PREFACE

Thank you for purchasing the GP Screen Editor Software, "GP-PRO/PB III for Windows Ver. 6.1" for use with Pro-face's GP series operator interfaces.

Please read this manual carefully in order to use this software properly, and be sure to keep this manual handy for future reference.

NOTES

(1) The copyrights to all programs and manuals included in the GP-PRO/PB III for Windows Ver. 6.1 (hereinafter referred to as "this product") are reserved by the Digital Electronics Corporation. Digital grants the use of this product to its users as described in the "Software Operating Conditions" documentation, included with this product's CD-ROM. Any actions violating the above-mentioned conditions are prohibited by both Japanese and foreign regulations.

(2) The contents of this manual have been thoroughly inspected. However, if you should find any errors or omissions in this manual, please inform your local GP representative of your findings.

(3) Regardless of article (2), the Digital Electronics Corporation shall not be held responsible for any damages or third party claims resulting from the use of this product.

(4) Differences may occur between the descriptions found in this manual and the actual functioning of this product. Therefore, the latest information on this product is provided in data files (i.e. Readme.txt files, etc.) and in separate documents. Please consult these sources as well as this manual prior to using the product.

(5) Even though the information contained in and displayed by this product may be related to intangible or intellectual properties of the Digital Electronics Corporation or third parties, the Digital Electronics Corporation shall not warrant or grant the use of said properties to any users and/or other third parties.

(6) The specifications set out in this manual are for overseas products only. As a result, some differences may exist between the specifications given here and for those of the identical Japanese product. Digital Electronics Corporation accepts no liability for issues related to the intellectual property rights of third parties or any issues related to the use of the information contained in or displayed by this product.

Digital Electronics Corporation, July 2002

For the rights to trademarks and trade names, see "TRADEMARK RIGHTS".

TRADEMARK RIGHTS

All company or product names used in this manual are the trade names, trademarks (including registered trademarks), or service marks of their respective companies.

This product omits individual descriptions of each of these rights.

Trademark / Trade Name	Right Holder
Microsoft, MS, MS-DOS, Windows, Windows 95, Windows 98, Windows Me, Windows XP, Windows NT, Windows 2000, Windows Explorer, Microsoft Excel	Microsoft Corporation, USA
Intel, Pentium	Intel Corporation, USA
Pro-face	Digital Electronics Corporation (in Japan and other countries)
Ethernet	Western Digital Electric Corporation, USA
IBM, VGA, IBM Compatible	International Business Machines Corporation (IBM), USA

The following terms differ from the above mentioned formal trade names and trademarks.

Term used in this manual	Formal Trade Name or Trademark
Windows 95	Microsoft® Windows®95 Operating System
Windows 98	Microsoft® Windows®98 Operating System
Windows Me	Microsoft® Windows®Me Operating System
Windows XP	Microsoft® Windows®XP Operating System
Windows NT	Microsoft® Windows NT® Operating System
Windows 2000	Microsoft® Windows®2000 Operating System
MS-DOS	Microsoft® MS-DOS® Operating System

LIST OF SUPPORTED MODELS

The following table lists the models compatible with GP-PRO/PB III for Windows Ver.6.1. The following series names or product names are used in the descriptions contained in this manual.

■ List of Supported GPs

Series		Product Name	Model	GP Type
GP70 series	GP-H70 series	GP-H70L	GPH70-LG11-24V	GPH70L
			GPH70-LG41-24VP	
		GP-H70S	GPH70-SC11-24V	GPH70S
			GPH70-SC41-24VP	
	GP-270 series	GP-270L	GP270-LG11-24V	GP270L
			GP270-LG21-24VP	
			GP270-LG31-24V	
		GP-270S	GP270-SC11-24V	GP270S
			GP270-SC21-24VP	
			GP270-SC31-24V	
	GP-370 series	GP-370L	GP370-LG11-24V	GP370L
			GP370-LG21-24VP	
			GP370-LG31-24V	
			GP370-LG41-24VP	
		GP-370S	GP370-SC11-24V	GP-370S
			GP370-SC21-24VP	
			GP370-SC31-24V	
			GP370-SC41-24VP	
	GP-470 series	GP-470E	GP470-EG11	GP470
			GP470-EG21-24VP	
			GP470-EG31-24V	
	GP-570 series	GP-570S	GP570-SC11	GP570
			GP570-SC21-24VP	
			GP570-SC31-24V	
		GP-570T	GP570-TC11	
			GP570-TC21-24VP	
			GP570-TC31-24V	
		GP-57JS	GP57J-SC11	
		GP-570VM	GP570-TV11	GP570VM
	GP-571 series	GP-571T	GP571-TC11	GP571T
	GP-675 series	GP-675S	GP675-SC11	GP675
		GP-675T	GP675-TC11	
			GP675-TC41-24VP	
	GP-870 series	GP-870VM	GP870-PV11	GP870VM
GP77 series	GP-377 series	GP-377L	GP377-LG11-24V	GP377L
			GP377-LG41-24V	
		GP-377S	GP377-SC11-24V	GP377S
			GP377-SC41-24V	
	GP-37W2 series	GP-37W2B	TP37W2-BG41-24V	GP37W2
GP77R series	GP-377R series	GP-377RT	GP377R-TC11-24V	GP377R
			GP377R-TC41-24V	
	GP-477R series	GP-477RE	GP477R-EG11	GP477R
			GP477R-EG41-24VP	
	GP-577R series	GP-577RS	GP577R-SC11	GP577R
			GP577R-SC41-24VP	
		GP-577RT	GP577R-TC11	
			GP577R-TC41-24VP	

1 Direct Access Communication

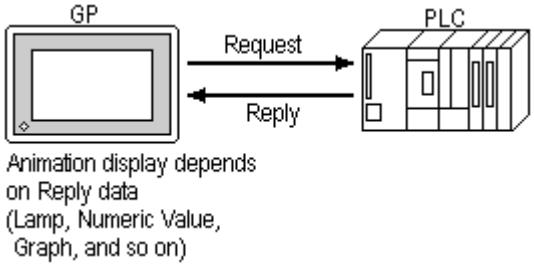
The *Direct Access* (Programless) format, which does not burden the PLC with protocol programs, runs communication between the GP and PLC. This chapter describes Direct Access Communication.

1.1 Communication Method

Depending on the part or tag setup, the GP can easily specify the PLC device. By doing so, the GP automatically requests the data required for operations (System Data) and the screen display from the PLC. Then the GP, depending on the PLC response, changes its screen display corresponding to its animation settings. Plus, data can be sent to the PLC using GP touch key input.

With Direct Access communication, the GP is always the master in the communication link.

In Direct Access Communication, data required by the screen display is automatically sent and received from the GP. Therefore, a PLC program for screen display operations is not necessary, thereby simplifying installation of the graphical control panel.



Caution

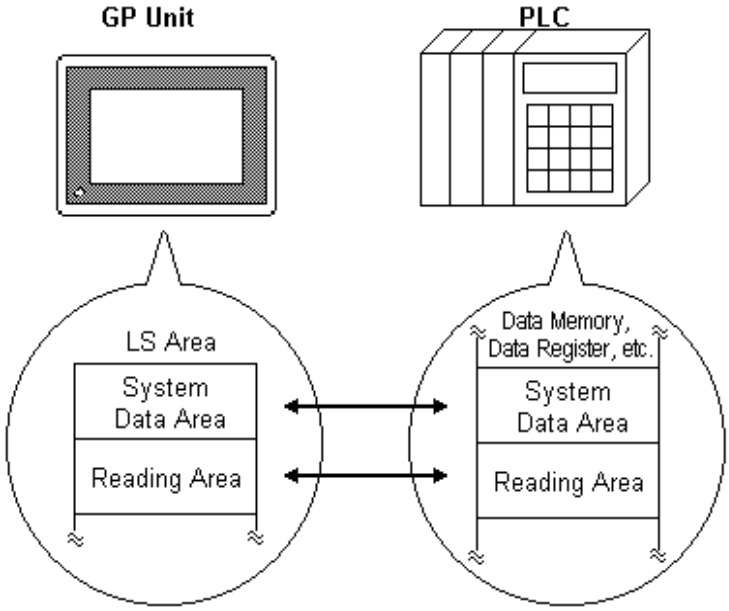
When an error occurs because data is read or written outside the PLC device range, the read/write operation continues retrying until the error is restored. For this reason, the action on the GP display screen may not seem to work. Check to make sure the device used for the part or tag is within the designated range for the PLC in use.

1.1.1 System Area Start Address

Setting up GP's INITIALIZE/STARTING ADDRESS OF SYSTEM DATA AREA automatically prepares the System Area in the PLC to make communication with the GP possible.

Reference *For more information on setting starting address of System Data Area, refer to "**PLC SETUP**" in each GP unit's User's manual (sold separately).*

Data Read/Write between GP and PLC



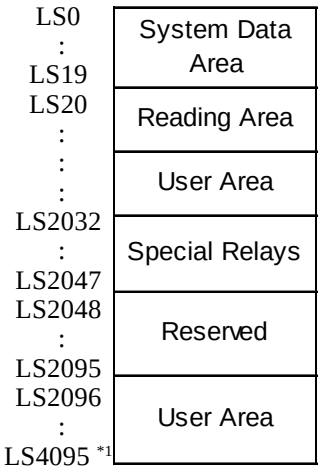
Note:

- **Depending on the PLC, the System Data Area can be set to a certain device. In that device, only the addresses not used by the PLC can be used for the System Data Area.**
- **Devices that are highlighted with a double lined box in the device table described in Chapter 2 and Chapter 5 are the only device areas that can be used for the System Area.**
- **The starting address of the system data area can also be specified using the GP-PRO/PBIII software's "system settings" area.**

Reference *For more information, refer to the GP-PRO/PBIII for Windows Operation Manual.*

1.1.2 LS Area Structure

The LS Area, located in the GP memory, is the area used for the GP's operations. The LS Area structure is as follows.



System Data Area This is the data write area for GP screen control data or error information necessary for operations.

Reading Area Stores data common to all screens, the block display data for trend graph, or video control data.*2 Up to 256 words can be designated here.

User Area The devices which are only for the GP's internal use, and cannot be allocated in the PLC. This area is used to process Parts and Tags which can only be processed by the GP internally and cannot be controlled by the PLC. This area can also store the video control data*2.

Important

When using the Device Monitor feature, the User Area (LS2096 to LS4095) will be reserved and cannot be used.

Special Relays This area, during GP communications, is where the various status information is setup.

Note:

The following describes how to access the LS Area.

• Word Address access

LS ****

└── 0000~4095

• Bit Address access

LS ** ****

└ Bit position 00~15 *3

└── Word Address 0000~4095

**1 GP2000 series units can use up to LS8191.*

**2 When using the GP-570VM, be sure to set the video control area (22 words). The video control area is designated in either the reading area or the user's area.*

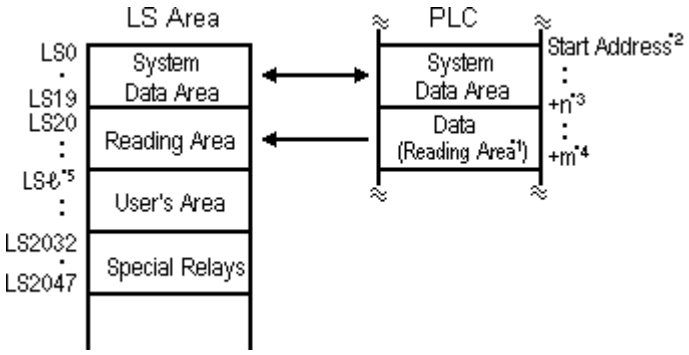
Each unit's User Manual (sold separately)

**3 Reference Yaskawa Electronic CP9200SH Series protocol, Bit No. is from 0 to F.*

Reserved Please do not use this area. It is only for GP's internal use. If you use this area, the GP will not operate properly.

1.1.3 About Each Address

Up to 20 words can be set as the System Data Area; up to 256 words can be set as the Reading Area.*1 The size of these determines each area's number of addresses.



Important

- ***Part or Tag addresses cannot be set so that they include the System Area and the Reading Area, or the Reading Area and the User's Area.***
- ***When setting Parts or Tags inside the System Data Area's addresses, specify their data length as 16 bits.***

**1 If the device range of your PLC is less than 256 words, the size of the PLC's device range minus the size of System Data Area gives the maximum size for the Reading Area.*

2 The Start Address means the start address of System Data Area specified in the **INITIALIZE menu.*

Reference *For more information, refer to "**5.5 PLC SETUP**" in each unit's User's Manual (sold separately)*

3 n = 0~20: Differs with the number of items selected for the System Data Area in the **INITIALIZE menu.*

**4 m = Reading Area Size*

**5 & = Reading Area Start Address (20) + Reading Area Size(m)*

1.1.4 Contents and Range of System Data Area

The following table describes the data write contents of the System Area for each address.

■ For a PLC using 16-bit addressing

- ***If your PLC supports only 8-bit addresses, please refer to the table on page 1-1-9.***
- ***When you wish to turn off the GP's display, use the display's ON/OFF bit (word address +9). Do not use the Control area's Backlight OFF bit (word address +14).***

- **The Word Address values assume that all the items have been selected for the System Data Area in the GP's INITIALIZE menu.**
- **Here, "item #" represents the item numbers shown in the System Environment Setup area's SYSTEM AREA SETUP; found in the GP OFFLINE mode's INITIALIZE area.**

	Item #	Word Addr	Contents	Bit	Detail
GP ↓ PLC Exclusive Writing Area	1	+0	Display Screen Number	1 to 8999 (However, 1 to 1999 when using BCD input)	
	2	+1	Error Status	0,1	Not used
			Each bit changes to reflect the GP error status. When an error occurs, the bit is set ON. A bit that has turned ON remains ON until the power is turned OFF and back ON, or until RUN mode is re-entered from OFFLINE mode. For Error Status data and processing notes, refer to the end of this section.	2	System ROM/RAM
				3	Memory Checksum
				4	SIO Framing
				5	SIO Parity
				6	SIO Over-run
				7,8	Not used
				9	Memory requires Initialization
				10	Timer Clock Error
				11	PLC
				12 to 15	Not used
	3	+2	Current YEAR, BCD 2 digits	Last two digits	
		+3	Current MONTH, BCD 2 digits	01 to 12 (month)	
		+4	Current DAY, BCD 2 digits	01 to 31 (date)	
		+5	Current TIME, BCD 4 digits	00 to 23 hr, 00 to 59 min	
	4	+6	Status *5	0,1	Reserved
				2	Now Printing *1
				3	Writes a set value *2
				4 to 6	Reserved
				7	PLC monopoly *3
				8	K-tag entry error *4
				9	Display 0: Possible, 1: Not Possible *6
				10	Backlight OFF *7
				11	Touch-panel input error *8
				12 to 15	Reserved
	5	+7	Reserved		

	Item #	Word Addr	Contents	Bit	Detail
PLC ↓ GP Exclusive Reading Area	6	+8	Change Screen Number	1 to 8999 (However, 1 to 1999 when using BCD input)	
	7	+9	Screen Display On/Off *15	FFFFh: Screen clears almost immediately. 0h: Screen turns ON. All other bits are reserved.	
	8	+10	Clock's YEAR set value, BCD 2 digits (+flag)	Last 2 digits (bit #15 is the clock's data write change flag *9)	
		+11	Clock's MONTH set value, BCD 2 digits	01 to 12	
		+12	Clock's DATE set value, BCD 2 digits	01 to 31	
		+13	Clock's TIME set value, BCD 4 digits	00 to 23 Hr: 00 to 59 Min	
	9	+14	Control *16	0	Backlight OFF *10
				1	Buzzer ON
				2	Starts printing
				3	Reserved
				4	Buzzer *11 0: Enabled, 1: Disabled
				5	AUX Output *11 0: Enabled, 1: Disabled
				6	Reserved
				7	PLC monopoly *12 0: Disabled, 1: Enabled
				8	VGA Display *13 0: Disabled, 1: Enabled
				9,10	Reserved
				11	Hard copy output *14 0: Enabled, 1: Disabled
				12 to 15	Reserved
	A	+15	Reserved	Set to 0	
	B	+16	Window Control *17	0	Display - 0: OFF, 1: ON
				1	Changing the order of window overlapping 0: Possible, 1: Not Possible
				2 to 15	Reserved
	C	+17	Window Registration Number *17	Global Window registration number selected by Indirect setup (Bin/BCD)	
	D	+18	Window Display Position (X coordinate data) *17	Global Window display coordinates selected by Indirect setup (Bin/BCD)	
		+19	Window Display Position (Y coordinate data) *17		

**1 This bit turns on during printing. Changing to OFFLINE mode while this bit is ON can scramble the print output.*

**2 Every time a value is written with the K-tag or Keypad Input Display, the bit is reversed.*

**3 When using Multi-link, the bit turns ON in the middle of PLC Monopolize.*

**4 When an alarm is setup in the middle of K-tag input, and a value outside the alarm range is entered, the bit turns ON. When you enter a value within the alarm range, or a screen change takes place, the bit turns OFF.*

*5 Monitor, in bit units, only the necessary bits. Since reserved bits may be used for GP system maintenance, etc., their ON/OFF status is not defined.

*6 <Display ON/OFF status>

The screen display ON/OFF can be detected from the PLC. This bit will change in the following cases:

(1) "FFFF" is written to the system data area's screen display ON/OFF bit (LS9 when using link type), to turn the screen display OFF. (Bit 9 = 1)

(2) After the stand-by time has elapsed, the screen display OFF bit is turned ON automatically. (Bit 9 = 1)

(3) The screen display OFF status has been changed to the screen display ON status via screen switching, etc. (Bit 9 = 0)

(4) The screen display ON/OFF status bit will not change via turning ON/OFF the system data area backlight OFF bit (Bit 0).

*7 <Backlight Burnout Detection>

The bit turns ON when backlight burnout is detected. This feature is available only on GP-377R, GP-377, GP2000, and GLC2000 series unit.

*8 <Touch-panel input error>

The touch-panel input error bit is turned ON when input in the same position continues for longer than the specified time.

*9 When the data write flag changes (OFF—>ON, or ON—>OFF), the clock data is rewritten.

E.g. October 16, 1995, 9:57 pm

The current data in word address +10 is 0000.

Month, Date, Time data is written as follows:

- In word address +11 0010
- In word address +12 0016
- In word address +13 2157

When the YEAR's 15th bit is turned on, the data is written.

- Inputting 8095 into word address +10 causes the clock datato rewrite.

*10 With the GP series except GP-477R, GP-470 and GP870 series units, the back-light turns OFF when this bit is ON(LCD display does not change) and turns ON when the bit is OFF.

When the Backlight OFF bit (word address +14) turns ON, only the backlight will turn OFF, however, the LCD display will remain ON and all touch switches set up on the display can still be used. Use the Screen display ON/OFF bit (word address +9) to actually turn the screen display OFF.

*11 Control Bit 1(Buzzer On) is output as shown below.

Buzzer output ..... When control bit 1 is ON, the GP internal buzzer is activated.

*12 When using n:1 (multi-link), PLC is monopolized when ON.

Reference Refer to ***Chapter 4.5, "About PLC Monopolize."***

**13 <Control VGA display>*

When the control VGA display bit is turned ON, the entire screen becomes a VGA display in the compatible mode using the VM unit with the GP-570VM, GP-870VM, or GP-2500/GP-2600.

When the VM unit is used with the GP-570VM, GP-870VM, or GP-2500/GP-2600 in the compatible mode, turning the control VGA display bit ON makes the entire screen a VGA display. Touching any position on the screen during the VGA display turns this bit OFF.

**14 Turning ON bit 11(Hard Copy Output) in the Control Area (word address +14) cancels the current printing of the display's hard copy.*

- *After printing is cancelled, bit 11, however, will not turn OFF automatically. Therefore, after checking the Status Area's Now Printing bit, turn OFF the Control Area's bit 11.*
- *When bit 11 in the Control Area is turned ON, hard copy cannot be created. If you cancel printing before it is completed, printing will stop after the last line of data on the panel's current display has been output. Data already input in the printer buffer's memory will not be deleted.*

**15 After the screen display ON/OFF bit (word address +13) is set to OFF, simply touching the screen will turn the display ON again.*

**16 Be sure to turn all reserved bits OFF since they may be used for GP system maintenance, etc.*

When writing data to the Control Area (Address +14) be sure to use bit units. Writing data in Word units can cause values to change.

**17* 

*For more about windows, refer to "**2.26 U-tag (Window Display)**" in the Tag Reference Manual.*

■ For a PLC using 8-bit addressing

Important

- ***The* Byte Address *values assume all the items have been selected for INITIALIZE's System Area. They differ depending upon whether the PLC addresses are displayed as decimal or octal.***
- ***The High and Low positions of the Byte Address of all items vary among PLCs.***
- ***To turn OFF the screen display, normally use address +18 (decimal) or address +22 (octal) (turning ON/OFF the screen display), rather than the Backlight OFF bit at address +28 (decimal) or address +34 (octal) (control).***

Note:

- **Here, "item numbers" represent the item numbers shown in the [System Environment Setup] area's [SYSTEM AREA SETUP]; found in the GP OFFLINE mode's [INITIALIZE] area.**

	Item #	Byte Addr		Contents	Bit	Detail
		Decimal	Octal			
GP ↓ PLC Exclusive Writing Area	1	+0	+0	Display Screen Number	1 to 8999 (However, 1 to 1999 when using BCD input)	
		+1	+1			
	2	+2	+2	Error Status Each bit changes to reflect the GP error status. When an error occurs, the bit is set ON. A bit that has turned ON remains ON until the power is turned OFF and back ON, or until RUN mode is re-entered from OFFLINE mode.	0,1	Not used
					2	System ROM/RAM
					3	Memory Checksum
					4	SIO Framing
					5	SIO Parity
					6	SIO Over-run
					7	Not used
		+3	+3	For details and the handling process about the Error Status contents, refer to the end of this section.	0	Not used
					1	Memory requires Initialization
					2	Timer Clock Error
					3	PLC SIO Error
					4 to 7	Not used
	3	+4	+4	Current YEAR BCD 2digits	Last 2 digits	
		+5	+5			
		+6	+6	Current MONTH BCD 2digits	01 to 12 (month)	
		+7	+7			
		+8	+10	Current DAY BCD 2digits	01 to 31 (date)	
		+9	+11			
		+10	+12	Current TIME BCD 4digits	00 to 23 hr, 00 to 59 min	
		+11	+13			

	Item #	Byte Addr		Contents	Position	Bit	Detail
		Decimal	Octal				
GP ↓ PLC	4	+12	+14	Status *7	Low	0,1	Reserved
						2	Now Printing *1
						3	K-tag write *2
						4 to 6	Reserved
						7	PLC Monopoly *3
		+13	+15		High	0	K-tag entry error *4
						1	Display: 0:ON, 1:OFF
						2	Backlight Burnout Detection *5
						3	Touch-panel input error *6
						4 to 7	Reserved
	5	+14	+16	Reserved			
		+15	+17				
PLC ↓ GP Exclusive Reading Area	6	+16	+20	Change Screen Number	1 to 8999 (However, 1 to 1999 when using BCD input)		
		+17	+21				
	7	+18	+22	Screen Display On/Off *16	FFFFh: Screen clears almost immediately. 0h: Screen turns ON. All other bits are reserved.		
		+19	+23				
	8	+20	+24	Clock's YEAR setup value BCD 2 digits (+flag)	Last 2 digits (15th bit of high address is the clock's data write change flag *8)		
		+21	+25				
		+22	+26	Clock's MONTH setup value BCD 2 digits	01 to 12		
		+23	+27				
		+24	+30	Clock's DATE setup value BCD 2 digits	01 to 31		
		+25	+31				
		+26	+32	Clock's TIME setup value BCD 4 digits	00 to 23 Hr: 00 to 59 Min		
		+27	+33				
	9	+28	+34		Low	0	Backlight OFF *9
						1	Buzzer ON
						2	Starts printing
						3	Reserved
						4	Buzzer *10 0: Enabled, 1: Disabled
						5	AUX Output *10 0: Enabled, 1: Disabled
						6	Reserved
						7	PLC Monopoly *11 0: Disabled, 1: Enabled
		+29	+35		High	0	VGA Display *12 0: Disabled, 1: Enabled
						1 to 2	Reserved
						3	Hard Copy output 0: Enabled, 1: Disabled
						4 to 7	Reserved
	A	+30	+36	Reserved	Set to 0		
		+31	+37				

	Item #	Byte Addr		Contents	Position	Bit	Detail
		Decimal	Octal				
PLC ↓ GP Exclusive Reading Area	B	+32	+40	Window Control *13 *15	Low	0	Display 0: Possible, 1: Not Possible
						1	Changing the order of window overlapping 0: Possible, 1: Not Possible
		+33	+41			2 to 15	Reserved
					High	2 to 15	Reserved
	C	+34	+42	Window Registration Number *13	Selected Global registration number for Indirect setup (Bin/BCD)		
		+35	+43				
	D	+36	+44	Window Display Position (X coordinate data) *13	Global Window display coordinates for Indirect setup (Bin/BCD)		
		+37	+45				
		+38	+46	Window Display Position (Y coordinate data) *13	Global Window display coordinates for Indirect setup (Bin/BCD)		
		+39	+47				

**1 This bit turns ON during printing. Changing to OFFLINE mode while this bit is ON can scramble the print output.*

**2 Every time a value is written with the K-tag, the bit is reversed.*

**3 When using Multi-link, the bit turns on in the middle of PLC Monopolize.*

**4 When an alarm is set up in the middle of K-tag input, and a value outside the alarm range is entered, the bit turns ON. When you enter a value within the alarm range, or a screen change takes place, the bit turns OFF.*

**5 <Backlight Burnout Detection>*

The bit turns ON when backlight burnout is detected. This feature is available only on GP-377R, GP-377, GP2000, and GLC2000 series unit.

**6 <Touch-panel input error>*

The touch-panel input error bit is turned ON when input in the same position continues for longer than the specified time.

**7 The vertical relationship of addresses differs depending on the PLC type.*
Monitor, in bit units, only the necessary bits.
Since reserved bits may be used for GP system maintenance, etc., their ON/OFF status is not defined.

**8 When the data write flag changes (OFF—>ON, or ON—>OFF), the clock data is rewritten.*

E.g. October 16, 1995, 9:57 pm

The current data in byte data addresses +24 and +25 is 0000.

Month, Date, Time byte data is written as follows:

- *In byte addresses +26,27 0010*
- *In byte addresses +30,31 0016*
- *In byte addresses +32,33 2157*

When the YEAR's 15th bit is turned on, the data is written.

- *Inputting 8095 into byte addresses +24 and +25 causes the clock data to rewrite.*

**9 For GP-675, GP-570, GP-577R, GP-370, GP-270, and GP-H70, the backlight turns OFF when this bit is ON. (LCD displays do not change.) Lights up when this bit turns OFF. When the Backlight OFF bit (byte address +34) turns ON, only the backlight will turn OFF, however ,the LCD display will remain ON, and all touch switches set up on the display can still be operated. Use the Screen display ON/ OFF bit (byte address +22) to turn OFF the screen display.*

**10 Control Bit 1(Buzzer On) is output as shown below.*

Buzzer output ..... When control bit 1 is ON, the GP internal buzzer is activated.

AUX output ..... When control bit 1 is ON, the AUX buzzer is activated.

11 When using **n:1 (multi-link), PLC is monopolized when ON.*

Reference *Refer to **Chapter 4.5, "About PLC Monopolize**."*

**12 For GP-570VM, the entire screen becomes a VGA display. Pressing a free position on the screen in the middle of VGA display turns this OFF.*

13* Reference *For more about windows, refer to "2.26 U-tag (Window Display)**" in the Tag Reference Manual.*

**14 The vertical relationship of addresses differs depending on the PLC type. Be sure to keep all Reserved bits turned OFF, since these bits may be needed for the GP system maintenance.*

**15 The vertical relationship of addresses differs depending on the PLC type.*

**16 After the screen display ON/OFF bit in byte address +22 is set to OFF, simply touching the screen will turn the display ON again.*

**17 Turning ON bit 3(Hard Copy Output) in the Control Area (byte address +35) cancels the current printing of the display's hard copy.*

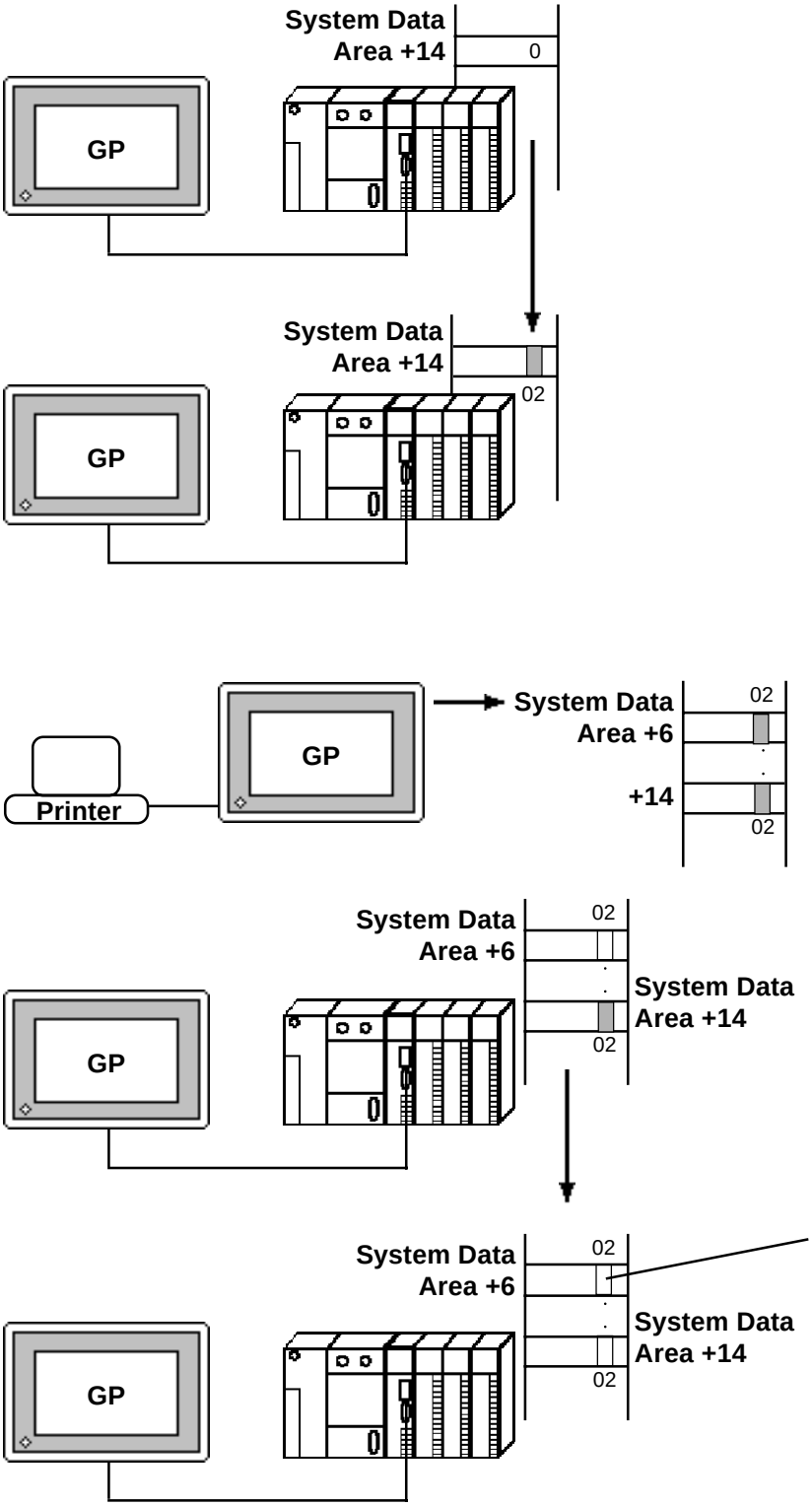
- After printing is cancelled, bit 3, however, will not turn OFF automatically. Therefore, after checking the Status area's Now Printing bit, turn OFF Control area bit 3.

- When bit 3 in the Control area is turned ON, hard copy cannot be created. If you cancel printing before it is completed, printing will stop after the last line of data on the panel's current display has been output. Data already input in the printer buffer's memory will not be deleted.

■ Error Status Contents and Correction Process

Error	Origin	Solution
System ROM/RAM	Problem with the hardware	Run Self-Diagnosis.
Memory Checksum	Because the screen file is corrupted, the screen memory data checksum does not match.	After powering up, check the screen where the error developed. (For details, refer to your Use's Manual, "Error Message" section.)
SIO Framing	Framing error	Check the SIO Setup. (For details, refer to you User's Manual, "Would Not Communicate" section.)
SIO Parity	Parity error	
SIO Over-run	Over-run error	
Memory requires Initialization	Internal Memory has not been initialized.	Initialize internal memory.
Timer clock Error	The GP internal clock has been interrupted.	The GP internal battery may be drained. Contact your local GP distributor for service.
PLC SIO Error (only for Direct Access type)	Either the SIO setup between the GP and PLC do not match, or an error has developed on the PLC side.	Check the SIO Setup. (For details, refer to you User's Manual, "Would Not Communicate" section.)

■ Printing out from the GP



1) When the second bit in PLC System Data Area +14 is turned ON, (data 4) is written.

2) When the second bit in System Data Area +14 is turned ON, the on-screen data is output to the printer for (hard copy).

At the same time, the second bit in System Data Area +6 is turned ON.

3) After printing is finished, the second bit in System Data Area +6 turns OFF,however, the second bit in System Data Area +14 remains ON.

4) After checking the second bit in System Area +6 turned OFF,

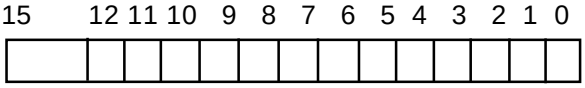
please turn OFF the second bit in System Area +14. Be sure to use the PLC to turn this bit OFF.

1.1.5 Special Relays

The structure of the GP-*70 Series' Special Relays is as follows.

LS2032	Common Relay Information	
LS2033	Base Screen Information	
LS2034	Reserved	
LS2035	1 Second Binary Counter	
LS2036	Tag Scan Time	
LS2037	SIO Cycle Time	
LS2038	Tag Scan Counter	
LS2039	SIO Error Code	
LS2040	max Token Circulation Speed	Used only with n:1 multi-link connection
LS2041	current Token Circulation Speed	
LS2042 : LS2047	Reserved	

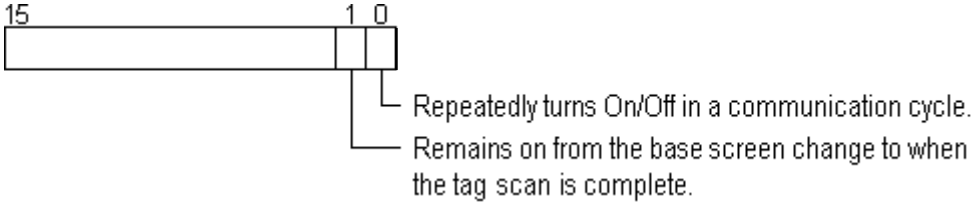
■ **Common Relay Information** (LS2032)



Bit	Contents
0	Repeatedly turns ON/OFF in a communication cycle.
1	Remains ON after when a screen change (base, window)occurs until the tag scan is complete.
2	ON only in the middle of an SIO error developing.
3	ON when displaying the Initial screen after powering up.
4	Always ON
5	Always OFF
6	Turns ON when backup SRAM data has been delated (Only for GP's equipped with backup SRAM).
7	Turns ON if a BCD error occurs while D script is being used. For more information about D script, refer to the Tag Reference Manual's section 3.1 "D script".
8	Turns ON if a zero division error occurs while D script is being used.
9	Filing data. Turns ON if the data is not transferred to Backup SRAM.
10	Filing data transfer is triggered by the Control Word Address. Turns ON if the data can not be transferred from PLC to SRAM. Also data transfer between PLCs is triggered by the Filing Data Display. Turns ON if the data is not transferred from PLC to SRAM only when the transfer complete bit address is used.
11	Filing data. Via transfer data to and from SRAM to LS area, via Filing Data Display.
12	When using D-script, turns ON if a communication error occurs when the function memcpy () is used, or reading the data from designated Address Offset. Turns OFF when data read is normally completed.
13-15	Reserved

Reference *For more information about D script, refer to Tag Reference Manual "**3.1 D-Script/ Global D-Script**".*

■ **Base Screen Information** (LS2033)



■ **Reserved** (LS2034)

The *Reserved* area value is indeterminate. Do not use this area.

■ **1 Second Binary Counter** (LS2035)

Begins counting in 1 second units, after powering up. The data is in binary format.

■ **Tag Scan Time** (LS2036)

The time it takes to scan the setup screen display tags. The data is stored in binary *ms* units. The data renews at the point when the management of all the object tags is complete. The initial data value is **0**. The measured time may differ by ± 10ms with the actual time.

■ **SIO Cycle Time** (LS2037)

The time it takes in 1 cycle, from the beginning to the end, to scan the SIO object (PLC internal System Area) and various devices. The data renews at the point when the management of the System Area and all the object devices is complete. The initial data value is **0**. The unit is 10ms.

■ **Tag Scan Counter** (LS2038)

Begins counting in binary units, roughly when the scan of the tags setup on the display screen is complete.

■ **SIO Error Code** (LS2039)

When an SIO error arises, the SIO error code displayed last is stored in binary data.

■ **Maximum Token Circulation Speed** (LS2040)
(only when using **n:1** Multi-link connection)

The maximum time it takes for the *token packet* (the right to communicate exclusively to the PLC) to circulate to the **n** number of connected GP's. The data is stored in binary *ms* units. The data renews when the maximum value changes or a screen change occurs. Its initial data

value is **0**. The unit is 10ms.

■ **Current Token Circulation Speed** (LS2041)

(only when using **n:1** Multi-link connection)

The current time it takes for the *token packet* (the right to communicate exclusively to the PLC) to circulate to the **n** number of connected GP's. The data is stored in binary *ms* units. The data renews when the current value changes or a screen change occurs. The initial data value is **0**. The unit is 10ms.

- ***If a problem occurs which causes an SIO error for an extended period of time, such as the unit's data transmission cable becomes loose or disconnected, etc., it may ultimately create a System Error. When this occurs, reset the GP.***
- ***When using the 1 Second Binary Counter and Tag Scan Counter value as the W-tag's monitor bit or D script's trigger bit, and the SIO error condition continues, it may develop into a System Error. When this occurs, reset the GP.***

Special Relays are not write protected. Be careful not to use a tag to overwrite this data.

When using a 1:1 connection, the initial Token Circulation Speed values remain (0).

Series			Product Name	Model	GP Type
GP2000 series	GP2000H series	GP-2301H series	GP-2301HL	GP2301H-LG41-24V	GP2301HL
			GP-2301HS	GP2301H-SC41-24V	GP2301HS
		GP-2401H series	GP-2401HT	GP2401H-TC41-24V	GP2401H
		GP-2300 series	GP-2300L	GP2300-LG41-24V	GP2300L
			GP-2300T	GP2300-TC41-24V	GP2300
		GP-2301 series	GP-2301L	GP2301-LG41-24V	GP2301L
			GP-2301S	GP2301-SC41-24V	GP2301S
		GP-2400 series	GP-2400T	GP2400-TC41-24V	GP2400
		GP-2500 series	GP-2500L	GP2500-LG41-24V	GP2500L
			GP-2500S	GP2500-SC41-24V	GP2500S
			GP-2500T	GP2500-TC11	GP2500
				GP2500-TC41-24V	
		GP-2501 series	GP-2501S	GP2501-SC11	GP2501S
			GP-2501T	GP2501-TC11	GP2501
		GP-2600 series	GP-2600T	GP2600-TC11	GP2600
				GP2600-TC41-24V	

◆ GLC Series

Series		Product Name	Model	GP Type
GLC100 series	GLC100 series	GLC100L	GLC100-LG41-24V	GLC100L
		GLC100S	GLC100-SC41-24V	GLC100S
GLC300 series	GLC300 series	GLC300T	GLC300-TC41-24V	GLC300T
GLC2000 series	GLC2300 series	GLC2300L	GLC2300-LG41-24V	GLC2300L
		GLS2300T	GLC2300-TC41-24V	GLC2300
	GLC2400 series	GLC2400T	GLC2400-TC41-24V	GLC2400
	GLC2600 series	GLC2600T	GLC2600-TC41-24V	GLC2600

◆Factory Gateway

Product Name	Model	GP Type
Factory Gateway	FGW-SE41-24V	Factory Gateway FGW-SE

Note:

- **For a list of the Device/PLC units the Factory Gateway can connect to, please refer to the [Factory Gateway Connection Tool Operation Manual].**
- **To use GP-Web and GP-Viewer features with the Factory Gateway unit, the GP-PRO/PBIII C-Package02 software is required.**

HOW TO USE THIS MANUAL

■Structure of this Manual

The "Device/PLC Connection Manual" is the fourth of four manuals for this product, and explains how to use the "GP-PRO/PB III for Windows Ver. 6.1" software (hereafter referred to as "this product"). Please refer to all of these manuals when using this product.
In addition to these manuals, data files containing supplemental information on updated functions are also provided.
To read these files, click on the [Start] button in your Windows OS main screen and select the [Programs]→[Pro-face]→[ProPB3 C-Package] menu. Then click on the [Read Me] selection.
For detailed information about GP series products, please refer to each GP's "User Manual" . (Optionally available)

Vol. 1	**Operation Manual**	Describes this product's operation procedures and all standard functions. (provided as PDF data)
Vol. 2	**Tag Reference Manual**	Describes the function of and detailed settings for all GP-PRO/PBIII Tags. (provided as PDF data)
Vol. 3	**Parts List**	Describes this product's pre-made Parts and symbols. (provided as PDF data)
Vol. 4	**Device/PLC Connection Manual (this manual)**	Describes the methods for connecting the GP to other, supported manufacturer PLCs. (provided as PDF data)

* The GP-PRO/PB III Manual describes the procedures for developing GP screens. When developing GLC, simply substitute "GLC" for "GP".

The PDF Manual CD-ROM also contains "Screen Data Layout Sheets" in Excel format. To view this data, use your Excel program to open any of the files shown below.
These sheets are useful for designing tag address settings, etc. and example sheets are installed as part of the GP-PRO/PBIII for Windows standard installation.
The following two layout sheets, "Device Allocation Table" and "Tag Layout Sheet", are in Microsoft Excel format and are located in the PDF Manual CD-ROM.

The following file location and file names are used.

Folder Name	File Name	Contents
Pro-face/propbwin/sheet	Device1E.xls	Device Allocation Table
	TAG1E.xls TAG2E.xls TAG3E.xls TAG4E.xls	Tag Layout Sheet

For information on the use of Microsoft Excel, please refer to the Excel software's User Manual.

■ Designation of Supported Models

The functions and settings supported by each model may vary depending on the supported models. In this manual, explanations given are based on the variation of the “Series” and “Product name” described in the “List of Supported Models”.

MANUAL SYMBOLS AND TERMINOLOGY

This manual uses the following symbols and terminology.

If you have any questions about the contents of this manual, please contact your local GP distributor.

Also, if you have any question about your personal computer or Windows, please contact your PC distributor or manufacturer.

■ Safety Symbols and Terms

This manual uses the following symbols and terms to identify important information related to the correct and safe operation of this product.

Symbol	Description
	Indicates a potentially hazardous situation that could result in serious injury or death.
	Indicates a potentially hazardous situation that could result in minor injury or equipment damage.
	Indicates a potentially damaging action or dangerous situation that could result in abnormal equipment operation or data loss.
	Indicates instructions or procedures that must be performed to ensure correct product use.
	Indicates instructions or procedures that must not be performed.

■ General Information Symbols and Terms

This manual uses the following symbols and terms for general information.

Symbol	Description
	Provides hints on correct product use, or supplementary information.
	Indicates an item's related information (manual name, page number).
IBM Compatible	Indicates a PC that can run the Windows® operating system.
PLC	Abbreviation for Programmable Logic Controller. Includes programmable logic controllers and sequencers.
GP	Generic name for the "GP Series" of programmable operator interface made by the Digital Electronics Corporation.
GLC	Generic name for the "GLC Series" of Graphic Logic Controller made by the Digital Electronics Corporation.

The meaning of symbols used in the section titled "Supported Devices" in Chapter 2 and Chapter 5 are described below.

oct8	Setup the address as Octal
xxx0	Word address' bottom column bit can only be set to 0
÷16	Word address can only be set to multiples of 16
÷16+1	Word address can only be set to multiples of 16 + 1
÷2	Word address can only be set to even numbers
÷8	Word address can only be set to multiples of 8
Bit15	Bit setup possible. After the word address, set the bit position, from 0~15
BitF	Bit setup possible. After the word address, set the bit position, from 0~F
Bit7	Bit setup possible. After the word address, set the bit position, from 0~7
Bit31	Bit setup possible. After the word address, set the bit position, from 0~31
L/H	When using 2 words (32 bit data), the relationship between the top and bottom data is: 0 **L** (low pos.) 1 **H** (high pos.)
H/L	When using 2 words (32 bit data), the relationship between the top and bottom data is: 0 **H** (high pos.) 1 **L** (low pos.)

The device ranges listed in the sections titled "Supported Devices" are the maximum setup ranges. The ranges may be smaller than illustrated, depending on your PLC type. For further details, refer to the corresponding PLC manual.

Setup the System Area in the devices that are shaded.

Reference *For information on System Area, refer to "**1.1 Communication Method**"*

TABLE OF CONTENTS

Chapter 3 Memory Link Communication

Chapter 4 n:1 (Multi-link)

Chapter 5 PLC-GP Connection (Multi-link)

Chapter 13 Inverters

Chapter 14 Servos

Chapter 15 Analyzers

Chapter 16 Connecting to the Handy Type GP

A1 Maximum Number of Consecutive PLC Addresses

A 2 Device Codes and Address Codes

A 3 Device Monitor

1.2 Efficient Data Communication

When using the PLC Direct Access Type, the GP unit communicates based on the device addresses set on each screen. As a result, the more parts or tags set on a screen, the more data is transferred, reducing the communication speed. For this reason, to speed up the response times, make data communication as efficient as possible.

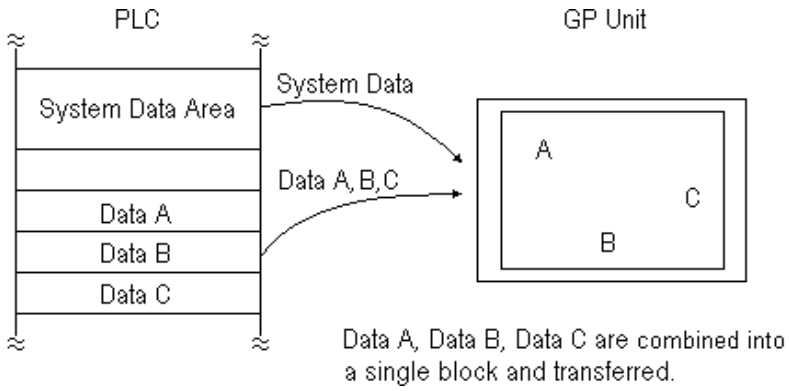
On the GP, in addition to the ordinary communication method, there are the *Block Transfer* and *LS Area Communication* methods, which upgrade data transfer efficiency.

1.2.1 Block Transfer

When displaying consecutive PLC devices on the GP, the GP automatically groups the transmission data into a block, which increases the communication speed.

The addresses in the determined data number range[*1] must be consecutive to use Data Block Transfer.

When parts or tags are set up in consecutive addresses, the GP automatically reads the data as a single block. When you wish to transfer a block, design your part or tag layout so that the addresses are consecutive.



**1 The maximum number of consecutive addresses is limited by the PLC device. Refer to the Appendix, "Maximum Number of Consecutive Addresses".*

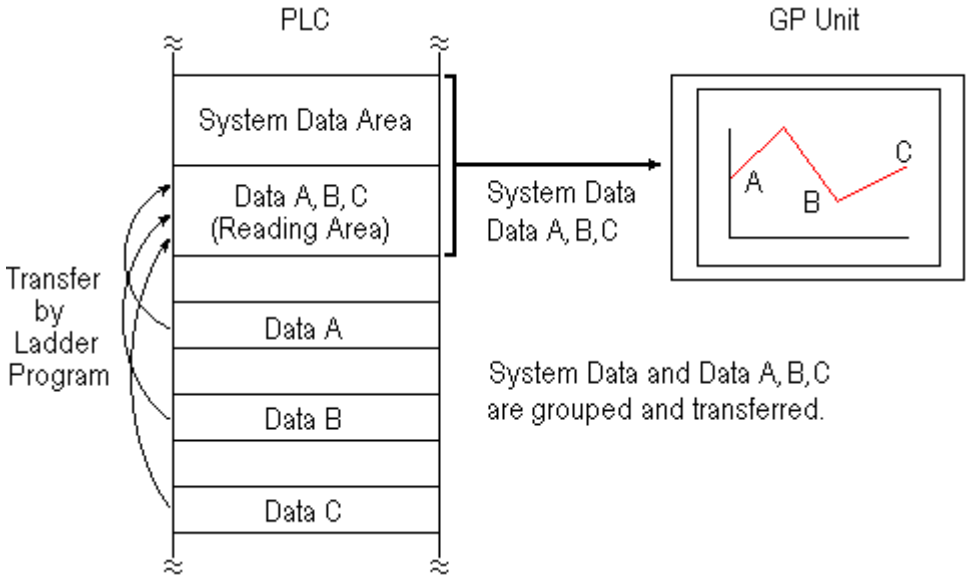
1.2.2 LS Area Communication

Use the LS area for communication in the following cases: when there is display data common to all screens, when there is Trend Graph block display data, or when a video window display is used. (GP-570VM only)

To run LS Area communication, first set up the size of the Reading Area in GP's INITIALIZE setting. Then transfer the common display data or block display trend graph data to the Reading Area, allocated in the PLC's internal memory. (Transfer according to the PLC ladder program.)

By doing so, the data transferred into the Reading Area *and* the System Data is transmitted to the GP unit in one transmission.

By using the LS Area Communication method, no matter what screen is displayed on the GP, the System Data is transmitted continually. Therefore, to change screens quicker, use LS Area Communication instead of Block Transfer.



Important

- ***Use LS Area transmission only when there is data common to all screens, when Trend Graph block display data is available, or when a video window display is being used. Otherwise, communication efficiency will not be realized.***
- ***Setting up a Reading Area that is too large can cause the display of tags that do not use the Reading Area, or can slow data communication speed.***
- ***When there are many parts or tags on a screen, set all the parts or tags to consecutive addresses. Block data transfer can be utilized as a result, speeding up transmission.***

1.2.3 Reset GP on Data Write Error

If a Write error occurs, you can cancel the error from the error display. You will need to set up this feature beforehand via the GP's OFFLINE mode's INITIALIZE area.

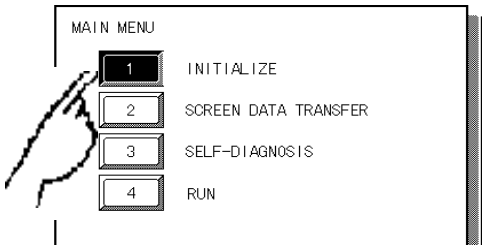
Reference Each GP User's Manual OFFLINE Mode

Note:

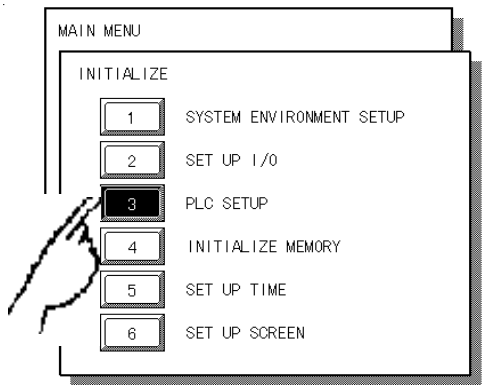
- **This feature is available only with GP77R, GP-377, GP-2000 series units.**
- **The factory setting is OFF.**

The following list shows the PLC types which do not support this feature.

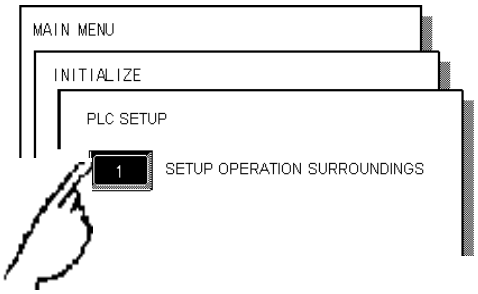
SIEMENS	Profibus Interbus-S Slave
Allen-Bradley	PLC-5 DataHighway+ SLC500 Remote I/O
Modicon	Modibus Slave Modibus Plus
Device Net Slave I/O	
CC-Link	
Memory Link SIO	
Memory Link Ethernet	



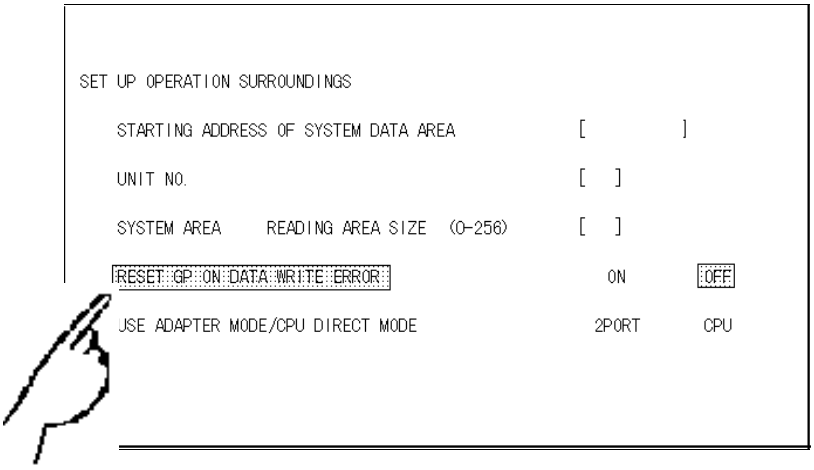
1) Touch item #1, INITIALIZE. The INITIALIZE menu will appear.



2) Touch item #3, PLC SETUP. The PLC SETUP menu appears.



3) Touch item #1, SET UP OPERATION SURROUNDINGS. The SET UP OPERATION SURROUNDINGS menu will appear.

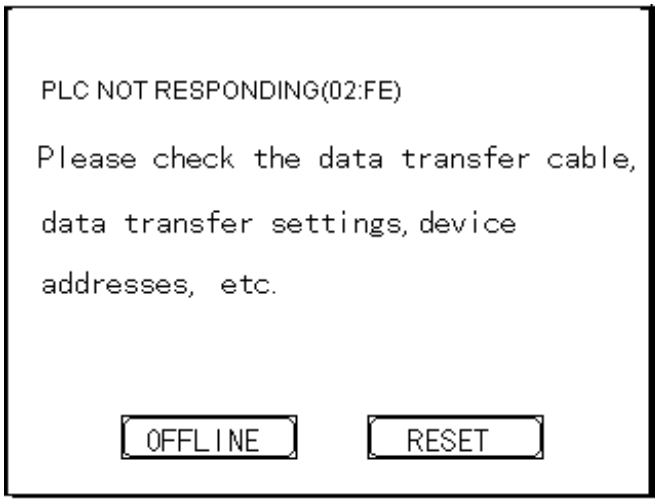


4) Touch the “RESET GP ON DATA WRITE ERROR” selection. The selected item is highlighted.

5) When DATA WRITE ERROR occurs, select ON to cancel the data write error.

When a DATA WRITE ERROR occurs, the screen shown here will be displayed.

*OFFLINE Mode Reference GP User Manual OFFLINE Mode



- If you select "OFFLINE" : The main menu will be displayed.
- If you select " RESET" : The GP will be reset, then change automatically to "OFFLINE" mode and a DATA WRITE ERROR will not occur.

1.3 Connectable PLCs

The following tables list the PLCs that can be connected and used with the GP.

Reference *For more information on connectable PLC models that are also Multi-Link unit compatible, "**4.2 Connectable PLCs**".*

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
MITSUBISHI	MELSEC-A	A2A, A3A , A4U	AJ71C24-S6 AJ71C24-S8 AJ71UC24		MITSUBISHI MELSEC-AnA (LINK)	○	○
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnA (CPU)	○	X
		A2U, A3U	AJ71C24-S6 AJ71C24-S8 AJ71UC24		MITSUBISHI MELSEC-AnA (LINK)	○	○
		A2U-S1, A3U, A2US-S1	CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnA (CPU)	○	X
		A0J2, A0J2H	A0J2-C214-S1		MITSUBISHI MELSEC-AnN (LINK)		
		A0J2H	CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnN (CPU)		
		A1N, A2N, A3N	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24	The link unit, AJ71UC24 has been confirmed only with A2N CPU.	MITSUBISHI MELSEC-AnN (LINK)		
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnN (CPU)		
		A3H, A2CJ-S3	CPU Direct Connection				
		A1S	A1SJ71C24-R2 A1SJ71UC24-R2 A1SJ71C24-R4		MITSUBISHI MELSEC-AnN (LINIK)		
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnN (CPU)		
		A2US	A1SJ71C24-R2 A1SJ71UC24-R2 A1SJ71C24-R4		MITSUBISHI MELSEC-AnA (LINK)	○	○
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnA (CPU)	○	X

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
MITSUBISHI	MELSEC-A	A1SJ, A2SH, A1SH	A1SJ71UC24-R4 A1SJ71UC24-R2		MITSUBISHI MELSEC-AnN (LINK)	○	X
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnN (CPU)		
		A2USH-S1	A1SJ71UC24-R4 A1SJ71UC24-R2		MITSUBISHI MELSEC-AnA (LINK)	○	○
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnA (CPU)	○	X
		A2CCPU24	Link I/F on CPU unit		MITSUBISHI MELSEC-AnN (LINK)		
			CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-AnN (CPU)		
	MELSEC-F_2	F_2-20M, F_2-40M, F_2-60M	F_2-232GF		MITSUBISHI MELSEC-F2 series		
	MELSEC-FX	FX_0, FX_1,FX_2C, FX_2 FX_{2N}-64MR FX_{2NC}-32MT FX_{0N} -60MR FX_{1S}	CPU Direct Connection	* When using a RS-232C connection, an FX-232AW interface unit is necessary with the RS-232C/RS-422 adapter. * If you use the FX Series' exclusive Programing Console I/F Interface cable (GP430-IP11-O), you can connect directly to the CPU unit without having to use the adapter.	MITSUBISHI MELSEC-FX (CPU)		
		A1FX	CPU Direct Connection	You can use the A Series' exclusive Programing Console I/F Interface cable	MITSUBISHI MELSEC-AnN (CPU)		
		FX_{2N}	FX2N-232-BD FX2N-485-BD	PLC's system must be Ver.1.06 or later.	MITSUBISHI MELSEC-FX2 (LINK)		
		FX_{2NC}-16MT FX_{2NC}-32MT FX_{2NC}-64MT FX_{2NC}-96MT	FX0N-232ADP				
	MELSEC-QnA	Q2A, Q2A-S1, Q4A	AJ71QC24 AJ71QC24-R4		MITSUBISHI MELSEC-QnA (LINK)	○	○
			AJ71UC24	Usable devices are limited	MITSUBISHI MELSEC-AnA (LINK)		

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
MITSUBISHI	MELSEC-QnA	Q2AS Q2ASH	A1SJ71QC24		MITSUBISHI MELSEC-QnA (LINK)	○	○
			A1SJ71UC24	Usable devices are limited	MITSUBISHI MELSEC-AnA (LINK)		
		Q2AS-S1	A1SJ71QC24N		MITSUBISHI MELSEC-QnA (LINK)		
			A1SJ71UC24-R2 A1SJ71UC24-R4	Usable devices are limited	MITSUBISHI MELSEC-AnA (LINK)		
		Q2A Q4A Q2AS Q2AS-S1 Q4AR	CPU Direct Connection	Can use the A-series exclusive Programming Console I/F cable (GP430-IP10-O). (Sold separately.)	MITSUBISHI MELSEC-QnA (CPU)	○	X
		Q4AR	AJ71QC24N		MITSUBISHI MELSEC-QnA (LINK)		
	MELSEC-Q	Q02CPU-A Q02HCPU-A Q06HCPU-A	A1SJ71UC24-R2 A1SJ7aUC24-R4		MITSUBISHI MELSEC-AnA (LINK)		
			CPU Direct Connection		MITSUBISHI MELSEC-AnA (CPU)		
		Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	QJ71C24 QJ71C24-R2		MITSUBISHI MELSEC-QnA (LINK)		
			CPU Direct Connection	Cannot connect to USB port on CPU unit.	MITSUBISHI MELSEC-Q (CPU)		
		Q00CPU Q01CPU Q00JCPU	QJ71C24 QJ71C24-R2		MITSUBISHI MELSEC-QnA (LINK)		
		Q00CPU C01CPU	CPU Direct Connection	Cannot connect to USB port on CPU unit.			
OMRON	SYSMAC C	C500 C500F C1000H C1000HF C2000 C2000H	C500-LK201-V1 C500-LK203	C1000HF can only use C500-LK203 link unit.	OMRON SYSMAC-C series	○	○
		C200H C200HS	C200H-LK201 C200H-LK202				
		C20H C28H C40H C200HS CQM1-CPU42	Link I/F on CPU unit (RS-232C Port)				
		C120 C120F C200H C500 C500F C1000H C2000 C2000H C1000HF	C120-LK201-V1 C120-LK202-V1 C500-LK203				
		SRM1-CO2, CPM1-20CDR-A CPM2A	CPM1-CIF01 CPM1-CIF11				

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
OMRON	SYSMAC C	C200HS, SRM1-C02, CQM1-CPU11, CQM1-CPU42, CPM1-20CDR-A CPM2A, CQM1H-CPU2I	CPU Direct Connection	Omron's isolation cable (CQM1-CIF01) is necessary.	OMRON SYSMAC-C series	○	○
		CPM2C	CPU Direct Connection	Omron's isolation cable CS1W-CN114 and CQM1-CIF01 are necessary.			
			CPM2C-CIF01				
		CQM1H-CPU51 CQM1H-CPU61	CQM1H-SCB41		OMRON SYSMAC-C 1:n Comm.		
	SYSMAC-α	C200HX-CPU85-Z C200HX-CPU64 C200HX-CPU44 C200HE-CPU42 C200HG-CPU63 C200HG-CPU43	C200HW-COM06	RS422 can use only the 4-wire type.			
			RS-232C Port on CPU unit				
		C200HE-CPU42-Z	C200H-LK202-V1				
		C200HX-CPU64-Z					
			C200H-LK201-V1				
	SYSMAC CV	CV500 CV1000 CVM1	Link I/F on CPU unit, CV500-LK201 (Host Link)	Tested with the CVM1-CPU01 for the CVM1 Series	OMRON SYSMAC-CV series	○	X
	SYSMAC CS1	CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42 CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	RS-232C Port on CPU unit		OMRON SYSMAC-CS1 series		
			Peripheral port on CPU unit				
			CS1W-SCB21 CS1W-SCB41 CS1W-SCU21				
	SYSMAC CJ	CJ1G-CPU44 CJ1G-CPU45	Peripheral port on CPU unit				
			RS-232C port on CPU unit				
			CJ1W-SCU41				

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
FUJI	MICREX-F	F80H, F120H F250	FFU120B		FUJI MICREX-F series	○	X
		F80H F120H F250 F30 F50 F60 F80 F81 F120 F120S F200	FFK100A-C10 FFK120A-C10	*When using FFK100A-C10, the ROM casette FMC312A-T (PC exclusive) is necessary. *To use FFK120A-C10, use the command setup type synchronous nonprocedure mode 1. The ROM cassette is unnecessary.			
		F70S	NC1L-RS2	Tested with the NC1P-S0 CPU			
		F80H F250	CPU Direct Connection Use the loader port.	Use the PC loader adapter (FLT-ASFK) made by Fuji Electric.	FUJI MICREX-F series (FLT)		
		F70S F80H F250	T-link I/F unit	Refer to T-link I/F unit User's Manual	FUJI MICREX-F series (T-link)		
	FLEX-PC	NB1, NB2, NB3	NB-RS1-AC		FUJI FLEX-PC series (Link)		
		NJ	NJ-RS2, NJ-RS4				
		NS	NS-RS1				
		NB1, NB2, NB3 NJ, NS	CPU Direct Connection		FUJI FLEX-PC (CPU)		
YASKAWA	Memocon-SC	U84 U84J	JAMSC-C8110		YASKAWA Memocon SC series	○	X
		U84S	JAMSC-C8610				
		GL40S	JAMSC-IF61 JAMSC-IF41A (extension)				
		GL60S GL60H GL70H	JAMSC-IF60 JAMSC-IF61				
		GL60S	JAMSC-IF612				
		GL120	CPU Direct Connection				
	MP900	MP930	MEMOBUS Port onCPU unit		YASKAWA OP9200SH series		
		MP920	MEMOBUS Port onCPU unit				
			JEPMC-CM200				
	Control Pack	CP-9200 CP-9200H	CPU Direct Connection		YASKAWA Memocon SC series		
		CP-9200SH	Link I/F on CPU unit		YASKAWA CP9200SH series		
	Memocon Micro	Micro	CPU Direct Connection		YASKAWA Memocon SC series		
	PROGIC-8	PROGIC-8 PC01	Link I/F on CPU unit		YASKAWA PROGIC 8 series		
	MEMCON-SC	GL120 GL130	JAMSC-120MON27100		YASKAWA GL120/130 series		

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
YASKAWA	MP900	MP920	217IF communication module (JEPMC-CM200)	YASKAWA's MPPanel *1 protocol. For connection to GP/GLC, set the GP-PRO/PBIII's "PLC name" to YASKAWA CP9200SH series. LS1900 to LS2019 cannot be used by Editor screen because the MPPanel Features uses this area.	YASKAWA MPPanel series	○	x
			MEMOBUS board on CPU unit				
		MP930 MP940	MEMOBUS board on CPU unit				
HITACHI	HIDIC-S10α	2α, 2αE 2αH	Link I/F on CPU unit		HITACHI HIDIC-S10α series	○	x
		4α, 4αF	LWE805				
	HIDIC H	H20, H28 H40, H64	CPU Direct Connection	Previously known as HIZAC H Series. Refer to Procedure 1 for data communication control.	HITACHI HIDIC-H series		
		H-200, H-300 H-302, H-700 H-702, H-2000 H-2002, H-252C H-4010, EH-150					
		MICRO-EH	Serial Port 1 or 2 on CPU unit				
		H-300, H-700 H-2000, H-2002	COMM-H COMM-2H				
		H-302, H-702 H-4010	COMM-2H				
	HIDIC H	EH-150 (EH-CPU448)	Serial Port 1 on CPU unit	Refer to Procedure 2 for data communication control.	HITACHI HIDIC-H2 series	○	x
		MICRO-EH	Serial Port 1 or 2 on CPU unit				
		H-302, H-702, H-2002, H-4010	COMM-2H				
	HIZAC EC	EC-40HR	CPU Direct Connection		HITACHI HIZAC-EC series		
	S10mini	LQP000 LQP010 LQP011	LQE060		HITACHI HIDIC-S10α series		
SHARP	New Satellite JW	JW20 JW70 JW100 JW-32CUH JW-32CUH1 JW-33CUH3	Link I/F on CPU unit (COMM Port)	CPU module equipped with a communication port is necessary. JW20, JW70, and JW100 is equipped as the standard for JW-22CU, JW-70CU, and JW-100CU.	SHARP New Satelite JW series	○	x
		JW20 JW-32CUH JW-32CUH1 JW-33CUH3	JW-21CM				
		JW50, W70 JW100	ZW-10CM, JW-10CM	JW-10CM tested only with 4-line.			

**1 For detailed information about the MPPanel, contact Yaskawa Electric Corporation.*

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
MATSUSHITA	MEWNET	FP3	AFP3462		MATSUSHITA MEWNET-FP series	○	X
		FP5	AFP5462				
		FP10(S)	COM. Port on CPU unit				
			AFP3462				
		FP1	RS-232C Port on CPU unit	Tested using C24C and C40C.			
			CPU Direct Connection				
		FP-M	Serial port connector on Board				
			CPU Direct Connection				
		FP10SH	COM.Port on CPU unit				
		FP2	COM.Port on CPU unit				
			CPU Direct Connection				
		FP0	RS-232C Port on CPU unit	CPU unit builted-in RS-232C is required.			
			CPU Direct connection				
		FPΣ	Tool Port on control unit				
			FPG-COM1 FPG-COM2				
YOKOGAWA	FACTORY ACE	FA500	LC01-0N LC02-0N	A-type CPU MP*0/AP*0 are not supported. Use together with B-type or higher. Can also use together with A-type CPU MP*1/AP*1.	YOKOGAWA FACTORY ACE *1 1:1 Comm.	○	○
		FA-M3	F3LC01-1N	Can communicate with F3SP10-0N CPU.			
			F3LC11-1N F3LC11-2N F3LC11-1F F3LC12-1F				
			CPU Direct Connection			○	X
	FACTORY ACE	FA500 (1:n connection)	LC02-0N	Instead of the FA500, the digital indication controller (UT37/38/2000) and the MR series recorder can be used in a multi-link connection, without programming.	YOKOGAWA FACTORY ACE *2 1:n Comm.	○	○

**1 Previously titled "FA-500" software on theGP-PRO II and GP-PRO III software.*

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
YOKOGAWA	FACTORY ACE	FA-M3 (1:n connection)	F3LC11-2N	Instead FA-M3, a digital indicating controller (UT37/ 38/ 2000) can be used with and recorder (mR Series) multi-link connections, without programming. Communication is tested with F3SP20-ON and F3SP35-5N CPUs.	YOKOGAWA FACTORY ACE *1 1:n Comm.	○	○
	STARDOM Standalone Type Controller	FCN FCJ	COM. port on CPU unit		YOKOGAWA FACTORY ACE 1:1 Comm.		
TOYOTA	TOYOPUC -PC2	PC2, L2	TLU-2652		TOYOTA TOYOPUC-PC2	○	○
		PC2J	THU-2755				
		PC2J (1:n connection)	THU-2755		TOYOTA TOYOPUC-PC2 1:n Comm.		
	TOYOPUC -PC3	PC3J	Link I/F on CPU unit		TOYOTA TOYOPUC-PC3J	○	X
			THU-2755				
		PC3J (1:n connection)	Link I/F on CPU unit		TOYOTA TOYOPUC-PC3J 1:n Comm.		
			THU-2755				
TOSHIBA	PROSEC EX	EX2000	Link I/F on CPU unit		TOSHIBA PROSEC -EX2000 series	○	X
	PROSEC T	T3,T3H, T2N,T2E	Link I/F on CPU unit		TOSHIBA PROSEC-T series		
		T2E	CM231E				
	PROVISOR B	B200CH B200CUF B200CURM B200CUFRM	B2000LM		TOSHIBA MACHINE TC200 series		
MACHINE TOSHIBA	PROVISOR TC200	TCCUH	TCCMW TCCMO Link I/F on CPU unit	When connecting the GP and PLC directly, set the Unit No. in the SET UP OPERATION SURROUNDINGS menu to 64.	TOSHIBA MACHINE TC200 series	○	X
		TCCUHS TCCUSS	Connector for RS-232C on CPU module		TOSHIBA MACHINE TC200-S series	○	○
			TCCMWA TCCMOA				
KOYO	KOSTAC SG	SG-8	Link I/F on CPU unit	Disconnect the programming console when communicating	KOYO KOSTAC-SG8 series	○	X
			G-01DM				
	KOSTAC SU	SU-5 SU-6	Link I/F on CPU unit				
			U-01DM				
		SU-6B	Link I/F on CPU unit				
	KOSTAC SZ	SZ-4	Link I/F on CPU unit				

**1 It was known as "FA-500M" software on GP-PRO II and GP-PRO III.*

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
KOYO	KOSTAC SR	SR-21 SR-22	E-02DM-R1		KOYO KOSTAC-SR21 /22 series	○	X
	DL205	D2-240	Link I/F on CPU unit*1		KOYO DL-205/405 Series		
	DL405	D4-430	D4-DCM				
		D4-440	D4-DCM				
			Link I/F on CPU unit*1				
	DL305	D3-330	D3-DCM		KOYO DL-305 Series		
GE FANUC	Series 90-30	CPU311 CPU331	CPU Direct Connection		GE FANUC SERIES 90 SNP-X	○	X
			IC693CMM311				
		CPU311 CPU360 CPU313 CPU363 CPU323 CPU364 CPU331 CSE311 CPU340 CSE313 CPU341 CSE323 CPU350 CSE331 CPU351CSE340 CPU352	Serial port on CPU unit		GE FANUC SERIES 90-30/70 SNP		
		CPU731 CPU772 CPU732 CPU781 CPU771 CPU782	IC693CMM711		GE FANUC SERIES 90 SNP-X		
		CPU731 CPX935 CPU771 CGR935 CPU772 CPM790 CPU780 CSE784 CPU781 CSE924 CPU782 CSE925 CPU788 CPX772 CPU789 CPX782 CPM915 CPX928 CPM925 CGR772	Serial port on CPU unit *2		GE FANUC SERIES 90-30/70 SNP		
FANUC	FANUC Power Mate (Motion controller)	Power Mate	CPU Direct Connection	Designate the GPs host as a Fanuc PLC. The GP series cannot connect to the CRT/MDI. The handy-type programmer DPL/MDI can be used jointly with the GP series connection type.	FANUC Power Mate series	○	X
	FANUC Series	16-MC	Link I/F on CPU unit	Designate the GPs host as a Fanuc PLC. Only RS232C Serial Port 2 (JP5B) can be used at this time.			

** 1 Connected to CPU module's general communication port.*

** 2 For CPX772, CPX782, CPX928, CPX935 CGR772 and CGR935, only Serial port2 can be used.*

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
IDEC	FA-2	PF2-CPU1 PF2-CPU5M	CPU Direct Connection	For an RS-232C connection, a link adapter PF2-CLA or computer link interface unit PFA-1U51 is necessary. For RS-422 connection, a link unit PFJ-U21 is necessary.	*1 Refer to the table below.	○	x
	FA-2J	PF2J-CPU1	CPU Direct Connection				
	FA-3S	PF3S-CP11, PF3S-CP12, PF3S-CP13	CPU Direct Connection				
		PF3S-CP12, PF3S-CP13	PF3S-SIF2 PF3S-SIF4				
	MICRO 3	MICRO 3	CPU Direct Connection		IZUMI MICRO3		
	MICROSmart FC4A series (All-in-one type)	FC4A-C10R2B FC4A-C16R2B FC4A-C24R2B	RS-232C port on CPU module		IDEC FC3/FC4A Series	○	○
			RS-232C Communication Board (Mini DIN type) FC4A-PC1				
			RS-485 Communication Board (Mini DIN type) FC4A-PC2				
			RS-485 Communication Board (Terminal type) FC4A-PC3				

**1 When connecting the GP with Izumi Electric's FA Series PLC, setup the object PLC to match the CPU.*

CPU	PLC name in PRO/PBIII
PF2-CPU1	IZUMI IDEC_1
PF2J-CPU1, PF3S-CP11	IZUMI IDEC_2
PF2-CPU5M, PF3S-CP12, PF3S-CP13	IZUMI IDEC_3

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
IDEC	MICROSmart FC4A series (Slim type)	FC4A-D20K3 FC4A-D20S3 FC4A-D20RK1 FC4A-D20RS1 FC4A-D40K3 FC4A-D40S3	RS-232C port on CPU module		IDEC FC3/FC4A Series	○	X
			RS-232C Communication Board (Mini DIN type) FC4A-PC1	HMI base module (FC4A-HPH1) is required.			
			RS-485 Communication Board (Mini DIN type) FC4A-PC2				
			RS-485 Communication Board (Terminal type) FC4A-PC3				
			RS-232C Communication Board (Mini DIN type) FC4A-HPC1				
			RS-485 Communication Board (Terminal type) FC4A-HPC2				
			RS-485 Communication Board (Mini DIN type) FC4A-HPC3				
	OpenNet Controller FC3 series	FC3A-CP2K FC3A-CP2S	RS-232C port 1 on CPU module				
			RS-232C port 2 on CPU module				
			RS-485 port on CPU module				
SIEMENS	SIMATIC S5	90 95U 100U	CP 521 SI		SIEMENS S5 3964(R) Protocol	○	X
			CPU Direct Connection		SIEMENS S5 90-115 series		
		115U	CP524, CP525		SIEMENS S5 3964(R) Protocol		
			CPU Direct Connecton		SIEMEMS S5 90-115 series		
		135U 155U	CP524, CP525		SIEMENS S5 3964(R) Protocol		
			CPU Direct Connection		SIEMENS S5 135-155 series		

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
SIEMENS	SIMATIC S7-200	CPU212, CPU214	CPU Direct Connection		SIEMENS S7-200PPI	○	X
		CPU214, CPU215, CPU216, CPU221, CPU222, CPU224, CPU226	CPU Cirect (via MPI Port)		SIEMENS S7-200 via MPI		
	SIMATIC S7-300	CPU312IFM, CPU313, CPU314, CPU314IFM, CPU315, CPU315-2DP, CPU316, CPU316-2DP, CPU318-2	CPU Direct (via MPI Port)		SIMATIC S7-300 / 400 via MPI		
		CPU313, CPU314, CPU315, CPU315-2DP	CP340	3964R via RK512	SIMATIC S7 via 3964 / RK512		
			CP341				
	SIMATIC S7-400	CPU412-1, CPU412-2DP, CPU413-1, CPU413-2DP, CPU414-1, CPU414-2DP	CPU Direct (via MPI Port)		SIMATIC S7-300/400 via MPI		
		CPU413-2DP	CP441-2		SIMATIC S7 via 3964/RK512		
	SIMATIC 505	545-1101, 545-1102, 545-1103, 545-1104, 545-1105, 545-1106, 555-1101, 555-1102, 555-1103, 555-1104, 555-1105, 555-1106	Link I/F on CPU unit		SIMATIC 545/555 CPU		
ROCKWELL (ALLEN-BRADLEY)	SLC 500	SLC-5/03 SLC-5/04	Link unit on CPU		Allen-Bradley SLC 500 series	○	X
	PLC-5	All PLC-5 processors which connect to the link units shown on the right	1785-KE 1770-KF2 1785-KE/C		Allen-Bradley PLC-5 series		
		PLC-5/11 PLC-5/20 PLC-5/30 PLC-5/40 PLC-5/40L PLC-5/60 PLC-5/60L	CPU Direct Connection				
	Control Logix5000	1756-L1 1756-L1M1 1756-L1M2 1756-L1M3 1756-L55M13 1756-L55M14 1756-L55M15	Link I/F on CPU unit		Allen Bradley Control Logix (DF1)		

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
ROCKWELL (ALLENBRADLEY)	MicroLogix 1000	1761-L16AWA 1761-L32AWA	CPU Direct Connection		Allen Bradley SLC500 series	○	x
		1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	Advanced Interface Converter 1761-NET-AIC				
	MicroLogix 1200	1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA 1762-L40BXB	CPU Direct Connection				
			Advanced Interface Converter 1761-NET-AIC				
	MicroLogix 1500	1764-LSP	CPU Direct Connection				
			Advanced Interface Converter 1761-NET-AIC				
KEYENCE	KZ-300	KZ-300 KZ-350	KZ-L2		Keyence KZ-300 series	○	x
	KZ-500	KZ-A500	CPU Direct Connection		Keyence KZ-A500 (CPU)		
			KZ-L10		Keyence KZ-A500 (Link)		
	KV	KV-10 KV-16 KV-24 KV-40	CPU Direct Connection		Keyence KV-10/16/24/40 series	○	○
	KV-700	KV-700	KV-L20		Keyence KZ-300 series	○	x
					Keyence KZ-A500 series (LINK)		
			CPU Direct Connection		Keyence KZ-A700 series (CPU)		
SHINKO	SELMART	SELMART	UC1-6		SHINKO SELMART series	○	x
MATSUSHITA	Panadac 7000	P7000-PLC-001 P7000-PLC-031H P7000-PLC-031S P7000-PLC-A01	GCP001		MATSUSHITA Panadac P7000 series	○	x

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII	GP Series GLC 2000 Series	GLC 100 Series GLC 300 Series
MODICON	884/984	884, 984A, 984B	Modbus Port on CPU		MODICON Modbus (Master)	○	x
ORIM VEXTA	E1	CPU11	MM01		ORIM VEXTA E1 Series	○	x
FATEK	Facon FB	20MC	Programming Port on CPU		FATEK FACON FB	○	x

Important

- ***If a PLC maker changes their PLC specifications or upgrades a PLC version, there is a possibility that communication with the GP may not work.***
- ***Depending on the CPU or Link I/F being used, communication speed varies. When designing your system, please check the communication speed.***
- ***If the PLC has a Data Reception (Write) ENABLE/DISABLE feature, used to control the reception of data from external devices while the PLC is in RUN mode, be sure to select [ENABLE] when using the unit.***
- ***The range of devices covered in this manual are only those which can communicate with a GP unit. However, among the PLC maker series names and device names mentioned here, certain devices may not be able to be used with all GP models.***
- ***Please be aware that necessary explanations, not reflected here, concerning GP-PLC connections may be added later.***
- ***GP77R and GP 2000 series unit's baud rate can be set to either 115.2kbps or 57600bps, however, if the PLC does not support the baud rate set on the GP, an error message will appear on the GP's display. The messages will differ depending on the PLC type.***
- ***When screen data is sent at 57600bps or higher to a GP series unit which does not support that rate, the baud rate will automatically change to 38400bps.***

2 PLC-GP Connection

This chapter describes the system configuration of PLC made by various manufacturers and the GP, and shows connection diagrams, supported devices, and examples of setting up the operating environment.

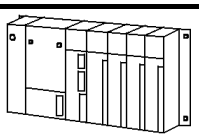
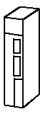
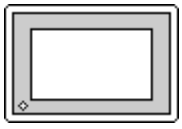
2.1 Mitsubishi Electric

2.1.1 System Structure

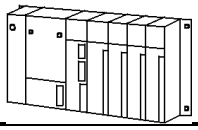
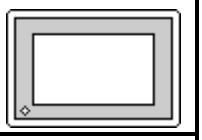
The following describes the system structure for connecting the GP to Mitsubishi Electric PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.1.2 Cable Diagrams**".*

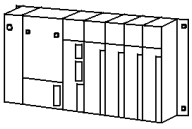
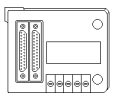
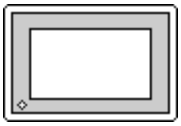
■ **MELSEC-A Series** (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 Computer Link Unit			
A2A,A3A,A2U, A3U,A4U	AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-0(5m)	GP Series
		RS-422 (Cable Diagram 2)	Digital's GP230-IS11-0(5m)	
A2US	A1SJ71C24-R2 A1SJ71UC24-R2	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS(3m)	
	A1SJ71UC24-R4	RS-422 (Cable Diagram 2)	Digital's GP230-IS11-0	
A2USH-S1	A1SJ71UC24-R4	RS-422 (Cable Diagram 2)	Digital's GP230-IS11-0	
	A1SJ71UC24-R2	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS(3m)	

■ MELSEC-N Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 Computer Link Unit			
A1N,A2N,A3N,	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24(Only A2N)	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-0(5m)	GP Series
		RS-422 (Cable Diagram 2)	Digital's GP230-IS11-0	
A0J2,AOJ2H	AOJ2-C214-S1			
A1S	A1SJ71C24-R2 A1SJ71UC24-R2	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS(3m)	
	A1SJ71C24-R4	RS-422 (Cable Diagram 2)	Digital's GP230-IS11-0(5m)	
A1SJ,A2SH,A1SH	A1SJ71UC24-R4			
	A1SJ71UC24-R2	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS(3m)	
A2CCPU24	Link I/F unit on CPU	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS(3m)	

■ MELSEC-A Series (CPU Direct Connection)

CPU *1	Adapter	Cable Diagram	Cables	GP
				
A2A,A3A,A4U,A3U, A2U-S1,A2US-S1, A2USH-S1,A2US		RS-422 (Cable Diagram 11) ***4**	Digital's A-Series Programing Console I/F Cable (isolation type) GP430-IP10-O(5m)	GP Series
A2A,A3A,A4U,A3U, A2U-S1,A2US-S1, A2USH-S1,A2US	Digital's 2 Port Adapter ***2** GP030-MD11-0	RS-422 (Refer to Mitsubishi's A Series PLC Manual "2 Port adapter II " for cable diagram information)		
A2A,A4U,A2U-S1 A2US,A3A,A2USH-S1	Digital's 2 Port Adapter II ***3** GP070-MD11	RS-422 (Refer to Mitsubishi's A Series PLC Manual "2 Port adapter II " for cable diagram information)	Digital's GP070-MDCB11(5m) cable or user's own made RS-422Cable	
	Mitsubishi's I/F unit FX-2PIF	Refer to Mitsubishi's manual		

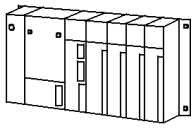
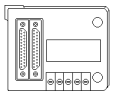
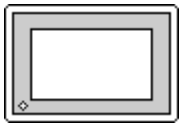
**1 Connect to the Programming Console I/F port.*

**2 When a Read/Write command is sent from ladder software while data is being transmitted between the PLC and the GP, there is a possibility the data transmission will not be completed normally.*

**3 When using 2 Port Adapter II, refer to its manual for the connectable PLCs.*

**4 This connection is used for only GP2000 series units. When using other series units, use the GP430-IP10-0.*

■ MELSEC-N Series (CPU Direct Connection)

CPU *1	Adapter	Cable Diagram	Cables	GP
				
A1N,A2N,A3N,A3H, A1S,A2SH, A2CJ-S3,A1SH, A2CCPUC24,A1SJ, A0J2H		RS-422 (Cable Diagram 11) *4	Digital's A-Series exclusive Programing Console I/F Cable(isolation type) GP430-IP10-0(5m)	GP Series
A1N,A2N,A3N,A3H, A1S,A2SH,A1SJ, A1SH	Digital's 2 Port Adapter *2 GP030-MD11-0	RS-422 (Refer to Mitsubishi's A Series PLC Manual "2 Port adapter " for cable diagram information)		
A1S,A2N,A3H, A3N,A1SJ,A2SH A1SH,A2CJ-S3, A0J2H	Digital's 2 Port Adapter II *3 GP070-MD11	RS-422 (Refer to Mitsubishi's A Series PLC Manual "2 Port adapter " for cable diagram information)	Digital's GP070-MDCB11(5m) or user's own made cable (RS-422)	
	Mitsubishi's Interface Unit FX-2PIF	Refer to Mitsubishi's PLC Manual		

**1 Connect to the Programming Console I/F port.*

**2 When a Read/Write command is sent from ladder software while data is being transmitted between the PLC and the GP, there is a possibility the data transmission will not be completed normally.*

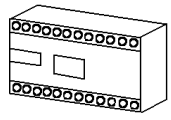
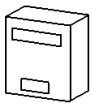
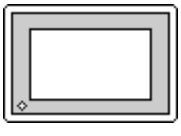
**3 When using 2 Port Adapter II, refer to its manual for the connectable PLCs.*

**4 This connection is used for only GP2000 series units. When using other series units, use the GP430-IP10-0.*

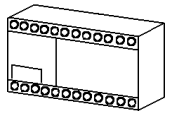
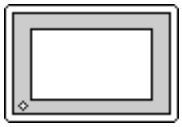
Caution

- **If you connect a CPU not listed here via the Direct CPU connection, you may damage the PLC.**
- **If the PLC has two ports, both of them cannot be connected to a GP at the same time.**

■ MELSEC-F_2 Series (using Link I/F)

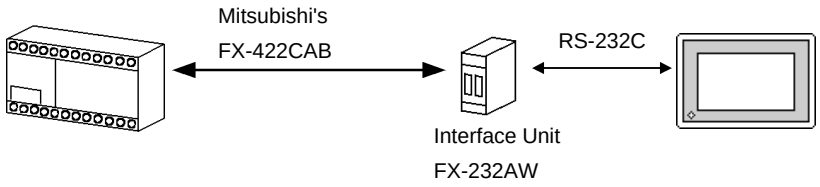
CPU	Adapter	Cable Diagram	Cables	GP
	 Interface Unit			
F2-20M, F2-40M, F2-60M	F2-232GF	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O(5m)cable, Mitusbishi's F2-232CAB(3m)cable	GP Series

■ MELSEC-FX Series (CPU Direct Connection)

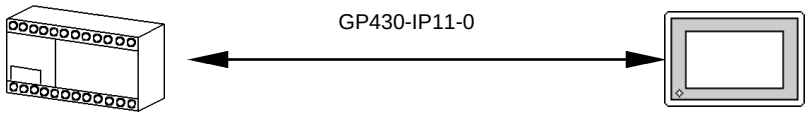
CPU	Adapter	Cable Diagram	Cables	GP
				
FX 1 ***2** FX 2 ***2** FX 2c ***2** FX 0 ***3** FX 2N-64MR ***3** FX 2NC-32MT ***3** FX 0N-60MR ***3** FX1S ***3**			Digital's FX Series exclusive Programming Console I/F Cable (isolation type) GP430-IP11-O (5m)	GP Series
FX1, FX2, FX2C, FX0 ***4** FX2NC-32MT ***4** FX2N-64MR ***4** FX0N-60MR ***4**	Mitsubishi's I/F unit FX-232AW ***1**	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-0(5m) Mitsubishi's F2-232CAB(3m)	
FX 2 ***5** FX 2N-64MR ***6** FX 2NC-32MT ***6** FX 0N-60MR ***6** AIFX ***7** FX1S	Digital's 2 Port Adapter II GP070-MD11 ***8**	Refer to Mitsubishi's PLC 2 Port Adapter II for A series Manual	Digital's GP070-MDCB11 or User-Prepared cable (RS-422)	
A1FX ***7**			Digital's GP410-IS00-0(5m) Mitsubishi's F2-232CAB(3m)	

**1 Although MELSEC-FX Series and the GP uses a CPU direct connection, to change an RS-422 signal to RS-232C's, the FX-232AW interface unit is necessary.*

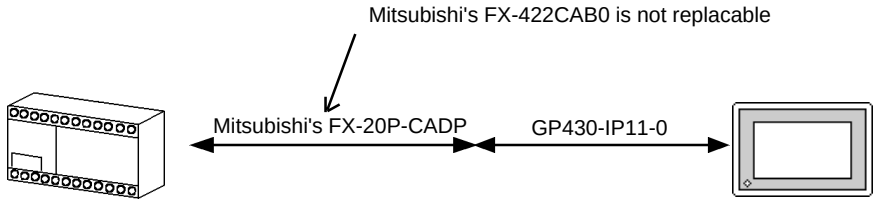
When connecting to FX_1, FX_2, and FX_{2C}, it is necessary to connect the Interface Unit with the PLC using Mitsubishi's FX-422CAB.



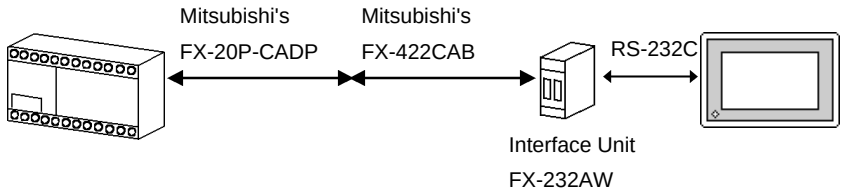
**2 When using Digital's GP430-IP11-0 for connecting an FX_1, FX_2, or FX_{2C}, use the Cable Diagram 2 shown below.*



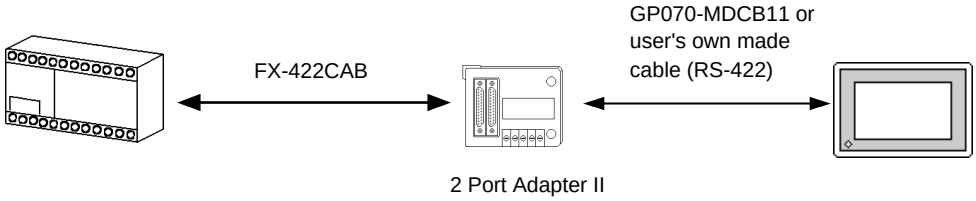
**3 When using Digital's GP430-IP11-0 for connecting FX_0 , FX_{2N}-64MR ,FX_{2NC}-32MT, FX_{0N}-60MR or FX_{1S} use Cable Diagram 3 shown.*



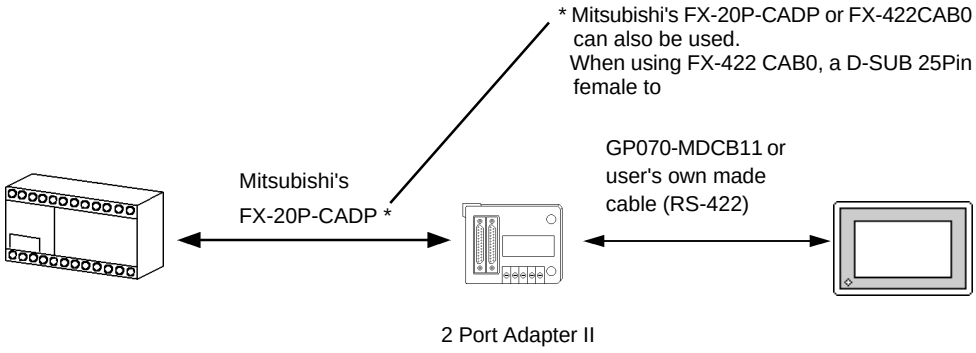
**4 When connecting to FX_0, FX_{2NC}-32MT, FX_{2N}-64MR, FX_{0N}-60MR, it is necessary to connect the Interface Unit with the PLC using Mitsubishi's RS-422CAB* and *FX-20P-CADP (see Diagram 4).*



**5 When using Digital's 2 Port Adapter II, it is necessary to connect the unit to the GP as shown below.*



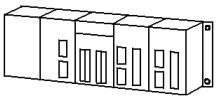
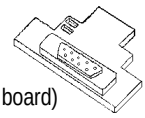
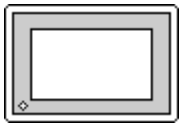
**6 When using Digital's 2 Port Adapter II, it is necessary to connect the units to the GP as shown below.*



**7 When using an A1FX, choose the MELSEC-N series as the GP-PRO/PBIII project file's PLC type (refer to the MELSEC-N series manuals for the range of devices available). You will also need an adaptor to adjust the connector's height to align it with that of the PLC's CPU cover.*

**8 When using 2 Port Adapter II, refer to its manual for the connectable PLCs*

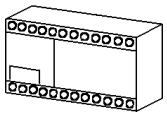
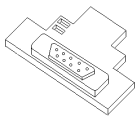
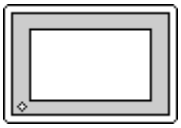
■ MELSEC-FX Series (using Expansion Board with Link Protocol)*1

CPU	Adapter	Cable Diagram	GP
	 (Expansion board)		
FX_{2N} *2	FX2N-232-BD	RS-232C (Cable Diagram 6)	GP Series
	FX2N-485-BD	RS-422 (Cable Diagram 7)	
FX2NC-16MT FX2NC-32MT FX2NC-64MT FX2NC-96MT	FX0N-232ADP	RS-232C (Cable Diagram 8)	

*1 Choose the Mitsubishi MELSEC-FX_2(LINK) selection as the GP-PRO/PB III project file's PLC type.

*2 The PLC's system version should be at least 1.06 or later. Check the PLC's version by reading out the data from the register (D8001). For detailed information refer to the Mitsubishi's FX 2N Series Micro Sequencer manuals.

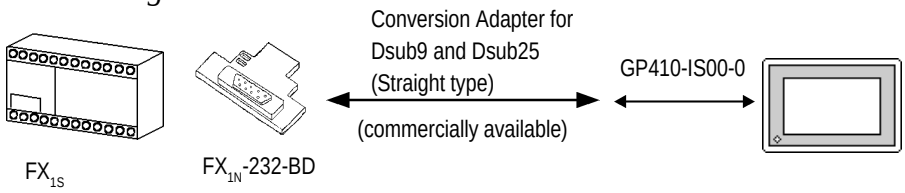
■ MELSEC-FX Series (Expansion board using CPU Direct Connection protocol)*1

CPU	Adapter	Cable Diagram	Cables	GP
	 (Expansion board)			
FX_{1S}	FX_{1N}-232-BD *2 (Diagram 1)	RS-232C	Digital's GP410-IS00-0 (5m)	GP Series
FX 2N-64MR	FX 2N-232-BD *3 (Diagram 2)	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m) Mitusbishi's F2-232CAB(5m)	
		RS-232C (Cable Diagram 4)		
	FX 2N-422-BD *4 (Diagram 3)		Digital's FX-Series exclusive Programming Console I/F Cable (isolation type) GP430-IP11-O (5m)	

*1 Choose the Mitsubishi MELSEC-FX(CPU) selection as the PLC type in the GP-PRO/PB III screen creation software.

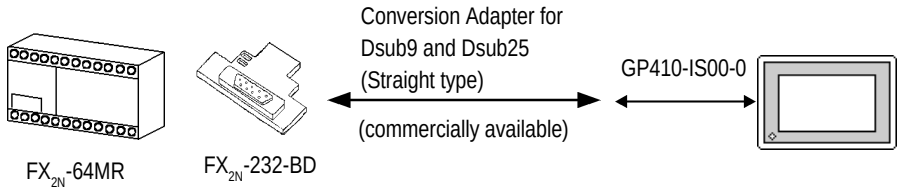
*2 Since a 9-pin connector is used by the PLC, a 25-pin conversion adapter is required.

Diagram 1



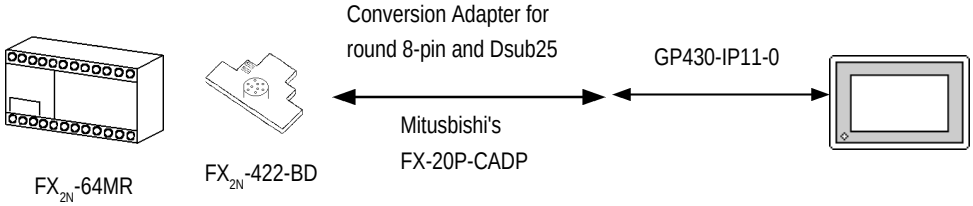
**3 Since a 9-pin connector is used by the PLC, a 25-pin conversion adapter is required.*

Diagram 2

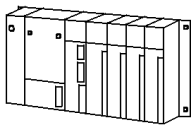
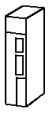
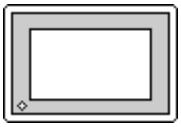


**4 A round 8-pin to 25-pin conversion cable, (Mitsubishi Electronic FX-20P-CADP) is required.*

Diagram 3



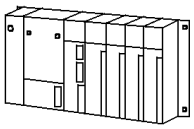
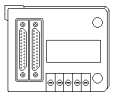
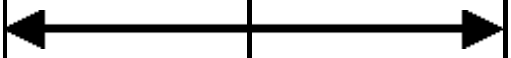
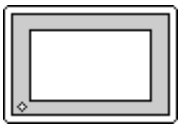
■ MELSEC-QnA Series (using Link I/F)

CPU	Adapter	Cable Diagram	Cables	GP
	 Serial Communication Unit / Computer Link Unit			
Q2A Q2A-S1 Q4A	AJ71QC24 (Serial Communication Unit) *1	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-0(5m)	GP Series
	AJ71UC24 (Computer Link Unit)	RS-422 (Cable Diagram 2)	Digital's GP230-IS-11-0(5m)	
	AJ71QC24N-R4	RS-422 (Cable Diagram 2) for CN-2	Digital's GP230-IS-11-0(5m)	
		RS-422 (Cable Diagram 5) for CN-1		
Q2AS Q2ASH	A1SJ71QC24 (Serial Communication Unit) *2	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS (3m)	
	A1SJ71UC24 (Computer Link Unit)	RS-422 (Cable Diagram 2)	Digital's GP230-IS-11-0(5m)	
Q2AS-S1	A1SJ71UC24-R2 A1SJ71UC24-R4	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS (3m)	
		RS-422 (Cable Diagram 2)	Digital's GP230-IS-11-0(5m)	
	A1SJ71QC24N	RS-232C (Cable Diagram 3)	Digital's GP000-IS02-MS (3m)	
		RS-422 (Cable Diagram 2)	Digital's GP230-IS-11-0(5m)	
Q4AR	AJ71QC24N	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-0(5m)	
		RS-422 (Cable Diagram 2)	Digital's GP230-IS-11-0(5m)	

**1 ROM : must be 7179B or higher.*

**2 ROM : must be 7179M or higher.*

■ MELSEC-QnA Series (CPU Direct Connection)

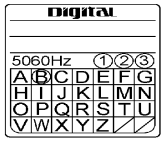
CPU	Adapter	Cable Diagram	Cables	GP
				
Q2A Q4A Q2AS Q2AS-S1 Q4AR		RS-422 (Cable Diagram 10) *3	Digital's A Series exclusivePrograming Console I/F cable (isolation type) GP430-IP10-O (5m)	GP Series
Q2A Q4A Q2AS Q2AS-S1	Digital's 2 Port Adapter *1 GP030-MD11-O *2	RS-422 (Refer to "Mitsubishi's PLC 2 Port Adapter Manual" for cable diagram information)		
Q2A Q4A Q2AS-S1 Q2ASH	Digital's 2 Port Adapter II *1 GP070-MD11 *2	Refer to " Mitsubishi's PLC A Series 2 Port Adapter II *1 Manual"	Digital' s GP070-MDCB11 or user's own cable (RS422)	

**1 When using 2 Port Adapter II, refer to its manual for the connectable PLCs.*

**2 When a Read/Write command is sent from ladder software while data is being transmitted between the PLC and the GP, there is a possibility the data transmission will not be completed normally. You may need to set the GP to the OFFLINE mode before you Read/Write in the program*

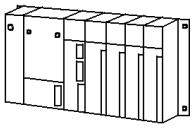
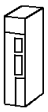
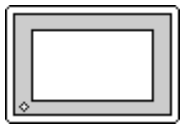
**3 This connection is used for only GP2000 series unit. When using other series unit, use the GP430-IP10-0.*

Note:

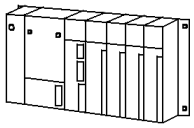
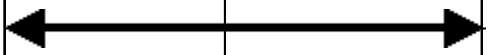
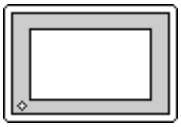


Digital's 2-port Adapter (GP030-MD11-0) will have this identification label.
Adapters that support the MELSEC-QnA unit have a circle around the "B" or later character.

■ MELSEC-Q Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cable	GP
	 Serial Communication Unit / Computer Link Unit			
Q02CPU-A Q02HCPU-A Q06HCPU-A	A1SJ71UC24-R4	RS-422 <Cable Diagram 2>	Digital's GP230-IS11-0	GP Series
	A1SJ71UC24-R2	RS-232C <Cable Diagram 3>	Digital's GP000-IS02-MS (3m)	
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00CPU Q01CPU Q00JCPU	QJ71C24	RS-422 <Cable Diagram 2>	Digital's GP230-IS11-0	
		RS-232C <Cable Diagram 3>	Digital's GP000-IS02-MS (3m)	
	QJ71C24-R2	RS-232C <Cable Diagram 3>	Digital's GP000-IS02-MS (3m)	

■ MELSEC-Q Series (CPU Direct Connection)

CPU	Cable Diagram	Cable	GP
			
Q02CPU-A Q02HCPU-A Q06HCPU-A	RS-232C <Cable Diagram 9>	Mitsubishi's QC30R2 (3m) (9pin/25pin conversion adaptor is necessary.)	GP Series
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00CPU Q01CPU	RS-232C <Cable Diagram 10>	Diatrend's DQCABR2 (3m) ***1**	

**1 When designating the length of a cable, be sure to use meters (*m).*
For the available range of cable lengths, please contact the Diatrend company.

2.1.2 Cable Diagrams

The cable diagram illustrated below and the cable diagrams recommended by Mitsubishi Electric Corporation may differ. Using these cables for your PLC, however, will not cause any problems.

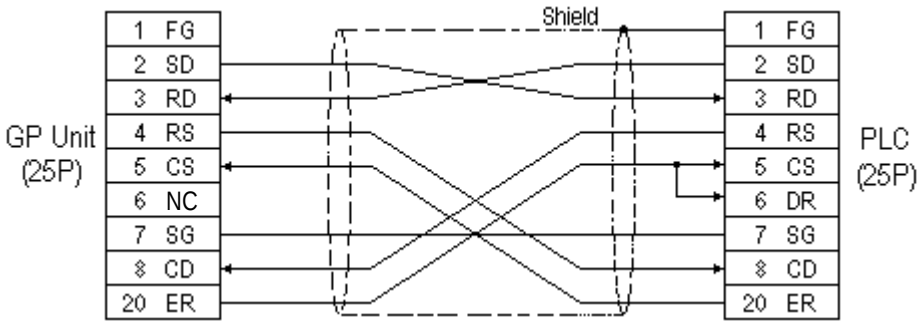
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a shielded cable is connected to the RS-422 port, it must be no longer than 600 m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)

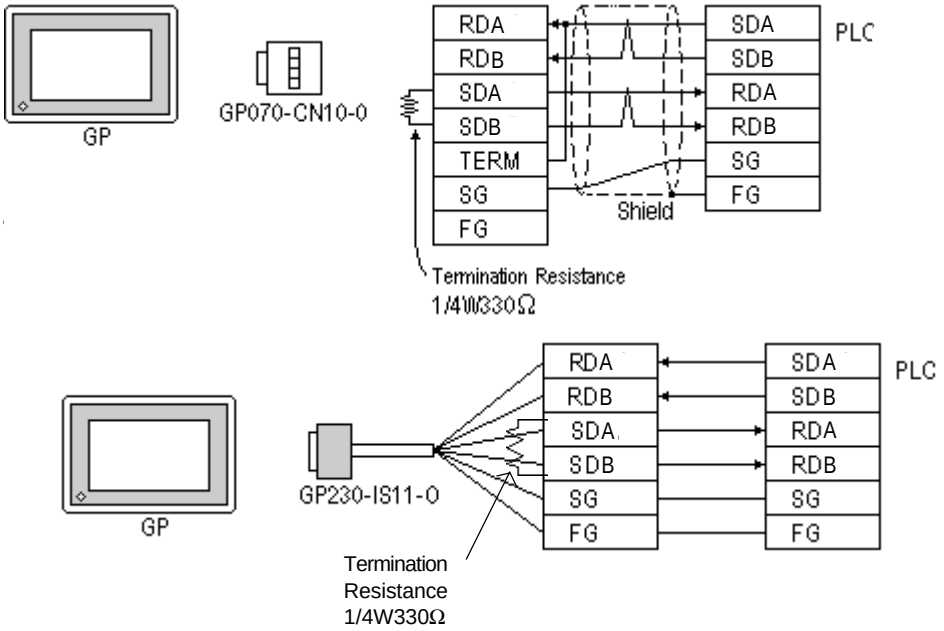


Cable Diagram 2 (RS-422)

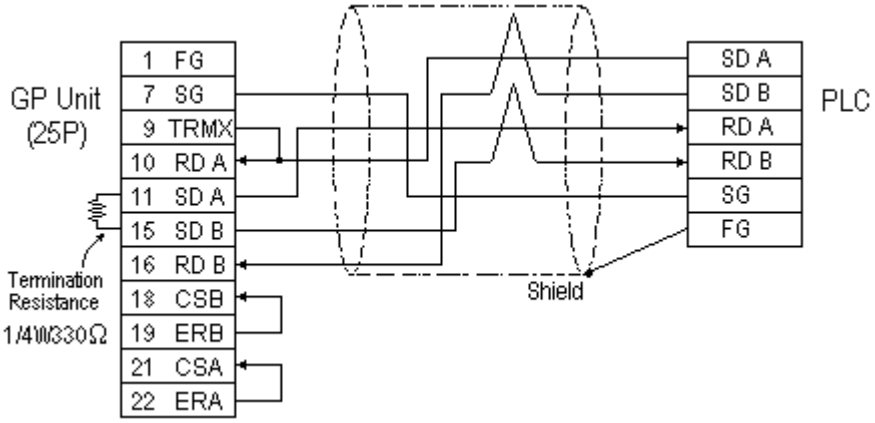
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

Important

- ***Turn on the PLC's termination resistance switch.***
- ***Depending on the type of PLC used, a termination resistance of 330Ω 1/2W is needed between SDA and SDB, and also between RDA and RDB if no DIP switch is available.***



• When making your own cable connections



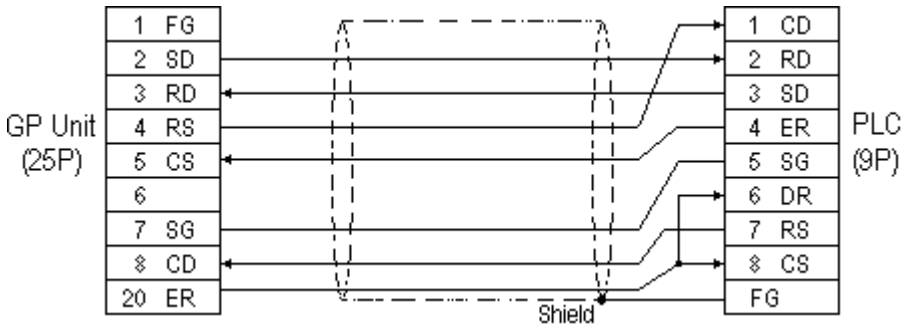
Note:

- **When making your own cable connections, we recommend using Mitsubishi's SPEV (SB)-MPC-0.2*3P for the cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Important

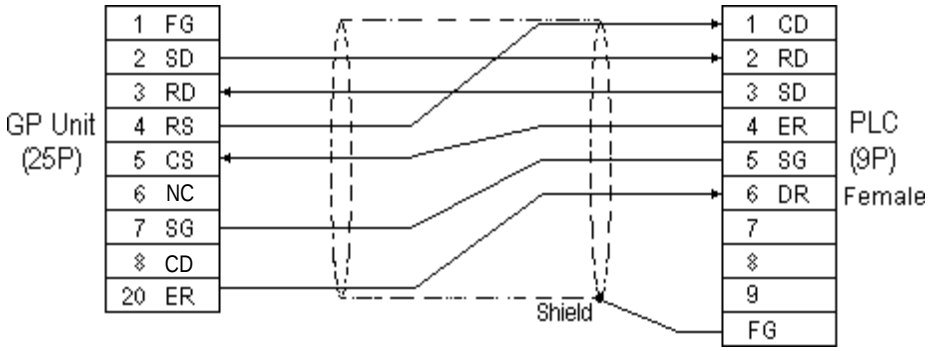
A termination resistance of 1/2W 330Ω is needed between the PLC connector's SDA and SDB, and also between RDA and RDB.

Cable Diagram 3 (RS-232C)



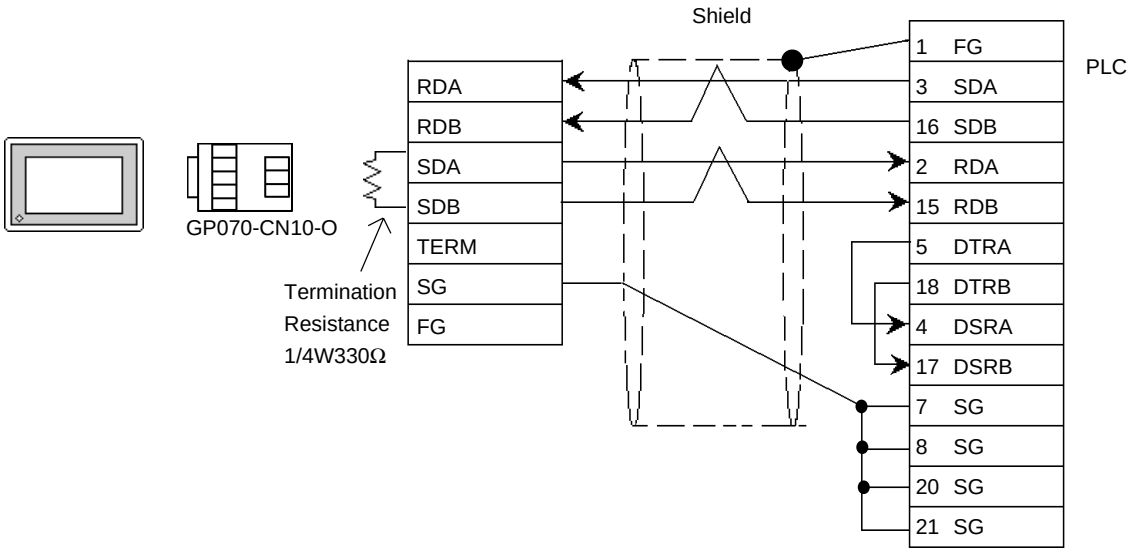
Careful! ***Connect the Shield to the PLC's FG terminal.***

Cable Diagram 4 (RS-232C)

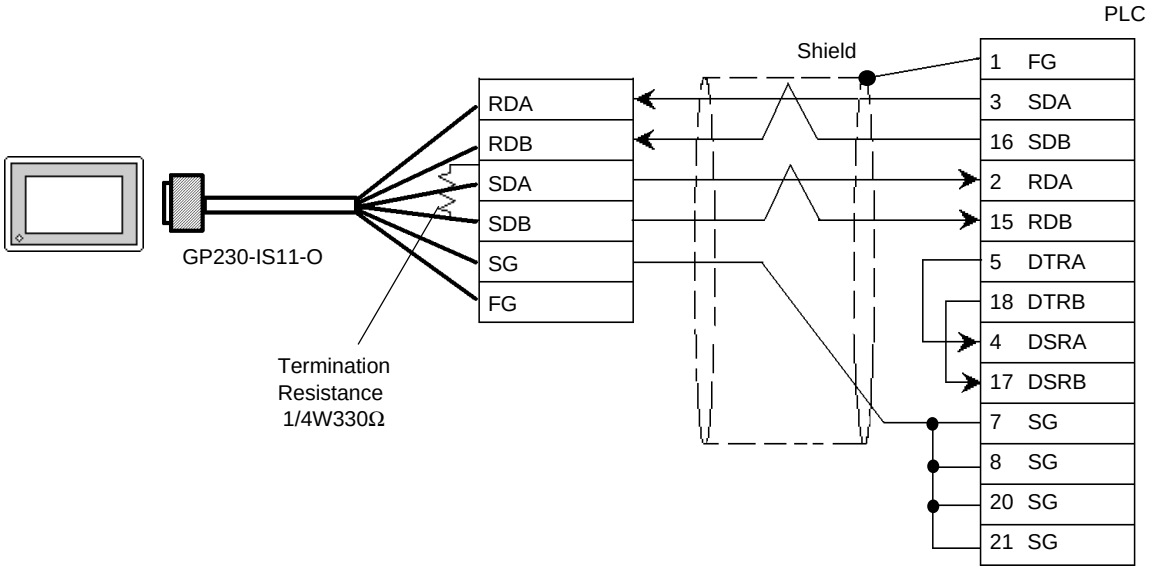


Cable Diagram 5 (RS-422)

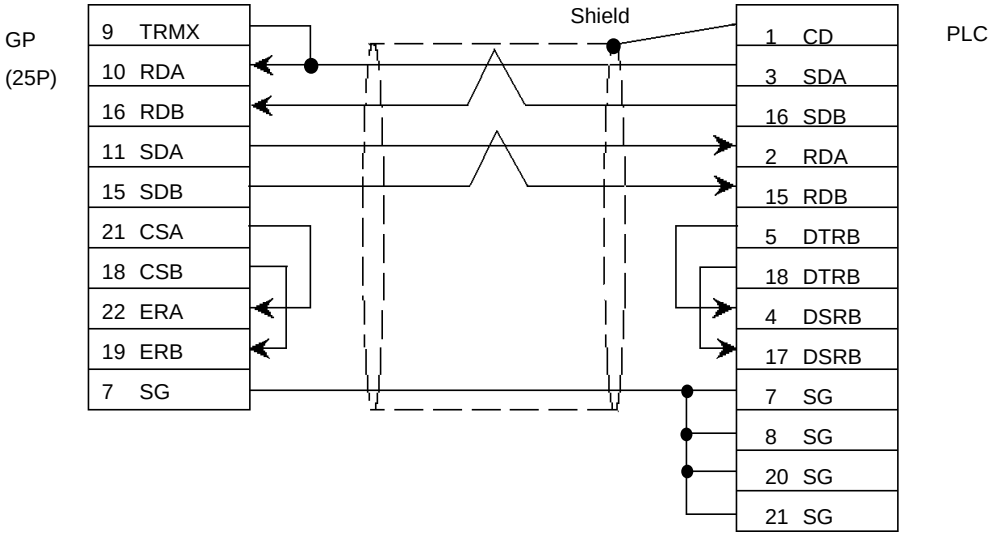
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



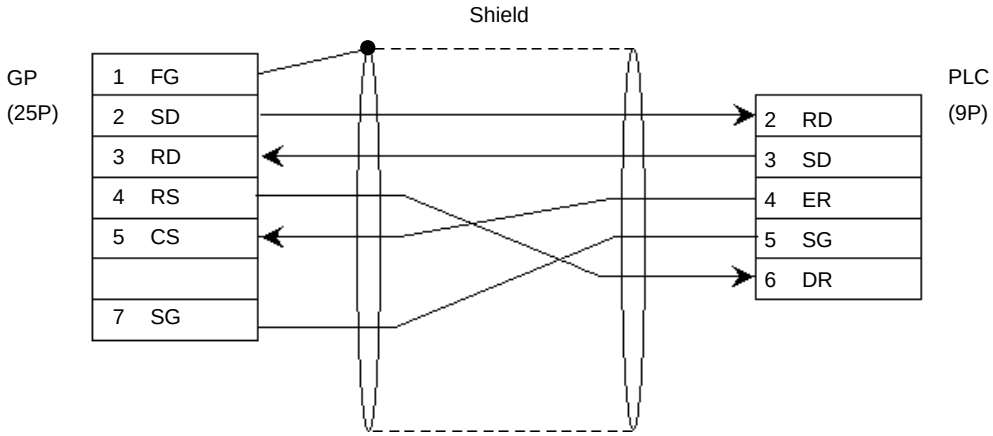
• When using Digital's RS-422 connector terminal adapter GP230-IS11-0



• When making your own cable



Cable Diagram 6 (RS-232C)

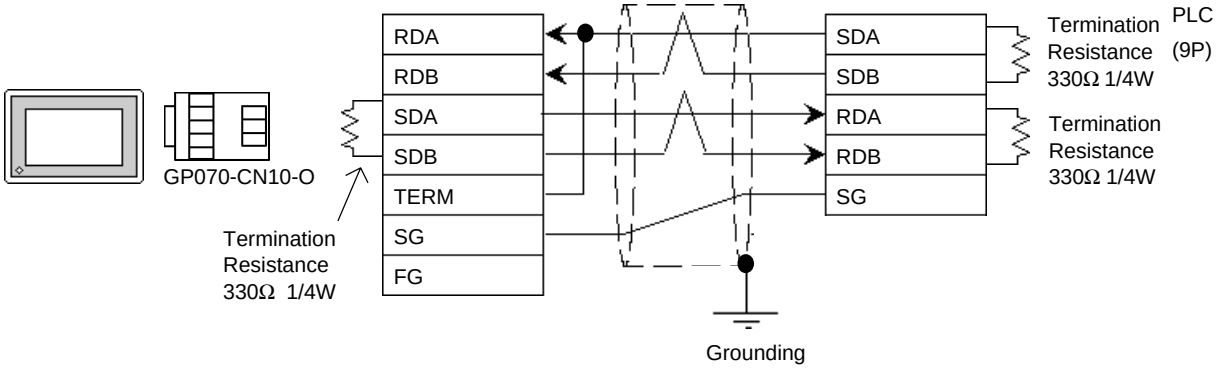


Cable Diagram 7 (RS-422)

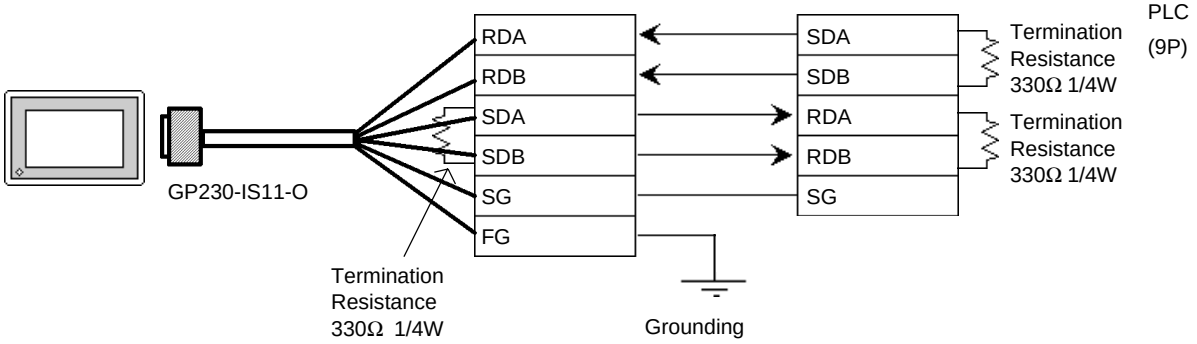
Important

- ***A termination resistance of 330Ω is needed between the PLC connector's SDA and SDB, and also between RDA and RDB.***
- ***When using the FX2N-485-BD, be sure the cable is less than 50 meters.***

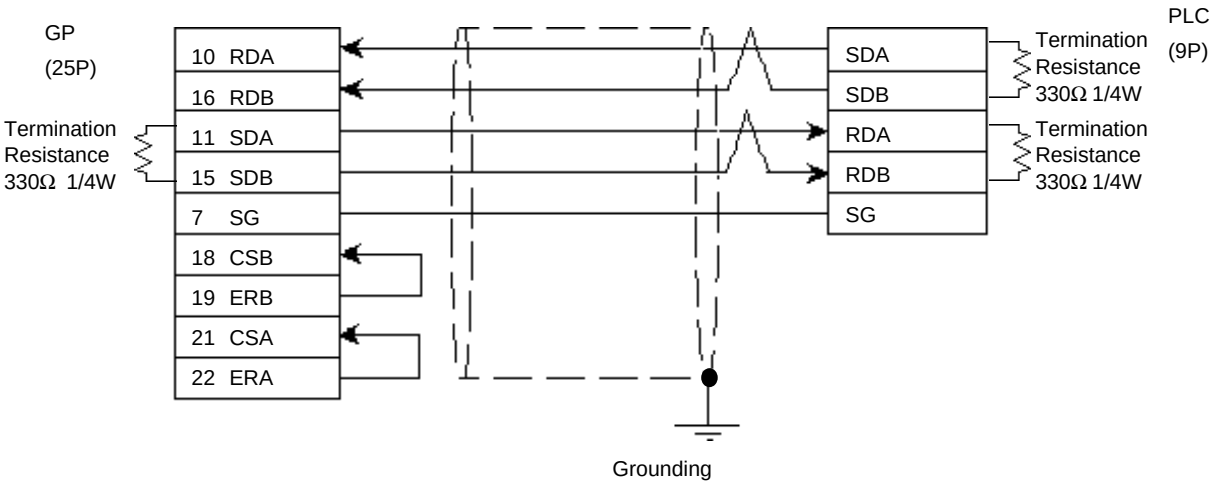
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



- When using Digital's RS-422 connector terminal adapter GP230-IS11-0

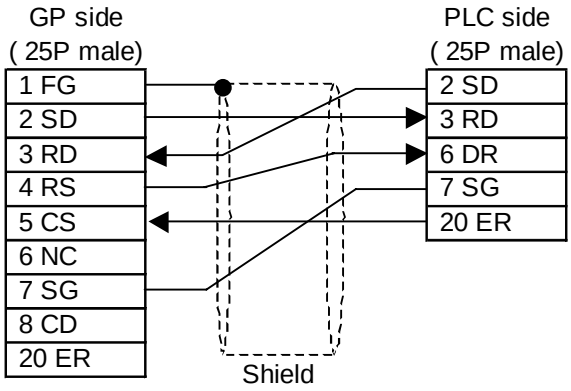


- When making your own cable



Note: **Digital recommends Mitsubishi Electric's SPEV(SB)-0.2-2P cable for this connection.**

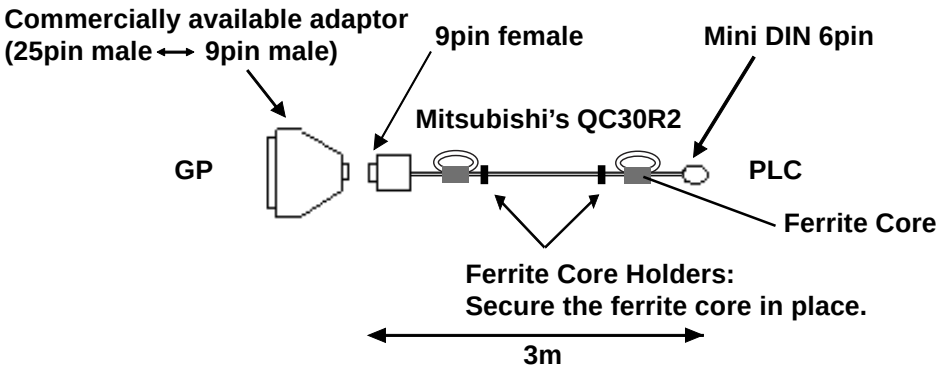
Cable Diagram 8 ***(RS-232C)***



Cable Diagram 9 ***(RS-232C)***

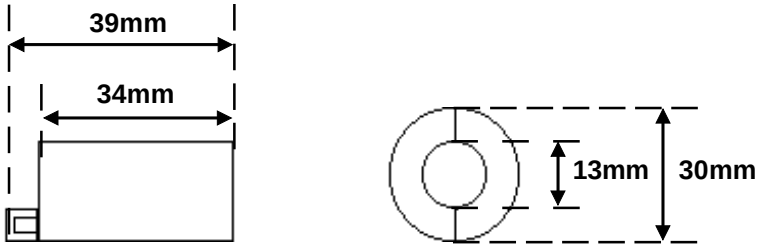
Important

- ***Attaching a Ferrite Core will reduce the amount of noise in your cable.***
- ***Attach two (2) Ferrite Cores to your cable, one at each end. Also, as shown in the drawing below, loop the cable once around the Ferrite Core.***
- ***When using a data communication cable that is 3m(approx. 10ft.) or longer, please use a cable made by the Diatrend company.***
- ***Be sure all cables are less than 15 meters long.***



<Recommended Ferrite Core>

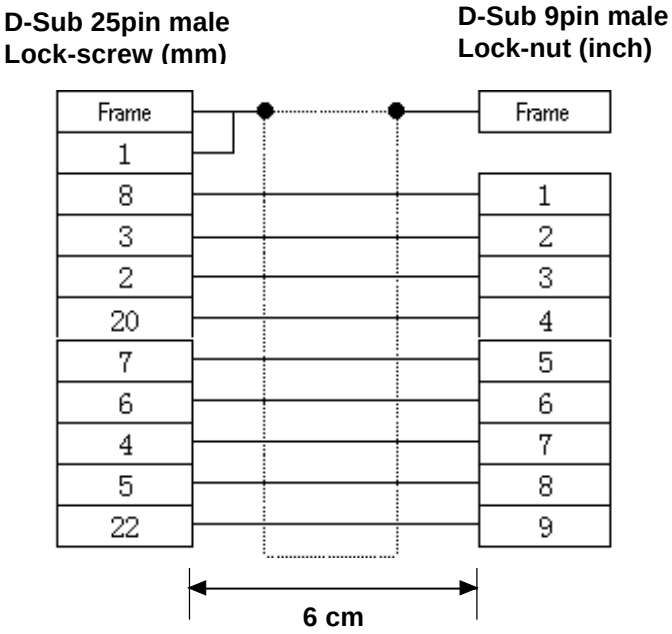
Maker :Seiwa Electronics Corporation
Model :E04SR301334



Conversion Adaptor Specifications

- Straight connection type
- D-Sub 25pin male Lock-screw (mm)
- D-Sub 9pin male Lock nut (inch)

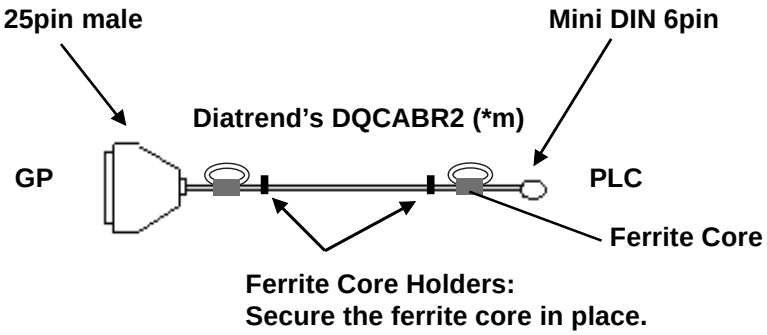
<Adaptor : Roas Co. Model No. ZA-403>



Cable Diagram 10 (RS-232C)

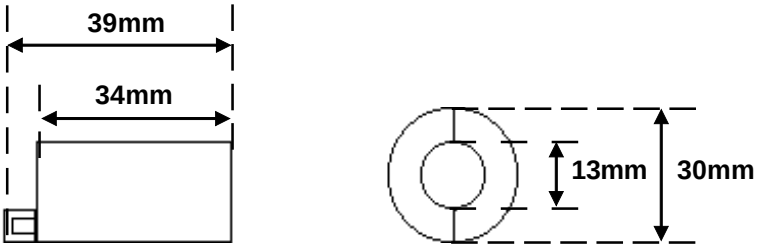
Important

- ***Attaching a Ferrite Core will reduce the amount of noise in your cable.***
- ***Attach two (2) Ferrite Cores to your cable, one at each end. Also, as shown in the drawing below, loop the cable once around the Ferrite Core.***
- ***When using a data communication cable that is 3m(approx. 10ft.) or longer, please use a cable made by the Diatrend company.***
- ***Be sure all cables are less than 15 meters long.***



<Recommended Ferrite Core>

Maker :Seiwa Electronics Corporation
Model :E04SR301334



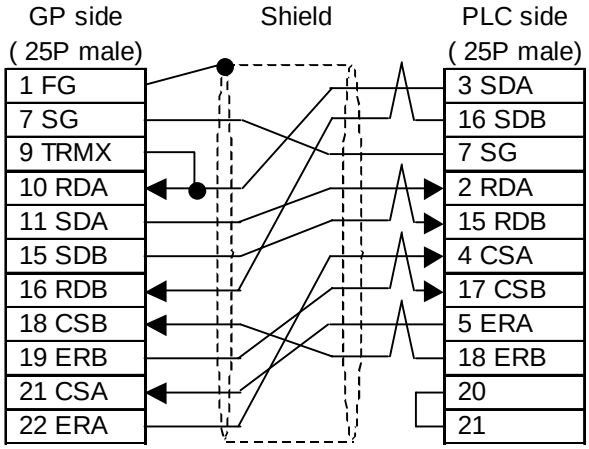
Note

- **Other manufacturer's ferrite cores can be also used. (The size should be the same as shown here.)**

Cable Diagram 11 (RS-422)

Important

- ***This cable diagram is only applicable for the GP2000 series.***



Note:

- **When pin 9 is connected to pin 10 on the serial interface of the GP unit, a termination resistance of 100Ω is provided between RDA and RDB.**

2.1.3 Supported Devices

The following table describes the range of devices supported by the GP.

■ MELSEC-A Series (AnA/ AnU/ A2US/ A2USH-S1)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	L/H
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M0000 ~ M8191	M0000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	L0000 ~ L8176	÷16	
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Annunciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B1FFF	———		
Timer (contact)	TS0000 ~ TS2047	———		
Timer (coil)	TC0000 ~ TC2047	———		
Counter (contact)	CS0000 ~ CS1023	———		
Counter (coil)	CC0000 ~ CC1023	———		
Timer (current value)	———	TN0000 ~ TN2047		
Counter (current value)	———	CN0000 ~ CN1023		
Data Register	———	D0000 ~ D8191	Bit15	
Special Register	———	D9000 ~ D9255	Bit15	
Link Register	———	W0000 ~ W1FFF	BitF	
File Register	———	R0000 ~ R8191	Bit15 *1	

**1 When using the File Register on AnA or AnU, use the User's Memory area in the memory cassettes listed below.*

A3NMCA-0 A3NMCA-2 A3NMCA-4 A3NMCA-8

A3NMCA-16 A3NMCA-24 A3NMCA-40 A3NMCA-56

A4UMCA-8E (only when using CPU Direct Communication)

When the File Register is setup and the memory cassette is not in use, an error will develop when communicating.

Caution

If a ladder program is stored in ROM when a direct connection is used, there may be cases where the file register may not be used.

■ MELSEC-N Series (AnN/ A2C/ A1S/ A3H/A0J2/A1SJ/A2SH/A1SH/A2CJ-S3)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	X0000 ~ X07F0	***0	
Output Relay	Y0000 ~ Y07FF	Y0000 ~ Y07F0	***0 *1	
Internal Relay	M0000 ~ M2047	M0000 ~ M2032	÷16	
Latch Relay	L0000 ~ L2047	———		
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16 *2	
Annunciator	F000 ~ F255	F000 ~ F240	÷16	
Link Relay	B0000 ~ B03FF	———		
Timer (contact)	TS000 ~ TS255	———		L/H
Timer (coil)	TC000 ~ TC255	———		
Counter (contact)	CS000 ~ CS255	———		
Counter (coil)	CC000 ~ CC255	———		
Timer (current value)	———	TN000 ~ TN255		
Counter (current value)	———	CN000 ~ CN255		
Data Register	———	D0000 ~ D1023	Bit15	
Link Register	———	W0000 ~ W03FF	BitF	
File Register	———	R0000 ~ R8191	Bit15 *3	

** 1 With the A2C, the Output Relays Y01F0~Y01FF (the word is Y01F0) cannot be setup for use on the PLC (only for A2C).*

** 2 MELSEC-AnN and AJ71C24-S3 (or AJ71C24) cannot be matched and used.*

** 3 When using the File Register on AnN or A3H, use the User's Memory area in the memory cassettes listed below.*

A3NMCA-0 A3NMCA-2 A3NMCA-4 A3NMCA-8

A3NMCA-16 A3NMCA-24 A3NMCA-40 A3NMCA-56

A4UMCA-8E (only when using CPU Direct Connection)

When the File Register is setup when the memory cassette is not in use, an error will develop when communicating.

Caution

If a ladder program is stored in ROM when a direct connection is used, there may be cases where the file register can not be used.

■ MELSEC-F_2 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars
Input Relay (X)	000 ~ 013, 400 ~ 413, 500 ~ 513	———	OCT 8
Output Relay (Y)	030 ~ 037, 430 ~ 437, 530 ~ 537	———	OCT 8
Timer (contact)(T)	050 ~ 057, 450 ~ 457, 550 ~ 557, 650 ~ 657	———	OCT 8
Counter (contact)(C)	060 ~ 067, 460 ~ 467, 560 ~ 567, 660 ~ 667	———	OCT 8
Hold Relay (M)	070 ~ 077, 100 ~ 177, 200 ~ 277, 470 ~ 477, 570 ~ 577	———	OCT 8
Keep Relay (M)	300 ~ 377	———	OCT 8
State (S)	800 ~ 877, 900 ~ 977, 600 ~ 647	———	OCT 8
Timer (current value)	———	TC050 ~ TC057 TC450 ~ TC457 TC550 ~ TC557 TC650 ~ TC657	OCT 8
Timer (set value)	———	TS050 ~ TS057 TS450 ~ TS457 TS550 ~ TS557 TS650 ~ TS657	OCT 8
Counter (current value)	———	CC060 ~ CC067 CC460 ~ CC467 CC560 ~ CC567 CC660 ~ CC667	OCT 8
Counter (set value)	———	CS060 ~ CS067 CS460 ~ CS467 CS560 ~ CS567 CS660 ~ CS667	OCT 8
Data Register	———	DW700 ~ DW777	OCT 8 Bit 15

Note: **Since the word addresses in F_2 Series' *Timer, Counter,* and *Data Register* bit length is 12, some tag functionality (i.e. N-tag, S-tag, C-tag, etc.) is limited.**

STOP **You cannot use 2 word (32 bit) data.**

■ MELSEC-FX Series (FX_0)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X017	X000	OCT 8	L/H
Output Relay	Y000 ~ Y015	Y000	OCT 8	
Internal Relay	M000 ~ M511	M000 ~ M496	÷ 16	
State	S000 ~ S063	S000 ~ S048	÷ 16	
Timer (contact)	TS000 ~ TS055	———		
Counter (contact)	CS000 ~ CS015	———		
Timer (current value)	———	TN000 ~ TN055		
Counter (current value)	———	CN000 ~ CN015		
Data Register	———	D000 ~ D031	Bit 15	

■ MELSEC-FX Series (Using Expansion Board with Link Protocol)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X0267	X0000 ~ X0240	OCT 8 ***0	L/H
Output Relay	Y0000 ~ Y0267	Y0000 ~ Y0240	OCT 8 ***0	
Auxilary Relay	M0000 ~ M3071	M0000 ~ M3056	÷ 16	
State	S0000 ~ S0991	S0000 ~ S0976	÷ 16	
Special Auxilary relay	M8000 ~ M8255	M8000 ~ M8240	÷ 16 *1	
Timer (contact)	TS000 ~ TS255	———		
Counter (contact)	CS000 ~ CS255	———		
Timer (current)	———	TN000 ~ TN255		
Counter (current)	———	CN000 ~ CN255	*2	
Data Register	———	D0000 ~ D7999	Bit 15	
Special Data Register	———	D8000 ~ D8255	Bit 15 *1	

**1 The Special Auxilary Relay and the Special Data Register are divided into three areas. These are the Exclusive Reading Area, the Exclusive Writing Area and the System Area. For details, refer to your PLC's manual.*

**2 Word addresses CN200 to CN255 are 32 bit counters.*

■ MELSEC-FX Series (FX_1/ FX_2/ FX_{2N}-64MR/ FX_{0N}-60MR/$FX2_{NC}$-32MT, using CPU Direct Connection)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X337	X000 ~ X320	OCT 8 *** 0 *2	L/H
Output Relay	Y000 ~ Y337	Y000 ~ Y320	OCT 8 *** 0	
Internal Relay	M0000 ~ M1535	M0000 ~ M1520	÷ 16	
State	S000 ~ S999	S000 ~ S976	÷ 16	
Timer (contact)	TS000 ~ TS255	———		
Counter (contact)	CS000 ~ CS255	———		
Timer (current value)	———	TN000 ~ TN255		
Counter (current value)	———	CN000 ~ CN255 *1		
Data Register	———	D000 ~ D999	Bit 15	

** 1 Addresses CN200 to CN255 are 32 bits long.*

** 2 Cannot perform data write.*

Important

- **The FX_{2N}-64MR can only be used for the range of devices listed above.**
- **Refer to the MELSEC-N series manuals for the A1FX's range of available devices.**

■ MELSEC-QnA Series (using Computer Unit AJ71QC24/A1SJ71QC24N/ AJ71QC24N-R4/AJ71QC24N or using CPU Direct Connection)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M00000 ~ M32767	M00000 ~ M32752	÷16	
Special Relay	SM0000 ~ SM2047	SM0000 ~ SM2032	÷16	
Latch Relay	L00000 ~ L32767	L00000 ~ L32752	÷16	
Annunciator	F00000 ~ F32767	F00000 ~ F32752	÷16	
Edge Relay	V00000 ~ V32767	V00000 ~ V32752	÷16	
Step Relay	S0000 ~ S8191	S0000 ~ S8176	÷16	L/H
Link Relay	B0000 ~ B7FFF	B0000 ~ B7FF0	***0	
Special Link Relay	SB000 ~ SB7FF	SB000 ~ SB7F0	***0	
Timer (contact)	TS00000 ~ TS22527	———		
Timer (coil)	TC00000 ~ TC22527	———		
Aggregate Timer (contact)	SS00000 ~ SS22527	———		
Aggregate Timer (coil)	SC00000 ~ SC22527	———		
Counter (contact)	CS00000 ~ CS22527	———		
Counter (coil)	CC00000 ~ CC22527	———		
Timer (current value)	———	TN00000 ~ TN22527		
Aggregate Timer (current value)	———	SN00000 ~ SN22527		
Counter (current value)	———	CN00000 ~ CN22527		
Data Register	———	D00000 ~ D25599	Bit 15	
Special Data Register	———	SD0000 ~ SD2047	Bit 15	
Link Data Register	———	W0000 ~ W63FF	Bit F	
Special Link Register	———	SW000 ~ SW7FF	Bit F	
File Register (normal)		R00000 ~ R32767	Bit 15 *1	
File Register (serial)	———	0R0000 ~ 0R7FFF : 1R0000 ~ 1R7FFF	Bit F *1	

** 1 When using File Register, a Memory Card is necessary.*

Usable capacity of the File Register varies depending on the capacity of the Memory Card.

■ MELSEC-QnA Series (using Computer Unit AJ71UC24/A1SJ71UC24-R2/A1SJ71UC24-R4)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X03FF	X0000 ~ X03F0	***0	
Output Relay	Y0000 ~ Y03FF	Y0000 ~ Y03F0	***0	
Internal Relay	M00000 ~ M8191	M00000 ~ M8176	÷16	
Special Relay	SM1000 ~ SM1255	SM1000 ~ SM1240	÷16	*1
Annunciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B0FFF	———	***0	
Timer (contact)	TS0000 ~ TS2047	———		
Timer (coil)	TC0000 ~ TC2047	———		L/H
Counter (contact)	CS0000 ~ CS1023	———		
Counter (coil)	CC0000 ~ CC1023	———		
Timer (current value)	———	TN0000 ~ TN2047		
Counter (current value)	———	CN0000 ~ CN1023		
Data Register	———	D0000 ~ D6143	Bit15	
Special Data Register	———	SD1000 ~ SD1255	Bit15	*1
Link Register	———	W0000 ~ W0FFF	BitF	

**1 Table data will change depending on whether the perspective is from the PLC or the User's PC.*

Device	GP-PRO/PBIII	PLC Manual
Special Relay	M9000 ~ M9255	SM1000 ~ SM1255 (cannot use SM0000~SM0999)
Special Register	D9000 ~ D9255	SD1000 ~ SD1255 (cannot use SD0000~SD0999)

◆ **MELSEC-QnA series communications mode selection (when using a link unit)**

When using the MELSEC-QnA series unit, either mode 2 or mode 1 can be selected during the entering of the initial settings, when the GP is in the OFFLINE mode.

Mode 2: This is a new communications mode. It is enabled when less than 64 devices have been designated by a single screen's tags. The communications speed has been improved. Select this mode when using less than 64 devices.

Mode 1: This mode is equivalent to the communications mode used previously. This mode is valid for 64 or more devices have been specified by a single screen's tags. The communications speed has been improved. Select this mode when using 64 or more devices.

- ***If the on-screen data memory area in the GP is initialized or if the on-screen data is transferred from the drawing software, the GP returns to mode 1 (its initial setting). Use the offline settings area to select mode 2.***
- ***In mode 2, the communications speed may not always be improved depending on which tags and system area are used, as well as how the PLC's read areas are allocated.***

■ MELSEC-Q Series (A mode, CPU Direct)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M0000 ~ M8191	M0000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	L0000 ~ L8176	÷16	
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Annunciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B1FFF	———		
Timer (contact)	TS0000 ~ TS2047	———		
Timer (coil)	TC0000 ~ TC2047	———		L/H
Counter (contact)	CS0000 ~ CS1023	———		
Counter (coil)	CC0000 ~ CC1023	———		
Timer (current value)	———	TN0000 ~ TN2047		
Counter (current value)	———	CN0000 ~ CN1023		
Data Register	———	D0000 ~ D8191	Bit 15	
Special Data Register	———	D9000 ~ D9255	Bit 15	
Link Register	———	W0000 ~ W1FFF	Bit F	
File Register	———	R0000 ~ R8191	Bit 15 *1	

** 1 The amount of space available when using the File Register will vary, depending on the amount of CPU ROM/RAM available, or the amount of memory available on the memory card.*

■ MELSEC-Q Series (Q mode Link I/F, CPU Direct)

Setup System Area here.

Device	Bit Address	Word Address	Notes	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	L/H
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M00000 ~ M32767	M00000 ~ M32752	÷16	
Special Relay	SM0000 ~ SM2047	SM0000 ~ SM2032	÷16	
Latch Relay	L0000 ~ L32767	L0000 ~ L32752	÷16	
Annunciator	F0000 ~ F32767	F0000 ~ F32752	÷16	
Edge Relay	V0000 ~ V32767	V0000 ~ V32752	÷16	
Step Relay	S0000 ~ S8191	S0000 ~ S8176	÷16	
Link Relay	B0000 ~ B7FFF	B0000 ~ B7FF0	***0	
Special Link Relay	SB000 ~ SB7FF	SB000 ~ SB7F0	***0	
Timer (contact)	TS00000 ~ TS23087	———		
Timer (coil)	TC00000 ~ TC23087	———		
Aggregate Timer (contact)	SS00000 ~ SS23087	———		
Aggregate Timer (coil)	SC00000 ~ SC23087	———		
Counter (contact)	CS00000 ~ CS23087	———		
Counter (coil)	CC00000 ~ CC23087	———		
Timer (current value)	———	TN00000 ~ TN23087		
Aggregate Timer (current value)	———	SN00000 ~ SN23087		
Counter (current value)	———	CN00000 ~ CN23087		
Data Register	———	D00000 ~ D25983	Bit15	
Special Data Register	———	SD0000 ~ SD2047	Bit15	
Link Data Register	———	W0000 ~ W657FF	BitF	
Special Link Register	———	SW000 ~ SW7FF	BitF	
File Register (normal)	———	R00000 ~ R32767	Bit15	*1
File Register (serial)	———	0R0000 ~ 0R7FFF	BitF	*1
	———	1R0000 ~ 1R7FFF	BitF	*1
	:	:	:	
	———	31R0000 ~ 31R67FF	BitF	*1

**1 The amount of space available when using the File Register will vary, depending on the amount of CPU ROM/RAM available, or the amount of memory available on the memory card.*

Note: Each device range represents the maximum range available, given the parameter settings.

Depending on your CPU, the usable device type and range may differ. Before using only a CPU, refer to your CPU User Manual.

2.1.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

Items affecting the PLC program cycle—

Please be aware that PLC program cycle time slows by approximately 8% when you connect the GP to the programming port and begin communications with the GP.

■ MELSEC-A Series / N Series (using Calculation Link Unit)

GP Setup		Computer Link Unit Setitings	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Channel Setup *1 Mode Setup (RS-232C)	RS-232C 4 (Format 4 protocol)
Communication Format (RS-422)	4-wire type	Channel Setup *1 Mode Setup (RS-422)	RS-422 8 (Format 4 protocol)
---		Write possible in RUN mode.	Possible
---		Sum Check	Yes
---		Enable Sender Termination Resistor *2	Yes
---		Enable Receiver Termination Resistor *2	Yes
Unit No.	0	Station Number	0

**1 A1SJ71C24-R2, A1SJ71UC24-R2, and A1SJ71C24-R4 do not have this setting.*

**2 The A171UC24 does not have this setting.*

■ MELSEC-A Series / N Series (CPU Direct Connection)

GP Setup		PLC Setitings
Baud Rate	9600 bps (fixed)	---
Data Length	8 bit (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Odd (fixed)	---
Data Flow Control	ER Control	---
Communication Format *1 (RS-232C)	RS-232C	---
Communication Format (RS-422)	4-wire type	---
Unit No.	0 (fixed)	---

**1 Only when using Digital's Programming Console I/F cable(GP430-IP10-0) for the A series unit. Otherwise a 4-wire type cable is required.*

■ MELSEC-A2C

GP Setup		A2C Setitings	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Check Parity setting even/oddd	Yes Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	Channel Setup Mode Setup	RS-232C 4 (Format 4 protocol)
---		Write possible in RUN mode	Possible
---		Sum Check	Yes
Unit No.	0	Station Number	0

■ MELSEC-F_2 Series

GP Setup		Interface Setitings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit (fixed)	Stop Bit	1 bit (fixed)
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Resistor Setting	Yes
---		Sum Check	Yes
Unit No.	0	Station Number	0

■ MELSEC-FX Series (using Expansion Board with Link Protocol)

GP Setup		Computer Link Unit Settings	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Computer Link	RS-232C I/F
Communication Format (RS-422)	4-wire type	Computer Link	RS485 (RS422) I/F
Unit No.	0	Station Number	0
---		Sum Check	Yes
---		Protocol	Yes
---		Control Method	4
---		Header	No
---		Terminator	No

Note: **The PLC's Station Number setting must be written to data register D8121, and all other PLC settings for the PLC must be written to data register D8120. For details, please refer to the Mitsubishi Electronics FX Series User Manual.**

■ MELSEC-FX Series *1 (CPU Direct Connection)

GP Setup		FX Series Settings
Baud Rate	9600 bps (fixed)	---
Data Length	7 bits (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Even (fixed)	---
Data Flow Control	ER Control	---
Communication Format	RS-232C	---
Unit No.	0 (fixed)	---

**1 The A1FX unit's settings are the same as the MELSEC-N Series (CPU Direct Connection).*

Caution **When the adapter (FX_{2N}-232-BD) is used, store "0" data in D8120.**

■ MELSEC-QnA (using Serial Communication Unit)

GP Setup		Serial Communication Unit Settings	
Baud Rate	19200 bps *1	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Mode Setup (RS-232C)	4 (Format 4 Protocol Mode)
Communication Format (RS-422)	4-wire type	Mode Setup (RS-422)	4 (Format 4 Protocol Mode)
---		Sum Check	Yes
---		Enable Sender Termination Resistor	Yes
---		Enable Receiver Termination Resistor	Yes
Unit No.	0	Station Number	0

**1 AJ71QC24-R4 , A1SJ71QC24N and AJ71QC24N can use a baud rate of 115,200bps.*

Note:

- **When your environment setup involves using MELSEC-QnA and the Computer Link Unit AJ71UC24 together, refer to the MELSEC-A Series' table.**
- **Serial communication units CH1 and CH2 can communicate at the same time, given any of the following conditions are true.**

  Condition 1 : The sticker on the top of the communication unit indicates the version is AB or later.

  Condition 2 : The date shown on the side of the communication unit indicates it was produced in September 1996(9609) or later.

  Condition 3 : The communication unit's ROM version is 7179M or later.

■ MELSEC-QnA (CPU Direct Connection)

GP Setup		PLC Settings
Baud Rate	19200 bps	---
Data Length	8 bits	---
Stop Bit	1 bit	---
Parity Bit	Odd	---
Data Flow Control	ER Control	---
Communication Format *1 (RS-232C)	RS-232C	---
Communication Format (RS-422)	4-wire type	---
Unit No.	0 (fixed)	---

**1 Only when using Digital 's Programming Console I/F cable (GP430-IP10-0) for the A series unit. Otherwise a 4-wire type cable is required.*

■ MELSEC-Q Series (A Mode CPU Direct Connection)

GP Setup		PLC Settings
Baud Rate	9600bps (fixed)	———
Data Length	8bit (fixed)	———
Stop Bit	1bit (fixed)	———
Parity Bit	Odd (fixed)	———
Data Flow Control	ER Control	———
Communication Format	RS-232C	———
Unit No.	0 (fixed)	———

■ MELSEC-Q Series (Q Mode CPU Direct Connection)

GP Setup		PLC Settings
Baud Rate	19200 bps	———
Data Length	8bit (fixed)	———
Stop Bit	1bit (fixed)	———
Parity Bit	Odd (fixed)	———
Data Flow Control	ER Control (fixed)	———
Communication Format	RS-232C (fixed)	———
Unit No.	0 (fixed)	———

Note:

- **Range of data transfer speeds is from 9600bps to 15,200bps. However, the maximum speed available with GP70 Series units (except for GP-377 Series units) is 38,400bps.**

■ MELSEC-Q Series (using A Mode CPU Computer Link Unit)

GP Setup		Computer Link Unit Settings	
Baud Rate	19200bps (fixed)	Baud Rate	19200 bps
Data Length	7bits (fixed)	Data Bit	7 bits
Stop Bit	2bits (fixed)	Stop Bit	2 bits
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Mode Setup (RS-232C)	4 (Format 4 Protocol Mode)
Communication Format (RS-422)	4-wire type	Mode Setup (RS-422)	4 (Format 4 Protocol Mode)
	-	Write possible in RUN mode	Possible
	-	Sum Check	Yes
Unit No.	0 (fixed)	Station Number	0

■ MELSEC-Q Series (Q Mode CPU Serial Communication Unit)

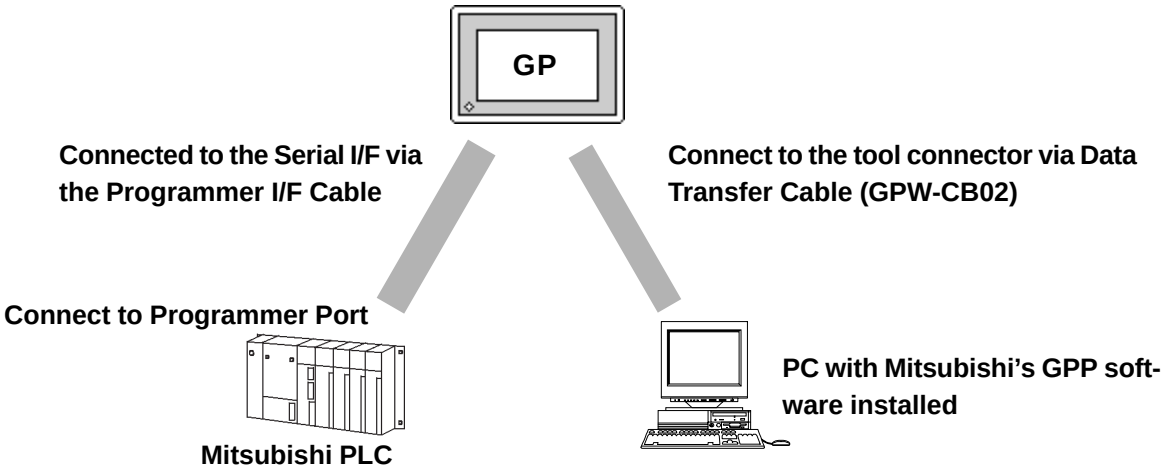
GP Setup		Serial Communication Unit Settings *1	
Baud Rate	19200bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Mode Setup (RS-232C)	4 (Format 4 Protocol Mode)
Communication Format (RS-422)	4-wire type	Mode Setup (RS-422)	4 (Format 4 Protocol Mode)
———		Sum Check	Yes
Unit No.	0	Station Number	0

***1 The setting is made by Mitsubishi's GPP function software.**

2.1.5 2-Port Feature

The 2-Port feature can be used in two ways:
(1)Via the GP's built-in 2-Port feature
(2)Via the external 2-Port Adapter II.
Both methods are described below:

■When Using GP unit's Internal 2-Port feature *1



1 The Device Monitor feature can also be used at the same time.

◆PLC models supporting Internal 2-Port Feature

Series	CPU
MELSEC-AnA Series	A2A, A2U-S1, A2USH-S1, A3A, A2US
MELSEC-AnN Series	A1S, A1SH, A2N, A3H, A2SH, A3N, A0J2H
MELSEC-QnA Series	Q2A, Q2A-S1, Q2AS-S1, Q2ASH, Q4A
MELSEC-FX Series *1	FX2N, FX2NC, FX0N
MELSEC-Q Series	Q02CPU-A,Q02HCPU-A,Q06HCPU-A, Q02CPU,Q02HCPU,Q06HCPU, Q12HCPU,Q25HCPU

1 MELSEC-FX Series' FX2 cannot use the internal 2-Port feature.

◆GP models supporting Internal 2-Port Feature

Series			GP type
GP-377 Series			GP-377L
			GP-377S
GP77R Series		GP-377R Series	GP-377RT
		GP-477R Series	GP-477RE
		GP-577R Series	GP-577RT
			GP-577RS
GP2000 Series	GP2000H Series	GP-2301H Series	GP-2301HL
			GP-2301HS
		GP-2401H Series	GP-2401HT
		GP-2300 Series	GP-2300L
			GP-2300T
		GP-2301 Series	GP-2301L
			GO-2301S
		GP-2400 Series	GP-2400T
		GP-2500 Series	GP-2500L
			GP-2500S
			GP-2500T
		GP-2501 Series	GP-2501S
			GP-2501T
		GP-2600 Series	GP-2600T

◆GPP Feature Software Package

MELSEC-A Series	NEC 98 Series SW2NX-GPPA type GPP feature software package or later DOS/V Series SW31VD-GPPA type GPP feature software package or later Windows95, Windows NT SW0D5*-GPPW type GPP feature software package or later
MELSEC-QnA Series	NEC 98 Series SW0NX-GPPQ type GPP feature software package DOS/V Series SW01VD-GPPQ type GPP feature software package Windows95, Windows NT SW0D5*-GPPW type GPP feature software package or later
MELSEC-FX Series	Windows 95 SW0PC-FXGP/WIN type GPP feature software package Windows 95, Windows NT SW4D5C-GPPW type GPP feature software package or later
MELSEC-Q Series	Windows 95, Windows NT SW4D5C-GPPW type GPP feature software package or later

■Internal 2-Port Feature Usage Notes

Note:

- The selections “USE ADAPTER MODE/CPU DIRECT MODE” will be displayed only when a direct CPU connection is used.
- The factory setting will become “Adapter”(the setting when using 2-Port Adapter II).
- This feature can be used only while the GP is in ONLINE mode.
- Use the Digital's trasnfer cable GPW-CB02.

Important

- ***If you transfer screen data while the GP is in ONLINE mode, the screen will not change to the data transfer screen automatically. Thus, you will need to change the screen manually to the OFFLINE mode's [Main Menu/ Transfer] screen.***
- ***Since the internal 2-Port feature uses the GP's single tool connector, you will not be able to use optional equipment which requires the tool connector (i.e. a Barcode Reader, etc.)***
- ***Peripheral equipment which cannot be connected to the GP's tool connector (such as a Programming Console) is not compatible with the GP's Internal 2-Port feature. To use this type of equipment, you will need to use the external 2- Port Adapter II.***
- ***When using the GP's built-in 2-Port feature, be sure not to switch to OFFLINE mode while the GPP software is communicating with the PLC. Switching to OFFLINE mode will result in a communication (data transfer) break***
- ***With GP2000, GP77R series units, if the 2-Port feature is designated, the Simulation feature cannot be used. Be sure to select "Adapter" or "Direct" when using the Simulation feature.***

Important

- ***When using the GP's built-in 2-Port feature with the MELSEC-Q Series, be sure to set your PC's data link speed to the same values as used by the GP. If the setting values are different, an error will appear on the GP and your PC. The error will appear as shown bellow.***

  <GP>

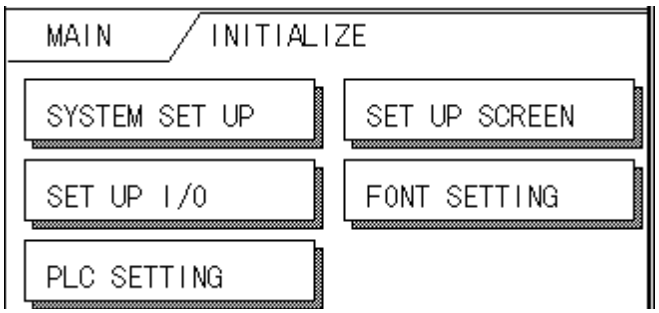
  "PC's data link speed is different. (02:F5)"

  <PC>

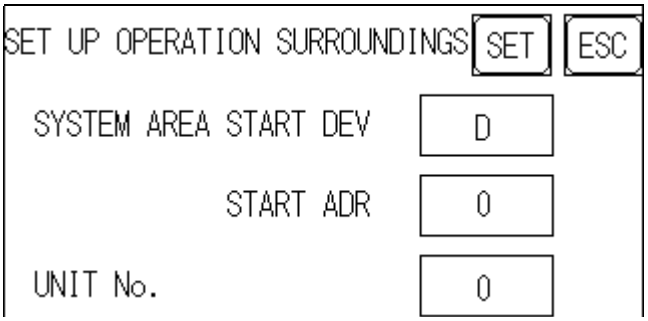
  "Cannot communicate with the PC."

<e.g : GP-377 series unit's screen>

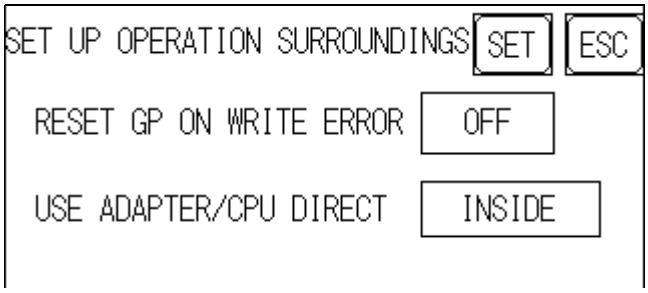
① Touch item, PLC SETTING. The SET UP OPERATION SURROUNDINGS menu will appear.



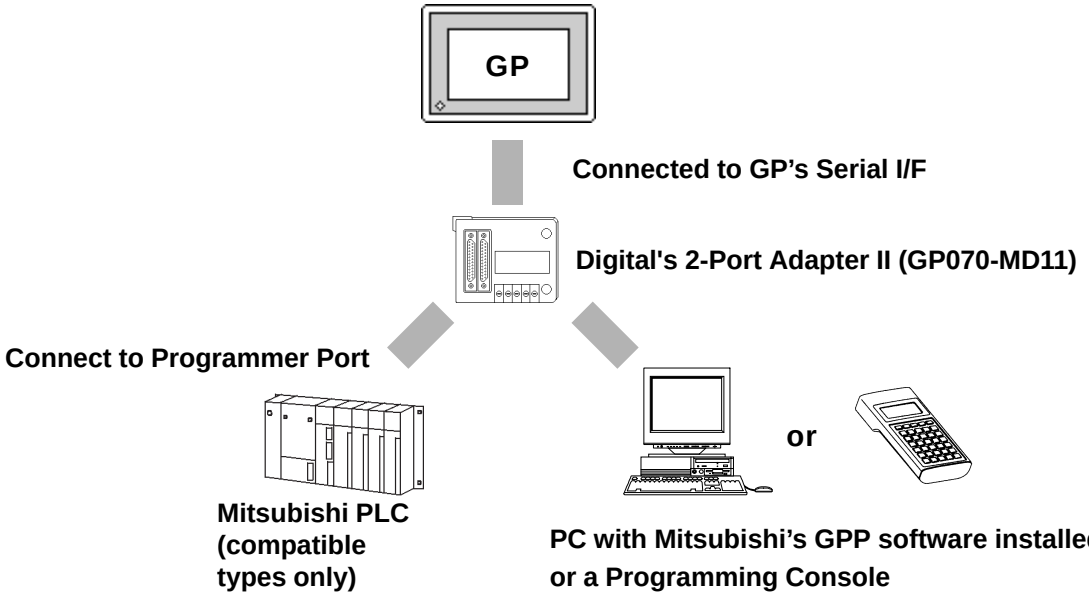
② Touch the button, SET on the upper right on the screen. The SET UP OPERATION SURROUNDINGS 2 menu appears.



③ Touch the "2-Port Feature/ CPU Direct" selection's right side setting box until "IN-SIDE" appears. When using the 2-Port Adapter II unit, select "Adapter", or "CPU" for a direct CPU connection. When using GP2000H Series units, select "Adapter + GPH".



■When Using the External 2-Port Adapter Cable *1



**1 2-Port Adapter can be used for the GP series units supporting the internal 2-Port feature .*

■PLCs supported by the 2-Port Adapter II

Note: **For information about which CPUs the 2-Port Adapter II (GP070-MD11) can connect to, refer to the 2-Port Adapter II Users Manual.**

■When Using the 2-Port Adapter II

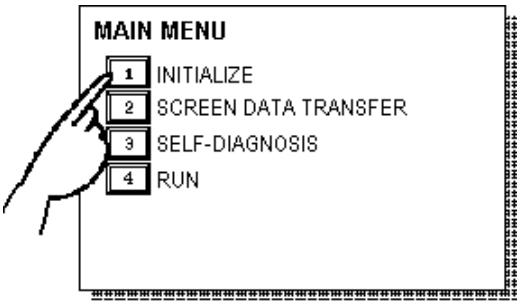
Set up from the GP's OFFLINE mode when using 2-Port Adapter II.

Reference *GP User Manual (Sold separately) , "OFFLINE Mode"*

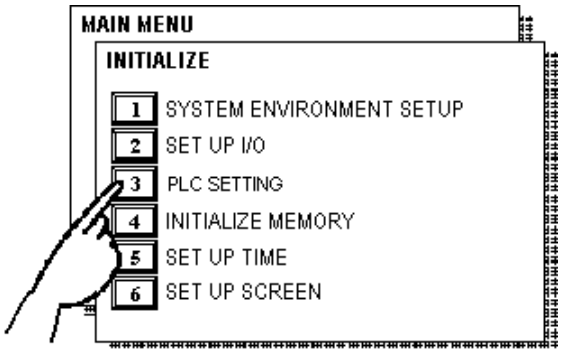
◆GP70 Series (except GP-377 series)

Note:
- The selections “USE ADAPTER MODE/CPU DIRECT MODE” will be displayed only when a direct CPU connection is used.
- The factory setting will become “2 Port”.

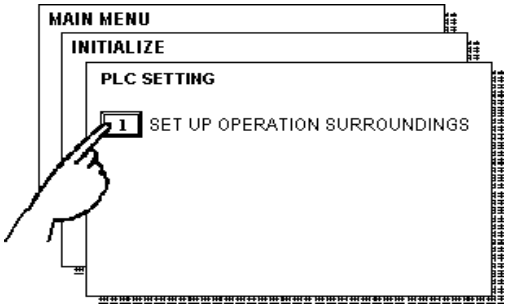
<e.g : GP-570 series unit's screen>



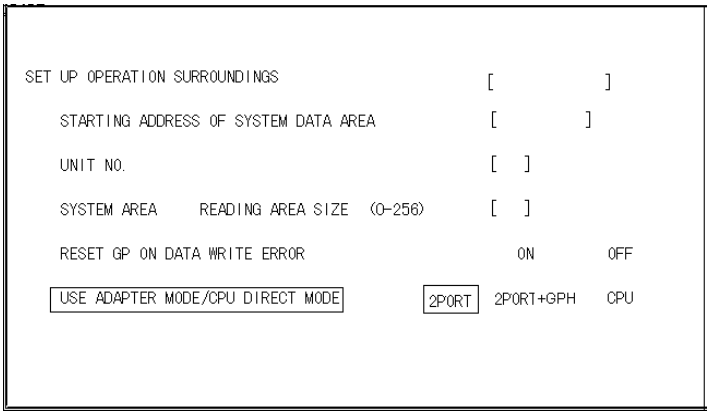
① Touch item #1, INITIALIZE. The INITIALIZE menu will appear.



② Touch item #3, PLC SETTING. The PLC SETTING menu appears.



③ Touch item #1, SET UP OPERATION SURROUNDINGS. The SET UP OPERATION SURROUNDINGS menu will appear.



GP70 Series Units

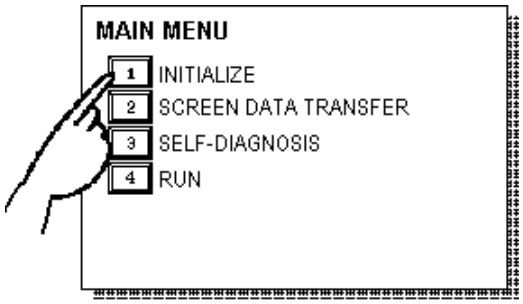
④ Touch the “USE ADAPTER MODE/CPU DIRECT MODE” selection. The selected item is highlighted.

⑤ When using the 2 port adapter II (GP070-MD11), select the *2PORT* option. For GPH70 however, select *2PORT + GPH*.
Select CPU when connecting CPU directly.

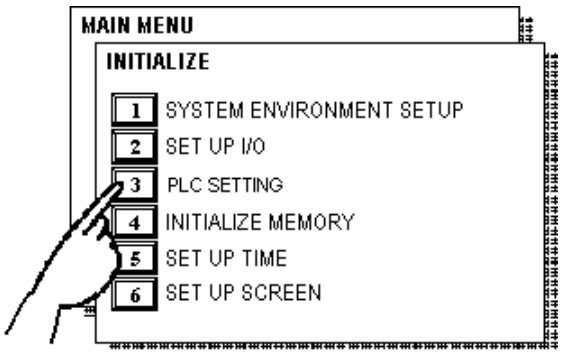
◆GP77R/GP2000 Series

Note:
- The selections “2 Port Mode/CPU DIRECT MODE” will be displayed only when a direct CPU connection is used.
- The factory setting will become “Adapter”.

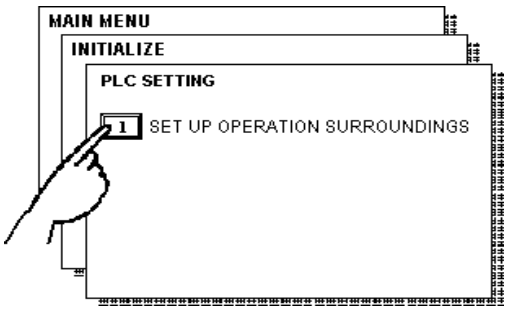
<e.g : GP-577R series unit's screen>



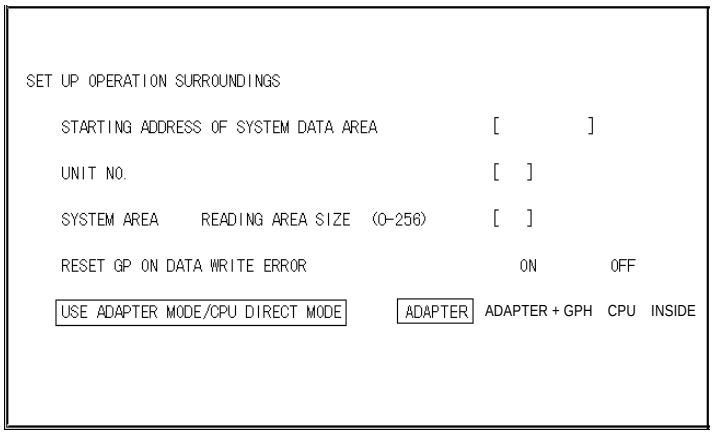
① Touch item #1, INITIALIZE. The INITIALIZE menu will appear.



② Touch item #3, PLC SETTING. The PLC SETTING menu appears.



③ Touch item #1, SET UP OPERATION SURROUNDINGS. The SET UP OPERATION SURROUNDINGS menu will appear.



GP77R Series Units

④ Touch the “USE ADAPTER MODE/CPU DIRECT MODE” selection. The selected item is highlighted.

⑤ When using the 2 Port Adapter II (GP070-MD11), select the *ADAPTER* option.
When using GP2000H Series units, select "Adapter + GPH".
Select *CPU* when connecting CPU directly.
When using the internal 2-Port feature, select *INSIDE* option.


MEMO

2.2 Omron

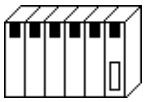
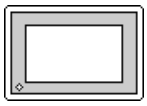
2.2.1 System Structure

The following describes the system structure for connecting the GP to Omron PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.2.2 Cable Diagrams**".*

Important ***If the PLC is used in RUN mode, "PLC COM. ERROR (02: 01)" may briefly display. The GP subsequently forces the PLC to enter the MONITOR mode (data can be written to the PLC, while it is in RUN mode); data communication will not be affected.***

■ SYSMAC C Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 Upper Link Unit	◄———	———►	
C200H	C200H-LK201 *1 C120-LK201-V1 *2	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	GP Series
	C200H-LK202 *1 C120-LK202-V1 *2	RS-422 (Cable Diagram 2)		
C200HS	C200H-LK201 *1 C120-LK201-V1 *2	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	
	C200H-LK202 *1	RS-422 (Cable Diagram 2)		
	CPU unit Link I/F *3	RS-232C (Cable Diagram 3)	Digital's GP000-IS03-MS (3m)	
C500, C500F, C1000H, C2000, C2000H	C120-LK201-V1 *2	RS-232C (Cable Diagram 1)	RS-232C Digital's GP410-IS00-O (5m)	
	C120-LK202-V1 *2	RS-422 (Cable Diagram 2)		
	C500-LK201-V1 *1	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)		
	C500-LK203 *1	RS-232C (Cable Diagram 1) RS-422(Cable Diagram 4)		
C1000HF	C500-LK203 *1			
C20H, C28H, C40H	CPU unit Link I/F *3	RS-232C (Cable Diagram 5)		
C120, C120F	C120-LK201-V1 *2	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	
	C120-LK202-V1 *2	RS-422 (Cable Diagram 2)		

** 1 Base installation type.*
** 2 CPU installation type.*
** 3 Connect to the RS-232C port.*

CPU	Link I/F	Cable Diagram	Cables	GP
CQM1-CPU42	RS-232C Port on CPU unit	RS-232C (Cable Diagram 3)	Omron's RS-232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's GP000-IS03-MS (3m)	GP Series
SRM1-C02 CPM2A	CPM1-CIF01 RS-232C Port on CPU unit	RS-232C (Cable Diagram 3)	Omron's RS-232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's GP000-IS03-MS (3m)	
	CPM1-CIF11	RS-422 (Cable Diagram 9)		
CPM1-20CDR-A	CPM1-CIF01	RS-232C (Cable Diagram 3)	Omron's RS-232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's GP000-IS03-MS (3m)	
	CPM1-CIF11	RS-422 (Cable Diagram 9)		
CQM1H-CPU21	RS-232C Port on CPU unit	RS-232C (Cable Diagram 3)	Omron's RS-232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's GP000-IS03-MS (3m)	
CPM2C	Peripheral port on CP2C-CIF01	RS-232C	Omron's cable CS1W-CN114 and CQM1-CIF01are required.	
	RS-232C port on CPM2C-CIF01	RS-232C (Cable Diagram 3)	Omron's RS-232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's GP000-IS03-MS (3m)	
CQM1H-CPU51 CQM1H-CPU61	CQM1H-SCB41 *1	RS-422 (1:n communication) *2 (Cable Diagram 12)	OMRON's B500-AL001 link adaptor *3	GP Series *4
		RS-422 (1:n communication) *2 (Cable Diagram 13)		

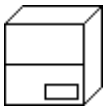
**1 Use the RS-422A/485 port, which is port 2 of the COM1H-SCB41 series communication board.*

**2 When "n" COM1H-CPU51/CCM1H-CPU61 units are connected to one GP unit for communication, the maximum for "n" is 8.*

**3 The RS-422 communication port on the PLC is a D-sub. For 1:n connections, use OMRON's link adaptor or terminal block.*

**4 Within the GP70 series units, this applies only to the GP377 series.*

■ SYSMAC C Series (CPU Direct Connection)

CPU *1	Cables	GP
		
C200HS, SRM1-C02, CQM1-CPU11, CQM1-CPU42, CPM1-20CDR-A, CQM1H-CPU21 *2 CPM2C *2	Omron Isolation Cable CQM1-CIF01	GP Series

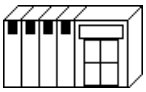
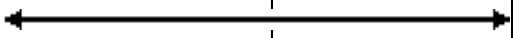
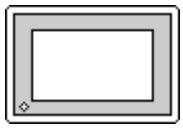
** 1 Connect to a peripheral port.*

**2 Omron's cable (CSIW-CN114) is required.*

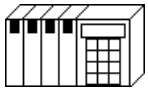
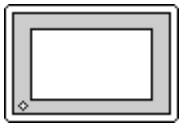
The CQM1-CPU11 has only one peripheral port, so a programming console cannot be used at the same time with the GP.

If power to CQM1 is turned OFF while it is connected to the GP, "RUN" (operation) will stop. To change CQM1 to RUN mode when the power is turned back ON, change the CQM1's [Power ON Operation Mode Setting] to [RUN].

■ SYSMAC-α Series (using Link I/F)

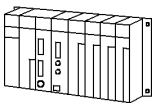
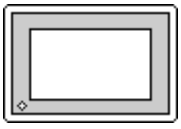
CPU	Link I/F	Cable Diagram	Cables	GP
	Communication board 			
C200HX-CPU85-Z C200HE-CPU64 C200HG-CPU44 C200HG-CPU42 C200HG-CPU63 C200HG-CPU43	C200HW-COM06	RS-232C (Cable Diagram 3) RS422 (Cable Diagram 6)	Omron's RS232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's RS232C cable GP000-IS03-MS (3m)	GP Series
C200HE-CPU42-Z C200HX-CPU64-Z	RS-232C Port on CPU unit	RS-232C (Cable Diagram 3)	Omron's RS232C cable XW2Z-200S (2m) XW2Z-500S (5m) Digital's RS232C cable GP000-IS03-MS (3m)	
	C200H-LK202-V1	RS-422 (Cable Diagram 2)		
	C200H-LK201-V1	RS-232C (Cable Diagram 1)	Digital's RS232C cable GP410-IS00-0 (5m)	

■ SYSMAC CV Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 Upper Link Unit			
CV500, CV1000, CVM1	CV500-LK201	RS-232C <SIO port 1 connection> (Cable Diagram 1) RS-232C <SIO port 2 connection> (Cable Diagram 7) RS422 <SIO port 2 connection> (Cable Diagram 8)	RS232C (SIO port 1 connection) Digital's GP410-IS00-O (5m)	GP Series
	CPU unit Link I/F *1	RS-232C (Cable Diagram 7) RS422 (Cable Diagram 8)		

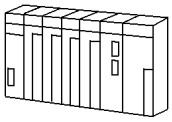
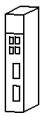
**1 Connect to the Host Link Port*

■ SYSMAC CS1 Series (1:1)

CPU	Link I/F	Cable Diagrams	Cables	GP
				
CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42 CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	RS-232C port for CPU unit	RS-232C (Cable Diagram 3)	Digital's GP000-IS03-MS(3m) Omron's XW2Z-200S(2m) XW2Z-500S(5m)	GP Series
	Peripheral Port for CPU unit	RS-232C *1 (Cable Diagram 11)	Omron's CS1W-CN225 *1 CS1W-CN625 *1	
	CS1W-SCU21	RS-232C (Port 1,2) (Cable Diagram 3)	Digital's GP000-IS03-MS(3m)	
	CS1W-SCB21	RS-232C (Port 1,2) (Cable Diagram 3)	Omron's XW2Z-200S(2m) XW2Z-500S(5m)	
	CS1W-SCB41	RS-232C (Port 1) (Cable Diagram 3)		
		RS-422 (Port 2) (Cable Diagram 10)		

**1 When connecting to the peripheral port, a particular cable is needed between GP and the CS1W-CN*25 cable, refer to this section's Cable Diagram 11 for the required cable.*

■ SYSMAC CJ Series

CPU	Link I/F	Cable Diagrams	Cables	GP
				
CJ1G-CPU44 CJ1G-CPU45	Peripheral port on CPU unit	RS-232C (Cable Diagram 11)	Digital's CS1W-CN225 *1 CS1W-CN625 *1	GP Series
	RS-232C port on CPU unit	RS-232C (Cable Diagram 3)	Digital's GP000-IS03-MS (3m) Omron's XW2Z-200S (2m) XW28-500S (5m)	
	CJ1W-SCU41	RS-232C (Port 2) (Cable Diagram 3)	Digital's GP000-IS03-MS (3m) Omron's XW2Z-200S (2m) XW28-500S (5m)	
	CJ1W-SCU41	RS-422 (Port 1) (Cable Diagram 10)		

**1 When connecting to the peripheral port, another cable is required between the GP and the CS1W-CN*25 cable. For details, refer to this section's Cable Diagram 11.*

2.2.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Omron Corp. may differ; in any case, using these cables for your PLC operations will not cause any problems.

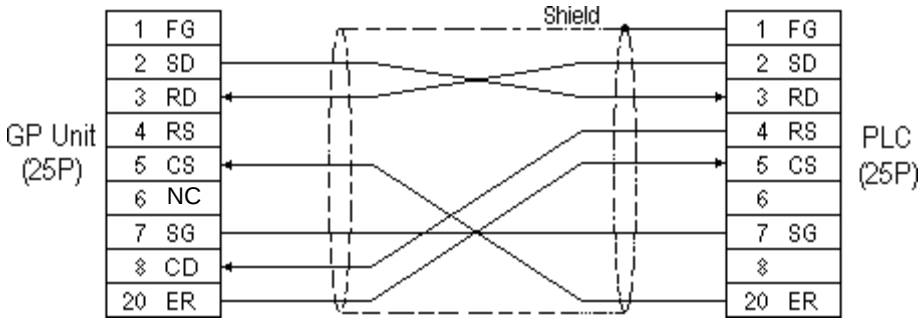
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***

Cable Diagram 1 (RS-232C)

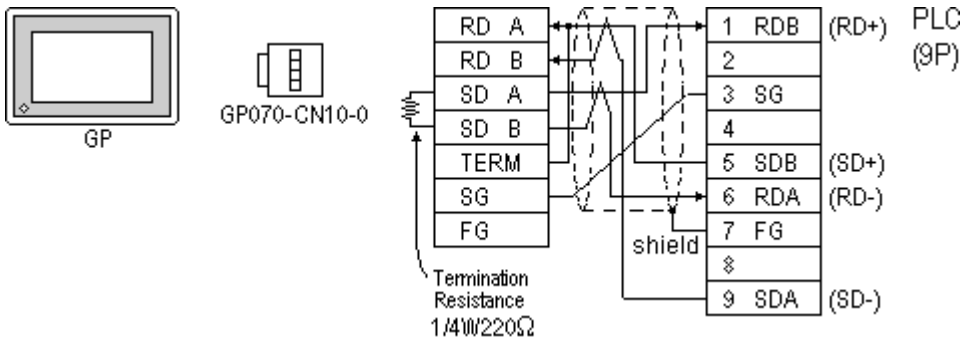


Cable Diagram 2 (RS-422)

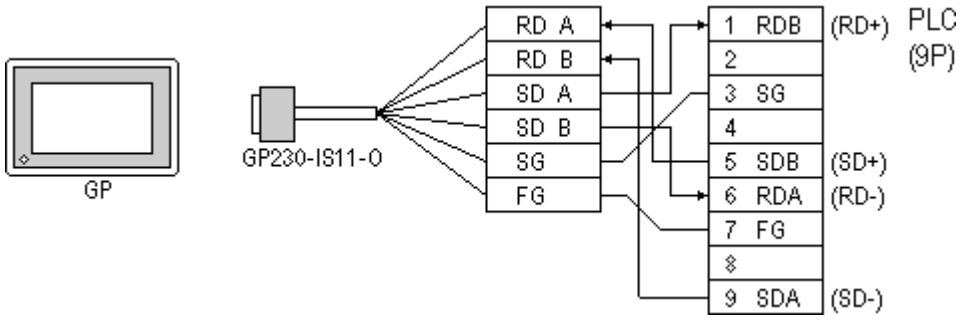
Important

- ***Turn on the* Termination Resistor *switch, on the PLC.***
- ***Signals A and B are opposite on the GP and PLC.***

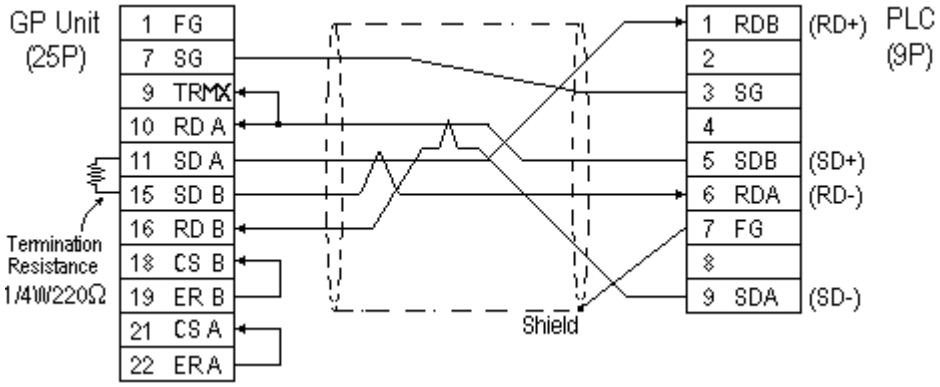
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections

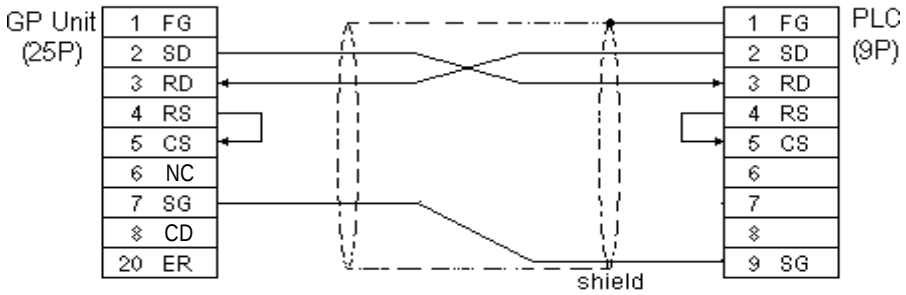


Note: **When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2) cable.**

Important

- ***When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.***
- ***If a shielded cable is connected to the RS-422 port, it must be no longer than 500 meters.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 3 (RS-232C)

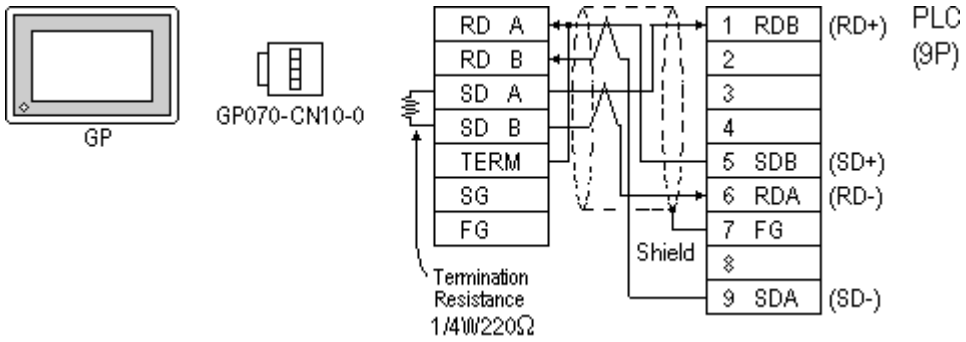


Note: **While the above connection diagram will differ slightly from the Omron XW2Z-200S (2m) and XW2Z-500S (5m) RS-232C cables, the system will operate smoothly using this design.**

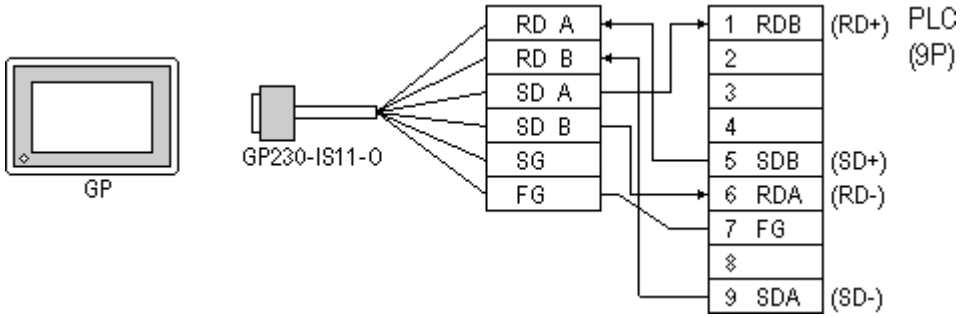
Cable Diagram 4 (RS-422)

Important
- ***Turn the* PLC's Termination Resistor *switch ON.***
- ***Signals A and B are opposite on the GP and PLC.***

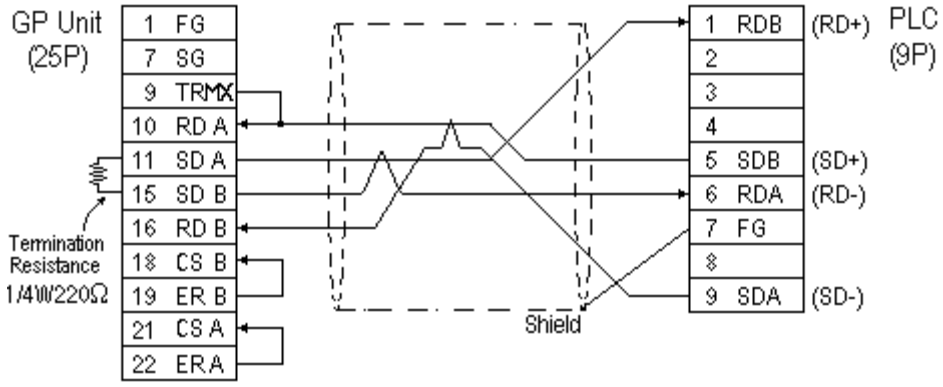
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0

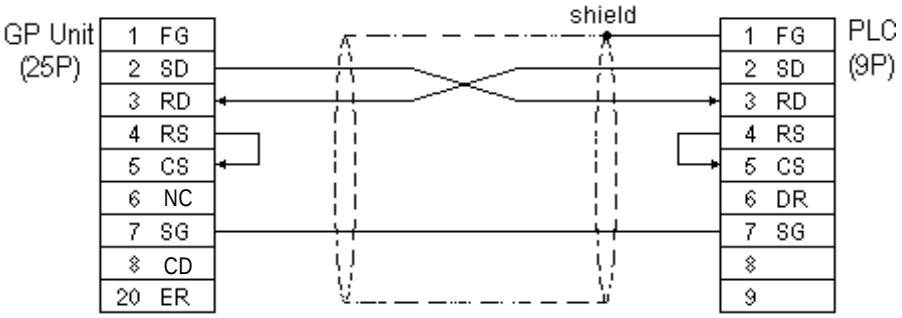


• When making your own cable connections



Note:
- **When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2) cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 5 (RS-232C)



Note: **Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2) cable is recommended as the connection cable.**

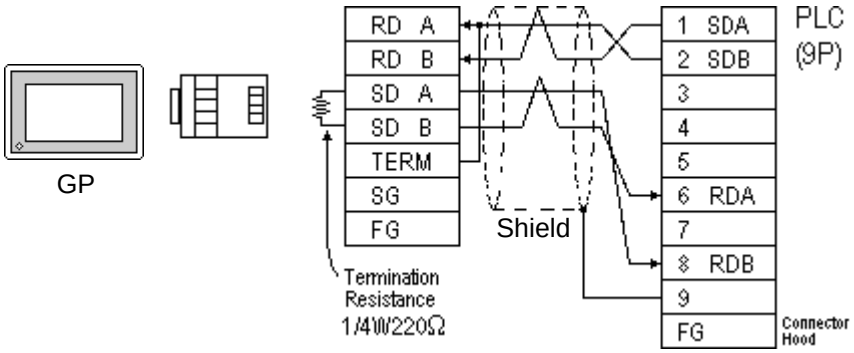
Cable Diagram 6 (RS-422)

Important

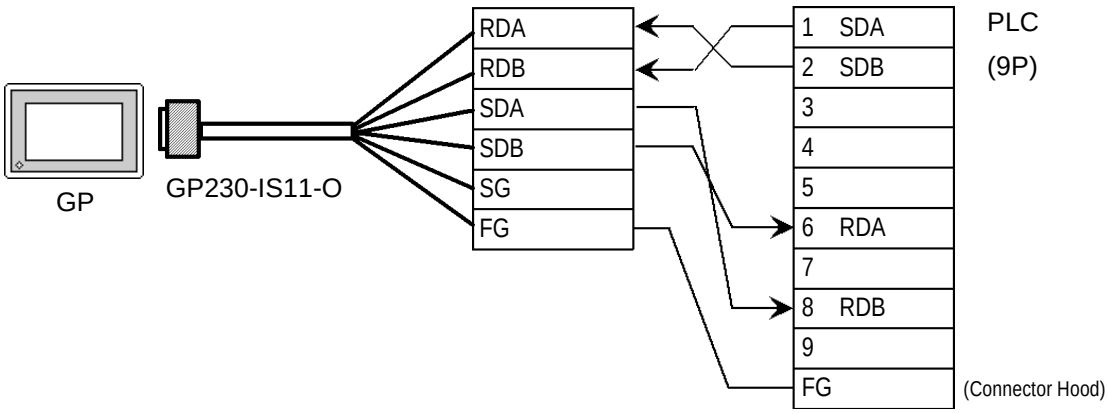
- ***Turn on the* Termination Resistor *switch, on the PLC side.***
- ***Signals A and B are opposite on the GP and PLC.***
- ***The connector and the connector hood, listed below, are included with the Communication board.***

Connector	***XW2A-0901***
Connector Hood	***XW2S-0901***

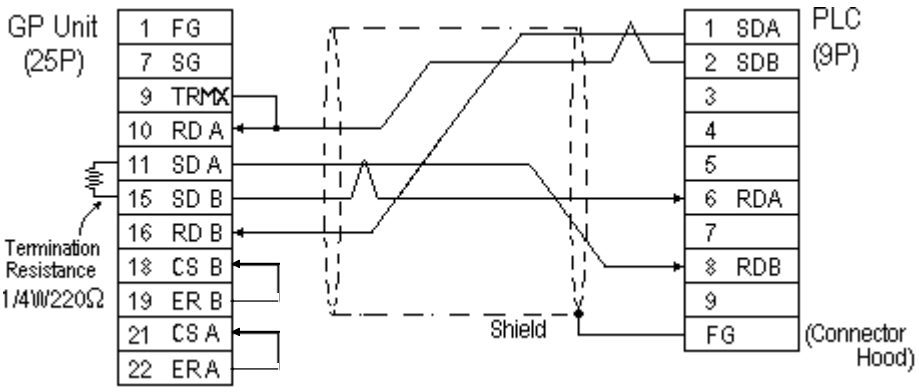
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 connector terminal adapter GP230-IS11-0



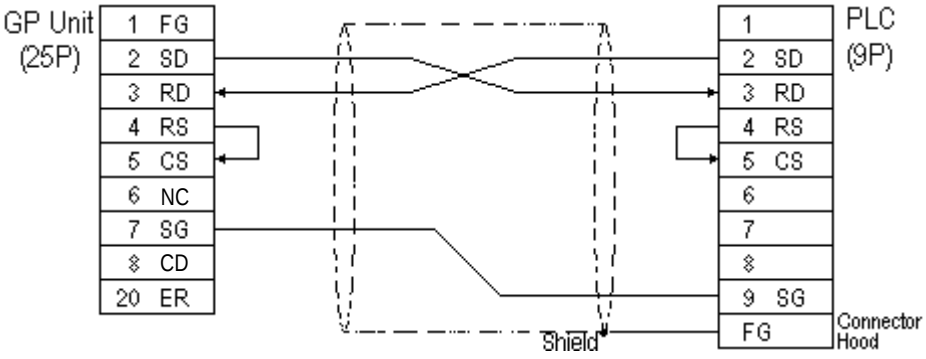
• When making your own cable connections



Note:

- **When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2) cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 7 (RS-232C)



Note:

- **One each of the connector and connector hood, listed below, are included with the CV500/CV1000 CPU unit. Only these connectors listed below can be used.**

  Connector XM2A-0901

  Connector Hood XM2S-0911

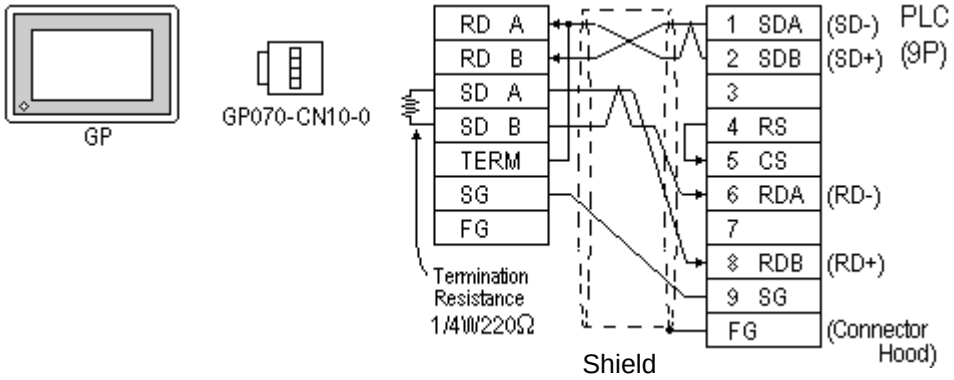
- **Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2) cable is recommended as the connection cable.**

Cable Diagram 8 (RS-422)

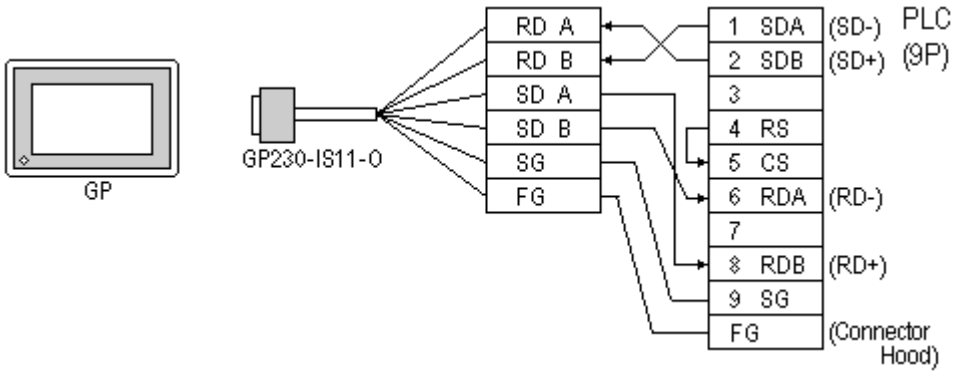
Important

- ***Setup the PLC's RS-232C/RS-422 toggle switch to RS-422.***
- ***Turn on the Termination Resistor switch, on the PLC side.***
- ***Signals A and B are opposite on the GP and PLC***
- ***The connector and connector hood, listed below, are included with the CV500/CV1000 CPU unit. Only these connectors can be used.***
  1 Connector XM2A-0901
  1 Connector Hood XM2S-0911

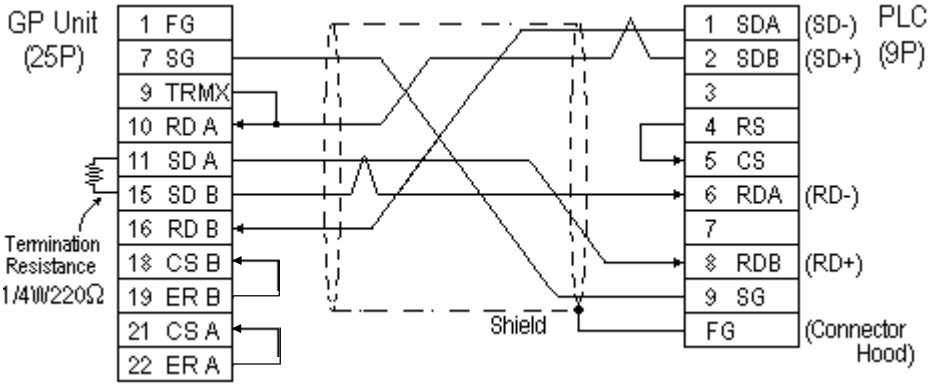
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



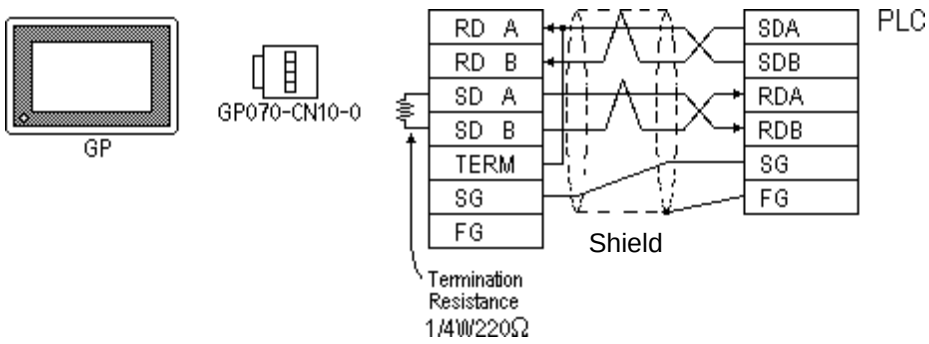
• When making your own cable connections



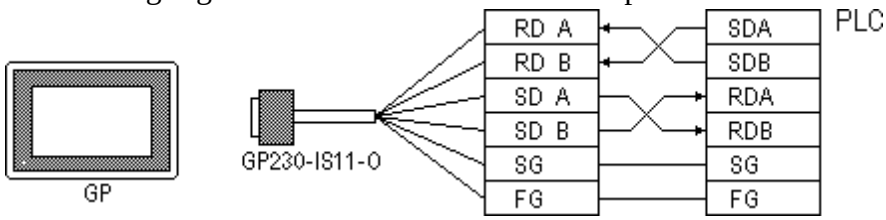
Note:

- **When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2) cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

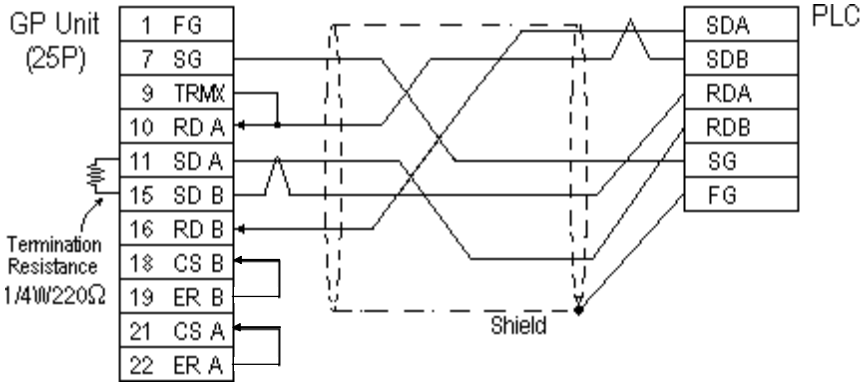
Cable Diagram 9 (RS-422)



• When using Digital's RS-422 connector terminal adapter GP230-IS11-0

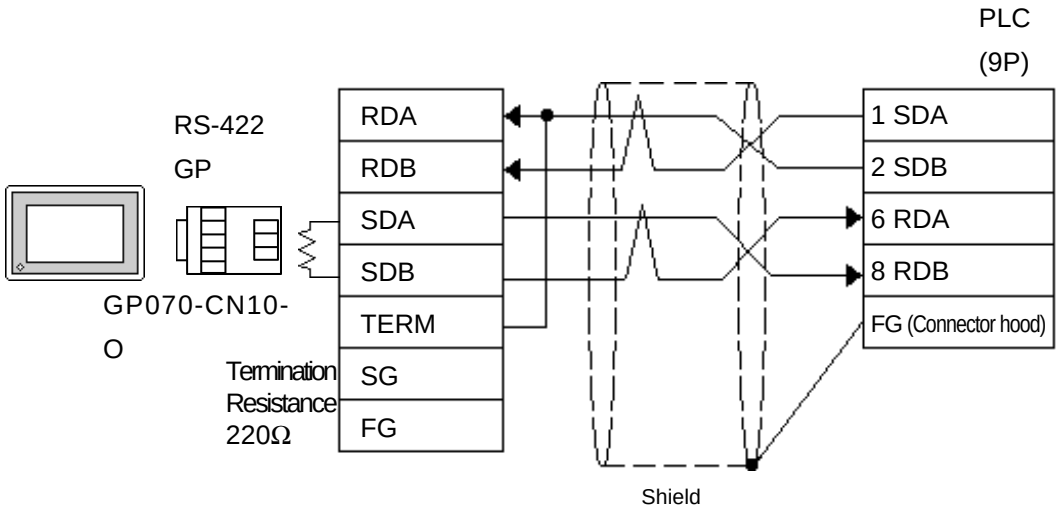


• When making your own cable connections

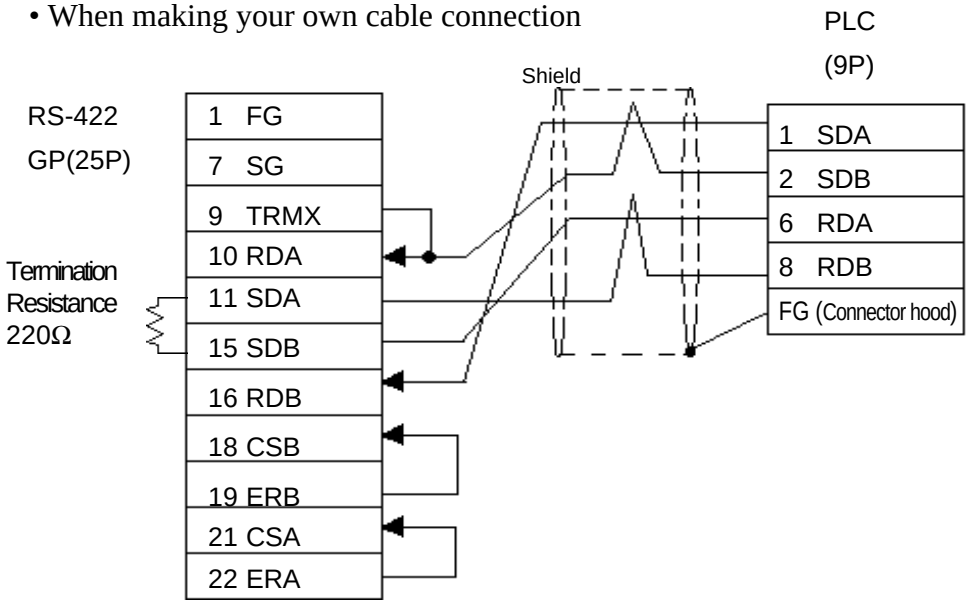


Cable Diagram 10 (RS-422)

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



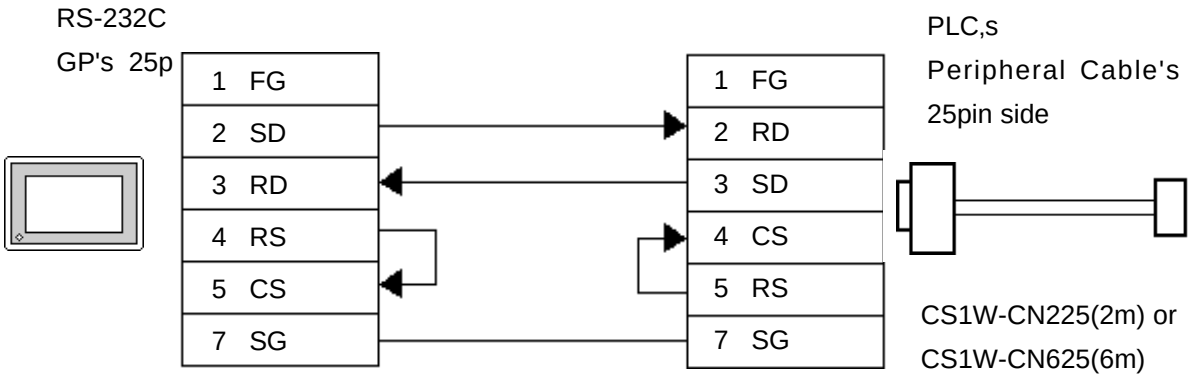
• When making your own cable connection



Note:

- **Turn ON the PLC's termination resistance switch.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **Be aware the A and B signals of the GP and PLC are opposite to each other.**
- **The cable length must be 500 meters or less.**
- **The Hiraga Hutech's CO-HC-ESV-3PX7/0.2 cable is recommended for this connection.**

Cable Diagram 11 (RS-232C)

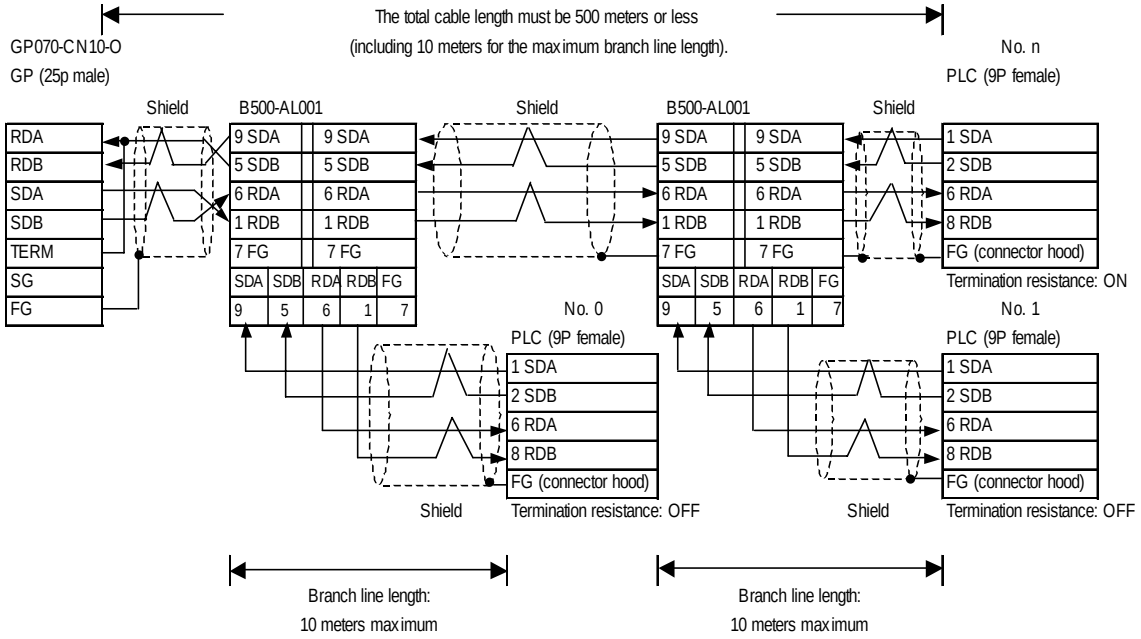


Cable Diagram 12 (RS-422, 4-wire type)

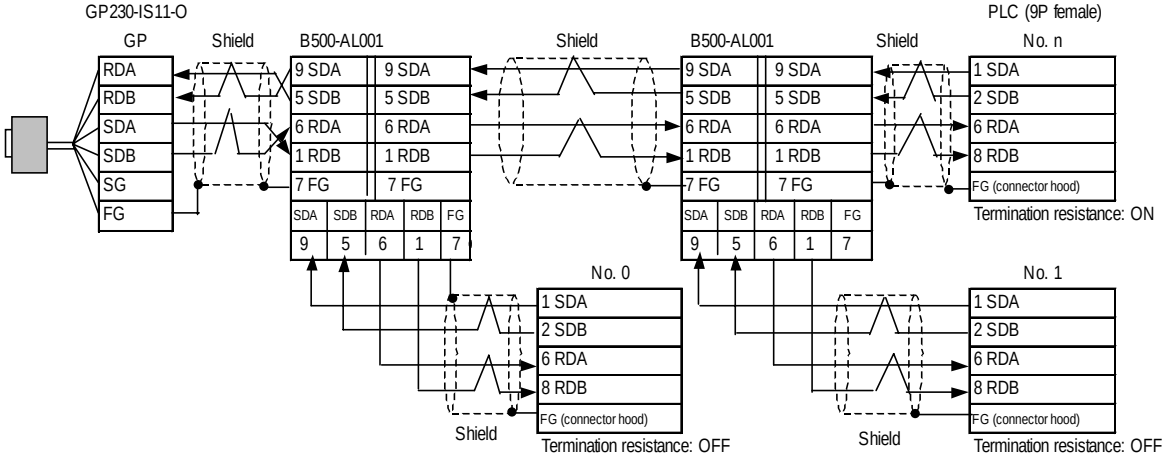
Important

- ***Hiraga Hutech's CO-HC-ESV-3P*7/0.2 cable is recommended for this connection.***
- ***Ground one end of the communication cable to either the RS-422A/RS-485 connector hood on the serial communication board, or to the GP.***
- ***The PLC has no SG connector, but its internal signal line is electrically insulated. Therefore, the SG connector on the GP/GLC requires no connection.***
- ***Set the termination resistance selector switch, [TERM] on the terminating SYSMAC-COM1H, to the "ON" position. If two units of PLCs are connected to the GP/GLC, the one having the longer distance for communication becomes the terminating station.***
- ***Set the 2-wire/4-wire selector switch, [WIRE] on the PLC to the "4" position.***
- ***The maximum cable length for RS-422/RS-485 communication is 500 meters. The total branch line length for T-branching is 10 meters. In the following cable diagram, the communication distance between the GP and No. n unit is covered by the total length of the cable i.e. main cable and branches. In cable diagram 1, No. 0 and No. 1 units are connected by a branch line.***
- ***To connect the PLC, use OMRON's B500-AL001 link adaptor or a terminal block.***

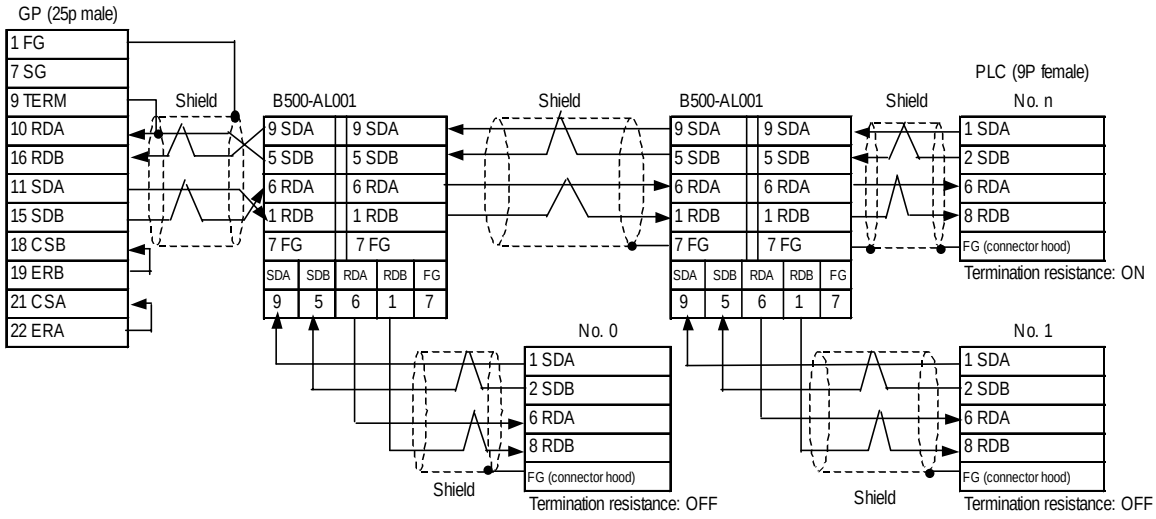
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable GP230-IS11-0



• When making your own cable connection

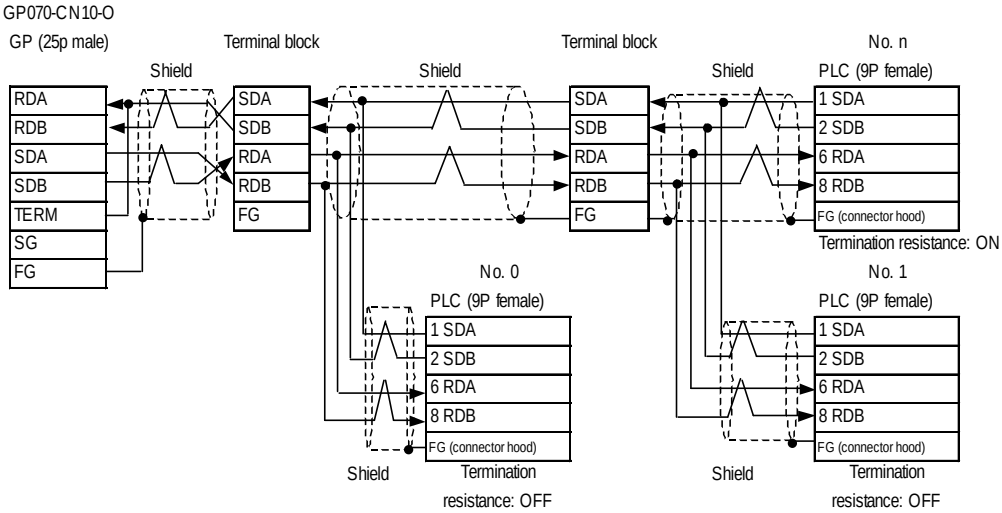


Cable Diagram 13 (RS-422, 4-wire type)

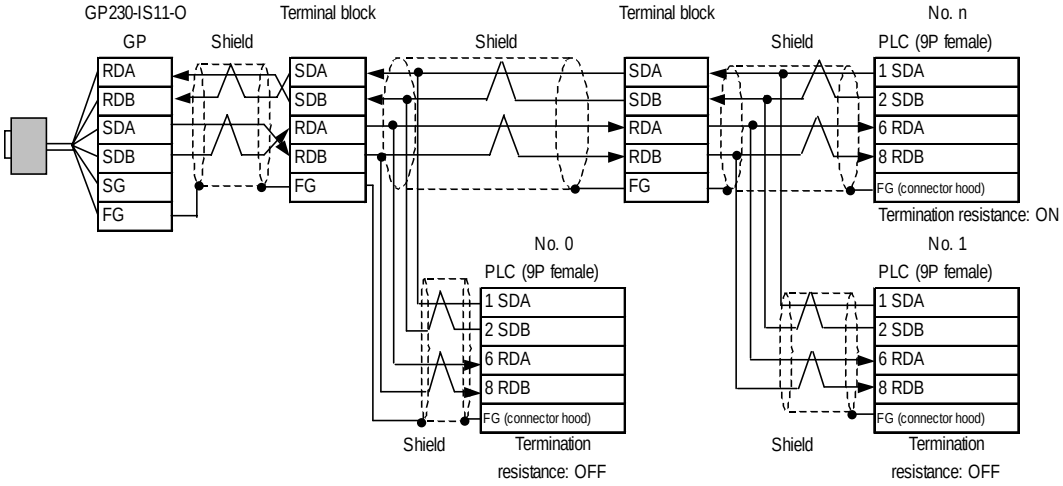
Important

- ***Hiraga Hutech's CO-HC-ESV-3P*7/0.2 cable is recommended for this connection.***
- ***Ground one end of the communication cable to either the RS-422A/RS-485 connector hood on the serial communication board, or to the GP.***
- ***The PLC has no SG connector, but its internal signal line is electrically insulated. Therefore, the SG connector on the GP/GLC requires no connection.***
- ***Set the termination resistance selector switch, [TERM] on the terminating SYSMAC-COM1H, to the "ON" position. If two units of PLCs are connected to the GP/GLC, the one having the longer distance for communication becomes the terminating station.***
- ***Set the 2-wire/4-wire selector switch, [WIRE] on the PLC to the "4" position.***
- ***The maximum cable length for RS-422/RS-485 communication is 500 meters. The total branch line length for T-branching is 10 meters. In the following cable diagram, the communication distance between the GP and No. n unit is covered by the total length of the cable i.e. main cable and branches. In cable diagram 1, No. 0 and No. 1 units are connected by a branch line.***
- ***To connect the PLC, use OMRON's B500-AL001 link adaptor or a terminal block.***

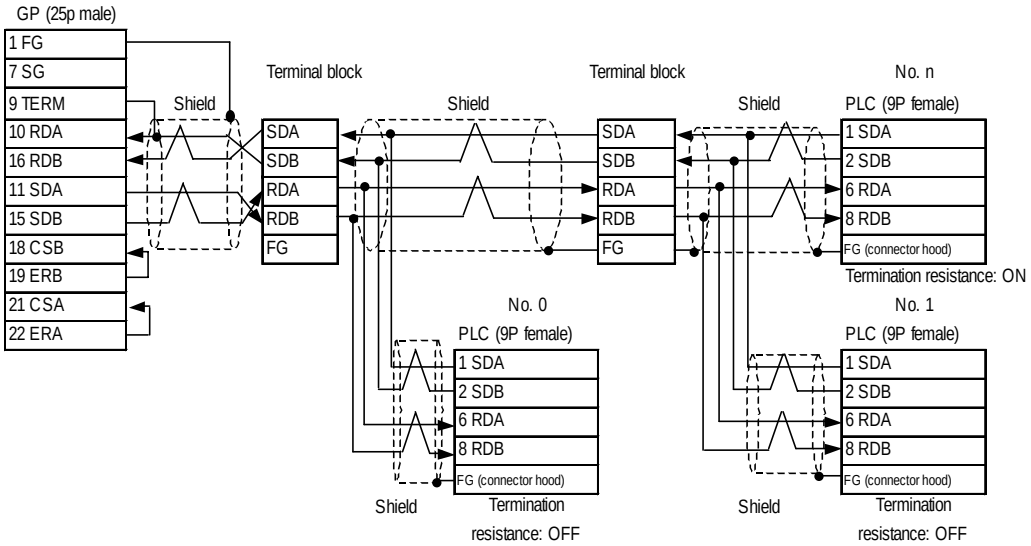
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable GP230-IS11-0



• When making your own cable connection



2.2.3 Supported Devices

The following describes the range of devices supported by the GP.

■ SYSMAC C Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
I/O Relay	00000 ~ 51115	000 ~ 511	*1	L/H
Internal Hold Relay				
Special Hold Relay				
Analog Setup Value Storage Area	22000 ~ 22315	220 ~ 223	*2	
Data Link Relay	LR0000 ~ LR6315	LR00 ~ LR63		
Auxilary Memory Relay	AR0000 ~ AR2715	AR00 ~ AR27		
Latch Relay	HR0000 ~ HR9915	HR00 ~HR99		
Timer (contact)	TIM000 ~ TIM511	---		
Counter (contact)	CNT000 ~ CNT511	---		
Timer (current value)	---	TIM000 ~ TIM511		
Counter (current value)	---	CNT000 ~ CNT511		
Data Memory	---	DM0000 ~ DM9999	Bit 15	

** 1 Depending on the CPU, differ the range of each supported device and the possibility of Data wirte. Before using, refer to each CPU User Manual.*

** 2 Can only be used by CQM1-CPU42.*

STOP

- **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit write operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

- **When running a GP-*30 Series ladder program, be aware of the above points.**

■ SYSMAC Series (COM1H-CPU51/COM1H-CPU61)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	00000 ~ 24315	000 ~ 243	*1	L/H
Internal Hold Relay			*2	
Special Hold Relay	24400 ~ 25507	244 ~ 255		
Link Relay	LR0000 ~ LR6315	LR00 ~ LR63		
Latch Relay	HR0000 ~ HR9915	HR00 ~ HR99		
Auxiliary Memory Relay	AR0000 ~ AR2715	AR00 ~ AR27		
Timer (contact)	TIM000 ~ TIM511	---		
Counter (contact)	CNT000 ~ CNT511	---		
Timer	---	TIM000 ~ TIM511		
Counter	---	CNT0100 ~ CNT511		
Data Memory	---	DM0000 ~ DM6655	Bit 15 *3 *5	
Extended Data Memory	---	EM0000 ~ EM6143	Bit 15 *4	

** 1 Some addresses do not exist in the I/O relay/internal hold relay's address range. For further information, refer to OMRON's Users' manual for SYSMAC-COM1H.*

**2 The bit addresses for the special hold relay are 24400 to 25415 and 25500 to 25507. Bit addresses 25508 to 25515 are not available.*

**3 Designation of first address in system*

Each station number is attached to the device name, DM. Select the device name for the station number you want to specify in the [GP SYSTEM SETUP] MODE SETUP and the SET UP OPERATION SURROUNDINGS menu on the offline GP/GLC.

**4 The extended data memory EM is only supported by the COM1H-CPU61.*

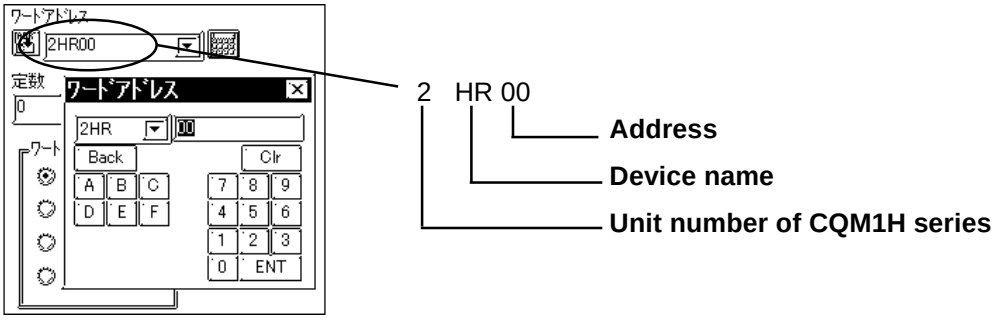
**5 Do not write any data to the error storage area DM6569 to DM6599 and the PC system setup area DM6600 to DM6655 in the data memory DM. For further information, refer to OMRON's related manual.*

STOP

- **When bit write is selected, the GP reads a word of data from the PLC's corresponding word address, turns a single bit ON, and then sends the entire word of data back to the PLC.**

  When the GP reads data from the PLC and writes it to the PLC, the data may not be written correctly if data is written to the same word address using the ladder program.

Note: • **When parts and tags are created in GP-PRO/PBIII, the PLC station number is attached to each device. The station numbers range from 0 to 7. This means that eight options are available for each device. See the following illustration:**



■ SYSMAC-α Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
I/O Relay I	00000 ~ 02915	000 ~ 029		L/H
I/O Relay II	30000 ~ 30915	300 ~ 309		
Internal Hold Relay I	03000 ~ 23515	030 ~ 235		
Internal Hold Relay II	31000 ~ 51115	310 ~ 511		
Special Hold Relay I	23600 ~ 25507	236 ~ 255		
Special Hold Relay II	25600 ~ 29915	256 ~ 299		
Latch Relay	HR0000 ~ HR9915	HR00 ~ HR99		
Auxilary Memory Relay	AR0000 ~ AR2715	AR00 ~ AR27		
Link Relay	LR0000 ~ LR6315	LR00 ~ LR63		
Timer (contact)	TIM000 ~ TIM511	---		
Counter (contact)	CNT000 ~ CNT511	---		
Timer (current value)	---	TIM000 ~ TIM511		
Conter (current value)	---	CNT000 ~ CNT511		
Data Memory	---	DM0000 ~ DM6655	Bit 15	

STOP • **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit write operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

• **When running a GP-*30 Series ladder program, be aware of the above points.**

◆ SYSMAC C or α series communications mode selection

When using the SYSMAC C or α series with the GP in OFFLINE mode, either mode 2 or mode 1 can be selected during the entry of the initial settings. Be aware you cannot disignate this settings from GP-PRO/PBIII for Windows.

- Mode 2: This is a newly added communications mode. This mode is enabled when less than 64 devices have been designated by a single screen's tags. The communications speed has been improved. Select this mode when using less than 64 devices.
- Mode 1: A communications mode equivalent to the old one. This mode is valid for 64 or more devices have been specified by a single screen's tags. The communications speed has been improved. Select this mode when using 64 or more devices.

- ***If the on-screen data memory area in the GP is initialized or if the on-screen data is transferred from the drawing software, the GP returns to mode 1 (its initial setting). Use the offline settings area to select mode 2.***
- ***In mode 2, the communications speed may not always be improved depending on which tags and system area are used, as well as how the read areas are allocated.***

■ SYSMAC-CV Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
I/O Relay I	00000 ~ 19915	000 ~ 199		L/H
Internal Hold Relay				
Sysmac BUS/2 Remote I/O Relay	020000 ~ 099915	0200 ~0999		
Data Link Relay	100000 ~ 119915	1000 ~ 1199		
Special Hold Relay	A00000 ~ A51115	A000 ~ A511		
Latch Relay	120000 ~ 149915	1200 ~ 1499		
Internal Aux. Relay	190000 ~ 229915	1900 ~ 2299		
SYSBUS Remote I/O Relay	230000 ~ 255515	2300 ~ 2555		
Timer (contact)	T0000 ~ T1023	---		
Counter (contact)	C0000 ~ C1023	---		
Timer (current value)	---	T0000 ~ T1023		
Conter (current value)	---	C0000 ~ C1023		
Data Memory	---	D0000 ~ D9999	Bit 15	

STOP

- **Write operations cannot be performed on the *Timer* and *Counter* bit devices.**
- **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit write operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

- **When running a GP-*30 Series ladder program, be aware of the above points.**

■ SYSMAC CS1/CJ Series

In this list, "Exp." means "Expansion". Setup system area here.

Device	Bit Address	Word Address	Particulars	
Channel I/O	CIO000000 ~ CIO614315	CIO00000 ~ CIO06143		
Internal Auxiliary Relay	W00000 ~ W51115	W000 ~ W511		
Hold Relay	H00000 ~ H51115	H000 ~ H511		
Special Auxiliary Relay	A00000 ~ A95915	A000 ~ A959	*1	
Timer(Contact)	T0000 ~ T4095	----	*3	
Counter(Contact)	C0000 ~ C4095	----	*3	
Timer(Current)	----	T0000 ~ T4095		
Counter(Current)	----	C0000 ~ C4095		L/H
Data Memory	D0000000 ~ D3276715	D00000 ~ D32767	*2	
Exp. Data Memory (E0 ~ EC)	E00000000 ~ EC3276715	E000000 ~ EC32767	*4	
Exp. Data Memory (Current Bank)	----	EM00000 ~ EM32767	Bit 15 *5	
Task Flag	----	TK0 ~ TK30	÷ 2 Bit 15 *3	
Index Register	----	IR0 ~ IR15	Bit 31 *3	
Data Register	----	DR0 ~ DR15	Bit 15 *3	

**1 Addresses A000 to A477 cannot be written to.*

**2 When using the Communication Unit (CS1W-SCU21/CJ1W-SCU41), addresses D30000 to D31599, since they are used for PLC system settings, should not be written to from the GP.*

When using the Communication Board (CS1W-SCB21/41), addresses D32000 to D32767 are used for PLC settings, should not be written to from the GP.

**3 Cannot be written to while running.*

**4 The range of Expansion Data Memory varies depending on the CPU type.*

Reference *For details about each device, refer to Omron's SYSMAC CS1/CJ Series Communication Board CS1W-SCB21-/41 Communication CS1W-SCU21/CJ1W-SCU41 Users Manual.*

**5 Expansion Data Memory (Current Bank) does not exist on SYSMAC CJ Series.*

2.2.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ SYSMAC C Series

GP Setup		Upper Link Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format *1 (RS-232C)	RS-232C
Communication Format (RS-422)	4-wire type	Communication Format *1 (RS422)	RS-422
---		Command Level *1	Level 1,2,3 is valid
---		Relation *1	1:N
---		DC +5V power supply *1	No
---		CTS Setup *1	Normally On
---		Mode Setup *2	Upper Link
---		Communication Conditons Setting Switch *3	OFF
---		Communication Port Function Setting Switch *4	SW1:OFF SW2:ON
Unit No.	0	Station Number	0

**1 This setup is unavailable for the RS-232C port of C200HS, CQM1 and CPH2A.*
**2 This setup is available only for the RS-232C port of C200HS and CQM1.*
**3 This setup is available only for CPM2A.*
**4 This setup is available only for CPM2C.*

■ SYSMAC C Series (CQM1H-CPU51/CQM1H-CPU61)

(1:n Communication)

GP/GLC Settings		PLC Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bit	Stop Bit	2 bit
Parity Bit	Even	Parity Bit	Even
Data Flow control	ER	———	———
Communication Format	4 wire type	2 wire/4 wire [WIRE]	4 wire
Unit No.	0	Station No.*1	0
———		Communication Conditions Format Setting*2	0
		Serial Communication Mode Setting*3	Upper Link
———		Terminator Switch [TERM]	Terminal station: ON Intermediate station: OFF

**1 Although Nos. 00 to 31 can be used for PLC station Nos., the maximum number of PLCs that can communicate with the GP on the 1:n communication basis is eight. Therefore, set up PLC station Nos. within the range of 00 to 07.*

**2 Communication Conditions Format Settings: DM6550 (Bits 0 to 3)*

DM6550 (Bit 0 to 3)	Communication Settings			
Default: 0	Baud Rate	Data Length	Stop Bit	Parity
(Standard Setting)	9600bps	7 bits	2 bits	Even

**3 Leave the serial communication mode setting DM6550 (bits 12 to 15) set to the default setting, 0.*

■ SYSMAC-α Series (using Communication board)

GP Setup		Communication board Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	4-wire type	RS-422/485 cable (2-wire/4-wire type) switching setting (dip switch 1)	4
Unit No.	0	Station Number	0

Note: **When using the above list's recommended settings, please perform the following.**
Port A: Store "0001" in DM6555, and store "0304"<HEX> in DM6556.
Port B: Store "0001" in DM6550, and store "0304"<HEX> in DM6551.

■ SYSMAC-α Series (when using the CPU's RS-232C port)

GP Setup		RS-232C port Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	Using Mode	Host (PLC) Link
Unit No.	0	Station Number	0

When using the above list's recommended settings, please follow the instructions given here.
CPU 232C Port: Store "0001" in DM6645, and store "0304" <HEX> in DM6646.

■ SYSMAC CV Series

GP Setup		Upper Link Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
Communication Format (RS-422)	4-wire type	Communication Format (RS-422)	RS-422
Unit No.	0 *1	Station Number	0 *1

** 1 When GP is connected to the Port 1 on the Upper Link Unit CV500-LK201, the station number must be fixed as "0". (The station number cannot be set on the PLC.)*

■ SYSMAC CS1/CJ Series <CPU unit's RS-232C Port>

GP Setup		PLC Setup	
Baud Rate	19200	Baud Rate	19200
Data Length	7	Data Length	7
Stop Bit	2	Stop Bit	2
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	——	——
Communication Format	RS-232C	——	——
Unit No.	0	Station No.	0
——	——	Dip Switch	SW1: OFF SW5: OFF SW7: OFF SW8: OFF
——	——	Mode Setup	Upper Link

■ SYSMAC CS1/CJ Series <CPU unit's Peripheral Port>

GP Setup		PLC Setup	
Baud Rate	19200	Baud Rate	19200
Data Length	7	Data Length	7
Stop Bit	2	Stop Bit	2
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	——	——
Communication Format	RS-232C	——	——
Unit No.	0	Station No.	0
——	——	Dip Switch	SW1: OFF SW4: ON SW7: OFF SW8: OFF
——	——	Mode Setup	Upper Link

■ SYSMAC CS1/CJ Series

< When using the Communication Board /Unit>

GP Setup		PLC Setup	
Baud Rate	19200	Baud Rate	19200
Data Length	7	Data Length	7
Stop Bit	2	Stop Bit	2
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	——	——
Communication Format (using RS-232C)	RS-232C	——	——
Communication Format (using RS-422)	4-wire type	WIRE (2-wire/4-wire type Switch)	4-wire type
		TERM (Termination Resistance Switch)	Termiantion Resistance ON
Unit.No	0	Upper Link Station No.	0
——	——	Serial Communicaion mode	Upper Link
——	——	Communication Delay Time	0
——	——	CTS Control	None

2.3 Fuji Electric

2.3.1 System Structure

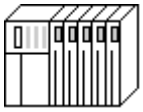
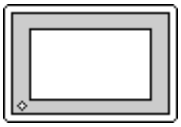
The following describes the system structure for connecting the GP to Fuji Electric Corporation, Ltd. PLCs.

Reference *Cable Diagrams mentioned in the following tables are listed in the section titled "**2.3.2 Cable Diagrams**".*

Important

- ***In the LS area, 32-bit length devices are not supported. Therefore, if the system area is allocated to BD, D1, or W33, no LS area other than the system area can be used.***

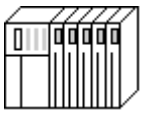
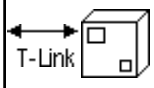
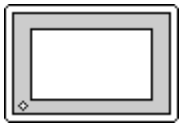
■ MICREX-F Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 PC I/F Module/ Generic I/F			
F80H, F120H, F250	FFU-120B PC Interface Module	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)	RS-232C Digital's GP410-IS00-O (5m)	GP Series
F70S (NC1P-S0)	NC1L-RS2 (Generic Interface) *1	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	

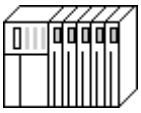
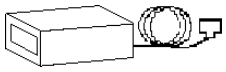
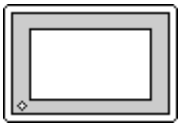
**1 When expansion units are attached via a T-Link system to a main PLC unit, and more than 2 link units are attached to the expansion unit, the GP unit can be attached to only one of the link units. (Simultaneous connection to 2 link units is not possible.)*

Simultaneous connection to 2 link units is possible only when they are attached to the main PLC unit.

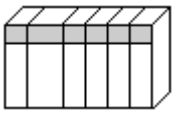
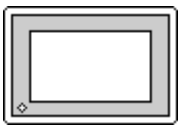
■ MICREX-F Series <T-link> (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
				
F80H, F120H, F250 F30, F50, F60, F80, F81, F120 F120S, F200	FFK120A-C10	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)	RS-232C Digital's GP410-IS00-O (5m)	GP Series
	FFK100A-C10	RS-232C (Cable Diagram 3)		

■ MICREX-F Series (FLT-ASFK) (CPU Direct Connection)

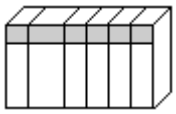
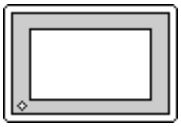
CPU	Adapter	Cable Diagram	Cables	GP
	PC Loader adapter 			
F80H, F250	Fuji Electric's FLT-ASFK	RS-232C (Cable Diagram 1)	RS-232C Digital's GP410-IS00-O	GP Series

■ FLEX-PC Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 General SIO Unit/ General I/F Module			
NB1, NB2, NB3	NB-RS1-AC (Generic RS-232C/ 485 SIO unit)	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)	RS-232C Digital's GP410-IS00-O (5m)	GP Series
NJ	NJ-RS2 (Generic RS-232C SIO interface module)	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	
	NJ-RS2 (Generic RS-485 SIO interface module)	RS-422 (Cable Diagram 2)		
NS	NS-RS1 (Generic RS-232C/485 interface module)	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)	RS-232C Digital's GP410-IS00-O (5m)	

Note: **Places noted as RS-422 can also use RS-485 on the PLC side.**

■ FLEX-PC Series (CPU Direct Connection)

CPU	Cable Diagram	GP
		
NB1, NB2, NB3, NJ, NS	RS-422 (Cable Diagram 4)	GP Series

Note: When using Digital's T-Link I/F Unit, refer to the GP-*50/70 Series T-Link I/F Unit User's Manual.

2.3.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Fuji Electric Co., Ltd. may differ; in any case, using these cables for your PLC operations will not cause any problems.

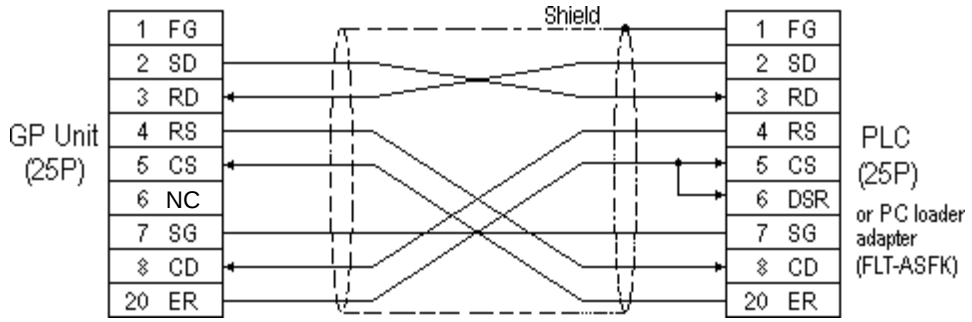
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)

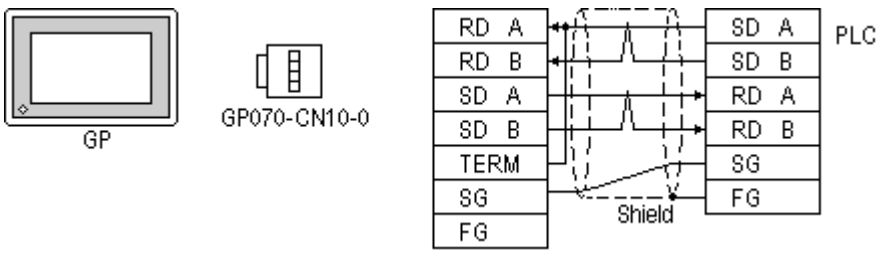


Cable Diagram 2 (RS-422)

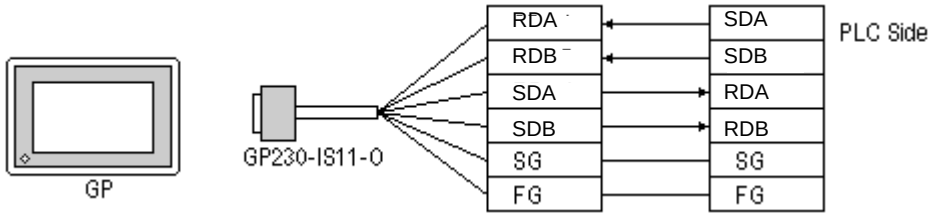
Careful!

Turn on the Termination Resistor switch, on the PLC side.

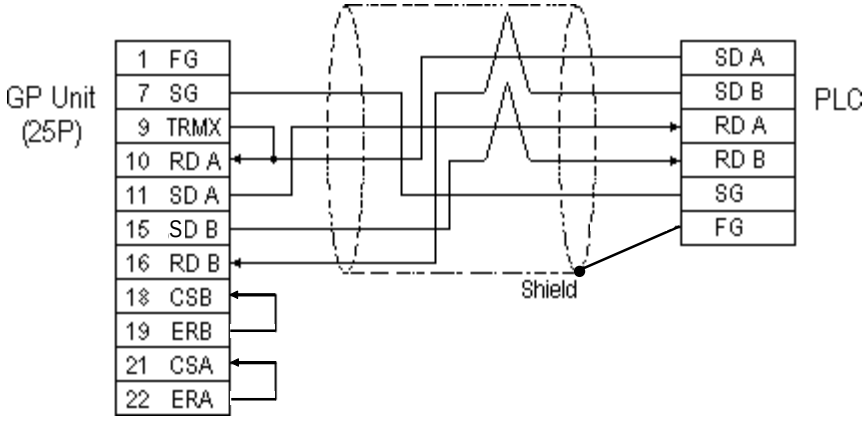
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



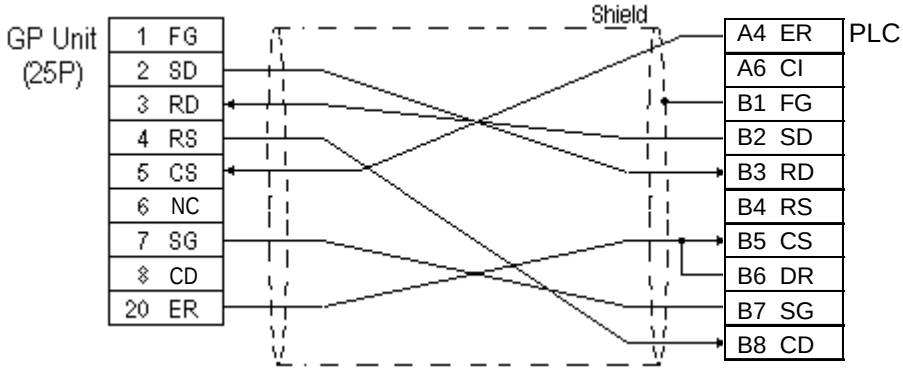
• When making your own cable connections



Note:

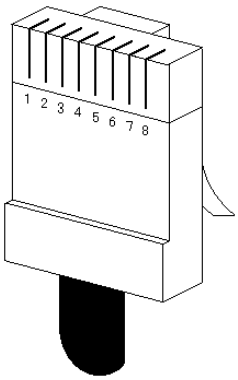
- **When making your own cable connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5S cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 3 (RS-232C)



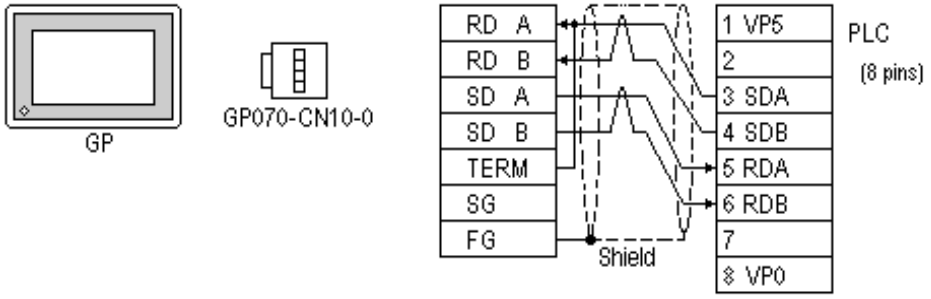
Cable Diagram 4 (RS-422)

For the PLC side connector (modular-jack) you can use Hirose's TM11P-88P.

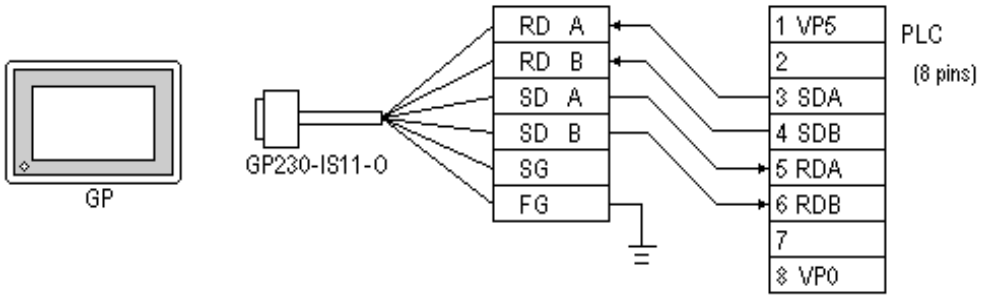


The pin numbers of the modular-jack for the connection diagrams below are based on the order described in the figure at the left.

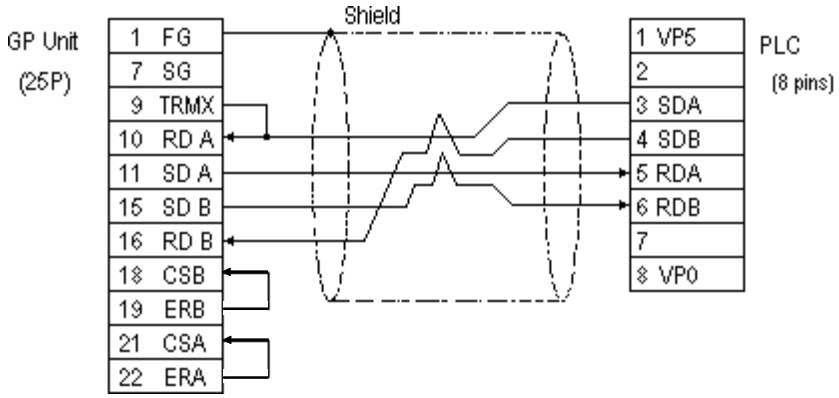
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections



When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

2.3.3 Supported Devices

The following describes the range of devices supported by the GP.

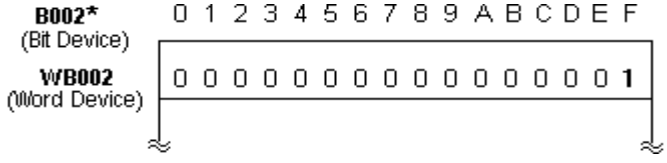
■ MICREX-F Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
I/O Relay	B0000 ~ B511F	WB0000 ~ WB0511	*1	
Direct I/O	---	W24.0000 ~ W24.0159		
Auxilary Relay	M0000 ~ M511F	WM0000 ~ WM0511	*1	
Keep Relay	K0000 ~ K063F	WK000 ~ WK063	*1	
Differential Relay	D0000 ~ D063F	WD000 ~ WD063	*1 *4	
Link Relay	L0000 ~ L511F	WL000 ~ WL0511	*1	
Special Relay	F00000 ~ F4095F	WF0000 ~ WF4095	*1 *4	
Announce Relay	A00000 ~ A4095F	WA0000 ~ WA4095	*1 *4	
Timer 0.01 sec	T0000 ~ T0511	---		
Timer 0.1 sec	T0512 ~ T1023	---		
Counter	C0000 ~ C0255	---		
Timer 0.01 sec (current value)	---	TR0000 ~ TR0511		
Timer 0.01 sec (setup value)	---	TS0000 ~ TS0511		H/L
Timer 0.1 sec (current value)	---	W9.000 ~ W9.511		
Counter (current value)	---	CR0000 ~ CR0255		
Counter (setup value)	---	CS0000 ~ CS0255		
Data Memory	---	BD0000 ~ BD4095	Bit 31	
	---	DI0000 ~ DI4095	Bit 31	
	---	SI0000 ~ SI4095	Bit 15	
File Memory	---	W30.0000 ~ W30.4094	Bit 15 *2	
	---	W31.0000 ~ W31.4094	Bit 15 *2	
	---	W32.0000 ~ W32.4094	Bit 15 *2	
	---	W33.0000 ~ W33.4094	Bit 31 *3	
	---	W34.0000 ~ W34.4094	Bit 31 *3	

** 1 The MSB (most significant bit) of a word device corresponds to bit **0** of the device, and the LSB (least significant bit) corresponds to bit **F**.*

E.g. When hexadecimal data **0001** is written to a Word device address



(See next page)

(from previous page)

** 2 Define and use 16 bit length data.*

** 3 Define and use 32 bit length data.*

** 4 This device cannot write. Use it only for reading.*

Important

- ***In this LS area, no 32-bit device is supported. Therefore, when the System Area is allocated to the BD, DL, or W33 devices, no LS Area other than the System Area can be used.***
- ***When using the GP-570VM or GP-870VM, do not allocate the System Area for BD, DI, or W33 word addresses.***
- ***Certain PLC models and versions may not be able to perform bit reading or writing.***

  F30 ..... not possible with versions 0.9 or lower
  F50 ..... not possible with versions 1.4 or lower
  F50H ..... not possible with versions 0.7 or lower
  F80 ..... not possible with any version
  F81 ..... not possible with any version
  F120 ..... not possible with any version
  F200 ..... not possible with any version

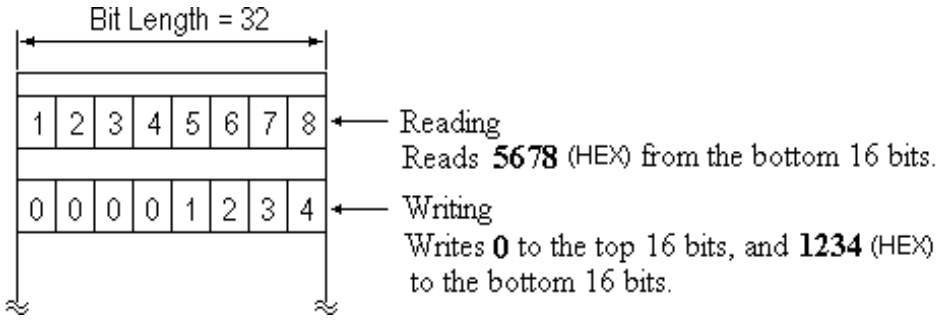
  Check the information plate on the side of the PLC to find the PLC's version information.

When processing 16-bit single word data:

Internally, the GP basically processes 1 word as 16 bit length data. As a result, the reading and writing of 32 bit length data devices are processed as follows:

Reading	From 32 bit data, reads data only from the bottom 16 bits.
Writing	From 32 bit data, writes data only to the bottom 16 bits, as 0 is written to the top 16 bits.

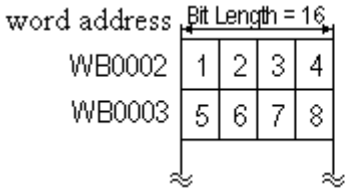
E.g. When data is **12345678** hex.



When processing 2 word 32-bit data:

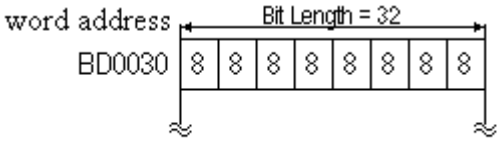
Two word addresses at bit length 16 are necessary to handle 32 bit long data, but when using a 32 bit device, only one word address needs to be specified.

When using a 16 bit device



32 bit data is handled with 2 word addresses for the N-tag (8 digit, BCD numeric display) and K-tag.

When using a 32 bit device



32 bit data is handled with a single word address for the N-tag (8 digit, BCD numeric display) and K-tag.

■ FLEX-PC Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	WX0000 ~ WX07F		
Output Relay	Y0000 ~ Y07FF	WY0000 ~ WY07F		
Intemal Relay	M0000 ~ M03FF	WM000 ~ WM03F		
Extended Intemal Relay	M0400 ~ M1FFF	WM040 ~ WM1FF		
Latch Relay	L0000 ~ L03FF	WL000 ~ WL03F		
Extended Latch Relay	L0400 ~ L1FFF	WL040 ~ WL1FF		
Special Relay	M8000 ~ M81 FF	WM800 ~ WM81F		
Timer	T0000 ~ T03FF	---		
Counter	C0000 ~ C01FF	---		L/H
Timer (current value)	---	T0000 ~ T03FF		
Timer (setup value)	---	TS0000 ~ TS03FF	*1	
Counter (current value)	---	C0000 ~ C01FF		
Counter (setup value)	---	CS0000 ~ CS01FF	*1	
Data Register	---	D0000 - D2FFF	Bit 15	
Special Register	---	D8000 ~ D837F	Bit 15	
Link Register	---	W0000 ~ W3FFF	Bit 15	
File Register	---	R0000 ~ R7EFF	Bit 15	

** 1 Define and use 16 bit length data.*

Note:

- **Cannot read the *Timer* and *Counter* setup value. However, the write operation is possible only when the PLC is in program mode.**

- **When the *Timer* and *Counter* setup values are written from the GP, the ladder is changed so that the setup value uses a relative reference. For this reason, be careful when the setup value for the *Timer* and *Counter* uses an indirect ladder. Normally, *access* is recommended for indirectly referenced devices.**

2.3.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ **MICREX-F Series** (using PC I/F module FFU120B)

GP Setup		FFU120B Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Transfer Condition	DTR on/ CTS on
Communication Format (RS-232C)	RS-232C	MODE Switch (RS-232C)	1
Communication Format (RS-422)	4-wire type	MODE Switch (RS-422)	3
---		Char. structure Switch	8 (INIT) is Off
---		RS-485 Station # setup Switch (Oniy for RS-485)	0
Unit No.	0 (fixed)	---	

Important

Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.

■ **MICREX-F Series** (using General Interface Module NC1L-RS2)

GP Setup		NC1L-RS2 Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parlty Bit	None	Parity Bit	None
Data Flow Control	ER Control	Transfer Condition	DTR on/CTS on
Communication Format	RS-232C	MODE Setup	1
---		Character Structure Switch	8 (Initialize Setup Process) is Off (Initial file)
Unit No.	0 (fixed)	---	

Important

Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.

■ MICREX-F Series (using PC I/F capsule FFK120A-C10)

GP Setup		FFK120A-C10 Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Transfer Condition	None
Communication Format (RS-232C)	RS-232C	MODE Switch (RS-232C)	1
Communication Format (RS-422)	4-wire type	MODE Switch (RS-422)	3
---		RS-485 Station # setup Switch (Only when using RS-485)	0
Unit No.	0 (fixed)	---	

Important

Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.

■ MICREX-F Series (using PC I/F capsule FFK100A-C10)

GP Setup		FFK100A-C10 Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (When using RS-232C)	RS-232C	---	
Unit No.	0 (fixed)	---	
---		PK access	Permitted
		Code conversion	Available

Important

Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.

■ MICREX-F Series (FLT-ASFK)

GP Setup		Adapter Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	---	
Parity Bit	None	Parity Bit ON/OFF EVEN/ODD	OFF None
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	0	---	
---		MODE	LOADER

■ FLEX-PC Series (using Link I/F)

GP Setup		Communication Unit / Interface Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Transfer Condition	DTR on/ CTS on
Communication Format (RS-232C)	RS-232C	MODE Switch (RS-232C)	1
Communication Format (RS-422)	4-wire type	MODE Switch (RS-422)	3
Unit No.	1	Station No.	1

■ FLEX-PC Series (using CPU Direct Connection)

GP Setup		PLC side Setup
Baud Rate	19200 bps(fixed)	---
Data Length	8 bits (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Odd (fixed)	---
Data Flow Control	ER Control (fixed)	---
Communication Format	4-wire type (fixed)	---
Unit No.	1 (fixed)	---

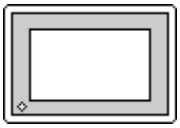
2.4 Yaskawa Electric

2.4.1 System Structure

The following describes the system structure for connecting the GP to Yaskawa PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.4.2 Cable Diagrams**".*

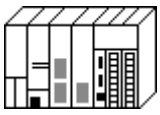
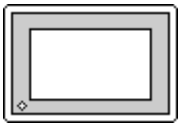
■ Memocon-SC Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 SIO Module			
U84, 84J	JAMSC-C8110	RS-232C (Cable Diagram 1)	Yaskawa Electric Corp's memory bus cable JZMSZ-W1015-21 *1	GP series
U84S	JAMSC-C8610			
GL40S	JAMSC-IF61 JAMSC-IF41A			
GL60H, GL70H	JAMSC-IF60 JAMSC-IF61			
GL60S	JAMSC-IF60 JAMSC-IF61			
	JAMSC-IF612	RS-422 (Cable Diagram 2)		

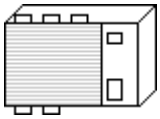
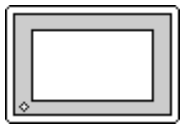
** 1 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377 and GP-377R series.*

Note: **Using *Multiple Link I/Fs*, maximum of 4 GP units can be connected at one time.**

■ Memocon-SC Series (CPU Direct Connection)

CPU	Cable Diagram	Cables	GP
			
GL120	RS-232C (Cable Diagram 3)	Yaskawa Electric Corp's JZMSZ-120W0200-03	GP Series

■ Control Pack Series (CPU Direct Connection)

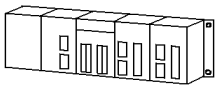
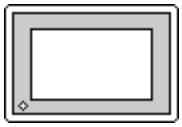
CPU	Cable Diagram	Cables	GP
			
CP-9200 CP-9200H	RS-232C (Cable Diagram 1)	Yaskawa Electric Corp's Memo BUS Cable JZMSZ-W1015-21 *2	GP Series

** 1 Connect to CP9200/CP9200H's machine controller (4CN, 6CN).*

** 2 Due to the size of its connector case, this cable connot be used for GP-270, GP-370, GP-377, GP-377R series.*

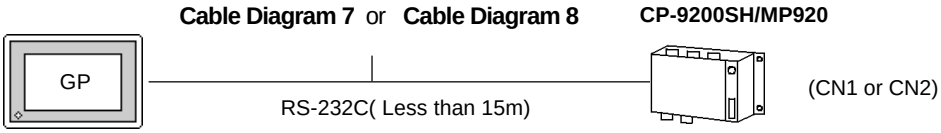
Note: **Two GPs can be connected to one CP-9200/CP9200H. When using two GPs, set it up so that the System Area of the GPs do not overlap.**

■ Control Pack Series (Link I/F)

CPU	Link I/F	Cables	GP
			
CP-9200SH *3	JACP-317217(CN1)	(Cable Diagram 7) (RS-232C)	GP Series
	JACP-317217(CN2)	(Cable Diagram 8) (RS-232C)	
	JACP-317217(CN3)	(Cable Diagram 9) (RS-422)	

** 3* **<1:1 Connection>**

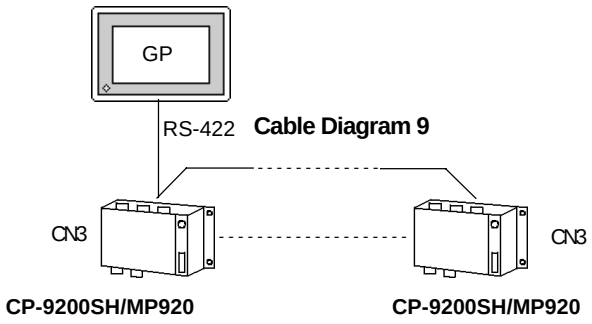
The drawing shown below is for the 1:1 connection.(CN means the circuit number.)



Important **CN1, CN2, CN3 can be connected at the same time, however, only one GP can be connected to one CN since it cannot use the Multi Link connection.**

When connecting a GP77R series' unit to a "**_21700_*****" or an older version of a 217IF unit, set the GP-PRO/PB III software "GP settings" Area's "Send Wait Time" to 20ms. ("GP Settings" - "Communication Settings" - "Advanced...")***

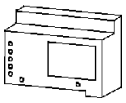
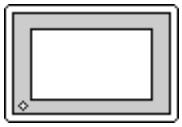
< 1:n Communication >



Note:

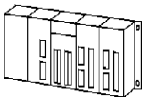
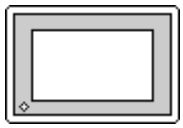
- **Within this system a total of thirty two (32) CPU units can be connected to one GP. The GP is designed so that it can be connected with a maximum of thirty two (32) CPU units.**
- **Two GPs can be connected to one CP-9200/CP9200H. When using two GPs, set them up so that their System Areas do not overlap.**

■ Memocon Micro (CPU Direct Connection)

CPU	Cable Diagram	GP
		
Micro *1	RS-232C (Cable Diagram 5)	GP Series

** 1 Connect to **COM1** port.*

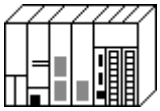
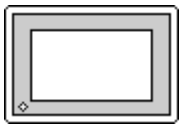
■ PROGIC-8 Series (using CPU unit Link I/F)

CPU	Cable Diagram	Cables	GP
			
PROGIC-8 *1	RS-232C (Cable Diagram 4)	Yaskawa Electric 's JEPMC-W5310-03 *2	GP Series

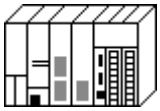
** 1 Connect to the PLC unit's PORT1(9P) or PORT2(15P).*

** 2 Can only use with PORT1 connection; PORT2 cannot be used because it has a 15P connector.*

■ **Memocon-SC Series** (GL 120/GL 130) (using Link I/F)

CPU	Link I/F	Cables	GP
	Computer Link Unit 		
GL120, GL130	FAMSC-120NOM 27100	RS-422 (Cable Diagram 6)	GP Series

■ **MP900 Series** (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Computer Link Unit 		
MP930	MEMOBUS Port on CPU unit (Port1, Port2)	RS-232C (Cable Diagram 7)	GP Series
MP920	MEMOBUS Port on CPU unit (Port1, Port2)	RS-232C (Cable Diagram 7)	
	JEPMC-CM200 *1 (CN1,CN2)		
	JEPMC-CM200 *1 (CN3)	RS-422 (Cable Diagram 9)	

**1 Refer to the previous page's CP-9200SH data for connection details.*

2.4.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Yaskawa Corporation may differ. Using these cables for your PLC operations, however, will not cause any problems.

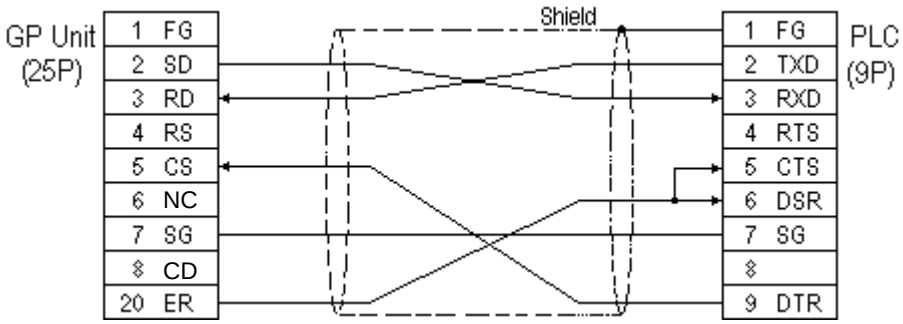
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

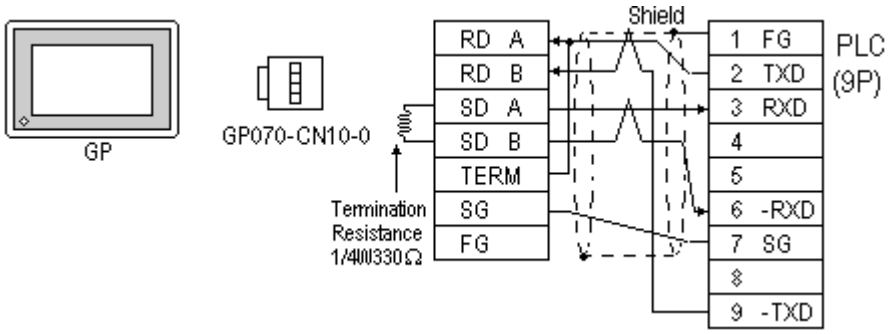
- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a connector hood and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)

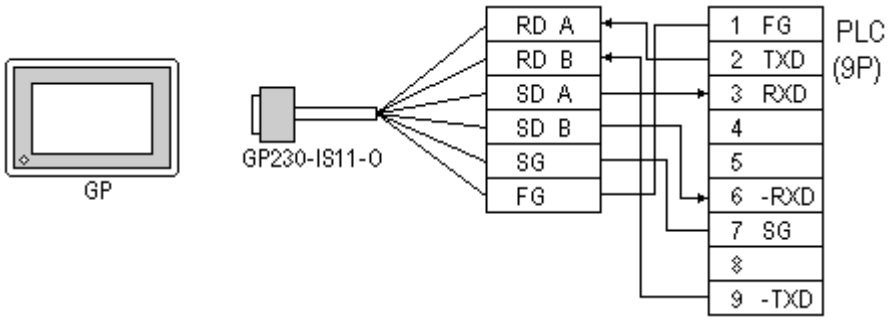


Cable Diagram 2 (RS-422)

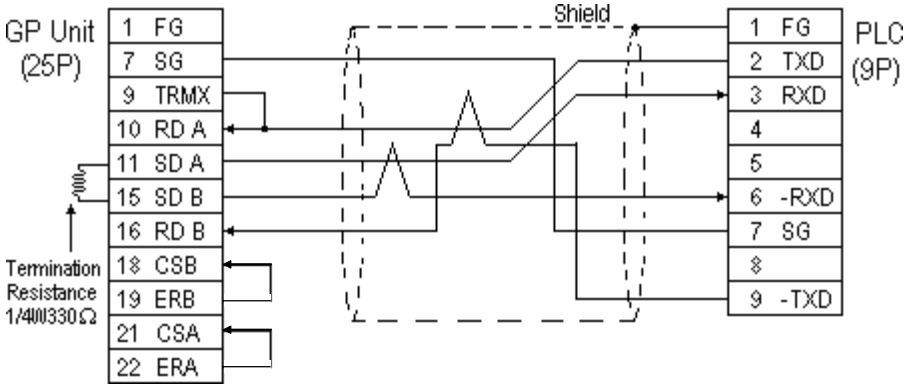
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0

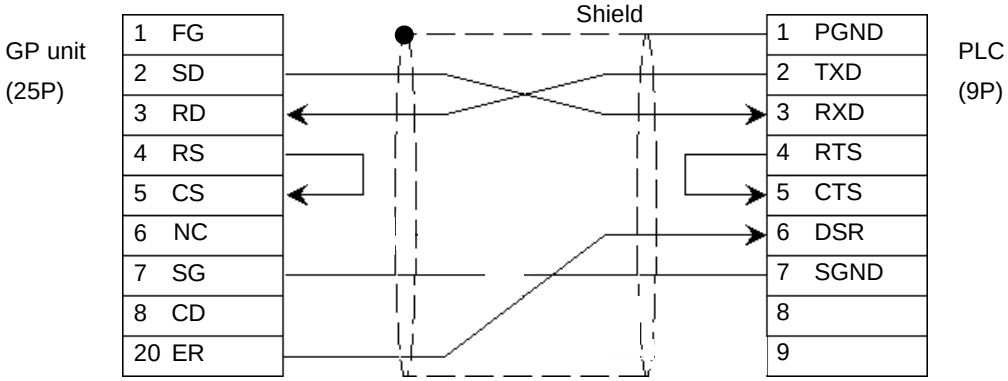


• When making your own cable connections

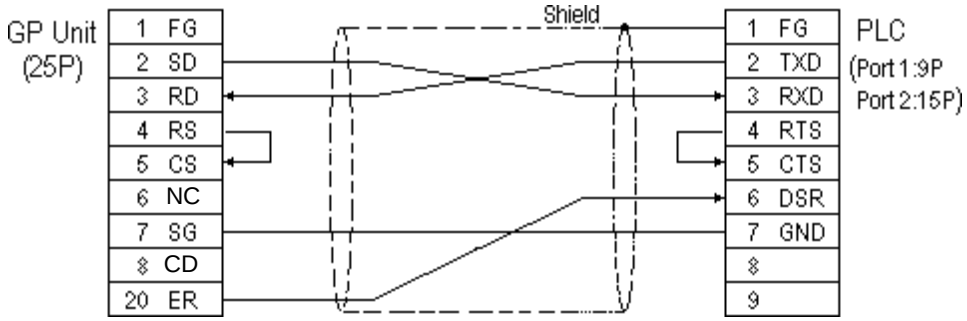


Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 3 (RS-232C)

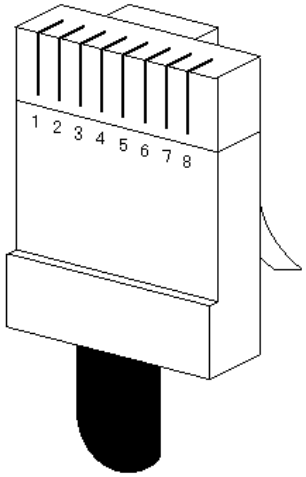


Cable Diagram 4 (RS-232C)

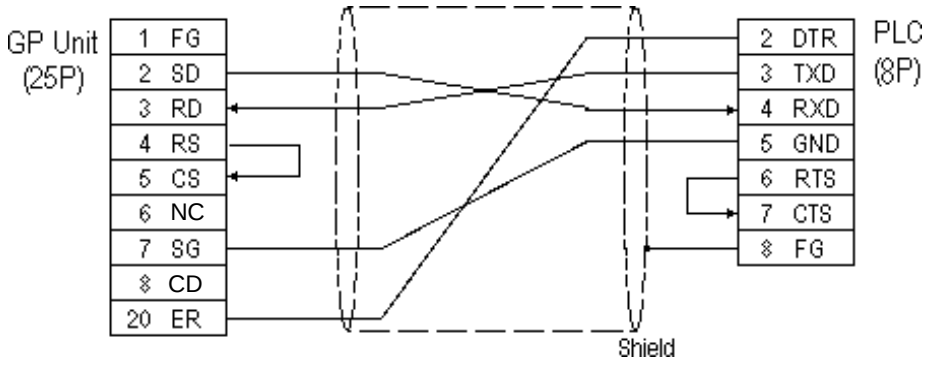


Cable Diagram 5 (RS-232C)

Note: **An RJ45 jack is used for the PLC.**

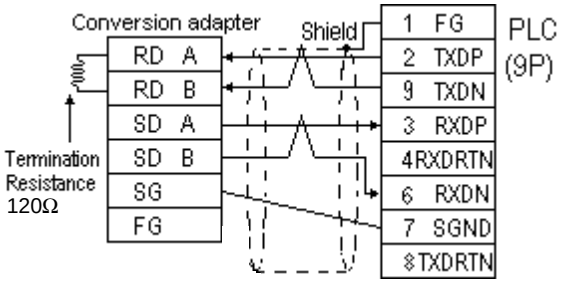


The pin numbers of the modular-jack for the connection diagrams below are based on the order described in the figure at the left.

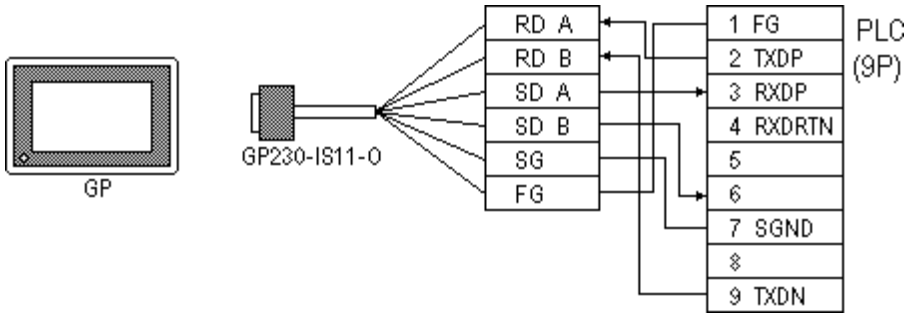


Cable Diagram 6 (RS-422)

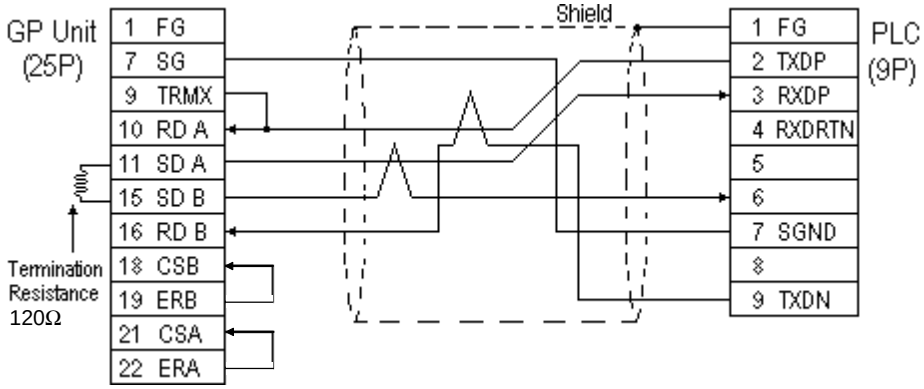
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0

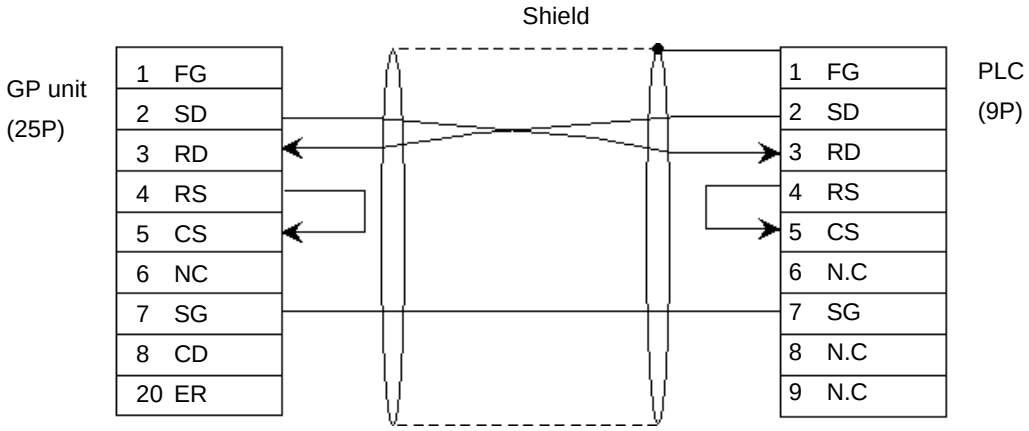


• When making your own cable connections

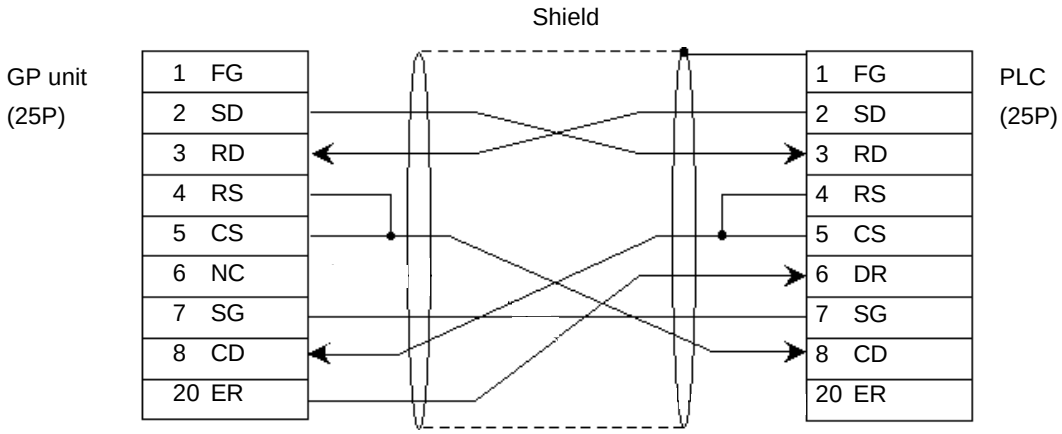


Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 7 (RS-232C)

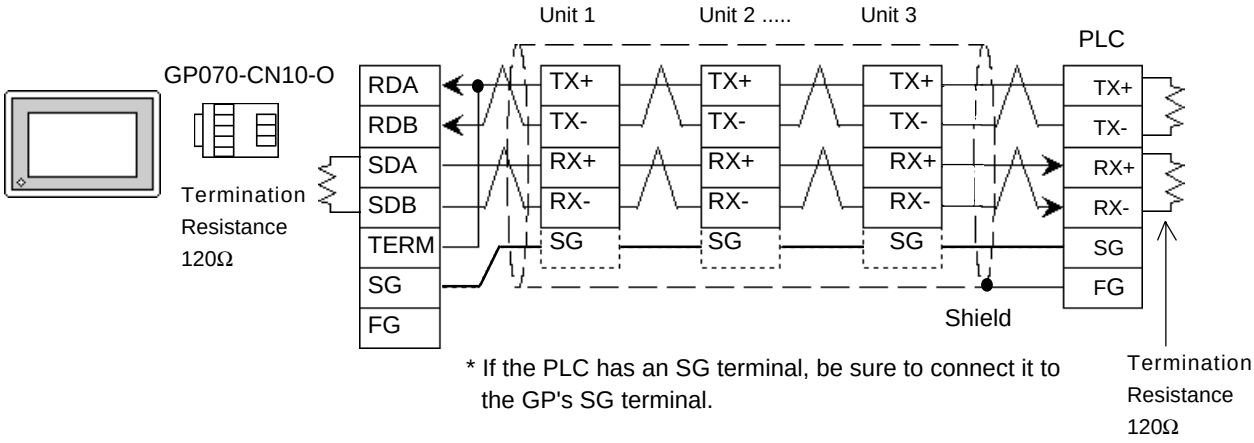


Cable Diagram 8 (RS-232C)

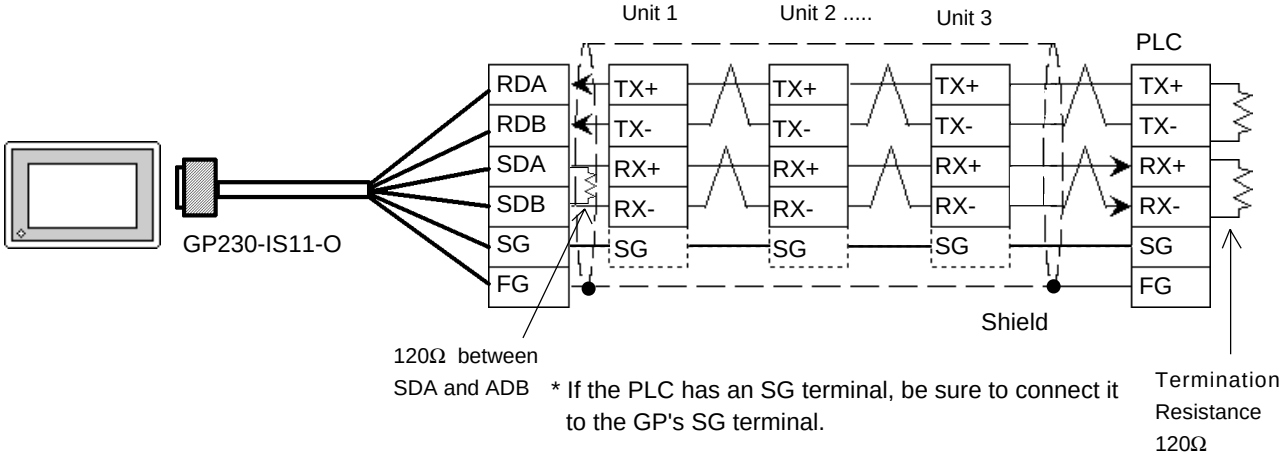


Cable Diagram 9 (RS-422)

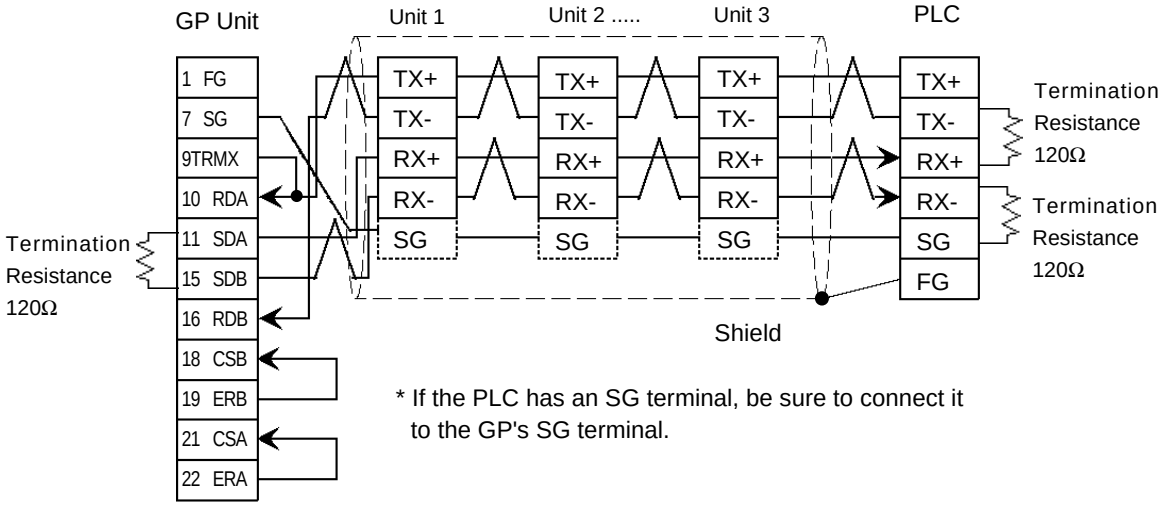
• When using Digital's RS-422 Connector terminal adapter GP070-CN10-0.



• When using Digital's RS-422 Cable, GP230-IS11-O.



• When making your own cable connections



2.4.3 Supported Devices

The following describes the range of devices supported by the GP.

■ Memocon-SC Series
(U84/84J/U84S/GL40S/GL60H/GL70H/GL60S)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Coil (Output/Internal)	00001 ~ 08192	---	*1	H/L
Input Relay	10001 ~ 14096	---	*1 *2	
Link Coil	D0001 ~ D1024	---	*1	
Input Register	---	30001 ~ 30512	Bit 15 *2	
Output/Keep Register	---	40001 ~ 49999	Bit 15	
Link Register	---	R0001 ~ R1024	Bit 15	
Constant Register	---	31001 ~ 35096	Bit 15	
Extended Register	---	A0000 ~ A7FFF	Bit 7	

■ **Memocon-SC Series** (GL120/GL130)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Coil (Output/Internal)	000001 ~ 008192	---	*1	H/L
Input Relay	100001 ~ 101024	---	*1 *2	
Link Coil 1	D10001 ~ D11024	---	*1	
Link Coil 2	D20001 ~ D21024	---	*1	
MC Relay 1	X10001 ~ X10256	---	*1 *2	
MC Relay 2	X20001 ~ X20256	---	*1 *2	
MC Coil 1	Y10001 ~ Y10256	---	*1	
MC Coil 2	Y20001 ~ Y20256	---	*1	
MC Code Relay 1	M10001 ~ M10096	---	*1 *2	
MC Code Relay 2	M20001 ~ M20096	---	*1 *2	
MC Control Relay 1	P10001 ~ P10256	---	*1 *2	
MC Control Relay 2	P20001 ~ P20256	---	*1 *2	
MC Control Coil 1	Q10001 ~ Q10256	---	*1	
MC Control Coil 2	Q20001 ~ Q20256	---	*2	
Input Register	---	300001 ~ 300512	Bit 15 *2	
Output Register	---	300001 ~ 300512	Bit 15	
Keep Register	---	400001 ~ 409999	Bit 15	
Link Register 1	---	R10001 ~ R11024	Bit 15	
Link Register 2	---	R20001 ~ R21024	Bit 15	
Constant Register	---	700001 ~ 704096	Bit 15	

**1 Can also specify as a word (16 bit data)*

**2 Cannot perform data write.*

■ Control Pack Series

Setup System Area here.

Device	Bit Address	CP-9200/CP-9200H's Register No. Corresponding to Address	Particulars	
Input Register	00001 ~ 02048	IB00000 ~ IB007FF	*1	L/H
Output Register	02049 ~ 04096	OB00000 ~ OB007FF	*1	
System Register	10001 ~ 12048	SB000000 ~ SB00127F (CPU#0's S-Register)	*1	

Device	Word Address	CP-9200/CP-9200H's Register No. Corresponding to Address	Particulars	
Input Register	49744 ~ 49871	IB00000 ~ IB007FF	Bit 15	L/H
Output Register	49872 ~ 49999	OB00000 ~ OB007FF	Bit 15	
System Register	30001 ~ 30256	SW00000 ~ SW00255 (CPU#0's S-Register)	Bit 15	
Data Register	31001 ~ 33048 (CP-9200H only)	DW00000 ~ DW02047 (CPU#1's D-Register)	Bit 15	
	40001 ~ 42048	DW00000 ~ DW02047 (CPU#0's D-Register)	Bit 15	
Common Register	42049 ~ 49743	MW00000 ~ MW07694	Bit 15	

** 1 Can also specify as a word (16 bit data).*

Careful!

- *If the above devices are used in the Control Pack series, the addresses converted using the above table should be entered.*
- *When you wish to use CP-9200 with CPU#1's Data Register or System Register, be sure to copy it to the Common Register (MW00000 ~ MW07694) first.*

■ Memocon Micro

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Coil (Output/Internal)	00001 ~ 01531	---	*1	H/L
Input Relay	10001 ~ 10511	---	*1	
Input Register	---	30001 ~ 30047	Bit 15	
Output/Keep Register	---	40001 ~ 41871	Bit 15	

** 1 Can also specify as a word (16 bit data).*

■ PROGIC-8 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Output Coil	O1 ~ O512	---	*1	H/L
Input Relay	I1 ~ I512	---	*1 *2	
Internal Coil	N1 ~ N1536	---	*1	
Link Coil	D1 ~ D1024	---	*1	
Data Register	---	W1 ~ W2048	Bit 15	
Data Register (1-word data)	---	SW1 ~ SW2048	Bit 15 *3	
Data Register (2-word data)	---	DW1 ~ DW2048	Bit 15 *3	
Input Register	---	Z1 ~ Z128	*2	
Link Register	---	R1 ~ R1024		
Link (1-word data)	---	SR1 ~ SR2048	*3	
Link (2-word data)	---	DR1 ~ DR2048	*3	

** 1 Can also specify as a word (16 bit data)*

** 2 Cannot perform data write.*

** 3 A data format compatible register. This is a virtual register applicable for the data in the PLC. It uses data register (W) and link register (R). The range of data which can be handled as 1-word is -9999 to 9999.*

1) Cautions related to using data register (SW) and link register (SR) are applicable to 1-word data.
If the SW and the SR are used, be sure to use values in the range from -9999 to 9999. Data must be displayed in four digits (decimal notation).

Differences in displayed values between SW, SR and W, R

Data in the PLC	SW, SR	W, R
9999	9999	9999
1001	1001	1001
1000	1000	1000
999	999	999
0	0	0
-1	-1	32769
-999	-999	33767
-1000	-1000	33768
-1001	-1001	33769
-9999	-9999	42767

(Continued on next page)

2) Cautions related to using a register applicable for 2-word data.
Using data register (DW) and link register (DR)

If the DW and the DR are used, be sure to use values in the range from -9999 to 9999. Data must be displayed in four digits (decimal notation).

Differences in displayed values between DW, DR and W, R (2-word)

Data in the PLC	DW, DR	W, R
99999999	99999999	655304463
10000001	10000001	65536001
10000000	10000000	65536000
9999999	9999999	65535999
10000	10000	65536
9999	9999	9999
0	0	0
-1	-1	2147483649
-9999	-9999	2147493647
-10000	-10000	2147549184
-10001	-10001	2147549185
-9999999	-9999999	2212955111

■ CP-9200SH / MP900 Series

Setup System Area here.

Device	GP Device Address	CP-9200SH Device	Amount	Paticulars	
Coil (bit device)	GMB00000 ~ GMB0624E	MB00000 + OFFSET to MB0624E + OFFSET	9999		
Coil (word device)	GMB0000 ~ GMB0624	MB0000 + OFFSET to MB0624 + OFFSET	625	*2	
Input Relay (bit device)	GIB00000 ~ GIB0270E	IB00000 + OFFSET to IB0270E + OFFSET	9999	*1	
Input Relay (word device)	GIB0000 ~ GIB0270	IB0000 + OFFSET to IB0270 + OFFSET	625	*1 *2	
Hold Register (word device)	GMW0000 ~ GMW1023	MW0000 + OFFSET to MW1023 + OFFSET	1024	Bit F	
	GMW1024 ~ GMW2047	MW1024 + OFFSET to MW2047 + OFFSET	1024	Bit F	
	GMW2048 ~ GMW3071	MW2048 + OFFSET to MW3071 + OFFSET	1024	Bit F	
	GMW3072 ~ GMW4095	MW3072 + OFFSET to MW4095 + OFFSET	1024	Bit F	
	GMW4096 ~ GMW5119	MW4096 + OFFSET to MW5119 + OFFSET	1024	Bit F	
	GMW5120 ~ GMW6143	MW5120 + OFFSET to MW6143 + OFFSET	1024	Bit F	L/H
	GMW6144 ~ GMW7167	MW6144 + OFFSET to MW7167 + OFFSET	1024	Bit F	
	GMW7168 ~ GMW8191	MW7168 + OFFSET to MW8191 + OFFSET	1024	Bit F	
	GMW8192 ~ GMW9215	MW8192 + OFFSET to MW9215 + OFFSET	1024	Bit F	
	GMW9216 ~ GMW9998	MW9216 + OFFSET to W9998 + OFFSET	783	Bit F	
Input Register (word device)	GIW0000 ~ ~ GIW03FF	IW0000 + OFFSET to IW03FF + OFFSET	1024	Bit F *1	
	GIW0400 ~ GIW07FF	IW0400 + OFFSET to IW07FF + OFFSET	1024	Bit F *1	
	GIW0800 ~ GIW08FF	IW0800 + OFFSET to IW08FF + OFFSET	1024	Bit F *1	
	GIW0C00 ~ GIW0FFF	IW0C00 + OFFSET to IW0FFF + OFFSET	1024	Bit F *1	
	GIW1000 ~ GIW13FF	IW1000 + OFFSET to IW13FF + OFFSET	1024 *Device range "0000" indicates it is hexa-decimal	Bit F *1	

**1 Can be read out from a GP, however cannot be written to a GP.*

**2 Cannot be written in the last (16th) bit of this address.(i.e, GMB0624/GIB0270)*

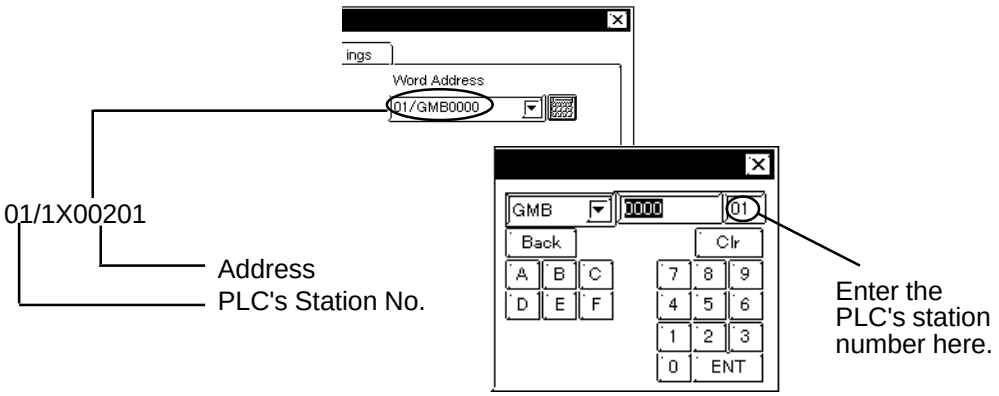
Important

- ***Designate the LS area bit at the end of the Word Address, using from 0 to F.***
- ***Since the CP-9200SH unit's protocol is applicable to a 1:n connection, it will differ from the MEMOCON-SC's protocol and internal method of representing devices. When you wish to modify the screen data from a MEMOCON-SC, you will need to reenter device data.***
- ***The hold Register and Input Register device settings must be entered within each block. Any settings that extend into other blocks are not allowed.***

  (Example: You cannot enter a 20 word long setting, starting from GMW1010.)

Note:

When you are setting up parts and tags in GP-PRO/PB III, you can designate PLC's station numbers as you are inputting addresses. If you do not designate the station numbers, the number following the one you previously entered will be automatically selected. (The factory setting is "1".)



2.4.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ Memocon-SC Series
(GL40S/GL60S/GL60H/GL70H) (GL120CPU Direct Connection)

GP Setup		Communication Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	Transfer Mode	RTU Mode (fixed)
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity On/Off EVEN/ODD	ON EVEN
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Delay Count *1	0
Unit No.	1	Station Number Setting	1

■ Memocon-SC Series (U84/U84J/U84S)

GP Setup		Communication Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Transfer Mode	RTU Mode
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	EVEN
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Port Delay Timer	0
Unit No.	1	Address	1

■ Memocon-SC Series (GL120/GL130)

GP Setup		Communication Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits		
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	ON/OFF	ON
Data Flow Control	ER Control	Even/ODD	Even
Communication Format	RS-422	Communicationsport	RS-422
---		Slave address No.	1
Unit No.	1	Communications bit	RTU mode (fixed)

** 1 There is no Delay Count for the JAMSC-IF60 SIO Module.*

■ PROGIC-8

GP Setup		Port 1/Port 2 Setup	
Baud Rate (for Port 1 connection)	9600 bps (fixed)	---	
Baud Rate (for Port 2 connection)	19200 bps	Baud Rate (for Port 2 connection)	19200 bps
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	Even	---	
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	---	

■ Control Pack Series

GP Setup		Machine Controller 4CN/6CN Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Station Number Setting	1

■ Memocon Micro

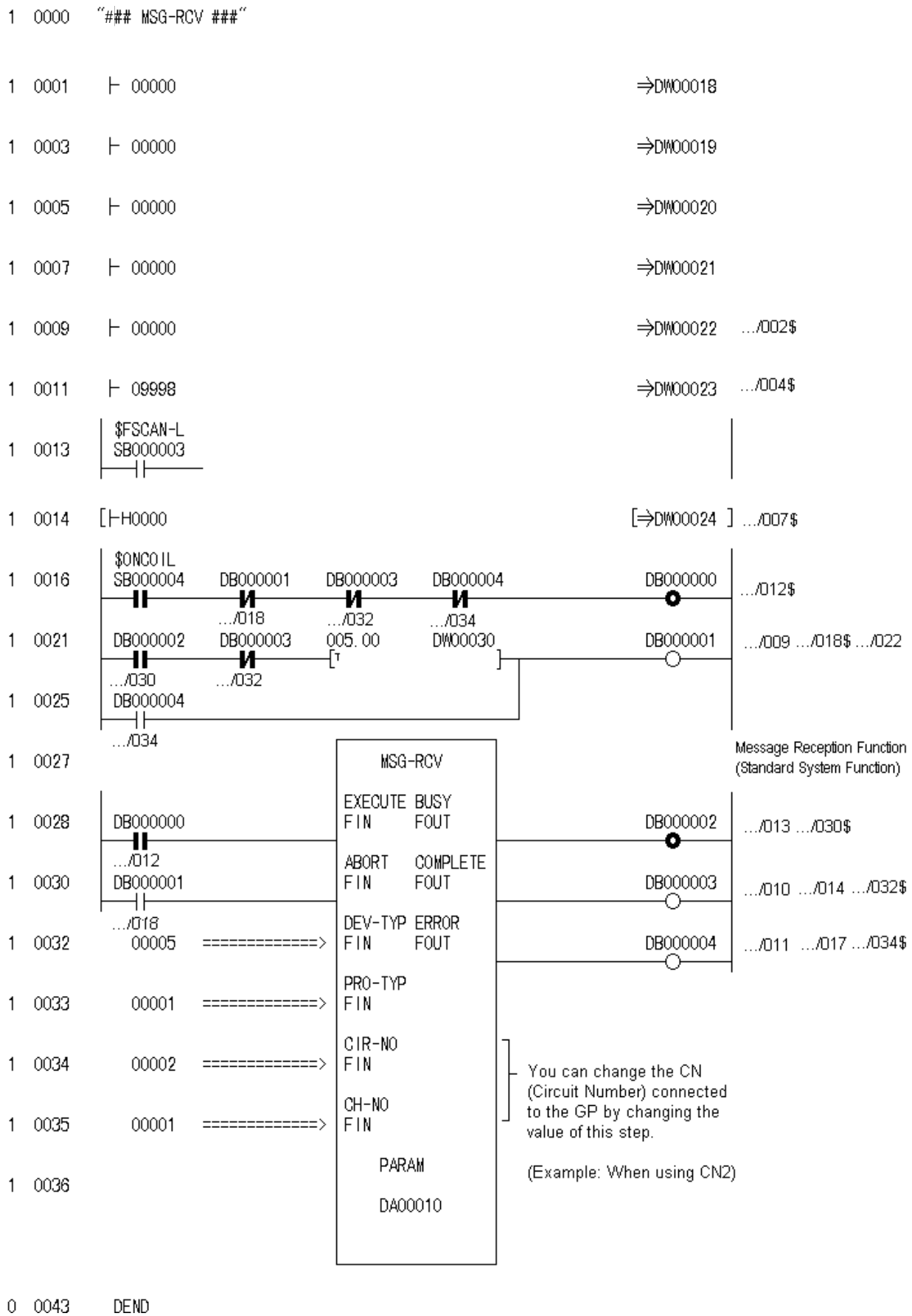
GP Setup		Comm1 Port Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Station Number Setting	1

■ Control Pack Series for CP-9200SH

	GP Setup	PLC Setup
Baud rate	9600bps	9600bps
Data Length	8	8
Stop Bit	1	1
Parity Bit	Even	Even
Data Flow Control	ER Control	ER Control
Communication Format (RS-232C)	RS-232C	CN1 or CN2
(RS-422)	4 Wire-Type	CN3
System Area Start Address	GMW0000	----------
Station No.	1 ~ 32	1 ~ 32

- **When connecting the GP77R Series unit to the "****-21700-****" or older vesion of 217IF unit, select the "GP Settings" menu's "Communication Settings" tab in 3.0 or later version of GP-PRO/PB III for Windows screen creation software, and click on the "Advanced" field, and then designate "20ms" for the "Send Wait" setting.**
- **A ladder program is needed when connecting the GP to a Yasukawa CP-217IF link I/F unit.**
- **Be aware that this sample program enables the GP to communicate with only one CN unit, and when you wish to use more than one CN unit at the same time you will need to create a ladder program for each CN.**
- **The PLC's communication settings cannot be entered by this program. You will need to enter these settings via the ladder software.**

■ Control Pack Series CP-9200SH Sample program



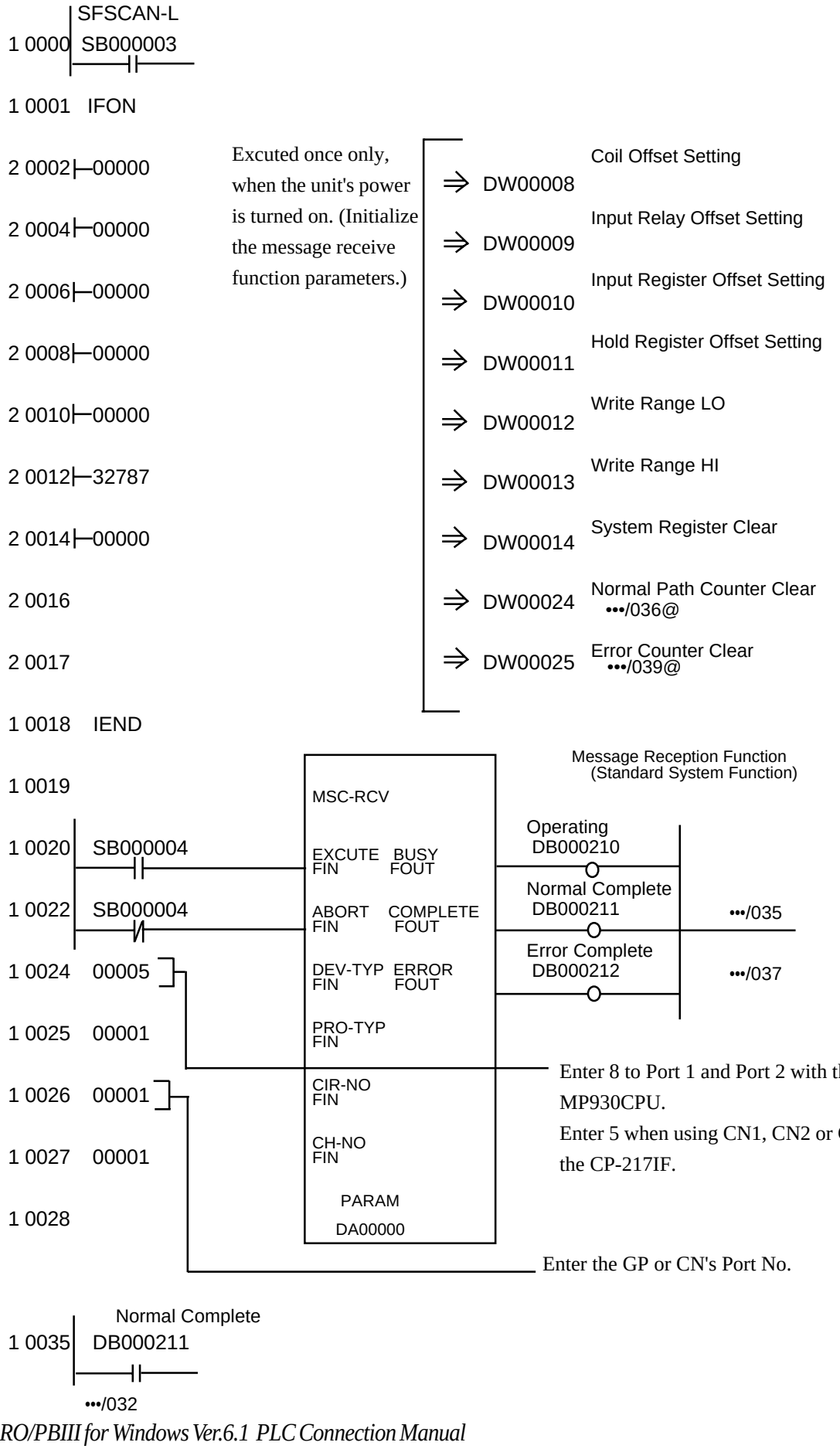
■ MP900 Series

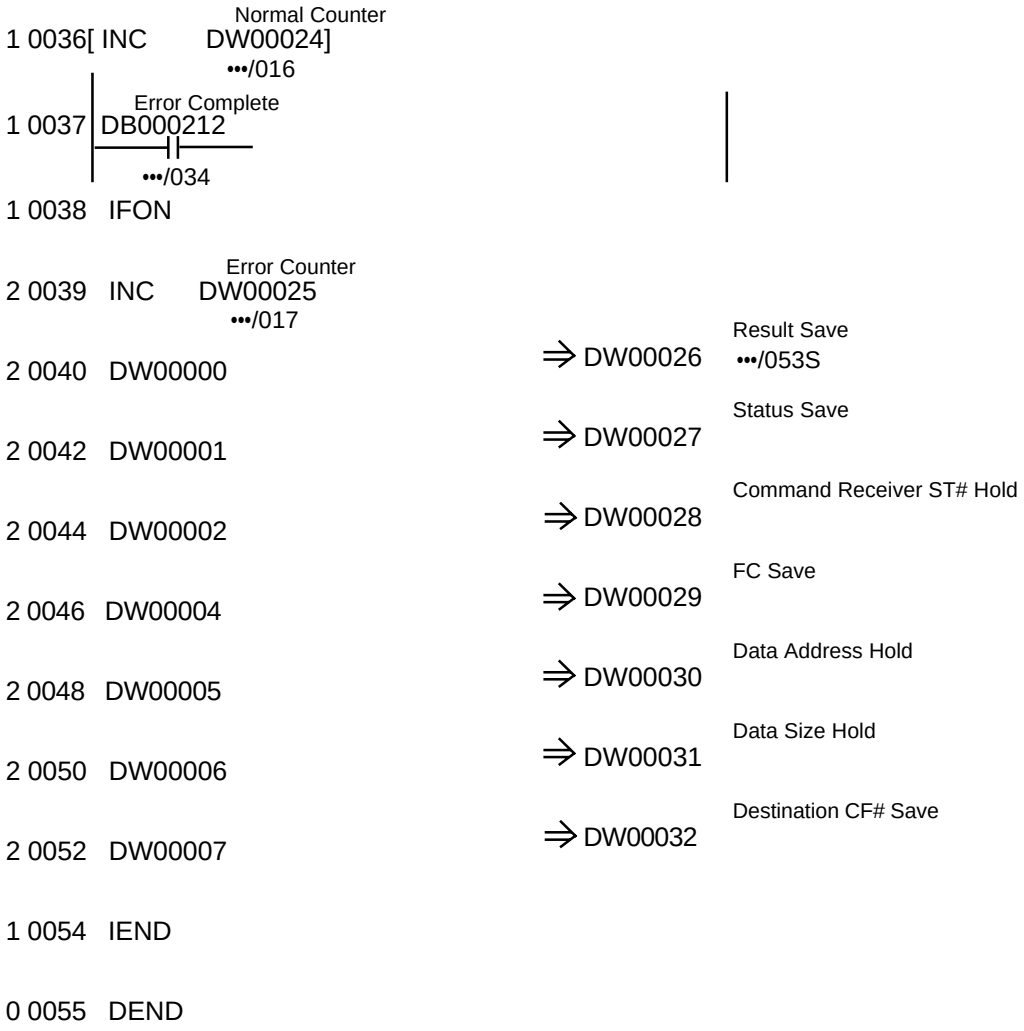
GP Setup		PLC Setup	
Baud rate	19200bps	Baud rate	19.2Kbps
Data Length	8	Data Length	8
Stop Bit	1	Stop Bit	1
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Send Mode	RTU
Communication Format (RS-232C)	RS-232C	Serial I/F (RS-232C)	RS-232C
Communication Format (RS-422)	4 Wire-Type	Serial I/F (RS-422)	RS-485
Unit No.	1	Device Address	01
———		Master Slave	Slave
———		Transmission Protocol	MEMOBUS

Note:

- **A ladder program is needed when connecting the GP Series unit to a Yasukawa Electric corporation CP-217IF link I/F unit's CN1,CN2,CN3 or to MEMOBUS Ports (Port 1 or Port 2).**
- **Be aware that this sample program enables the GP to communicate with only one CN unit, and when you wish to use more than one CN unit at the same time you will need to create a ladder program for each CN.**
- **The PLC's communication settings cannot be entered by this program. You will need to enter these settings via the ladder software.**

■ MP900 Series Sample program




Normal Counter
1 0036[INC DW00024]
•••/016
Error Complete
1 0037 DB000212
•••/034
1 0038 IFON
Error Counter
2 0039 INC DW00025
•••/017
2 0040 DW00000
2 0042 DW00001
2 0044 DW00002
2 0046 DW00004
2 0048 DW00005
2 0050 DW00006
2 0052 DW00007
1 0054 IEND
0 0055 DEND
⇒ DW00026
Result Save
•••/053S
⇒ DW00027
Status Save
⇒ DW00028
Command Receiver ST# Hold
⇒ DW00029
FC Save
⇒ DW00030
Data Address Hold
⇒ DW00031
Data Size Hold
⇒ DW00032
Destination CF# Save

2.5 Hitachi

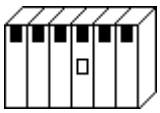
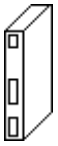
2.5.1 System Structure

The following describes the system structure for connecting the GP to Hitachi Ltd. PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.5.2 Cable Diagrams**".*

Note: **"HIDIC H Series" is made by Hitachi Industrial Equipment System Co., Ltd.**

■ HIDIC-S10α Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 Upper Link Module		
2α (LWP000) *1 2α E(LWP040) *1 2α H(LWP070) *1	CPU unit Link I/F	RS-422 (Hitachi H-7338 type; Cable Diagram 1)	GP Series
4α , 4αF	LWE805		

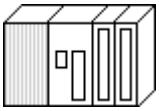
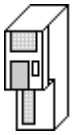
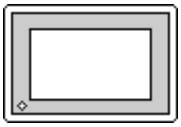
** 1 Connect to the CPU Module's HOST LINK COMPUTER LINK Input/Output Terminal (Upper Calculation I/F).*

■ S10 mini Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
LQP000 LQP010 LQP011	LQE060	RS-232C <Cable Diagram 6>	GP Series

■ HIDIC H Series (using Link I/F)

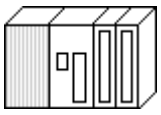
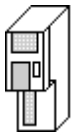
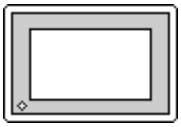
Procedure 1 for transmission control

CPU	Link I/F	Cable Diagram	Cable	GP
	 COMM Module			
H-300(CPU-03Ha), H-700(CPU-07Ha), H-2000(CPU-20Ha), H-2002 (CPU2-20H)	COMM-H COMM-2H	RS-232C (Cable Diagram 2) RS-422 (Cable Diagram 4)	RS-232C Hitachi peripheral cable GPCB05H *1 or WPCB02H *1	GP Series
H-302(CPU2-03H) H-702(CPU2-07H) H-4010 (CPU3-40H)	COMM-2H			

** 1 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377,GP-377R and GP-2300 series unit.*

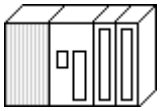
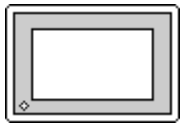
■ HIDIC H Series/COMM-2H (using Link I/F)

Procedure 2 for transmission control

CPU	Link I/F	Cable Diagram	Cable	GP
	 COMM Module			
H-302 (CPU2-03H) H-702 (CPU2-07H) H-2002 (CPU2-20H) H-4010 (CPU3-40H)	COMM-2H	RS-232C (Cable Diagram 2) RS-422 (Cable Diagram 4)	RS-232C Hitachi's peripheral cable GPCB05H *1 or WPCB02H *1	GP Series

**1 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377, GP-377R, and GP-2300 series unit.*

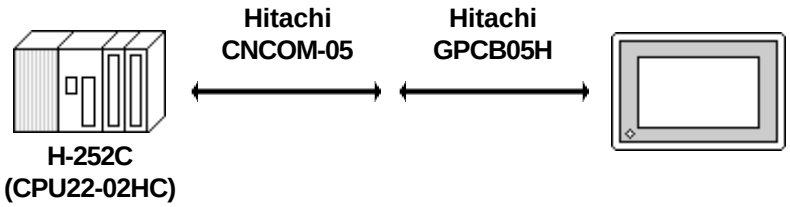
■ HIDIC H Series (CPU Direct Connection)

CPU	Cable Diagram	Cable	GP
			
H20,H28,H40,H64	RS-232C (Cable Diagram 2)	Hitachi peripheral cable GPCB05H *9	GP Series
H-200(CPU-02H) *1 H-300(CPU-03Ha) *1 H-700(CPU-07Ha) *1 H-2000(CPU-20Ha) *1			
H-252C(CPU22-02HC) *1 *2 H-302(CPU2-03H) H-702(CPU2-07H) H-2002(CPU2-20H) *1 H-4010(CPU3-40H) *1 *4	(Cable Diagram 2, 3) *3	Hitachi peripheral cable GPCB05H(4800bps) *9 or WPCB02H(19200bps) *9	
EH-150(EH-CPU104, EH-CPU208, EH-CPU316) *5 *7	RS-232C (Cable Diagram 2, 3) *8		
EH-150(EH-CPU448) *6 *7	RS-422 (Cable Diagram 7)		
MICRO-EH(EH-D10ooo, EH-A14ooo, EH-D14ooo, EH-A23ooo, EH-A28ooo, EH-D28ooo) *10	RS-232C (PORT1) (Cable Diagram 2) *7		
MICRO-EH(EH-A23ooo, EH-A28ooo, EH-D28ooo) *10	RS-422 (PORT2) (Cable Diagram 8)		

** 1 Connect to the CPU module's peripheral port.*

** 2 If the CPU is connected to port 2, a Hitachi CNCOM-05 conversion cable between the round connector (8-pin) and the D sub-connector (15-pin) is required.*

<Fig. 1>



**3 You will need to change the wiring depending on the baud rate. Use (Cable Diagram 2) when the baud rate is 4800bps, and use (Cable Diagram 3) when the baud rate is 19200bps. <Fig.1> is only for when the baud rate is 4800bps.*

**4 If the CPU's software revision is J or later, and DIPSWI's No.3 and No.4 are turned OFF, you can set the baud rate to 38400bps by using (Cable Diagram3).*

**5 Connect to the CPU module's serial port 1 or serial port 2.*

**6 Connect to the CPU module's serial port 1.*

**7 If the CPU is connected to a GP, a Hitachi EH-RS05 conversion cable between the modular jack (8-pin) and the D sub-connector (5-pin) is required.*

**8 If the CPU is connected to serial port 2, you will need to change the wiring depending on the baud rate.*

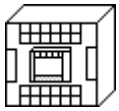
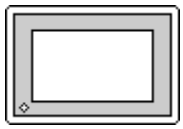
When the baud rate is 19200bps or 38400bps, use Cable Diagram 3.

When the baud rate is 4800bps or 9600bps, use Cable Diagram2.

** 9 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377, GP-377R, and GP-2300 series.*

**10 The Controller's model number "□" will vary, depending on each controller's specifications.*

■ HIZAC EC Series (CPU Direct Connection)

CPU	Cable Diagram	GP
		
EC-40HR	RS-232C (Cable Diagram 5)	GP Series

2.5.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Hitachi Ltd. may differ; however, using these cables for your PLC operations will not cause any problems.

Careful!

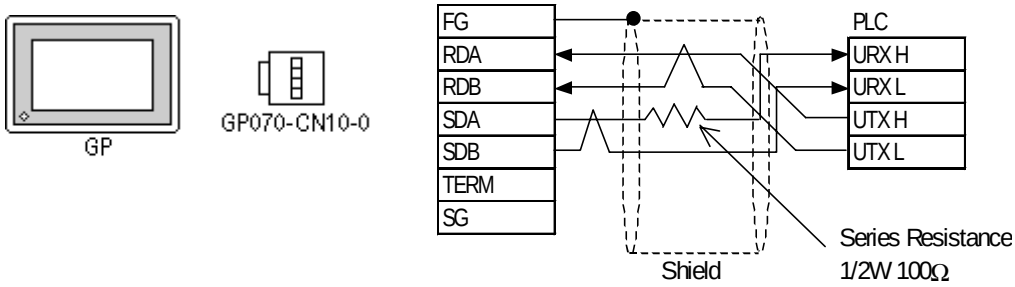
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

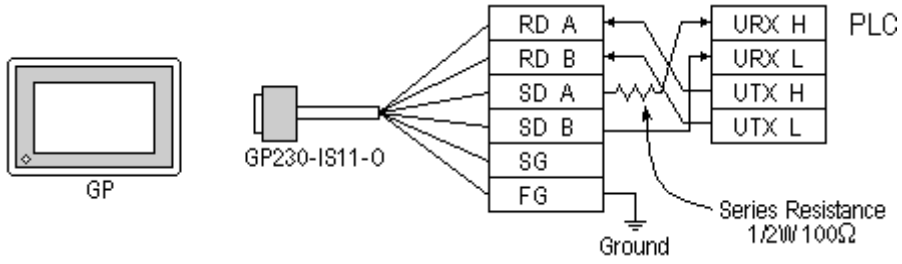
- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a connector hood and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***
- ***For the RS-422 connection, refer to Hitachi's PLC manual for the cable length.***

Cable Diagram 1 (RS-422)

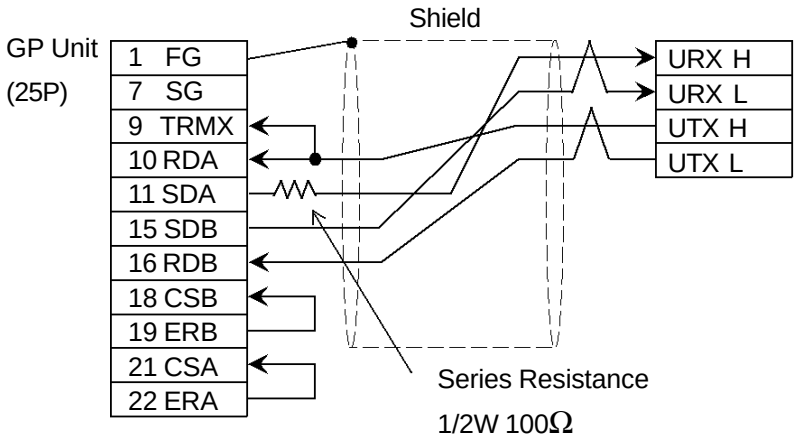
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



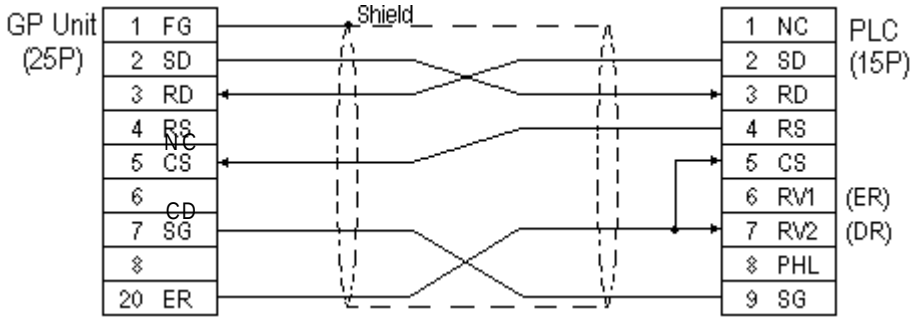
• When making your own cable connections



Note:

- **When making your own connections, we recommend using Hitachi Densen's KPEV-SB-3P0.5mm² cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 2 (RS-232C)



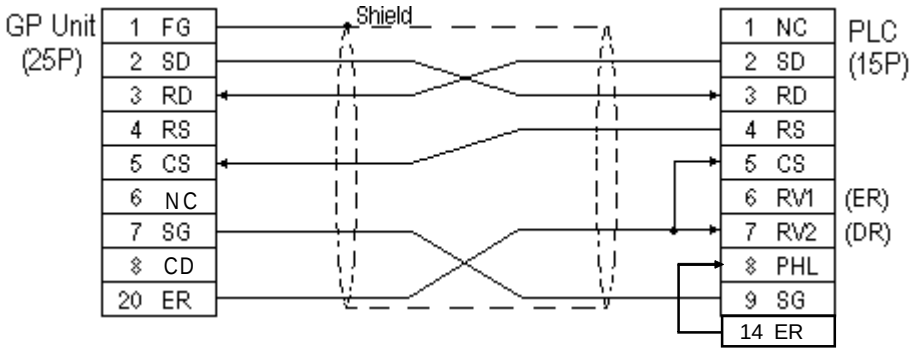
Note:

When an error develops during communication, there may be a delay before the error message displays as the unit runs the retry process.

Careful!

In Procedure 1 for transmission control, when the GP and PLC program console (GPCL) are operated at the same time, a PLC COM ERROR: (02:37) on the GP and a CPU Hold Error in the GPCL may develop. In such cases, the GP automatically reverts to its normal state. Run the GPCL operation again.

Cable Diagram 3 (RS-232C)

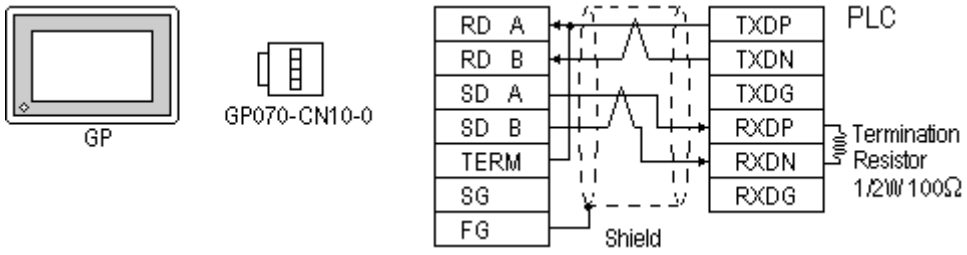


When an error develops during communication, there may be a delay before the error message displays as the unit runs the retry process.

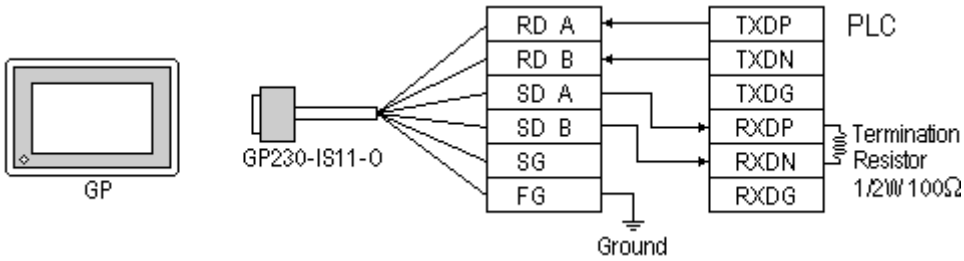
In Procedure 1 for transmission control, when the GP and PLC program console (GPCL) are operated at the same time, a PLC COM ERROR: (02:37) on the GP and a CPU Hold Error in the GPCL may develop. In such cases, the GP automatically reverts to its normal state. Run the GPCL operation again.

Cable Diagram 4 (RS-422)

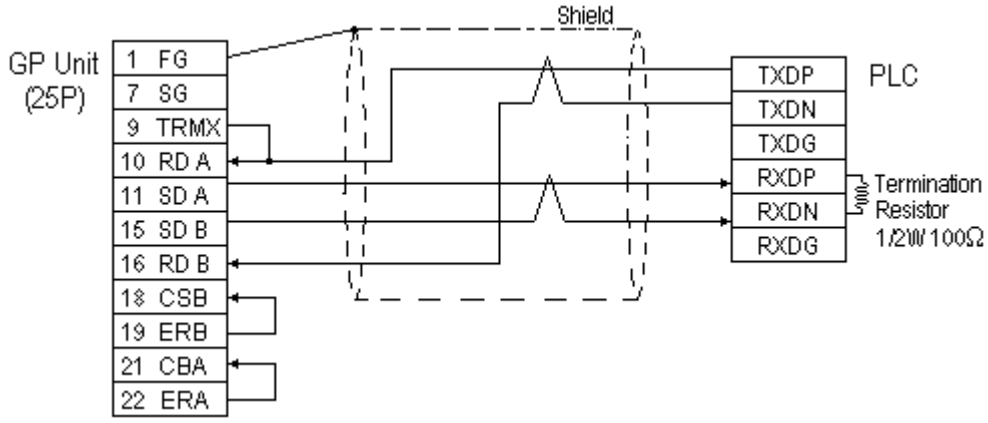
• When using Digital's RS-422 connector terminal GP070-CN10-0 adapter



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections



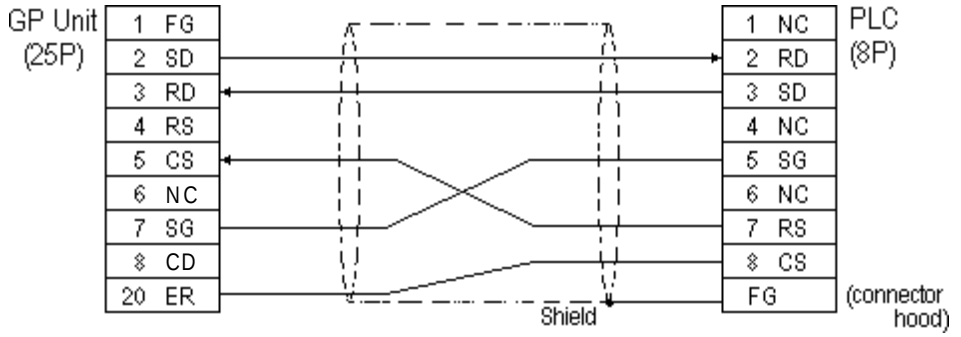
Note: • **When an error develops during communication, there may be a delay before the error message displays, as the unit runs the *retry* process.**

Careful! *When the GP and PLC program consoles (GPCL) are operated at the same time, a PLC COM ERROR: (02:37) on the GP and a CPU Hold Error in the GPCL may develop. In such cases, the GP automatically reverts to its normal state. Run the GPCL operation again.*

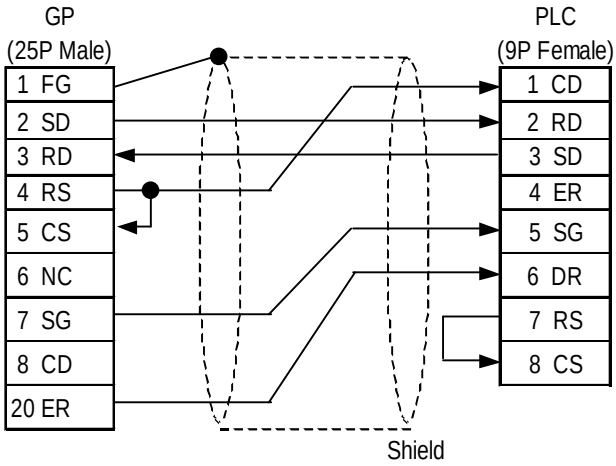
Note: • **When making your own connections, we recommend using Hitachi Densen's KPEV-SB-3P0.5mm² cable.**

• **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 5 (RS-232C)

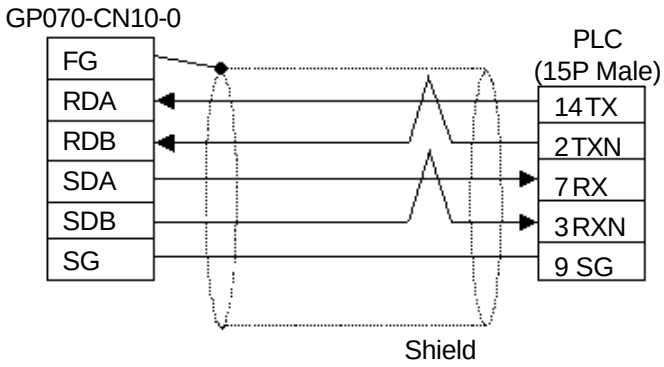


Cable Diagram 6 (RS-232C)

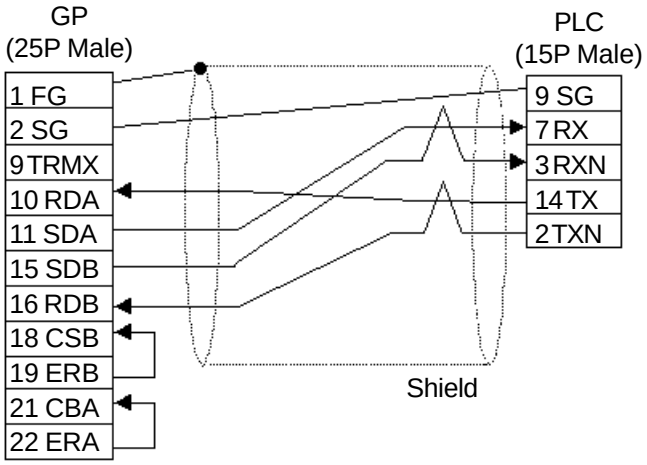


Cable Diagram 7 (RS-422, 4-wire)

• When using Digital's RS-422 connector terminal GP070-CN10-0 adapter

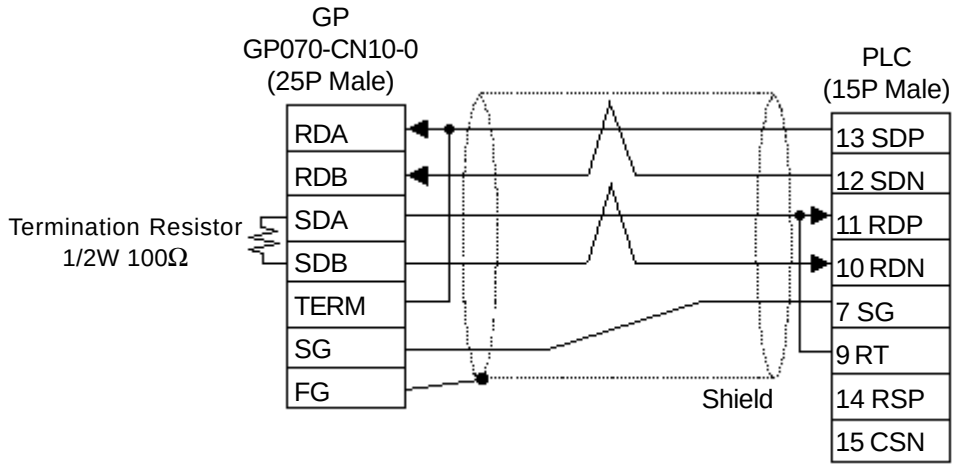


• When making your own cable connections

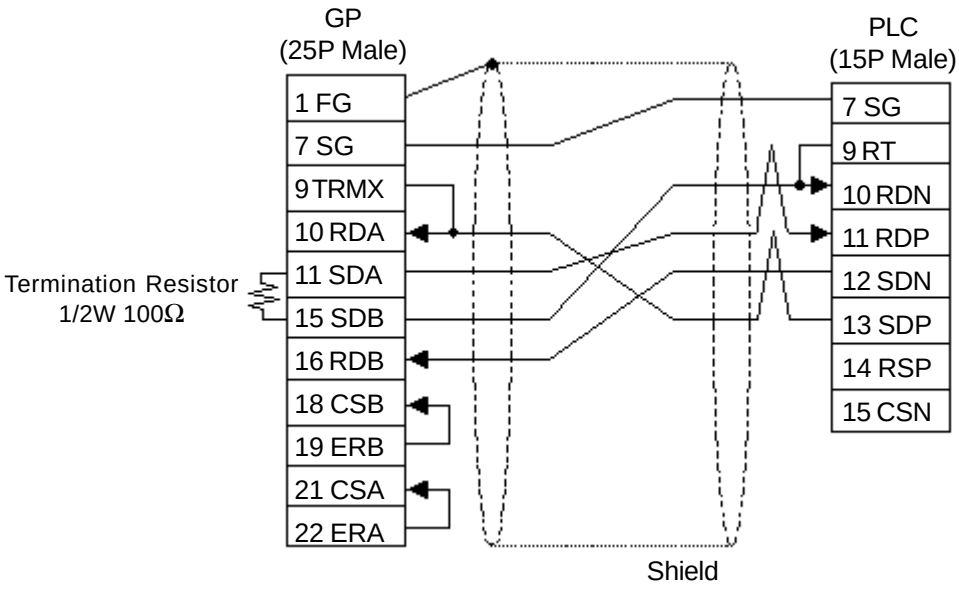


Cable Diagram 8 (RS-422, 4-wire)

• When using Digital's RS-422 connector terminal GP070-CN10-0 adapter



• When making your own cable connections



Note: • **Short-circuiting pin Nos. 9 and 10 on the PLC provides a termination resistance of 120Ω**

2.5.3 Supported Devices

The following describes the range of devices supported by the GP.

■ HIDIC S10α Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X7FF	XW000 ~ XW7F0		H/L
Output Relay	Y000 ~ Y77FF	YW000 ~ YW7F0		
Internal Relay	R000 ~ R7FF	RW000 ~ RW7F0		
Global Link	G000 ~ GFFF	GW000 ~ GWFF0		
System Register	S000 ~ SBFF	SW000 ~ SWBF0	*1	
E Word	EW400 ~ EWFFF	EW400 ~ EWFF0		
Event	E000 ~ E0FF	EW000 ~ EW0F0		
Keep Relay	K000 ~ K1FF	KW000 ~ KW1F0		
On-Delay Timer	T000 ~ T1FF	TW000 ~ TW1F0	*2	
One Shot Timer	U000 ~ U07F	UW000 ~ UW070	*2	
Up/Down Counter	C000 ~ C03F	CW000 ~ CW030	*2	
On-Delay Timer (elapsed value)	---	TC000 ~ TC1FF		L/H
On-Delay Timer (setup value)	---	TS000 ~ TS1FF		
One Shot Timer (elapsed value)	---	UC000 ~ UC07F		
One Shot Timer (setup value)	---	US000 ~ US07F		
Up/Down Counter (elapsed value)	---	CC000 ~ CC03F		
Up/Down Counter (setup value)	---	CS000 ~ CS03F		
Data Register	---	DW000 ~ DWFFF	Bit	H/L
Work Register	---	FW000 ~ FWBFF	Bit	
Extended Register	---	MS000 ~ MSFFF Address on GP-PRO/PBIII	Bit *3	

** 1 Cannot perform data write.*

** 2 Point of Contact.*

** 3 Access is possible for 4K words of Extended Memory (8 bits per address). The top address of the Extended Memory to be accessed is set in the [SET UP OPERATION SURROUNDINGS] area of the INITIALIZE menu. (Refer to "Extended Memory Top Address Setup.") Be sure to set the address(es) accessed by the GP within the limits of the PLC's specified Extended Memory address area. For PLC Extended Memory address setting procedures, refer to the PLC maker's manual.*

■ S10 mini Series

Setup System Area here.

Device	Bit Address	Word Address	Remarks
External Input	X000 ~ XFFF	XW000 ~ XWFF0	*1
External Output	Y000 ~ YFFF	YW000 ~ YWFF0	*1
Internal Register	R000 ~ RFFF	RW000 ~ RWFF0	*1
Global Link Register	G000 ~ GFFF	GW000 ~ GWFF0	*1
Event Register	E000 ~ E0FF	EW000 ~ EW0F0	*1
Event Register	EW400 ~ EWFFF	EW400 ~ EWFF0	*2
Keep Relay	K000 ~ KFFF	KW000 ~ KWFF0	*1
System Register	S000 ~ SBFF	SW000 ~ SWBF0	*1 *3
On-delay Timer	T000 ~ T1FF	TW000 ~ TW1F0	*1
One-shot Timer	U000 ~ U0FF	UW000 ~ UW0FF	*1
Up-down Counter	C000 ~ C0FF	CW000 ~ CW0FF	*1
Transfer Register	J000 ~ JFFF	JW000 ~ JWFF0	*1
Reciev Register	Q000 ~ QFFF	QW000 ~ QWFF0	*1
Expansion Internal Register	M000 ~ MFFF	MW000 ~ MWFF0	*1
On-delay Timer (Current Value)	———	TC000 ~ TC1FF	
On-delay Timer (Set Value)	———	TS000 ~ TS1FF	
One-shot Timer (Current Value)	———	UC000 ~ UC0FF	
One-shot Timer (Set Value)	———	US000 ~ US0FF	
Up-down Counter (Current Value)	———	CC000 ~ CC0FF	
Up-down Counter (Set Value)	———	CS000 ~ CS0FF	
Work Register	———	FW000 ~ FWBFF	Bit F
Data Register	———	DW000 ~ DWFFF	Bit F
Expansion Resister	———	MS000 ~ MSFFF	Bit F *4

*1 *Because of the PLC specifications, the highest bit has been designated as 0 and the lowest bit as 15. Therefore, when Bit 0 turns ON, "32768" will be written to the top Word.*

*2 *The higher and lower bit order will be reversed. When EW400 is turned ON, E40F will be turned ON on the PLC.*

*3 *Data cannot be written.*

**4 In expansion memory (1 address = 8 bits), 4K Words can be accessed. Designate the top address of the expansion memory to be accessed, via [Default Settings] - [Set Up Operation Surroundings] (see the following page). The GP's access address will then be designated within the range of expansion memory address range set up in the PLC. For the detailed information about how to set up the PLC's expansion memory address range, refer to that PLC's manual.*

Note: Depending on your CPU, the usable device type and range may differ. Before using only a CPU, refer to your CPU User Manual.

Cautions when using HIDIC S10α and S10 mini

♦ **Accessed Extended Memory Address**

Access Address = Top Address + Device Address set by GP-PRO/PBIII for Windows

E.g. When the Top Address = 180000 and the Device Address is MS 1FF;

180000 + 3FE = 1803FE

Since the PLC uses 8 bits for its extended memory addresses, this number is doubled.

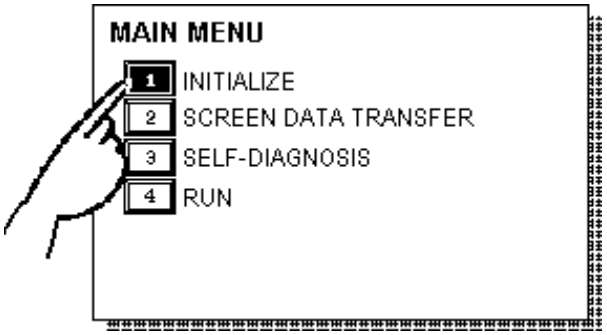
♦ **Extended Memory Top Address Setup**

Specify the extended memory address at the initial setup when the GP is in the OFFLINE mode.

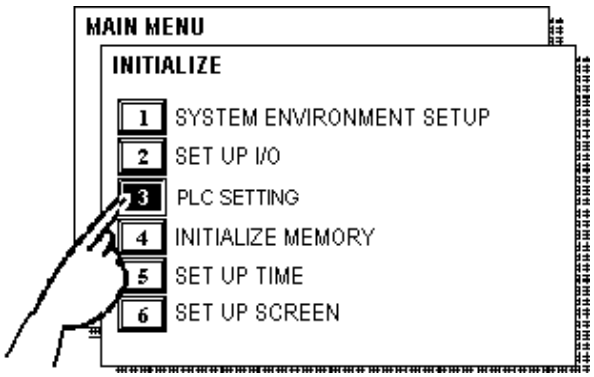
Reference *OFFLINE mode —> Refer to —> User's Manuals (sold separately),* ***Chapter 4 "OFFLINE Mode"***

Note: For the input range (values) 0HEX to FE000HEX, be sure to add the offset value (100000HEX) to the range values to create the actual address setting. If, however, the GP does not access Extended Memory, these addresses do not need to be set.

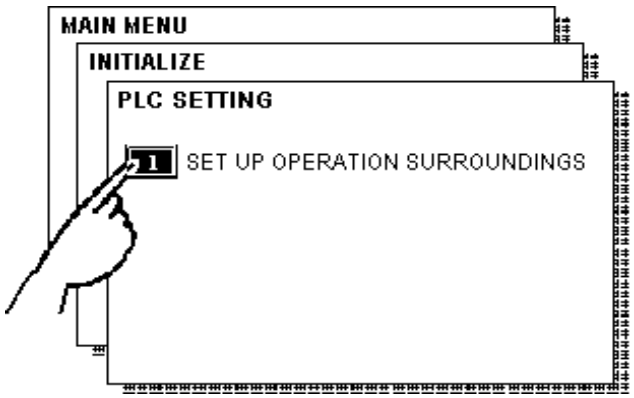
If the GP uses tags or parts to access the PLC's program area, errors in either the PLC or the GP may occur. Therefore, it is recommended that the [Extended Memory Addresses] in an area not used by the PLC.



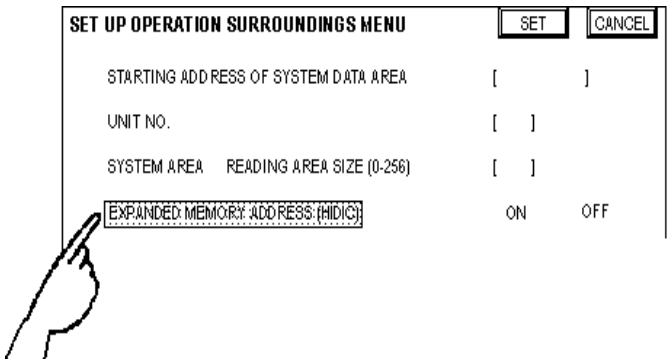
① Touch item #1, INITIALIZE. The INITIALIZE menu will appear.



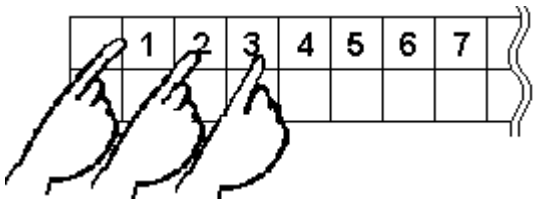
② Touch item #3, PLC SETTING. The PLC SETTING menu will appear.



③ Touch item #1, SET UP OPERATION SURROUNDINGS. The SET UP OPERATION SURROUNDINGS menu will appear.



④ Touch the "EXPANDED MEMORY ADDRESS (HIDIC)" selection. The selected item is highlighted.



⑤ Use the Touch Keys at the bottom of the screens to enter the desired value.

<Example> When setting the value of 180000, enter [80000].

■ HIDIC H (HIZAC H) Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
External Input	X00000 ~ X05A95	WX0000 ~ WX05A7	*1	
External Output	Y00000 ~ Y05A95	WY0000 ~ WY05A7	*1	
Remote Input Relay	X10000 ~ X49A95	WX1000 ~ WX49A7	*1	
Remote Output Relay	Y10000 ~ Y49A95	WY1000 ~ WY49A7	*1	
Internal Output	R000 ~ R7BF	---		
CPU Link Area 1	L0000 ~ L3FFF	WL000 ~ WL3FF		
CPU Link Area 2	L10000 ~ L13FFF	WL1000 ~ WL13FF		
Data Area	M0000 ~ M3FFF	WM000 ~ WM3FF		
On Delay Timer	TD000 ~ TD1023	---		
Single Shot Timer	SS000 ~ SS1023	---		L/H
Watch Dog Timer	WDT000 ~ WDT1023	---		
Monostable Timer	MS000 ~ MS1023	---		
Accumulation Timer	TMR000 ~ TMR1023	---		
Up Counter	CU000 ~ CU2047	---		
Ring Counter	RCU000 ~ RCU2047	---		
Up/Down Counter	CT000 ~ CT2047	---		
Timer/Counter (Elapsed Time)	---	TC000 ~ TC2047		
Word Internal Output	---	WR0000 ~ WRC3FF	Bit F	
Network Link Area	---	WN0000~WN7FFF		

**1 Write your data as follows.*

E.g. *External Input* unit No. 1, Slot No. 2, Module Bit No. 34

X 0 1 2 3 4

- 4 — Module Bit No.
- 2 — Slot No.
- 1 — Unit No.

E.g. *External Input* unit No. 1, Slot No. 2, Module Word No. 3.

W X 0 1 2 3

- 3 — Module Word No.
- 2 — Slot No.
- 1 — Unit No.

If the first CPU link (L0000 to L3FFF) and the second CPU link (L10000 to L13FFF) are used with any GP-PRO/PB III for Windows drawing software which is Ver. 1.0 or earlier, enter L00000 to L03FFF for the first CPU link; and enter L100000 to L103FFF for the second CPU link by adding a zero to each one.

If GP-PRO/PB III for Windows Ver. 2.0 or later is used, enter the addresses shown in the previous page's table.

If you upgrade your GP-PRO/PB III for Windows Ver. 1.0 or earlier to Ver. 2.0 or later, your internal data will not be affected. Only the addresses to be entered are different.

The device type, the applicable range, and the ability or disability of writing may be different depending upon your CPU. Check with the manual for your CPU before use.

■ HIZAC EC Series

Setup System Area here.

Device	Bit Address	Word Address	Vertical Address	Particulars	
External Input	X000 ~ X015	WX000 ~ WX014	VX000	÷16 *1 *3 (Only for Vertical Address)	
	X020 ~ X035	WX020 ~ WX034	VX020		
	X040 ~ X055	WX040 ~ WX054	VX040		
	X060 ~ X075	WX060 ~ WX074	VX060		
	X080 ~ X095	WX080 ~ WX094	VX080		
	X100 ~ X115	WX100 ~ WX114	VX100		
	X120 ~ X135	WX120 ~ WX134	VX120		
	X140 ~ X155	WX140 ~ WX154	VX140		
	X160 ~ X175	WX160 ~ WX174	VX160		
	X180 ~ X195	WX180 ~ WX194	VY180		
External Output	Y200 ~ Y215	WY200 ~ WY214	VY200	÷16 *2 *3 (Only for Vertical Address)	L/H
	Y220 ~ Y235	WY220 ~ WY234	VY220		
	Y240 ~ Y255	WY240 ~ WY254	VY240		
	Y260 ~ Y275	WY260 ~ WY274	VY260		
	Y280 ~ Y295	WY280 ~ WY294	VY280		
	Y300 ~ Y315	WY300 ~ WY314	VY300		
	Y320 ~ Y335	WY320 ~ WY334	VY320		
	Y340 ~ Y355	WY340 ~ WY354	VY340		
	Y360 ~ Y375	WY360 ~ WY374	VY360		
	Y380 ~ Y395	WY380 ~ WY394	VY380		
Internal Output	M400 ~ M655	WM400 ~WM654	VM400 ~ VM640	÷2 ÷16 (Only for Vertical Address)	
	M700 ~ M955	WM700 ~ WM954	VM700 ~ VM940		
	M960 ~ M991	WM960 ~ WM990	VM960 ~ VM976		
Timer/Counter (contact, or coil)	TC000 ~ TC095	---	---		
Timer/Counter (elapsed time)	---	TC100 ~ TC195	---		H/L
Timer/Counter (setup value)	---	TC200 ~ TC295	---	*4	

** 1 Due to the hardware structure, I/O numbers without the external terminals are OFF during RUN mode.*

** 2 Due to the hardware structure, the I/O numbers without the external terminals will have the same feature as the Internal Output (M).*

** 3 When writing word data, more than two consecutive word addresses cannot be written.*

** 4 Even if you change a value using a T/W/K-tag in the middle of running the PLC, restarting the PLC initializes using the values setup in the ladder program.*

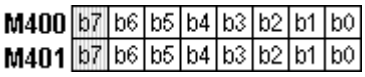
Important

A maximum of 108 words from WM400, WM700 can be used as the Read Area. However, Word Addresses from EM960 cannot be used as the Read Area. If any address from EM960 is used as the Read Area, the "PLC COM. ERROR(02:FA)" message will appear.

Note:

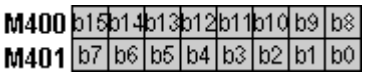
- **Bit Address**

  A bit address (1 point) uses the data area of one byte. The bit address turns the highest bit (b7) on/off in the corresponding data area.



- **Word Address**

  Word address uses the data area of 2 bytes. For example, selecting M400 causes the setup of the next address, M401, as well.



- **Vertical Address**

  Uses the highest bit (b7) of 16 consecutive addresses to form word data.

  The Vertical Address can only use numbers divisible by16.

- **The Internal Output (bit address) functions as listed below.**

M400~M655	**Data not preserved when powered off**
M700~M955	**Data preserved when powered off**
M960~M991	**Special Area**

2.5.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ HIDIC S10α Series

GP Setup		Upper Computer I/F, Upper Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps *1
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd (fixed)	---	
Data Flow Control	ER Control	---	
Communication Format	4-wire type	---	
Unit No.	0	---	

**1 LWP000 is fixed (setup is unnecessary).*

■ S10 mini Series

GP Setup		Upper Computer I/F, Upper Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	———	
Stop Bit	1 bit (fixed)	———	
Parity Bit	Odd (fixed)	———	
Data Flow Control	ER Control	———	
Communication Format	RS-232C	Communication Format Protocol setting switch	RS-232C 8 or 9 *1
Unit No.	0	———	

**1 When using CN1 and CN2 simultaneously, set them so that their numbers will not duplicate.*

■ **HIDIC H Series** (using COMM module)
Procedure 1 for transmission control

GP Setup		COMM Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
Communication Format (RS-422)	4-wire type	Communication Format (RS-422) Mode Switch	RS-422 2
---		Sum Check	Yes
Unit No. (RS-232C)	0	Station No. (RS-232C)	0
Unit No. (RS-422)	1	Station No. (RS-422)	1

■ **HIDIC-H Series/COMM-2H** Procedure 2 for transmission control

GP Setup		COMM Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C) Mode Switch	RS-232C 9
Communication Format (RS-422)	4-wire type	Communication Format (RS-422) Mode Switch	RS-422 9
---		Sum Check	Yes
Unit No. (RS-232C)	0	Station No. (RS-232C)	0
Unit No. (RS-422)	1	Station No. (RS-422)	1

■ HIDIC-H Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate	4800 bps *1	Baud Rate	4800 bps *1
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Data Flow Control	DTR Control
Communication Format	RS-232C	Communication Format	RS-232C
---		Operation Mode	Transmission Control Procedure 1
Unit No.	0	Station No.	0

*1 With some CPUs, a baud rate of 19200bps or 38400bps can be used. Refer to"**2.5.1 System Structure**" for details.*

■ HIDIC EH150 Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate *1	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C or 4-wire type	Mode Setting Switch	SW1 : OFF (Normal mode)
			SW5 : ON (Exclusive mode)
			SW7 : OFF (Normal Operation mode)
			SW8 : OFF (Normal Operation mode)
		Port ON/OFF Switch	ON (Programer Connection)
		Exclusive Port Setting *2	Special Internal Output WRF037 *3
Unit No.	0	---	

*1 Set the Mode Setting Switch. (SW3, 4 : Port 1, SW6 : Port 2)
When using Prot 2, the cable diagram needs to be changed.*

Reference *refer to 2.5.1 System Structure*

2 Set when using EH-CPU448.

*3 Ddepending on the your Interface and Procedure, varies as shown below.
RS-232C Procedure 1 : 8000H
RS-232C Procedure 2 : C000H
RS-422 Procedure 1 with unit No. : A1xxH (xx indicates GP's Unit No.)
RS-422 Procedure 2 with unit No. : E1xxH (xx indicates GP's Unit No.)*

4 Only EH-CPU448's serial port1 can be set.

■ HIZAC EC Series

GP Setup		PLC Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity On/Off Parity	On Even
Data Flow Control	ER Control	Data Flow Control	DTR Control
Communication Format	RS-232C	Communication Mode	COM2 Mode (Command mode)
---		Sum Check	Yes
Unit No.	0 (fixed)	---	

■ MICRO-EH Series

GP Setup		PLC Setup	
Baud Rate	9600 bps	Baud Rate	19200 bps
Data Length	7 bits (fixed)	---	---
Stop Bit	1 bit (fixed)	---	---
Parity Bit	Even (fixed)	---	---
Data Flow Control	ER Control	---	---
Communication Format	RS-232C, 4-wire	---	---
Unit No.	0	Port 1 Setup	Special Internal Output Set to WRF01A *1
---	---	Port 2 Setup	Special Internal Output Set to WRF03D *2

*1 *Transmission Control Procedure 1: 000H*
Transmission Control Procedure 2: 8000H

*2 *Transmission Control Procedure 1 (with Station Number) (192000 bps): A200H*
Transmission Control Procedure 2 (with Station Number) (192000 bps): E200H


MEMO

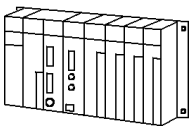
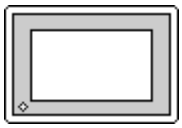
2.6 Sharp

2.6.1 System Structure

The following describes the system structure for connecting the GP to Sharp PLCs.

Reference *The Cable Diagrams mentioned in the following table are listed in the section titled "**2.6.2 Cable Diagrams**".*

■ New Satellite JW Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 Link I/F		
JW20	Link I/F on CPU unit *1	RS-232C (Cable Diagram 1)	GP Series
	JW-21CM	RS-422 4-wire type (Cable Diagram 3) RS-422 2-wire type (Cable Diagram 4)	
JW-32CUH JW-32CUH1 JW-33CUH3	Link I/F on CPU unit	RS-232C Connected to PG/COMM2 port (Cable Diagram 2)	
		RS-422 (4 wire type Connected to PG/COMM1 port or PG/COMM2 port (Cable Diagram 5)	
	JW-21CM	RS-422 4-wire type (Cable Diagram 3)	
JW50	JW-10CM	RS-422 4-wire type (Cabe Diagram 3)	
	ZW-10CM	RS-422 4-wire type (Cabe Diagram 3) RS-422 2-wire type (Cabe Diagram 4)	
JW70, JW100	Link I/F on CPU unit *1	RS-232C (Cabe Diagram 1)	
	JW-10CM	RS-422 4-wire type (Cabe Diagram 3)	
	ZW-10CM	RS-422 4-wire type (Cabe Diagram 3) RS-422 2-wire type (Cabe Diagram 4)	

**1 Connect to the CPU Module's (JW-22CU, JW-70CU, JW-100CU) communication port.*

Note: **Places noted as RS-422 can also use RS-485 on the PLC side.**

2.6.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Sharp may differ, however, using these cables for your PLC operations will not cause any problems.

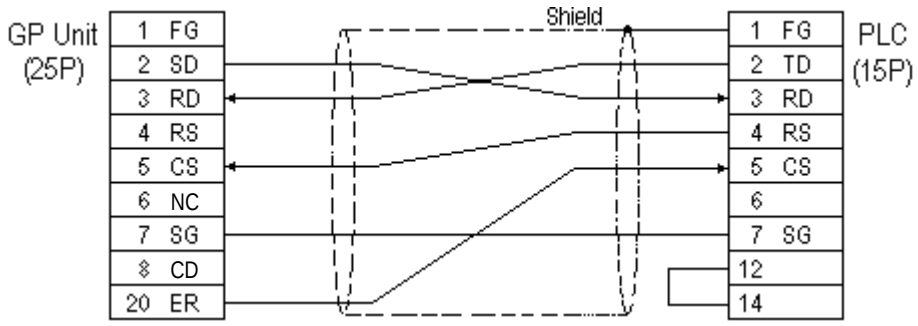
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***
- ***For the RS-422 connection, refer to Sharp's PLC manual for the cable length.***

Cable Diagram 1 (RS-232C)

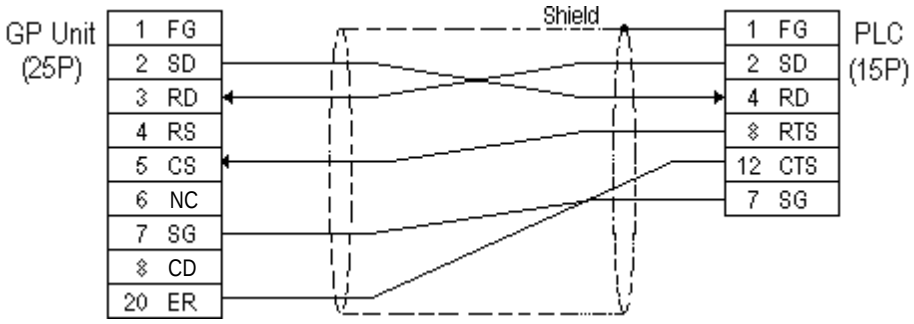


Note:

Fujikura Densen's 7P*7/0.18 57VV-SB is recommended for the connection cable.

Cable Diagram 2 (RS-232C)

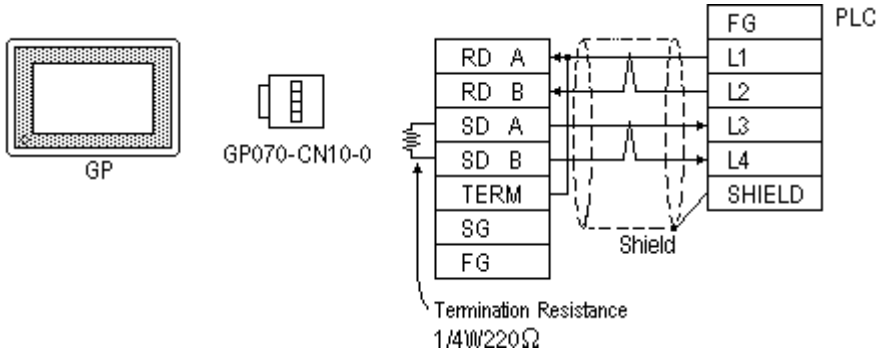
Do not use pin Nos. 14 and 15 for connection with the GP since their voltage is +5V.



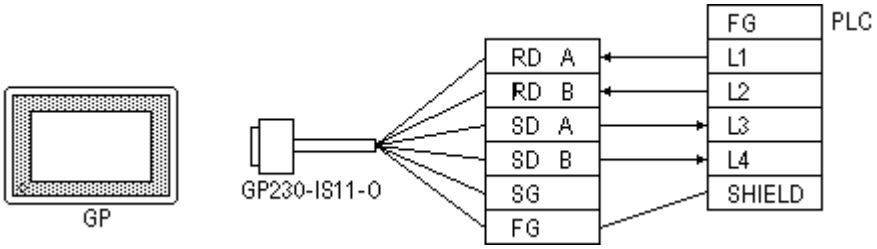
Cable Diagram 3 (RS-422)

Turn on the PLC's Termination Resistor switch.

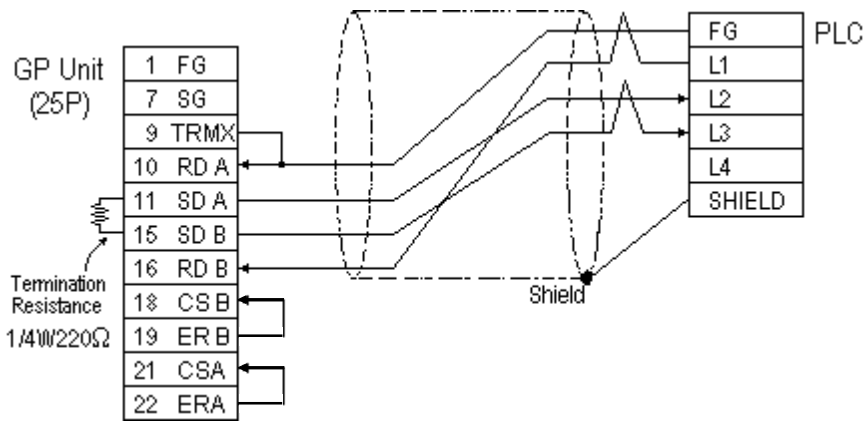
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable, GP230-IS11-0



• When making your own cable connections



Note:

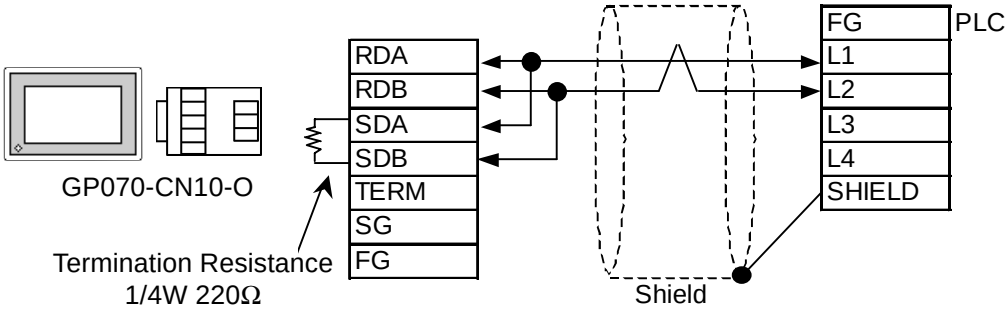
- **When making your own cable connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 4 (RS-422)

Careful!

Turn on the Termination Resistor switch, on the PLC.

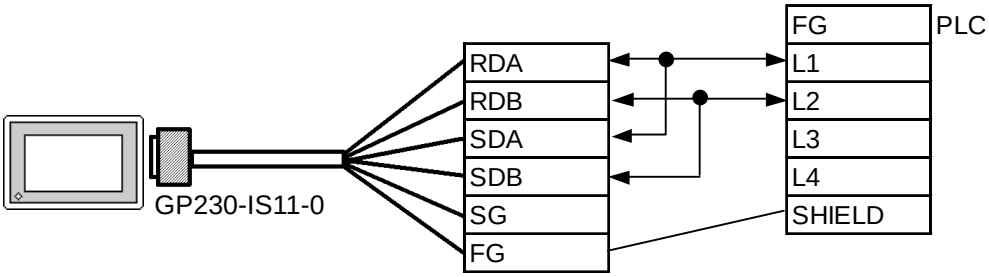
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



Note:

Connect terminals SD A and RD A to terminal base L1, and SD B and RD B to terminal block's L2 line.

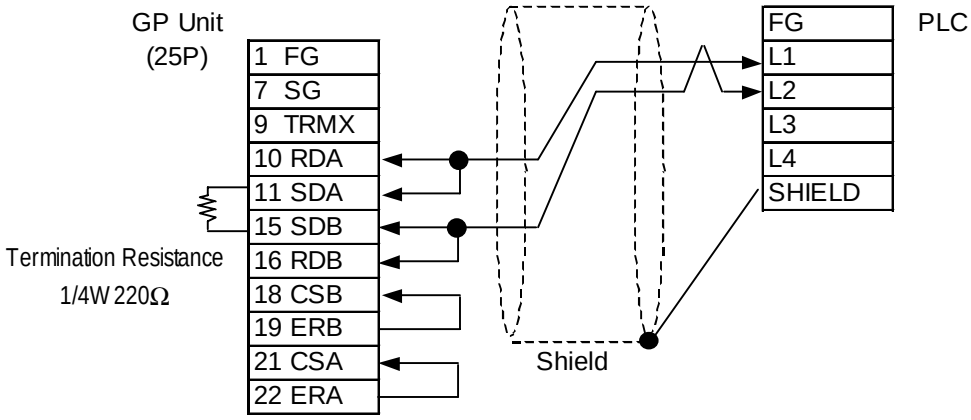
• When using Digital's RS-422 cable, GP230-IS11-0



Note:

- **Connect terminals SD A and RD A to terminal base L1, and SD B and RD B to terminal block's L2 line.**

• When making your own cable connections



Note:

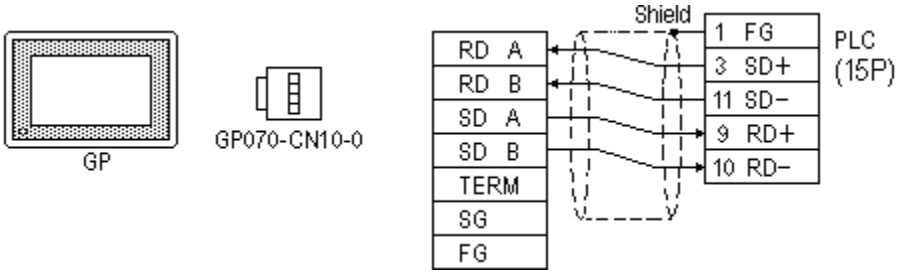
- **When making your own cable connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 5 (RS-422)

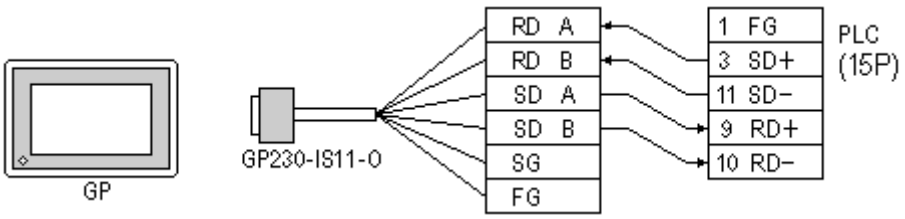
Careful!

- *Do not connect anything to pin Nos. 2, 4, 8, and 12.*
- *Do not use pin Nos. 14 and 15 for connection with the GP since their voltage is +5V.*

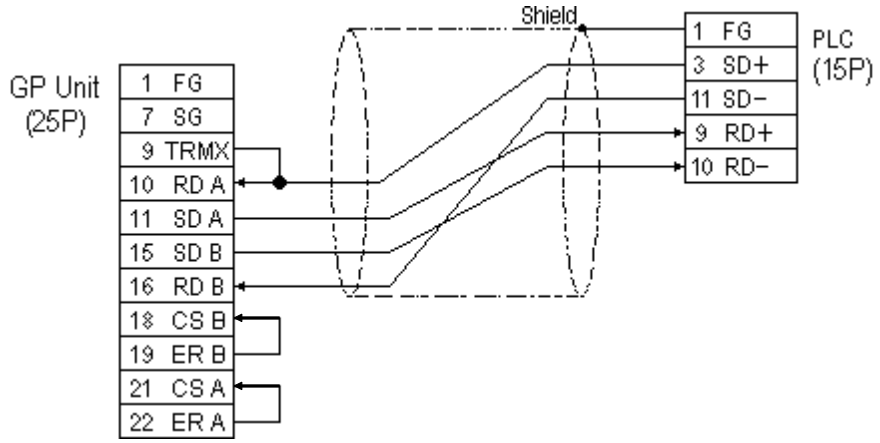
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable, GP230-IS11-0



• When making your own cable connections



Note: **Our recommendation for making your own cable is Hitachi's CO-SPEV-SB(A) 3P0.5mm².**

2.6.3 Supported Devices

The following describes the range of devices supported by the GP.

■ New Satellite JW Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Relay	00000 ~ 15777	A0000 ~ A1576 (⊐0000 ~ ⊐1576)	÷2	
Timer (contact)	T0000 ~ T0776	---		
Counter (contact)	C0000 ~ C0776	---		
Timer/Counter (current value)	---	T0000 ~ T0777		
		B0000 ~ B3776 (b0000 ~ b3776)	÷2 Bit 15	
Register	---	09000 ~ 09776	÷2 Bit 15	
	---	19000 ~ 19776		
	---	29000 ~ 29776		L/H
	---	39000 ~ 39776		
	---	49000 ~ 49776		
	---	59000 ~ 59776		
	---	69000 ~ 69776		
	---	79000 ~ 79776		
	---	89000 ~ 89776		
	---	99000 ~ 99776		
File Register	---	1000000 ~ 7177776	÷2 Bit 15 *1	

** 1 The file register consists of a file number and an address.*

E.g. **1 000000**

Address
File number

Careful!

*The PLC manual uses the values displayed in brackets for the Relay and Timer/Counter (current value) (B) word addresses; as a result, when entering, be sure to use **A**XXXX or **B**XXXX.*

Note:

That the range of addresses that can be used will vary depending on the type of PLC.

■ New Satellite JW-32CUH Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Relay	00000 ~ 15777	A0000 ~ A1576 (□0000 ~ □1576)	÷2	
	20000 ~ 75777	A2000 ~ A7576 (□2000 ~ □7576)		
Timer (contact)	T0000 ~ T1777	---		
Counter (contact)	C0000 ~ C1777	---		
Timer/Counter (current value)	---	B0000 ~ B3776 (b0000 ~ b3776)	÷2	
Register	---	09000 ~ 09776	÷2 Bit 15	
	---	19000 ~ 19776		
	---	29000 ~ 29776		
	---	39000 ~ 39776		
	---	49000 ~ 49776		
	---	59000 ~ 59776		
	---	69000 ~ 69776		L/H
	---	79000 ~ 79776		
	---	89000 ~ 89776		
	---	99000 ~ 99776		
	---	E0000 ~E0776		
	---	E1000 ~ E1776		
	---	E2000 ~ E2776		
	---	E3000 ~ E3776		
	---	E4000 ~ E4776		
	---	E5000 ~ E5776		
	---	E6000 ~ E6776		
	---	E7000 ~ E7776		
File Register 1	---	1000000 ~ 1037776	÷2 Bit 15 *1	
File Register 2	---	2000000 ~ 2177776		

** 1 The file register consists of a file number and an address.*

E.g. **1 000000**

Address
File number

Careful! *The PLC manual uses the values displayed in brackets for the Relay and Timer/Counter (current value) (B) word addresses; as a result, when entering, be sure to use **A**XXXX or **B**XXXX.*

Note: **The range of addresses that can be used will vary depending on the type of PLC.**

■ New Satellite JW Series (JW-33CUH3)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Relay	00000 ~ 15777	A0000 ~ A1576 (コ0000 ~ コ 1576)	÷2	
	20000 ~ 75777	A2000 ~ A7576 (コ2000 ~ コ7576)		
Timer (contact)	T0000 ~ T1777	———		
Counter(contact)	C0000 ~ C1777	———		
Timer/Counter (current value)	———	B0000 ~ B3776 (b0000 ~ b3776)	÷2	
Register	———	09000 ~ 09776	÷2 Bit 15	
	———	19000 ~ 19776		
	———	29000 ~ 29776		
	———	39000 ~ 39776		
	———	49000 ~ 49776		
	———	59000 ~ 59776		L/H
	———	69000 ~ 69776		
	———	79000 ~ 79776		
	———	89000 ~ 89776		
	———	99000 ~ 99776		
	———	E0000 ~ E0776		
	———	E1000 ~ E1776		
	———	E2000 ~ E2776		
	———	E3000 ~ E3776		
	———	E4000 ~ E4776		
	———	E5000 ~ E5776		
	———	E6000 ~ E6776		
	———	E7000 ~ E7776		
File Register 1	———	1000000 ~ 1037776	÷2 Bit 15	
File Register 2	———	2000000 ~ 2177776		
File Register 3	———	3000000 ~ 3037776		
File Register 10-1F	———	F10000000 ~ F1F177776	* 1	
File Register 20-2C	———	F20000000 ~ F2C177776		

** 1 The file register consists of a file number and an address.*

E.g. **1 000000**

Address
File number

Careful!

The PLC manual uses the values displayed in brackets for the Relay and Timer/Counter (current value) (B) word addresses; as a result, when entering, be sure to use AXXXX or BXXXX.

Note:

The range of addresses that can be used will vary depending on the type of PLC.

2.6.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ New Satellite JW Series (Using Link I/F on CPU unit)

GP Setup		Communication Port Setup	
Baud Rate *1	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Communication Format (4-wire)	4 wire type	---	
Communication Format (2-wire)	2 wire type	---	
Unit No.	1	Station Number	1

■ New Satellite JW Series (Using Link I/F)

GP Setup		Link Unit Setup	
Baud Rate *1	19200 bps	Baud Rate	19200 bps
Data Length	7 bits (fixed)	Data Bit	7 bits (fixed)
Stop Bit	2 bits (fixed)	Stop Bit	2 bits (fixed)
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (4-wire)	4 wire type	Comm Mode (SIO Line#) (4-wire type)	4 wire type
Communication Format (2-wire)	2 wire type	Comm Mode (SIO Line#) (4-wire type)	2 wire type
---		Function Setup Switch (S0)	Computer Link
Unit No.	1	Station Number	1

**1 115200bps can be used when the JW-32CUH1 or the JW-33CUH3 is used.*

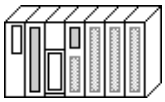
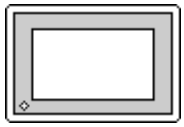
2.7 Matsushita Electric Works

2.7.1 System Structure

The following describes the system structure for connecting the GP to Matsushita Electric Works PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.7.2 Cable Diagrams**".*

■ MEWNET Series (using Link Unit)

CPU	Link I/F	Cable Diagram	Cables	GP
	 Computer Communication Unit (C.C.U.)	←	→	
FP1 (C24, C40C)	CPU unit Upper Link I/F *1	RS-232C (Cable Diagram 1) *5	Matsushita AFB85813 *4	GP Series
FP10SH FP2	CPU unit Upper Link I/F *2	RS-232C (Cable Diagram 1)	Matsushita AFB85813 *4	
FP3	AFP3462			
FP5	AFP5462			
FP10(S)	AFP3462			
	Upper Link I/F on CPU *2			
FP-M	Upper Link I/F on CPU *3	RS232C (Cable Diagram 1) *5		
FP0	Upper Link I/F on CPU *1	RS232C (Cable Diagram 6)		
FPG-C32T FPG-C32T2 FPG-C24R2	FPG-COM1 FPG-COM2	RS232C (Cable Diagram 7)		
		RS232C (Cable Diagram 8)		

**1 Connect to the RS-232C port.*

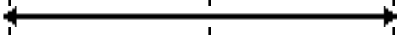
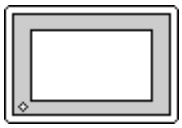
**2 Connect to COM port.*

**3 Connect to Serial port connector.*

**4 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370 , GP-377, GP-377R and GP-2300 series unit.*

**5 Use <Cable Diagram 2 > if the PLC's version is 2.6 or older.*

■ **MEWNET Series** (using CPUdirect connection)

<table>
<tr><th>CPU</th><th>Adapter</th><th>Cable Diagram</th><th>Cables</th><th>GP</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td></td><td>  </td></tr>
<tr><td rowspan="2">FP1 *1</td><td></td><td>RS-422
(Cable Diagram 3)</td><td></td><td rowspan="4">GP Series</td></tr>
<tr><td>Matsushita Electric Works' RS-422/232C terminal changer AFP8550 adapter *2</td><td>RS-232C
(Cable Diagram 4)</td><td></td></tr>
<tr><td>FP-M *3</td><td></td><td>RS-232C
(Cable Diagram 5)</td><td></td></tr>
<tr><td>FPO *4
FP2 *1
FPG-C32T
FPG-C32T2
FPG-C24R2</td><td></td><td>RS-232C (For cable diagram, refer to Matsushita's FP pc M5 type (AFC8513) users manual)</td><td>Matsushita's FP personal computer M5 type (AFC8513)</td></tr>
</table>

** 1 Connect to the Programming Tool connector.*

** 2 It is necessary to connect the RS-422/RS-232C adapter with the PLC using Matsushita's FP1peripheral AFP15205 connection programmable cable .*

** 3 Connect to the Program connector.*

**4 Connect to the Tool port.*

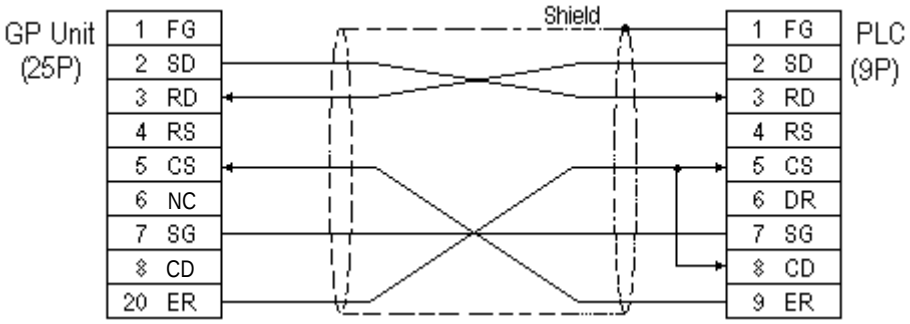
2.7.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Matsushita Electric Works may differ, however, using these cables for your PLC operations will not cause any problems.

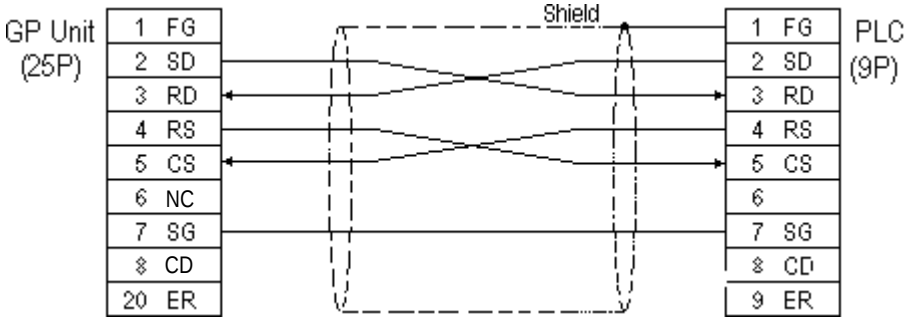
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, be sure to connect the SG (signal ground).***
- ***For the RS-422 connection, refer to Matsushita's PLC manual for the cable length.***

Cable Diagram 1 (RS-232C)



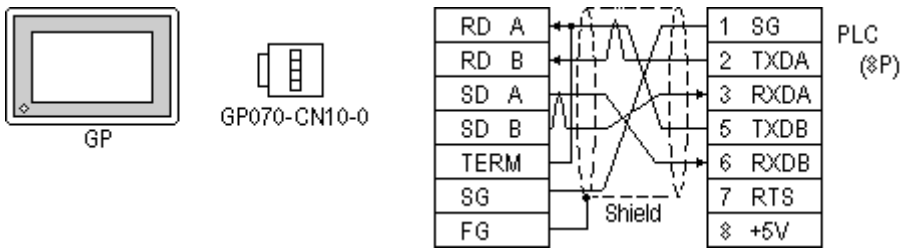
Cable Diagram 2 (RS-232C)



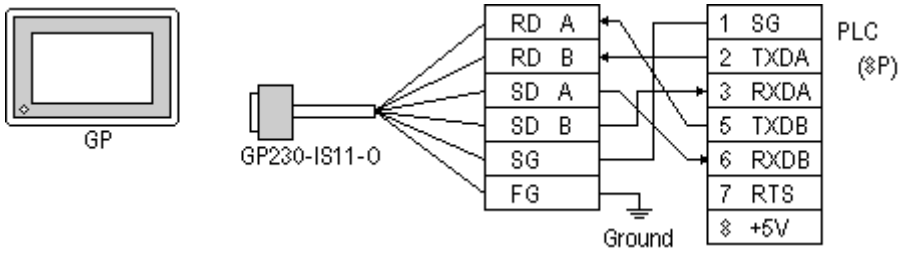
Cable Diagram 3 (RS-422)

Note: **You can use Hirose's circular HR212-10P-8P for the PLC connector.**

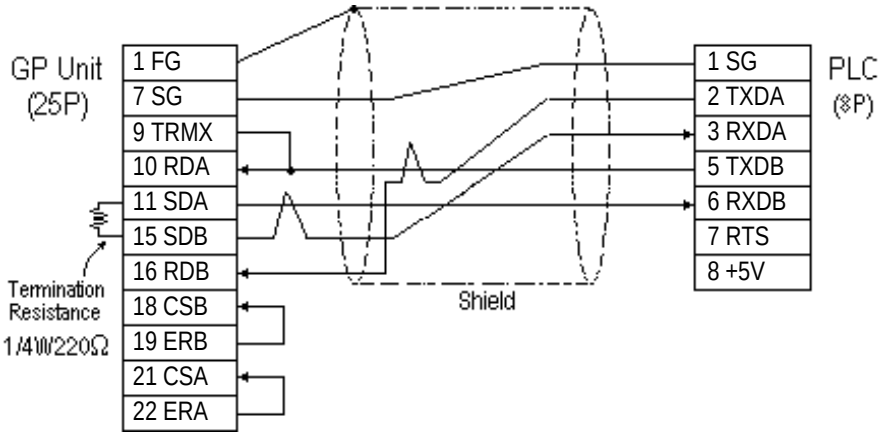
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable, GP230-IS11-0

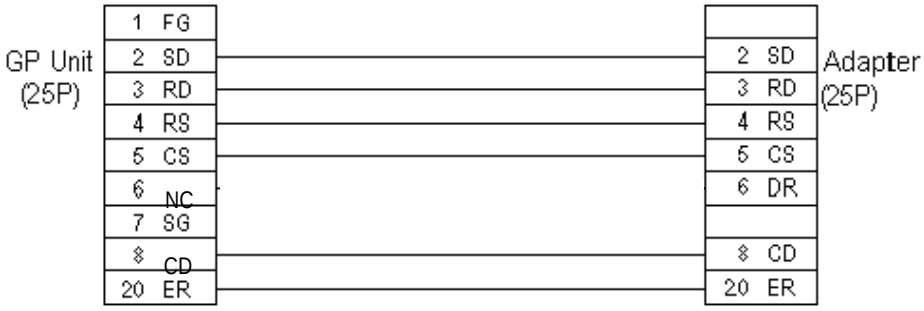


• When making your own cable connections

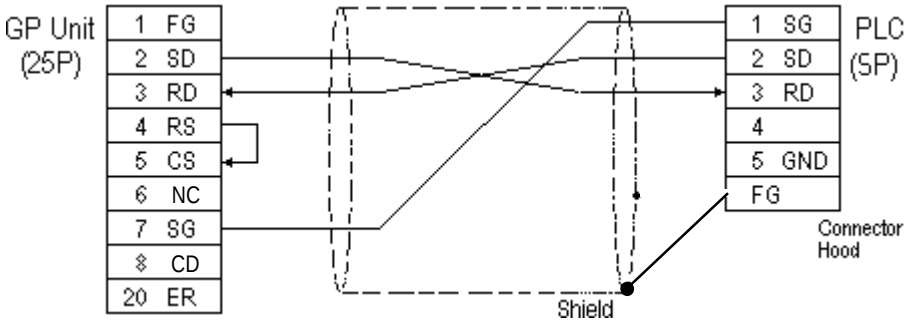


Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

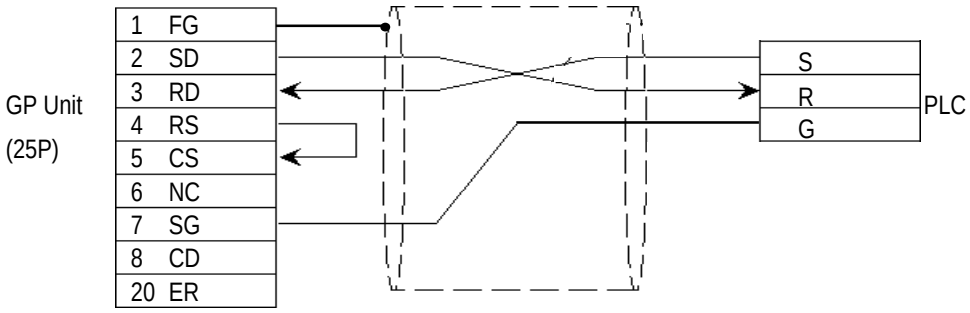
Cable Diagram 4 (RS-232C)



Cable Diagram 5 (RS-232C)

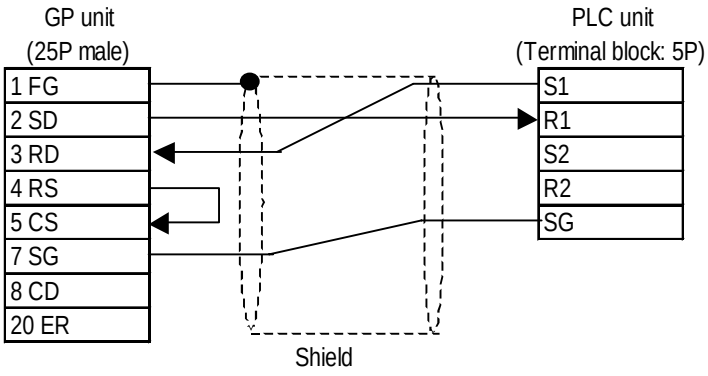


Cable Diagram 6 (RS-232C)



Cable Diagram 7 (COM port 1, RS-232C)

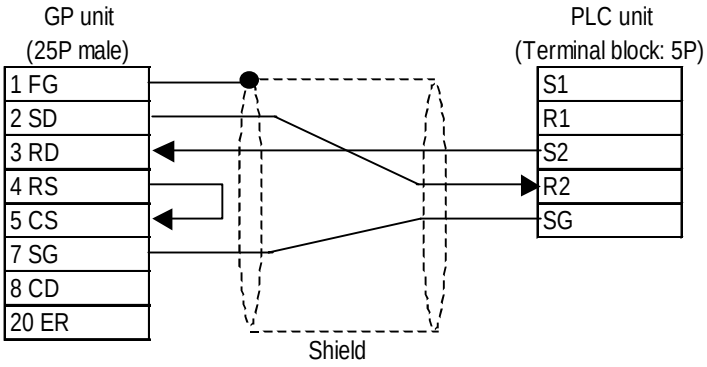
• When making your own connections



Note: • **The SG is common to COM ports 1 and 2.**

Cable Diagram 8 (COM port 2, RS-232C)

• When making your own connections



Note: • **The SG is common to COM ports 1 and 2.**

2.7.3 Supported Devices

The following describes the range of devices supported by the GP.

■ MEWNET Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X511F	WX000 ~ WX511	*1	L/H
Output Relay	Y0000 ~ Y511F	WY000 ~ WY511		
Internal Relay	R0000 ~ R886F	WR000 ~ WR886		
Link Relay	L000 ~ L639F	WL000 ~ WL639		
Special Relay	R9000 ~ R910F	WR900 ~ WR910	*1	
Timer (contact)	T0000 ~ T3071	---	*1	
Counter (contact)	C0000 ~ C3071	---	*1	
Timer/Counter (elapsed time)	---	EV0000 ~ EV3071	*1	
Timer/Counter (setup value)	---	SV0000 ~ SV3071	*1	
Data Register	---	DT0000 ~ DT10239	Bit 15 *2	
Link Register	---	Ld0000 ~ Ld8447	Bit 15	
File Register	---	FL00000 ~ FL32764	Bit 15	
Special Data Register	---	DT90000~DT90511	Bit 15 *3	

**1 Cannot perform data write.*

**2 Some CPU types use this device's word address DT09000 and higher as the Special Data Register.*

**3 Only the FP10SH, FP10S, FP10 and FP2 can use this device.*

Note:

- **When using the Timer and Counter with FP-M, setup each range in the System Register.**

Important

- ***Some CPU devices also have extensions, but only the device ranges shown here can be used.***
- ***For the system area, only the range between DT0000 and DT8999 can be specified.***
- ***The types and ranges of available devices may differ depending upon your CPU unit. Before use, check with the manual for your CPU unit.***

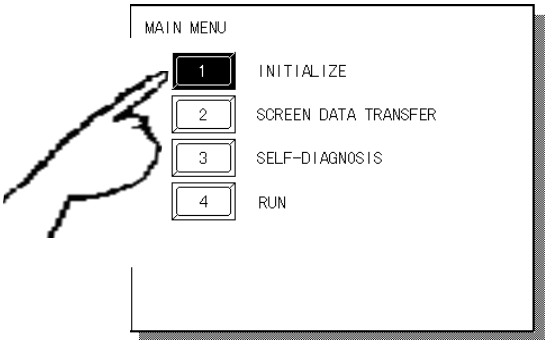
◆ Monitor Set-up

With the MEWNET-FP series, be sure to change the GP to offline mode before inputting the initial Monitor settings.

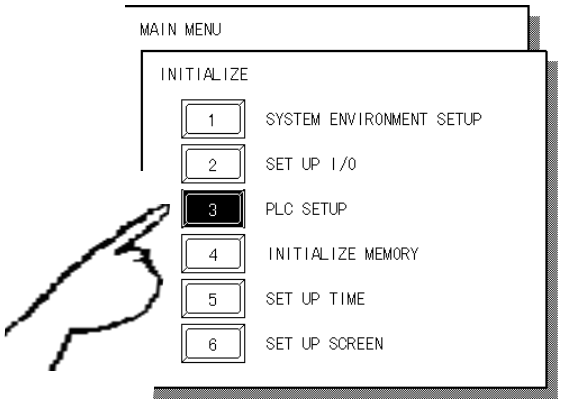
Reference *Offline mode -> refer to each Users' manual, Chapter 4 Offline Mode*

Careful! *[Monitor is Registered] is preinstalled as the initial value.*

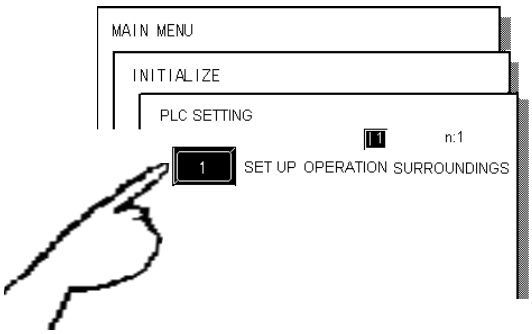
When a PLC has 2 or more communication units (CCUs) installed with one CPU, and each of those CCUs is connected to a GP, be sure this setting is [OFF].



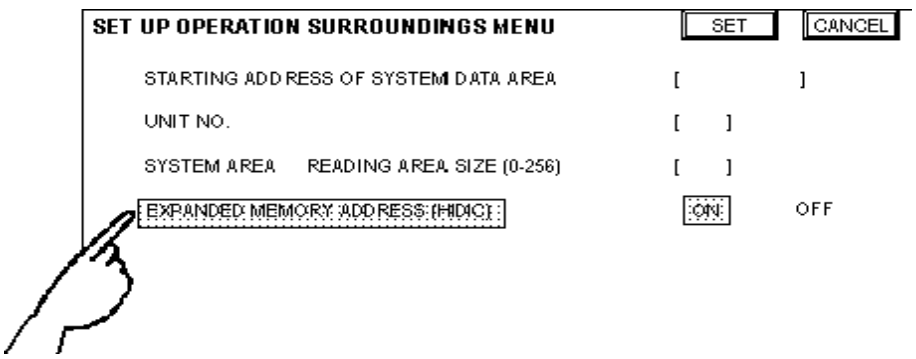
① Touch item #1, INITIALIZE. The INITIALIZE menu will appear.



② Touch item #3, PLC SETUP. The PLC SETTING menu will appear.



③ Touch selection [1:1] and then item #1, SET UP OPERATION SURROUNDINGS. The selected option is then highlighted.



④ Touch MONITOR REGISTER and the text will change to reverse video to show it has been selected.

⑤ When the PLC has only a single (1) communication unit (CCU), which is attached to a single GP, select [ON]. When a PLC has 2 or more communication units (CCUs) installed with one CPU, and each of the CCUs is connected to a GP, select [OFF].

2.7.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ FP1 (using CPU Upper Link I/F)

GP Setup		Computer Communication Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		RS-232C port Operation Select	1 (Computer Link)
---		RS-422 port Unit No.	1
Unit No.	1	Unit No.	1

■ FP1 (CPU Direct Connection)

GP Setup		Computer Communication Unit Setup	
Baud Rate	19200 bps	---	
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd (fixed)	---	
Data Flow Control	ER Control	---	
Communication Format	4-wire type *1	---	
---		RS-232C Port Operation Selection	1 (computer link)
---		RS-422 Port Unit No.	1
Unit No.	1 (fixed)	---	

**1 If an RS-422/232C conversion adapter is in use, set the communication format to "RS-232C".*

■ FP3/FP5/ FP10(S) (When using Computer Communication Unit)

GP Setup		Computer Communication Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	Control Signal *1	Make CS/CP ineffective
Communication Format	RS-232C	---	
Unit No.	1	Station No.	1

**1 The FP-10(S) does not have the Control Signal setting.*

■ FP10(S) /FP10SH /FP2(When using COM Port)

GP Setup		COM Port Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps *1
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Unit No.	1

**1 The FP10SH can also send data at 115200bps.*

■ FP2 (CPU Direct Connection)

GP Setup		Tool Port Setup	
Baud Rate	19200bps	Baud Rate	19200bps
Data Length	8bit	Run Mode Setting Switch	SW1:OFF
Stop Bit	1bit	Data Length	8bit
Parity Bit	Odd	————	
Data Flow Control	ER Control	————	
Communication Format	RS-232C	————	
Unit No.	1	Unit No.	1
————		Modem Connection	No Connection

■ FP-M (When using Serial Port Connector)

GP Setup		FPM Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	Start code End code	No STX CR
Communication Format	RS-232C	Communication Format	RS-232C
---		Selection of serial port operation	1 (computer link)
Unit No.	1	Station number	1

■ FP-M (When using a Programmable Connector)

GP Setup		FP-M Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd (fixed)	---	
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Station number	1

■ FPO (Using Link I/F on CPU)

GP Setup		FPO Setup	
Baud Rate	9600bps	Baud Rate	9600bps
Data Length	8bit	Data Length	8bit
Stop Bit	1bit	Stop Bit	1bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	Data Flow Control	ER Control
Unit No.	1	Unit No.	1

■ FPO (CPU Direct connection)

GP Setup		FPO Setup	
Baud Rate	9600bps	Baud Rate	9600bps
Data Length	8bit	Data Length	8bit
Stop Bit	1bit (fixed)	Stop Bit	-------
Parity Bit	Odd (fixed)	Parity Bit	-------
Data Flow Control	ER Control	Data Flow Control	ER Control
Unit No.	1	Unit No.	1

■ FP Σ (Using Link I/F)

GP Setup		FPO Setup	
Baud Rate	9600bps	Baud Rate	9600bps
Data Length	8bits	Data Length	8bits
Stop Bit	1bit	Stop Bit	1bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	Data Flow Control	ER Control
Unit No.	1	Unit No.	1
Communication Format	RS-232C	-------	-------

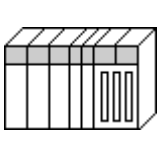
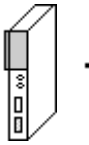
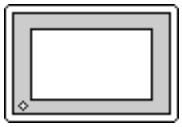
2.8 Yokogawa Electric

2.8.1 System Structure

The following describes the system structure for connecting the GP to Yokogawa Electric Corp. PLCs.

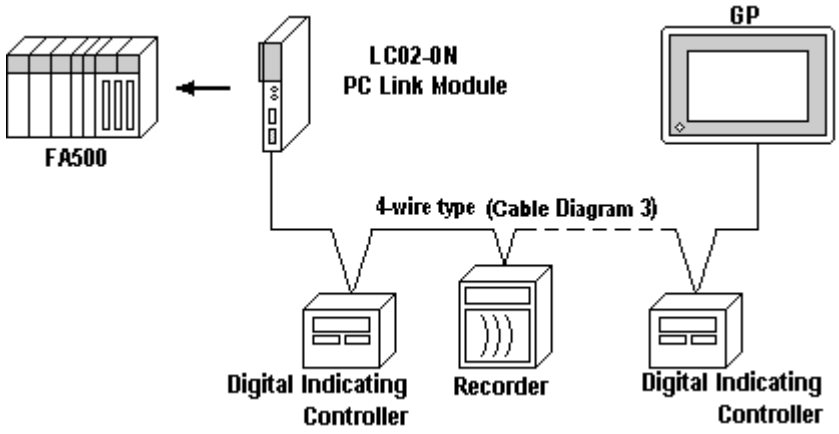
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.8.2 Cable Diagrams**".*

■ FACTORY ACE Series/FA500 (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 PC Link Module			
FA500	LC01-ON	RS-232C (Cable Diagram 1)	Digital's GP-410-IS00-O (5m)	GP Series
	LC02-ON	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)	RS-232C Digital's GP410-IS00-O (5m)	
		RS-422 1:n communication *1 (Cable Diagram 3)		

** 1* ***1:n Communication***

*The system structure of 1:n communication for Yokogawa PLCs (**FA500**), or equipment supporting its protcol (n#), and a GP unit (1) used as an upper link protocol is described here.*



(See next page)

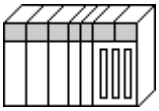
(Continued from previous page)

* FA500 and equipment (Digital Indicating Controller, <UT37/38/2000> and Recorder, <μR-Series>...etc) supporting the same protocol are hereafter referred to as *PA Equipment*.

- *Be sure to use only one GP in the system.*
- *In the Link above, maximum 32 PA Equipment can be connected to one GP.*
- *When Sequence Control is unnecessary, the system structure is possible without the PLC.*
- *Using the method above, Unit No. s 1~16 can be setup; a Unit No. of 17 or higher cannot be used.*

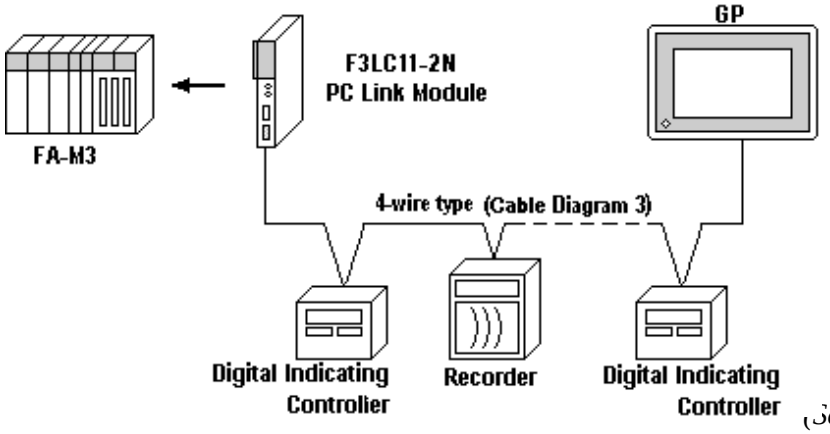
Note: Wherever RS-422 appears in the table, RS-485 can be used on the PLC.

■ FACTORY ACE Series/FA-M3 (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 PC Link Module			
F3SP10-0N	F3LC01-1N	RS-232C (Cable Diagram 4)		GP Series
F3SP20-0N, F3SP21-0N, F3SP25-2N, F3SP28-3N, F3SP30-0N, F3SP35-5N, F3SP38-6N, F3SP53-4H, F3SP58-6H, F3FP36-3N, F3SP28-3S, F3SP38-6S, F3SP53-4S, F3SP58-6S, F3SP59-7S	F3LC11-1N F3LC11-1F F3LC12-1F	RS-232C (Cable Diagram 4)		
	F3LC11-2N	RS-422 (4-wire type) (Cable Diagram 2)		
		RS-422 (2-wire type) (Cable Diagram 5)		
	F3LC11-2N	RS-422, 4-wire type 1:n communication *1 (Cable Diagram 3)		
		RS-422, 2-wire type 1:n communication (Cable Diagram 6)		

1* ***1:n Communication*

*The system structure of 1:n communication for Yokogawa PLCs (**FA-M3**), or equipment supporting its protcol (n#), and a GP unit (1) used as an upper link protocol is described here.*



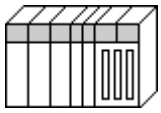
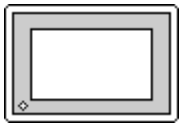
(See next page)

* FA-M3 and equipment (Digital Indicating Controller, <UT37/38/2000> and Recorder, <mR-Series>...etc) supporting the same protocol is referred to as *PA Equipment*, below.

- *Be sure to use only one GP in the system.*
- *In the* Link *above, maximum 32 PA Equipment can be connected to one GP.*
- *When Sequence Control is unnecessary, the system structure can be created without the PLC.*
- *In the method above, Unit No. of 1~16 can be setup; a Unit No. of 17 or more cannot be used.*

Note: **Wherever RS-422 appears in the table, RS-485 can be used on the PLC.**

■ FACTORY ACE Series/FA-M3 (CPU Direct Connection)

CPU	Cables	GP
		
F3SP21-0N, F3SP25-2N, F3SP28-3N, F3SP35-5N, F3SP38-6N, F3SP53-4H, F3SP58-6H, F3SP28-3S, F3SP38-6S, F3SP53-4S, F3SP58-6S, F3SP59-7S	Yokogawa's cable for programming tool KM11-2N*A	GP Series

STOP **Two GP units cannot be connected at the same time using the PC Link I/F.**

■ STARDOM Standalone Type Controller

CPU	Cables	GP
FCN FCJ	RS-232C (Cable Diagram 4)	GP Series

2.8.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Yokogawa Electric may differ, however, using these cables for your PLC operations will not cause any problems.

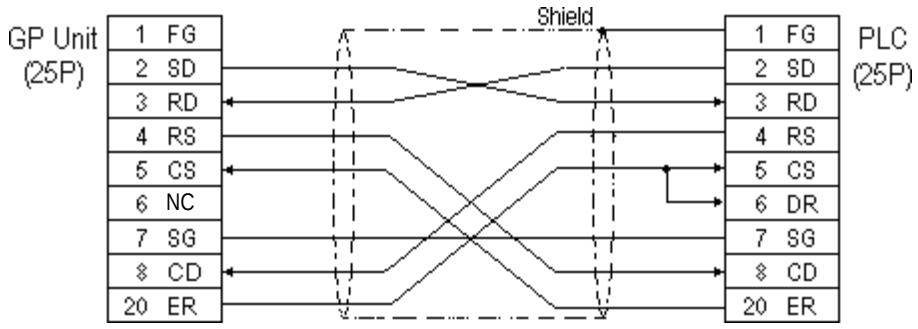
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

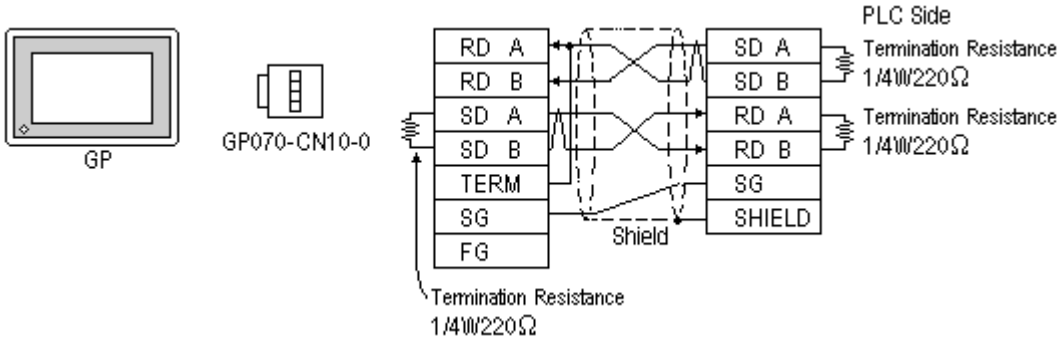
- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***
- ***For the RS-422 connection, refer to Yokogawa's PLC manual for the cable length.***

Cable Diagram 1 (RS-232C)

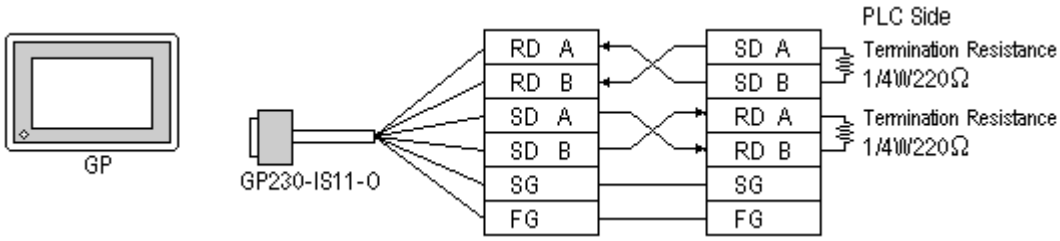


Cable Diagram 2 (RS-422)

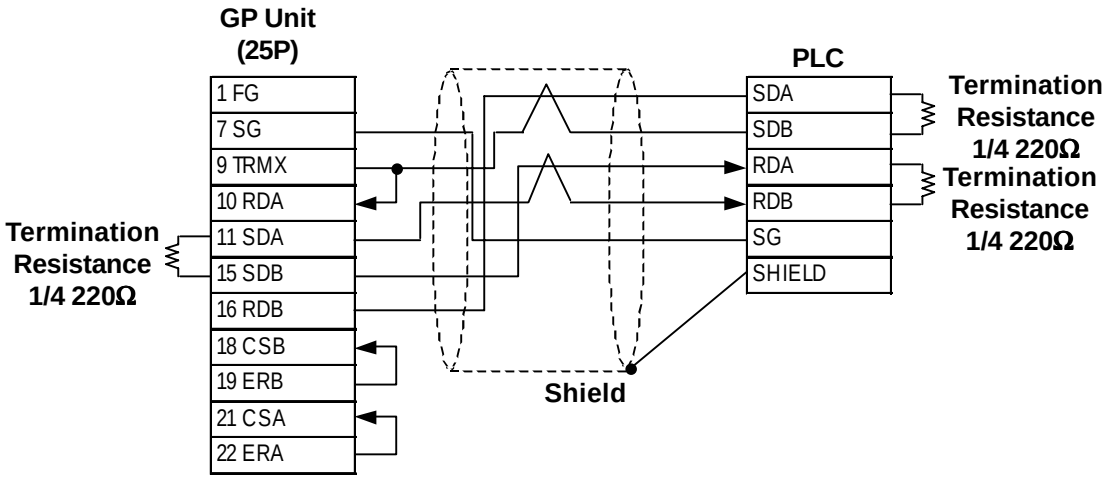
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections



Note:

- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5SQ cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

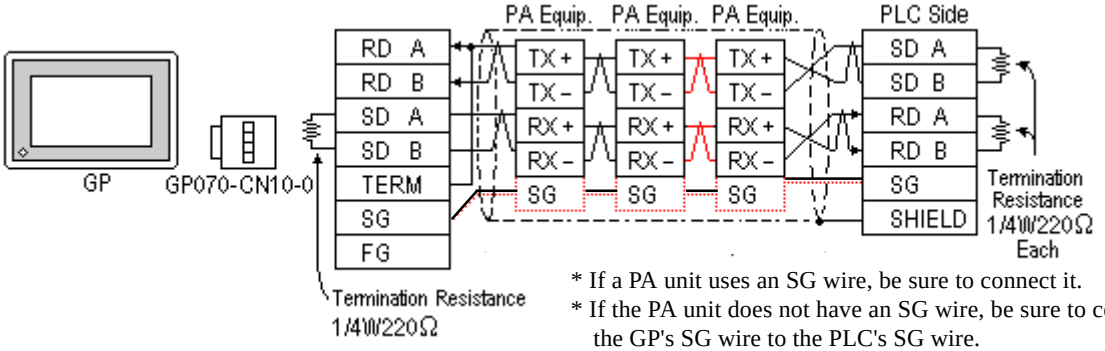
Cable Diagram 3 (RS-422)

The diagrams below are examples of wire connections on both ends of the GP and PLC. Setup the termination resistors on both ends of the equipment, as illustrated.

Important

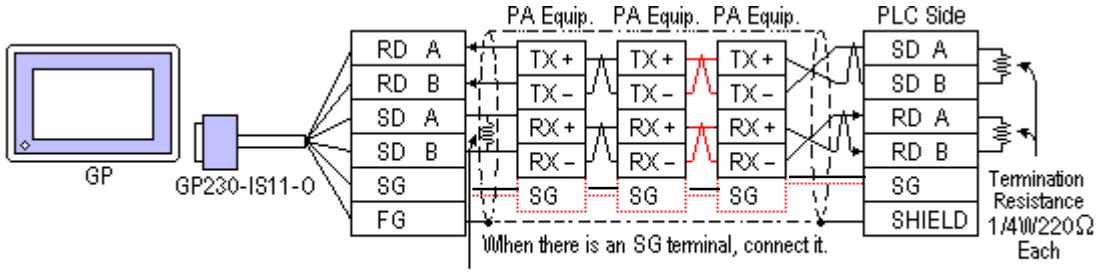
- ***Be careful as the reading of the A signal and B signal is opposite on the GP and the LC02-0N (PLC).***
- ***Make the PC Link I/F Station Number from 2 to 32.***
- ***Setup the PA unit connected to the GP using different Unit Numbers. An error will develop if multiple PA units are setup using the same Unit Number. When an error occurs, the error message "Recieving Data Error occurs (02:FD:**)" (** indicates the unit No.) will appear.***
- ***Setup the GP (1) and PA units (n#) with the same Communication Settings.***

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



* If a PA unit uses an SG wire, be sure to connect it.
* If the PA unit does not have an SG wire, be sure to connect the GP's SG wire to the PLC's SG wire.

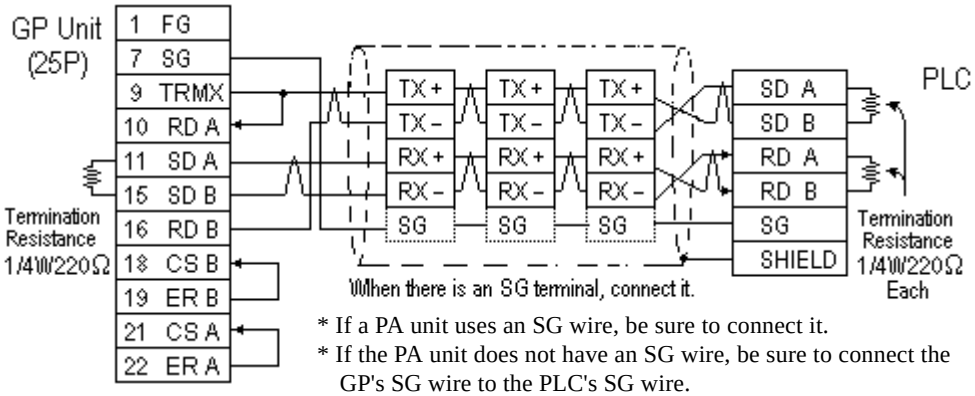
• When using Digital's RS-422 Cable, GP230-IS11-0



* Termination Resistance 1/4W220Ω

* If a PA unit uses an SG wire, be sure to connect it.
* If the PA unit does not have an SG wire, be sure to connect the GP's SG wire to the PLC's SG wire.

• When making your own cable connections

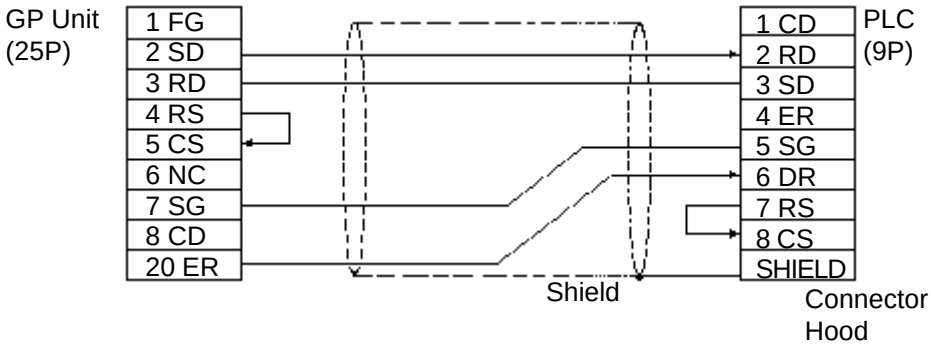


* If a PA unit uses an SG wire, be sure to connect it.
* If the PA unit does not have an SG wire, be sure to connect the GP's SG wire to the PLC's SG wire.

Note:

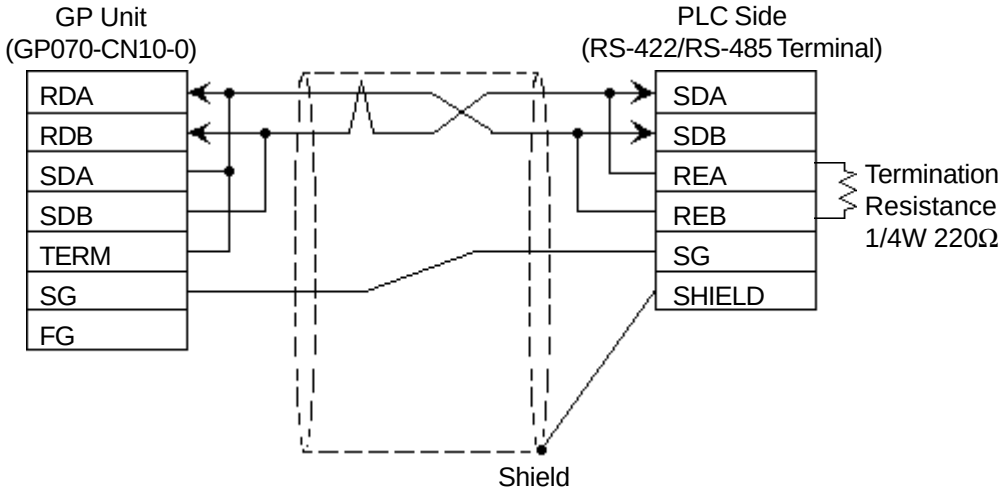
When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

Cable Diagram 4 (RS-232C)

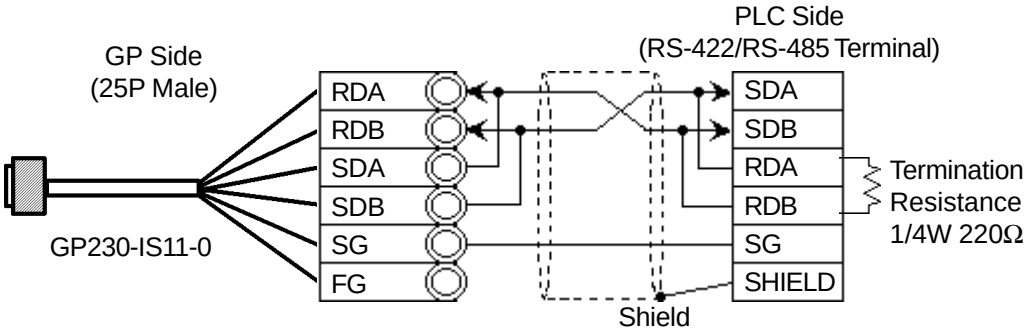


Cable Diagram 5 (RS-422)

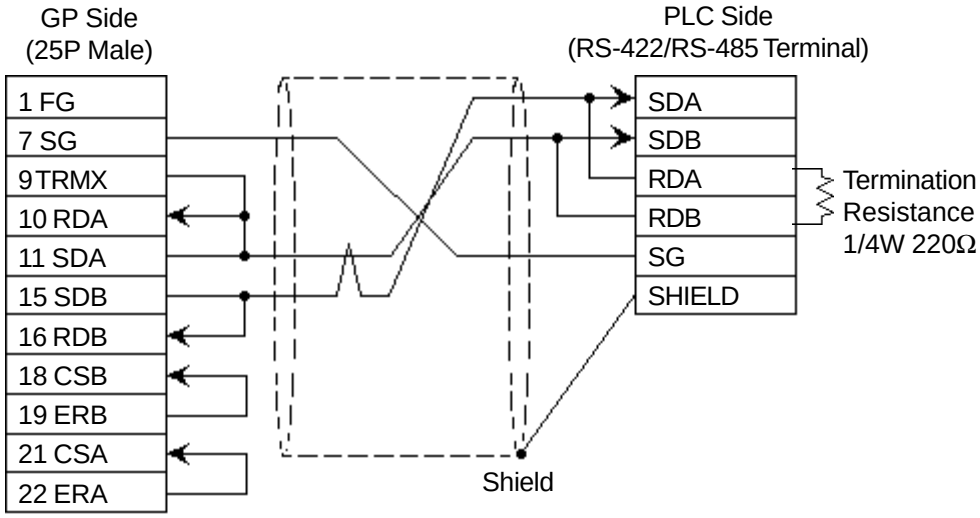
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable, GP230-IS11-0

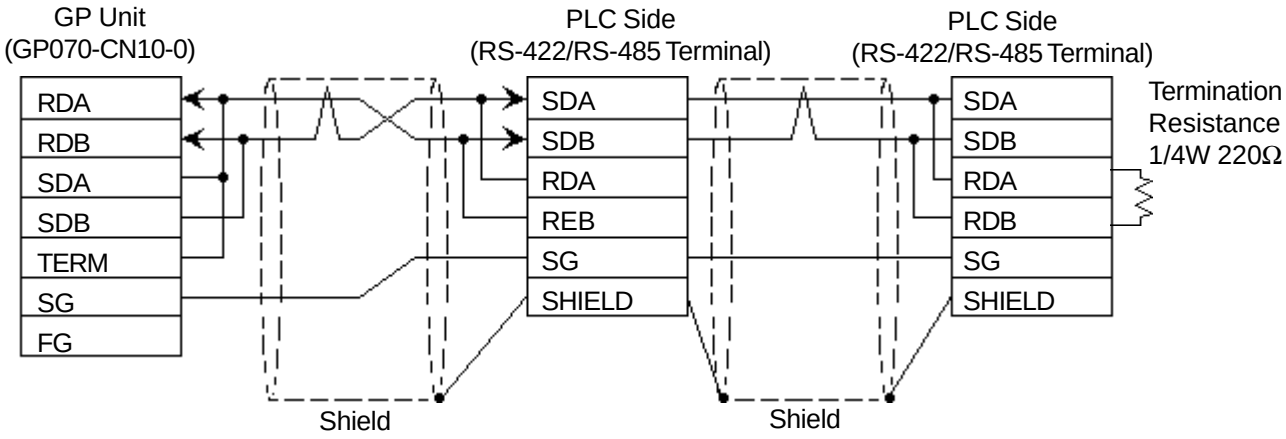


• When making your own cable connections

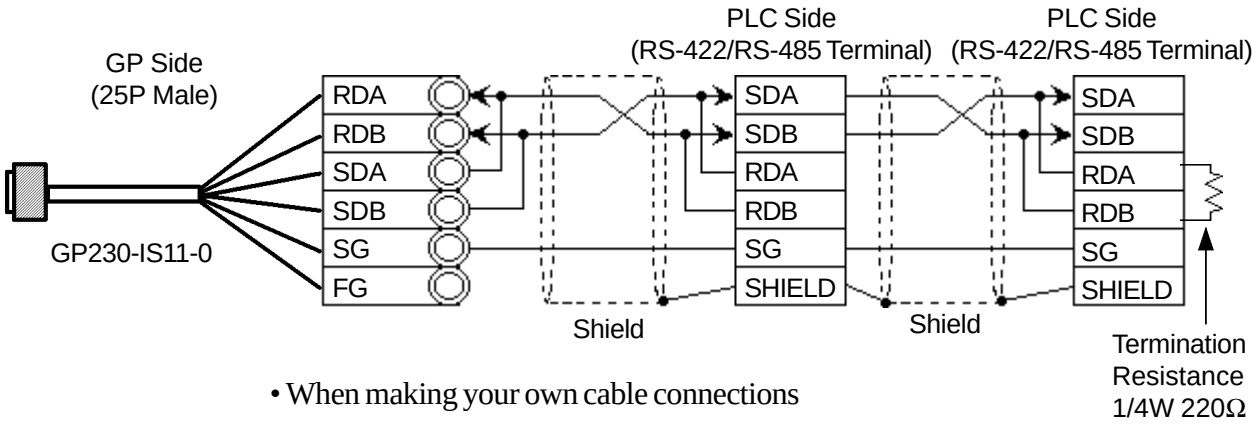


Cable Diagram 6 (RS-422)

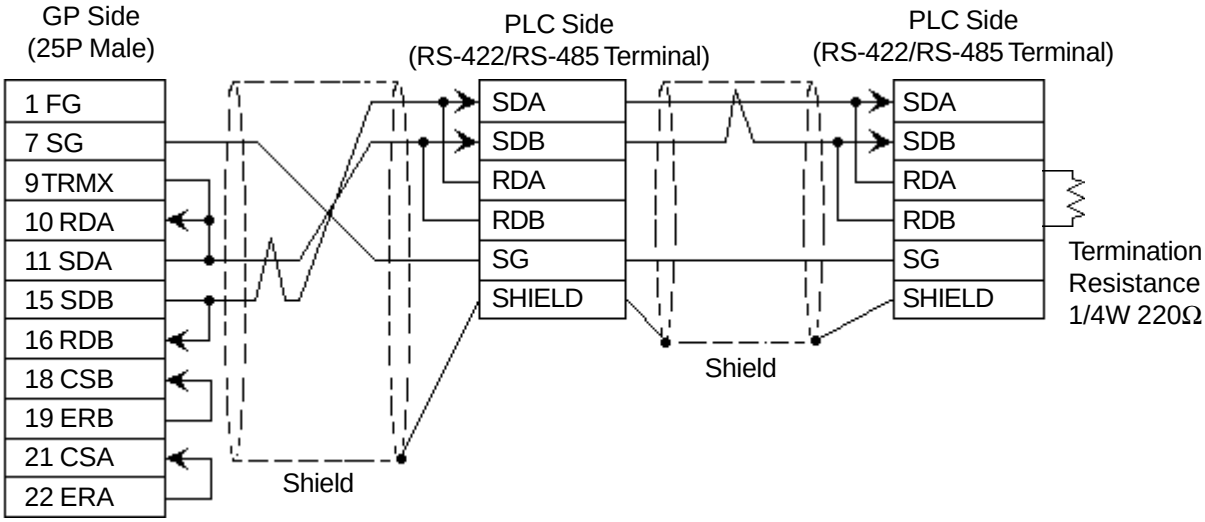
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 cable, GP230-IS11-0



• When making your own cable connections



Note:

- **If the connection is terminated while 2-wire type communication is being carried out, use the 2-wire termination resistance switch on the PC link module (F3LC11-2N).**
- **The names of the poles A and B are reversed between the GP and the PLC.**

2.8.3 Supported Devices

The following describes the range of devices supported by the GP.

■ **FA500** (1:1 communication) Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X61164	X00201 ~ X61149	÷16+1 *1 *2	L/H
Output Relay	Y00201 ~ Y61164	Y00201 ~ Y61149	÷16+1 *1 *2	
Internal Relay	I0001 ~ I2048	I0001 ~ I2033	÷16+1 *2	
Joint Relay	E0001 ~ E2048	E0001 ~ E2033	÷16+1	
Special Relay	M001 ~ M512	M001 ~ M497	÷16+1 *2 *3	
Link Relay	L0001 ~ L1024	L0001 ~ L1009	÷16+1 *2 *3	
Timer (contact)	T001 ~ T256	---	*2	
Counter (contact)	C001 ~ C256	---	*2	
Timer (current value)	---	TP001 ~ TP256	*2	
Timer (setup value)	---	TS001 ~ TS256	*2	
Counter (current value)	---	CP001 ~ CP256	*2	
Counter (setup value)	---	CS001 ~ CS256	*2	
Data Register	---	D0001 ~ D2048	Bit 15 *2	
Common Register	---	B0001 ~ B2048	Bit 15 *2	
Special Register	---	Z001 ~ Z128	Bit 15 *2*3	
Link Register	---	W0001 ~ W1024	Bit 15 *2*3	

** 1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and Output Relay can only be a multiple of 16 +1.*

E.g. For X00201

X 002 01
Slot No. — Terminal No.

** 2 Write the CPU Number (1~4) in front of the device name.*

E.g. For Internal Relay I0001, CPU #3:

3 I0001
CPU No. — Device Name

** 3 Cannot perform data write.*

■ FA500 (1:n communication)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X61164	X00201 ~ X61149	÷16+1 *1*2	L/H
Output Relay	Y00201 ~ Y61164	Y00201 ~ Y61149	÷16+1 *1*2	
Internal Relay	I0001 ~ I2048	I0001 ~ I2033	÷16+1 *2	
Joint Relay	E0001 ~ E2048	E0001 ~ E2033	÷16+1	
Special Relay	M001 ~ M512	M001 ~ M497	÷16+1 *2*3	
Link Relay	L0001 ~ L1024	L0001 ~ L1009	÷16+1 *2*3	
Timer (contact)	T001 ~ T256	---	*2	
Counter (contact)	C001 ~ C256	---	*2	
Timer (current value)	---	TP001 ~ TP256	*2	
Timer (setup value)	---	TS001 ~ TS256	*2	
Counter (current value)	---	CP001 ~ CP256	*2	
Counter (setup value)	---	CS001 ~ CS256	*2	
Data Register	---	D0001 ~ D2047	Bit 15 *2	
Common Register	---	B0001 ~ B2047	Bit 15 *2	
Special Register	---	Z001 ~ Z128	Bit 15 *2*3	
Link Register	---	W0001 ~ W1024	Bit 15 *2*3	

** 1 When setting Word Address, set the value of the terminal number, 01~49, of the last two digits for the* Input Relay *and* Output Relay to *a multiple of 16+1.*

E.g. For X00201

X 002 01

Slot No. — Terminal No.

** 2 Write the CPU Number (1~4) in front of the device name.*

E.g. For Internal Relay I0001, CPU #3:

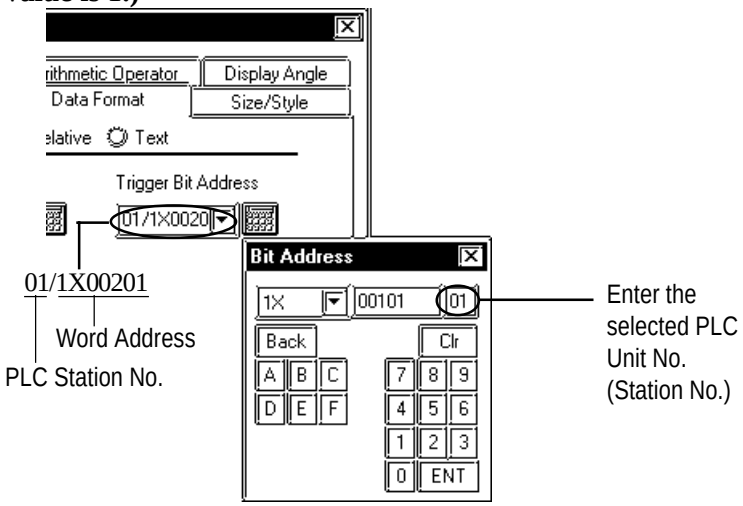
3 I0001

Device Name

CPU No.

** 3 Cannot perform data write.*

Note: **When setting tags up in GP-PRO/PBIII for Windows, the PLC Station number can be specified during address Input. If a station number is not indicated, it automatically uses the previously entered station number. (The initial default value is** 1**.)**



■ FA-M3 (1:1 Communication)

Setup System Area here.

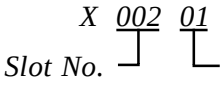
Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X71664	X00201 ~ X71649	÷16+] *1 *2	L/H
Output Relay	Y00201 ~ Y71664	Y00201 ~ Y71649	÷16+] *1	
Internal Relay	I00001 ~ I65535	I00001 ~ I65521	÷16+]	
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	÷16+]	
Special Relay	M0001 ~ M9984	M0001 ~ M9969	÷16+]	
Link Relay	L00001 ~ L78194	L00001 ~ L78177	÷16+]	
Timer (contact)	T0001 ~ T3072	---	*2	
Counter (contact)	C0001 ~ C3072	---	*2	
Timer (current value)	---	TP0001 ~ TP3072		
Timer (setup value)	---	TS0001 ~ TS3072	*2	
Counter (current value)	---	CP0001 ~ CP3072		
Counter (setup value)	---	CS0001 ~ CS3072	*2	
Data Register	---	D00001 ~ D65535	Bit 15	
File Register	---	B00001 ~ B065536	Bit 15 *3 *4	
		B065537 ~ B131072		
		B131073 ~ B196608		
		B196609 ~ B262144		
Joint Register	---	R0001 ~ R4096	Bit 15	
Special Register	---	Z001 ~ Z1024	Bit 15	
Link Register	---	W00001 ~ W74096	Bit 15 *5	

(See next page)

**1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and*

Output Relay can only be a multiple of 16 +1.

E.g. For X00201



**2 Cannot perform data write.*

**3 File registers are each 65,535 words on your GP application.*

You cannot extend over more than a single data "block" when performingthe following features.

Be sure to set these features' settings so they are within a single data block.

1) "a-tag " settings

2) Performing Block read/write from Pro-Server

3) Desginating the "Convert from" and "Conver to" address for the "Address Conversion" features

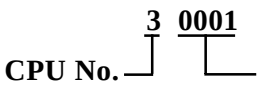
**4 When using a PC Link module, only Link Register up to B99999 can be used.*

**5 A total of up to 4,096 link registers can be used.*

Note:

- **Write the CPU Number (1~4) in front of the device name.**

  E.g. For Internal Relay I0001, CPU #3:



- **The range of device that can be used will vary depending on the type of PLC.**

  For detailed information refer to the Yokogawa's Sequnce CPU manual.

■ FA-M3 (1:n Communication)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X71364	X00201 ~ X71349	÷16+1 *1 *2	
Output Relay	Y00201 ~ Y71364	Y00201 ~ Y71349	÷16+1 *1	
Internal Relay	I0001 ~ I16384	I0001 ~ I16369	÷16+1	
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	÷16+1	
Special Relay	M0001 ~ M9984	M0001 ~ M9969	÷16+1	
Link Relay	L00001 ~ L71024	L00001 ~ L71009	÷16+1	
Timer (contact)	T0001 ~ T2047	---	*2	
Counter (contact)	C0001 ~ C2047	---	*2	
Timer (current value)	---	TP0001 ~ TP2047		L/H
Timer (setup value)	---	TS0001 ~ TS2047		
Counter (current value)	---	CP0001 ~ CP2047		
Counter (setup value)	---	CS0001 ~ CS2047		
Data Register	---	D0001 ~ D2047	Bit 15	
File Register	---	B0001 ~ B2047	Bit 15	
Joint Register	---	R0001 ~ R2047	Bit 15	
Special Register	---	Z001 ~ Z1024	Bit 15	
Link Register	---	W0001 ~ W11023	Bit 15 *3	

**1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and Output Relay can only be a multiple of 16 +1.*

E.g. For X00201

X 002 01

Slot No. — Terminal No.

**2 Cannot perform data write.*

**3 A total of up to 4,096 link registers can be used.*

Note:

• Write the CPU Number (1~4) in front of the device name.

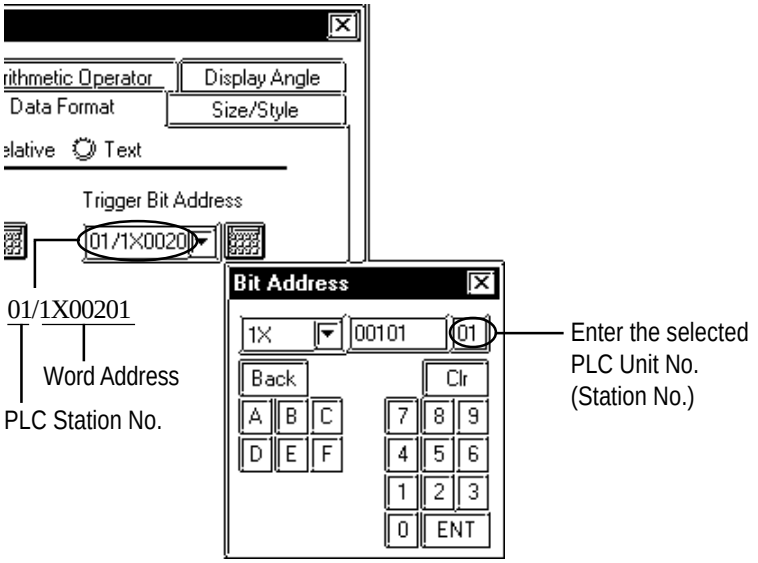
E.g. For Internal Relay I0001, CPU #3:

3 I0001

CPU No. — Device Name

The range of device that can be used will vary depending on the type of PLC. For detailed information refer to the Yokogawa's Sequnce CPU manual.

Note: • **When running tag setup in GP-PRO/PBIII for Windows, the PLC Station number can be specified at address Input. If a station number is not indicated, it automatically uses the previously entered station number. (The initial default value is 1.)**



■ STARDOM Standalone Type Controller

Register Image	Bit Address	Word Address	Particulars
Internal Relay	I0001 ~ I32767	I0001 ~ 32753	÷16+1
Data Register	---	D00001 ~ D32767	Bit 15
File Register	---	B000001 ~ B032767	Bit 15

Note: • **Set each device using a CPU number of 1.**

2.8.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ FACTORY ACE Series (using Link I/F RS-232C connection)

GP Setup		PC Link Module Setup	
Baud Rate	19200 bps	Baud Rate *1	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Check Sum	No
---		Specify End Character	Yes
---		Protect Function	No
---		Data Format Setup Switch	8 OFF
Unit No.	1	Station Number *2	1

**1 The PC Link I/F F3LC11-1F can be communicated by 115.2kbps.*

**2 The PC Link I/F F3LC01-1N does not have this setting.*

■ FACTORY ACE Series (using Link I/F RS-422 connection)

GP Setup		PC Link Module/PA Equipment Setup	
Baud Rate (1:1 comm)	19200 bps	Baud Rate (1:1 comm)	19200 bps
Baud Rate (1:n comm)	9600 bps	Baud Rate (1:n comm)	9600 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format (Select 4-wire type)	4-wire type	---	
Communication Format (Select 2-wire type)	2-wire type	---	
---		Check Sum	No
---		Specify End Character	Yes
---		Protect Function	No
---		Data Format Setup Switch	8 OFF
Unit No. (1:1 comm)	FA-500: 2 FA-M3: 1	Station No. (1:1 comm)	FA-500: 2 FA-M3: 1
Unit No. (1:n comm)	Match with PC Link Module station No.	Station No. (1:n comm)	Set up so that all PA Equip., PC Link module No.s are different

■ FACTORY ACE Series (FA-M3 CPU Direct Connection)

GP Setup		CPU Communication Port Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps *1
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		PC Link Function	Use
---		Check Sum	No
---		Specify End Character	Yes
---		Protect Function	No
Unit No.	1	---	

**1 For F3SP28-3N, F3SP38-6N, F3SP53-4H, and F3SP58-6H, a baud rate of 115200 bps is also available.*

■ STARDOM Standalone Type Controller

GP Setup		CPU Communication Port Setup	
Baud Rate	19200 bps *4	Baud Rate	19200 bps *1*4
Data Length	8 bits	Data Length	8 bits *1
Stop Bit	1 bit	Stop Bit	1 bit *1
Parity Bit	None	Parity Bit	None *1
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Check Sum	No *2
---		Specify End Character	Yes *2
Unit No.	1	Station No.	1 *2

**1 Set these parameters in the COM port setup using the Web browser.*

**2 Pass the settings to the task startup FB parameters.*

**3 Set the COM port as follows:*

Com1SioDriver=DUONUS_S10
Com2SioDriver=DUONUS_S10
ConsoleComPort=(blank)

**4: Communication at 115.2 kbps is possible.*

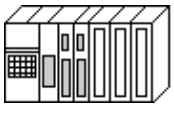
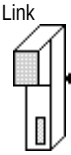
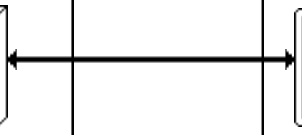
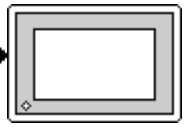
2.9 Toyota Machine Works

2.9.1 System Structure

The following describes the system structure for connecting the GP to Toyota Machine Works PLCs.

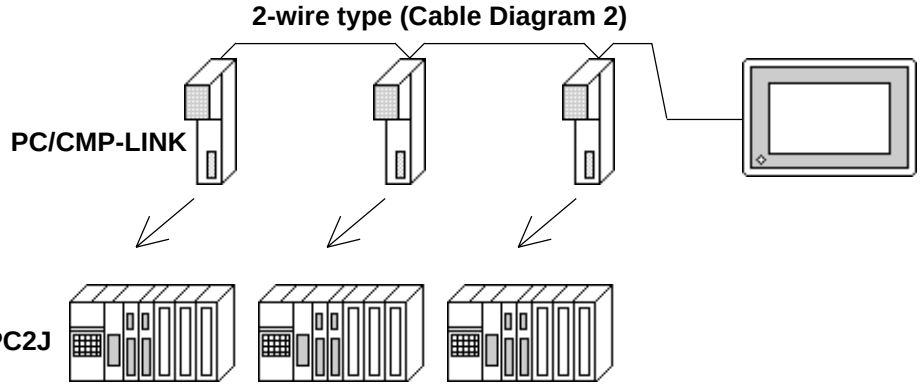
Reference *The Cable Diagram mentioned in the following table is listed in the section titled "**2.9.2 Cable Diagrams.**"*

■ TOYOPUC-PC2 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Computer Link Module/ Link I/F 		
PC2, L2	TPU-2652 (Computer Link Module)	RS-422 (Cable Diagram 1)	GP series
PC2J	THU-2755 (PC/CMP Link Unit)		
	THU-2755	RS-422 *1 1:n communication (Cable Diagram 2)	

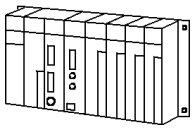
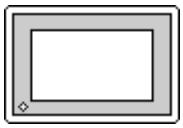
**1 The following system configuration shows how to communicate between one GP and "n" PC2J PLCs, using a host link protocol.*

- *Only one GP can be used in this system.*



- *Up to 16 PC2J units can be connected to the single GP.*

■ TOYOPUC-PC3J

CPU	Link I/F	Cable Diagram	GP
			
PC3J	Link I/F for CPU unit	RS-422 (4 wires) (Cable Diagram 3)	GP Series
		RS-422 (2 wires) (Cable Diagram 4)	
		RS-422 (4 wires) (1:n) (Cable Diagram 5)	
		RS-422 (2 wires) (1:n) (Cable Diagram 6)	
	PC/CMP-Link (THU-2755) *1	RS-422 (2 wires) (Cable Diagram 7)	
		RS-422 (2 wires) (1:n) (Cable Diagram 8)	

*1 *When using PC3J commands to operate the PC/CMP-LINK(THU-2775), a Ver.5.00 or higher link unit is required. This unit, however, will not have the settings for the PC2J or PC3J switches (SW). If a PC3J command is sent to a version5.00 or lower link unit, an error code will appear on the bottom left corner on the GP screen.*

Note:

- **A maximum of 16 PLCs can be connected.**
- **For the connection cable, the Chugoku Densen Kogyo's double shield twist cable, 0-VCTF-SS 2C*0.75mm^2 is recommended.**
- **The maximum cable length is 600 meters.**

2.9.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Toyota Machine Works, Ltd. may differ; however, using these cables for your PLC operations will not cause any problems.

Careful!

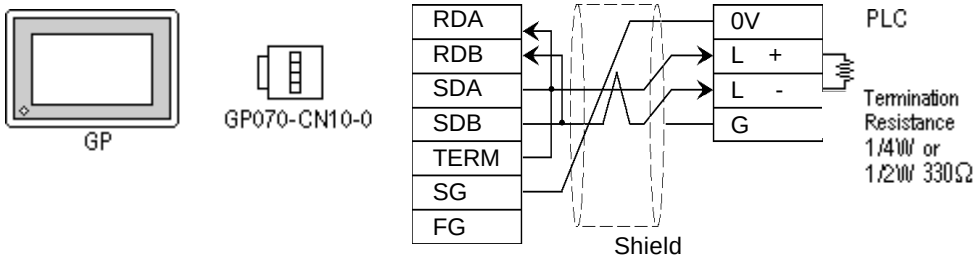
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-422)

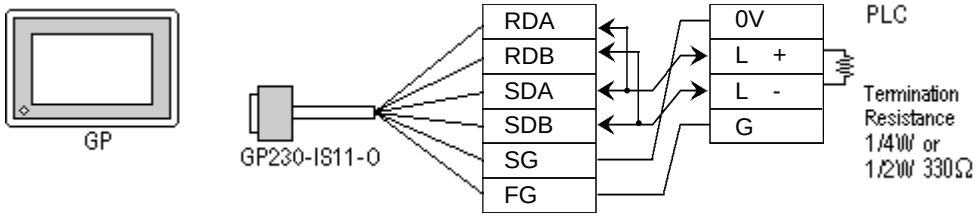
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



Note:

Connect terminals SD A and SD B to terminal L+, and SD B and RD B to terminal L-.

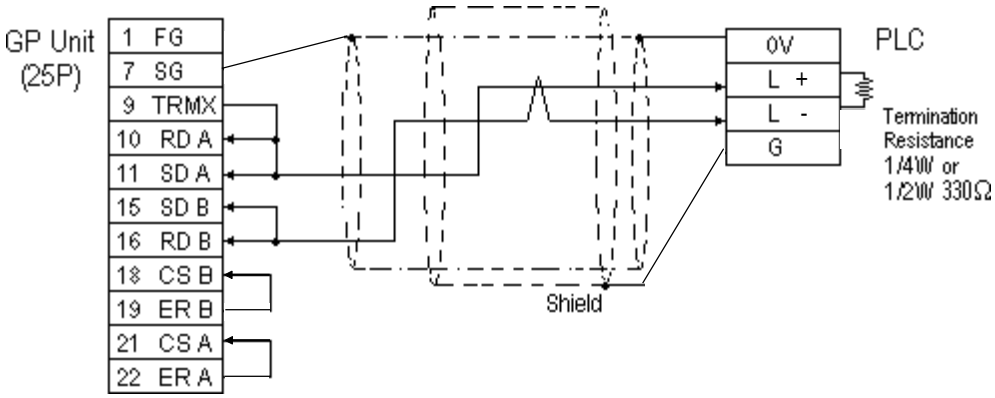
• When using Digital's RS-422 Cable, GP230-IS11-0



Note:

Connect terminals SDA and SDB to terminal L+, and SDB and RDB to terminal L-.

• When making your own cable connections

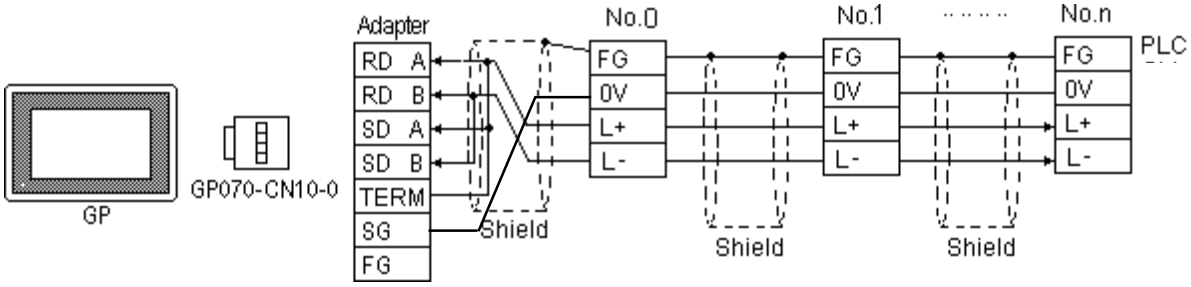


Note:

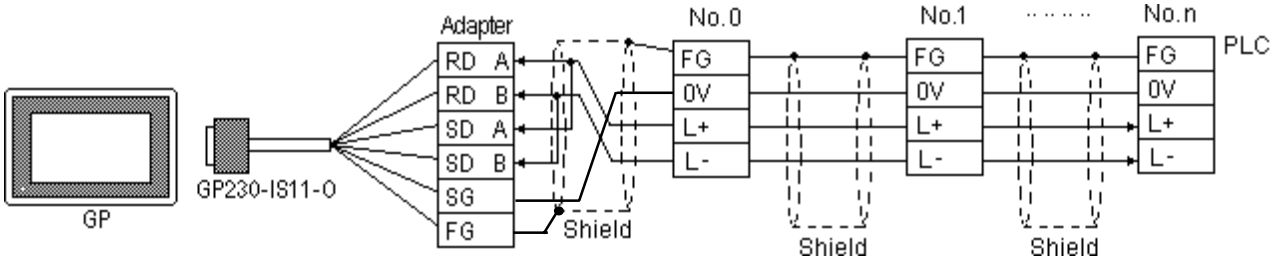
- **When making your own connections, we recommend using Chugoku Densen Kogi's O-VCTF-SS2C*0.75mm² (2 overlapping *Shield Twist Pair*) cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 2 (RS-422)

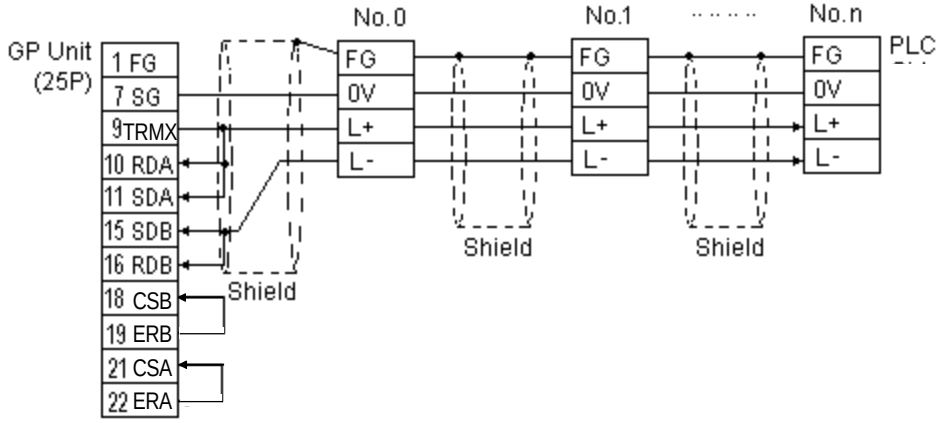
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0

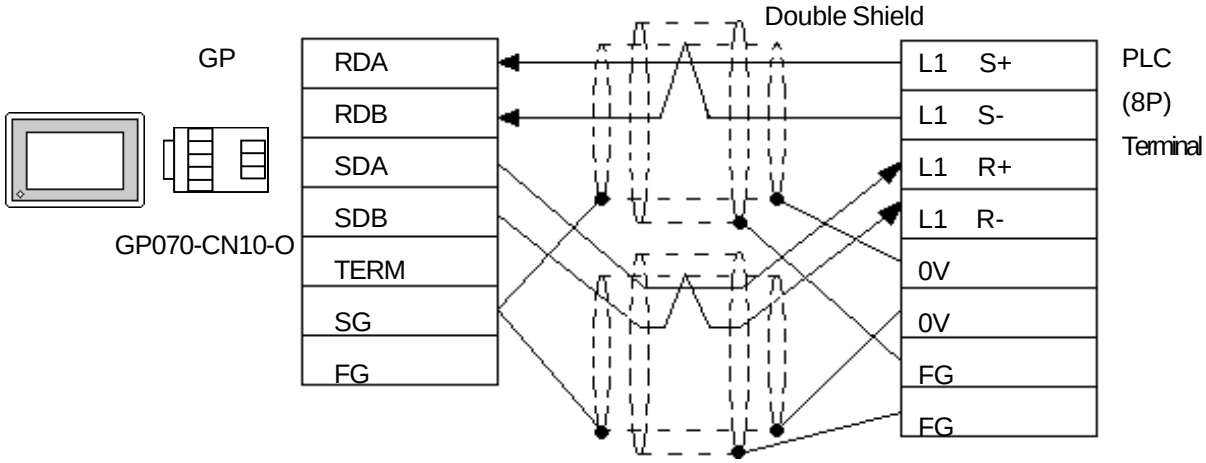


• When making your own cable connections



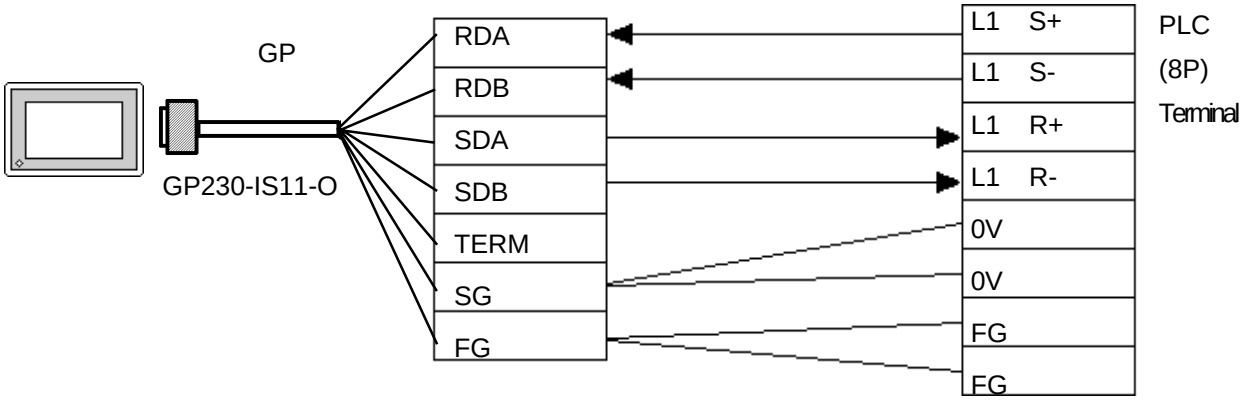
Cable Diagram 3 RS-422 4-wire type

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

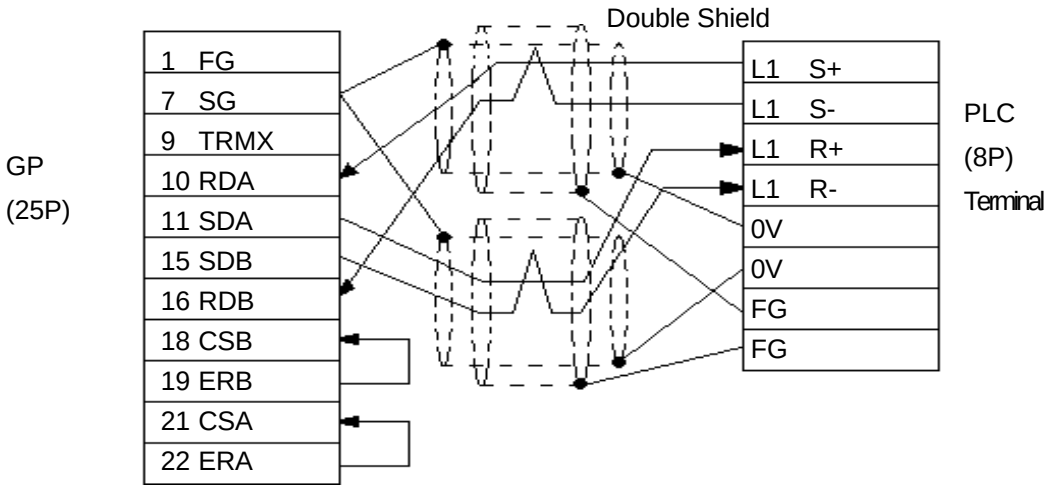


• When using Digital's RS-422 cable, GP230-IS12-0

Note: **In areas with excessive noise, use a double shielded cable.**

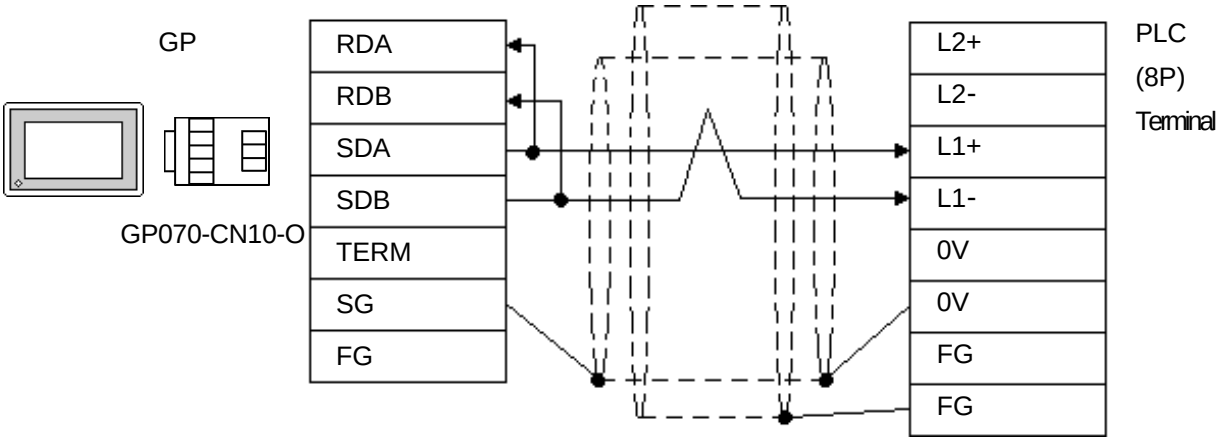


• When making your own cable



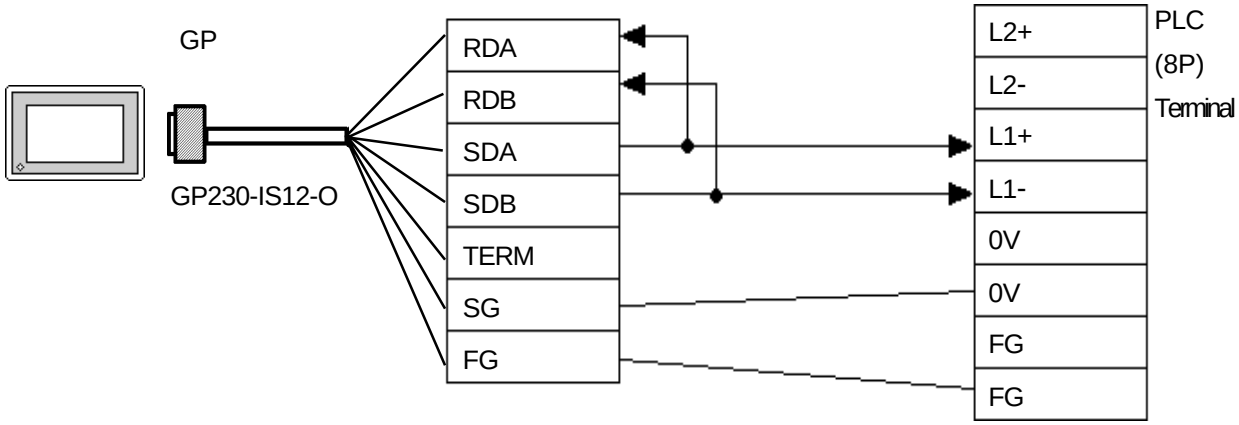
Cable Diagram 4 (1:1) RS-422 2-wire type, using I/F unit for CPU

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

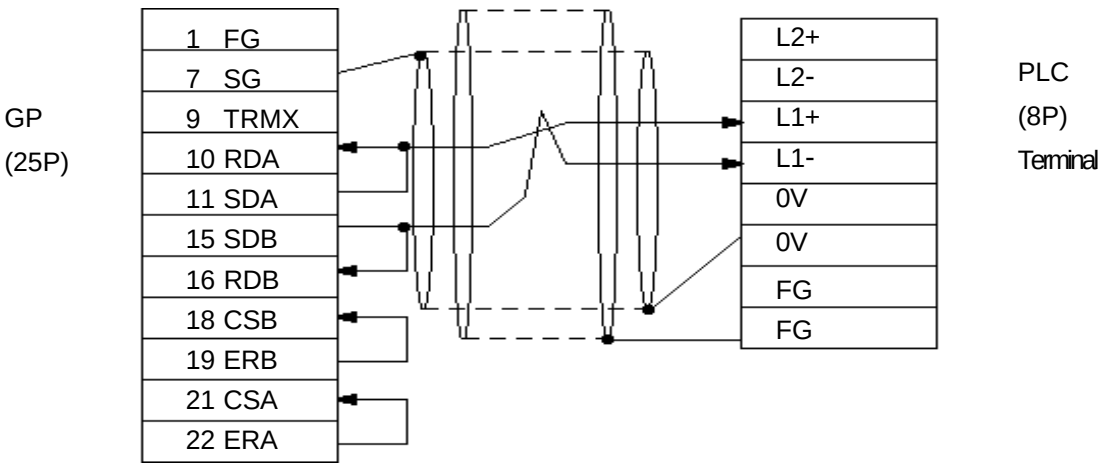


• When using Digital's RS-422 cable, GP230-IS12-0

Note: **In areas with excessive noise, use a double shielded cable.**

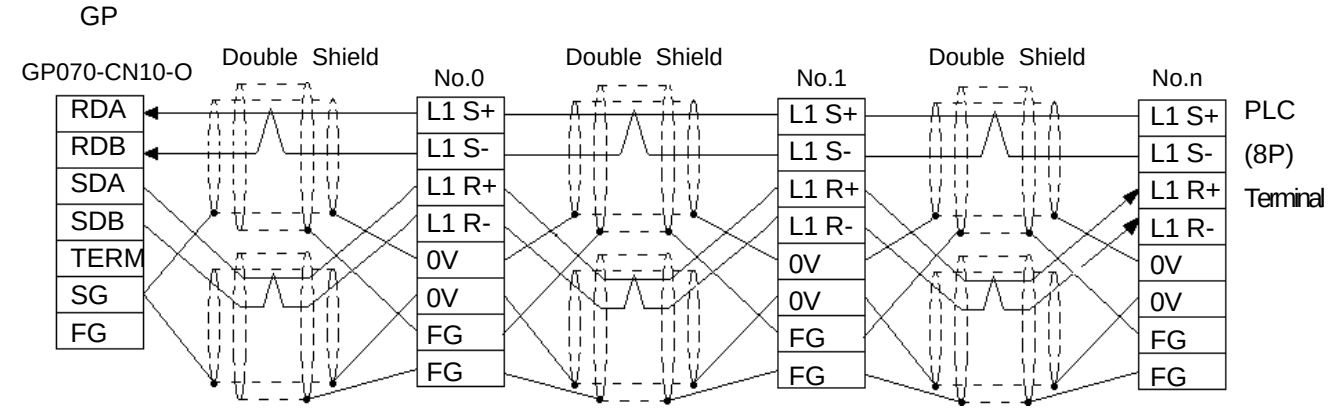


• When making your own cable



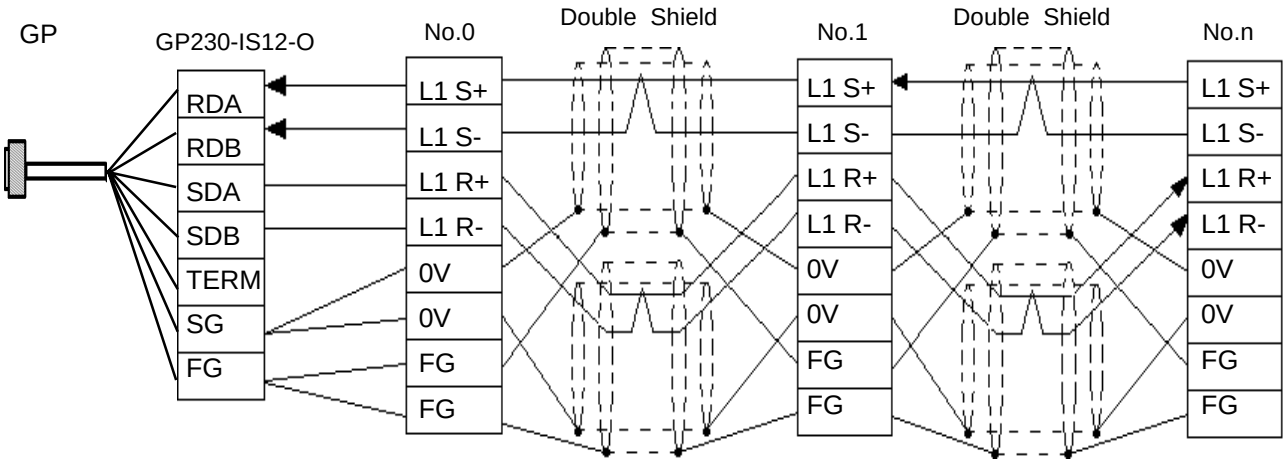
Cable Diagram 5 (1:n) RS-422 4-wire type

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

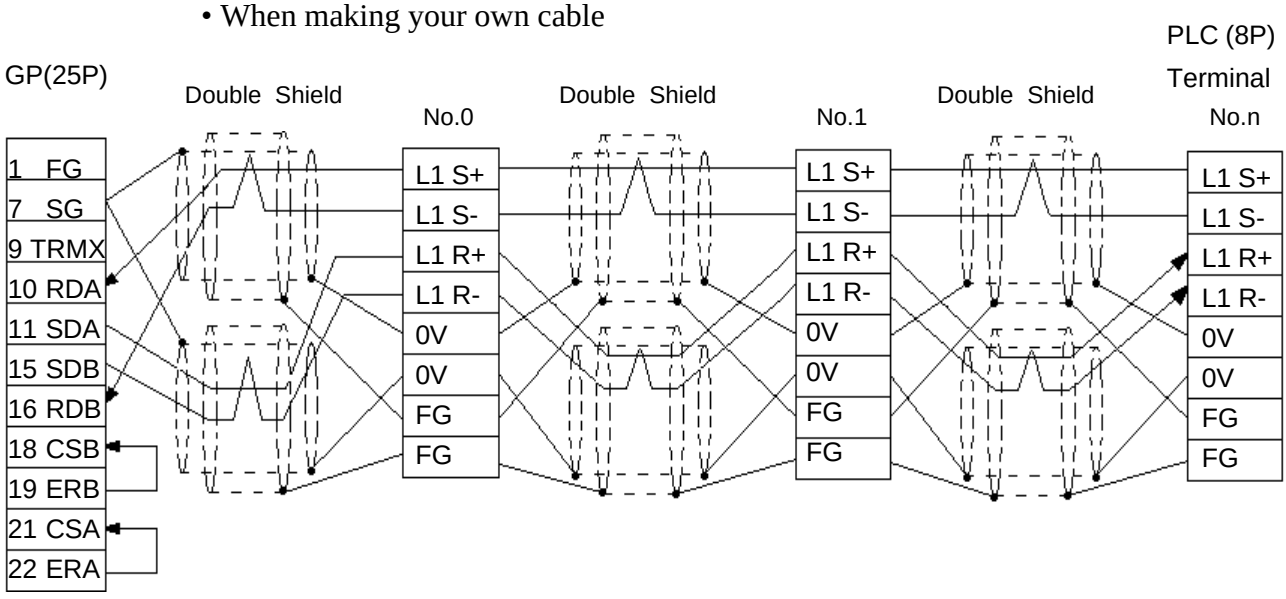


• When using Digital's RS-422 cable, GP230-IS12-0

Note: **In areas with excessive noise, use a double shielded cable.**

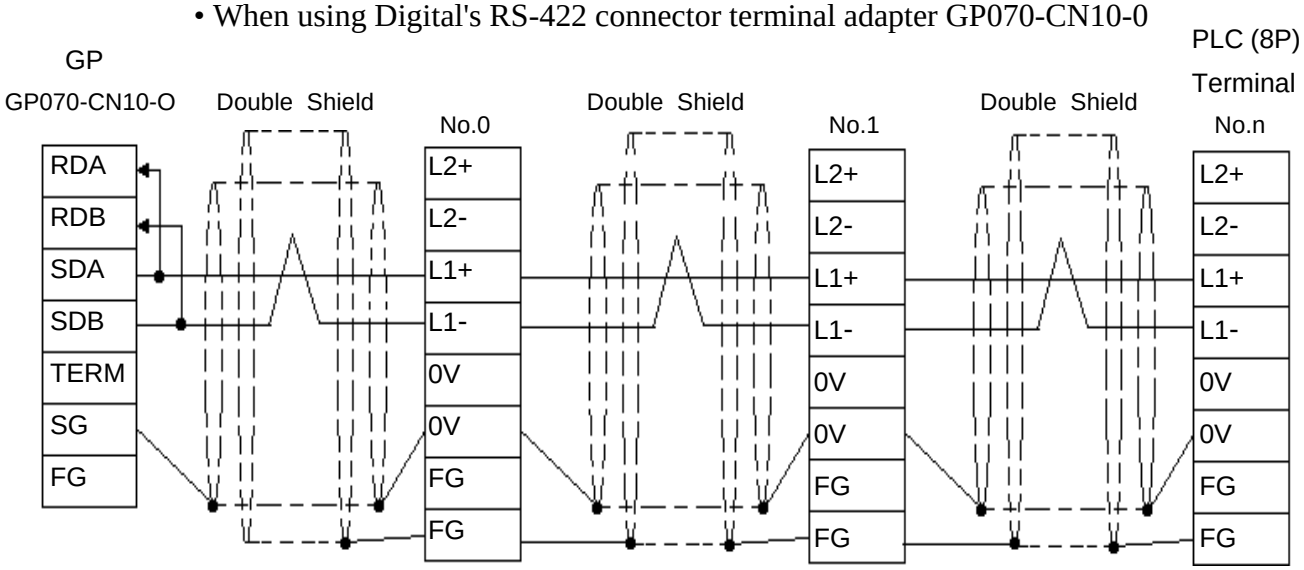


• When making your own cable



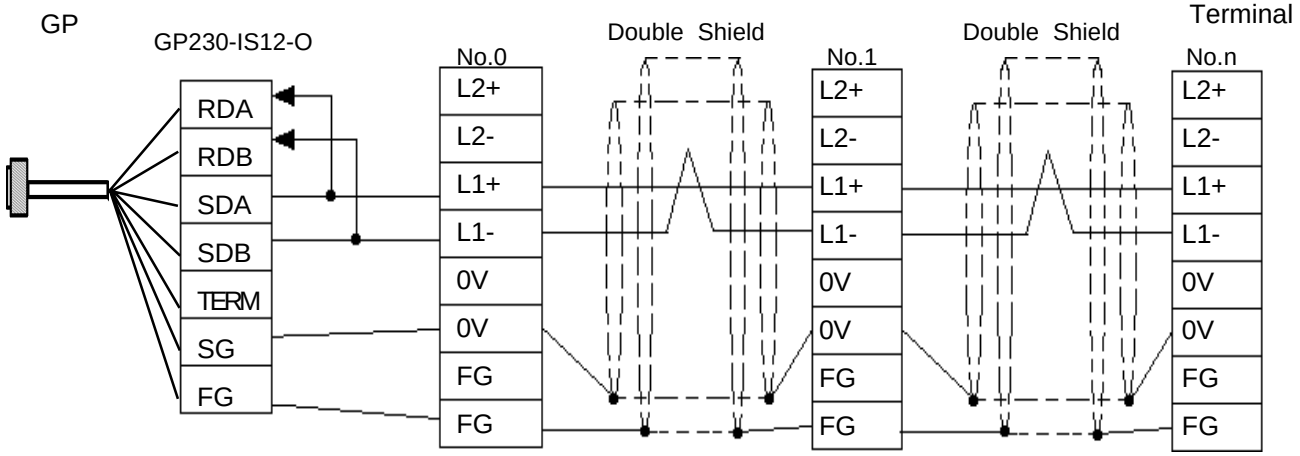
Cable Diagram 6 (1:n) RS-422 2-wire type, using I/F unit for CPU

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

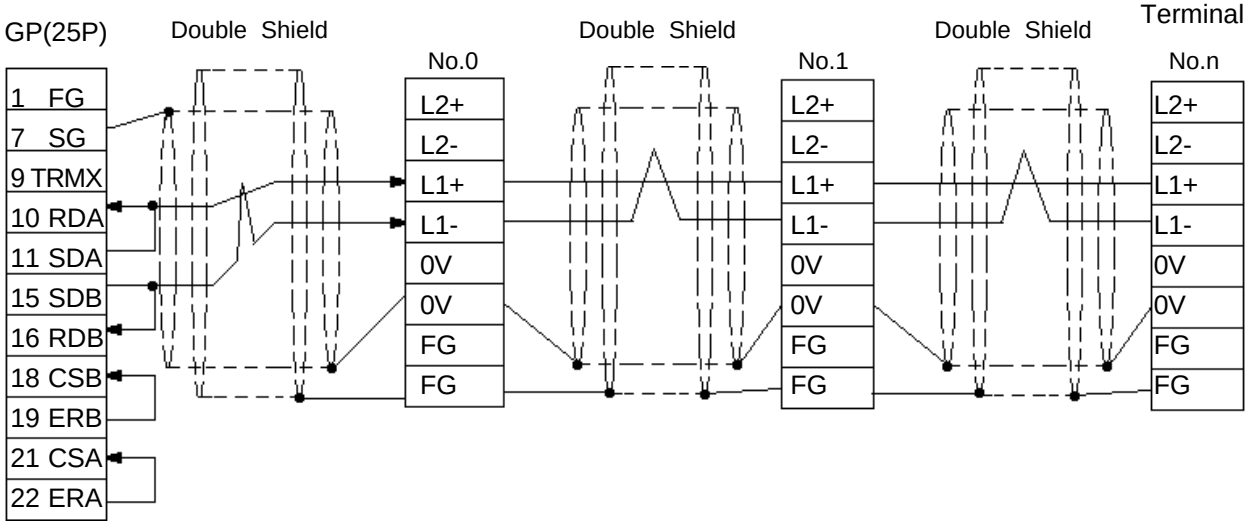


• When using Digital's RS-422 cable, GP230-IS12-0

Note: **In areas with excessive noise, use a double shielded cable.**

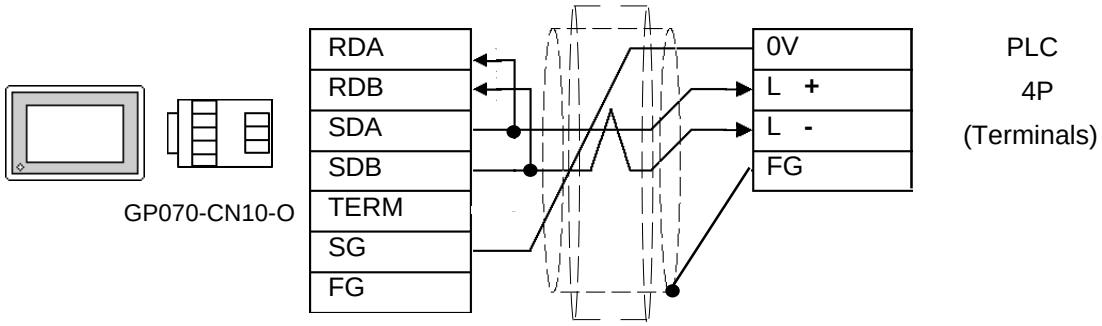


• When making your own cable



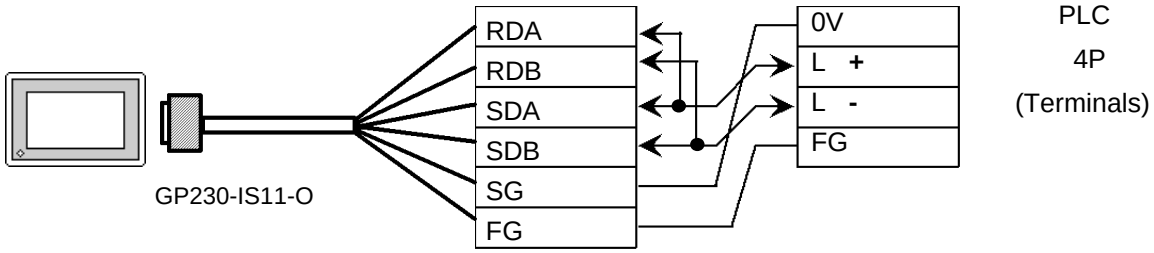
Cable Diagram 7 (1:1) <PC/CMP-Link> RS-422 2-wire type

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

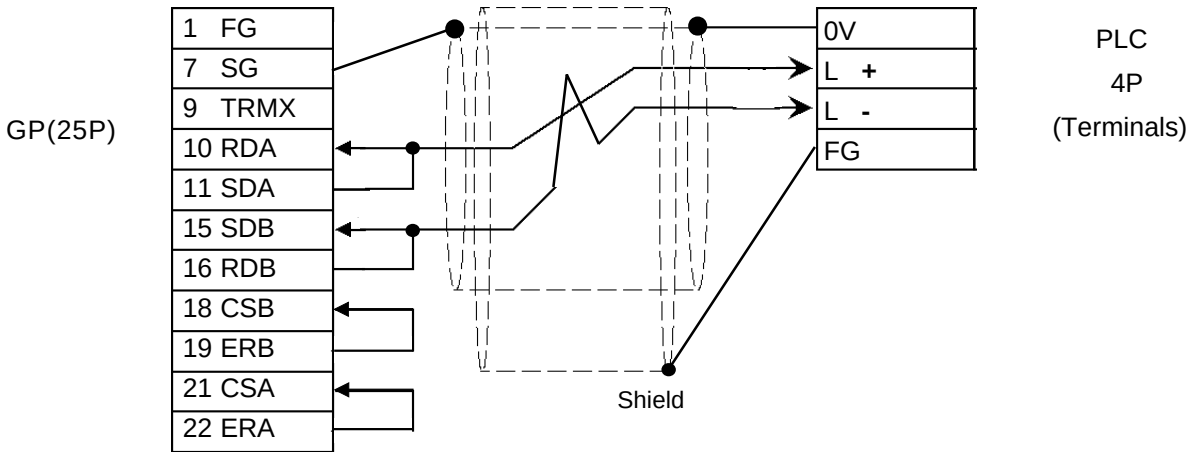


• When using Digital's RS-422 cable, GP230-IS11-0

Note: **In areas with excessive noise, use a double shielded cable.**

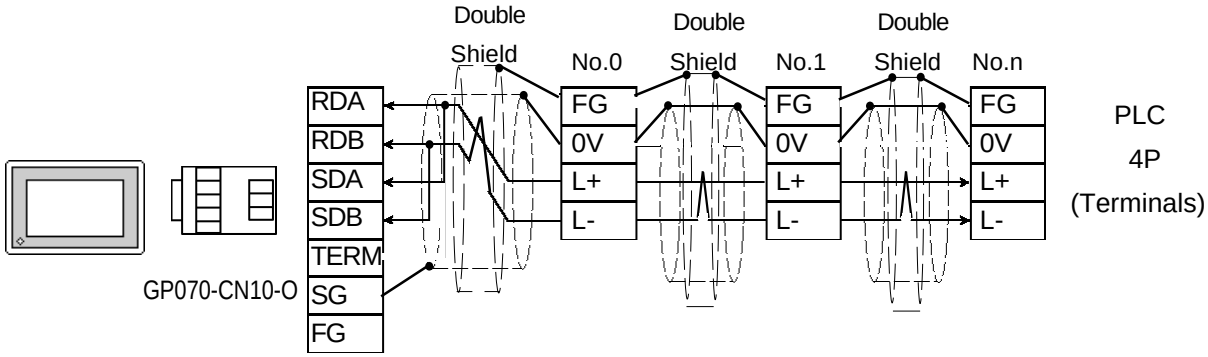


• When making your own cable



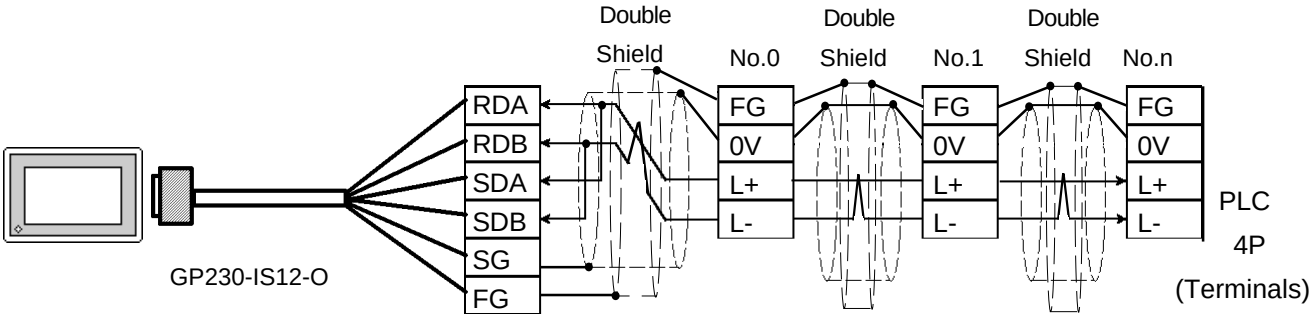
Cable Diagram 8 (1:n) <PC/CMP-Link> RS-422 2-wire type

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0

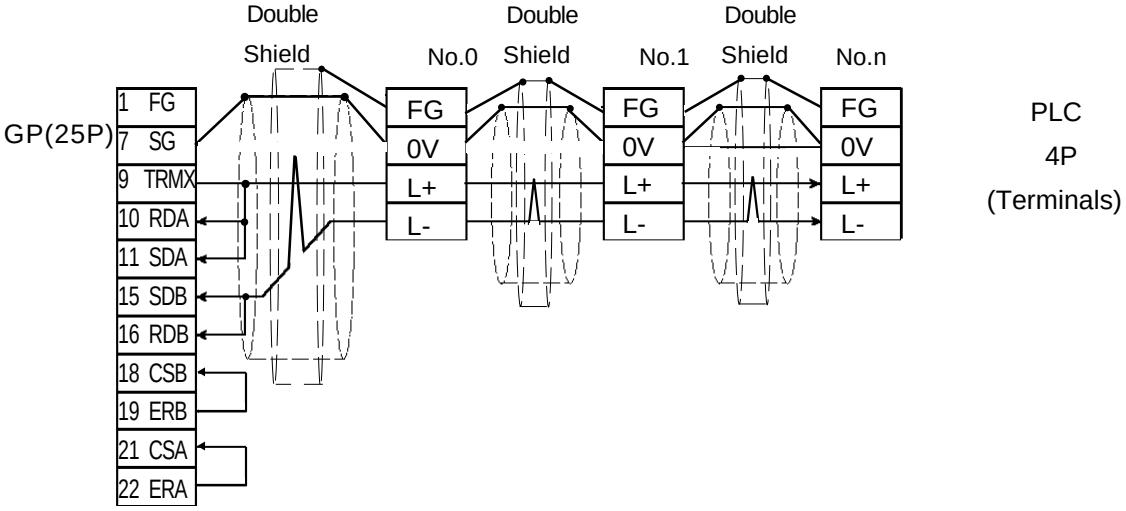


• When using Digital's RS-422 cable, GP230-IS12-0

Note: In areas with excessive noise, use a double shielded cable.



• When making your own cable



2.9.3 Supported Devices

The following describes the range of devices supported by the GP.

■ TOYOPUC-PC2 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X7FF	X0000 ~ X007F		L/H
Output Relay	Y000 ~ Y7FF	Y0000 ~ Y007F		
Internal Relay	M000 ~ M7FF	M0000 ~ M007F		
Keep Relay	K000 ~ K2FF	K0000 ~ K002F		
Link Relay	L000 ~ L7FF	L0000 ~ L007F		
Special Relay	V000 ~V0FF	V000~V00F		
Edge Detection	P000 ~ P1FF	——		
Timer (contact)	T000 ~ T1FF	——		
Counter (contact)	C000 ~ C1FF	——		
Current Value Register	——	N0000 ~ N01FF		
Data Register	——	D0000 ~ D2FFF	Bit	
Link Register	——	R0000 ~ R07FF	Bit	
File Register	——	B0000~B1FFF	Bit	
Special Register	——	S0000 ~ S03FF	Bit	

■ TOYOPUC-PC2 Series (1:n Connection)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	X0000 ~ X007F		L/H
Output Relay	Y0000 ~ Y07FF	Y0000 ~ Y007F		
Internal Relay	M0000 ~ M07FF	M0000 ~ M007F		
Keep Relay	K0000 ~ K02FF	K0000 ~ K002F		
Link Relay	L0000 ~ L07FF	L0000~L007F		
Special Relay	V0000 ~V00FF	V0000~V000F		
Edge Detection	P0000 ~ P01FF	---		
Timer (contact)	T0000 ~ T01FF	---		
Counter (contact)	C0000 ~ C01FF	---		
Current Value Register	---	N0000 ~ N01FF		
Data Register	---	D0000 ~ D0FFF	Bit	
Link Register	---	R0000 ~ R07FF	Bit	
File Register	---	B0000 ~ B0FFF	Bit	
Special Register	---	S0000 ~ S03FF	Bit	

■ TOYOPUC-PC3J (1:1 connection)

In this list, "Exp." means "Expansion". Setup system area here.

Device	Bit Address	Word Address	Comments
Input	1X0000 ~ 1X03FF	1X0000 ~ 1X003F	
	2X0000 ~ 2X03FF	2X0000 ~ 2X003F	
	3X0000 ~ 3X03FF	3X0000 ~ 3X003F	
Output	1Y0000 ~ 1Y03FF	1Y0000 ~ 1Y003F	
	2Y0000 ~ 2Y03FF	2Y0000 ~ 2Y003F	
	3Y0000 ~ 3Y03FF	3Y0000 ~ 3Y003F	
Internal Relay	1M0000 ~ 1M07FF	1M0000 ~ 1M007F	
	2M0000 ~ 2M07FF	2M0000 ~ 2M007F	
	3M0000 ~ 3M07FF	3M0000 ~ 3M007F	
Keep Relay	1K0000 ~ 1K02FF	1K0000 ~ 1K002F	
	2K0000 ~ 2K02FF	2K0000 ~ 2K002F	
	3K0000 ~ 3K02FF	3K0000 ~ 3K002F	
Link Relay	1L0000 ~ 1L07FF	1L0000 ~ 1L007F	
	2L0000 ~ 2L07FF	2L0000 ~ 2L007F	
	3L0000 ~ 3L07FF	3L0000 ~ 3L007F	
Special Relay	1V0000 ~ 1V00FF	1V0000 ~ 1V000F	
	2V0000 ~ 2V00FF	2V0000 ~ 2V000F	
	3V0000 ~ 3V00FF	3V0000 ~ 3V000F	
Edge Detection	1P0000 ~ 1P01FF	----	
	2P0000 ~ 2P01FF	----	
	3P0000 ~ 3P01FF	----	
Timer	1T0000 ~ 1T01FF	1T0000 ~ 1T001F	
	2T0000 ~ 2T01FF	2T0000 ~ 2T001F	
	3T0000 ~ 3T01FF	3T0000 ~ 3T001F	
Counter	1C0000 ~ 1C01FF	1C0000 ~ 1C001F	
	2C0000 ~ 2C01FF	2C0000 ~ 2C001F	L/H
	3C0000 ~ 3C01FF	3C0000 ~ 3C001F	
Data Register	1D00000 ~ 1D2FFFF	1D0000 ~ 1D2FFF	
	2D00000 ~ 2D2FFFF	2D0000 ~ 2D2FFF	
	3D00000 ~ 3D2FFFF	3D0000 ~ 3D2FFF	
Link Register	1R00000 ~ 1R07FFF	1R0000 ~ 1R07FF	
	2R00000 ~ 2R07FFF	2R0000 ~ 2R07FF	
	3R00000 ~ 3R07FFF	3R0000 ~ 3R07FF	
Special Register	1S00000 ~ 1S03FFF	1S0000 ~ 1S03FF	
	2S00000 ~ 2S03FFF	2S0000 ~ 2S03FF	
	3S00000 ~ 3S03FFF	3S0000 ~ 3S03FF	
Current Value Register	1N00000 ~ 1N01FFF	1N0000 ~ 1N01FF	
	2N00000 ~ 2N01FFF	2N0000 ~ 2N01FF	
	3N00000 ~ 3N01FFF	3N0000 ~ 3N01FF	
File Register	B00000 ~ B1FFFF	B0000 ~ B1FFF	
Exp. Input	EX0000 ~ EX07FF	EX0000 ~ EX007F	
Exp. Output	EY0000 ~ EY07FF	EY0000 ~ EY007F	
Exp.Internal Relay	EM0000 ~ EM1FFF	EM0000 ~ EM01FF	
Exp. Keep Relay	EK0000 ~ EK0FFF	EK0000 ~ EK00FF	
Exp.n Link Relay	EL0000 ~ EL1FFF	EL0000 ~ EL01FF	
Exp. Special Relay	EV0000 ~ EV0FFF	EV0000 ~ EV00FF	
Exp. Edge Relay	EP0000 ~ EP0FFF	----	
Exp. Timer	ET0000 ~ ET07FF	ET0000 ~ ET007F	
Exp. Counter	EC0000 ~ EC07FF	EC0000 ~ EC007F	
Exp. Special Register	ES00000 ~ ES07FFF	ES0000 ~ ES07FF	
Exp. Current Value Register	EN00000 ~ EN07FFF	EN0000 ~ EN07FF	
Exp. Setting Value Register	H00000 ~ H07FFF	H0000 ~ H07FF	
Exp. Data Register	U00000 ~ U7FFFF	U0000 ~ U7FFF	

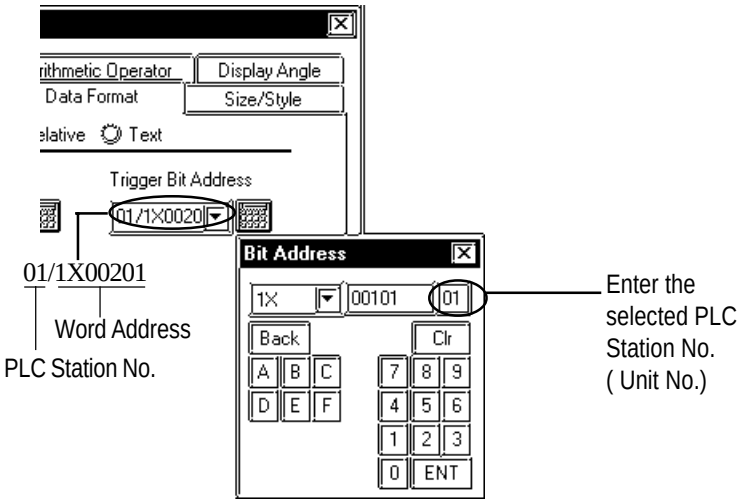
■ TOYOPUC-PC3J (1:n connection)

In this list, "Exp." means "Expansion".

Setup system area here.

Device	Bit Address	Word Address	Comments
Input	1X0000 ~ 1X03FF	1X0000 ~ 1X003F	L/H
	2X0000 ~ 2X03FF	2X0000 ~ 2X003F	
	3X0000 ~ 3X03FF	3X0000 ~ 3X003F	
Output	1Y0000 ~ 1Y03FF	1Y0000 ~ 1Y003F	
	2Y0000 ~ 2Y03FF	2Y0000 ~ 2Y003F	
	3Y0000 ~ 3Y03FF	3Y0000 ~ 3Y003F	
Internal Relay	1M0000 ~ 1M07FF	1M0000 ~ 007F	
	2M0000 ~ 2M07FF	2M0000 ~ 007F	
	3M0000 ~ 3M07FF	3M0000 ~ 007F	
Keep Relay	1K0000 ~ 1K02FF	1K0000 ~ 1K002F	
	2K0000 ~ 2K02FF	2K0000 ~ 2K002F	
	3K0000 ~ 3K02FF	3K0000 ~ 3K002F	
Link Relay	1L0000 ~ 1L07FF	1L0000 ~ 007F	
	2L0000 ~ 2L07FF	2L0000 ~ 007F	
	3L0000 ~ 3L07FF	3L0000 ~ 007F	
Special Relay	1V0000 ~ 1V00FF	1V0000 ~ 000F	
	2V0000 ~ 2V00FF	2V0000 ~ 000F	
	3V0000 ~ 3V00FF	3V0000 ~ 000F	
Edge Detection	1P0000 ~ 1P01FF	----	
	2P0000 ~ 2P01FF	----	
	3P0000 ~ 3P01FF	----	
Timer	1T0000 ~ 1T01FF	1T0000 ~ 1T001F	
	2T0000 ~ 2T01FF	2T0000 ~ 2T001F	
	3T0000 ~ 3T01FF	3T0000 ~ 3T001F	
Counter	1C0000 ~ 1C01FF	1C0000 ~ 1C001F	
	2C0000 ~ 2C01FF	2C0000 ~ 2C001F	
	3C0000 ~ 3C01FF	3C0000 ~ 3C001F	
Data Register	1D00000 ~ 1D0FFFF	1D0000 ~ 1D0FFF	
	2D00000 ~ 2D0FFFF	2D0000 ~ 2D0FFF	
	3D00000 ~ 3D0FFFF	3D0000 ~ 3D0FFF	
Link Register	1R00000 ~ 1R07FFF	1R0000 ~ 1R07FF	
	2R00000 ~ 2R07FFF	2R0000 ~ 2R07FF	
	3R00000 ~ 3R07FFF	3R0000 ~ 3R07FF	
Special Register	1S00000 ~ 1S03FFF	1S0000 ~ 1S03FF	
	2S00000 ~ 2S03FFF	2S0000 ~ 2S03FF	
	3S00000 ~ 3S03FFF	3S0000 ~ 3S03FF	
Current Value Register	1N00000 ~ 1N01FFF	1N0000 ~ 1N01FF	
	2N00000 ~ 2N01FFF	2N0000 ~ 2N01FF	
	3N00000 ~ 3N01FFF	3N0000 ~ 3N01FF	
File Register	B00000 ~ B0FFFF	B0000 ~ B0FFF	
Exp. Input	EX0000 ~ EX07FF	EX0000 ~ EX007F	
Exp. Output	EY0000 ~ EY07FF	EY0000 ~ EY007F	
Exp. Internal Relay	EM0000 ~ EM0FFF	EM0000 ~ EM01FF	
Exp. Keep Relay	EK0000 ~ EK0FFF	EK0000 ~ EK00FF	
Exp. Link Relay	EL0000 ~ EL0FFF	EL0000 ~ EL01FF	
Exp. Special Relay	EV0000 ~ EV0FFF	EV0000 ~ EV00FF	
Exp. Edge Relay	EP0000 ~ EP0FFF	----	
Exp. Timer	ET0000 ~ ET07FF	ET0000 ~ ET007F	
Exp. Counter	EC0000 ~ EC07FF	EC0000 ~ EC007F	
Exp.Special Register	ES00000 ~ ES07FFF	ES0000 ~ ES07FF	
Exp.Current Value Register	EN00000 ~ EN07FFF	EN0000 ~ EN07FF	
Exp. Setting Value Register	H00000 ~ H07FFF	H0000 ~ H07FF	
Exp. Data Register	U00000 ~ U0FFFF	U0000 ~ U0FFF	

- **The range of devices supported may differ for 1:1 communication and for 1:n communication. A maximum of 16 PLCs can be connected.**
- **When setting tags in GP-PRO/PBIII for Windows, the PLC Station number can be specified during address Input. If a station number is not indicated, the previously entered station number is used. (The default value is 0)**



2.9.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ TOYOPUC-PC2 Series (PC2/L2)

GP Setup		Computer Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	2-wire type	---	
---		Card Classification	CMP Link
---		SET5	Watch Dog Timer ON
Unit No.	0	Station Number Setting	0

■ TOYOPUC-PC2 Series (PC2J)

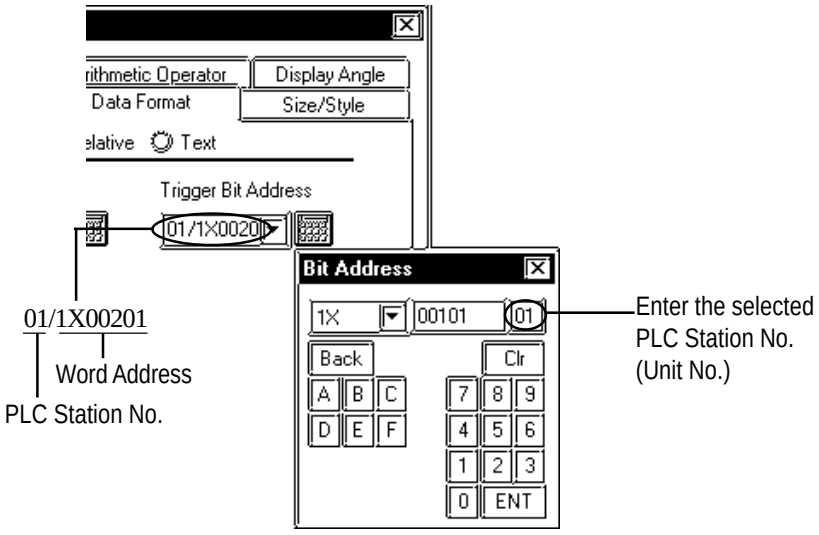
GP Setup		Computer Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	2-wire type	---	
---		Internal Switch (SW4)	1 is Off 2 is On
Unit No.	1	Station Number Setting	1

■ TOYOPUC-PC2 Series (PC2J) (1:n connection)

GP Setup		Computer Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	2-wire type	---	
Unit No. *1	Match this number with that of any PC/CMP link.	Station Number Setting *1	All PC/CMP link numbers must be different from each other.
---		Internal Switch (SW4)	1 is Off 2 is On

**1 The memory used for the system area and the read area is allocated to the PLC which has been given the same number as that of the GP.*

Note: **When entering tag address data in GP-PRO/PBIII for Windows, the PLC Station number can be specified. If a station number is not indicated, the previously entered station number is used. (The initial default value is 1.)**



■ TOYOPUC-PC3J (1:1 connection) <Link I/F on CPU unit>

GP Setup		PLC Setup	
Baud Rate *1	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format *2	4-wire or 2-wire type	RS-422 communication port	4-wire or 2-wire type
Unit No.	0	Station No.	0

*1 *The CPU's Link I/F unit maximum baud rate is 57600bps. It does not support 115200bps.*

*2 *Change the communication format depending on the cables you use.*

■ TOYOPUC-PC3J (1:n connection) <Link I/F on CPU unit>

GP Setup		PLC Setup	
Baud Rate *1	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format *2	4-wire or 2-wire type	RS-422 communication port	4-wire or 2-wire type
Unit No.	Select any unit number between 0 to 15. *3	Station No.	All link station numbers must be different

*1 *The CPU's Link I/F unit maximum baud rate is 57600bps. It does not support 115200bps.*

*2 *Change the communication format depending on the cable you use.*

*3 *A maximum of 16 PLCs can be connected. The PLC's station number must be in base8, however, GP's unit number must be in decimal.*

■ TOYOPUC-PC3J (1:1 connection) <PC/CMP-Link>

GP Setup		PLC Setup	
Baud Rate *1	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format	2-wire type	RS-422 communication port *2	2-wire type
Unit No.	0	Station No.	0

*1 *The PC/CMP-Link (THU-2755) unit's maximum baud rate is 57600bps. It does not support 115200bps.*

*2 *With the PC/CMP-Link (THU-2755), only a 2-wire type can be used. When using PC3J commands, the link unit must be version 5.00 or higher.*

■ TOYOPUC-PC3J (1:n connection) <PC/CMP-Link>

GP Setup		PLC Setup	
Baud Rate *1	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format	2-wire type	RS-422 communication port *2	2-wire type
Unit No. *3	Select any unit number between 0 to 15.	Station No.	All PC/CMP link station numbers must be different
----	----	Internal Switch	SW4-1 OFF
			SW4-2 ON

*1 *The PC/CMP-Link (THU-2755) unit's maximum baud rate is 57600bps. It does not support 115200bps.*

*2 *With the PC/CMP-Link (THU-2755), only a 2-wire type can be used. When using PC3J commands, the link unit must be version 5.00 or higher.*

*3 *A maximum of 16 PLCs can be connected. The PLC's station number must be in octal, however, GP's unit number must be in decimal.*

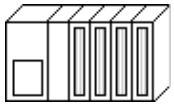
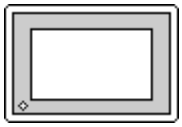
2.10 Toshiba

2.10.1 System Structure

The following describes the system structure for connecting the GP to Toshiba PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.10.2 Cable Diagrams**".*

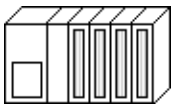
■ PROSEC EX Series (using CPU unit Link I/F)

CPU	Cable Diagram	GP
		
EX2000 *1	RS-422 (Cable Diagram 1)	GP series

**1 Connect to the Main Processor module (MPU6620).*

Note: **Areas noted as using RS-422 can also use RS-485 on the PLC side.**

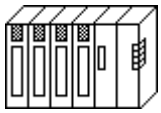
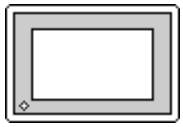
■ PROSEC T Series (using CPU unit Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 Link Master Module		
T3 *1, T3H,	CPU Link I/Funit	RS-422 (Cable Diagram2)	GP Series
T2E	CPU Programming Port	RS-232C (Cable Diagram4)	
T2N	CPU Link I/Funit	RS-422 (Cable Diagram2)	
		RS-232C (Cable Diagram5)	
T2E	CM231E	RS-422 (Cable Diagram1)	

**1 Connect to the CPU module's computer link port.*

Note: **Areas noted as using RS-422 can also use RS-485 on the PLC side.**

■ **PROVISOR B Series** (using CPU unit Link I/F)

CPU	Link I/F	Cable Diagram	GP
			
B200CU, B200CUF, B200CURM, B200CUFRM	B 2000LM	RS-232C (Cable Diagram 3)	GP Series

*When connecting the GP and B200 Series, setup the Link I/F's Mode Setup/Delimiter to **CR**.*

2.10.2 Cable Diagrams

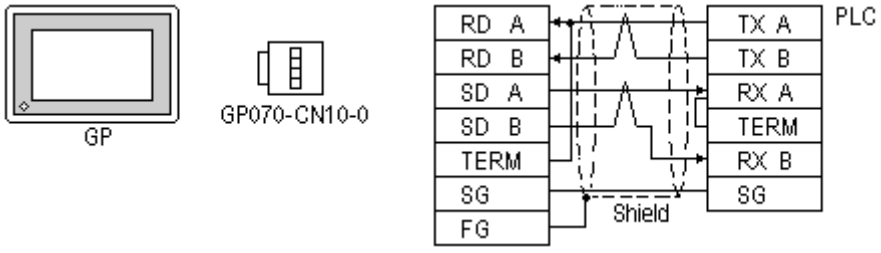
The cable diagrams illustrated below and the cable diagrams recommended by Toshiba may differ; however, using these cables for your PLC operations will not cause any problems.

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

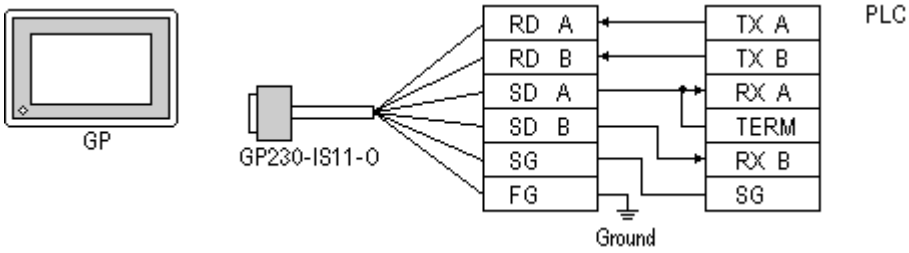
- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***
- ***When using RS422 connection, please check the length of the cable with Toshiba PLC's users manual.***

Cable Diagram 1 (RS-422)

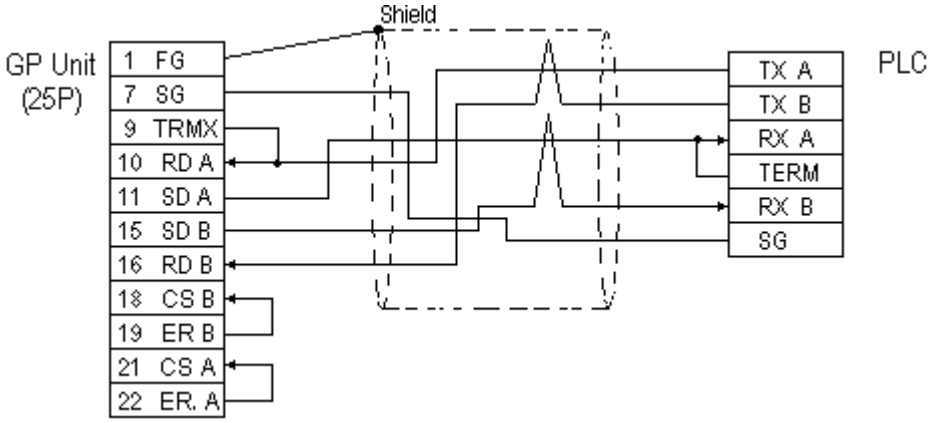
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections

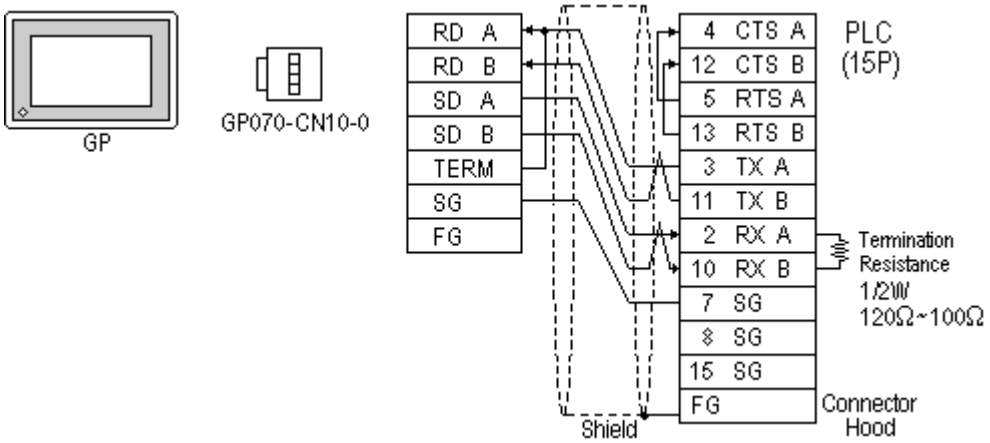


Note:

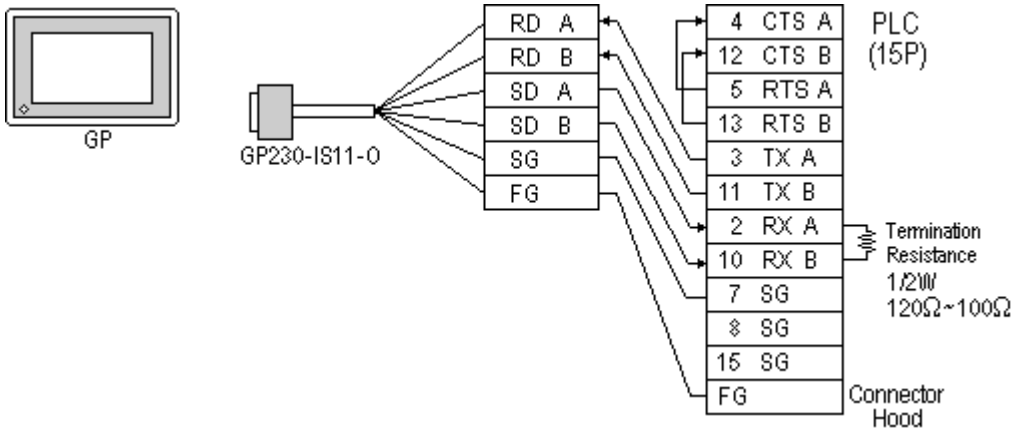
- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 2 (RS-422)

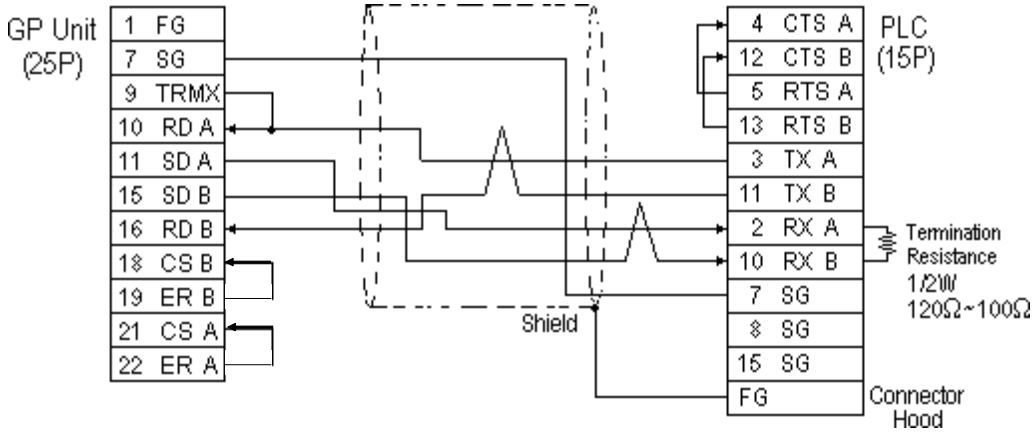
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



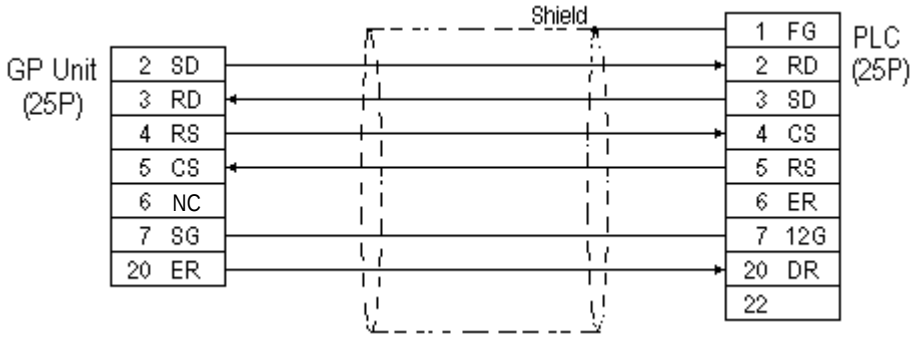
• When making your own cable connections



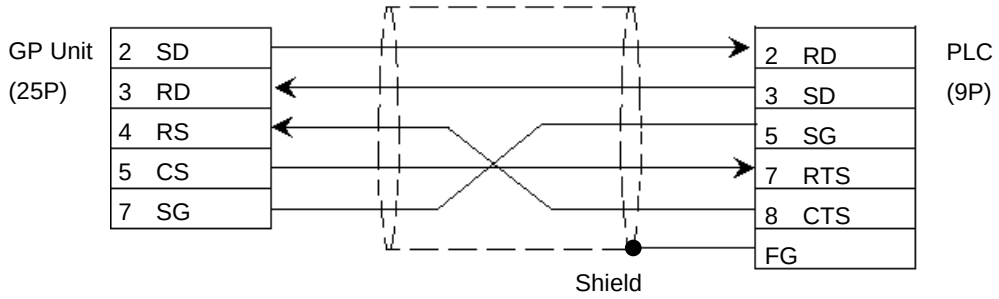
Note:

- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **When using RS422 connection, please check the length of the cable with Toshiba PLC's users manual.**

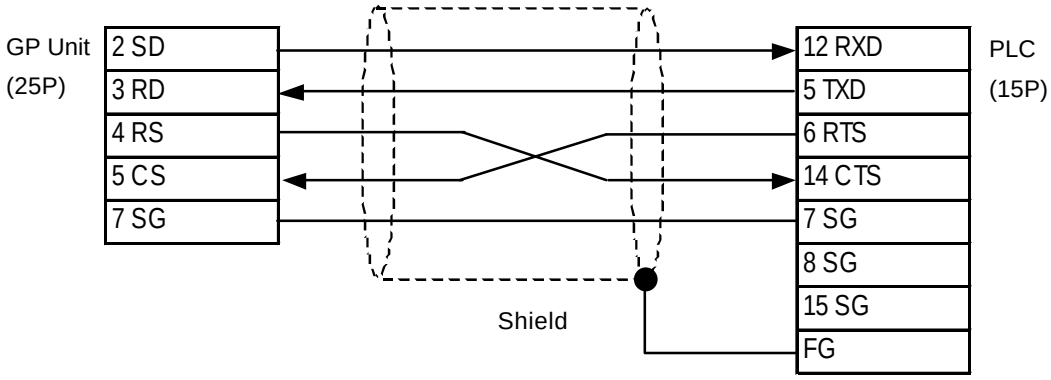
Cable Diagram 3 (RS-232C)



Cable Diagram 4 (RS-232C)



Cable Diagram 5 (RS-232C)



2.10.3 Supported Devices

The following describes the range of devices supported by the GP.

■ PROSEC EX Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
External Input	X00000 ~ X0499F	XW0000 ~ XW0499		
External Output	Y00000 ~ Y0499F	YW0000 ~ YW0499		
Auxilary Relay	R00000 ~ R0999F	RW0000 ~ RW0999		
Link Register (relay)	Z00000 ~ Z0999F	ZW0000 ~ ZW1999		H/L
Timer (contact)	T0000 ~ T0499	---		
Counter (contact)	C0000 ~ C0499	---		
Timer (current value)	---	T0000 ~ T0499		
Counter (current value)	---	C0000 ~ C0499		L/H
Data Register	---	D00000 ~ D16383	Bit 15	H/L

■ PROSEC T Series(T3,T3H,T2N,T2E)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
External Input	X0000 ~ X511F	XW0000 ~ XW511		
External Output	Y0000 ~ Y511F	YW0000 ~ YW511		
Internal Relay	R0000 ~ R999F	RW000 ~ RW999		
Special Relay	S0000 ~ S255F	SW000 ~ SW255		
Link Register Relay	Z0000 ~ Z999F	---		
Link Relay	L0000 ~ L255F	---		
Timer (contact)	T000 ~ T999	---	*1	L/H
Counter (contact)	C000 ~ C511	---	*1	
Timer (current value)	---	T000 ~ T999		
Counter (current value)	---	C000 ~ C511		
Data Register	---	D0000 ~ D8191	Bit 15	
Link Register	---	W0000 ~ W2047	Bit 15	
File Register	---	F0000 ~ F32767	Bit 15	

** 1 Data cannot be written.*

Note: The Device Range may differ depending on the CPU type. For the details, refer to the Yoshiba's PLC manual.

■ PROVISOR B Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ XF7F	XW00 ~ XWF7	*1	L/H
Output Relay	Y000 ~ YF7F	YW00 ~ YWF7	*1	
Internal Relay	R000 ~ R77F	RW00 ~ RW77	*1	
Extended Internal Relay-1	G000 ~ GF7F	GW00 ~ GWF7	*1	
Extended Internal Relay-2	H000 ~ HF7F	HW00 ~ HWF7	*1	
Special AUX Relay	A000 ~ A16F	AW00 ~ AW16	*1	
Latch Relay	L000 ~ L07F	LW00 ~ LW07	*1	
Shift Register	S000 ~ S07F	SW00 ~ SW07	*1	
Edge Relay	E000 ~ E77F	EW00 ~ EW77	*1	
Timer (contact)	T000 ~ T77F	TW00 ~ TW77	*1	
Counter (contact)	C000 ~ C77F	CW00 ~ CW77	*1	
Timer/Counter (current value)	P0000 ~ P77FF	P000 ~ P77F		
Timer/Counter (setup value)	V0000 ~ V77FF	V000 ~ V77F		
Generic Register 1	D0000 ~ DF7FF	D000 ~ DF7F		
Generic Register 2	B0000 ~ BF7FF	B000 ~ BF7F		

** 1 Be careful as the Word Address fields differ between the GP screen editing software GP-PRO/PBIII for Windows and the corresponding PLC manual.*

E.g. Input Relay

PRO-PBIII	PLC Manual
XW00 ~ XWF7	X00W ~ XF7W

STOP **When the *Input Relay* address is setup in a ladder program input field, Set/Reset cannot be performed from the GP. The same holds true for an address (all devices) setup in an output field.**

2.10.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ PROSEC EX Series

GP Setup		Main Processor Module/CPU Module Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	4-wire type	---	
Unit No.	1	Station Number	1

■ PROSEC T Series

GP Setup		CPU Module Setup	
Baud Rate	19200 bps *1*2	Baud Rate	19200 bps *1*2
Data Length	8 bits *2	Data Bit	8 bits *2
Stop Bit	2 bits *2	Stop Bit	2 bits *2
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	4-wire type	---	
Unit No.	1	Station Number	1

**1 PLC specifications state that when a PROSEC T3 (Ver. 1.4 or lower) is used, data transmission is possible only at speeds of 9600 bps or less.*

**2 The T2E uses a baud rate of 9600bps, a data length of 8bits and the stop bit is 1(fixed).*

■ PROVISOR B Series

GP Setup		Link Master Module Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Operation Mode	Link Mode
Unit No.	0	Station Number	0

2.11 Toshiba Machine

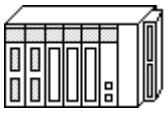
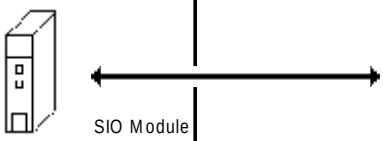
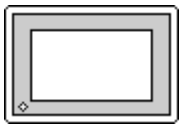
2.11.1 System Structure

The following describes the system structure for connecting the GP to Toshiba Machine PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.11.2 Cable Diagrams**".*

Note: **Match up the GP Unit No. and each PC Number when multiple PCs are connected using PC Link.**

■ PROVISOR TC200 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 SIO Module		
TCCUH	TCCMW TCCMO	RS-232C (Cable Diagram 1)	GP Series
	Link I/F on CPU *1		
TCCUHS TCCUSS	RS-232C connector on CPU module	RS-232C (Cable Diagram 2)	
	TCCMWA TCCMOA		

**1 Connect to the RS-232C connector.*

2.11.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Toshiba Machine may differ, however, using these cables for your PLC operations will not cause any problems.

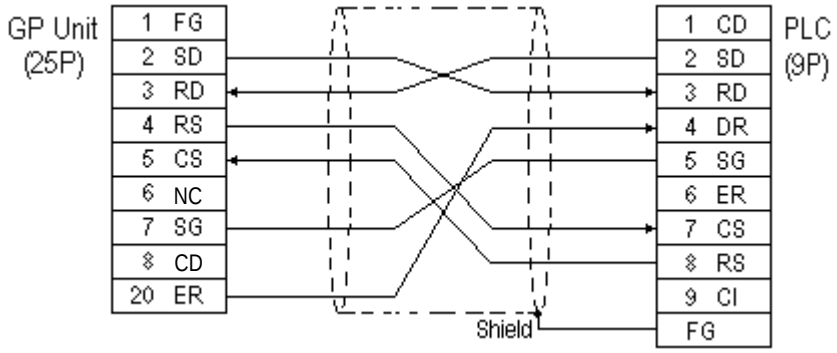
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

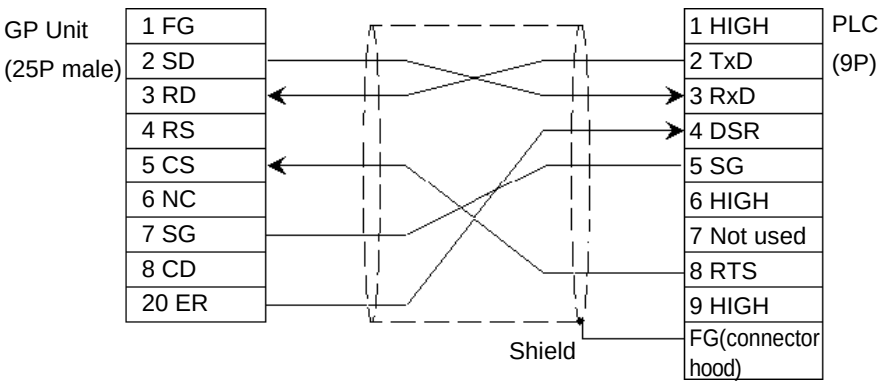
Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)



Cable Diagram 2 (RS-232)



2.11.3 Supported Devices

The following describes the range of devices supported by the GP.

■ PROVISOR TC200 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay 1	X000 ~ XF7F	XW00 ~ XWF7	*1 *2	
Input Relay 2	I000 ~ IF7F	IW00 ~ IWF7	*1 *2	
Output Relay 1	Y000 ~ YF7F	YW00 ~ YWF7	*1 *2	
Output Relay 2	O000 ~ OF7F	OW00 ~ OWF7	*1 *2	
Internal Relay	R000 ~ R77F	RW00 ~ RW77	*1 *2	
Extended Internal Relay 1	G000 ~ GF7F	GW00 ~ GWF7	*1 *2	
Extended Internal Relay 2	H000 ~ HF7F	HW00 ~ HWF7	*1 *2	
Extended Internal Relay 3	J000 ~ JF7F	JW00 ~ JWF7	*1 *2	
Extended Internal Relay 4	K000 ~ KF7F	KW00 ~ KWF7	*1 *2	
Special AUX Relay	A000 ~ A16F	AW00 ~ AW16	*1 *2	
Latch Relay	L000 ~ L07F	LW00 ~ LW07	*1 *2	
Shift Register	S000 ~ S07F	SW00 ~ SW07	*1 *2	L/H
Edge Relay	E000 ~ E77F	EW00 ~ EW77	*1 *2	
Timer (contact)	T000 ~ T77F	TW00 ~ TW77	*1 *2 *4	
Counter (contact)	C000 ~ C77F	CW00 ~ CW77	*1 *2 *4	
Timer/Counter (current value)	—	P000 ~ P77F	Bit *3	
Timer/Counter (setup value)	—	V000 ~ V77F	Bit *3	
Generic Register 1	—	D000 ~ DF7F	Bit *3	
Generic Register 2	—	B000 ~ BF7F	Bit *3	
Generic Register 3	—	U000 ~ UF7F	Bit *3	
Generic Register 4	—	M000 ~ MF7F	Bit *3	
Generic Register 5	—	Q000 ~ QF7F	Bit *3	

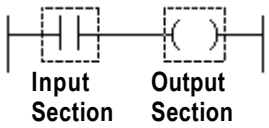
** 1 Word Address fields can differ between GP-PRO/PBIII for Windows and the corresponding PLC manual.*

E.g. Input Relay

GP-PRO/PBIII	PLC Manual
XW00~XWF7	X00W~XF7W

Data cannot be written from the GP/GLC to the input relay (x,1). The calculation result in a ladder program takes priority for all the ladder program output section devices. Therefore, no data can be written from the GP/GLC.

E.g. Ladder Program



*2 In GP-PRO/PB III for Windows, the word address' last digit is hexadecimal. You can enter any number between 0 and F as the last digit, however, since the PLC's word address' last digit is octal, you can only enter a number between 0 and 7 as the last digit.

*3 In GP-PRO/PB III for Windows, the word address' second to last digit is hexadecimal and you can enter any number between 0 and F. However, since the PLC's word address' second to last digit and octal is you can only enter a number between 0 and 7 as the second to last digit.

*4 The addresses of the timer/counter (contact) range from TW/CW00 to TW/CW77, however the internal memory area is not consecutive. This range is divided into two areas, e.g., TW/CW00 to TW/CW37 and TW/CW40 to TW/CW77.

- **The number of consecutive words that can be used for the following GP-PRO/PB III and Pro-Server is limited:**

  1) Number of monitored words using tag

  - **Bit device (X, Y, I, O, R, G, H, J, K, A, L, S, E, T, C): No more than eight words can be specified.**
  - **Word device (P, V, D, B, U, M, Q): No more than 127 words can be specified.**
  - **Even if data is within the above word limit, no word can be specified outside of the octal range.**

  The use of the a-tag allows you to specify words exceeding the limit.

  E.g.) To monitor more than eight words (If the a-tag's) Monitored Word Address is RW0 and you wish to monitor more than eight words, on the a-tag, set the Monitored Word Address to RW0 and set the Number of Monitored Words to 9 or more.

  2) Number of addresses specified for copying stored data or initializing memory using D-Script's memory operation function

  - **All devices: No more than 40 words can be specified.**

  If this limit is exceeded, divide the words (into blocks that are within the limit) and then use the memory operation function.

  3) LS Read area

  - **When the entire system area is selected:**

    no more than 107 words can be specified.

  - **When the entire system area is deselected:**

    no more than 127 words can be specified.

  *** The size that can be specified varies depending upon the selected number (20 words maximum) in the system area.**

- ***Even if data is within the above word limit of words, no word can be specified that is outside of the octal range.***

Words can only be used within the allowed range.

E.g.) If the entire system area is selected (20 words) and the first address of the system area is set to D060, no more than 12 words can be specified in the loading area.

4) Pro-Server

- ***All devices: No more than 40 words can be specified.***

  If this limit is exceeded, divide the words (into blocks that are within the limit) and then write data.

- ***When data is batch loaded in batch from the PLC via the Pro-Server device monitor for the Pro-Server, the range can only be from the first device address up to the one just before the octal digit of a device address.***

5) Writing from SRAM to the PLC using the data filing function

- ***All devices: No more than 40 words can be specified.***
- ***Even if data is within the above word limit, no word can be specified that is outside of the octal range.***

E.g.) If the stored first address is set to D060, no more than 32 words can be specified as data.

If this limit is exceeded, divide the words (into blocks that are within the limit) and then write data.

- **The device type and range that can be used may vary depending upon your CPU. Check with the manual for your CPU before use.**

2.11.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ PROVISOR TC200 Series (using SIO module)

GP Setup		SIO Module Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Select Function Switch	3 is On
Unit No.	0	PC Number	0

■ PROVISOR TC200 Series (using RS-232C Connector)

GP Setup		RS-232C Connector Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	64 (fixed)	---	

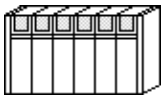
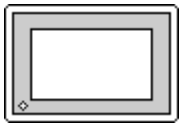
2.12 Koyo Electronics Industries

2.12.1 System Structure

The following describes the system structure for connecting the GP to Koyo Electronics Industries PLCs.

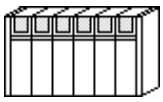
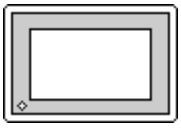
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.12.2 Cable Diagrams**".*

■ KOSTAC SG Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 Upper Link Module		
SG-8	G01-DM	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 2)	GP series
	CPU Unit Upper Link I/F *1	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 3)	

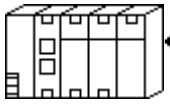
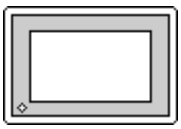
**1 Connect to the CPU module's generic communication port.*

■ KOSTAC SU Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 Upper Link Module		
SU-5	U01-DM	RS-232C (Cable Diagram 1)	GP series
SU-6	U01-DM		
	CPU Unit Upper Link I/F *1		
SU-6B	CPU Unit Upper Link I/F *1	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 3)	

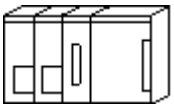
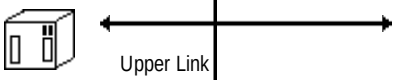
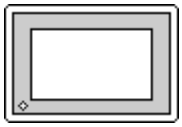
**1 Connect to the CPU module's generic communication port.*

■ KOSTAC SZ Series (using CPU unit Link I/F)

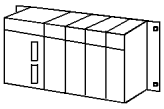
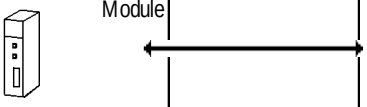
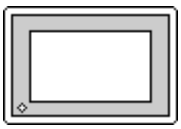
CPU	Cable Diagram	GP
		
SZ-4 *1	RS-232C (Cable Diagram 4)	GP series

** 1 Connect to the CPU module's generic communication port.*

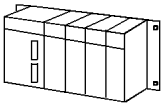
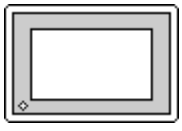
■ KOSTAC SR Series (using Upper Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 Upper Link I/F		
SR-21 SR-22	E-02DM-R1	RS-422 (Cable Diagram 2)	GP series

■ DL-405 Series (using Link I/F)

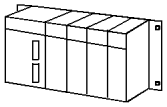
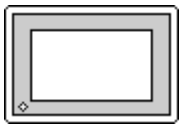
CPU	Link I/F	Cable Diagram	GP
	 Upper Link Module		
D4-430	D4-DCM	RS-232C (Cable Diagram 1)	GP series
D4-440	D4-DCM		
	Link I/F on CPU unit		

■ DL-205 Series (using Link I/F on CPU unit)

CPU	Cable Diagram	GP
		
D2-240 *1	RS-232C (Cable Diagram 5)	GP series

** 1 Connect to the CPU module's generic communication port.*

■ **DL-305 Series** (using Link I/F on CPU unit)

CPU	Link I/F	Cable Diagram	GP
	 Upper Link I/F		
D3-330	D3-DCM	RS-422 (Cable Diagram 2)	GP

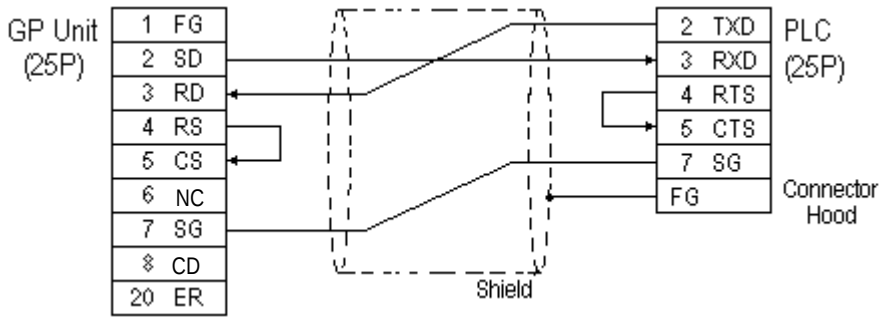
2.12.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Koyo Electronic Industries may differ, however, using these cables for your PLC operations will not cause any problems.

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

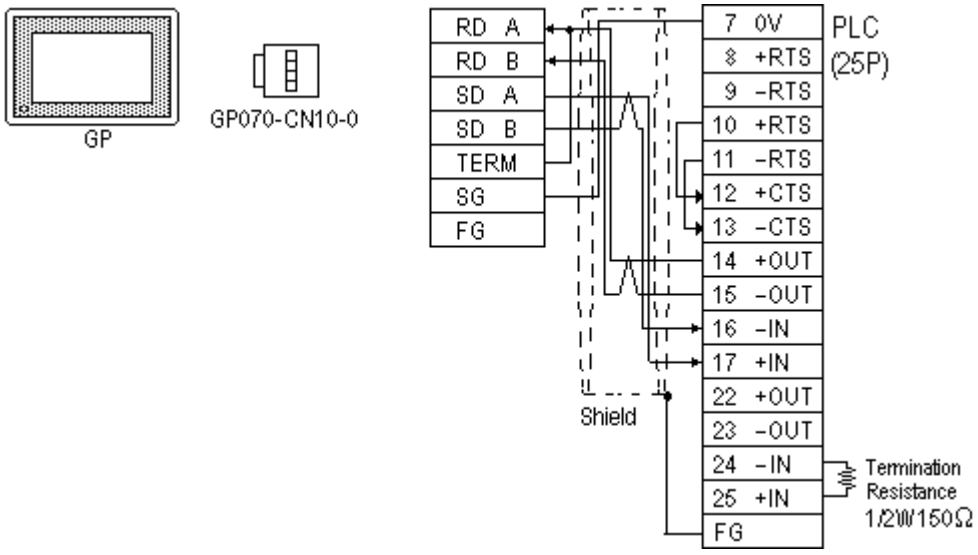
- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***
- ***For the RS-422 connection, use a cable length less than 600m.***

Cable Diagram 1 (RS-232C)

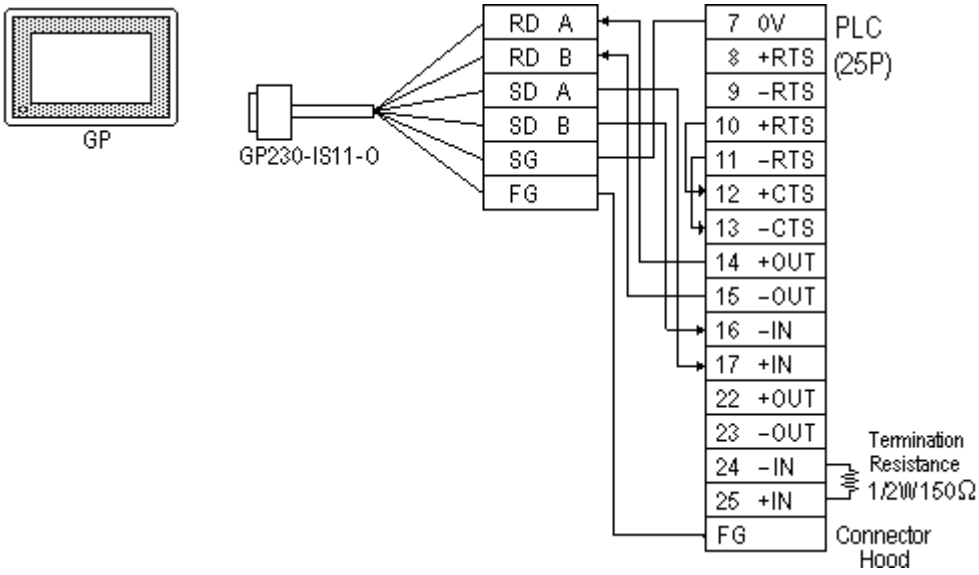


Cable Diagram 2 (RS-422)

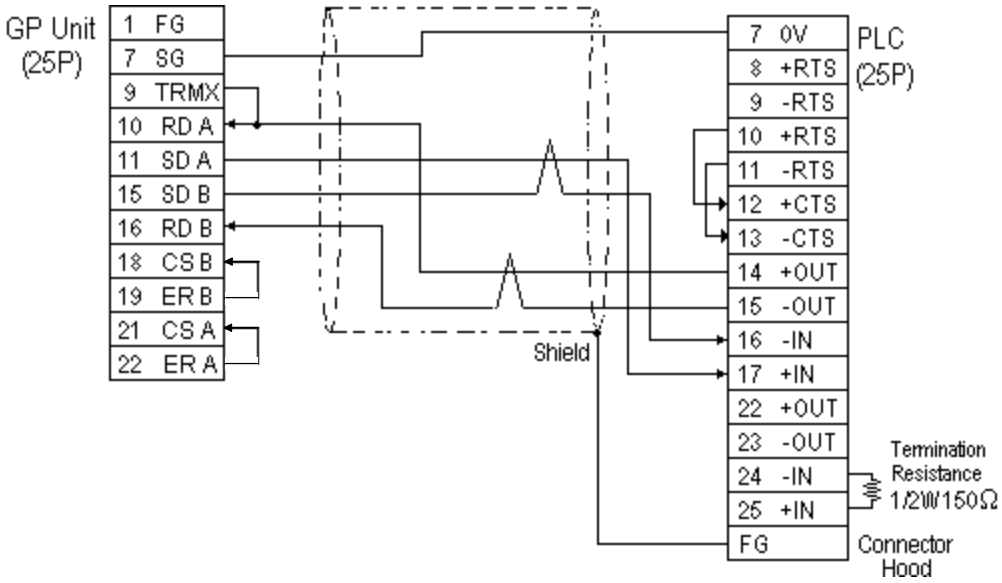
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections

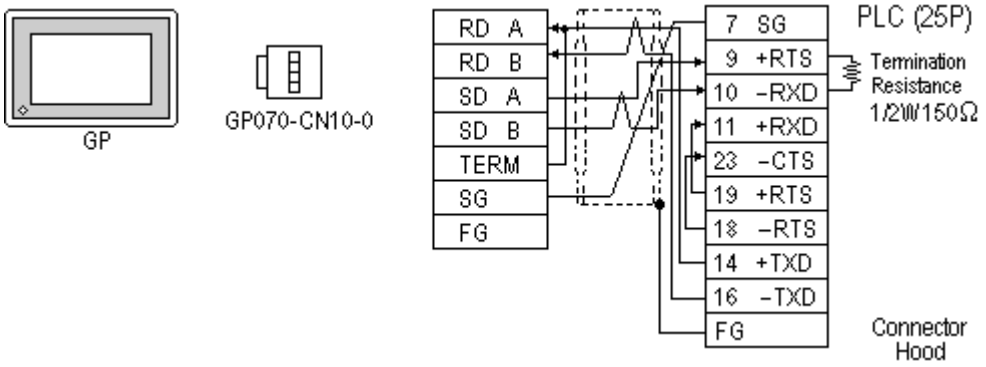


Note:

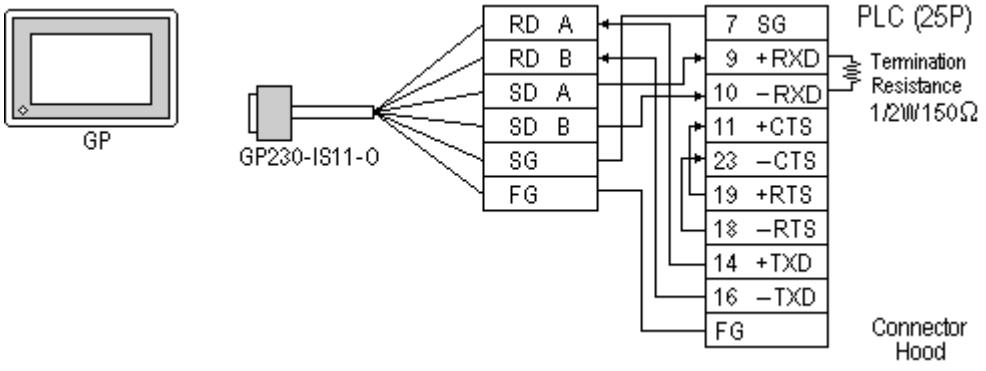
- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.3SQ cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **When using RS-422 connection, the cable length must not be any longer than 600 meters.**

Cable Diagram 3 (RS-422)

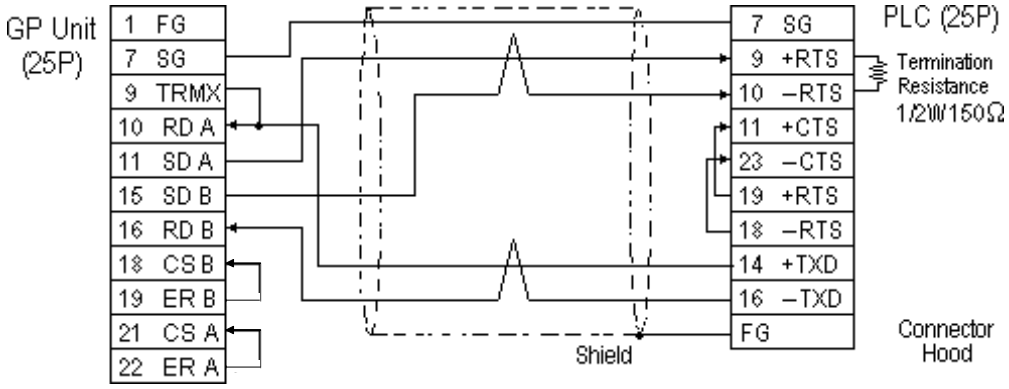
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



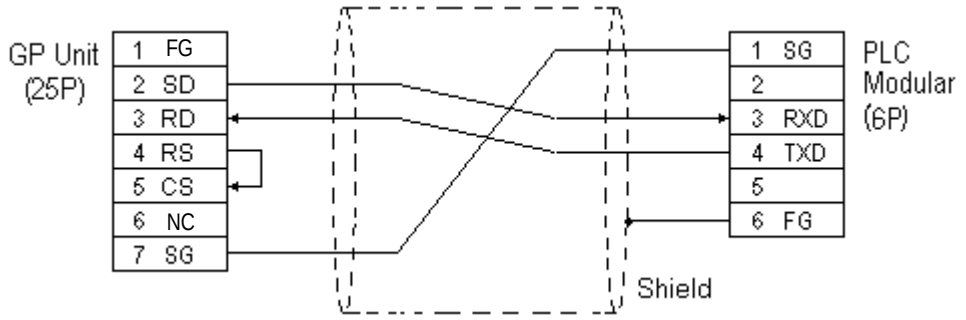
• When making your own cable connections



Note:

- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.3SQ cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **When using RS-422 connection, the cable length must not be any longer than 600 meters.**

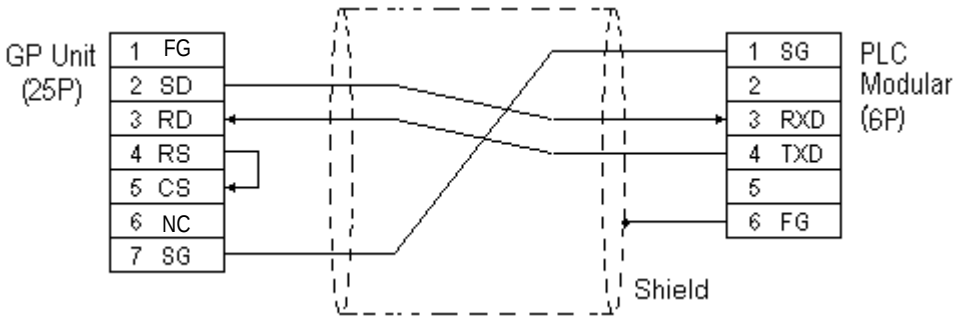
Cable Diagram 4 (RS-232C)



Note:

The GP connection uses SZ-4's Port 2 (generic SIO port). Port 1 is the program communication port (Programming Console S-20P).

Cable Diagram 5 (RS-232C)



Note:

The GP connection uses D2-240's Port 2 (generic SIO port). Port 1 is the program communication port.

2.12.3 Supported Devices

The following describes the range of devices supported by the GP.

■ KOSTAC SG Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	I0000 ~ I1777	R40400 ~ R40477	oct	L/H
Output Relay	Q0000 ~ Q1777	R40500 ~ R40577	oct	
Control Relay	M0000 ~ M3777	R40600 ~ R40777	oct	
Stage	S0000 ~ S1777	R41000 ~ R41077	oct	
Link Relay (input)	GI0000 ~ GI3777	R40000 ~ R40177	oct	
Specified Transfer Relay (output)	GQ0000 ~ GQ3777	R40200 ~ R40377	oct	
Timer (contact)	T000 ~ T377	R41100 ~ R41117	oct	
Counter (contact)	C000 ~ C377	R41140 ~ R41157	oct	
Timer (elapsed time)	---	R0000 ~ R0377	oct	
Counter (elapsed value)	---	R1000 ~ R1377	oct	
Variable Memory 1	---	R400 ~ R777	oct Bit 15	
Variable Memory 2	---	R1400 ~ R7377	oct Bit 15	
Variable Memory 3	---	R10000 ~ R37777	oct Bit 15	

■ KOSTAC SU Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	I000 ~ I477	R40400 ~ R40423	oct8	L/H
Output Relay	Q000 ~ Q477	R40500 ~ R40523	oct8	
Control Relay	M0000 ~ M1777	R40600 ~ R40677	oct8	
Stage	S0000 ~ S1777	R41000 ~ R41077	oct8	
Link Relay/Link Input	GI0000 ~ GI1777	R40000 ~ R40077	oct8	
Special Relay	SP000 ~ SP137 SP320 ~ SP717	R41200 ~ R41205 R41215 ~ R41234	oct8 *1	
Timer (contact)	T000 ~ T377	R41100 ~ R41117	oct8	
Counter (contact)	C000 ~ C177	R41140 ~ R41157	oct8	
Timer (elapsed time)	---	R0000 ~ R0377	oct8	
Counter (elapsed value)	---	R1000 ~ R1177	oct8	
Data Register	---	R1400 ~ R7377	oct8 Bit15	
Special Register	---	R700 ~ R737 R7400 ~ R7777	oct8 Bit15 *1	
Expanded Register	---	R10000 ~ R17777	oct8 Bit15 *2	

** 1 Only the SU-6B will check connections (Only the SU-6B can use special registers R700 to R737), however it cannot write data.*

**2 Only the SU-6B can be used.*

■ KOSTAC SZ Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	I000 ~ I0477	R40400 ~ R40423	oct8	L/H
Output Relay	Q0000 ~ Q0477	R40500 ~ R40523	oct8	
Control Relay	M0000 ~ Q0377	R40600 ~ R40617	oct8	
Stage	---	R41000 ~ R41037	oct8	
Timer (contact)	T000 ~ T177	R41100 ~ R41107	oct8	
Counter (contact)	C000 ~ C177	R41140 ~ R41147	oct8	
Timer (elapsed time)	---	R0000 ~ R0177	oct8	
Counter (elapsed value)	---	R1000 ~ R1177	oct8	
Variable Memory 2	---	R2000 ~ R3777	oct8 Bit15	

■ KOSTAC SR Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input/Output	000 ~ 157 700 ~ 767	R000 ~ R014 R070	OCT8	L/H
Control Relay	160 ~ 377 770 ~ 777	R016 ~ R036 R076	OCT8	
Shift Register	400 ~ 577	R040 ~ R056	OCT8	
Timer/Counter (contact)	600 ~ 677	R060 ~ R066	OCT8	
Timer/Counter (elapsed value)	---	R600 ~ R677	OCT8	
Data Register	---	R400 ~ R577	OCT8 Bit15 ÷2	

Cannot perform only bit write operations. Use byte units to perform bit write operations, where all other bits besides the selected bit, are cleared to 0.

■ DL-405 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X477	V40400 ~ V40423	OCT8	L/H
Output Relay	Y000 ~ Y477	V40500 ~ V40523	OCT8	
Internal Relay	C0000 ~ C1777	V40600 ~ V40677	OCT8	
Stage	S0000 ~ S1777	V41000 ~ V41077	OCT8	
Link Relay/Link Input	GX0000 ~ GX1777	V40000 ~ V40077	OCT8	
Special Relay	SP000 ~ SP137 SP320 ~ SP717	V41200 ~ V41205 V41215 ~ V41234	OCT8	
Timer (contact)	T000 ~ T377	V41100 ~ V41117	OCT8	
Counter (contact)	CT000 ~ CT177	V41140 ~ V41147	OCT8	
Timer (elapsed time)	---	V0000 ~ V0377	OCT8	
Counter (elapsed value)	---	V1000 ~ V1177	OCT8	
Data Register	---	V1400 ~ V7377	OCT8 Bit15	
Special Register	---	V7400 ~ V7777	OCT8 Bit15	

■ DL-205 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X0477	V40400 ~ V40423	OCT8	L/H
Output Relay	Y0000 ~ Y0477	V40500 ~ V40523	OCT8	
Control Relay	C0000 ~ C0377	V40600 ~ V40617	OCT8	
Stage	---	V41000 ~ V41037	OCT8	
Timer (contact)	T000 ~ 177	V41100 ~ V41107	OCT8	
Counter (contact)	CT000 ~ CT177	V41140 ~ V41147	OCT8	
Timer (elapsed time)	---	V0000 ~ V0177	OCT8	
Counter (elapsed value)	---	V1000 ~ V1177	OCT8	
Variable Memory 2	---	V2000 ~ V3777	OCT8 Bit 15	

■ DL-305 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input/Output	000 ~ 157 700 ~ 767	V000 ~ V014 V070	OCT8	L/H
Control Relay	160 ~ 377 770 ~ 777	V016 ~ V036 V076	OCT8	
Shift Register	400 ~ 577	V040 ~ V056	OCT8	
Timer/Counter (contact)	600 ~ 677	V060 ~ V066	OCT8	
Timer/Counter (elapsed value)	---	V600 ~ V677	OCT8	
Data Register	---	V400 ~ V577	OCT8 Bit 15 ÷2	

2.12.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ KOSTAC SG Series (using Upper Link I/F)

GP Setup		Upper Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	4-wire type	---	
---		Master/Slave Setup	Slave
---		Transfer Mode	Hex
Unit No.	1	Station Number	1

■ KOSTAC SG Series (using General SIO Port)

GP Setup		Generic SIO Port Setup	
Baud Rate	19200 bps (fixed)	Baud Rate	19200 bps (fixed)
Data Length	8 bits (fixed)	Data Length	8 bits (fixed)
Stop Bit	1 bit (fixed)	Stop Bit	1 bit (fixed)
Parity Bit	Odd (fixed)	Parity Bit	Odd (fixed)
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	Dipswitch 1 (CCM SIO Port) is ON
Communication Format (RS-422)	4-wire type	Communication Format (RS-422)	Dipswitch 4 (CCM SIO Port) is Off
---		Transfer Mode *1	Hex
Unit No.	1	CCM Number *1	1

**1 Turn Dip Switch 2 (CCM Station No.) OFF, and run Transfer mode and CCM Station Number setup with the programmer. Communication will not occur when Dip Switch 2 is ON and the transfer Mode is not designated as Hex.*

■ KOSTAC SU Series (using Upper Link I/F)

GP Setup		Generic Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Station Number	1

■ KOSTAC SU Series (using General SIO Port)

GP Setup		Generic SIO Port Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	4-wire type	---	
---		Data Format *1	Hex
Unit No.	1	Station Number	1

**1 Turn* Dip Switch 2 *(CCM Station No.) OFF, and run Transfer mode and CCM Station Number setup with the programmer. Communication will not occur when Dip Switch 2 is ON and the transfer Mode is* not *designated as Hex.*

■ KOSTAC SZ Series

GP Setup		Generic SIO Port Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Data Format *1	Hex
Unit No.	1	Station Number	1

**1 Turn* Dip Switch 2 *(CCM Station No.) OFF, and run Transfer mode and CCM Station Number setup with the programmer. Communication will not occur when Dip Switch 2 is ON and the transfer Mode is* not *designated as Hex.*

■ KOSTAC SR Series

GP Setup		CPU Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format	4-line	---	
---		Tum Around Relay	No delay
---		Power Up Mode	RUN mode
---		Transmission Mode	Hex
Unit No.	1	Station Number	1

■ DL405 Series (using Upper Link I/F)

GP Setup		Upper Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Station Number	1

■ DL-405 Series (using General SIO Port)

GP Setup		Generic SIO Port Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	4-wire type	---	
---		Data Format *1	Hex
Unit No.	1	Station Number	1

**1 Turn* Dip Switch 2 *(CCM Station No.) OFF, and run Transfer mode and CCM Station Number setup with the programmer. Communication will not occur when Dip Switch 2 is ON and the transfer Mode is* not *designated as Hex.*

■ DL-205 Series

GP Setup		Generic SIO Port Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Data Format *1	Hex
Unit No.	1	Station Number	1

**1 Turn* Dip Switch 2 *(CCM Station No.) OFF, and run Transfer mode and CCM Station Number setup with the programmer. Communication will not occur when Dip Switch 2 is ON and the transfer Mode is* not *designated as Hex.*

■ DL-305 Series

GP Setup		CPU Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format	4-wire type	---	
---		Turn Around Relay	No delay
---		Power Up Mode	RUN mode
---		Data Format *1	Hex
Unit No.	1	Station Number	1

*1 *Turn* Dip Switch 2 *(CCM Station No.) OFF, and run Transfer mode and CCM Station Number setup with the programmer. Communication will not occur when Dip Switch 2 is ON and the transfer Mode is* not *designated as Hex.*

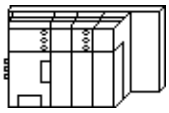
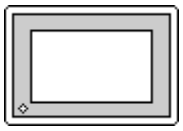
2.13 GE Fanuc Automation

2.13.1 System Structure

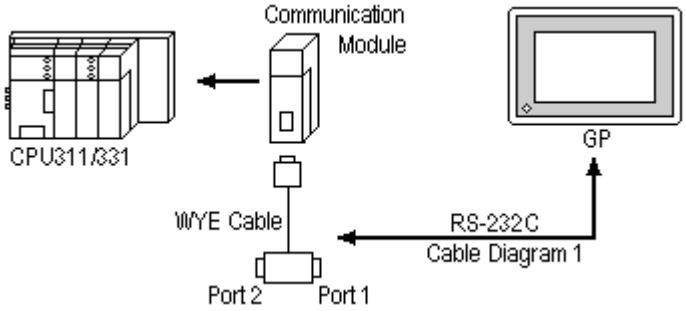
The following describes the system structure for connecting the GP to GE Fanuc PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.13.2 Cable Diagrams**".*

■ Series 90-30 (using SNP-X Protocol/Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Communication Module 		
CPU311, CPU331	IC693CMM311 *1 *2	RS-232C (Cable Diagram 1)	GP series

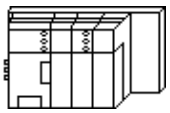
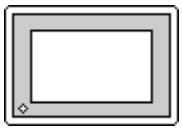
** 1 When using the SIO module (IC693CMM311), the PLC's WYE cable is necessary.*



Connect to Port 1 or Port 2. However, when connected to Port 2, switch to RS-232C in the programming console. Both Port 1 and Port 2 can be connected at the same time to two GPs.

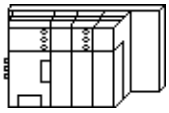
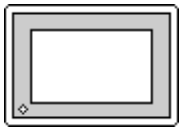
** 2 Select SNP-X protocol using the programming console.*

■ Series 90-30 (SNP-X Protocol/CPU Direct Connection)

CPU	Cable Diagram	GP
		
CPU311, CPU331	RS-422 (Cable Diagram 2)	GP series

Communication speed is faster than when using the SIO module, however, you cannot use the programming console and the GP at the same time.

■ Series 90-70 (using SNP-X Protocol/Link I/F)

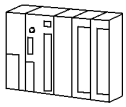
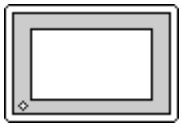
CPU	Link I/F	Cable Diagram	GP
	 SIO Module		
CPU731/732, CPU771/772, CPU781/782	IC697CMM711 *1 *2	RS-232C (Cable Diagram 1) RS-422 (Cable Diagram 3)	GP series

**1 Select SNP-X protocol using the programming console.*

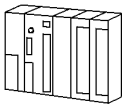
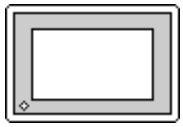
**2 Connect to the SIO module's Port 1 or Port 2, and change to RS-232C or RS-422/485 with the programming console. Cannot connect GPs to both Port 1 and Port 2.*

Places noted as RS-422 can also use RS-485 on the PLC side.

■ Series 90-30 (SNP Protocol, CPU Direct Connection)

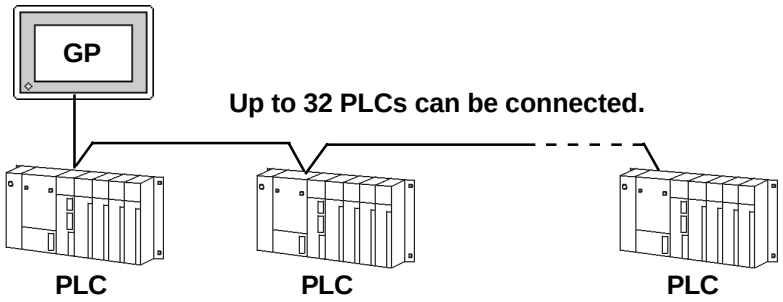
CPU	Cable Diagram	GP
		
CPU311 CPU350 CSE311 CPU313 CPU351 CSE313 CPU323 CPU352 CSE323 CPU331 CPU360 CSE331 CPU340 CPU363 CSE340 CPU341 CPU364	RS422 <Cable Diagram 4> RS422 (1:n connection) <Cable Diagram 5>	GP Series units

■ Series 90-70 (SNP Protocol, CPU Direct Connection)

CPU	Cable Diagram	GP
		
CPU731 CPU789 CSE924 CPU771 CPM915 CSE925 CPU772 CPM925 CPX772 CPU780 CPX935 CPX782 CPU781 CGR935 CPX928 CPU782 CPM790 CGR772 CPU788 CSE784	RS422 <Cable Diagram 4> RS422 (1:n connection) <Cable Diagram 5>	GP Series units

Note:

- **Up to 32 PLCs can be connected to one GP.**
- **Be sure that only one (a single) GP unit is connected to this system.**



- **If multiple PLCs are used, the GP screen's refresh speed may slow when any of the following conditions occur.**
  - **When a single GP screen is used to monitor many PLCs.**
  - **When a single GP screen's Part or Tag address settings are not consecutive.**

  To keep the GP's screen refresh speed as high as possible, the following points are recommended.
  - **Do not monitor more than three (3) PLCs on one GP screen.**
  - **Try to keep each screen's Part items and Tag address settings consecutive.**

2.13.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by GE Fanuc Automation may differ, however, using these cables for your PLC operations will not cause any problems.

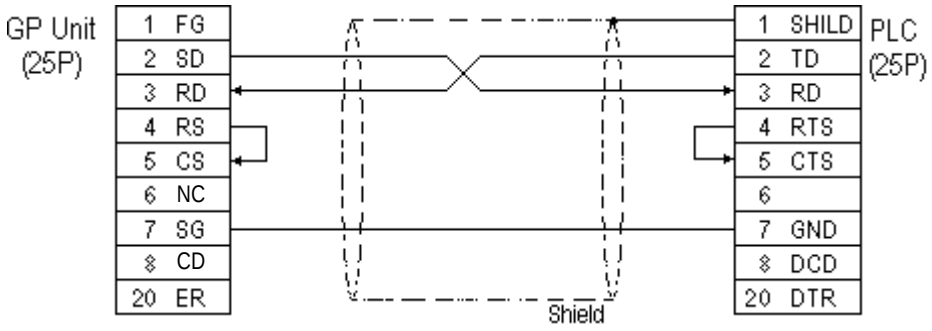
Careful!

- *Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.*

Important

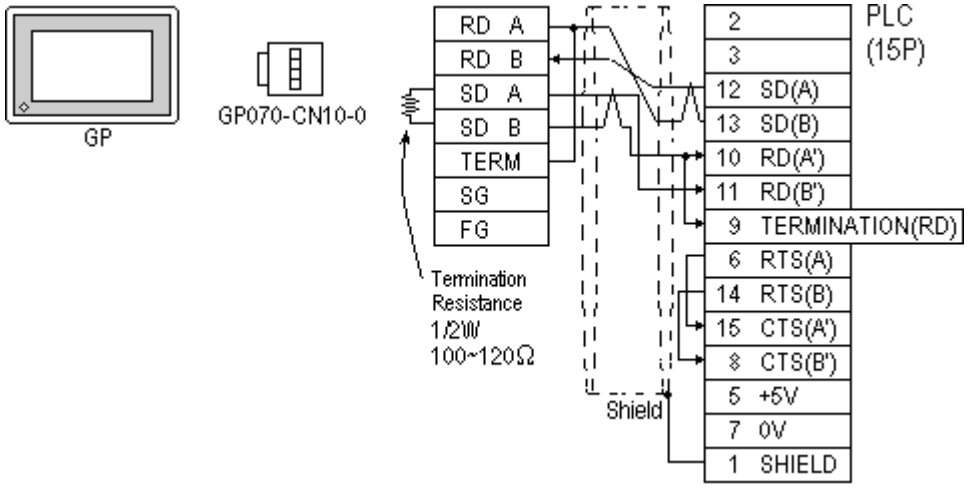
- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***Different PLC manuals will write their RS-422 connection drawings (i.e. RD (A), RD (B), SD (A), and SD (B)) differently. Thus, be sure to refer to your specific PLC's manual for this information. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)

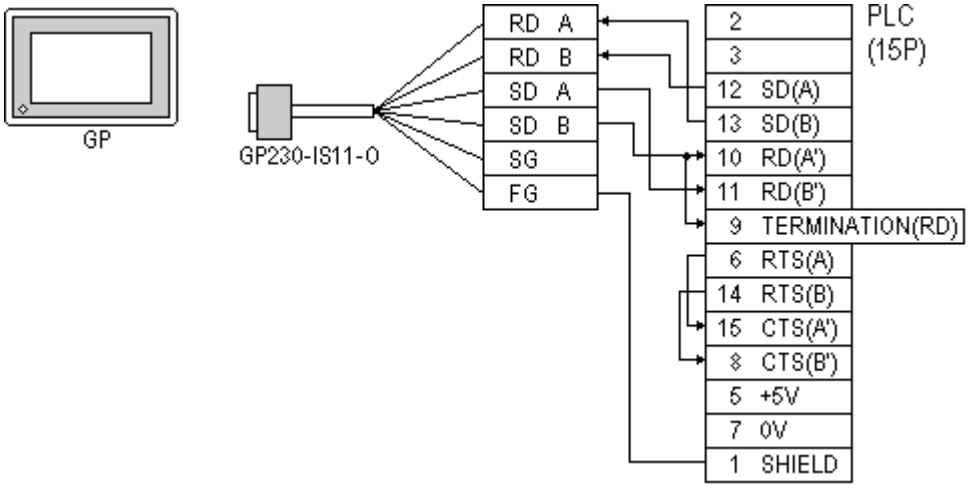


Cable Diagram 2 (RS-422)

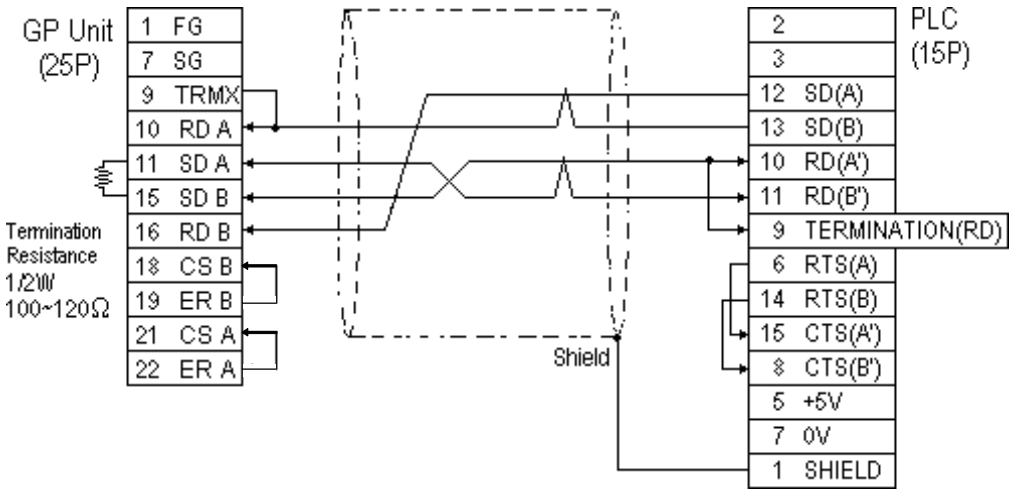
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



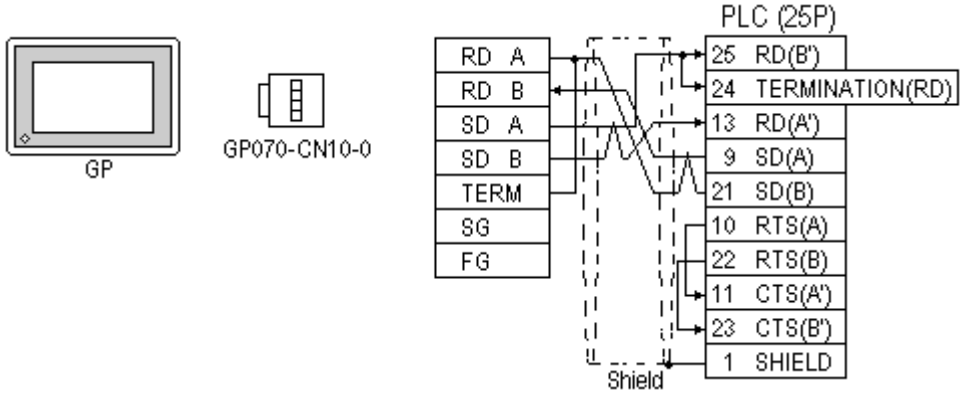
• When making your own cable connections



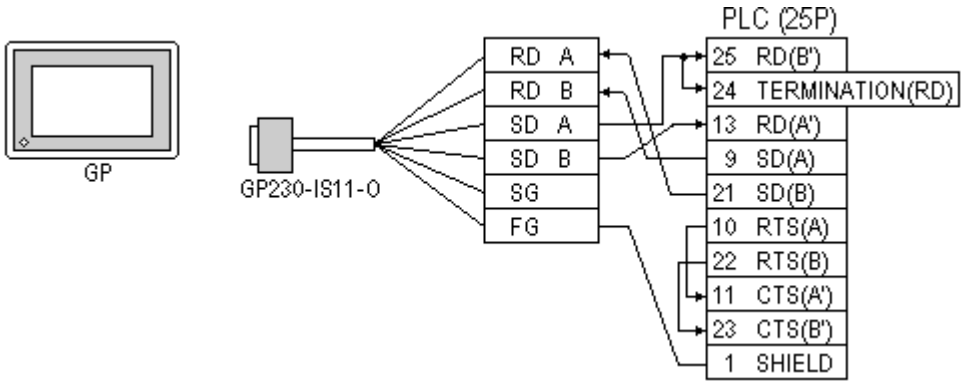
Note:
- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **When using RS-422 connection, please check the cable length with GE Fanuc Automation PLC's users manual.**

Cable Diagram 3 (RS-422)

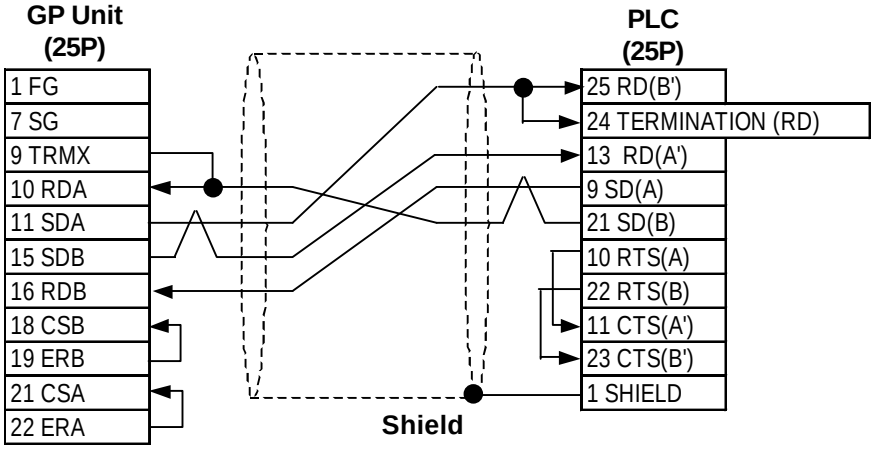
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



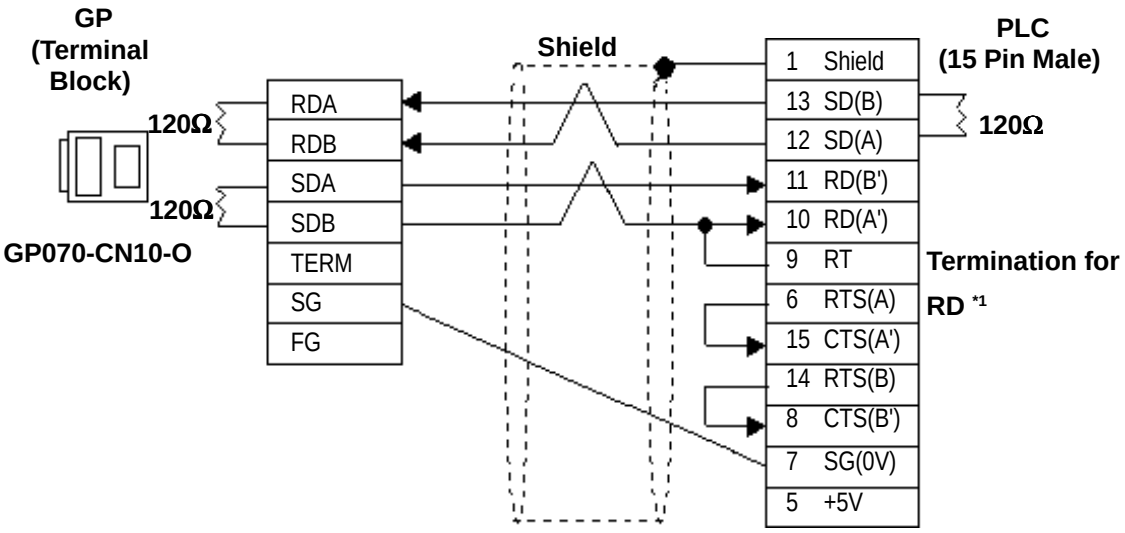
• When making your own cable connections



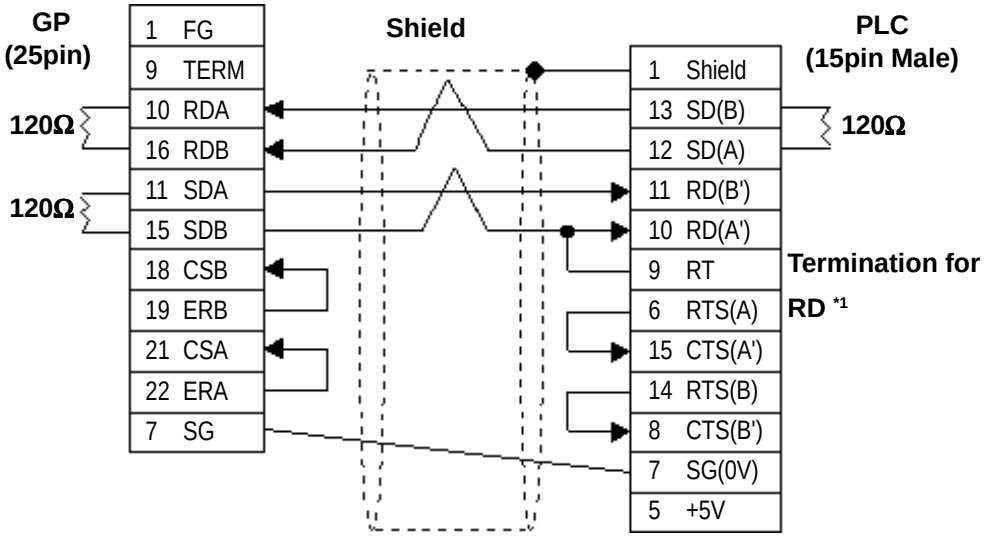
Note:
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **When using RS-422 connection, please check the cable length with GE Fanuc Automation PLC's users manual.**

Cable Diagram 4 (1:1) (RS-422)

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When making your own cable



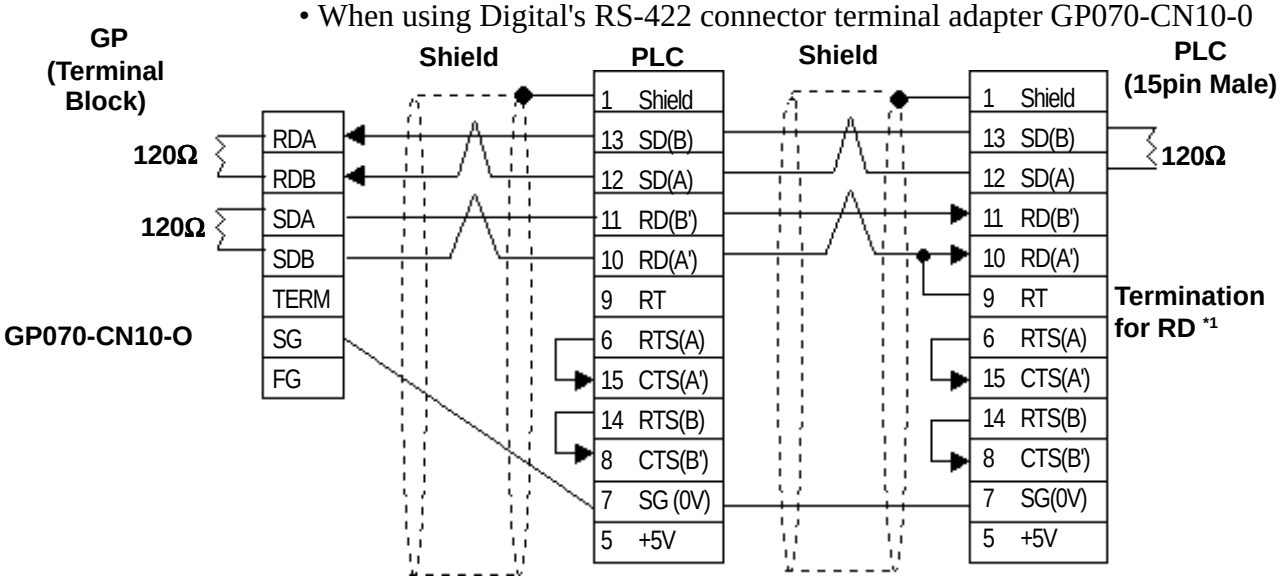
**1 When connecting #9 and #10 pins in the GP Serial I/F, a termination resistance of 120Ω is added between RD-(A') and RD-(B'). When using CPU731 and CPU771, a termination resistance of 120Ω is added between RD-(A') and RD-(B') connecting #9 and #11 pins.*

Important

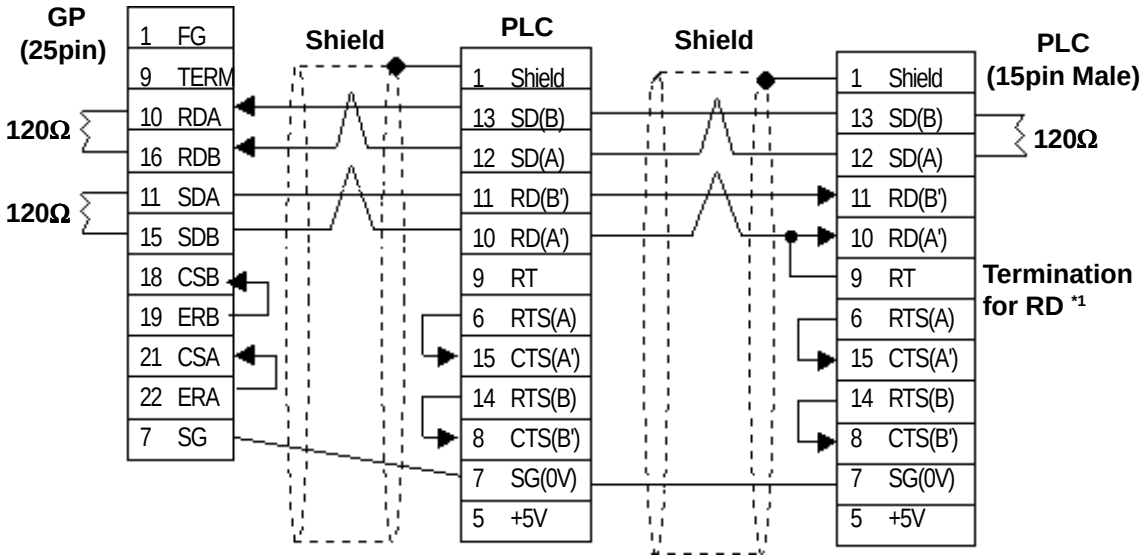
- ***Ground your Controller's FG terminal according to your country's applicable standard. For details, refer to the corresponding Controller's manual.***
- ***When connecting a cable's Shield line to an FG terminal, consider the needs of your system when deciding which side of the cable (GP or Controller) to connect. (The example below connects to the Controller's FG terminal.)***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***The cable length must be 600 meters or less.***

Cable Diagram 5 (1:n) (RS-422)

• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When making your own cable



**1 When connecting #9 and #10 pins in the GP Serial I/F, a termination resistance of 120Ω is added between RD-(A') and RD-(B'). When using CPU731 and CPU771, a termination resistance of 120Ω is added between RD-(A') and RD-(B') connecting #9 and #11 pins.*

Important

- ***Ground your Controller's FG terminal according to your country's applicable standard. For details, refer to the corresponding Controller's manual.***
- ***When connecting a cable's Shield line to an FG terminal, consider the needs of your system when deciding which side of the cable (GP or Controller) to connect. (The example below connects to the Controller's FG terminal.)***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***The cable length must be 600 meters or less.***

2.13.3 Supported Devices

The following tables describe the range of devices supported by the GP.

■ Series 90-70/90-30 (SNP-X protocol)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay (I)	I0001 ~ I12288	I00001 ~ I12273	÷16+1	L/H
Output Relay (Q)	Q00001 ~ Q12288	Q0001 ~ Q12273	÷16+1	
Internal Relay (M)	M00001 ~ M12288	M0001 ~ M12273	÷16+1	
Global Relay (G)	G0001 ~ G7680	G0001 ~ G7665	÷16+1	
Momentary Relay (T)	T001 ~ T256	T001 ~ T241	÷16+1	
System Function Relay (SA)	SA001 ~ SA128	SA001 ~ SA113	÷16+1	
System Function Relay (SB)	SB001 ~ SB128	SB001 ~ SB113	÷16+1	
System Function Relay (SC)	SC001 ~ SC128	SC001 ~ SC113	÷16+1	
System Function Relay (S)	S001 ~ S128	S001 ~ S113	÷16+1 *1	
Register (R)	---	R00001 ~ R32640	Bit 15	
Analog Input (AI)	---	AI0001 ~ AI32640	Bit 15	
Analog Output (AQ)	---	AQ0001 ~ AQ32640	Bit 15	

**1 Data cannot be written to this relay. If data is written, a host communication error (02:0F:03) will be displayed.*

Important ***Depending on the CPU used, the devices address ranges may differ.***

■ GE Fanuc 90-30/90-70 (SNP protocol)

Setup System Area here.

Device	Bit Address	Word Address	Comments	
Input Relay (I)	I00001 ~ I12288	I00001 ~ I12273	Same as word address value divided by 2, then plus 1	L/H
Output Relay (Q)	Q00001 ~ Q12288	Q00001 ~ Q12273	Same as word address value divided by 2, then plus 1	
Idnternal Relay (M)	M00001 ~ M12288	M00001 ~ M12273	Same as word address value divided by 2, then plus 1	
Global Relay (G)	G0001 ~ G7680	G0001 ~ G7665	Same as word address value divided by 2, then plus 1	
Temporary Relay (T)	T001 ~ T256	T001 ~ T241	Same as word address value divided by 2, then plus 1	
System Status Relay (SA)	SA001 ~ SA128	SA001 ~ SA113	Same as word address value divided by 2, then plus 1	
System Status Relay (SB)	SB001 ~ SB128	SB001 ~ SB113	Same as word address value divided by 2, then plus 1	
System Status Relay (SC)	SC001 ~ SC128	SC001 ~ SC113	Same as word address value divided by 2, then plus 1	
System Status Relay (S)	S001 ~ S128	S001 ~ S113	Same as word address value divided by 2, then plus 1[*1]	
Register (R)	---------	R00001 ~ R01024	Bit 15	
	---------	R01025 ~ R02048		
	---------	R02049 ~ R03072		
	---------	R03073 ~ R04096		
	---------	R04097 ~ R05120		
	---------	R05121 ~ R06144		
	---------	R06145 ~ R07168		
	---------	R07169 ~ R08192		
	---------	R08193 ~ R09216		
	---------	R09217 ~ R10240		
	---------	R10241 ~ R11264		
	---------	R11265 ~ R12288		
	---------	R12289 ~ R13312		
	---------	R13313 ~ R14336		
	---------	R14337 ~ R15360		
	---------	R15361 ~ R16384		
	---------	R16385 ~ R17408		
	---------	R17409 ~ R18432		
	---------	R18433 ~ R19456		
	---------	R19457 ~ R20480		
	---------	R20481 ~ R21504		
	---------	R21505 ~ R22528		
	---------	R22529 ~ R23552		
	---------	R23553 ~ R24576		
	---------	R24577 ~ R25600		
	---------	R25601 ~ R26624		
	---------	R26625 ~ R27648		
	---------	R27649 ~ R28672		
	---------	R28673 ~ R29696		
	---------	R29697 ~ R30720		
	---------	R30721 ~ R31744		
	---------	R31745 ~ R32768		

Device	Bit Address	Word Address	Comments	
Analog Input (AI)	---------	AI0001 ~ AI1024	Bit 15	L/H
	---------	AI1025 ~ AI2048		
	---------	AI2049 ~ AI3072		
	---------	AI3073 ~ AI4096		
	---------	AI4097 ~ AI5120		
	---------	AI5121 ~ AI6144		
	---------	AI6145 ~ AI7168		
	---------	AI7169 ~ AI8192		
	---------	AI8193 ~ AI9216		
	---------	AI9217 ~ AI10240		
	---------	AI10241 ~ AI11264		
	---------	AI11265 ~ AI12288		
	---------	AI12289 ~ AI13312		
	---------	AI13313 ~ AI14336		
	---------	AI14337 ~ AI15360		
	---------	AI15361 ~ AI16384		
	---------	AI16385 ~ AI17408		
	---------	AI17409 ~ AI18432		
	---------	AI18433 ~ AI19456		
	---------	AI19457 ~ AI20480		
	---------	AI20481 ~ AI21504		
	---------	AI21505 ~ AI22528		
	---------	AI22529 ~ AI23552		
	---------	AI23553 ~ AI24576		
	---------	AI24577 ~ AI25600		
	---------	AI25601 ~ AI26624		
	---------	AI27649 ~ AI28672		
	---------	AI28673 ~ AI29696		
	---------	AI29697 ~ AI30720		
	---------	AI30721 ~ AI31744		
	---------	AI31745 ~ AI32768		
Analog Output (AQ)	---------	AQ0001 ~ AQ1024	Bit 15	
	---------	AQ1025 ~ AQ2048		
	---------	AQ2049 ~ AQI3072		
	---------	AQ3073 ~ AQ4096		
	---------	AQ4097 ~ AQ5120		
	---------	AQ5121 ~ AQ6144		
	---------	AQ6145 ~ AQ7168		
	---------	AQ7169 ~ AQ8192		
	---------	AQ8193 ~ AQ9216		
	---------	AQ9217 ~ AQ10240		
	---------	AQ10241 ~ AQ11264		
	---------	AQ11265 ~ AQ12288		
	---------	AQ12289 ~ AQ13312		
	---------	AQ13313 ~ AQ14336		
	---------	AQ14337 ~ AQ15360		
	---------	AQ15361 ~ AQ16384		
	---------	AQ16385 ~ AQ17408		
	---------	AQ17409 ~ AQ18432		
	---------	AQ18433 ~ AQ19456		
	---------	AQ19457 ~ AQ20480		

Device	Bit Address	Word Address	Comments	
Analog Output (AQ)	---------	AQ20481 ~ AQ21504	Bit[15]	L/H
	---------	AQ21505 ~ AQ22528		
	---------	AQ22529 ~ AQ23552		
	---------	AQ23553 ~ AQ24576		
	---------	AQ26625 ~ AQ27648		
	---------	AQ27649 ~ AQ28672		
	---------	AQ28673 ~ AQ29696		
	---------	AQ29697 ~ AQ30720		
	---------	AQ30721 ~ AQ31744		
	---------	AQ31745 ~ AQ32768		

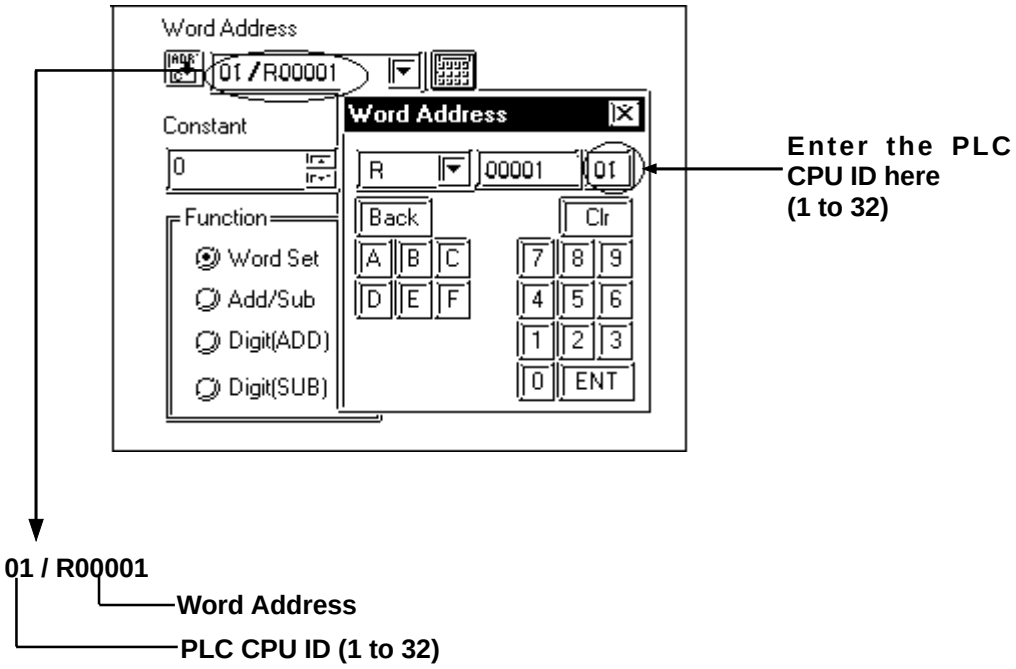
Depending on the CPU used, the devices address ranges may differ.

Important

- ***If bit write is performed using the bit designation feature in any of these Bit 15 devices, all bits except the designated bit will turn to "0".***
- ***The range of each device's address will vary depending on the CPU type.***

Note:

- **When setting up Tags and Parts in GP-PRO/PBIII for Windows, the PLC CPU ID number can also be designated. If a CPU ID number is not specified, the previously entered CPU ID number is automaticalluy used. (The default value is "01".)**



<Driver Usage Restriction>

- **When using 1:n connection, the R, AI and AQ devices data areas are each 1024 words on your GP application. You cannot extend over more than one data "block" when performing the following features. Be sure to set these features' settings so they are within one data block.**
  - **System Area Settings**
  - **"a-tag " settings**
  - **Performing Block read/write using the 2-Way feature**

  Ex) You cannot set a 20 word-data block starting from R1020.
- **When setting a PLC's CPU ID, be sure to use a number from "1" to "32" as the CPU ID so that the selected number is used as the PLC's unit number.**

2.13.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ Series 90-30 (SNP-X protocol, using Link I/F)

GP Setup		SIO Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	Data Bit	8 bits (fixed)
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	RS-232C	Communication Format	RS-232C *1
---		MODE	SNP ONLY
Unit No.	0 (fixed)	Station Number	0 (fixed)

■ Series 90-30 (SNP-X protocol, CPU Direct Connection *2)

GP Setup		Communication Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	Data Bit	8 bits (fixed)
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	4-wire type	---	
Unit No.	0 (fixed)	Station Number	0 (fixed)

**1 Only when connecting to Port 2. This setting is not used for Port 1.*

**2 This must be set through either the ladder logic, or from the programming console unit.*

■ Series 90-70 (SNP-X protocol)

GP Setup		Communication Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	Data Bit	8 bits (fixed)
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
Communication Format (RS-422)	4-wire type	Communication Format (RS-422)	RS-422/485
---		MODE	SNP ONLY
Unit No.	0 (fixed)	Station Number	0 (fixed)

■ Series 90-30/90-70 (SNP protocol)

GP		PLC	
Transmission speed	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	Data Length	8 bits (fixed)
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER)(fixed)	---	---
Communication Format	4-wire type (fixed)	---	---
Unit No.	1	CPU ID *1	1

**1 Setting Method: when setting a PLC's CPU ID, be sure to use a number from "1" to "32" as the CPU ID so that the selected number is used as the PLC's unit number.*


MEMO

2.14 Fanuc Motion Controller

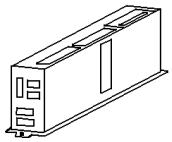
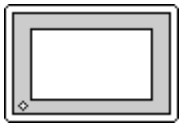
2.14.1 System Structure

The following describes the system structure for connecting the GP to Fanuc Motion Controller PLCs.

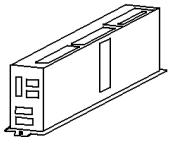
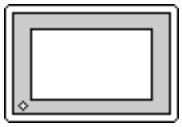
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.14.2 Cable Diagrams**".*

Important ***Be sure to inform the Fanuc Corporation clearly that the system will be connected with GP series unit(s).***

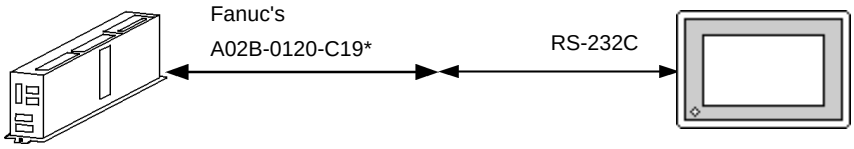
■ FANUC Power Mate Series

CPU	Cable Diagram	GP
		
Power Mate -MODEL D	RS-422 (Cable Diagram 1)	GP Series

■ FANUC Series

CPU	Cable Diagram	Cables	GP
			
16-MC *1	RS-232C (Cable Diagram 2)	Digital's GP410-IS00-O(5m)	

**1 When connecting to 16-MC, Fanuc's converting cable A02B-0120-C19 is needed to connect a D-Sub connector (20pins) and a D-Sub connector (25pins).*



Important ***The 16-MC unit can be connected only to serial port 2 (JD5B). It cannot be connected to serial port 1 (JD5A).***

2.14.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by GE Fanuc Automation may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1 (RS-422)

Careful!

- *Connect a Termination Unit to the Motion Controller's JD15. The Termination Unit, with a resistance of 100Ω is connected to the* RD B *and* RD A *points.*

Motion Controller
JD15

1 RD B — Termination Resistance
2 RD A — 1/2W100Ω

- *Ground your Motion Controller Unit's FG terminal. For details, refer to the Motion Controller manual.*
- *Ground the* Shield *to the* Cable Clamp*.*
- *If a communications cable is used, it must be connected to the SG (signal ground).*

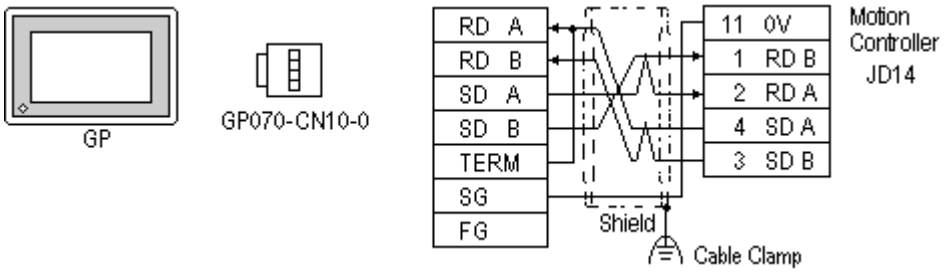
Important

When using RS-422 connection, check the cable length with Fanuc Motion Controller PLC's users manual.

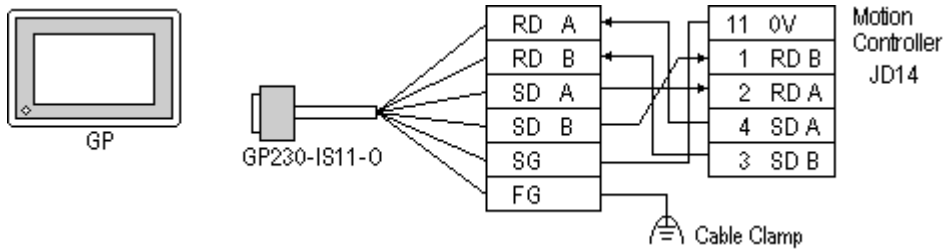
Note:

- **Recommended Cable: Oki Densen's A66L-0001-0284#10P**
- **Recommended Connector: Honda Tsushin Kogyo's PCR-E20FS**
- **Recommended Connector Case: Honda Tsushin Kogyo's PCR-V20LA**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

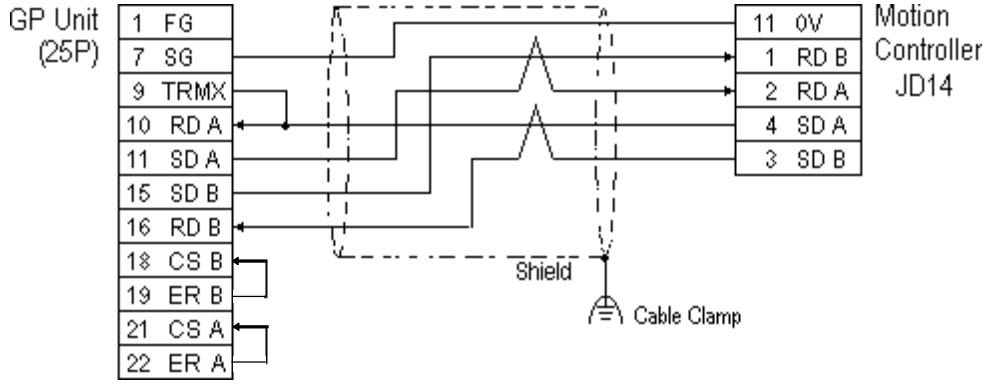
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



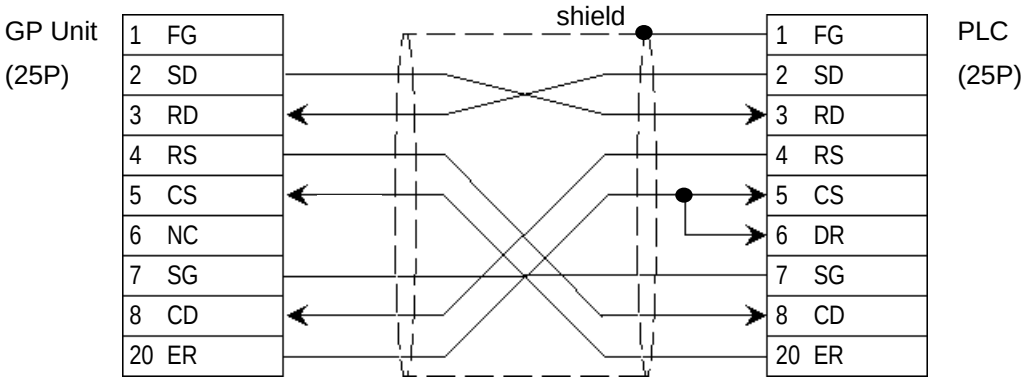
• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections



Cable Diagram 2 (RS-232C)



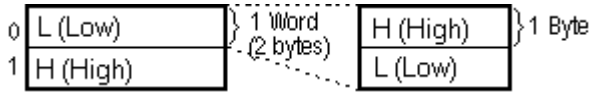
2.14.3 Supported Devices

The following describes the range of devices supported by the GP.

■ FANUC Power Mate Series [ ] Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay (X)	X000000 ~ X001277 X010000 ~ X010637	X00000 ~ X00126 X01000 ~ X01062	÷2	L/H
Output Relay (Y)	Y000000 ~ Y001277 Y010000 ~ Y010637	Y00000 ~ Y00126 Y01000 ~ Y01062	÷2	
Internal Relay (R)	R000000 ~ R009997	R00000 ~ R00998	÷2	
Keep Relay (K)	K00000 ~ K00197	K0000 ~ K0018	÷2	
Timer (T)	---	T0000 ~ T0078	÷2	
Counter (C)	---	C0000 ~ C0078	÷2	
Data Table (D)	---	D0000 ~ D01858	÷2 Bit 7	

- **The address' High/Low relationship is as follows:**



- **When entering the *Input Relay*, *Output Relay*, *Internal Relay*, and *Data Table*, enter a 0, after each letter (X,Y,R,D). (The values in the table above already have a 0 added.)**

  E.g. X0 0120; Y0 01000

- **A PLC Communication Error develops when an address outside the range is entered.**

  E.g. HOST COMMUNICATION ERROR (02 : 0F : * *)

* *	Meaning	Solution
04	The entered address does not exist.	Check the range of available Motion Controller addresses, and setup all addresses within this range.
05	The entered data length is incorrect.	

Input Bit Address data using Decimal/Octal.

Careful!

E.g. **K0063 7**

Decimal ┘ └ Octal

2.14.4 Environment Setup

The following lists Digital's recommended Motion Controller and GP communication settings.

■ FANUC Power Mate Series

GP Setup		Motion Controller JD14 Setup
Baud Rate	19200 bps (fixed)	---
Data Length	8 bits (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Even (fixed)	---
Data Flow Control	ER Control (fixed)	---
Communication Format	4-wire type (fixed)	---
Unit. No.	0 (fixed)	---

■ FANUC Series

GP Setup		JD5P Setup
Baud Rate	19200bps(fixed)	----------
Data Length	8bits(fixed)	----------
Stop Bit	1bit(fixed)	----------
Parity Bit	Even(fixed)	----------
Data Flow Control	ER Control (fixed)	----------
Communication Format	RS232C	----------
Unit No.	0 (fixed)	----------


MEMO

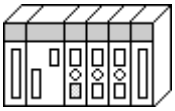
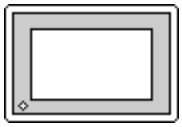
2.15 IDEC

2.15.1 System Structure

The following describes the system structure for connecting the GP to IDEC PLCs.

Reference *The* Cable Diagrams *mentioned in the following tables are listed in the section titled "**2.15.2 Cable Diagrams**".*

■ **FA Series** (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 Serial Interface Module			
PF3S-CP12, PF3S-CP13	PF3S-SIF2	RS-232C (Cable Diagram 1)	IDEC Corp.'s PF3S-KS1 *1	GP Series
	PF3S-SIF4	RS-422 (Cable Diagram 2)		

**1 Due to the size of its connector, this cable cannot be used for GP-270, GP-370, GP-377,GP-377R and GP-2300 series.*

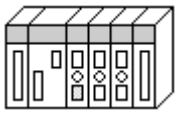
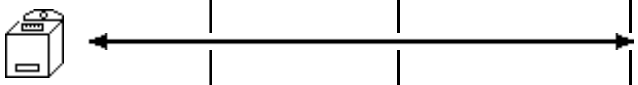
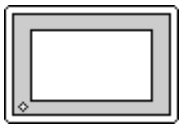
Note:

- **After powering up, it takes about 1 second to enter RUN mode when the *memory pack* capacity of the PF3S-SIF2(4) is 1K *step*, and it takes about 4 seconds when the memory pack capacity is 4K step. As a result, the GP Start Time setup needs to be set for these situations.**

  Reference *About the GP Start Time setup, refer to each GP Series User Manual, " System Environment Setup"*

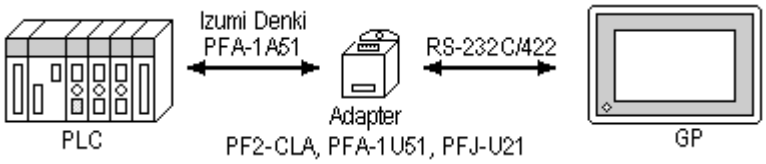
- **Wherever RS-422 appears, RS-485 can be substituted on the PLC.**

■ FA Series (CPU Direct Connection)

CPU *1	Adapter *2	Cable Diagram	Cables	GP
				
PF2-CPU1, PF2-CPU5M, PF2J-CPU1, PF3S-CP11, PF3S-CP12, PF3S-CP13	PF2-CLA PFA-1U51	RS-232C (Cable Diagram 3)	IDEC Corp.'s PFA-1A52 shaped computer cable *3	GP Series
	PFJ-U21	RS-422 (Cable Diagram 4)		

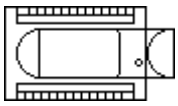
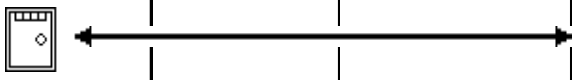
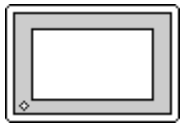
**1 Connect to the programming loader port.*

**2 It is necessary to connect the programming loader port and the adapter with Izumi PFA link cable PFA-1A51(30cm). Diagram below*



**3 Due to the size of its connector size, this cable cannot be used for GP-270, GP-370 ,GP-377 and GP-377R series.*

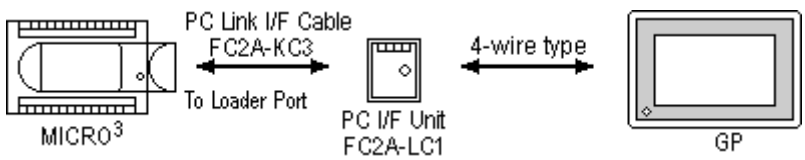
■ MICRO³ (CPU Direct Connection)

CPU	Adapter	Cable Diagram	Cables	GP
				
MICRO³			PC Link I/F cable *1 *2 FC2A-KC1	GP Series
	PC I/F Unit FC2A-LC1 *3	RS-422 (Cable Diagram 5)		

**1 Use Izumi exclusive PC interface cable as the communication cable.*

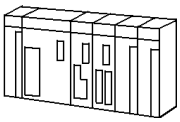
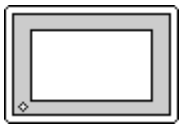
**2 When using the PC I/F cable FC2A-KC1, the GP side becomes RS-232C SIO.*

**3 Izumi PC Link I/F cable—FC2A-KC3—is necessary when connecting the PC I/F Unit—FC2A-LC1—and the PLC. Diagram below*



Note: **Places noted as RS-422 can also use RS-485 on the PLC side.**

■ MICROSmart FC4A Series (All-In-One Type)

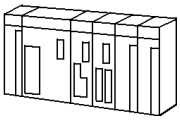
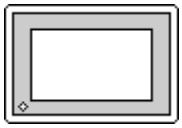
CPU	Link I/F	Cable Diagram	Cables	GP/GLC
				
FC4A-C10R2B FC4A-C16R2B FC4A-C24R2B	Port 1 on CPU module	RS-232C <Cable Diagram 6>	IDEC Corporation FC2A-KP1C (2.4m) *2 FC4A-KC2C (5m) *3	GP or GLC Series
	FC4A-PC1 (Mini DIN type) *1	RS-232C <Cable Diagram 7>		
	FC4A-PC3 (Terminal type) *1	RS-422 <Cable Diagram 8>		
	FC4A-PC2 (Mini DIN type) *1	RS-422 <Cable Diagram 9>	IDEC Corporation HG9Z-XC135	

**1 Connect to Port 2 Connector.*

**2 The connector for the GP unit must be created.*

**3 This cable has the connector for the GP unit.*

■ MICROSmart FC4A Series (Slim Type)

CPU	Link I/F	Cable Diagram	Cables	GP/GLC
				
FC4A-D20K3 FC4A-D20S3 FC4A-D20RK1 FC4A-D20RS1 FC4A-D40K3 FC4A-D40S3	Port 1 on CPU module	RS-232C <Cable Diagram 6>	IDEC Corporation FC2A-KP1C (2.4m) *2 FC4A-KP2C (5m) *3	GP or GLC Series
	FC4A-PC1 (Mini DIN type) *4	RS-232C <Cable Diagram 7>		
	FC4A-PC3 (Terminal type) *4	RS-422 <Cable Diagram 8>		
	FC4A-PC2 (Mini DIN type) *4	RS-422 <Cable Diagram 9>	IDEC Corporation HG9Z-XC135	
	FC4A-HPC1 (Mini DIN Type) *1	RS-232C <Cable Diagram 7>	IDEC Corporation FC2A-KP1C (2.4 m) *2 FC4A-KP2C (5 m) *3	
	FC4A-HPC2 (Terminal Type) *1	RS-422 <Cable Diagram 8>		
	FC4A-HPC3 (Mini DIN Type) *1	RS-422 <Cable Diagram 9>	IDEC Corporation HG9Z-XC135	

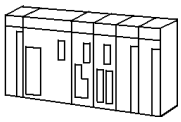
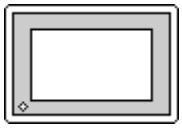
**1. Connect to Port 2 Connector.*

**2. The connector for the GP unit must be created.*

**3. The connector for the GP unit will not need to be created.*

**4. The HMI base module (model FC4A-HPH1) is required.*

■OpenNet Controller FC3 Series

CPU	Link I/F	Cable Diagram	Cables	GP/GLC
				
FC3A-CP2K FC3A-CP2S	RS-232C Port 1 on CPU module	RS-232C <Cable Diagram 7>	IDEC Corporation HG9Z-XCM12 (2m) FC2A-KP1C (2.4m) *1 FC4A-KC2C (5m) *2	GP or GLC Series
	RS-232C Port 2 on CPU module			
	RS-485 Port on CPU module	RS-422 <Cable Diagram 10>		

**1 The connector for the GP unit must be created.*

**2 This cable has the connector for the GP unit.*

2.15.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by IDEC Corp. may differ; however, using these cables for your PLC operations will not cause any problems.

Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

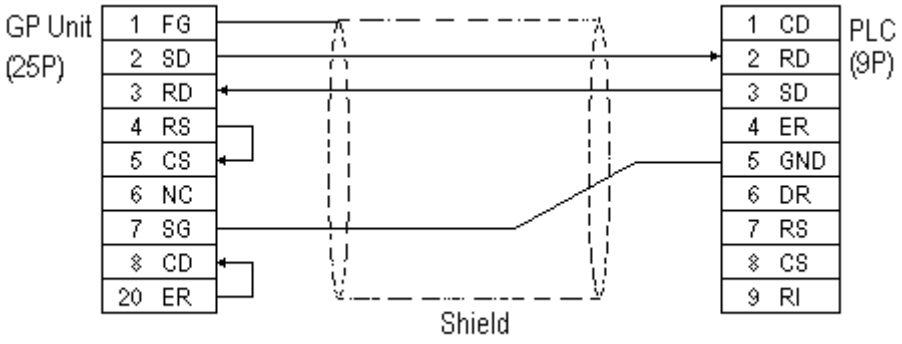
Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment settings. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)

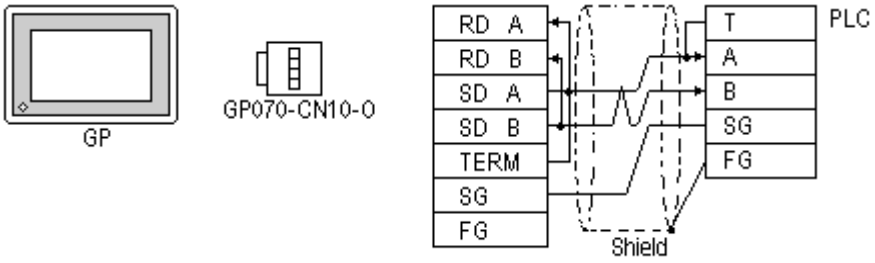
Important

- ***Be sure the RS-232C cable length is 15m or less.***

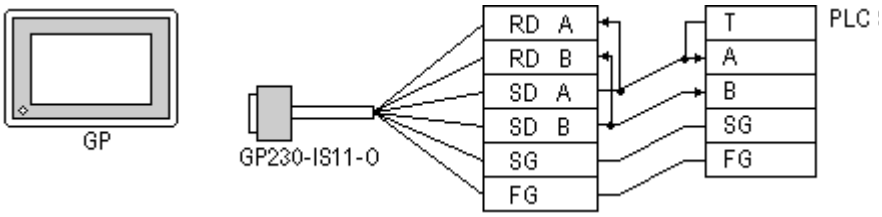


Cable Diagram 2 (RS-422)

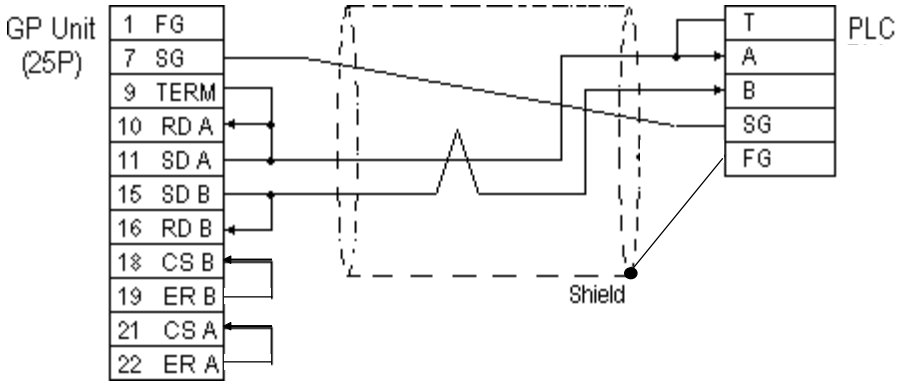
• When using Digital's RS-422 connector terminal adapter, GP070-CN



• When using Digital's RS-422 Cable, GP230-IS11-0



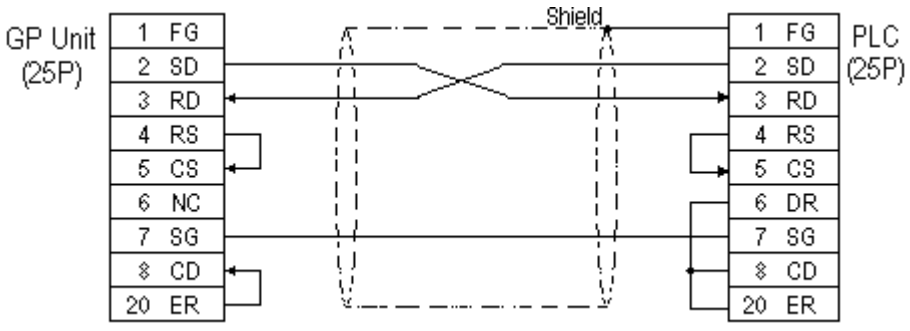
• When making your own cable connections



Note:

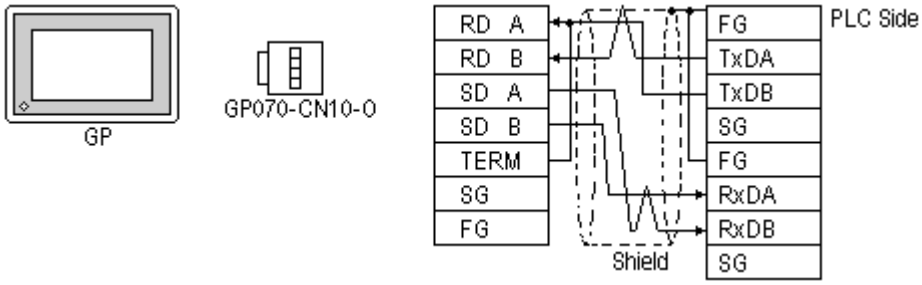
- **When making your own connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P*0.5SQ twist pair cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **For the RS-422 connection, refer to IDEC's PLC manual for the cable length.**

Cable Diagram 3 (RS-232C)

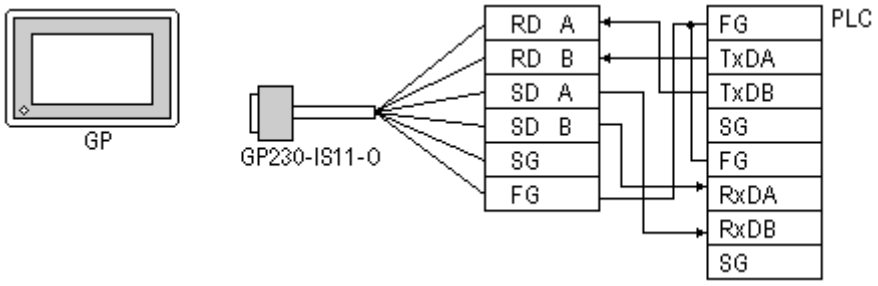


Cable Diagram 4 (RS-422)

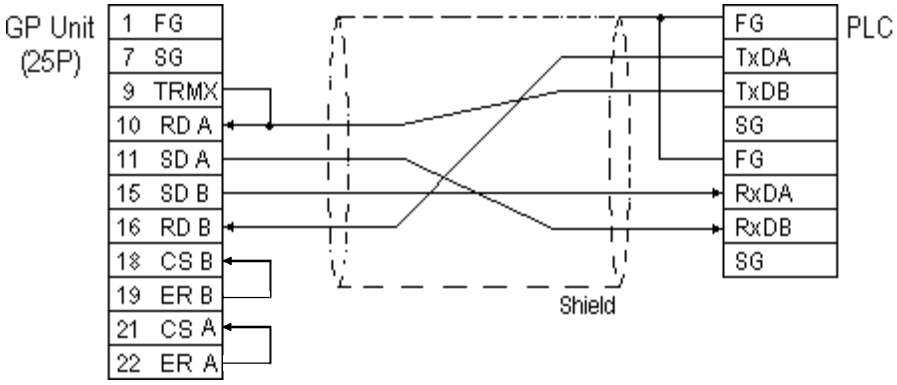
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections

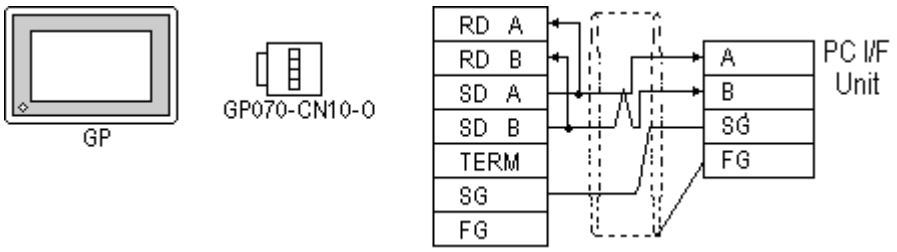


Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

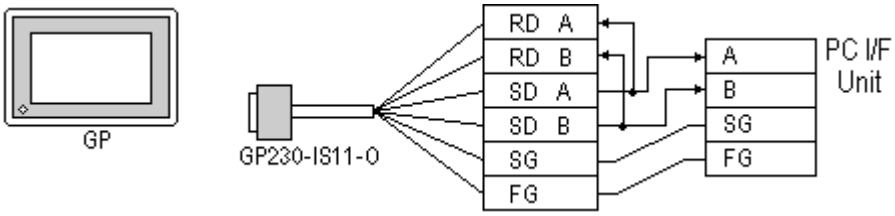
- **For the RS-422 connection, refer to IDEC's PLC manual for the cable length.**

Cable Diagram 5 (RS-422)

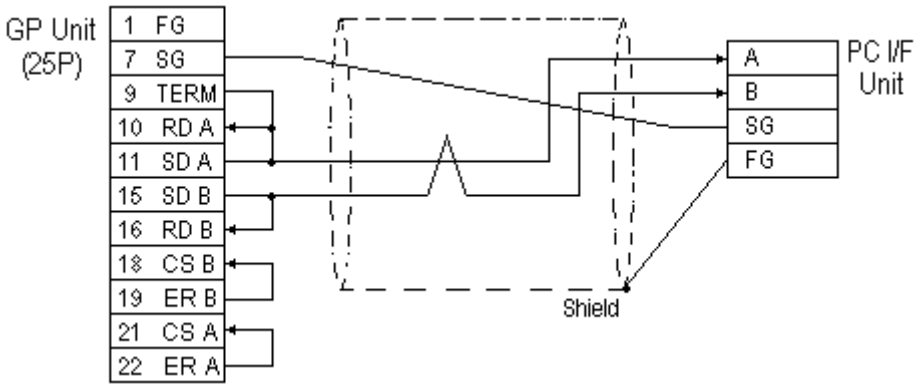
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections



Note:

- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **For the RS-422 connection, refer to IDEC's PLC manual for the cable length.**

Cable Diagram 6 (RS-232C)

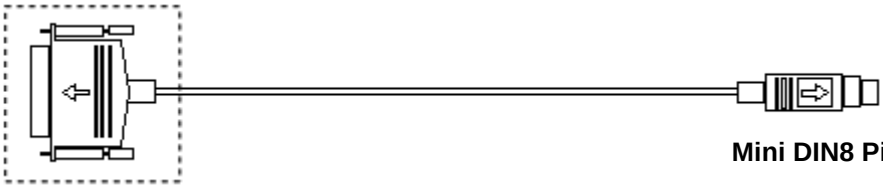
Important

- ***For RS-232C communication format, use IDEC Corporation Communication Cable.***
- ***When connecting the cable more than 5m, use RS-422 communication format.***

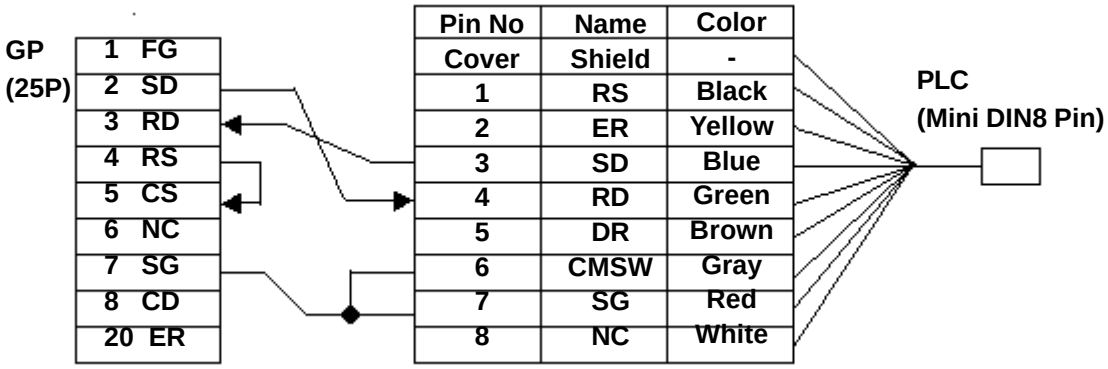
Reference *Cable Diagram 8.*

• Using IDEC Corporation Communication Cable (model:FC2A-KP1C)>

The GP's Dsub 25-pin connector must be created by the user. Be sure to make your own cable as shown below.



Dsub25-pin Connector (male)



Cable Diagram 7 (RS-232C)

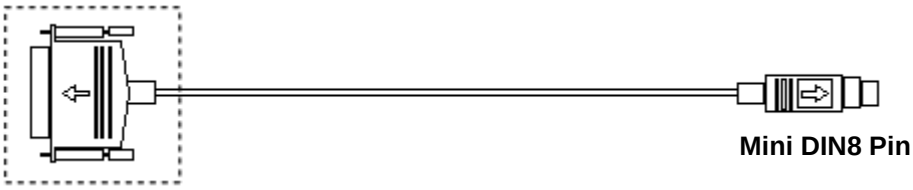
Important

- ***For RS-232C communication format, use IDEC Corporation Communication Cable.***
- ***When connecting the cable more than 5m, use RS-422 communication format.***

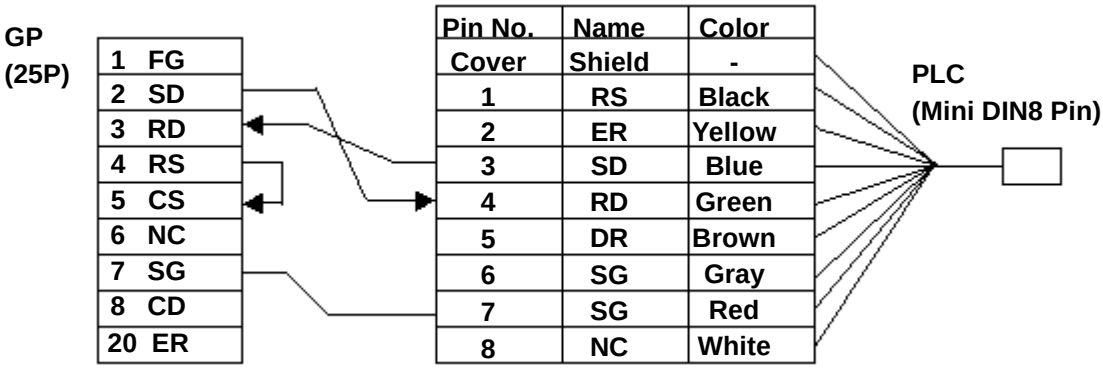
Reference *Cable Diagram 8 for MICROSmart FC4A Series, or Cable Diagram 10 for OpenNet Controller FC3 Series.*

• Using IDEC Corporation Communication Cable (model:FC2A-KP1C)

The GP's Dsub 25-pin connector must be created by the user. Be sure to make your own cable as shown below.



Dsub25-pin Connector (male)



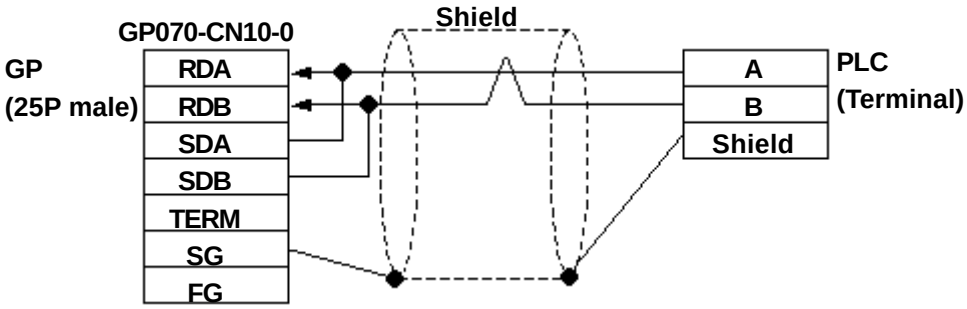
Cable Diagram 8 (RS-422, 2-wire type)

Important

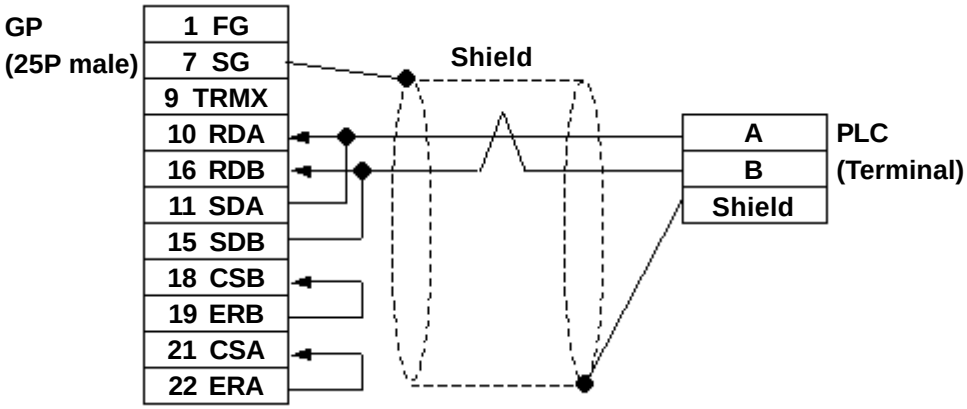
- ***Use the following cable for the MICROSmart RS-485 Communication Board FC4A-PC3 (Terminal type):***

  Coaxial Twisted pair wire
- ***All RS-422 cables should be no more than 200 meters long.***
- ***When using RS-422 communication format, be sure not to connect the termination resistance. If you do, the GP will not work properly.***

• Using Pro-face RS-422 connector terminal adaptor GP070-CN10-0



• When making your own cables

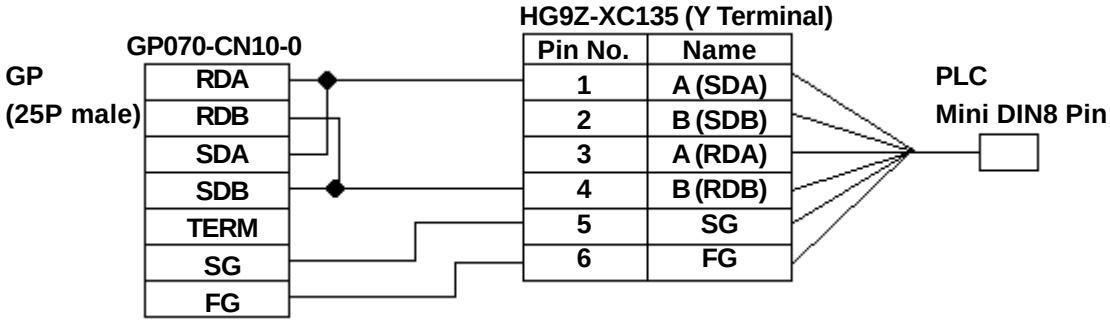


Cable Diagram 9 (RS-422, 2-wire type)

Important

- ***When using RS-422 communication format, be sure not to connect the termination resistance. If you do, the GP will not work properly.***

• Using IDEC Corporation cable HG9Z-XC135



Note:

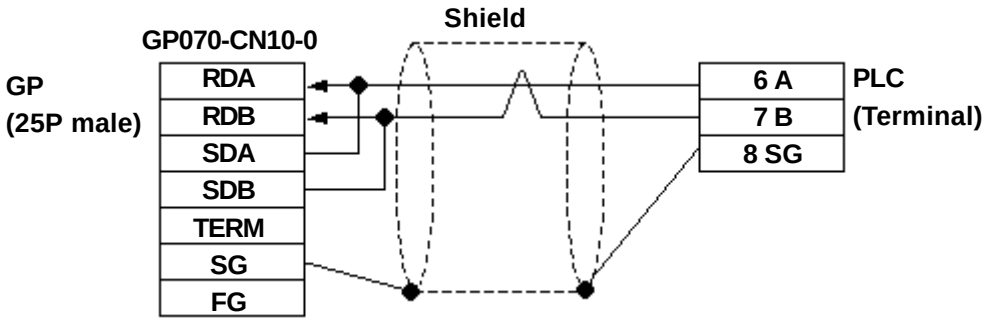
- **The PLC side connector's No. 1 and No. 3 pins, and No. 2 and No. 4 pins, respectively, are connected internally.**
- **Since the HG9Z-XC135 cable's No. 2 and No. 3 terminals cannot be used, be sure to wrap them with insulating tape.**

Cable Diagram 10 (RS-422, 2-wire type)

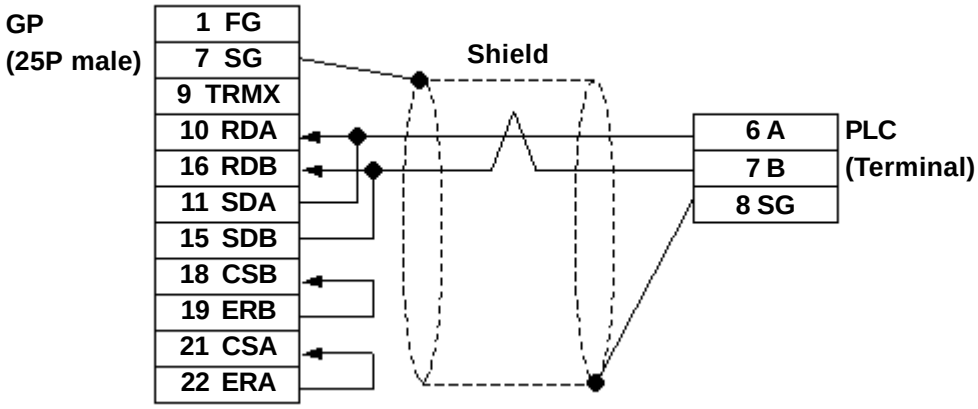
Important

- ***Recommended cable for OpenNet Controller RS-485 Port: Twisted pair wire with f 0.9 Shield***
- ***All RS-422 cables should be no more than 200 meters long.***
- ***When using RS-422 communication format, be sure not to connect the termination resistance. If you do, the GP will not work properly.***

• Using Pro-face RS-422 connector terminal adaptor GP070-CN10-0



• When making your own cable



2.15.3 Supported Devices

The following describes the range of devices supported by the GP.

■ FA Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X637	WX00 ~ WX63	÷2	L/H
Output Relay	Y000 ~ Y637	WY000 ~ WY63	÷2	
Internal Relay	M000 ~ M2557	WM000 ~ WM255	÷2	
Shift Register	R000 ~ R223	WR000 ~ WR223	÷16	
Timer (contact)	T000 ~ T255	---	*1	
Timer 10msec (contact)	H000 ~ H079	---	*1	
Counter (contact)	C000 ~ C255	---	*1	
Timer (setup value)	---	TS000 ~ TS255		
Timer (current value)	---	T000 ~ T255	*1	
Timer 10msec (current value)	---	H000 ~ H079	*1	
Counter (setup value)	---	CS000 ~ CS255		
Counter (current value)	---	C000 ~ C255	*1	
Data Register	---	D0000 ~ D2989	Bit 15	
Control Register	---	D3000 ~ D3071	Bit 15	

**1 Cannot perform data write.*

Careful!

Enter Decimal Octal bit address input for the Input Relay, Output Relay, and the Internal Relay.

E.g. X63 7
- Octal
- Decimal

■ MICRO³

Setup System Area here.

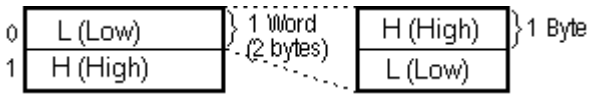
Device	Bit Address	Word Address	Particulars	
Input Relay	x00000 ~ x0037	X0000 ~ X0002	÷2	
Output Relay	y00000 ~ y0037	Y0000 ~ Y0002	÷2	
Internal Relay	m00000 ~ m0277	M0000 ~ M0026	÷2	
Shift Register	r0000 ~ r0063	R0000 ~ R0048	÷16	
Timer (contact)	T0000 ~ T0031	---	*1*2	
Counter (contact)	C0000 ~ C0031	---	*1*2	L/H
Timer (setup value)	---	T0000 ~ T0031	*2	
Timer (elapsed time)	---	t0000 ~ t0031	*2	
Counter (setup value)	---	C0000 ~ C0031	*2	
Counter (elapsed value)	---	c0000 ~ c0031	*2	
Data Register	---	D0000 ~ D0099	Bit 15	

**1 Cannot perform data write.*

**2 The combined total of timers and counters can be up to 32.*

Note:

- **The Input/Output Relay range depends on the basic unit's Input/Output number.**
- **The address' High/Low relationship is as follows:**



Careful!

Enter Decimal Octal bit address input for the Input Relay, Output Relay, and the Internal Relay.

E.g. m0002 7
- 7 → Octal
- m0002 → Decimal

■ MICROSmart FC4A Series

Setup System Area here

Device	Bit Address	Word Address	Other	
Input	X0000 ~ X0307	X000 ~ X030	÷2 *1	L/H
Output	Y0000 ~ Y0307	Y000 ~ Y030	÷2	
Internal Relay	M0000 ~ M1277	M000 ~ M126	÷2	
Special Internal Relay	M8000 ~ M8157	M800 ~ M814	÷2	
Shift Register	R0000 ~ R0127	R0000 ~ R0112	÷16	
Timer (contact value)	T0000 ~ T0099	————	*1 *2	
Counter (contact value)	C0000 ~ C0099	————	*1 *2	
Timer (setup value)	————	T0000 ~ T0099		
Timer (elapsed value)	————	t0000 ~ t0099		
Counter (setup value)	————	C0000 ~ C0099		
Counter (elapsed value)	————	c0000 ~ c0099		
Data Register	————	D0000 ~ D1299	Bit 15	
Special Data Register	————	D8000 ~ D8199	Bit 15	
Extended Data Register	————	D2000 ~ D7999	Bit 15 *4	
Enter Timer/Counter setup value	————	Q0 *3		—

**1 Data Write is not possible.*

**2 When writing to this device, the "Host Communication Error (02:FB)" will appear.*

**3 Q0 is a virtual device. This is the only device used to write Timer/Counter setup values to Non-volatile Memory. When data is written to this address, new Timer/Counter setup values are written to Non-volatile Memory. To prevent accidental deletion of data due to RAM Backup Battery recharge failure, be sure to write your data to Non-volatile Memory. However, when Non-volatile Memory is written to, the Ladder program's scan time is delayed. Be sure not to write to this device every time the Timer/Counter setup value is changed. Also, data cannot be read out from this device.*

**4 Depending on the CPU used, the devices address ranges may differ.*

■ OpenNet Controller FC3 Series

Setup System Area here

Device	Bit Address	Word Address	Other	
Input	X0000 ~ X0597	X000 ~ X058	÷2 *1	L/H
Output	Y0000 ~ Y0597	Y000 ~ Y058	÷2	
Internal Relay	M0000 ~ M2557	M000 ~ M254	÷2	
Special Internal Relay	M8000 ~ M8237	M800 ~ M822	÷2	
Shift Register	R0000 ~ R0255	R0000 ~ R0240	÷16	
Timer (contact value)	T0000 ~ T0255	————	*1 *2	
Counter (contact value)	C0000 ~ C0255	————	*1 *2	
Timer (setup value)	————	T0000 ~ T0255		
Timer(elapsed value)	————	t0000 ~ t0255		
Counter (setup value)	————	C0000 ~ C0255		
Counter (elapsed value)	————	c0000 ~ c0255		
Data Register	————	D0000 ~ D7999	Bit 15	
Special Data Register	————	D8000 ~ D8999	Bit 15	
Link Register	————	L0100 ~ L1317	Bit 15 *3	

**1 Data Write is not possible.*

**2 When writing to this device, the "Host Communication Error (02:FB)" will appear.*

2 **Link Register Device Restrictions*

In GP-PRO/PBIII for Windows, even though from 0 to 9 (Decimal) can be entered as the last digit of a word address, only 0 to 7 can be entered for a PLC address.

Also, even though addresses L0728 to L0999 can be entered, this range does not exist on the PLC, and therefore cannot be used.

Additionally, when entering tag settings, any of the following conditions may occur.

A) During Data Read

When a non-existing address is designated for a Tag, or when Read Out is performed from an area that includes a non-existing address, a Host Communication Error (02:06) will appear on the GP.

Ex) When an N-tag's word address is designated as L0108.

Or, when an S-tag's word address is designated as L0100, and the number of display characters is set to 20.

B) During Data Write

When a non-existing address is designated for a Tag, or when Block Write is performed for a block that exceeds 40 words, a Host Communication Error (02:06) will appear on the GP.

Ex) When an N-tag's word address is designated as L0108.

Or, when using the D-Script Memory Copy function, if the Word Address starts from L0100 and 41 copies are designated.

C) Using the Tag Multiple Copy Feature

When creating multiple copies of a Tag, after the copying is finished, be sure to check that all the Tag addresses created can actually be used.

Ex) When an L-Tag's initial word address is designated as L0100 and the copy setting is 10, addresses L0100 to L0109 will be used. In this case, L0108 and L0109 will be out of the available (Base 8) range.

Reference *For the available range of Link Register Addresses and detailed information, refer to the IDEC Corporation's "OpenNet Controller FC3 Series Instruction Manual".*

2.15.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ FA Series (using Serial Interface Module)

GP Setup		Serial Interface Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	2-wire type	---	
Unit No.	0	Device Number	0

■ FA Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-2422)	4-wire type	---	
Unit. No.	0	Device Number	0

■ MICRO^3

GP Setup		Loader Port Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (when using PC I/F Unit FC2A-KC1)	RS-232C	---	
Communication Format (RS-422)	2-wire type	---	
Unit No.	0	Device Number	0

Note: **The PLC setup above is the same as the Basic setup mode. When connected to the GP or Loader, communication is available in Basic setup mode (condition when the Mode Change Input Number terminal is OFF). To change the communication setup, use Option setup mode (condition when the Mode Change Input Number terminal is ON).**

■ MICROSmart FC4A Series

GP/GLC Settings		PLC Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	---
Communication Format (RS-232C)	RS-232C	---	---
Communication Format (RS-485)	2-wire type	---	---
Unit No.	0	Device No.	0
---	---	Port Communication Type	Maintenance Communication
---	---	Communication Switchover Input	No

■ OpenNet Controller FC3 Series

GP/GLC Settings		PLC Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-485)	2-wire type	---	
Unit No.	0	Device No. DIP-SW4 ~ 8	0
---	---	RS-485 Communication Mode DIP-SW1	OFF (Maintenance)
		RS-232C Port 1Communication Mode DIP-SW2	OFF (Maintenance)
		RS-232C Port 2 Communication Mode DIP-SW3	OFF (Maintenance)
---	---	Communication Switchover Input	No

◆Monitor Register

When using OpenNet Controller FC3 Series, the Monitor Register feature can be set. Using this function, Block reads of discrete addresses (maximum of 40 words) can be made. This function can also be used, when using the Multi Port Communication or connecting your PC. Be sure to set the Monitor Register feature from the SETUP OPERATION SURROUNDINGS MENU in the GP OFFLINE mode or from [GP SETUP] -> [MODE SETTINGS] in the GP Screen Editor (GP-PRO/PBIII for Windows).

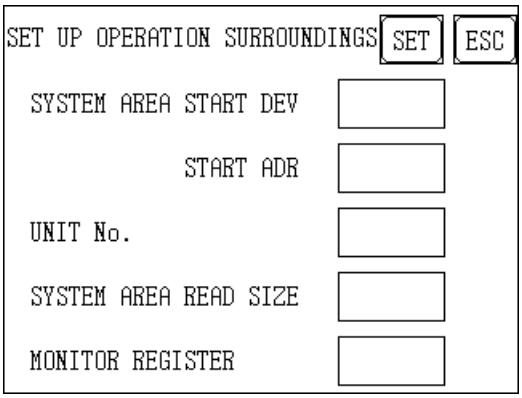
Reference Refer to each GP User Manual, OFFLINE MODE.

Note:
- **The Monitor Register feature cannot be used on MICROSmart FC4A Series. Be sure to set the Monitor Register setting to "No". If the MONITOR SETTING feature is set to "Yes", a "Host Communication Error (02:03)" will appeare.**

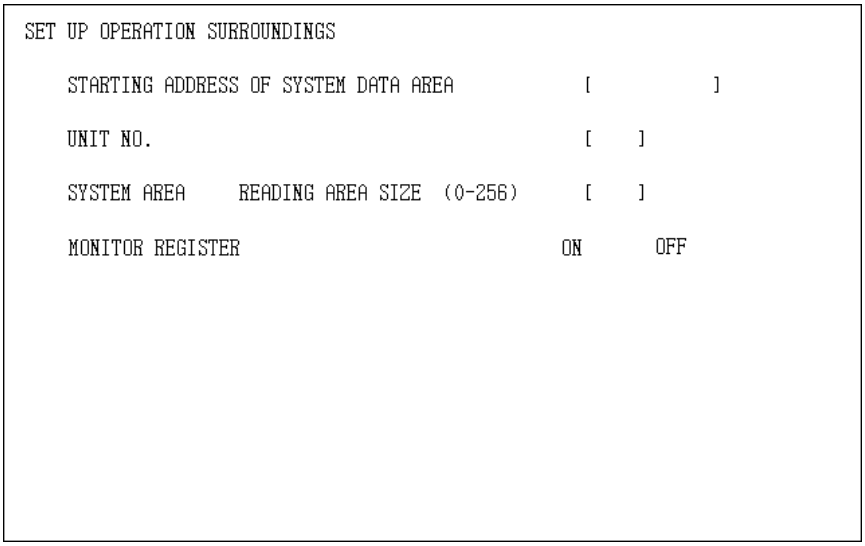
  Reference *Refer to this manual, 2.15.4 Error Codes.*

- **Default setting is "No".**
- **Depending on whether you are using a GP or a GLC series unit, the OFFLINE mode's SETUP OPERATION SURROUNDING MENU, the menu that appears may differ. Setup the Monitor Register area as shown below.**

<GP-H70/ GP-270/GP-370/GLC-100 Series>

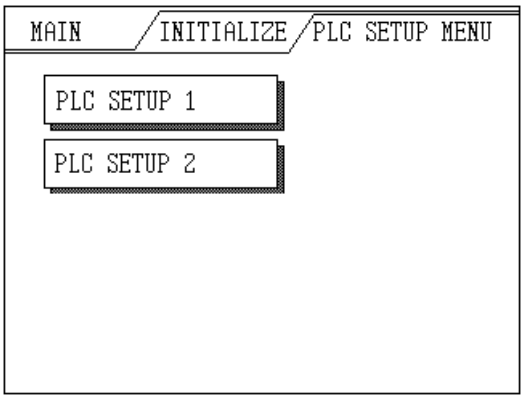


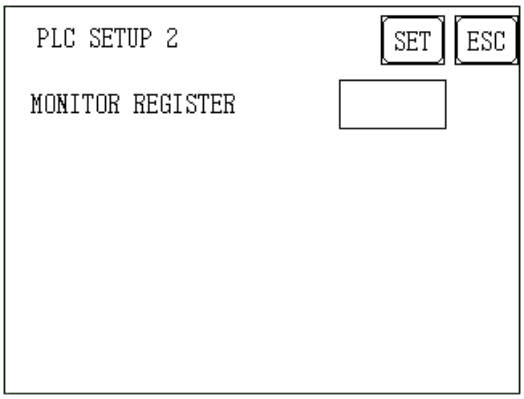
<GP-470/GP-570/GP-675/GP-870 Series>



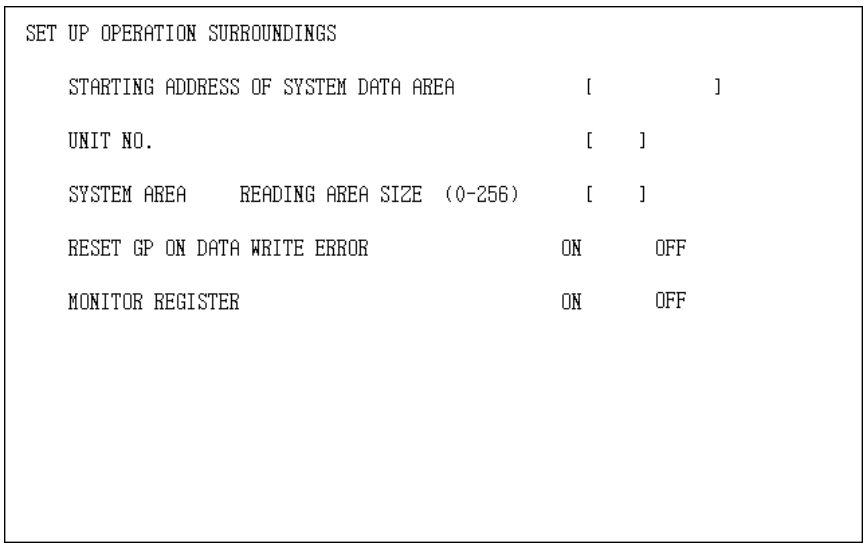
<GP-377/GP-377R/GP-2300/GLC-2300Series>

Set the Monitor Register feature from the SETUP OPERATION SURROUNDINGS MENU [PLC SETUP MENU] -> [PLC SETUP 2] in the GP OFFLINE mode.



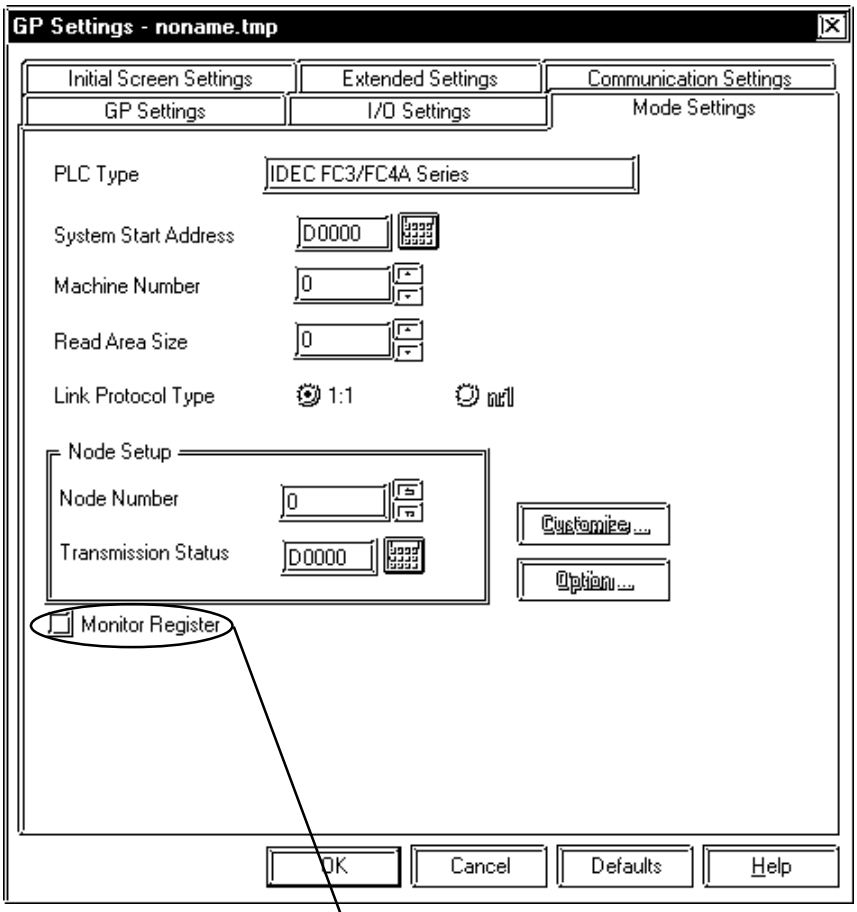


<GP-477R/GP-577R/GP2000/GLC300/GLC2000 Series>



- **Setting Monitor Register from the GP Screen Editor (GP-PRO/PBIII for Windows)**

  Set the Monitor Register feature from [GP SETUP] -> [MODE SETTINGS] in the GP Screen Editor (GP-PRO/PBIII for Windows). This feature's default setting is "not selected".



Click this radio box to set the Monitor Register.

2.15.5 Error Codes

■PLC Specific Error Codes

◆MICROSmart FC4A Series/OpenNet Controller FC3 Series

IDEC Corporation PLCs have two types of error codes, “Communication Error Code” and “NG Code”. A “Communication Error” means the error occurred during transmission. “NG Error” means the error occurred after receiving the message from the PLC. “NG Code” is the error code for standard GP/GLC units. “Communication Error Code” and “NG Error Code” are displayed via the “Host Communication Error (02:**)”, and will appear in the left lower corner of the GP/GLC screen (** indicates the PLC’s error code).

• Communication Error Code

Error Code	Error Type	Error Contents
00	BCC error	Appended BCC code does not match BCC calculated value of received data.
01	Flame error	Quantity of received bits differs from the preset value (stop bit is 0 for example).
02	Data send/receive error	Parity Error or Overrun error occured.
03	Command error	Unsupported request message is received.
04	Procedure/data quantity error	Received request message does not match the expected data (including quantity of data).

• NG Code

Error Code	Error Name	Meanings
06	Data range error	Invalid data range designated.
07	Timer/Counter preset value change error	Preset value change attempted to timer or counter with preset value designated by data register.
10	Data error	Invalid data other than 0 (30h) - 9 (39h) or A (41h) - F(46h).
11	Setting error	Incorrect setting for user communication.

Reference *For more details about error codes, refer to the IDEC Corporation’s “COMPUTER LINK SYSTEM USER’S MANUAL”.*


MEMO

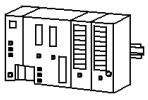
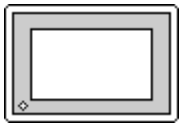
2.16 Siemens

2.16.1 System Structure

The following describes the system structure for connecting the GP to Siemens PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.16.2 Cable Diagrams**".*

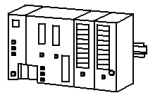
■ SIMATIC S5 Series (using Link I/F <3964/3964R via RK512 Protocol>)

CPU	Link I/F	Cable Diagram	GP
			
90U, 95U, 100U	CP521 S1	RS-232C (Cable Diagram 1)	GP Series
115U	CP524 CP525		
115U (CPU944)	CPU unit Link I/F *1		
135U, 155U	CP524 CP525		
135U, 155U (CPU928B)	CPU unit Link I/F *1		

**1 Connect to SI2 Port.*

Note: Supports both 3964 and 3964R protocols. The GP automatically discriminates between the two.
For better error detection, the 3964R is recommended.

■ SIMATIC S5 Series (CPU Direct)

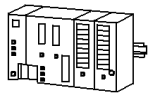
CPU *1	Cables	GP
		
90U, 95U, 100U (CPU100/102/103), 115U (CPU941/942/943/944), 135U/155U (CPU922/928/928B)	Digital's current loop converter *2 GP000-IS11-O	GP Series *3

**1 Connect to the Programming port.*

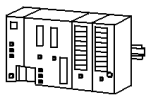
**2 Due to the size of its connector, this cable cannot be used for GP-270, GP-370 , and GP-377R series units.*

**3 Cannot be connected to GP2000 and GLC2000 Series units.*

■ SIMATIC S7-200 Series (PPI Connection)

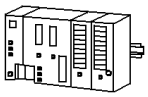
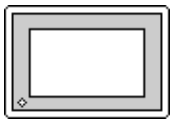
CPU	Cables	GP
		
CPU212, CPU214	RS422 (Cable Diagram 2)	GP Series

■ SIMATIC S7-200 Series (MPI Direct)

CPU	Cable Diagram	GP
		
CPU214, CPU215, CPU216, CPU221, CPU222, CPU224, CPU226	RS-422 (Cable Diagram 11)	GP/GLC Series *1
	RS-422 (Cable Diagram 12)	
	RS-422 (Cable Diagram 13)	

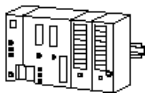
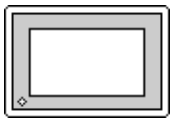
**1 Refer to this section's ◆Connectable GP/GLC units for SIMATIC S7-200/300/400 Series (MPI Direct).*

■ SIMATIC S7-300 Series (MPI Direct)

CPU	Cable Diagram	GP
		
CPU312IFM CPU313 CPU314 CPU314IFM CPU315 CPU315-2DP CPU316 CPU316-2DP CPU318-2	RS-422 (Cable Diagram 11) RS-422 (Cable Diagram 12) RS-422 (Cable Diagram 13)	GP/GLC Series *1

**1 Refer to this section's ◆Connectable GP/GLC units for SIMATIC S7-200/300/400 Series (MPI Direct).*

■ SIMATIC S7-400 Series (MPI Direct)

CPU	Cable Diagram	GP
		
CPU412-1 CPU412-2DP CPU413-1 CPU413-2DP CPU414-1 CPU414-2DP CPU414-3DP CPU416-1 CPU416-2DP CPU416-3DP CPU-417-4	RS-422 (Cable Diagram 11) RS-422 (Cable Diagram 12) RS-422 (Cable Diagram 13)	GP/GLC Series *1

**1 Refer to this section's ◆Connectable GP/GLC units for SIMATIC S7-200/300/400 Series (MPI Direct).*

◆Connectable GP/GLC units for SIMATIC S7-200/300/400 Series (MPI Direct)

Series Name			Product Name	187500bps *1
GP70 Series		GP-377 Series	GP-377L	—
			GP-377S	—
		GP-37W2 Series	GP-37W2B	Rev.L or higher
GP77R Series		GP-377R Series	GP-377RT	—
		GP-477R Series	GP-477RE	—
		GP-577R Series	GP-577RS	—
			GP-577RT	—
GP2000 Series		GP-2300 Series	GP-2300L	Rev. I or higher
			GP-2300T	Rev. I or higher
		GP-2301 Series	GP-2301L	Rev. I or higher
			GP-2301S	Rev. I or higher
		GP-2400 Series	GP-2400T	Rev. H or higher
		GP-2500 Series	GP-2500L	Rev. B or higher
			GP-2500S	Rev. A or higher
			GP-2500T (Only GP2500-TC41-24V)	Rev. C or higher
		GP-2501 Series	GP-2501S	—
			GP-2501T	—
		GP-2600 Series	GP-2600T (Only GP2600-TC41-24V)	Rev. C or higher
	GP2000H Series	GP-2301H Series	GP-2301HL	All Rev.
			GP-2301HS	All Rev.
		GP-2401H Series	GP-2401HT	All Rev.
GLC2000 Series		GLC2300 Series	GLC-2300L	Rev. I or higher
			GLC-2300T	Rev. I or higher
		GLC2300 Series	GLC-2400T	—
		GLC2300 Series	GLC-2600T	—

**1 When using a unit that cannot operate at 187500bps, be sure to select another data transfer speed.* Reference *2.16.4 Environment Setting Example*

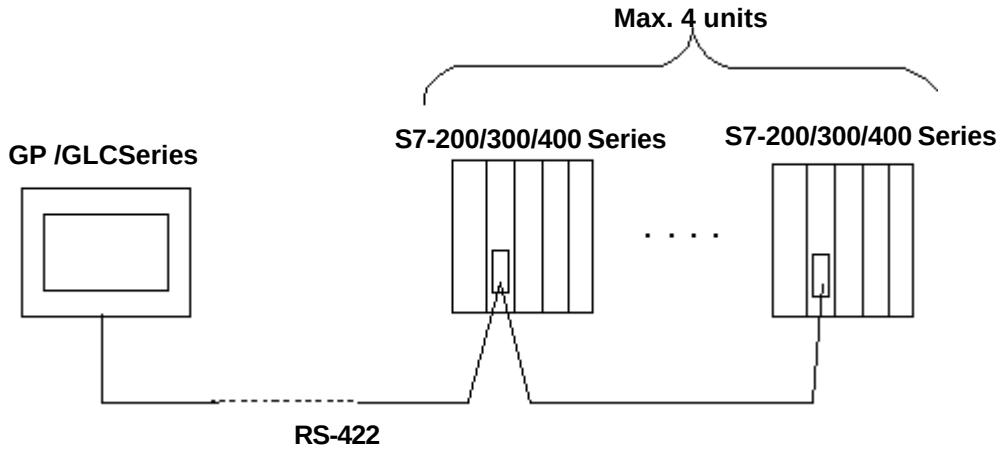
Important

- ***When transferring data using a GLC2000 unit at 187500bps, be sure to either set the Ladder Scan Time to 8 times longer than the Logic Time, or set the Percent Scan at 10%.***

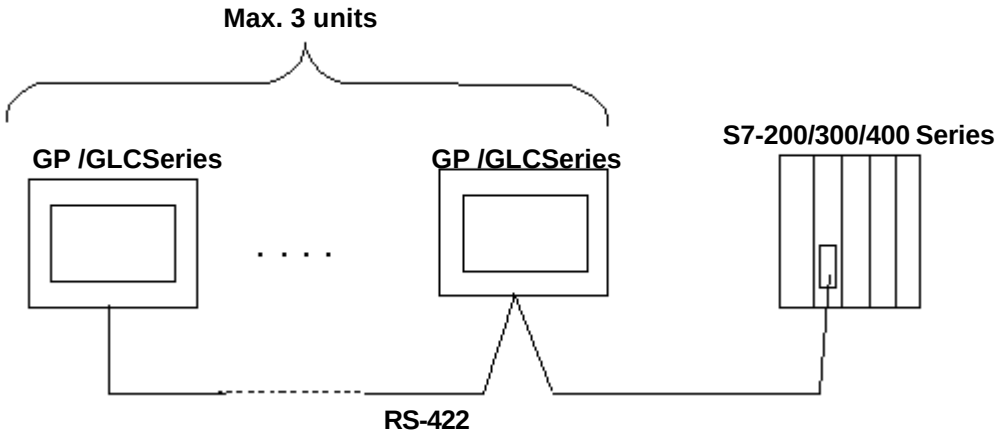
  For setting information, refer to your "Pro-Control Editor User Manual".

◆ **Connection Structure**

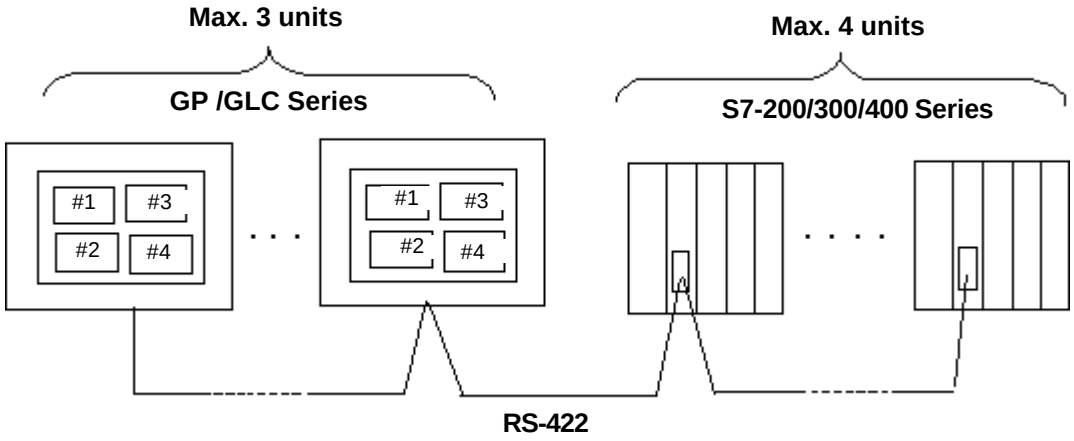
1:n RS-422 2-wire type



n:1 RS-422 2-wire type



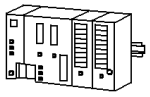
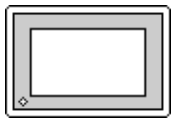
n:m RS-422 2-wire type



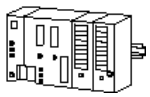
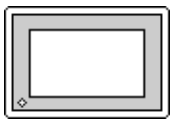
* *The connections 1:n and n:1 can be made on the same line.*

Note: **For details about MPI Network, refer to Siemens's Manual.**

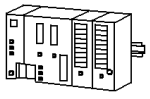
■ SIMATIC S7-300 Series (MPI via adapter)

CPU	Link I/F	Cable Diagram	GP
			
CPU312IFM, CPU313, CPU314, CPU315, CPU315-2DP,	HMI Adapter 6ES7-972-0CA 10-0XA0	RS-232C (Cable Diagram 3)	GP Series
	PC Adapter 6ES7-972-0CA21-0XA0	RS-232C (Cable Diagram 3)	
	PC/MPI Cable 6ES7901-2BF00-0AA0	RS-232C (Cable Diagram 4)	
	Digital's GP070-MPI-41		

■ SIMATIC S7-400 Series (MPI via adapter)

CPU	Link I/F	Cable Diagram	GP
			
CPU413-2DP	HMI Adapter 6ES7-972-0CA 10-0XA0	RS-232C (Cable Diagram 3)	GP Series
	PC Adapter 6ES7-972-0CA21-0XA0	RS-232C (Cable Diagram 3)	
	PC/MPI Cable 6ES7901-2BF00-0AA0	RS-232C (Cable Diagram 4)	
	Digital's GP070-MPI-41		

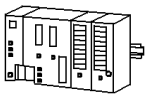
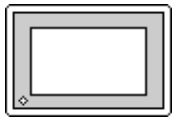
■ SIMATIC S7-300Series (Using Adapter <3964/RK512 >)

CPU	Link I/F	Cable Diagram	GP
			
CPU313, CPU314, CPU315, CPU315-2DP	CP340 *1	RS-232C (Cable Diagram 5)	GP Series
	CP341		

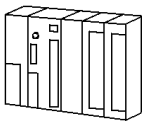
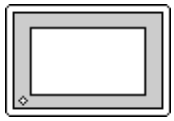
**1 When using the CP340 Link I/F an "Interpreter program" is required on the PLC. This is contained in the GP-PRO/PBIII for Windows CD-ROM 's "CP340" folder. Please see "README" file in this folder in order to install this program.*

Note: This driver cannot be used with the CPU312IFM.

■ SIMATIC S7-400 Series (Using Adapter <3964/RK512 >)

CPU	Link I/F	Cable Diagram	GP
			
CPU413-2DP	CP441-2	RS-422 (Cable Diagram 6)	

■ SIMATIC 505 Series

CPU	Cable Diagram	GP
		
545-1101, 545-1102, 545-1103, 545-1104, 545-1105, 545-1106, 555-1101, 555-1102, 555-1103, 555-1104, 555-1105, 555-1106	RS-232C Port 1 Connection (Cable Diagram 7)	GP Series
545-1101, 545-1102, 555-1101, 555-1102	RS-422(4-wire type) Port 2 Connection (Cable Diagram 8)	
545-1104, 545-1105, 545-1106, 555-1103, 555-1104, 555-1105, 555-1106	RS-422(4-wire type) Port 2 Connection (Cable Diagram 9)	
545-1103, 545-1104, 545-1105, 545-1106, 555-1103, 555-1104, 555-1105, 555-1106	RS-232C Port 2 Connection (Cable Diagram 10)	
545-1101, 545-1102, 555-1101, 555-1102	RS-232C Port 2 Connection (Cable Diagram 11)	

2.16.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Siemens may differ, however, using these cables for your PLC operations will not cause any problems.

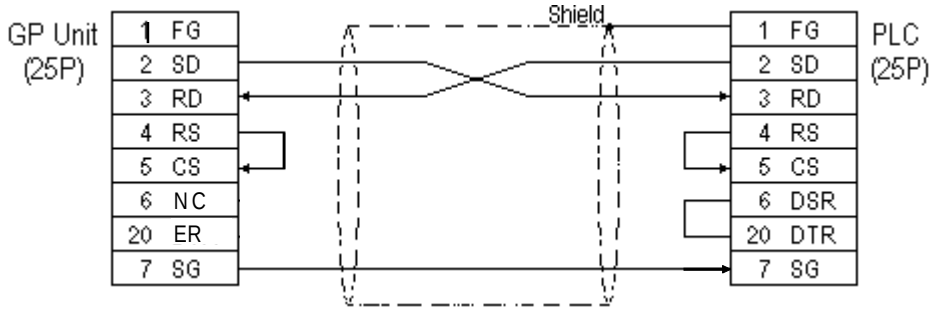
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

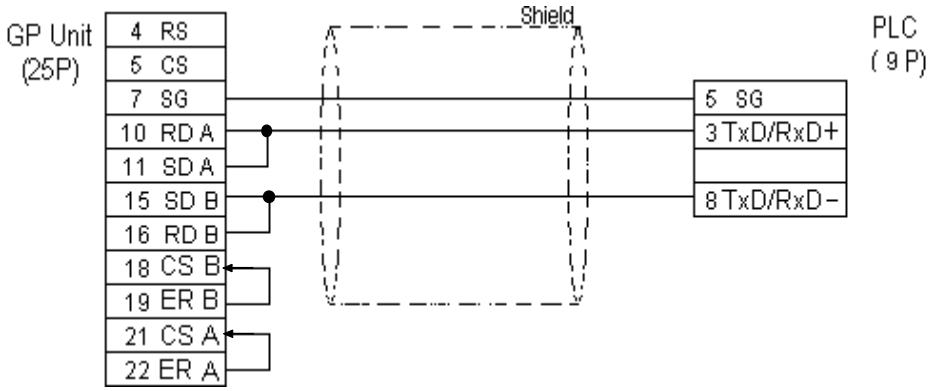
Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* Housing *and Grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length 15m or less.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

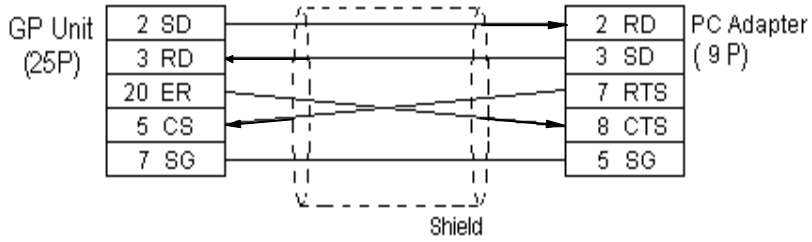
Cable Diagram 1 (RS-232C)



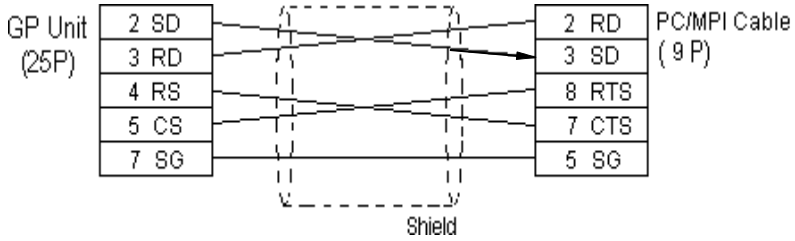
Cable Diagram 2 (RS-422)



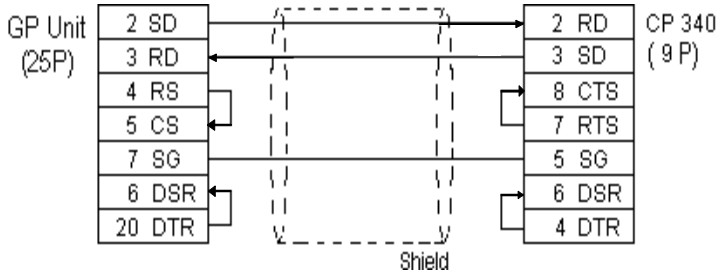
Cable Diagram 3 (RS-232C)



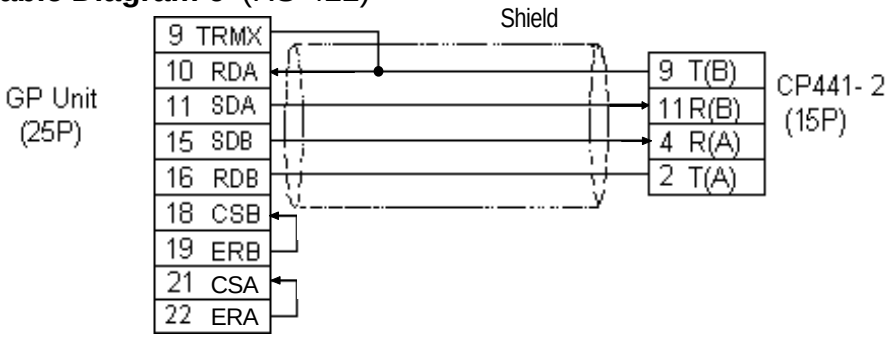
Cable Diagram 4 (RS-232C)



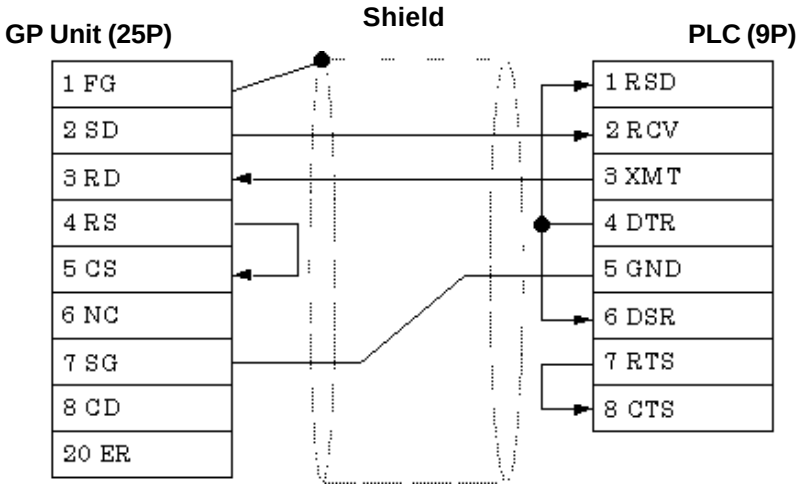
Cable Diagram 5 (RS-232C)



Cable Diagram 6 (RS-422)

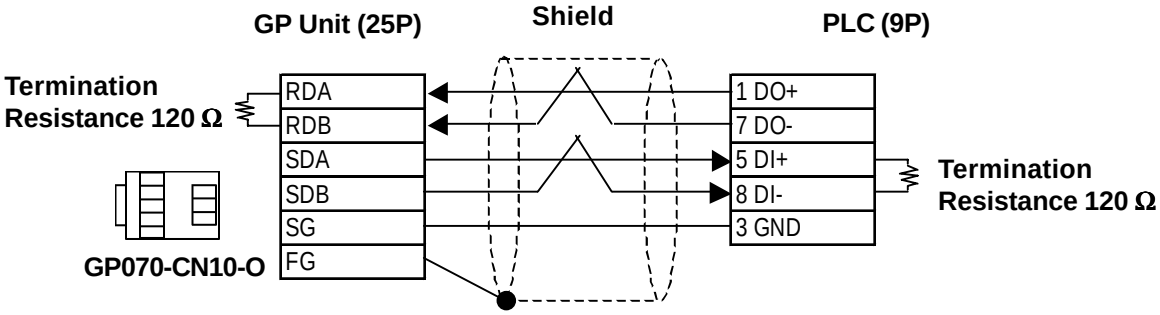


Cable Diagram 7 (RS-232C)

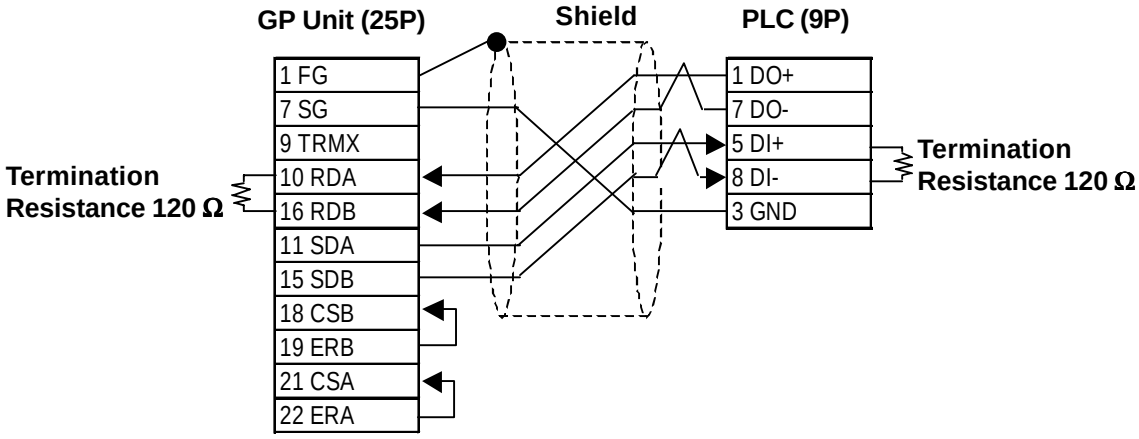


Cable Diagram 8 (RS-422)

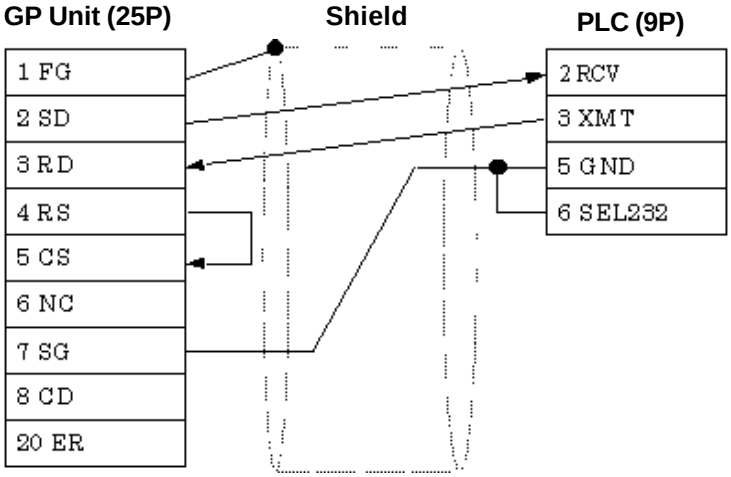
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



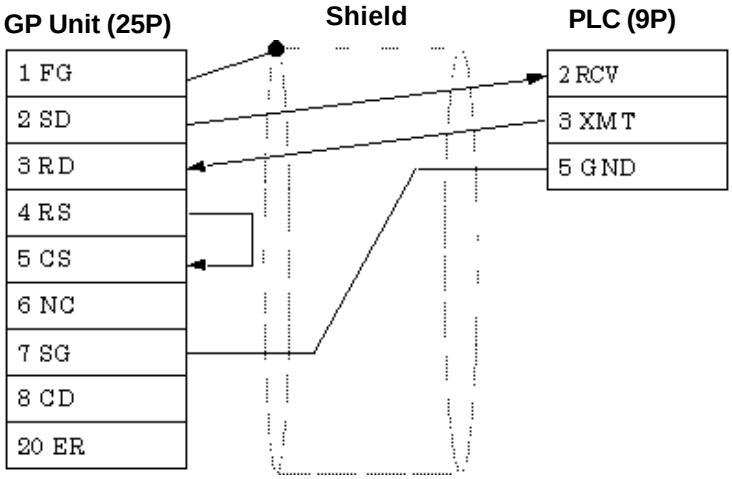
• When making your own cable connections



Cable Diagram 9 (RS-232C)



Cable Diagram 10 (RS-232C)

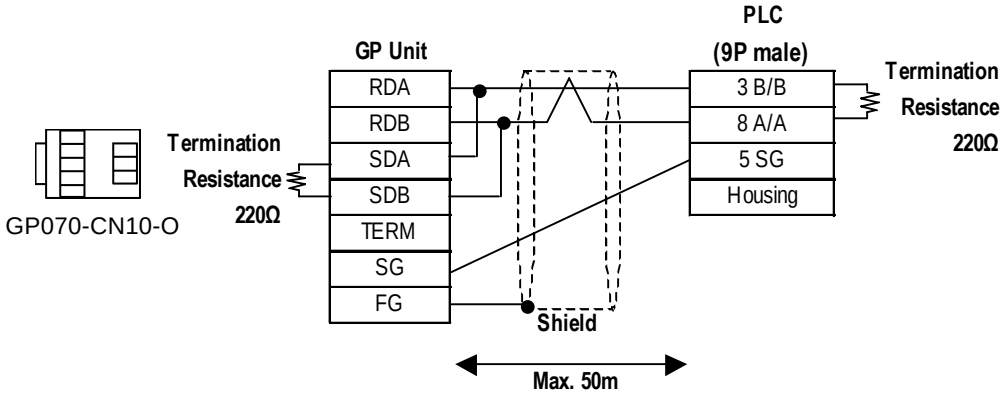


Cable Diagram 11 (RS-422 2-wire type)

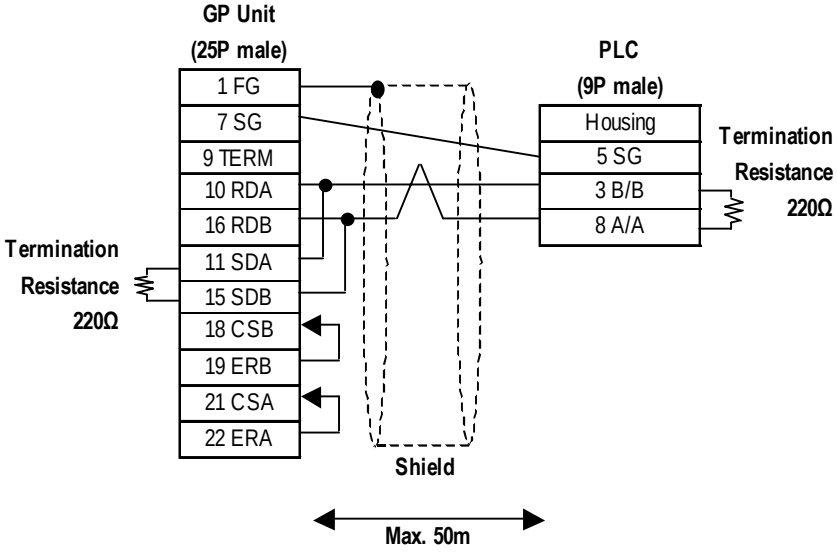
Important

- ***Use a cable length 50m or less for a single segment.***

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



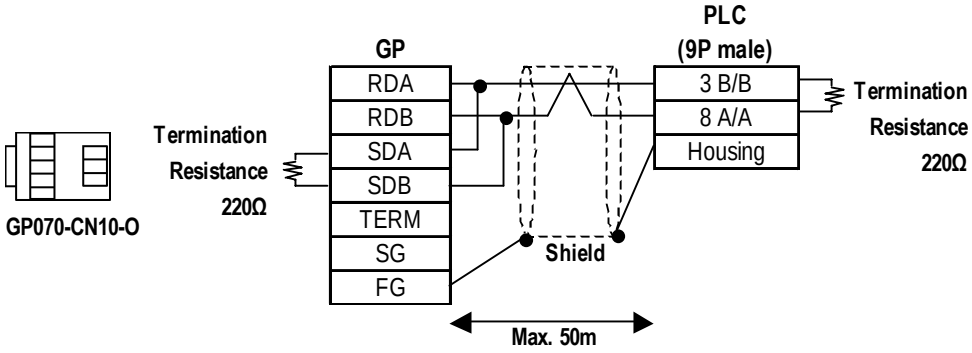
• When making your own cable connections



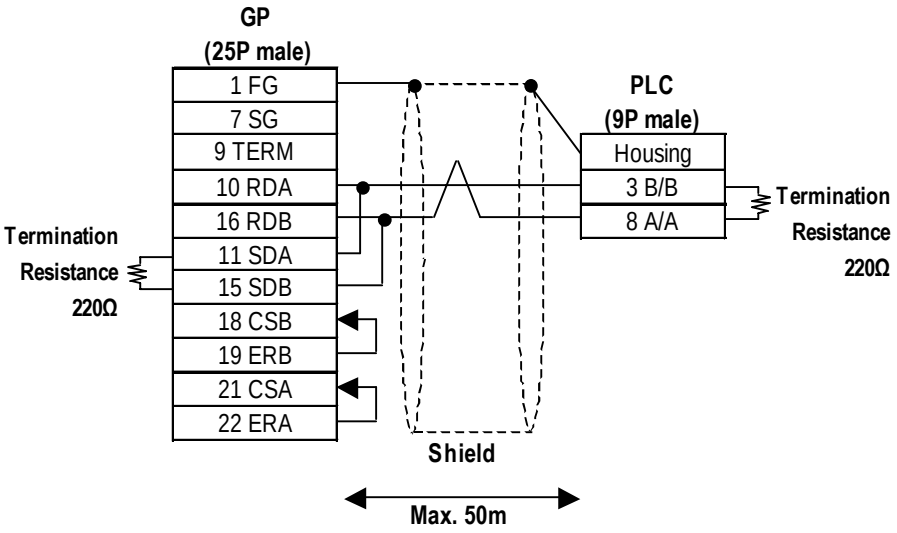
When using the following PLCs (MPI and Profibus port are the same type), the following cable diagram also can be used.

318-2(6ES7 318 2AJ00), 412-1(6ES7 412 1XF03), 412-2DP(6ES7 412 2XG00),414-2DP(6ES7 414 2XG03), 414-3DP(6ES7 414-3XJ00), 416-2DP(6ES7 416 2XK02), 416-3DP(6ES7 416-3XL00), 417-4(6ES7 417-4XL00)

- When using Digital's RS-422 connector terminal adapter, GP070-CN10-O and Siemens's Profibus Connector.



- When making your own cable connections

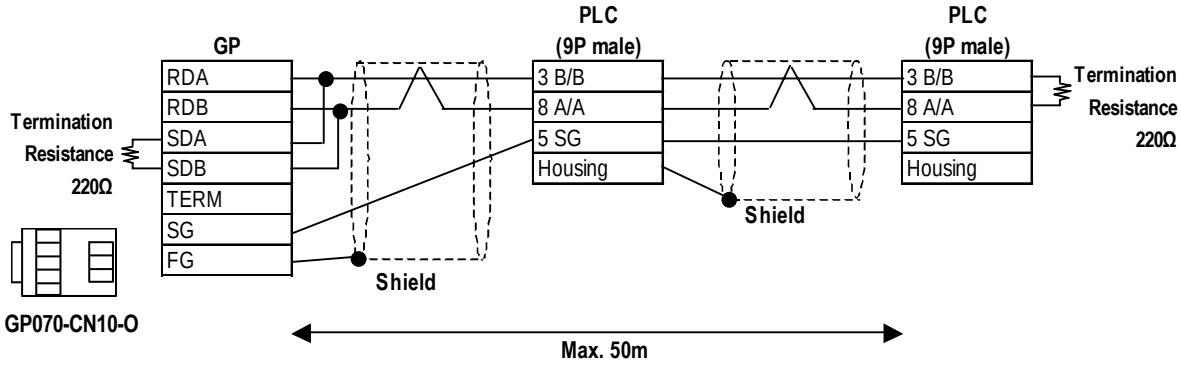


Cable Diagram 12 (RS-422 2-wire type)

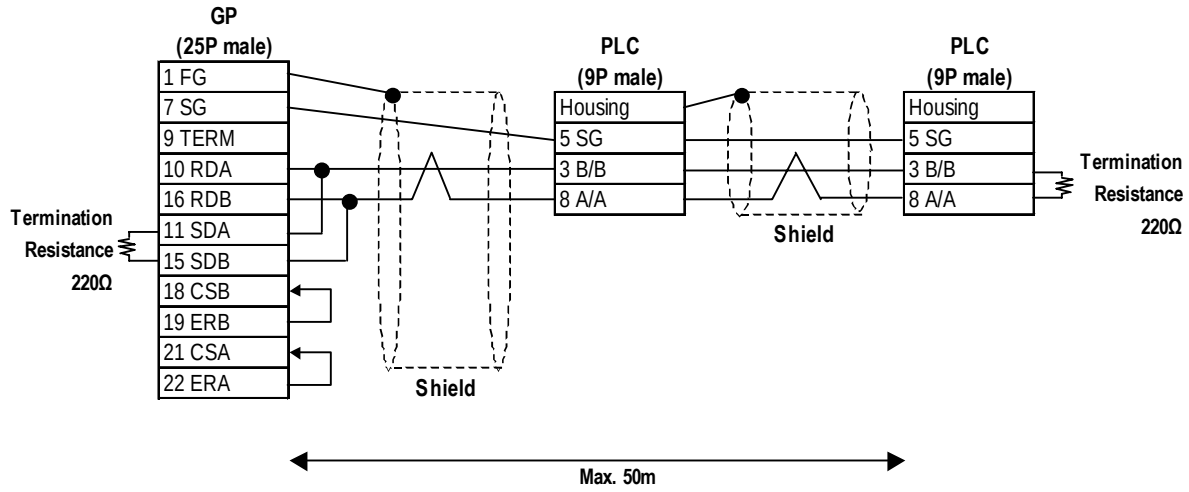
Important

- ***Use a cable length less than 50m for a single segment.***

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When making your own cable connections



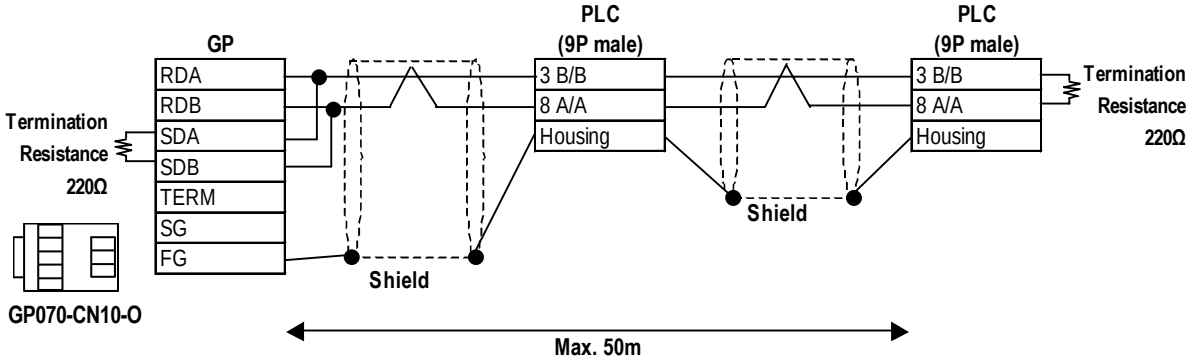
Note:

When making your own cable connections, we recommend to use the terminal between the cables because the PLC side connector is Dsub 9-pin connector.

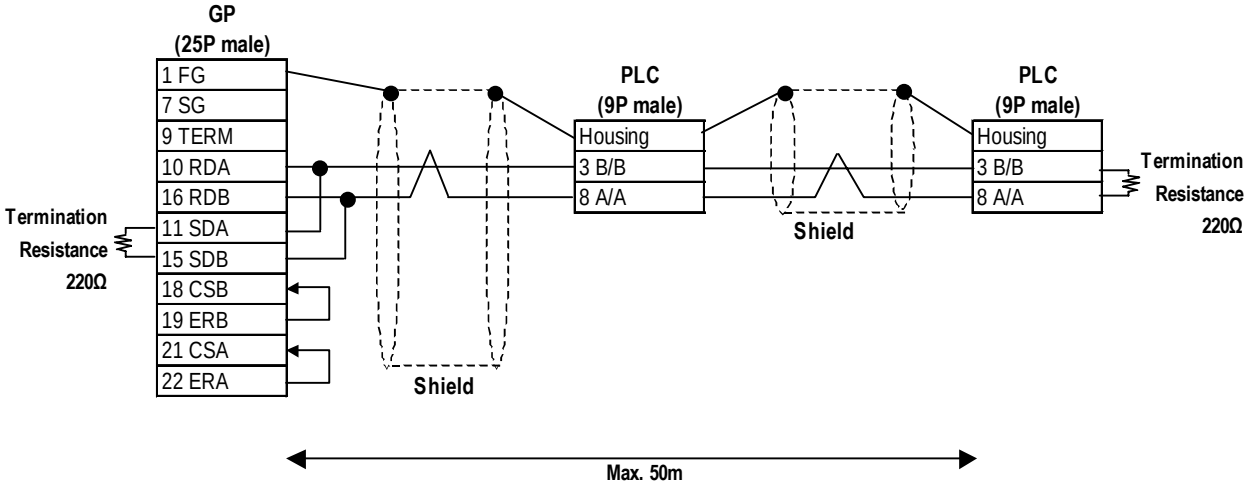
When using the following PLCs (MPI and Profibus port are the same type), the following cable diagram also can be used.

318-2(6ES7 318 2AJ00), 412-1(6ES7 412 1XF03), 412-2DP(6ES7 412 2XG00),414-2DP(6ES7 414 2XG03), 414-3DP(6ES7 414-3XJ00), 416-2DP(6ES7 416 2XK02), 416-3DP(6ES7 416-3XL00), 417-4(6ES7 417-4XL00)

- When using Digital's RS-422 connector terminal adapter, GP070-CN10-O and Siemens's Profibus Connector.



- When making your own cable connections

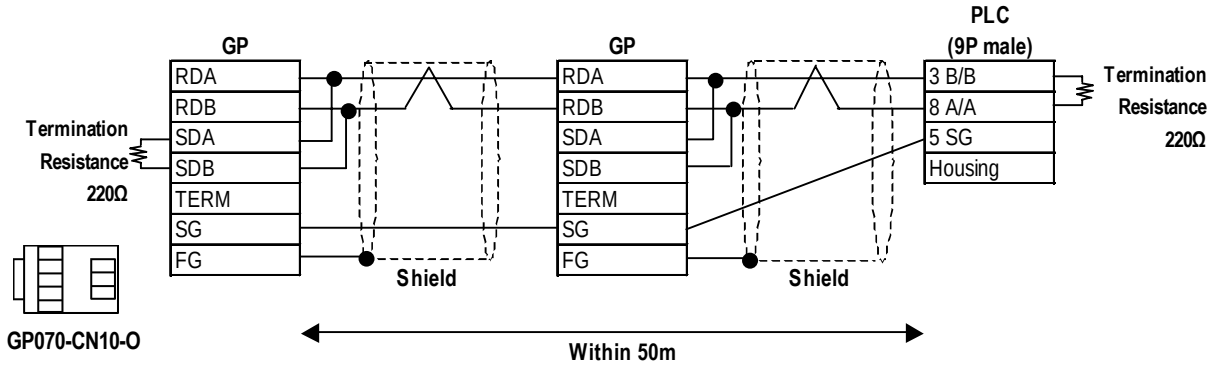


Cable Diagram 13 (RS-422 2-wire type)

Important

- ***Use a cable length less than 50m for a single segment.***

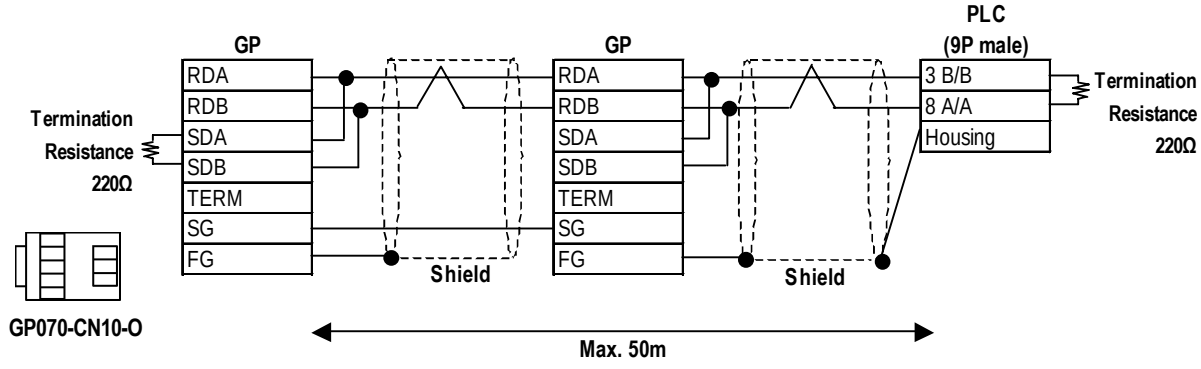
- When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



When using the following PLCs (MPI and Profibus port are the same type), the following cable diagram also can be used.

318-2(6ES7 318 2AJ00), 412-1(6ES7 412 1XF03), 412-2DP(6ES7 412 2XG00),414-2DP(6ES7 414 2XG03), 414-3DP(6ES7 414-3XJ00), 416-2DP(6ES7 416 2XK02), 416-3DP(6ES7 416-3XL00), 417-4(6ES7 417-4XL00)

- When using Digital's RS-422 connector terminal adapter, GP070-CN10-O and Siemens's Profibus Connector.



2.16.3 Supported Devices

The following tables describe the range of devices supported by the GP.

■ SIMATIC S5 Series (using Adapter)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Data Register	---	D003000 ~ D255255	Bit F *1*2	H/L
Extended Data Register	---	X003000 ~ X255255	Bit F *1*2	

■ SIMATIC S5 Series (CPU Direct)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	I0000 ~ I1277	IW000 ~ IW126	÷2 *3	H/L
Output Relay	Q0000 ~ Q1277	QW000 ~ QW126	÷2 *3	
Internal Relay	F0000 ~ F2557	FW000 ~ FW254	÷2 *3	
Timer	---	T000 ~ T255		L/H
Counter	---	C000 ~ C255		
Data Register	---	D002000 ~ D255255	Bit F *1 *4	H/L
Extended Data Register	---	X002000 ~ X255255	Bit F *1 *4 *5	

** 1 The range for the Data Register and the Extended Data Register must also be set up in the PLC. Communication will not occur with the GP when the System Area range is not setup.*

** 2 The Data Register and Extended Data Register is as illustrated below.*

E.g. D003 000

- 000 — Data Word (DW) No. 000~255
- D003 — Data Block (DB) No. 003~255

** 3 The bit device illustration for the PLC side is different.*

E.g.

GP	PLC
Q0007	Q0.7

** 4 The Data Register and Extended Data Register is as illustrated below.*

E.g. D002 000

- 000 — Data Word (DW) No. 000~255
- D002 — Data Block (DB) No. 002~255

** 5 The Extended Data Register is possible only with S5 135U/155U.*

Note: **For information about Bit Write process differences, see the end of this section.**

■ SIMATIC S7-200 Series (PPI Coonnection)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input	I00 ~ I77	IW0 ~ IW6	÷2 *1	H/L
Output	Q00 ~ Q77	QW0 ~ QW6	÷2 *1	
Internal Memory	M000 ~ M317	MW00 ~ MW30	÷2 *1	
Special Memory	SM000 ~ SM857	SMW00 ~ SMW84	÷2 *1	
Timer Bit	T000 ~ T127	---		
Counter Bit	C00 ~ C63	---		
Variable Memory	---	VW0000 ~ VW4094	÷2	
Timer Word	---	TW000 ~ TW127		
Counter Word	---	CW000 ~ CW127		

**1 The bit position is the last digit entered. There is no '.' delimeter - e.g. I3.7 is equivalent to 137 in GP-PRO/PBIII.*

■ SIMATIC S7-200 Series (MPI Direct)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input	I0000.0 ~ I0015.7	IW0000 ~ IW0014	÷2	H/L
Output	Q0000.0 ~ Q0015.7	QW0000 ~ QW0014	÷2	
Internal	M0000.0 ~ M0031.7	MW0000 ~ MW0030	÷2	
Timer	---	T0000 ~ T0255	*1	
Counter	---	C0000 ~ C0255	*1	
Variable Memory	---	VW0000 ~ VW5118	÷2 Bit 7	

**1 Cannot be written in. When performing data written, a Host communication Error (02:FB) will occur.* Reference *2.16.5 Error Codes*

Important

- ***Pro-Server cannot read/write.***
- ***When connecting multiple GP units, be sure to set each unit's system area top address so that it does not overlap the system area of another GP.***

■ SIMATIC S7-300/400 Series (MPI Direct/MPI via adapter)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input	E00000.0 ~ E00127.7	EW00000 ~ EW00126	÷2 *1	H/L
Output	A00000.0 ~ A00127.7	AW00000 ~ AW00126	÷2 *1	
Internal	M00000.0 ~ M00255.7	MW00000 ~ MW00254	÷2 *1	
Timer	---	T00000 ~ T00127	*2 *3	
Counter	---	Z00000 ~ Z00063	*2 *3	
Data Block	---	DB1W00000 ~ DB60W65532	÷2 Bit 7 *4	
Data Block	DB1.DBX0.0 ~ DB65535.DBX65533.7	DB1.DBW0 ~ DB65535.DBW65532	÷2 *5	

**1 When using a GP70 Series unit (except for GP-377 Series units), only devices of the PLC registered as #1 in the Target Node (PLC) area can be used. All other GP/GLC units can use PLC device #1 to #4, set up in the Target Node (PLC) area. For Target Node setting, refer to 2.16.4 Environment Setup.*

2. Data write cannot be performed. If data write is attempted, a Host Communication error (02:FB) will occur.* **Reference *2.16.5 Error Codes*

**3. Only the PLC device registered as #1 in the Target Node (PLC) area can be used. For Target Node setting, refer to 2.16.4 Environment Setup.*

**4 The addressing format for entering on GP-PRO/PB III is different from the convention used in the S7-300/400 - e.g. DB63W00020 is equivalent to DB63.DBW20.*

**5 When Data Blocks other than DB61 in a 1:1 Connection or using a 1:n connection designating data blocks for multiple PLCs, use this address. However, the maximum number of data blocks is 40. GP70 Series units (except for GP-377 Series units) cannot use this devices.*

Important

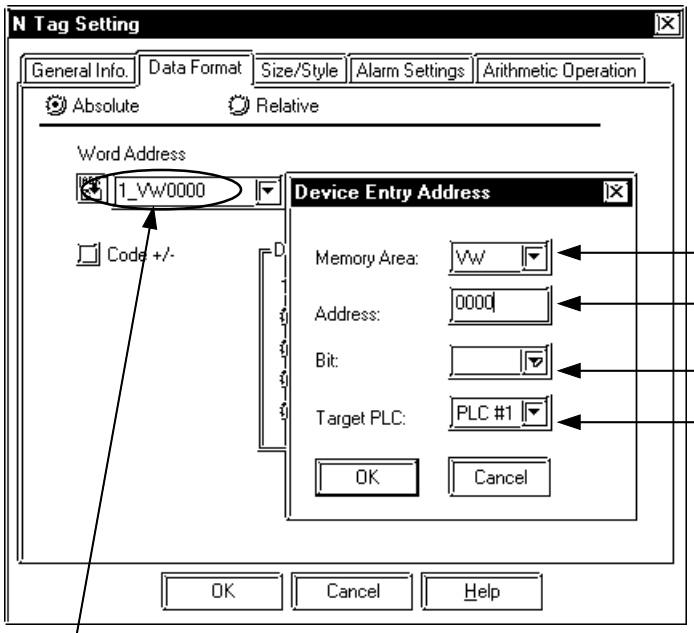
- ***Pro-Server read/write of devices using data blocks DB1.DBW0 to DB65535.DBW65532 is not possible. With other devices, read/write is possible only with the PLC registered as #1 in the Target Node (PLC) area. For Target Node setting, refer to 2.16.4 Environment Setup.***
- ***When designating indirect addresses for E-tags and K-tags, devices using data blocks DB1.DBW0 to DB65535.DBW65532 cannot be used.***
- ***When connecting multiple GP units, be sure to set each unit's system area top address so that it does not overlap the system area of another GP.***

◆ **Setting the GP-PRO/PBIII for Windows**

To set any Part or Tag on the GP-PRO/PBIII, specify the registration number of the PLC when entering the address. If not, the last entered device number is assumed. (The default value is 01).

To use a registration number, previously register that number by selecting MPI Network from the Mode Settings tab of the GP Settings window.

- **When setting an N-tag connecting to SIMATIC S7-200 Series units (MPI Direct)**



Device name

Address

Bit position

Target PLC No. Select a PLC 's registerd Number #1 to #4 in the Target Node (PLC) area.

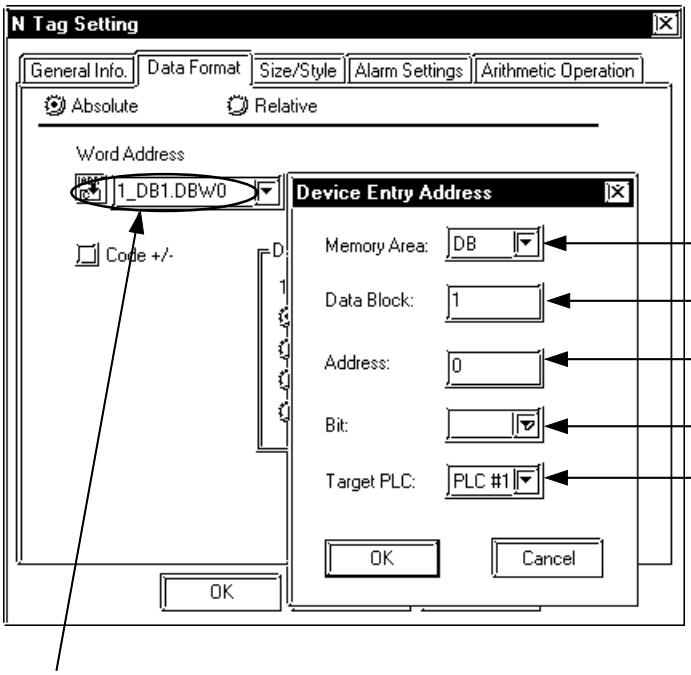
Reference
2.16.4 Environment Setup

1_VW0000

Device address

PLC's Registered Number setting in the Target Node (PLC) area.

- **When setting an N-tag connecting to SIMATIC S7-300/400 Series units (MPI Direct/MPI via Adapter)**



Device name

Data Block

Address

Bit position

Target PLC No. Select a PLC 's registerd Number #1 to #4 in the Target Node (PLC) area.

Reference
2.16.4 Environment Setup

1_DB1.DBW0

Device address

PLC's Registered Number setting in the Target Node (PLC) area.

■ SIMATIC S7-300/400 (via 3964/RK512)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Data Memory	DB1W000000 ~ DB60W002547	DB1W00000 ~ DB60W00254	÷2 *1*2	H/L

Note:

It is possible to enable/disable the Block Check Character (BCC) in PLC to GP communications.
This can be performed via the GP's OFFLINE mode, or, via the GP-PRO/PBIII Editor's Mode Area's "Option" Command.

**1 Some Data Blocks are reserved for the 3964 interpreter program: DB2,DB3,DB5 & DB10.*

**2 The addressing format for entering settings in GP-PRO/PB III is different from the convention used in the S7-300/400 - e.g. DB63W00020 is equivalent to DB63.DBW20.*

■ SIMATIC 505 Series

Setup System Area here.

Device	Bit Address	Word Adress	Particulars	
Variable Memory	————	V00001 ~ V26624		L/H
Word Input	————	WX00001 ~ WX08192	*1	
Word Output	————	WY00001 ~ WY08192		
Discrete Input accessed as bit	X0001 ~ X8192	————		
Discrete Output accessed as bit	Y0001 ~ Y8192	————		
Control Relay Accessed as bit	CR00001 ~ CR32768	————		
Loop Gain	————	LKC0001 ~ LKC0064	*2	
Loop Reset	————	LTI0001 ~ LTI0064	*2	
Loop Rate	————	LTD0001 ~ LTD0064	*2	
Loop Alarm High Limit	————	LHA0001 ~ LHA0064	*2	
Loop Low Alarm Limit	————	LLA0001 ~ LLA0064	*2	
Loop Process Variable	————	LPV0001 ~ LPV0064	*2	
Loop PV High Limit	————	LPVH0001 ~ LPVH0064	*2	
Loop PV Low Limit	————	LPVL0001 ~ LPVL0064	*2	
Loop Orange Deviation Limit	————	LODA0001 ~ LODA0064	*2	
Loop Yellow Deviation Alarm Limit	————	LYDA0001 ~ LYDA0064	*2	
Loop Sample Rate	————	LTS0001 ~ LTS0064	*2	
Loop Setpoint	————	LSP0001 ~ LSP0064	*2	
Loop Output	————	LMN0001 ~ LMN0064	*2	
Loop Error	————	LERR0001 ~ LERR0064	*1 *2	
Loop Bias	————	LMX0001 ~ LMX0064	*2	
Loop Alarm High-High Limit	————	LHHA0001 ~ LHHA0064	*2	
Loop Low-Low Alarm Unit	————	LLLA0001 ~ LLLA0064	*2	
Loop Rate of Change Alarm Limit	————	LRCA0001 ~ LRCA0064	*2	
Loop Setpoint High Point	————	LSPH0001 ~ LSPH0064	*2	

(Continued on next page)

■ SIMATIC 505 Series

Device	Bit Address	Word Adress	Particulars	
Loop Setpoint Low Limit	————	LSPL0001 ~ LSPL0064	*2	
Loop Alarm Deadband	————	LADB0001 ~ LADB0064	*2	
Loop V-flags	————	LVF0001 ~ LVF0064		
Most Significant Word of Loop C-flags	————	LCFH0001 ~ LCFH0064		L/H
Least Significant Word of Loop C-flags	————	LCFL0001 ~ LCFL0064		
Analog Alarm/Alarm Acknowledge Flags	————	AADB0001 ~ AADB0128	*2	
Most Significant Word of Analog Alarm C-flags	————	ACFH0001 ~ ACFH0128		L/H
Least Significant Word of Analog Alarm C-flags	————	ACFL0001 ~ ACFL0128		
Analog Alarm Error	————	AERR0001 ~ AERR0128	*1*2	
Analog Alarm High Alarm Limit	————	AHA0001 ~ AHA0128	*2	
Analog Alarm High-High Alarm Limit	————	AHHA0001 ~ AHHA0128	*2	
Analog Alarm Low Alarm Limit	————	ALA0001 ~ ALA0128	*2	
Analog Alarm Low-Low Alarm Limit	————	ALLA0001 ~ ALLA0128	*2	
Analog Alarm Loop Orange Deviation Alarm Limit	————	AODA0001 ~ AODA0128	*2	
Analog Alarm Process Variable	————	APV0001 ~ APV0128	*2	
Analog Alarm Rate of Change Alarm Limit	————	ARCA0001 ~ ARCA0128	*2	
Analog Alarm Setpoint	————	ASP0001 ~ ASP0128	*2	
Analog Alarm SP High Limit	————	ASPH0001 ~ ASPH0128	*2	
Analog Alarm SP Low Limit	————	ASPL0001 ~ ASPL0128	*2	
Analog Alarm Sample Rate	————	ATS0001 ~ ATS0128	*2	
Analog Alarm Yellow Deviation Alarm Limit	————	AYDA0001 ~ AYDA0128	*2	
Timer/Counter Preset	————	TCP0001 ~ TCP1024	*3	
Timer/Counter Current	————	TCC0001 ~ TCC1024	*3	
Drum Counter Preset	————	DCP0101 ~ DCP6416	*3*4	
Drum Step Preset	————	DSP0001 ~ DSP0064	*3*5*6	L/H
Drum Step Current	————	DSC0001 ~ DSC0064	*3*5*6	
Status Word	————	STW0001 ~ STW0222	*1	
Drum Count Current	————	DCC0001 ~ DCC0064	*1	

(Continued on next page)

(From previous page)

**1 The GP cannot write data to this device. Use it only for reading.*

**2 This device uses Float. When this type of device is used, only the E-tag and K-tag's "32 bit Float" setting can be used.*

**3 32 bit reading / writing, or reading / writing a K-tag's text string cannot be performed.*

**4 Address entry method:*

Enter 1.01 as "101"

Enter 1.02 as "102"

Enter 1.03 as "103"

...

Enter 1.16 as "116"

Enter 2.01 as "201"

Enter 2.02 as "202"

...

Enter 64.15 as "6415"

Enter 64.16 as "6416"

**5 Entry range is from 0 to 15 (dec.)*

**6 +1 is added to all data input from the GP to the PLC. -1 is added to all data output from the PLC to the GP.*

GP		*PLC*	
1	*→*	*2*	*("1" entered from the GP is changed to "2" in the PLC.)*
5	*←*	*6*	*("6" sent from the PLC to the GP will become "5".)*

2.16.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ SIMATIC S5 Series (using Link I/F)

GP Setup		Link I/F Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	---	
Communication Format (RS-422)	4-wire type	---	
Unit No.	0 (fixed)	---	

■ SIMATIC S5 Series (CPU Direct)

GP Setup		PC Link Unit Setup
Baud Rate	9600 bps (fixed)	---
Data Length	8 bits (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Even (fixed)	---
Data Flow Control	ER Control (fixed)	---
Communication Format	RS-232C (fixed)	---
Unit No.	0 (fixed)	---

System Data Area Setup

- SYSTEM DATA AREA START DB—used to setup the Data Register's Data Block (DB) Number.
- SYSTEM DATA AREA START DW—used to setup the Data Register's Data Word (DW) Number.

Reference *"2.16.3 Supported Devices"*

If Link I/F is used, the system's number is indicated before the DB (Data Block) on the INITIALIZE area's [SETUP OPERATION SURROUNDINGS] screen. Changing this number, however, is not necessary since this data will be used only for future expansion.

STOP

- **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit wirte operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

- **When running a GP-*30 Series ladder program, be aware of the above points.**

■ SIMATIC S7-200 Series (PPI Connection)

GP Setup		PC Link Unit Setup
Baud Rate	9600 bps	---
Data Bit	8 bits	---
Parity Bit	Even	---
Stop Bit	1 bit	---
Data Flow Control	ER Control	---
Communication-format	RS-422 2-wire type	---
GP No.	1	---
PLC No.	2	2

■ SIMATIC S7-200 Series (MPI Direct)

GP Setup				PLC Setup	
Baud Rate *1			19200 bps	Baud Rate	19200 bps
Data Length			8 bits (fixed)	————	————
Stop Bit			1 bit (fixed)	————	————
Parity Bit			Even (fixed)	————	————
Data Flow Control			ER (fixed)	————	————
Communication Format			RS-422 2-Wire type (fixed)	————	————
Highest Node No. *2 *3			31	Highest Address *3	31
GP is Only Master *4			ON	————	————
Local Node (GP) *5			1	————	————
Target Node (PLC)	No. of PLCs *7		1	————	————
	Node Num *8	#1	2	MPI Address *6	2
		#2	Depeneding on the PLC's MPI Address	MPI Address *6	0 to 126
		#3	Depeneding on the PLC's MPI Address	MPI Address *6	0 to 126
		#4	Depeneding on the PLC's MPI Address	MPI Address *6	0 to 126

**1 Baude Rate can be 9600bps, 19200bps or 187500bps depending on the PLC unit's Baud rate. However, certain GP units cannot use the 187500bps speed.*

Reference 2.16.1 System Structure SIMATIC S7-200 Series (MPI Direct)

If the 187500bps speed is used with incompatible GP Series units, a Host Communication error (02:F2) will occur.

Reference 2.16.5 Error Codes

**2 15/31/63/126 can be selected. Be sure this setting is the same as the PLC unit's Highest Address setting.*

**3 15/31/63/126 can be selected. On a single network, choose the value that is higher than the maximum value of the GP's Local Node or the PLC's MPI Address. For example, if the maximum value is 16, then select 31.Specify the smallest practical value for the maximum node address. This will shorten the time required for initializing the network.*

**4 When MPI master does not exist on a single network, a GP can be master. When GP is master, set to ON.*

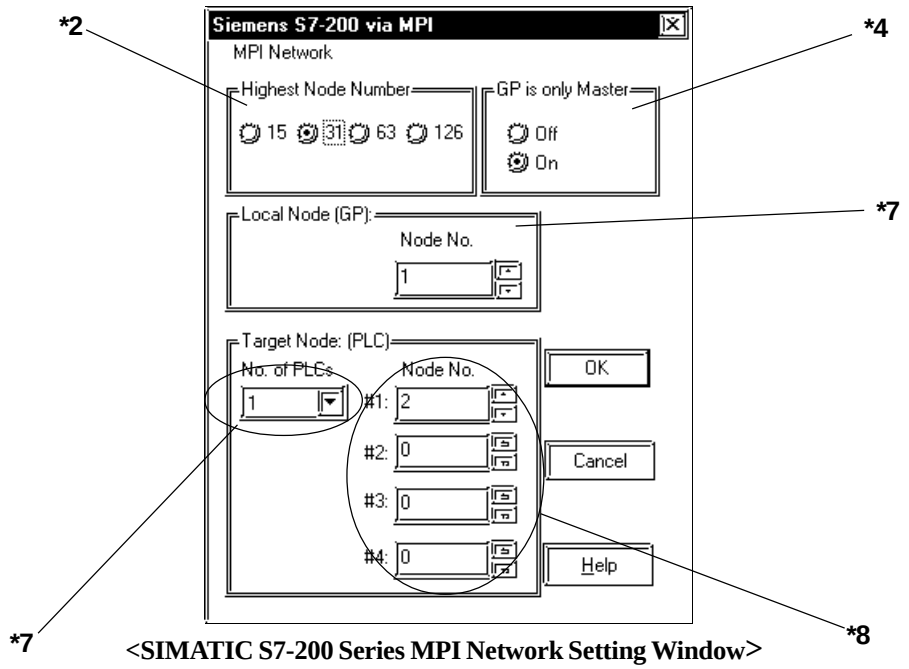
**5 Set the GP's unit number. Setting range is from 0 to 126, and the maximum number of GP units that can be connected is 3. Be sure this number is not used as a PLC's Node No.*

**6 Set the PLC unit's node number. Setting range is from 0 to 126, and the maximum number of PLCs that can be connected is 4. Be sure this number is not used as a GP and another PLC unit's Node No.*

**7 Select the number of PLCs to use for data communication.*

**8 Register the PLC's MPI Address. This setting can only be entered using the GP-PRO/PBIII software. The GP unit's OFFLINE mode cannot be used.*

Note: **The following diagram is Siemens S7-200 Series MPI Network setting window. This window is displayed by clicking on the [MPI Network] button in the [GP System Setup]-[Mode Settings] tab. The number in the diagram refers to the footnote number as shown above.**



<SIMATIC S7-200 Series MPI Network Setting Window>

■ SIMATIC S7-300/400 Series (MPI Direct)

GP Setup				PLC Setup	
Baud Rate *1			19200 bps	Baud Rate	19200 bpd
Data Length			8 bits (fixed)	————	————
Stop Bit			1 bit (fixed)	————	————
Parity Bit			Even (fixed)	————	————
Data flow Control			ER (fixed)	————	————
Communication Format			RS-422 2-wire type (fixed)	————	————
Highest Node No. *2 *3			31	Highest Address *3	31
Connection Method *4			Direct (fixed)	————	————
Local Node (GP) *5			1	————	————
Target Node (PLC)	No. of PLCs *7		1	————	————
	Node Num *8	#1	2	MPI Address *6	2
		#2	Depending on the PLC MPI Address	MPI Address *6	0 to 126
		#3	Depending on the PLC MPI Address	MPI Address *6	0 to 126
		#4	Depending on the PLC MPI Address	MPI Address *6	0 to 126

**1 Baud Rate speed can be 19200 bps or 187500 bps depending on the PLC unit'sBaud rate. However, certain GP units cannot use the 187500 bps speed.* Reference *2.16.1 System Structure ◆Connectable GP/GLC units for SIMATIC S7-200/300/400 Series(MPI Direct)*

If 187500 bps is used with an incompatible GP Series units, a Host Communication error (02:F2) will occur. Reference *2.16.5 Error Codes*

**2 15/31/63/126 can be selected. Be sure this setting is the same as the PLC unit's Highest Address setting.*

**3 15/31/63/126 can be selected. On a single network, choose the value that is higher than the maximum value of the GP's Local Node or the PLC's MPI Address. For example, if the maximum value is 16, then select 31. Specify the smallest practical value for the maximum node address. This will shorten the time required for initializing the network.*

**4 Set the Connection Method. When connecting to the MPI port directly, set to "Direct".*

**5 Set the GP's unit number. Setting range is from 0 to 126. Maximum number of GP units that can be connected is 3. Be sure this number is not used as a PLC's Node No.*

**6 Set the PLC unit's node number. Setting range is from 0 to 126, and the maximum number of PLCs that can be connected is 4. Be sure this number is not used as a GP and another PLC unit's Node No.*

**7 Select the number of PLCs to use for data communication. Setting range is from 1 to 4.*

**8 Register the PLC's MPI Address. Depending on the No. of PLCs setting, from #2 to #4 can be set. This setting can only be entered using the GP-PRO/PBIII software. The GP unit's OFFLINE mode cannot be used.*

■ SIMATIC S7-300/400 Series (MPI via adapter)

GP Setup				PLC Setup	
Baud Rate *1			19200 bps	Baud Rate *9	————
Data Length			8 bits (fixed)	————	————
Stop Bit			1 bit (fixed)	————	————
Parity Bit			Even (fixed)	————	————
Data flow Control			ER (fixed)	————	————
Communication Format			RS-232C (fixed)	————	————
Highest Node No. *2*3			31	Highest Address *3	31
Connection Method *4			via Adapter (fixed)	————	————
Local Node (GP) *5			1	————	————
Target Node (PLC)	No. of PLCs *7		1	————	————
	Node Num *8	#1	2	MPI Address *6	2
		#2	Depending on the PLC MPI Address	MPI Address *6	0 to 126
		#3	Depending on the PLC MPI Address	MPI Address *6	0 to 126
		#4	Depending on the PLC MPI Address	MPI Address *6	0 to 126

**1 When using an HMI Adapter, Baud Rate speed can be 19200 bps, 38400 bps or 115200 bps. However, when using another adapter, Baud Rate speed can only be 19200 bps.*

**2 15/31/63/126 can be selected. Be sure this setting is the same as the PLC unit's Highest Address setting.*

**3 15/31/63/126 can be selected. On a single network, choose the value that is higher than the maximum value of the GP's Local Node or the PLC's MPI Address. For example, if the maximum value is 16, then select 31.Specify the smallest practical value for the maximum node address. This will shorten the time required for initializing the network.*

**4 Set the Connection Method. When using an adapter, set it to "via Adapter".*

**5 Set the GP's unit number. Setting range is from 0 to 126, and the maximum number of GP units that can be connected is 3. Be sure this number is not used as a PLC's Node No.*

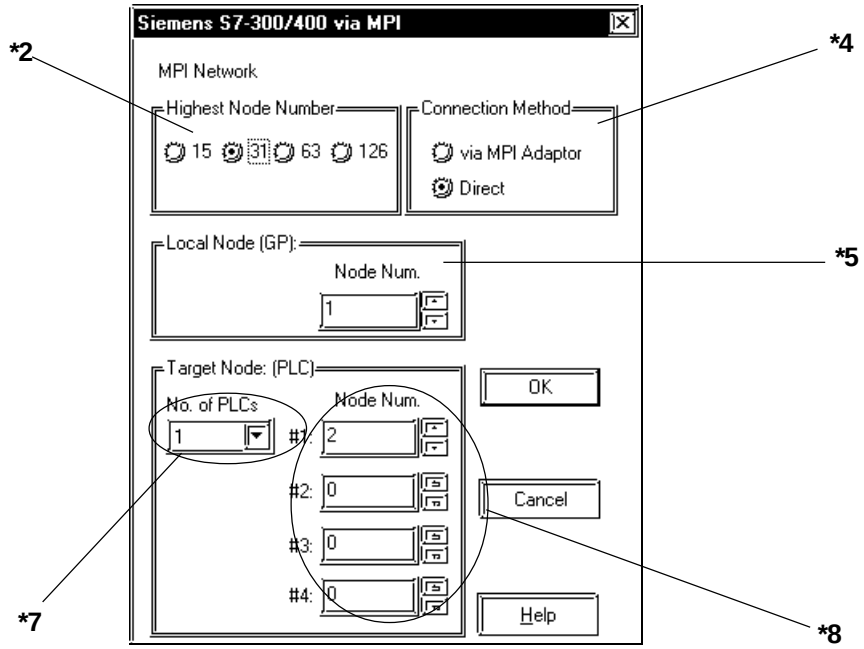
**6 Set the PLC unit's node number. Setting range is from 0 to 126, and the maximum number of PLCs that can be connected is 4. Be sure this number is not used as a GP and another PLC unit's Node No.*

**7 Select the number of PLCs to use for data communication. Setting range is from 1 to 4.*

**8 Register the PLC's MPI Address. Depending on the No.of PLC setting, from #2 to #4 can be set. This setting can only be entered using the GP-PRO/PBIII software. The GP unit's OFFLINE mode cannot be used.*

**9 The Baud Rate Setting does not required.*

Note: **The following diagram is Siemens S7-300/400 Series MPI Network setting window. This window is displayed by clicking on the [MPI Network] button in the [GP System Setup]-[Mode Settings] tab. The number in the diagram refers to the footnote number as shown above.**



<SIMATIC S7-300/400 Series MPI Network Setting Window>

■ SIMATIC S7-300 (Using Adapter< 3964/RK512>)

GP Setup		PC Link Unit Setup
Communication-format	RS-232C	---
Baud Rate	19200 bps	---
Data Bit	8 bits	---
Parity Bit	Even	---
Stop Bit	1 bit	---
Data Flow Control	ER Control	---

Note: **It is possible to enable/disable the Block Check Character (BCC) in communications between the PLC and the GP. This configuration can be performed via the Editor's [Mode] -> [Option] menu.**

■ SIMATIC S7-400 Using Adapter< 3964/RK512>)

GP Setup		PC Link Unit Setup
Communication-format	RS422	---
Baud Rate	19200 bps	---
Data Bit	8 bits	---
Parity	Even	---
Stop Bit	1 bit	---
Data Flow Control	ER Control	---

■ SIMATIC 505

GP Setup		PLC Settings	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7bits (fixed)
Stop Bit	1 bit	Stop Bit	1bit (fixed)
Parity Bit	Odd	Parity Bit	Odd (fixed)
Data Flow Control	ER Control	————	————
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	Turn on the Dip Switch 1 on CPU.
Communication Format (RS-422)	RS-422 (4-wire type)	Communication Format (RS-422)	Turn on the Dip Switch 1 on CPU.

2.16.5 Error Codes

<MPI Error Codes>

An error code specific to the MPI is displayed in the lower left corner of the GP screen like "Host communication error (02:**:##)." ** stands for the error code specific to the MPI. ## stands for the Node No. of the PLC on which the error has occurred. Error Codes F0, F2 and F3 is not displayed the Node No. of the PLC

■ Error Codes

Error Code	Description
F0	The cable is not connected. The PLC's power is OFF.
F1	Unable to locate target node.
F2	GP does not support 187500bps data transfer speed.
F3	A Timeout has occurred on the MPI network.
F4	Failed to connect to Target Node.
F5	Designated device or address does not exist, or other similar problem.

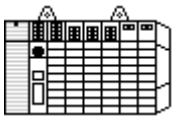
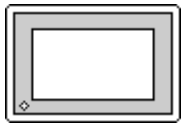
2.17 Rockwell (Allen-Bradley)

2.17.1 System Structure

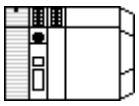
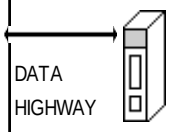
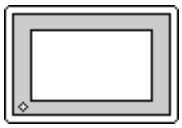
The following describes the system structure for connecting the GP to Rockwell (Allen-Bradley) PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.17.2 Cable Diagrams**".*

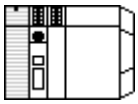
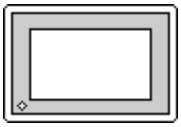
■ SLC 500 Series (using CPU unit Link I/F)

CPU	Cable Diagram	GP
		
SLC-5/03 SLC-5/04	RS-232C (Cable Diagram 1)	GP Series

■ PLC-5 Series (using Link I/F)

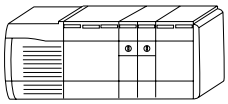
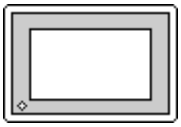
CPU	Link I/F	Cable Diagram	GP
	 DATA HIGHWAY PLUS		
All PLC-5 processors which can connect one of the link unit shown on the right.	1785-KE 1785-KE/C	RS-232C (Cable Diagram 2)	GP Series
	1770-KF2	RS-232C (Cable Diagram 3) RS-422 (Cable Diagram 4)	

■ PLC-5 Series (CPU Direct Connection)

CPU *1	Cables Diagram	GP
		
PLC-5/11 PLC-5/20 PLC-5/30 PLC-5/40 PLC-5/40L PLC-5/60 PLC-5/60L	RS-232C (Cable Diagram 3) RS-422 (Cable Diagram 5)	GP Series

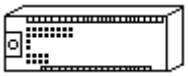
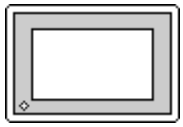
**1 Connect to Channel 0 (CH0).*

■ ControlLogix 5000 Series (using CPU unit Link I/F)

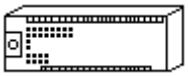
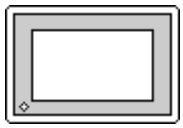
CPU	Cable Diagram	GP/GLC
		
1756-L1 1756-L1M1 1756-L1M2 1756-L1M3 1756-L55M13 1756-L55M14 1756-L55M15	RS-232C <Cable Diagram 6>	GP Series *1 GLC Series

**1 This unit can be used with the GP-377 Series, GP77R Series, GP2000 Series, GLC2000 Series units.*

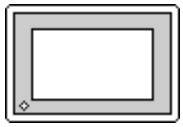
■ MicroLogix 1000 Series (CPU Direct Connection)

CPU	Link	Cable Diagram	GP
			
1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	RS-232C port on CPU unit	RS-232C <Cable Diagram 7>	GP Series

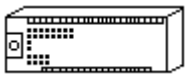
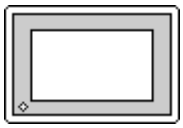
■ MicroLogix 1200 Series (CPU Direct Connection)

CPU	Link	Cable Diagram	GP
			
1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40B WA 1762-L40BXB	RS-232C port on CPU unit	RS-232C <Cable Diagram 7>	GP Series

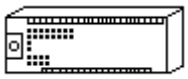
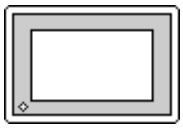
■ MicroLogix 1200 Series (CPU Direct Connection)

CPU	Link	Cable Diagram	GP
			
1764-LSP	RS-232C port on Base unit	RS-232C <Cable Diagram 7>	GP Series

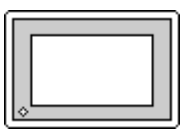
■ MicroLogix 1000 Series (using Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	Advanced Interface Converter (1761-NET-AIC)	RS-232C <Cable Diagram 8>	GP Series

■ MicroLogix 1000 Series (using Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA 1762-L40BXB	Advanced Interface Converter (1761-NET-AIC)	RS-232C <Cable Diagram 8>	GP Series

■ MicroLogix 1500 Series (using Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1764-LSP	Advanced Interface Converter (1761-NET-AIC)	RS-232C <Cable Diagram 8>	GP Series

2.17.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Rockwell (Allen-Bradley) may differ; however, using these cables for your PLC operations will not cause any problems.

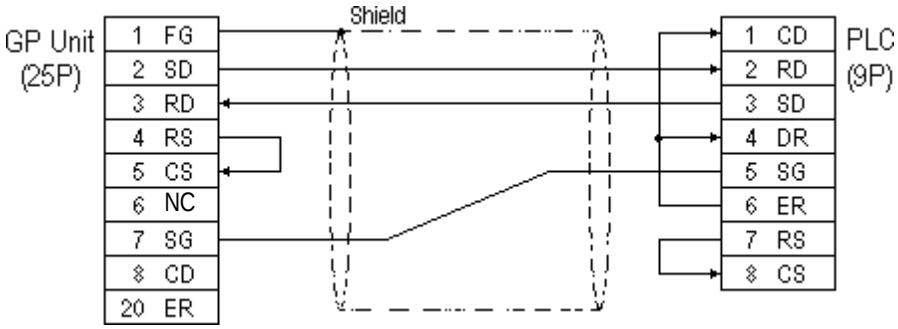
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

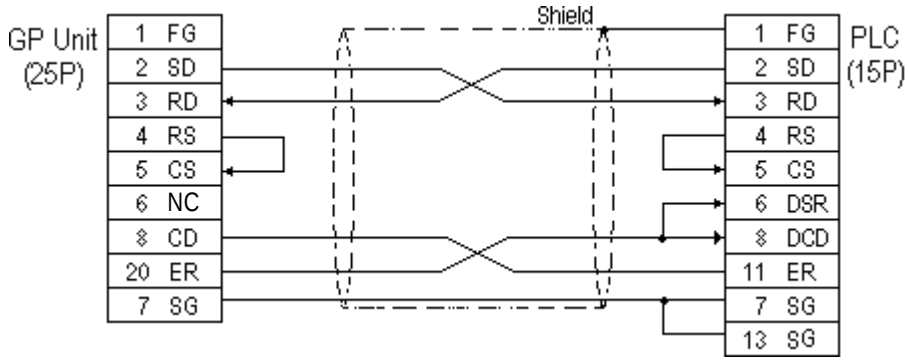
Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***
- ***For the RS-422 connection, refer to Rockwell's PLC manual for the cable length.***

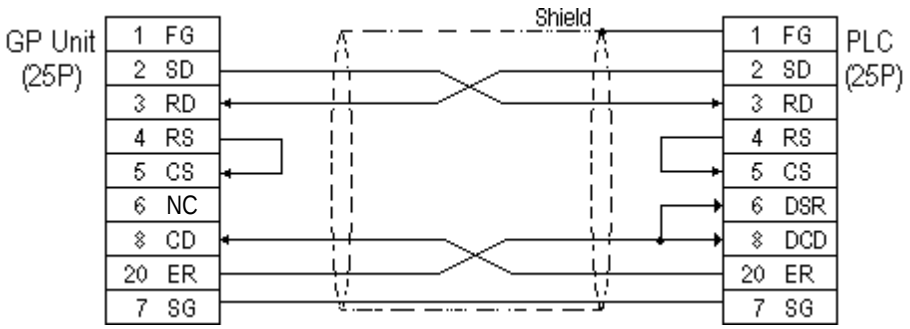
Cable Diagram 1 (RS-232C)



Cable Diagram 2 (RS-232C)

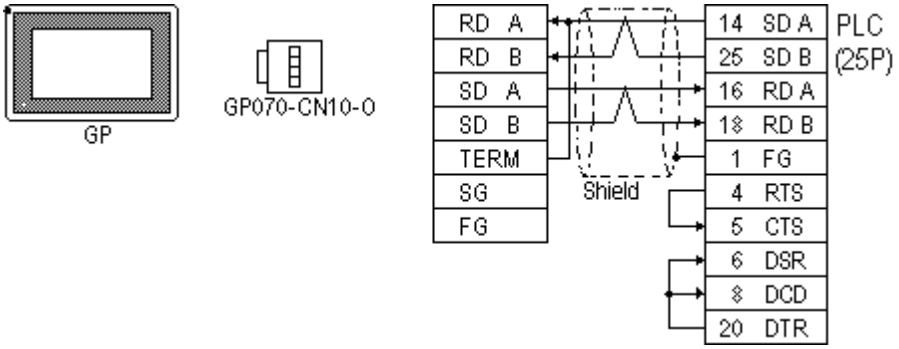


Cable Diagram 3 (RS-232C)

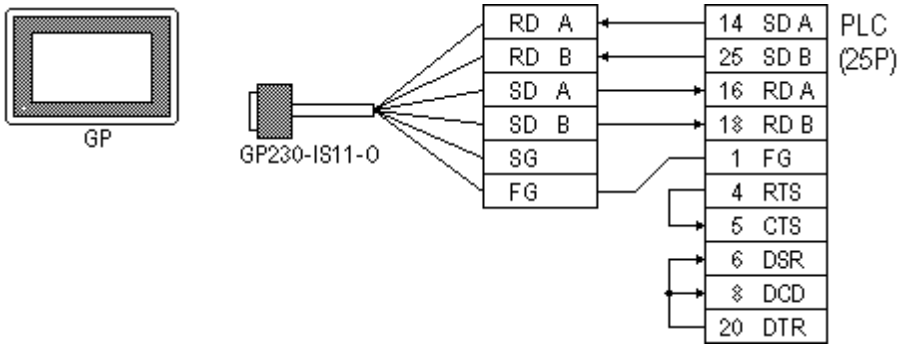


Cable Diagram 4 (RS-422)

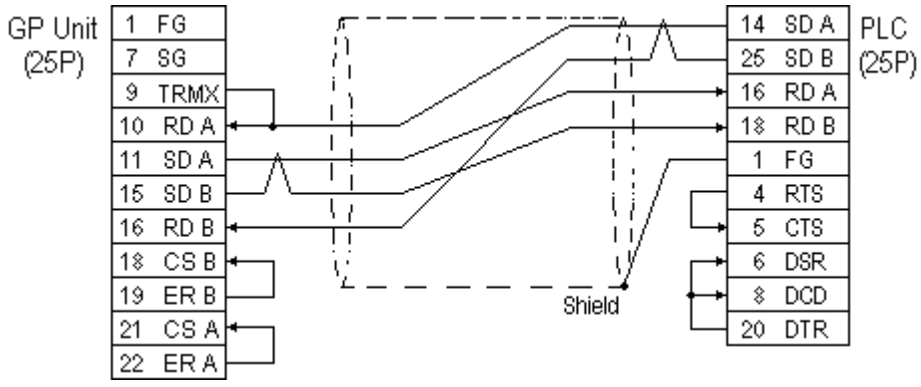
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



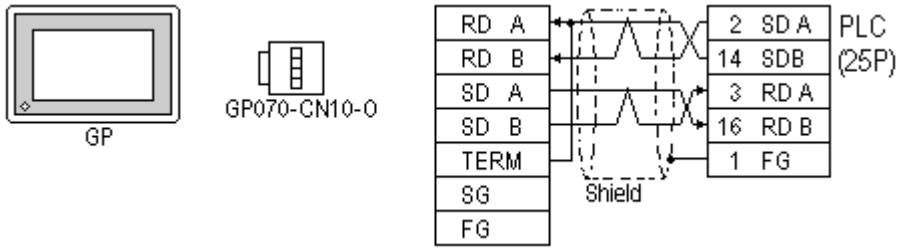
• When making your own cable connections



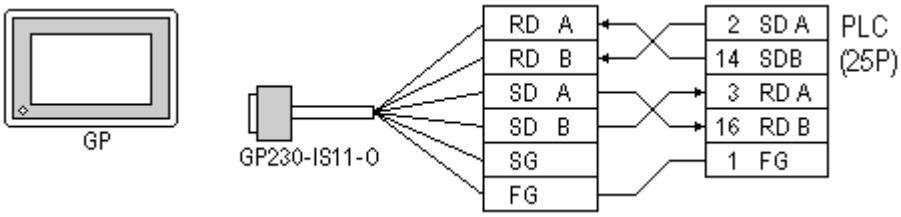
When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

Cable Diagram 5 (RS-422)

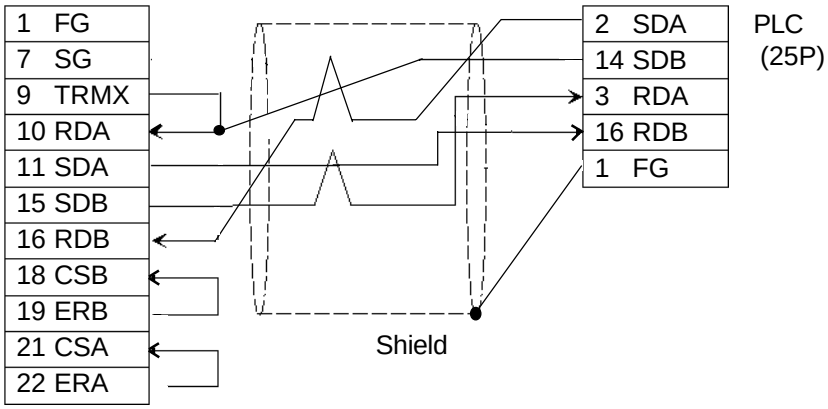
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0

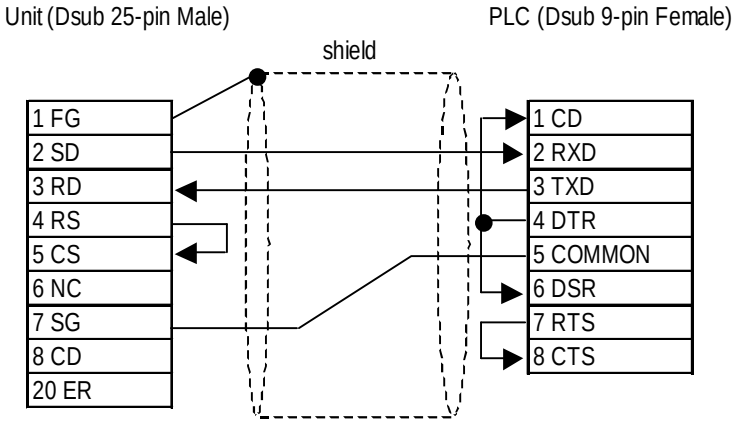


• When making your own cable connections



When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

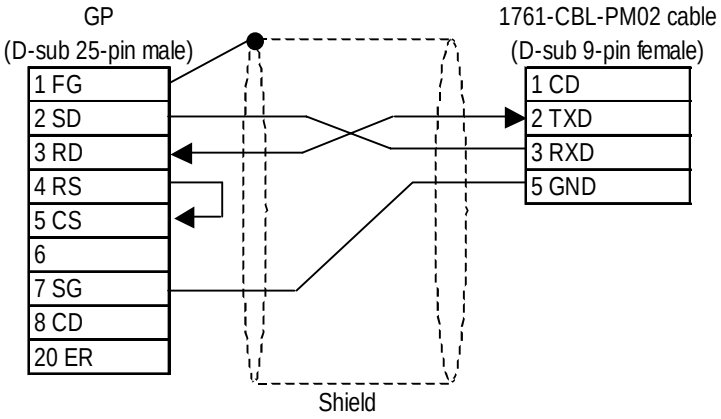
Cable Diagram 6 (RS-232C)



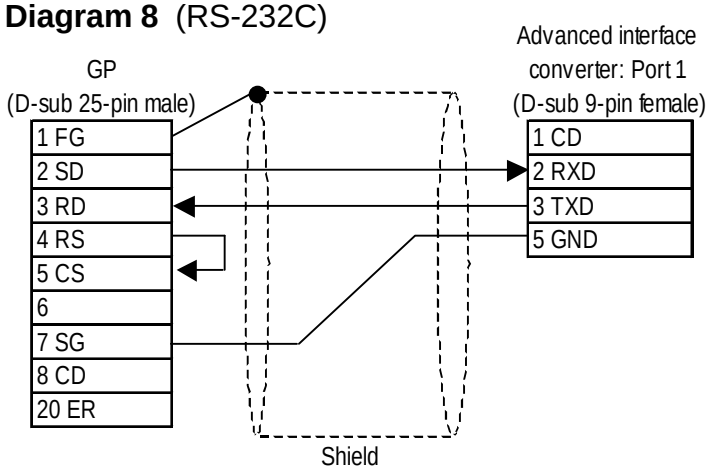
Note:

- **Connect the shield to the GP's FG terminal.**
- **If a communications cable is used, it must be connected to the SG terminal and COMMON terminal.**

Cable Diagram 7 (RS-232C)



Cable Diagram 8 (RS-232C)



2.17.3 Supported Devices

The following describes the range of devices supported by the GP.

■ SLC 500/MicroLogix 1000•1200•1500 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Bit	B3:000/00 ~ B3:255/15	B3:000 ~ B3:255	H/L	
	B9:000/00 ~ B255:255/15	B9:000 ~ B255:255		
Timer (TT: Timing Bit)	T4:000/TT ~ T4:255/TT	---		L/H
	T9:000/TT ~ T255:255/TT			
Timer (DN: Completion Bit)	T4:000/DN ~ T4:255/DN	---		
	T9:000/DN ~ T255:255/DN			
Timer (PRE: Setup Value)	---	T4:000.PRE ~ TP4.255.PRE	*1	
		T9:000.PRE ~ T255.255.PRE		
Timer (ACC: Current Value)	---	T4.000.ACC ~ T4:255.ACC	*1	
		T9.000.ACC ~ T255:255.ACC		
Counter (CU: Up Count)	C5:000/CU ~ C5:255/CU	---		
	C9:000/CU ~ C255:255/CU			
Counter (DC: Down Count)	C5:000/CD ~ C5:255/CD	---		
	C9:000/CD ~ C255:255/CD			
Counter (CN: Completion Bit)	C5:000/DN ~ C5:255/DN	---		
	C9:000/DN ~ C255:255/DN			
Counter (PRE: Setup Value)	---	C5:000.CP~ C5.255.CP	*1	
		C9.000.CP ~ C255:255.CP		
Counter (ACC: Current Value)	---	C5:000.CA ~ C5:255.CA	*1	
		C9.000.CA ~ C255:255.CA		
Integer	---	N7:000 ~ N7:255	Bit 15	H/L
		N9:000 ~ N255:255		
Floating point	---	F8:000 ~ F255:255		L/H

**1 When reading and writing consecutive addresses that are all two words or longer, reading will take longer than for other devices, and the overall screen refresh speed will be slower.*

Note:

- **The range of available devices depends on the type of CPU used. For available device range information, refer to your PLC's manual.**
- **In the above tables, the address descriptions and input methods used in GP-PRO/PBIII for Windows V6.0 or earlier software may vary, however the internal data can be converted. Even if GP-PRO/PBIII for Windows V6.0 or later software is used, the internal data will not be damaged.**
- **When using Version 6.0 or earlier address displays and input methods with Versions 6.1 or later software, be sure to use the following steps.**

  1) Locate and open the folder named [SLC500] in your GP/PRO/PBIII for Windows Version 6.1 or later CD-ROM.

  2) Copy the file named [SLC500.TBL] to the folder [PLCTBL] on your PC's hard disk drive. (This folder was created when Version 6.1 was installed.)

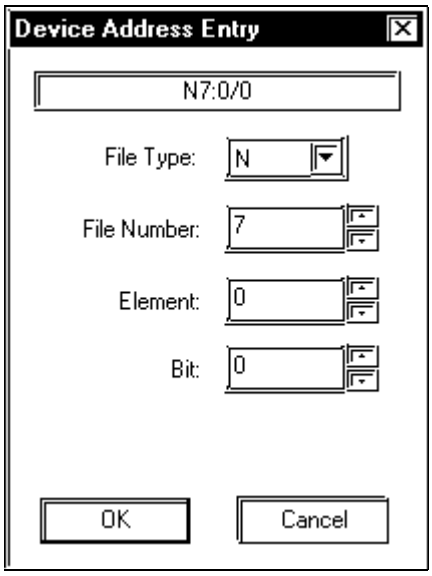
  3) Delete the [SLC500.PTO] from the folder [PTO] was creaated when GP-PRO/PBIII was installed.

  4) Start up GP-PRO/PBIII for Windows. You will now be able to use Version 6.0 or earlier address displays and input methods.
- **File Numbers 0~8 are the User's default files.**
- **A PLC COM Error (02:10) develops when a device cannot be allocated into the PLC data table map.**
- **According to the PLC specifications, the input and output relays cannot perform direct reads and writes. As a result, perform the following procedures via the PLC:**

  When reading data; use a ladder program to move the input and output relay data either as bits or as integers, and then read out those bits or integers.

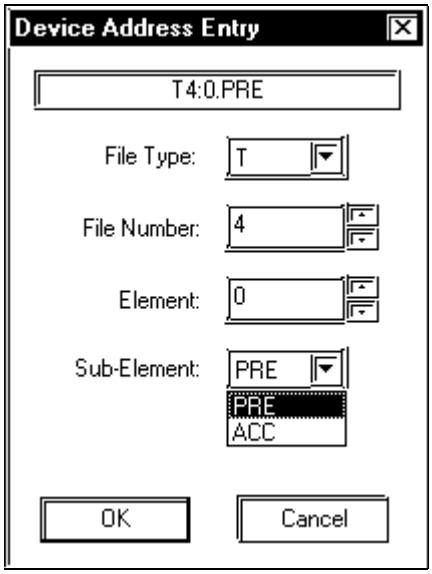
  When writing data; write the data as either bits or integers, and then use the ladder program to move the data to the input or output relays.
- **In Rockwell (Allen-Bradley) PLCs, the structure of each device's data is determined from the Element; however, in GP-PRO/PBIII for Windows there is no Element. Therefore, use the following examples when entering device data.**

• For word devices N, B, and F



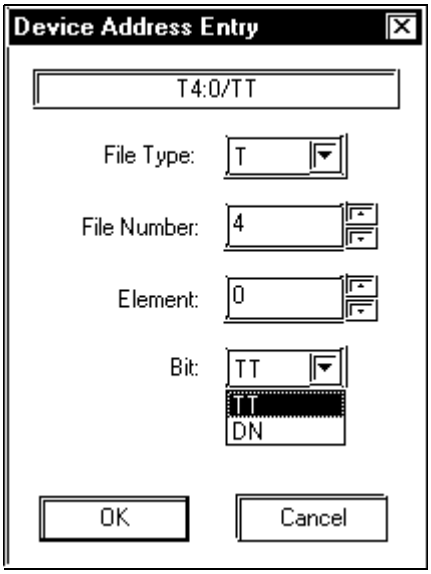
Display after input: N7:0

• For word devices T and C



Display after input: T4:0.PRE

• For bit devices T and C



Display after input: T4:0/TT

■ PLC-5 Series

Setup System Area here.

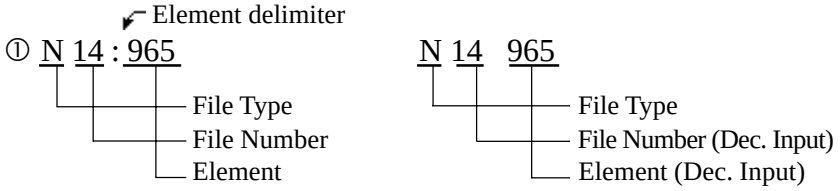
Device	Bit Address	Word Address	Particulars	
Input Relay	I00000 ~ I27717	I000 ~ I277	÷8	H/L
Output Relay	O00000 ~ O27717	O000 ~ O277	÷8	
Internal Relay	B300000 ~ B6799915	B3000 ~ B67999		
Timer (TT: Timing Bit)	TT3000 ~ TT67999	---		L/H
Timer (TD: Complete Bit)	TD3000 ~ TD67999	---		
Counter (CC: Count)	CC3000 ~ CC67999	---		
Counter (CD: Complete Bit)	CD3000 ~ CD67999	---		
Timer (ACC: Current Value)	---	TA3000 ~ TA67999		
Timer (PRE: Setup Value)	---	TP3000 ~ TP67999		
Counter (ACC: Current Value)	---	CA3000 ~ CA67999		
Counter (PRE: Setup Value)	---	CP3000 ~ CP67999		
Data Register Integer	---	N3000 ~ N67999	Bit 15	H/L
Data Register BCD	---	D3000 ~ D67999	Bit 15	
Data Register ASCII	---	A3000 ~ A67999	Bit 15	

Note:

- **The range of supported devices may be different depending on your CPU.**
- **In Rockwell (Allen-Bradley) PLCs, the structure of each device data is determined from the *Element*; in GP-PRO/PBIII for Windows there is no concept called the *Element*. Use the following examples when entering device data.**

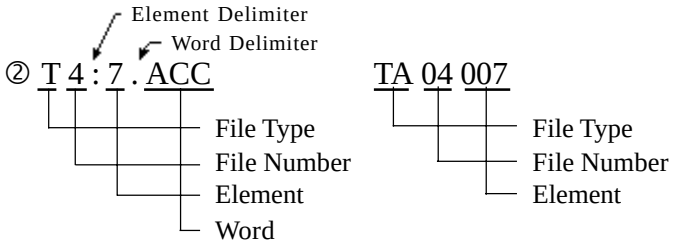
PLC Data **GP-PRO/PBIII Input**

■*When Using Elements*

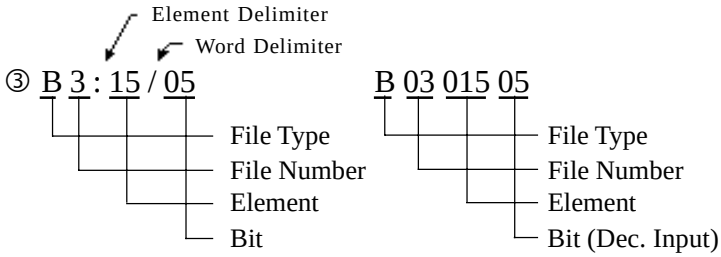


PLC Side **GP-PRO/PBIII Input**

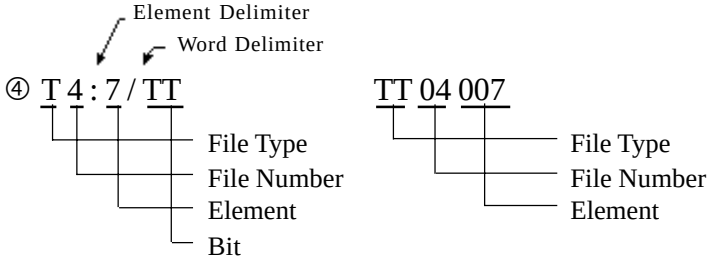
■*When Using Words*



■*When Using Bits*

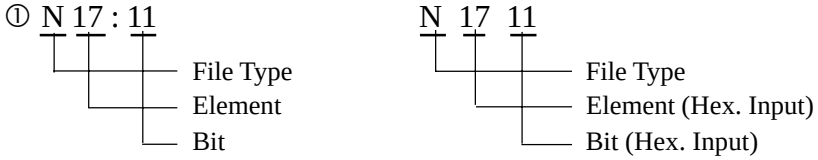


B301505 represents the same data as B3/245 (number 245 bits of file number 3). However, GP-PRO/PBIII for Windows cannot be used to input B3/245 directly.



- **There is no File Number for the *Input Relay* and *Output Relay*. Also, the Element and Bit Numbers are Hexadecimal.**

PLC Side **GP-PRO/PBIII Input**



■ ControlLogix 5000 Series

Setup System Area here.

Device	Bit Address	Word Address	Paticular	
Bit (BOOL)	BOOL00000000~BOOL99999931	BOOL000000~BOOL999999	*1*3	L/H
8 bit integer (SINT)	————	SINT000000~SINT999998	Bit 7 ÷2 *1	
16 bit integer (INT)	————	INT000000~INT999999	Bit 15 *1	
32 bit integer (DINT)	————	DINT000000~DINT999999	Bit 31 *1	
32 bit float (REAL)	————	REAL000000~REAL999999	*1*2	H/L

***1 When using a GP Series unit to access a ControlLogix 5000 Series unit's data memory, you must first allocate data memory's array elements. When allocating array elements, use File numbers and Element numbers. An address designation example is shown below for GP-PRO/PBIII for Windows.**

INT 123 100
Element number (0~999)
File number (0~999)

***2 This device uses Float. When this type of device is used, only the E-tag and K-tag's "32-bit Float" setting can be used.**

***3 The BOOL device descriptions used in the GP-PRO/PBIII manual and the RSLogix 5000 manual are different. Please be aware of these differences when setting up BOOL devices.**

GP-PRO/PBIII manual	000000 00~ 000000 31	000001 00~ 000001 31	000002 00~ 000002 31	~	000999 00~ 000999 31
RSLogix 5000 manual	0~31	32~63	64~95	~	31968~31999

Important

When using the GP to access a PLC device, be sure to first allocate all Tags used by PLC Data Memory to their respective devices. Use the Rockwell's RSLogix 5000 ladder logic software to allocate these devices.

If device allocation is not performed, a Host Communication Error will occur (02:D6).

Reference *2.17.5 Error Codes*

Device Setting Example

The following explanation is for the ControlLogix 5000 device allocation.

1) PLC Tag Settings

Designate the Tag Name and Type.

- Tag Name : Can be set to any value. (Not related to GP device name)
- Type : Use one of the following data types for the Element setting.

(Use the same device name as the GP)

BOOL (32-bit data type)

INT (word data type)

DINT (dword data type)

SINT (byte data type)

REAL (float data type)

Example 1

Tag Name	Type
N7	INT[200]
DINT1	DINT[100]
DATA2	SINT[50]

This example's data uses the following values.

Row1 : Tag Name "N7" uses the INT data type for a 200 element array.

Row2 : Tag Name "DINT1" uses the DINT data type for a 100 element array.

Row3 : Tag Name "DATA2" uses the SINT data type for a 50 element array.

Be sure to set the number of array elements within the GP unit's maximum usable range. (The GP can access up to 999 elements.)

Also, if array elements are not designated, only one element can be used.

Ex. Tag Name:N8, Type:INT allows only one word to be used by N8.

2) Mapping Settings

The tag name set in 1) can have any desired file number allocated to it. It is not possible to set the same file number to two tag names.

Example 2

File Number	Tag Number
2	DATA2
1	DINT1
7	N7

2.17.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ SLC 500 Series

GP Setup		Special Interface Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	---	
Stop Bit	1 bit (fixed)	---	
Parity Bit	EVEN	Parity Bit	EVEN
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
---		Communication Driver	DF1 HALF-DUPLEX SLAVE *1
---		Duplicate Packet Detection	DISABLE *1
---		Error Detection	BCC *1
---		Control Line	No Handshaking *1
Unit No. (DH GP) *2	0	Station Address *2	0

** 1 Will not operate with any other settings.*

** 2 Setup the Station Address and the GP's Unit No. (DH GP) address to the same value (address set as decimal values). It is unnecessary to setup the DH PLC address.*

Reference *Specifying DH addresses*

■ PLC-5 Series

GP Setup		CPU (CH0), 1785-KE, 1770-KF2	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits (fixed)	Data Length	8 bits (fixed)
Stop Bit	1 bit (fixed)	Stop Bit	1 bit (fixed)
Parity Bit	EVEN	Parity Bit	EVEN
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
Communication Format (RS-422)	4-wire type	Communication Format (RS-422)	RS-422A
---		Comm. protocol	Half duplex (DF1 Slave for CH0) *1
---		Dupulicate Detect	OFF *1
---		Error Check	BCC *1
---		Control Line	NO HANDSHAKING *1
---		Other CH0 Parameters	50
---		DF1 retries	3
---		Diag file	0 (unused file)
---		RTS send delay	0
---		RTS off delay	0
---		Network link *2	Data Highway Plus
Unit No. (DH GP) *3	0	Station Address *4 *5 (1785-KE, 1770-KF2 side)	0
Unit No. (DH PLC) *3	1	Station Address *4 (CPU side)	1

**1 Will not operate with any other settings.*

**2 This is the KF2 setup*

**3 Set the DH GP to station address 1785-KE or 1770-KF2, and set the DH PLC's to the CPU's station address. When using the 1785-KE or 1770-KF2, enter different numbers for the DH GP and DH PLC addresses. With a direct CPU connection, enter the same values in the DH GP and DH PLC addresses. With the GP in Offline Mode, use the "Operating Environment Setup" area to enter the DH address (DH, GP, DH, PLC) base 10 (decimal) values.*

Reference *Specifying DH addresses*

**4 When using the programming unit, make sure the Terminal Address (programming equipment address) and the Station Address do not overlap.*

**5 Unavailable for CPU Direct Connection.*

Note: **When using CH0, setup the CPU to *Slave*. Do not setup as *Point to Point*.**

■ ControlLogix 5000 Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate *1	19200 bps
Data Length	8 bit	Data Bits *1	8 bit
Stop Bit	1 bit	Stop Bit *1	1 bit
Parity Bit	Even	Parity *1	Even
Data Flow Control	ER	————	————
Communication Format	RS-232C	————	————
Unit No.	0	Station Address *2	0
————		Mode *1	System
————		Control Line *1	No Handshake
————		RTS Send Delay *1	0
————		RTS Off Delay *1	0
————		Protocol *2	DF1 Slave
————		Transmit Retries *2	3
————		Slave Poll Timeout *2	3000
————		EOT Suppression *2	No Check
————		Error Detection *2	BCC
————		Enable Duplicate Detection *2	No Check (Disable)

**1 Set via the Rockwell Ladder Logic Software RSLogix 5000 "Serial Port" menu.*

**2 Set via the Rockwell Ladder Logic Software RSLogix 5000 "System Protocol" menu.*

■ MicroLogix 1000 Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	————	————
Stop Bit	1 bit	————	————
Parity Bit	Non	Parity	Non
Control Method	ER Control	————	————
Communication Format	RS-232C	————	————
	RS-422 (4-wire type)	————	————
DH Address GP DH Address PLC *1	0 to 254	Node Address	0 to 254
————		Driver	DF1 Half Duplex Slave
————		Control Line	No Handshaking
————		Error Detection	BCC
————		E0T Suppression	No Check
————		Duplicate Packet Detect	No Check
————		Poll Timeout	3000
————		Message Retries	3
————		Pre Transmit Delay	0

**1 Specify the same address for DH Address GP and DH Address PLC.*

■ MicroLogix 1200/1500 Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	———	———
Stop Bit	1 bit	———	———
Parity Bit	Even	Parity	non
Control Method	ER Control	———	———
Communication Format	RS-232C	———	———
	RS-422 (4-wire type)	———	———
DH Address GP DH Address PLC *1	0 to 254	Node Address	0 to 254
Communication Format	RS-232C	———	———
———		Driver	DF1 Half Duplex Slave
———		Control Line	No Handshaking
———		Error Detection	BCC
———		EOT Suppression	OFF
———		Duplicate Packet Detect	OFF
———		Poll Timeout	3000
———		Message Retris	3
———		Pre Transmit Delay	0

**1 Specify the same address for DH Address GP and DH Address PLC.*

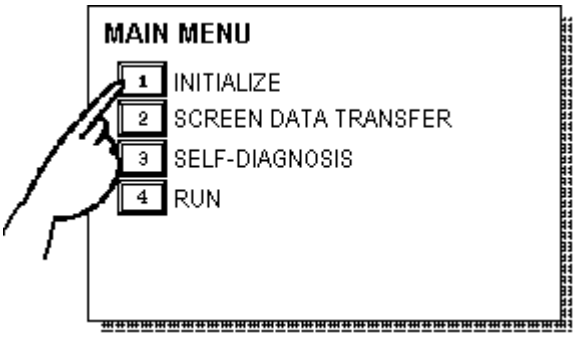
■ MicroLogix 1000/1200/1500 Series (Using Advanced Interface Converter)

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	Auto
Data Length	8 bits	———	———
Stop Bit	1 bit	———	———
Parity Bit	Non	———	———
Control Method	ER Control	———	———
Communication Format	RS-232C	———	———
	RS-422 (4-wire type)	———	———
DH Address GP DH Address PLC *1	0 to 254	———	———

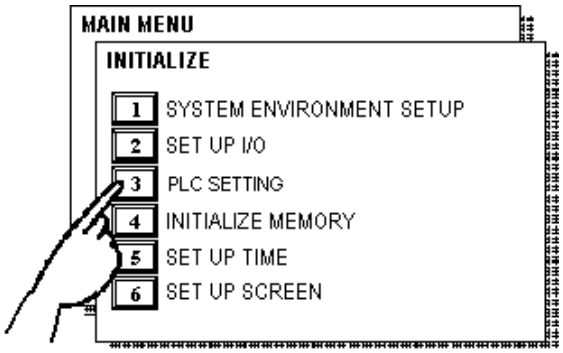
**1 Specify the same address for DH Address GP and DH Address PLC.*

■ Specifying DH addresses

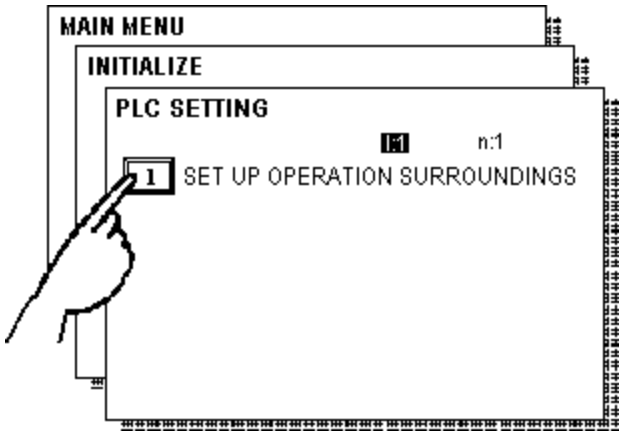
Set up the operating environment at the initial setup when the GP is in the OFFLINE mode.



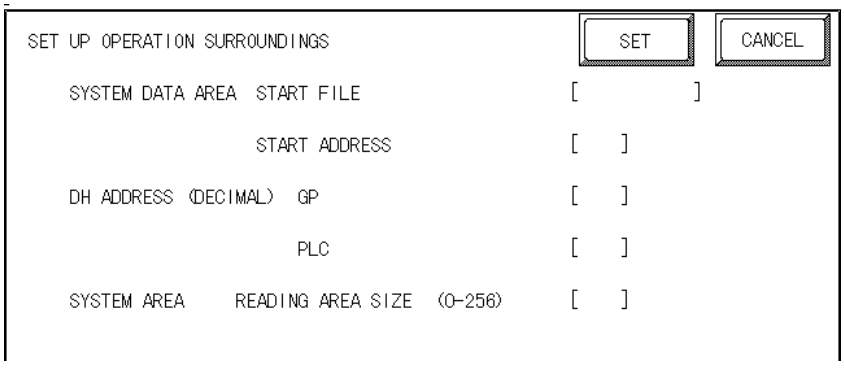
① Touch item #1, INITIALIZE. The INITIALIZE menu will appear.



② Touch item #3, PLC SETTING. The PLC SETTING menu will appear.



③ Touch selection [1:1] and then item #1, SET UP OPERATION SURROUNDINGS. The selected option is then highlighted.



④ Specify the DH addresses.

2.17.5 Error Codes

■PLC Error Codes

Controller error codes are represented by the "Host communication error (02:**)", and indicated in the left lower corner of the GP screen. (** stands for an error code.)

Host Communication Error (02:**)

PLC Error Code

*** There are two types of PLC error codes - STS and EXT STS.**

EXT STS error codes have the characters "0xD0" attached to them, to prevent them from overlapping with STS error codes. Thus, all error codes with the last characters of "0xCF" or earlier are STS error codes.

Ex.

When a (02:D2) Host Communication Error occurs, it becomes the EXT STS error code of "0x02".

When a (02:C0) Host Communication Error occurs, it becomes the STS error code of "0xC0".

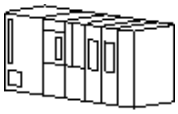
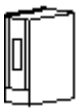
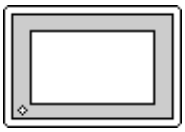
2.18 Keyence

2.18.1 System Structure

The following describes the system structure for connecting the GP to Keyence PLCs.

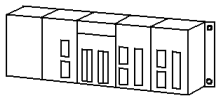
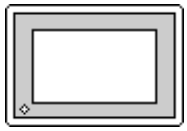
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.18.2 Cable Diagrams**".*

■ KZ-300/KZ-350 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 PC Link Unit		
KZ-300 KZ-350	KZ-L2	RS-232C Port 1 Connection (Cable Diagram 1) RS-232C Port 2 Connection (Cable Diagram 2) RS-422 Port 2 Connection (Cable Diagram 3)	GP Series

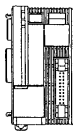
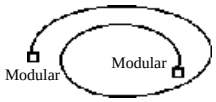
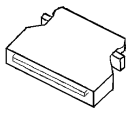
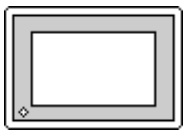
Note: **Port 1 and Port 2 can be connected at the same time on the GP. When connected at the same time, the Communication Setup for Port 1 and Port 2 must be the same.**

■ KZ-A500 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
			
KZ-A500	KZ-L10	RS-232C, connected to Port 1. (Cable Diagram 4)	GP Series
		RS-232C ,connected to Port 2. (Cable Diagram 2)	
		RS-232C ,connected to Port 2. (Cable Diagram 3)	

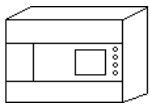
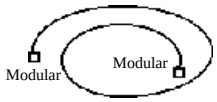
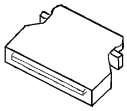
Important ***Port 1 (RS232C), Port 2 (RS232-C or RS422) and the modular controller on CPU unit can be used at the same time.***

■ KZ-A500 (CPU Direct Connection)

CPU	Cables	Connector	GP
			
KZ-A500	Keyence Corp.'s OP-26487	Keyence Corp.'s OP-26485 *1	GP Series

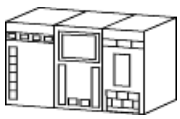
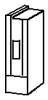
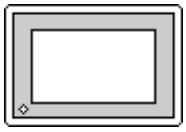
*1 *The above CPU cannot be directly connected to the GP2300 or GLC2300 series because of the connector cover size. In this case, use Digital's CA1-EXCBL/D25-01 extension cable.*

■ KV Series (CPU Direct Connection)

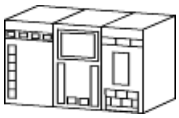
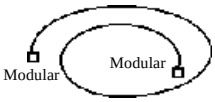
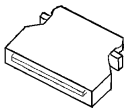
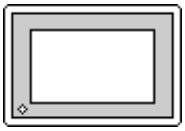
CPU	Cables	Connector	GP/GLC
			
KV-10 KV-16 KV-24 KV-40	Keyence Corp.'s OP-26487	Keyence Corp.'s OP-26485 *1	GP Series GLC Series

*1 *The above CPU cannot be directly connected to the GP2300 or GLC2300 series because of the connector cover size. In this case, use Digital's CA1-EXCBL/D25-01 extension cable.*

■ KV-700 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP/GLC
	PC Link Unit 		
KV-700	KV-L20	RS-232C (Communication Port 1) <Cable Diagram 5>	GP Series GLC Series
		RS-232C (Communication Port 2) <Cable Diagram 6>	
		RS-422 (Communication Port 2) <Cable Diagram 7>	

■ KV-700 Series (CPU Direct Connection)

CPU	Cables	Connector	GP/GLC
			
KV-700	Keyence Corp.'s OP-26487	Keyence Corp.'s OP-26485 *1	GP Series *2 GLC Series

*1 *The above CPU cannot be directly connected to the GP2300 or GLC2300 series because of the connector cover size. In this case, use Digital's CA1-EXCBL/D25-01 extension cable.*

*2 *In the GP70 series units, only GP377 series units can be used.*

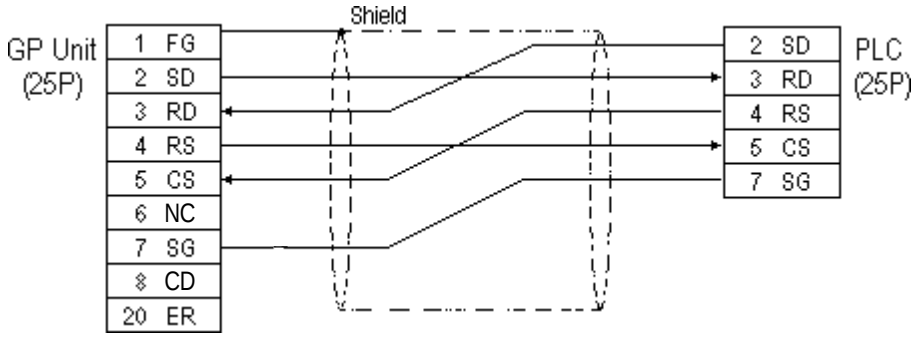
2.18.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Keyence may differ, however, using these cables for your PLC operations will not cause any problems.

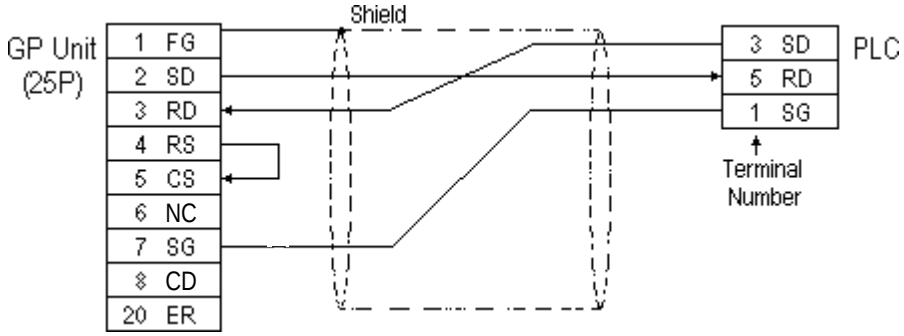
Careful!

- *Connect the FG line of the Shield cable to the GP.*
- *For the RS-232C connection, use a cable length less than 15m.*
- *If a communications cable is used, it must be connected to the SG (signal ground).*
- *For the RS-422 connection, refer to Keyence's PLC manual for the cable length.*

Cable Diagram 1 *(RS-232C)*



Cable Diagram 2 (RS-232C)



Cable Diagram 3 (RS-422)

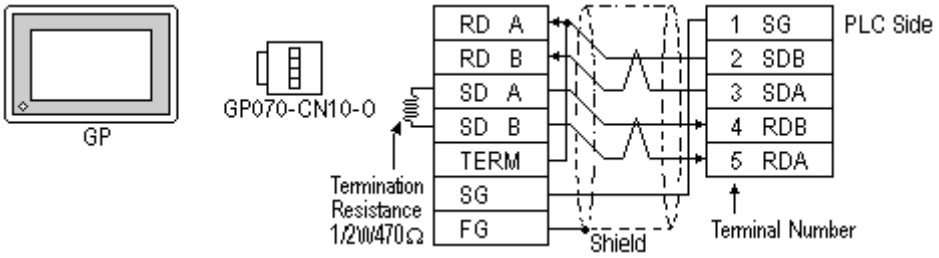
Careful!

Turn the PLC's Termination Resistor switch ON.

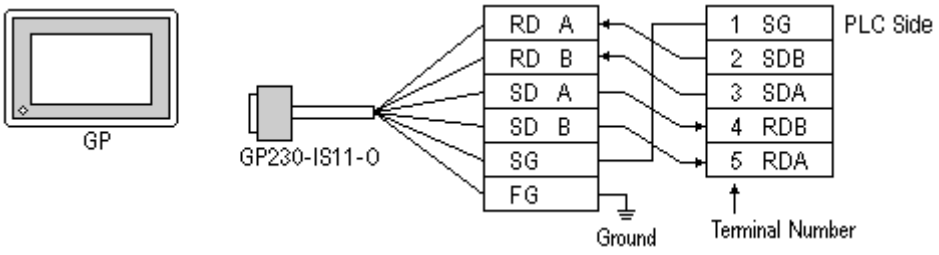
Important

The reading of the A and B signals is reversed on the GP and PLC.

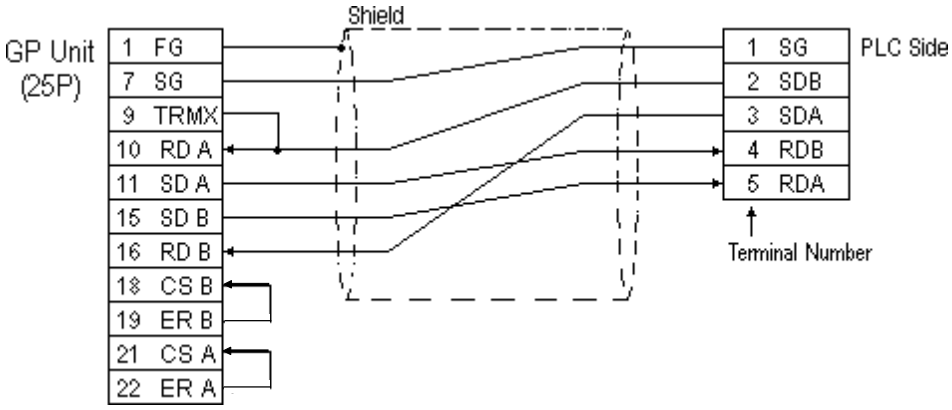
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



• When using Digital's RS-422 Cable, GP230-IS11-0



• When making your own cable connections



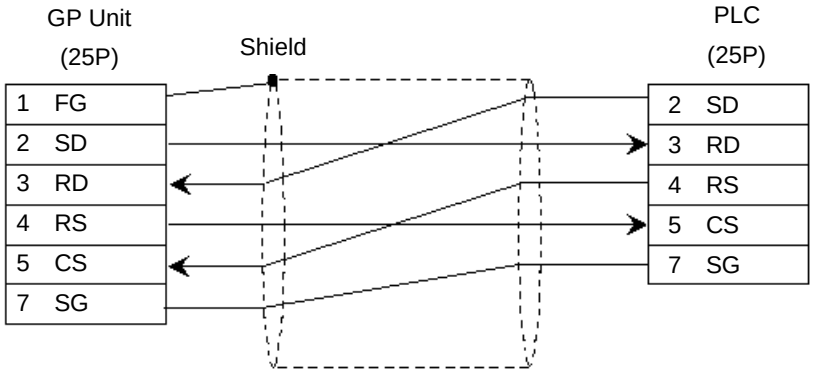
Note

- **Hirakawa Densen's H-9293A (C0-HC-ESV-3P*7/0.2) is the recommended cable.**
- **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
- **When using RS-422 connection, please check the cable length with Keyence PLC users manual.**

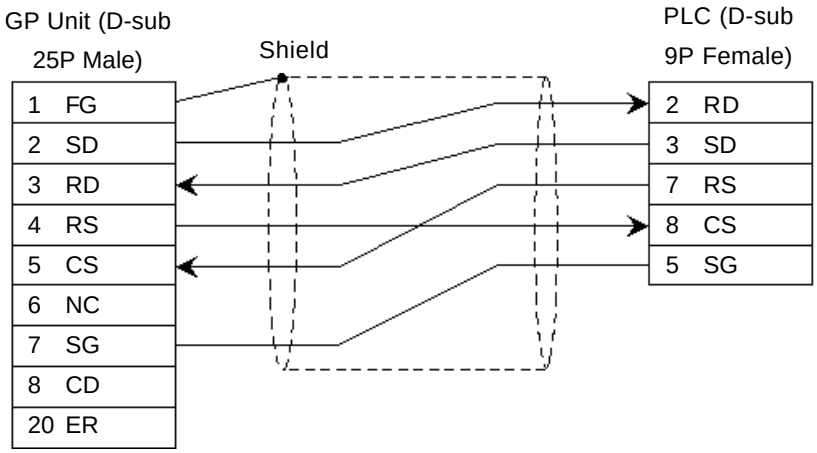
Cable Diagram 4 (RS-232C) port1

Note:

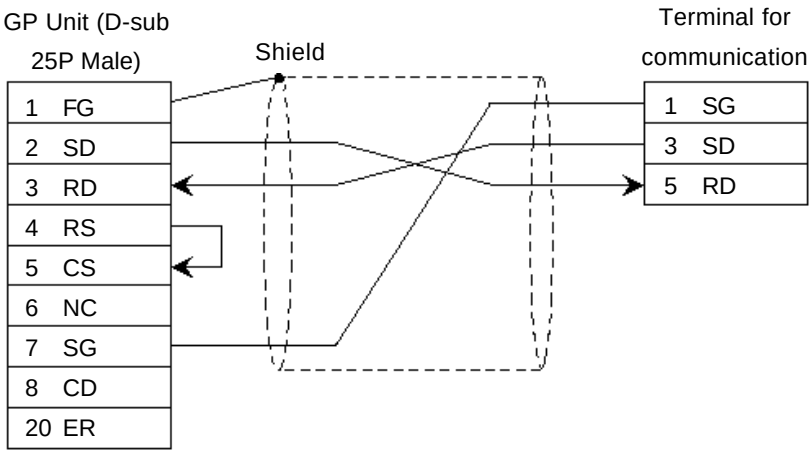
- **When using an RS-232C cable, the cable must be no longer than 15meters.**
- **When using an RS-422 cable, the cable must be no longer than 500meters.**



Cable Diagram 5 (RS-232C) port 1



Cable Diagram 6 (RS-232C) port 2

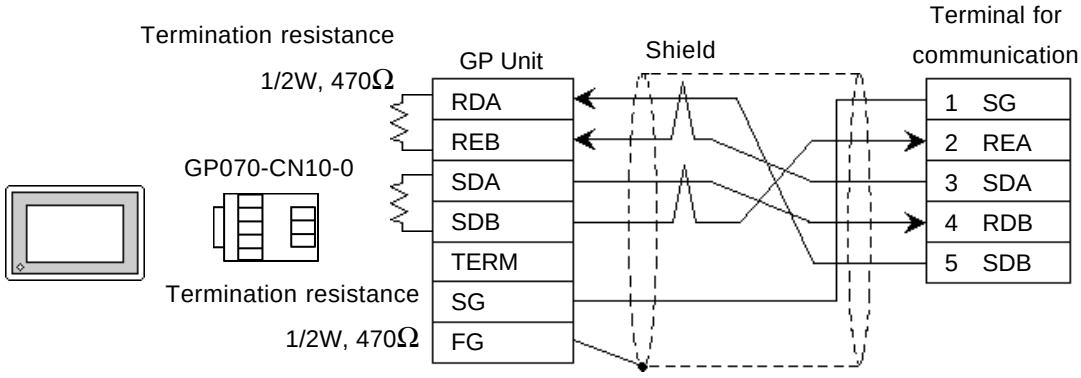


Cable Diagram 7 (RS-422) 4-wire type

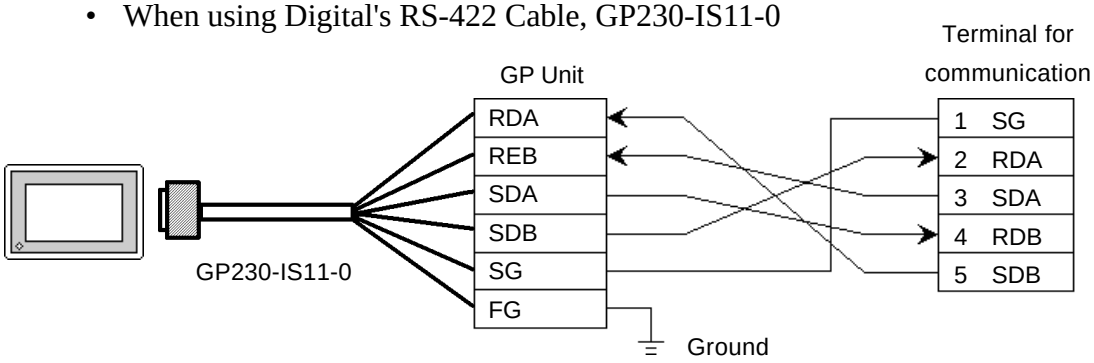
Careful!

- *The termination resistance on the PLC side becomes active when the Terminator Select switch on the unit is turned ON.*
- *The names of poles A and B are inverted between the GP and the PLC.*
- *The cable length should be within 500 meters.*

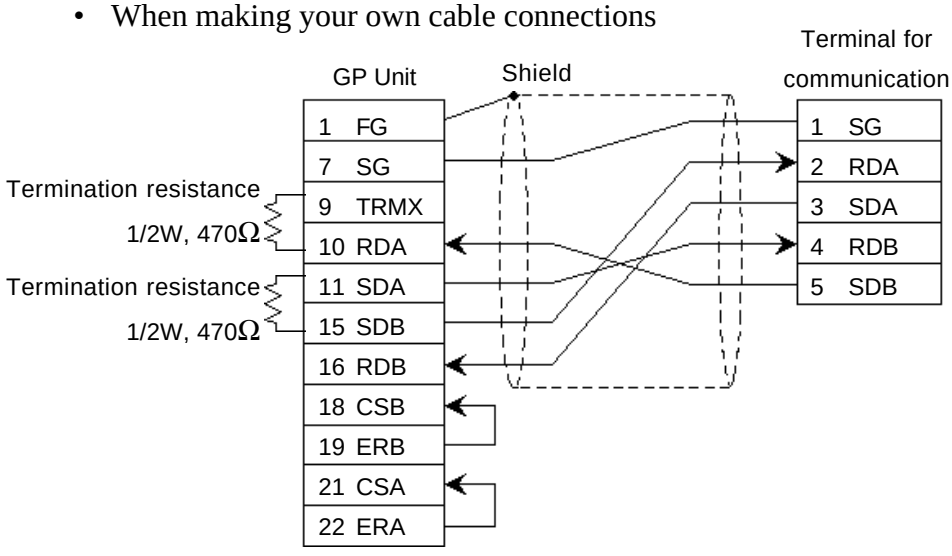
- When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



- When using Digital's RS-422 Cable, GP230-IS11-0



- When making your own cable connections



2.18.3 Supported Devices

The following describes the range of devices supported by the GP.

■ KZ-300/KZ-350 Series

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	00000 ~ 0009	00 ~ 00		L/H
	7000 ~ 17415	70 ~ 174	*1	
Output Relay	0500 ~ 0503	05 ~ 05		
	7500 ~ 17915	75 ~ 179	*2	
Help Relay	0504 ~ 0915	---		
Internal Help Relay	1000 ~ 6915	10 ~ 69		
Special Help Relay	2000 ~ 2915	20 ~ 29		
Timer (contact)	T000 ~ T249	---		
Counter (contact)	C000 ~ C249	---		
Timer (current value)	---	T000 ~ T249		
Counter (current value)	---	C000 ~ C249		
Data Memory	---	DM0000 ~ DM9999	Bit 15	
Temporary Data Memory	---	TM00 ~ TM31	Bit 15	

** 1 Address numbers *000~*400 are available for the bit device addresses,and *0~*4 are available for the word addresses displayed.*

Bit Address	Word Address
addr 7000	70
addr 7001 to addr 7400	71 to 74
addr 8000	80
addr 8100 to addr 8400	81 to 84
addr 17000 to addr 17400	170 to 174

** 2 Address numbers *500~*900 are available for the bit device addresses, and *5~*9 are available for the word addresses displayed.*

Bit Address	Word Address
addr 7500	75
addr 7600 to addr 7900	76 to 79
addr 8500	85
addr 8600 to addr 8900	86 to 89
addr 17500 to addr 17900	175 to 179

■ KZ-A500 (CPU Direct Connection)

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	X0000 ~ X07F0	xxx0	L/H
Output Relay	Y0000 ~ Y07FF	Y0000 ~ Y07F0	xxx0	
Internal Relay	M0000 ~ M8191	M000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	---		
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Annunciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B0FFF	---		
Timer (contact)	TS0000 ~ TS2047	---		
Timer (coil)	TC0000 ~ TC2047	---		
Counter (contact)	CS0000 ~ CS1023	---		
Counter (coil)	CC0000 ~ CC1023	---		
Timer (current value)	---	TN0000 ~ TN2047		
Counter (current value)	---	CN0000 ~ CN1023		
Data Register	---	D0000 ~ D6143	Bit15	
Special Register	---	D9000 ~ D9255	Bit15	
Link Register	---	W0000 ~ W0FFF	BitF	
File Register	---	R0000 ~ R8191	Bit15	

■ KZ-A500 (using Link I/F)

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	X0000 ~ X07F0	***0	
Output Relay	Y0000 ~ Y07FF	Y0000 ~ Y07F0	***0	
Internal Relay	M0000 ~ M8191	M0000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	L0000 ~ L8176	÷16	
Link Relay	B0000 ~ B0FFF	————		
Annunciator Relay	F0000 ~ F2047	F0000 ~ F2032	÷16	
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Timer (connect)	TS0000 ~ TS2047	————		
Timer (coil)	TC0000 ~ TC2047	————		L/H
Counter (connect)	CS0000 ~ CS1023	————		
Counter (coil)	CC0000 ~ CC1023	————		
Timer (current value)	————	TN0000 ~ TN2047		
Counter (current value)	————	CN0000 ~ CN1023		
Data Register	————	D0000 ~ D6143	Bit 15	
Link Register	————	W0000 ~ W0FFF	Bit F	
File Register	————	R0000 ~ R8191	Bit 15	
Special Register	————	D9000 ~ D9255	Bit 15	

■ KV Series (KV-10/KV-16/KV-24/KV-40)

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input/Output Relay	00000 ~ 00915	000 ~ 009		L/H
	07000 ~ 17915	070 ~ 179		
Internal AUX Relay	01000 ~ 01915	010 ~ 019		
	03000 ~ 06915	030 ~ 069		
Special AUX Relay	02000 ~ 02915	020 ~ 029	*1	
Timer (contact)	T000 ~ T249	————		
Counter (contact)	C000 ~ C249	————		
High-Speed Counter Comparator (contact)	CTC0 ~ CTC3	————	*2	
Timer (set value)	————	TS000 ~ TS249		
Counter (set value)	————	CS000 ~ CS249		
Timer (current value)	————	TC000 ~ TC249		
Counter (current value)	————	CC000 ~ CC249		
Data Memory	————	DM0000 ~ DM1999	Bit 15	
Temporary Data Memory	————	TM00 ~ TM31	Bit 15	
Digital Trimmer	————	AT0 ~ AT1	*2	
High-Speed Counter (current value)	————	CTH0 ~ CTH1		
High-Speed Counter Comparator (set value)	————	CTC0 ~ CTC3		

**1 Some addresses are not available for writes.*

**2 Not available for writes*

■ KV-700 Series (using the KZ-300 series protocol)

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	00000 ~ 00009	000 ~ 000	*1	L/H
Output Relay	00500 ~ 00503	005 ~ 005		
Internal AUX Relay	00504 ~ 00915	005 ~ 009		
Extended Input/Output Relay Internal AUX Relay	01000 ~ 59915	010 ~ 599		
Control Relay	60000 ~ 63915	600 ~ 639	*2	
Timer (contact)	T000 ~ T511	————	*3	
Counter (contact)	C000 ~ C511	————	*3	
Timer (current value)	————	T000 ~ T511	*3	
Counter (current value)	————	C000 ~ C511	*3	
Data Memory	————	DM0000 ~ DM9999	Bit 15 *4	
Temporary Data Memory	————	TM000 ~ TM511	Bit 15	
Control Memory	————	TM0520 ~ TM4519	Bit 15 *5	

*1 PLC or GP data writing is not possible.

*2 GP cannot write data to any address.

*3 Only available when the timer command and the counter command exist in the ladder program.

*4 The device range for the PLC is between DM0000 and DM19999, but addresses up to DM9999 are only accessible to the GP.

*5 Some addresses are not available for writes.

■ KV-700 Series (using the KZ-A500 (link) protocol)

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X009	X00 ~ X00	xxx0 *1*2	L/H
Output Relay	X050 ~ X053	X05 ~ X05	xxx0 *2	
Internal AUX Relay	X054 ~ X09F	X05 ~ X09	xxx0 *2	
Control Relay	M0000 ~ M3915	M0000 ~ M3904	÷16 *3*4	
Timer (contact)	TS000 ~ TS511	————	*5	
Counter (contact)	CS000 ~ CS511	————	*5	
High-Speed Counter Comparator (contact)	CS512 ~ CS515	————	*5*6	
Timer (current value)	————	TN000 ~ TN511	*5	
Counter (current value)	————	CN000 ~ CN511	*5	
High-Speed Counter (current value)	————	CN512 ~ CN513	*5	
Data Memory	————	D00000 ~ D19999	Bit15 *7*8	
Control Memory	————	D50000 ~ D53999	Bit15 *7*3	

**1 PLC or GP data writing are not available for writes.*

**2 Addresses must be specified using hexadecimal numbers.*

**3 Some addresses are not available for writes.*

**4 For addresses, only multiples of 16 may be specified.*

**5 Only available when the timer command, the counter command, and the high-speed timer command exist in the ladder program.*

**6 GP cannot write data to any address.*

**7 Even if the file registers are registered as R50000 to R539999, similar device addresses can be used, e.g., R51111 = D51111.*

■ KV-700 Series (CPU Direct Connection)

Set up System Area here.

Device	Bit Address	Word Address	Particulars	
Input/Output Relay	00000~59915	000~599		L/H
Internal AUX Relay				
Control Relay	CR0000~CR3915	CR00~CR39		
Timer (contact)	T000~T511	————		
Counter (contact)	C000~C511	————		
High-Speed Counter Comparator (contact)	CTC0~CTC3	————	*1	
Timer (set value)	————	TS000~TS511	*2	
Counter (set value)	————	CS000~CS511	*2	
Timer (current value)	————	TC000~TC511	*2	
Counter (current value)	————	CC000~CC511	*2	
Data Memory	————	DM00000~DM39999	Bit 15	
Temporary Data Memory	————	TM000~TM511	Bit 15	
Control Memory	————	CM0000~CM3999	Bit 15	
Digital Trimmer	————	TRM0~TRM7	*2	
High-Speed Counter (current value)	————	CTH0~CTH1	*2	
High-Speed Counter Comparator (set value)	————	CTC0~CTC3	*2	

*1 Not available for writes.

*2 32-bit device

2.18.4 Environment Setup

The following lists Digital's recommended PLC and GP communication setups.

■ KZ-300/KZ-350 Series

GP Setup		PC Link Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C	Port 2 Toggle Switch (RS-232C) *1	RS-232C
Communication Format (RS-422)	4-wire type	Port 2 Toggle Switch (RS-422) *1	RS-422A
---		RUN Mode	Link Mode
Unit No.	0	Station Number	0

**1 Setup not necessary when using Port1.*

■ KZ-A500 (CPU Direct Connection)

GP Setup		PLC Setup
Baud Rate	9600 bps	---
Data Length	8 bits (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Odd (fixed)	---
Data Flow Control	ER Control	---
Communication Format (RS-232C)	RS-232C	---
Unit No.	0 (fixed)	---

Effect of PLC program on cycle time

Caution

If the KZ-A500 is connected directly to the CPU, the cycle time of the PLC program is delayed by about 8% after communication with the GP begins.

■ KZ-A500 (using Link I/F)

GP Setup		PLC Setup	
Baud Rate	19200bps *1	Baud Rate	19200bps
Data Length	7	Data Length	7
Stop Bit	1	Stop Bit	1
Parity Bit	None	Parity Bit	None
Data Flow Control	ER	———	———
Communication Format (RS-232C)	RS-232C	RS-232C Communication Port	Port 1 or Port 2 *2
Communication Format (RS-422)	4-Wire Type	RS-422 Communication Port	Port 2 *3
——		Communication Type	Normal
——		Changing device data during RUN	Possible
——		Checksum	Yes
——		Operation Mode	Protocol Mode 4
Unit No.	0	STATION No.	0

**1 The maximum baud rate is 38400bps.*

**2 When using an RS-232C cable on port 2, be sure to set the INTERFACE switch to "232C"(right side setting.) Also, set the TERMINATOR switch to OFF, since it will not be used.*

**3 When using an RS-422 cable, set the INTERFACE switch to "422"(left side setting,) and the TERMINATOR switch to ON.*

■ KV/KV-700 Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate	19200bps	———	———
Data Length	8 bits (fixed)	———	———
Stop Bit	1 bit (fixed)	———	———
Parity Bit	Even (fixed)	———	———
Data Flow Control	ER Control	———	———
Communication Format	RS-232C	———	———
Unit No.	0	———	———

Note:

- **The baud rate can be from 9600 to 57600 bps.**
- **The PLC requires no setup due to its automatic recognition of settings.**

■ KZ-700 Series (using the KZ-300 series protocol)

GP Setup		PLC Setup	
Baud Rate	19200bps *1	Baud Rate	19200bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	RS, CS Flow Control	No
Communication Format (RS-232C)	RS-232C	Communication Port 1	Fixed to 232C
		Communication Port 2 Selector Switch	232C
Communication Format (RS-422)	4-Wire Type	Communication Port 2 Selector Switch	422A
———		Operation Mode	Link Mode
Unit No.	0	Station No.	0

**1 The maximum baud rate is 115,200 bps.*

■ KZ-700 Series (using the KZ-A500 series protocol)

GP Setup		PLC Setup	
Baud Rate	19200bps *1	Baud Rate	19200bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	1 bits	Stop Bit	1 bits
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	———	
Communication Format (RS-232C)	RS-232C	Communication Port 1	Fixed to 232C
		Communication Port 2 Selector Switch	232C
Communication Format (RS-422)	4-Wire Type	Communication Port 2 Selector Switch	422A
———		Operation Mode	Protocol Mode 4
———		Checksum	Yes
Unit No.	0	Station No.	0

**1 The maximum baud rate is 115,200 bps.*

2.18.5 Error Codes

■PLC Error Codes

◆**KV/KV-700 Series** (CPU Direct Connection)

Controller error codes are represented by the "Host communication error (02:**)", and indicated in the left lower corner of the GP screen. (** stands for an error code.)

Host Communication Error (02:**)

PLC Error Code

Error Code	Description
02	Occurs when you write to a device that cannot be written to. (High Speed Counter Comparator (contact))
04	Occurs when the PLC uses an unsupported baud rate to send data.
31	Occurs when an undefined device is accessed. *1

***1 When writing to a Timer (contact/current value/set value), Counter (contact/current value/set value), High Speed Counter, High Speed Counter Comparator (set value), these values must be set in advance using a Ladder Program.**

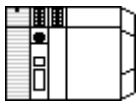
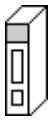
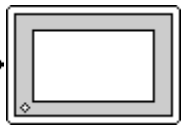
2.19 Shinko Electric

2.19.1 System Structure

The following describes the system structure for connecting the GP to Shinko Electric PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.19.2 Cable Diagrams**".*

■ SELMART Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	 LINK MODULE		
SELMART	UC1-6	RS-232C (Cable Diagram 1)	GP Series

2.19.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Shinko Electric company may differ, however, using these cables for your PLC operations will not cause any problems.

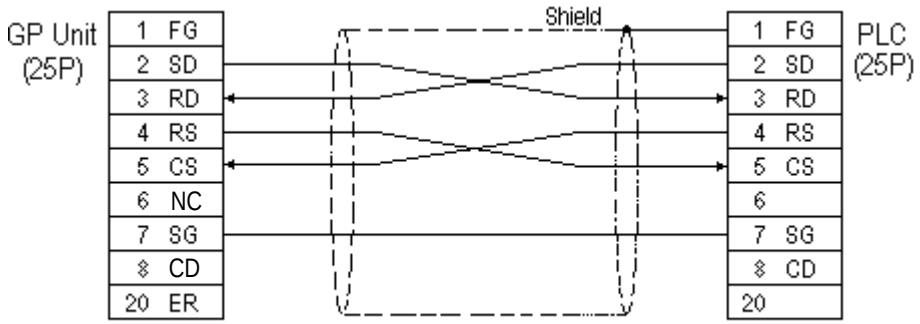
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a* connector hood *and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)



2.19.3 Supported Devices

The following describes the range of devices supported by the GP.

■ SELMART Series

Setup System Area Here

Device	Bit Address	Word Address	Particulars	
Data Register	---	D00000 ~ D09999	Bit 15 *1	L/H

** 1 Data register values are allocated using the SELMART's V conversion. (Performed via the SELMART CPU card.)*

2.19.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ SELMART Series

GP Setup		Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	0	Unit No.	0


MEMO

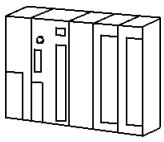
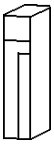
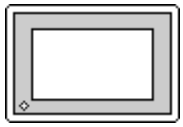
2.20 Matsushita Electric Industrial

2.20.1 System Structure

The following describes the system structure for connecting the GP to Matsushita Electronics PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.20.2 Cable Diagrams**".*

■ Panadac P7000 Series

CPU	Link I/F	Cable Diagram	GP
			
P7000-PLC-001 P7000-PLC-031H P7000-PLC-031S P7000-PLC-A01	SIO module P7000-GCP-001	RS-232C (Cable Diagram 1)	GP Series

2.20.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Matsushita Electronics may differ, however, using these cables for your PLC operations will not cause any problems.

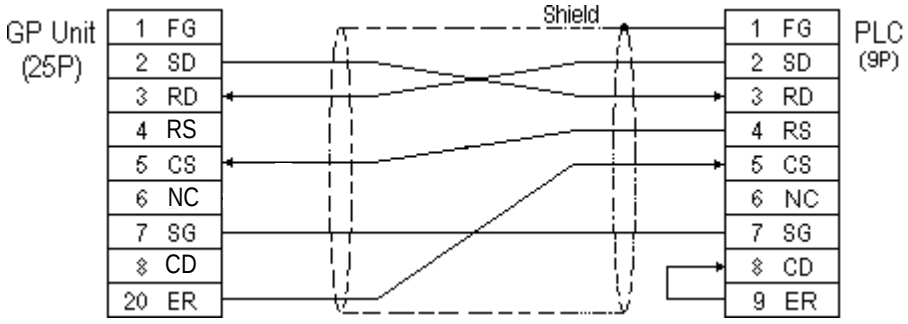
Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment.***
- ***For the RS-232C connection, use a cable length less than 15m.***
- ***If a communications cable is used, it must be connected to the SG (signal ground).***

Cable Diagram 1 (RS-232C)



2.20.3 Supported Devices

The following describes the range of devices supported by the GP.

■ Panadac P7000 Series

Setup System Area here.

	Device	Bit Address	Word Address	Particulars
Bit Device	Data Resister	IN0000 ~ IN07FF	IN0000 ~ IN007F	
	Input/Output Relay	OT0000 ~ OT07FF	OT0000 ~ OT007F	
	Internal Relay	RL0000 ~ RL07FF	RL0000 ~ RL007F	
	Holding Relay	KR0000 ~KR03FF	KR0000 ~ KR003F	
	Link Relay	LK0000 ~ LK07FF	LK00000 ~ LK007F	
	Status Relay	ST0000 ~ ST01FF	ST0000 ~ ST001F	
	MC Status Relay	MS0000 ~ MS03FF	MS0000 ~ MS003F	
	Timer State Relay	TS0000 ~ TS01FF	TS0000 ~ TS001F	
	Timer-up Relay	TU0000 ~ TU01FF	TU0000 ~ TU001F	
	Count-up Relay	CU0000 ~ CU007F	CU0000 ~ CU0007	
	CPU Input Relay	CI0000 ~ CI01FF	CI0000 ~ CI001F	*1
	CPU Output Relay	C00000 ~ C001FF	C00000 ~ C0001F	
Word Device	Data Memory	M00000 ~ M07FFF	M0000 ~ M07FF	
	Link Register	LM00000 ~ LM07FFF	LM0000 ~ LM07FF	
	Timer (set value)	---	TM0000 ~ TM07FF	
	Timer (current value)		CT0000 ~ CT007F	
	Counter Value		TC0000 ~ TC01FF	*2
	Position Data	---	PM0000 ~ PM07FF	*3

**1 If a CPU module is not connected, these are handled as internal relays.*

**2 This is a 32-bit device.*

**3 If a 32-bit device NC module is not connected, this is handled as an internal relay.*

Note:

If 2-word (32-bit) data are used, the vertical relation of addresses is shown as follows:

1	L (lower)
0	H (upper)

2.20.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ Panadac P7000 Series

GP Setup		Setting of SIO module	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	None	Parity Bit ON/OFF Even/Odd	None
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	1	Slave address number	0
		Mode	COMMAND mode
		Delimiter	CR

The setting of the machine number is fixed, and cannot be specified on the PLC.

If there is any difference in the PLC and the GP settings, a communications error occurs.

The GP must be set to ER control.

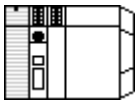
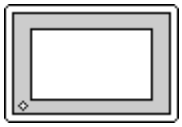
2.21 Modicon

2.21.1 System Structure

The following describes the system structure for connecting the GP to Modicon PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.21.2 Cable Diagrams**".*

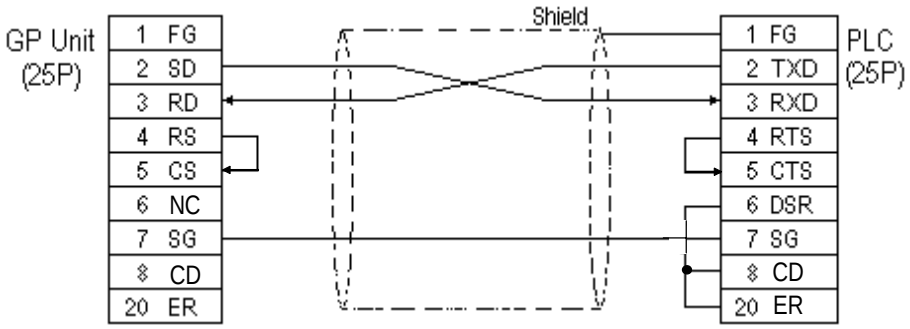
■ **Modicon Modbus** (CPU Direct Connection)

CPU	Cable Diagram	GP
		
884, 984A, 984B	RS-232C (Cable Diagram 1)	GP Series
Slot Mount 984	RS-232C (Cable Diagram 2)	

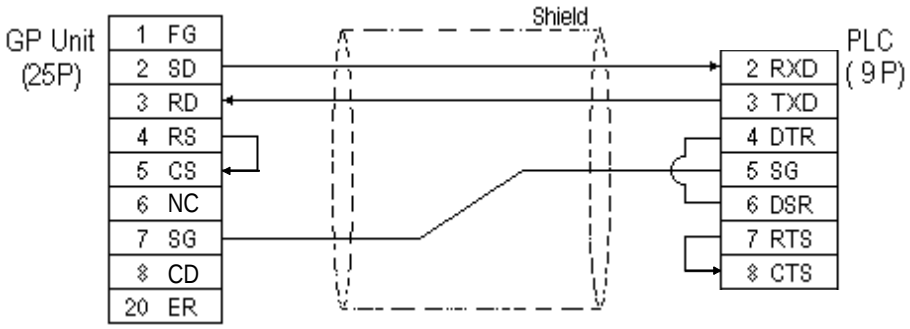
2.21.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Modicon may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1 (RS-232C)



Cable Diagram 2 (RS-232C)



2.21.3 Supported Devices

The following describes the range of devices supported by the GP.

■ Modicon Modbus (GP Master)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Output Bit	00001 ~ 08192	---	÷16+1	L/H
Input Bit	10001 ~ 18192	---	÷16+1 *1	
Output Register	---	40001~ 49999		
Input Register	---	30001 ~ 39999	*1	

** 1 Cannot perform data writing.*

2.21.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ Modicon Modbus

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bit	Mode	RTU (8)
Stop Bit	1 bit	Stop/Data	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	---
Communication Format (RS-232C)	RS-232C	---	---
Communication Format (RS-422)	---	---	---
Unit No.	1 (fixed)	Station Address	1

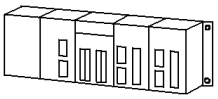
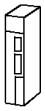
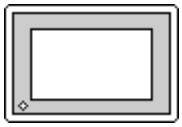
2.22 ORIM VEXTA

2.22.1 System Structure

The following describes the system structure for connecting the GP to ORIM VEXTA PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.22.2 Cable Diagrams**".*

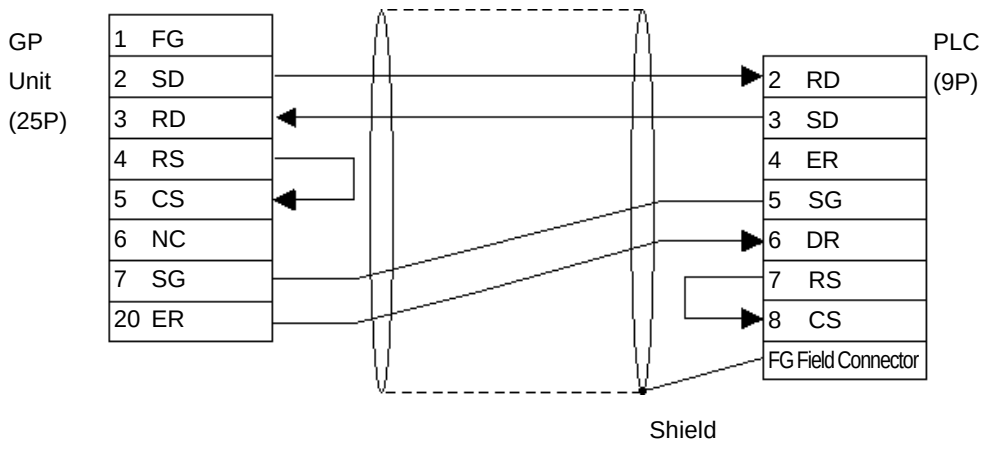
■ E1 Series (Link I/F)

CPU	Link I/F	Cable Diagram	GP
			
CPU11	MM01	RS232C (Cable Diagram 1)	GP Series

2.22.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by ORIM VEXTA may differ, however, regardless of these differences, using Digital's recommended diagrams will not cause any operation problems.

Cable Diagram 1 (RS-232C)



Note:

- **You will need to make your own cable.**
- **When using an RS-232C cable, the cable must be no longer than 15 meters.**

2.22.3 Supported Devices

The following describes the range of devices supported by the GP.

■ E1 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Register (I)	I000100 ~ I000815	I0001 ~ I0008		L/H
ON Event Input Register(IU)	IU00100 ~ IU00815	IU001 ~ IU008	*2	
OFF Event Input Register(ID)	ID00100 ~ ID000815	ID001 ~ ID008	*2	
Output Register(O)	O000100 ~ O000815	O0001 ~ O0008		
Analog Input Register(AD)	-------	AD001 ~ AD008	Bit 15 *2	
Analog Output Register(DA)	-------	DA001 ~ DA008	Bit 15	
Position Register (M)	M000100 ~ M010031	M0001 ~ M100	*3	H/L
Speed Register Low(SL)	-------	SL001 ~ SL100	Bit 31 *3	
Speed Register High(SH)	-------	SH001 ~ SH100	Bit 31 *3	
Speed Register Raise(SR)	-------	SR001 ~ SR100	Bit 31 *3	
Speed Register Decrease(SD)	-------	SD001 ~ SD100	Bit 31 *3	
Universal Register(R)	R000100 ~ R100015	R0001 ~ R1000		L/H
Universal Double-Length Register(RD)	RD00100 ~ RD50031	RD001 ~ RD500	*3	
Base Resister (B)	B000000 ~ B000915	B0000 ~ B0009		
Current Motor Position(MP)	-------	MP001~MP008	Bit 31 *3 *2	H/L
Current Motor Status(MP)	MS00100 ~ MS00815	MS001 ~ MS008	*2	L/H
SY Register(SY)	SY00100 ~ SY10015	SY001 ~ SY100	*1 *2	

*1 *For further information about SY register, refer to ORIM VEXTA's Motion Controller E1 Series Operation manual.*

*2 *Data cannot be written to here.*

*3 *This device is 32 bit.*

2.22.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ E1 Series

GP Setup		PLC Setup	
Baud Rate	9600 bps *1	Baud Rate	9600 bps
Data Length	8 bits	Mode	8 bits
Stop Bit	1 bit	Stop/Data	1 bit
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	ER Control
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C (fixed)
Station No.	1 (fixed)	Station No.	---
---		Checksum	Yes
---		Designate Termination Coode	Yes
---		Protection	No

**1 The maximum baud rate is 19200 bps.*


MEMO

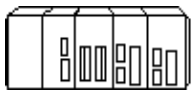
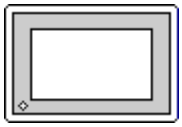
2.23 FATEK

2.23.1 System Structure

The following describes the system structure for connecting to Fatek's Facon PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**2.23.2 Cable Diagrams**".*

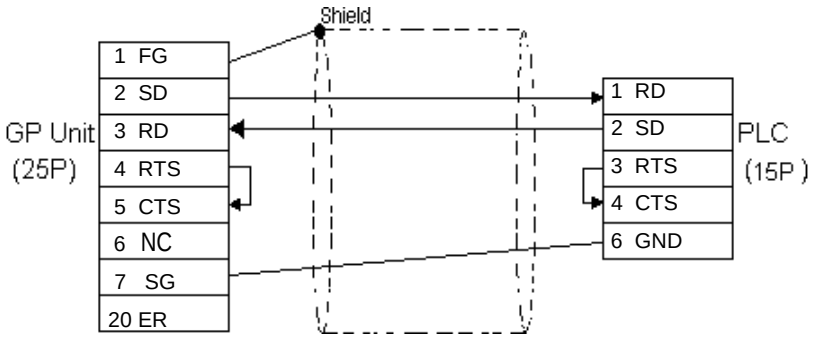
■ Facon FB 20MC (using CPU Direct Connection)

CPU	Cable Diagram	GP
		
20MC	Programming port on CPU (Cable Diagram 1)	GP Series

2.23.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by FATEK may differ, however, regardless of these differences, using Digital's recommended diagrams will not cause any operation problems.

Cable Diagram 1 (RS-232C)



Important ***Please do not connect or disconnect the cable while the PLC and the GP are communicating.***

2.23.3 Supported Devices

The following describes the range of devices supported by the GP.

■ Facon FB 20MC (using CPU Direct Connection)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input points	X0 ~ X159	WX0 ~ WX144	*1	L/H
Output Relays	Y0 ~ Y159	WY0 ~ WY144		
Internal Relays	M0 ~ M1399	WM0 ~ WM1376		
Special Relays	SM1912 ~ SM2001	WSM1912 ~ WSM1976		
Step Relays	S0 ~ S999	WS0 ~ WS984		
Timer Registers	T0 ~ T255	-----		
Counter Registers	C0 ~ C255	-----		
Timer Registers	-----	TMR0 ~ TMR255		
Counter Registers	-----	CTR0 ~ CTR199		
Data Register	-----	HR0 ~ HR3839	Bit 15	
Input Registers	-----	IR3840 ~ IR3847	Bit 15 *2	
Output Registers	-----	OR3904 ~ OR3911	Bit 15	
HSC Registers	-----	HSC4096 ~ HSC4127	Bit 15	
Calendar Registers	-----	RTC4128 ~ RTC4135	Bit 15	
Special Register	-----	SR4136 ~ SR4167	Bit 15 *2	
Read-Only Registers	-----	ROR5000 ~ ROR8071	Bit 15	

**1 Read Only for Word Devices.*

**2 Read Only.*

2.23.4 Environment Setup

The following table lists Digital's recommended PLC and GP communication settings.

■ Facon FB 20MC (using CPU Direct Connection)

	GP Setup	PLC Setup
Baud Rate (bps)	9600 (fixed)	-----
Data Length	7bits (fixed)	-----
Stop Bit	1bit (fixed)	-----
Parity Bit	Even (fixed)	-----
Data Flow Control	ER Control (fixed)	-----
Communication Format (RS-232C)	RS-232C (fixed)	-----
Unit No.	1-255	1-255
-----	-----	DSW BIT1 -> OFF
-----	-----	DSW BIT2 -> OFF

- ***The PLC's station number setting can be entered via the programmable controller's "Set Station No." setting area.***


MEMO

3 Memory Link Communication

Read this chapter if you are using the GP unit with the memory link communications.

This chapter explains one-to-one communication between the GP unit and equipment such as a personal computer or a one-board microcomputer which do not have their own protocols.

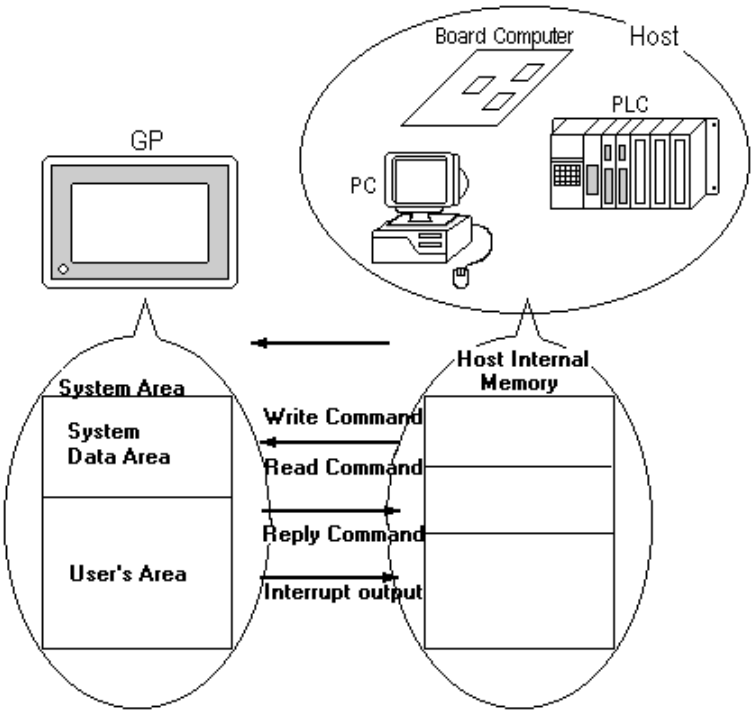
Reference
- *For information about the extended mode, refer to the GP70 Series Memory Link Communication Protocol Manual.*
- *For details, refer to the GP70 Series Memory Link Communifation Protocol Manual for GP Ethernet I/F Unit (sold separately).*

3.1 Setting Up Memory Link Communication

Data transmission between the GP and Host (PLC) are run according to the host's ladder logic program.

Reference *Refer to the section titled "**3.4 Sample Program**".*

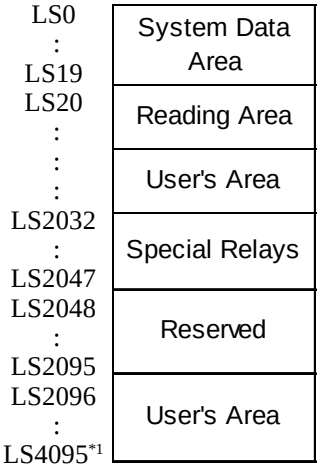
The GP runs its screen display relying on the host's data write commands, which are based on the screen display's data send restrictions. And, the GP, following the host's Reading command, passes stored data over to the host. Communication occurs between the GP and host in this way, and normally, the initiative is held on the host side. Data transmission between the GP and PLC is aided by the memory area (System Area) prepared internally in the GP.



3.1.1 System Area

The System Area is the medium that allows data transmission between the GP and host. The System area is prepared internally in the GP; the GP runs the screen display based on the System Area data.

The System Area is 4096 words in size, organized as follows.



◆System Data Area

This is the write area for data necessary to operate the GP screen control data and error information. The data write contents of each address is predetermined.

Reference *For more information, refer to **3-1-2 "Contents and Range of System Data Area"***

◆User's Area

This area is used for GP-Host data transmissions. On the host side, determine which GP address the data will be written to, and create a program to perform the data write operation. Plus, to display the written data on the GP side, another setup must be performed: Part or Tag Setup.

For the host to read data written with K-tags (Keypad Input) and T-tags (Touch Panel Input), a program must be made on the host side that reads data from the GP.

Important ***When using the Device Monitor feature, the User's Area (LS2096 to LS4095) will be reserved and cannot be used.***

◆Special Relay

This area is for setting up GP's various status information.

Note:

- **Writing to System Address 13, using a T-tag, or similar method, causes an *interrupt* output to the host. On the host, read this one byte using a command like the BASIC INPUT$ instruction, to call various subroutines which depend on the value, thus greatly simplifying the program.**
- **When specifying an address bit, enter the bit position (00~15) after the word device.**

  E.g. When specifying bit 02 of User's Area address 20:

  Word 20 02 Bit Position

◆Reserved

Please do not use this area. It is only for GP's internal use. If you use this area, the GP will not operate properly.

**1 For GP2000 series units, up to LS8191 may be used.*

3.1.2 Contents and Range of System Data Area

Important

When you wish to turn the GP's display OFF, use the Screen Display ON/OFF bit. Do not use the Control area's Backlight OFF bit. Be aware that this feature's system Data Area settings and range used during Memory Link Communication will differ from the settings used with Direct Access Communication.

Address	Detail	Function	Bit	Particulars
1	Status *11		0, 1	Reserved
			2	Now Printing *1
			3	Writes a set value *2
			4 ~ 7	Reserved
			8	K-tag entry error *3
			9	Display 0:ON, 1:OFF *4
			10	Backlight burnout detection *5
			11	Touch-Panel Input Error *6
			12 ~ 15	Reserved
3	Error Status Each bit changes according to the GP error function. When an error occurs, the corresponding bit will turn on. * A bit that has turned on remains on until the power is turned off and back on, or until RUN mode is re-entered from OFFLINE mode or details and the handling process about the Error Status contents, refer to the Section 1-1-4.		0, 1	Unused
			2	System ROM/RAM
			3	Screen Memory Checksum
			4	SIO Framing
			5	SIO Parity
			6	SIO Overrun
			7, 8	Unused
			9	Initialization of Internal Memory Checksum Necessary
			10	Timer Lock Error
			11 ~ 15	Unused
4	Clock Data (Year)	"Year / Month / Day / Hour / Minute" Data is stored in BCD's 2digits. (E.g.) 98/02/01 17:15	0 ~ 7	Stores the last 2 digits of the Calendar year as 2 BCD digits
			8 ~ 15	Unused
5	Clock Data (Month)		0 ~ 7	Stores 01 to 12 (Month) as 2 BCD digits
			8 ~ 15	Unused
6	Clock Data (Day)		0 ~ 7	Stores 00 to 31 (Day) as 2 BCD digits
			8 ~ 15	Unused
7	Clock Data (Hour)		0 ~ 7	Stores 00 to 23 (Hour) as 2 BCD digits
			8 ~ 15	Unused
8	Clock Data (Minute)		0 ~ 7	Stores 00 to 59 (Minute) as 2 BCD digits
			8 ~ 15	Unused
10	Interrupt Output (Touch OFF)*16	If you Write in word data, the bottom 8 bits will be output as an interupput code after touching OFF.However FFh will not be output.		
11	Control *12		0	Backlight *7
			1	Buzzer ON
			2	Starts Printing
			3	Reserved
			4	Buzzer *8 - - - 0:enabled 1: disabled
			5	AUX Output - - - 0:enabled 1: disabled
			6	Interrupt Output when touching panel to turn the display ON. (Interrupt Code:FFh) 0: Disabled 1: Enabled *16
			7	Reserved
			8	VGA display *9 - - - 0: Disabled 1: Enabled
			9, 10	Reserved
			11	Hard copy output *15 - - - 0: Enabled 1: Disabled
			12 ~ 15	Reserved

Address	Detail	Function	Bit	Particulars
12	Screen Display *13 ON/OFF	FFFFh : Screen clears almost immediately 0h: Screen turns ON		
13	Interrupt Output *14	Using a Touch Tag or other method to write absolute value data from GP causes an output of the interrupt code using the contents of the bottom 8 bits (Will not out put FFh)		
15	Screen Display No.	Write the Screen No. in binary to change the screen display	0 ~ 14	Screen change number, 1 to 8999.(1 to 1999 when using BCD input)
			15	Forced Screen Change
16	Window Control *10		0	Display - - 0: OFF 1: ON
			1	Changing ghe order of window overlapping - - 0: Possible 1: Not Possible
			2 ~ 15	Reserved
17	Window Registration No. *10	Global Window registration number selected indirectly (BIN/BCD)		
18	Window Display Position *10 (X-coordinate)	Global Window display position reached indirectly (BIN/BCD)		
19	Window Display Position *10 (Y-coordinate)			

**1 Changing to OFFLINE mode in the middle of printing can cause a disordering of the Print output.*

**2 Every time a value is written with the K-tag or Keypad Input Display, the bit is reversed.*

**3 If an (input value range) Error has been set for the K-tag data being entered, and a value outside the allowed range is entered, the bit lights. If, however, a value is entered that is within the Error range, or if the display screen is changed, this bit will turn OFF.*

**4 <Display ON/OFF status>*

The screen display ON/OFF can be detected from the PLC. This bit will change in the following cases:

(1) "FFFF" is written to the system data area's screen display ON/OFF bit (LS9 when using link type), to turn the screen display OFF. (Bit 9 = 1)

(2) After the stand-by time has elapsed, the screen display OFF bit is turned ON automatically. (Bit 9 = 1)

(3) The screen display OFF status has been changed to the screen display ON status via screen switching, etc. (Bit 9 = 0)

(4) The screen display ON/OFF status bit will not change via turning ON/OFF the system data area backlight OFF bit (Bit 0).

**5 <Backlight Burnout Detection>*

The bit turns ON when backlight burnout is detected. This feature is available only on GP-377R, GP-377, GP2000, and GLC2000 series unit.

**6 <Touch-panel input error>*

The touch-panel input error bit is turned ON when input in the same position continues for longer than the specified time.

**7 With the GP series except GP-477R, GP-470, and GP-870 series units, the backlight turns OFF when this bit is ON(LCD display does not change) and turns ON when the bit is OFF.*

When the Control area's Backlight OFF bit turns ON, only the backlight will turn OFF, however, the LCD display will remain ON and all touch switches set up on the display can still be used. Use the Screen display ON/OFF bit to actually turn the screen display OFF.

**8 Control Bit 1 (Buzzer On) outputs as shown below.*

Buzzer Sound ..... While Control Bit1 is on, the GP internal buzzer is activated.

AUX Output ..... While Control Bit 1 is on, the AUX buzzer output is activated.

**9 When using GP-570VM and GP-870VM, the entire screen becomes a VGA display when this bit is on. Pressing the screen options position during a VGA display turns this function off.*

10* **Reference *For more about windows, refer to "**2.26 U-tag (Window Display)**" GP-PRO/PBIII for Windows Tag Reference Manual.*

**11 Monitor, in bit units, only the necessary bits.*

Since reserved bits may be used for GP system maintenance, etc., their ON/OFF status is not defined.

**12 Be sure to turn all reserved bits OFF since they may be used for GP system maintenance, etc.*

**13 After the System Data Area's "Screen Display ON/OFF" bit is set to turn the display OFF, simply touching the screen will turn the display ON again.*

**14 Do not write control codes 00 to 1F to word addresses 10 and 13. It may terminate data communication.*

**15 Turning ON bit 11(Hard Copy Output) in the Control Area will cancel the current printing of the display's hard copy.*

- *After printing is cancelled, bit 11, however, will not turn OFF automatically. Therefore, after checking the Status Area's Now Printing bit, turn off the Control Area's bit 11.*
- *While bit 11 in the Control area is turned ON, hard copy cannot be created. If you cancel printing before it is completed, printing will stop after the last line data on the panel's current display has been output. Data already input in the printer buffer's memory will not be deleted.*

**16 Interrupt output when touching the panel to turn the display OFF to ON.*

- *Only when the display is turned ON by touching the panel, interrupt output will be operated.*
- *When using GP-H70, interrupt output will not be operated if the display is turned ON by the Operation Switch on the rear side.*

STOP

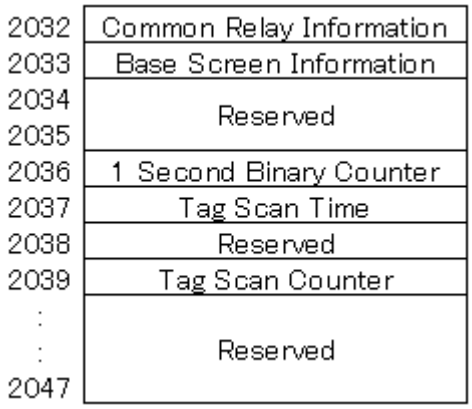
- **Addresses 0, 2, 9, 14 are reserved areas. Do not write data to this area.**
- **When addresses 3, 12, 13, 15 are utilized for System Control, displays that depend on tags do not function.**
- **When addresses 12, 13, 15 are used to control word units, bit write cannot be performed.**
- **Writing FFFFh to address 12 causes the screen display to erase within moments. When you wish to erase the screen using the STANDBY MODE TIME entered in GP's INITIALIZE setup, write 0000h in address 12.**
- **Do not write the control code 00~1F in addresses 10 and 13. Data transmission may become impossible.**

3.1.3 Special Relay

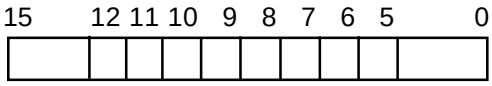
The structure of the Special Relay is as follows:

◆Reserved

The Reserved address value is undefined. Do not use this area.



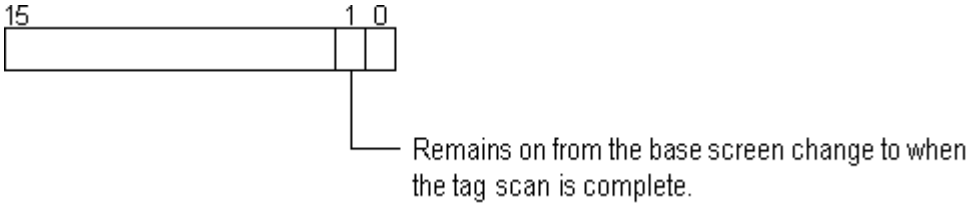
◆Common Relay Information (2032)



Bit	Contents
0	Reserved
1	Remains ON from when a screen change (base, window)occurs until the tag scan is complete.
2	ON only in the middle of an SIO error developing.
3	ON when displaying the Initial screen after powering up.
4	Always ON
5	Always OFF
6	Turns ON when backup SRAM data has been delated (Only for GP's equipped with backup SRAM).
7	Turns ON if a BCD error occurs while D script is being used. For more information about D script, refer to the Tag Reference Manual's section 3.1 "D script".
8	Turns ON if a zero division error occurs while D script is being used.
9	Filing data. Turns ON if the data is not transferred to Backup SRAM.
10	Filing data transfer is triggered by the Control Word Address. Turns ON if the data can not be transferred from PLC to SRAM. Also data transfer between PLCs is triggered by the Filing Data Display. Turns ON if the data is not transferred from PLC to SRAM only when the transfer complete bit address is used.
11	Filing data. Via transfer data to and from SRAM to LS area, via Filing Data Display.
12	When using D-script, turns ON if a communication error occurs when the function memcpy () is used, or reading the data from designated Address Offset. Turns OFF when data read is normally completed.
13-15	Reserved

Reference *For more information about the D-script, refer to the Tag Reference Manual "**3.1 D-Script/Global D-Script**".*

◆**Base Screen Information (2033)**



◆**1 Second Binary Counter (2035)**

Begins counting in one second intervals after the GP's power is turned ON. The data is binary.

◆**Tag Scan Time (2036)**

The time it takes to prepare all the tags setup on the display screen. The data is stored as binary, millisecond units. The data renews itself at the point when preparation for all the object tags is complete. The data's default value is 0. It is accurate within + 10ms.

◆**Tag Scan Counter (2038)**

Counts until the all the tags setup on the display screen have completed their preparations. The data is binary.

STOP **The Special Relay is not write protected. Do not turn this Relay's data ON or OFF using tags or other method.**


MEMO

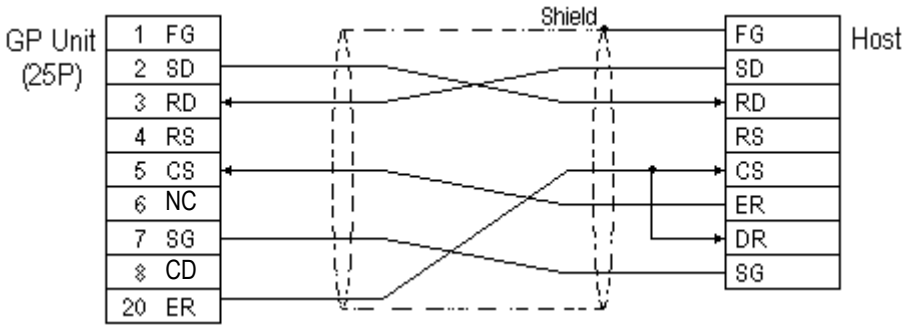
3.2 Cable Diagrams

Explains the connection between the GP and host.

3.2.1 RS-232C Communication

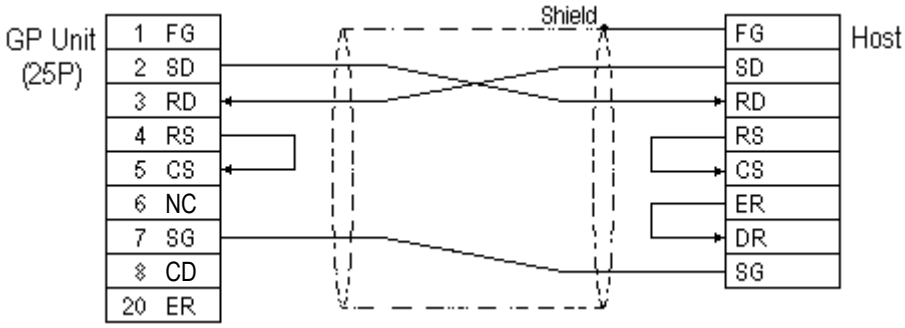
When using an RS-232C cable, there are two types of control formats: DTR (ER) Control and XON/XOFF Control. The GP-Host connection for each type is illustrated below.

■ DTR (ER) Control



STOP **Set the host's control software so that the host will not transmit data to the GP when the GP's ER is turned OFF.**

■ XON/XOFF Control



Important

- ***Depending on the host, the RS-232C connector's shape, pin numbers and corresponding signal names may differ. Be sure to follow the host interface specifications.***
- ***The maximum cable length is 15m.***

3.2.2 RS-422 Communication

When using an RS-422 cable, there is only the XON/XOFF Control. The various GP-Host connections are illustrated below.

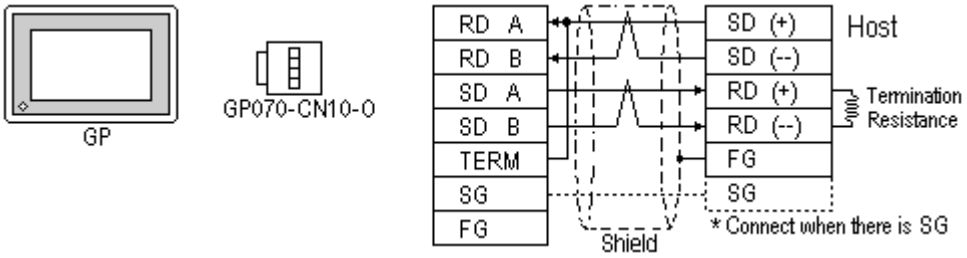
Careful!

- *Insert a termination resistor between RDA-RDB.*
- *For a 24AWG line, use a twist pair cable with a static electrical capacity of 50pF/m, and a standard characteristic impedance of 100Ω.*

Important

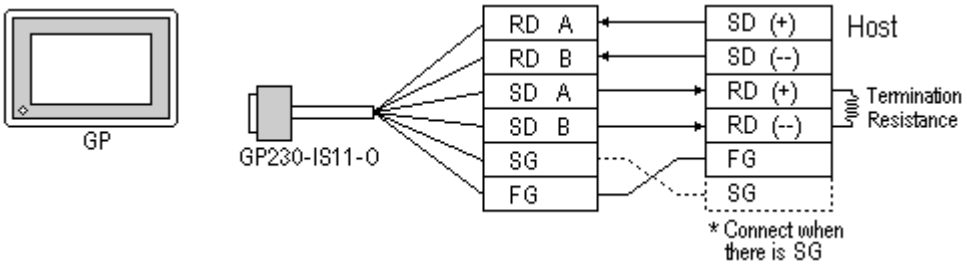
- ***The maximum length of the cable is 600m.***
- ***Depending on the connected Host, the connection method and termination resistance differs.***

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-0



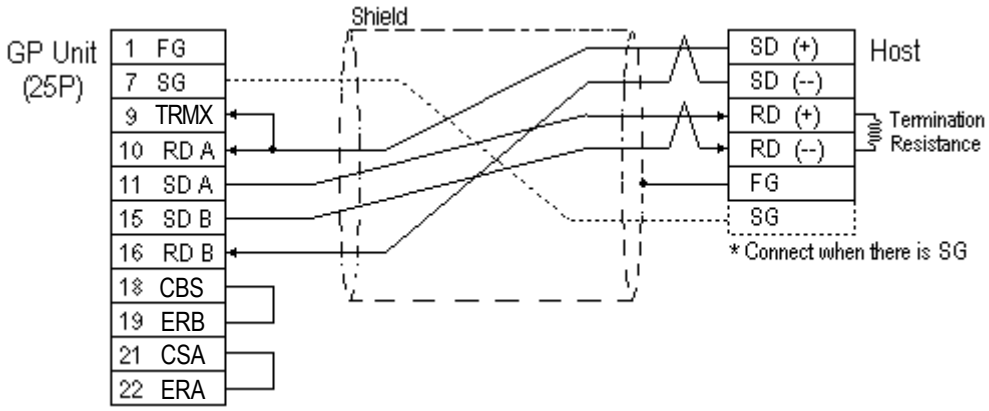
Note: **As a result of connecting GP070-CN10-0's RDA and TERM, a 100Ω termination resistance is inserted between RDA—RDB on the GP.**

• When using Digital's RS-422 Cable, GP230-IS11-0



Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

• When making your own cable connections

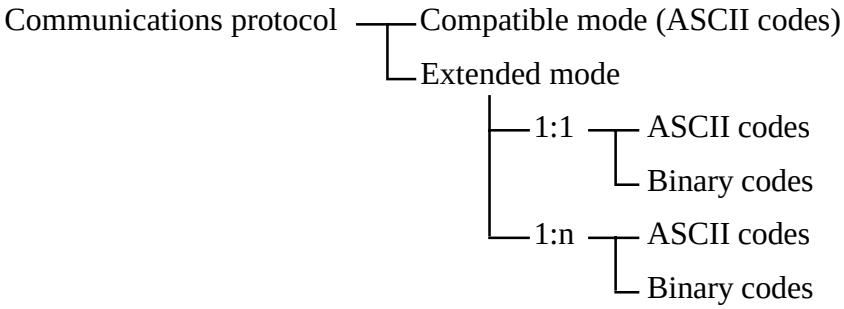


When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.


MEMO

3.3 Memory Link Command

The communications protocol shows the format of data transferred between the host computer and the GP and the procedure for this data transfer. The communications protocol for the GP is classified into the following modes according to the application and the data processing capability of the host computer.



■ Compatible mode

In this mode, only writing to the system area (Esc W) and reading from the system area (Esc R) commands are performed using communications protocol. The compatible mode is basically a teletype protocol using ASCII codes. Therefore, the load for controlling the communications on the host computer is decreased. In contrast, the reliability of the transmitted and received data is relatively low.

■ Extended mode

This mode is a protocol which supports not only commands for writing to and reading from the system area, but also drawing commands. The extended mode is a communications protocol compatible with the multi-drop connection between the host computer and the GP. To improve the reliability of communications data, you may specify whether sum check codes are used or not and whether ACK and NCK are used or not. The ASCII codes and the binary codes are dependent on the development of the software environment. Select whichever codes are appropriate.

Note: **Only the commands in the compatible mode are covered in this manual.**

Reference *For the extended mode, Refer to The Memory Link Communications Manual for the GP70 Series (sold separately).*

GP-Host data transmissions are run as described for each command below.

Read command This command reads data from the setup System Area address.

Reply command This command responds to the Read command and passes this data from the GP to the Host.

Write command This command writes the data to the setup System Area address.

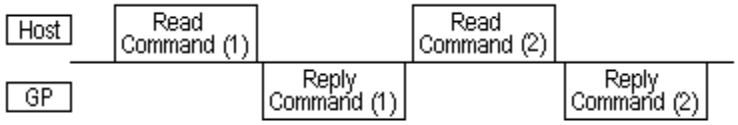
Interrupt output Using a touch tag or other method to write data to System Data Area address 13 causes an interrupt code in the contents of the bottom 8 bits, which is then output to the Host side.

When using double-words (32-bit data), the upper and lower data are set up as follows:

0	**H (High)**	(Upper)
1	**L (Low)**	(Lower)

Send the read command from the Host after receiving the reply command.

<Example> Data communication between the Host computer and the GP

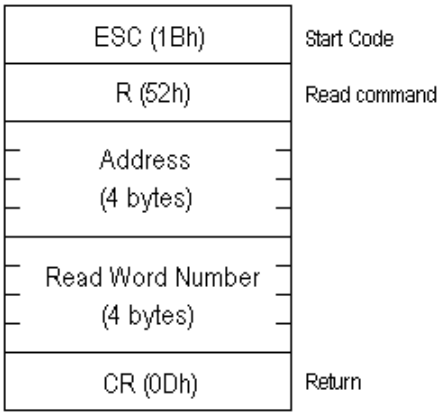


Send the read command (2) after receiving the reply command (1).

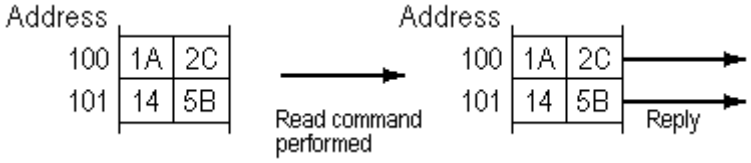
When the read command is sent continuously without waiting for the reply command, a system error may be generated two or three hours later.

3.3.1 Read Command

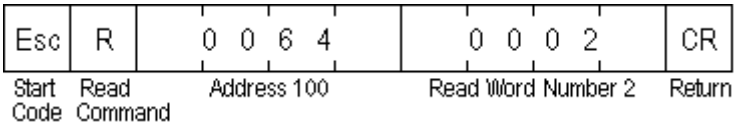
The contents of the Read command are as follows:



E.g. Reads 2 words of hexadecimal data from System Area address 100.



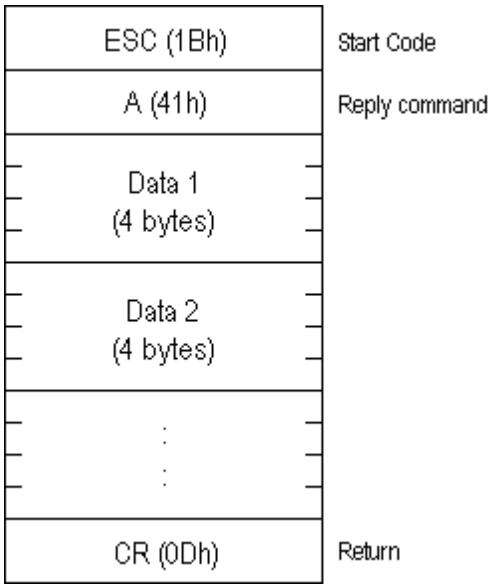
Read Command



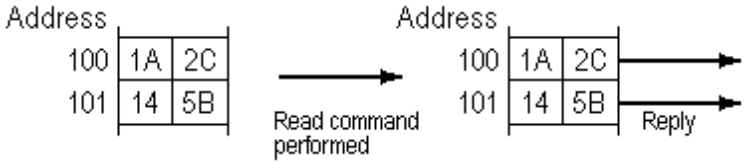
The *Address* and *Read Word Number* can be entered in ASCII Code.

3.3.2 Reply Command

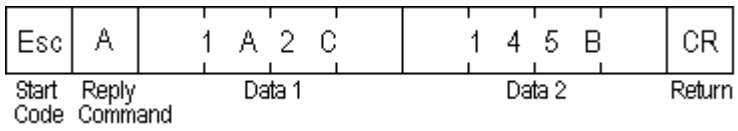
The contents of the Reply command are as follows:



E.g. Read 2 words of hexadecimal data from System Area address 100.



Reply Command

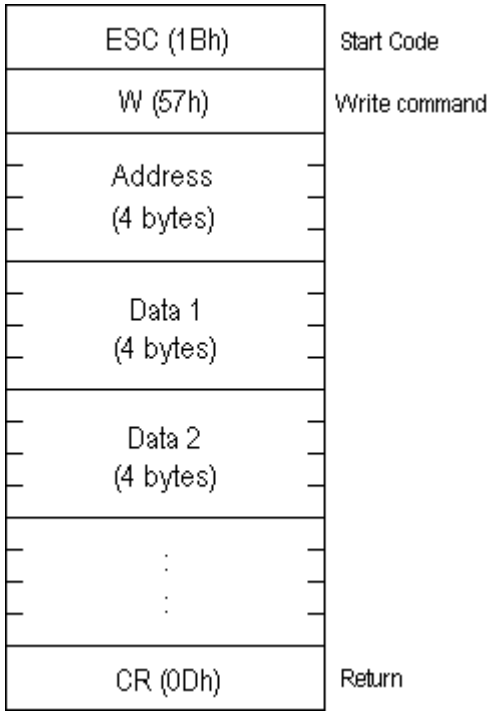


Note:

- **The response command is output automatically from the GP in answer to the read command received.**
- **The *Address* and *Data* can be entered in ASCII Code.**
- **Data is read, in order, from the setup address.**

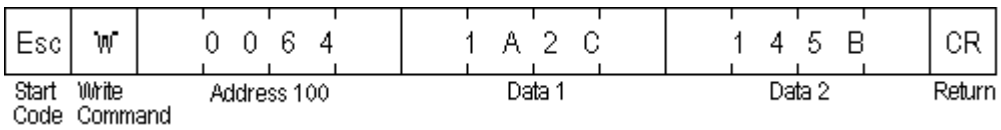
3.3.3 Write Command

The contents of the Write command are as follows:



E.g. Writes hexadecimal data 1A2C and 145B from System Area address 100.

Write Command



Note:

- **The *Address* and *Data* can be entered in ASCII Code.**
- **Data is written, in order, from the setup (start) address.**
- **In Compatible mode, the Reply command does not return.**
- **If you keep send the Write command to GP constantly, be aware that GP might fail to update the screen data.**


MEMO

3.4 Sample System

This section provides examples of the Host program and GP tag setup which are necessary for data transmissions between the GP and Host. Plus, when the tag setup below is run with the sample program, it demonstrates a GP screen change.

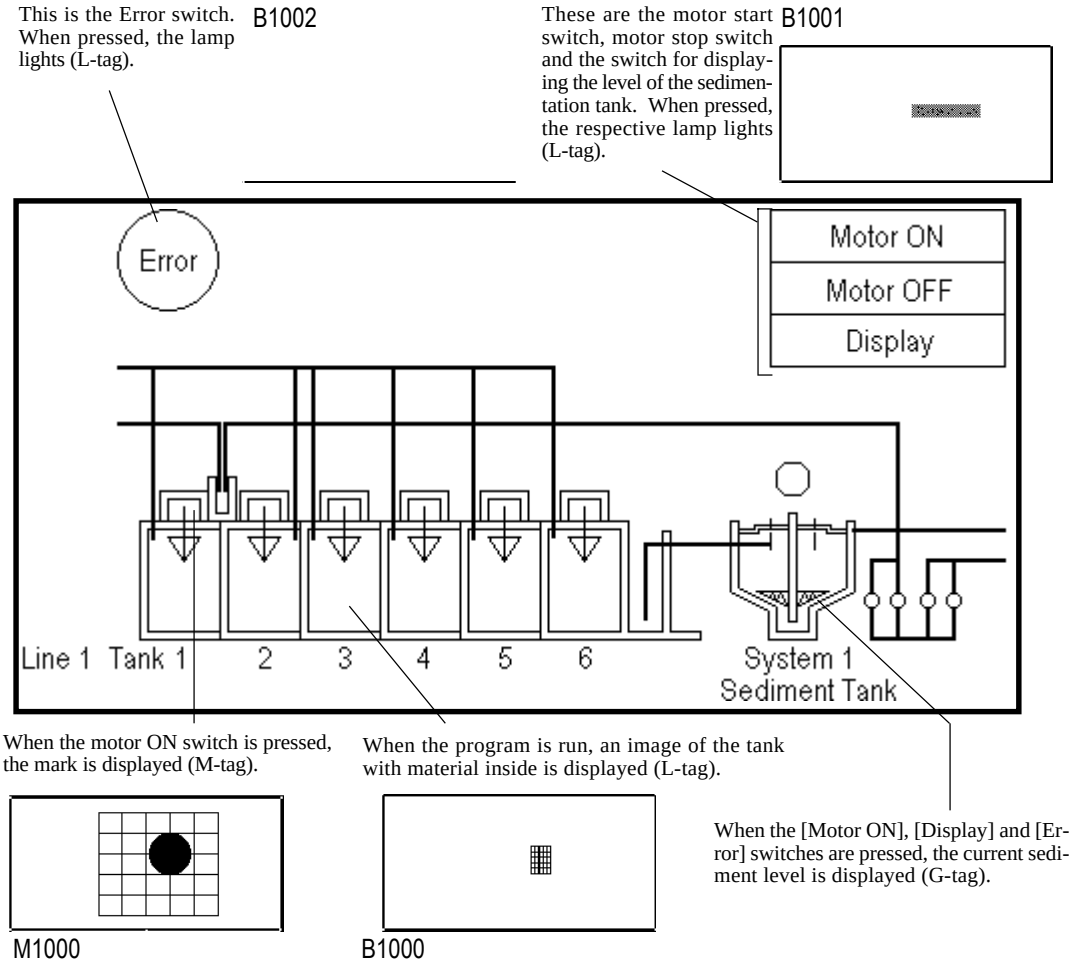
Use the following steps to create the screens shown below.

When the [Motor ON], [Motor OFF], [Display], or [Error] switch is pressed, that switch's respective interrupt code is output to the host system, starting the following operations (T-tag).

Switch Explanation

[Motor ON]	Starts the motor to supply 50% of the sediment into the sedimentation tank.
[Motor OFF]	Stops the motor.
[Display]	"50% of the sediment is being supplied to the sedimentation tank."
[Error]	"Only 20% of the sediment has been supplied to the sedimentation tank."

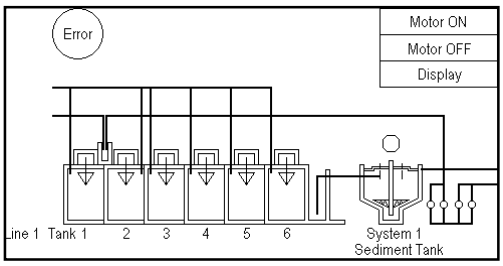
■ System Example



■ Screen Creation

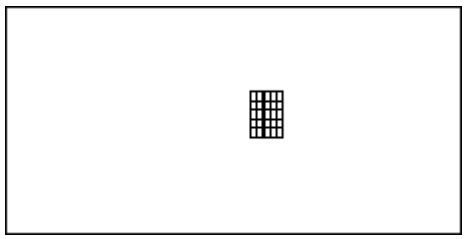
(1) Use the GP-PRO/PBIII for Windows software to create the screens.

B1



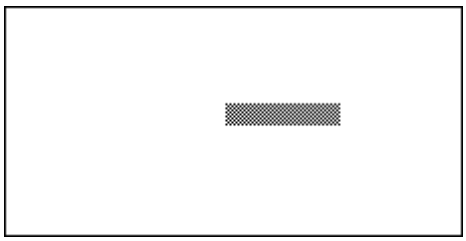
This screen is displayed when the GP is operating.

B1000



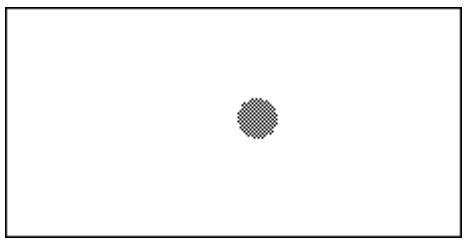
This screen represents the material to be put into the aeration tank.

B1001



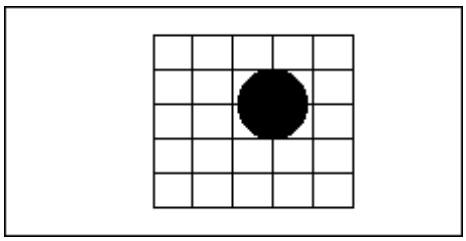
This screen shows the [Motor ON], [Motor OFF] and [Display] lamp's ON pattern.

B1002



This screen shows the [Error] switch's ON pattern.

M1000



This screen shows the mark displayed when the motor is started.

(2) Use the GP-PRO/PBIII for Windows software to setup Tags

◆ Tag Setup Example

T-tag List

File No.	Tag Name	Ope. Mode	Word Addr	Word Write	Fixed No.	Reverse Display	Starting point coordinate	Ending point coordinate	Details
B1	T1	Word	13	Word Set 16 bit	0031	On	Coordinates entered will vary according to screen being used.		Motor ON
B2	T2				0032				Motor OFF
B1	T3				0033				Display
B1	T4				0034				Error

L-tag List

File No.	Tag Name	Diplay Mode	Bit Addr	File Access	Direct Access File No.	Delete	Display coordincates	Detailas
B1	L1	0 --> 1 Erase Operation On	002000	Direct Access	B1000	On	Coordinates entered will vary according to screen being used.	Tank 1
B1	L2		002001					Tank 2
B1	L3		002002					Tank 3
B1	L4		002003					Tank 4
B1	L5		002004					Tank 5
B1	L6		002005					Tank 6
B1	L11		002100		B1001			"Motor ON" Reverse
B1	L12		002101					"Motor OFF" Reverse
B1	L13		002102					"Display" Reverse
B1	L14		002103		B1002			"Error" Reverse

When you wish to display L1~6 (L-tag) at the same time, turn all bits in address 20 ON.

M-tag List

File No.	Tag Name	Bit Addr	Diplay Mode	Color Attr. 0	Color Attr. 1	Magnify	File Access	Direct Access File No.	Display coordinates	Details
B1	M1	002200	Displays On/Off	Fg Clr:Black Bg Clr: Black Blink: Off	Fg Clr:White Bg Clr: Black Blink: Off	1 X 1	Direct Access	M1000	Coordinates entered will vary according to screen being used.	Motor 1
B1	M2	002201								Motor 2
B1	M3	002202								Motor 3
B1	M4	002203								Motor 4
B1	M5	002204								Motor 5
B1	M6	002205								Motor 6

When you wish to display L1~6 (M-tag) at the same time, turn all bits in address 20 ON.

G-tag List

File No.	Tag Name	Word addr	Data Type	Data Format	Code	Bit Length	Input Code	Color Attr.	Graph type	Dir.	Tiling Pttrn.	Alarm	Starting point coordinate	Ending point coordinate	Details
B1	G1	0023	Relative Value	BCD	+	16	None	Fg: White Bg: Black Blink: Off	Trend Graph	Up	2	Off	Coordinates entered will vary according to screen being used.		Sediment Tank

◆ **Address Map**

Tags used in the Sample program are allotted to their corresponding address as follows.

T-tag —> Address 13

Writing data to Address 13 (Interrupt) causes an output of the bottom 1 byte code from the RS-232C port. For this reason, the T-tag uses word write.

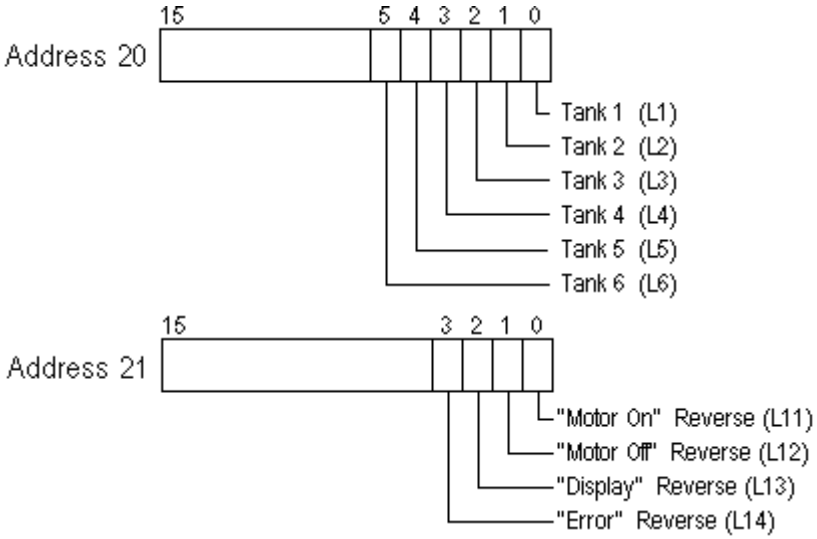
Motor ON (T1)..... word write 0031 to address 13

Motor OFF (T2) ..... word write 0032 to address 13

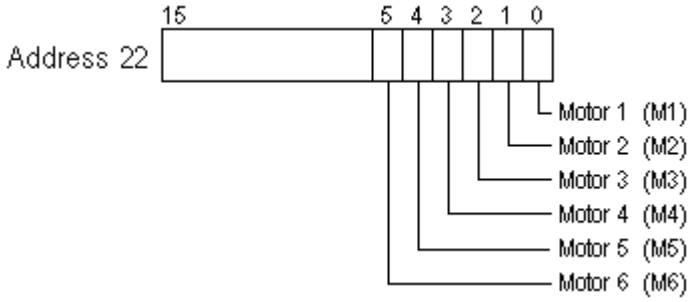
Display (T3) ..... word write 0033 to address 13

Error (T4) ..... word write 0034 to address 13

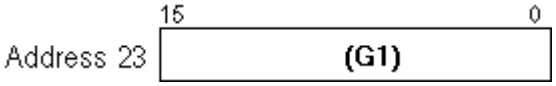
L-tag —> Address 20, Address 21



M-tag —>Address 22



G-tag —> Address 23



(3) The host unit's company creates the program for data transfer between the GP and the host.

◆ **Sample Program**

E.g. If an IBM PC/AT-compatible machine and the C language are used:

```
/*****************************************************************************************************************/
/*                                                                                                               */
/*  GP series     Sample program for memory link communications                                                  */
/*                                                                                                               */
/*****************************************************************************************************************/

#include<stdio.h>
#include<dos.h>
#include<string.h>
#include<stdlib.h>
#include<conio.h>

#define  data_size_str2              20          /*The data size of str2 is 20 bytes*/
#define  data_size_wr_data           24          /*The data size of wr_data is 24 bytes*/

#define  serial_port_BIOS            0x14        /*PC serial port BIOS*/
#define  serial_port_number          0x00        /*Serial port number used*/
#define  serial_port_INT             0xE7        /*The serial port is initialized.*/
#define  serial_port_parameter       0xE7        /*9600bps,8bit,stopbit;1,parity;none*/

#define  get_status                  0x03        /*The status of the serial port is acquired.*/
#define  serial_port_write           0x01        /*The serial port is written.*/
#define  serial_port_read            0x02        /*The serial port is read out.*/

#define  status_bit_6000             0x60000     /*Port status bits 13 and 14*/
#define  status_bit_0020             0x0020      /*Port status bit 5*/

/*****************************************************************************************************************/
/*                Communications settings for the SI0                                                            */
/*****************************************************************************************************************/
void  open_SIO (void);                           /*Communications settings for RS232C*/

/*****************************************************************************************************************/
/*              Acquisition and identification of port status                                                    */
/*****************************************************************************************************************/
int   err_status (void);  /*The port status is acquired.*/
void  write_ready (void); /*The transmission buffer register and the transmission register statuses are acquired.*/
int.  read_ready (void);  /*Confirmation of data set status*/

/*****************************************************************************************************************/
/*                           Writing data                                                                        */
/*****************************************************************************************************************/
void  write_data (char wr_data);      /*The data is written to the registers.*/
void  write (char *wr_data);          /*The data is written to the GP.*/

/*****************************************************************************************************************/
/*                          Reading data                                                                         */
/*****************************************************************************************************************/
int   read_data (void);                          /*The data is read from the GP.*/
void  change_screen (int interrupt_data);        /*The received data in an interruption from the GP is identified.*/
int   read (void);                               /*The received data in an interruption from the GP is read.*/

/*****************************************************************************************************************/
/*                      Confirmation of key entries                                                              */
/*****************************************************************************************************************/
int   kbhit (void);

/*****************************************************************************************************************/
/*                          Global variables                                                                     */
/*****************************************************************************************************************/
int   interrupt_data,port_status+;
char  *str2;
```

```
void main (void)
{
        int no_data;
        str2 =  (char*) malloc (sizeof (char) *data_sezi_str2); /*The memory for str2 is secured.*/
        char *wr_data =  (char*) malloc (sizeof (char) *data_size_wr_data);
                                        /*The memory for wr_data is secured.*/
        open_SIO ();          /*Communication settings for RS232C*/
        wr_data = "\x1bW000F0001\x0d\0" ; /*0x1 is written to address 15: screen number 1 setup*/
        write (wr_data);
        wr_data = "\x1bW0014003F\x0d\0";
              /*0x3F is written to address 20: Materials are put into aeration tanks Nos. 1 to 6.*/
        write (wr_data);
/*************************************************************************/
/*      The data reception from the GP is identified.                    */
/*  If the Write key is pressed, the execution is completed.             */
/*************************************************************************/
       while (1)
       {
              no_data = read ();
              if (no_data == 1)      /*If there is any key entry, no_data=1.*/
             {
                    break;
             }
              else
             {
                    wr_data = str2;
                    write (wr_data);
             }
       }
       getch ();                    /*The codes for keys are removed from the key buffer.*/
       free (wr_data);                 /*The memory area for wr_data is freed up.*/
       free (str2);                 /*The memory area for str2 is freed up.*/
}

/*The transmission buffer register status and the transmission register status are acquired.*/
void write_ready (void)
{
       int err6000;

       err6000 = 0;
       while (status_bit_6000 != err6000)
       {
             err6000 = err_status () & status_bit_6000;
       }
       return;
}

/*Confirmation of data set status*/
int read_ready (void)
{
       int no_data,err0020;

       err0020 = 0;
       while (status_bit_0020 != err0020)
       }
             err0020 = 344_status () & status bit_0020;
             if (kbhit ())       /*Confirms whether there is a key entry or not.*/
             {
                    no_data = 1;/*If there is a key entry, no_data=1.*/
                    break;      /*The program is terminated.*/
             }
```

```
    }
     return (no_data);
}
/*Data is written to the GP.*/

void write (char *wr_data)
{
     while (*wr_data != '\0')       /*The data is written until it becomes NULL.*/
    {
            write_ready ();
            write_data (*wr_data);
            wr_data++;        /*The address pointed to by the pointer is incremented.*/
     }
     return;
}
/*****************************************************************************/
/*          The interrupt data received from the GP is confirmed.        */
/*          The data is written to addresses 20, 21, 22, and 23.         */
/*****************************************************************************/
void change_screen (int interrupt_data)
{
      switch (interrupt_data)
/*If interrupt_data is 1, 0x1 is written to address 21, 0x3F to address 22, and 0x50 to address 23.*/
                case   1: str2 = "\x1bW00150001003F0050\x0d\0";
                        break;

/*If interrupt_data is 2, 0x2 is written to address 21, 0x0 to address 22, and 0x0 to address 23.*/
                case   2: str2 = "\x1bW00150002000000000\x9d\0";
                        break;

/*If interrupt_data is 3, 0x4 is written to address 21, 0x0 to address 22, and 0x50 to address 23.*/
                case   3: str2 = "\x1bW00150000400000050\x0d\0";
                        break;

/*If interrupt_data is 4, 0x8 is written to address 21, 0x0 to address 22, and 0x20 to address 23.*/
                case   4; str2 = "\x1bW00150000800000020\x0d\0";
                        break;

/*If interrupt_data is other than 1 to 4, NULL is written.*/
               default  : str2 = "\0";
                       break;
       {
       return;
}

/*****************************************************************************/
/*          The interrupt data received from the GP is read.             */
/*  Reading is performed until the interrupt_data becomes other than NULL.  */
/*****************************************************************************/
int read (void)
{
       int no_data;
       do
       {
              no_data = read_ready (); /*Confirmation of data set status*/
              if (no_data == 1)       /*If there is a key entry, no_data=1.*/
              {
                   break;
              }
              else
              {
```

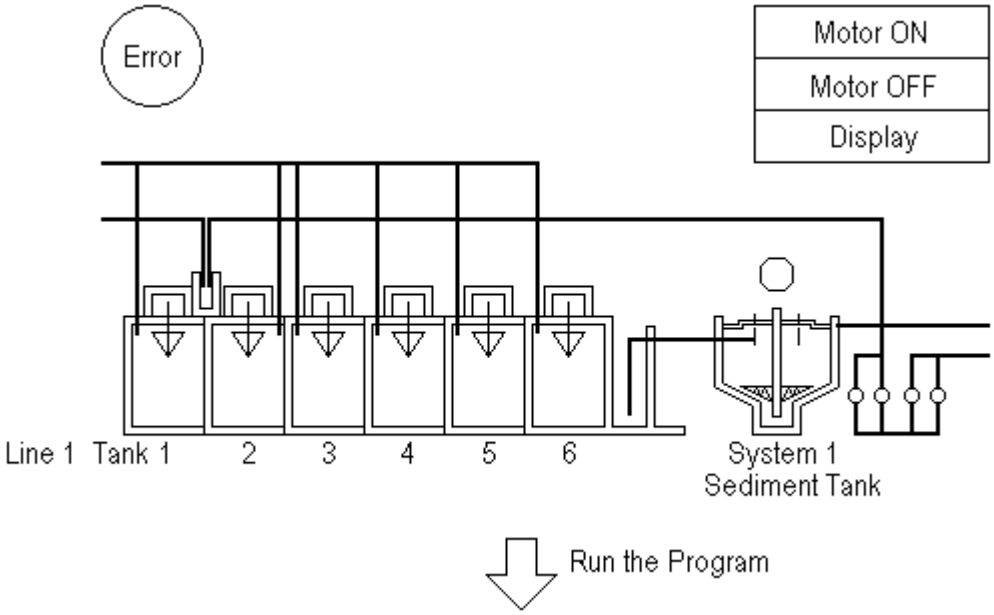
```
                    read_data ();      /*The data received from the GP is read out./*
                    change_screen (interrupt_data); /*The data received from the GP is identified.*/
                }
            } while (*str2 == '\0');
            return (no_data);
    }
    /*Communications settings for RS232C*/

void open_SIO (void)
{
        union REGS regs ;
                regs.x.dx = serial_port_number;
                regs.h.ah = serial_port_INT;
                regs.h.al = serial_port_parameter;
                int86 (serial_port_BIOS,&regs,&regs);
        return;
}

/*The port status is acquired.*/
int err_status  (void)
{
        union REGS regs;
                regs.x.dx = serial_port_number;
                regs.h.ah = get_status;
                int86 (serial_port_BIOS,&regs,&regs);
                port_status = regs.x.ax;
        return (port_status);
}

/*The data is written to the registers*/
void write_data (char wr_data)
{
        union REGS regs;
                regs.x.dx = serial_port number;
                regs.h.ah = serial_port_write;
                regs.h.al = wr_data;
                int86 (serial_port_BIOS,&regs,&regs);
        return;
}

/*The data is read from the GP*/
int read_data (void)
{
        union REGS regs;
                regs.x.dx = serial_port_number;
                regs.h.ah = serial_port_read;
                int86 (serial_port_BIOS,&regs,&regs);
                interrupt_data = regs.h.al;
        return (interrupt_data);
}
```

The availability of open_SI0 (void), err_status (void), write_data (char wr_data), and read_data (void) will depend on the models used. If the program is written on a personal computer that is not IBM -compatible, it must be modified in order to be used.

(4) After screen data is transferred to the GP, display (operation) can begin.

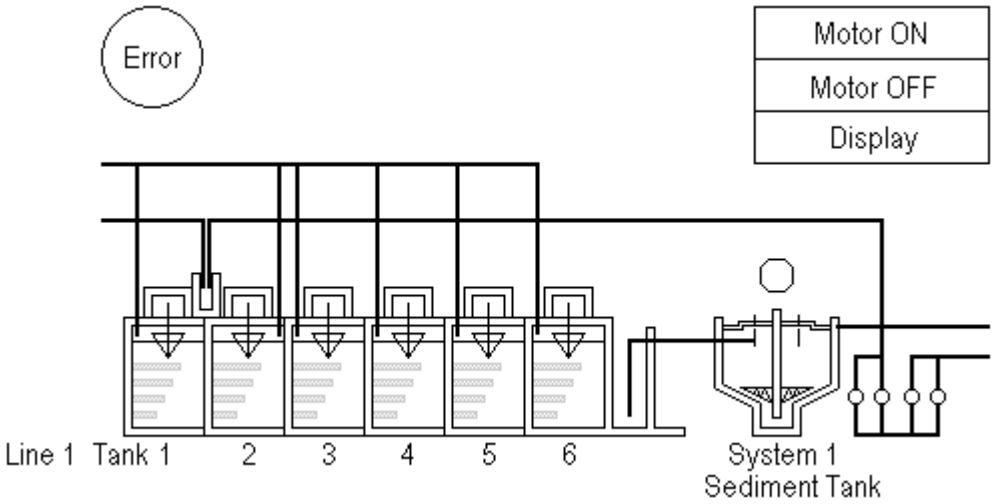
◆ **GP Run Screen**

GP Screen (Before running program)

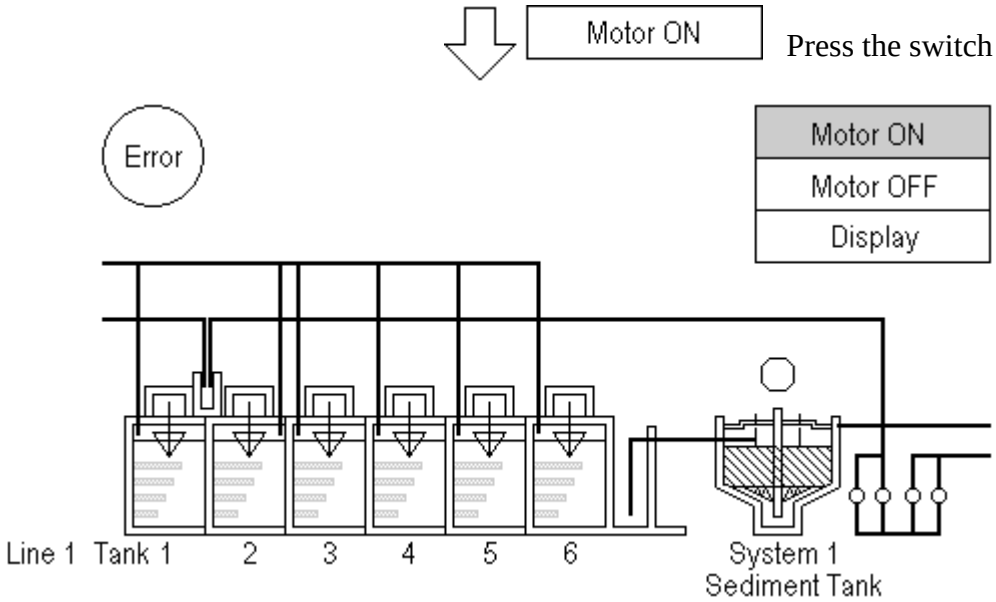


Run the Program

GP Screen (After running program)



Six Libraries  appear in the No. 90 screen display.

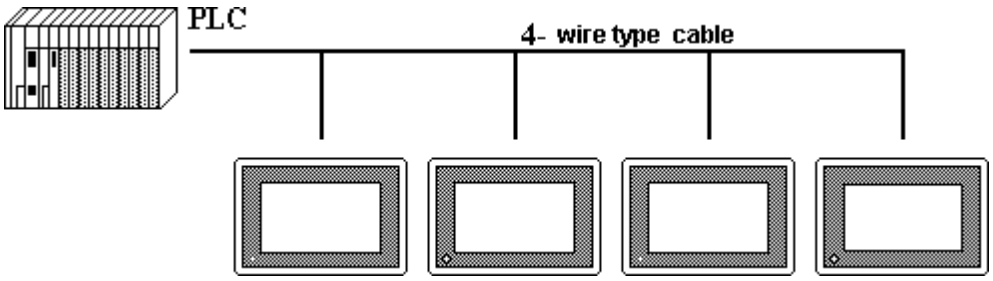


ASCII Code "31" = Data "1" is output to the Host, causing the screen to change.

4 n:1 (Multi-link)

This chapter describes the overview of n:1 (multi-link) communications and the necessary steps for preparing multi-link communications.

4.1 n:1 About Multi-link



The communication software supports Programless **n:1** (multi-link) connections, whereby multiple GPs are connected to a single PLC.

In **n:1** (multi-link) communication, a token, which authorizes PLC communication, is passed successively among the GPs so that communication with the PLC occurs in an orderly fashion.

The maximum total length of the cables is 600m. However, when the maximum extended length for the PLC is less than this, model the setup after the PLC value.

- **Connection multiple GP units to one PLC**

  Multiple GPs can be connected to each PLC computer (top unit) Link I/F. Maximum 16 connections are possible; for most practical purposes, use up to 4 connections.

- **Programless Communication**

  A particular program for **n:1** (multi-link) is not necessary, as the selected Promgramless protocol can also be used in the multi-link format.

- **Multi-link connections possible without exclusive hardware**

- **from Large to Medium sized GP units**

  Large and Medium sized GP-*70, GP-77R and GP2000 Series displays can be connected in a *random* order in **n:1** (multi-link) communication.

- **GP screen data designed for 1:1 connection**

  The multi-link connection can even use GP screen data designed for a **1:1** connection.

•Maintenance possible on connected GP

In the middle of RUN mode for a **n:1** (multi-link) connection, the communication of a *free* GP can be stopped. This function is available so that adding or editing screen data, turning the GP power On/Off, debugging, maintenance, and so on, can be performed without disrupting the system.

Note:

- **In GP's INITIALIZE/PLC SETUP/STATION SETUP screen, enter the same NETWORK INFORMATION ADDRESS for all connected GP's.**
- **Because increasing the number of GP connections slows the GP display and operation speed, consider it carefully at the end of your system calculations.**
- **To utilize display efficiency, set up the tag addresses consecutively; when tag addresses are *not* consecutive, the processing speed decreases.**
- **The PLC Scan Time (cycle time) affects the base system's response time.**
- **When the PLC power is turned off during communication, a communication error may appear on the GP.**
- **When a connector hood is used to ground the FG line at the end of the GP—PLC connection, use an electric conductor.**

Careful!

Entering touch input on multiple GPs at the same time may increase the time it takes for the PLC to respond. This occurs because the first screen must refresh its display before the second display can receive its reply. As a result, do not use both GP units at the same time.

Important

When GP-*30 series and GP-*70 series systems are combined and n:1 (multi-link) connections are used, note that the GP-*30 systems cannot use the following functions.

- ***PLC exclusive usage that uses the system data area's LS14.***
- ***Function for informing other GPs when a single GP has exclusive use of the PLC.***
- ***Time for release of exclusive use.***

<Matrix showing GP recognition of PLC Monopoly>

GP-*30 series	GP-*50 series	GP-*70/GP2000 series
Touch Panel Monopoly	Not recognized	Not recognized
Not recognized	**Exclusive use of either touch panel or LS14**	Recognized
Not recognized	Recognized	**Exclusive use of the touch panel or of the LS14**

Important

For GPs that do not recognize PLC monopoly, their display is not refreshed until monopoly is released, and errors are not displayed.

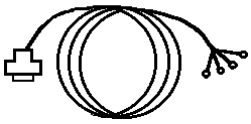
Reference *For information about GP-*30 series panels' exclusive use of PLCs, refer to GP series PLC connection manual, multi-link protocol*

Reference *For information about GP-*70 series panels' exclusive use of PLCs, refer to* ***Chapter 4.5, About PLC monopoly***

Also, with the GP70 series, PLCs connectability may vary depending on the models involved.

■ Option Parts

Digital's *Multi-link* type cable or RS-422 connector terminal adapter is recommended for **n:1** (multi-link) connections.

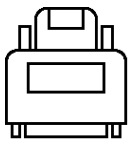


Mitsubishi type Cable (GP230-IS12-0)

I/F cable (5m) to run communication between various PLCs and GP.

Can use as a secondary cable from the Relay terminal.

RS-422 Connector Terminal Adapter (GP070-CN10-0)



This adapter exchanges the RS-422 terminal output from the GP Series' SIO connector.

Connect with the recommended cable by the corresponding PLC maker.


MEMO

4.2 Connectable PLCs

The following is a list of the PLCs which support GP multi-link connections.

Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup	GP Series GLC2000 Series	GLC100 Series GLC300 Series
MITSUBISHI ELECTRIC	MELSEC-A	A2A A3A A4U	AJ71C24-S6 AJ71C24-S8 AJ71UC24		Mitsubishi's MELSEC-AnA (LINK)	○	○
		A2U	AJ71UC24				
		A2US	A1SJ71C24-R4 A1SJ71UC24-RS				
		A2USH-S1	A1SJ71UC24-R4				
		A1N A2N A3N	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24		Mitsubishi's MELSEC-AnN (LINK)	○	X
		AOJ2 AOJ2H	AOJ2-C214-S1				
		A1SJ	A1SJ71UC24-R4				
		A1S,A1SH A2SH	A1SJ71C24-R4				
		A2CCPUC24	Link I/F on CPU Link		Mitsubishi's MELSEC-AnN (LINK)		
	MELSEC-FX	FX_{2N}	FX2N-485-BD		Mitsubishi's MELSEC-FX (LINK)		
	MELSEC-QnA	Q2A Q2A-S1 Q4A	AJ71QC24 AJ71QC24N-R4		Mitsubishi's MELSEC-QnA (LINK)		
			AJ71UC24	Usable device type limited	Mitsubishi's MELSEC-AnA (LINK)		
		Q2AS	A1JS71QC24		Mitsubishi's MELSEC-QnA (LINK)		
			A1JS71UC24	Usable device type limited	Mitsubishi's MELSEC-AnA (LINK)		
		Q2AS-S1	A1SJ71QC24N		Mitsubishi's MELSEC-QnA (LINK)		
			A1SJ71UC24-R4	Usable device type limited	Mitsubishi's MELSEC-AnA (LINK)		
		Q4AR	AJ71QC24N		Mitsubishi's MELSEC-QnA (LINK)		

Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup	GP Series GLC2000 Series	GLC100 Series GLC300 Series
MITSUBISHI ELECTRIC	MELSEC-Q	Q02CPU-A Q02HCPU-A Q06HCPU-A	A1SJ71UC24-R4		Mitsubishi's MELSEC-AnA (LINK)	○	X
		Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00CPU Q01CPU Q00JCPU	QJ71C24		Mitsubishi's MELSEC-QnA (LINK)		
OMRON	SYSMAC C	C500 C500F C1000H C1000HF C2000 C2000H	C500-LK201-V1 C500-LK203	C1000HF can only use C500-LK203 link unit.	OMRON SYSMAC-C series	○	○
		C200H C200HS	C200H-LK202				
		C120 C120F C200H C500 C500F C1000H C2000 C2000H	C120-LK202-V1				
		SRM1-CO2 CPM1-20CDR-A CPM2A	CPM1-CIF11				
	SYSMAC-α	C200HX-CPU64 C200HG-CPU43 C200HE-CPU42	C200HW-COM06	CPU64 checks the connection. Only the 4-wire type can be used.			
		C200HX-CPU64-Z	C200H-LK202-V1				

Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup	GP Series GLC2000 Series	GLC100 Series GLC300 Series
OMRON	SYSMAC CV	CV500 CV1000 CVM1	Link I/F on CPU unit CV500-LK201		OMRON SYSMAC-CV	○	X
	SYSMAC CS1	CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42 CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	CSW-SCB41	RS-422 (Port 2)	OMRON SYSMAC-CS1 series		
	SYSMAC CJ	CJ1G-CPU44 CJ1G-CPU45	CJ1W-SCU41				
HITACHI	HIDIC H	H-2000 H-2002	COMM-H COMM-2H	Standard HIZAC H series. Transmission control procedure 1	HITACHI HIZAC-H series	○	X
		H-302 H-702 H-4010	COMM-2H				
		MICRO-EH	Serial Port2 on CPU unit				
		EH-150 (EH-CPU448)	Serial Port1 on CPU unit				
		H-302 H-702 H-2002 H-4010	COMM-2H	Transmission control procedure 2	HITACHI HIDIC-H2 series		
		MICRO-EH	Serial Port2 on CPU unit				

Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup	GP Series GLC2000 Series	GLC100 Series GLC300 Series
MATSUSHITA	MEWNET	FP10S *1 FP10SH	Link I/F on CPU unit		MATSUSHITA MEWNET-FP series	○	X
YOKOGAWA	FACTORY ACE	FA-M3	F3LC11-2N	CPU uses F3SP20-ON and F3SP35-5N to check connection.	YOKOGAWA *2 FACTORY ACE 1:1 Comm.	○	X
		FA-M3 (n:m Connection)	F3LC11-2N	In addition to the FA-M3, multi-link connections using a digital Indicating Controller (UT37/38/2000) and recorder (mR series) can be made without programming. The CPU uses F3SP20-N and F3SP35-5 to check the	YOKOGAWA *3 FACTORY ACE 1:n Comm.		
TOSHIBA	PROSEC T	T3	Link I/F on CPU unit		TOSHIBA PROSEC-T Series	○	X
BRADLEY	ALLEN SLC500	SLC-5/03 SLC-5/04	Link I/F on CPU unit		Allen Bradley SLC500 Series	○	X

*1 Use Version 1.8 or higher.

*2 "FA-500" in earlier version (GP-PROII, GP-PROIII)

*3 "FA-500M" in earlier version (GP-PROII, GP-PROIII)

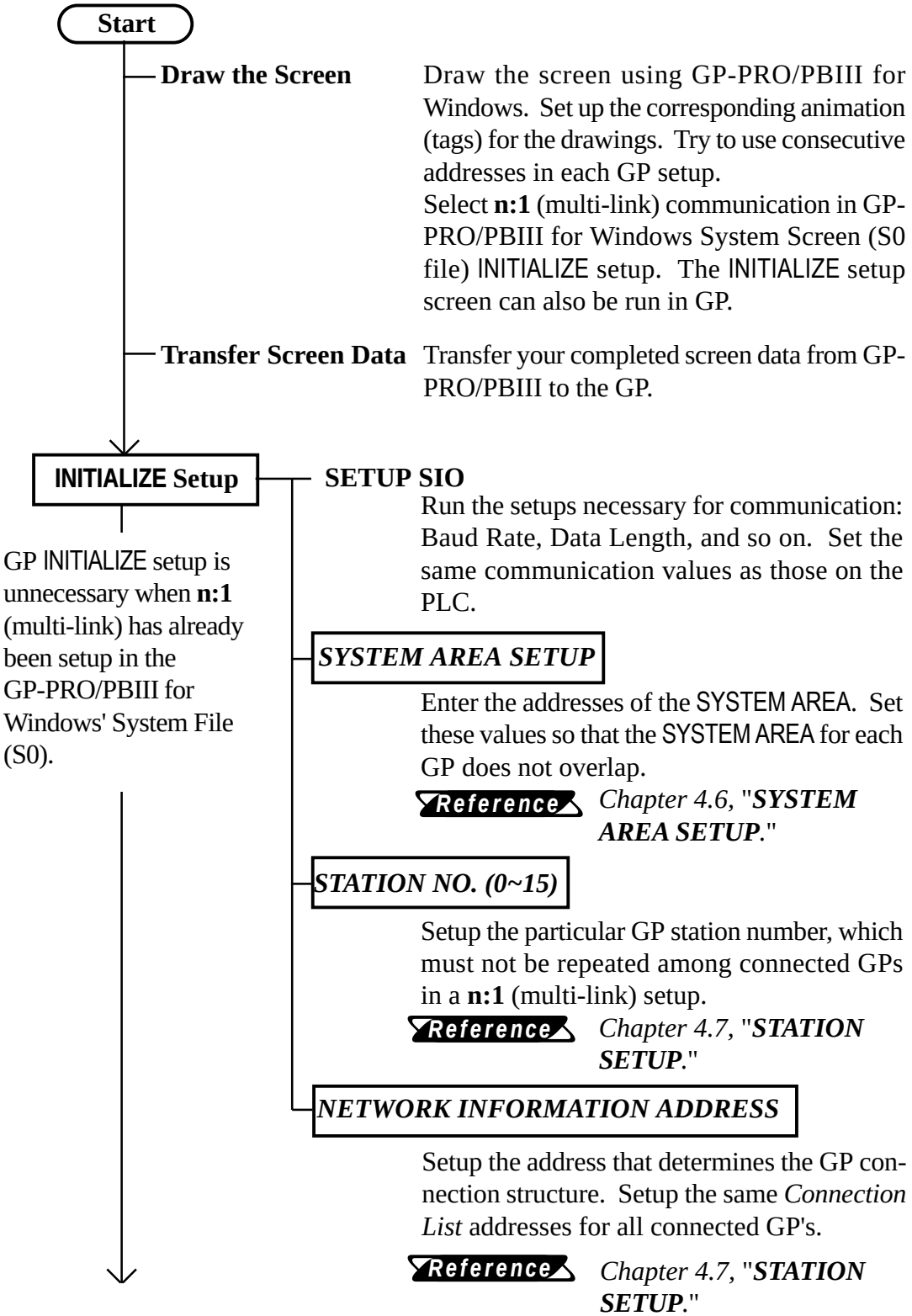
Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup	GP Series GLC2000 Series	GLC100 Series GLC300 Series
ROCKWELL ALLEN BRADLEY	MicroLogix 1000	1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	Advanced Interface Converter (1761-NET-AIC)		Allen Bradley SLC500 Series	○	X
	MicroLogix 1200	1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA 1762-L40BXB					
	MicroLogix 1500	1764-LSP					
KEYENCE	KZ-300	KZ-300	KZ-L2		KEYENCE KZ-300 Series	○	X
	KZ-350	KZ-350					
	KV-700	KV-700	KV-L20				
YASUKAWA	MEMOCON-SC	GL120 GL130	JAMSC-120NOM27100		YSUKAWA Memocon-sc Series	○	X
SHARP	New Satellite JW	JW-33CUH3	Link I/F on CPU unit		Sharp New Satellite JW Series	○	X
			JW-21CM *1				

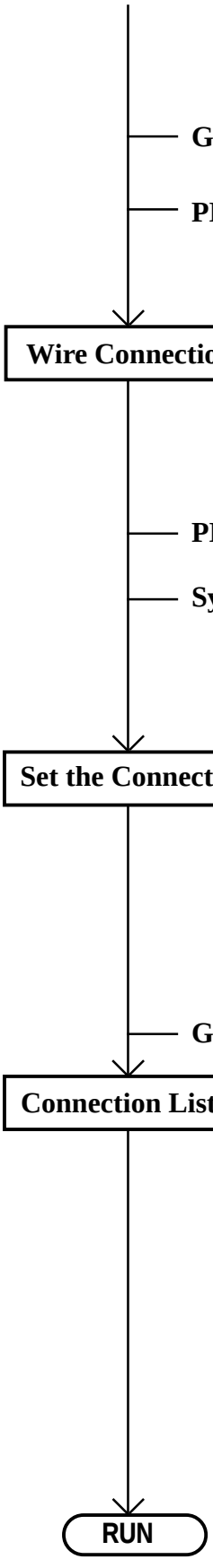
**1 Be sure to use a ROM verson that is 30Hn or higher when you use JW-21CM . If the ROM version is 30H, some file registers will not be available. The JW30H cannot be used, because it does not have a ROM version mark.*

- ***If a PLC maker changes their PLC specifications, or upgrades the PLC version, there is a possibility that communication with the GP may not operate normally.***
- ***Depending on the CPU or Link I/F being used, communication speed vary. Also, when multilink connections (n:1) are used, speed may be slower. Thus, when designing your system, please check that the communication speeds meet your requirements.***

4.3 Prior to RUN mode

This section outlines the steps for **n:1** (multi-link) communication. Particularly important steps have a rectangular frame.





Setup the same as the GP communication setup.

Connect so that **n:1** (multi-link) communication can take place.

Reference ***Chapter 5, "PLC-GP Connection (Multi-Link)".***

Use the Ladder Program to initialize the entire area of the PLC Data Register's System Area.

In the setup Connection List address of the NETWORK INFORMATION ADDRESS, using a Ladder program, turn on the corresponding bit for each GP STATION NO.

Reference ***Chapter 4.7, "STATION SETUP."***

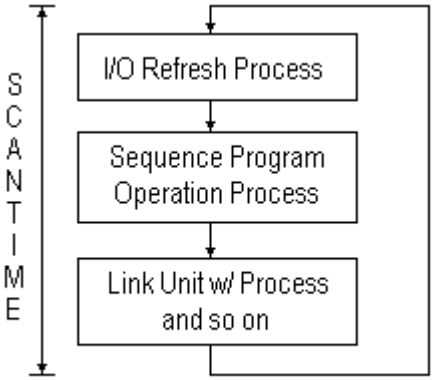
Using a Ladder program, compare the data of the Connection List and Validation List setup in the NETWORK INFORMATION ADDRESS.

When the Connection List and Validation List values are not the same, communication is not occurring. See INITIALIZE's NETWORK INFORMATION ADDRESS again.

Reference ***Chapter 4.7, "STATION SETUP."***

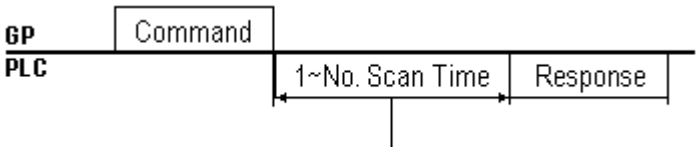
4.4 PLC Scan Time

When using the GP in **n:1** (multi-link), the PLC scan time greatly influences the GP Display/Operation speed. The time it takes to run a process series, common to PLCs, and repeated as shown in the diagram below, is known as the *scan time*. If the scan time gets longer, the Display/Operation speed, because it remains in proportion, slows down.



Scan Time Construction

In the step *Link I/F w/ Process and so on* in the above diagram, the PLC runs the process linked to the command *from* the GP.



After sending a command, the time it takes for a response varies among PLC's.

Wait Time Reference Example

- MELSEC A Series

  Read .... 1 Scan time
  Write.... 2 Scan time

Note: **For details, refer to the corresponding PLC manual.**

To raise (speed up) the response time, wherever possible, create a system with short scan times. (For example, for sequence program allocation and so on.)


MEMO

4.5 About PLC Monopolize

A PLC monopoly occurs when one of many GPs uses the PLC exclusively. For example, use PLC monopolize when you wish to setup data using the keyboard on the GP screen, or when displaying data Input/Output on a single GP.

■ PLC Monopoly

There are two ways of monopolizing the PLC:

1. Turn bit 7 of System Area address LS14 ON,
2. Set the GP TOUCH MONOPOLIZE option ON in GP's INITIALIZE off-line menu.

Reference *Chapter 4.8, "CUSTOMIZE SETUP."*

■ PLC Monopoly Release

Turn OFF the #7 bit of the GP System Area's LS14.

When the PLC is used exclusively using the method stated above in (1), the time period of exclusive use can be set. After that period is over, exclusive use is automatically released.

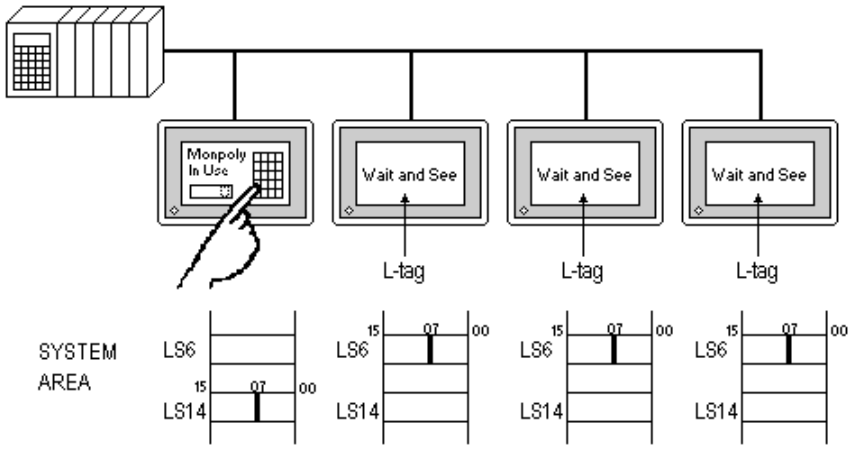
Reference *Chapter 4.8, "CUSTOMIZE SETUP."*

When a GP is monopolizing the PLC, bit 7 of System Area address LS6 (Status) turns ON for the other GPs. These GPs are in a *wait* state.

Operations run in GPs in a wait state are carried out only after communication is resumed. For this reason, there is the possibility errors will occur in accumulated operations. Plus, the PLC cannot check the System Area bit of Wait and See GPs.

We recommend using L-tag and W-tag, U-tag, and so on, to display whether a GP is in Monopoly or Wait and See mode.

E.g. Make the 7th bit of System Area's LS6 (Status) the trigger bit which displays the L-tag message "Waiting".



Note:

- **When LS14's (Control) bit is turned ON in multiple GPs, the PLC Monopolize function is carried out on the GP whose bit turned ON first.**
- **While one of the GPs monopolizes the PLC, the other GP displays remain static.**

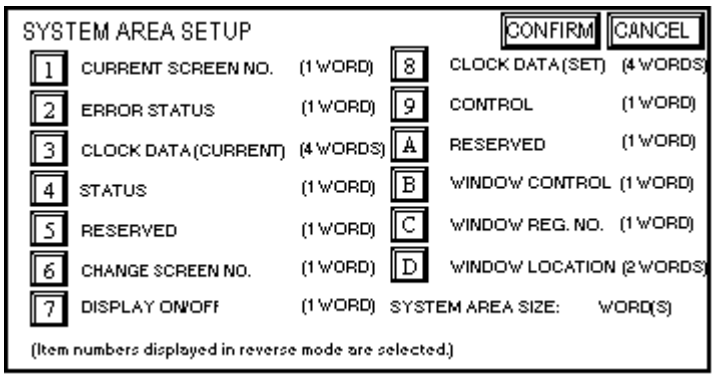
4.6 SYSTEM AREA SETUP

This section's data will help you to set up the System Area[*1].

In **n:1** (multi-link) communication, to layout the System Area for the number of connected GPs, data of the entire system will increase. For this reason, the processing speed of each GP may slow down.

Selecting only necessary items for the System Area is recommended.

When setting the system data area while in the GP's off-line mode, be sure to use the [2 SYSTEM AREA SETUP], located inside the [1 INITIALIZE] menus's [2 SETUP OPERATION SURROUNDINGS] selection screen.



(GP-470 Screen)

Note:

- **Setup the System Area for all the connected GP's. Do not overlap any of the allotted PLC Data Register (D) or Data Memory (DM) addresses.**
- **When System Area items are not selected, the Reading Area start address becomes the System Area start address.**
- **There is a process where not selecting the System Area items increases the GP management speed; however, operations where the PLC controls the GP, such as a Screen Change command sent from the PLC or PLC monopolize, cannot be run.**
- **When you wish to change the screen despite System Area items not being selected, indirectly use W-tag's ADD mode, and write the PLC Data Register contents into GP's internal LS8.**

**1 The System Area is the area necessary for the PLC to control the GP. The items selected here are allotted to the PLC's internal memory.*

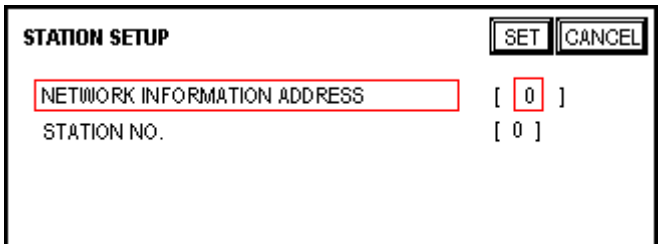
Reference *For details about the System Area, refer to **Chapter 1.1, Direct Access Communication.***


MEMO

4.7 STATION SETUP

The STATION SETUP, necessary for the **n:1** (multi-link) setup, checks whether correct communications run with the connected GP System configuration.

When setting the system data area while in the GP's OFFLINE mode, be sure to use the [2 STATION SETUP], located inside the [1 INITIALIZE] menu's [2 SET UP OPERATION SURROUNDINGS] selection screen.



(GP-470 Screen)

- **NETWORK INFORMATION ADDRESS**

  In the **n:1** (multi-link) connection, the Network Information uses 2 words in its correspondences. These 2 words are made up of the Connection List and the Validation List (described later in this section). Allocate these respective areas into the PLC's Data Register (D) or Data Memory (DM).

PLC Data Register

+ 0	CONNECTION LIST	PLC-->GP
+ 1	VALIDATION LIST	GP-->PLC

Important

In the NETWORK INFORMATION ADDRESS, set up the same address to all the GPs connected to the same Link I/F. Furthermore, when there are 2 ports in the connected Link I/F, do not make them the same address.

- **Connection List**

  The word address for the Connection List sets up the number of GPs connected to the PLC, registered beforehand on the PLC side. When these GPs are connected to the PLC, the corresponding PLC bit numbers for the particular GP Stations (see bottom) turn on.

  - **When the GP is connected to the PLC, and the option of GP only correspondence ends and OFFLINE mode is entered, the GP Station Number turns the**

Note: **corresponding PLC bit off.**

Bit 15Bit 0

For example, when these 4 GP units—bit 0, bit 2, bit 3, bit 5—are connected, 002D (h) is written here.

Connection List 0 0 0 0 0 0 0 0 0 0 **1** 0 **1** **1** 0 **1** **002D (h)**

Careful!
- *Be certain to set up the GP before running the program.*
- *Turn bits not connected to the GP off.*

STOP **Avoid keeping the bits in the list of connected stations OFF for long periods of time even though the GP is connected.**

- **Verification List**

This area responds to the correspondence from each connected GP. In the Verification List, when the same bit numbers as the Connection List turn On, the corre spondence is accepted. The Station Numbers of the communicating GPs turn their corresponding PLC bit number on.

Bit 15 Bit 0

If the correspondence between the GP and PLC is correct, the same value as in the Connection List is written to the Verification List.

For example, the value 002D (h) in the Connection List, set up as the 0 bit, 2 bit, 3 bit, and 5 bit, writes to the Verification List.

Connection List 0 0 0 0 0 0 0 0 0 0 **1** 0 **1** **1** 0 **1** 002D (h)

Verification List 0 0 0 0 0 0 0 0 0 0 **1** 0 **1** **1** 0 **1** 002D (h)

Note: **When the Connection List and Verification List do not match, a COMMUNICATION ERROR occurs. Check the setup again.**

Careful! *When changing the type of connection, first turn all the List bits Off.*

- **STATION NO.**

  This is the setup for the GP Station Number mentioned in the above section. The setup range is from 0 to 15, and the only other restriction is the GP STATION NO. must be unique in the system. If STATION NO.'s are repeated, a COMMUNICATION ERROR occurs.

The STATION NO. is the number allocated to the particular GP unit. This number is not related to the Link I/F Machine number.

< Station Setting Data Example >

The following shows the example of station settings used to connect two (2) GPs by n:1(multi-link) connection.

	GP1	GP2
Station No. *1	1	1
GP Station No. *2	0	1
Storage Address *3	D100	D100

**1 Enter the station numbers of the link unit being connected.*

**2 Be sure that you do not create any duplicate GP station numbers (from 0 to 15).*

**3 All GPs must be set so as to use the same storage address to avoid overlapping System Data Area's settings.*

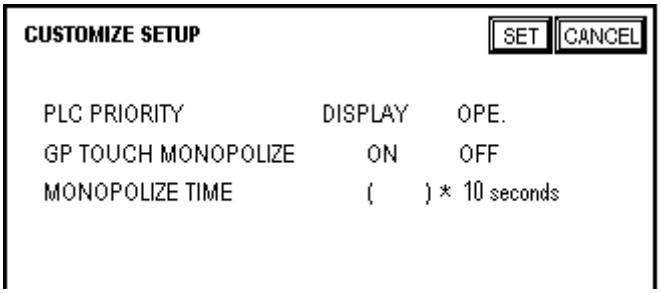
Writing [3] in [D100] enables the system to start communication after you finished all settings shown above.


MEMO

4.8 CUSTOMIZE SETUP

The Customize function alters the **n:1** (multi-link) connection's communication to make it more effective. To run communication efficiently, determine whether to use Operation or Display priority with your GP. As a result, the communication response speed can be upgraded. (However, this changes with the screen information.)

When setting the system data area while in the GP's OFFLINE mode, be sure to use the [CUSTOMIZE SETUP], located inside the [INITIALIZE] menus's [SET UP OPERATION SURROUNDINGS] selection screen.



(GP-470 Screen)

- **PLC PRIORITY**

  According to how the GP is used, select either Operation priority (OPE.) or Display priority.

- **Display**

  Set up the GP to this option when using the GP mainly as a monitor screen. The GP will command a higher display speed as a result; however, the response time for the touch panel's operations will slow.

- **Operation**

  Set up the GP to this option when using the GP mainly as an operation panel. As a result, the GP will command better touch panel numeric input and switch response times.

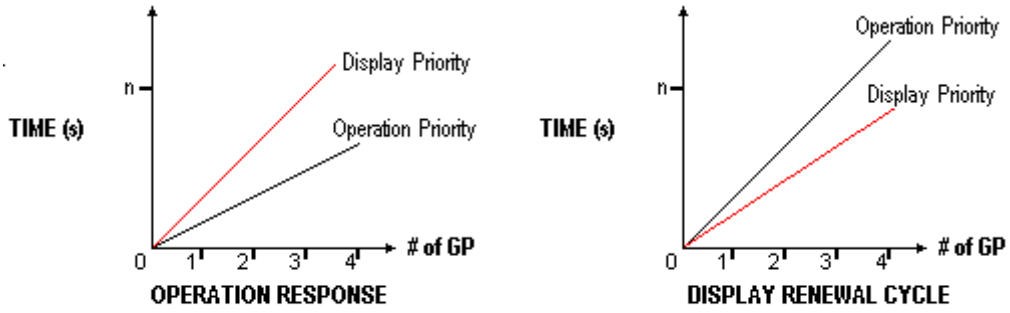
  Leaving the GP in this mode does not influence the touch panel operation response time of the rest of the GPs very much; however, the screen display renewal cycle will slow down.

Note:

- **In a basic setup, run the same setup for all connected GPs.**
- **To increase the display speed, restrict the address setup to consecutive addresses wherever possible. And make bit addresses consecutive to the word unit.**

- **Speed Difference between Display Priority and Operation Priority**

  When using the Mitsubishi Electric Corp. A3A PLC, with a scan time of 20ms with consecutive addresses (80 words not included in the System Area), the difference in reading speed is as shown in the following graphs.



- **GP TOUCH MONOPOLIZE**

  The monopolizing of touch panel use can be set ON or OFF. When you want to use the PLC exclusively (Reference ***Chapter 4.5, About PLC Monopolize***.) with a Momentary operation setup on the touch panel, turn GP TOUCH MONOPOLIZE on.

  When this setup is on, the touch panel uses the PLC exclusively whenever the momentary operation setup on the panel is pressed. In this way, you can perform inching operation via a momentary switch. When you stop pressing the panel, exclusive use ends.

- **MONOPOLIZE TIME** (0~2550s)

  This field controls the length of time for the monopolize process when no other touch panel operations are performed. The Monopolize process begins when the System Data Area's 7th bit of word address LS14 turns on, and ends either when the bit turns off, or when the time set here passes.

Note:

- **Pressing the touch panel in the middle of the monopolize process interrupts the MONOPOLIZE TIME function, ending exclusive use.**
- **When MONOPOLIZE TIME is set to** 0**, the monopolize function does not end automatically.**

Reference *For more about the contents of System Data Area LS6 (status) and LS14 (control), refer to* ***Chapter 1.1.4,*** "***Contents and Range of System Area***."

5 PLC-GP Connection (Multi-link)

This chapter describes the system configuration of PLC made by various manufacturers and the GP, and shows connection diagrams, supported devices, and examples of setting up the operating environment.

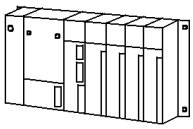
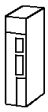
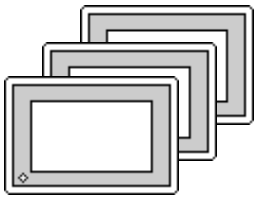
5.1 Mitsubishi Electric

5.1.1 System Structure

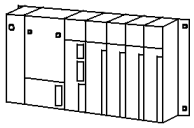
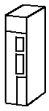
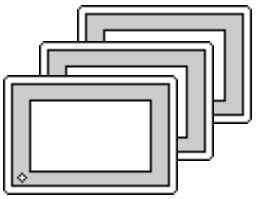
The following describes the system structure for connecting the GP to Mitsubishi Electric PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.1.2 Cable Diagrams**".*

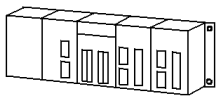
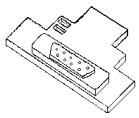
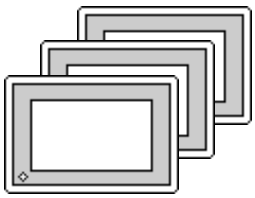
■ **MELSEC-A Series** (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Computer Link Unit 		
A2A A3A A4U	AJ71C24-S6 AJ71C24-S8 AJ71UC24	(Cable Diagram 1)	GP series
A2US	A1SJ71C24-R4 A1SJ71UC24-R4		
A2USH-S1	A1SJ71UC24-R4		

■ MELSEC-N Series (Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Computer Link Unit 		
A1N A2N A3N	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24	(Cable Diagram 1)	GP series
A0J2,A0J2H	A0J2-C214-S1		
A1S	A1SJ71C24-R4		
A1SJ,A2SH,A1SH	A1SJ71UC24-R4		
A2CCPU24	Link I/F on CPU unit		

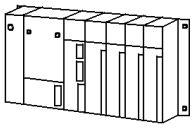
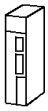
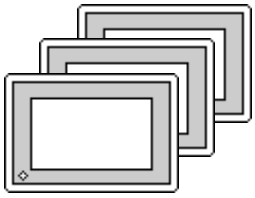
■ MELSEC-FX Series (Expansion Board with Link I/F protocol) *1

CPU	Adapter	Cable Diagram	GP
	Expansion board 		
FX2N *2	FX2N-485-BD	RS-422 (Cable Diagram 2)	GP series

**1 Choose Mitsubishi's MELSEC-FX2(Link) as the GP-PRO/PBIII project file's PLC type.*

**2 The PLC's system version should be at least 1.06 or later. Check the PLC's version by reading out the data from the register (D8001). For detailed information refer to the Mitsubishi's FX 2N Series Micro Sequencer manuals.*

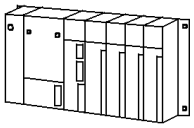
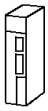
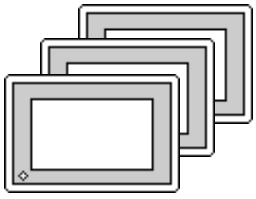
■ MELSEC-QnA Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Serial Communicaiton Unit / Computer Link Unit 		
Q2A,Q2A-S1,Q4A	AJ71QC24 (serial communication unit) *1 AJ71UC24 (computer link unit)	RS-422 (Cable Diagram 1)	GP series
	AJ71QC24N-R4	RS-422 (Cable Diagram 2) for CN-1	
Q2AS	A1SJ71QC24N(serial communication unit) *2 A1SJ71UC24(computer link unit)	RS-422 (Cable Diagram 1)	
Q2AS-S1	A1SJ71QC24N A1SJ71UC24-R4	RS-422 (Cable Diagram 1)	
Q4AR	AJ71QC24N	RS-422 (Cable Diagram1)	

**1 ROM : must be higher than 7179B.*

**2 ROM : must be higher than 7179M.*

■ MELSEC-Q Series

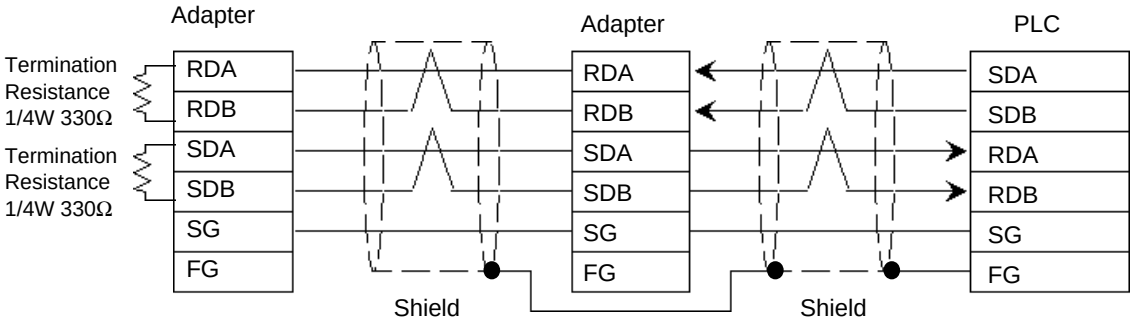
CPU	Link I/F	Cable Diagram	GP
	Serial Communication Unit / Computer Link Unit 		
Q02CPU-A Q02HCPU-A Q06HCPU-A	A1SJ71UC24-R4	RS-422 (Cable Diagram 1)	GP series
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00CPU Q01CPU C00JCPU	QJ71C24	RS-422 (Cable Diagram 1)	

5.1.2 Cable Diagrams

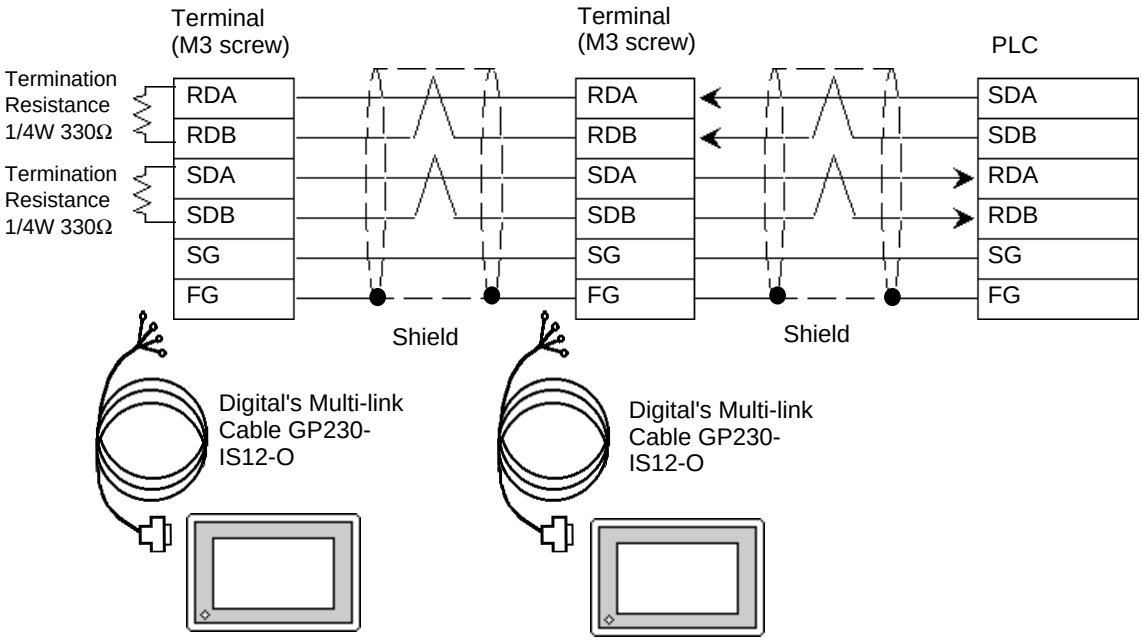
The cable doagrams illustrated below and the cable diagrams recommended by Mitsubishi Electric Corp. may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



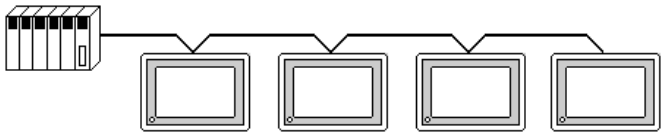
• When using Digital's Multi-link Cable, GP230-IS12-O



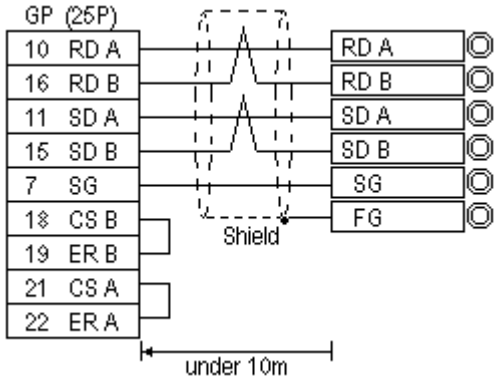
STOP *Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.*

Important

- ***Pull out the Transfer Cable Shield cover and shape it into a wire and connect it to the PLC's FG terminal.***
- ***GP230-IS12-O Cable FG terminal is not connected to GP's FG.***
- ***Place a Termination Resistor at both ends of the cable. The Termination Resistor is automatically setup when the PLC's Termination Resistor switch is turned ON.***
- ***Fot the RS-422 connection, use a cable length less than 500m.***
- ***As a general rule, connect the PLC at either end of the circuit, not in the middle.***

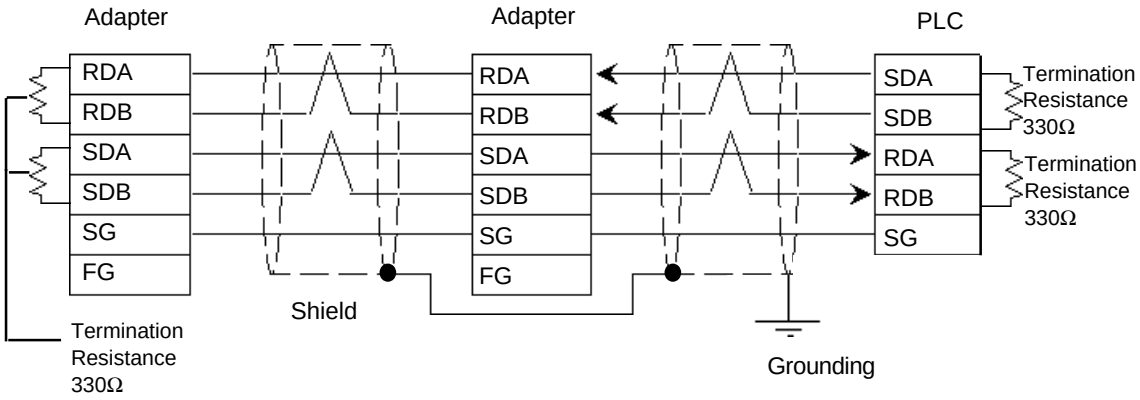


Note: **When making your own cable, Mitsubishi's SPEV (SB)-MPC-0.2*3P cable is recommended as the connection cable.**
The cable connection lines are as illustrated below and should be less than 10m.

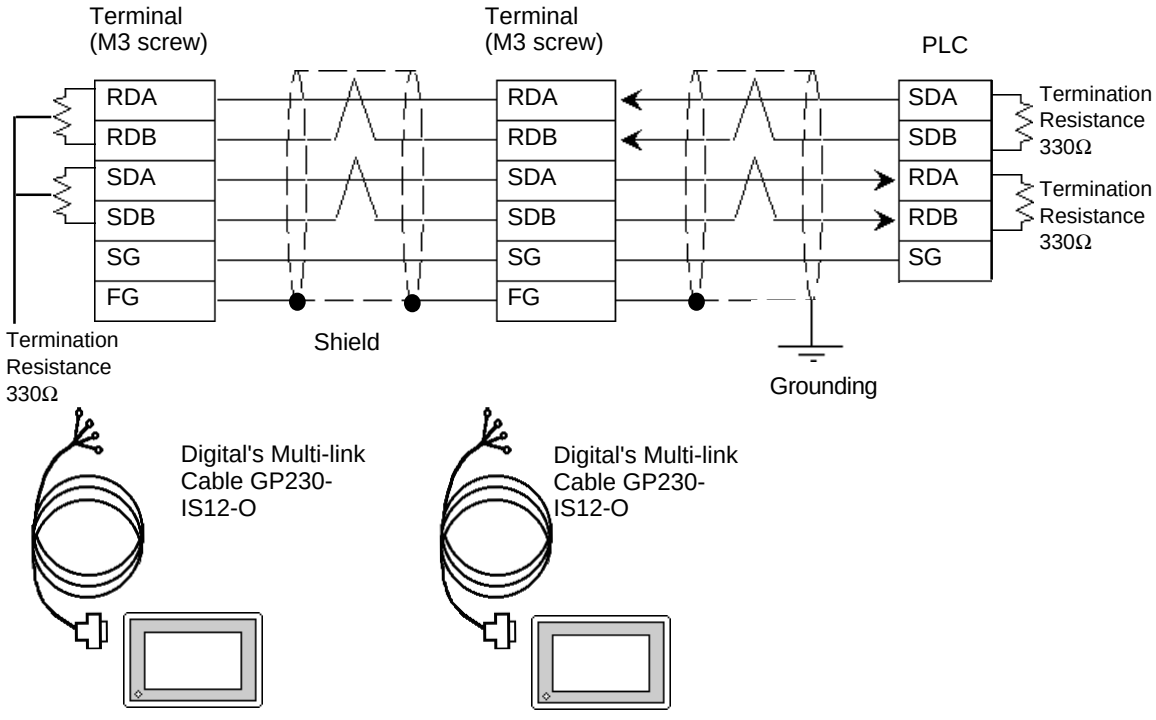


Cable Diagram 2

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



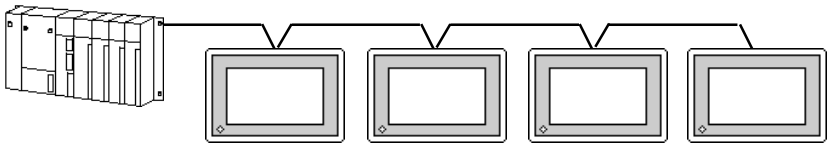
• When using Digital's GP230-IS12-0 (Multi Link Cable)



Ground your PLC's FG terminal according to your country's applicable standard. For details refer to your PLC's manual.

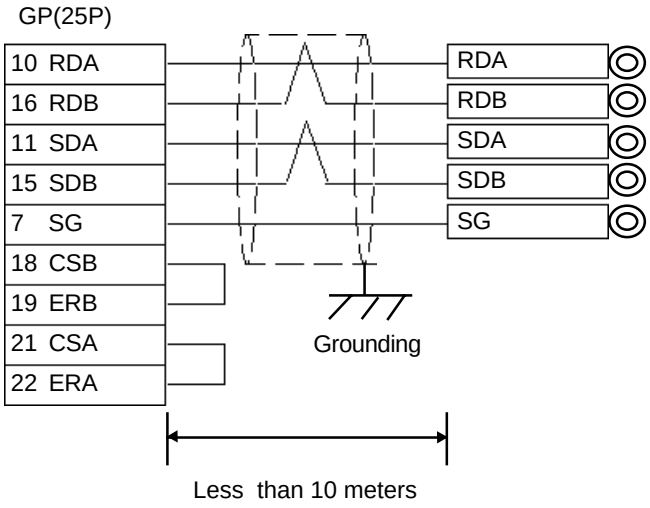
Important

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-0 cable's FG terminal is not connected to the GP's FG line.***
- ***Connect a terminating resistor to both ends of the cable.***
- ***When using FX2N-485-BD, the cable must not be longer than 50m.***
- ***As a general rule, connect the PLC at the end of the circuit's wiring (see below).***



Note:

- **When making your own cable, the Mitsubishi SPEV (SB)-0.2-2P is recommended.**
- **The cable connection lines are as shown below. The cables used between the GP and the terminals should be less than 10meters long.**



5.1.3 Supported Devices

The following describes the range of devices supported by the GP.

■ MELSEC-A Series (AnA/ AnU/ A2US/ A2USH-S1)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	xxx0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	xxx0	
Internal Relay	M0000 ~ M8191	M0000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	L0000 ~ L8176	÷16	
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Annuniciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B1FFF	---		
Timer (contact)	TS0000 ~ TS2047	---		
Timer (coil)	TC0000 ~ TC2047	---		L/H
Counter (contact)	CS0000 ~ CS1023	---		
Counter (coil)	CC0000 ~ CC1023	---		
Timer (current value)	---	TN0000 ~ TN2047		
Counter (current value)	---	CN0000 ~ CN1023		
Data Register	---	D0000 ~ D8191	Bit15	
Special Register	---	D9000 ~ D9255	Bit15	
Link Register	---	W0000 ~ W1FFF	BitF	
File Register	---	R0000 ~ R8191	Bit15 *1	

** 1 When using the File Register and the AnA or AnU, use the User's memory area in the memory cassettes.*
When the File Register is setup when the memory cassette is not in use, an error will develop when communicating.

■ MELSEC-N Series (AnN/ A2C/ A1S/ A1SJ/A2SH)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	X0000 ~ X07F0	XXX0	L/H
Output Relay	Y0000 ~ Y07FF	Y0000 ~ Y07F0	XXX0 *1	
Internal Relay	M0000 ~ M2047	M0000 ~ M2032	÷16	
Latch Relay	L0000 ~ L2047	---		
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16 *2	
Annuniciator	F0000 ~ F255	F000 ~ F240	÷16	
Link Relay	B0000 ~ B03FF	---		
Timer (contact)	TS000 ~ TS255	---		
Timer (coil)	TC000 ~ TC255	---		
Counter (contact)	CS000 ~ CS255	---		
Counter (coil)	CC000 ~ CC255	---		
Timer (current value)	---	TN000 ~ TN255		
Counter (current value)	---	CN000 ~ CN255		
Data Register	---	D0000 ~ D1023	Bit15	
Link Register	---	W0000 ~ W03FF	BitF	
File Register	---	R0000 ~ R8191	Bit15 *3	

** 1 The Output Relays Y01F0-Y01FF (word Y01F0) are used by the PLC, and cannot be set.. (only for A2C)*

** 2 A MELSEC-AnN and AJ71C24-S3 (or AJ71C24) cannot be matched and used.*

** 3 When using the File Register and the AnN, use the User's memory area in the memory cassettes.*
When the File Register is setup when the memory cassette is not in use, an error will develop when communicating.

■ **MELSEC-FX Series** (using Expansion board with Link Protocol)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X0267	X0000 ~ X0240	OCT 8 *** 0	L/H
Output Relay	Y0000 ~ Y0267	Y0000 ~ Y0240	OCT 8 *** 0	
Auxiliary Relay	M0000 ~ M3071	M0000 ~ M3056	÷ 16	
State	S0000 ~ S0991	S0000 ~ S0976	÷ 16	
Special Auxiliary Relay	M8000 ~ M8255	M8000 ~ M8240	÷ 16 *1	
Timer (contact)	TS000 ~ TS255	———		
Counter (contact)	CS000 ~ CS255	———		
Timer (current value)	———	TN000 ~ TN255		
Counter (current value)	———	CN000 ~ CN255	*2	
Data Register	———	D0000 ~ D7999	Bit 15	
Special Data Register	———	D8000 ~ D8255	Bit 15 *1	

**1 The Special Relay and the Special Data Register are divided into three areas. These are the Exclusive Reading Area, the Exclusive Writing Area and the System Area. For details, refer to your PLC's manual.*

**2 Word addresses CN200 to CN255 are 32 bit counters.*

■ MELSEC-QnA Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M00000 ~ M32767	M00000 ~ M32752	÷16	
Special Relay	SM0000 ~ SM2047	SM0000 ~ SM2032	÷16	
Latch Relay	L00000 ~ L32767	L00000 ~ L32752	÷16	
Annunciator	F00000 ~ F32767	F00000 ~ F32752	÷16	
Edge Relay	V00000 ~ V32767	V00000 ~ V32752	÷16	
Step Relay	S0000 ~ S8191	S0000 ~ S8176	÷16	
Link Relay	B0000 ~ B7FFF	B0000 ~ B7FF0	***0	
Special Relay	SB000 ~ SB7FF	SB000 ~ SB7F0	***0	
Timer (contact)	TS00000 ~ TS22527	--------		
Timer (coil)	TC00000 ~ TC22527	--------		
Aggregation Timer (contact)	SS00000 ~ SS22527	--------		L/H
Aggregation Timer (coil)	SC00000 ~ SC22527	--------		
Counter (contact)	CS00000 ~ CS22527	--------		
Counter (coil)	CC00000 ~ CC22527	--------		
Timer (current value)	--------	TN00000 ~ TN22527		
Aggregation Timer (current value)	--------	SN00000 ~ SN22527		
Counter (current value)	--------	CN00000 ~ CN22527		
Data Register	--------	D00000 ~ D25599	Bit15	
Special Register	--------	SD0000 ~ SD2047	BitF	
Link Register	--------	W0000 ~ W63FF	BitF	
Special Link Register	--------	SW000 ~ SW7FF	Bit15	
File Register (nomal)	--------	R00000 ~ R32767	Bit15 *1	
File Register (serial)	--------	0R0000 ~ 0R7FFF 1R0000 ~ 1R7FFF	BitF *1	

** 1 When using the File Register, a Memory Card is necessary. Depending on the Memory Card being used, the File Register's device range differs.*

■ MELSEC-Q Series (A Mode CPU)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	L/H
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M0000 ~ M8191	M0000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	L0000 ~ L8176	÷16	
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Annunciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B1FFF	———		
Timer (Contact)	TS0000 ~ TS2047	———		
Timer (Coil)	TC0000 ~ TC2047	———		
Counter (Contact)	CS0000 ~ CS1023	———		
Counter (Coil)	CC0000 ~ CC1023	———		
Timer (Current Value)	———	TN0000 ~ TN2047		
Counter (Current Value)	———	CN0000 ~ CN1023		
Data Register	———	D0000 ~ D8191	Bit15	
Spcial Register	———	D9000 ~ D9255	Bit15	
Link Register	———	W0000 ~ W1FFF	BitF	
File Register	———	R0000 ~ R8191	Bit15 *1	

** 1 The amount of space available when using the File Register will vary, depending on the amount of CPU ROM/RAM available, or the amount of memory available on the memory card.*

■ MELSEC-Q Series (Q Mode CPU)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal Relay	M00000 ~ M32767	M00000 ~ M32752	÷16	
Special Relay	SM0000 ~ SM2047	SM0000 ~ SM2032	÷16	
Latch Relay	L00000 ~ L32767	L00000 ~ L32752	÷16	
Annunciator	F00000 ~ F32767	F00000 ~ F32752	÷16	
Edge Relay	V00000 ~ V32767	V00000 ~ V32752	÷16	
Step Relay	S0000 ~ S8191	S0000 ~ S8176	÷16	
Link Relay	B0000 ~ B7FFF	B0000 ~ B7FF0	***0	
Special Relay	SB000 ~ SB7FF	SB000 ~ SB7F0	***0	
Timer (contact)	TS00000 ~ TS23087	--------		
Timer (coil)	TC00000 ~ TC23087	--------		
Aggregation Timer (contact)	SS00000 ~ SS23087	--------		L/H
Aggregation Timer (coil)	SC00000 ~ SC23087	--------		
Counter (contact)	CS00000 ~ CS23087	--------		
Counter (coil)	CC00000 ~ CC23087	--------		
Timer (current value)	--------	TN00000 ~ TN23087		
Aggregation Timer (current value)	--------	SN00000 ~ SN23087		
Counter (current value)	--------	CN00000 ~ CN23087		
Data Register	--------	D00000 ~ D25983	Bit15	
Special Register	--------	SD0000 ~ SD2047	Bit15	
Link Register	--------	W0000 ~ W657F	BitF	
Special Link Register	--------	SW000 ~ SW7FF	BitF	
File Register (nomal)	--------	R00000 ~ R32767	Bit15 *1	
File Register (serial)	--------	0R0000 ~ 0R7FFF	BitF *1	
	--------	1R0000 ~ 1R7FFF	BitF *1	
	:	:	:	
	--------	31R0000 ~ 31R67FF	BitF *1	

** 1 The amount of space available when using the File Register will vary, depending on the amount of CPU ROM/RAM available, or the amount of memory available on the memory card.*

Note:

- **The device ranges given here are based on the maximum values possible for parameter settings. Depending on your CPU, usable device types and range may differ. Before using, refer to your CPU user manual.**

5.1.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ MELSEC-A Series (When using Computer Link I/F)

GP Setup		PLC (Data Register) Setup	
Baud Rate	19200 bps	Baud Rate	19200
Data Length	7 bit	Data Length	7 bit
Stop Bit	2 bit	Stop Bit	2 bit
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	--------	
Communicaiton Format	4-wire type	Channel setup Mode Setup	RS-422 8 (Format 4 protocol)
--------		Write during RUN	Yes
--------		Sumcheck	Yes
--------		Transmission area terminal resistance	Present
--------		Receiving area terminal resistance	Present
Unit No.	0	Station No.	0

■ MELSEC-FX Series (FX_{2N})

GP Setup		PLC (Data Register) Setup	
Baud Rate	19200 bps	Baud Rate	19200
Data Length	7	Data Length	7
Stop Bit	2	Stop Bit	2
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	--------	
Communicaiton Format	4-wire type	Computer Link	RS485(RS422) I/F
Station No.	0	Station No.	0
--------		Sumcheck	Yes
--------		Protocol	Yes
--------		Mode	Format 4 protocol
--------		Header	No
--------		Terminator	No

Note:

- **PLC's Station NO. data must be written in data register D8121 and other settings must be written in data register D8120. For details refer to Mitsubishi's "FX Communication Users Manual".**

■ MELSEC-QnA Series

GP Setup		PLC (Data Register) Setup	
Baud Rate	19200 bps *1	Baud Rate	19200
Data Length	7 bit	Data Length	7 bit
Stop Bit	2 bit	Stop Bit	2 bit
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---------	
Communicaiton Format	4-wire type	Mode Setup	4 (Format 4 protocol)
---------		Sumcheck	Yes
---------		Transmission area terminal resistance	Present
---------		Receiving area terminal resistance	Present
Unit No.	0	Station No.	0

**1 AJ71QC24N-R4, A1SJ71QC24N, AJ71QC24N can use a baud rate of 115.2kbps.*

Note:

- **CH1 and CH2 of a serial communication unit can communicate at the same time, given any of the following conditions.**
- **Refer to the MELSEC A Series table when using environment with MELSEC QnA and Computer Link I/F AJ71UC24 together.**

Condition 1 : The sticker on the top of the communication unit indicates the version is AB or later.

Condition 2 : The date shown on the side of the communication unit indicates it was produced in September 1996 (9609) or later.

Condition 3 : The communication ROM version is 7179M or later.

■ MELSEC-Q Series (using A Mode CPU Computer Link Unit)

GP Setup		Computer Link Unit Settings	
Baud Rate	19200 bps (fixed)	Baud Rate	19200 bps
Data Length	7 bits (fixed)	Data Length	7 bits
Stop Bit	2 bits (fixed)	Stop Bit	2 bits
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---------	
Communicaiton Format (RS-422)	4-wire type	Mode Setup (RS-422)	8 (Format 4 Protocol Mode)
---------		Write possible in RUN mode	Possible
---------		Sumcheck	Yes
Unit No.	0 (fixed)	Station No.	0

■ **MELSEC-Q Series** (Q Mode CPU Serial Communication Unit)

GP Setup		Serial Communication Unit Settings *1	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Check Parity setting even/odd	Yes Even
Data Flow Control	ER Control	---------	
Communicaiton Format (RS-422)	4-wire type	Mode Setup (RS-422)	4 (Format 4 Protocol Mode)
---------		Sumcheck	Yes
Unit No.	0	Station No.	0

**1 The setting is made by Mitsubishi's GPP function software.*

5.2 OMRON

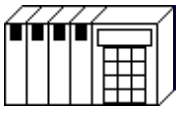
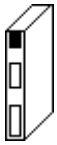
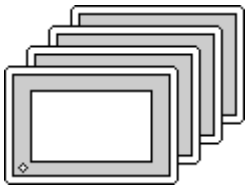
5.2.1 System Structure

The following describes the system structure for connecting the GP to Omron PLCs.

Reference *The* Cable Diagrams *mentioned in the following tables are listed in the section titled "**5.2.2 Cable Diagrams**".*

Important ***If the PLC is used in RUN mode, "PLC COM. ERROR (02: 01)" may appear. The GP subsequently forces the PLC to enter MONITOR mode (data can be written to the PLC only while it is in RUN mode); data communications will not be affected.***

■ **SYSMAC C Series** (using Link I/F)

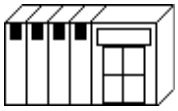
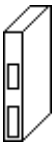
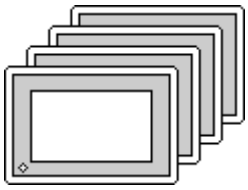
CPU	Link I/F	Cable Diagram	GP
	 Upper Link Unit		
C200H	C200H-LK202 *1 C120-LK202-V1 *2	RS-422 (Cable Diagram 1)	GP Series
C200HS	C200H-LK202 *1		
C500, C500F, C1000H, C2000, C2000H	C120-LK202-V1 *2 C500-LK201-V1 *1		
	C500-LK203 *1	RS-422 (Cable Diagram 2)	
C1000HF	C500-LK203 *1		
C120, C120F	C120-LK202-V1 *2	RS-422 (Cable Diagram 1)	
SRM1-C02 CPM1-20CDR-A CPM2A	CPM1-CIF11	RS-422 (Cable Diagram 5)	

** 1 Base installation type.*

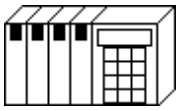
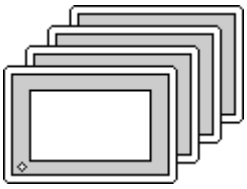
** 2 Connected to the CPU.*

Note: **When you wish to run communications at a high speed, use the upper Link I/F (CPU type) C120-LK202-V1.**

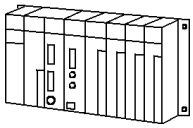
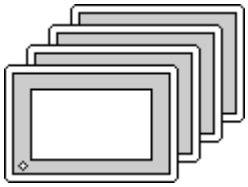
■ SYSMAC-α Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Communication Board 		
C200HX-CPU64, C200HG-CPU43, C200GE-CPU42	C200HW-COM06	RS-422 (Cable Diagram 3)	GP series
C200HX-CPU64-Z	C200H-LK202-V1	RS-422 (Cable Diagram 1)	

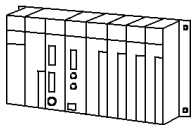
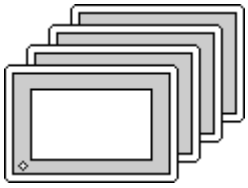
■ SYSMAC CV Series (using Link I/F and CPU Unit Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Communication Board 		
CV500, CV1000, CVM1	CV500-LK201 CPU Unit Link I/F	RS-422 (Cable Diagram 4)	GP series

■ SYSMAC CS1 Series < using Link I/F>

CPU	Link I/F	Cable Diagram	GP
			
CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42 CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	CS1W-SCB41	RS-422 (Port 2) (Cable Diagram 6)	GP Series

■ SYSMAC CJ Series (using Link I/F)

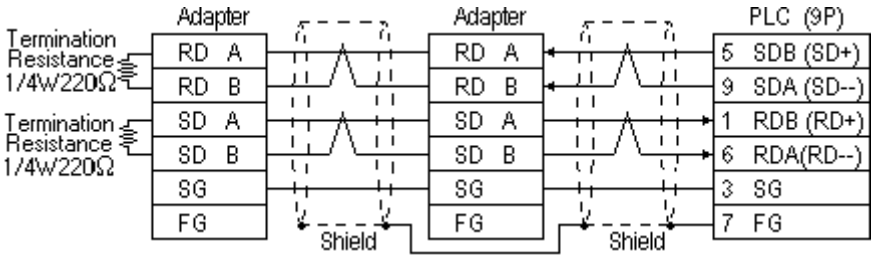
CPU	Link I/F	Cable Diagram	GP
			
CJ1G-CPU44 CJ1G-CPU45	CJ1W-SCU41	RS-422 (Cable Diagram 6)	GP series

5.2.2 Cable Diagrams

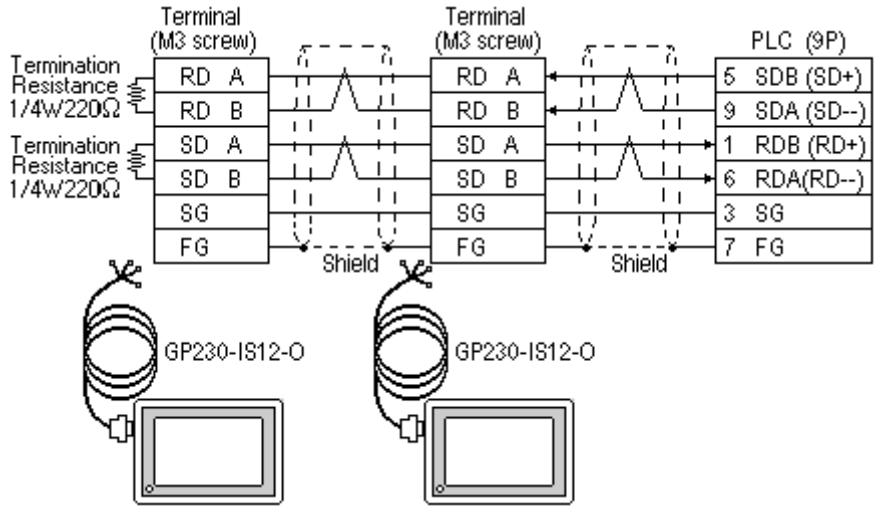
The cable diagrams shown below and the cable diagrams recommended by Omron may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O



Careful!

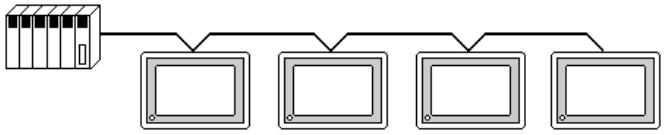
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resistor where the GP and PLC are positioned at either end of the cable. The Termination Resister is automatically setup when the PLC's Termination Resistor switch is turned ON.***

Important

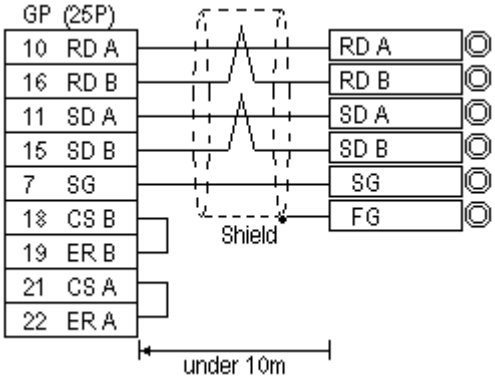
- ***For the RS-422 connection, use a cable length less than 500m.***
- ***As a general rule, connect the PLC at either end of the circuit.***



Note:

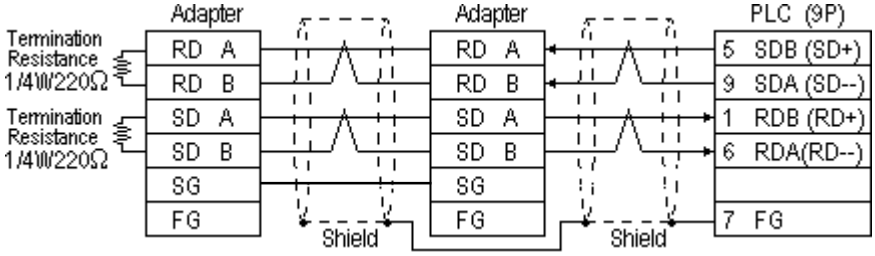
When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2).

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10 meters.

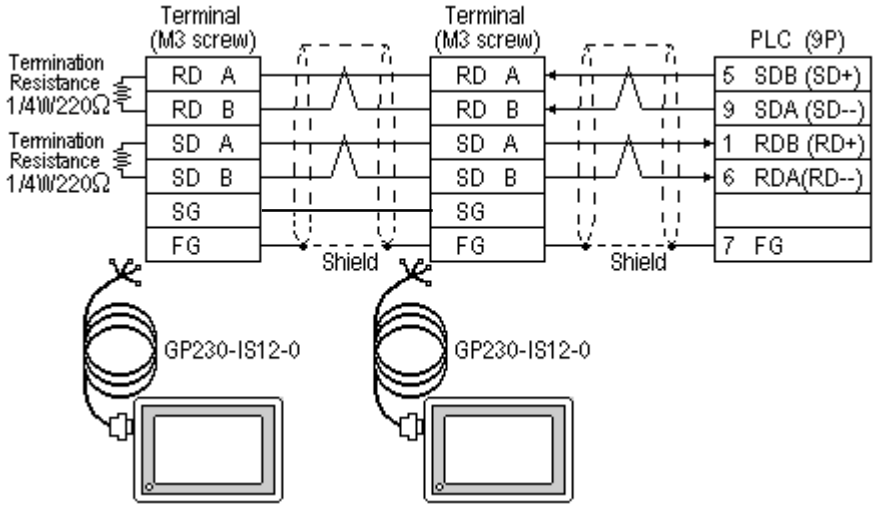


Cable Diagram 2

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O

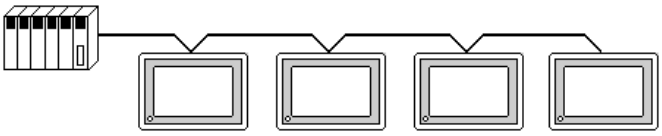


• When using Digital's Multi-link Cable, GP230-IS12-O



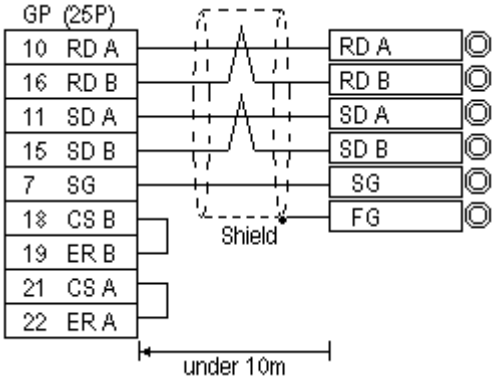
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resister at both ends of the cable. The termination Resister is automatically setup when the PLC's Termination Resister switch is turned ON.***
- ***As a general rule, connect the PLC at either end of the circuit.***



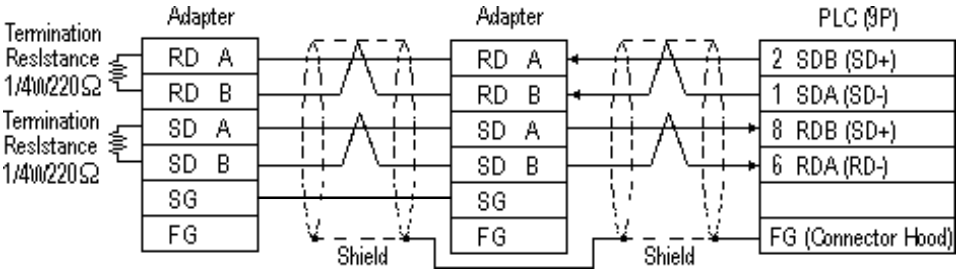
When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2).

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10 meters.

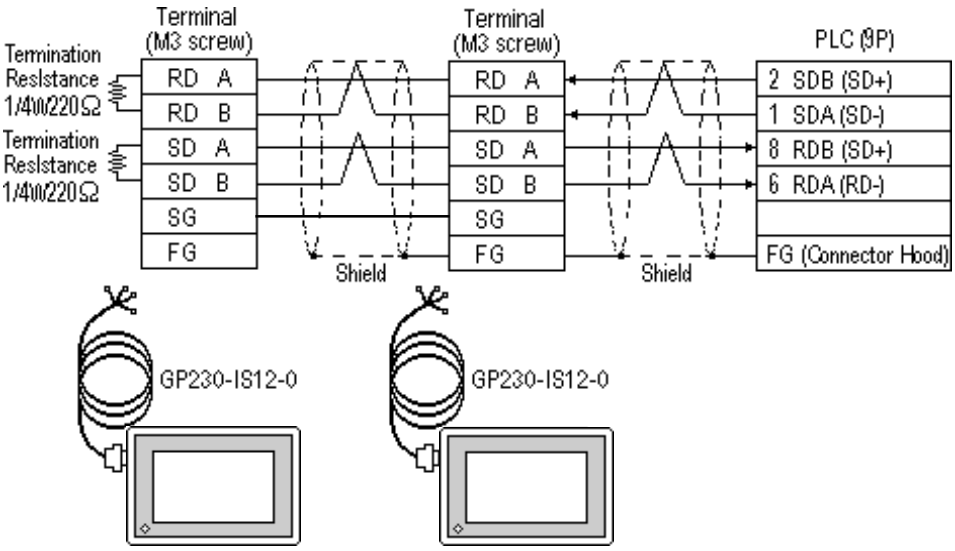


Cable Diagram 3

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O

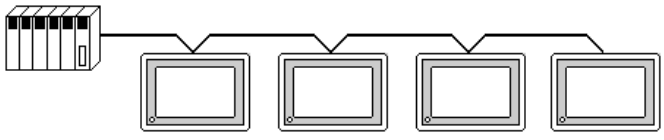


Careful!

Ground your PLC's FG terminal according to your country's applicable standards. For details, refer to the corresponding PLC manual.

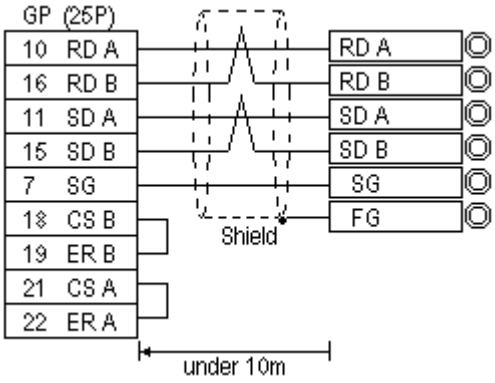
Important

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resistor at both ends of the cable. The Termination Resistor is automatically setup when the PLC's Termination Resistor switch is turned ON.***
- ***As a general rule, connect the PLC at one end of the circuit.***



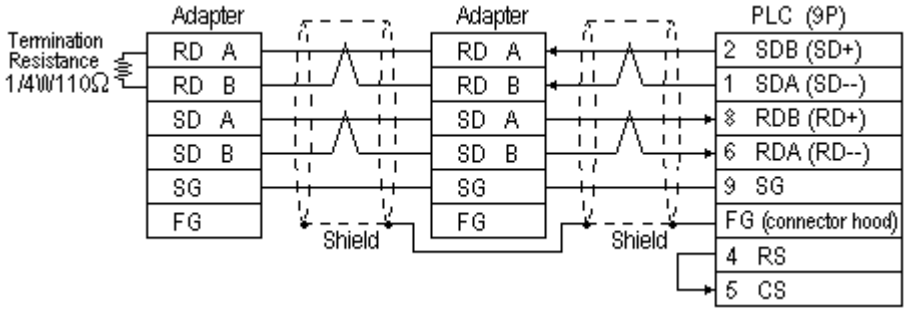
When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2).

The cable connection lines are shown below. The cables between the GP and the terminals should be less than 10 meters.

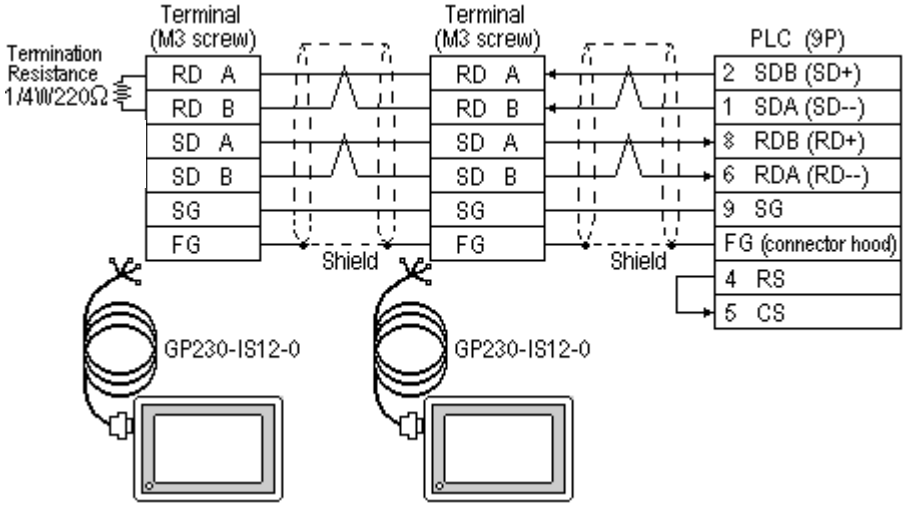


Cable Diagram 4

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O

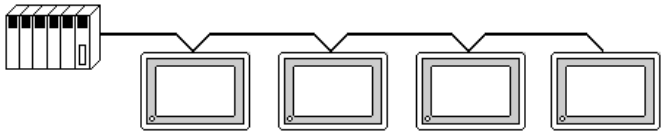


• When using Digital's Multi-link Cable, GP230-IS12-O



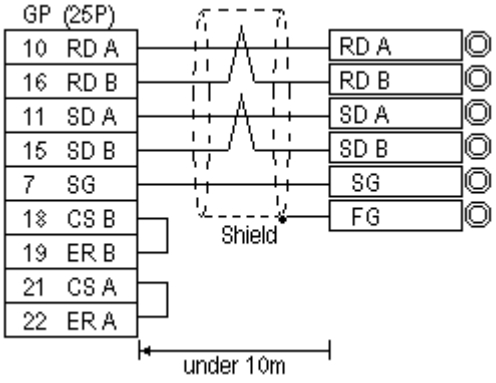
Ground your PLC's FG terminal according to your country's applicable standards. For details, refer to the corresponding PLC manual.

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***Setup the PLC's RS-232C/422 toggle switch as RS-422.***
- ***An Omron connector (XM2A-0901) and connector hood(XM2S-0911) is included with each CV500/CV1000 CPU unit. Other connectors are not compatible.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resistor at both ends of the cable. The Termination Resistor is automatically setup when the PLC's Termination Resistor switch is turned ON.***
- ***As a general rule, connect the PLC at one end of the circuit.***



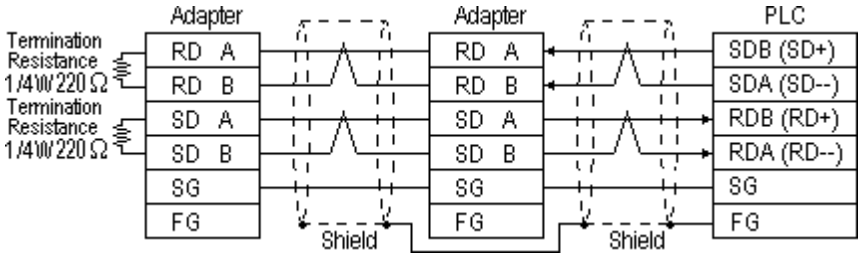
When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2).

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10 meters.

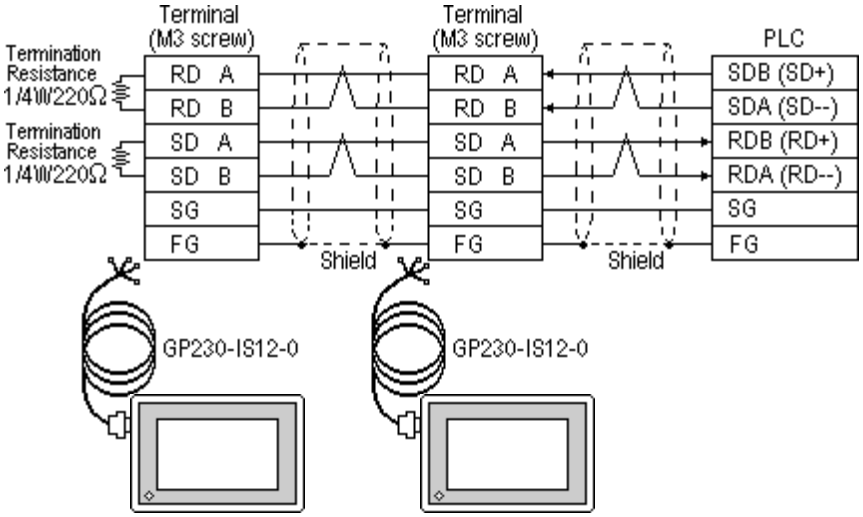


Cable Diagram 5

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O



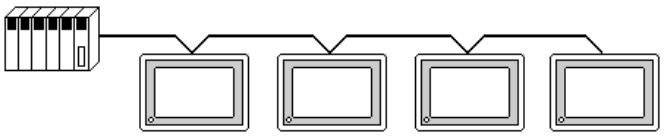
Careful!

Ground your PLC's FG terminal according to your country's applicable standards. For details, refer to the corresponding PLC manual.

Important

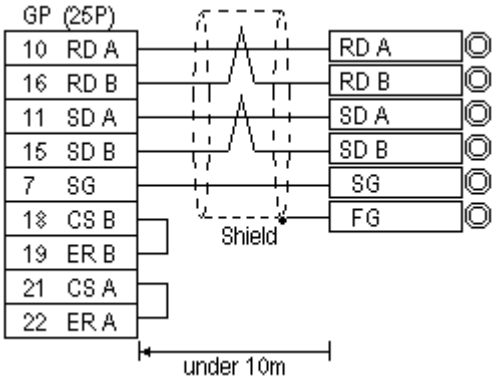
- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resistor at both ends of the cable. The Termination Resistor is automatically setup when the PLC's Termination Resistor switch is turned ON.***

• As a general rule, connect the PLC at one end of the circuit.



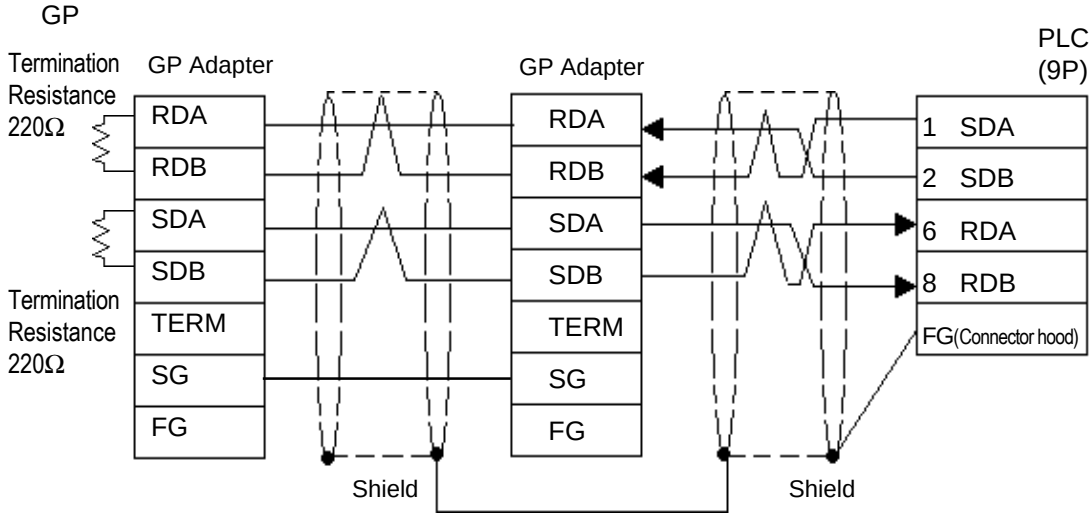
When making your own cable connections, we recommend using Hirakawa Densen's H-9293A (CO-HC-ESV-3P*7/0.2).

The cable connection lines are shown below. The cables between the GP and the terminals should be less than 10 meters.

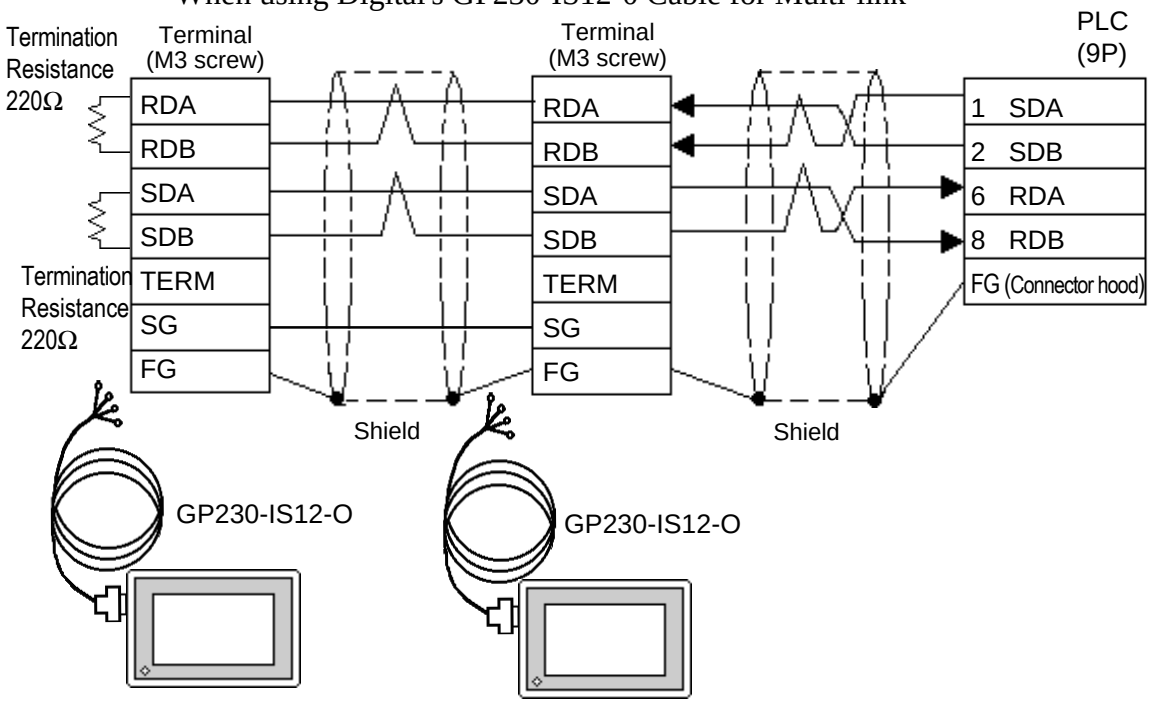


Cable Diagram 6

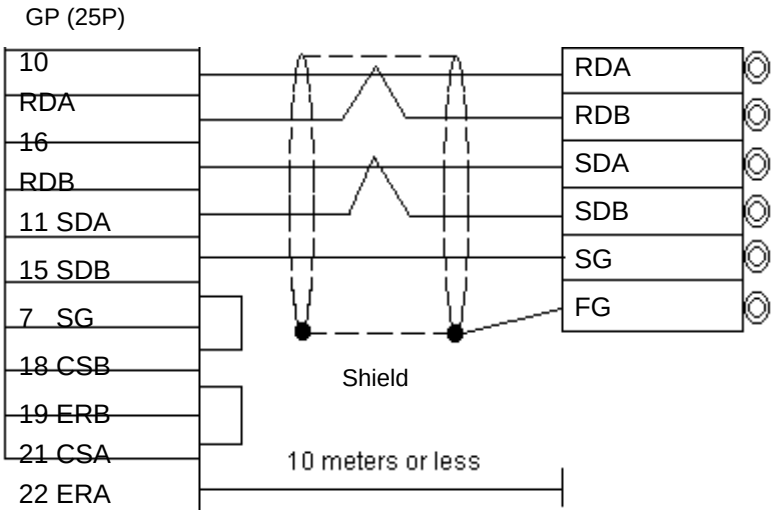
• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



• When using Digital's GP230-IS12-0 Cable for Multi-link



• When making your own cable instead of using GP230-IS12-0



Note:

- **Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.**
- **GP230-IS12-0 cable's FG terminal is not connected to GP's FG terminal.**
- **Be aware the A and B signals of the GP and PLC are opposite to each other.**
- **Place a Termination Resistor where the GP and PLC are positioned at either end of the cable.**
- **The PLC's termination resistance will be automatically set when the board's Termination Resistance Switch is turned ON.**
- **As a general rule, connect the PLC on either end of the circuit.**
- **RS-422 cables must be 500 meters or less.**
- **The Hirakawa Hewtech's CO-HC-ESV-3PX7/0.2 cable is recommended for this connection.**

5.2.3 Supported Devices

The following describes the range of devices supported by the GP.

■ SYSMAC C Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
I/O Relay	00000 ~ 51115	000 ~ 511		L/H
Internal Hold Relay				
Analog Setup Value Storage Area	22000~ 22315	220 ~ 223		
Data Link Relay	LR0000 ~ LR6315	LR00 ~ LR63		
Special Hold Relay	24400 ~ 25515	244 ~ 255	*1	
Auxilary Memory Relay	AR0000 ~ AR2715	AR00 ~ AR27		
Hold Relay	HR0000 ~ HR9915	HR00 ~ HR99		
Timer (contact)	TIM000 ~ TIM511	---		
Counter (contact)	CNT000 ~ CNT511	---		
Timer (current value)	---	TIM000 ~ TIM511		
Counter (current value)	---	CNT000 ~ CNT511		
Data Memory	---	DM0000 ~ DM9999	Bit 15	

** 1 Use the I/O Relay/Internal Hold Relay for setting up this data.*

Note: **The procedure for writing bits for T- and W-tags is different for the GP-*30, the GP-*50, and the GP-70 series units:**

When performing the bit write operation (other than *Reverse*) using T and W tags on the GP-*30 Series, the corresponding word address, other than the selected bits, is cleared.

Important

- **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit write operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

- **When running a GP-*30 Series ladder program, be aware of the above points.**

■ SYSMAC-α Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
I/O Relay I	00000 ~ 02915	000 ~ 029		L/H
I/O Relay II	30000 ~ 30915	300 ~ 309		
Internal Hold Relay I	03000 ~ 23515	030 ~ 235		
Internal Hold Relay II	31000 ~ 51115	310 ~ 511		
Special Hold Relay I	23600 ~ 25507	236 ~ 255		
Special Hold Relay II	25600 ~ 29915	256 ~ 299		
Hold Relay	HR0000 ~ HR9915	HR00 ~ HR99		
Auxilary Memory Relay	AR0000 ~ AR2715	AR00 ~ AR27		
Link Relay	LR0000 ~ LR6315	LR00 ~ LR63		
Timer (contact)	TIM000 ~ TIM511	---		
Counter (contact)	CNT000 ~ CNT511	---		
Timer (current value)	---	TIM000 ~ TIM511		
Counter (current value)	---	CNT000 ~ CNT511		
Data Memory	---	DM0000 ~ DM6655	Bit 15	

Note:

The procedure for writing bits for T- and W-tags is different for the GP series.

When performing the bit write operation (other than *Reverse*) using T and W tags on the GP-*30 Series, the corresponding word address, other than the selected bits, is cleared.

Important

- **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit write operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

- **When running a GP-*30 Series ladder program, be aware of the above points.**

■ SYSMAC CV Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
I/O Relay	00000 ~ 19915	000 ~ 199		L/H
Internal Hold Relay				
Sysmac BUS/2 Remote I/O Relay	020000 ~ 099915	0200 ~ 0999		
Data Link Relay	100000 ~ 119915	1000 ~ 1199		
Special Hold Relay	A00000 ~ A51115	A000 ~ A511		
Hold Relay	120000 ~ 149915	1200 ~ 1499		
Internal Aux. Relay	190000 ~ 229915	1900 ~ 2299		
SYSBUS Remote I/O Relay	230000 ~ 255515	2300 ~ 2555		
Timer (contact)	T0000 ~ T1023	---		
Counter (contact)	C0000 ~ C1023	---		
Timer (current value)	---	T0000 ~ T1023		
Counter (current value)	---	C0000 ~ C1023		
Data Memory	---	D0000 ~ D9999	Bit 15	

STOP

- **Write operations cannot be performed on the Timer and Counter bit devices.**
- **Cannot use the Data Memory extended addresses (E).**

Note:

- **The procedure for writing bits for T- and W-tags is different for the GP series.**
- **When performing the bit write operation (other than *Reverse*) using T and W tags on the GP-*30 Series, the corresponding word address, other than the selected bits, is cleared.**

Important

- **The method of writing bits will differ depending on the GP series.**

<GP-*30 series>

When the bit write operation (other than *Reverse*) is performed, the corresponding word address will set the bits to 0 (except the designated bits).

<Except GP-*30 series>

When the bit write operation is performed, the GP reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

- **When running a GP-*30 Series ladder program, be aware of the above points.**

■ SYSMAC CS1/CJ Series

In this list, "Exp." means "Expansion".

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Channel I/O	000000 ~ 614315	0000 ~ 6143		
Internal Auxiliary Relay	W00000 ~ W51115	W000 ~ W511		
Hold Relay	H00000 ~ H51115	H000 ~ H511		
Special Auxiliary Relay	A00000 ~ A95915	A000 ~ A959	*1	
Timer(Contact)	T0000 ~ T4095	----	*3	
Counter(Contact)	C0000 ~ C4095	----	*3	
Timer(Current)	----	T0000 ~ T4095		
Counter(Current)	----	C0000 ~ C4095		L/H
Data Memory	D0000000 ~ D3276715	D00000 ~ D32767	*2	
Exp. Data Memory (E0 ~ EC)	E00000000 ~ EC3276715	E000000 ~ EC32767	*4	
Exp. Data Memory (Current Bank)	----	EM00000 ~ EM32767	Bit 15	
Task Flag	----	TK0 ~ TK30	÷ 2 Bit 15 *3	
Index Register	----	IR0 ~ IR15	Bit 31 *3	
Data Register	----	DR0 ~ DR15	Bit 15 *3	

**1 Addresses A000 to A477 cannot be written to.*

**2 When using the Communication Unit (CS1W-SCU21/CJ1W-SCU41), addresses D30000 to D31599, since they are used for PLC system settings, should not be written to from the GP.*

When using the Communication Board (CS1W-SCB21/41), addresses D32000 to D32767 are used for PLC settings, should not be written to from the GP.

**3 Cannot be written to.*

**4 The range of Expansion Data Memory varies depending on the CPU type.*

Reference *For details about each device, refer to Omron's SYSMAC CS1 /CJ Series Communication Board CS1W-SCB21-/41 Communication CS1W-SCU21/ CJ1W-SCU41 and CJ1W-SCU41 Users Manual.*

5.2.4 Environment Setup

The following tables contain Digital's recommended PLC and GP communication settings. The recommended settings are for an RS-232C connection.

■ SYSMAC C Series

GP Setup		Upper Link Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Communication Format	RS-422
---		Command Level	Level 1,2,3 is valid
---		Relation	1:N
---		DC +5V power supply	No
---		CTS Setup	Normally On
Unit. No.	0	Station Number	0

■ SYSMAC-α Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Change dip SW 1 to indicate either RS-422 or 485 cable (2-wire or 4-wire type)	4
Unit. No.	0	Station Number	0

■ SYSMAC CV Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Communication Format	RS-422
Unit. No.	0	Station Number	0

■ SYSMAC CS1/CJ Series

GP Setup		PLC Setup	
Baud Rate	19200	Baud Rate	19200
Data Length	7	Data Length	7
Stop Bit	2	Stop Bit	2
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	-	-
Communication Format (using RS422)	4-wire type	WIRE (2-wire/4-wire type Switch)	4-wire type
-	-	TERM (Termination Resistance Switch)	Termiantion Resistance ON
Unit.No	0	Upper Link Station No.	0
-	-	Serial Communicaion mode	Upper Link
-	-	Communication Delay Time	0
-	-	CTS Control	None

5.3 Hitachi

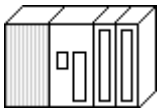
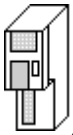
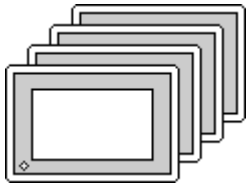
5.3.1 System Structure

The following describes the system structure for connecting the GP to Hitachi PLCs.

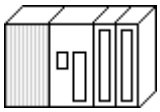
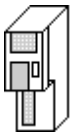
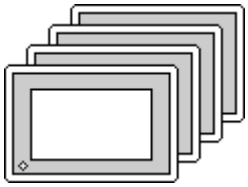
Reference *The* Cable Diagrams *mentioned in the following tables are listed in the section titled "**5.3.2 Cable Diagrams**".*

Note: **"HIDIC H Series" is made by Hitachi Industrial Equipment System Co., Ltd.**

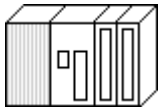
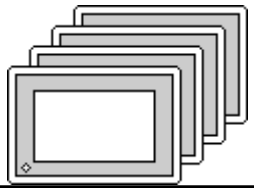
■ **HIDIC H Series** (using Link I/F)
Procedure 1 for transmission control

CPU	Link I/F	Cable Diagram	GP
	 COMM Module		
H-2000 (CPU-20Ha), H-2002 (CPU2-20H)	COMM-H COMM-2H	(Cable Diagram 1)	GP Series
H-302 (CPU2-03H) H-702 (CPU2-07H) H-4010 (CPU3-40H)	COMM-2H		

■ **HIDIC H Series/COMM-2H** (using Link I/F)
Procedure 2 for transmission control

CPU	Link I/F	Cable Diagram	GP
	 COMM Module		
H-302 (CPU2-03H) H-702 (CPU2-07H) H-2000 (CPU-20Ha) H-2002 (CPU-20H)	COMM-2H	(Cable Diagram 1)	GP Series

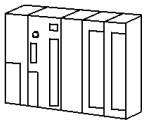
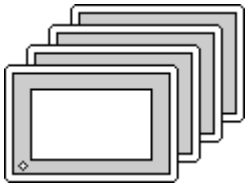
■ **HIDIC H Series** (CPU Direct Connection)
Procedure 1 for transmission control

CPU	Cable Diagram	GP
		
EH-150 (EH-CPU448) *1 *2	(Cable Diagram 2)	GP Series

**1 Connect to the CPU module's Serial Port 1.*

**2 When connecting to a GP, a Hitachi EH-RS05,a conversion cable is required between the modular jack (8-pin) and the Dsub connector (5-pin) are required.*

■ **MICRO-EH** (Port 2 on CPU)
Procedures 1 and 2 for transmission control

CPU	Cable Diagram	GP
		
MICRO-EH (EH-A23□□□, EH-A28□□□, EH-D28□□□)*1	(Cable Diagram 3)	GP Series

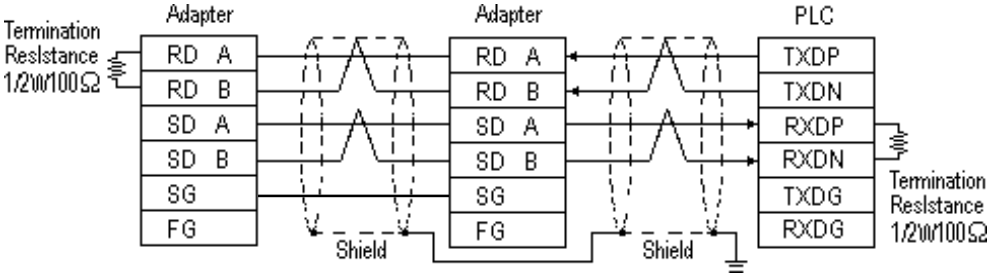
**1 □ varies depending upon the functional specification of the CPU.*

5.3.2 Cable Diagrams

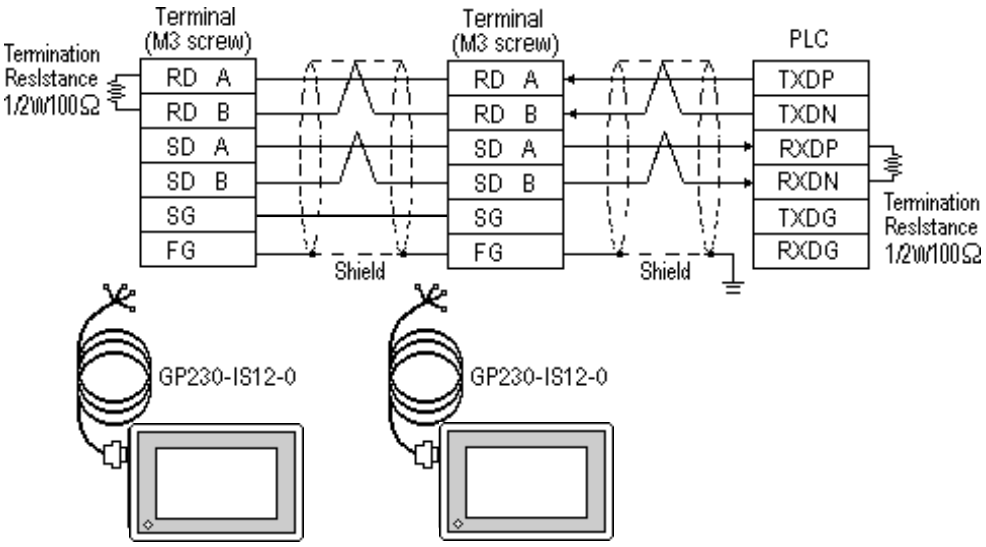
The cable diagrams illustrated below and the cable diagrams recommended by Hitachi Ltd. may differ, however, using these cables for PLC operation will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O

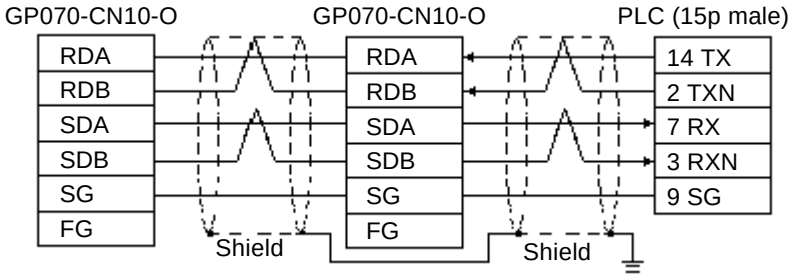


• When using Digital's Multi-link Cable, GP230-IS12-O

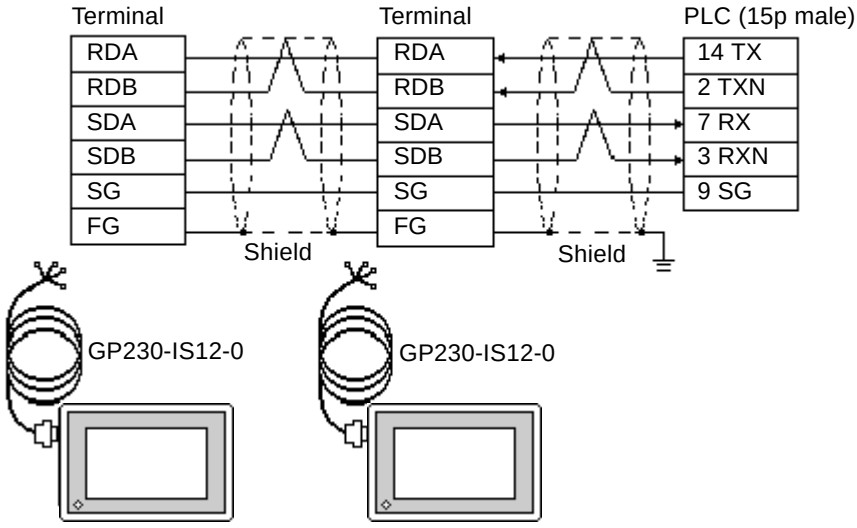


Cable Diagram 2

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O

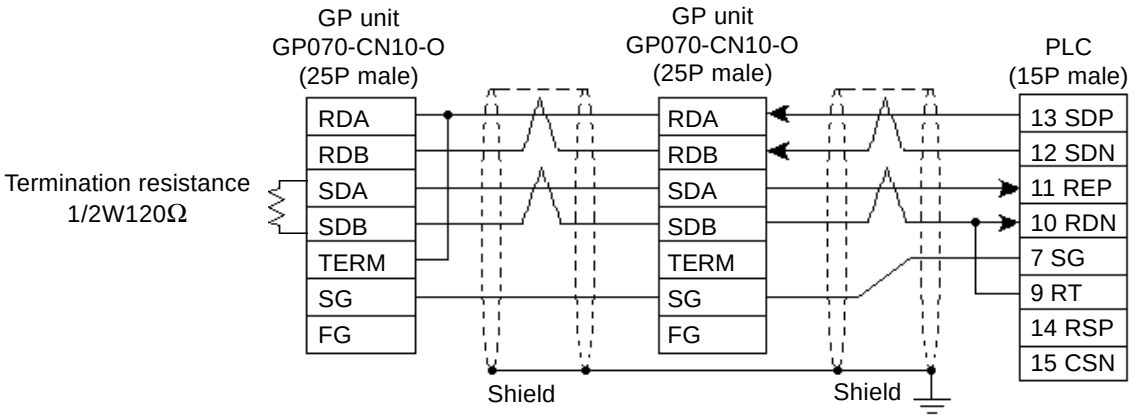


• When using Digital's Multi-link Cable, GP230-IS12-O

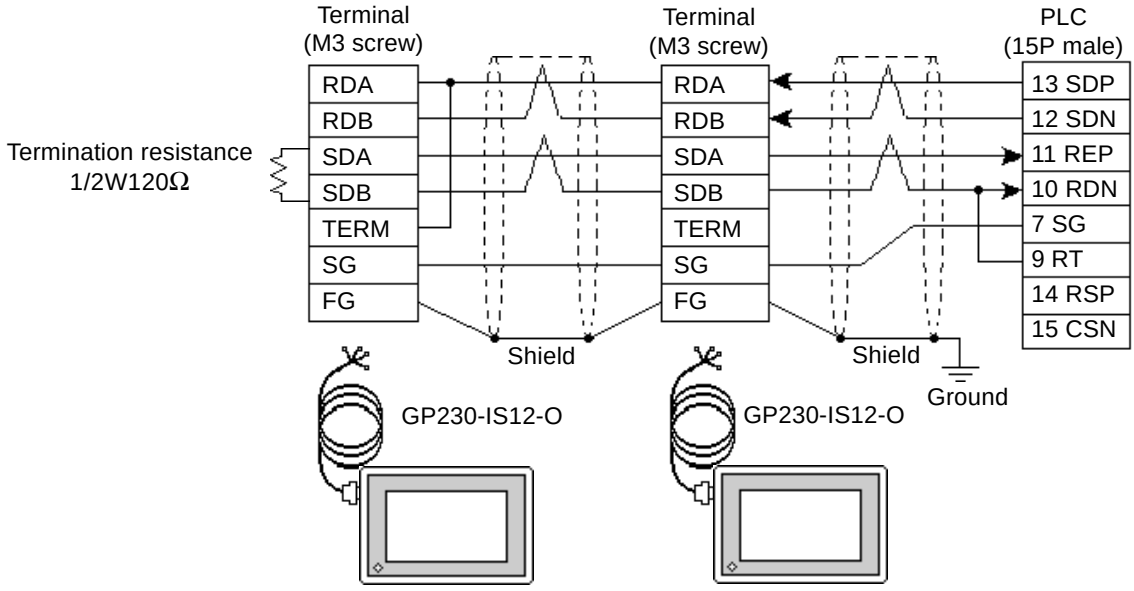


Cable Diagram 3 (RS-422 4-wire type)

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O

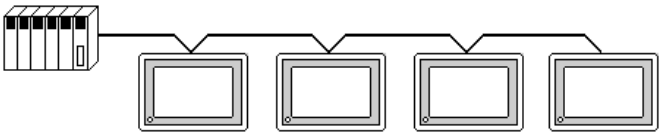


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

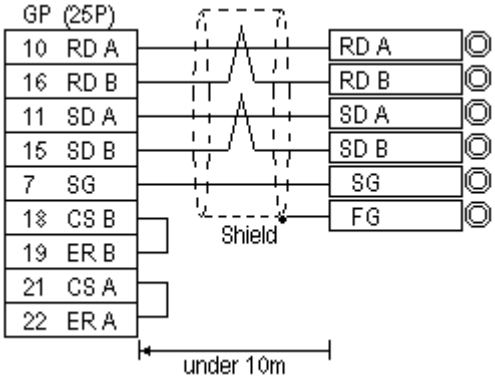
- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Place a Termination Resistor at both ends of the cable.***
- ***When using the COMM module, set its mode No. to "2".***
- ***If an error occurs during data transmission, the program will be "retried" (resent), thereby delaying the occurrence/display of a transmission error until the retrying is finished.***
- ***If the GP and the PLC's program consoles are operated simultaneously, the GP may generate a [Host SIO error (02: 37)] and the GPCL may generate a [CPU Exclusive Use Error]. In this case, the GP will automatically restart. The GPCL should be restarted.***
- ***For the RS-422 connection, use a cable length less than 250m.***
- ***As a general rule, connect the PLC at one end of the circuit.***



Note:

- **When making your own cable connections, we recommend using Hitachi Densen's KPEV-SB-3P 0.5 mm^2.**

  The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.3.3 Supported Devices

The following describes the range of devices supported by the GP.

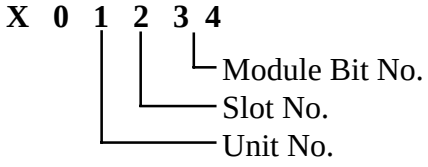
■ HIDIC H (HIZAC H) Series

Setup System Area or Communication Information's Storing Address here.

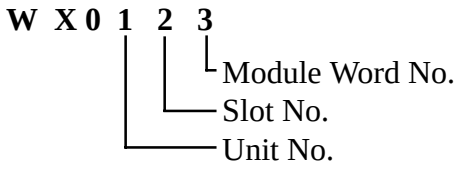
Device	Bit Address	Word Address	Particulars	
External Input	X00000 ~ X05A95	WX0000 ~ WX05A7	*1	L/H
External Output	Y00000 ~ Y05A95	WY0000 ~ WY05A7	*1	
Remote Input Relay	X10000 ~ X49A95	WX1000 ~ WX49A7	*1	
Remote Output Relay	Y10000 ~ Y49A95	WY1000 ~ WY49A7	*1	
Internal Output	R000 ~ R7BF	---		
CPU Link Area 1	L0000 ~ L3FFF	WL000 ~ WL3FF		
CPU Link Area 2	L10000 ~ L13FFF	WL1000 ~ WL13FF		
Data Area	M0000 ~ M3FFF	WM000 ~ WM3FF		
On Delay Timer	TD000 ~ TD1023	---		
Single Shot Timer	SS000 ~ SS1023	---		
Watch Dog Timer	WDT000 ~ WDT1023	---		
Monostable Timer	MS000 ~ MS1023	---		
Accumulation Timer	TMR000 ~ TMR1023	---		
Up Counter	CU000 ~ CU2047	---		
Ring Counter	RCU000 ~ RCU2047	---		
Up/Down Counter	CT000 ~ CT2047	---		
Timer/Counter (Elapsed Time)	---	TC000 ~ TC2047		
Word Internal Output	---	WR0000 ~ WRC3FF		
Network Link Area	---	WN0000~WN7FFF	Bit F	

**1 Write the data as follows.*

E.g. *External Input* unit No. 1, Slot No. 2, Module Bit No. 34



E.g. *External Input* unit No. 1, Slot No. 2, Module Word No. 3.



If the first CPU link (L0000 to L3FFF) and the second CPU link (L10000 to L13FFF) are used with any GP-PRO/PB III for Windows drawing software Ver. 1.0, enter L00000 to L03FFF for the first CPU link; and enter L100000 to L103FFF for the second CPU link by adding a zero to each one.

If you use Ver. 2.0 or later GP-PRO/PB III for Windows screen editor software is used, enter the addresses shown in the previous page's table.

If you upgrade your GP-PRO/PB III for Windows Ver. 1.0 software to Ver. 2.0 or later, your internal data will not be affected. Only the input method will change.

5.3.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ **HIDIC H Series** Procedure 1 for transmission control

GP Setup		COMM Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Channel Setup Mode Setup	RS-422 2
---		Sum Check	Yes
Unit. No.	1	Station Number Setting	1

■ **HIDIC H Series/COMM-2H** Procedure 2 for transmission control

GP Setup		COMM Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Channel Setup Mode Setup	RS-422 9
---		Sum Check	Yes
Unit. No.	1	Station Number Setting	1

■ HIDIC EH150 Series Procedure 1 for transmission control

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate *1	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	—	
Communication Format	4-wire type	Mode Setting Switch	SW1 : OFF (Normal mode)
			SW5 : ON (Exclusive mode)
			SW7 : OFF (Normal Operation mode)
			SW8 : OFF (Normal Operation mode)
—		Exclusive Port Setting	Special Internal Output set to WRF037 *3
Unit No.	0	—	

**1 Set the Mode Setting Switch. (SW3, 4 : Port 1 setting)*

**2 Depending on the your Interface and Procedure, varies as shown below.*
RS-422 Procedure 1 with unit No. : A1xxH (xx indicates GP's Unit No.)
RS-422 Procedure 2 with unit No. : E1xxH (xx indicates GP's Unit No.)

■ MICRO-EH Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits (fixed)	---	---
Stop Bit	1 bit (fixed)	---	---
Parity Bit	Even (fixed)	---	---
Data Flow Control	ER Control	---	---
Communication Format	4-wire type	---	---
Unit No.	0	---	---
---	---	Port 2 Setup	Special Internal Output Set to WRF03D *1

**1 Transmission control procedure 1 (with station number) (192000 bps): A200H*
Transmission control procedure 2 (with station number) (192000 bps): E200H


MEMO

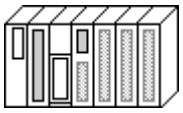
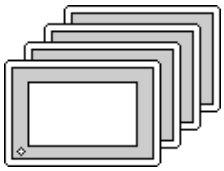
5.4 Matsushita Electric

5.4.1 System Structure

The following describes the system structure for connecting the GP to Matsushita Electric PLCs.

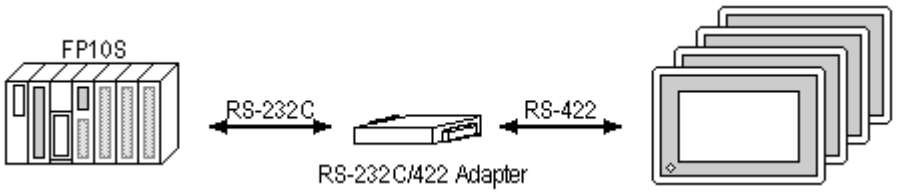
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.4.2 Cable Diagrams**".*

■ MEWNET Series (using CPU unit Link I/F)

CPU	Cable Diagram	GP
		
FP10S (Ver 1.8+) *1 FP10SH	(Cable Diagram 1)	GP Series

** 1 Connect to COM port.*

An RS-232C/422 adapter is necessary (see below) for connections. Use the RS-232C/422 adapter's 422 side as the terminal, and power other than from the communication line, obtained externally.

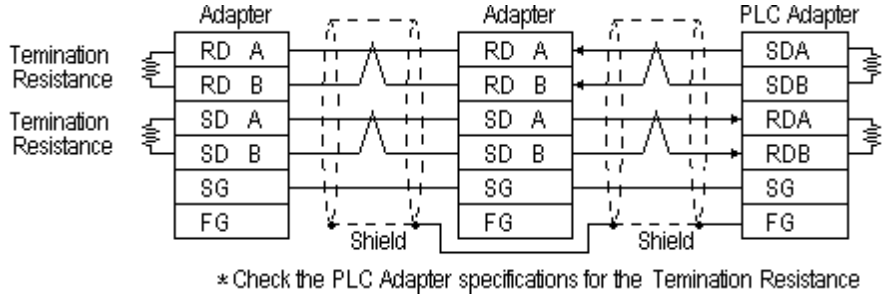


5.4.2 Cable Diagrams

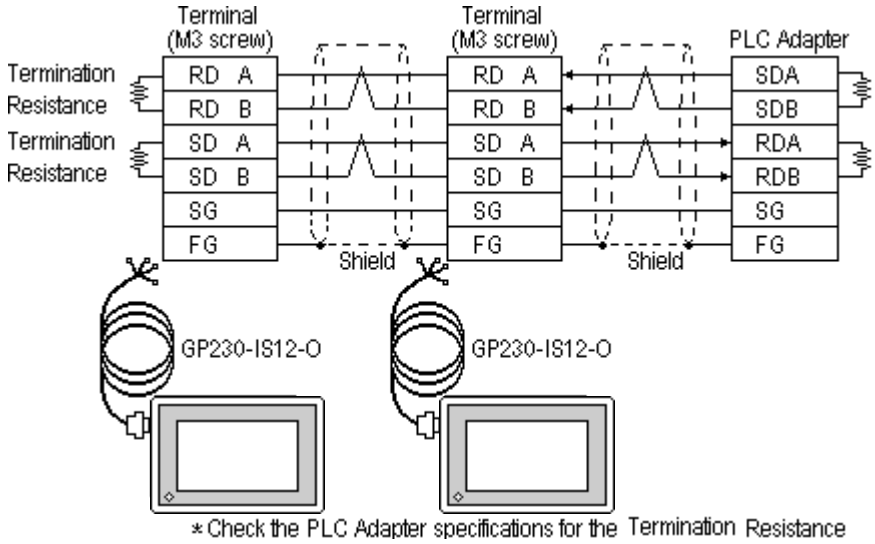
The cable diagrams illustrated below and the cable diagrams recommended by Matsushita Electric may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Digram 1

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O

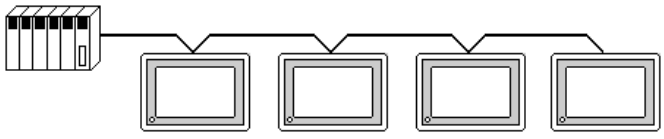


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

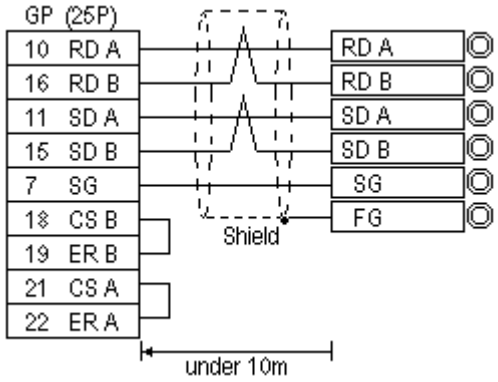
Important

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resistor at bothe ends of the cable.***
- ***As a general rule, connect the PLC on one end of the circuit.***



Note: • **When making your own connections, Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable is recommended.**

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.4.3 Supported Devices

The following describes the range of devices supported by the GP.

■ MEWNET Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X511F	WX000 ~ WX511	*1	L/H
Output Relay	Y0000 ~ Y511F	WY000 ~ WY511		
Internal Relay	R0000 ~ R886F	WR000 ~ WR886		
Link Relay	L000 ~ L639F	WL000 ~ WL639		
Special Relay	R9000 ~ R910F	WR900 ~ WR910	*1	
Timer (contact)	T0000 ~ T3071	---	*1	
Counter (contact)	C0000 ~ C3071	---	*1	
Timer/Counter (elapsed time)	---	EV0000 ~ EV3071	*1	
Timer/Counter (setup value)	---	SV0000 ~ SV3071	*1	
Data Register	---	DT0000 ~ DT10239	Bit 15 *2	
Link Register	---	Ld0000 ~ Ld8447	Bit 15	
File Register	---	FL00000 ~ FL32764	Bit 15	
Special Data Register	---	DT90000~DT90511	Bit 15 *3	

**1 Cannot perform data write.*

**2 Some CPU types use this device's word address DT09000 and higher as the Special Data Register.*

**3 Only the FP10SH, FP10S, FP10 and FP2 can use this device.*

5.4.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ FP10S/FP10SH

GP Setup		COM Port Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Countrol		
Communication Format	4-wire type		
		Environ Task Allowable Time Setup	K5000
Unit No.	1	Unit No.	1

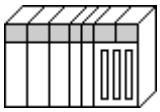
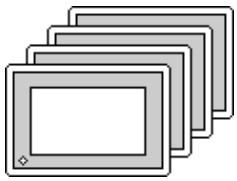
5.5 Yokogawa Electric

5.5.1 System Structure

The following describes the system structure for connecting the GP to Yokogawa Electric PLCs.

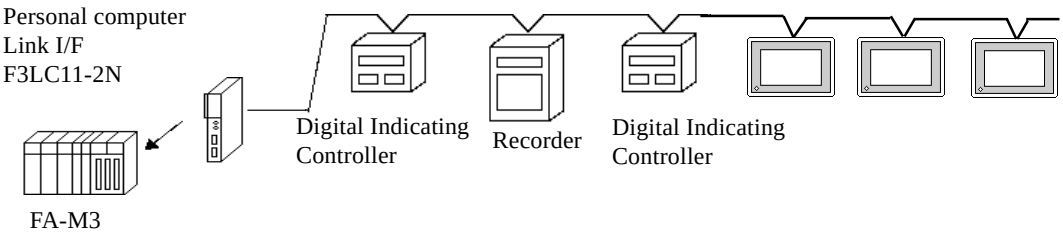
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.5.2 Cable Diagrams**".*

■ FACTORY ACE Series/FA-M3 (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	PC Link Unit 		
F3SP20-0N,F3SP21-0N, F3SP25-2N,F3SP28-3N, F3SP30-0N,F3SP35-5N, F3SP38-6N,F3SP53-4H, F3SP58-6H,F3SP36-3N, F3SP28-3S,F3SP38-6S, F3SP53-4S,F3SP58-6S, F3SP59-7S	F3LC11-2N	With n:1 transmission *1 (Cable Diagram 1) With n:m transmission *1 (Cable Diagram 2)	GP Series

** 1 The diagram below shows the system configuration recommended to allow n:m data transmission, using the host link protocol, between the Yokogawa Electric PLC [FA-M3] (or equipment supporting the same protocol - m units), and the GP (n units).*

4-wire type <connection diagram 3>



Note:

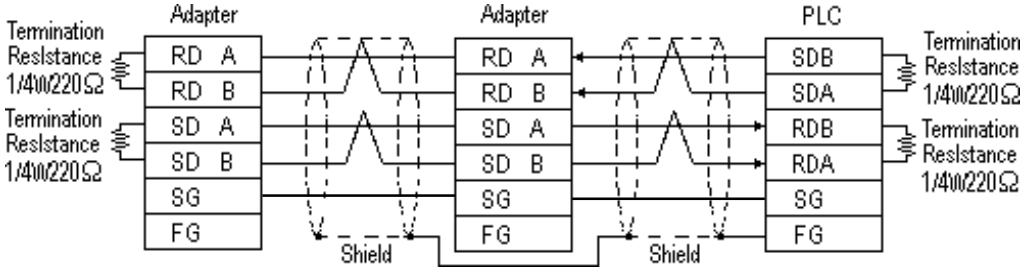
- **Hereafter, equipment (i.e. a digital Indicating <UT37/38/2000> or recorder <mR series>) which supports either the FA-M3 or an identical protocol, will be called PA equipment.**
- **According to this PLC's design specifications, PA equipment can utilize from No. 1 through No.16 device positions, however, Nos. 17 and above cannot be used.**

5.5.2 Cable Diagrams

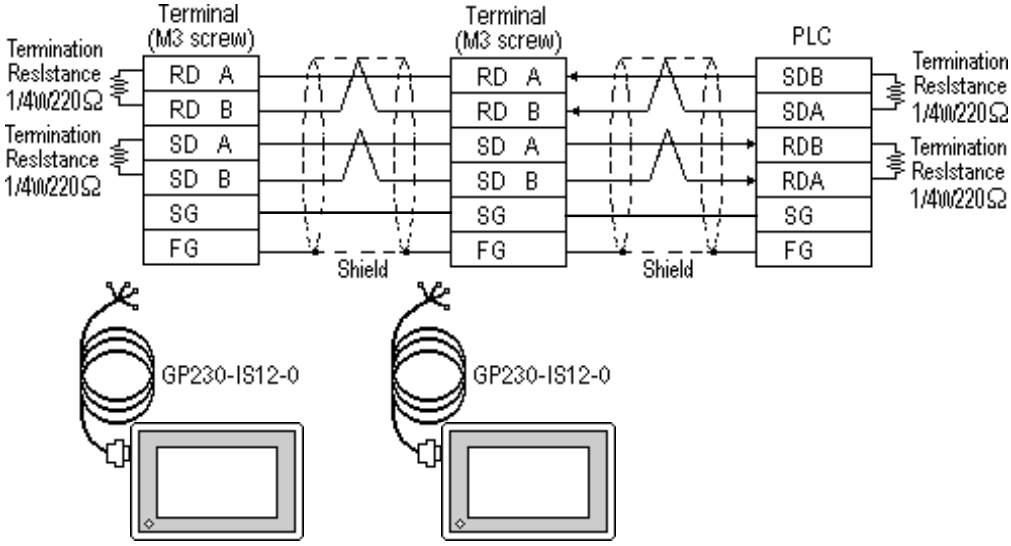
The cable lines illustrated below and the cable lines recommended by Yokogawa Electric may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O

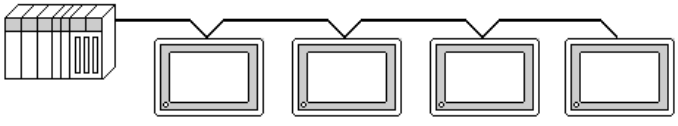


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

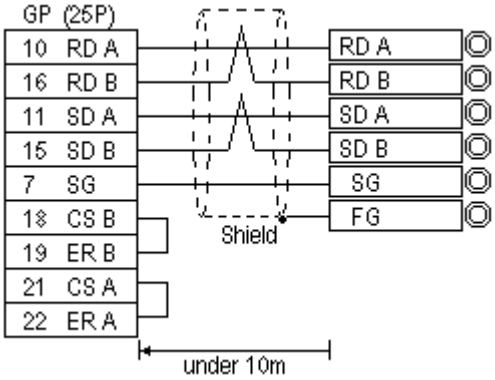
Important

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Connect a Termination Resistor at both ends of the cable.***
- ***As a general rule, connect the PLC on one end of the circuit.***



When making your own cable connections, we recommend using Hitachi Densen's CO-SPEV-SB (A) 3P* 0.5SQ.

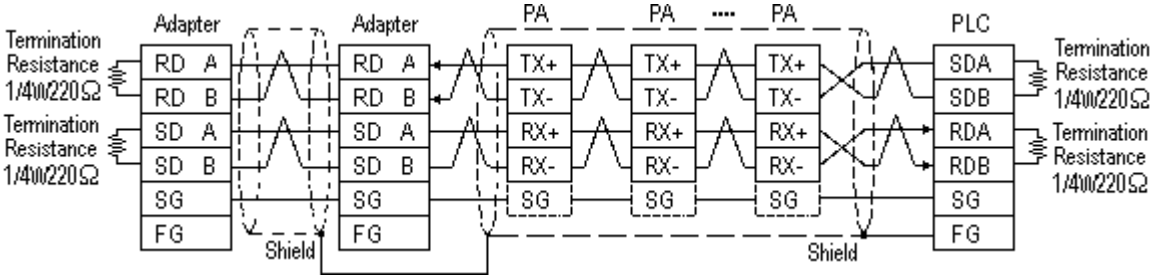
The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



Cable Diagram 2

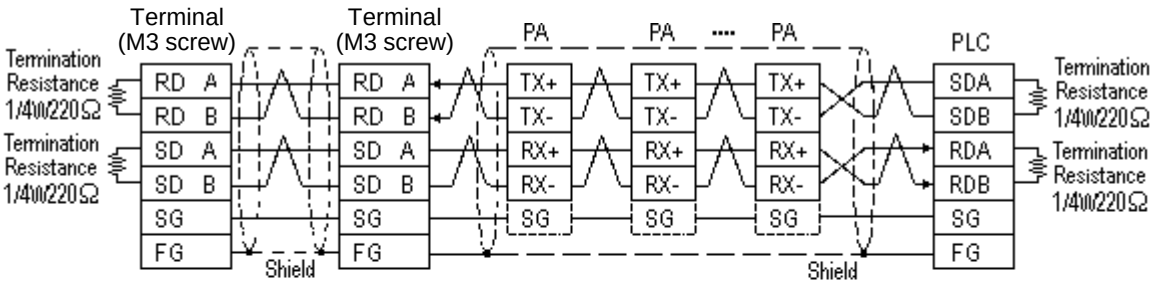
The following diagram is an example of the connection between the GP and PLC, showing both sides/ends of the wiring. Be sure to install terminating resistors as shown, on both side of the equipment.

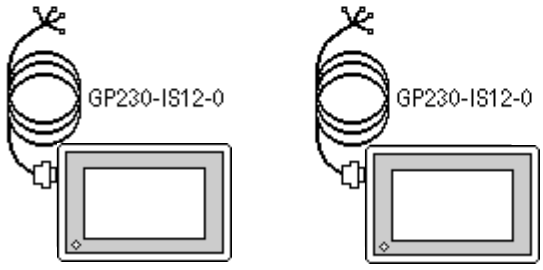
• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



* If a PA unit uses an SG wire, be sure to connect it.
* If the PA unit does not have an SG wire, be sure to connect the GP's SG wire to the PLC's SG wire.

• When using Digital's Multi-link Cable, GP230-IS12-O





* If a PA unit uses an SG wire, be sure to connect it.
* If the PA unit does not have an SG wire, be sure to connect the GP's SG wire to the PLC's SG wire.

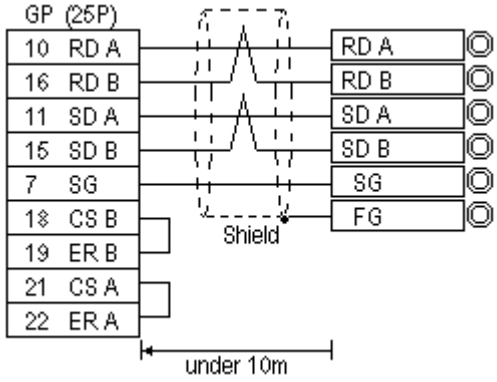
Important

- ***The naming/labeling of the A and B pins on the GP side is the reverse of the PLC side.***
- ***Set up the personal computer Link I/Fs, using station(s) No. 1 to No.32.***
- ***Set up unique numbers for each piece of PA equipment to be connected to the GP. If the same number is used by 2 or more pieces of PA equipment, errors will occur.***
- ***Be sure that the data transmission settings between each GP (n units) and its related PA equipment (m units) are identical.***
- ***Ground your PLC's FG terminal according to your country's applicable standard.***
- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Be aware the A and B signals of the GP and PLC are opposite to each other.***
- ***Place a Termination Resistor at either end of the cable.***
- ***As a general rule, connect the PLC on either end of the circuit.***

Note:

When making your own cable connections, we recommend using Hitachi Densen's CO-SPEV-SB (A) 3P* 0.5SQ.

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.5.3 Supported Devices

The following describes the range of devices supported by the GP.

■ FA-M3 (n:1 communication)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X71661	X00201 ~ X71649	÷16+1 *1*2	L/H
Output Relay	Y00201 ~ Y71664	Y00201 ~ Y71649	÷16+1 *1	
Internal Relay	I00001 ~ I65535	I00001 ~ I65521	÷16+1	
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	÷16+1	
Special Relay	M0001 ~ M9984	M0001 ~ M9969	÷16+1	
Link Relay	L00001 ~ L78192	L00001 ~ L78177	÷16+1	
Timer (contact)	T0001 ~ T3072	---	*2	
Counter (contact)	C0001 ~ C3072	---	*2	
Timer (current value)	---	TP0001 ~ TP3072		
Timer (setup value)	---	TS0001 ~ TS3072	*2	
Counter (current value)	---	CP0001 ~ CP3072		
Counter (setup value)	---	CS0001 ~ CS3072	*2	
Data Register	---	D00001 ~ D65535	Bit 15	
File Register	---	B00001 ~ B65536	Bit 15 *3*4	
		B065537 ~ B131072		
		B131073 ~ B196608		
		B196609 ~ B262144		
Joint Register	---	R0001 ~ R4096	Bit 15	
Special Register	---	Z001 ~ Z1024	Bit 15	
Link Register	---	W00001 ~ W74096	Bit 15 *5	

**1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and*

Output Relay can only be a multiple of 16 +1.

E.g. For X00201

X 002 01

Slot No. — Terminal No.

**2 Cannot perform data write.*

(Continued on next page)

**3 File registers are each 65,535 words on your GP application.*

You cannot extend over more than a single data "block" when performingthe following features.

Be sure to set these features' settings so they are within a single data block.

1) "a-tag " settings

2) Performing Block read/write from Pro-Server

3) Desginating the "Convert from" and "Conver to" address for the "Address Conversion" features

**4 When using a PC Link module, only Link Register up to B99999 can be used.*

**5 A total of up to 4,096 link registers can be used.*

Note:

- **Write the CPU Number (1~4) in front of the device name.**

E.g. For Internal Relay I0001, CPU #3:

3 I0001

CPU No. — Device Name

- **The range of device that can be used will vary depending on the type of PLC.**

For detailed information refer to the Yokogawa's Sequnce CPU manual.

■ FA-M3 (n:m communication)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X71364	X00201 ~ X71349	÷16+] *1*2	
Output Relay	Y00201 ~ Y71364	Y00201 ~ Y71349	÷16+] *1	
Internal Relay	I0001 ~ I16384	I0001 ~ I16369	÷16+]	
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	÷16+]	
Special Relay	M0001 ~ M9984	M0001 ~ M9969	÷16+]	
Link Relay	L00001 ~ L71024	L00001 ~ L71009	÷16+]	
Timer (contact)	T0001 ~ T2047	---	*2	
Counter (contact)	C0001 ~ C2047	---	*2	
Timer (current value)	---	TP0001 ~ TP2047		L/H
Timer (setup value)	---	TS0001 ~ TS2047	*2	
Counter (current value)	---	CP0001 ~ CP2047		
Counter (setup value)	---	CS0001 ~ CS2047	*2	
Data Register	---	D0001 ~ D2047	Bit 15]	
File Register	---	B0001 ~ B2047	Bit 15]	
Joint Register	---	R0001 ~ R2047	Bit 15]	
Special Register	---	Z001 ~ Z1024	Bit 15]	
Link Register	---	W00001 ~ W11023	Bit 15] *3	

(Continued on next page)

**1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and Output Relay can only be a multiple of 16 +1.*

E.g. For X00201

X 002 01

Slot No. — Terminal No.

**2 Cannot perform data write.*

**3 A total of up to 4,096 link registers can be used.*

Note:

• Write the CPU Number (1~4) in front of the device name.

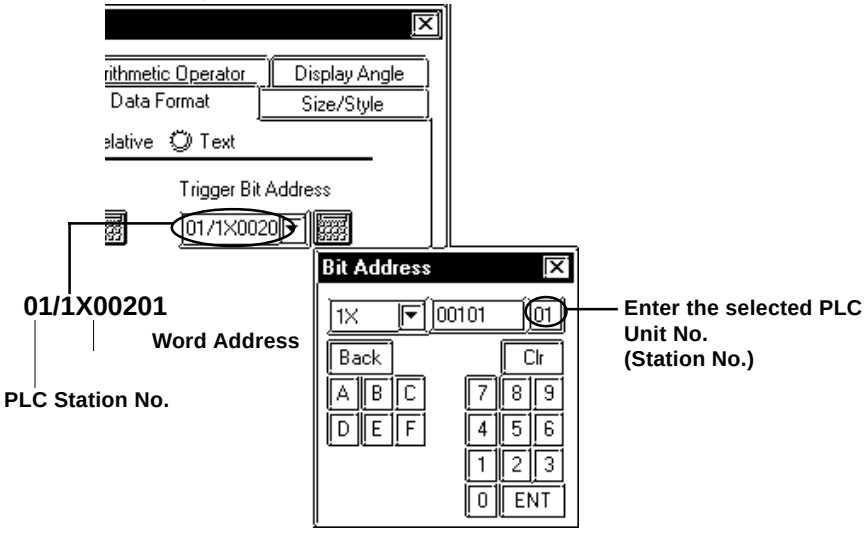
E.g. For Internal Relay I0001, CPU #3:

3 I0001

CPU No. — Device Name

The range of device that can be used will vary depending on the type of PLC. For detailed information refer to the Yokogawa's Sequnce CPU manual.

• When setting tags up in GP-PRO/PBIII for Windows, the PLC Station number can be specified during address Input. If a station number is not designated, it automatically uses the previously entered station number. (The initial default value is 1**.)**



5.5.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ FACTORY ACE Series

GP Setup		Link I/F Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	---	
Communication Format	4-wire type	---	
---		Check Sum	No
---		Specify End Character	Yes
---		Protect Function	No
---		Data Format Setup Switch	8 OFF
Unit No.	1	Station Number	1
Unit. No. (n:m Comm)	Match so all GP, PC Link Unit station no.s are the same.	Station No. (n:m Comm)	Setup so all PA Equip., PC Link Unit no.'s are different.

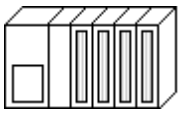
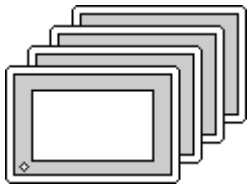
5.6 Toshiba

5.6.1 System Structure

The following describes the system structure for connecting the GP to Toshiba PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.6.2 Cable Diagrams**".*

■ **PROSEC T Series** (using CPU unit Link I/F)

CPU	Cable Diagram	GP
		
T3 (Version 1.8+) *1	(Cable Diagram 1)	GP Series

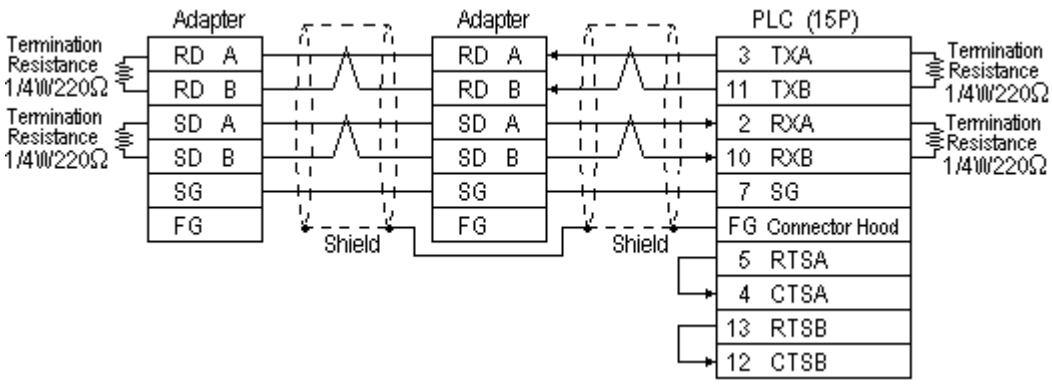
**1 Connect to the CPU Module's computer link port.*

5.6.2 Cable Diagrams

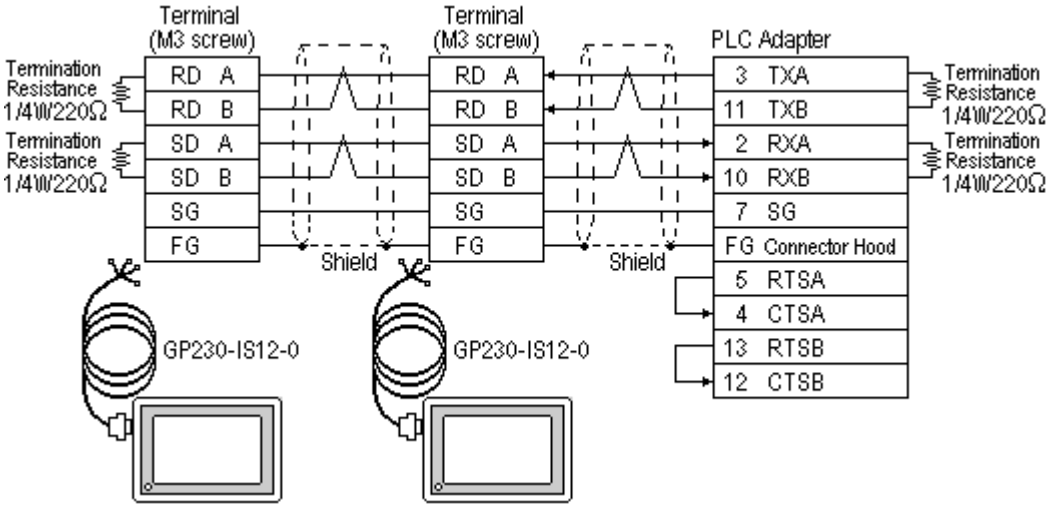
The cable diagrams illustrated below and the cable diagrams recommended by Toshiba may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O

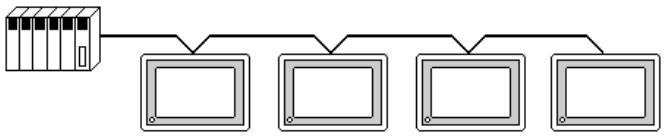


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

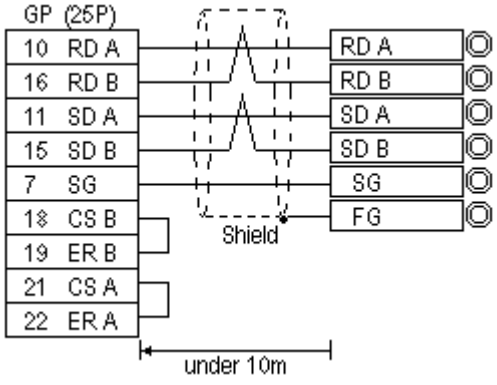
- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Attach a Termination Resistor at both ends of the cable.***
- ***For the RS-422 connection, refer to Toshiba's PLC manual for the cabele length.***
- ***As a general rule, connect the PLC at the end of the circuit.***



Note:

When making your own cable, Hitachi Densen's CO-SPEV-SB-(A) 3P*0.5 cable is recommended as the connection cable.

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.6.3 Supported Devices

The following describes the range of devices supported by the GP.

■ PROSEC T Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
External Input	X00000 ~ X255F	XW0000 ~ XW255		L/H
External Output	Y00000 ~ Y255F	YW0000 ~ YW255		
Internal Relay	R00000 ~ R511F	RW0000 ~ RW511		
Special Relay	S0000 ~ S255F	SW000 ~ SW255		
Link Register Relay	Z0000 ~ Z511F	---		
Link Relay	L0000 ~ L255F	---		
Timer (contact)	T000 ~ T255	---		
Counter (contact)	C000 ~ C255	---		
Timer (current value)	---	T000 ~ T511		
Counter (current value)	---	C000 ~ C511		
Data Register	---	D0000 ~ D8191	Bit 15	
Link Register	---	W0000 ~ W1023	Bit 15	
File Register	---	F0000 ~ F8191	Bit 15	

5.6.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ PROSEC T Series

GP Setup		CPU Module Setup	
Baud Rate	19200 bps *1	Baud Rate	19200 bps *1
Data Length	8 bits	Data Bit	8 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Odd	Parity Bit	Odd
Data Flow Control	ER Control	---	
Communication Format	4-wire type	---	
Unit No.	1	Station Number	1

** 1 According to this PLC's specifications, if the PROSEC T3 is Ver. 1.4 or lower, data transmission is possible only at 9600 bps or less .*


MEMO

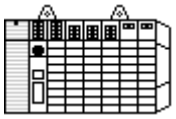
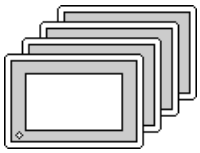
5.7 Rockwell (Allen-Bradley)

5.7.1 System Structure

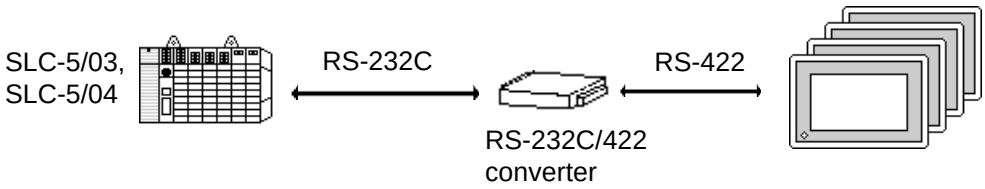
The following describes the system structure for connecting the GP to Rockwell (Allen-Bradley) PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.7.2 Cable Diagrams**".*

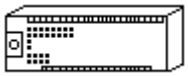
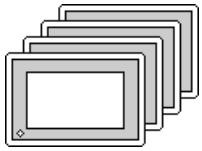
■ SLC 500 Series (using CPU unit Link I/F)

CPU	Cable Diagram	GP
		
SLC-5/03 SLC-5/04	(Cable Diagram 1)*1	GP Series

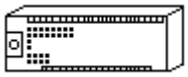
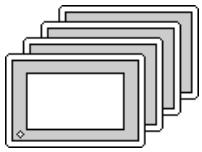
** 1 An RS-232C/422 converter is required. (Refer to the diagram below.) Use an RS-232C/422 converter with the terminal block on the RS-422 side, and which uses a power supply other than that used by the communication line.*



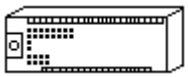
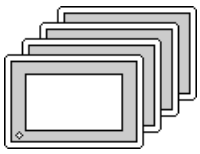
■ MicroLogix 1000 Series (Using Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	Advanced Interface Converter (1761-NET-AIC)	RS-422 <Cable Diagram 1> *1	GP Series

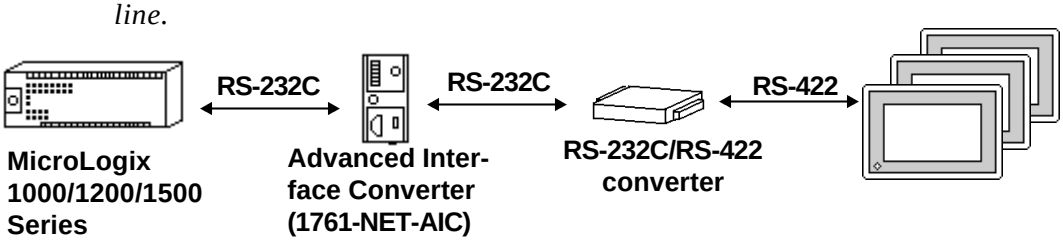
■ MicroLogix 1200 Series (Using Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA 1762-L40BXB	Advanced Interface Converter (1761-NET-AIC)	RS-422 <Cable Diagram 1> *1	GP Series

■ MicroLogix 1500 Series (Using Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1764-LSP	Advanced Interface Converter (1761-NET-AIC)	RS-422 <Cable Diagram 1> *1	GP Series

*1 *An RS-232C/RS-422 converter is required. (Refer to the diagram below.) Use an RS-232C/RS-422 converter with the terminal block on the RS-422 side. Be sure to use a power supply other than that used by the communication line.*

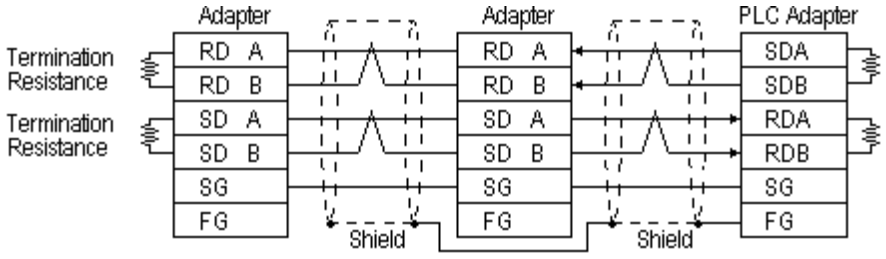


5.7.2 Cable Diagrams

Although some wiring diagrams recommended by Rockwell (Allen-Bradley) may differ from the wiring diagrams illustrated below, please use the diagrams shown in this manual.

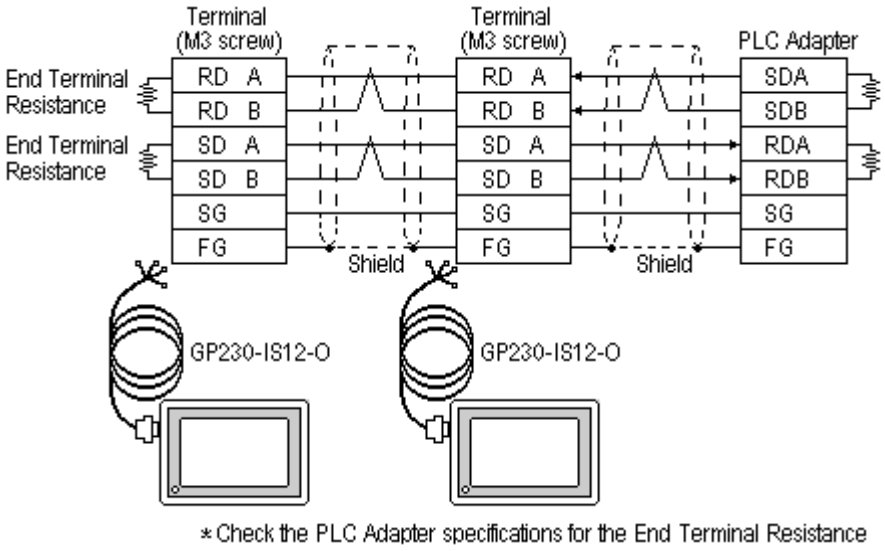
Cable Digram 1

• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



* Check the PLC Adapter specifications for the Termination Resistance

• When using Digital's Multi-link Cable, GP230-IS12-O

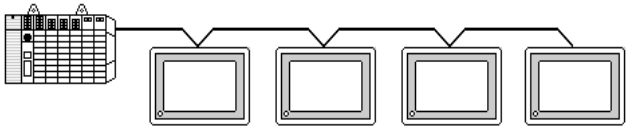


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

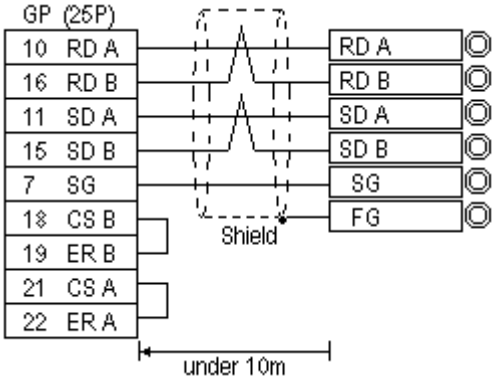
- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Attach a Termination Resistor at both ends of the cable.***
- ***For the RS-422 connection, refer to Rockwell's PLC manual for the cable length.***
- ***As a general rule, connect the PLC to one end of the circuit.***



Note:

When making your own connections, Hitachi Densen's CO-SPEV-SB(A)3P*0.5 cable is recommended.

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.7.3 Supported Devices

The following describes the range of devices supported by the GP.

■ SLC 500/MicroLogix 1000•1200•1500 Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Bit	B3:000/00 ~ B3:255/15	B3:000 ~ B3:255		H/L
	B9:000/00 ~ B255:255/15	B9:000 ~ B255:255		
Timer (TT: Timing Bit)	T4:000/TT ~ T4:255/TT	---		L/H
	T9:000/TT ~ T255:255/TT			
Timer (DN: Completion Bit)	T4:000/DN ~ T4:255/DN	---		
	T9:000/DN ~ T255:255/DN			
Timer (PRE: Setup Value)	---	T4:000.PRE ~ TP4.255.PRE	*1	
		T9:000.PRE ~ T255.255.PRE		
Timer (ACC: Current Value)	---	T4.000.ACC ~ T4:255.ACC	*1	
		T9.000.ACC ~ T255:255.ACC		
Counter (CU: Up Count)	C5:000/CU ~ C5:255/CU	---		
	C9:000/CU ~ C255:255/CU			
Counter (DC: Down Count)	C5:000/CD ~ C5:255/CD	---		
	C9:000/CD ~ C255:255/CD			
Counter (CN: Completion Bit)	C5:000/DN ~ C5:255/DN	---		
	C9:000/DN ~ C255:255/DN			
Counter (PRE: Setup Value)	---	C5:000.CP ~ C5.255.CP	*1	
		C9.000.CP ~ C255:255.CP		
Counter (ACC: Current Value)	---	C5:000.CA ~ C5:255.CA	*1	
		C9.000.CA ~ C255:255.CA		
Integral Number	---	N7:000 ~ N7:255	Bit F	H/L
		N9:000 ~ N255:255		
Floating point	---	F8:000 ~ F255:255		L/H

**1When reading and writing consecutive addresses at least two words long, reading will take longer than for other devices, and the screen refresh will be slower.*

Note:

- **The range of available devices depends on the type of CPU used. For available device range information, refer to your PLC's manual.**
- **In the above tables, the address descriptions and input methods used in GP-PRO/PBIII for Windows V6.0* or earlier software may vary, however the internal data can be converted. Even if GP-PRO/PBIII for Windows V6.0* or later software is used, the internal data will not be damaged.**
- **When using Version 6.0 or earlier address displays and input methods with Versions 6.1 or later software, be sure to use the following steps.**

  1) Locate and open the folder named [SLC500] in your GP/PRO/PBIII for Windows Version 6.1 or later CD-ROM.

  2) Copy the file named [SLC500.TBL] to the folder [PLCTBL] on your PC's hard disk drive. (This folder was created when Version 6.1 was installed.)

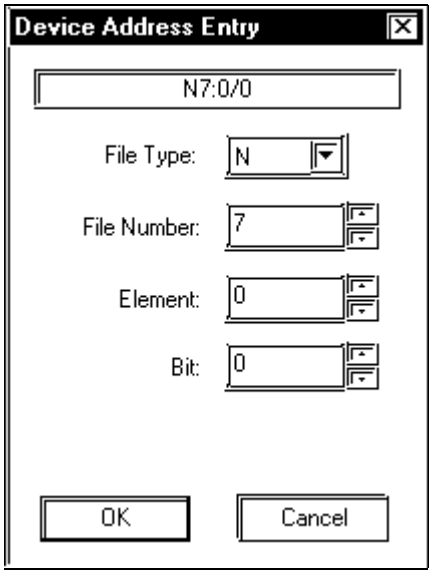
  3) Delete the [SLC500.PTO] from the folder [PTO] was creaated when GP-PRO/PBIII was installed.

  4) Start up GP/PRO/PBIII for Windows. You will now be able to use Version 6.0 or earlier address displays and input methods.
- **File Numbers 0 to 8 are the User's default files.**
- **A PLC COM Error (02:10) will occur when a device cannot be allocated into the PLC data table map.**
- **According to the PLC specifications, the input and output relays cannot perform direct reads and writes. As a result, perform the following procedures via the PLC:**

  When reading data; use a ladder program to move the input and output relay data either as bits or as integers, and then read out those bits or integers.

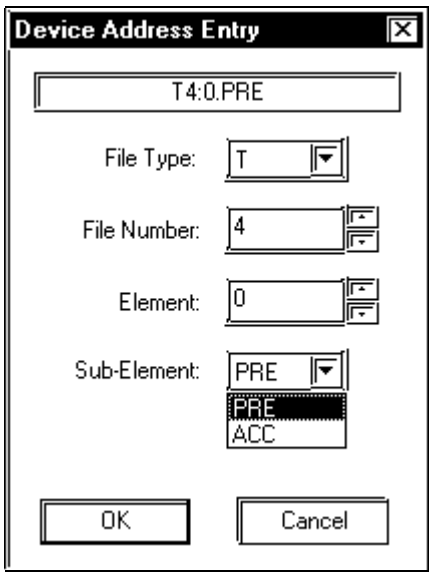
  When writing data; write the data as either bits or integers and then use the ladder program to move the data to the input or output relays.
- **In Rockwell (Allen-Bradley) PLCs, the structure of each device's data is determined from the Element; in GP-PRO/PBIII for Windows there is no Element. Therefore, use the following example when entering device dta.**

• For word devices N, B, and F



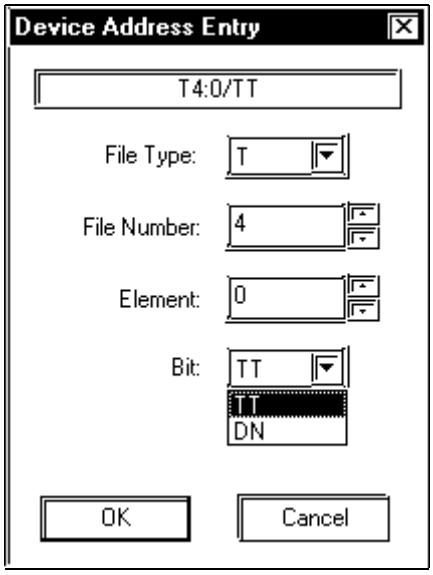
Display after input: N7:0

• For word devices T and C



Display after input: T4:0.PRE

• For bit devices T and C



Display after input: T4:0/TT

5.7.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ SLC 500 Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	Even	Parity Bit	EVEN
Data Flow Control	ER Control	---	
Communication Format	4 wire type	---	
---		Communication Driver	DF1 HALF-DUPLEX SLAVE *1
---		Duplicate Packet Detection	DISABLE *1
---		Error Detection	BCC *1
---		Control Line	No Handshaking *1
Unit No. (DH GP) *2	0	Station Address *2	0

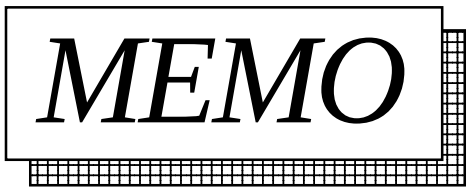
*1 *Will not operate without these settings.*

*2 *Be sure that the Station Address and the GP's Unit No. (DH GP) address are the same value (address set as decimal values). It is unnecessary to setup the DH PLC address.*

■ MicroLogix 1000/1200/1500 Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate	Auto
Data Length	8 bits	---	---
Stop Bit	1 bit	---	---
Parity Bit	Even	---	---
Data Flow Control	ER Control	---	---
Communication Format	RS-232C	---	---
	RS-422 (4-wire type)	---	---
DH Address GP DH Address PLC *1	0	---	---

*1 *Specify the same address for DH Address GP and DH Address PLC.*


MEMO

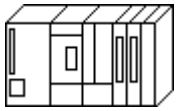
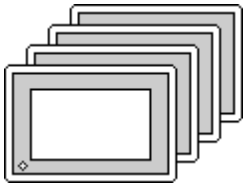
5.8 Keyence

5.8.1 System Structure

The following describes the system structure for connecting the GP to Keyence PLCs.

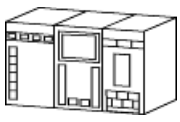
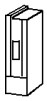
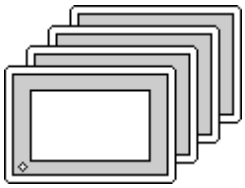
Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.8.2 Cable Diagrams**".*

■ KZ-300/KZ-350 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	PC Link Unit 		
KZ-300 KZ-350	KZ-L2 *1	(Cable Diagram 1)	GP Series

**1 Connect to Port 2.*

■ KV-700 Series

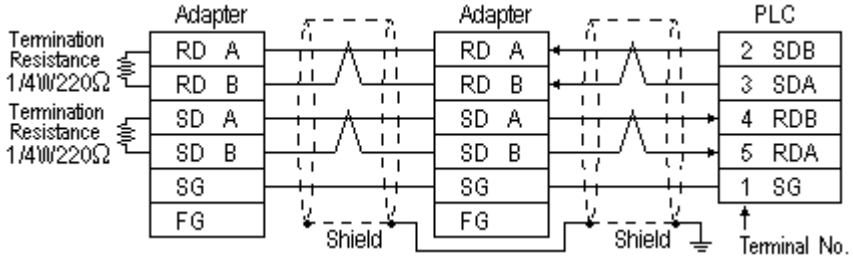
CPU	Link I/F	Cable Diagram	GP
	PC Link Unit 		
KV-700	KV-L20	(Cable Diagram 1)	GP Series

5.8.2 Cable Diagrams

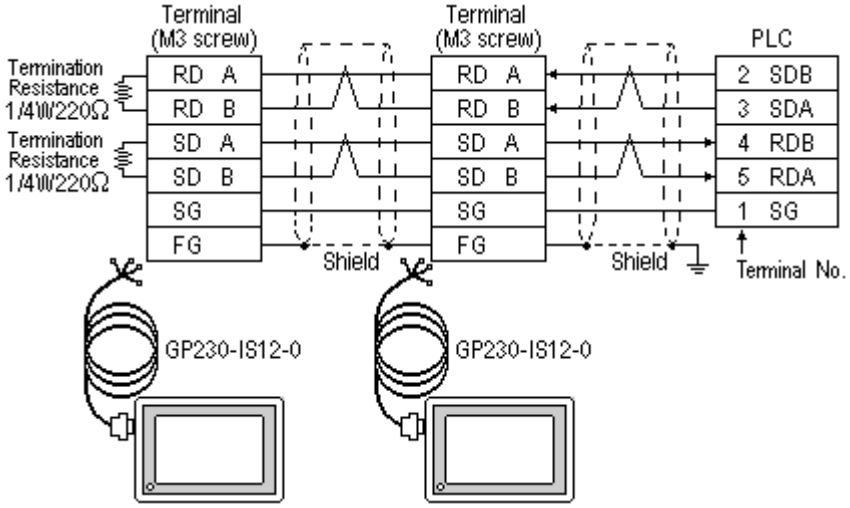
The cable lines illustrated below and the cable lines recommended by Keyence may differ; however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O

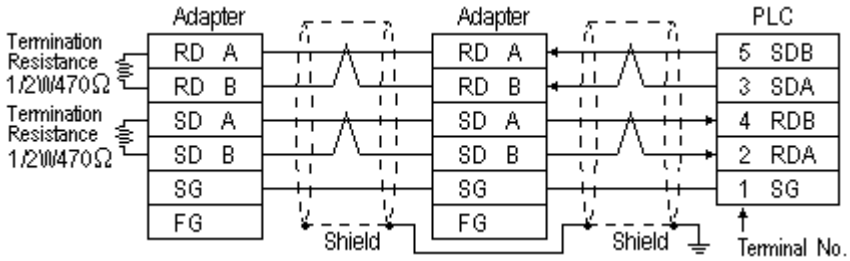


• When using Digital's Multi-link Cable, GP230-IS12-O

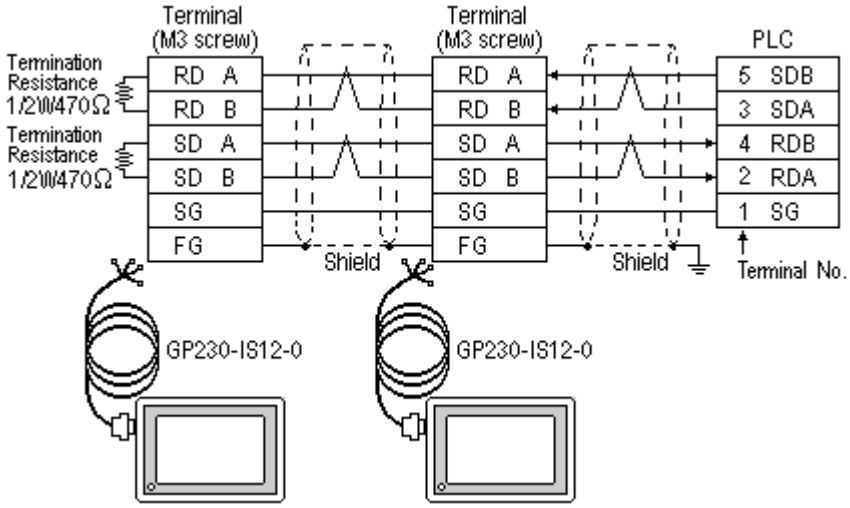


Cable Diagram 2

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O

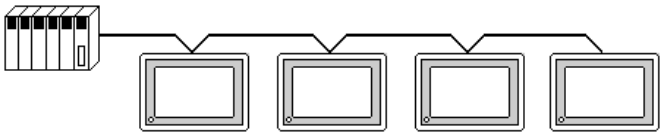


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

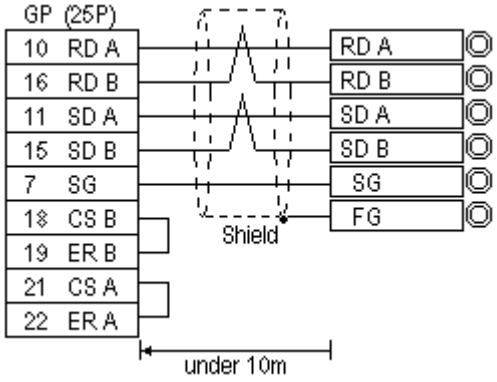
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Note that the naming/labeling of the A and B pins on the GP side is the reverse of the PLC side.***
- ***Attach a Termination Resistor to both ends of the cable.***
- ***For the RS-422 connection, refer to Keyence's PLC manual for the cable length.***
- ***As a general rule, connect the PLC to one end of the circuit.***



Note:

When making your own cable, Hirakawa's H-9293A (CO-HC-ESV-3P*7/0.2) cable is recommended.

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.8.3 Supported Devices

The following describes the range of devices supported by the GP.

■ KZ-300/KZ-350 Series

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input Relay	00000 ~ 0009	00 ~ 00		L/H
	7000 ~ 17415	70 ~ 174	*1	
Output Relay	0500 ~ 0503	05 ~ 05		
	7500 ~ 17915	75 ~ 179	*2	
Auxiliary Relay	0504 ~ 0915	---		
Internal Relay	1000 ~ 6915	10 ~ 69		
Special Relay	2000 ~ 2915	20 ~ 29		
Timer (contact)	T000 ~ T249	---		
Counter (contact)	C000 ~ C249	---		
Timer (current value)		T000 ~ T249		
Counter (current value)		C000 ~ C249		
Data Memory		DM0000 ~ DM9999	Bit 15	
Temp. Data Memory		TM00 ~ TM31	Bit 15	

** 1 Address numbers *000~*400 are available for bit device addresses, and *0~*4 are available for word device addresses.*

Bit Address	Word Address
addr 7000	70
addr 7100-7400	71-74
addr 8000	80
addr 8100-8400	81-84
addr 17000-17400	170-174

** 2 Address numbers *500~*900 are available for bit device addresses and *5~*9 are available for word device addresses.*

Bit Address	Word Address
addr 7500	75
addr 7600-7900	76-79
addr 8500	85
addr 8600-8900	86-89
addr 17500-17900	175-179

■ **KV-700 Series** (using the KZ-300 series protocol)

Device	Bit Address	Word Address	Particulars
Input Relay	000000 ~ 00009	000 ~ 000	*1
Output Relay	00500 ~ 00503	005 ~ 005	
Internal AUX Relay	00504 ~00915	005 ~ 009	
Extended Input/Output Relay Internal AUX Relay	01000 ~ 59915	010 ~ 599	
Control Relay	60000 ~ 63915	600 ~ 639	*2
Timer (contact)	T000 ~ T511	---	*3
Counter (contact)	C000 ~ C511	---	*3
Timer (current value)	---	T000 ~ T511	*3
Counter (current value)	---	C000 ~ C511	*3
Data Memory	---	DM0000 ~ DM9999	Bit 15 *4
Temporary Data Memory	---	TM000 ~ TM511	Bit 15
Control Memory	---	TM0520 ~ TM4519	Bit 15 *5

**1 PLC or GP data writing is not possible.*

**2 GP cannot write data to any address.*

**3 Only available when the timer command and the counter command exist in the ladder program.*

**4 The device range of the PLC is between DM0000 and DM19999, but only the addresses up to DM9999 are accessible to the GP.*

**5 Certain addresses cannot be written to. For data write details, refer to your PLC's manual.*

5.8.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ KZ-300/KZ-350 Series

GP Setup		PC Link Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Port Toggle Switch	RS-422A
---		RUN Mode	Link Mode
Unit No.	0	Station Number	0

■ KV-700 Series (using the KZ-300 series protocol)

GP Setup		PLC Setup	
Baud Rate	19200 bps *1	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	RS, CS Flow Control	No
Communication Format (RS-232C)	RS-232C	Communication Port 2 Selector Switch	232C
Communication Format (RS-422)	4-wire type	Communication Port 2 Selector Switch	422A
---		Operation Mode	Link Mode
Unit No.	0	Station No.	0

**1 The maximum baud rate is 115,200 bps.*


MEMO

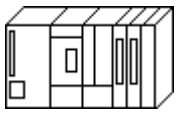
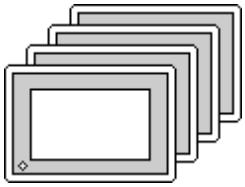
5.9 Yaskawa Electric

5.9.1 System Structure

The following describes the system structure for connecting the GP to Yaskawa Electric PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.9.2 Cable Diagrams**".*

■ **Memocon-sc Series/GL 120, 130** (using Link I/F)

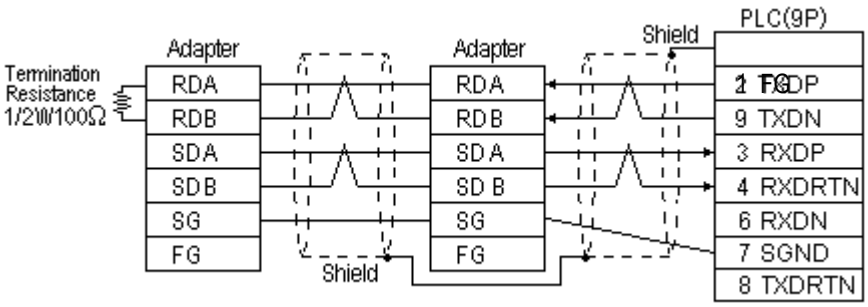
CPU	Link I/F	Cable Diagram	GP
	Link Unit 		
GL120 GL130	JAMSC-120NOM27100	RS-422 (Cable Diagram 1)	GP Series

5.9.2 Cable Diagrams

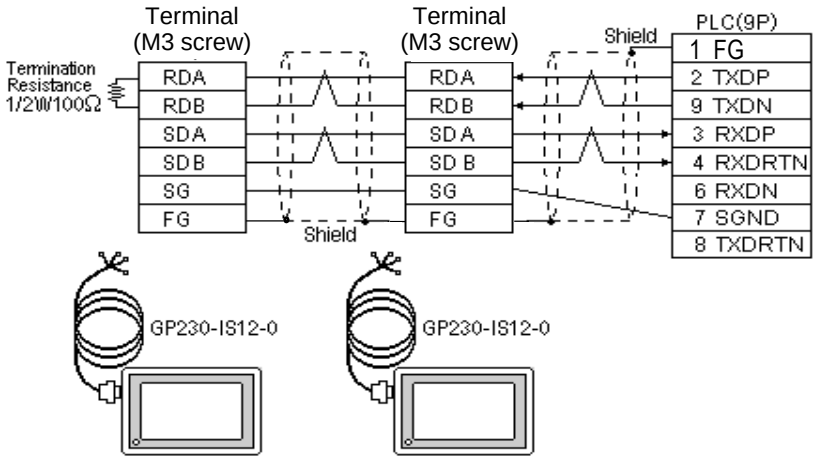
The cable diagrams illustrated below and the cable diagrams recommended by Yaskawa Electric may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O.



• When using Digital's Multi-link Cable, GP230-IS12-O

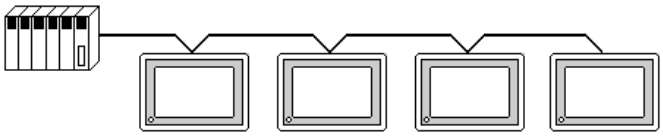


Careful!

Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

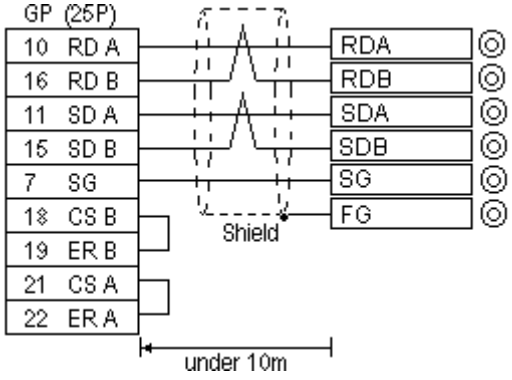
- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Attach a Termination Resistor to both ends of the cable.***
- ***For the RS-422 connection, refer to Yaskawa Electric's PLC manual for the cable length.***
- ***As a general rule, connect the PLC to one end of the circuit.***



Note:

When making your own cable, Hitachi's CO-SPEV-SB (A) 3P*0.5 cable is recommended.

The cable connection lines are as illustrated below. The cables between the GP and the terminals should be less than 10m.



5.9.3 Supported Devices

The following describes the range of devices supported by the GP.

■ Memocon-sc series (GL120 and GL130)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Coil (output/internal)	000001 ~ 008192	---	*1	H/L
Input Relay	100001 ~ 101024	---	*1*2	
Link Coil 1	D10001 ~ D11024	---	*1	
Link Coil 2	D20001 ~ D21024		*1	
MC Relay 1	X10001 ~ X10256	---	*1*2	
MC Relay 2	X20001 ~ X20256	---	*1*2	
MC Coil 1	Y10001 ~ Y10256	---	*1	
MC Coil 2	Y20001 ~ Y20256	---	*1	
MC Code Relay 1	M10001 ~ M10096	---	*1*2	
MC Code Relay 2	M20001 ~ M20096	---	*1*2	
MC Control Relay 1	P10001 ~ P10256	---	*1*2	
MC Control Relay 2	P20001 ~ P20256	---	*1*2	
MC Control Coil 1	Q10001 ~ Q10256	---	*1	
MC Control Coil 2	Q20001 ~ Q20256	---	*1	
Input Register	---	300001 ~ 300512	Bit 15 *2	
Output Register	---	300001 ~ 300512	Bit 15	
Holding Register	---	400001 ~ 409999	Bit 15	
Link Register 1	---	R10001 ~ R11024	Bit 15	
Link Register 2	---	R20001 ~ R21024	Bit 15	
Constant Register	---	700001 ~ 704096	Bit 15	

** 1 1-word (16-bit) data day be specified.*

** 2 Data cannot be written here.*

5.9.4 Environment Setup

The following lists Digital's recommended PLC and GP communication settings.

■ Memocon-sc series (GL 120 and GL 130)

GP Setup		PC Link Unit Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	---	
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit ON/OFF EVEN/ODD	ON Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Communication Format	RS-422
Unit No.	1	Slave address number	1
---		Transmission bit	RTU mode (fixed)

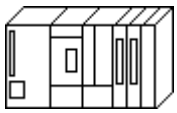
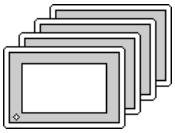
5.10 SHARP

5.10.1 System Structure

The following describes the system structure for connecting the GP to Sharp PLCs.

Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "**5.10.2 Cable Diagrams**".*

■ New Satellite JW

CPU	Link I/F	Cable Diagram	GP
			
JW-33CUH3	Link I/F on CPU unit	RS-422 (4 wires) (Connected to PG/COM 1 port or PG/COM 2 port) (Cable Diagram 1)	GP Series
	JW-21CM	RS-422 (4 wires) (Cable Diagram 2)	

Important ***When using JW-21CM, be aware that some link units have usage restrictions depending on the ROM version.***

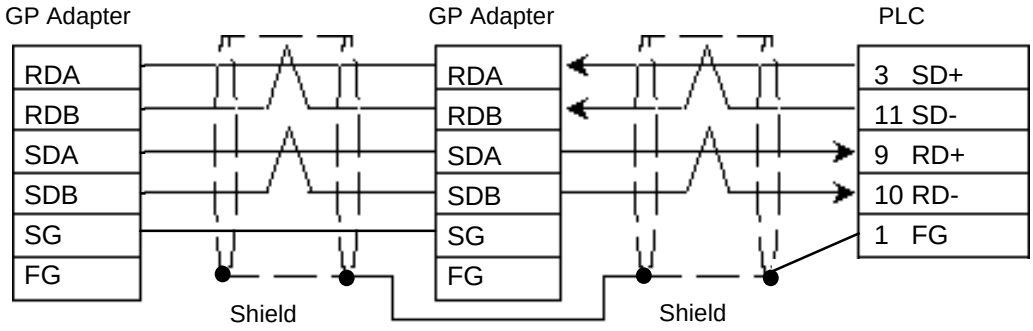
Version Seal	Usage Restrictions
30Hn	Can use without restrictions.
30H	Cannot be read or written from and to File Register from 10 to 2C. Cannot be read or written from and to File Register Address from 100000 to 176777.
No Seal	Cannot use JW30H series.

5.10.2 Cable Diagrams

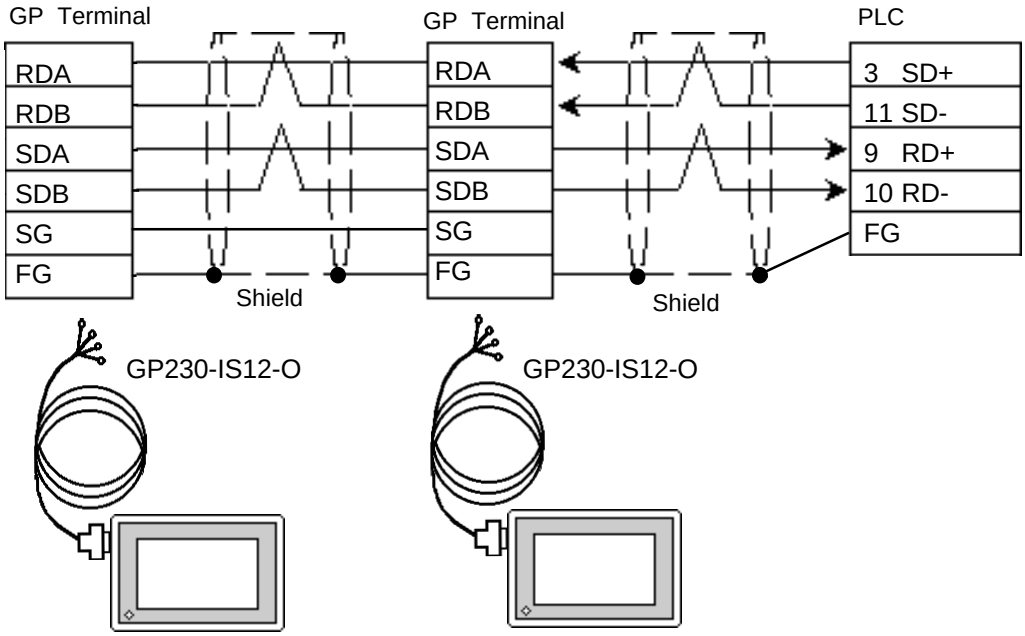
The cable diagrams illustrated below and the cable diagrams recommended by Yaskawa Electric may differ, however, using these cables for your PLC operations will not cause any problems.

Cable Diagram 1

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When using Digital's Multi-link Cable, GP230-IS12-O



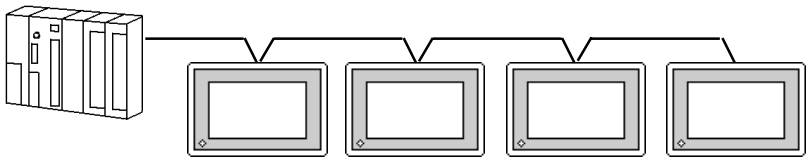
Careful!

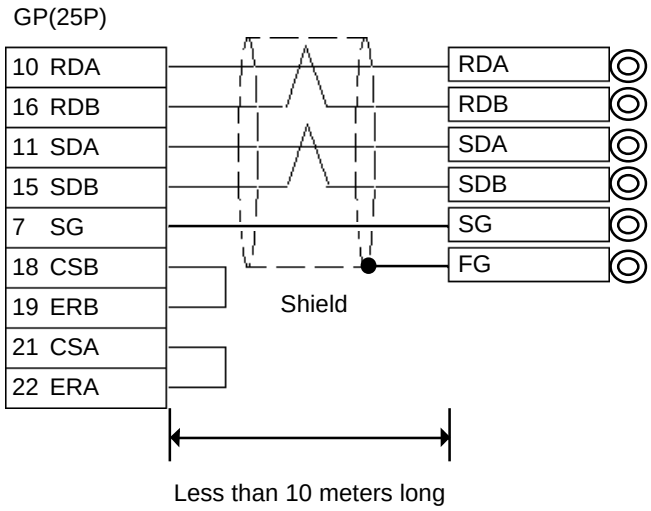
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.

Important

- ***Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.***
- ***The GP230-IS12-O Cable FG terminal is not connected to the GP's FG.***
- ***Attach a Termination Resistor to both ends of the cable.***
- ***As a general rule, connect the PLC to one end of the circuit.***

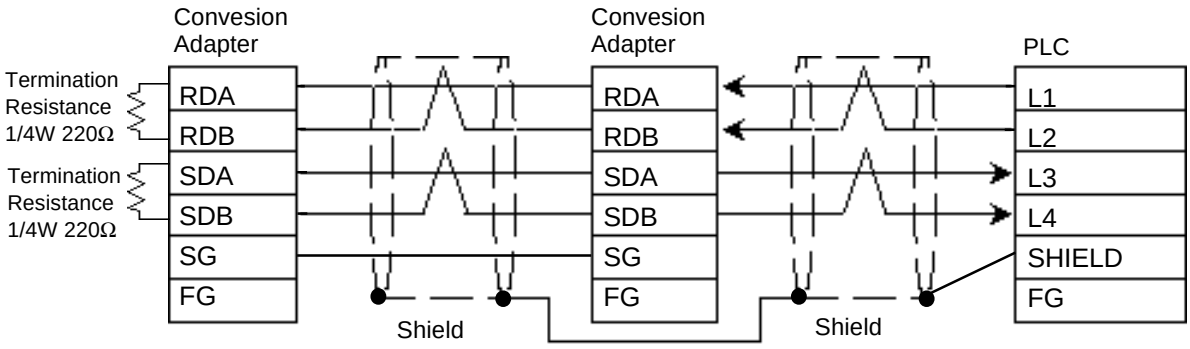
Note: **When making your own cable, Hitachi's CO-SPEV -SB(A) 3P0.5mm² cable is recommended as the connection cable.**
The cable connection lines are as shown below. The cables between the GP and the terminals should be less than 10m.



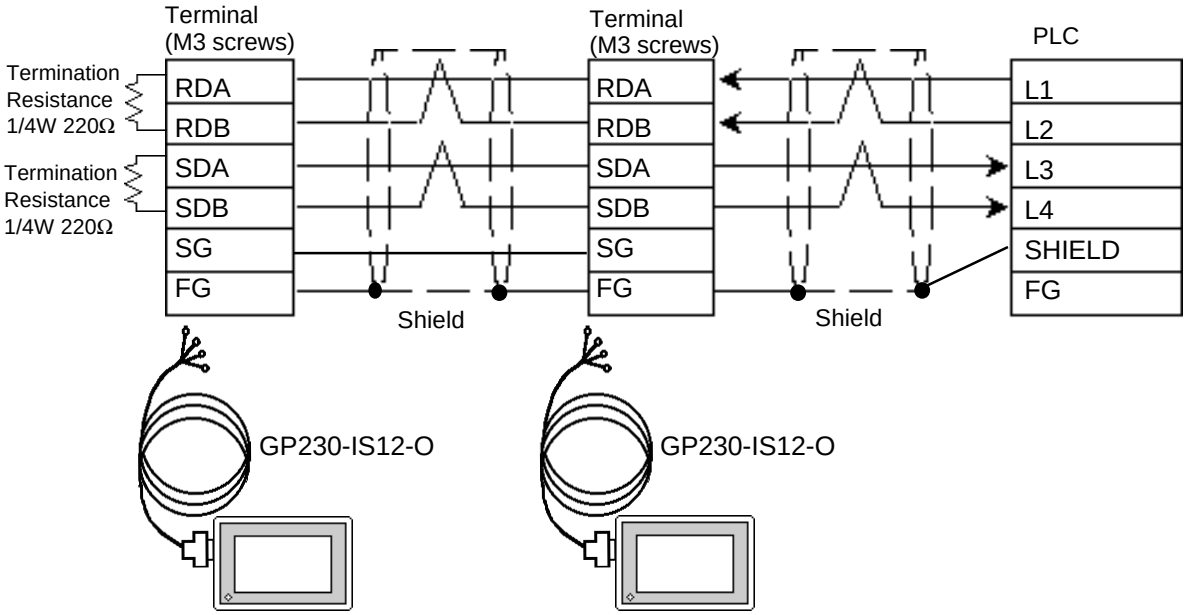


Cable Diagram 2

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O

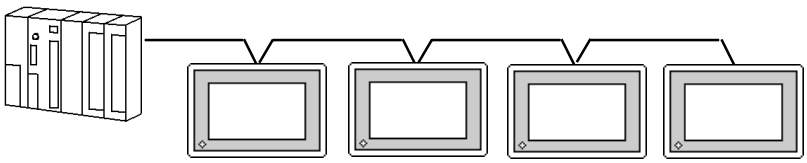


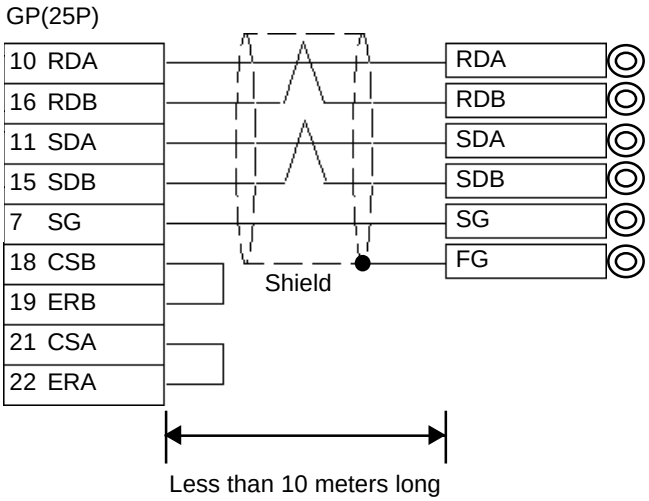
• When using Digital's Multi-link Cable, GP230-IS12-O



Note:

- **When making your own cable, Hitachi's CO-SPEV -SB(A) 3P0.5mm² cable is recommended as the connection cable.**
  The cable connection lines are as shown below. The cables between the GP and the terminals should be less than 10m.
- **Use a cable length less than 600m.**





5.10.3 Supported Devices

The following lists Digital's recommended PLC and GP communication settings.

■ New Satellite JW (JW-33CUH3)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Relay	00000 ~ 15777	A0000 ~ A1576 (ヨ0000 ~ ヨ1576)	÷ 2	
	20000 ~ 75777	A2000 ~ A7576 (ヨ2000 ~ ヨ7576)		
Timer (contact)	T0000 ~ T1777	————		
Counter (contact)	C0000 ~ C1777	————		
Timer/Counter (current value)	————	B0000 ~ B3776 (b0000 ~ b3776)	÷ 2 Bit 15	
Register	————	09000 ~ 09776	÷ 2 Bit 15	L/H
		19000 ~ 19776		
		29000 ~ 29776		
		39000 ~ 39776		
		49000 ~ 49776		
		59000 ~ 59776		
		69000 ~ 69776		
		79000 ~ 79776		
		89000 ~ 89776		
		99000 ~ 99776		
		E0000 ~ E0776		
		E1000 ~ E1776		
		E2000 ~ E2776		
		E3000 ~ E3776		
		E4000 ~ E4776		
		E5000 ~ E5776		
		E6000 ~ E6776		
		E7000 ~ E7776		
File Register 1	————	1000000 ~ 1037776	÷ 2 Bit 15 *1	
File Register 2		2000000 ~ 2177776		
File Register 3		3000000 ~ 3037776		
File Register 10-1F		F10000000 ~ F1F177776		
File Register 20-2C		F20000000 ~ F2C177776		

** 1 File Registers consist of a File number and an Address.*

<e.g.> 1 000000

- 000000 — Address
- 1 — File number (For File Register 10 to 2C, enter "F10 to F2C" here as shown above).

÷ 2 *Enter even numbers only for Word Address*

Bit 15 *You can select a bit. input a bit position after Word Address. The value of a bit position must be between 0 to 15.*

STOP **Word Address Relay and Timer/Counter current value (B) are shown in brackets on the PLC's Uesrs manual, however, you must enter " A**** ", " B**** " when you are entering the value in the GP-PRO/PB III software.**

5.10.4 Environment Setup

The following shows Digital's recommended PLC settings and GP settings.

■ New Satellite JW Series (Using JW-21CM)

GP Setup		Link Unit Setup *3	
Baud Rate	19200 bps	Baud Rate	19200bps
Data Length	7 bits (fixed)	Data bit	7 bits (fixed)
Stop Bit	2 bit (fixed)	Stop Bit	2 bit (fixed)
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communicaiton Format	4-wire type	Communicaiton Mode	4-wire type
---		Function Setting Switch (SO)	Computer Link
Unit No. *1	1 (1 to 31)	Station Address *2	1(1 to 37)

■ New Satellite JW Series (Using Link I/F on CPU unit)

GP Setup		Link Unit Setup *3	
Baud Rate *4	19200 bps	Baud Rate	19200 bps
Data Length	7 bits (fixed)	Data bit	7 bits (fixed)
Stop Bit	2 bit (fixed)	Stop Bit	2 bit (fixed)
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	4-wire type	Communication Mode	4-wire type
Unit No. *1	1(1 to 31)	Station Address *2	1(1 to 37)

< PLC Settings >

Please set up the PLC system memory (#***) as shown below. For these settings, only PRO-Control or the Ladder Programming software can be used. The PLC system memory cannot be accessed by GP.

PLC System Memory No.	Details	
#234	Baud Rate, Parity, Stop bit	Communication 1
#235	Station No. 001 ~ 037oct	(PG/COM1 port)settings
#236	Baud Rate, Parity, Stop bit	Communication 2
#237	Station No. 001 ~ 037oct	(PG/COM2 port)settings

**1 This value must be in decinal.*

**2 This value must be in octal.*

**3 For PLC settings, use the link unit's switch. For details, please refer to Sharp's JW-21CM users manual.*

** 4 When Using Link I/F on CPU unit, the baud rate 115.2k bps can also be used.*

6 Special Connection

6.1 Connectable PLCs

The following table lists the PLCs that can be connected and used with the GP via a special connection.

Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup
ROCKWELL (ALLEN-BRADLEY)	MicroLogix 1000	1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	Advanced Interface Converter 1761-NET-AIC		AB SLC500 DH485
	MicroLogix 1200	1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA 1762-L40BXB			
	MicroLogix 1500	1764-LSP			
	SLC 500	SLC-5/01 SLC-5/02 SLC-5/03 SLC-5/04	DH485 Port on CPU	It is possible to directly connect the PLC having DH485 port.	
			1747-AIC Link coupler (Allen-Bradley's)	Connection to the DH485 network can be made by using the linkcoupler shown at left.	
		SLC-5/04	DH Plus port on CPU		AB Data Highway Plus
	PLC5	PLC5/20	DH Plus port on CPU		AB Data Highway Plus
		PLC5	REMOTE I/O Channel on CPU		AB Remote IO

Co.	Series Name	CPU	Link I/F	Comments	Screen Editor PLC setup
MODICON	Modbus Master				Modicon Modbus (SLAVE)
	884/984	884, 984A, 984B	Modbus Plus Port on CPU		Modicon Modbus Plus

The following table lists the GPs that can be connected and used with special connection.

<GP List 1>

Series Name		Product Name
GP70 Series	GP-470 Series	GP-470E
	GP-570 Series	GP-570S
		GP-570T
		GP-57JS
		GP-570VM
	GP-571 Series	GP-571T
	GP-675 Series	GP-675S
		GP-675T
	GP-870 Series	GP-870VM
GP77 Series	GP-477R Series	GP-477RE
	GP-577R Series	GP-577RS
		GP-577RT
GP2000 Seires *1	GP-2500 Series	GP-2500L
		GP-2500S
		GP-2500T
	GP-2501 Series	GP-2501S
		GP-2501T
	GP-2600 Series	GP-2600T

**1 When using a GP2000 Series units, a bus conversion unit (PSL-CONV00) is required.*

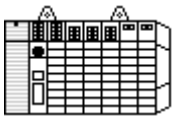
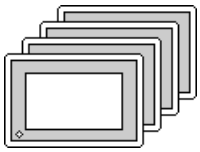
<GP List 2>

Series Name		Product Name
GP70 Series	GP-270 Series	GP-270L
		GP-270S
	GP-370 Series	GP-370S
		GP-370T
GP77R Series	GP-377R Series	GP-377RT

6.2 Rockwell (Allen-Bradley)

6.2.1 System Structure

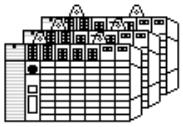
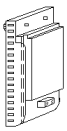
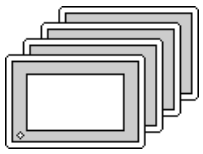
■ SLC 500 Series (Using DH485)

CPU	Unit	Cable Diagram	GP
			
SLC-5/01 SLC-5/02 SLC-5/03 SLC-5/04		TCP's *1 HMI-CAB-C83 *2	GP Series
	1747-PIC Link coupler (Allen Bradley's)	TCP's *1 HMI-CAB-C84 *2	

**1 Use the HMI CAB-C83 cable at 1:1, or HMI CAB-C84 at m:n.*

**2 Manufactured by Total Control Products, Inc.*

■ SLC 500 Series (Using Data Highway Plus)

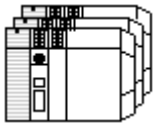
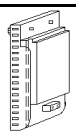
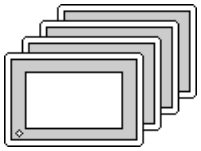
CPU	Cable Diagram	Unit	GP
		 DH Plus Module	
SLC-5/04	(Cable Diagram 1)	TCP's *1 QPI-ABD-201	Large Size GPs *2
		TCP's *1 QPJ-ABD-201	Medium Size GPs *3

**1 Manufactured by Total Control Products, Inc.*

**2 For details, refer to 6.1 Connectable PLCs, <GP List1>.*

**3 For details, refer to 6.1 Connectable PLCs, <GP List2>.*

■ PLC-5 Series (Using Data Highway Plus)

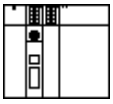
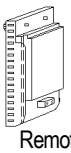
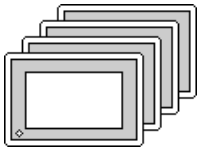
CPU	Cable Diagram	Unit	GP
		 DH Plus Module	
PLC-5/20	(Cable Diagram 1)	QPI-ABD-201 (TCP's) *1	Large Size GPs *2
		QPI-ABD-201 (TCP's) *1	Medium Size GPs *3

**1 Product manufactured by Total Control Products, Inc.*

**2 For details, refer to 6.1 Connectable PLCs, <GP List1>.*

**3 For details, refer to 6.1 Connectable PLCs, <GP List2>.*

■ PLC-5 Series (Using Remote I/O)

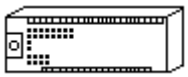
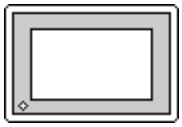
CPU	Cable Diagram	Unit	GP
		 Remote I/O	
PLC-5	(Cable Diagram 1)	QPI-ABR-201 (TCP's) *1	Large Size GPs *2
		QPJ-ABR-201 (TCP's) *1	Medium Size GPs *3

**1 Product manufactured by Total Control Products, Inc.*

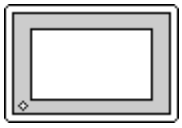
**2 For details, refer to 6.1 Connectable PLCs, <GP List1>.*

**3 For details, refer to 6.1 Connectable PLCs, <GP List2>.*

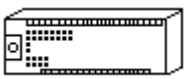
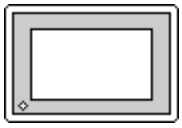
■ MicroLogix 1000 Series (Using DH485)

CPU	Link	Cable Diagram	GP
			
1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	RS-232C port on CPU unit	RS-232C <Cable Diagram 2>	GP Series

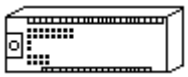
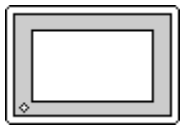
■ MicroLogix 1200 Series (Using DH485)

CPU	Link	Cable Diagram	GP
			
1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA 1762-L40BXB	RS-232C port on CPU unit	RS-232C <Cable Diagram 2>	GP Series

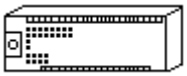
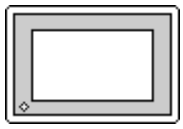
■ MicroLogix 1500 Series (Using DH485)

CPU	Link	Cable Diagram	GP
			
1764-LSP	RS-232C port on Base unit	RS-232C <Cable Diagram 2>	GP Series

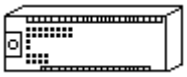
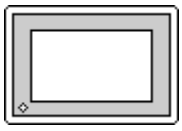
■ MicroLogix 1000 Series (Using DH485 with Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1761-L16AWA 1761-L32AWA 1761-L20AWA-5A 1761-L10BWA 1761-L16BWA 1761-L20BWA-5A 1761-L32BWA 1761-L10BWB 1761-L16BWB 1761-L20BWB-5A 1761-L32BWB 1761-L16BBB 1761-L32BBB 1761-L32AAA	Advanced Interface Converter (1761-NET-AIC)	RS-232C port connection <Cable Diagram 3> RS-422 (2-wire type) port 3 connection <Cable Diagram 4>	GP Series

■ MicroLogix 1200 Series (Using DH485 with Advanced Interface Converter)

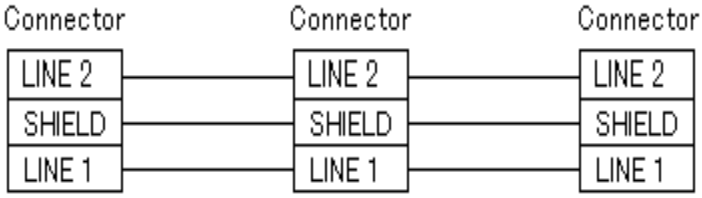
CPU	Link	Cable Diagram	GP
			
1762-L24AWA 1762-L24BWA 1762-L24BXB 1762-L40AWA 1762-L40BWA	Advanced Interface Converter (1761-NET-AIC)	RS-232C port connection <Cable Diagram 3> RS-422 (2-wire type) port 3 connection <Cable Diagram 4>	GP Series

■ MicroLogix 1500 Series (Using DH485 with Advanced Interface Converter)

CPU	Link	Cable Diagram	GP
			
1764-LSP	Advanced Interface Converter (1761-NET-AIC)	RS-232C port connection <Cable Diagram 3> RS-422 (2-wire type) port 3 connection <Cable Diagram 4>	GP Series

6.2.2 Cable Diagrams

Cable Diagram 1 (Using Data Highway Plus /Remote I/O)

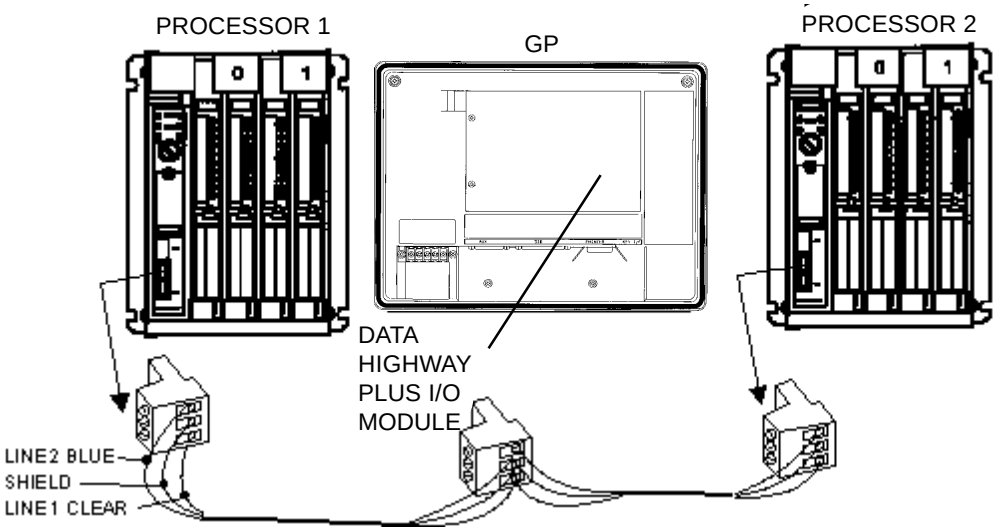


Important

- ***The connector is supplied as an accessory for the PLC.***

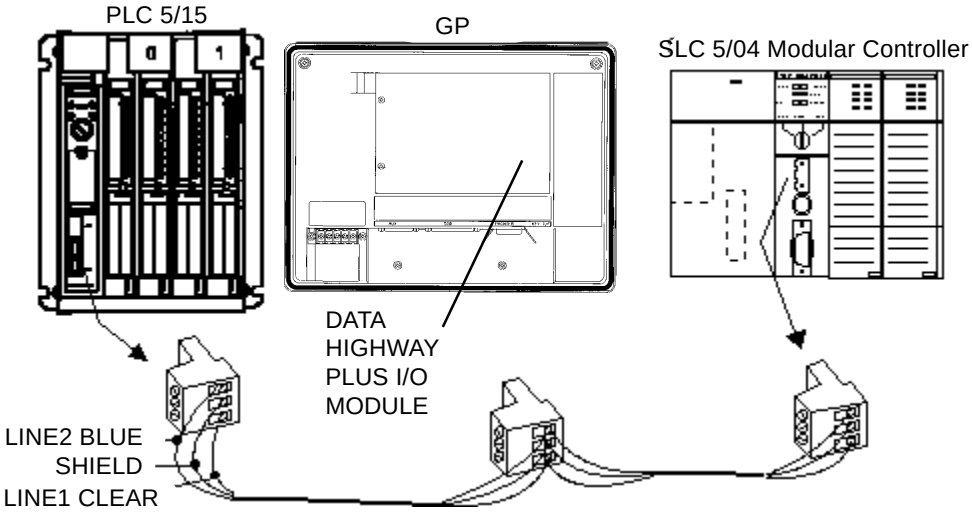
Connection to Data Highway Plus

The following drawing shows a GP connected to two PLC-5 processors on a Data Highway Plus network.



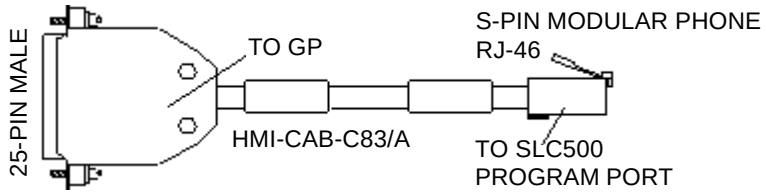
SLC 5/04 DH+ Connection

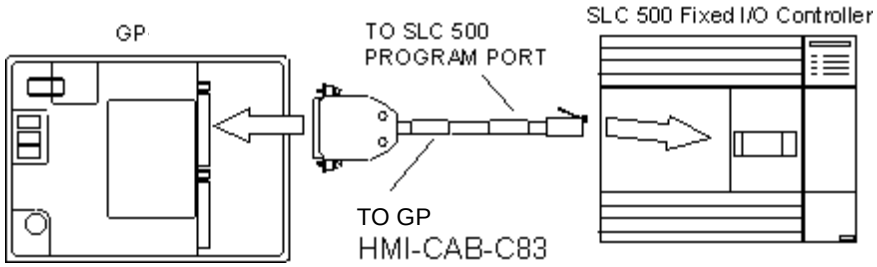
The drawing shows a possible configuration for DH+.



HMI-CAB-C83 Cable

This cable connects a single GP unit directly to the Rockwell (Allen-Bradley) SLC 500 Programming Port.





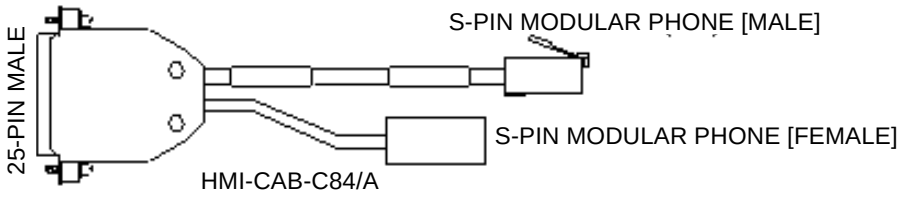
HMI-CAB-C84 Cable

This cable connects the GP's serial port to the Rockwell (Allen-Bradley) SLC 500 Programming Port.

The cable is designed to allow connection to additional devices such as an Rockwell (Allen-Bradley) 1747-PIC Interface Converter.

Warning

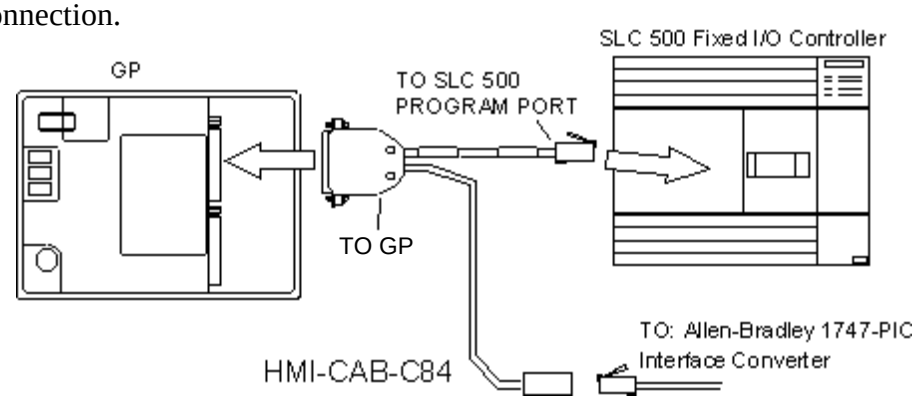
This cable is 6 feet (approximately 2 meters) long. Do not attempt to make it longer.



SLC 500 Network Connection for Programming Equipment (DH485)

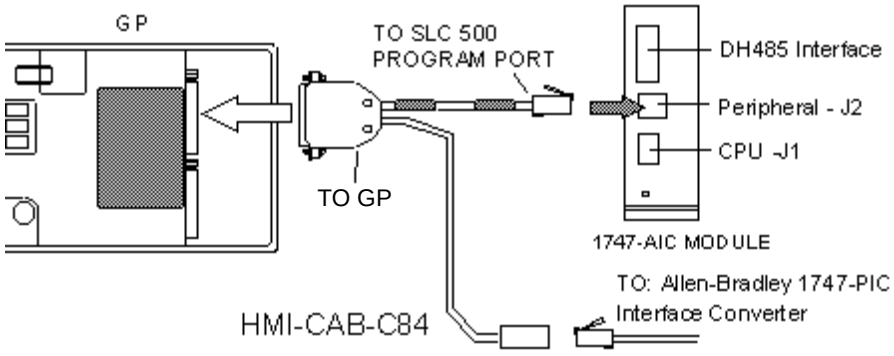
This connection allows two devices to be connected to the PLC. In this case, a programming terminal can be connected to the PLC using a 1747-PIC Interface Converter connected to the HMI-CAB-C84 cable.

The drawing shows the connections for adding a second device to the network connection.

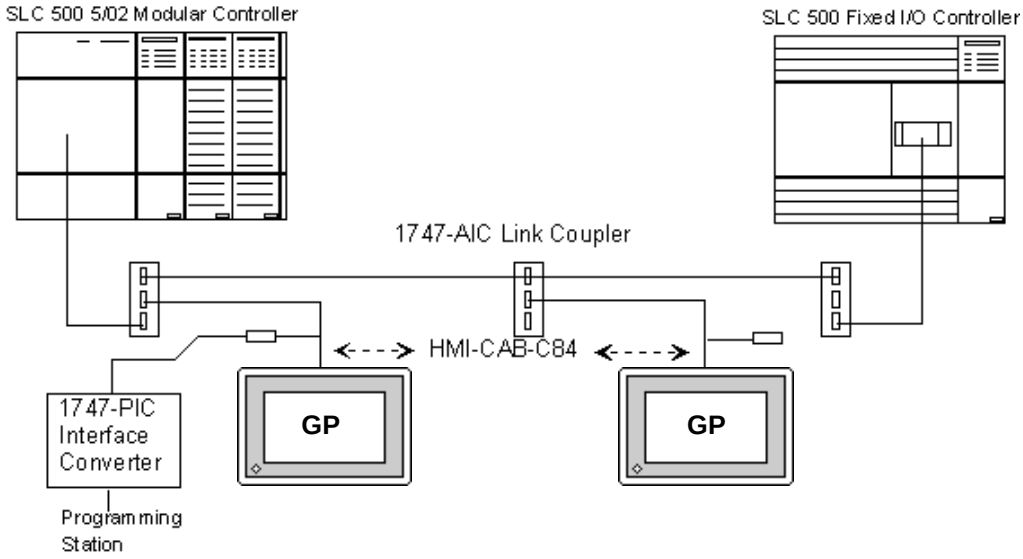


Connecting to a 1747 AIC Module (DH485)

Connect the HMI-CAB-C84 cable to the 1747 AIC Module as shown below.

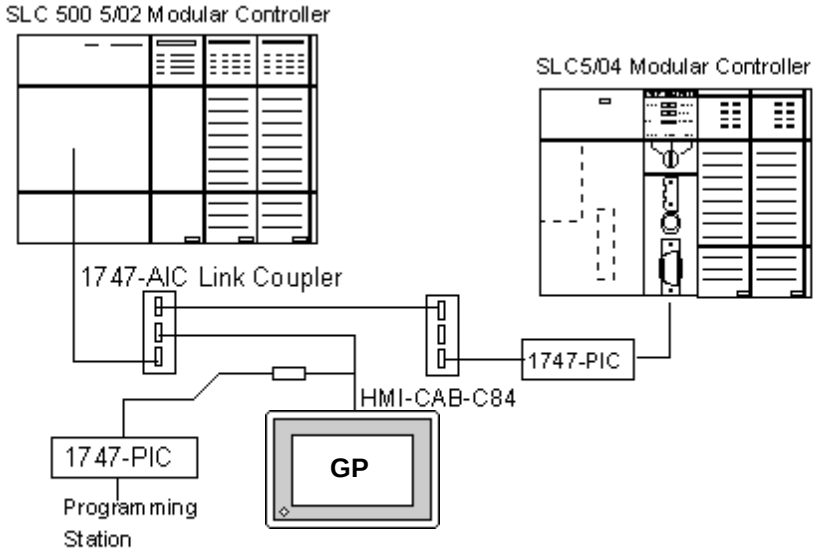


SLC 500 Net work Connection using 1747 AIC Link Couplers (DH485)

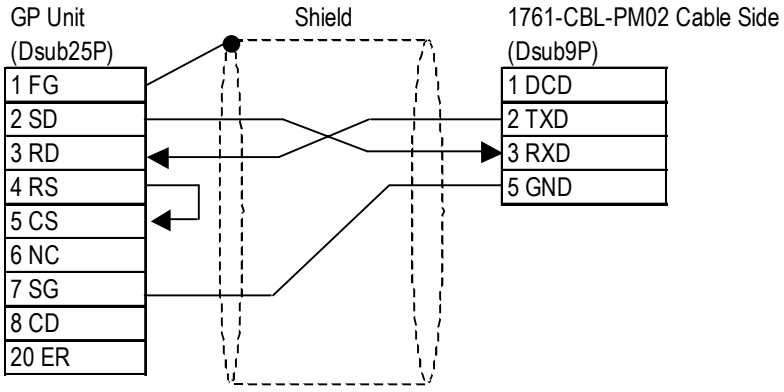


SLC 5/03 and SLC 5/04 DH485 Connections

You can connect channel 0 of the SLC 5/03 and SLC 5/04 modules to the 1747-PIC to make a connection to the DH485 network.



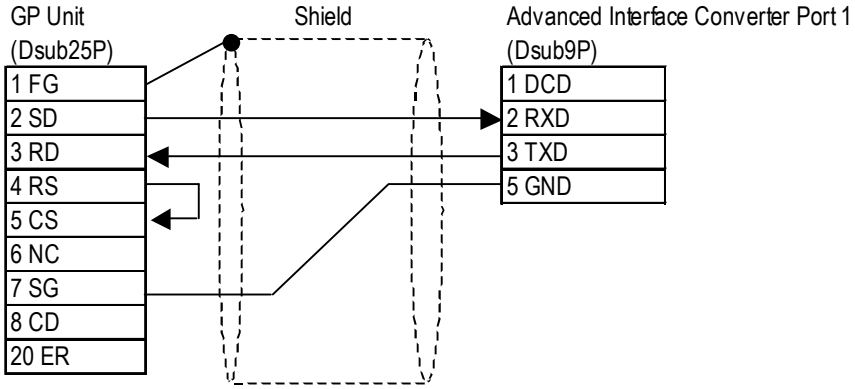
Cable Diagram 2 (RS-232C)



Important

• Use a cable length less than 15m.

Cable Diagram 3 (RS-232C)

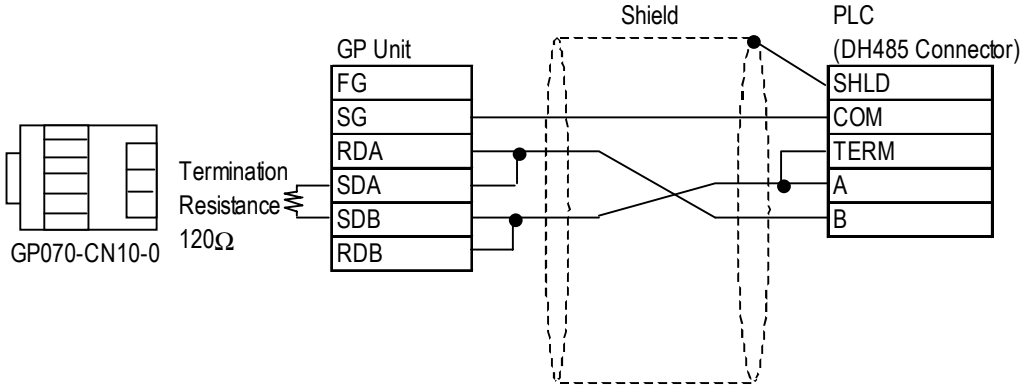


Important

• Use a cable length less than 15m.

Cable Diagram 4 (RS-422C)

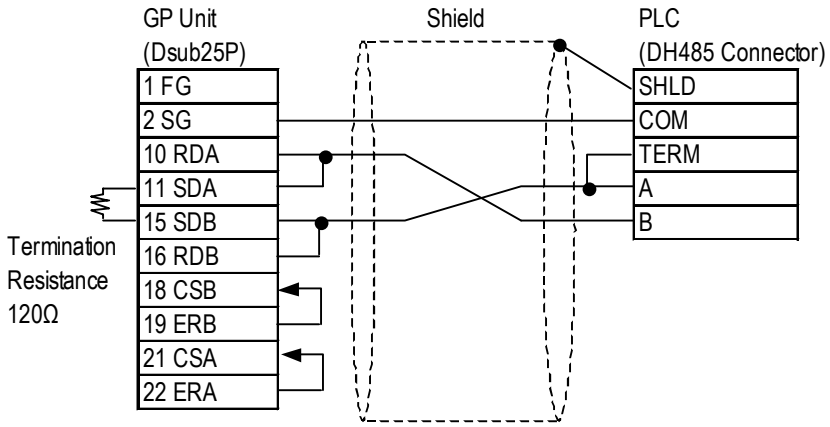
• When using Digital's RS-422 connector terminal adapter GP070-CN10-O



Important

• Use a cable length less than 600m.

• When making your own connections.



Important

• Use a cable length less than 600m.

6.2.3 Supported Devices

■ SLC 500 Series (Using DH485 or Data Highway Plus)

Setup System Area here

Device	Bit Address	Word Address	Particulars	
Status	S2:000/0 ~ S2:15/15	S2:000 ~ S2:15	SLC5/01	L/H
	S2:000/0 ~ S2:32/15	S2:000 ~ S2:32	SLC5/02	
	S2:000/0 ~ S2:83/15	S2:000 ~ S2:83	SLC5/03	
Bit	B3:000/0 ~ B3:255/15	B3:000 ~ B3:255		
Timer (TT: Timing Bit)	T4:000.TT ~ T4:255./TT	---		
	T10:000.TT ~ S255:255.TT	---		
Timer (DN: Completion Bit)	T4:000.DN ~ T4:255./DN	---		
	T10:000.DN ~ S255:255.DN	---		
Timer EN: Enable Bit)	T4:000.EN ~ T4:255.EN	---		
	T10:000.EN ~ S255:255.EN	---		
Timer (PRE: Current Value)	---	T4:000.PRE ~ T4:255.PRE		
	---	T10:000.PRE ~ S255:255.PRE		
Timer (Acc: Setup Value)	---	T4:000.ACC ~ T4:255.ACC		
	---	T10:000.ACC~ S255:255.ACC		
Counter (CU: Up Count)	C5:000.CU ~ C5:255.CU	---		
	C10:000.CU ~ C255:255.CU	---		
Counter (CU: Down Count)	C5:000.CD ~ C5:255.CD	---		
	C10:000.CD ~ C255:255.CD	---		
Counter (DN: Completion Bit)	C5:000.DN ~ C5:255.DN	---		
	C10:000.DN ~ C255:255.DN	---		
Counter (OV: Overflow)	C5:000.OV ~ C5:255.OV	---		
	C10:000.OV ~ C255:255.OV	---		
Counter (UN: Underflow)	C5:000.UN ~ C5:255.UN	---		
	C10:000.UN ~ C255:255.UN	---		
Counter (UA: newly current value reading)	C5:000.UA ~ C5:255.UA	---		
	C10:000.UA ~ C255:255.UA	---		
Counter (Current Value)	---	C5:000.ACC ~ C5:255.ACC		
	---	C10:000.ACC ~ C255:255.ACC		
Counter (Current Value)	---	C5:000.PRE ~ C5:255.PRE		
	---	C10:000.PRE ~ C255:255.PRE		
Control (DN)	R6:000.DN ~ R6:255.DN	---		
	R10:000.DN ~ R255:255.DN	---		
Control (EN)	R6:000.EN ~ R6:255.EN	---		
	R10:000.EN ~ R255:255.EN	---		
Control (ER)	R6:000.ER ~ R6:255.ER	---		
	R10:000.ER ~ R255:255.ER	---		
Control (UL)	R6:000.UL ~ R6:255.UL	---		
	R10:000.UL ~ R255:255.UL	---		

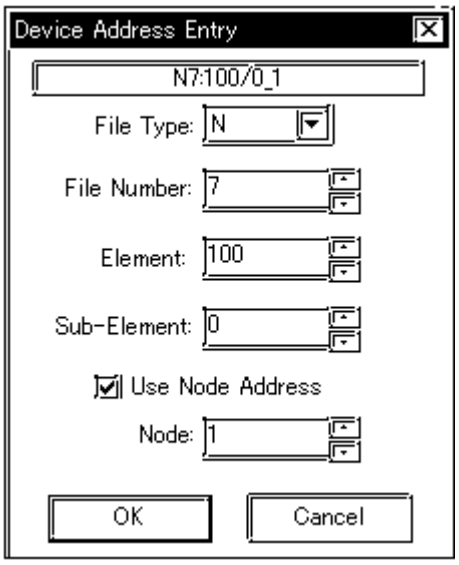
■ **SLC 500 Series** (Using DH485 or Data Highway Plus) (Continued)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Control (IN)	R6:000.IN ~ R6:255.IN	---		L/H
	R10:000.IN ~ R255:255.IN	---		
Control (EN)	R6:000.FD ~ R6:255.FD	---		
	R10:000.FD ~ R255:255.FD	---		
Control (LEN)	---	R6:000.LEN ~ R6:255.LEN		
	---	R10:000.LEN ~ R255:255.LEN		
Control (POS)	---	R6:000.POS ~ R6:255.POS		
	---	R10:000.POS ~ R255:255.POS		
Integral Number (N)	N7:000/0 ~ N7:255/15	N7:000 ~ N7:255		
	N10:000/0 ~ N255:255/15	N10:000 ~ N255:255		

Note:

- **You may specify a station number of the PLC when entering addresses during the setup of parts and tags in GP-PRO/PBIII. If no station number is specified, the last entered number is assumed (the default value is 1).**



N7:100/00_1

- PLC's Node Address — DH485: 0 to 31 (Decimal); DH Plus: 0 to 77 (Octal)
- Bit Address (Sub element)
- Element
- File No.
- File Type

■ PLC-5 Series (Using Data Highway Plus)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Output	0:0/0 ~ 0.37/17	---		L/H
Input	1:0/0 ~ 1.37/17	---		
Status	S2:000/0 ~ S2:15/15	S2:000 ~ S2:15		
Bit	B3:000/0 ~ B3:999/15	B3:000 ~ B3:999		
Timer (TT: Timing Bit)	T4:000.TT ~ T4:999./TT	---		
	T8:000.TT ~ S999:999.TT	---		
Timer (DN: Completion Bit)	T4:000.DN ~ T4:999./DN	---		
	T8:000.DN ~ T999:999.DN	---		
Timer EN: Enable Bit)	T4:000.EN ~ T4:999./EN	---		
	T8:000.EN ~ T999:999.EN	---		
Timer (PRE: Current Value)	---	T4:000.PRE ~ T4:999.PRE		
	---	T8:000.PRE ~ S999:999.PRE		
Timer (Acc: Setup Value)	---	T4:000.ACC ~ T4:999.ACC		
	---	T8:000.ACC~ T999:999.ACC		
Counter (CU: Up Count)	C5:000.CU ~ C5:999.CU	---		
	C8:000.CU ~ C999:999.CU	---		
Counter (CU: Down Count)	C5:000.CD ~ C5:999.CD	---		
	C8:000.CD ~ C999:999.CD	---		
Counter (DN: Completion Bit)	C5:000.DN ~ C5:999.DN	---		
	C8:000.DN ~ C999:999.DN	---		
Counter (OV: Overflow)	C5:000.OV ~ C5:999.OV	---		
	C8:000.OV ~ C999:999.OV	---		
Counter (UN: Underflow)	C5:000.UN ~ C5:999.UN	---		
	C8:000.UN ~ C999:999.UN	---		
Counter (UA: newly current value reading)	C5:000.UA ~ C5:999.UA	---		
	C8:000.UA ~ C999:999.UA	---		
Counter (Current Value)	---	C5:000.ACC ~ C5:999.ACC		
	---	C8:000.ACC ~ C999:999.ACC		
Counter (Current Value)	---	C5:000.PRE ~ C5:999.PRE		
	---	C8:000.PRE ~ C999:999.PRE		
Control (DN)	R6:000.DN ~ R6:999.DN	---		
	R8:000.DN ~ R999:999.DN	---		
Control (EN)	R6:000.EN ~ R6:999.EN	---		
	R8:000.EN ~ R999:999.EN	---		
Control (ER)	R6:000.ER ~ R6:999.ER	---		
	R8:000.ER ~ R999:999.ER	---		
Control (UL)	R6:000.UL ~ R6:999.UL	---		
	R8:000.UL ~ R999:999.UL	---		
Control (IN)	R6:000.IN ~ R6:999.IN	---		
	R8:000.IN ~ R999:999.IN	---		

■ PLC-5 Series (Using Data Highway Plus) (Continued)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Control (FD)	R6:000.IN ~ R6:999.FD	---		L/H
	R8:000.IN ~ R999:999.FD	---		
Control (LEN)	---	R6:000.LEN ~ R6:999.LEN		
	---	R10:000.LEN ~ R999:999.LEN		
Control (POS)	---	R6:000.POS ~ R6:999.POS		
	---	R10:000.POS ~ R999:999.POS		
Integral Numberl (N)	N7:000/0 ~ N7:999/15	N7:000 ~ N7:999		
	N8:000/0 ~ N:999/15	N8:000 ~ N:999:999		
Floating point (F)	---	F8:000 ~ F999:999		
ASCII (A)	---	A12:000 ~ A999:999		H/L

Note:

- **The range of supported devices may differ depending on your CPU.**
- **These maximum ranges may not be supported by some PLC configurations.**

■ PLC-5 Series (Using Remote I/O)

Device	Bit Address	Word Address	Particulars
Input	I:000/00 ~ I:377/17	I:000 ~ I:377	
Output	O:000/00 ~ O:377/17	O:000 ~ O.377	
Block Transfer (Read)	BTR:0000:00/00 ~ BTR:3771:63/15	BTR:0000:00 ~ BTR:3771:63	*1
Block Transfer (Write)	BTW:0000:00/00 ~ BTW:3771:63/15	BTW:0000:00 ~ BTW:3771:63	*1

**1 Block Transfer Read & Write (BTR & BTW) must be configured in the Environment Setup (See next section) before being able to use these addresses.*

Note:

- **These maximum ranges may not be supported by some PLC configurations.**
- **This driver cannot allocate the System Data Area for the PLC's Device Addresses.**

■ MicroLogix 1000 Series (using DH485)

Device	Bit Address	Word Address	Particulars	
Output (O)	O0:0/0	—	*3	
Input (I)	I1:0/0 ~ I1:1/17	—	*3	
Status (S)	S2:0/0 ~ S2:31/15	S2:0 ~ S2:31	*1 *2	
Bit (B)	B3:0/0 ~ B3:31/15	B3:0 ~ B31:2		L/H
Timer (PRE:Preset Value)	—	T4:0.PRE ~ T4:39.PRE	*4	
Timer (ACC:Accumlator Value)	—	T4:0.ACC ~ T4:39.ACC	*4	
Timer (EN:Enable Bit)	T4:0.EN ~ T4:39.EN	—		
Timer (TT:Timing Bit)	T4:0.TT ~ T4:39.TT	—		
Timer (DN:Done Bit)	T4:0.DN ~ T4:39.DN	—		
Counter (PRE:Preset Value)	—	C5:0.PRE ~ C5:31.PRE	*4	
Counter (ACC:Accumlator Value)	—	C5:0.ACC ~ C5:31.ACC	*4	
Counter (CU:Count up enable bit)	C5:0.CU ~ C5:31.CU	—		
Counter (CD:Count down enable)	C5:0.CD ~ C5:31.CD	—		
Counter (DN:Done Bit)	C5:0.DN ~ C5:31.DN	—		
Counter (OV:Overflow bit)	C5:0.OV ~ C5:31.OV	—		
Counter (UN:Underflow bit)	C5:0.UN ~ C5:31.UN	—		
Counter (UA:Update accumlator bit)	C5:0.UA ~ C5:31.UA	—		
Control (LEN:Length Value)	—	R6:0.LEN ~ R6:15.LEN	*4	
Control (POS:Position Value)	—	R6:0.POS ~ R6:15.POS	*4	
Control (EN:Enable bit)	R6:0.EN ~ R6:15.EN	—		
Control (EU:Update enable bit)	R6:0.EU ~ R6:15.EU	—		
Control (DN:Done bit)	R6:0.DN ~ R6:15.DN	—		
Control (EM:Stack empty bit)	R6:0.EM ~ R6:15.EM	—		
Control (ER:Error bit)	R6:0.ER ~ R6:15.ER	—		
Control (UL:Unload)	R6:0.UL ~ R6:15.UL	—		
Control (IN:Inhibit bit)	R6:0.IN ~ R6:15.IN	—		
Control (FD:Found bit)	R6:0.FD ~ R6:15.FD	—		
Integer (N)	N7:0/0 ~ N7:104/15	N7:0 ~ N7:104		L/H

**1 No data can be written.*

**2 Addresses up to S:65/15 may be used for the PLC, and those up to S:31/15 for the GP.*

**3 Bit part: Octal input*

**4 Only 16-bit addresses may be specified. Since this is a structured device, trying to access it using a 32-bit address will result in accessing a different element. For the configuration of a structure device, refer to the corresponding PLC manual.*

- ***No ASCII (A), Floating point (F), and String (ST) devices exist in the MicroLogix1000.***

■ MicroLogix 1200 Series (using DH485)

Device	Bit Address	Word Address	Particulars	
Output (O)	O0:0/0 ~ O0:3/17	—	*5	
Input (I)	I1:0/0 ~ I1:3/17	—	*5	
Status (S)	S2:0/0 ~ S2:31/15	S2:0 ~ S2:31	*1 *2	
Bit (B)	B3:0/0 ~ B3:255/15 B9:0/0 ~ B255:255/15	B3:0 ~ B3:255 B9:0 ~ B255:255		L/H
Timer (PRE:Preset value)	—	T4:0.PRE ~ T4:255.PRE T9:0.PRE ~ T255:255.PRE	*3	
Timer (ACC:Accumulator value)	—	T4:0.ACC ~ T4:255.ACC T9:0.ACC ~ T255:255.ACC	*3	
Timer (EN:Enable bit)	T4:0.EN ~ T4:255.EN T9:0.EN ~ T255:255.EN	—	*6	
Timer (TT:Timing bit)	T4:0.TT ~ T4:255.TT T9:0.TT ~ T255:255.TT	—		
Timer (DN:Done bit)	T4:0.DN ~ T4:255.DN T9:0.DN ~ T255:255.DN	—		
Counter (PRE:Preset value)	—	C5:0.PRE ~ C5:255.PRE C9:0.PRE ~ C255:255.PRE	*3	
Counter (ACC:Accumulator value)	—	C5:0.ACC ~ C5:255.ACC C9:0.ACC ~ C255:255.ACC	*3	
Counter (CU:Count up enable bit)	C5:0.CU ~ C5:255.CU C9:0.CU ~ C255:255.CU	—		
Counter (CD:Count down enable bit)	C5:0.CD ~ C5:255.CD C9:0.CD ~ C255:255.CD	—		
Counter (DN:Done bit)	C5:0.DN ~ C5:255.DN C9:0.DN ~ C255:255.DN	—		
Counter (OV:Overflow bit)	C5:0.OV ~ C5:255.OV C9:0.OV ~ C255:255.OV	—		
Counter (UN:Underflow bit)	C5:0.UN ~ C5:255.UN C255:0.UN ~ C255:255.UN	—		
Counter (UA:Update accumulator bit)	C5:0.UA ~ C5:255.UA C9:0.UA ~ C255:255.UA	—		
Control (LEN:Length value)	—	R6:0.LEN ~ R6:255.LEN R9:0.LEN ~ R255:255.LEN	*3	
Control (POS:Positon value)	—	R6:0.POS ~ R6:255.POS R9:0.POS ~ R255:255.POS	*3	
Control (EN:Enable bit)	R6:0.EN ~ R6:255.EN R9:0.EN ~ R255:255.EN	—		
Control (EU:Update enable bit)	R6:0.EU ~ R6:255.EU R9:0.EU ~ R255:255.EU	—		
Control (DN:Done bit)	R6:0.DN ~ R6:255.DN R9:0.DN ~ R255:255.DN	—		
Control (EM:Stack empty bit)	R6:0.EM ~ R6:255.EM R9:0.EM ~ R255:255.EM	—		
Control (ER:Error bit)	R6:0.ER ~ R6:255.ER R9:0.ER ~ R255:255.ER	—		
Control (UL:Unload bit)	R6:0.UL ~ R6:255.UL R9:0.UL ~ R255:255.UL	—		
Control (IN:Inhibit bit)	R6:0.IN ~ R6:255.IN R9:0.IN ~ R255:255.IN	—		
Control (FD:Found bit)	R6:0.FD ~ R6:255.FD R9:0.FD ~ R255:255.FD	—		

Integer (N)	N7:0/0 ~ N7:255/15 N9:0/0 ~ N255:255/15	N7:0 ~ N7:255 N9:0 ~ N255:255		L/H
Floating point (F)	—	F8:0 ~ F8:255 F9:0 ~ F255:255	*4	
String (ST)	—	ST9:0 ~ ST9:46 ST10:0 ~ ST10:46 . . . ST255:0 ~ ST255:46	*1 *7	

**1 No data can be written.*

**2 The addresses up to S:65/15 may be used for the PLC, and those up to S:31/15 for the GP.*

**3 Only 16-bit addresses may be specified. Since this is a structure device, trying to make access using a 32-bit address will result in accessing a different element. For the configuration of a structure device, refer to the corresponding manual for the PLC.*

**4 32-bit device*

**5 Bit part: Octal input*

**6 If the bits are turned ON by the GP when File No. is 255, the upper communication error (02:CF) occurs. The bits can only be turned OFF.*

**7 Character string type*

Important

- ***No ASCII (A) devices exist in the MicroLogix1200. The Long (L), Message (MG), PID (PID), and Programmable Limit Switch (PLS) are not supported by the GP.***

■ MicroLogix 1500 Series (using DH485)

Device	Bit Address	Word Address	Particulars	
Output (O)	O0:0/0 ~ O0:3/17	—	*4	
Input (I)	I1:0/0 ~ I1:3/17	—	*4	
Status (S)	S2:0/0 ~ S2:31/15	S2:0 ~ S2:31	*1 *2	
Bit (B)	B3:0/0 ~ B3:255/15 B9:0/0 ~ B255:255/15	B3:0 ~ B3:255 B9:0 ~ B255:255		L/H
Timer (PRE:Preset value)	—	T4:0.PRE ~ T4:255.PRE T9:0.PRE ~ T255:255.PRE	*3	
Timer (ACC:Accumulator value)	—	T4:0.ACC ~ T4:255.ACC T9:0.ACC ~ T255:255.ACC	*3	
Timer (EN:Enable bit)	T4:0.EN ~ T4:255.EN T9:0.EN ~ T255:255.EN	—	*5	
Timer (TT:Timing bit)	T4:0.TT ~ T4:255.TT T9:0.TT ~ T255:255.TT	—		
Timer (DN:Done bit)	T4:0.DN ~ T4:255.DN T9:0.DN ~ T255:255.DN	—		
Counter (PRE:Preset value)	—	C5:0.PRE ~ C5:255.PRE C9:0.PRE ~ C255:255.PRE	*3	
Counter (ACC:Accumulator value)	—	C5:0.ACC ~ C5:255.ACC C9:0.ACC ~ C255:255.ACC	*3	
Counter (CU:Count up enable bit)	C5:0.CU ~ C5:255.CU C9:0.CU ~ C255:255.CU	—		
Counter (CD:Count down enable bit)	C5:0.CD ~ C5:255.CD C9:0.CD ~ C255:255.CD	—		
Counter (DN:Done bit)	C5:0.DN ~ C5:255.DN C9:0.DN ~ C255:255.DN	—		
Counter (OV:Overflow bit)	C5:0.OV ~ C5:255.OV C9:0.OV ~ C255:255.OV	—		
Counter (UN:Underflow bit)	C5:0.UN ~ C5:255.UN C255:0.UN ~ C255:255.UN	—		
Counter (UA:Update accumulator bit)	C5:0.UA ~ C5:255.UA C9:0.UA ~ C255:255.UA	—		
Control (LEN:Length value)	—	R6:0.LEN ~ R6:255.LEN R9:0.LEN ~ R255:255.LEN	*3	
Control (POS:Positon value)	—	R6:0.POS ~ R6:255.POS R9:0.POS ~ R255:255.POS	*3	
Control (EN:Enable bit)	R6:0.EN ~ R6:255.EN R9:0.EN ~ R255:255.EN	—		
Control (EU:Update enable bit)	R6:0.EU ~ R6:255.EU R9:0.EU ~ R255:255.EU	—		
Control (DN:Done bit)	R6:0.DN ~ R6:255.DN R9:0.DN ~ R255:255.DN	—		
Control (EM:Stack empty bit)	R6:0.EM ~ R6:255.EM R9:0.EM ~ R255:255.EM	—		
Control (ER:Error bit)	R6:0.ER ~ R6:255.ER R9:0.ER ~ R255:255.ER	—		
Control (UL:Unload bit)	R6:0.UL ~ R6:255.UL R9:0.UL ~ R255:255.UL	—		
Control (IN:Inhibit bit)	R6:0.IN ~ R6:255.IN R9:0.IN ~ R255:255.IN	—		
Control (FD:Found bit)	R6:0.FD ~ R6:255.FD R9:0.FD ~ R255:255.FD	—		

Integer (N)	N7:0/0 ~ N7:255/15 N9:0/0 ~ N255:255/15	N7:0 ~ N7:255 N9:0 ~ N255:255		L/H
String (ST)	—	ST9:0 ~ ST9:46 ST10:0 ~ ST10:46 . . . ST255:0 ~ ST255:46	*1 *3 *6	

**1 No data can be written.*

**2 Since addresses up to S:65/15 may be used for the PLC and those up to S:31/15 can be set up for the GP, the maximum is S:31/15*

**3 Only 16-bit addresses may be specified. Since this is a structured device, trying to access it using a 32-bit address will result in accessing a different element. For the configuration of a structured device, refer to the corresponding PLC manual.*

**4 Bit setting: Octal*

**5 If the bits are turned ON by the GP when File No. is 255, a host communication error (02:CF) occurs. The bits can only be turned OFF.*

**6 Character string type*

- ***No Floating point (F) and ASCII (A) devices exist in the MicroLogix1500. The Long (L), Message (MG), and PID (PID) are not supported by the GP.***

6.2.4 Environment Setup

- ***When entering the GP OFFLINE mode's Set up Operation Surroundings, be sure to select the [GP-PRO/PBIII for Windows] Edit mode. (Data Highway Plus and Remote I/O)***
- ***These settings cannot be set using the GP's OFFLINE Communication Settings. Be sure to use GP-PRO/PBIII for this.***
- ***These settings cannot be set using the GP's Environment Settings. Be sure to use GP-PRO/PBIII for this.***
- ***E and K-tags cannot use the "Indirect" Setting.***
- ***32 bit-length data cannot be written. (DH485)***
- ***K-tag text (columns) data cannot be written. (DH485)***
- ***After the H-tag starts (is triggered), data cannot be read (out).***
- ***After the S-tag starts (is triggered), data cannot be read (out).***
- ***The Trend graph's group data display's PLC device designation feature cannot be used.***
- ***The System Area and the Read (In) Area cannot be used. (Only with Remote I/O)***
- ***For GP70 Series, the data backup feature cannot be used (Data Highway Plus, Remote I/O).***
- ***D-Script 's Memory Copy and Offset Address features cannot be used.***
- ***The Logging and Filing Data features cannot be used.***
- ***2-Way Driver can access to only LS area.***

■ SLC 500 Series (Using DH485)

GP Setup		PLC Setup	
Baud Rate	19200 bps	---	
Data Length	8 bits	---	
Stop Bit	1 bit	---	
Parity Bit	Even	---	
Data Flow Control	ER Control	---	
Communication Format (RS-232C)	RS-232C *1	---	
Communication Format (RS-422)	2-wire type *2	---	
Unit No.	---	---	
Source ID	0	---	
Destination ID	1	Node Address	1
Maximum ID	31	Maximum Address	31

** 1 Set the Communication Format to RS-232C when using the HMI-CAB-C84 cable.*

** 2 Set the Communication Format to RS-422 when using the HMI-CAB-C83 cable.*

■ SLC 500 Series (Using Data Highway Plus)

GP Setup		PLC Setup	
Baud Rate	---	---	---
Data Length	---	---	---
Stop Bit	---	---	---
Parity Bit	---	---	---
Data Flow Control	---	---	---
Communication Format (RS-232C)	---	---	---
Communication Format (RS-422)	---	---	---
Unit No.	---	---	---
Source ID *1	0	---	---
Destination ID *1	1	Node Address	1

** 1 These settings can be made by "option" of GP system setting in Drawing Software (PRO/PBIII for Windows). It is not possible to set from the GP's OFFLINE menu.*

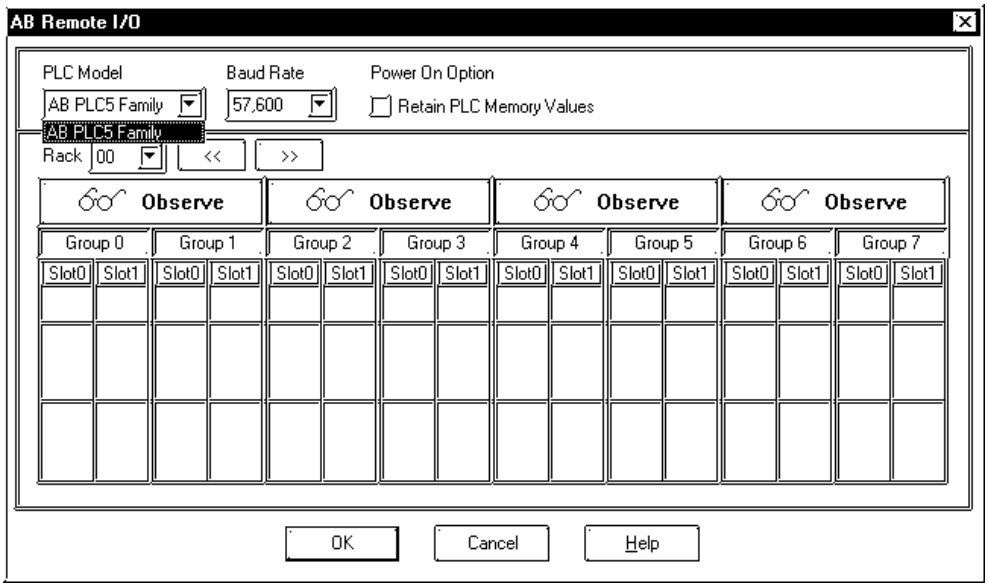
■ PLC 5 Series (Using Data Highway Plus)

GP Setup		PLC Setup	
Baud Rate	57600 bps	Baud Rate	57600 bps
Data Length	---	---	---
Stop Bit	---	---	---
Parity Bit	---	---	---
Data Flow Control	---	---	---
Communication Format (RS-232C)	---	---	---
Communication Format (RS-422)	---	---	---
Unit No.	---	---	---
Source ID *1	0	---	---
Destination ID *1	1	Node Address	1

** 1 These settings can be set via the GP-PRO/PBIII [Option] area. These settings cannot be set using the GP's OFFLINE Mode.*

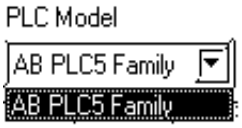
■ PLC-5 Series (Using Remote I/O)

If you select the PLC type setting as [AB Remote I/O] for your GP-PRO/PBIII project, you will also need to configure your GP unit's I/O addresses. After the project is setup, the following configuration window can be found by clicking on the Mode Settings area's "Rack Setup" button.



◆ **PLC Model**

Currently, only the AB PLC 5 Family is supported.

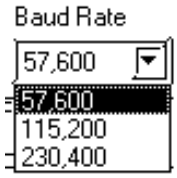


◆ **Baud Rate**

Select the baud rate used for the Remore I/O network. This selection must match that of the intended network.

Important

Early versions of the QPI-ABR-001 RIO modules are not capable of operating at 230,400bps baud.



◆ **Retain PLC Memory Values**

To retain the memory values of all data input and all Block Transfer Reads (BTR), click on the checkbox titled "Retain PLC Memory Values. If this box is not checked, all data values will be set to 0 when the power is cycled (turned off).

◆ **Rack**

A rack corresponds to the I/O rack number of the I/O chassis in which you have placed the targetI/O module. For rack emulation, the target I/O module is the emulated rack. The valid ranges for rack numbers are shown below. You cannot do a block transfer to a rack above address 17.

Processor	Maximum No. of Racks	Valid Range (octal)
PLC-5/10, -5/12, -5/15	4	00 - 03
PLC -5/25, -5/30	8	00 - 07
PLC-5/40, -5/40L	16	00 - 17
PLC-5/60, -5/60L	24	00 - 27

1. Observe Mode

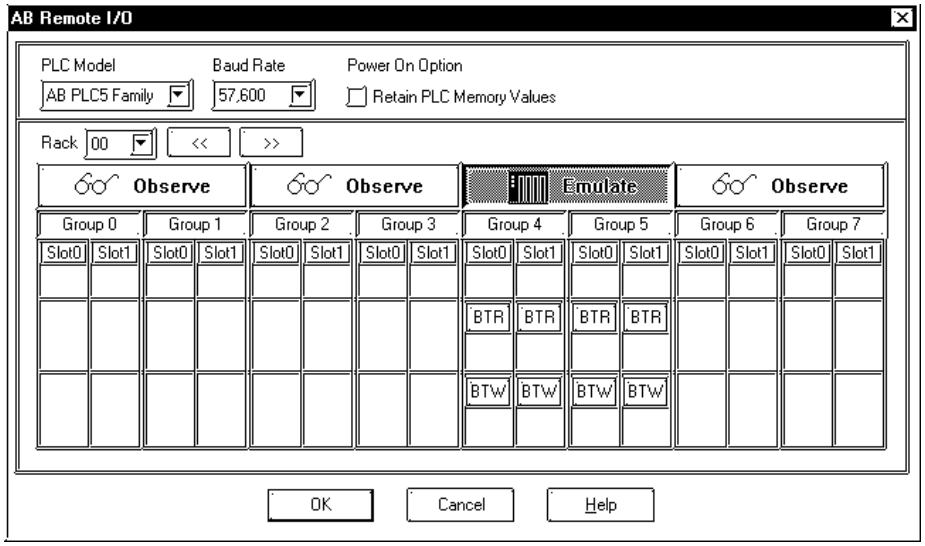
When you first start a project using Remote I/O, all racks are in OBSERVE mode, which allows the target display to listen to all discrete I/O transfers on the Remote I/O link.

An Allen Bradley rack corresponds to 128 input bits and 128 output bits of defined PLC data table memory. In the PLC memory, a "data table" reserves 128 bits for both input and output. This data table then allows the PLC to communicate with all other devices. No matter what I/O scheme (configuration) is being used, 1, 1/2, 1/4 slot addressing, the limit per rack is 128 bits.

When you select two (2) slot addressing, each pair of slots is assigned to the corresponding pair of words in the input and output image tables. You assign one I/O rack number to eight (8) I/O groups. The following drawing shows a rack of I/O that has been set up to use 2-slot addressing.

2. Emulate Mode

You can also have your GP emulate a rack for only discrete I/O, or configure it to work with "Block Transfer" read and write operations.



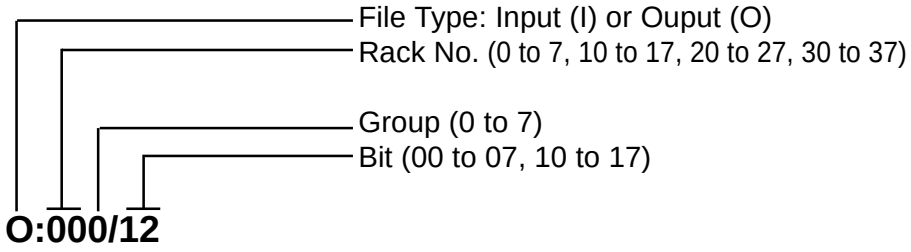
■ Discrete I/O

From the configuration shown above (this window can be called up using the Project Setup area Mode tab's "Rack Setup" selction), select the areas of the master PLC's I/O table that the GP should emulate.

Caution

These areas should not be used by any other device.

In the above example, this GP will emulate Rack 00, Groups 4 and 5. This means that the GP can use addresses O:004/00 to O:004/17 and I:004/00 to I:004/17.



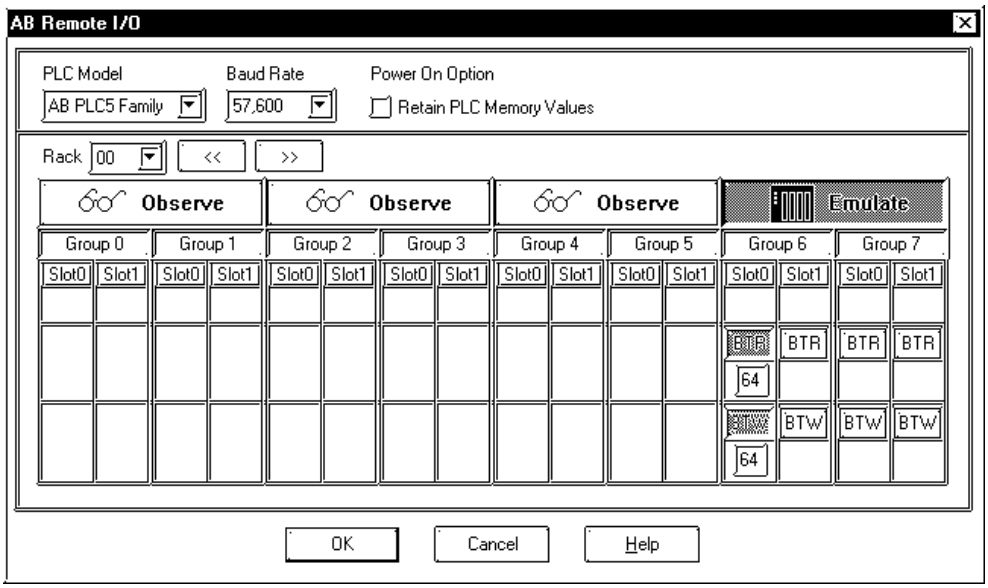
■ Block Transfer

"Block Transfer" commands allow you to send and receive data to and from a PLC.

Use the configuration window shown below (called up by clicking on the Project Setup area Mode tab's [Option]) to select the areas of the master PLC's I/O table that should be used by the GP for Block transfer (Read or Write) and how many words (0 to 64) should be transferred.

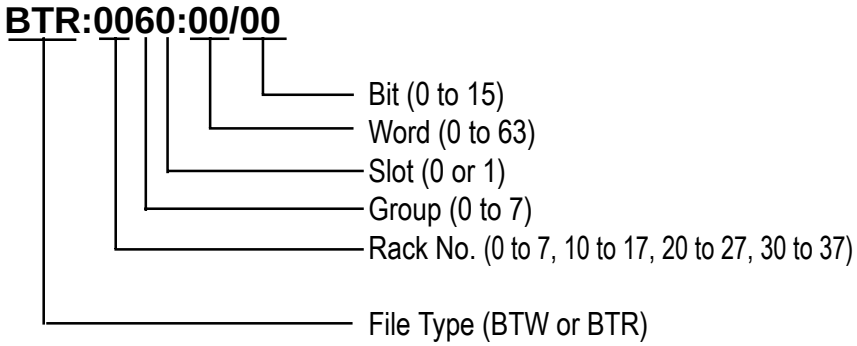
Important ***These areas should not be used by any other device.***

The block transfer area selected here must be accompanied by an equivalent Block Transfer command in the PLC ladder program.

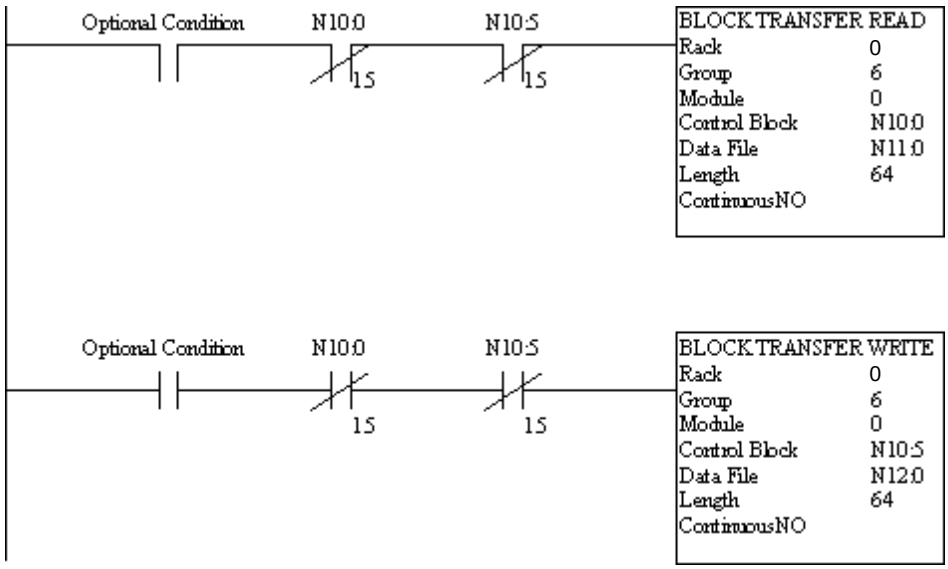


The difference between the BTR and BTW data types is very important. A BTR is s "Block Transfer Read" from the GP to the PLC, which means the GP can write to this area. A BTW is a "Block Transfer Write" from the PLC to the GP, which means the GP can read data from this area.

In the above example, the GP is using Rack 00, Group 6, Slot 0 for Block Transfer. Slot 0 is set with a BTR and BTW of 64. This means that the GP can use addresses BTR:0060:00 to BTR:0060:63, and BTW:0060:00 to BTW:0060:63.



The ladder program below shows how to transfer data from the GP to N10:0 to 63 and data (from the PLC's) N:11:0 to 63 into the GP.



■ MicroLogix 1000/1200/1500 Series

GP Setup		PLC (Channel 0) Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	---	---
Stop Bit	1 bit	---	---
Parity Bit	Even	---	---
Control Method	ER Control	---	---
Communication Format	RS-232C	---	---
	RS-422 (2-wire Type)	---	---
Source ID *1	0 to 31	---	---
Destination ID *1	0 to 31	Node Address *1	0 to 31
Maximum ID *2	0 to 31	Max.Node Address *2	0 to 31
---	---	Dribver	DH485
---	---	Token Hold Factor	2

**1 Specify only unique node addresses so that they do not overlap node addresses of other equipment connected to the DH485 network.*

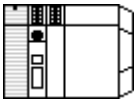
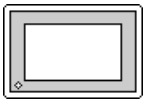
**2 This is the largest node address of the active processor. Specify the smallest practical value for the maximum node address. This will shorten the time required for initializing the network. All the node addresses are continuously specified starting with 0. When the value specified for the maximum node address is the same as that connected to the DH485 network, the transmission speed of the DH485 network can be improved.*


MEMO

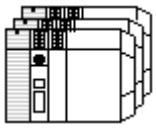
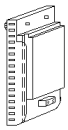
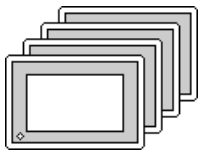
6.3 Modicon

6.3.1 System Structure

■ Modicon Modbus (GP Slave)

Host	Cable Diagram	GP
		
Modbus Master	RS-232C (Cable Diagram 1)	GP Series (Slave)
	RS-422 (Cable Diagram 2)	

■ Modicon Modbus Plus (CPU Direct Connection)

CPU	Cable Diagram	Unit	GP
		 Modbus Plus Module	
884, 984A, 984B	Modbus Plus cable	QPI-MBP-201 (TCP's) *1	Large Size GPs *2
		QPJ-MBP-201 (TCP's) *1	Medium Size GPs *3

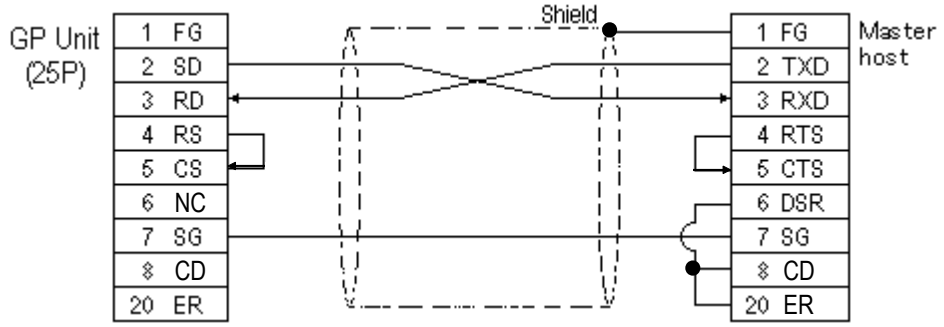
*1 Product manufactured by Total Control Products, Inc.

*2 For details, refer to 6.1 Connectable PLCs <GP List 1>.

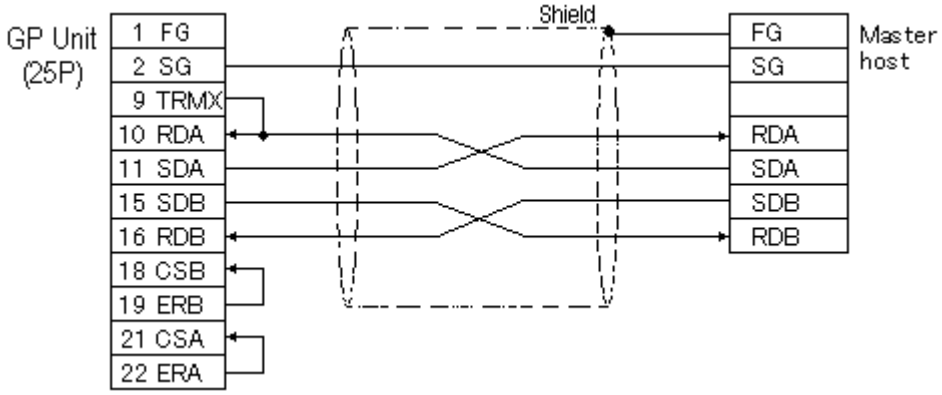
*3 For details, refer to 6.1 Connectable PLCs <GP List 2>.

6.3.2 Cable Diagrams

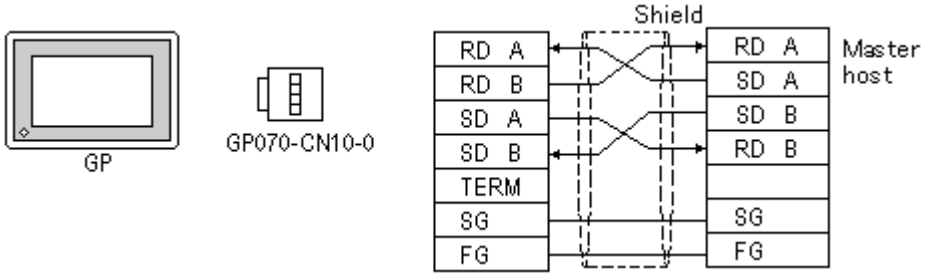
Cable Diagram 1 (RS-232C)



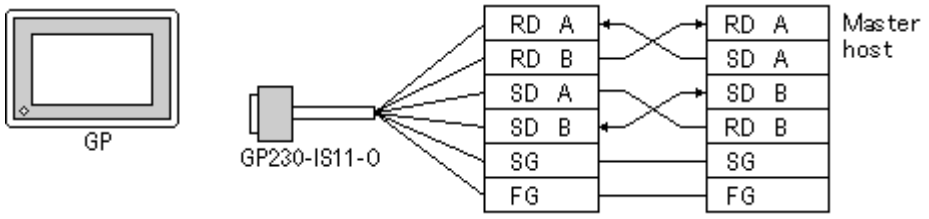
Cable Diagram 2 (RS-422)



• When using Digital's RS-422 connector terminal adapter GP070-CN10-0



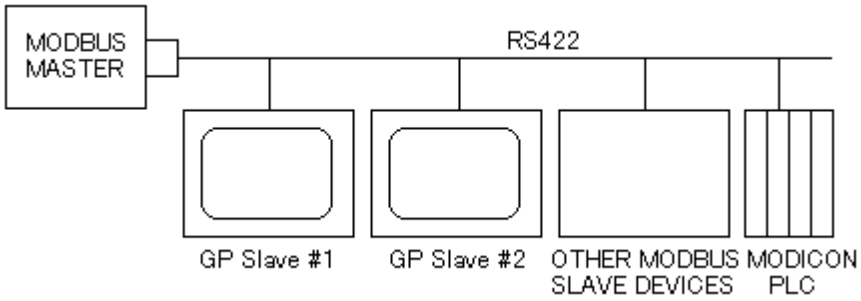
• When using Digital's RS-422 Cable, GP230-IS11-0



Note: **Wiring varies depending on types of master host.**

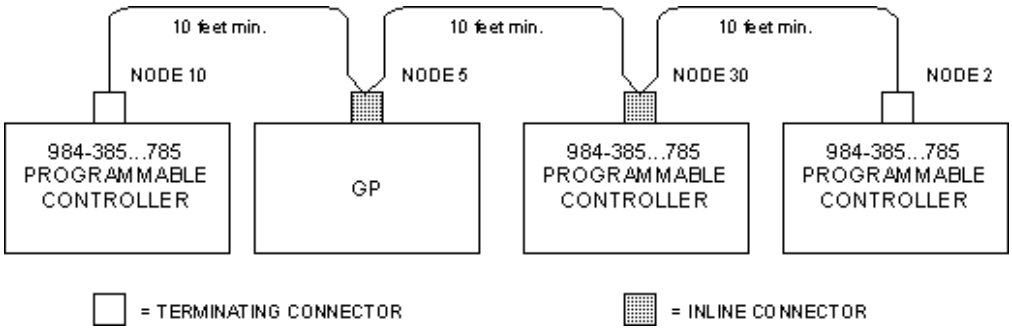
Modbus Slave Diagram

The drawing shows how a GP might be connected as a slave device.



Sample Network (Modbus Plus)

Each node has an LED indicator that flashes patterns to show its status on the network. A simple network consists of two or more nodes connected to a single section.



6.3.3 Supported Devices

■ Modicon Modbus (GP Slave)

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Output Register	---	40001 ~ 49999		L/H

■ Modicon Modbus Plus

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Output Bit	00001 ~ 08192	---	*1	L/H
Input Bit	10001 ~ 18192	---	*1*2	
Output Relay	---	40001 ~ 49999		
Input Register	---	30001 ~ 39999	*2	

**1 Can also specify a word (16 bit data).*

**2 Cannot perform data write.*

6.3.4 Environment Setup

■ Modicon Modbus (GP Slave)

GP Setup		COM Port	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	RTV (8 bits)
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	EVEN
Data Flow Control	ER	Data Flow Control	ER
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
Communication Format (RS-422)	RS422	Communication Format (RS-422)	RS422
Unit No.	1	Unit No. *1	1

1 Unit No. shows the number of the GP itself.

■ Modicon Modbus Plus

GP Setup		COM Port	
Baud Rate	---	---	---
Data Length	---	---	---
Stop Bit	---	---	---
Parity Bit	---	---	---
Data Flow Control	---	---	---
Communication Format (RS-232C)	---	---	---
Communication Format (RS-422)	---	---	---
Unit No.	---	---	---
Station Address *1	1	---	---
Route Selection *2	1	Station Address	2

** 1 Set the station address with the Dip Switch for Modbus Plus module (QPI-MBP-201/QPJ-MBP-201).*

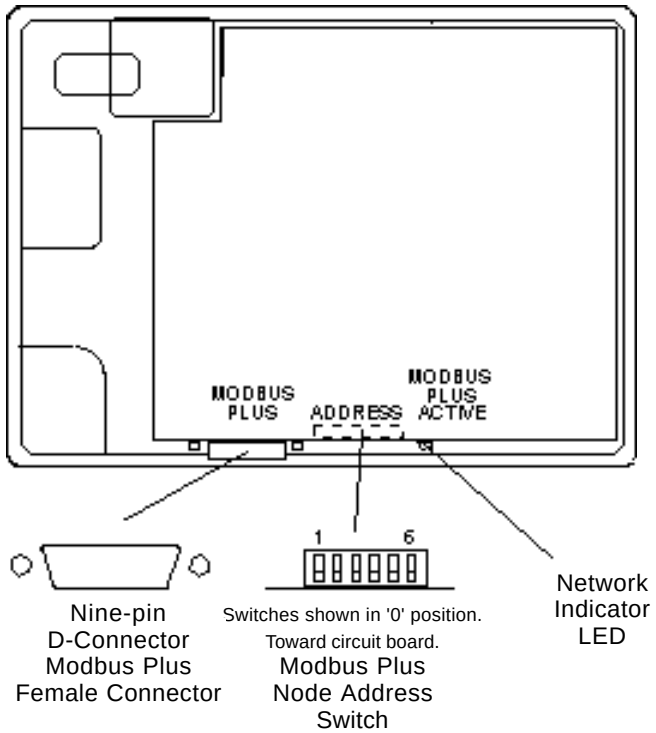
** 2 Route Selection can be made via the GP-PRO/PBIII System Settings area's "Option" menu.*

Important

- ***Operation Environment settings cannot be set using the GP's OFFLINE mode. Be sure to use the GP-PRO/PBIII [System Setup] area to do this.***
- ***E and K-tags cannot use the "Indirect" Setting.***
- ***After the H-tag starts (is triggered), data cannot be read (out).***
- ***After the S-tag starts (is triggered), data cannot be read (out).***
- ***The Trend graph's group data display's PLC device designation cannot be made.***
- ***For GP70 Series, the data backup feature cannot be used, (only with Modbus PLUS).***
- ***D-Script 's Memory Copy and Offset Address features cannot be used.***
- ***The Logging and Filing Data features cannot be used.***
- ***2-Way Driver can access to only LS Area.***
- ***LS Area (Read Area) Restrictions***
  Unable to write records in the Read Area that exceed the boundary of 1024 and 41 words.

Modbus Plus Adapter Module

The following drawing illustrates the Modbus Plus Adapter I/O module on a GP270 display.



Station Address Switches

Station Address Switch Positions

	1	2	3	4	5	6
	(1)	(2)	(4)	(8)	(16)	(32)
1	0	0	0	0	0	0
2	1	0	0	0	0	0
26	1	0	0	1	1	0
32	1	1	1	1	1	0
64	1	1	1	1	1	1

Add one to switch a desired address setting. Switch down=ON=0.

Route Strings

Route strings are added to a variable name to locate the PLC address, which may be at the end of a chain. Each point on the link must be defined in order to arrive at the selected processor. For example, a route might be 60, 20, and 1, which would appear at the end of the variable name as 4100_60.20.1. If you define Route A as 60.20.1, then the variable name can be 4100_A. There are 26 route menus, designated A through Z.

The above setting can be made via the GP-PRO/PBIII System Settings area's "Option" menu.

7 Ethernet Connections

This chapter describes the system configuration of PLC made by various manufacturers and the GP [Ethernet], and explains the supported devices and examples of setting up the operating environment.

Important ***If Ethernet communication is performed using by the memory link method are used,***

Reference *Refer to the GP70 Series Memory Link Communication Protocol Manual. (GP Ethernet I/F Unit)*

7.1 Connectable PLCs

The following tables list the PLCs that can be connected and used with the GP.

	Series Names	CPU	Ethernet Unit	Comments	PLC type in PRO/PBIII
MITSUBISHI	MELSEC-A	A2A A3A A2U-S1 A2N	AJ71E71	When using GP70, GP77R series units and the GP-2501T, an Ethernet-compatible unit is required. <GP/GLC List 1>	MITSUBISHI MELSEC-A(ETHER)
		A2US	A1SJ71E71		
	MELSEC-Q (Q mode CPU)	Q00CPU Q01CPU Q00JCPU Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	QJ71E71 QJ71E71-B2	When using GP77R series units and the GP-2501T, an optional Ethernet unit is required. <GP/GLC List 2>	MITSUBISHI MELSEC-Q(ETHER)
	MELSEC-QnA	Q2A Q2A-S1 Q3A Q4A Q4AR	AJ71QE71 AJ71QE71-B5		
		Q2AS Q2ASH Q2AS-S1 Q2ASH-S1	A1SJ71QE71-B2 A1SJ71QE71-B5		

Careful! *When using the MELSEC-Q Series Multi CPU system, only Ethernet Unit's Control CPU that are connected to the GP can be accessed.*

	Series Name	CPU	Ethernet Unit	Comments	PLC type in PRO/PBIII
TOSHIBA	PROSEC-T	T3H	EN311	When using GP70, GP77R series units and the GP-2501T, an Ethernet-compatible unit is required. <GP/GLC List 1>	TOSHIBA PROSEC-T(ETHER)
		T2N	PU-235N PU-245N		
YOKOGAWA	FACTORY ACE FA-M3	F3SP20-0N F3SP21-0N F3SP25-2N F3SP30-0N F3SP35-5N F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S	F3LE01-5T F3LE11-0T	When using GP70, GP77R series units and the GP-2501T, an Ethernet-conmpatible unit is required. <GP/GLC List 1>	YOKOGAWA FA-M3 (ETHER)
OMRON	SYSMAC CS1 Series	CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42 CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	CS1W-ETN01	When using GP77R series units and the GP-2501T, an optional Ethernet unit is required. This units should not be used to connect with Pro-Server. <GP/GLC List 2>	OMRON SYSMAC-CS1 (ETHER)
	SYSMAC CJ Series	CJ1G-CPU44 CJ1G-CPU45	CJ1W-ETN11		
Meidensha	UNISEQUE Series	RC100	RM105	<GP/GLC list 2>	Meidensha Ethernet
		ADC4000	AM417		
		ADC7000			

The GP/GLC series applicable for Ethernet are listed below:

■ List 1 of Applicable GP/GLC Units

Series Name		Product Name	Optional Ethernet I/F Unit	Built-in Ethernet Port
GP70 Series	GP-470 Series	GP-470E	❍	x
	GP-570 Series	GP-570S	❍	x
		GP-570T	❍	x
		GP-57JS	❍	x
		GP-570VM	❍	x
	GP-571 Series	GP-571T	❍	x
	GP-675 Series	GP-675S	❍	x
		GP-675T	❍	x
	GP-870 Series	GP-870VM	❍	x
GP77R Series	GP-377R Series	GP-377RT	❍*1 *2	x
	GP-477R Series	GP-477RE	❍*2	x
	GP-577R Series	GP-577RS	❍*2	x
		GP-577RT	❍*2	x
GP2000 Series	GP-2300 Series	GP-2300L	x	❍
		GP-2300T	x	❍
	GP-2400 Series	GP-2400T	x	❍
	GP-2500 Series	GP-2500L	❍*3 *4	❍
		GP-2500S	❍*3 *4	❍
		GP-2500T	❍*3 *4	❍
	GP-2501 Series	GP-2501S	❍*2 *3	x
		GP-2501T	❍*2 *3	x
	GP-2600 Series	GP-2600T	❍*3 *4	❍
GLC2000 Series	GLC-2300 Series	GLC-2300L	x	❍
		GLC-2300T	x	❍
	GLC-2400 Series	GLC-2400T	x	❍
	GLC-2600 Series	GLC-2600T	❍*3 *4	❍

**1 Only the Multi unit can be used.*

**2 The 2-Way Driver (Pro-server, GP-Web and others) cannot be used.*

**3 When using the optional Ethernet I/F unit, a bus conversion unit (PSL-CONV00) is required.*

**4 Using the optional Ethernet I/F Unit allows you to set up separate Class and Net No.s for 2-Way Driver applications (Pro-Server, GP-Web and others) and the PLC. When doing this, data transfer with the PLC is performed through the optional Ethernet I/F Unit.*

■ List 2 of Applicable GP/GLC Units

Series Name		Product Name	Expansion Ethernet Unit	Built-in Ethernet Port
GP77R Series	GP-377R Series	GP-377RT	❍*1*2	x
	GP-477R Series	GP-477RE	❍*2	x
	GP-577R Series	GP-577RS	❍*2	x
		GP-577RT	❍	x
GP2000 Series	GP-2300 Series	GP-2300L	x	❍
		GP-2300T	x	❍
	GP-2400 Series	GP-2400T	x	❍
	GP-2500 Series	GP-2500L	❍*3*4	❍
		GP-2500S	❍*3*4	❍
		GP-2500T	❍*3*4	❍
	GP-2501 Series	GP-2501S	❍*2*3	x
		GP2501T	❍*2*3	x
	GP-2600 Series	GP-2600T	❍*3*4	❍
GLC2000 Series	GLC-2300 Series	GLC-2300L	x	❍
		GLC-2300T	x	❍
	GLC-2400 Series	GLC-2400T	x	❍
	GLC-2600 Series	GLC-2600T	❍*3*4	❍

**1 Only Multi unit can be used.*

**2 The 2-Way Driver (Pro-Server, GP-Web and others) cannot be used.*

**3 When using optional Ethernet I/F unit, a bus conversion unit (PSL-CONV00) is required.*

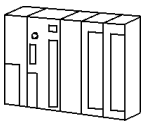
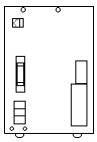
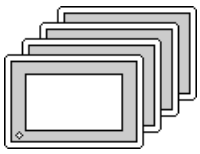
**4 Using the optional Ethernet I/F Unit allows you to set up separate Class and Net No.s for 2-Way Driver applications (Pro-Server, GP-Web and others) and the PLC. When doing this, data transfer with the PLC is performed through the optional Ethernet I/F Unit.*

7.2 Mitsubishi Electric

7.2.1 System Structure for Ethernet Connection

This section explains the system structure for the Ethernet connection between a PLC made by Mitsubishi Electric and the GP.

■ MELSEC-A Series/AJ71E71, A1SJ71E71 (using Ethernet Unit)

CPU	Link I/F	Cable Diagram	Cables	Unit	GP/GLC
	 Ethernet Unit				
A2A, A3A, A2N, A2U-S1	AJ71E71		Ethernet cable (conforming to the IEEE802.3)	Digital's GP Ethernet I/F Unit (GP070-ET11/GP070--ET41) GP77R Series Multi Unit E (GP077-MLTE11) GP-377R Series Multi Unit (GP377-MLTE11)	GP/GLC Series *1
A2US	A1SJ71E71				

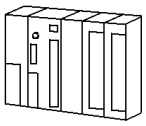
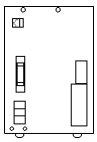
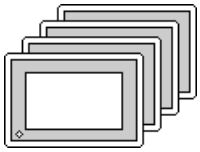
**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 1 of Applicable GP/GLC Units.*

Note:

- **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, however, refer to the user's manual for the main unit.**

■ MELSEC-Q Series

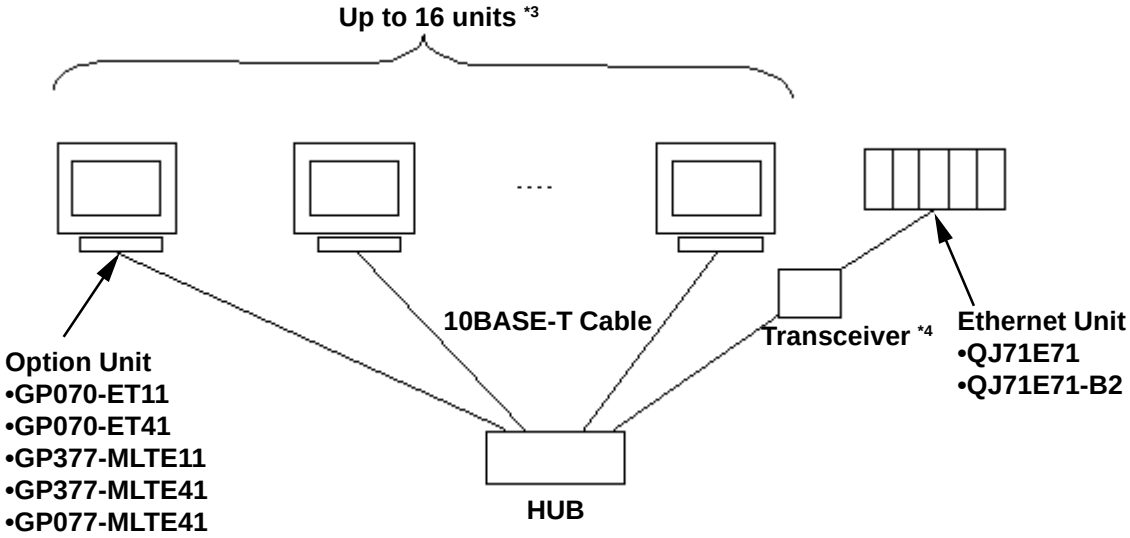
CPU	LinkI/F	Cable Diagram	Cables	Unit	GP/GLC
	 Ethernet Unit				
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	QJ71E71 QJ71E71-B2		Ethernet cable (conforming to the IEEE802.3)	Digital's GP Ethernet I/F Unit GP070-ET11 GP070-ET41 GP377-MLTE11 GP377-MLTE41 GP077-MLTE41	GP/GLC Series *1

**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 1 of Applicable GP/GLC Units.*

Note: • **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, however, refer to the user's manual for the main unit.**

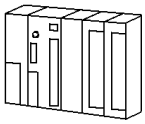
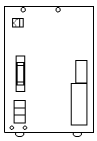
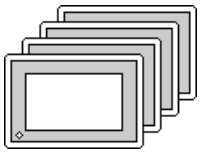
◆ Connction Structure



**3 When transmitting data via the PLC's OPEN Setting feature instead of the Auto OPEN UDP Port feature, up to 16 GP units can be connected. Also, when using the PLC's Auto Open UDP Port feature, there is no limitationfor for the number of GP units that can be connected.*

**4 When using a 10BASE-5 or a 10BASE-2 cable with the Mitsubishi PLC, use a transceiver to connect this cable with the 10BASE-T cable.*

■ MELSEC-QnA Series

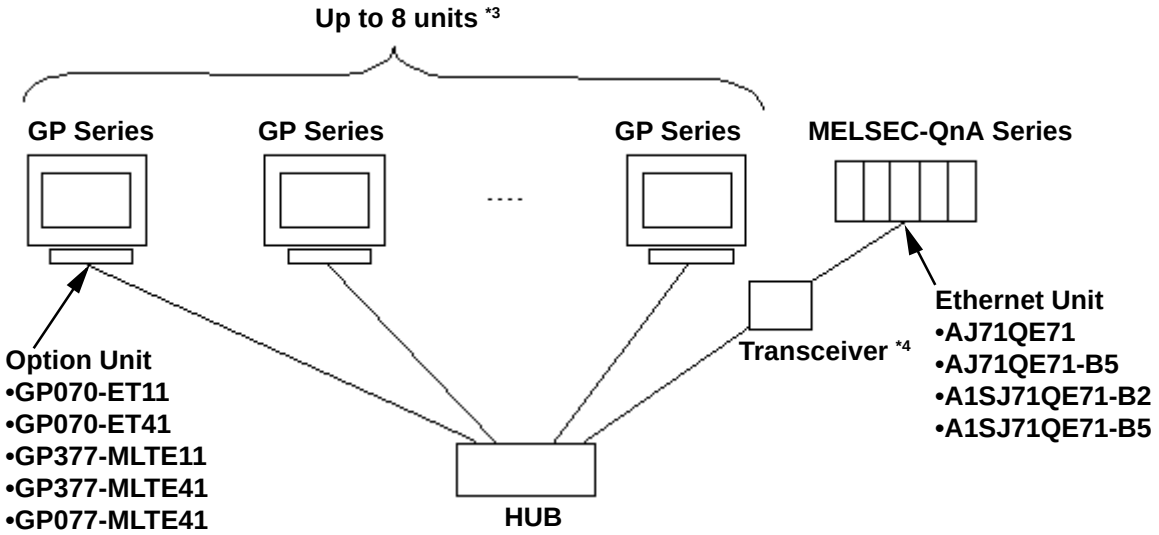
CPU	Link I/F	Cable Diagram	Cables	Unit	GP/GLC
	 Ethernet Unit				
Q2A Q2A-S1 Q3A Q4A Q4AR	AJ71QE71 AJ71QE71-B5		Ethernet cable (conforming to the IEEE802.3)	Digital's GP Ethernet I/F Unit GP070-ET11 GP070-ET41 GP377-MLTE11 GP377-MLTE41 GP077-MLTE41	GP/GLC Series *1
Q2AS Q2AS-S1 Q2ASH Q2ASH-S1	A1SJ71QE71-B2 A1SJ71QE71-B5				

**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 1 of Applicable GP/GLC Units.*

Note: • **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, however, refer to the user's manual for the main unit.**

◆ Connection Structure



**3 When transmitting data via the PLC's OPEN Setting feature instead of the Auto OPEN UDP Port feature, up to 8 GP units can be connected. Also, when using the PLC's Auto Open UDP Port feature, there is no limitationfor for the number of GP units that can be connected.*

**4 When using a 10BASE-5 or a 10BASE-2 cable with the Mitsubishi PLC, use a transceiver to connect this cable with the 10BASE-T cable.*

7.2.2 Supported Devices

The following describes the range of devices supported by the GP.

■ MELSEC-A Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X07F0	xxx0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y07F0	xxx0	
Internal Relay	M0000 ~ M8191	M0000 ~ M8176	÷16	
Latch Relay	L0000 ~ L8191	---		
Special Relay	M9000 ~ M9255	M9000 ~ M9240	÷16	
Annunciator	F0000 ~ F2047	F0000 ~ F2032	÷16	
Link Relay	B0000 ~ B0FFF	---		
Timer (contact)	TS0000 ~ TS2047	---		
Timer (coil)	TC0000 ~ TC2047	---		L/H
Counter (contact)	CS0000 ~ CS1023	---		
Counter (coil)	CC0000 ~ CC1023	---		
Timer (current value)	---	TN0000 ~ TN2047		
Counter (current value)	---	CN0000 ~ CN1023		
Data Register	---	D0000 ~ D6143	Bit15	
Special Register	---	D9000 ~ D9255	Bit15	
Link Register	---	W0000 ~ W0FFF	BitF	
File Register	---	R0000 ~ R8191	Bit15	

Note: The range of supported devices may differ depending on your CPU. For the range of supported devices for each CPU, refer to the User's Manual for Model AJ71E71 Interface Unit by Mitsubishi Electric.

■ MELSEC-Q/MELSEC-QnA Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X1FFF	X0000 ~ X1FF0	xxx0	
Output Relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	xxx0	
Internal Relay	M0000 ~ M32767	M0000 ~ M32752	÷16	
Special Relay	SM0000 ~ SM2047	SM0000 ~ SM2032	÷16	
Latch Relay	L0000 ~ L32767	L0000 ~ L32752	÷16	
Annunciator	F0000 ~ F32767	F0000 ~ F32767	÷16	
Edge Relay	V0000 ~ V32767	V0000 ~ V32752	÷16	
Step Relay	S0000 ~ S8191	S0000 ~ S8176	÷16	
Link Relay	B0000 ~ B7FFF	B0000 ~ B7FF0	xxx0	
Special Link Relay	SB000 ~ SB7FF	SB000 ~ SB7F0	xxx0	
Timer (contact)	TS00000 ~ TS23087	————		
Timer (Coil)	TC00000 ~ TC23087	————		
Aggregate Timer (contact)	SS00000 ~ SS23087	————		
Aggregate Timer (coil)	SC00000 ~ SC23087	————		
Counter (contact)	CS00000 ~ CS23087	————		L/H
Counter (coil)	CC00000 ~ CC23087	————		
Timer (current value)	————	TN00000 ~ TN23087		
Aggregate Timer (current value)	————	SN00000 ~ SN23087		
Counter (current value)	————	CN00000 ~ CN23087		
Data Register	————	D00000 ~ D25983	Bit15	
Special Register	————	SD0000 ~ SD2047	Bit15	
Link Register	————	W0000 ~ W657F	BitF	
Special Link Register	————	SW000 ~ SW7FF	BitF	
File Register (Normal)	————	R0000 ~ R32767	Bit15	
File Register (Serial)	————	0R0000 ~ 0R7FFF	BitF	
	————	1R0000 ~ 1R7FFF	BitF	
	:	:	:	
	————	30R0000 ~ 30R7FFF	BitF	
	————	31R0000 ~ 31R67FF	BitF	

Note:

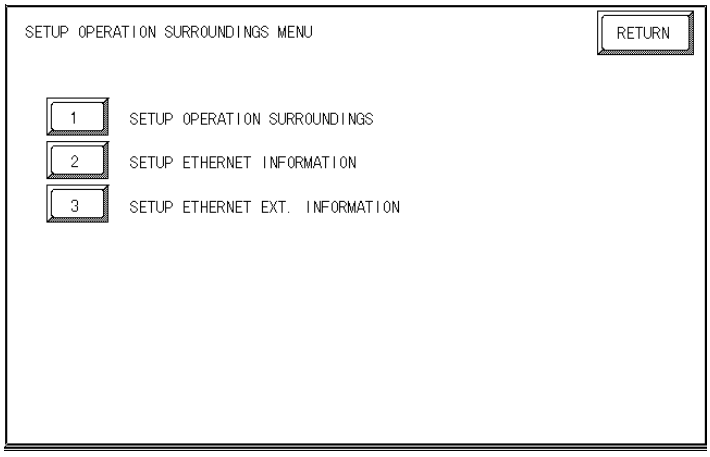
- **The device ranges given here show the maximum range available for each parameter setting.**
- **When using File Regsters, depending on the type of unit used, a PLC Memory Card may be required. Depending on the size of the Memory Card, the device ranges will change. For details, refer to Mitsubishi Electric Co., Ltd's User's Manual.**
- **When using the QnA series unit's File Registers, depending on the QnA unit's CPU version, certain usage restrictions will apply. For details, refer to Mitsubishi Electric Co., Ltd.'s User's Manual for QnA Series.**

7.2.3 Environment Setup

■ GP Settings

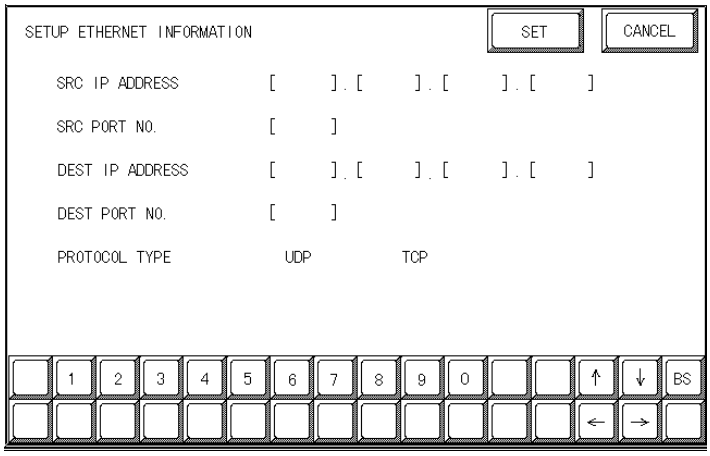
The communications settings for the GP, which are required for communications via the Ethernet, as shown below:

◆ SET UP OPERATION SURROUNDINGS Menu



◆ SET UP ETHERNET INFORMATION

Select “SET UP ETHERNET INFORMATION,” and then enter the necessary information for each item.



- **SRC IP ADDRESS**

  Enter the IP address for the GP at your station. To do this, separate the 32 bits of the IP address into four segments of eight bits each, delimit those segments with a dot, and then enter them as decimal numbers.

- **SRC PORT NO.**

  Enter your station port number in the range from 1024 to 65535.

- **DEST IP ADDRESS**

  Enter the IP address of the other station (the MELSEC).

- **DEST PORT NO.**

  Enter the port number of the other station in the range from 1024 to 65535.

- **PROTOCOL TYPE**

  You can select either UDP or TCP communication. If the power will be turned ON/OFF synchronously, it is recommended that you use UDP communications.

For the IP addresses, check with the network manager. Do not specify any duplicate IP address.

Important

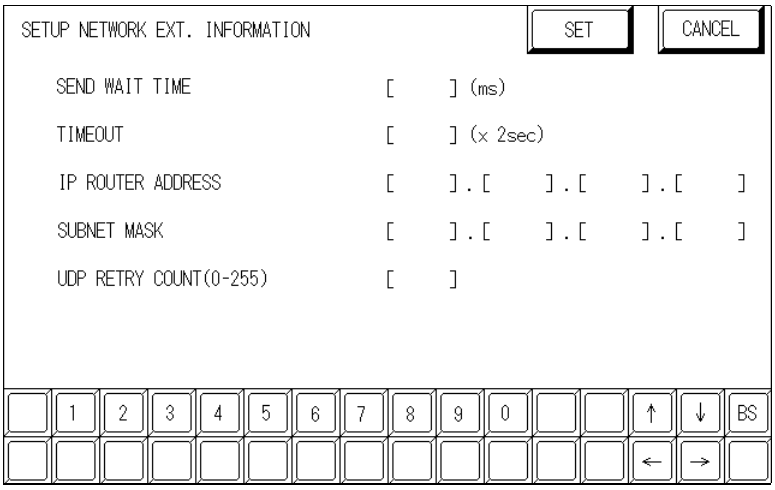
When using the built-in Ethernet port on a GP2000 or GLC2000 series unit, be sure not to set any duplicate "SRC PORT No." values.

Check the 2-way driver's "SRC PORT No." setting via the following menu:

GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

The default value is 8000. The 2-way driver uses this port and the following 9 ports (8000 ~ 8009). Be sure not to use Port No.s 5001 and 5002, since they are used by the PLC's Ethernet Unit.

◆ SET UP NETWORK EXT. INFORMATION



- **SEND WAIT TIME (0 to 255)**

  Wait time can be added when a command is transmitted from the GP. Use the wait time if the traffic on the communications line is heavy. If no wait time is required, enter “0.”

- **TIMEOUT (0 to 65535)**

  Enter the desired timeout value. If no response is received from the other station within the specified time, a timeout occurs. If "0" is specified, the default time is 15 seconds when it is TCP communication, and is 5 seconds when it is UDP communication.

- **IP ROUTE ADDRESS**

  Enter the IP address of the router (only one). If no router is used, enter "0" in all fields.

- **SUBNET MASK**

  Enter subnet masks. If no subnet mask is used, enter "0" in all fields.

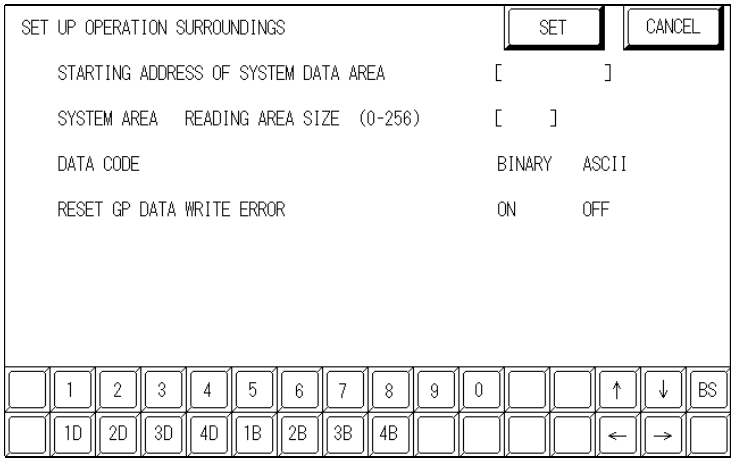
- **UDP RETRY COUNT (0 to 255)**

  Designates the number of times the GP re-sends a command when there is no reply from the other port and a timeout occurs. When no reply is received after the re-try setting number is reached, an error message will appear on the GP screen.

Important

If the memory is initialized in the OFFLINE mode, random values may be included. Be sure to check the displayed values.

◆ **SET UP OPERATION SURROUNDINGS**



- **DATA CODE (Set only when connecting to a MELSEC-Q Series and MELSEC-QnA Series)**

  This selection controls the type of DATA CODE settings used. Select either BINARY or ASCII, and confirm that the PLC settings are the same.

■ Sample Ladder Program

◆ MELSEC-A Series (Ethernet interface unit: AJ71E71)

PLC's Ladder Program is needed to communicate with the GP.

Reference *For the complete details of settings, refer to the user's manual for Model AJ71E71 Ethernet Interface Unit (Mitsubishi Electric).*

The follwing is a sample ladder.

<Sample Ladder>

```
LD      M9038
DMOVP   Hxxxxxxxx       D100 (IP address of PLC) *1
MOVP    K0          D102
MOV     H0100       D116  (Settings for UDP communications)
MOV     K1024       D124  (Port number of PLC)
MOV     K1024       D127  (Port number of GP)
DMOV    Hxxxxxxxx   D125  (IP address of GP) *1
DMOV    HFFFFFFFF       D128
MOV     HFFFF       D130
LD      M9036
TOP     H0000   H0000       D100  K50
LD      X0019
MOV     K5      D113
TOP     H0000   K13         D113   K1
LD      M9036
OUT     Y0019
LD      M9036
OUT     Y0008
END
```

**1 For the IP addresses, check with the network manager. "xxxxxxxx" stands for an IP address in the hexadecimal notation. Do not specify any duplicate addresses.*

Important ***Be sure that any addresses (D...) used in the communications settings for the PLC are not the same as the first address of the system on the GP.***

◆ MELSEC-Q Series

Prior to GP starting GP communciation, the MNET/10H Ethernet settings must be set in the PLC's ladder logic software. The setting values are as shown below.

1. Network Parameter MNET/10H Ethernet Settings
2. Ethernet Operation Settings
3. OPEN Settings

1. Network Parameter MNET/10H Ethernet Settings

Items	PLC Settings
Network Classification	Ethernet
First I/O No.	Any number *1
Network No.	Any number *1
Group No.	Any number *1
Machine No.	Any number *1
Mode	Online

**1 This setting does not effect PLC/GP communication.*

2. Ethernet Operation Settings

Recommended Settings

Items	PLC Settings	
Data Code Settings	BINARY Code	ASCII Code
Initial Timing Settings	Not waiting for OPEN	Always waiting for OPEN
IP Address Settings	Any number *1	
Write Possible in RUN mode	Not allowed	Allowed *2

**1 Please contact your computer network supervisor to confirm your setting data.*

**2 When performing Write from a GP in RUN mode, set the Write Possible in RUN mode to "Allowed".*

3. OPEN Settings

Items	PLC Settings			Remarks
Protocol	TCP/IP		UDP/IP	Should be same as GP unit's Communcation Format Settings.
OPEN Format *1	Active	Fullpassive	Unpassive	Either Fullpassive or Unpassive can be used.
SRC Port No.	Any number *2			Should be same as GP unit's DEST Port No.
DEST IP Address	Any number *2 *3			Should be same as GP unit's SRC IP Address.
DEST Port Address	Any number *2 *3			Should be same as GP unit's SRC Port No
Fixed Buffer	Transmission		Subscription	Independent of GP.
Fixed Buffer Method	Yes		No	Independent of GP.
Paring Open	Yes		No	Independent of GP.
Confirming	No		Yes	Both can be used.

**1 Can be used only when Protocol is set to TCP/IP.*

**2 Please contact your computer network supervisor to confirm your setting data.*

**3 If OPEN Format is set to "Unpassive", this item does not need to be set*

When the Auto Open UDP Port feature is used, the Table 3. OPEN Settings are not needed. When these settings are used, however, the PLC's port number is 5000 (default setting).

Reference *For details, refer to Mitsubishi Electric's Q and QnA Series Ethernet Interface User Manuals.*

◆ **MELSEC-QnA Series**

PLC's Ethernet Unit Dipswitch Settings and a Ladder Program are needed to communicate with the GP.

Ethernet Unit Settings

• Operation Mode Setting Switch

Contents	Settings
Operation Mode Settings	0:Online

• Communication Condition Setting Switch

Recommended Settings

Switch	Contents	Settings	
SW1	Action performed when TCP/IP Timeout occurs	OFF:When TCP/IP Timeout Error occurs, the line is closed.	ON:When TCP/IP Timeout Error occurs, the line is not closed.
SW2	Data Code Settings	OFF:BINARY Code	ON:ASCII Code
SW3	Auto Start Settings	OFF:Perform action(s) defined in Y19.	ON:Regardless of Y19, after unit is turned ON again or is Reset, Initialization is performed.
SW4~SW6	Cannot use (fixed to OFF)		
SW7	CPU Communication Timing Settings *1	OFF:Write in RUN mode is Impossible.	ON:Write in RUN mode is Possible.
SW8	Initial Timing Settings	OFF:Quick Start (start without time delay)	ON:Normal Start (Start after 20 seconds time delay)

**1 When performing Write From GP in RUN mode, set the CPU Comunication Timing Settings to ON.*

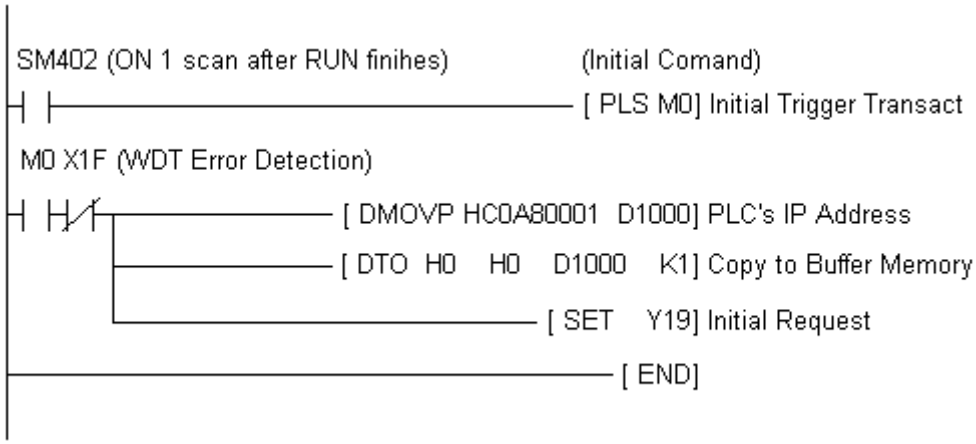
Sample Ladder Program

This Sample Ladder Program is for communication via the Auto Open UDP Port No. (default:5000).

• PLC IP Address: 192.168.0.1

• PLC Port No.: 5000

When communicating via this function, the GP's IP Address and Port No. do not need to be set.



Reference *The sample ladder above is the minimum ladder to communicate with GP via UDP/IP. For details about error processing and TCP/IP communication, refer to Mitsubishi Electric Co., Ltd.'s User's manual for QnA Series Ethernet Interface Unit (Detail manual).*

7.2.4 Error Code

Reference *About the GP Ethernet Speicific Error Codes, refer to the end of this Chapter, "Protocol Stack Error Codes".*

■PLC SPECIFIC ERROR CODES

PLC error codes are displayed by the " Host Communication Error (02:**:**)", and indicated in the left lower corner of the GP screen. (**:**indicates the PLC's specific error codes)

Error Code	Description	Status
0055	Write error in RUN mode	Write in RUN mode is set to OFF.
4031	CPU Device Settings Error	Designated device is outside allowable range.

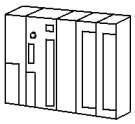
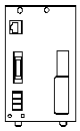
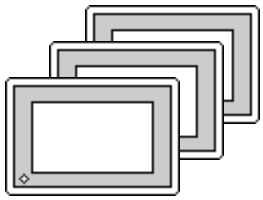
Reference *For more details about error codes, refer to Mitsubishi Electric Co., Ltd.'s User's Manuals for Q Series Ethernet Interface Unit and QnA Series Ethernet Interface Unit.*

7.3 TOSHIBA

7.3.1 System Structure for Ethernet Connection

This section explains the system structure for the Ethernet connection between a PLC made by Toshiba and the GP.

■ PROSEC T Series (using Ethernet unit)

CPU	Link I/F	Cables	Unit	GP/GLC
	Ethernet Unit 			
T3H	EN311	Ethernet cable (conforming to the IEEE802.3)	Digital's GP Ethernet I/F unit (GP070-ET11/GP070-ET41) GP77R Series Multi Unit E (GP077-MLTE11) GP377R Series Multi Unit (GP377-MLTE11)	GP/GLC Series *1
T2N	PU-235N PU-245N			

**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 1 of Applicable GP/GLC Units.*

Note:

- **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, however, refer to the user's manual for the main unit.**

7.3.2 Supported Devices

The following describes the range of devices supported by the GP.

■ PROSEC T Series (T3H)

Setup System Area here.

Device	Bit Address	Word Address	Particular	
Input Device	X0000 ~ X511F	XW000 ~ XW511		L/H
Output Device	Y0000 ~ Y511F	YW000 ~ YW511		
Auxiliary Relay	R0000 ~ R999F	RW000 ~ RW999		
Special Relay	S0000 ~ S255F	SW000 ~ SW255		
Link Register Relay	Z0000 ~ Z999F	-		
Link Relay	L0000 ~ L255F	LW000 ~ LW255		
Timer (contact)	T000 ~ T999	-	Read only	
Counter (contact)	C000 ~ C511	-	Read only	
Timer (current value)	-	T000 ~ T999		
Counter (current value)	-	C000 ~ C511		
Data Register	-	D0000 ~ D8191	Bit 15	
Link Register	-	W0000 ~ W2047	Bit 15	
File Register	-	F00000 ~ F32767	Bit 15	

Note: **The range of supported devices may be different depending on your CPU. For details, refer to Toshiba PLC's user's manual.**

Important ***If you Write in Read Only Timer (contact) device or in Read Only Counter (contact) device, the "PLC COM. ERROR (02:10)" message will appear.***

■ PROSEC T Series (T2N)

Setup System Area here.

Device	Bit Address	Word Address	Particular	
Input Device	X0000 ~ X127F	XW000 ~ XW127		L/H
Output Device	Y0000 ~ Y127F	YW000 ~ YW127		
Auxiliary Relay	R0000 ~ R255F	RW000 ~ RW255		
Special Relay	S0000 ~ S255F	SW000 ~ SW255		
Link Register Relay	Z0000 ~ Z999F	-		
Link Relay	L0000 ~ L255F	LW000 ~ LW255		
Timer (contact)	T000 ~ T511	-	Read Only	
Counter (contact)	C000 ~ C511	-	Read Only	
Timer (current value)	-	T000 ~ T511		
Counter (current value)	-	C000 ~ C511		
Data Register	-	D0000 ~ D8191	Bit 15	
Link Register	-	W0000 ~ W2047	Bit 15	
File Register	-	F0000 ~ F1023	Bit 15	

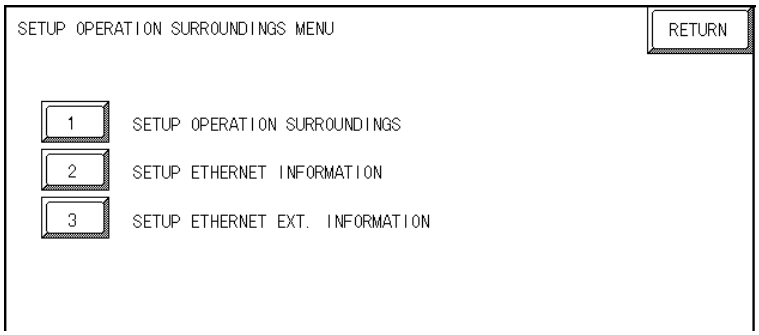
Important

If you Write in Read Only Timer (contact) device or in Read Only Counter (contact) device, the "PLC COM. ERROR (02:10)" message will appear.

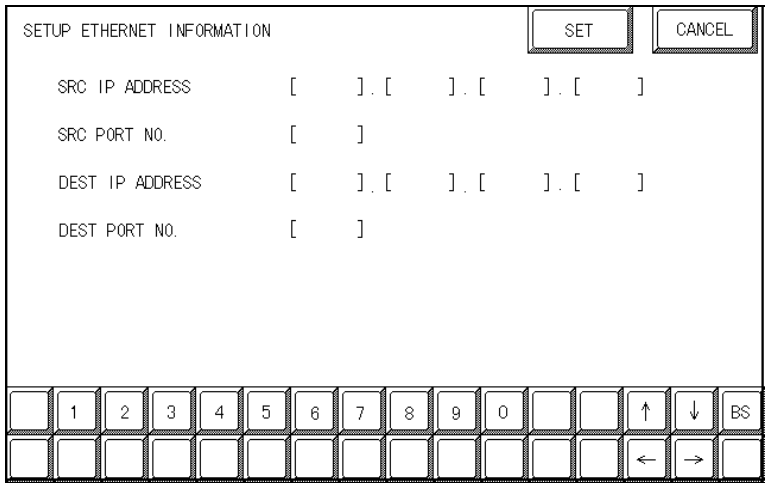
7.3.3 Environment Setup

■ GP Unit Setup

The following describes GP settings for using Ethernet communicaiton.



Important ***Set the station No. to "0" for [1] SET UP OPERATION SURROUNDINGS.***



Select "SETUP ETHERNET INFORMATION" and set up the Addresses and Port Numbers.

• SRC IP ADDRESS

Enter GP's SRC IP Address. Input a dot between every 8 bits to divide the IP Address (32 bits all together) into four gorups, and enter decimal numbers in each groups.

• SRC PORT NO.

Set the SRC Port No. between 1024 and 65535.

• DEST IP ADDRESS

Set the PROSEC's DST IP Address.

• DEST PORT NO.

Set the DEST Port No. between 1024 and 65535.

Note: **The communication method is UDP format.**

Important

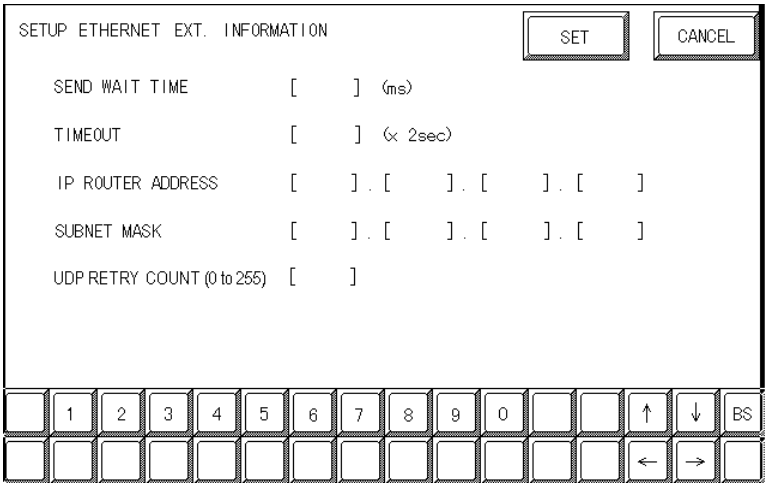
When using the built-in Ethernet port on a GP2000 or GLC2000 series unit, be sure not to set any duplicate "SRC PORT No." values.

Check the 2-way driver's "SRC PORT No." setting via the following menu:

GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

The default value is 8000. The 2-way driver uses this port and the following 9 ports.

Regarding the IP Address and the Port No., please confirm these points with your Network supervisor. You must not duplicate the number you have already used for an IP Address setting.



SEND WAIT TIME

You can display the waiting time while GP's command is actually sent. This function is useful when there is a lot of traffic in your system. If not using, set it to "0".

TIMEOUT

You can set time for waiting for a replay from the destination. If any replay is not made by the destination within time you set to, the communication will be timeout. "0" setting is the default value as 15 second-setting for timeout.

IP ROUTER ADDRESS

Set Router's IP Address. (There is only one setting for Router.) If not using, set all values to "0".

SUBNET MASK

Set the Subnet Mask . If not using, set all values to "0".

UDP RETRY COUNT (0 to 255)

Important

- ***If you intialize the memory from the OFFLINE mode, some values might be automatically set to the factory settings. Please confirm all values after intialization.***
- ***Refer to the PLC's users manual for PLC settings.***
- ***Set the Ethernet module to the RUN mode after you have set the IP Address and the Port No.***

■ Sample Ladder Program

The following is the Sample Program shown in the Toshiba's Ethernet Module Users Manual.

◆IP Address \ Port No. settings

```
   | R0502                                                              R0602       |
1  |---||--------------------------------------------------------------( )----------|
   |                                                 /*  Parameter setting request */
   | R0602
2  |---||---------- +[12544 MOV RW000 ] [00018 MOV RW001 ]-------------------------- |
   |      |                                          /* Set Module and CMD No.*/
   |      |                                                                         |
   |      |          +[**** MOV RW002] [**** MOV RW003] [**** MOV RW004]------------ |
   |      |                                          /* Set IP Address and Port No.*/
   |      |                                                                         |
   |      |          +[RW000 SEND RW010] [RST R0502]--------------------------------- |
   |                                                 /* Set Request              */
   |                                                                                |
```

Important

Please contact your computer network supervisor to confirm your IP Address and Port No.

◆Operation Mode control

```
    | R0503                                                                  R0603      |
1   |---||----------------------------------------------------------------------( )-----------|
    |                                                         /*  Control request       */
    | R0603
2   |---||---------  +[12544  MOV  RW000  ]  [00019  MOV  RW001 ]------------------------ |
    |       |                                                 /* Set Module and CMD No.*/
    |       |                                                                             |
    |       |        +[04144 MOV RW002]------------------------------------------------- |
    |       |                                                /* Set designation data*/
    |       |                                                                             |
    |       |        +[RW000 SEND RW010]  [RST R0503]------------------------------------ |
    |                                                         /* Set Request          */
    |                                                                                     |
```

Important ***After setting an IP Address, you need to switch the system to LINE Mode.***

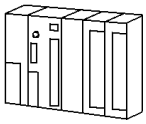
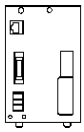
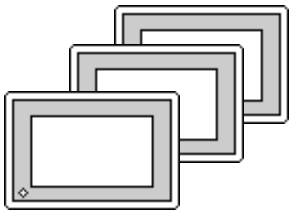

MEMO

7.4 Yokogawa Electric

7.4.1 System Structure for Ethernet Connection

This section explains the system structure for the Ethernet connection between a PLC made by Yokogawa Electric Corp. and the GP.

■ FACTORY ACE Series/FA-M3 (Using Ethernet Unit)

CPU	Link I/F	Cable	Unit	GP/GLC
	Ethernet Unit 			
F3SP20-0N F3SP21-0N F3SP25-2N F3SP30-0N F3SP35-0N F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S	F3LE01-5T F3LE11-0T	Ethernet Cable IEEE802.3 standard	Digital's GP Ethernet I/F unit (GP070-ET11/GP070-ET41) GP77R Series Multi Unit E (GP077-MLTE11) GP-377R Series Multi Unit (GP377-MLTE11)	GP/GLC Series *1

**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 1 of Applicable GP/GLC Units.*

Note: • **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, however, refer to the user's manual for the main unit.**

7.4.2 Supported Devices

The following list shows the range of devices supported by the GP.

■ FA-M3 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X71664	X00201 ~ X71649	÷16+1 *1 *2	L/H
Output Relay	Y00201 ~ Y71664	Y00201 ~ Y71649	÷16+1 *1	
Internal Relay	I00001 ~ I32768	I00001 ~ I32753	÷16+1	
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	÷16+1	
Special Relay	M0001 ~ M9984	M0001 ~ M9969	÷16+1	
Link Relay	L00001 ~ L78192	L00001 ~ L78177	÷16+1	
Timer (contact)	T0001 ~ T3072	---		
Counter (contact)	C0001 ~ C3072	---		
Timer (current value)	---	TP0001 ~ TP3072		
Timer (setup value)	---	TS0001 ~ TS3072	*2	
Counter (current value)	---	CP0001 ~ CP3072		
Counter (setup value)	---	CS0001 ~ CS3072	*2	
Data Register	---	D0001 ~ D32768	Bit 15	
File Register	---	B00001 ~ B065536	Bit 15 *3	
		B065537 ~ B131072		
		B131073 ~ B196608		
		B196609 ~ B262144		
Joint Register	---	R0001 ~ R4096	Bit 15	
Special Register	---	Z001 ~ Z1024	Bit 15	
Link Register	---	W00001 ~ W74096	Bit 15 *4	

**1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and*

Output Relay can only be a multiple of 16 +1.

E.g. For X00201

X 002 01

Slot No. — Terminal No.

**2 Cannot perform data write.*

(Continued on next page)

**3 File registers are each 65,535 words on your GP application.*

You cannot extend over more than a single data "block" when performingthe following features.

Be sure to set these features' settings so they are within a single data block.

1) "a-tag " settings

2) Performing Block read/write from Pro-Server

3) Desginating the "Convert from" and "Conver to" address for the "Address Conversion" features

**4 When using a PC Link module, only Link Register up to B99999 can be used.*

**5 A total of up to 4,096 link registers can be used.*

• Write the CPU Number (1~4) in front of the device name.

E.g. For Internal Relay I0001, CPU #3:

3 I0001

CPU No. Device Name

- **The range of device that can be used will vary depending on the type of PLC.**

  For detailed information refer to the Yokogawa's Sequnce CPU manual.

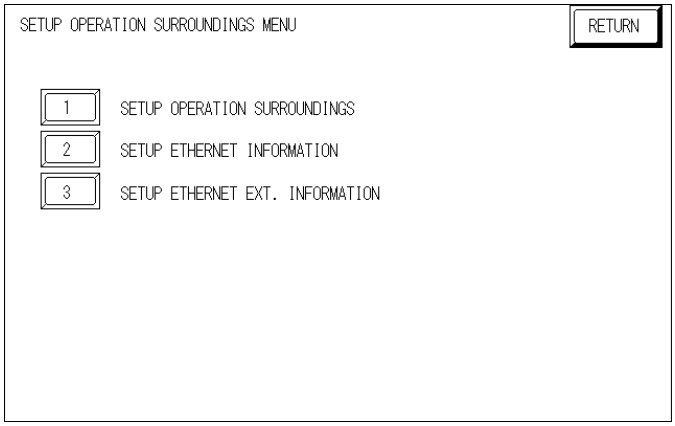
- **The Device fields used will differ depending on the type of PLC. Refer to the Yokogawa PLC's manual for the range allowed for the device address area.**

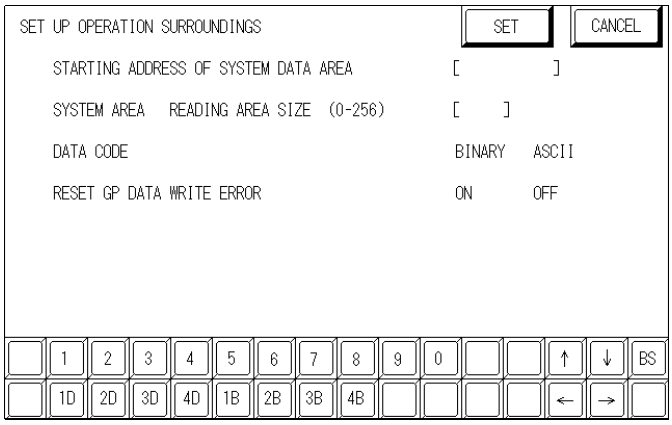
7.4.3 Environment Setup

■ GP Settings

The GP's required Ethernet communication settings are shown below.

◆SETUP OPERATION SURROUNDINGS MENU



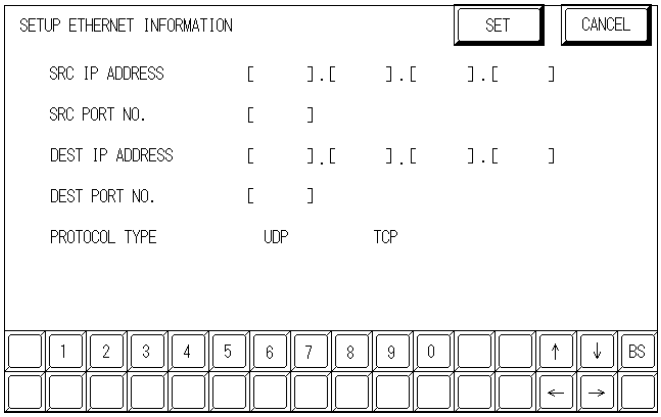


DATA CODE

This selection controls the date code settings. Select either BINARY or ASCII. Be sure this value is the same as the current PLC setting.

◆SETUP ETHERNET INFORMATION

Select "SET UP ETHERNET INFORMATION," from the above screen and enter the necessary information for each item shown below.



SRC IP ADDRESS

Enter the IP address for your GP here. The IP address 32 bits are separated into four segments of eight bits each, delimited with a dot. All are decimal numbers.

SRC PORT NO.

Enter your station's port number here, from 1024 to 65535.

DEST IP ADDRESS

Enter the IP address of the other station (PLC).

DEST PORT NO.

Enter the port number for the other station. In this case, 12289.

PROTOCOL TYPE

You can select either UDP or TCP communication. If the power will be turned ON/OFF asynchronously, it is recommended that you use UDP communications.

Do not specify duplicate IP addresses. Contact the network manager about IP addresses.

Important

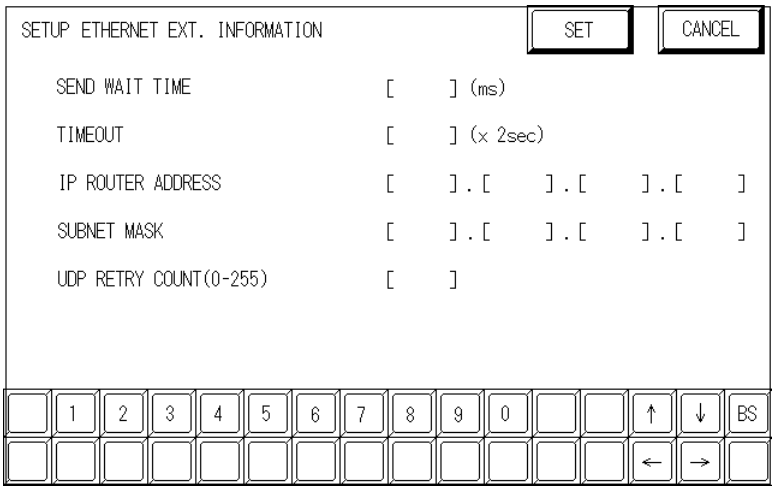
When using the built-in Ethernet port on a GP2000 or GLC2000 series unit, be sure not to set any duplicate "SRC PORT No." values.

Check the 2-way driver's "SRC PORT No." setting via the following menu:

GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

The default value is 8000. The 2-way driver uses this port and the following 9 ports.

- **SET UP ETHERNET EXT. INFORMATION**



SEND WAIT TIME (0 to 255)

Wait time can be added when a command is transmitted from the GP. Use the wait time if the traffic on the communications line is heavy. If no wait time is required, enter "0."

TIMEOUT (0 to 65535)

Enter the desired timeout value. If no response is received from the other station within the specified time, a timeout occurs. If "0" is specified, the default time is 15 seconds when using TCP, and 5 seconds when using UDP.

IP ROUTER ADDRESS

Enter the IP address of the router (one only). If no router is used, enter a "0" in each of the four fields.

SUBNET MASK

Enter the subnet mask data. If no subnet mask is used, enter a "0" in each of the four fields.

UDP RETRY COUNT (0 to 255)

Designates the number of times the GP re-sends a command when there is no reply from the other port and a timeout occurs. When no reply is received after the re-try setting number is reached, an error message will appear on the GP screen.

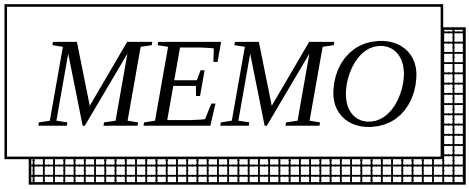
Important

If the GP's memory is initialized in OFFLINE mode, random values may appear in these settings. Be sure to check all displayed values after performing initialization.

■ PLC Settings

The PLC's required Ethernet communication settings are shown below. Designate the setting via the Ethernet module's side face switch.

PLC Settings	
Data Code Switch	ON (Binary)/OFF(ASCII)
Write Protect	OFF (Not Protected)
TCP Timeout	OFF (Close)
Run Mode	OFF (RUN)
IP Address	Set via Rotary Switch

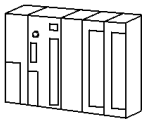
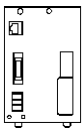
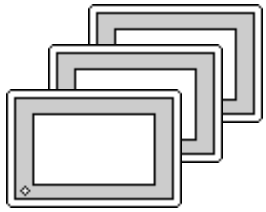

MEMO

7.5 Omron

7.5.1 System Structure for Ethernet Connection

This section explains the system structures for the Ethernet connection between OMRON PLCs and GP units.

■SYSMAC CS1 Series

CPU	LinkI/F	Cables	Unit	GP
	 Ethernet Unit			
CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42	CS1W-ETN01	Ethernet cable (compatible with the IEEE802.3)	Pro-face Ethernet I/F Unit GP070-ET11 GP070-ET41 GP377-MLTE11 GP377-MLTE41 GP077-MLTE41	GP Series *1

**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 2 of Applicable GP/GLC Units.*

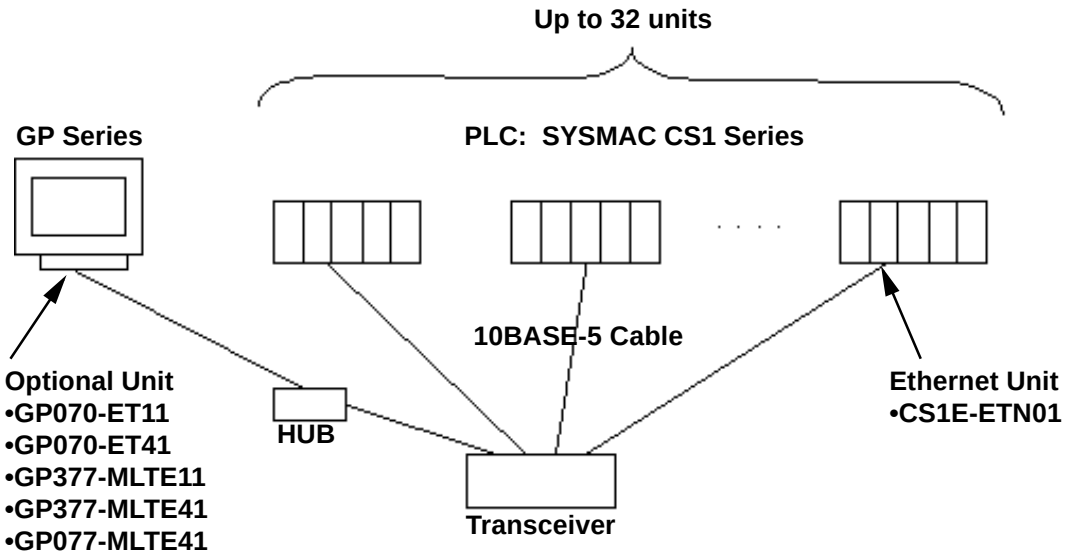
Note:

- **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series units, however, refer to the user's manual for the main unit.**

Careful! *Do not to connect this Ethernet network with Pro-Server.*

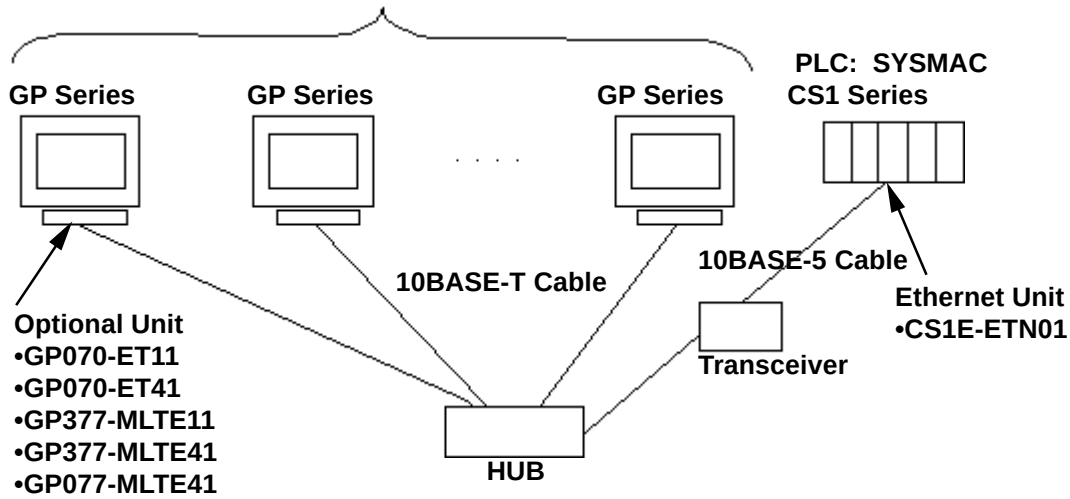
◆**Connection Structure**

Ex.) 1 : n connection

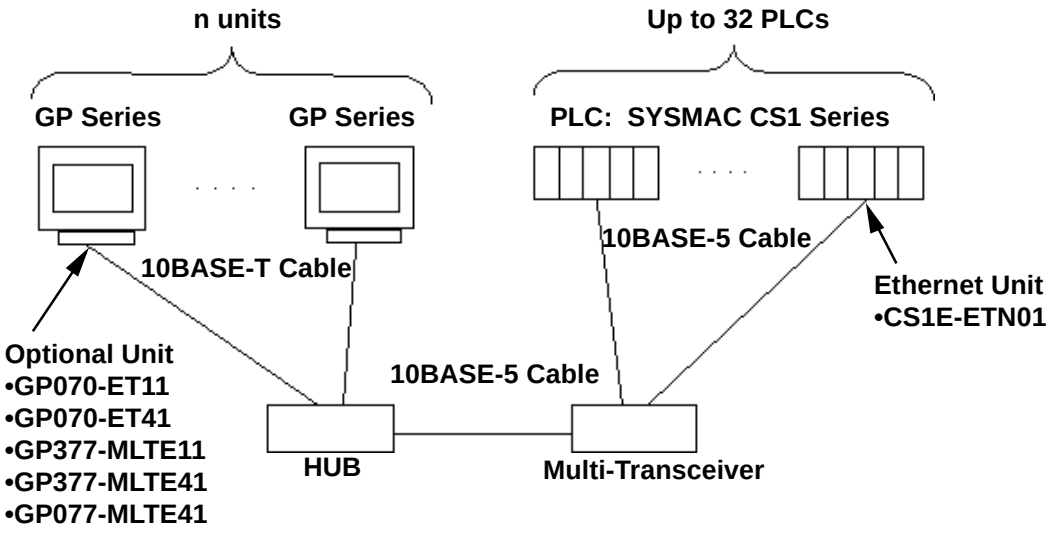


Ex.) n:1 connection

n units (While there is no limitation to the number of units connected, as the number increases, the comunication load will also increase, which can lead to slower comunication.)

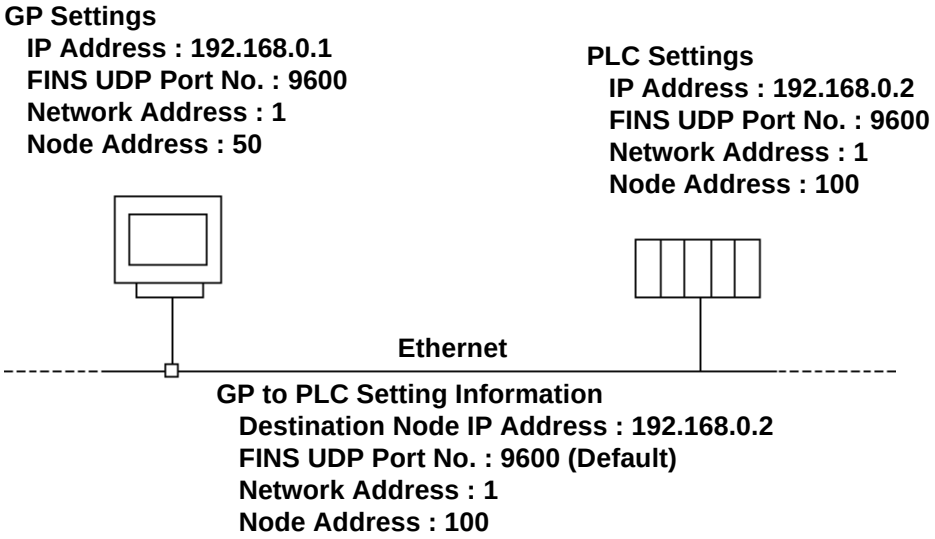


Ex.) n:m connection

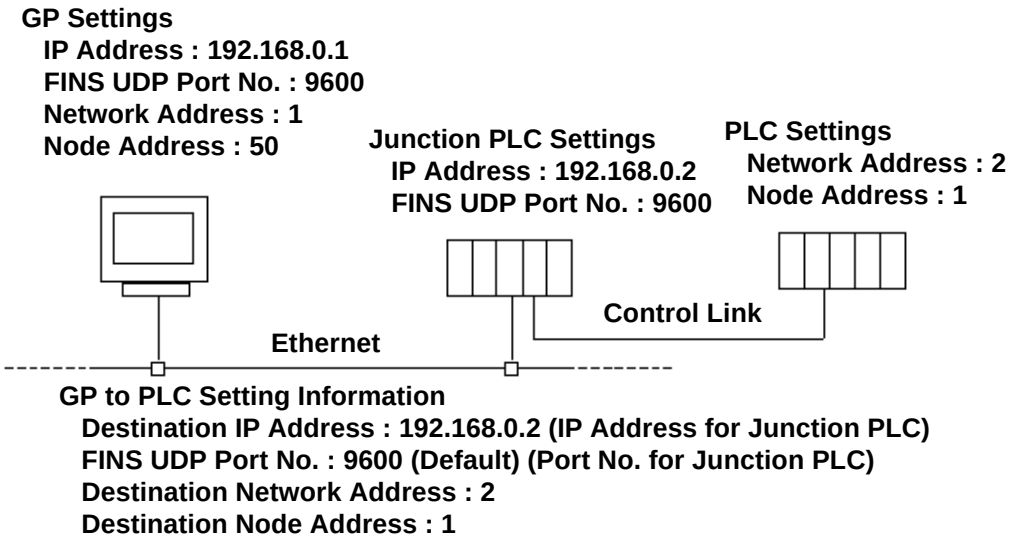


◆Network Design

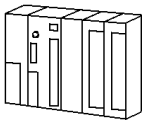
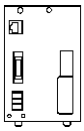
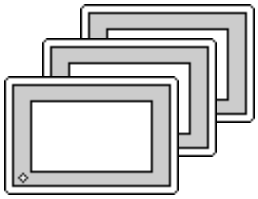
• When the GP and the target PLC use the same network address.



• When there is a junction PLC used between the GP and target PLC.



■SYSMAC CJ Series

CPU	Link I/F	Applicable Cable	Unit	GP/GLC
	 Ethernet Unit			
CJ1G-CPU44 CJ1G-CPU45	CJ1W-ETN11	Ethernet Cable Equivalent to IEEE802.3 Product	Digital's GP070-ET11 GP070-ET41 GP377-MLTE11 GP377-MLTE41 GP077-MLTE41	GP/GLC Series *1

**1 When using GP/GLC and extended units, refer to*

Reference *7.1 Connectable PLCs, ■ List 2 of Applicable GP/GLC Units.*

Note: • **For cable connections, refer to the user manual for each optional unit. For GP2000 and GLC2000 series units, however, refer to that unit's user manual.**

Careful! *This series CPU cannot be connected to Pro-Server.*

7.5.2 Supported Devices

The following list shows the range of devices supported by the GP.

■SYSMAC CS1/CJ Series

Setup System Area here.

Device	Bit Address	Word Address	Other	
Channel I/O	CIO000000 ~ CIO614315	CIO0000 ~ CIO6143	*2	L/H
Internal Auxiliary Relay	W00000 ~ W51115	W000 ~ W511		
Hold Relay	H00000 ~ H51115	H000 ~ H511		
Special Auxiliary Relay	A00000 ~ A95915	A000 ~ A959	*1	
Timer (Contact)	T0000 ~ T4095	————	*3	
Counter (Contact)	C0000 ~ C4095	————	*3	
Timer (Current)	————	T0000 ~ T4095		
Counter (Current)	————	C0000 ~ C4095		
Data Memory	D0000000 ~ D3276715	D00000 ~ D32767	*2	
Expansion Data Memory (E0 ~ EC)	E00000000 ~ EC3276715	E000000 ~ EC32767	*4	
Expansion Data Memory (Current Bank)	————	EM00000 ~ EM32767	*5 Bit 15	
Task Flag	————	TK0 ~ TK30	*3 ÷2 Bit 15	
Index Register	————	IR0 ~ IR15	*3 Bit 31	
Data Register	————	DR0 ~ DR15	*3 Bit 15	

**1 A00 through A477 are not available for writes.*

**2 When the Ethernet unit (CS1W-ETN01) is used, the data memory addresses D30000 through D31599 and the channel I/O addresses C101500 through C101899 are used as the system setup area by the PLC. Therefore, do not write data to these addresses from the GP.*

Reference *For further details, refer to the user's manual for OMRON's SYSMAC CS1 Series Ethernet Unit, CS1W-ETN01J.*

**3 Data cannot be written in RUN mode.*

**4 The range of the extended data memory (E0 to EC) varies depending upon the CPU models.*

**5 Extended data memory (current bank) is not available with CJ series CPUs.*

■CS1 Ethernet Protocol Limitation

Even though the CS1 Ethernet Protocol can access more than one CPU, the following limitations apply.

◆Device Address and Node Number Limitations

When a device address's size is larger than 1024 (1K) or a different network and node addresses is set, the number of available device addresses will vary. The GP uses internal records are used to set the device addresses. There records are limited to 64. For example, when the D0 device address is set, a single record is used in the GP. For detailed examples, refer to the following chart.

Ex1.) Number of records used when designatng tag setting numbers.

Setting No.	NetWork Address	Node Address	Device Address	Remaining Number of records in GP-PRO/PBIII	Other
1	1	1	D0	63	Uses one record
2	1	1	D1024	62	Uses one record
3	2	1	D0	61	Uses one record
4	2	1	D1024	60	Uses one record
5	2	1	T0	60	Since the node number and address range already exist as setting No.3, no records will be used.
6	2	1	T1024	60	Since the node number and address range already exist as setting No.4, no records will be used.
7	2	1	D2048	59	Uses one record
8	2	2	D2048	58	Uses one record
9	3	1	D2048	57	Uses one record
10	3	1	D2049	57	Since the node number and address range already exist as setting No.9, no records will be used.

When the total number of Network Addresses, Node Addresses and Device Addresses are exceeds 1024, GP internal records are used. However, if the Network Address, Node Address and Device Address are the same type, no record will be used, even if the device types are different.

Ex2.) When setting tags from D00000 to D16384 in Data Memory, since one record is used for every 1024 addresses, a total of 16 records will be used.

16384/1024=16

Therefore, when setting the same number of tags for each node, settings for only a total of only four nodes can be set.

64/16=4

Note: **When the number of records is over 65, the following error message will appear on the GP Screen Editor software (GP-PRO/PBIII for Windows).**

"Address entry limit reached. No more can be entried"

◆ PLC Device Block Write Restrictions

The GP unit processes data internally by separating data into blocks of 1024 words.

Therefore, when a Block Write is requested that uses 41 or more words and will exceed the 1024 word limit,

the following features cannot be used.

- PLC Device Write using D-Script's Memory Operation Feature

- Write from GP/GLC SRAM to PLC Device using Filing Feature

- Write to LS Area's Read Area

If the above problem occurs, separate the data so that the number of words used by the Block Write is 1024 or less.

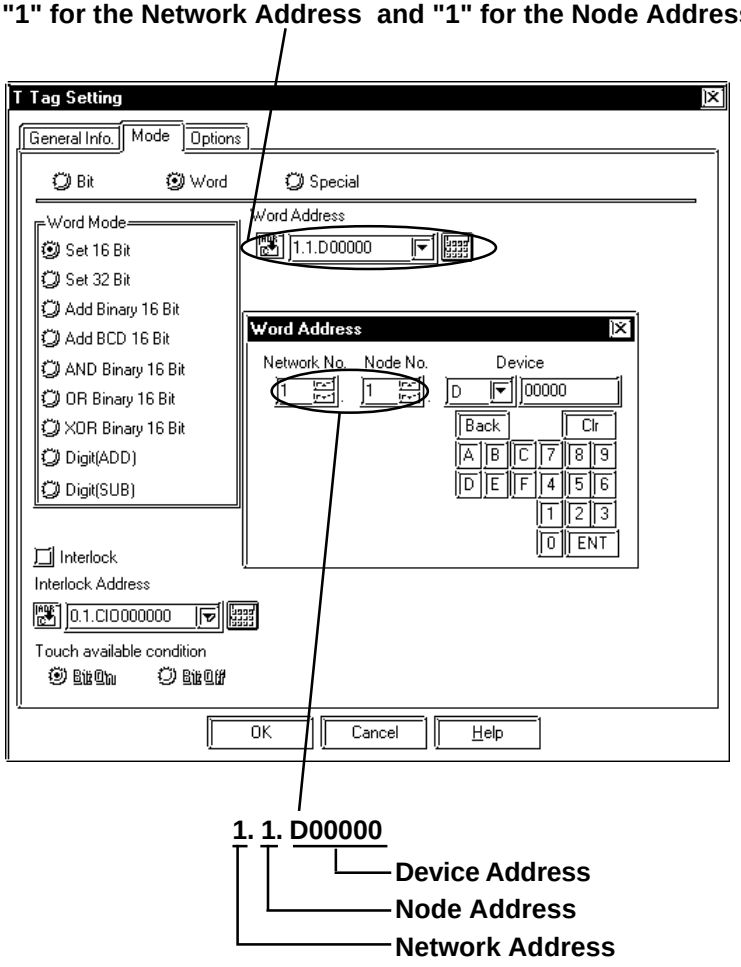
◆ **When setting parts or tags from GP Screen Editor (GP-PRO/PBIII for Windows)**

Before setting parts or tags, Network Information settings must be entered. Network Information Setting can be set from the [GP SYSTEM SETTING]->[MODE SETTIN]->[Network Information] screen.

Reference *this manual, **7.5.3 Environment Setup***

Specifying the PLC's Network Address and Node Address when setting parts or tags, allows the specified PLC's Device to be read out.

Setting Example
When the Destination Network Address is 1 and Node Address is 1, "1" for the Network Address and "1" for the Node Address.



Note: **In case of setting parts or tags from GP Screen Editor (GP-PRO/PBIII for Windows), PLC's Network Address and Node Address can be set when inputting the address. When the Network Address or Node Address are not specified, the previously entered numbers are kept. When entering new setup values, the default values are:**

Network Address : 0

Node Address : 1

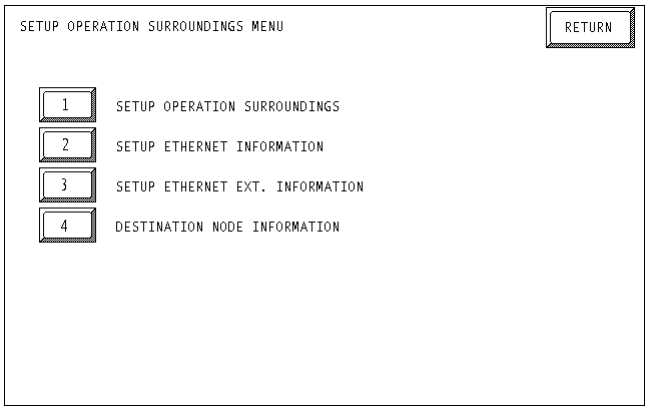
7.5.3 Environment Setup

■GP Settings

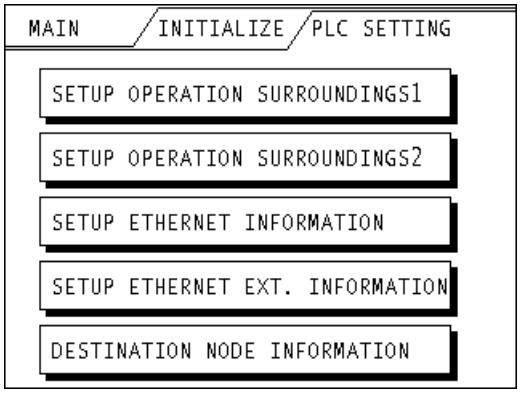
The following screens show the GP's communication settings, which are required for communications via the Ethernet connection:

◆SET UP OPERATION SURROUNDINGS MENU

<GP-477R Series, GP-577R Series, GP2000 Series>

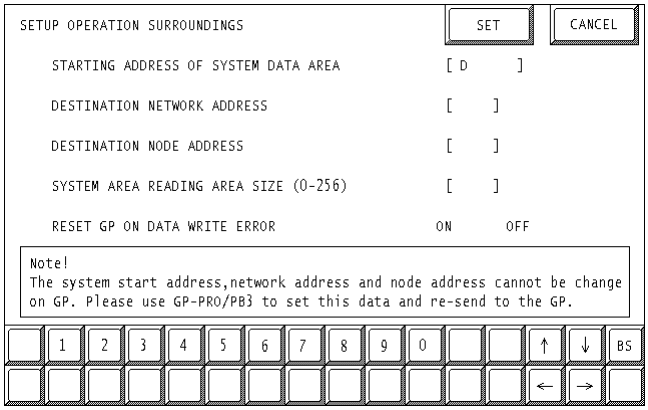


<GP-377R Series>

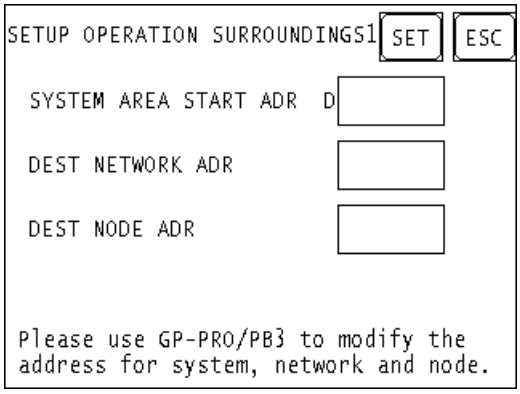


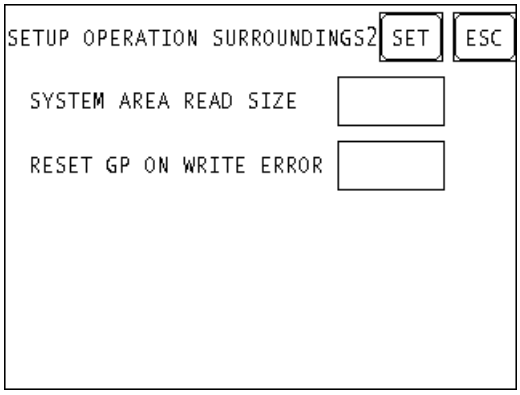
• SET UP OPERATION SURROUNDINGS

<GP-477R Series, GP-577R Series, GP2000 Series>



<GP-377R Series>





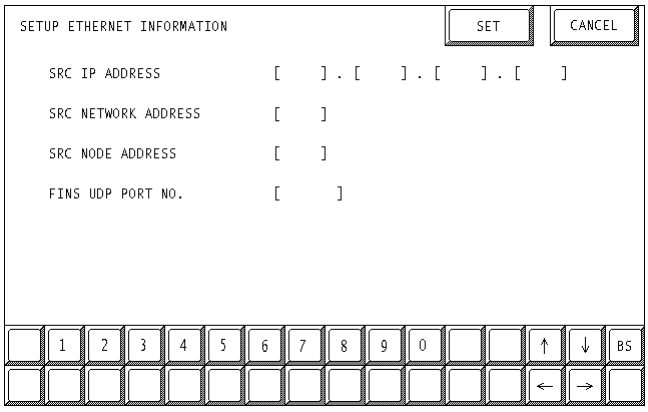
Careful! *Be sure the Destination Network Address and Destination Node Address entered are the same as the PLC's settings. However, the Destination Network Address and Destination Node Address settings cannot be changed from the GP's OFFLINE mode. Be sure to make these settings from the GP Screen Editor's [GP SYSTEM SETUP] -> [MODE SETUP] setting area..*

Reference *This manual, **7.5.3 Environment Setup** ■GP Screen Editor software (GP-PRO/PBIII for Windows) Settings*

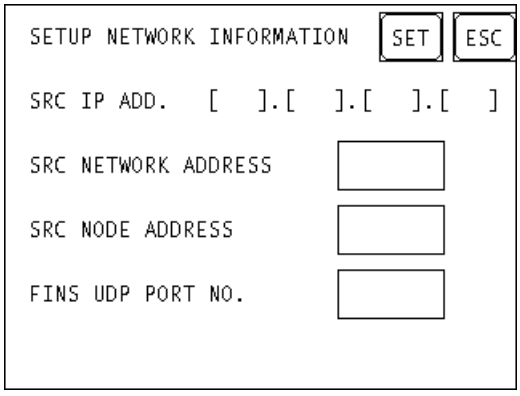
◆SETUP ETHERNET INFORMATION

Enter each item in the SET UP ETHERNET INFORMATION screen.

<GP-477R Series, GP-577R Series, GP2000 Series>



<GP-377R Series>



- **SRC IP ADDRESS**

  Enter the IP address for the GP at your satation. To do this, separate the 32 bits of the IP address into four segments of eight bits each, delimit those segments with a dot, and then enter them as decimal numbers.

- **SRC NETWORK ADDRESS (0 to 127)**

  Enter your GP's Network address.

- **SRC NODE ADDRESS (0 to 126)**

  Enter your GP's Node address.

- **FINS UDP PORT NO. (1024 to 65535)**

  Enter the FINS UDP port number, between 1024 and 65535. Set the port number so that it is the same as the PLC's FINS UDP port number. The PLC's default value is 9600. When connecting one PLC with more than one GP unit, all GP FINS UDP port numbers need to be set as the same values.

STOP **Do not specify duplicate IP addresses. Contact your network manager about assigning IP addresses.**

Important

- ***When using the built-in Ethernet port on a GP2000 Series unit, be sure not to enter duplicate "SRC PORT No." values.***

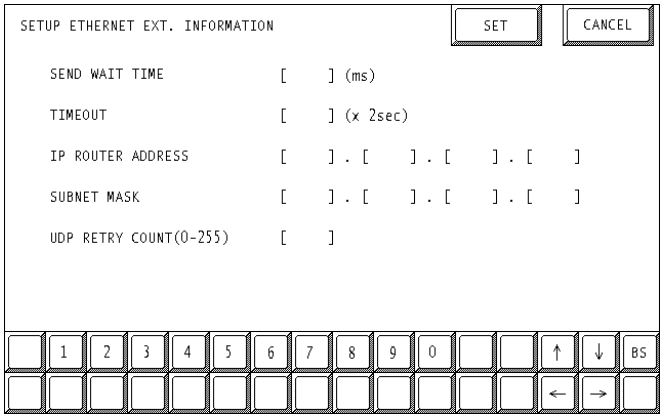
  Check the 2-way driver's "SRC PORT No." Setting via the following menu:

  GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION] screen.

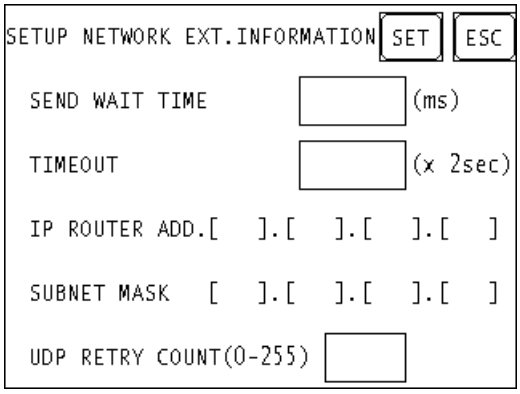
  The default value is 8000. The 2-way driver uses this port and the following nine ports for a total of 10 (8000 ~ 8009).

◆SET UP NETWORK EXT. INFORMATION

<GP-477R Series, GP-577R Series, GP2000 Series>



<GP-377R Series>



• SEND WAIT TIME (0 to 255)

Wait time can be added when a command is transmitted from the GP. Use the wait time if the traffic on the communications line is heavy. If no wait time is required, enter "0."

• TIMEOUT (0 to 65535)

Enter the desired timeout value. If no response is received from the other station within the specified time, a timeout occurs. If "0" is specified, the default time is 5 seconds with UDP/IP communication.

• IP ROUTER ADDRESS

Enter the IP address of the router (only one). If no router is used, enter "0" in all fields.

• SUBNET MASK

Enter the subnet mask settings. If no subnet mask is used, enter "0" in all fields.

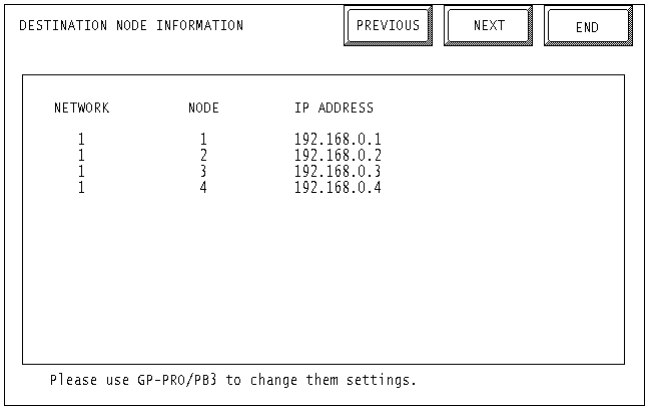
• UDP RETRY COUNT (0 to 255)

Designates the number of times the GP re-sends a command when there is no reply from the other port and a timeout occurs. When no reply is received after the retry setting number is reached, an error message will appear on the GP screen.

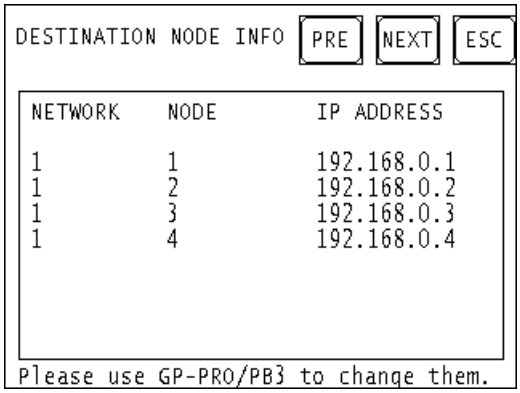
• If GP memory is initialized in OFFLINE mode, random values may be included. Download the GP System Setting from GP-PRO/PBIII for Windows.

• DESTINATION NODE INFORMATION

<GP-477R Series, GP-577R Series, GP2000 Series>



<GP-377R Series>



• DESTINATION NODE INFORMATION

The Destination (PLC) Network Address, Destination Node Address and IP Address are displayed here. Press [NEXT] button to see the next page.

Careful!

The DESTINATION NODE INFORMATION cannot be set or changed from the OFFLINE mode. Set or change these values from the GP Screen Editor software (GP-PRO/PBIII for Windows) [GP SYSTEM SETTINGS]-> [MODE SETTINGS] -> [NETWORK INFOMATION SETTINGS].

Reference

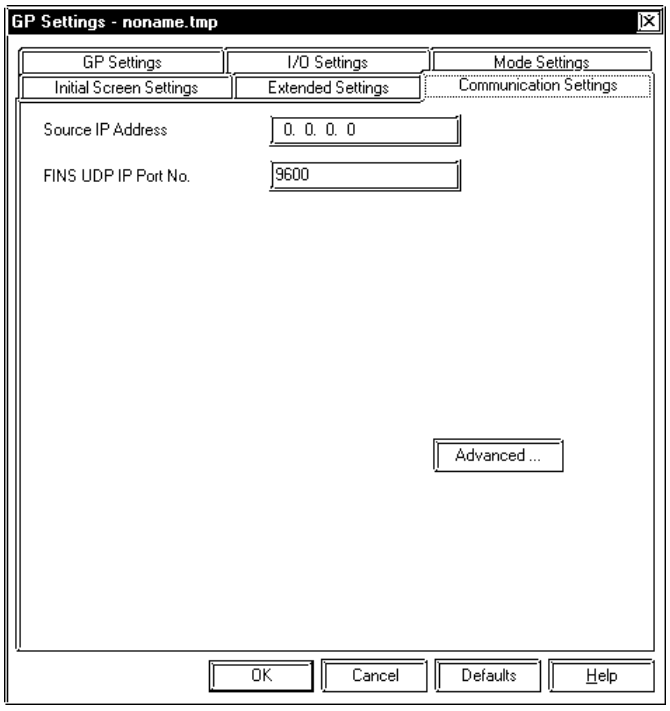
*This manual, **7.5.3 Environment Setup** ■GP Screen Editor software (GP-PRO/PBIII for Windows) Settings*

■ GP Screen Editor software (GP-PRO/PBIII for Windows) settings

The following items can be entered from the GP Screen Editor software (GP-PRO/PBIII for Windows) [GP SYSTEM SETTINGS] -> [MODE SETTING] area.

Menu	Sub Menu	Item
Communication Settings	_____	SRC IP ADDRESS
		FINS UDP PORT NO.
	Addvanced Communication Settings	SEND WAIT TIME
		TIME OUT
		IP ROUTER ADDRESS
		SUBNET MASK
Mode Settings	_____	SYSTEM START ADDRESS
		READ AREA SIZE
	Network Information Settings	NETWORK ADDRESS
		NODE ADDRESS
		DESTINATION NETWORK ADDRESS
		DESTINATION NODE ADDRESS
		DESTINATION IP ADDRESS

◆COMMUNICATION SETTINGS



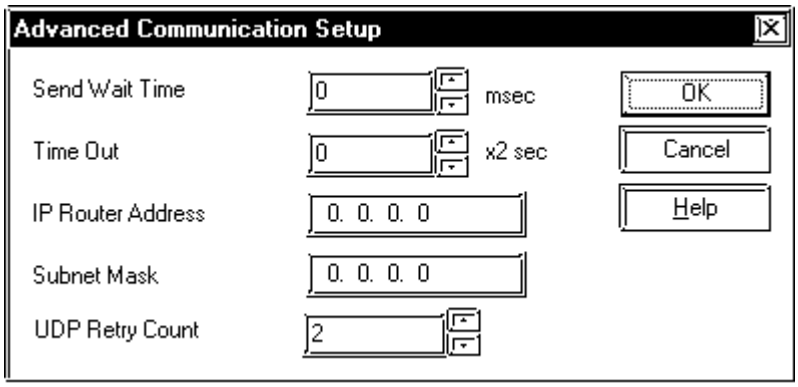
- **SRC IP ADDRESS**

  Enter the IP address for the GP at your satation. To do this, separate the 32 bits of the IP address into four segments of eight bits each, delimit those segments with a dot, and then enter them as decimal numbers.

- **FINS UDP PORT NO. (1024 ~ 65535)**

  Enter the FINS UDP port number, between 1024 and 65535. Set the port number so that it is the same as the PLC's FINS UDP port number. The PLC's default value is 9600. When connecting one PLC with more than one GP unit, all GP FINS UDP port numbers need to be set as the same values.

•ADDVANCED COMMUNICATION SETTINGS



• SEND WAIT TIME (0 to 255)

Wait time can be added when a command is transmitted from the GP. Use the wait time if the traffic on the communications line is heavy. If no wait time is required, enter “0.”

• TIMEOUT (0 to 65535)

Enter the desired timeout value. If no response is received from the other station within the specified time, a timeout occurs. If “0” is specified, the default time is 5 seconds with UDP/IP communication.

• IP ROUTER ADDRESS

Enter the IP address of the router (only one). If no router is used, enter “0” in all fields.

• SUBNET MASK

Enter the subnet mask settings. If no subnet mask is used, enter “0” in all fields.

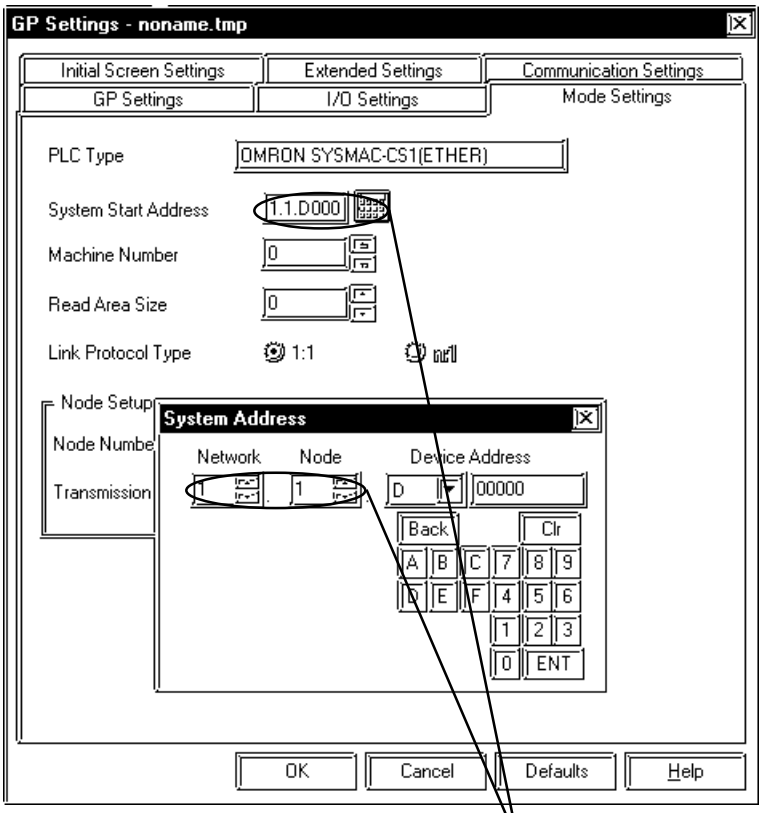
• UDP RETRY COUNT (0 to 255)

Designates the number of times the GP re-sends a command when there is no reply from the other port and a timeout occurs. When no reply is received after the retry setting number is reached, an error message will appear on the GP screen.

◆MODE SETTINGS

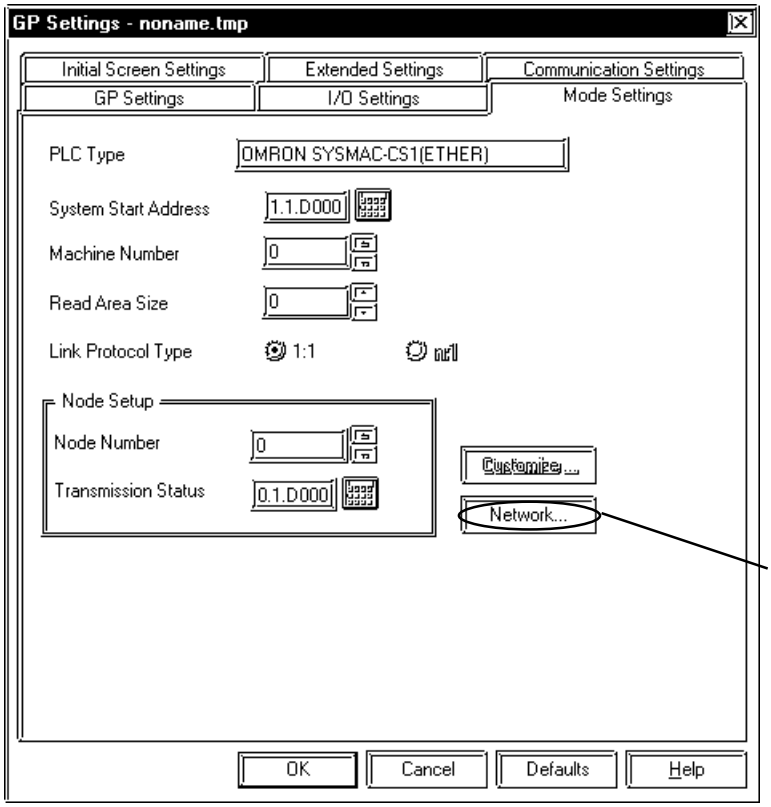
•SYSTEM START ADDRESS SETTINGS

System Start Address Settings are as shown below. The System Area and Read Area are assigned to thePLC node designated here.



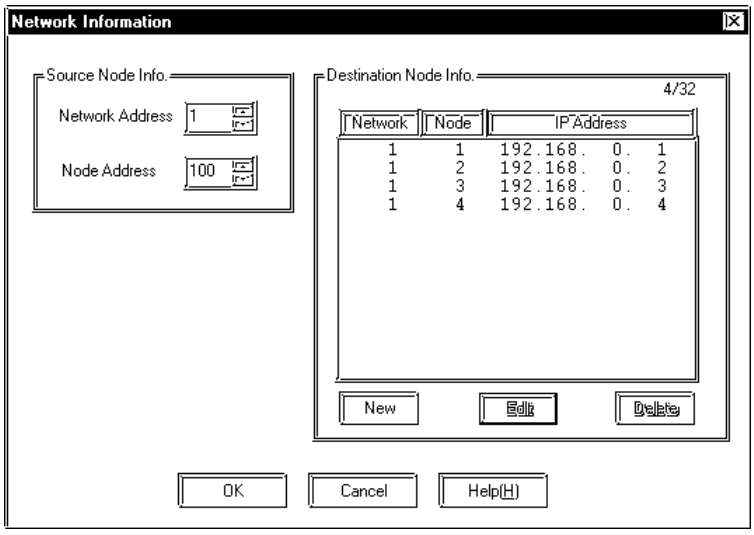
The System Start Address is allocated to the PLC node entered here. Set the Network Address and Node Address to the same address values as set in the Destination Node Infomation. (Set in the [MODE SETTINGS] -> [NETWORK SETTINGS].).

•NETWORK INFORMATION SETTINGS



Click on this button to set the Network Information.

The Source Node Info and Destination Node Info are set as shown below.

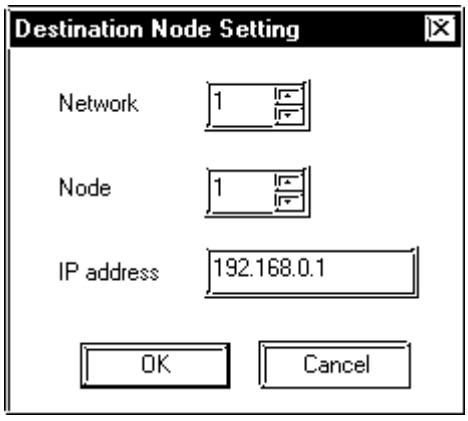


The Source Node Info can be entered by clicking on that item directly.

- **SOURCE NODE INFO.**

  Enter your GP's Network Address and Node Address.

When entering Destination Node Information Settings, click on New or Edit button and the dialog box shown below appears.



- **DESTINATION NODE SETTING**

  Enter the destination PLC Node number. The Maximum number of Nodes is 32. The Destination PLC Node IP Address needs to be set to the same address as the target PLC or the junction PLC's IP address. The Destination Network Address and Destination Node Address need to be set to the target PLC's addresses.

■PLC SETTINGS

◆SYSMAC CS1 Series

Item	GP Settings		PLC Settings	
SRC IP Address	SRC IP Address	GP's Address *1	IP Address Setting Switch	PLC's Address
SRC Node Address	SRC Node Address	GP's Address	Node No. Switch	PLC's No.
SRC Network Address	SRC Network Address	GP's Address	Network Address	PLC's Address
Destination IP Address	Destination IP Address	Target or transit PLC's IP Address	IP Address Table	GP's IP Address
Destination Node Address	Destination Node Address	Target or transit PLC's Node Address	IP Address Table	GP's Node Address
Destination Network Address	Destination Network Address	Target or transit PLC's Network Address	————	————
Port No. *2	FINS UDP Port No.	9600	FINS UDP Port No.	9600

**1 Contact your network administrator about setting values.*

**2 PLC's default Port number is 9600. Be sure to set the same number as the GP setting.*

When using the following function on a GP2000 Series unit, be sure not to use duplicate port number values. Check the 2-way driver's port number setting via the following menu:

GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

The default value is 8000. The 2-way driver uses this port and the following nine ports for a total of 10 (8000 ~ 8009).

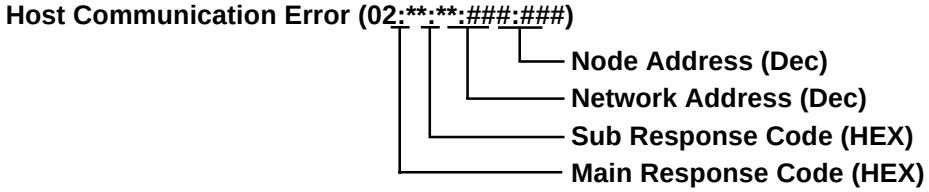
Be sure not to set a duplicate Node Address in the same Network Address group.

7.5.4 Error Code

Reference *About the GP Ethernet Specific Error Codes, refer to the end of this Chapter, "Protocol Stack Error Codes".*

■PLC SPECIFIC ERROR CODES

The PLC error codes are displayed by the " Host Communication Error (02:**:**:###:###)", and are indicated in the left lower corner of the GP screen. (**:**indicates the PLC error codes and ###:### indicates the Network Address and Node Address.) PLC error codes are shown using 2-byte, Main Response Codes and Sub Response Code.



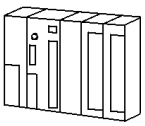
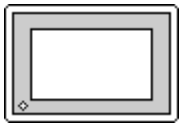
Reference *For more details about error codes, refer to Omron Communications Reference Manual for SYSMAC CS1 Series (Chapter5 FINS Commands, End Codes).*

7.6 Meidensha

7.6.1 System Structure

This section explains the system structure for the Ethernet connection between a Meidensha PLC and the GP/GLC.

■ UNISEQUE Series

PLC	Link I/F	Cables	Optional Ethernet I/F unit	GP/GLC
	 Ethernet Unit			
UNISEQUE RC100	RM105	Ethernet cable conforming to IEEE802.3	Digital's GP Ethernet I/F unit GP070-ET41 GP-377R Series Multi Unit E GP377-MLTE11 GP377-MLTE41 GP77R Series Multi Unit E GP077-MLTE41	GP/GLC Series *1
UNISEQUE ADC4000	AM417			
UNISEQUE ADC7000				

**1 For the applicable GP/GLC series units, the applicability of the optional Ethernet I/F unit, and the availability of the built-in Ethernet port, refer to*

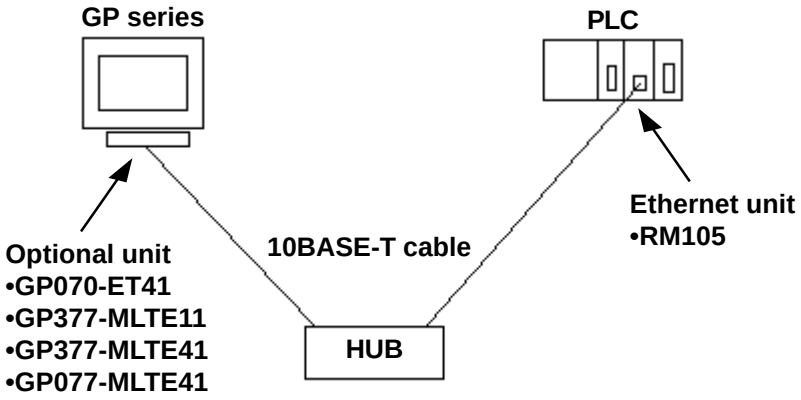
Reference *7.1 Connectable PLCs, List 2 of Applicable GP/GLC units.*

Note:

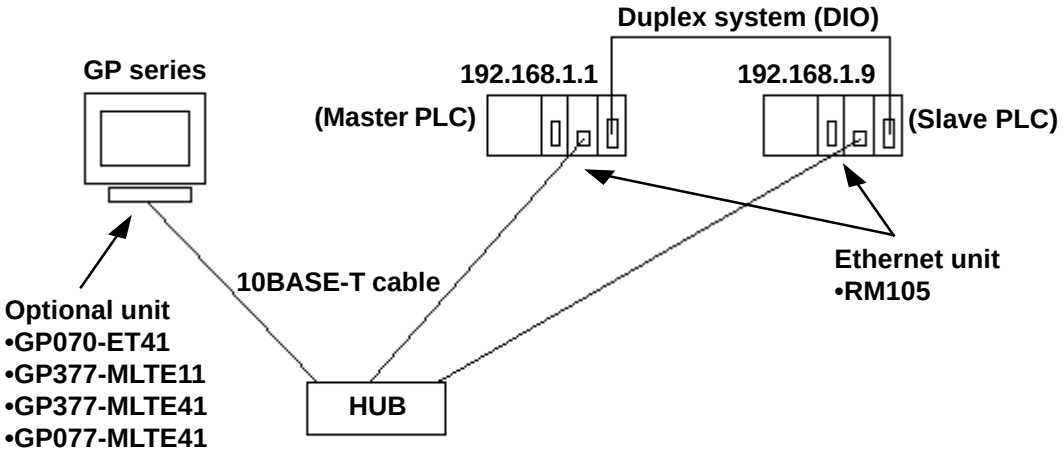
- **For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, refer to the user's manual for that unit.**

◆**Connection Structure**

Ex.) 1 : 1 connection



Ex.) Duplex system connection



Note:

- **The IP address of the Slave PLC is that of the Master PLC plus 8. For example, when the IP address of the Master PLC is 192.168.1.1, the IP address of the Slave PLC is 192.168.1.9. The GP ignores any UDP broadcast data other than that to the specified IP address.**

  For further information about a duplex system, refer to the PLC's user's manual.

7.6.2 Supported Devices

The following describes the range of devices supported by the GP.

■ UNISEQUE Series

Setup System Area here.

Device	Bit Address	Word Address	Other	
Memory	00000 ~ 1FFFF	0000 ~ 1FFF		L/H

Note:

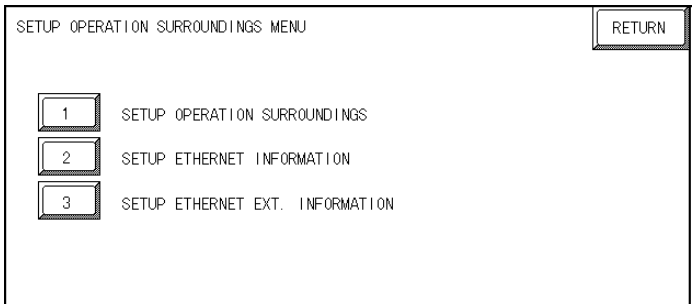
- **The address range(s) available will vary depending on the CPU used. Be sure to check this information in your CPU's manual prior to creating your system.**

7.6.3 Environment Setup

■ GP Settings

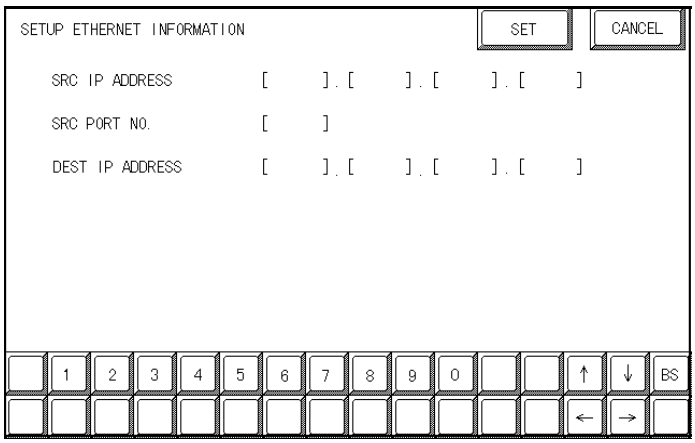
The following describes GP settings for using Ethernet communication.

◆ SETUP OPERATION SURROUNDINGS MENU



◆ SETUP EHTERNET INFORMATION

Select "SETUP ETHERNET INFORMATION" and enter each parameter.



SRC IP ADDRESS

Enter the GP's SRC IP Address. Enter a dot between every 8 bits to divide the IP Address (32 bits all together) into four gorups, and enter decimal numbers in each group.

SRC PORT NO.

Set the SRC Port No. between 1024 and 65535.

DEST IP ADDRESS

Set the PROSEC's DST IP Address.

- **Regarding the IP Address and the Port No., please confirm these points with your Network supervisor. You must not duplicate the number you have already used for an IP Address setting.**

Important

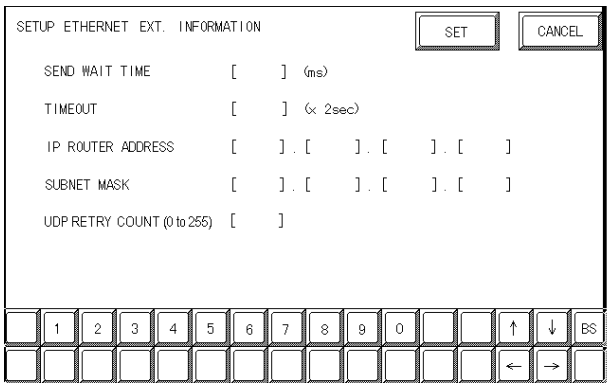
- ***When using the built-in Ethernet port on a GP2000 or GLC2000 series unit, be sure not to set any duplicate "SRC PORT No." values.***

  Check the 2-Way Driver's "SRC PORT No." setting via the following menu:

  GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

  The default value is 8000. The 2-Way Driver uses this port and the following 9 ports.

◆ SETUP ETHERNET EXT. INFROMATION



SEND WAIT TIME

You can display the waiting time while GP's command is actually sent. This function is useful when there is a lot of traffic in your system. If not used, set it to "0".

TIMEOUT

You can set the time for waiting for a reply from the destination. If any reply is not made by the destination within the time you set, a communication timeout will occur. "0" setting is the default value as 15 second-setting for timeout.

IP ROUTER ADDRESS

Set Router's IP Address. (There is only one setting for Router.) If not used, set all values to "0".

SUBNET MASK

Set the Subnet Mask . If not used, set all values to "0".

UDP RETRY COUNT (0 to 255)

This setting cannot be used, and the setting value is disabled.

Important

- ***If you initialize GP/GLC memory from the OFFLINE mode, some values may revert to the factory settings. Please confirm all values after initialization.***

■ PLC Unit Setup

◆ UNISEQUE Series

GP Setup		PLC Setup	
IP address of user's station	IP address of GP	---	---
Port No. of user's station	IP address of GP	---	---
IP address of destination	IP address of PLC	IP address	IP address of PLC
---	---	Port No. TCP	20010 (fixed)
---	---	Port No. UDP	20050 (fixed)
---	---	Broadcast	Available/unavailable

**1 For the setting values, check with the network administrator.*

**2 If the built-in Ethernet port is used on the GP2000 or GLC2000 series, check that the "Port No. of user's station" is not duplicated with the port No. for the 2-Way Driver.*

The port No. for the 2-Way Driver can be checked by selecting [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION]. The default value is 8000. The 2-Way Driver uses 10 continuous ports (8000 to 8009) starting with the default setting.

**3 If a duplex system connection is used, specify the IP address of the Master PLC.*

The GP automatically recognizes the IP address of the Slave PLC. Therefore, specify the IP address of the Slave PLC by adding 8 to the IP address of the Master PLC.

Example:

IP address of Master PLC: 192.168.0.1

IP address of Slave PLC: 192.168.0.9

7.6.4 Error Code

Reference *For error codes specific to the GP Ethernet, refer to "Protocol Stack Error Codes" at the end of Chapter 7 of this chapter.*

■ PLC SPECIFIC ERROR CODES

An error code specific to the PLC is displayed in the lower left corner of the GP/GLC screen like "Host communication error (02:**)" (** stands for the error code specific to the PLC).

◆ UNISEQUE Series

Error Code	Description	Status
05	Illegal access	Addressing is illegal.
08	Error mode	The CPU is disabled for transmission (e.g., because the PLC's ladder program stops).


MEMO

7.7 Protocol Stack Error Codes

7.7.1 Protocol Stack Error Codes

The error codes related to the protocol stack are displayed on the GP screen as follows:

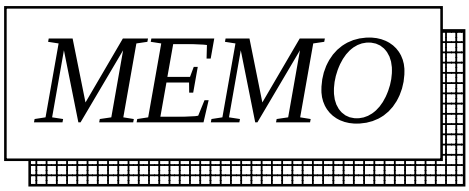
PLC COM. ERROR (02:FE:**)

"**" represents any of the error codes 00 to F0 shown in the above table.

Error code	Description	Other
00	There is a setup error related to the IP address of your station at initialization.	
05	Initialization has failed.	
06	Abortion of communications has failed.	
07	An attempt was made to establish a connection before initialization was successfully completed.	
08	The port number of your station is abnormal.	
09	The port number of the destination station is abnormal.	
0A	The IP address of the other station is abnormal.	
0B	The same port number is already being used by the UDP for establishing the connection.	
0C	The same port number is already being used by the TCP for establishing the connection.	
0D	The protocol stack has refused connection establishment.	
0E	The protocol stack has returned the unsuccessful establishment of a connection.	
0F	The connection has been shut down.	
10	All the connections are busy. No connection is available.	
13	Your station is aborted by the other station	
30	There is no reply from the protocol stack	
32	There is no reply from the other station	*1
40	The designated Node Addresses do not exist in Network Information.	*1
41	I/O Memory Type for Randam Read Out response data is wrong.	*1
42	Network Information does not exist.	
F0	Undefined error.	

**1 When using an Omron CS1 Series unit, the error code display is as shown below. The Network Addresses and Node Addresses also are displayed.*

Host Communication Error (02:FE::###:###)"**


MEMO

8 Profibus-DP

8.1 Connectable PLCs

The following tables list the PLCs that can be connected and used with the GP.

PLC Maker	Series Name	CPU Type (ex.)	Notes	PLC Setting
Siemens	S7 300 S7 400	S7 315-2-DP S7 413-2-DP	Profibus unit is required	PROFIBUS

The following table lists the GPs that can be connected and used with the Profibus-DP.

<GP List>

Series Name		Product Name	Unit
GP70 Series	GP-470 Series	GP-470E	Profibus-DP Module (GP070-PF11) *1
	GP-570 Series	GP-570L	
		GP-570S	
		GP-570T	
	GP-675 Series	GP-675S	
		GP-675T	
GP77R Series	GP-477R Series	GP-477RE	
	GP-577R Series	GP-577RS	
		GP-577RT	
GP2000 Series	GP-2500 Series	GP-2500L	
		GP-2500S	
		GP-2500T	
	GP-2501 Series	GP-2501S	
		GP-2501T	
	GP-2600 Series	GP-2600T	

**1 For GP2000 Series units, a bus conversion unit (PSL-CONV00) is required.*

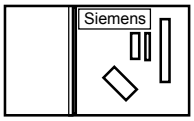
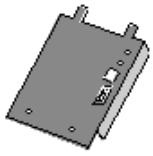
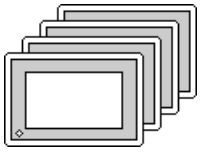

MEMO

8.2 Profibus-DP

8.2.1 System Structure for Profibus-DP Connection

The following table shows the types of PLCs that can be used with Digital's GP panel.

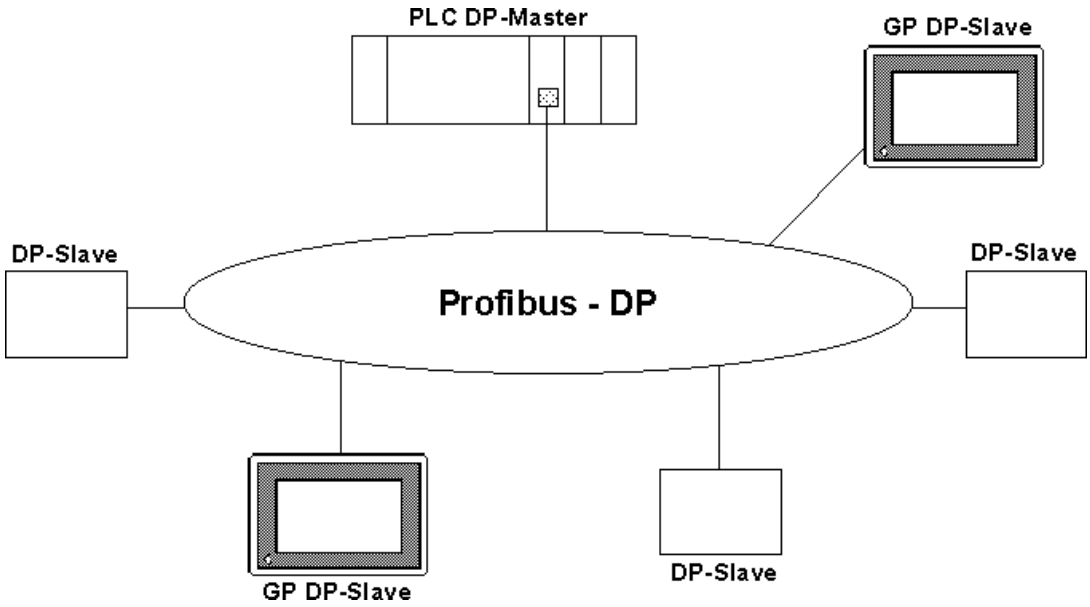
■ SIMATIC S7-300/400 Series

CPU	Cable Diagram	Link I/F	GP
			
S7-300 Series i.e. S7 315-2-DP S7-400 Series i.e. CPU 413-2-D	RS-485 (Cable Diagram 1)	Profibus-DP Module (GP070-PF11)	GP Series *1

**1 When using GP units, refer to 8.1 Connectable PLCs <GP List>.*

■ Typical Profibus-DP System Layout

The following diagram shows the standard design of a typical Profibus-DP system.



Caution

Be sure to earth the PLC's FG according to your country's earthing standards.
(For details, please refer to the PLC maker's manual)
Pull out a small amount of the Transfer Cable's shield, make a wire out of it and connect it to the PLC's FG terminal.

Note:

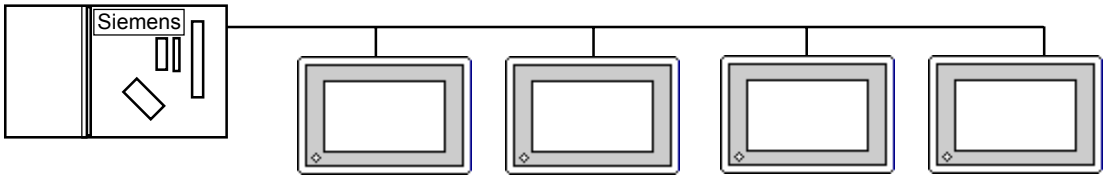
Cable Data (for S7315-2-DP model)

Parameters:	**Line A Line B, according to Profibus-DP DIN 19245 part1/4.91, section 3.1.2.3**
Wire Gauge:	**>0.64mm >0.53mm**
Conductor Area:	**>0.34mm^2 >0.22mm^2**

■ Profibus Network Layout

The maximum number of GPs that can be connected at any one time will depend on the size of the User PLC's I/O memory. For example, given the User is using a Seimens S7315-2-DP, the following connections would be possible.

Maximum No.	for Packet Transfer	**-**	**4**
of Connections	for Direct I/O	**-**	**64**



8.2.2 Data Transfer with GP via Profibus-DP

■ Data Transfer Settings

There are two modes of operation for data transfer: Direct I/O and Packet Transfer. These can be selected from the “OFFLINE mode” on the GP. Typical settings for this OFFLINE screen are shown below.

■ From the initial OFFLINE menu screen:

1) Select [INITIALIZE] to call up the initial settings screen.
2) Select the [SET UP OPERATION SURROUNDINGS] menu item (screen below appears).
3) Configure the environment settings to suit your particular requirements. (Ex. Direct I/O, Input/Output Area Size, etc.)

Use PRO-PBIII to set the System Area's start address. This cannot be set with the GP's OFFLINE mode.

```
SET UP OPERATION SURROUNDINGS

        SYSTEM DATA AREA  START DATA BLOCK [   0010   ]

                     START DATA WORD [   000  ]

        SYSTEM AREA READING AREA SIZE (0 - 256)[ 0 ]

        COMMUNICATION DATA TYPE            DIRECT I/O  PACKET

        DIRECT I/O START ADDRESS            [  LS0020  ]

                 INPUT AREA SIZE       [   16  ]

                 OUTPUT AREA SIZE      [   16  ]
```

■ Direct I/O

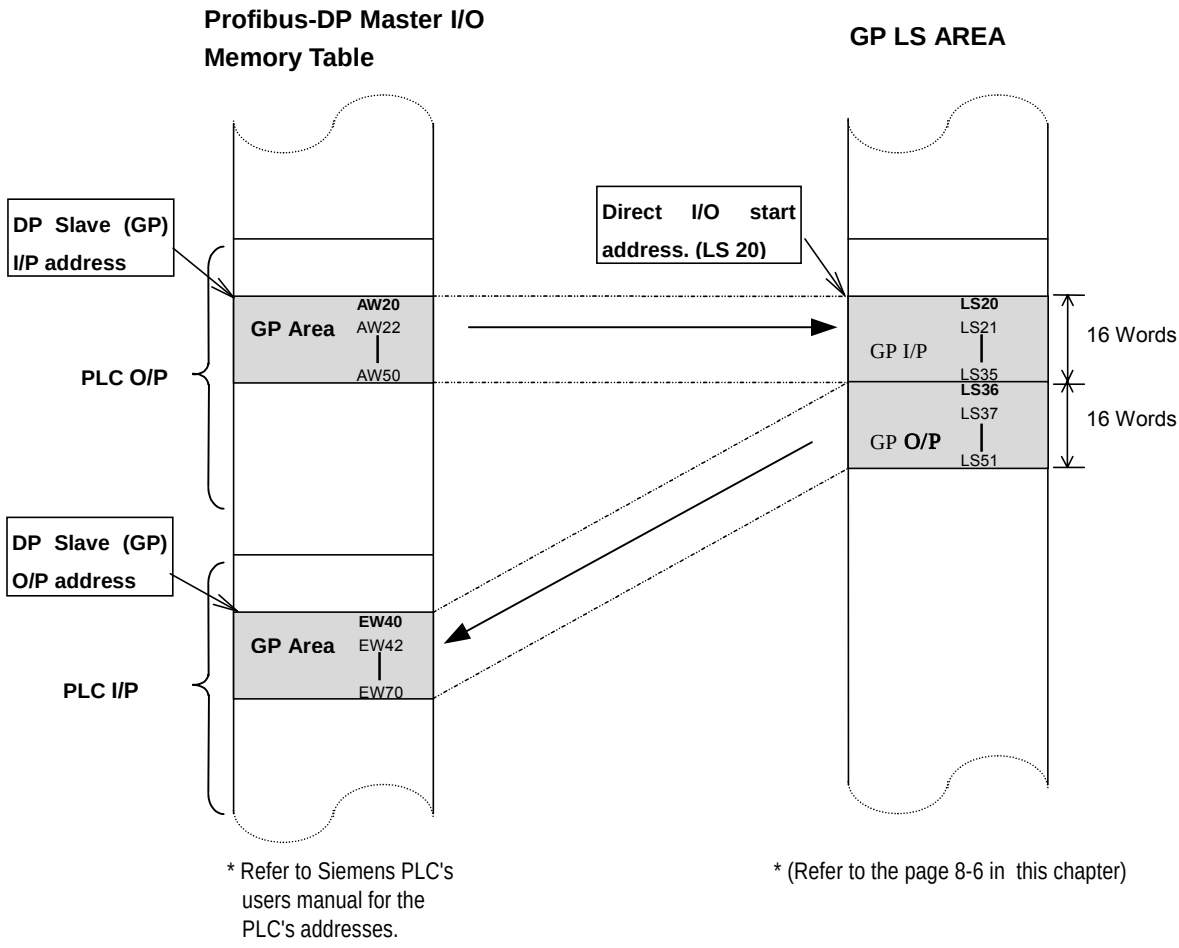
The GP can communicate with a master PLC in a very simple manner using the “Direct I/O” configuration. With this method, an area of memory is mapped from the GP’s LS area into the PLC’s input area and an area of the PLC’s output is mapped into the GP’s LS area. Set the start address of the direct I/O where you would like the GP’s internal memory to be mapped from, e.g. LS20. Set the Input and Output area sizes (in words) as required (max. 64 words). These are the sizes of the areas which will be mapped to and from the PLC and are shown below as shaded areas.

Caution

Input and output sizes must match those set up in the designated hardware configuration.

Reference *this section's ■ "Configuring the GP as a Profibus-DP Slave"*

This concept is illustrated below. The GP Slave Input and Output start addresses, EW40 and AW20, have been configured using the PLC programming device (for other PLC types, see relevant documentation on how to configure Input anda Output addresses).



■ Packet Transfer

This option gives the user greater flexibility than the Direct I/O option, allowing him to read a wider range of devices. This flexibility is the result of using an interpreter program, run on the PLC, in addition to the User's own PLC program(s). For information about these items, refer to the "README. TXT" file in the " FIELDBUS" folder on the GP-PRO/PB III for Windows Ver.5.0 CD-ROM.

■ GP Packet Transfer Environment Settings

The following settings are needed to allow the GP to function in the packet transfer mode:

1) Use the OFFLINE screen's SETUP OPERATION SURROUNDINGS area to choose the "PACKET" communication option.
Reference *"8.2.2 Data Transfer with GP via Profibus-DP"*
2) Set this area's INPUT AREA SIZE and OUTPUT AREA SIZE settings to "0".

Caution **If the INPUT and OUTPUT AREA values are not set to "0", packet transfer cannot be performed.**

■ PLC (Master) Packet Transfer Environment Settings

The Profibus interface unit must be configured as an input and output device, and both the input and output areas need to be allocated 16 bytes of PLC memory.

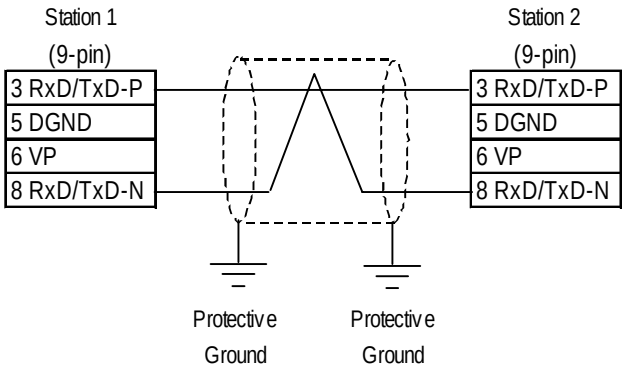
■ "Configuring the GP as a Profibus-DP Slave" and "Installation of Interpreter Project"

For information about these items, refer to the "README. TXT" file in the " FIELDBUS" folder on the GP-PRO/PB III for Windows Ver.5.0 CD-ROM.

8.2.3 Cable Diagram

The following cable diagram should be used when making a cable for the Profibus-DP cable's connector.

Cable Diagram 1 RS-485



8.2.4 Supported Devices

■ Profibus-DP (for Direct I/O)

The range of devices supported by the GP is shown below.

Device	Bit Addresses	Word Addresses
LS	LS00200 - LS1999F	LS0020 - LS1999

Caution

- **The User must confirm that sufficient memory is available for the Input and Output areas. For example, if the User chooses 32 words I/P and 32 words O/P, the maximum value for the Direct I/O start address is LS1935.**
- **The System Area function is NOT available in DIO mode.**

■ SIMATIC S7-300/400 Series (for Packet Transfer)

Setup System Area here.

Device	Bit Address	Word Address	Note
Data register		DB2W0000 - DB60W65534	*1, *2
Input relay	I000000- I655357	IW00000- IW65534	*3, *4
Output relay	O000000 - O655357	OW00000 - OW65534	*3
Internal memory	M00000 - M655357	MW00000 - MW65534	*3

**1 The data range used for the Data Register must be set up in the PLC by the User. Please confirm that all data addresses referenced actually exist (are valid).*

**2 The S7 Data Register uses the following Byte Addressing method:*

E.g. DB2W 50

Represents data Word 50. Values 0 to 65534 are valid. (even addressing only)

Represents data Block 2. Values DB2W - DB60W are valid.

**3 The Bit Device illustration is as follows:*

E.g,

GP Inscription	PLC Inscription
I0007	I0.7

**4 The Input relay device cannot be written from the GP.*


Caution

- **Failure to configure the Profibus unit correctly can result in inconsistent GP operation on the Profibus network.**
- **This protocol is intended to be used as a generic protocol for all Profibus PLC's. As a result, the ranges and devices stated here are not intended for any single PLC maker. The user should be sure to check that all values used are those required for their specific PLC.**

Environment Setup Cautions

- **The user must be sure to use the normal Profibus configuration software to configure the GP unit for use on the Profibus network. Also, the User must ensure that all devices and addresses designated actually exist, otherwise the User's PLC may stop.**
- **When using the Siemens S7 family of PLCs, the system area start address must be set via the editor software.**
- **The user must be sure that the System Area's start address is set so that sufficient memory is available for all the System Area used. For example, if 10 words of system area are used, the maximum start area address would be 65524.**


Important

Use PRO-PBIII to set the System Area's start address. This cannot be set with the GP's OFFLINE mode.

8.2.5 Environment Setup

■ GP Data Transfer Settings

	GP Settings		
Data Transfer Speed		9.6K to 12Mbps *1	
Data Transfer Method	RS-485		
System Area Start Address		**DB2W0**	DB60W65514
Station No. *2		**0**	127

: Default Settings

**1 The data transfer speed is automatically changed, according to the ladder software's specifications. Thus, setting this speed via the GP is not necessary.*

**2 Station No.s are set via the Profibus Rotary Switches.*

■ Data Transfer Setup Checklist

The following items should be confirmed prior to transferring data on the Profibus network.

1) Be sure that all the installation procedures have been followed.
2) Be sure the Profibus unit's two rotary switches are set correctly and, if required, a terminating resistor is used.
3) If necessary, be sure the default hardware configuration provided on the Installation disk has been modified correctly.
4) Be sure to use the GP's OFFLINE Mode screens to designate the correct options for either a Packet Transfer or Direct I/O configuration. (Use the steps shown below to call up this screen)

From the initial OFFLINE menu screen:

1) Select [INITIALIZE] to call up the initial settings screen.
2) Select the [SET UP OPERATION SURROUNDINGS] menu item (next screen appears).
3) Configure the environment settings to suit your particular requirements. (Ex. Direct I/O, Input/Output Area Size, etc.)

■ "Configuring the GP as a Profibus-DP Slave" and "Installation of Interpreter Project"

For information about these items, refer to the "README. TXT" file in the " FIELDBUS" folder on the GP-PRO/PB III for Windows Ver5.0 CD-ROM.

8.2.6 Profibus Specific Error Codes

If the error code "PLC COM. ERROR (02:F6)" appears on the screen after data has been downloaded from the User's PC to the GP unit, one of the following problems may have occurred.

1) The User has configured the GP to operate in Direct I/O mode, and is now trying to reference devices other than those designated in LS memory.

2) The User is running the GP in Direct I/O mode, and the system memory area has not been cleared. (Set to "0")

Error Code	How to Correct
PLC COM Error 02:F6 *1	1) Be sure that your screen data uses only the designated LS area(s). 2) Reset the System Area (to all zeroes).

**1 For information about other types of error messages, refer to the Operation manual's error message appendix.*

Caution

If the data transmission cable is accidentally cut or disconnected for a long period of time, a system error will occur, which will cause the system to hangup. (Error Codes: 005:02D:010 or 008:02D:010)


MEMO

9 CC-Link

In this chapter, the GP panel CC-Link unit's range of compatible PLCs, their system design and the range of applicable devices are explained.

9.1 Connectable PLCs

The chart below shows the range of PLCs that can be connected to the CC-Link.

■ Remote Device Station

	Series Name	CPU	Link I/F Unit or CPU Direct Connection	Special Conditions	GP-Pro/PBIII [PLC Type] selection
Mitsubishi	A Series	A2A A3A A3N A2U-S1	CC-Link Unit A Series AJ61BT11	CC-Link Compatible unit is required	CC-Link Type
		A2US A2USH-S1	A Series A1SJ61BT11		
	QnA Series	Q3A Q4A	QnA Series AJ61QBT11		

■ Connectable GP/GLC Units for CC-Link Remote Device Station

Series Name		Product Name	Unit
GP70 Series	GP-470 Series	GP-470E	Units Applicable to CC-Link *1
	GP-570 Series	GP-570S	
		GP-570T	
		GP-57JS	
		GP-570VM	
	GP-571 Series	GP-571T	
	GP-675 Series	GP-675S	
		GP-675T	
	GP-870 Series	GP-870VM	
GP77R Series	GP-477R Series	GP-477RE	
	GP-577R Series	GP-577RS	
		GP-577RT	
GP2000 Series	GP-2500 Series	GP-2500L	
		GP-2500S	
		GP-2500T	
	GP-2501 Series	GP-2501S	
		GP-2501T	
	GP-2600 Series	GP-2600T	
GLC2000 Series	GLC2600 Series	GLC2600T	

**1 When using GP2000/GLC2000 series units, a bus conversion unit (PSL-CONV00) is required.*

■ Intelligent Device Station

	Series Name	CPU	CC-Link Unit	Special Conditions	GP-Pro/PBIII [PLC Type] selection
Mitsubishi Electric Corp.	MELSEC-A	A1S A1SH A1SJ A1SJH A1SCPUC24-R2 A2S A2SH A2US A2US-S1 A2USH-S1	A1SJ61BT11	(PLC) CC-Link unit's software version J or higher	CC-Link intelligent device
		A0J2H A1N A2N A2N-S1 A3N A3H A2A A2A-S1 A3A A2U A2U-S1 A3U A4U	AJ61BT11		
	MELSEC-QnA	Q2AS Q2ASH	A1SJ61QBT11	(PLC) CC-Link unit's software version J or higher	
		Q2A Q2A-S1 Q3A Q4A Q4AR	AJ61QBT11		
	MELSEC-Q	Q00CPU Q01CPU Q00JCPU Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	QJ61BT11		
		Q02CPU-A Q02HCPU-A Q06HCPU-A	A1SJ61BT11	A Mode CPU	

■ Connectable GP/GLC Units for CC-Link Intelligent Device Station

Series Name		Product Name	Unit
GP70 Series	GP-377 Series	GP-377L	Units Applicable to CC-Link *1
		GP-377S	
GP77R Series	GP-377R Series	GP377RT	
	GP-477R Series	GP-477RE	
	GP-577R Series	GP-577RS	
		GP-577RT	

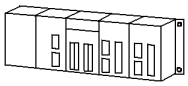
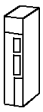
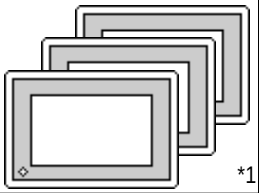
**1 When using GP-477R/GP-577R series units, the GLC bus conversion unit (GLC300-BCB11) is required.*


MEMO

9.2 Remote Device Station

9.2.1 System Structure

■ A series/QnA series (Link I/F)

CPU	Link	Wiring Drawing	Cable(s)	Unit	GP
					 *1
A2A **A3A** **A3N** **A2U-S1**	AJ61BT11	RS485 (refer to next page)	Kuramo Electronics' FANC-SB0.5mm^{2}x3 Twisted Pair Shielded Cable	CC-Link Unit GP070-CL11	GP Series *2
A2US **A2USH-S1**	A1SJ61BT11				
Q3A **Q4A**	AJ61QBT11				

**1 All GP Units connected to the Master station have the following conditions:*

(1) {(1×a)+(2×b)+(3×c)+(4×d)} ≦ 64
a: No. of units occupying 1 node
b: No. of units occupying 2 nodes
c: No. of units occupying 3 nodes
d: No. of units occupying 4 nodes

(2) {(16×A)+(54×B)+(88×C)} ≦ 2304
A: No.of Remote I/O nodes used ≦ 64
B: No. of Remote Device nodes ≦ 42
C: No. of Local nodes ≦ 26

Maximum No. of Connectable GPs

The GP will become a Remote Device node and the minimum number of occupyable nodes becomes two (2). As a result, the number of GPs that can be connected to a single Master node is 32.

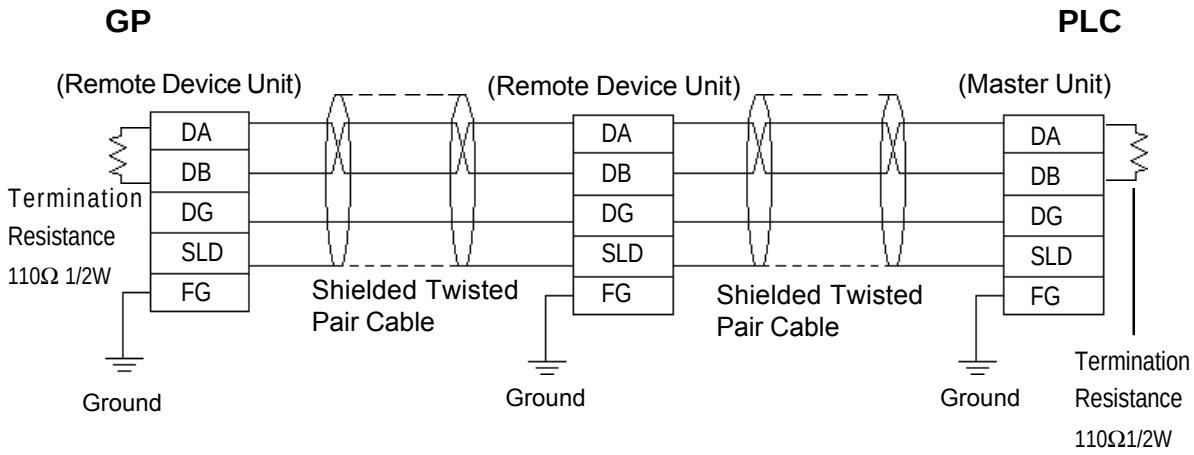
Reference *For detailed information about the Master node's system design, please refer to **Mitsubishi Electric [AJ61BT11/ A1SJ61BT11] Unit CC-Link System Master and Local Unit User's Manual**, or the **[AJ61QBT11/A1SJ61QBT11 Unit CC-Link System Master and Local Unit User] Manual's [System Design]** section.*

**2 For a list of GP/GLC series that can use the CC-Link remote device station, refer to*

Reference *9.1 Connectable PLCs ■ Cannectable GP/GLC Units. For CC-Link Remote Device Station.*

9.2.2 Cable Diagram

When connecting the GP (Remote Unit) to the PLC (Master Unit), use twisted pair cable and wire the connectors as follows:



Important

- ***Be sure to attach termination resistors to each end of a linked system, between DA-DB. A Terminating Resistor is already attached to the PLC's CC-Link unit.***
- ***The GP becomes the remote device node.***
- ***The node order and the actual unit connection order are not related.***
- ***T-type and Star-type connections are not possible.***

9.2.3 Environment Settings

The following are Digital's recommended data transmission settings for the PLC and GP.

■ Mitsubishi Electric A and Q Series Units

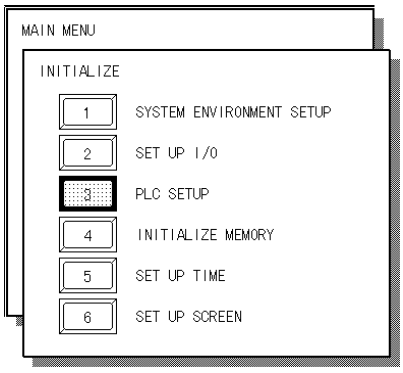
GP Settings		PLC CC-Link Unit Settings	
Transfer Speed	10M, 5M, 2.5M, 625K, 156K	**Transfer Speed**	Set via Rotary Switch
Occupied Nodes	2 to 4	**Occupied Nodes**	Ladder program is used to set no. of occupied nodes in the Node Information area. ***1**
No. of Nodes	1 to 63	**No. of Nodes**	Ladder program is used to set Node No. in the Node Information area. ***1 *2**
Node Type	Remote Device Station (fixed)	**Node Type**	Ladder program is used to set the Node Type in the Node Information area. ***1**
Monitoring Method	Ordinary Monitor, Command Monitor	**Monitoring Method**	Can be entered via Ladder program ***3**
Environment Settings	Use GP screen to enter settings (See Foot Note ***4**)		

1 For detailed information about the Master station's system design, please refer to **Mitsubishi Electric [AJ61BT11/A1SJ61BT11] Unit CC-Link System Master and Local Unit User's Manual, or the **[AJ61QBT11/A1SJ61QBT11 Unit CC-Link System Master and Local Unit User] Manual's [System Design]** section.*

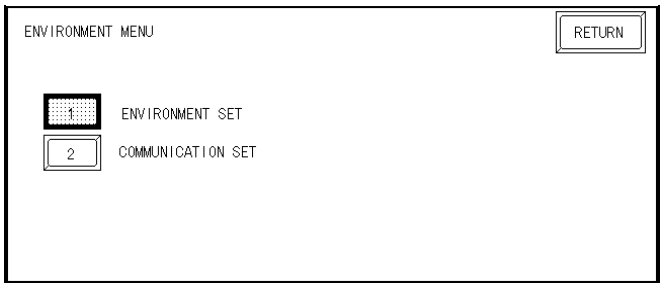
**2 The Master Node's node number must always be set to "0". (Use the Master Unit's rotary switch)*

**3 Only the settings on the GP can be changed. If, however, a ladder program has been used to enter settings (using Initial Setting commands), those settings are the highest priority.*

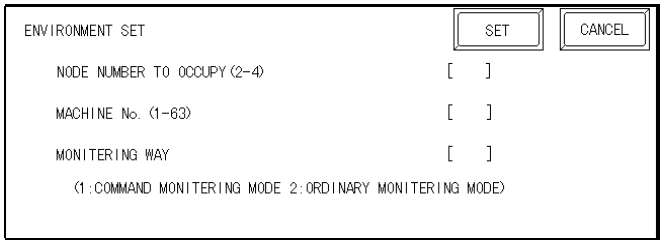
**4 (HOW TO SET UP THE GP SCREEN)*



1. Touch the [PLC SETUP] selection.



2.Touch the [ENVIRONMENT SET] selection.



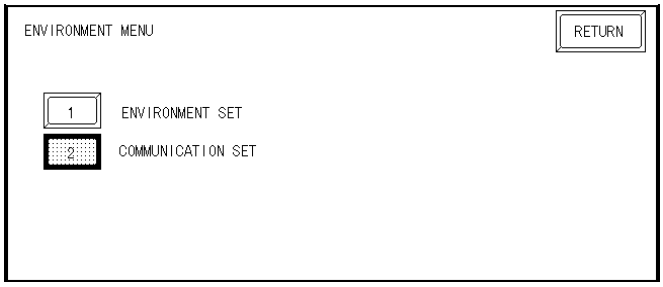
In the [ENVIRONMENT SET] menu:

Enter the desired settings for Node Number to Occupy, Machine No. and Monitoring Way.

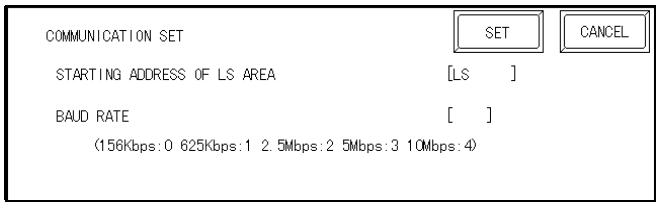
NODE NUMBER TO OCCUPY enter 2, 3 or 4.

MACHINE NO. enter from 1 to 63 for the machine number. If “3” occupied nodes are used, the limit is 62; if “4” occupied nodes are used, the limit is 61.

MONITORING WAY either Command or Ordinary Monitoring can be used.



3. Touch the [COMMUNICATION SET] selection.



In the [COMMUNICATION SET] menu:

Enter the [STARTING ADDRESS OF LS AREA] and [BAUD RATE] settings.

STARTING ADDRESS OF LS AREA This start address is used for the allocation of the Remote Input/Output and Remote Device Areas in the GP’s System Area (20 to 1980).

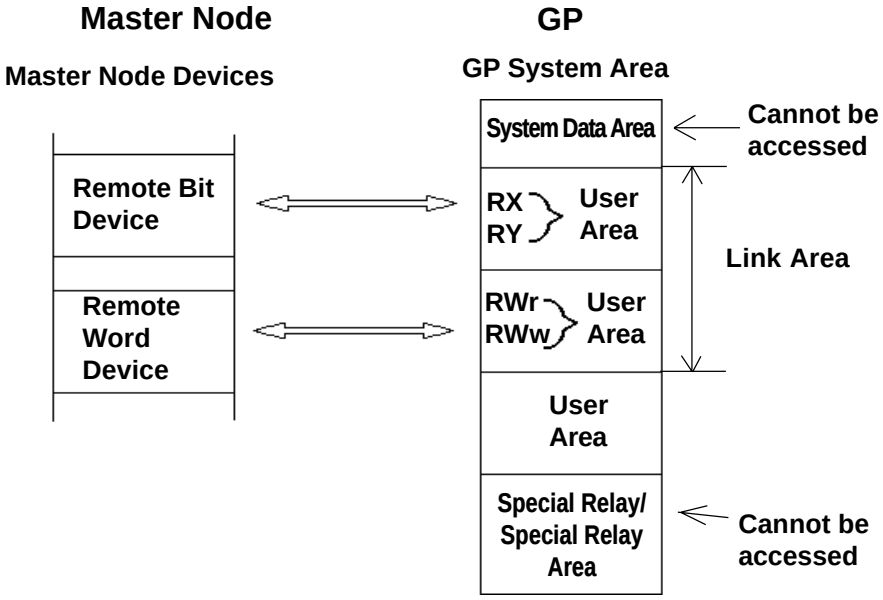
9.2.4 Monitoring Specifications

9.2.4.1 Overview

When using the CC-Link, the GP must be registered as a Remote Device node and use a direct connection with a CC-Link compatible PLC. Here, either the Ordinary or Command Monitoring method can be used.

◆Ordinary Monitoring

The Master Node's devices are occupied (via Link Areas) in the GP's System Area, as shown below.

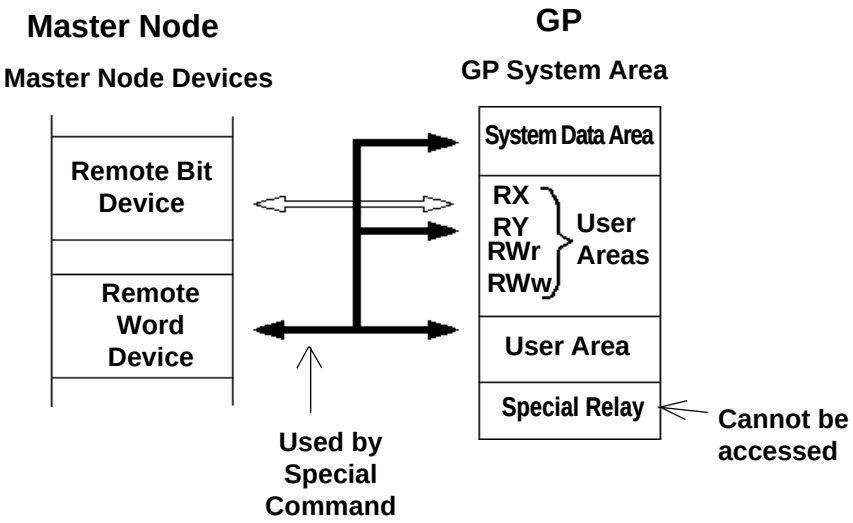


When using the Ordinary Monitoring method, the System Device Area and the Special Relay Area cannot be accessed.

- **Command Monitoring**

  The Remote Bit Device, like the Ordinary Monitor, can directly access the User Area's Bit Device.

  The Remote Word Device, depending on the commands entered to the device, can directly access the GP's User and System areas.



- **Using Indirect Access**

  The CC-Link Special Command (write/read commands) can be used to store/access data in the GP System Area's Remote Word Device.

  Reference *9.2.3 ■ Command Monitoring*

Important

- ***The contents of the System Data Area will convert to Memory Link type.***
- ***When using Command Monitoring, data cannot be written to the RX, RY, RWw, or RWr user areas.***
- ***The GP's Special Relay area cannot be accessed.***

■GP I/O Designations

From GP to Master Station

Link Output	Signal Name
RX m0	User Area The following number of nodes can be occupied: 2 nodes: 48 points 3 nodes: 80 points 4 nodes: 112 points
RX m1	
RX m2	
RX m3	
RX m4	
RX m5	
RX m6	
RX m7	
RX m8	
RX m9	
RX mA	
RX mB	
RX mC	
RX mD	
RX mE	
RX mF	
: :	
RX (m+n) 0	Display Completed Flag
RX (m+n) 1	Reserved for System Area
RX (m+n) 2	
RX (m+n) 3	
RX (m+n) 4	Reserved
RX (m+n) 5	Touch ON Completed Flag
RX (m+n) 6	Reserved
RX (m+n) 7	Tag Code Output Request Flag
RX (m+n) 8	Reserved
RX (m+n) 9	Initial Data Setting Completed Flag
RX (m+n) A	Error Condition Flag
RX (m+n) B	Remote Ready
RX (m+n) C	Reserved
RX (m+n) D	Reserved
RX (m+n) E	Reserved
RX (m+n) F	Reserved

From Master Station to GP

Link Output	Signal Name
RY m0	User Area The following number of nodes can be occupied: 2 nodes: 48 points 3 nodes: 80 points 4 nodes: 112 points
RY m1	
RY m2	
RY m3	
RY m4	
RY m5	
RY m6	
RY m7	
RY m8	
RY m9	
RY mA	
RY mB	
RY mC	
RY mD	
RY mE	
RY mF	
: :	
RY (m+n) 0	Display Request Flag
RY (m+n) 1	Display Monitor Request Flag
RY (m+n) 2	Display Periodic Write Request Flag
RY (m+n) 3	Reserved for System Area
RY (m+n) 4	
RY (m+n) 5	
RY (m+n) 6	
RY (m+n) 7	
RY (m+n) 8	Reserved
RY (m+n) 9	Initial Data Setting Request Flag
RY (m+n) A	Error Reset Request Flag
RY (m+n) B	Reserved
RY (m+n) C	Reserved
RY (m+n) D	Reserved
RY (m+n) E	Reserved
RY (m+n) F	Reserved

Note:

m: (Node No. - 1) x 2H

n: As stated below

No. of Occupied Nodes	2 Nodes	3 Nodes	4 Nodes
n	3	5	7

- **GP I/O Definition Details**

From GP to Master Station

Link Input	Signal Name	Explanation
RX (m+n) 0	Display Completed Flag *1	When the Display Completed Flag (RY (m+n)0) turns ON, the GP's Processing Completed will turn ON. Also, when the GP turns the Display Request Flag OFF, the Display Completed Flag also turns OFF.
RX (m+n) 5	Touch ON Completed Flag	When data is written to the GP's System Data Area 13, Rx(m+n)5 will turn ON. The PLC then uses the Continuous Read Command, and, after reading the contents of the GP's System Data Area 13, it turns OFF.
RX (m+n) 7	Tag Code Output Request Flag	Same as RX(m+n)5.
RX (m+n) 9	Initial Data Setting Completed Flag *1	When the Initial Data Setting Reauest (RY(m+n)9) turns ON, the Initial Data Setting Completed will also turn ON. Also, when the Initial Data Setting is completed, the Initial Data Setting Request Flag and the Initial Data Setting Completed Flag will both turn OFF.
RX (m+n) A	Error Condition Flag	When a command error occurs while the GP's System Area is being used, this flag turns ON.
RX (m+n) B	Remote Ready	When the GP has been changed to ONLINE mode and data linking has been completed successfully, this turns ON. Also, when the GP is in either OFFLINE mode or having its Initial Data entered, this turns OFF.

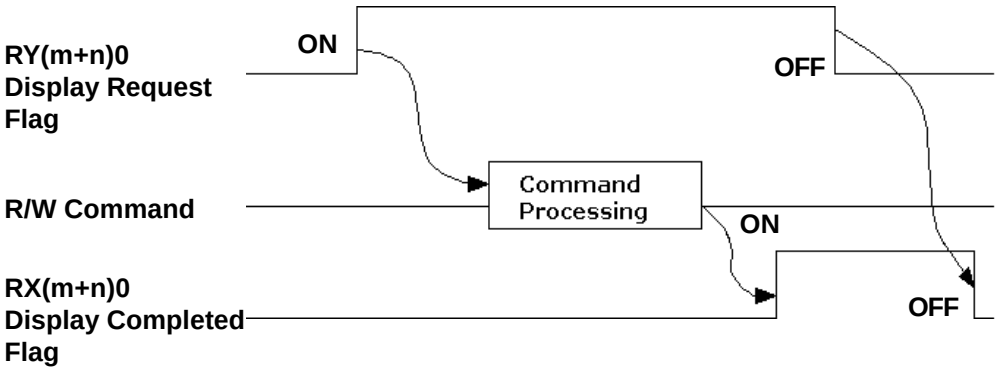
From Master Station to GP

Link Input	Signal Name	Explanation
RY (m+n) 0	Display Request Flag ***1**	When a read or write are being performed to the GP's System Area, this flag turns ON.
RY (m+n) 1	Display Monitor Request Flag ***1**	When the System Area is being read of a GP that has had Monitor Registration performed for its RWrn area, this flag turns ON.
RY (m+n) 2	Display Periodic Write Request Flag ***1**	When the System Area is being written to on a GP that has been registered for the periodic writing of data previously written to the RWwm area, this flag turns ON.
RY (m+n) 9	Initial Data Setting Request Flag ***1**	Initial processing is performed when this flag is ON.
RY (m+n) A	Error Reset Request Flag	When the Error Reset Request Flag turns ON, the Error Condition Flag RX(m+n)A turns OFF.

**1 Only needed during Special Command Monitor. Normally not used.*

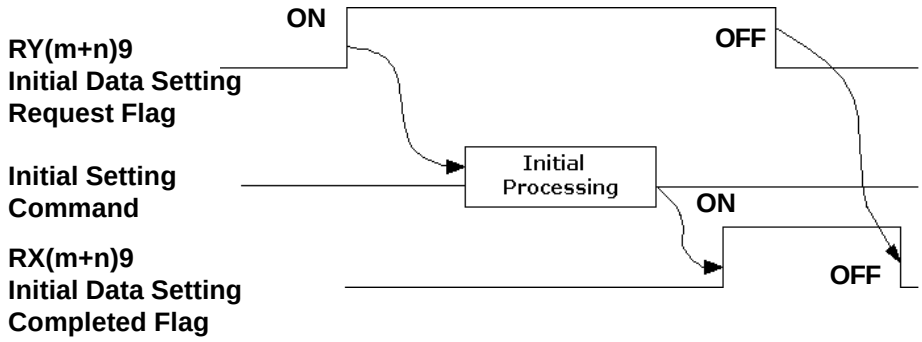
- **Display Completed Flag, Display Request Flag**

  When the Display Request Flag turns ON, the completion of command processing causes the Display Completed Flag to turn ON. When the Display Request Flag turns OFF, the Display Completed Flag will also turn OFF. Be sure to use the ladder program to turn OFF the Display Request Flag after checking the Display Completed Flag has been turned ON.



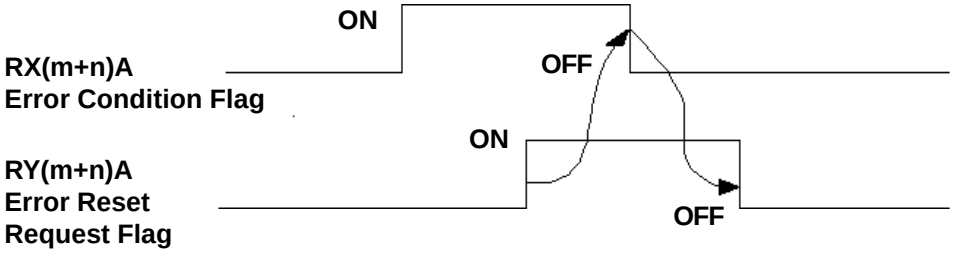
- **Initial Data Setting Completed Flag, Initial Data Setting Request Flag**

  When the Initial Data Setting Completed Flag turns ON, the completion of the initial processing causes the Initial Data Setting Completed Flag to turn ON. When the Initial Data Setting Request Flag turns OFF, the Initial Data Setting Completed Flag turns OFF.



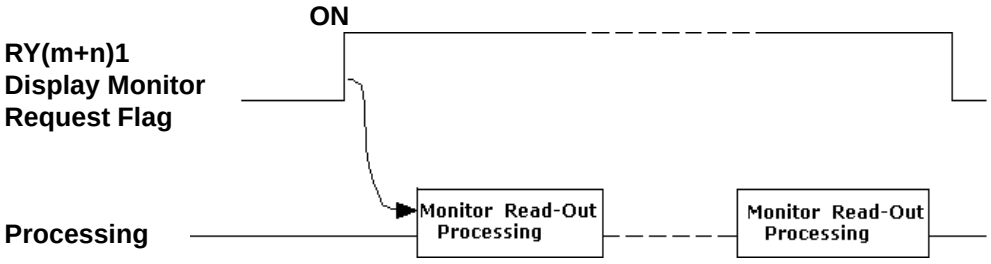
- **Error Condition Flag, Error Reset Request Flag**

  When the Command Monitor feature is being used and an error occurs, the Error Condition Flag and the Error Reset Request Flags both turn ON, causing the Error Condition Flag to turn OFF..



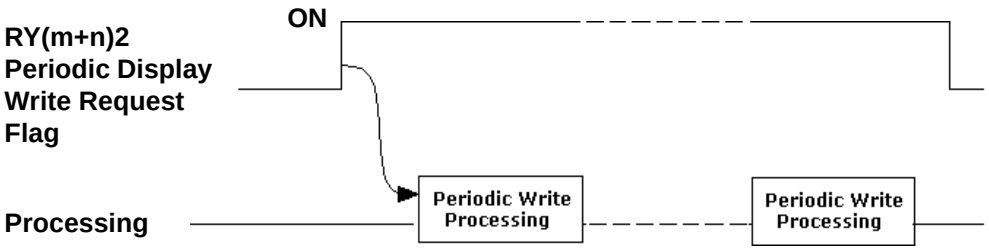
- **Display Monitor Request Flag**

  When the Display Monitor Request Flag turns ON, data from the system area of the GP registered for monitoring will be read out.



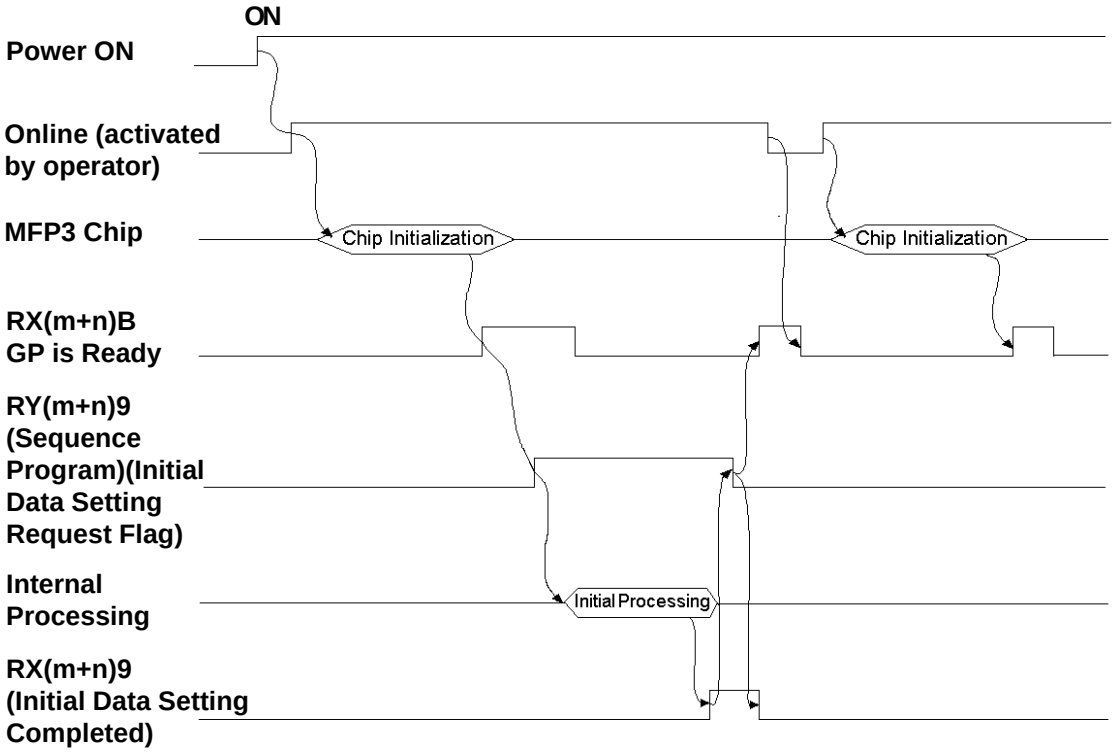
- **Periodic Display Write Request Flag**

  While the Periodic Display Write Request is ON, data is periodically written to a registered GP's system area.



- **Remote Ready**

  When the GP's OS is started and online, the Remote Ready:RX(m+n)B bit is ON.

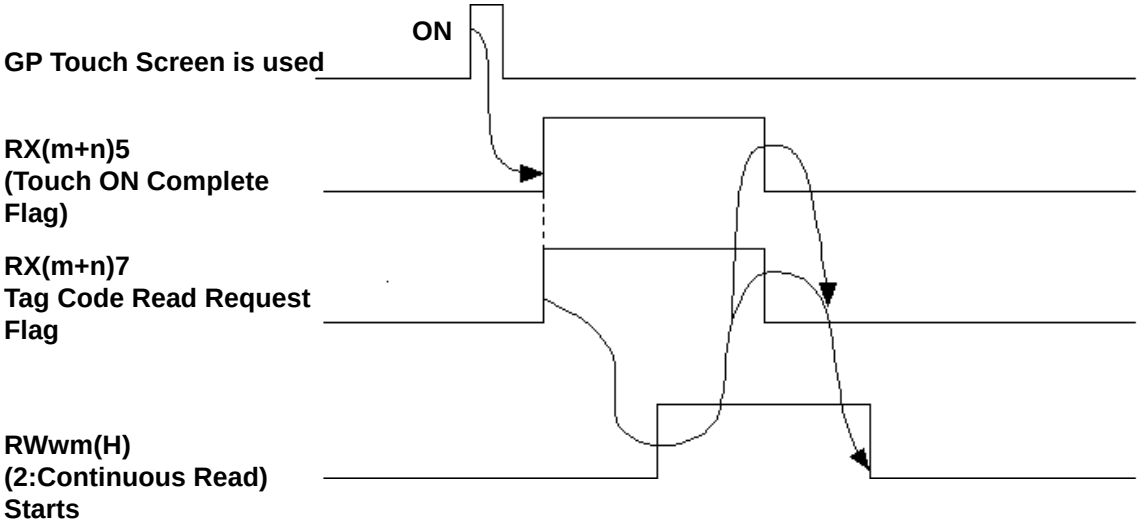


■Sending Tag Codes to the Master Node

This feature is for sending Tag Code data from the GP's System Area to the Master Node, via the GP's touch panel. When a GP touch or other type of tag is used to perform an absolute write to the GP's System Data Area 13 (decimal), the RX(m+n)5 (Touch ON Complete Flag) turns ON. When this bit turns ON,the RX(m+n)7(Tag Code Read Request Flag) also turns ON.

When the Master Node is performing continuous read requests on the GP's System Data Area 13, prior to a Read being completed, the GP will turn RX(m+n)5 OFF. This, in turn, will cause the RX(m+n)7 bit to turn OFF. This method is used to send numeric data from the GP's touch panel (using the 8 bit interrupt codes shown below) tothe Master Node.

- **Input/Output Signal Timing**



9.2.4.2 Ordinary Monitoring

- **GP Register Descriptions**

From Master Station to GP

Address	Contents
RW wm	When 2 Nodes are occupied: 8 points
RW wm+1	
RW wm+2	
RW wm+3	
RW wm+4	
RW wm+5	
RW wm+6	
RW wm+7	
RW wm+8	When 3 Nodes are occupied: 12 points
RW wm+9	
RW wm+A	
RW wm+B	
RW wm+C	When 4 Nodes are occupied: 16 points
RW wm+D	
RW wm+E	
RW wm+F	

From GP to Master Station

Address	Contents
RW rn	When 2 Nodes are occupied: 8 points
RW rn+1	
RW rn+2	
RW rn+3	
RW rn+4	
RW rn+5	
RW rn+6	
RW rn+7	
RW rn+8	When 3 Nodes are occupied: 12 points
RW rn+9	
RW rn+A	
RW rn+B	
RW rn+C	When 4 Nodes are occupied: 16 points
RW rn+D	
RW rn+E	
RW rn+F	

Note: **Concerning the characters m and n:**
The chart here shows how the Remote Register's 4h units are calculated.

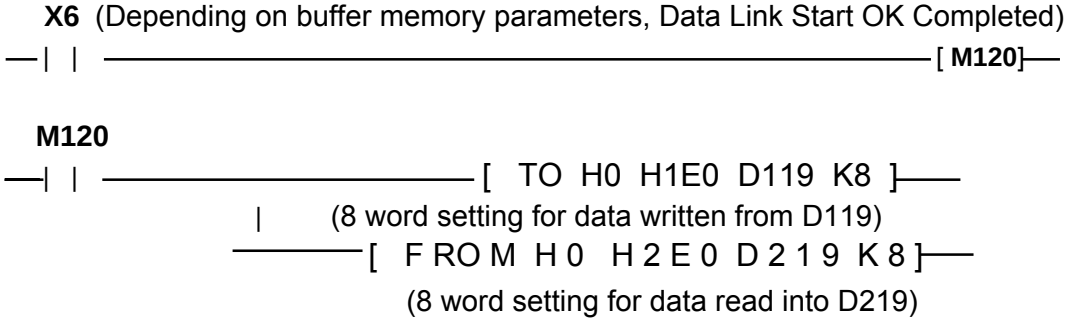
Machine No.	m	n
1	0	100
2	4	104
3	8	108
~	~	~

Note: **With Ordinary Monitoring, the value written into the Master Node's RWw area is reflected in the User Area's Link Area RWw(+36 to +51). Also, the value in the User Area's Link Area RWr(+20 to +35) is reflected in the Master Node's RWr.**

Reference *9.2.3 ■ Occupied Nodes.*

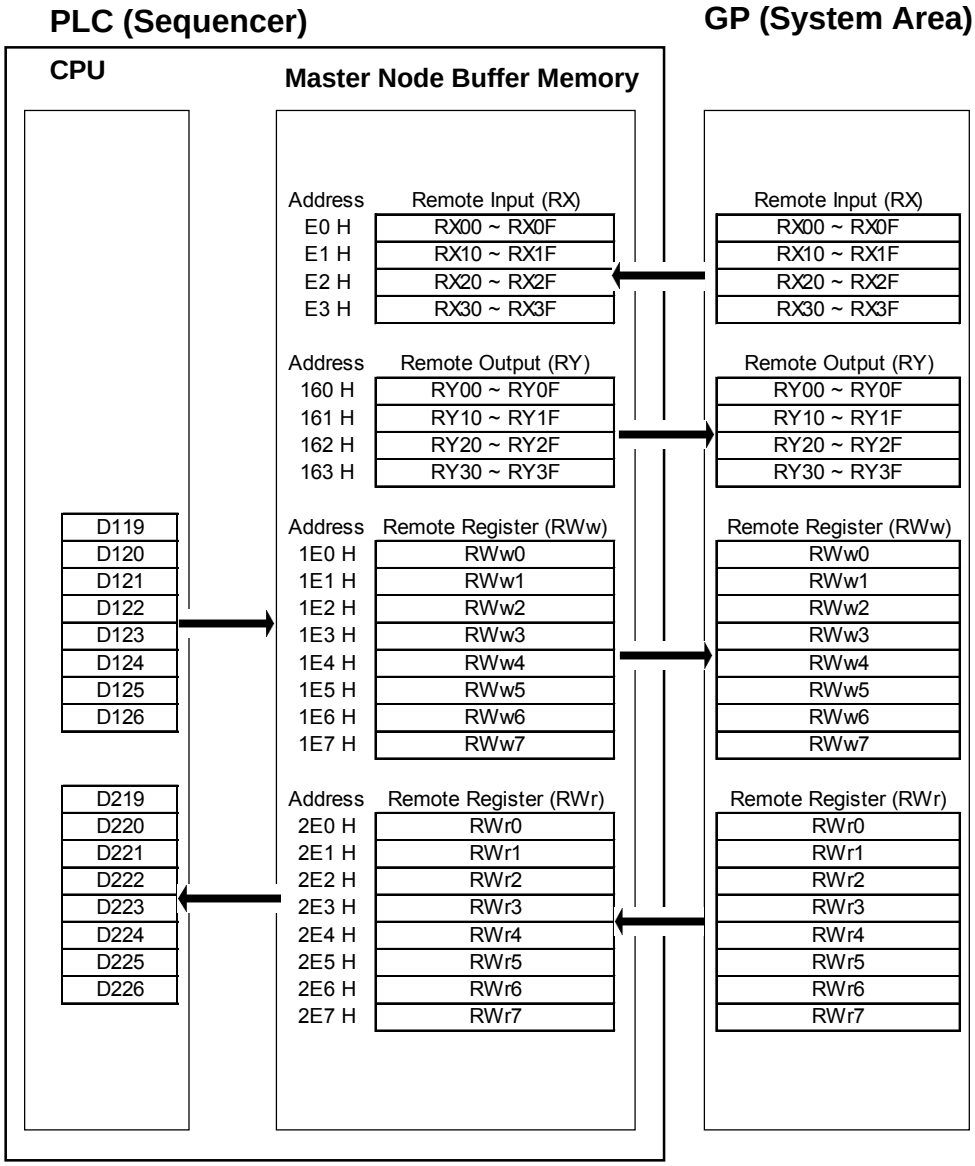
- **Ordinary Monitoring Sequence Drawing**

(Sequence Program)



■ PLC (Sequencer) Progam for Displaying Ordinary Monitor Data

The following drawing shows the PLC's CPU and Master Node Buffer Memory, in addition to the GP's System Data Area.



The above chart shows examples of when the CPU's D119 to D126 data is sent to RWw0 to RWw7, and when RWr0 to RWr7's data is sent to D219 to D226.

9.2.4.3 Command Monitoring

■GP Register Descriptions

◆Master Node to GP

Address	Contents
RW wm	**Command**
RW wm+1	When each command (refer to the each command details) occupies 2 Nodes: 8 points.
RW wm+2	
RW wm+3	
RW wm+4	
RW wm+5	
RW wm+6	
RW wm+7	
RW wm+8	When 3 Nodes are occupied: 12 points
RW wm+9	
RW wm+A	
RW wm+B	
RW wm+C	When 4 Nodes are occupied: 16 points
RW wm+D	
RW wm+E	
RW wm+F	

◆GP to Master Node

Address	Contents
RW rn	**Response** *1
RW rn+1	When each command (refer to the each command details) occupies 2 Nodes: 8 points.
RW rn+2	
RW rn+3	
RW rn+4	
RW rn+5	
RW rn+6	
RW rn+7	
RW rn+8	When 3 Nodes are occupied: 12 points
RW rn+9	
RW rn+A	
RW rn+B	
RW rn+C	When 4 Nodes are occupied: 16 points
RW rn+D	
RW rn+E	
RW rn+F	

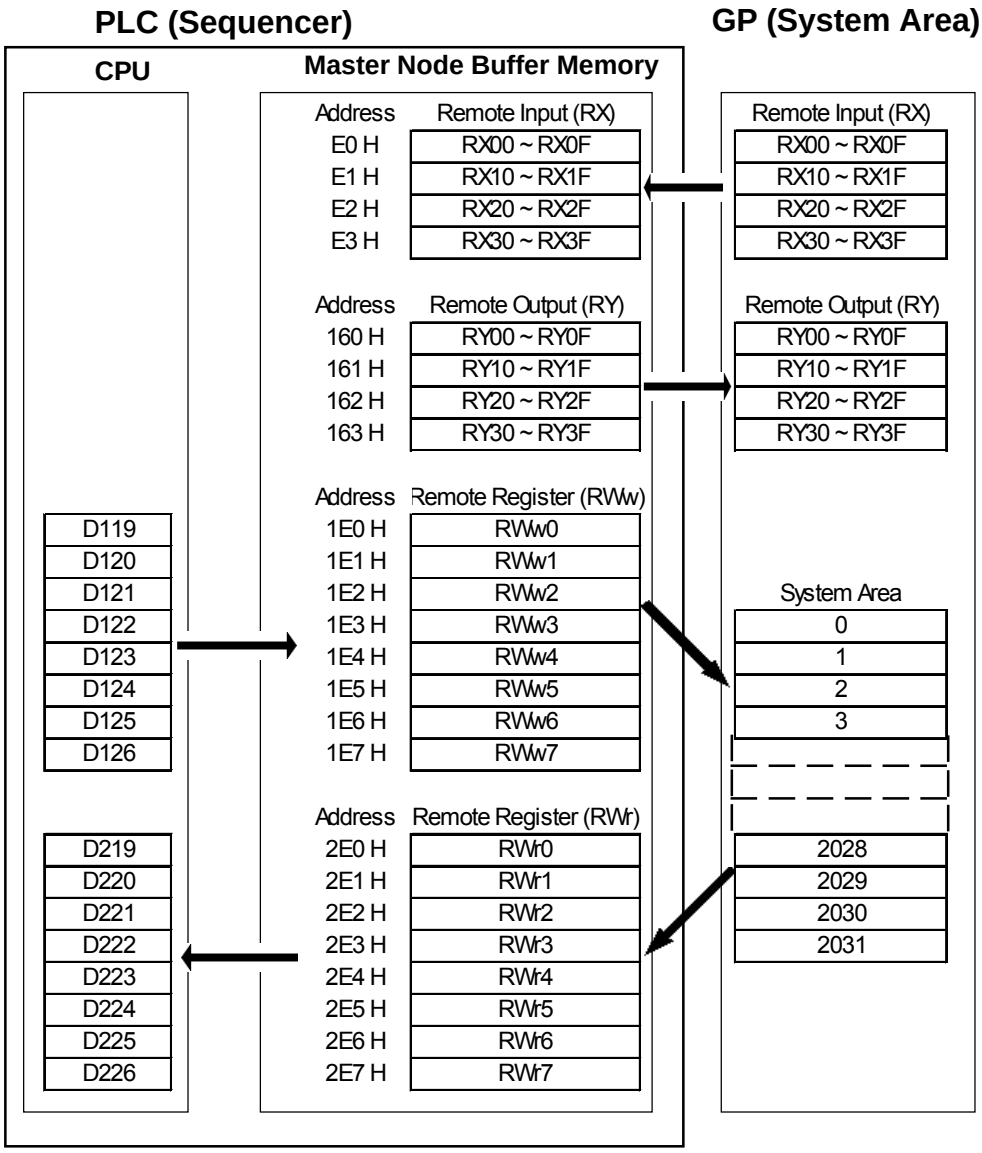
Note: Concerning the characters m and n:
The chart here shows how the Remote Register's 4h units are calculated.

Machine No.	m	n
1	0	100
2	4	104
3	8	108
~	~	~

**1 Error code will be set only when errors occur.*

■Signal Details

The following drawing shows the PLC's CPU and Master Node Buffer Memory, in addition to the GP's System Data Area.



The figures show the PLC CPU's D119 used as the start address for the storage of commands, with D129 being used as the start address for the storage of read out data.

◆ Command List

Command No.	Name	Contents
1	Initial Setting Command	Changes the current Mode.
2	Continous Read Command	Reads out each piece of word data from the GP System Area's designated address.
3	Random Read Command	Reads out data from multiple GP System Area addresses.
4	Continuous Write Command	Writes each piece of word data to the designated GP System Area address.
5	Random Write Command	Writes data to multiple GP System Area addresses.
6	Register Monitor Command	Registers multiple GP System Area addresses for monitoring.
8	Register Periodic Write Command	Registers multiple GP System Area addresses for writing.

■ Initial Setting Command

Address	Contents
RWwm (H)	1: Initial Settings
RWwm (L)	1: Use Command Monitor Mode 2: Use Ordinary Monitor Mode
RWwm +1 to RWwm +F	Cannot be used
RWrn to RWrn +F	Cannot be used

The Initial Setting command (either Ordinary or Command Monitor) can also be designated via the GP's OFFLINE mode. However, if this command is designated via a ladder program, the ladder program has priority. If no ladder program settings are present, the OFFLINE mode settings are enabled.

< Sequence Program Example > (Uses Initial Setting command to operate the Command Monitoring Mode.)

```
—[ <> k 1  D 1 0 0 0 ]———————————— [ MOV  H 1 0 1  D 1 1 9 ]——
                    (Initial Setting Command (H) and Command Monitor Mode (L) settings)
                    ————————————[ T O  H 0  H 1 E 0  D 1 1 9  K 1 ]—
                  | (Save the above settings to the designated buffer address)
                    ————————————[ T O  H 0  H 1 6 3  H 2 0 0  K 1 ]—
 (Initial Data Setting Request Flag ON)
  M 9036(Normally ON)
——  | |  ———————————— [ F R O M  H 0  H E 3  D 1 0 0 0  K 1 ]——
 |                  (Save Initial Data Setting Completed Flag to D1000)
          ————————————————————[ S F R  D 1 0 0 0  K 9 ] ——
                                        (Shift all data 9 bits to the right)
—[ = k 1  D 1 0 0 0 ] ——Ladder program for performing another command
```

■ Continuous Read Command

Address	Contents
RWwm (H)	2: Continuous Read
RWwm (L)	1-14: No. of Words (W/4 occupied nodes: max. 14 points, w/3 occupied nodes: max. 10 points, w/2 occupied nodes: max. 6 points)
RWwm +1	0 to 2031: GP System Area's designated address
RWwm +2 to RWwm +F	Cannot be used
RWrn to RWrn +D	Reads out each piece of word data from the GP System Area's designated address.
RWrn +E to RWrn +F	Cannot be used

< Sequence Program Example > (Continuous Read of 6 words from address 0 in GP memory)

```
 X6   (Data Link normal startup completed using buffer memory's parameter)
—| |———————————————————————————[ S E T  M 1 1 0 ]—
 M110
—| |———————————————————————————[ M O V   K 5 1 8   D 1 1 9 ]—

   |    ( Sets 2 : Continuous Read(H), and  6 : no. of points(L) )
   ——————————————————————————[ M O V   K 0   D 1 2 0 ]———
   |    ( Designates Address 0  in GP Memory)
   ——————————————————————————[ T O  H 0  H 1 E 0  D 1 1 9  K 2 ]
   |    ( Saves above settings to the buffer memory)
   ——————————————————————————[ M O V   K 1   D 1 4 9 ]———
   |
   ——————————————————————————[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]
   |    (GP Request Flag ON)
   ——————————————————————————[ F R O M  H 0  H 2 E 0  D 2 2 9  K 6 ]—
        ( Saves Continuous Read values in device D229)
```

In order to send T-tag data to a PLC, and also enable the master station to read the touched value using the Continuous Read command.

< Sequence Program Example (Using LS13) **>**

(Values in brackets( ) are when LS10 is used)

```
   X 6    (Data Link normal startup completed using buffer memory's parameter)
— | |———————————————————————————[ S E T  M 1 1 0 ]———
 M 9 0 3 6 (Normally ON)
— | |———————————————————————[ F R O M  H 0  H E 3  D 1 0 0 0  K 1 ]———
     |                    (Saves Data stored in Buffer memory to D1000)
     ——————————————————————————[ S F R  D 1 0 0 0  K 5 ]———
                          (Shifts all data 5 bits to the right)  (K 6)
—[ = H 4 5  D 1 0 0 0 ]———————————————————[ M O V  K 5 1 8  D 1 1 9 ]———
  (H 2 3 )          |          (Designates 6 words for Continuous Read)
(Touch ON Completed Flag)———————————[ M O V  K 1 3  D 1 2 0 ]———
                    |                (K 1 0) (Set address13 in the GP internal memory)
                    ————[ T O  H 0  H 1 E 0  D 1 1 9  K 2 ]———
                    |        ( Saves above settings to buffer memory)
                    ————————[ M O V  K 1  D 1 4 9 ]———
                    |
                    ————[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]———
                          (GP Request Flag ON)
```

■ Random Read Command

Address	Contents
RWwm (H)	3: Random Read
RWwm (L)	1-14: No. of Words (W/4 occupied nodes: max. 14 points, w/3 occupied nodes: max. 10 points, w/2 occupied nodes: max. 6 points)
RWwm +1 to RWrn +F	0 to 2031: GP System Area's designated address
RWrn to RWrn +D	Reads out each piece of word data from the GP System Area's designated address.
RWrn +E to RWrn +F	Cannot be used

< Sequence Program Example > (For random read GP memory address 100)

```
    X6  (Data Link normal startup completed using buffer memory's parameter)
──| |──────────────────────────────────────[ S E T  M 1 1 0 ]─
 M110
──| |──────────────────────────────[ M O V   K 7 6 9   D 1 1 9 ]─

   |    ( Designates 3 : Random Read(H), and  1 : no. of points(L) )
   ──────────────────────────[ M O V   K 1 0 0   D 1 2 0 ]─
   |    ( Designates address 100 in the GP internal Memory)
   ──────────────────[ T O  H 0  H 1 E 0  D 1 1 9  K 2 ]
   |    ( Saves above settings to buffer memory)
   ──────────────────────[ M O V   K 1   D 1 4 9 ]──
   |
   ──────────────────────[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]
   |    (Display Request Flag ON)
   ──────────────────[ F R O M  H 0  H 2 E 0  D 2 2 9  K 1 ]─
        ( Saves Random Read values in device D229)
```

■ Continuous Write Command

Address	Contents
RWwm (H)	4: Continuous Write
RWwm (L)	1-14: No. of Words (W/4 occupied nodes: max. 14 points, w/3 occupied nodes: max. 10 points, w/2 occupied nodes: max. 6 points)
RWwm +1	0 to 2031: GP System Area's designated address
RWwm +2 to RWwm +F	Write data
RWrn to RWrn +F	Cannot be used

Data cannot be written to the Link area.

< Sequence Program Example > (Writes 6 words units continuously from GP memory address 2026. This example uses Write data 1,2,3,4,5 and 6.)

```
   X6   (Data Link normal startup completed using buffer memory's parameter)
──| |──────────────────────────────────────[ S E T  M 1 1 0 ]──
   M110
──| |──────────────────────────────────[ M O V   K 1 0 3 0   D 1 1 9 ]──

    |    (Designates 4 : Continuous Write(H), and  6 : no. of points(L) )
    ──────────────────────[ M O V   K 2 0 2 6   D 1 2 0 ]──
    |    (Designates addresses in GP memory)
    ──────────────────────[ M O V   K 1   D 1 2 1 ]──
    |    (Write 1 to address 2026 in GP memory)
    ──────────────────────[ M O V   K 2   D 1 2 2 ]──
    |    (Write 2 to address 2027 in GP memory)
    ──────────────────────[ M O V   K 3   D 1 2 3 ]──
    |    (Write 3 to address 2028 in GP memory)
    ──────────────────────[ M O V   K 4   D 1 2 4 ]──
    I    (Write 4 to address 2029 in GP memory)
    ──────────────────────[ M O V   K 5   D 1 2 5 ]──
    |    (Write 5 to address 2030 in GP memory)
    ──────────────────────[ M O V   K 6   D 1 2 6 ]──
    |    (Write 6 to address 2031 in GP memory)
    ──────────────────────[ M O V   K 1   D 1 4 9 ]──
    |
    ──────────────────────[ T O  H 0  H 1 E 0  D 1 1 9  K 8 ]──
    |    ( Saves the above settings to buffer memory)
    ──────────────────────[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]──
         (Display Request Flag ON)
```

■ Random Write Command

Address	Contents
RWwm (H)	5: Random Write
RWwm (L)	1-7: No. of Words (W/4 occupied nodes: max. 7 points, w/3 occupied nodes: max. 5 points, w/2 occupied nodes: max. 3 points)
RWwm +1	0 to 2031: GP System Area's designated address
RWwm +2	Write data
-	
RWwm +D	0 to 2031: GP System Area's designated address
RWwm +E	Write data
RWwm +F	Cannot be used
RWrn to RWrn +3	Cannot be used

Data cannot be written to the Link area.

< Sequence Program Example > (For random writing to address 0, 1100 and 1979 in GP memory. This example uses Write data 1,2, and 3.)

```
    X6  (Data Link normal startup completed using buffer memory's parameter)
—| |————————————————————————————[ S E T  M 1 1 0 ]——
 M110
—| |————————————————————————————[ M O V  K 1 2 8 3  D 1 1 9 ]——

    |    (Designates 5 : Random Write(H), and  3 : no. of points(L) )
    |————————————————————————————[ M O V  K 0  D 1 2 0 ]——
    |    (Designates address 0 in GP memory)
    |————————————————————————————[ M O V  K 1  D 1 2 1 ]——
    |    (Write 1 to address 0 in GP memory)
    |————————————————————————————[ M O V  K 1 1 0 0  D 1 2 2 ]——
    |    (Designates address 1100 in GP memory)
    |————————————————————————————[ M O V  K 2  D 1 2 3 ]——
    |    (Write 2 to address 1100 in GP memory)
    |————————————————————————————[ M O V  K 1 9 7 9  D 1 2 4 ]——
    I    (Designates address 1979 in GP memory)
    |————————————————————————————[ M O V  K 3  D 1 2 5 ]——
    |    (Write 3 to address 1979 in GP memory)
    |————————————————————————————[ T O  H 0  H 1 E 0  D 1 1 9  K 7 ]——
    |    ( Saves above settings to buffer memory)
    |————————————————————————————[ M O V  K 1  D 1 4 9 ]——
    |
    |————————————————————————————[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]——
        (Display Request Flag ON)
```

■ Register Monitor Command

Address	Contents
RWwm (H)	6: Register Monitor
RWwm (L)	1-14: No. of Words (W/4 occupied nodes: max. 14 points, w/3 occupied nodes: max. 10 points, w/2 occupied nodes: max. 6 points)
RWwm +1 to RWwm +F	0 to 2031: GP System Area's designated address
RWrn to RWrn +F	Cannot be used

< Sequence Program Example > (When setting GP memory addresses 0, 100, 200, 1000, 1500 and 2031 for Register Monitor)

```
   X6  (Data Link normal startup completed using buffer memory's parameter)
──| |──────────────────────────────────────[ S E T  M 1 1 0 ]──
 M110
──| |──────────────────────────────[ M O V  H 6 0 6  D 1 1 9 ]──

    |   (Designates 6 : Register Monitor(H), and  6 : no. of points(L))
    ──────────────────────────[ M O V  K 0  D 1 2 0 ]──
    |   (Designates Address 0 in GP memory)
    ──────────────────────────[ M O V  K 1 0 0  D 1 2 1 ]──
    |   (Designates Address 100 in GP memory)
    ──────────────────────────[ M O V  K 2 0 0  D 1 2 2 ]──
    |   (Designates Address 200 in GP memory)
    ──────────────────────────[ M O V  K 1 0 0 0  D 1 2 3 ]──
    |   (Designates Address 1000 in GP memory)
    ──────────────────────────[ M O V  K 1 5 0 0  D 1 2 4 ]──
    I   (Designates Address 1500 in GP memory)
    ──────────────────────────[ M O V  K 2 0 3 1  D 1 2 5 ]──
    |   (Designates Address 2031 in GP memory)
    ──────────────────────────[ T O  H 0  H 1 E 0  D 1 1 9  K 7 ]──
    |   (Saves above settings in buffer memory)
    ──────────────────────────[ M O V  K 1  D 1 4 9 ]──
    |
    ──────────────────────────[ M O V  K 2  D 1 4 8 ]──
    |
    ──────────────────────[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]──
    |   (Display Request Flag ON)
    ──────────────────────[ F R O M  H 0  H 2 E 0  D 2 2 9  K 6 ]──
                    (Saves values stored in 6 word units from D229)
  M 9 0 3 6 (Normally ON)
──| |──────────────────[ F R O M  H 0  H E 3  D 1 0 0 0  K 1 ]──
                              (Saves Display Completed Flag to D1000)
```

- When using Monitor Request Flag (during Monitoring) refer to the Sequence Program Example below.

```
──[  = K 2 0 4 9  D 1 0 0 0 ]──────────[ T O  H 0  H 1 6 3  D 1 4 8  K 1 ]──
 ( When Display Complete Flag is ON)    (Display Monitor Request Flag ON)
```

■ Register Periodic Write Command

Address	Contents
RWwm (H)	8: Register Periodic Write
RWwm (L)	1-7: No. of Words (W/4 occupied nodes: max. 7 points, w/3 occupied nodes: max. 5 points, w/2 occupied nodes: max. 3 points)
RWwm +1 to RWwm +F	0 to 2031: GP System Area's designated address
RWrn to RWrn +F	Cannot be used

Data cannot be written to the Link area.

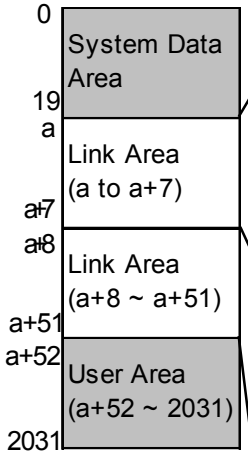
< Sequence Program Example > (When setting addresses 0, 1100 and 2031 in GP memory as Register Periodic Write)

```
──[ = K 0  D 1 0 0 0 ]──────────────[ M O V   K 2 0 5 1   D 1 1 9 ]──────
     |   (Designates 8 : Register Periodic Write(H), and  3 : no. of points(L) )
     ──────────────────────────────[ M O V   K 0   D 1 2 0 ]──
     |   (Designate address 0 in GP memory)
     ──────────────────────────────[ M O V   K 1 1 0 0  D 1 2 1 ]─
     |   (Designate address 1100 in GP memory)
     ──────────────────────────────[ M O V   K 2 0 3 1  D 1 2 2 ]─
     |   (Designate address 2031 in GP memory)
     ──────────────────────────────[ T O  H 0  H 1 E 0  D 1 1 9  K 4 ]──
     |    ( Saves above settings in buffer memory)
     ──────────────────────────────[ M O V   K 1  D 1 4 9 ]──
     |
     ──────────────────────────────[ M O V   K 4  D 1 4 8 ]──
     |
     ──────────────────────────────[ T O  H 0  H 1 6 3  D 1 4 9  K 1 ]─
                    (Display Request Flag ON)

  M 9 0 3 6 (Normally ON)
──| |──────────────────────────────[ F R O M  H 0  H E 3  D 1 0 0 0  K 1 ]──
                  (Saves buffer contents <Display Complete Flag> to D1000)

──[  = K 2 0 4 9  D 1 0 0 0 ]──────────[ T O  H 0  H 1 6 3  D 1 4 8  K 1 ]──
  ( When Display Complete Flag is ON)   (Display Periodic Write Request Flag ON)

  M 9 0 3 6 (Normally ON)
──| |──────────────────────────────[ T O  H 0  H 1 E 0  D 1 1 9  K 1 ]──
                  (Data will be written in periodically when a value is input to D119)
```

For further information about the ladder program and settings, please refer to Mitsubishi's "AJ61BT11/A1SJ61BT11 type CC-Link System Master Local Unit Users Manual (Details)" or "AJ61QBT11/A1SJ61QBT11 type CC-Link System Master Local Unit Users Manual (Details)"

9.2.5 Occupied Node

■ 2 Nodes Occupied

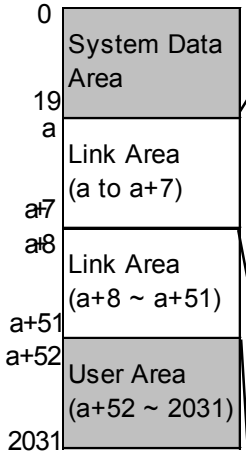


LS area (Word Address)	Bit	Signal	Detail
a to a+2	0 to F	RXm0 to RXmF to RX(m+2)0 to RX(m+2)F	User's Area (RX) : 3words occupied (When 2 nodes are occupied)
a+3	0	RX(m+n)0	Display Complete Flag
	1	RX(m+n)1	Reserved
	2	RX(m+n)2	Reserved
	3	RX(m+n)3	Reserved
	4	RX(m+n)4	Reserved
	5	RX(m+n)5	Touch ON Complete Flag
	6	RX(m+n)6	Reserved
	7	RX(m+n)7	Tag Code Read Out Request Flag
	8	RX(m+n)8	Reserved
	9	RX(m+n)9	Initial Data Setting Completed Flag
	10	RX(m+n)A	Error Flag
	11	RX(m+n)B	Remote READY
	12	RX(m+n)C	Reserved
	13	RX(m+n)D	Reserved
	14	RX(m+n)E	Reserved
	15	RX(m+n)F	Reserved
a+4 to a+7		Not used	
a+8		Reserved	
a+9		Reserved	
a+10 to a+12	0 to F	RYm0 to RYmF to RY(m+2)0 to RY(m+2)F	User's Area (RY) : 3words occupied (When 2 nodes are occupied)
a+13	0	RY(m+n)0	Display Request Flag
	1	RY(m+n)1	Display Monitor Request Flag
	2	RY(m+n)2	Display Periodic Write Request Flag
	3	RY(m+n)3	Reserved
	4	RY(m+n)4	Reserved
	5	RY(m+n)5	Reserved
	6	RY(m+n)6	Reserved
	7	RY(m+n)7	Reserved
	8	RY(m+n)8	Reserved
	9	RY(m+n)9	Initial Data Setting Request Flag
	10	RY(m+n)A	Error Reset Request Flag
	11	RY(m+n)B	Reserved
	12	RY(m+n)C	Reserved
	13	RY(m+n)D	Reserved
	14	RY(m+n)E	Reserved
	15	RY(m+n)F	Reserved
a+14 to a+17		Not used	
a+18		Reserved	
a+19		Reserved	
a+20 to a+27		Rwr	Rwr (R to M) during ordinary montoring
a+28 to a+35		Not used	
a+36 to a+43		RWw	RWw (M to R) during ordinary montoring
a+44 to a+51		Not used	

Note:

- **Shaded areas are used when 2 to 4 nodes are used on common.**
- **"a" means a Start Address.(a³ 20)**
- **"System area" is used for writing GP display switching data/ error data. The type of data written is defined in each address. The contents of this area are the same as the Memory Link Type.** Reference *Refer to **3.1.2 Contents and Range of System Data Area.***

■ 3 Nodes Occupied

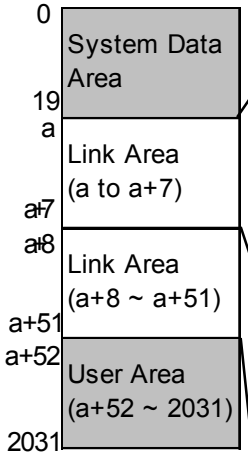


LS area (Word Device)	Bit	Signal	Contents
a to a+4	0 to F	RXm0 to RX mF to RX (m+4)0 to RX (m+4)F	User's Area (RX) : 5 words occupied (When 3 nodes are occupied)
a+5	0	RX(m+n)0	Display Complete Flag
	1	RX(m+n)1	Reserved
	2	RX(m+n)2	Reserved
	3	RX(m+n)3	Reserved
	4	RX(m+n)4	Reserved
	5	RX(m+n)5	Touch ON Complete Flag
	6	RX(m+n)6	Reserved
	7	RX(m+n)7	Tag Code Read Out Request Flag
	8	RX(m+n)8	Reserved
	9	RX(m+n)9	Initial Data Setting Completed Flag
	10	RX(m+n)A	Error Flag
	11	RX(m+n)B	Remote READY
	12	RX(m+n)C	Reserved
	13	RX(m+n)D	Reserved
	14	RX(m+n)E	Reserved
	15	RX(m+n)F	Reserved
a+6 to a+7		Not used	
a+8		Reserved	
a+9		Reserved	
a+10 to a+14	0 to F	RYm0 to RY mF to RY (m+4)0 to RY (m+4)F	User's Area (RY) : 5 words occupied (When 3 nodes are occupied)
a+15	0	RX(m+n)0	Display Request Flag
	1	RX(m+n)1	Display Monitor Request Flag
	2	RX(m+n)2	Display Periodic Write Request Flag
	3	RX(m+n)3	Reserved
	4	RX(m+n)4	Reserved
	5	RX(m+n)5	Reserved
	6	RX(m+n)6	Reserved
	7	RX(m+n)7	Reserved
	8	RX(m+n)8	Reserved
	9	RX(m+n)9	Initial Data Setting Request Flag
	10	RX(m+n)A	Error Reset Request Flag
	11	RX(m+n)B	Reserved
	12	RX(m+n)C	Reserved
	13	RX(m+n)D	Reserved
	14	RX(m+n)E	Reserved
	15	RX(m+n)F	Reserved
a+16 to a+17		Not used	
a+18		Reserved	
a+19		Reserved	
a+20 to a+31		RWr	Rwr (R to M) during ordinary montoring
a+32 to a+35		Not used	
a+36 to a+47		RWw	RWw (M to R) during ordinary montoring
a+48 to a+51		Not used	

Note:

- **Shaded areas are used when 2 to 4 nodes are used on common.**
- **"a" means a Start Address.(a= 20)**
- **"System area" is used for writing GP display switching data/ error data. The type of data written is defined in each address. The contents of this area are the same as the Memory Link Type.** Reference *Refer to **3.1.2 Contents and Range of System Data Area.***

■4 Nodes Occupied



LS area (Word Device)	Bit	Signal	Contents
a to a+6	0 to F	RXm0 to RX mF to RX (m+6)0 to RX (m+6)F	User's Area (RX) : 7 words occupied (When 4 nodes are occupied)
a+7	0	RX(m+n)0	Display Complete Flag
	1	RX(m+n)1	Reserved
	2	RX(m+n)2	Reserved
	3	RX(m+n)3	Reserved
	4	RX(m+n)4	Reserved
	5	RX(m+n)5	Touch ON Complete Flag
	6	RX(m+n)6	Reserved
	7	RX(m+n)7	Tag Code Read Out Request Flag
	8	RX(m+n)8	Reserved
	9	RX(m+n)9	Initial Data Setting Completed Flag
	10	RX(m+n)A	Error Flag
	11	RX(m+n)B	Remote READY
	12	RX(m+n)C	Reserved
	13	RX(m+n)D	Reserved
	14	RX(m+n)E	Reserved
	15	RX(m+n)F	Reserved
a+8		Reserved	
a+9		Reserved	
a+10 to a+16	0 to F	RYm0 to RY mF to RY (m+6)0 to RY (m+6)F	User's Area (RY) : 7 words occupied (When 4 nodes are occupied)
a+17	0	RX(m+n)0	Display Request Flag
	1	RX(m+n)1	Display Monitor Request Flag
	2	RX(m+n)2	Display Periodic Write Request Flag
	3	RX(m+n)3	Reserved
	4	RX(m+n)4	Reserved
	5	RX(m+n)5	Reserved
	6	RX(m+n)6	Reserved
	7	RX(m+n)7	Reserved
	8	RX(m+n)8	Reserved
	9	RX(m+n)9	Initial Data Setting Request Flag
	10	RX(m+n)A	Error Reset Request Flag
	11	RX(m+n)B	Reserved
	12	RX(m+n)C	Reserved
	13	RX(m+n)D	Reserved
	14	RX(m+n)E	Reserved
	15	RX(m+n)F	Reserved
a+18		Reserved	
a+19		Reserved	
a+20 to a+35		RWr	Rwr (R to M) during ordinary montoring
a+36 to a+51		RWw	RWw (M to R) during ordinary montoring

Note:

- **Shaded areas are used when 2 to 4 nodes are used on common.**
- **"a" means a Start Address.(a³ 20)**
- **"System area" is used for writing GP display switching data/ error data. The type of data written is defined in each address. The contents of this area are the same as the Memory Link Type.** **Reference** *Refer to **3.1.2 Contents and Range of System Data Area.***

9.2.6 Error Code

The following list shows the error codes used with CC-Link. These error codes will appear on the screen as, for example, " PLC COM. ERROR, (02: **)", where ** stands for an error code listed below.

Error Code (**)	Error Details
01	Designated device point is not within the limited range
02	Designated address is not within the limited range
03	Command is not defined
04	Incorrect initial command is designated.(Do not use the Request Flag for initial
05	Undefined mode is designated for initial command
06	Not registered in Monitor Command
07	Not registered in Periodic Write Command
08	Data attempted to be written in the write prohibited system area
09	In the OFFLINE mode now
14	No Reply from Hardware
15	Problem in Hardware
16	Node Number switch setting error
17	Baud Rate Switch setting error
18	Set up Node Number switch change error
19	Set up Baud Rate switch change error
1A	CRC error
1B	Time over error
1C	0 channel carrier detection error
1D	1 channel carrier detection error
1E	Communication Transfer error
1F	Y data or RWw data, numerical error
20	Y data, numerical error
21	RWw data, numerical error

If a command error occurrs while exclusive command monitor is used, the GP will automatically set the error codes above in RWr, then turn ON the Error Status Flag "RX(m+n)A" and the Display Complete Flag "RX(m+n)0" .

◆Troubleshooting

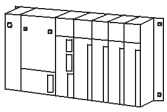
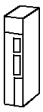
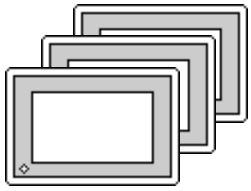
GP Error Display (bottom left corner)	Status
PLC COM.ERROR (02:14)	PLC's power supply turned off during normal communication
PLC COM.ERROR (02:14)	Cable between PLC and GP is not properly connected
PLC COM.ERROR (02:15)	GP's rear unit is not attached
PLC COM.ERROR (02:15)	GP's rear unit is not properly attached
PLC COM.ERROR (02:14)	GP is not registered in the current parameters.
PLC COM.ERROR (02:14)	Baud Rate is not applicable
PLC COM.ERROR (02:14)	Node number is duplicated.
PLC COM.ERROR (02:1A) Blinking	Terminating resister is not connected

9.3 Intelligent Device Station

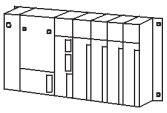
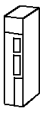
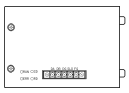
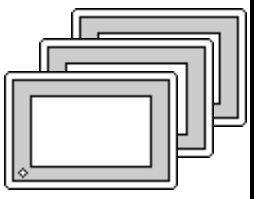
9.3.1 System Configuration

This section shows system configurations used when connecting Mitsubishi Electric PLCs and GP.

■ MELSEC-A Series

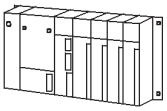
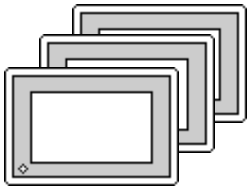
CPU	Link I/F	Cable Diagram	Cables	Unit	GP
					
A1S, A1SH, A1SJ, A1SJH, A1SCPUC24-R2, A2S, A2SH, A2US, A2US-S1, A2USH-S1	A1SJ61BT11	RS-485 <Cable Diagram 1>	Kurashige Denko's Twisted pair cable with shield Model: FANC-SB 0.5 mm2 × 3 or FANC-SBH 0.5 mm2 × 3 or FANC-SB110H	CC-Link unit (MFP1) model: GP077R-CL11	GP Series
A0J2H, A1N, A2N, A2N-S1, A3N, A3M, A3H, A2A, A2A-S1, A3A, A2U, A2U-S1, A3U, A4U	AJ61BT11				

■ MELSEC-QnA Series

CPU	Link I/F	Cable Diagram	Cables	Unit	GP
					
Q2AS Q2ASH	A1SJ61QBT11	RS-485 <Cable Diagram 1>	Kurashige Denko's Twisted pair cable with shield Model: FANC-SB 0.5 mm2 × 3 or FANC-SBH 0.5 mm2 × 3 or FANC-SB110H	CC-Link unit (MFP1) GP077R-CL11	GP Series
Q2A Q2A-S1 Q3A Q4A Q4AR	AJ61QBT11				

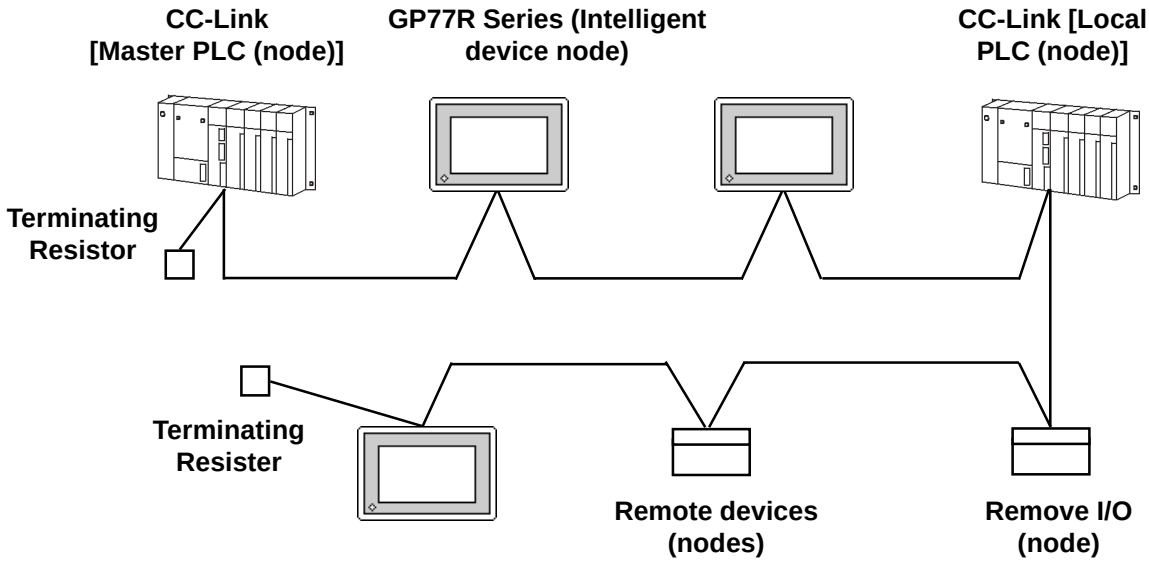
Note: • **For a list of GP series units that can use the CC-Link Intelligent Device Station, refer to Reference 9.1 Connectable PLCs ■ Connectable GP/GLC Units for CC-Link Intelligent Device Station.**

■ MELSEC-Q Series

CPU	Link I/F	Cable Diagram	Cables	Unit	GP
					
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	QJ61BT11	RS-485 <Cable Diagram 1>	Kurashige Denko's Twisted pair cable with shield Model: FANC-SB 0.5 mm^2 × 3 or FANC-SBH 0.5 mm^2 × 3 or FANC-SB110H	CC-Link unit (MFP1) GP077R-CL11	GP Series
Q02CPU-A Q02HCPU-A Q06HCPUA-A	A1SJ61BT11				

Note: • **For a list of GP series units that can use the CC-Link Intelligent Device Station, refer to Reference 9.1 Connectable PLCs ■ Connectaable GP/GLC Units for CC-Link Intelligent Device Station.**

■ Network Connection Example



◆Number of Connectable Units

All GP units connected to the master PLC (node) have the following operation conditions:

1. {(1 X a)+(2 X b)+(3 X c)+(4 X d)} ≦ 64

   a: Number of units occupying 1 node

   b: Number of units occupying 2 nodes

   c: Number of units occupying 3 nodes

   d: Number of units occupying 4 nodes

2. {(16 X A)+(54 X B)+(88 X C)}≦ 2304

   A: Number of remote I/O nodes ≦ 64

   B: Number of remote device nodes ≦ 42

   C: Number of local and intelligent device nodes ≦ 26

◆Maximum number of connectable GPs

The GP will become an intelligent device node. Also, the minimum number of occupying nodes is 1. As a result, the number of GPs that can be connected to a single master node is 26.

Note: For more detailed information about master node system design, refer to the following manuals' system design chapter:

Mitsubishi Electric:

- **AJ61BT11/A1SJ61BT11 Unit CC-Link System Master and Local Unit User's Manual (Details)**
- **AJ61QBT11/A1SJ61QBT11 Unit CC-Link System Master and Local Unit User's Manual (Details)**
- **QJ61BT11 Unit CC-Link System Master and Local Unit User's Manual (Details)**

Important

- ***The transient transmission is processed more slowly than the cyclic transmission. If fast processing is required, use the cyclic transmission.***

9.3.2 Cable Diagram

Although the cable diagram shown below and those recommended by the Mitsubishi Electric Corp. may differ, using these cables for connection will not cause any problems.

■ Recommended Cables

The recommended cables are as follows:

CC-Link cable: **Kurashige Denko FANC-SB 0.5 mm² X 3**

CC-Link High cable: **Kurashige Denko FANC-SBH 0.5 mm² X 3**

CC-Link cable (New Type): **Kurashige Denko FANC-SB110H**

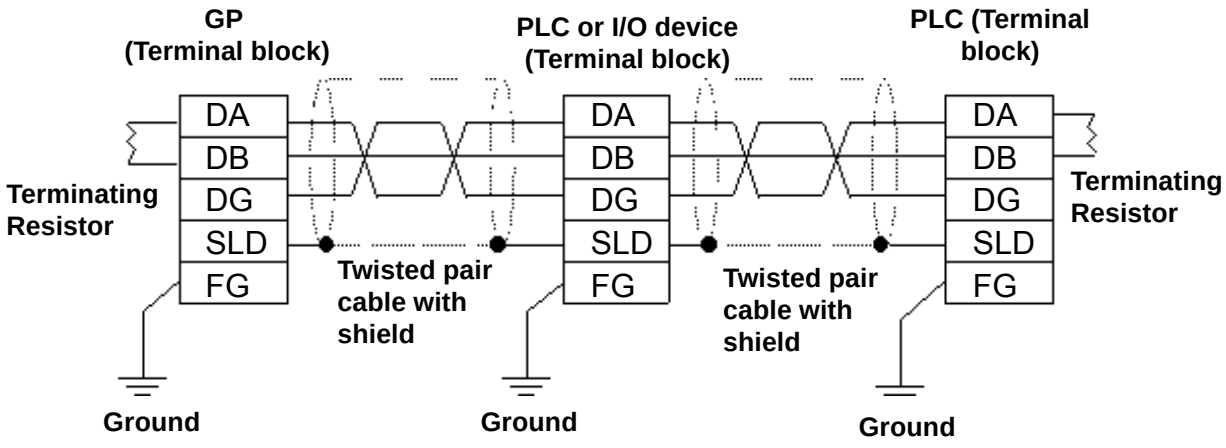
Important

- ***Be sure to use only CC-Link cables.***
- ***CC-Link cables and CC-Link high performance cable, cannot be used simultaneously.***
- ***For details about T-junction connections, refer to Mitsubishi Electric CC-Link Master Unit Manual.****1

*1 Mitsubishi Electric manuals:

- *AJ61BT11/A1SJ61BT11 Unit CC-Link System Master and Local Unit User's Manual (Details)*
- *AJ61QBT11/A1SJ61QBT11 Unit CC-Link System Master and Local Unit User's Manual (Details)*
- QJ61BT11 Unit CC-Link System Master and Local Unit User's Manual *(Details)*

Cable Diagram 1 (RS-485)



Note:

- **Connect the shield wires to each unit's SLD terminal.**

  The SLD terminal is connected internally be connected to the FG terminal. Use a grounding method applicable to your area's regulations and laws.
- **Insert the Master Unit's terminating resistor at both ends of the data link (between DA and DB). Be aware that terminating resistance value of the CC-Link cable will differ from that of the CC-Link high performance cable.**
- **For more detailed information about terminating resistance values and cable lengths, refer to Mitsubishi Electric CC-Link Master Unit Manual.*1**

9.3.3 Supported Devices

The following lists show the range of devices supported by the GP.

Note: **Each device's address range may differ depending on your CPU model. For each CPU device range, refer to Mitsubishi Electric PLC manuals.**

■ MELSEC-A/QnA/Q Series (Common for All Series Units) (Cyclic Transmission)

Device	Bit Address	Word Address	Particulars	
Remote input	RX000 ~ RX7FF	RX000 ~ RX7F0	***0 *1	L/H
Remote output	RY000 ~ RY7FF	RY000 ~ RY7F0	***0	
Remote resistor	RWw000 ~ RWwFFF	RWw00 ~ RWwFF		
Remote resistor	RWr000 ~ RWrFFF	RWr00 ~ RWrFF	*1	

**1 Data cannot be written from the GP. Only data read can be performed. "RX", "RY", "RWx", and "RWw" are the names used on the GP. On the master node, these assigned names will become opposite.*

	Assigned Name			
GP	RX	RY	RWw	RWr
PLC	RY	RX	RWr	RWw

■ MELSEC-A Series (Transient transmission)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	L/H
Output relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal relay	M0000 ~ M8191	M0000 ~ M8191	÷16	
Special relay	M9_000 ~ M9_255	M9_000 ~ M9_240	÷16	*1
Retain relay	L0000 ~ L8191	L0000 ~ L8176	÷16	
Link relay	B0000 ~ B1FFF	B0000 ~ B1FF0	***0	
Timer (contact)	TS0000 ~ TS2047	TS0000 ~ TS2032	÷16	
Timer (coil)	TC0000 ~ TC2047	TC0000 ~ TC2032	÷16	
Counter (contact)	CS0000 ~ CS1023	CS0000 ~ CS1008	÷16	
Counter (coil)	CC0000 ~ CC1023	CC0000 ~ CC1008	÷16	
Timer (current value)	---------	TN00000 ~ TN2047	Bit15	
Counter (current value)	---------	CN0000 ~ CN1023	Bit15	
Data register	---------	D0000 ~ D8191	Bit15	
Special register	---------	D9_000 ~ D9_255	Bit15	*2
Link register	---------	W0000 ~ W1FFF	BitF	
File register	---------	R0000 ~ R8191	Bit15	

**1 When designating special relay devices, select "M9_" in the screen editor.*

**2 When designating special register devices, select "D9_" in the screen editor.*

Note:

Annunciator devices are inaccessible.

E-tag or K-tag indirect addresses cannot be designated.

■ MELSEC-QnA/Q Series (Transient transmission)

Setup System Area or Communication Information's Storing Address here.

Device	Bit Address	Word Address	Particulars	
Input relay	X0000 ~ X1FFF	X0000 ~ X1FF0	***0	
Output relay	Y0000 ~ Y1FFF	Y0000 ~ Y1FF0	***0	
Internal relay	M0000 ~ M32767	M0000 ~ M32752	÷16	
Special relay	SM0000 ~ SM2047	SM0000 ~ SM2032	÷16	
Latch relay	L0000 ~ L32767	L0000 ~ L32752	÷16	
Link relay	B0000 ~ B7FFF	B0000 ~ B7FF0	***0	
Special link relay	SB000 ~ SB7FF	SB000 ~ SB7F0	***0	
Timer (contact)	TS00000 ~ TS23087	TS00000 ~ TS23072	÷16	
Timer (coil)	TC00000 ~ TC23087	TC00000 ~ TC23072	÷16	
Totaling timer (contact)	SS00000 ~ SS23087	SS00000 ~ SS23072	÷16	
Totaling timer (coil)	SC00000 ~ SC23087	SC00000 ~ SC23072	÷16	L/H
Counter (contact)	CS00000 ~ CS23087	CS00000 ~ CS23072	÷16	
Counter (coil)	CC00000 ~ CC23087	CC00000 ~ CC23072	÷16	
Timer (current value)	---------	TN00000 ~ TN23087	Bit15	
Totaling timer (current value)	---------	SN00000 ~ SN23087	Bit15	
Counter (current value)	---------	CN00000 ~ CN23087	Bit15	
Data register	---------	D00000 ~ D25983	Bit15	
Special register	---------	SD0000 ~ SD2047	Bit15	
Link register	---------	W0000 ~ W657F	BitF	
Special link register	---------	SW000 ~ SW7FF	BitF	
File register	---------	R0000 ~ R32767	Bit15	

Note: Annunciator, Edge relay, and Step relay devices are not accessible.

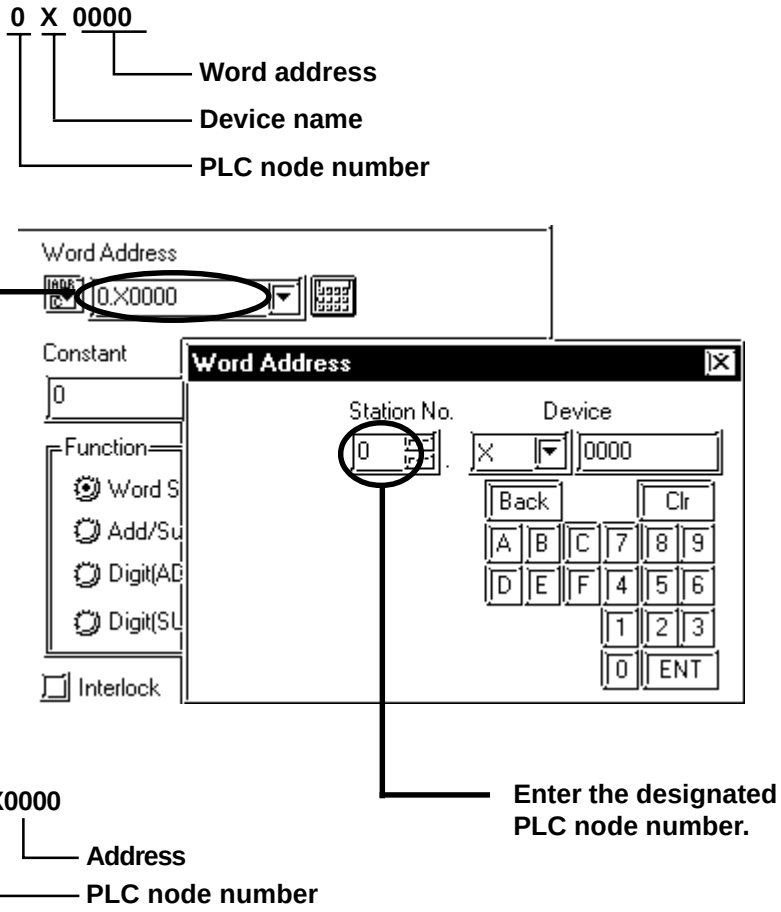
E-tag or K-tag indirect addresses cannot be designated.

Note: **When performing Part and tag settings via GP-PRO/PB III for Windows, designate the PLC node number at the same time as entering addresses. (The default value used when the software starts is "0".)**

When using cyclic transmission, node number settings are unnecessary.

Reference *Reference: For the devices on which cyclic transmission can be performed, refer to 9.3.3 Supported Devices, MELSEC-A/QnA/Q Series (Common for All Series Units) (Cyclic Transmission).*

<e.g.> When a device address is "X0000":
Enter "X" for the device name, and "0000" for the address.



■ CC-Link Intelligent Device Station Limitations

CC-Link intelligent Device Station have the following limitations.

◆ Device Addresses and Nodes Connection Limitations

When a block's size limit (1024: 1K) is exceeded, or a different node's device address is used, GP unit internal records are used to set device addresses. These records are limited to 64.

For example, when the D0 device address is set, a single record is used in the GP. For detailed examples, refer to the following chart.

E.x. 1)
Number of records used when performing the following tag settings:

Setting No.	Setting Node No.	Device Address	Remaining Number of Records in GP-PRO/PB III	Remarks
1	1	D0	63	Uses one record
2	1	D1024	62	Uses one record
3	2	D0	61	Uses one record
4	2	D1024	60	Uses one record
5	2	R0	60	Since the node number and address range already exist as setting No. 3, no records will be used.
6	2	R1024	60	Since the node number and address range already exist as setting No. 4, no records will be used.
7	2	D2048	59	Uses one record
8	3	D2048	58	Uses one record
9	3	D2049	58	Since the node number and address range already exist as setting No. 8, no records will be used.

Also, if a different node number is used, or the size of an address exceeds the block limit of 1024 (1KB), a GP internal record is used. However, if only the device name is changed, or if the new address range used is the same size as the previously set range, a record will not need to be used.

Ex. 2)

When setting data resister up to D16384 as well as setting addresses in a block (1024: 1K) via tag settings, 16 internal records will be used.

16384÷1024 =16

Therefore, when performing the same amount of tag settings for each node, settings can be performed for only a total of 4 nodes.

* When the number of internal records exceeds 64, the following error message will appear on the GP screen editor software:

"The number of device addresses has exceeded the upper limit. Cannot perform any more settings.

◆ PLC Device Block Write Restrictions

The GP unit processes data internally by separating data into blocks of 1024 words.

Therefore, when a Block Write is requested that uses 41 or more words and will exceed the 1024 word limit,

the following features cannot be used.

- PLC Device Write using D-Script's Memory Operation Feature

- Write from GP/GLC SRAM to PLC Device using Filing Feature

- Write to LS Area's Read Area

If the above problem occurs, separate the data so that the number of words used by the Block Write is 1024 or less.

<Cyclic Transmission>

All remote input/output and remote register data that has been allocated to the master node via the CC-Link parameter settings, can be read.

From this data, only RX and RWr allocated to the GP via the master node can be written from the GP. (These names will become RY and RWw on the GP.)

■ Number of Bits Allocable to the GP

Device	Number of Nodes Occupied		Remark
	1 Node	4 Nodes	
Remote input (RX)	32 bits	128 bits	No. of bits
Remote output (RY)	32 bits	128 bits	No. of bits
Remote register (RWr)	4 words	16 words	No. of word
Remote register (RWw)	4 words	16 words	No. of word

■ Remote Input/Output Signals (Individual to Master Nodes)

The following data explains the GP's individual node input/output signal allocation. There are two signal allocation, methods: using or not using remote READY flag or not using it. Also, the input/output signal will vary depending on the set number of occupying nodes (1 node/4 nodes).

◆ When remote READY flag (default) is not used:

The "n" character used in the following table reflects the address number used for each node by the master node.

Signal Direction: GP -> Master Node			Signal Direction: Master Node -> GP		
Device No.		Signal Name	Device No.		Signal Name
Number of Occupying Nodes			Number of Occupying Nodes		
1 Node	4 Nodes		1 Node	4 Nodes	
RYn0 ~ RYnF	RYn0 ~ RY(n+6)F	User area	RXn0 ~ RXnF	RXn0 ~ RX(n+6)F	User area
RY(n+1)0 ~ RY(n+1)C	RY(n+7)0 ~ RY(n+7)C		RX(n+1)0 ~ RX(n+1)C	RX(n+7)0 ~ RX(n+7)C	
RY(n+1)E ~ RY(n+1)F	RY(n+7)E ~ RY(n+7)F	Prohibited to use *1	RX(n+1)E ~ RX(n+1)F	RX(n+7)E ~ RX(n+7)F	Prohibited to use *1

**1 The last 2 bits cannot be used for any node settings.*

◆ **When using remote READY flag (default):**

The “n” character used in the following table reflects the address number used for each node by the master node.

Signal Direction: GP -> Master Node			Signal Direction: Master Node -> GP		
Device No.		Signal Name	Device No.		Signal Name
Number of Occupying Nodes			Number of Occupying Nodes		
1 Node	4 Nodes		1 Node	4 Nodes	
RYn0 ~ RYnF	RYn0 ~ RY(n+6)F	User area	RXn0 ~ RXnF	RXn0 ~ RX(n+6)F	User area
RY(n+1)0 ~ RY(n+1)A	RY(n+7)0 ~ RY(n+7)A	Prohibited to use	RX(n+1)0 ~ RX(n+1)A	RX(n+7)0 ~ RX(n+7)A	Prohibited to use
RY(n+1)B	RY(n+7)B	Remote READY flag *1	RX(n+1)B	RX(n+7)B	
RY(n+1)C ~ RY(n+1)F	RY(n+7)C ~ RY(n+7)F	Prohibited to use	RX(n+1)C ~ RX(n+1)F	RX(n+7)C ~ RX(n+7)F	

**1 The remote READY flag will turn ON during GP start-up. When turning the GP's power ON, when resetting the hardware, and when the GP is ready for operation, the remote READY flag will turn ON. Even while the GP's power is ON, the remote READY flag will turn OFF during offline operation and while performing initial processing. Use this feature for the interlock circuit used when reading and writing data from the CC-Link master node.*

■ Relationship between Master and Individual Nodes

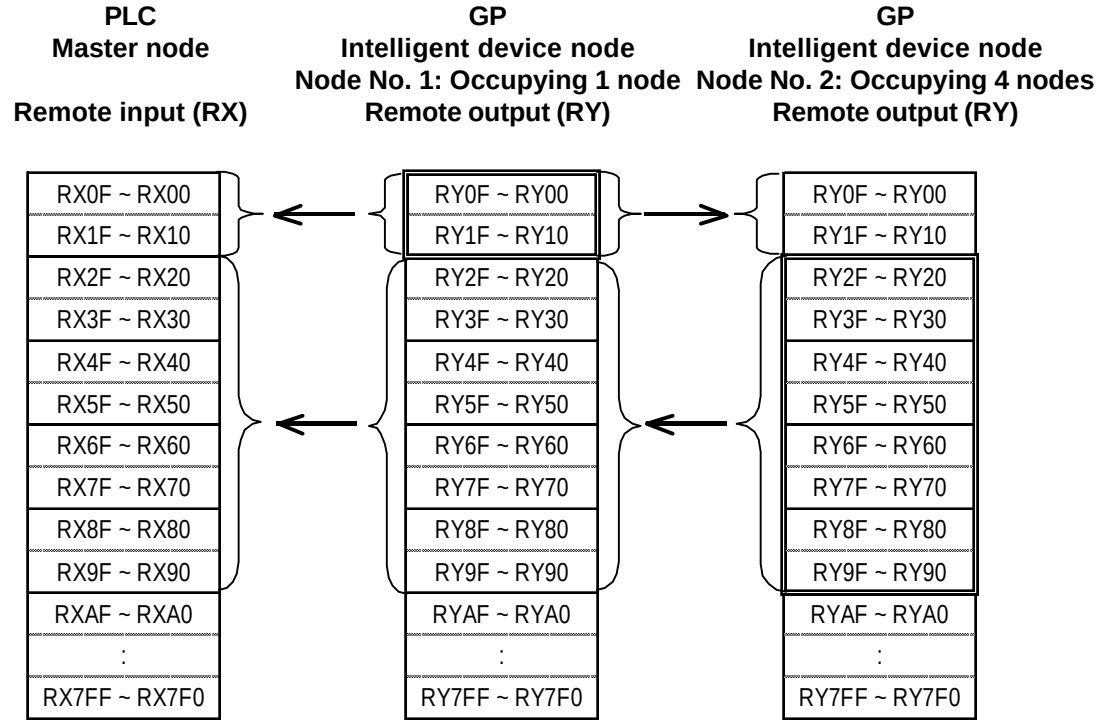
The following data explains the GP's remote register allocation.
The remote register will vary depending on the number of occupying nodes (1 node/4 nodes) set.

The “m” and “n” characters used in the following table reflect the address numbers used for each node by the master node.

Data Direction	Address		Area
	Number of Occupying Nodes		
	1 Node	4 Nodes	
GP -> Master node	RWwm ~ RWwm+3	RWwm ~ RWwm+F	Data write area
Master node -> GP	RWrn ~ RWrn+3	RWrn ~ RWrn+F	Data read area

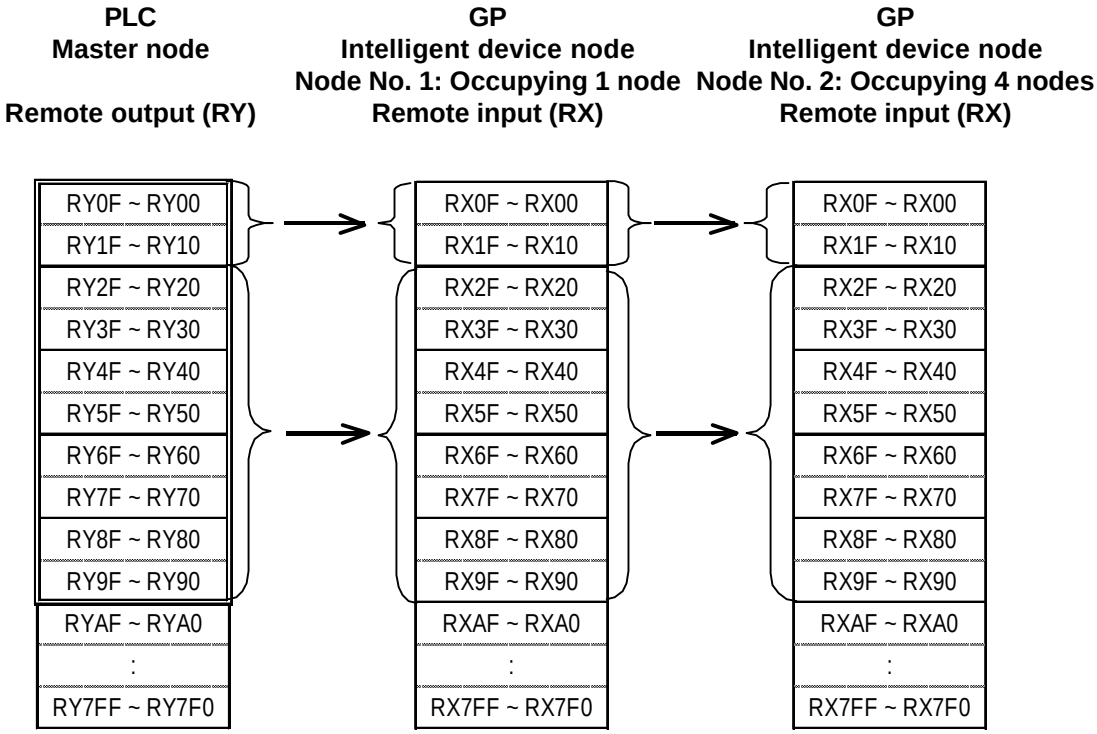
■ Remote Enput Allocation via Master Node

Data can be written from the GP to these areas.



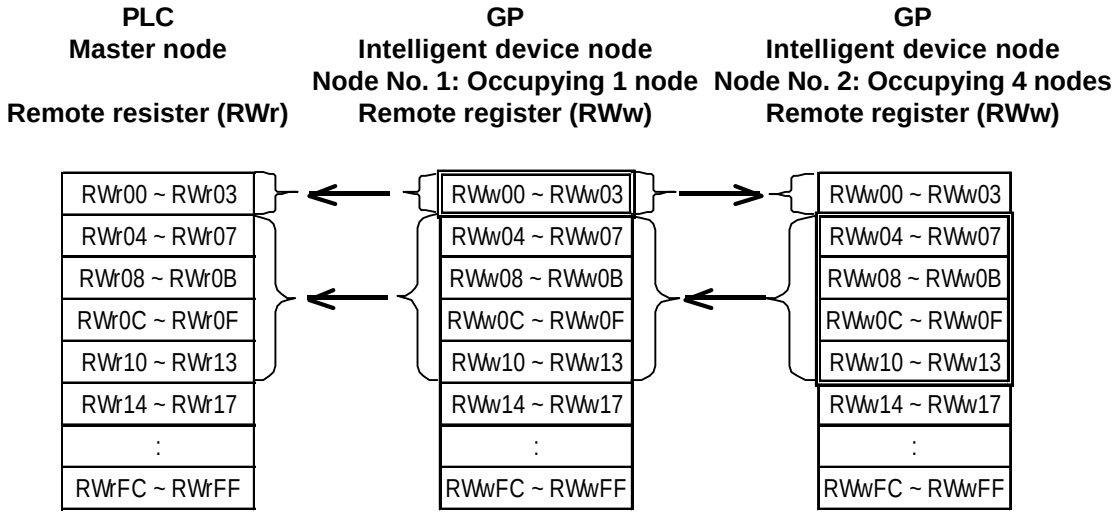
■ Remote Output Allocation via Master Node

Data can be written from the GP to these areas.



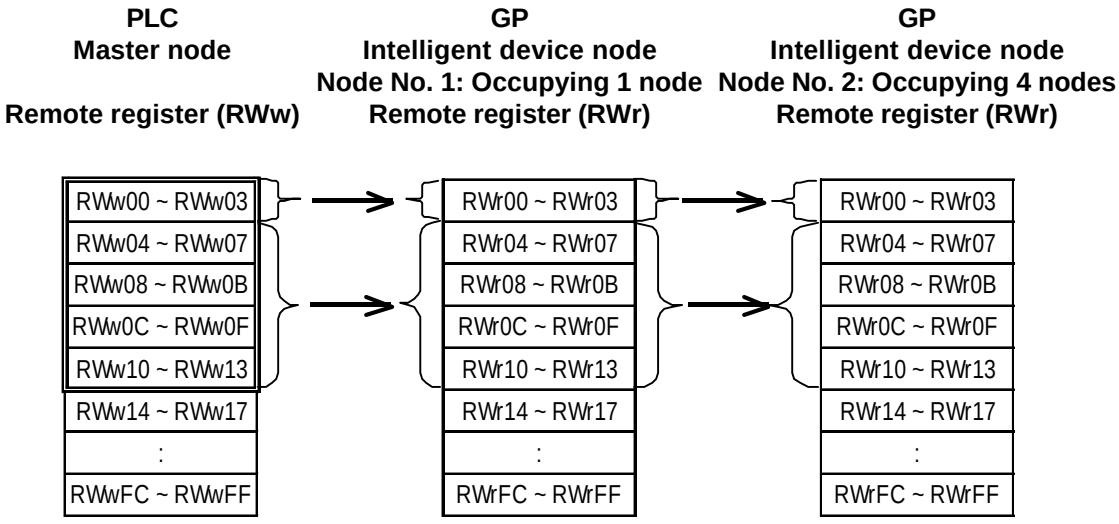
■ Remote Register (data read area) Allocation via Master Node

Data can be written from the GP to these areas.



■ Remote Register (data write area) allocation via Master Node

Data can be written from the GP to these areas.



9.3.4 Environment Setup

The following table shows Digital's recommended PLC and GP communication settings.

■ MELSEC-A/QnA/Q Series

GP Settings		PLC (Master Node CC-Link Unit) Settings	
Baud Rate	156kbps	Baud Rate Setting Switch	0 (156kbps)
No. of Occupyable Nodes	1	Node Information Settings	*1
Node No.	1	Node Information Settings	*1
Data Input Status	Clear	————	————
Remote READY flag	Not used	————	————
————	————	Node No. Setting Switch	0 (master)
————	————	Mode Setting Switch	0 (online)
————	————	Condition Setting Switch	All OFF

**1 The A Series requires a ladder program to enter the CC-Link settings.*

Reference *Refer to 9.3.4 Environment Setup, Sample Ladder*

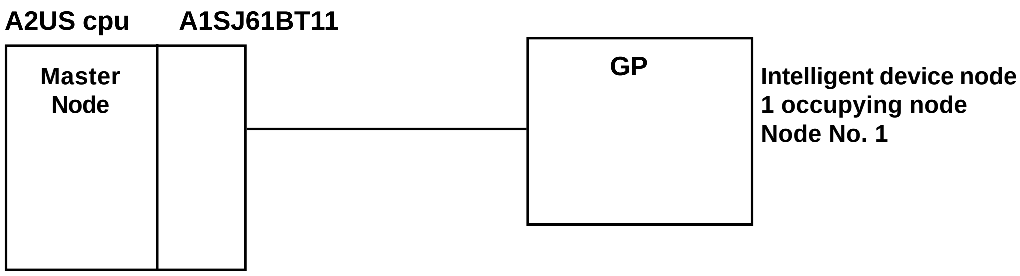
- *The QnA/Q Series' CC-Link settings are entered via entering the network parameter settings on the ladder program.*
- *For more detailed information about ladder program settings, refer to Mitsubishi Electric [AJ61BT11/A1SJ61BT11] Unit CC-Link System Master and Local Unit User's Manual (Details), [AJ61QBT11/A1SJ61QBT11] Unit CC-Link System Master and Local Unit User's Manual (Details), or [QJ61BT11] Unit CC-Link System Master and Local Unit User's Manual (Details)'s [Parameter Settings] section.*

Note:

- *Be sure to set the master node number to "0". (Use the rotary switch to set the master node unit's node number setting switch.)*
- *To assign other nodes, the Mitsubishi ladder logic program's the network parameter settings feature is required (CC-Link).*

■ Sample Ladder Program

The following is a sample ladder used when performing communication via the structure shown below:

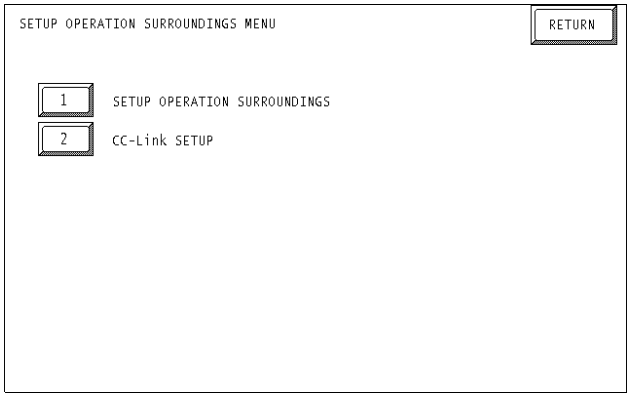



```
     X0           X0F
---|/|------------|  |------------------------------------------------------------------ [ PLS  L300 ] ----  X0: Unit problem  XF: Unit ready
   L300
-----|  |-------------------------------------------------------------------------------- [ SET  L301 ] ----  Unit parameter setting command
   L300
-----|  |-------------------------------------------------------------------------------- [ MOV  K1  D0 ] ----  No. of units connected: 1
          |                                                                                                      (excluding the master node)
          |---------------------------------------------------------------------------- [ MOV  K7  D1 ] ----  Retry frequency: 7
          |
          |---------------------------------------------------------------------------- [ MOV  K1  D2 ] ----  No. of Automatic return function: 1
          |
          |--------------------------------------------------------------------- [ TO  H0  H1  D0  K3 ] ----  Stores D0 to D2 in buffer memory H1
          |
          |---------------------------------------------------------------------------- [ MOV  K0  D3 ] ----  Operation performed at CPU
          |                                                                                                      down: 0 ( stop )
          |--------------------------------------------------------------------- [ TO  H0  H6  D3  K1 ] ----  Stores D3 in buffer memory H6
          |
          |------------------------------------------------------------------------ [ MOV  H2101  D4 ] ----  GP node type: 2 No. of occupying
          |                                                                                                      nodes: 1 Node No. : 1
          |-------------------------------------------------------------------- [ TO  H0  H20  D4  K1 ] ----  Stores D4 in buffer memory H20
          |
          |-------------------------------------------------------------------------------- [ RST  L301 ] ----  Unit parameter settings completed
   M9038
-----|  |------------------------------------------------------------------------------------------ [ SET  Y0 ] ----  Unit refresh command
     X0           X0F
----|/|-----------|  |--------------------------------------------------------------------- [ PLS  L302 ] ----  X0: Unit problem  XF: Unit ready
   L302
-----|  |---------------------------------------------------------------------------------------- [ SET  L303 ] ----  Data link activation command
   L303
-----|  |------------------------------------------------------------------------------------------ [ SET  Y6 ] ----  Data link activation request
     X6
-----|  |---------------------------------------------------------------------------------------- [ RST  L303 ] ----  Data link activation request flag OFF
          |
          |-------------------------------------------------------------------------------- [ RST  L303 ] ----  Data link activation normally completed
     X7
-----|  |---------------------------------------------------------------------- [ FROM  H0  H668  D50  K1 ] ----  Error code read when data link activation
          |                                                                                                      is abnormally completed
          |---------------------------------------------------------------------------------- [ RST  Y6 ] ----  Data link activation normally request flag OFF
          |
          |-------------------------------------------------------------------------------- [ RST  L303 ] ----  Data link activation abnormally completed
```

■ GP Settings

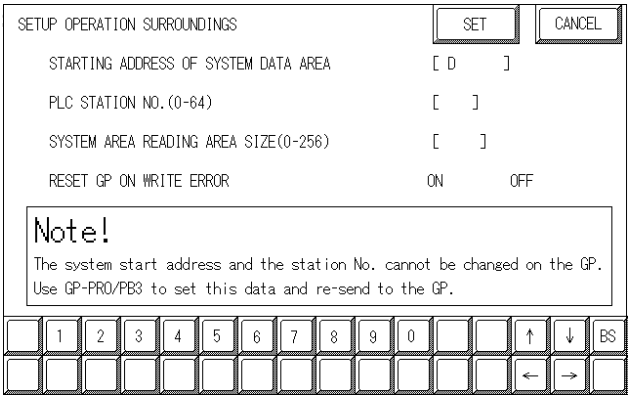
Enter the GP settings used for CC-Link communication, via the following screens. Use either GP screen editor software or GP offline menu to enter the number of occupying nodes, GP's node number, and baud rate.

◆ Operating Environment Menu



◆ Operating Environment Settings

Select [1 PLC SETUP] from the operating environment menu and enter each



STARTING ADDRESS OF SYSTEM DATA AREA *1

the first address from which the system area begins to be allocated.

PLC Node No. (1 to 64) *1

the PLC node number to which the system area is allocatecd.

SYSTEM AREA READING AREA SIZE (0-256)

Enter the sysytem area's reading area size.

RESET GP ON DATA WRITE ERROR

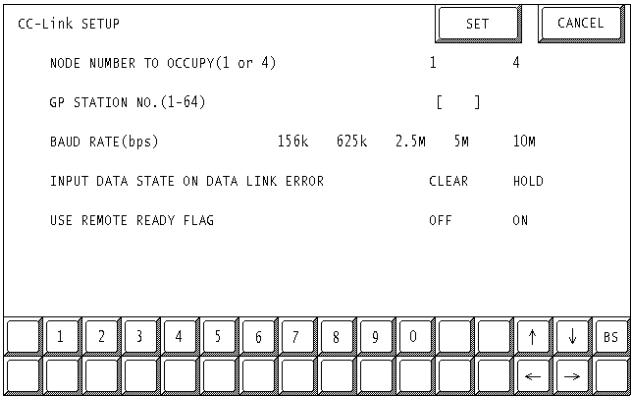
Select the data write operation status when a data write error occurs. (Applicable only for GP77R Seried)

**1 This setting cannot be changed with GP's OFFLINE mode.*

When changing the setting, perfom with [GP System Setting] of GP-Pro/PB III.

◆ CC-Link Settings

Select [2 CC-Link SETUP] from the operating environment menu and enter each setting.



No. of Occupying Nodes (1 or 4)

Select the number of nodes that the GP occupies.

GP Node No. (1 to 64)

Enter the GP's node number.

Baud Rate (156 kbps to 10 Mbps)

Enter the communication baud rate.

Input Data Status Used for Abnormal data Link (Clear or Retained)

Enter the input data status used when a problem occurs on data link.

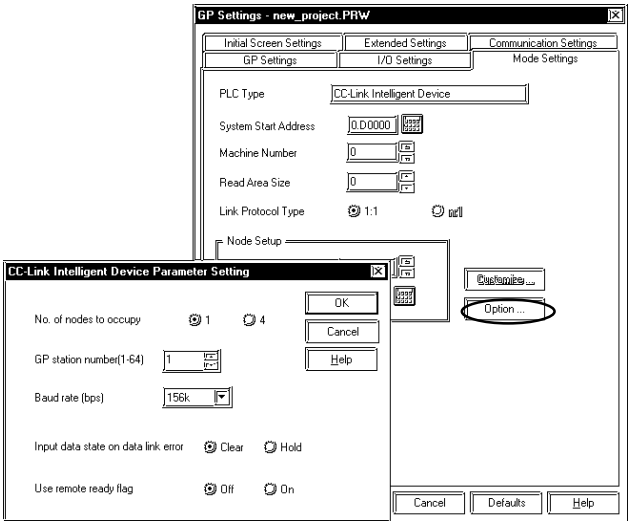
Remote READY Flag

Select if the remote READY flag is used.

For more detailed information about the remote READY fla Reference refer to 9.3.3 supported Device; Remote Input /Out put Signal from Individual to Master Nodes.

◆ GP Screen Editor Software Settings

Enter the necessary data via [GP System Settings][Mode Settings][Options].



9.3.5 Error Codes

■ PLC Error Codes

The error codes specific to the PLC will appear on the GP screen's left bottom, as follows:

Host Communication Error (02::**:##)".**

The "**" characters indicate an error code specific to the PLC (via the 16 system), and the "##" characters indicate the PLC number, on which an error occurred.

<e.g.> When "0xB802" is returned from node No. 1, the error code will appear as follows:

Host Communication Error (02:B8:02:01)

Note: For more detailed information about error codes, refer to the following Mitsubishi Electric's manuals:

AJ61BT11/A1SJ61BT11 Unit CC-Link System Master and Local Unit User's Manual (Details)

AJ61QBT11/A1SJ61QBT11 Unit CC-Link System Master and Local Unit User's Manual (Details)

QJ61BT11 Unit CC-Link System Master and Local Unit User's Manual (Details)

◆ Error Codes Specific to GP CC-Link Intelligent Device

The error codes specific to the GP's internal CC-Link intelligent device nodes are as follows. Each error code will appear on the GP screen's left bottom, in a format of "Host Communication Error (02:**)".

The "**" characters reflect one of the following error codes.

Error Code	Error
01	The check sum did not match during initialization.
02	The check sum reverse did not match during initialization.
03	Data link normal activation was not completed after initialization.
04	Shared memory read request was failed.
05	Shared memory write request was failed.
06	There was no response from the firmware during initialization.
11	An incorrect device code was designated during device read.
12	The transient command procedure was not normally completed during device read.
21	An incorrect device code was designated during device write.
22	The transient command procedure was not normally completed during device write.
23	Out of the internal memory buffer area
30	Undefined error (This type of error usually never occurs and can occur due to program bugs, memory destruction, etc.)

10 Device Net

10.1 Connectable PLCs

The following tables list the PLCs that can be connected and used with the GP.

Co.	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII
Rockwell (Allen-Bradley)	SLC500	SLC-5/04	1747-SDN	Device Net Unit (GP070-DN41)is required.	Device Net Slave I/O
	PLC-5	PLC-5/20	1771-SDN		
Omron	SYSMAC CS1	CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1H-CPU63 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42	C200HW-DRM21-V1		
		CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	CS1W-DRM21		
Hitachi	S10mini	LQP000 LQP010 LQP011	LQE070		
Yokogawa Electric	FA-3	F3SP20-0N F3SP21-0N F3SP25-2N F3SP28-3N F3SP30-0N F3SP35-5N F3SP38-6N F3SP53-4H F3SP58-6H F3SP36-3N	F3LD01-0N		

The following table lists the GPs units that can be connected and used with DeviceNet.

■ List of Applicable GP/GLC Units

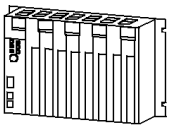
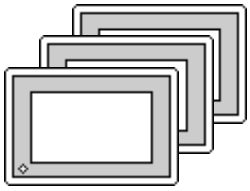
Series Name		Product Name	Unit
GP70 Series	GP-470 Series	GP-470E	DeviceNet Unit (GP070-DN41) *1
	GP-570 Series	GP-570S	
		GP-570T	
		GP-57JS	
		GP-570VM	
	GP-571 Series	GP-571T	
	GP-675 Series	GP-675S	
		GP-675T	
	GP-870 Series	GP-870VM	
GP77R Series	GP-477R Series	GP-477RE	
	GP-577R Series	GP-577RS	
		GP-577RT	
GP2000 Series	GP-2500 Series	GP-2500L	
		GP-2500S	
		GP-2500T	
	GP-2501 Series	GP-2501S	
		GP-2501T	
	GP-2600 Series	GP-2600T	
GLC2000 Series	GLC2600 Series	GLC2600T	

**1 When using GP2000/GLC2000 series units, a bus conversion unit (PSL-CONV00) is required.*

10.2 Slave I/O

10.2.1 System Structure for Device Net Connection

The following table shows the system structure for connecting the GP to PLCs supporting Device Net.

CPU	Link I/F	Cable Diagram	Link I/F	GP
				
PLC units compatible with Device Net	Device Net Master Unit	Cable Diagram 1	Device Net I/F Unit (GP070-DN41)	GP Series *1

*1 *For a list of GP/GLC units units that can use the DeviceNet, refer to* Reference *10.1 Connectable PLCs* ■ *List of Applicable GP/GLC Units in this manual.*

Note:

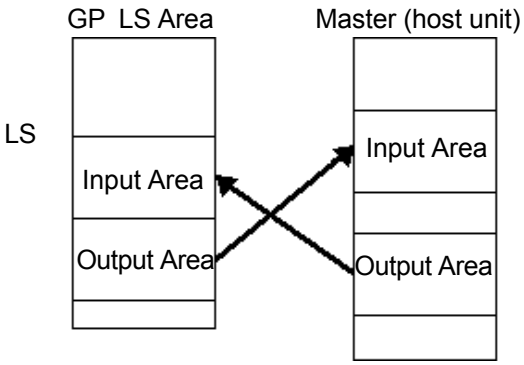
- **For the cable used, refer to <10.2.2 Cable Diagram> ◆List of Cables Dedicated to DeviceNet.**

■ Slave I/O

Slave I/O is the feature that converts I/O data automatically between the PLC installed with the master unit and GP unit.
Slave I/O uses a special link method that does not allow a user to access a PLC directly.

When using Device Net Connection the GP series unit performs like an I/O terminal (Remote terminal). The GP's LS area will be used as a device which inputs/outputs data with the host (PLC).

The master (host PLC) unit Output area is allocated to GP's Input area, and the master's Input area is allocated to GP's Output area. The LS area's Input area is followed in sequence by the Output area. (See below)

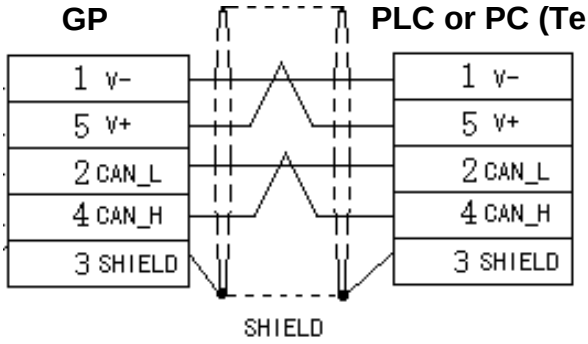


Note:

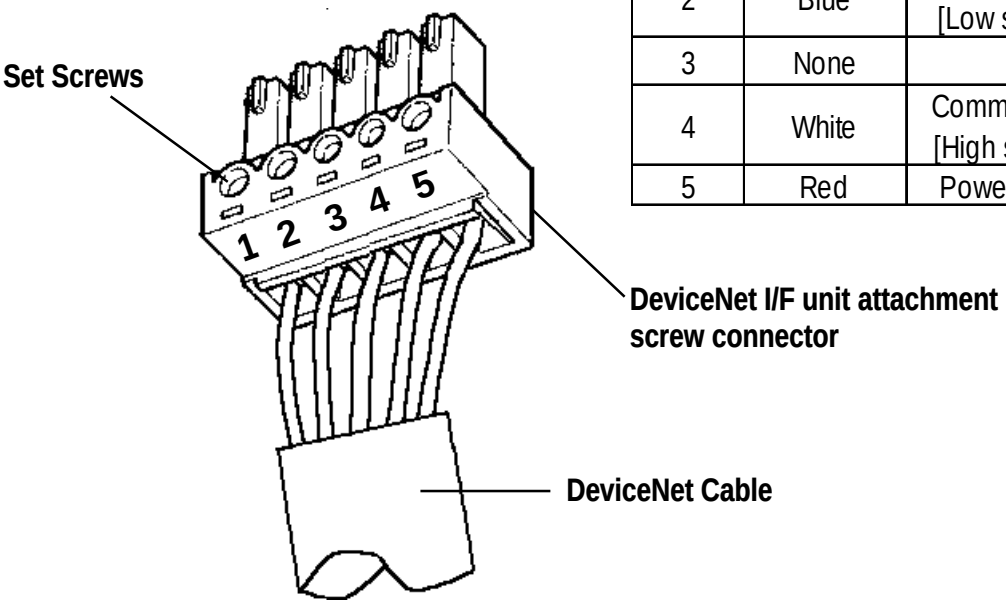
- **Only the LS Area's User Area (from LS20 to LS1999) is used for this communication.**
- **The System Area (from LS0 to LS19) and Reading Area settings cannot be used for PLC communication.**
- **GP will be used as a slave unit.**
- **Explicit Message Communication is not supported.**
- **The Contents in System Area are programless.**

10.2.2 Cable Diagram

<Cable Diagram 1>



Pin No.	Wire Cover Color	Comment
1	Black	Power Supply (V-)
2	Blue	Communication Data [Low side] (CAN_L)
3	None	Shield
4	White	Communication Data [High side] (CAN_H)
5	Red	Power Supply (V+)



Important

After all connector wires are attached to the connector, connect the connector to the Device Net I/F Unit (5-wire type).
Be sure to connect Terminating Resistors (121Ω1/4W) to both sides of the cable.

■ List Device Net Cables

There are two types of cable, thick and thin, for the Device Net unit.

Be sure to use only cables that meet the Device Net specifications. The following two cables are recommended.

- Rockwell (Allen Bradley) Thick type 1485C-PI-A***
- Rockwell (Allen Bradley) Thin type 1485C-PI-C***

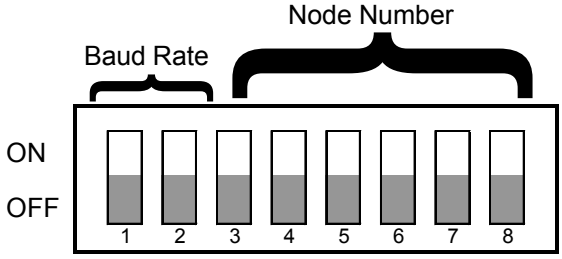
10.2.3 Environment Setup

The following lists Digital's recommended GP settings.

Baud Rate and Node Number Settings

◆ GP Unit

For setting the baud rate and the node number, use the Dip Swith (8 positions) on the rear side of the Device Net expansion unit (Model: GP070-DN41). The normal SIO communication setting cannot be used. Node number is available from0 to 63 on the GP.



Baud Rate	DIPSW1	DIPSW2
125K	0	0
250K	0	1
500K	1	0
Reserved	1	1

Node No.	D3	D4	D5	D6	D7	D8
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
:	:	:	:	:	:	:
61	1	1	1	1	0	1
62	1	1	1	1	1	0
63	1	1	1	1	1	1

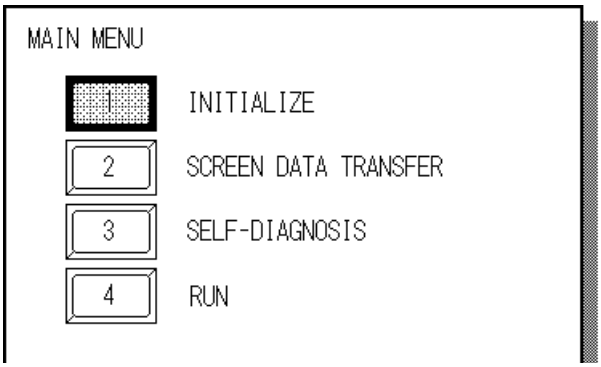
◆PLC Unit

For PLC settings, refer to each company' s Device Net communication unit's manual.

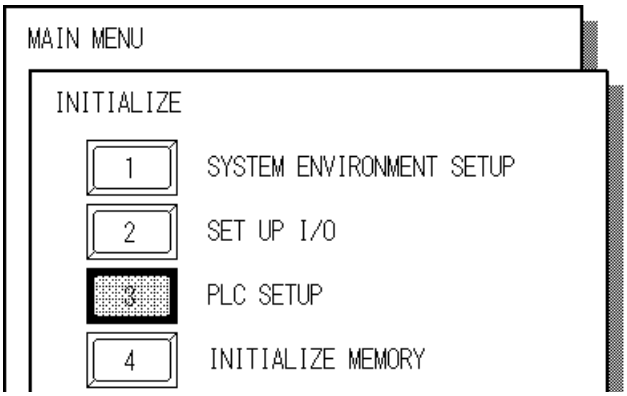
Input / Output area Settings

Enter the GP's communication settings via the SET UP OPERATION SURROUNDINGS menu.

< GP Example screen >



① Touch the INITIALIZE selection. The INITIALIZE menu will appear.



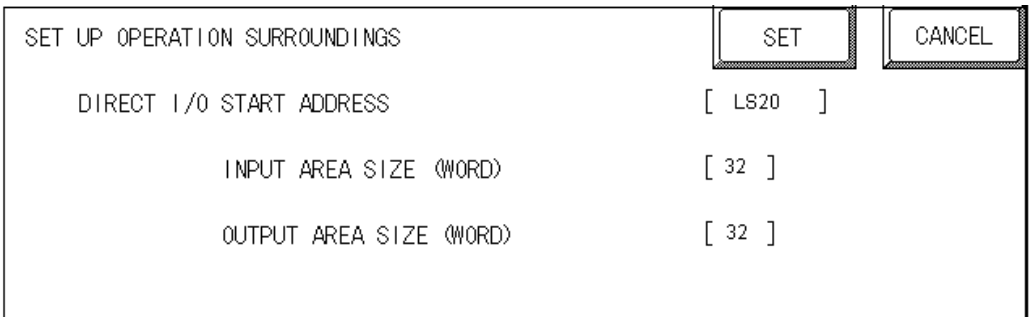
② Touch the PLC SETUP selection. The SET UP OPERATION SURROUNDINGS menu will appear.

Note: The Initialize screen's SET UP I/O area's settings disabled.

◆ **Enter the following settings to begin I/O communication.**

- In the DIO Start Address, enter a value from LS20-LS1999.
- In the Input Area Size, enter a value from 0-127 words.

  Set the word area size that is equal to the output area size of the DeviceNet master unit.



- In the Output Area Size, enter a value from 0-127 words.
  Set a word area size equal to the input area size of the DeviceNet master unit.

The GP's SYSTEM DATA AREA(LS0 to LS19) cannot be allocated.

< PLC Settings >

For PLC settings, refer to each company's Device Net communication unit's manual.

10.2.4 Supported Devices

	Word Address	Particulars	
Input Area Size (word)	0 to 127	*1	L/H
Output Area Size (word)	0 to 127	*1	
DIO Start Address	LS20 to LS1999	*2	

**1 Though the Input /Outpuut area size can be set from 0 to 127, the maximum I/O size used per slave will differ depending on each company's master unit specifications.*

The I/O size that each company supports is shown as below.

PLC Series	Input Area Size (word)	Output Area Size (word)
Rockwell SLC500	0 to 64	0 to 64
Rockwell PLC-5	0 to 64	0 to 64
Omron SYSMAC CS1	0 to 32	o to32
HITACHI S10mini	0 to 127	0 to 127
YOKOGAWA FA-M3	0 to 127	0 to 127

**2 Designate the DIO Start Address within the range shown below.*
20 ≦ DIO Start Address ≦ 2000 - Input Area Size - Output Area Size

e.g: When Input Area Size =4, and Output Area Size =16,
the setting range of the DIO Start Address should be:
20 ≦ DIO Start Address ≦ 1980

10.2.5 Error Codes

The following list shows the error codes for the Device Net connection. These error codes will appear as "PLC COM.ERROR (02:**)" on the bottom left on the GP screen. (** stands for an error code.)

Error Code	Details	Status
14	No reply from the hardware	Unit is not properly installed
		Unit Error
16	A communication error occurred	Communication Setting Error
		Communication Line Error
		Node No. is duplicated

11 Interbus

11.1 Connectable PLCs

The following tables list the PLCs that can be connected and used with the GP.

■ Direct I/O Mode

Maker	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII
Siemens	S7-400	CPU413-2DP	Phoenix Contact IBSS7-400 DSC/I-T		INTERBUS SLAVE
All others	Various PCs	—	Phoenix Contact IBS PC ISA SC/I-T		

■ Packet Transfer Mode

Maker	Series Name	CPU	Link Unit	Comments	PLC name in PRO/PBIII
Siemens	S7-400	CPU413-2DP	Phoenix Contact IBSS7-400 DSC/I-T		INTERBUS SLAVE

The following tables list the GPs that can be connected and used with Interbus.

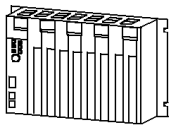
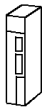
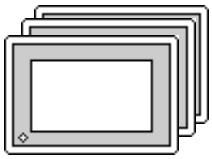
Series Name		Product Name	Unit
GP70 Series	GP-470 Series	GP-470E	Interbus Slave Module (GP070-IB41) *1
	GP-570 Series	GP-570S	
		GP-570T	
		GP-57JS	
		GP-570VM	
	GP-571 Series	GP-571T	
	GP-675 Series	GP-675S	
		GP-675T	
GP77R Series	GP-477R Series	GP-477RE	
	GP-577R Series	GP-577RS	
		GP-577RT	
GP2000 Series	GP-2500 Series	GP-2500L	
		GP-2500S	
		GP-2500T	
	GP-2600 Series	GP-2600S	
		GP-2600T	

**1 When using GP2000 Series units, a bus conversion unit (PSL-CONV00) is required.*

11.2 Slave I/O

11.2.1 System Structure

The following table shows the system structure for connecting the GP to Siemens PLCs and PCs.

CPU	Link I/F	Cable Diagram	Recommended Cables	Link I/F	GP
					
CPU413-2DP	Phoenix Contact IBS S7-400 DSC/I-T	(Cable Diagram 1)	Phoenix Contact IBS RBC 2M *1-KONFEX-T	Interbus Slave Module (GP070-IB41)	GP Series *2
Various PCs	Phoenix Contact IBS PC ISA SC/I-T	(Cable Diagram 1)			

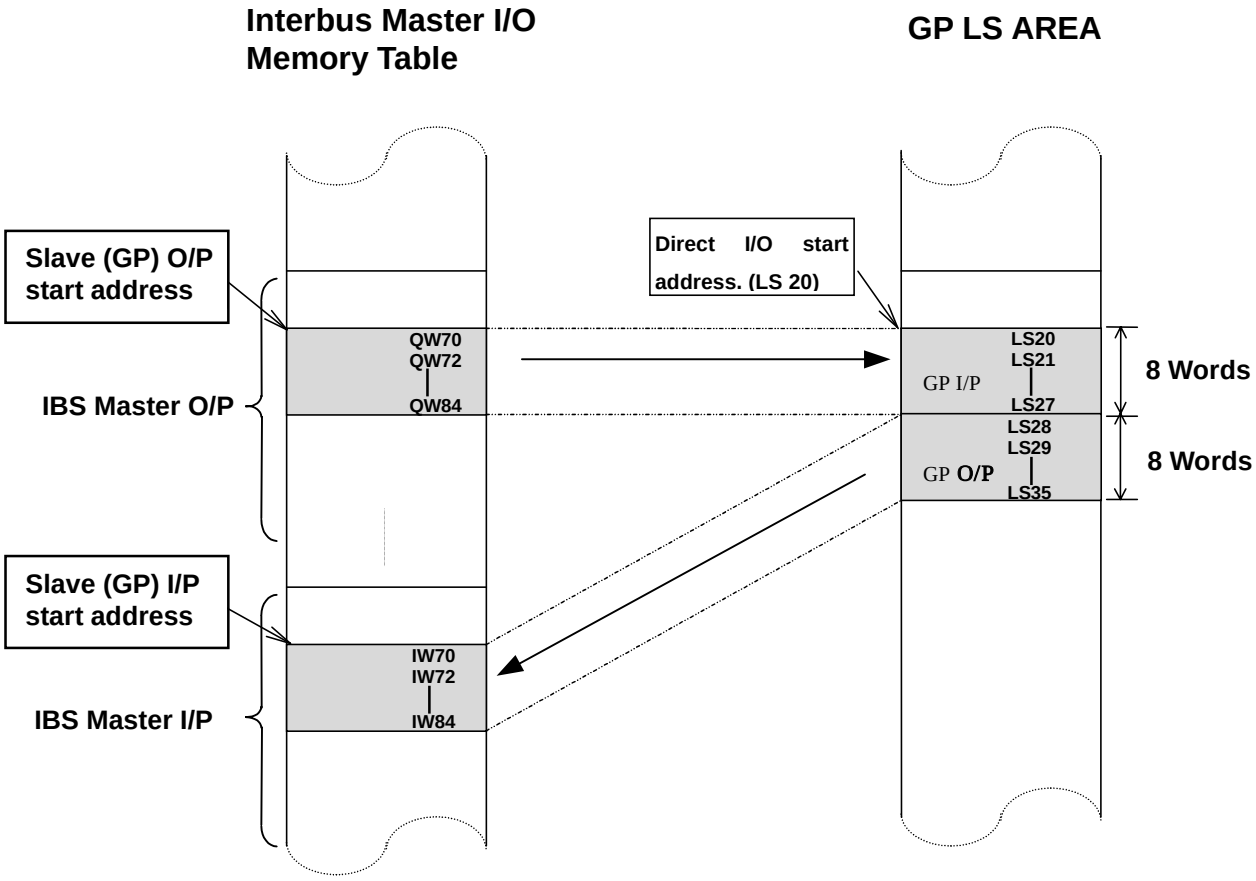
**1 2M indicates the length of the cable as 2 meters. 5M indicates a length of 5 meters etc.*

**2 For details, Reference refer to 11.1 Connectable PLCs.*

Note: • **The GP is used is a slave unit.**

■ Direct I/O Mode

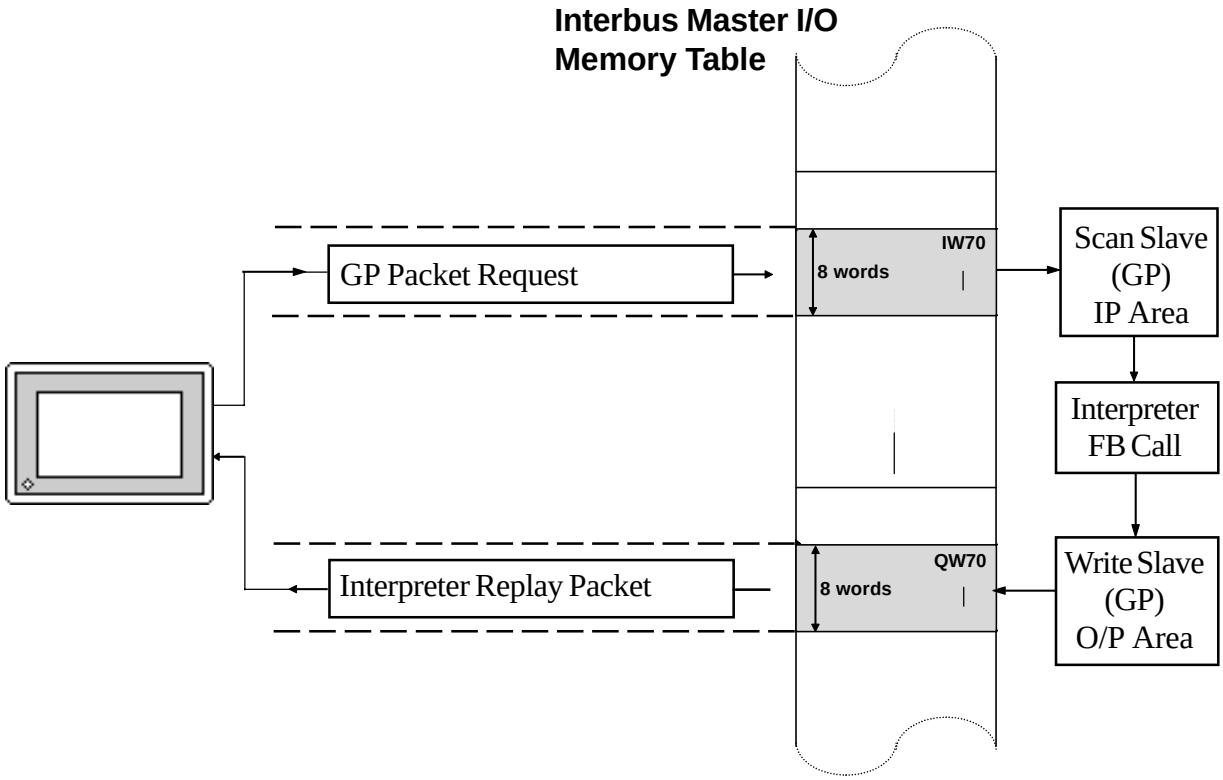
When communicating via Interbus in “Direct I/O” mode, the GP communicates with an Interbus master in a very simple manner. An area of memory is mapped from the GP’s LS area into the Interbus master’s input area and an area of the Interbus master’s output is mapped into the GP’s LS area. This is demonstrated in the following diagram example (Input & Output size 8 Words).



The GP Slave Input and Output start addresses and sizes (IW40 and QW20 in the above example) have to be configured using the Interbus Master's configuration software. Please refer to the Interbus Master's documentation for instructions on how to make these settings.

■ Packet Transfer Mode

When communicating via Interbus in “Packet Transfer” mode, the GP acts as a “Logical Master”, i.e. it can request to read and write any data areas in the PLC as if it was a master. In this mode an “Interpreter Function Block” is required in the PLC. In this mode the GP uses a fixed input and output area size (16 bytes or 8 words) of the PLCs I/O memory Table. The GP transmits commands (read or write requests) based on its outputs. The PLC’s interpreter function block scans this input area and performs the requested action, then places the result on the output area. See the diagram below for an explanation.



The GP Slave Input and Output start addresses and sizes (IW256 and QW 256 in the previous example) have to be configured using the Interbus Master's configuration software. Please refer to the Interbus Master's documentation for instructions on how to create these settings. Currently a function block exists only for the S7-400 PLC. This should be called from OB1 of the Step 7 Program. Please refer to the following example for how to call this.

- **In this example the GP uses input address IW70 and output address QW70. It is also necessary to use 3 bytes of PLC internal memory. In this example, Marker bytes (MB) 103, 104 and 105 are used.**

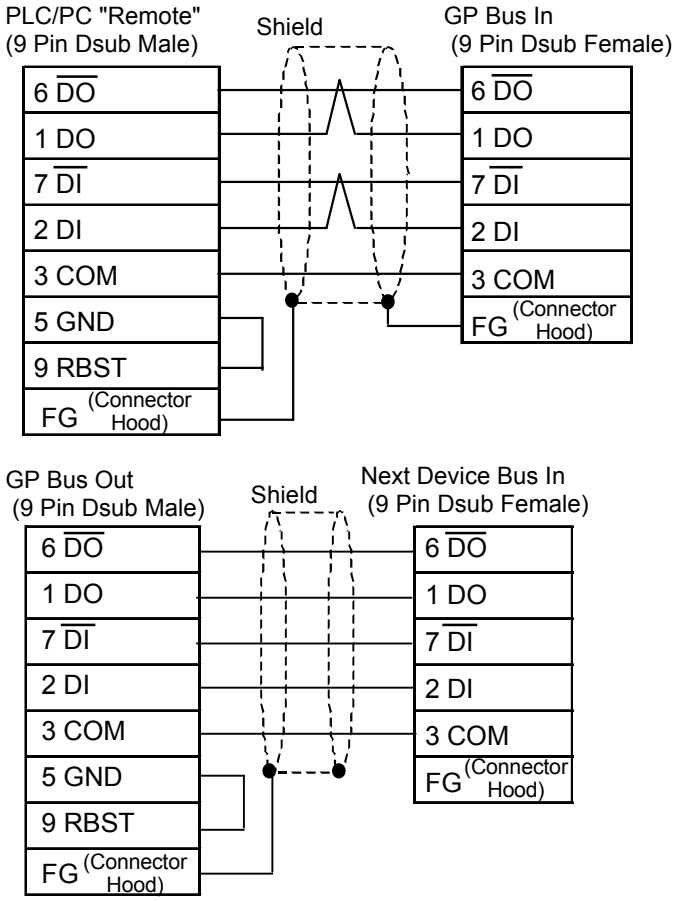
```
OB1: MAIN BLOCK
???

Network 1 : GP-PROFIBUS/INTERBUS INTERPRETER CALL

IP/OP_ADDR:  First I/O byte addresses of GP panel like configured in S7 HW CONFIG
             in decimal format
ERR_BYTE:    Interpreter error due to bad data format
             Byte 0: Bad device type (DB,M,I,O)
             Byte 1: Bad Data Block Address (word address over range)
             Byte 2: Attempt to write to a input
             Byte 3: Unknow Data block operations
             Byte 4: Interpreter general error
TEMP_OUT     Output byte 0 previous scan value
             Byte 6:
             Byte 7:


  CALL   FC    99
    IP_ADDR   := 70              // GP First input byte address
    OP_ADDR   := 70              // GP First input byte address
    ERR_BYTE  := 103             // Interpreter error byte (see comment)
    TEMP_OUT  := 104             // First output byte buffer for extended addressing
    GP_STATUS := 105             // Profibus new data request checking (see comment)
```

- **The Interpreter Function Block can be found in the example S7-400 PLC project is contained on the GP-PRO/PBIII for Windows CD-ROM which (folder name is "FIELDBUS"). This was created with version 3.2 of the Step 7 Software. Please follow the instration instructions in the README.TXT file on how to install this.**

11.2.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by Phoenix Contact may differ. Using these cables for your PLC, however, will not cause any problems.

Cable Diagram 1



Reference *For details, refer to Digital's* ***GP70 Series Interbus I/F Unit Users Manual****.*

11.2.3 Supported Devices

■ Direct I/O Mode

	Word Address	Particulars	Default
Input Area size (Word)	0~10	Read Only	0
Output Area size (Word)	0~10		0
Direct I/O Start Address	LS0020~LS1999		LS20

The System Area (LS0 to LS19) and Reading Area settings cannot be used for PLC communications. Only LS Area's User's Area (LS20 to LS1999) can be used for communication. The maximum Input & Output Size is 10 Words (20 bytes) each.

Note:
- **Only the LS Area's User Area (from LS20 to LS1999) is used for this communication.**
- **The System Area (from LS0 to LS19) and Reading Area settings cannot be used for the PLC communication.**
- **The System Data Area's contents will become programless.**

■ **Packet Transfer Mode**

Setup System Area here.

	Bit Address	Word Address	Note
Data Block	—	DB2W00000-DB60W65534	*1*2
Input Relay	I000000-I655357	IW00000-IW65534	*3*4
Output Repay	O000000-O655357	OW00000-OW65534	*3
Internal Memory	M000000-M655357	MW00000-MW65534	*3

**1 The Data Block Memory to be used in the GP-PRO/PBIII for Windows must be configured in the PLC first. Please confirm that all addresses to be accessed already exist in the PLC.*

**2 The address format for Data Block Memory is according to Siemens S7 conventions. This is word (16 bit) addressing of Byte addresses so only even addresses are valid e.g. DB2W0050 represents Data Block 2, Word 50.*

**3 The address format for these devices is according to Siemens S7 conventions. For bit addressing the last digit represents the bit position, e.g. I0164 represents byte 16, bit number 4. For word addressing only even byte addresses can be used.*

**4 Input relays cannot be written to by the GP.*

Note:
- **The Interpreter Function Block can be found in an example S7-400 PLC project that is contained on the GP-PRO/PBIII for Windows CD-ROM in the folder "FIELDBUS". This was created with version 3.2 of the Step 7 Software. Please follow the instructions in the README.TXT file on how to install this.**

11.2.4 Environment Setup

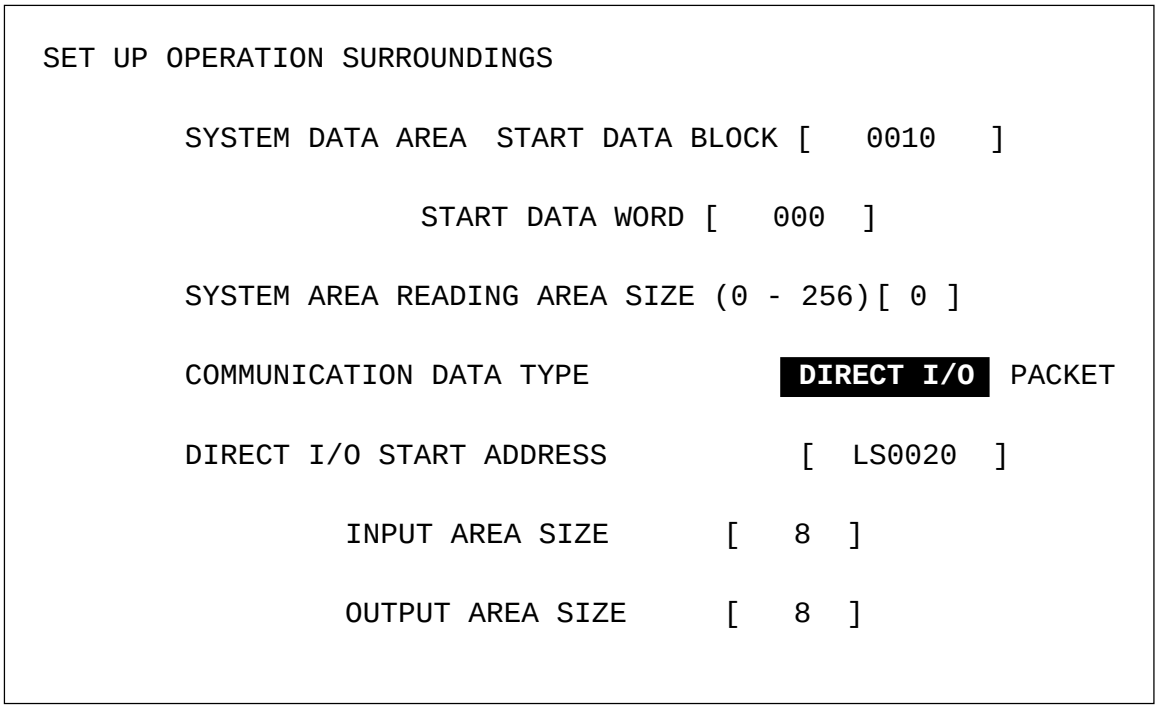
There are no communication parameters to be set up on the GP side of the Interbus Connection. The Master PLC/PC automatically assigns node addresses to each slave on the network and the baud rate is fixed at 500 Kbps.

	GP	PLC/Interbus Master
Transmission speed	500 Kbps (fixed)	500 Kbps (fixed)
Node No.	Automatically Configured	Automatically Configured

The GP's OFFLINE screen used to enter these communication settings is shown below. The settings on this screen govern the manner in which the GP communicates via Interbus, i.e. the communication data type (Direct I/O or Packet Transfer) and for Direct I/O; the addresses in the GP's internal memory where data will be read and written from, and the sizes of these blocks of data. These settings can be also made from the GP setup menu in GP-PRO/PBIII for Windows software. For Packet Transfer please set the Input and Output Area Size via this menu.

◆ **From the initial OFFLINE menu screen:**

1) Select [INITIALIZE] to call up the initial settings screen.
2) Select the [SET UP OPERATION SURROUNDINGS] menu item (screen below appears).
3) Configure the environment settings to suit your particular requirements. (Ex. Communication Data Type, Input/Output Area Size, etc.)



The input and output area sizes used here must match those set up in the Interbus Master's configuration for the GP slave. Please refer to the Interbus Master's documentation. For Packet Transfer Mode, the input and output size are fixed at 16 bytes.

11.2.5 Interbus Specific Error Code

The following list shows the error codes for the Device Net connection. These error codes will appear as "PLC COM.ERROR (02:**)" on the bottom left on the GP screen. (** stands for an error code.)

Error Code	Details	Status
14	No reply from Interbus H/W module	Unit is not properly installed, or unit failure
16	Interbus Not online	Configuration error

12 Indicating Controllers

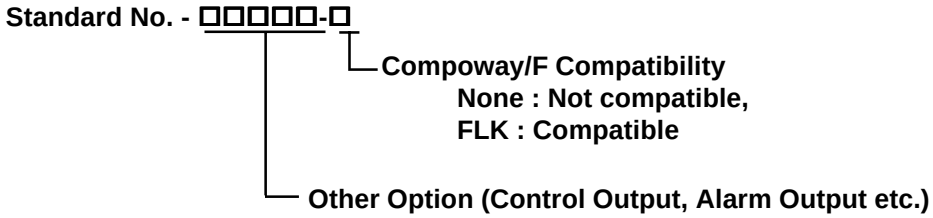
12.1 Connectable Controllers

Company	Series	Controller [*1]	Note	PLC name in Pro/PB III
Yokogawa M&C Corp.	UT100	UT130, UT150, UT152, UT155, UP150		YOKOGAWA FACTORY ACE 1:1 Comm. or YOKOGAWA FACTORY ACE 1:n Comm.
	UT2000	UT2400-□ UT2800-□		
	UT3000	UT3040-□□1 UT3080-□□1 UT3160-□□1		
	GREEN SERIES	UT320-□1 UT350-□1 UT420-□7 UT450-□1 UT450-□2		
Yamatake Corp.	SDC	SDC20, SDC21 SDC30, SDC31 SDC40A, SDC40B SDC40G		YAMATAKE SDC SERIES
	DMC	DMC10		
RKC INSTRUMENT INC.	CB	CB100 Z-1021 CB400 Z-1021 CB500 Z-1021 CB700 Z-1021 CB900 Z-1021	Applicable for Modbus protocol	RKC CB/SR-Mini (MODBUS)
	SR-Mini	H-PCP-A Z-1021		
Omron Corporation	THERMAC NEO Electronic Temperature Controller	E5EN-□□□□□-FLK [*2] E5CN-□□□□□-FLK E5GN-□□□□□-FLK E5AN-□□□□□-FLK		OMRON THERMAC NEO
	In-Panel NEO Temperature Controller	E5ZN-□□□□□-FLK [*2]		
Sinko Technos Corp.	C	CPT-20A	Optional unit is required when using muliple channels. [*3]	SHINKO TECHNOS INDICATING
	FC	FCD-13A□□,C FCD-13A□□,C5 FCD-15A□□,C FCD-15A□□,C5 FCR-13A□□,C FCR-13A□□,C5 FCR-15A□□,C FCR-15A□□,C5	When using the Controller for the first time, select the serial communication option. (,C:RS-232C) (,C5:RS-485) [*4]	

Company	Series	Controller *1	Note	PLC name in PRO/PBIII
Sinko Technos Corp.	FIR	FIR-201-M□□,C FIR-201-M□□,C5	When using the Controller for the first time, select the serial communication option. (,C:RS-232C) (,C5:RS-485) *4	SHINKO TECHNOS INDICATING
	GC	GCS-300□□,C5		
	FCL	FCL-13A□□,C5		
	PC-900	PC-935□□,C PC-935□□,C5 PC-955□□,C PC-955□□,C5		
Fuji Electric Corporation	Micro-Controller X (PXR)	PXR4□□□□-□□M00 *5 PXR4□□□□-□□V00		FUJI TEMPERATURE PXR
TOHO ELECTRONICS INC. *6	TTM-004	TTM-004-□-A□□□		TOHO ELECTRONICS TTM SERIES
	TTM-X04	TTM-X04-□-□□□□		
	TTM-00B	TTM-00B-□-□□□□		
	TTM-10L	TTM-10L-□-□-□ *7		
	TTM-100B	TTM-100B4-□□-□□□□-□□□ TTM-100B8-□□-□□□□-□□□		
	TTM-110 Series	TTM-114-□-□ □-□□□□□□□-□ TTM-115-□-□ □-□□□□□□□-□ TTM-117-□-□ □-□□□□□□□-□ TTM-119-□-□ □-□□□□□□□-□		
	TTM-110B	TTM-110B-□-□ □-□□□□□□□-□		
	TTM-120 Series	TTM-124-□-□ □-□□□□□□□-□ TTM-125-□-□ □-□□□□□□□-□ TTM-127-□-□ □-□□□□□□□-□ TTM-129-□-□ □-□□□□□□□-□		
	TTM-300 Series	TTM-304-□-□N-□□□□-□ TTM-305-□-□N-□□□□-□ TTM-309-□-□N-□□□□-□		
	TTM-300B	TTM-300B-□-□N-□□□□-□		
	TTM-1020 Series	TTM-1520-□ □-□ □-□□□-□ TTM-1521-□ □-□ □-□□□-□ TTM-1522-□ □-□ □-□□□-□ TTM-1523-□ □-□ □-□□□-□ TTM-1524-□ □-□ □-□□□-□ TTM-1525-□ □-□ □-□□□-□ TTM-1920-□ □-□ □-□□□-□ TTM-1921-□ □-□ □-□□□-□ TTM-1922-□ □-□ □-□□□-□ TTM-1923-□ □-□ □-□□□-□ TTM-1924-□ □-□ □-□□□-□ TTM-1925-□ □-□ □-□□□-□		
Fenwal	AL series	AL24R-□□□-□□□-□□□ *8 *9		Fenwal AL series

*1 The Controller's model number "□" will vary depending on each controller's functionality specifications.

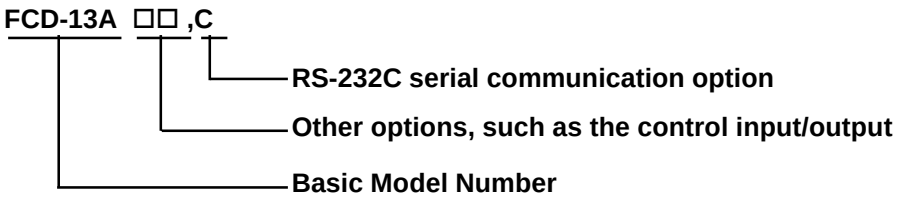
**2* Omron Controller's model number consists of the following items.



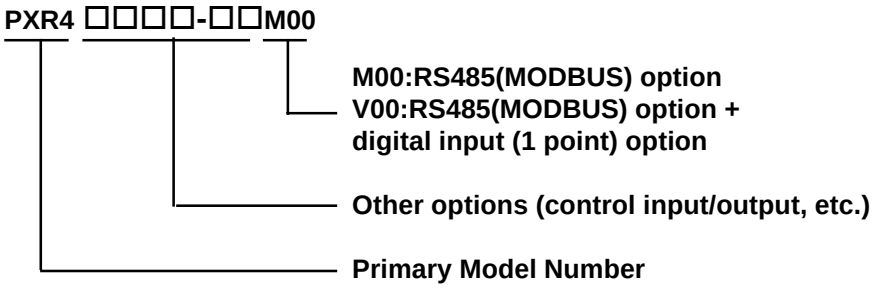
**3 When using multiple channels with a C Series unit, the 2 ch temperature control unit (CCT-235-2-□□) is required. For model number details"□□", refer to the C Series catalog.*

**4 Items with the serial communication option have a ",C" or ",C5" after the basic model number.*

Ex.) When specifying the RS-232C serial communication option for the FC Series.



**5 When connecting the Controller to a GP, the RS485(MODBUS) option "M00" or "V00" is required.*



**6 About TOHO Controller's Model Number*

The Controller model number is used to designate if a Controlleris equipped with comunication features or not. To check whether your Controller has comunication features, refer to your Controller's User Manual or Catalog.

For example, the Controller model number of the TTM-004 Controller is shown below. Only Controllers with the character "M" in their model number's Option section (the three right-most characters) are equipped with communication feature.

TTM-004-□-A□□□

Symbol	Output1
R	Relay Contact
P	SSR Drive Voltage

Symbol	Option
	No options
A	EV1 Contact Output Relay
B	EV2 or Output 2 Contact Output Relay
C	Voltage Output for SSR Drive (Output 2)
D	CT Input
E	DI Input
M	RS-485 Communication Format

*7 TTM-10L Unit Communication Format

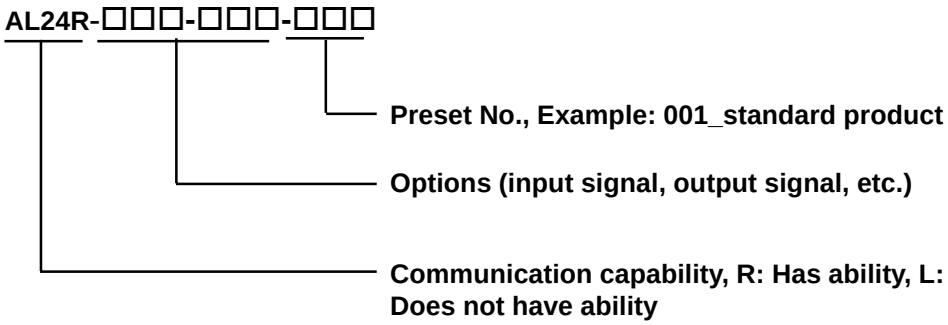
Depending on the unit's model number, the TTM-10L can use, either the RS-485 or the RS-232C format. Select the Communication Format as shown below (Communication Format can be selected either RS-485 or RS-232C.).

TTM-10L-□-□-□

Symbol	Option
	No options
A	Event Output
M1	RS-485 Communication Format
M2	RS-232C Communication Format

*8 Fenwal's Temperature Controller Model Number

When connected to the GP/GLC, only a model with RS-485 communication ability can be used for communication. Such a model can be identified using a suffix to the basic model, which represents that communication capability. For further information on models, refer to the AL series catalog.



9 For the temperature controller, a production number of 02010023 or later and a serial number of 0204 or later are required.

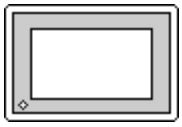
12.2 Yokogawa M&C Controllers

12.2.1 System Structure

This chapter describes the system configuration used when connecting this Controller to the GP/GLC.

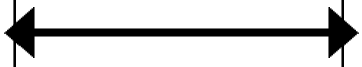
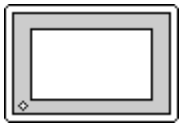
■ UT2000 Series/GREEN SERIES

(1:1 communication)

Controller *1	Cable Diagram	GP/GLC
		
UT2400-☐ UT2800-☐	RS-422 (4 wires) <Cable Diagram 1>	GP/GLC Series
UT320-☐1 UT350-☐1 UT420-☐7 UT450-☐1 UT450-☐2		

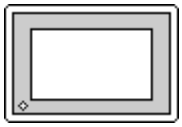
**1 The Controller's model number "☐" will vary depending on each controller's functionality specifications.*

(1:n (multi-drop) Communication)

Controller *1	Cable Diagram	GP/GLC
		
UT2400-☐ UT2800-☐	RS-422 (4 wires) <Cable Diagram 2>	GP/GLC Series
UT320-☐1 UT350-☐1 UT420-☐7 UT450-☐1 UT450-☐2		

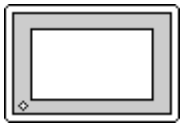
**1 The Controller's model number "☐" will vary depending on each controller functionality specifications.*

■ UT3000

Controller *1	Cable Diagram	GP/GLC
		
UT3040-□□1 UT3080-□□1 UT3160-□□1	RS-422 (1:1 connection) <Cable Diagram 3> RS-422 (1:n connection) <Cable Diagram 4>	GP/GLC Series

**1 The Controller's model number "□ " will vary depending on each controller's functionality specifications.*

■ UT100

Controller *1	Cable Diagram	GP/GLC
		
UT130, UT150, UP150	RS-422 (1:1 connection) <Cable Diagram 5>	GP/GLC Series
	RS-422 (1:n connection) <Cable Diagram 6>	
UT152, UT155	RS-422 (1:1 connection) <Cable Diagram 7>	
	RS-422 (1:n connection) <Cable Diagram 8>	

12.2.2 Cable Diagrams

The cable diagrams shown below and those recommended by Yokogawa or Yokogawa M&C may differ, however, using these cable connections for your Controller's operations will not cause any problems.

Careful!

- *Ground the Controller's FG terminal according to your country's applicable standard.*

Important

- ***When connecting the FG wire to the cable connector's hood, be sure that the hood material is conductive.***
- ***The maximum RS-422 cable length is 500 meters. When connecting this cable, be sure to connect the SG terminal.***

■ Terminal Numbers Used When Using an RS-422 Cable

Important

- ***The terminal numbers used when using an RS-422 cable for connection will vary depending on each Controller model.***

  On the cable diagram, however, these terminal numbers are not shown, and please refer to the numbers shown below for cable connection.

♦UT2000 Series

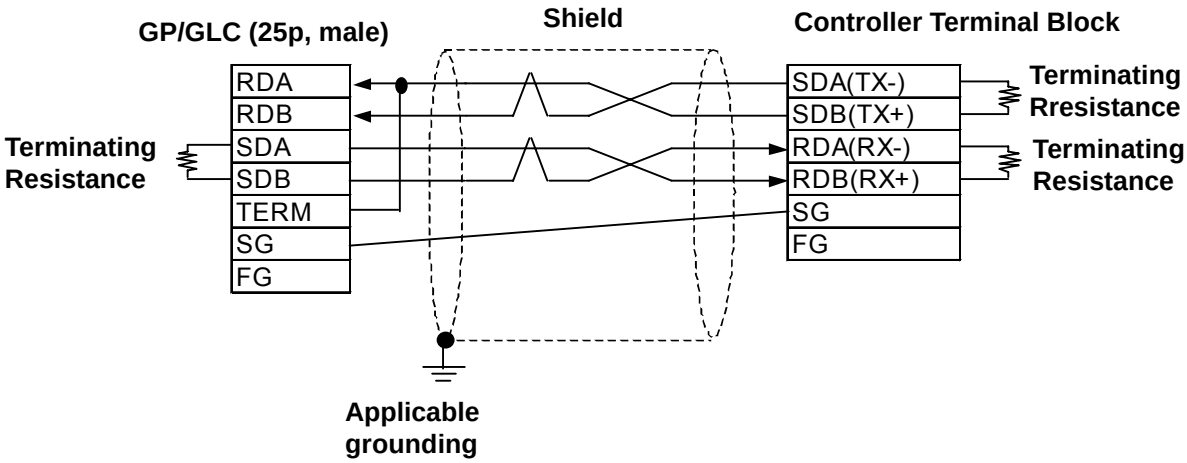
Signal Name	Terminal No.
TX+	4
TX-	6
RX+	3
RX-	5
SG	2
FG	1

♦GREEN Series

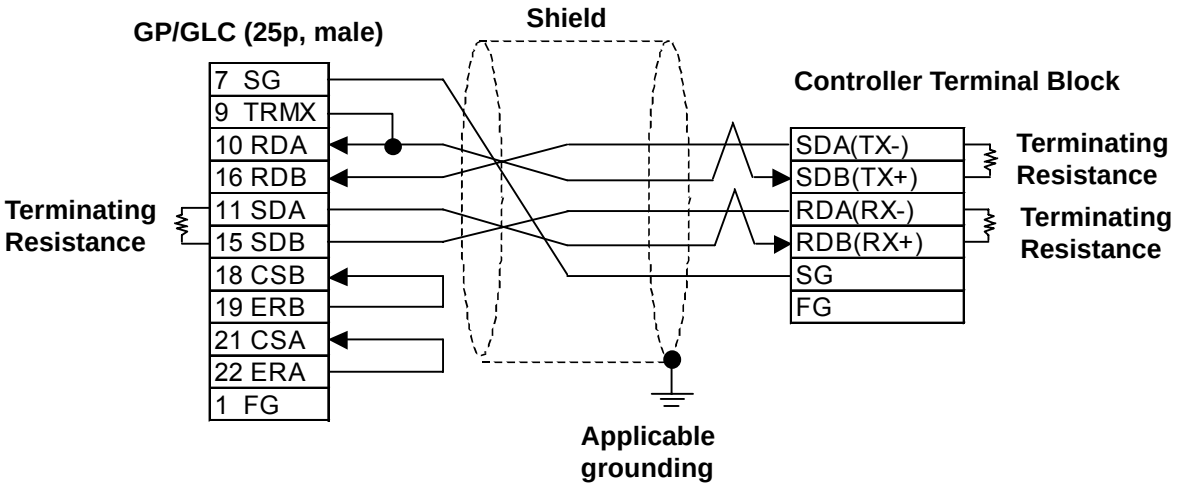
Signal Name	Terminal No.
SDA(-)	24
SDB(+)	23
RDA(-)	26
RDB(+)	25
SG	27

Cable Diagram 1 (1:1) (RS-422 4 Wires)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When preparing a cable on your own specifications>



Note:

Hitachi Densen's CO-SPEV-SB(A)3P*0.5SQ cable is recommended.

Depending on the Controller model, the FG terminal may not be equipped.

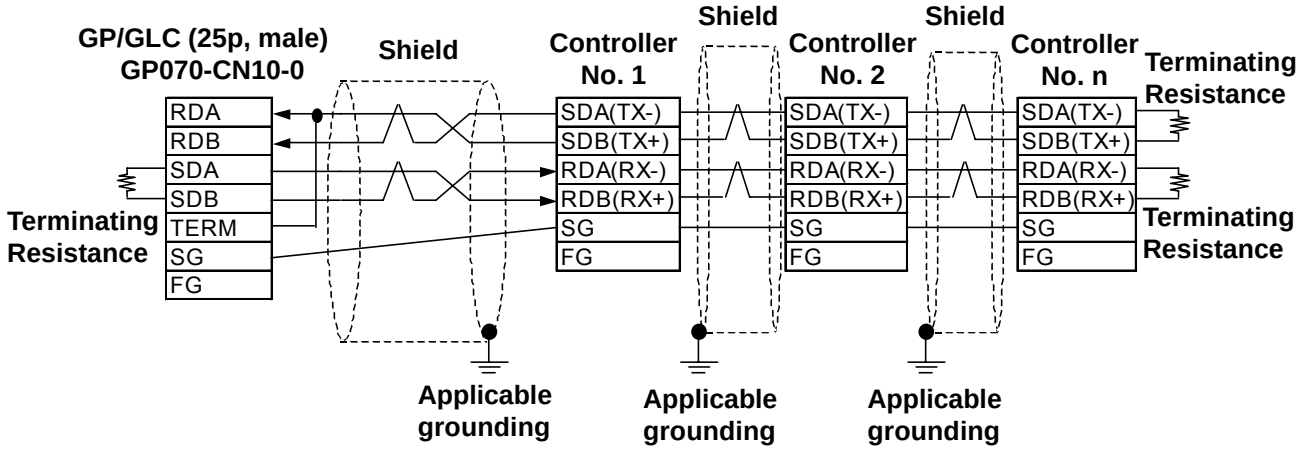
The GREEN SERIES' terminating resistance is 220Ω (1/4W) and the UT2000 Series' terminating resistance is 100Ω(1/2W) or more.

Connecting the GP/GLC serial interface's Nos. 9 and 10 pins will insert 100Ω terminating resistance between RDA and RDB.

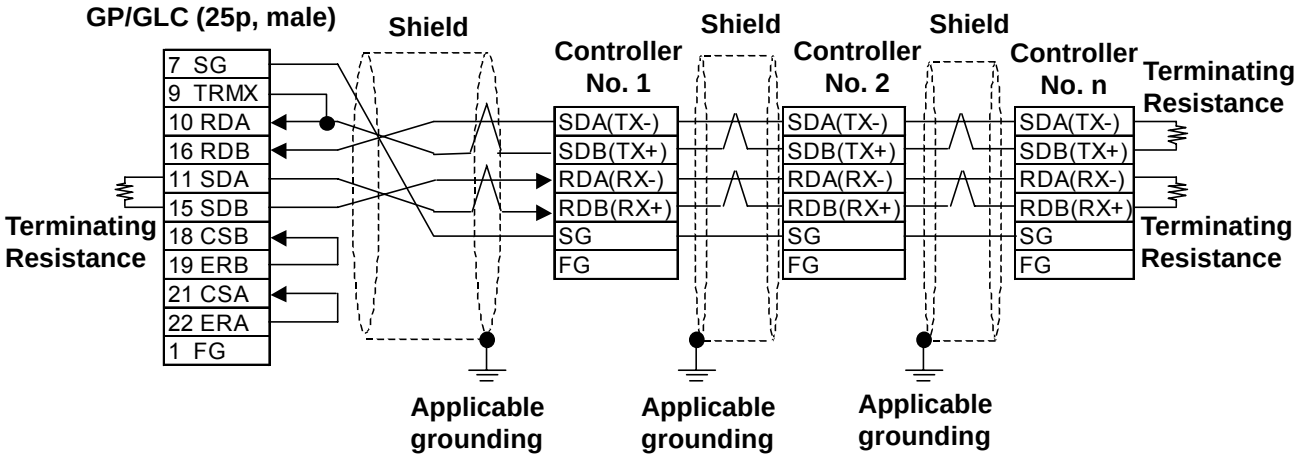
When using an RS-422 cable, be sure to keep its length within 500 meters.

Cable Diagram 2 (1:n) (RS-422 4 Wires)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When preparing a cable on your own specifications>



Note:

The maximum RS-422 (4 wires) cable length is 500 meters.

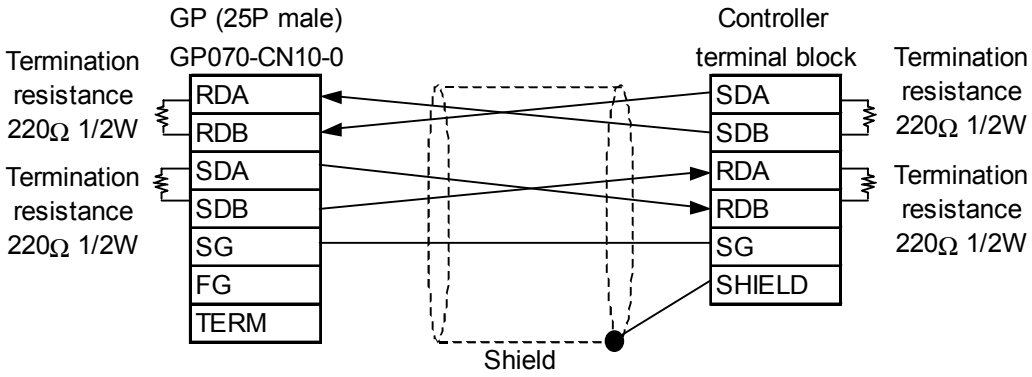
Up to 31 Controllers (up to 16 for UT2000 Series) can be connected.

Depending on the Controller model, the FG terminal may not be equipped.

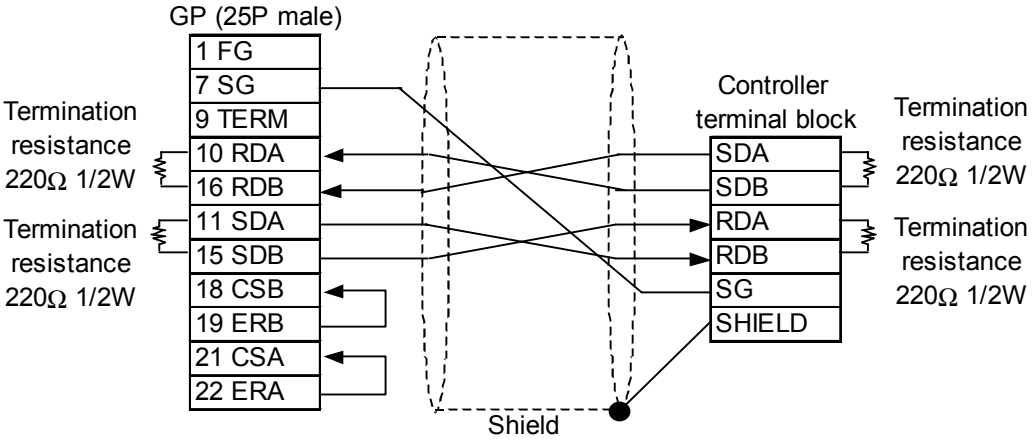
The GREEN SERIES' terminating resistance is 220Ω(1/4W) and the UT2000 Series' terminating resistance is 100Ω(1/2W) or more.

Cable Diagram 3 (1:1) (RS-422 4 Wires)

<When using Digital's RS-422 connector terminal adapter CP-070-CN10-0>



<When making your own cable>

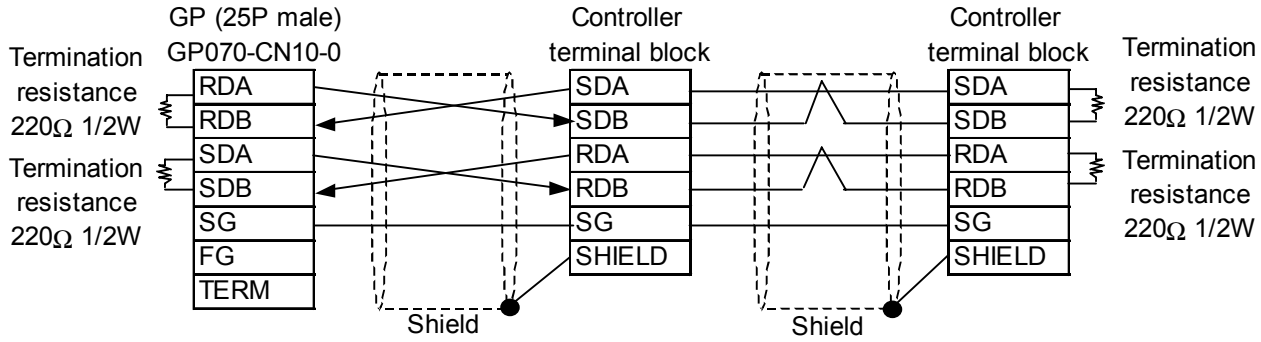


Important

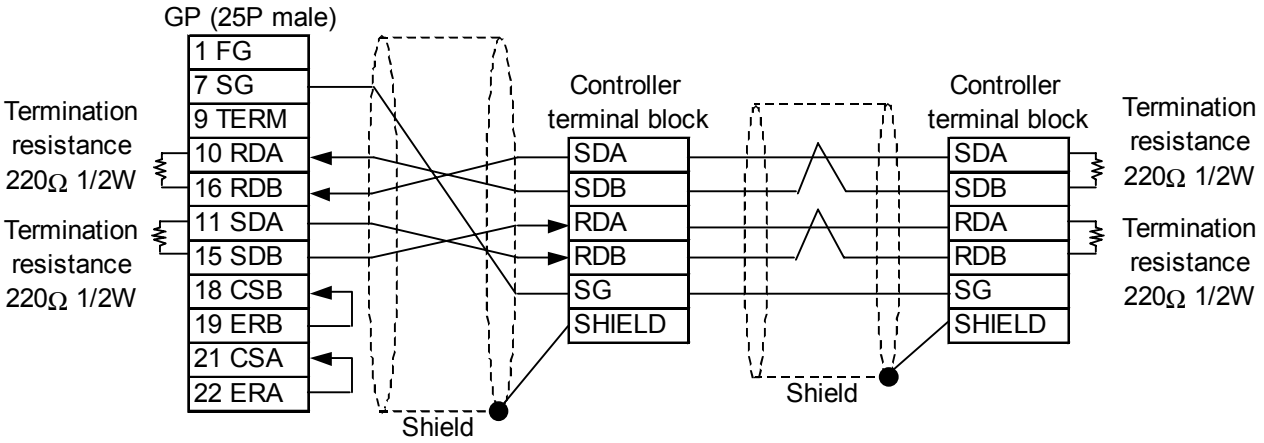
- ***Maximum cable length is 600 m.***

Cable Diagram 4 (1:n) (RS-422 4 Wires)

<When using Digital's RS-422 connector terminal adapter CP-070-CN10-0>



<When making your own cable>

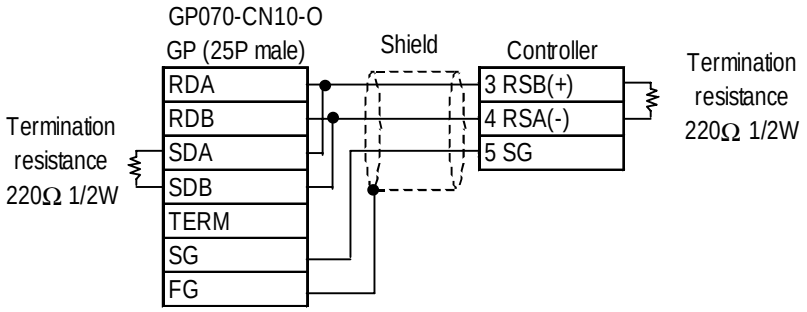


Important

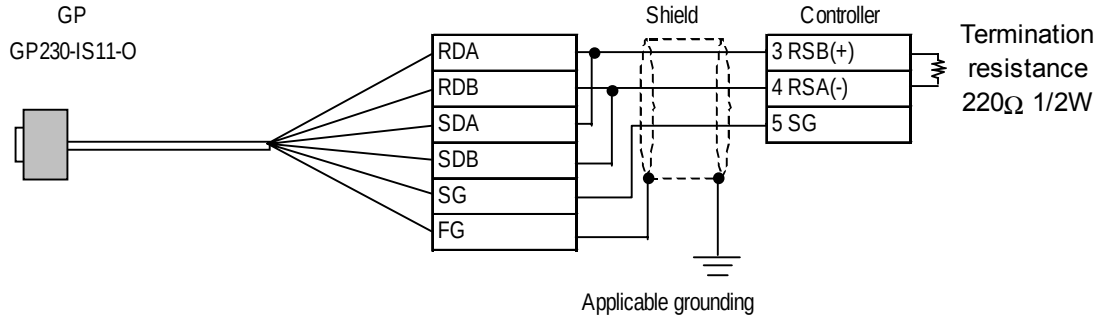
- ***Maximum cable length is 600 m.***

Cable Diagram 5 (1:1) (RS-422 2 Wires)

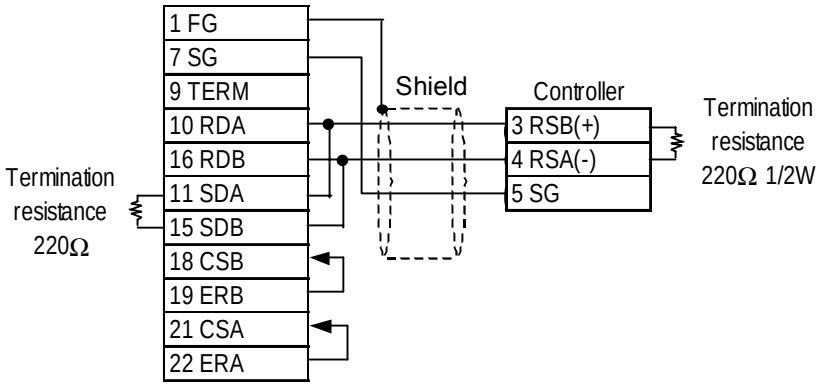
<When using Digital's RS-422 connector terminal adapter CP-070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>

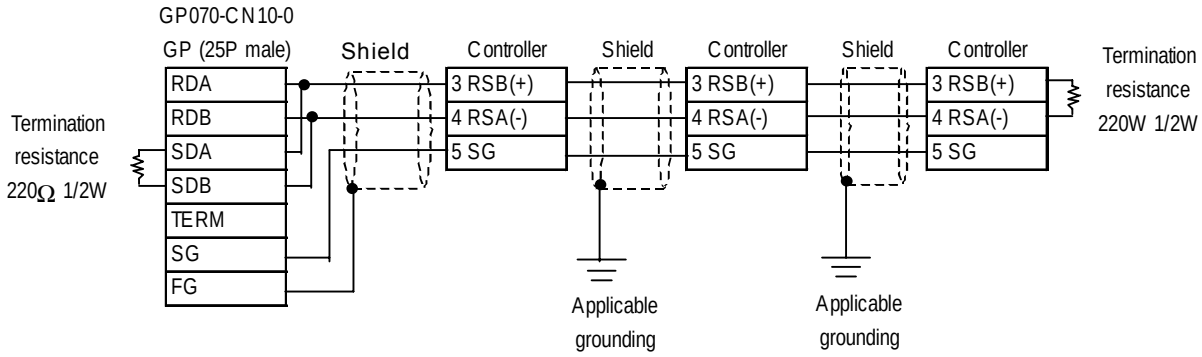


<When making your own cable>

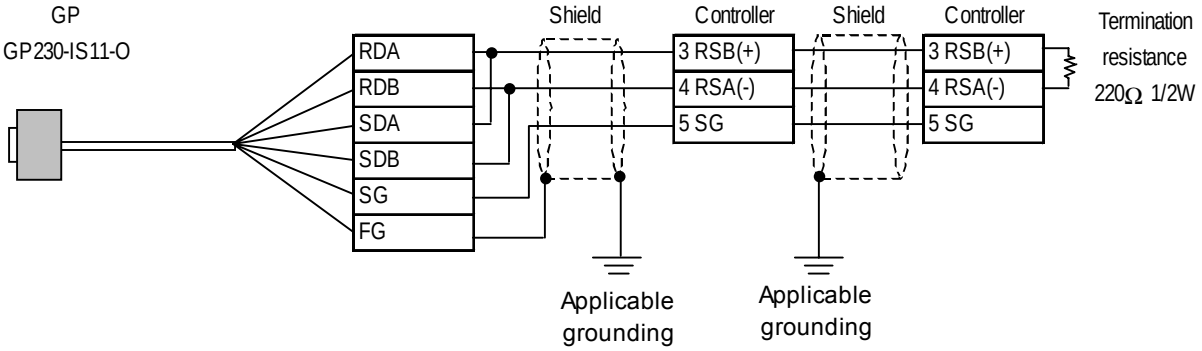


Cable Diagram 6 (1:n) (RS-422 2 Wires)

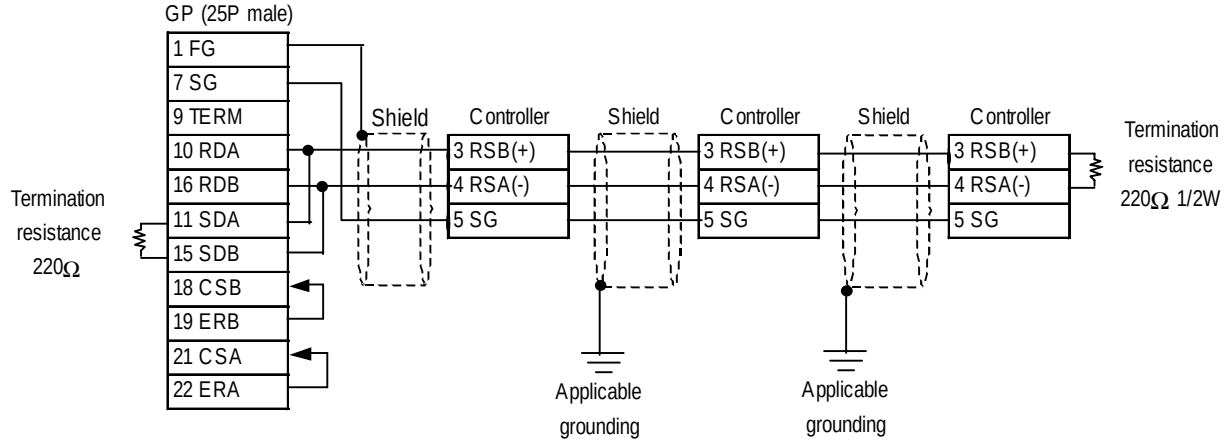
<When using Digital's RS-422 connector terminal adapter CP-070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>

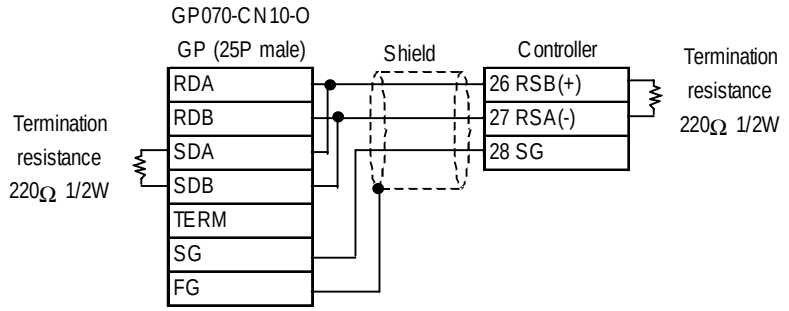


<When making your own cable>

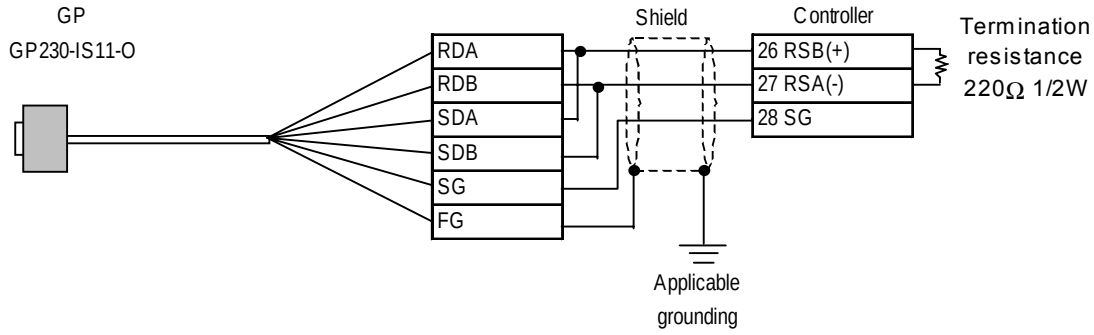


Cable Diagram 7 (1:1) (RS-422 2 Wires)

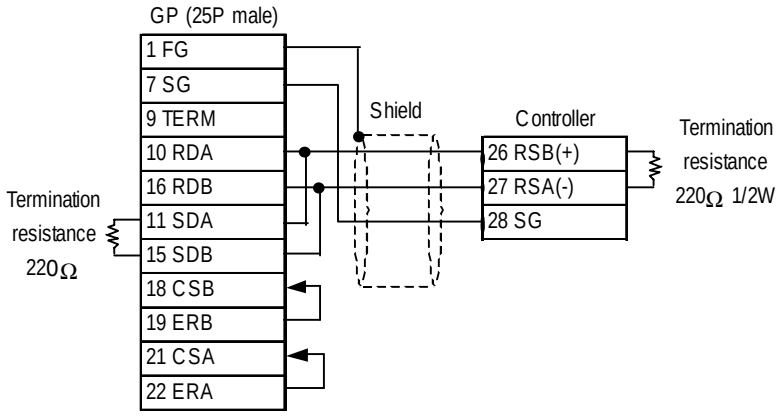
<When using Digital's RS-422 connector terminal adapter CP-070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>

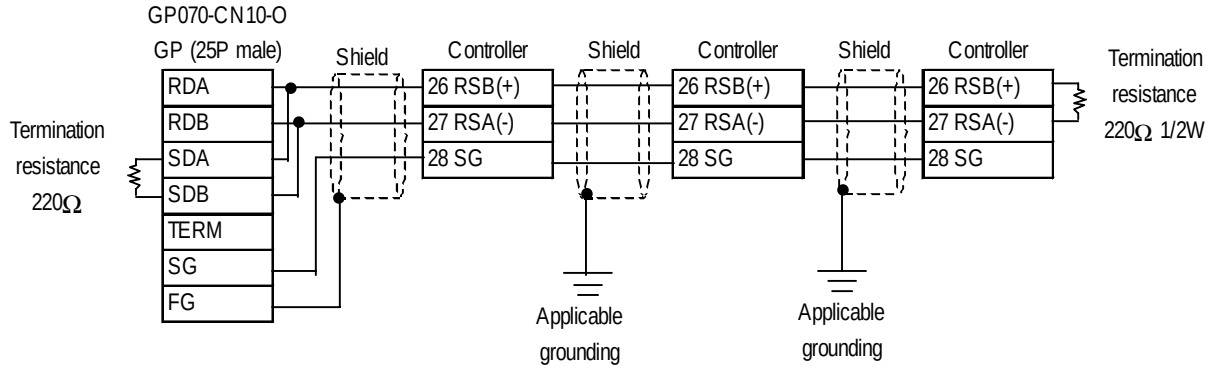


<When making your own cable>

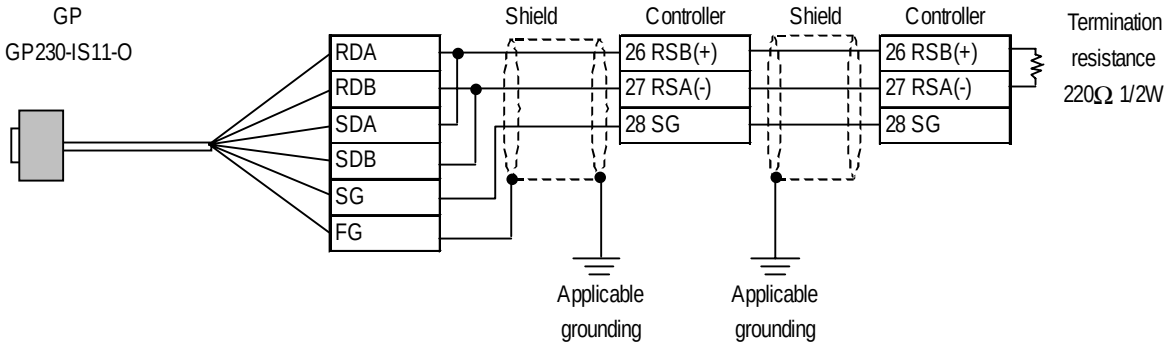


Cable Diagram 8 (1:n) (RS-422 2 Wires)

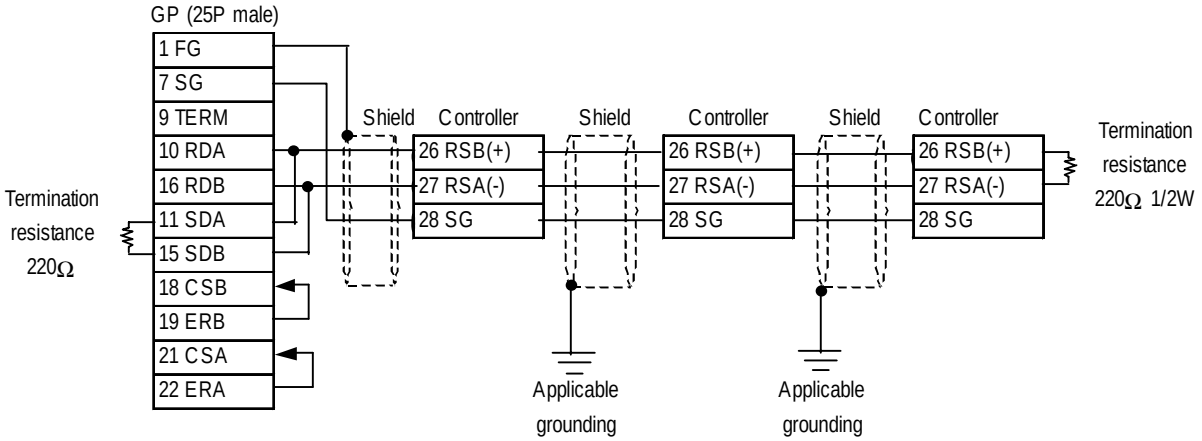
<When using Digital's RS-422 connector terminal adapter CP-070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>



<When making your own cable>



12.2.3 Supported Devices

The following lists show the ranges of devices supported by the GP/GLC.

■ UT2000 Series

Depending on the Controller model, prohibit areas are specified even within the following ranges.

Reference *Refer to Yokogawa's "UT2000 Detailed operation manual"*

Device	Bit Address	Word Address	Remarks	
I	I0001 ~ I1024	I0001 ~ I1009	[÷16+1]	L/H
D	————	D0001 ~ D1024	[Bit 15]	

■ GREEN SERIES

Depending on the Controller model, prohibit areas are specified even within the following ranges.

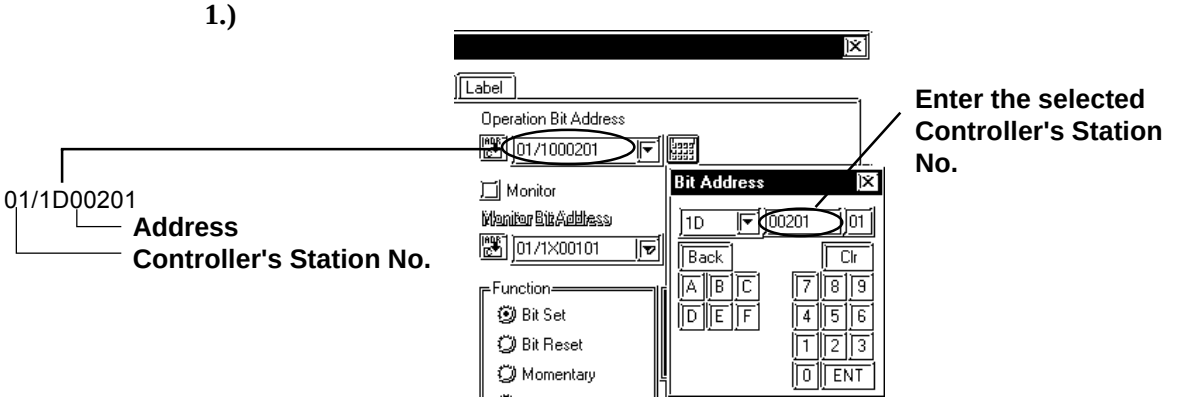
Reference *Refer to Yokogawa M&C's "UT350/UT320 Digital Indicated Controllers Operation Manual" and "GREEN SERIES further User's Manual".*

Device	Bit Address	Word Address	Remarks	
I	I0001 ~ I2048	I0001 ~ I2033	[÷16+1]	H/L
D	————	D0001 ~ D1274	[Bit 15]	

Important

- ***The system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP screen editor software, or via the OFFLINE screen, it is impossible to actually allocate the system area to the Controller's data area.***
- ***Be careful as the Device fields differ depending on the type of Controller. Refer to the Controller's manual for the range allowed for the device address area.***
  After screen data is converted from a different type of Controller, be sure to check if the device addresses used are correct.
  Be sure to check the supported device addresses before using Trend graphs or tags in your screens that use multiple words over continuous addresses.

Note: **When using tags in the screen editor software, the PLC Station number can be designated during address input. When a station number is not designated, the previously entered station number is automatically used. (The default value is 1.)**



■ UT3000

Device	Bit Address	Word Address	Remarks	
D-register	————	D0101 ~ D3206	Bit 5 *1 *2 *3	L/H
I-relay	I0001 ~ I1024	I0001 ~ I0497	*1	
W-register	————	W0101 ~ W1606	Bit 5	

**1 Writing a value to any write-protected address will not result in an error, however that value will not be reflected.*

**2 The T-tag cannot be used to write a value to an address that is not used by a parameter between loops (e.g., an address from D207 to D300 that are not used and is between loops 1 and 2).*

**3 Yokogawa's FACTORY ACE 1:n communication protocol only allows you to specify addresses D00001 to D02047. For addresses D02048 or larger, use the W-device. For the address maps of the W-register and D-register, refer to the list of D-registers/I-relays in the PC-LINK communication interface volume of the user's manual for UT3000 network temperature controller.*

Important

- ***System information is stored at D0001 to D0040. Therefore, do not write any value to these addresses. If any illegal value is written to such an address, the RUN LED on the CPU will turn OFF and the ERR LED will turn ON. Data will be sent, but the UT3000 will not operate. Since the default value for the first address in the system area is D0001, be very careful of the above point. Either change the first address in the system area in the GP-PRO/PBIII for Windows in advance or do not use the system area.***

■ UT100

◆ 1:1 communication

Device	Bit Address	Word Address	Remarks
D-register	————	d1 ~ d32768	Bit 15 *1 *2 *3 L/H

◆ 1:n communication

Device	Bit Address	Word Address	Remarks
D-register	————	d1 ~ d2047	Bit 15 *1 *2 *3 L/H

*1 *Some devices are write-protected. For their addresses, refer to Yokogawa M&C's TU100 series user's manual.*

*2 *Only d401 to d420 may be allocated as system area memory for the controller. Be careful of this point when the system area is set in GP-PRO/PBIII for Windows or in the GP/GLC's OFFLINE mode.*

*3 *This protocol is shared by Yokogawa's PLC. When a screen is set up in GP/PRO/PBIII, even though many values may be input for the PLC's devices, only d is available for a UT100 series controller.*

12.2.4 Environment Setup

The following list shows the recommended Controller and GP/GLC communication settings.

■ UT2000 Series/GREEN SERIES

GP/GLC Settings			Controller Settings		
Baud Rate	9600 bps		Baud Rate		9600 bps
Data Length	8 bit		Data Length		8 bit
Stop Bit	1 bit		Stop Bit		1 bit
Parity Bit	Even		Parity Bit		Even
Data Flow Control	ER		——		——
Communication Format (When using RS-422)	4-wire Type		——		——
——	——		For Dip Switch Communication Mode Selection	UT2000 Series	ON
			Protocol Selection (PSL)	GREEN SERIES	Personal computer link communication
Unit No.	UT2000 Series	1 ~ 16	Station No. (communication address)	UT2000 Series	1 ~ 16
	GREEN SERIES	1 ~ 31		GREEN SERIES	1 ~ 31

◆Controller Communication Settings

<UT2000 Series>
Use the unit's rear face rotary switches:

(1) Use the communication condition setting rotary switch to enter the communication condition.
(2) Use the station number selection rotary switch to enter the unit number.
(3) Turn the communication mode selection dip switch ON.

<GREEN SERIES>
Use the unit's front keys:

(1) Hold down the Controller's [SET/ENT] key for 3 seconds or more to change the screen from [operation] to [operation parameter] .
(2) When "OP.PA" appears on the measurement value (PV) display, use either △or▽ key to display "STUP".
(3) For UT350/UT320, every time you press the [SET/ENT] key, the screen will change one by one, in the order of [Protocol Selection] --> [Baud Rate] --> [Parity] --> [Stop Bit] --> [Data Length] --> [Communiaction Address].

For UT450/UT420, press the [SET/ENT] key once, and the [Setup Parameter Settings] screen will appear. Use either △or▽key to select "r485", and then, press the [SET/ENT] key again. After this, use the same procedure used for UT350/UT320.

■ UT3000

GP/GLC Settings		Controller Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	None	Parity Bit	None
Data Flow Control	ER Control	Sum Check	ON
Communication Format	4-wire Type	Designation of Terminating Character	None
Unit No.	1	Protection	None
——		Station No.	1

■ UT100

GP/GLC Settings		Controller Settings *1		Settings
Baud Rate	9600 bps	Baud Rate	9600 bps	BPS: 9.6
Data Length	8 bits	Data Length	8 bits	DLN: 8
Stop Bit	1 bit	Stop Bit	1 bit	STP: 1
Parity Bit	Even	Parity Bit	Even	PR1: EVN
Control Method	ER Control	——	——	——
Communication Format	2-wire Type	Communication Format	RS-485 Communication	——
Unit No.	1	Communication Address *2	1	ADR: 1
——		Protocol	PC Link Communication (without Sum Check)	PSL: 0

*1. In order to comply with Yokogawa M&C's UT100 series controller, the existing Yokogawa's PLC protocol has been expanded. The default values for the GP/GLC remain unchanged to comply with the PLC. To communicate with the controller, change the communication settings to those for the controller.

*2. The communication addresses for the controller can be specified in a range between 1 and 99. However, those for setting parts and tags on the GP-PRO/PBIII are only allowed in a range between 1 and 32. Only communication between a single GP/GLC unit and a maximum of 31 controllers is possible. Therefore, take care not to specify wrong communication addresses for the controllers.

12.3 Yamatake Controllers

12.3.1 System Structure

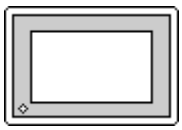
This chapter describes the system configuration used when connecting this Controller to the GP.

Important

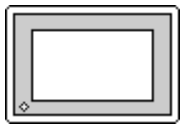
- ***GP/GLC's System Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP's screen editor software or via the GP/GLC's OFFLINE screen, it is impossible to actually allocate the system area to the Controller's data area.

■ **SDC Series** (1:1 communication)

Controller	Cable Diagram	GP/GLC
		
SDC 20 SDC 21 SDC 40A SDC 40B SDC 40G	RS-232C <Cable Diagram 1>	GP Series or GLCSeries
SDC 20 SDC 21 SDC 30 SDC 31 SDC 40A SDC 40B SDC 40G	RS-422 (4 wires) <Cable Diagram 2>	
	RS-422 (2 wires) <Cable Diagram 3>	

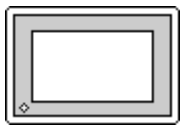
■ **SDC Series** (1:n (multi-drop) communication)

CPU	Cable Diagram	GP/GLC
		
SDC 20 SDC 21 SDC 30 SDC 31 SDC 40A SDC 40B SDC 40G	RS-422 (4 wires) <Cable Diagram 4> RS-422 (2 wires) <Cable Diagram 5>	GP/GLC Series

■ **DMC10** (1:1 communication)

CPU	Cable Diagram	GP/GLC
		
DMC10	RS-422 (2 wires) <Cable Diagram 6>	GP/GLC Series

■ **DMC10** (1:n (multi-drop) communication)

CPU	Cable Diagram	GP/GLC
		
DMC10	RS-422 (2 wires) <Cable Diagram 7>	GP/GLC Series

12.3.2 Cable Diagrams

The cable diagrams shown below and those recommended by Yamatake may differ, however, using these cables for Controller's operations will not cause any problems.

Important

- ***When connecting the FG terminal to the connector cover, be sure that the connector cover material is conductive.***
- ***Ground the Controller's FG terminal according to your country's applicable standard. For details, refer to your Controller's manual.***
- ***When connecting a cable's shield line to an FG terminal, consider the needs of your system when deciding which side of the cable (GP/GLC or Controller) to connect. (The example below connects to the Controller's FG terminal.)***

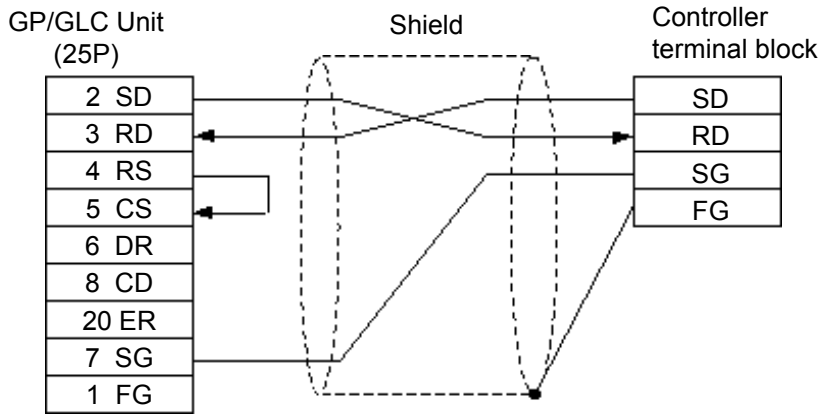
- ***The maximum RS-232C cable length is 15 meters. If a communication cable is used, be sure to connect its SG (signal ground) terminal.***
- ***The maximum RS-422 cable length is 500 meters.***
- ***The recommended RS-422 cables are as follows:***

Recommended Cables

Company		Type
Fujikura Densen	2 wires	IPEV-S-0.9mm^2×1P
	3 wires	ITEV-S-0.9mm^2×1T
Hitachi Densen	2 wires	KPEV-S-0.9mm^2×1P
	3 wires	KTEV-S-0.9mm^2×1T

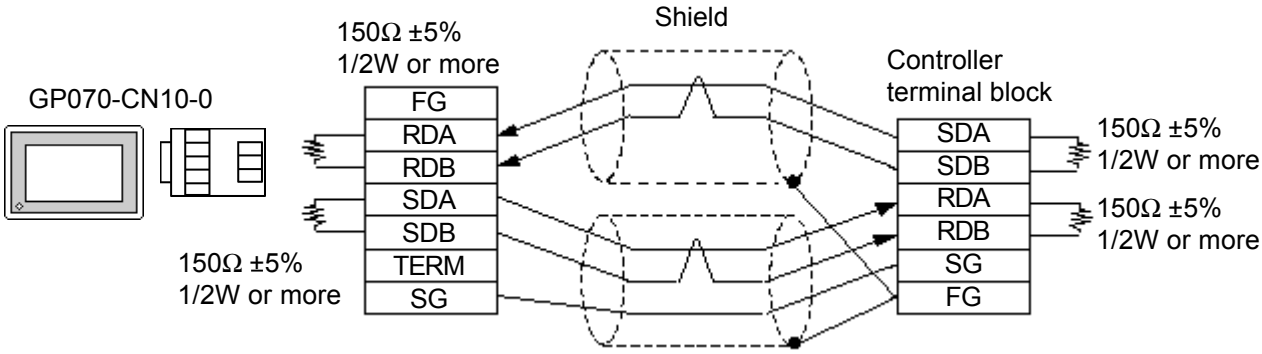
- ***Since the Controller's terminal numbers will differ depending on the type of additional functions, check these numbers with the Controller's appropriate manual.***

Cable Diagram 1 (1:1) (RS-232C)

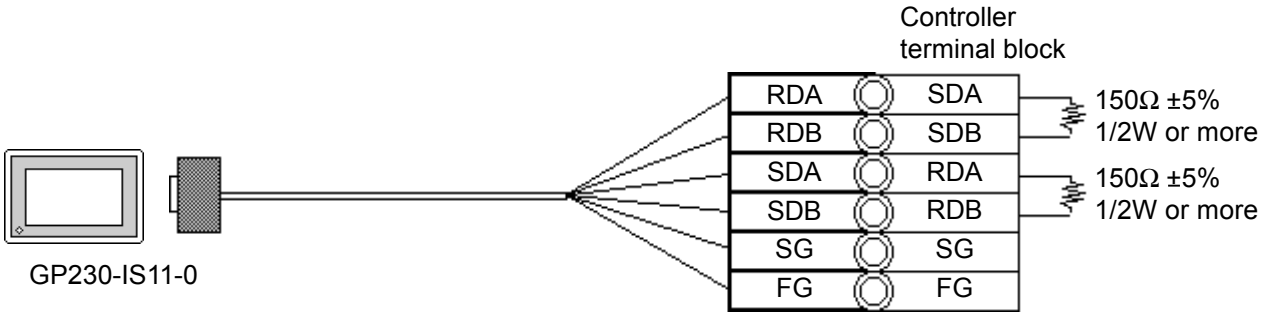


Cable Diagram 2 (1:1) RS-422 4 Wires, RS-422 5 Wires

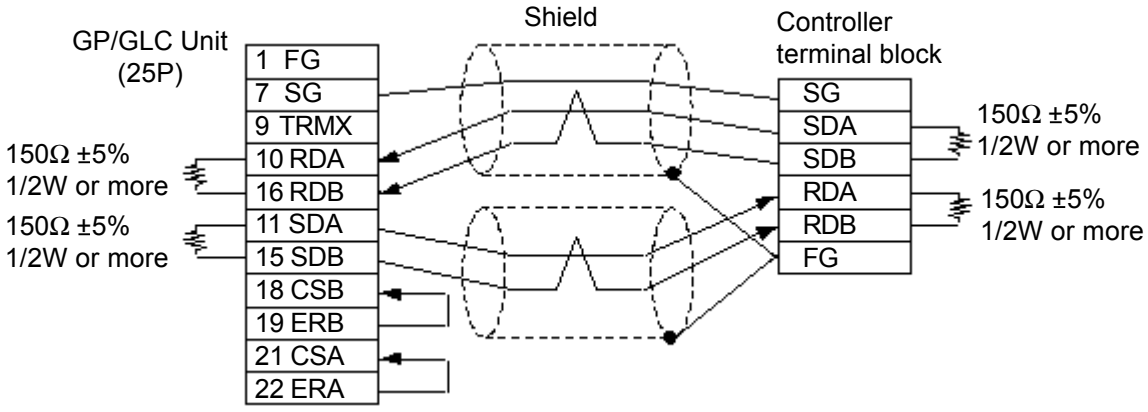
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When using Digital's RS-422 cable GP0230-IS11-0>

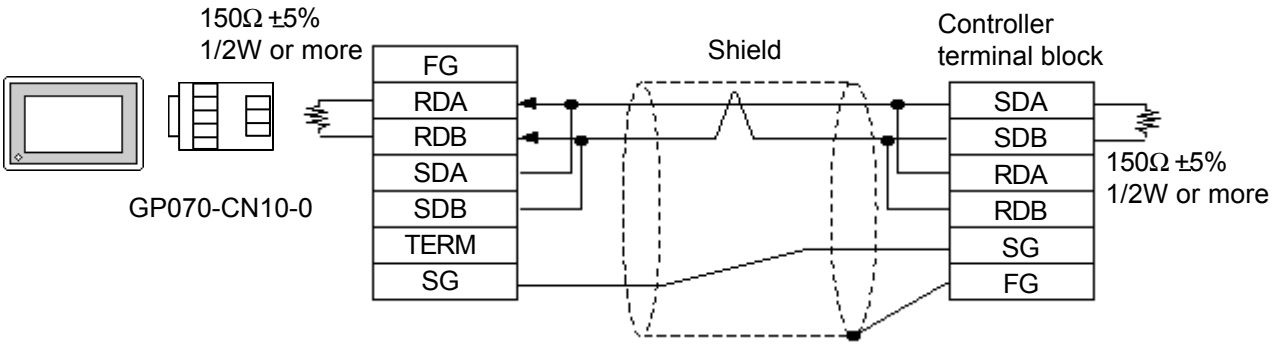


<When making your own cable>

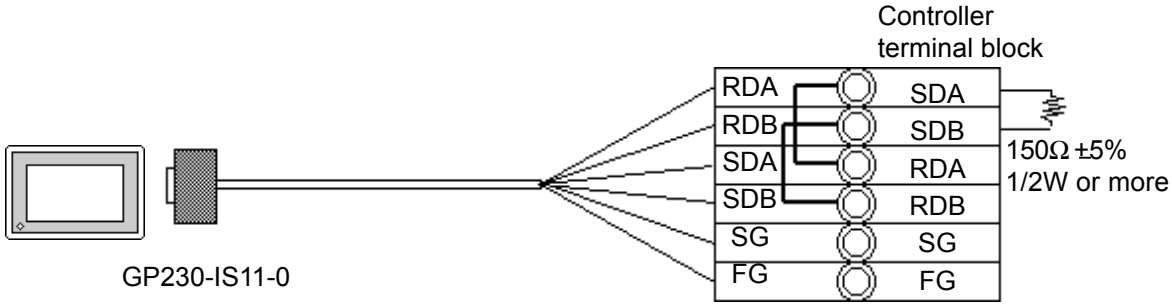


Cable Diagram 3 (1:1) RS-422 2 Wires, RS-422 3 Wires

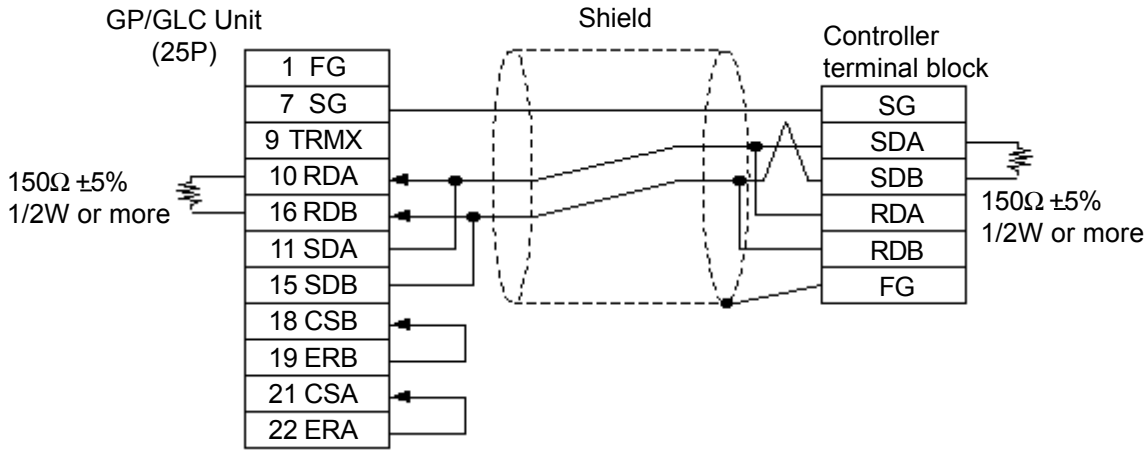
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>

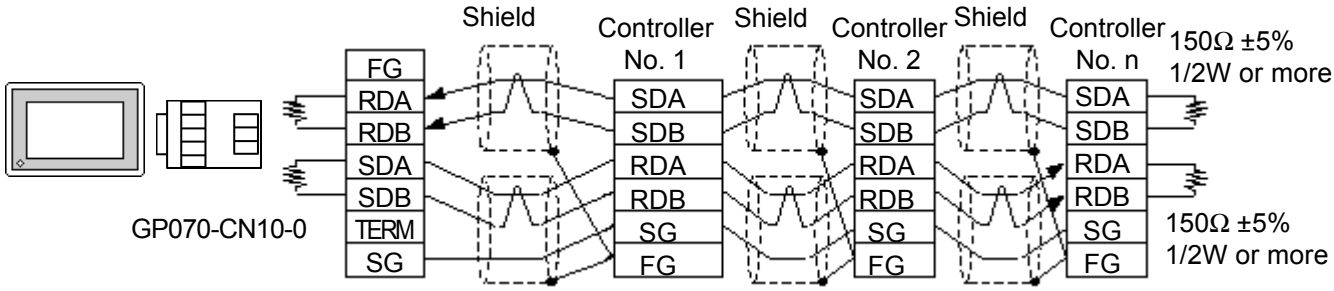


<When making your own cable>

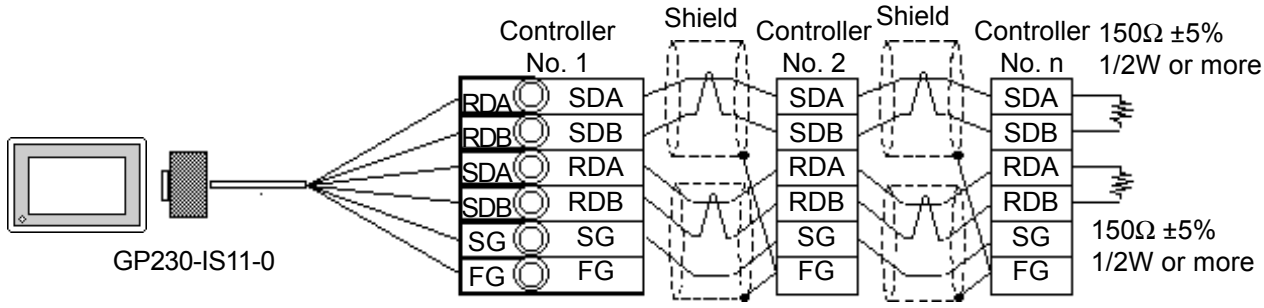


Cable Diagram 4 (1:n) RS-422 4 Wires, RS-422 5 Wires

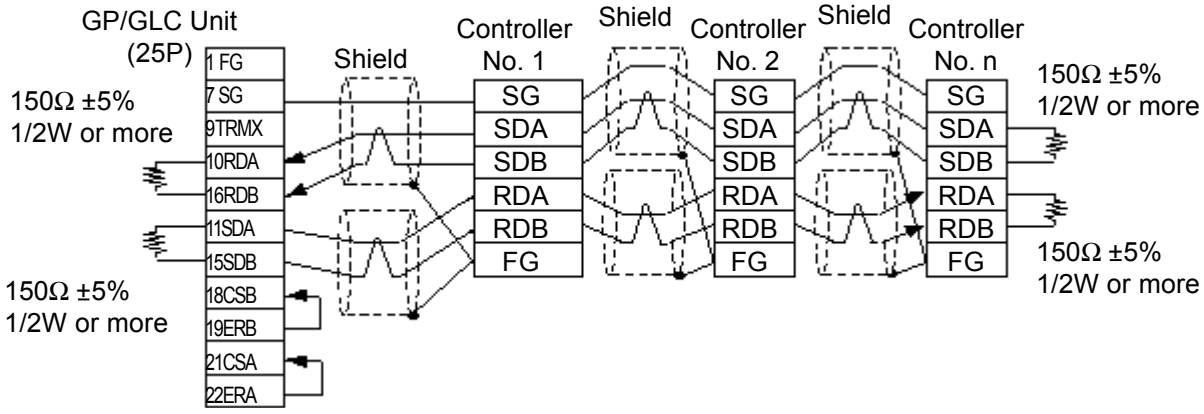
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>

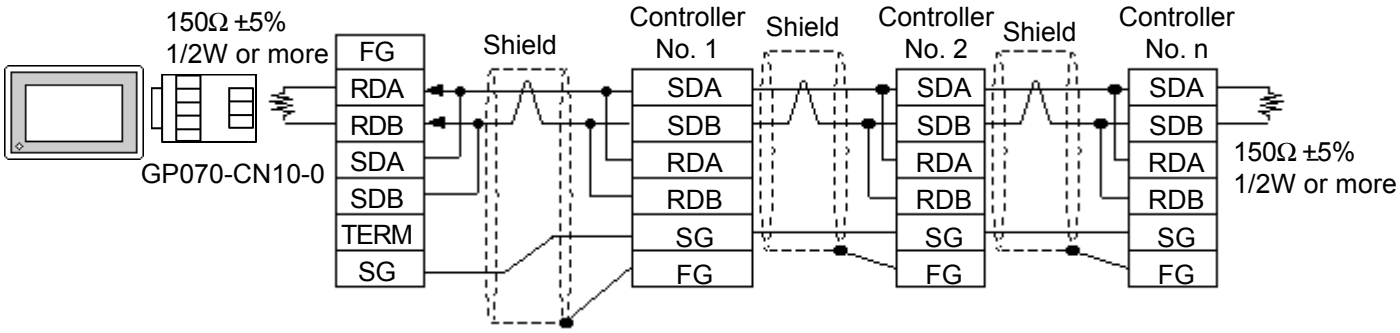


<When making your own cable>

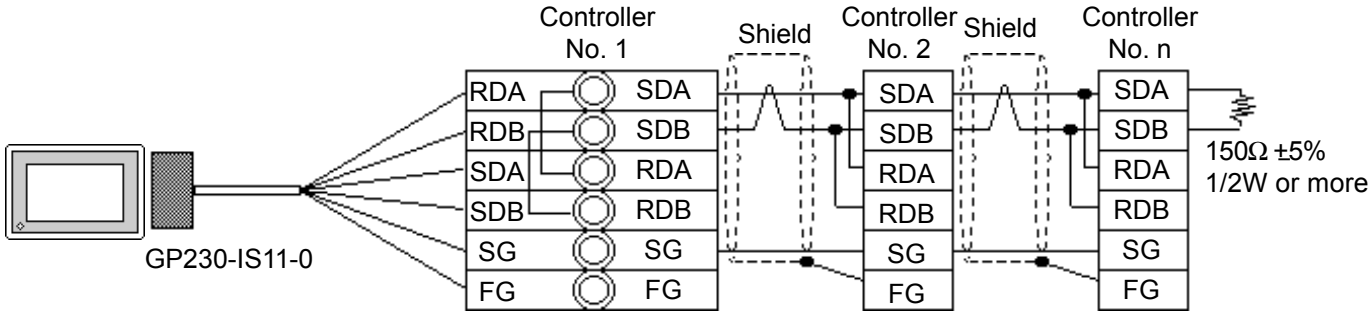


Cable Diagram 5 (1:n) RS-422 2 Wires, RS-422 3 Wires

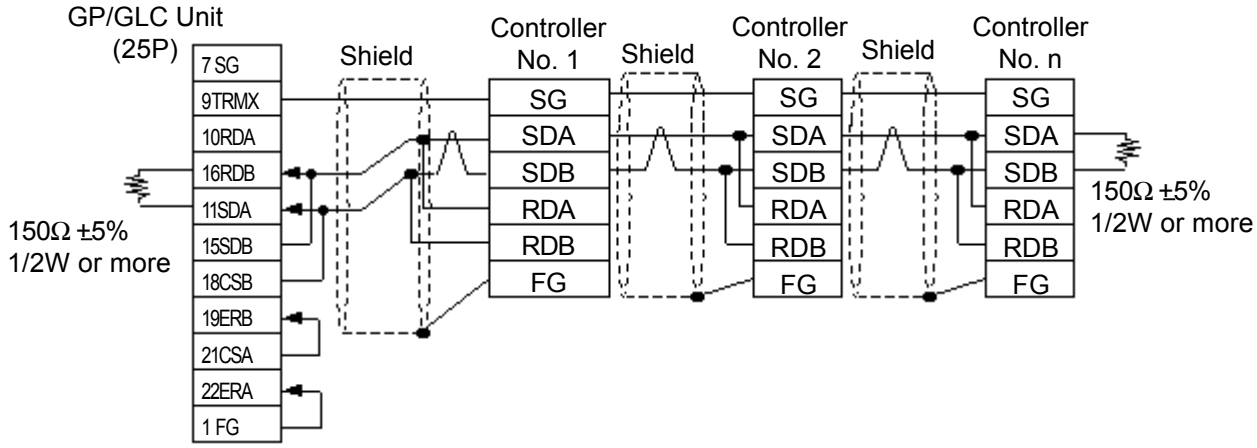
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When using Digital's RS-422 cable GP230-IS11-0>

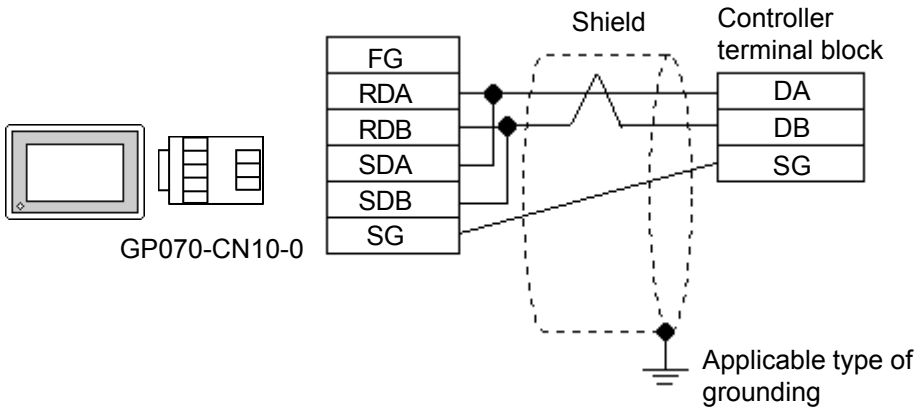


<When making your own cable>

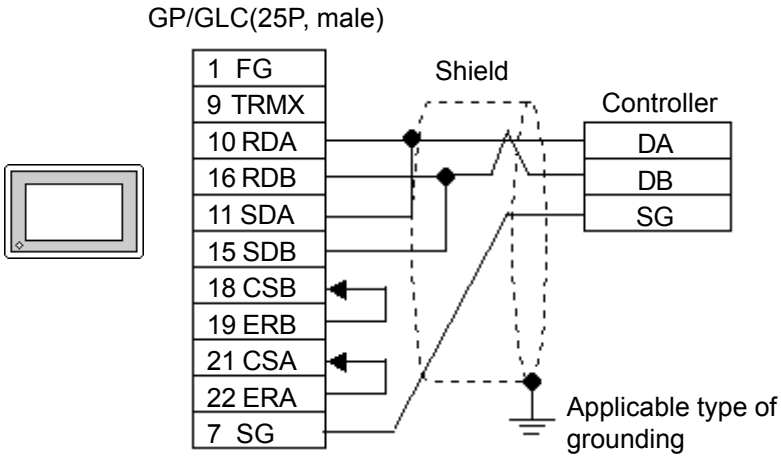


Cable Diagram 6 (1:1) RS-422 2 Wires, RS-422 3 Wires

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When making your own cable>

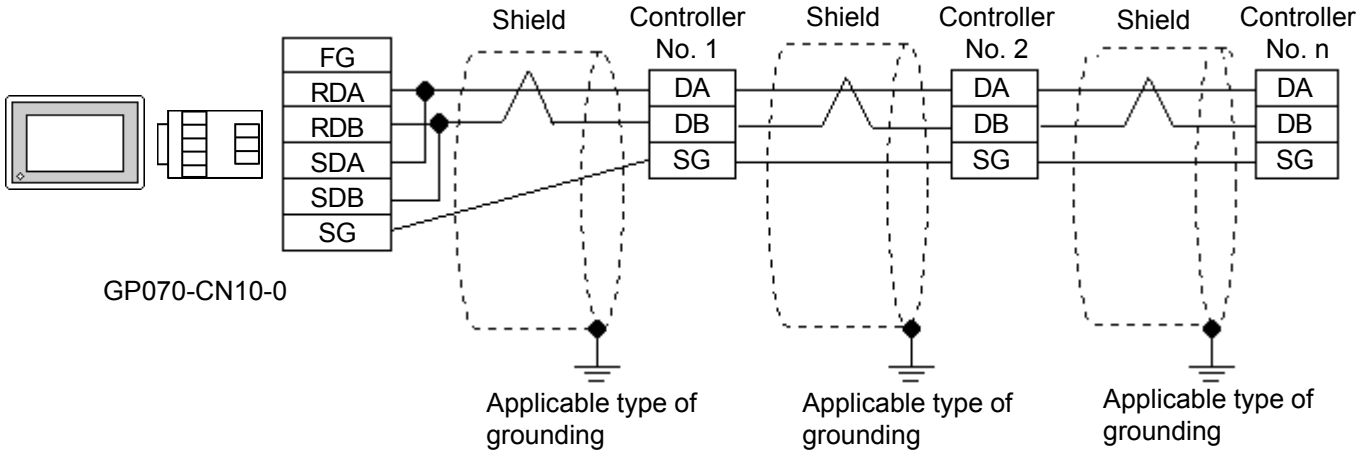


Important

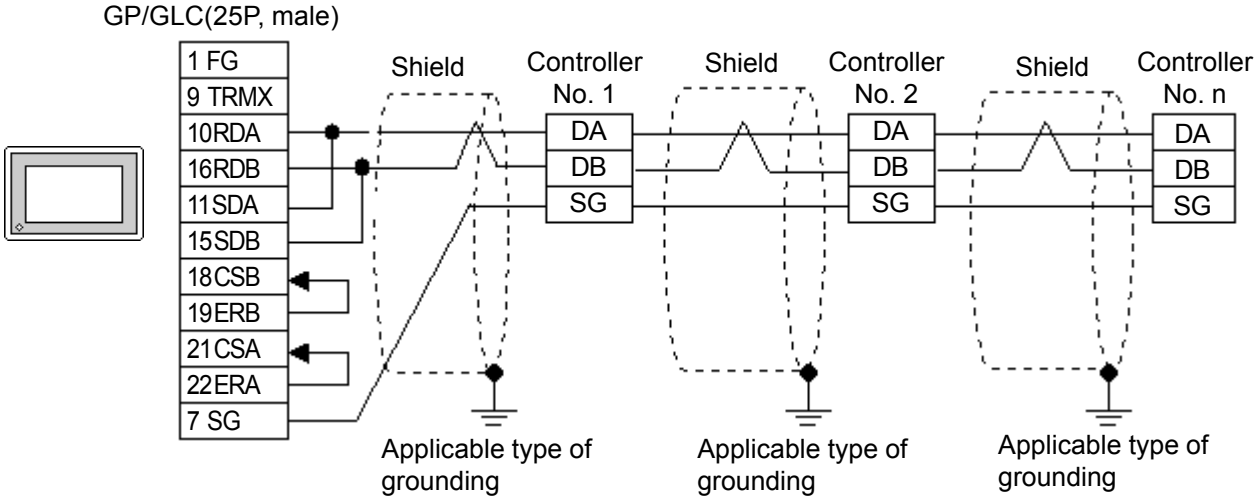
- ***Since terminating resistance is provided inside the Controller, DO NOT connect additional terminating resistance.***

Cable Diagram 7 (1:n) RS-422 2 Wires, RS-422 3 Wires

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When making your own cable>



Important

- ***Since terminating resistance is provided inside the Controller, DO NOT connect additional terminating resistance.***

12.3.3 Supported Devices

The following lists show the ranges of devices supported by the GP/GLC.

■ SDC Series

Device	Bit Address	Word Address	Remarks	
Data	00000 ~ 8999F	0000 ~ 8999		H/L

■ DMC10*1

Device	Bit Address	Word Address	Remarks	
Data	10010 ~ 7804F	1001 ~ 7804		H/L

**1. Data cannot be written or read to some Addresses. For more detailed information, refer to the Yamatake's appropriate Operation manual.*

Important

- ***GP/GLC's System Data Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP screen editor software or via the GP/GLC's OFFLINE screen, it is impossible to actually allocate the system area to the Controller's data area.

- ***Be careful that the Device fields differ depending on the type of Controller. Refer to the Controller's manual for the range allowed for the device address area.***

  After screen data is converted form a different type of Controller, be sure to check if the device addresses used are correct.

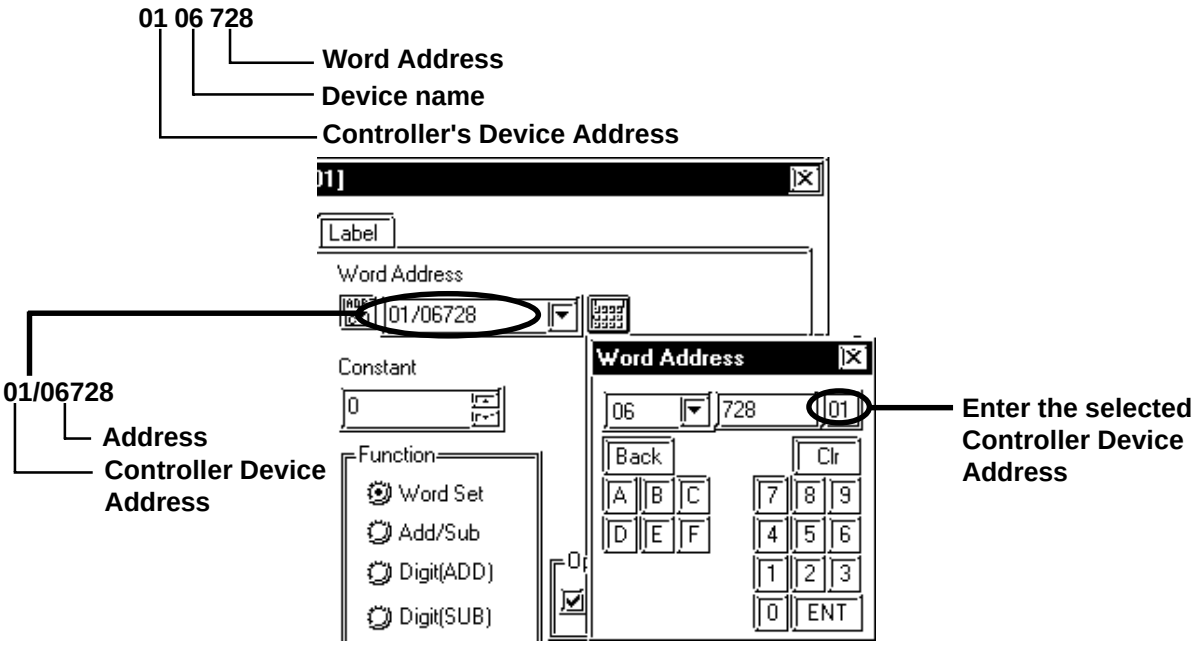
  Be sure to check the supported device addresses before using Trend graphs or tags in your screens that use multiple words over continuous addresses.

Note:

- **When entering device addresses via the GP screen editor software, the top address (left-most digit) is used for the device name and remaining three digits (0 to 999) are used for the Controller data addresses.**
- **When settings tags in the screen editor software, the device address can be designated during address input. When a device number is not designated, the previously entered device number is automatically used. (The default value is 1.)**

<e.g.> When entering Device Address "6728":

Enter the device name "6", and then the Word Address "728".



12.3.4 Environment Setup

The following tables show Digital's recommended Controller and GP/PLC communication settings.

■ SDC Series

GP Settings		Controller Settings	
Baud Rate	9600bps	Baud Rate	9600bps
Data Length	8bit	Data Length	8bit
Stop Bit	1bit	Stop Bit	1bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	--------	--------
Communication Format (when using RS-232C *1)	RS-232C	--------	--------
Communication Format (when using RS-422)	4 wires	--------	--------
Communication Format (when using RS-422)	2 wires	--------	--------
Unit No.	Select a desired unit number from 1 to 32.	Device Address	Enter all different Controller device addresses.

**1 RS-232C communication can be performed with SDC20, SDC21, SDC40A, SDC40B, and SDC40G.*

Important

- ***Although the Controller's device address input range is from 0 to 127, be sure to use only from 1 to 32 on the GP/GLC to match the Controller's device address to the GP's.***
- ***When using 1:n communication, up to 31 Controllers can be connected.***
- ***When the device address is designated as 0 (default value), communication is not be performed.***

■ DMC10

GP Settings		Controller Settings	
Baud Rate	19200bps	Baud Rate	19200bps
Data Length	8bit	Data Length	8bit
Stop Bit	1bit	Stop Bit	1bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	--------	--------
Communication Format (when using RS-422	2 wires	--------	--------
Unit No. *2	Select a desired unit number from 1 to 15.	Device Address	Enter all different Controller device addresses (1 to F).

**2 Unit numbers entered on the GLC are decimal numbers.*

12.4 RKC INSTRUMENT INC. Controllers

12.4.1 System Structure

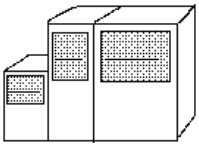
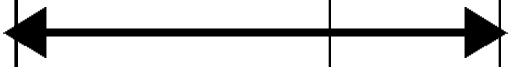
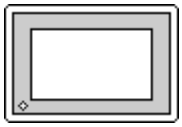
The following describes the system configuration used when connecting the GP/GLC to RKC Controller.


Important

- ***GP/GLC's System Area (LS0 to LS19) Settings***

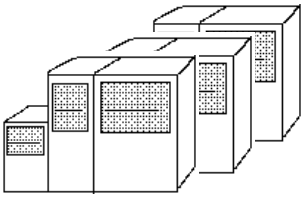
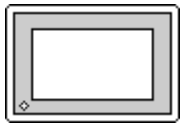
  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP's screen creation software or via the GP/GLC's OFFLINE screen, be careful that you do not use the Controller's own data area.

■ **CB Series/SR-Mini Series** (1:1 communication)

Controller	Cable Diagram	Cables	GP
			
H-PCP-A Z-1021	RS-232C (Cable Diagram 1)	RKC's W-BF-01- XXXX *1	GP Series Units GLC Series Units
	RS-422 (4 wires) (Cable Diagram 2)		
CB100 Z-1021 CB400 Z-1021 CB500 Z-1021 CB700 Z-1021 CB900 Z-1021 (Applicable for Modbus Protocol)	RS-422 (2 wires) (Cable Diagram 3)		

**1 XXXX indicates the cable length (mm).*

■ CB Series/SR-Mini Series (1:n communication)

Controller	Cable Diagram	Cable	GP
			
H-PCP-A Z-1021	RS-422 (4 wires) (Cable Diagram 4)	RKC's W-BF-01-XXXX *1 W-BF-02-XXXX	GP Series Units GLC Series Units
CB100 Z-1021 CB400 Z-1021 CB500 Z-1021 CB700 Z-1021 CB900 Z-1021 (Applicable for Modbus Protocol)	RS-422 (2 wires) (Cable Diagram 5)		

**1 XXXX indicates the cable length (mm).*

12.4.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by the RKC INSTRUMENT INC. may differ, however, using these cables for your Controller's operations will not cause any problems.

Important

- ***When connecting the FG terminal to the connector cover, be sure that the connector cover conducts current.***
- ***Ground your Controller's FG terminal according to your country's applicable standard. For details, refer to your Controller's manual.***
- ***When connecting a cable's Shield line to an FG terminal, consider the needs of your system when deciding which side of the cable (GP/GLC or Controller) to connect. (The example below connects to the Controller's FG terminal.)***

■ CB Series

Important

- ***Up to 31 CB Series units can be connected to a single GP/GLC.***
- ***If a communications cable is used, be sure to connect its SG (signal ground) terminal.***
- ***RS-422 (2 wires) cables, must be less than 500 meters long.***
- ***The following RS-422 cable is recommended.***

Company	Item No.	Type
Hirakawa Densen	2207-510-008	CO-HC-ESV-3P X 7/0.2

Important

- ***The Controller terminal number will differ depending on the type of CPU used. The following examples reflect all the CB series units supported by the Digital Electronics Corporation.***

<CB100,CB400,CB500,CB900>

Terminal No.	Signal Name
13	SG
14	T/R(A)
15	T/R(B)

<CB700>

Terminal No.	Signal Name
7	SG
8	T/R(A)
9	T/R(B)

■ SR-Mini Series

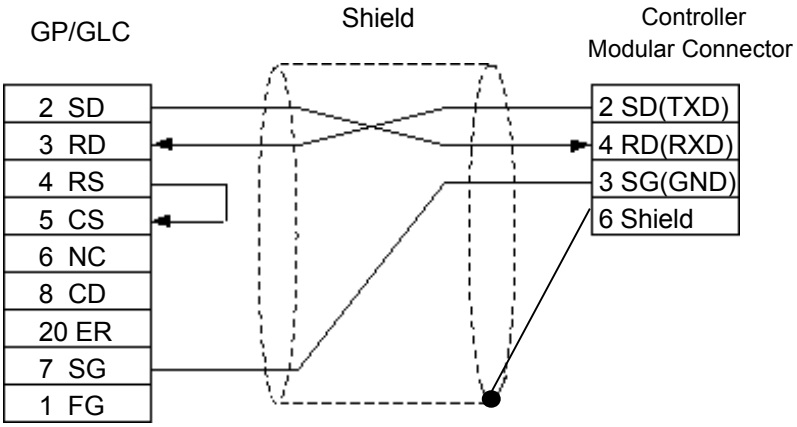
Important

- ***Up to 16 SR-Mini Series modules can be connected to a single GP/GLC.***
- ***If a communications cable is used, be sure to connect its SG (signal ground) terminal.***
- ***RS-232C cables should be less than 15 meters long.***
- ***RS-422 (2 wire) cables should be less than 500 meters long.***
- ***The following RS-422 cables are recommended for SR-Mini Series units.***

Company	Type	Comments
RKC INSTRUMENT INC.	W-BF-01- XXXX *1	Used when connecting a SR-Mini to a GP/GLC
RKC INSTRUMENT INC.	W-BF-02- XXXX *1	Used when connecting a SR-Min to SR-Mini

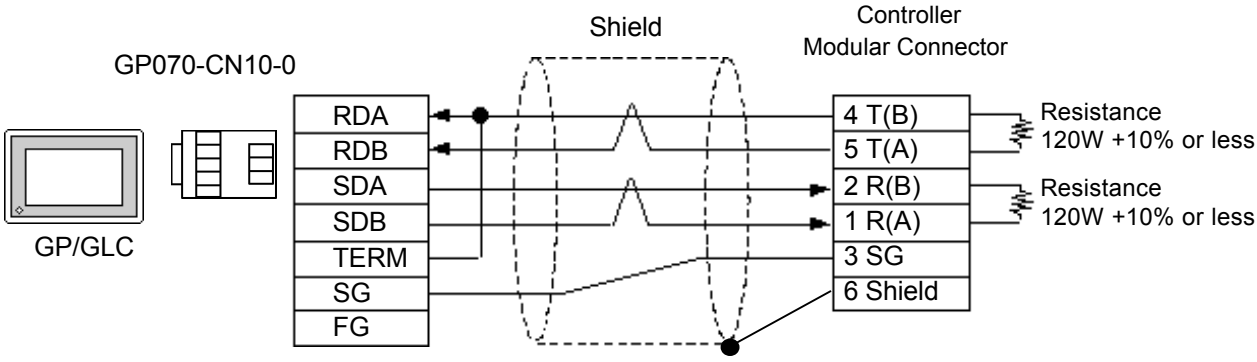
**1 XXXX indicates the cable length (mm).*

Cable Diagram 1 (1:1) RS-232C

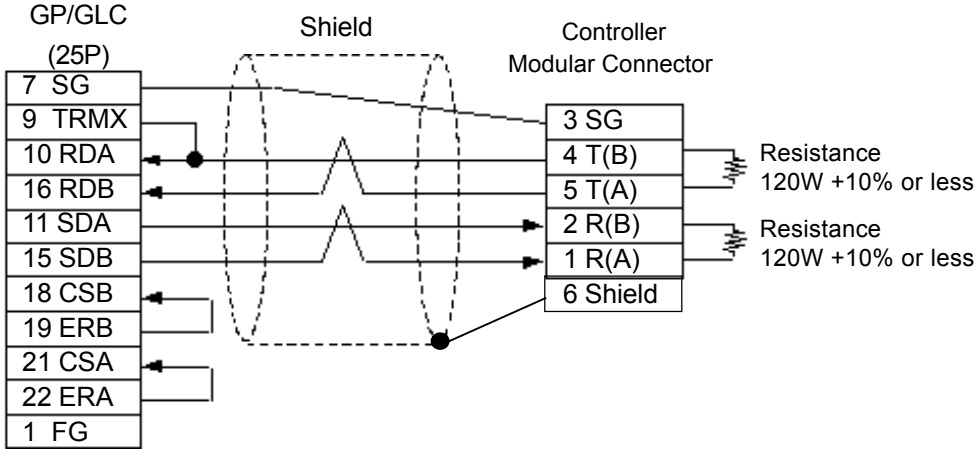


Cable Diagram 2 (1:1) RS-422 4 Wires

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

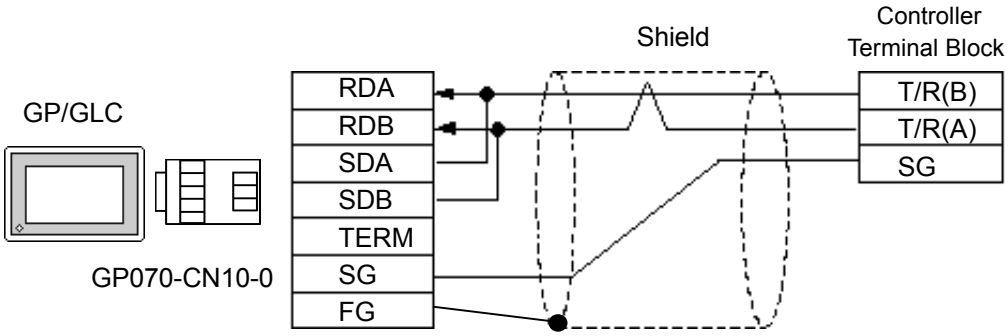


<When making your own cable>

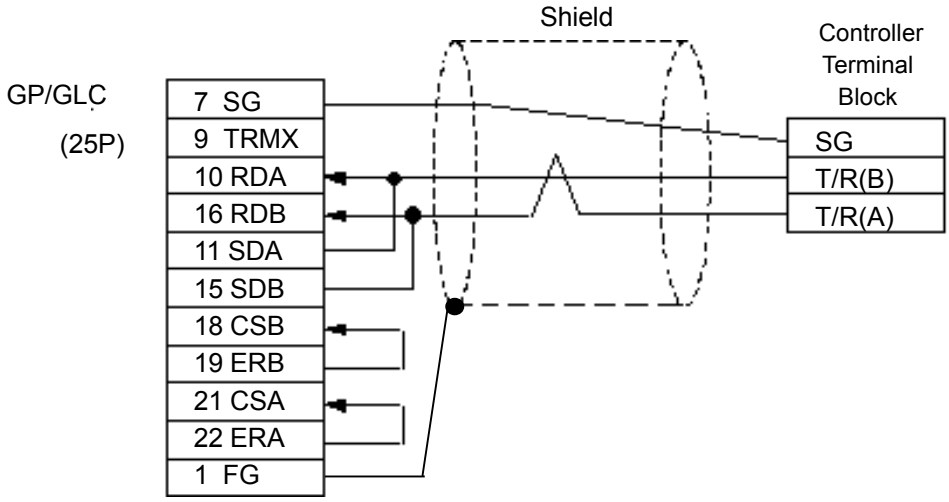


Cable Diagram 3 (1:1) RS-422 2 Wires

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

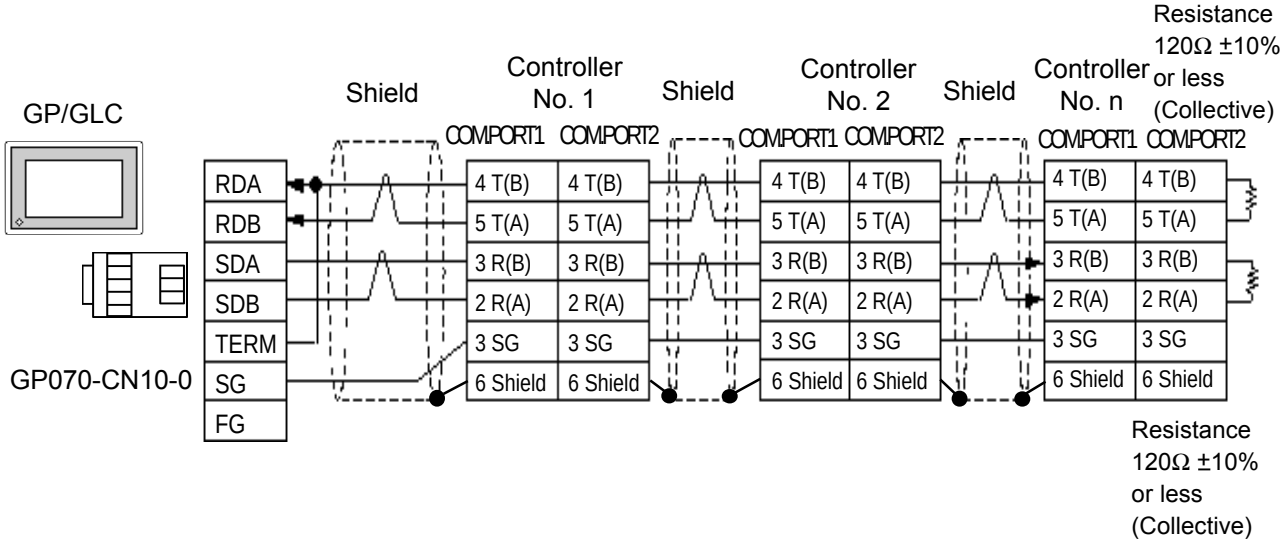


<When making your own cable>

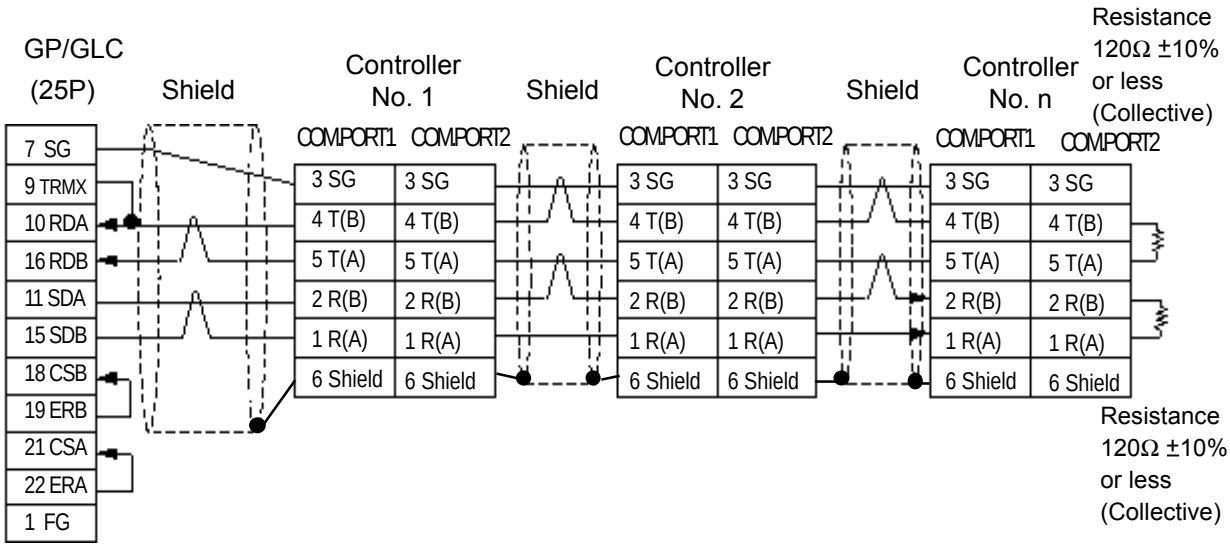


Cable Diagram 4 (1:n) RS-422 4 Wires

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

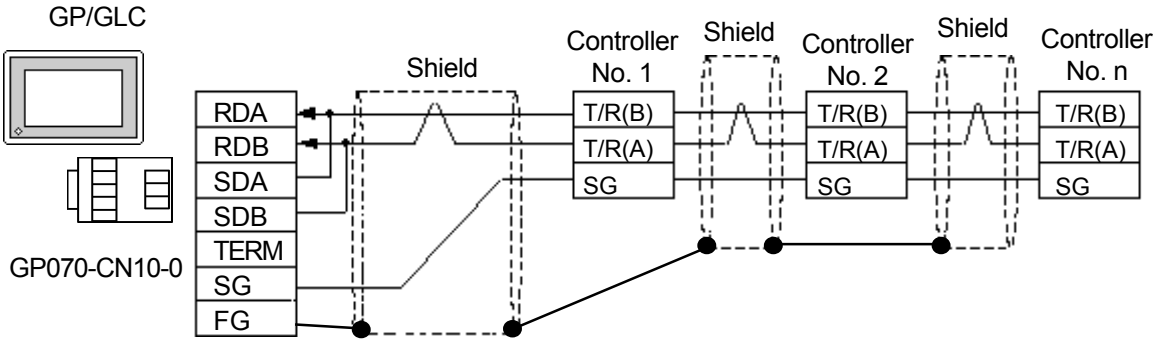


<When making your own cable>

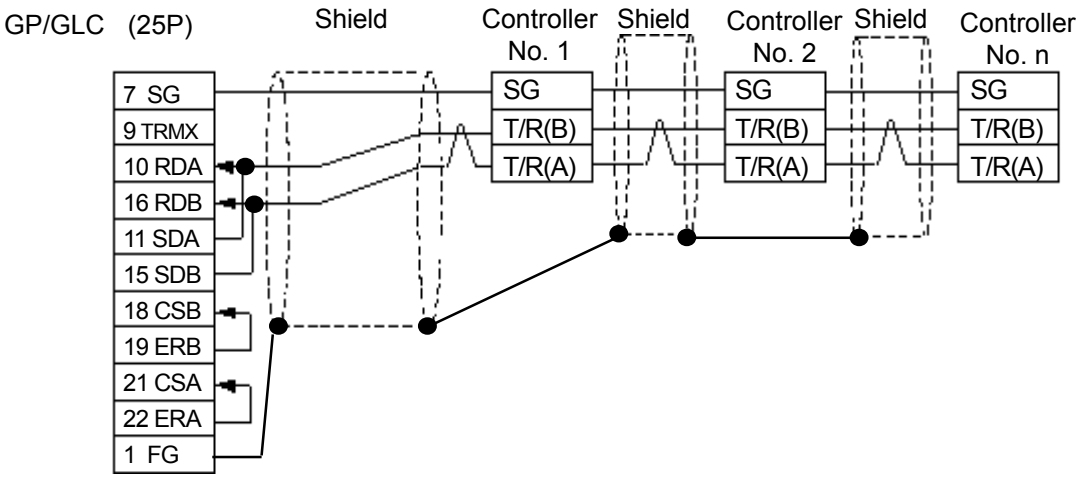


Cable Diagram 5 (1:n) RS-422 2 Wires

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When making your own cable>



12.4.3 Supported Devices

The following list shows the range of devices supported by the GP/GLC.

■ CB Series

Device	Bit Address	Word Address	Comments	
Data	00000 ~ 02EEF	0000 ~ 02EE		H/L

Important

- ***GP/GLC's System Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP's screen creation software or via the GP/GLC's OFFLINE screen, be careful that you do not use the Controller's own data area.

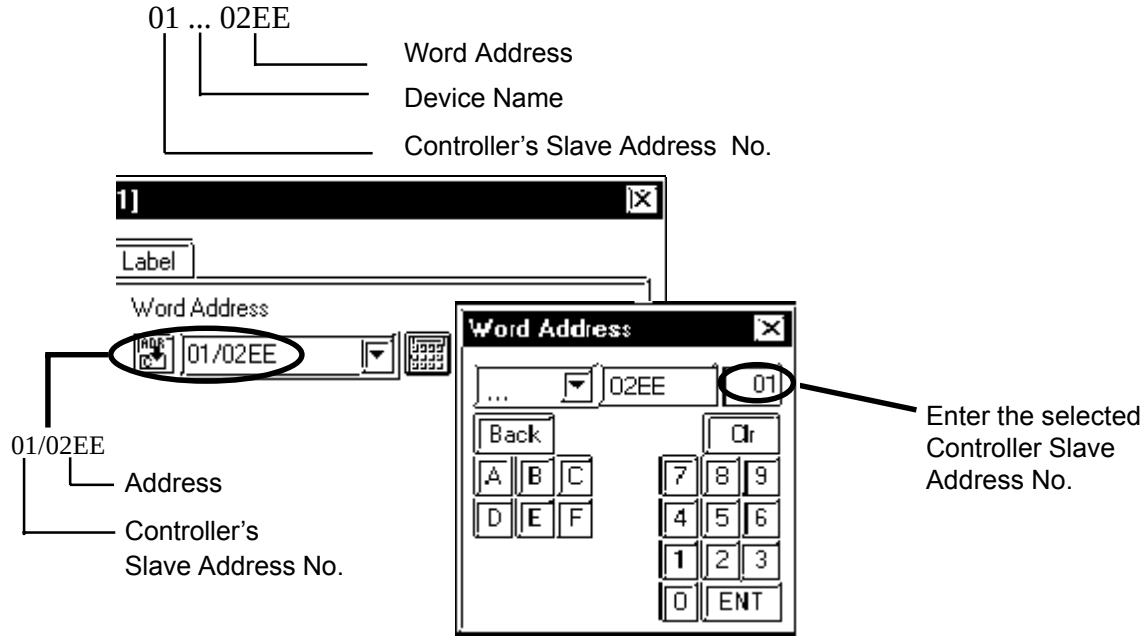
- ***The data communication feature will not operate when the slave address No. is set to "0". (The default value is 0.)***

Note:

- **When using tags in the screen editor software, the PLC Station number can be specified during address Input. If a station number is not indicated, the previously entered station number is automatically used. (The default value is 1.)**

E.g. When entering Device Address 02EE

Enter the Device Name "...", and the Word Address "02EE".



12.4.4 Environment Setup

The following table lists Digital's recommended RKC INSTRUMENT INC. Controller and GP communication settings.

GP Settings		Controller Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	None	Parity Bit	None
Data Flow control	ER	--------	--------
Communication Format using RS-232C *1	RS-232C	--------	--------
Communication Format using RS-422 (4-wire) *2	4-wire type	--------	--------
Communication Format using RS-422 (2-wire)	2-wire type	--------	--------
Unit No.	Select any unit number from 1 to 32.	Slave Address No.	Select any unit number from 1 to 32.

**1 RS-232C can be used when the H-PCP-A (Z-1021) is used.*

**2 Only the H-PCP-A (Z-1021) can use a 4 wire cable, and only CB series units can use a 2 wire cable.*

- ***The Controller's slave address number range is from 0 to 99 for the CB series units (the data communication feature does not operate when it is set to "0".) and from 1 to 16 for the SR-Mini series units. Use only from 1 to 32 on the GP/GLC.***
- ***With a 1:n connection, up to 31 CB series units, and up to 16 SR-Mini series units can be connected to a single GP.***


MEMO

12.5 Omron Corporation Controllers

12.5.1 System Structure

The following describes the system configuration used when connecting the GP/GLC to this Controller.

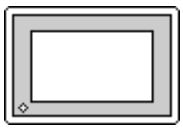
Important

- ***GP/GLC's System Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller area. Even though you can enter the system area settings via the GP/GLC's screen creation software or via the GP's OFFLINE screen, be careful that you do not actually use the Controller area.

■ THERMAC NEO Electronic Temperature Controller

(1:1 communication)

Electronic *1 Temperature Controller	Cable Diagram	GP/GLC
		
E5EN-□□□□□-FLK E5AN-□□□□□-FLK	RS-232C <Cable diagram 1>	(GP or GLC series)
E5EN-□□□□□-FLK E5CN-□□□□□-FLK E5GN-□□□□□-FLK E5AN-□□□□□-FLK	RS-422 (2-wire type) <Cable diagram 2>	

**1 The Controller's model number "□" will vary depending on each controller functionality specifications.*

■ THERMAC NEO Electronic Temperature Controller

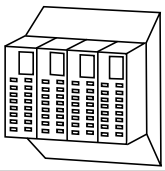
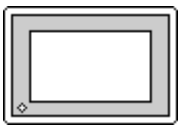
(1:n communication)

Electronic *1 Temperature Controller	Cable Diagram	GP/GLC
		
E5EN-□□□□□-FLK E5CN-□□□□□-FLK E5GN-□□□□□-FLK E5AN-□□□□□-FLK	RS-422 (2-wire type) <Cable diagram 3>	(GP or GLC series)

**1 The Controller's model number "□" will vary depending on each controller functionality specifications.*

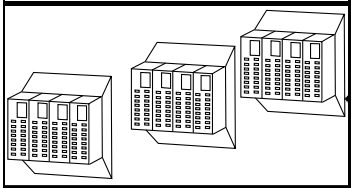
■ In-Panel NEO Temperature Controller

◆1:1 Connection

Temperature Controller *1	Cable Diagram	GP/GLC
		
E5ZN-□□□□□-FLK	RS-422 (2-wire type) <Cable diagram 2>	GP Series or GLC Series

**1 The Controller's model number "□" will vary depending on each controller functionality specifications.*

◆1:n Connection

Temperature Controller *1	Cable Diagram	GP/GLC
		
E5ZN-□□□□□-FLK	RS-422 (2-wire type) <Cable diagram 3>	GP Series or GLC Series

**1 The Controller's model number "□" will vary depending on each controller functionality specifications.*

12.5.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by Omron Corporation may differ, however, using these cables for your Controller's operations will not cause any problems.

Important

- ***For an RS-232C cable, use a cable length of less than 15 meters. Also, be sure to connect its SG (signal ground) terminal.***
- ***For an RS-422 cable, use a cable length less than 500 meters.***
- ***Digital recommends the following RS-422 cables.***

■ Recommended RS-422 Cable

No.	Model *1	Standard
1	E5EN-□□□□□-FLK, E5CN-□□□□□-FLK, E5AN-□□□□□-FLK	AWG28 or above
2	E5GN-□□□□□-FLK	AWG14 to AWG24

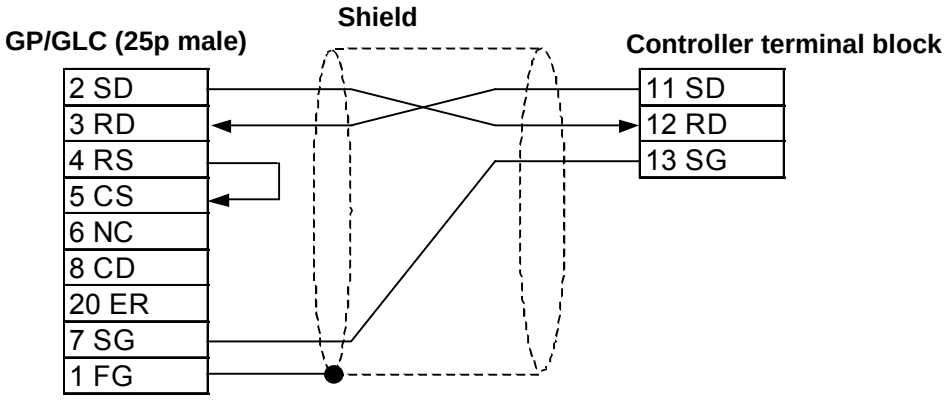
**1 The Controller's model number "□" will vary depending on each controller functionality specifications.*

■ Recommended RS-232C Cable

No.	Model *1	Standard
1	E5EN-□□□□□-FLK E5AN-□□□□□-FLK	Twisted pair wire with shield, AWG28 or above

**1 The Controller's model number "□" will vary depending on each controller functionality specifications.*

Cable Diagram 1 (1:1) RS-232C



Cable Diagram 2 (1:1) RS-422

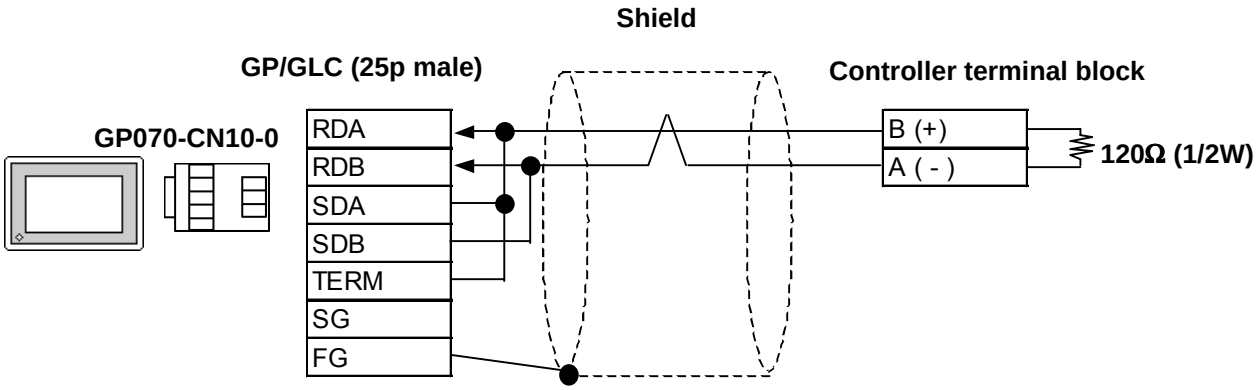
Important

- ***The Pin Nos. used with a RS-422 connection will vary depending on the type of controller used. Terminal numbers are not shown in the following RS-422 cable diagrams. Refer to the following tables and diagrams when making all wiring connections.***

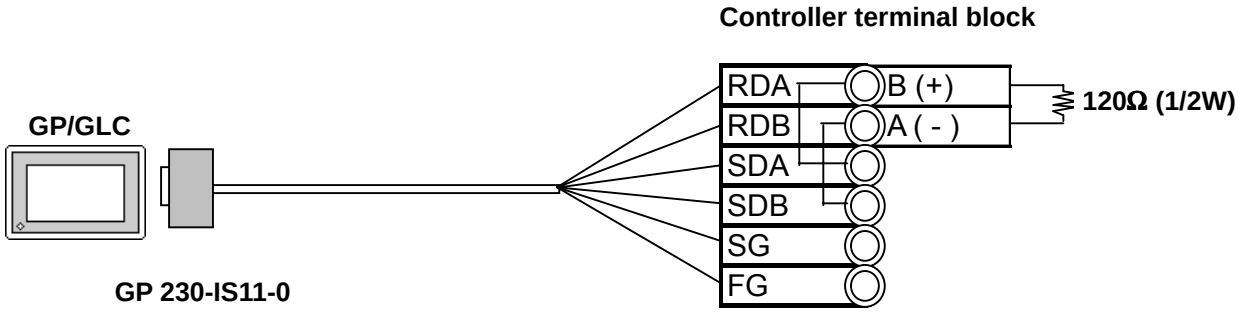
■ Pin No.

Abbreviation	E5EN/E5CN/E5AN	E5GN	E5ZN
A(-)	12	6	24
B(+)	11	5	23

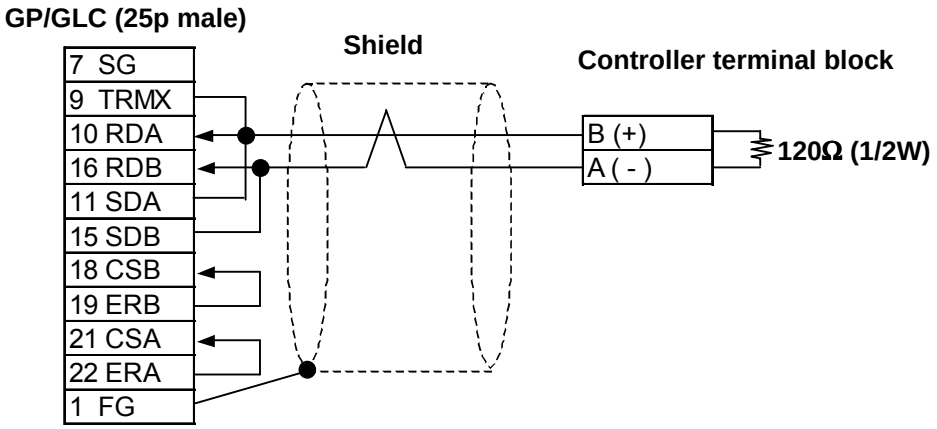
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When using Digital's RS-422 cable, GP230-IS11-0>



<When making your own cable>



Cable Diagram 3 (1:n) RS-422 2 Wires

Important

- ***The Pin Nos. used with a RS-422 connection will vary depending on the type of controller used. Terminal numbers are not shown in the following RS-422 cable diagrams. Refer to the following tables and diagrams when making all wiring connections.***

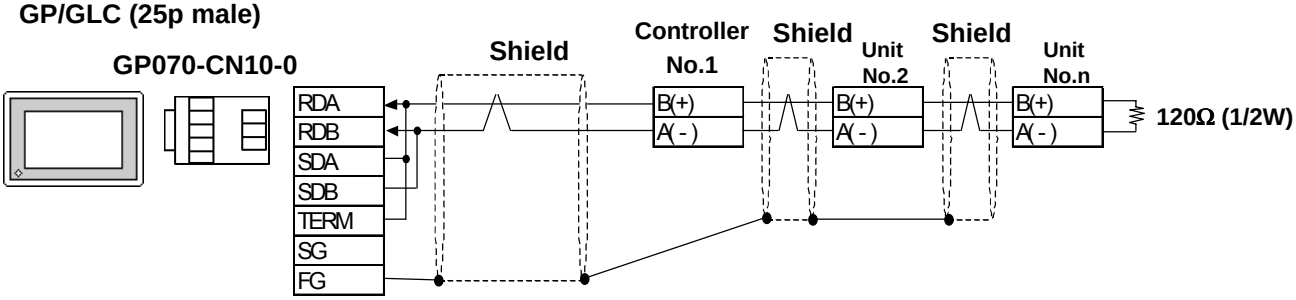
■ Pin No.

Abbreviation	E5EN/E5CN/E5AN	E5GN	E5ZN
A(-)	12	6	24
B(+)	11	5	23

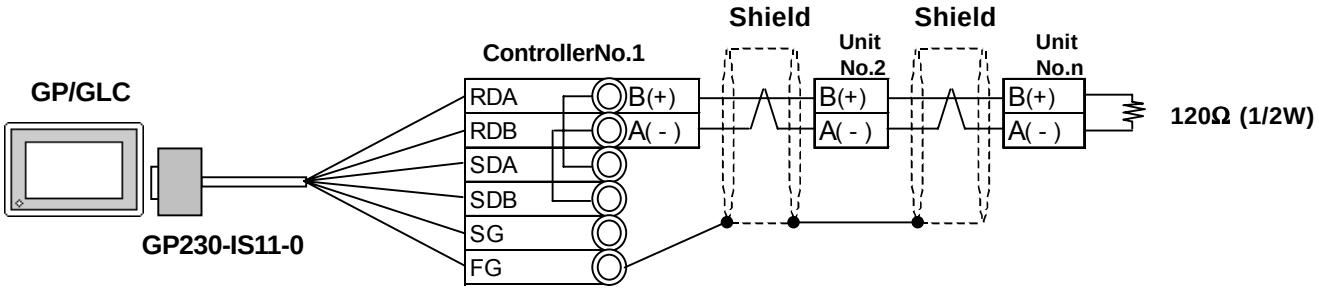
Note:

- **For the shield wire grounding, be sure to use dispersion grounding, parallel grounding or series grounding (shown below), depending on your electrical equipment conditions.**

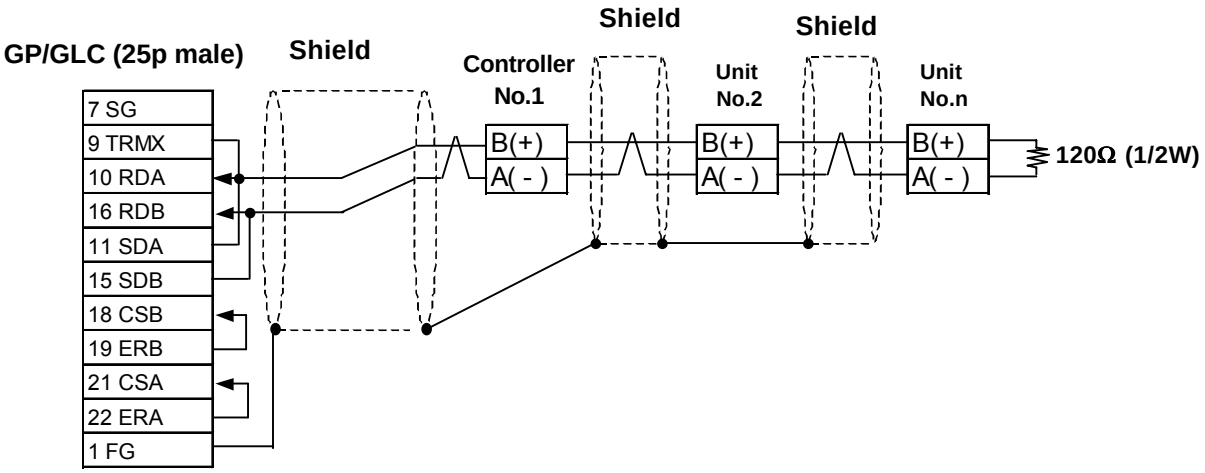
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>
(An example of series grounding)



<When using Digital's RS-422 cable, GP230-IS11-0>
(An example of series grounding)



<When making your own cable>
(An example of series grounding)



12.5.3 Supported Devices

The following list shows the range of devices supported by the GP/GLC.

■ THERMAC NEO Electronic Temperature Controller

Device	Bit Addresses	Word Addresses	Remarks	
Variable Areas	C0000000 to C0000531	C00000 to C00005	Double word device (write disabled) *1	H/L
	C1000000 to C1001C31	C10000 to C1001C	Double word device	
	C3000000 to C3003531	C30000 to C30035	Double word device	
Operation Commands	A000000 to A000815	A0000 to A0008	Word device	

**1 Data write is not possible.*

■ In-Panel NEO Temperature Controller

Device	Bit Addresses	Word Addresses	Remarks	
Variable Areas	C0000000 to C0000631 C0010000 to C0010631	C00000 to C00006 C00100 to C00106	Double word device *1	H/L
	C1000000 to C1001931 C1010000 to C1011931	C10000 to C10019 C10100 to C10119	Double word device	
	C3000000 to C3002E31 C3010000 to C3012E31	C30000 to C3002E C30100 to C3012E	Double word device *2	
Operation Commands	A000000 to A000B15	A0000 to A000B	Word device *3*4	

**1 No data can be written.*

2 Switch over to the setup area 1 when writing data. If not, the upper communication error (02:22:03:) message will appear on the GP screen.*

Reference *11.5.5. "Error Codes."*

**3 No data can be read out.*

**4 To execute the operation command (write), specify the command code at the device address. For the value to be written, specify related information. To specify related information, use a hexadecimal number, e.g., 0x00, 0x01, 0x10, or 0x11.*

Reference *Omron Corporation "User's Manual for Model E5ZN Temperature Controller - Communication"*

E.g.) When the command code is "00"

Command code	Description	Related information		GP Setup
"00"	Communication write	"00" or "10": OFF (write protected)	◄►	0x00 or 0x10
		"01" or "11": ON (write unprotected)		0x01 or 0x11

GP-PRO/PBIII for Windows' Simulation feature is not available with this protocol. To avoid a possible GP/GLC malfunction, do not use this feature.

- ***The system area (20 words) of GP/GLC cannot be used. Although it is possible to set addresses for this area with the GP screen editor software, or via the GP/GLC's OFFLINE mode, it is impossible to actually allocate the system area to the controller's data area.***
- ***Be careful as the Device fields differ depending on the type of Controller. Refer to the Controller's manual for the range allowed for the device address area.***

- ***After screen data is converted from a different type of Controller, be sure to check if the device addresses used are correct.***
- ***Be sure to check that the device addresses are supported before using. Trend graphs or tags in your screens which use multiple words over continuous addresses.***
- ***When using the GLC, Pro-Control Editor Ver. 2.0 or higher is required.***
- ***When using Pro-Server Ver. 2.0, be careful about the following points.***

  1) The Status Monitor feature cannot be used to monitor Tag scan time, communication cycle time, token circulation speed maximum/minimum values, and communication error codes.

  2) LS devices cannot be monitored or written to.

Note:

- **This protocol's LS area uses a 32-bit device.**
- **When setting Tags in the screen editor software, the Controller communication unit No. can be specified during address input. If a communication unit No. is not indicated, the previously entered communication unit No. is automatically used. (The default value is 1.)**

E.g. When entering Device Address C00000

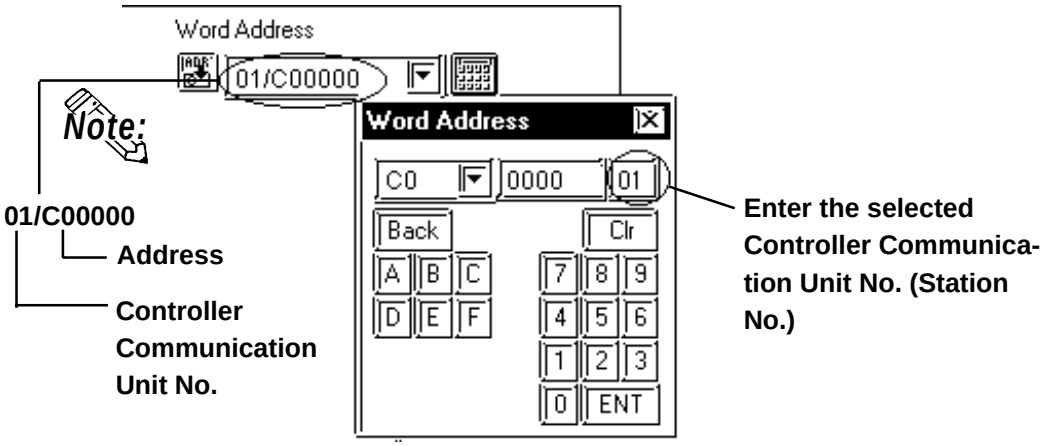
Enter the Device Name "C0", and the Word Address "0000".

01 C0 0000

Word Address

Device Name

Controller Communication Unit



Note:

- **After the Controller's power is turned ON, it may take a few seconds until the Controller starts. Therefore, if the GP/GLC and the Controller are turned ON at the same time, there may be a delay of several seconds until communication starts.**

■ Operation Commands

Command codes 00 to 08 are used for operation command service (command) to provide a total of 9 write commands.

Certain command operations are identical, and the result (arbitrary value) is written to a variable area.

Device code	Word address	Command code	Meaning
A	0000	00	Data Transfer Write
	0001	01	RUN / STOP
	0002	02	Multi-SP
	0003	03	AT RUN / STOP
	0004	04	Write mode
	0005	05	Store RAM data
	0006	06	Software reset
	0007	07	Setting area shift 1
	0008	08	Protection level shift

Note:

- **When a write command is performed, the device code used in the screen creation software is 'A', and that command code is entered instead of the device address.**

  Related data (2 bytes) is designated by each write tag's setting value. Since this device is a write-only device, readout is disabled. If used for readout, i.e. an N-tag, a host communication error (02:F0:) (** is set tag unit No.) will appear in the lower left corner of the GP/GLC screen.**

- **Device "C0, C1, C3"**
  C0, C1 and C3 devices are not used as device symbols. Instead they identify a variable area's data type.

Reference User Manual (SGTD-706) for OMRON's E5AN/E5EN/ E5CN/E5GN Electronic Temperature Controller

12.5.4 Environment Setup

The following table lists the recommended Controller and GP/GLC communication settings.

■ THERMAC NEO Controller

GP/GLC Settings		Controller Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow control	ER	--------	--------
Communication Format (using RS-232C) *1	RS-232C	--------	--------
Communication Format (using RS-422 - 4-line)	4 wire type	--------	--------
Communication Format (using RS-422 - 2-line)	2 wire type	--------	--------
Unit No. *2	1 to 32	Unit No.	1 to 32

**1 The E5EN and the E5AN use an RS-232C connection.*

**2 It is possible to set a Controller communication unit No.from 0 to 99, however, the GP/GLC can only be set from 1 to 32.*

With a 1:n connection, up to 31 controllers can be connected to a single GP.

■ In-Panel NEO Temperature Controller

GP or GLC Setup		Temperature Controller Setup	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow control	ER Control	--------	--------
Communication Format	RS-422 (2-Wire Type)	--------	--------
Unit No. *1	1 to 15	Communication Unit No.	1 to 15

**1 Even though the communication unit number may be specified in a range between 0 and F on the temperature controller, only a range between 1 and F can be used on the GP/GLC unit. To load data to the GP unit, match the GP unit number with the converted decimal number of the controller address where the data to be loaded is stored.*
In case of 1:n, a maximum of 15 temperature controllers may be connected.

12.5.5 Error Codes

■ GP/GLC Error Codes

Error codes are indicated in the left lower corner of the GP/GLC screen.

Error codes consist of three types. When an error occurs, the corresponding error code and GP station number (where the error occurred) are saved either in LS2039 or LS2070. Since the method used will vary depending on the error type, refer to the following list for details. (Data saved in LS2039 or LS2070 is shown using hexa-decimal characters.)

1. Error Code (02:12) – 2 units
   - Error Code 0x12
   - Data saved in LS2039 0x12 (error code)
   - Data saved in LS2070 0 (fixed as “0”)
2. Error Code (02:12:34) – 3 units
   - Error Code 0x12. The GP station number where the error occurred is 34(0x22)
   - Data saved in LS2039 0x1222 (The two digits shown here by “12” represent the error code, and the last two digits “22” represent the station no. Note that “0x” is not shown on the display.)
   - Data saved in LS2070 0 (fixed as “0”)
3. Error Code (02:12:34:56) – 4 units
   - Error Code 0x1234. TheGP unit number where the error occurred is 56(0x38)
   - Data saved in LS2039 0x1234 (error code)
   - Data saved in LS2070 0x38 (station no.)

<Temperature Controller Error Codes>

Any error code specific to the temperature controller is displayed at the lower left part of the GP screen, e.g. “Host Communication Error (02:❍❍:△△:□□).”

❍❍: △△stands for the error code specific to the temperature controller, and □□ indicates the temperature controller number.

Error Code	Error Name	Cause
11:03	Starting Address Error	An address outside the range was specified at drawing
11:04	Ending Address Error	The range of writing consecutive addresses with the K-tag or the like exceeds the setting range of the controller.
11:00	Parameter Error	The data written from the GP exceeds the setting range of the controller.
30:03	Read Only	An attempt was made to write data to “C0 Device” in the write protected range.
22:03	Operation Error	• An attempt was made to write data when writes were disabled on the controller. • The temperature controller malfunctions.

12.6 Shinko Technos Corporation Controllers

12.6.1 System Structure

The following describes the system configuration used when connecting the GP/GLC to this Controller.

- ***Do not use the system area because the GP/GLC's system area (LS0 to LS19) cannot be allocated to the Controller area. (Deselect all system area selection items.)***
- ***The Controller's read area can be used as normal.***

■ C Series

CPU	Control Unit*1	Cable Diagram	Cables	GP
CPT-20A	CCT-235-2-□□	RS-422 <Cable Diagram 4>	CPM Shinko Technos Corporation	GP series GLC series
		RS-422 (1:n) <Cable Diagram 5>	CPM and CPP Shinko Technos Corporation	

**1 The Controller's model number "□□" changes, according to the options selected . For details about model numbers, refer to the C Series catalog.*

■ FC Series

Controller *1	Link I/F	Cable Diagram	GP
FCD-13A□□,C FCD-15A□□,C FCR-13A□□,C FCR-15A□□,C	Serial Communication Option:C	RS-232C <Cable Diagram 1>	GP Series GLC Series
FCD-13A□□,C5 FCD-15A□□,C5 FCR-13A□□,C5 FCR-15A□□,C5	Serial Communication Option:C5	RS-422 <Cable Diagram 2>	
		RS-422 (1:n) <Cable Diagram 3>	

**1 The Controller's model number "□□" changes, according to the options selected .*
Items with the serial communication option have a ",C" or ",C5" after the basic model number.
For details about model numbers, refer to each series catalog.

■ FIR Series

Controller *1	Link I/F	Cable Diagram	GP
FIR-201-M□□,C FIR-201-M□□,C	Serial Communication Option:C	RS-232C <Cable Diagram 1>	GP Series GLC Series
FIR-201-M□□,C5 FIR-201-M□□,C5	Serial Communication Option:C5	RS-422 <Cable Diagram 2>	
		RS-422 (1:n) <Cable Diagram 3>	

■ GC Series

Controller *1	Link I/F	Cable Diagram	GP
GCS-300□□,C5	Serial Communication Option:C5	RS-422 <Cable Diagram 2>	GP Series GLC Series
		RS-422 (1:n Communication) <Cable Diagram 3>	

■ FCL Series

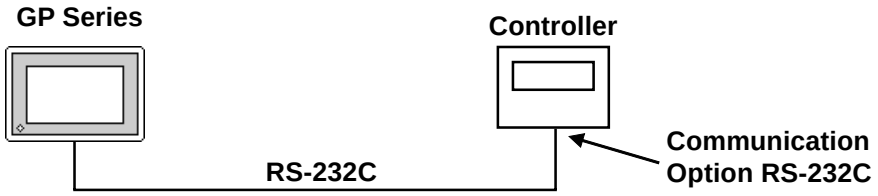
Controller *1	Link I/F	Cable Diagram	GP
FCL-13A□□,C5	Serial Communication Option:C5	RS-422 <Cable Diagram 2>	GP Series GLC Series
		RS-422 (1:n Communication) <Cable Diagram 3>	

■ PC-900 Series

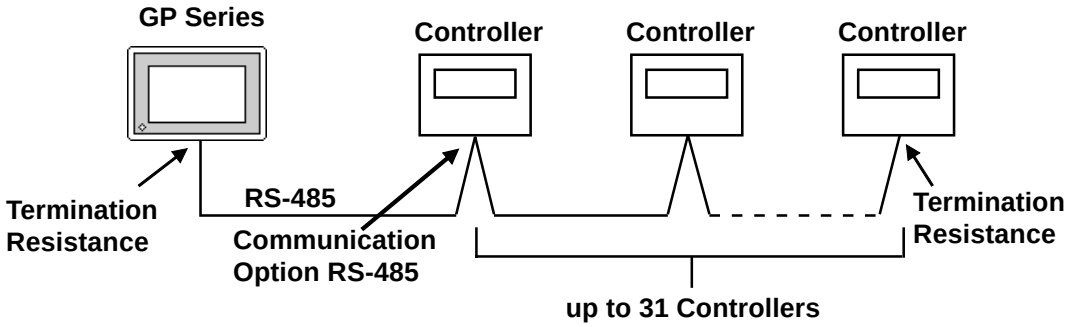
Controller *1	Link I/F	Cable Diagram	GP
PC-935□□,C PC-955□□,C	Serial Communication Option:C	RS-232C <Cable Diagram 1>	GP Series GLC Series
PC-935□□,C5 PC-955□□,C5	Serial Communication Option:C5	RS-422 <Cable Diagram 2>	
		RS-422 (1:n Communication) <Cable Diagram 3>	

**1 The Controller's model number "□□ " changes, according to the options selected .*
Items with the serial communication option have a ",C" or ",C5" after the basic model number.
For details about model numbers, refer to each series catalog.

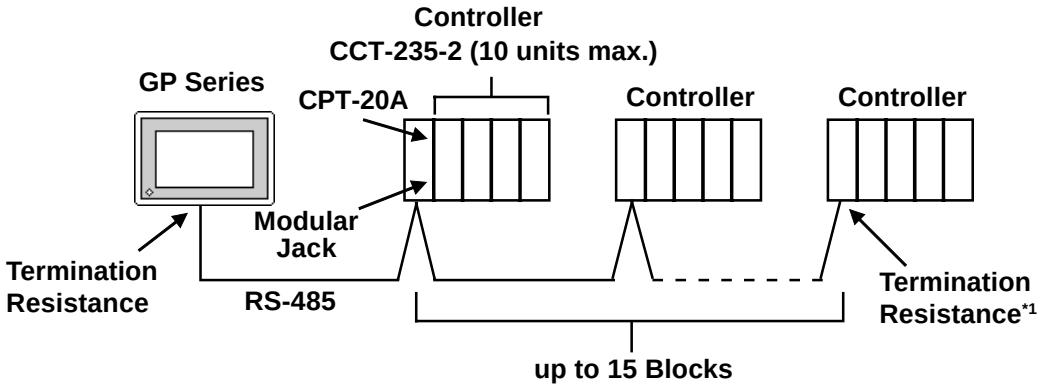
◆When connecting an RS-232C cable (for RS232C compatible Controllers)



◆RS-485 cable (except the C Series Controller)



◆RS-485 cable (connecting with the C Series Controller)



**1 Turn Controller's termination resistance switch ON.*

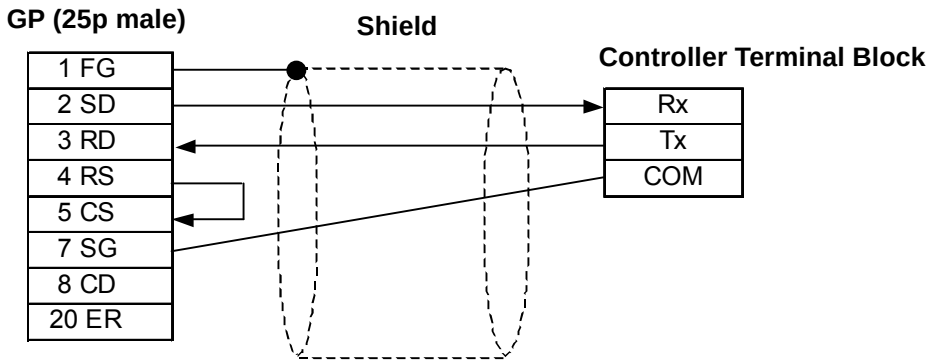
12.6.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by Shinko Technos Corporation may differ, however, using these cables for your Controller's operations will not cause any problems.

Important

- ***Ground your PLC's FG terminal according to your country's applicable standard.***
- ***Since some Controllers do not have a GND signal (FG), be careful when selecting the side (GP or Indicating Controller) used for connecting the FG wire to the shield.***
- ***When connecting the FG wire to the cable connector's cover, be sure it is made from a conductive material.***
- ***For an RS-232C cable, use a cable length of 15 meters or less.***
- ***For an RS-422 cable, use a cable length of 600 meters or less.***
- ***Digital recommends the OTSC-2PVB-7/0.32TA cable, made by O-NAMBA Corporation.***

Cable Diagram 1

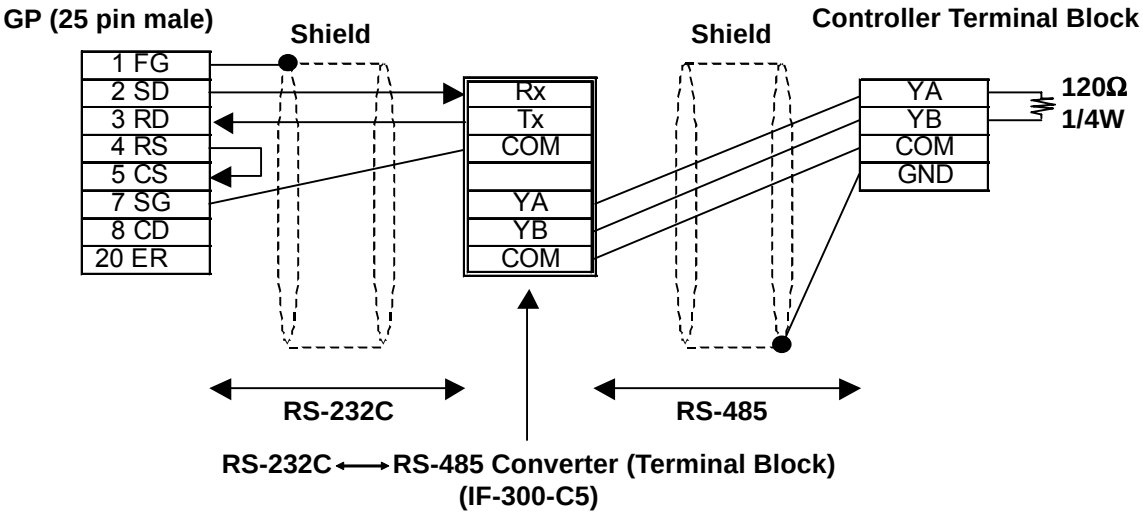


Cable Diagram 2

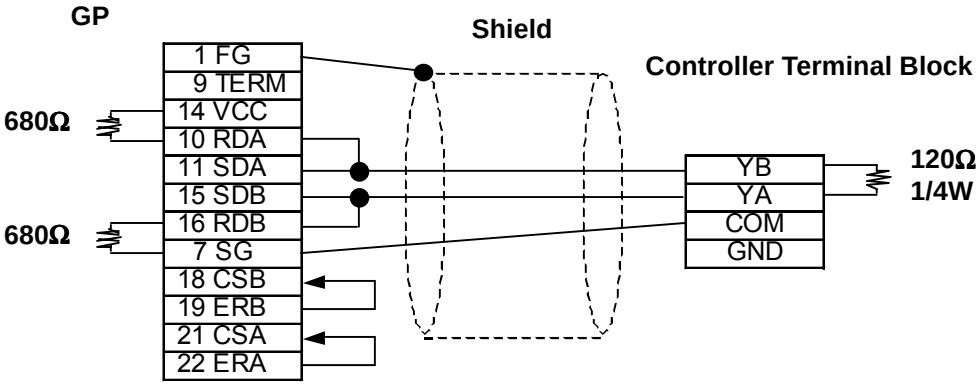
There are two ways of connecting the GP and the Controller. One is using the Shinko Technos' RS-232C ⟷ RS-485 Converter (IF-300-C5). The other is using an RS-485 cable.

<When using Shinko Technos's RS-232C⟷ RS-485 Converter (IF-300-CS)>

When using this converter, be sure the GP's communication setting is "RS-232C".
Do not use any other manufacturer's converter.



<When connecting the GP and the Controller with RS-485 cable>

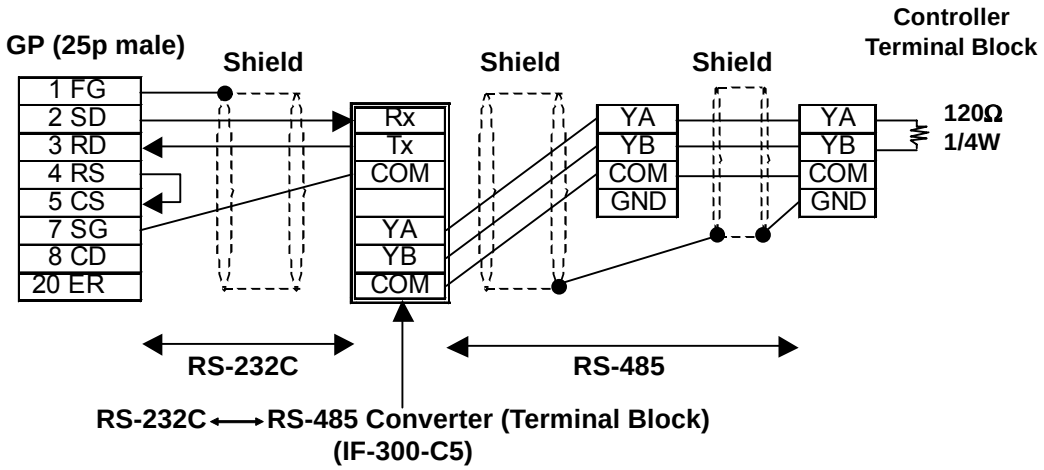


Cable Diagram 3

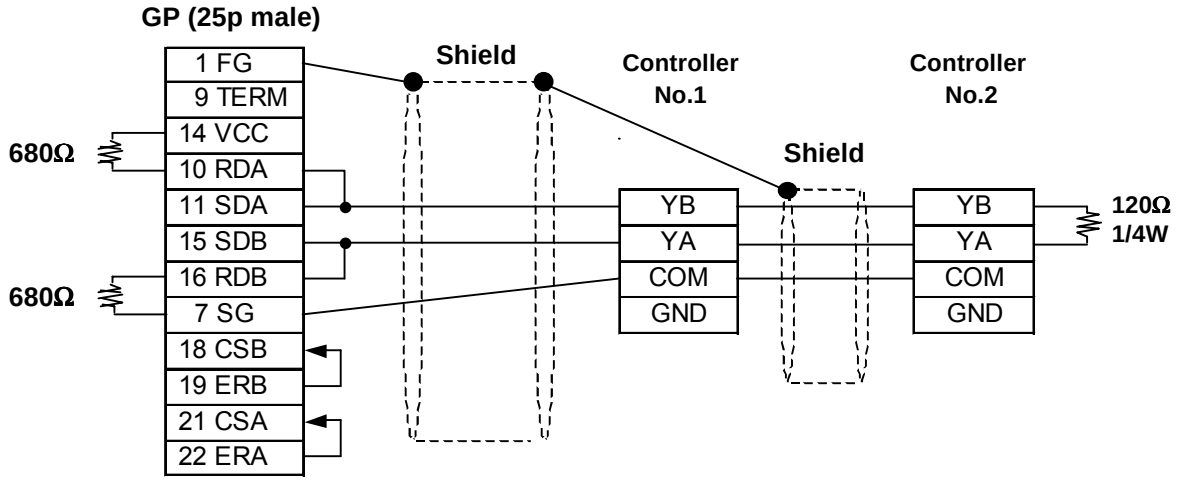
There are two ways of connecting the GP and the Controller. One is using the Shinko Technos' RS-232C ⟷ RS-485 Converter (IF-300-C5). The other is using an RS-485 cable.

<When using Shinko Technos's RS-232C⟷ RS-485 Converter (IF-300-C5)>

When using this converter, be sure the GP's communication setting is "RS-232C".
Do not use any other manufacturer's converter.

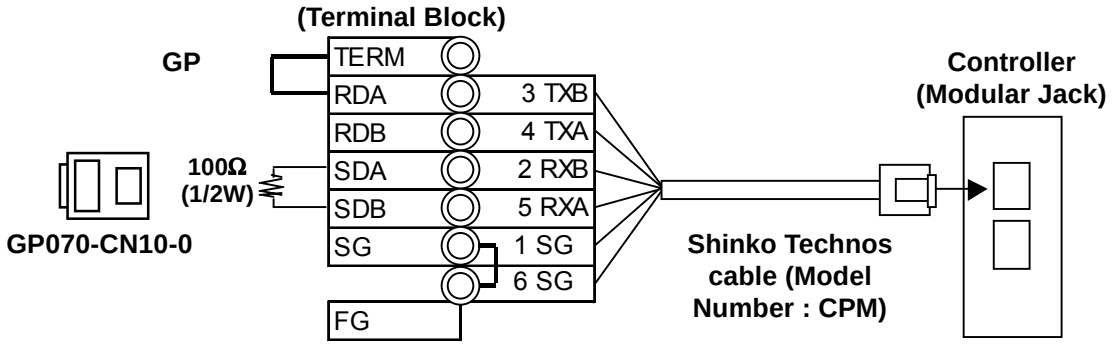


<When connecting the GP and the Controller via RS-485 cable>



Cable Diagram 4 (RS-422)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

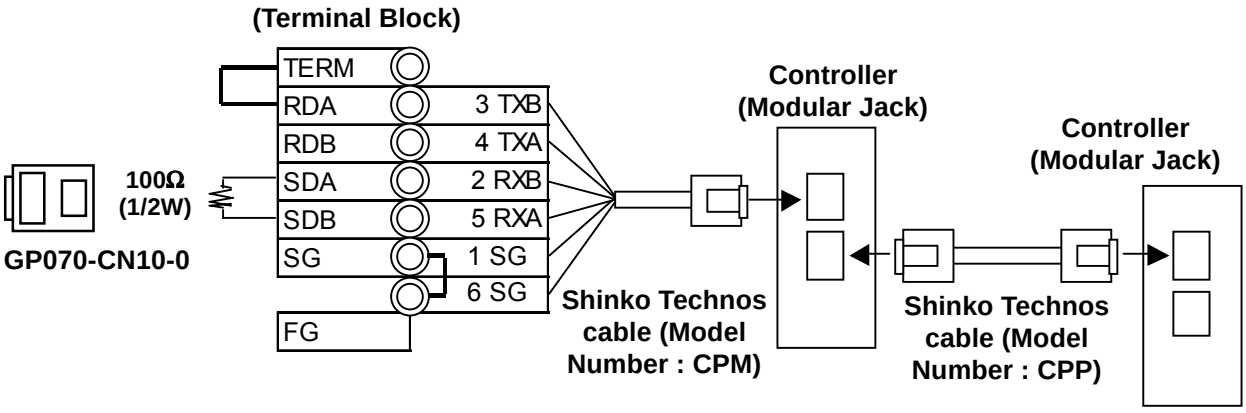


Note:

- **Be sure to use only the Shinko Technos Corporation "CPM" cable.**

Cable Diagram 5 (RS-422)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



Note:

Be sure to use only the Shinko Technos Corporation "CPM" and "CPP" cables.

Be aware the A and B signals of the GP and PLC are reversed.

To enable the Controller's termination resistance, turn dip switch No.2 ON.

12.6.3 Supported Devices

The following list shows the range of devices supported by the GP/GLC.

■ C Series

Device	Bit Addresses*1	Word Addresses*1	
Channel 1	1CH010 ~ 1CH84F	1CH01 ~ 1CH84	H/L
Channel 2	2CH010 ~ 2CH84F	2CH01 ~ 2CH84	
Channel 3	3CH010 ~ 3CH84F	3CH01 ~ 3CH84	
Channel 4	4CH010 ~ 4CH84F	4CH01 ~ 4CH84	
Channel 5	5CH010 ~ 5CH84F	5CH01 ~ 5CH84	
Channel 6	6CH010 ~ 6CH84F	6CH01 ~ 6CH84	
Channel 7	7CH010 ~ 7CH84F	7CH01 ~ 7CH84	
Channel 8	8CH010 ~ 8CH84F	8CH01 ~ 8CH84	
Channel 9	9CH010 ~ 9CH84F	9CH01 ~ 9CH84	
Channel 10	10CH010 ~ 10CH84F	10CH01 ~ 10CH84	
Channel 11	11CH010 ~ 11CH84F	11CH01 ~ 11CH84	
Channel 12	12CH010 ~ 12CH84F	12CH01 ~ 12CH84	
Channel 13	13CH010 ~ 13CH84F	13CH01 ~ 13CH84	
Channel 14	14CH010 ~ 14CH84F	14CH01 ~ 14CH84	
Channel 15	15CH010 ~ 15CH84F	15CH01 ~ 15CH84	
Channel 16	16CH010 ~ 16CH84F	16CH01 ~ 16CH84	
Channel 17	17CH010 ~ 17CH84F	17CH01 ~ 17CH84	
Channel 18	18CH010 ~ 18CH84F	18CH01 ~ 18CH84	
Channel 19	19CH010 ~ 19CH84F	19CH01 ~ 19CH84	
Channel 20	20CH010 ~ 20CH84F	20CH01 ~ 20CH84	

**1 Input all addresses in hexadecimal characters.*

Note: **The GP processes all Controller data items in the same way.**

Designating an address means that the data item number specifies the address.

For information about data item types and numbers, refer to the Multi Point Temperature Control Unit C Series Guide "Communication Command List", made by Shinko Technos Corporation.

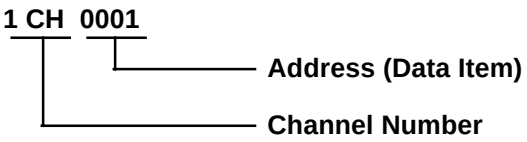
The following data item list is mentioned in the C Series communication guide for each channel. The C Series supports up to 20 channels.

Command Type	Data Item	Data
20H/50H	0001H : Main setting value (SV) setting	Setting Value
20H/50H	0002H : Main proportional band setting	Setting Value
20H/50H	0003H : Integral time setting	Setting Value
20H/50H	0004H : Derivative time setting	Setting Value
.	:	:

The item Nos. here are the GP addresses.

20H:Read command can be performed.
50H:Write command can be performed.

- When the channel 1 data item is “the setting of main setting value (SV)”, the item No. is “0001H”, and the GP’s address is the following:



- The channel 1 data item “the integrated time setting”, has an item number of “0003H”, and the GP address is “1CH0003”.
- The channel 2 data item “the integrated time setting” has an item number of “0003H”, and the GP address is “2CH0003”.
- When the command type is 20H, data read can be performed. When it is 50H, data write can be performed.

  (20H/50H are used to perform read and write.)

■ FC Series

Device	Bit Addresses*1	Word Addresses*1	
Data Item	00010 ~ 0086F	0001 ~ 0086	H/L
Setting Value Memory 1	1S010 ~ 1S86F	1S01 ~ 1S86	
Setting Value Memory 2	2S010 ~ 2S86F	2S01 ~ 2S86	
Setting Value Memory 3	3S010 ~ 3S86F	3S01 ~ 3S86	
Setting Value Memory 4	4S010 ~ 4S86F	4S01 ~ 4S86	
Setting Value Memory 5	5S010 ~ 5S86F	5S01 ~ 5S86	
Setting Value Memory 6	6S010 ~ 6S86F	6S01 ~ 6S86	
Setting Value Memory 7	7S010 ~ 7S86F	7S01 ~ 7S86	

**1 Input all addresses in hexadecimal characters.*

Note:

- **The GP processes all Controller data items in the same way.**
- **Designating an address means that the data item number specifies the address.**
- **For information about data item types and numbers, refer to the FC Series Communication (Option : C,C5) Guide "Communication Command List", made by Shinko Technos Corporation.**

The following data item list is mentioned in the FC Series communication guide for each channel. When the command type is 20H, data read can be performed. When it is 50H, data write can be performed.

(20H/50H are used to perform read and write.)

Contents	Sub Addresses	Command Classification	Data Items
Main setting value or step temperature setting value	1 to 7	20H/50H	0001H
Setting value memory number or step number selection	0	20H/50H	0002H
PID auto-tuning Performance / Cancellation	0	20H/50H	0003H
Proportional band setting	1 to 7	20H/50H	0004H
:	:	:	:

Sub Addresses (Setting Memory No.)

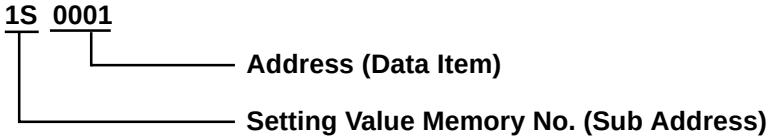
The item No. here is the GP addresses

When using the FC Series, the sub addresses must be selected. Here, "sub addresses" mean "the setting value memory No.". For example, "sub address 1" means "setting value memory No.1". The data items, that the sub addresses are needed to be set, therefore, are needed to be specified the device of "setting value memory *".

Data items with the sub addresses that do not need to be set (when the sub address is 0), can specify only the number of data items.

E.g. Data items with the sub addresses that do not need to be set.

When setting value memory No.1, GP address data items (the main setting value, "step temperature setting value") are as follows:



E.g. Data items with the sub addresses that do not need to be set.

GP address data items (the setting value memory number selection, "step numbers") are as follows:

■ FIR/GC/FCL Series

Device	Bit Addresses*1	Word Addresses*1	
Data Item	00010 ~ 00A3F	0001 ~ 00A3	H/L

**1 Input all addresses in hexadecimal characters.*

Note:

- **The GP processes all Controller data items in the same way.**
- **Designating an address means that the data item number specifies the address.**
- **For information about data item types and numbers, refer to the FIR-201-M Communication Guide "Communication Command List", GCS-300 Communication Guide "Communication Command List", and "FCL-13A Communication Guide "Communication Command List", made by Shinko Technos Corporation.**

The following data item list is mentioned in the FIR Series communication guide for each channel. When the command type is 20H, data read can be performed. When it is 50H, data write can be performed.

(20H/50H allow read and write to be performed.)

Command Type	Data Item	Data
20H/50H	0001H : Alarm 1 (A1) Setting	Setting Value
20H/50H	0002H : Alarm 2 (A2) Setting	Setting Value
20H/50H	0003H : Alarm 3 (A3) Setting	Setting Value
20H/50H	0004H : Setting Value Lock Designation	Setting Value
:	:	:

The item Nos. here are the GP addresses.

20H:Read command can be performed.
50H:Write command can be performed.

- For the data item "Alarm 1 (A1) Setting", the item number is 0001H. As a result, the GP address is as follows:

- For the data item "Alarm 2 (A2) Setting", the item number is 0002H. As a result, the GP address is "0002".

■ PC-900 Series

Device	Bit Addresses	Word Addresses	Remarks	
Data Items	00010 ~ 0400F	0001 ~ 0400	*2	H/L
	04010 ~ 0800F	0401 ~ 0800		
	08010 ~ 0C00F	0801 ~ 0C00		
	0C010 ~ 1000F	0C01 ~ 1000		
	10010 ~ 1400F	1001 ~ 1400		
	14010 ~ 1800F	1401 ~ 1800		
	18010 ~ 1C00F	1801 ~ 1C00		
	1C010 ~ 2000C	1C01 ~ 2000		
	20010 ~ 2400F	2001 ~ 2400		
	24010 ~ 2800F	2401 ~ 2800		
	28010 ~ 2C00F	2801 ~ 2C00		
	2C010 ~ 3000F	2C01 ~ 3000		
	30010 ~ 3400F	3001 ~ 3400		
	34010 ~ 3800F	3401 ~ 3800		
	38010 ~ 3C00F	3801 ~ 3C00		
	3C010 ~ 4000F	3C01 ~ 4000		
	40010 ~ 4400F	4001 ~ 4400		
	44010 ~ 4800F	4401 ~ 4800		
	48010 ~ 4C00F	4801 ~ 4C00		
	4C010 ~ 5000F	4C01 ~ 5000		
	50010 ~ 5400F	5001 ~ 5400		
	54010 ~ 5800F	5401 ~ 5800		
	58010 ~ 5C00F	5801 ~ 5C00		
	5C010 ~ 6000C	5C01 ~ 6000		
	60010 ~ 6400F	6001 ~ 6400		
	64010 ~ 6800F	6401 ~ 6800		
	68010 ~ 6C00F	6801 ~ 6C00		
	6C010 ~ 7000C	6C01 ~ 7000		
	70010 ~ 7400F	7001 ~ 7400		
	74010 ~ 7800F	7401 ~ 7800		
	78010 ~ 7C00F	7801 ~ 7C00		
	7C010 ~ 7991F	7C01 ~ 7991		

**1 Input all addresses in hexadecimal characters.*

**2 The data items are internally processed, with each "block" being divided into 1024 words (0x400). Therefore, be aware of that the following functions cannot be used with settings that cross a block (1024 words). Be sure to set the data items within one block when using this series unit.*

1) "a" tag setting
(alarms will not displayed)

2) Block Read - using the 2-way function
(Only the maximam number of addresses in the selected block will be displayed.)

Note:

- **The GP processes all Controller data items in the same way.**
- **Designating an address means that the data item number specifies the address.**
- **For information about data item types and numbers, refer to the PC-935, PC-955 communication (option : C, C5, SVTC) guide "Communication Command List", made by Shinko Technos Corporation.**

The following data item list is mentioned in the PC-900 Series communication guide for each channel. When the command type is 20H, data read can be performed. When it is 50H, data write can be performed.

(20H/50H are used to perform read and write.)

Command Classification	Data Item	Data
20H/50H	0001H : Fixed value control / Main setting value setting	Setting Value
20H/50H	0002H : Fixed value control / Control output (OUT1) proportional band setting	Setting Value
20H/50H	0003H : Fixed value control / Integral time setting	Setting Value
20H/50H	0004H : Fixed value control / Derivative time setting	Setting Value
:	:	:

The item Nos. here are the GP addresses.

20H:Read command can be performed.
50H:Write command can be performed.

For data item "The setting of the main setting value (SV) for the stationary position control", the item number is 0001H. As a result, the GP address is as follows.

0002

Address (Data Item)

For data item "The setting of the integrated time for the stationary position control", the item number is 0003H. As a result, the GP address is "0003".

For data item details, refer to the following Shinko Technos Corporation communication guides.

Series	Models	Guides
C	CPT-20A	Multi-Point Temperature Control Unit C Series Guide
FC	FCD-130	FC Series Communication (Option:C,C5) Guide
	FCD-150	
	FCR-130	
	FCR-150	
	FCS-200	
FIR	FIR-200	FIR Communication Guide
GC	GCS-300	GCS Communication Guide
FCL	FCL-100	FCL Communication Guide
PC-900	PC-935	PC-935, PC-955 Communication (Option:C,C5,SVTC) Guide
	PC-955	

Note:

- **When the data item's setting value uses a decimal point items, the GP displays a value 10 times larger than the setting value. Also, when writing, be sure to write a value 10 times larger than the setting value.**

E.g. In case of the PC-900 Series' control output (OUT1) proportional zone

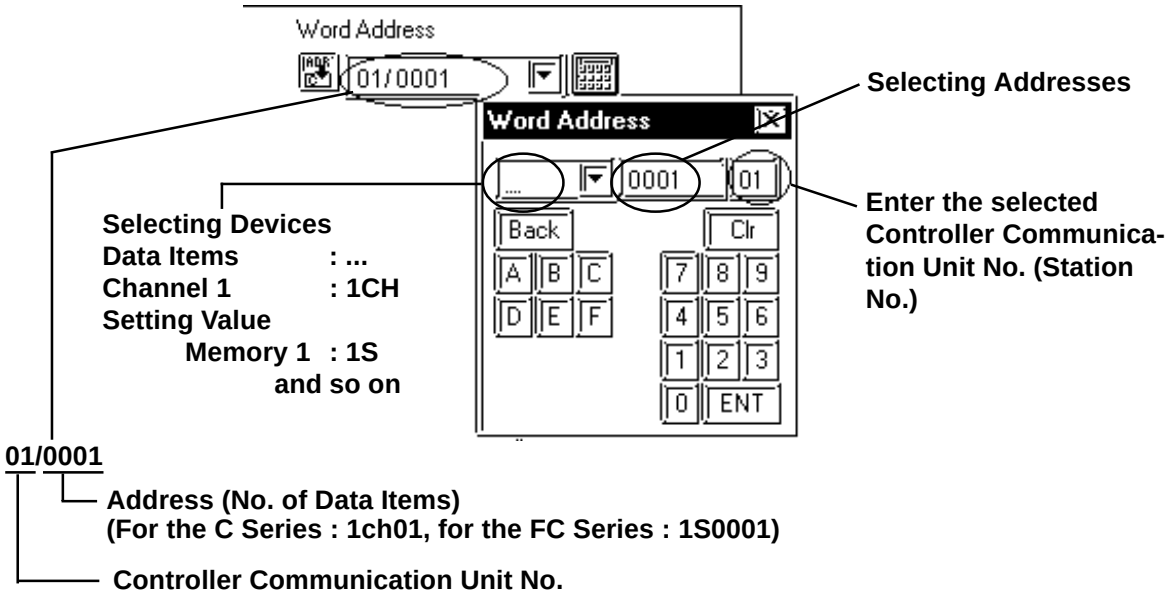
Indication of Controllers / Setting Value : 2.5%

Indication of the GP : 25

Also, refer to each model's communication guide for details (with/without a decimal point) about data item setting value ranges.

Note:

- **When setting Tags in the screen editor software, the Controller communication unit No. can be specified during address input. If a communication unit No. is not indicated, the previously entered communication unit No. is automatically used. (The default value is 1.)**



Important

- ***GP/GLC's System Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP's screen editor software or via the GP/GLC's OFFLINE screen, it is impossible to actually allocate the system area to the Controller's data area.

12.6.4 Environment Setup

The following table lists the recommended Controller and GP/GLC communication settings.

■ C Series

GP/GLC Settings		Controller Settings	
Baud Rate	9600 bps	**Baud Rate**	9600 bps
Data Length	7 bits	--------	--------
Stop Bit	1 bit	--------	--------
Parity Bit	Even	--------	--------
Data Flow control	ER	--------	--------
Communication Format	4 Wires	--------	--------
Unit No.	1	**Unit No.**[*1]	1

**1 It is possible to set a Controller communication unit No.from 0 to 15, however, the GP/GLC can only be set from 1 to 15.*

■ FC/FIR/GC/FCL/PC-900 Series

GP/GLC Settings		Controller Settings	
Baud Rate	9600 bps	**Baud Rate**	9600 bps
Data Length	7 bits	--------	--------
Stop Bit	1 bit	--------	--------
Parity Bit	Even	--------	--------
Data Flow control	ER	--------	--------
Communication Format (using RS-232C)	RS-232C	**Communication Format** [*1]	Serial Communication
Communication Format (using RS-422)	2 wire type	**Communication Format** [*1]	Serial Communication
Unit No.	1	**Unit No.** [*2]	1

**1 PC-900 series only*

**2 It is possible to set a Controller communication unit No.from 0 to 95, however, the GP/GLC can only be set from 1 to 32.*

12.6.5 Error Code

Controller error codes are represented by the “Host communication error (02:**:##)”, and indicated in the left lower corner of the GP screen.

Error Codes	Meaning
01	Command does not exist
03	Exceeds setting value range
04	Unable to set (during AT execution)
05	Key operation has activated Setting Mode

For more details about the error codes, see

Reference *“The Controller Manual : Communication Guide for each series made by Shinko Technos Corporation”*

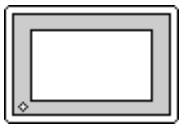

MEMO

12.7 Fuji Electronic Corporation Controllers

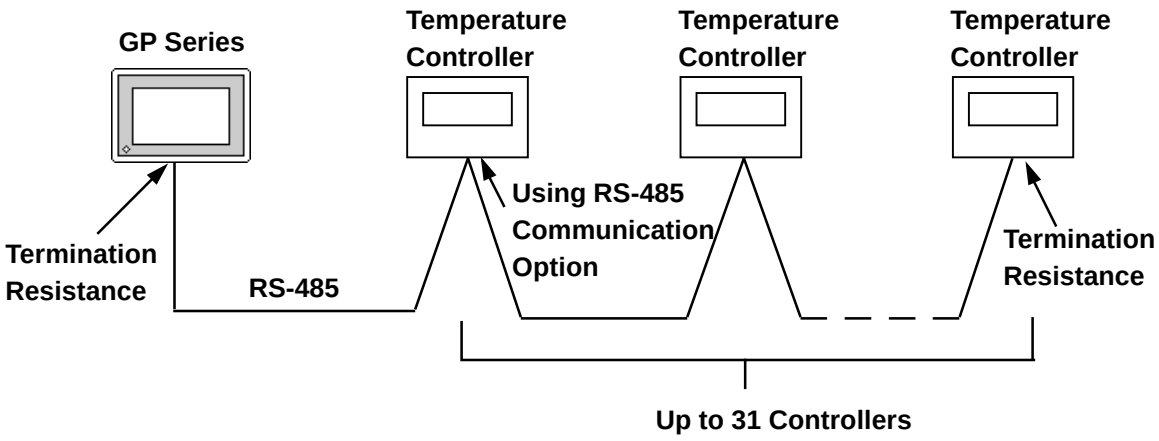
12.7.1 System Structure

The following describes the system configuration used when connecting the GP/GLC to this Controller.

■ Micro-Controller X Series (Model:PXR)

Controller *1	Cable Diagram	GP/GLC
		
PXR4□□□□-□□M00	RS-422 <Cable diagram 1>	GP series GLC series
PXR4□□□□-□□V00	RS-422 (1:n) <Cable diagram 2>	

**1 The Controller's model number "□" will change, according to the options selected. For model number details, refer to the PXR4 Series catalog. When connecting the Controller to a GP, the RS-485 (MODBUS) option "M00" or "V00" is required.*



12.7.2 Cable Diagrams

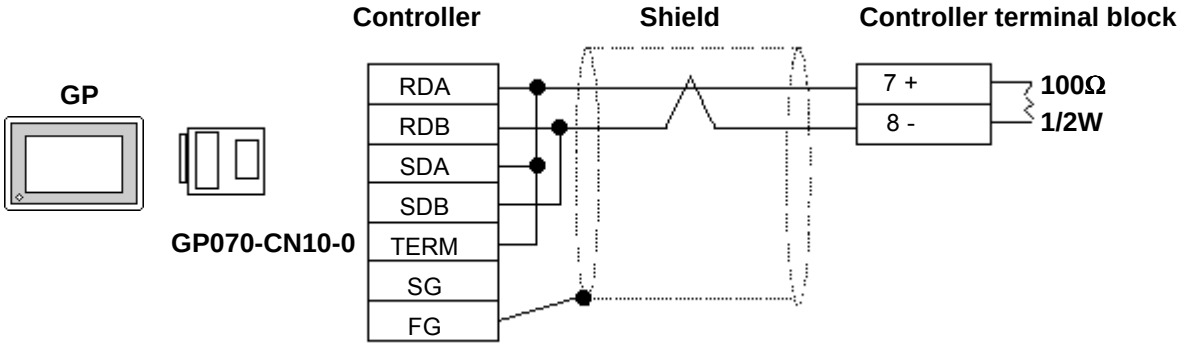
The cable diagrams shown below and the cable diagrams recommended by Fuji Electric Co., Ltd. differ, however, using these cables for your Controller's operations will not cause any problems.

Important

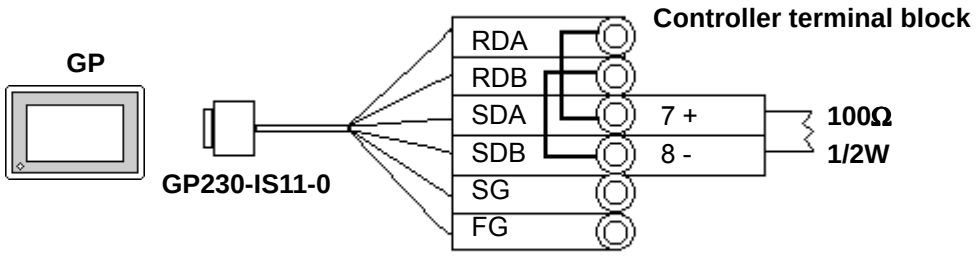
- ***Ground your PLC's FG terminal according to your country's applicable standard.***
- ***All RS-422 cables should be no more than 500 meters long.***

■ Cable Diagram 1 (1:1) RS-422(2-wire type)

• Using Digital's RS-422 connector terminal adapter GP070-CN10-0



• Using Digital's RS-422 Cable GP230-IS11-0



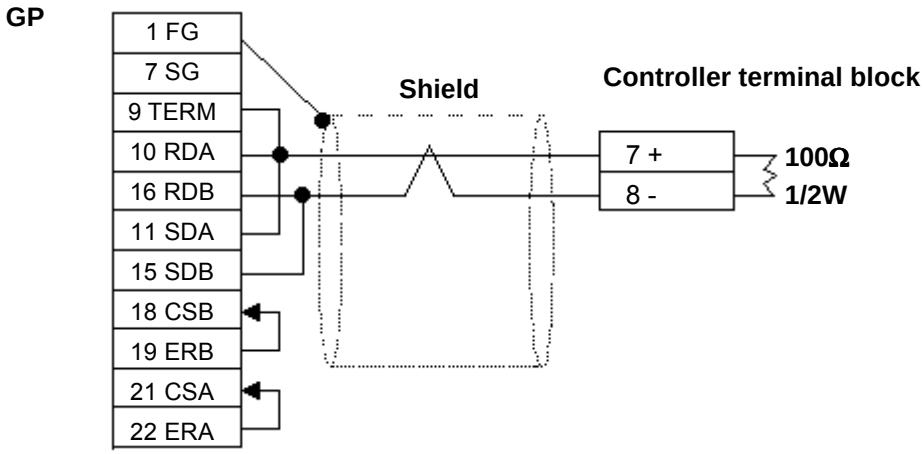
Note:

- **Be sure that RDA - SDA and RDB - SDB are both connected to the Controller terminal block.**

Important

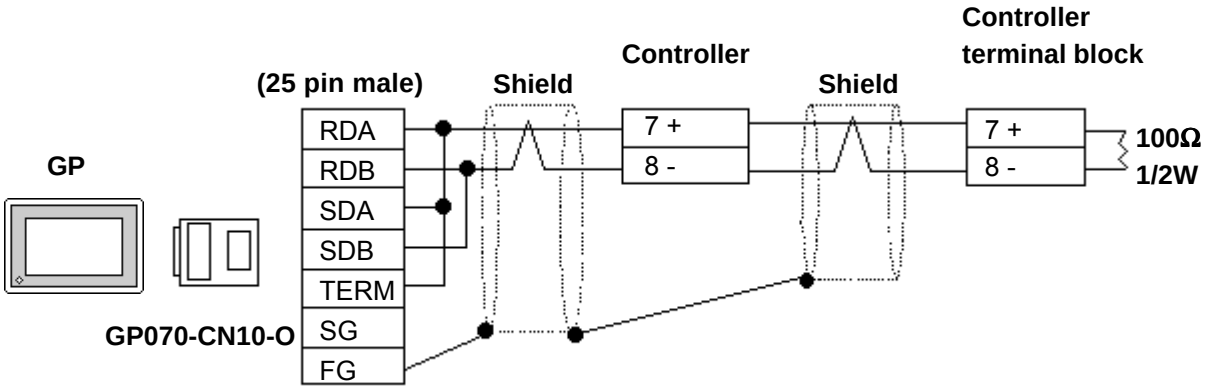
- ***Since the SG and FG lines cannot be connected to the controller terminal block, be sure to cover them with insulating tape.***

• When making your own cables

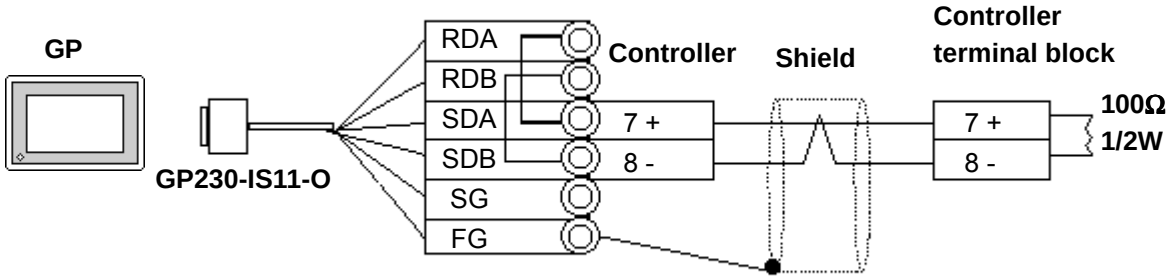


■ Cable Diagram 2 (1:n) RS-422 (2-wire type)

• Using Digital's RS-422 connector terminal adapter GP070-CN10-0



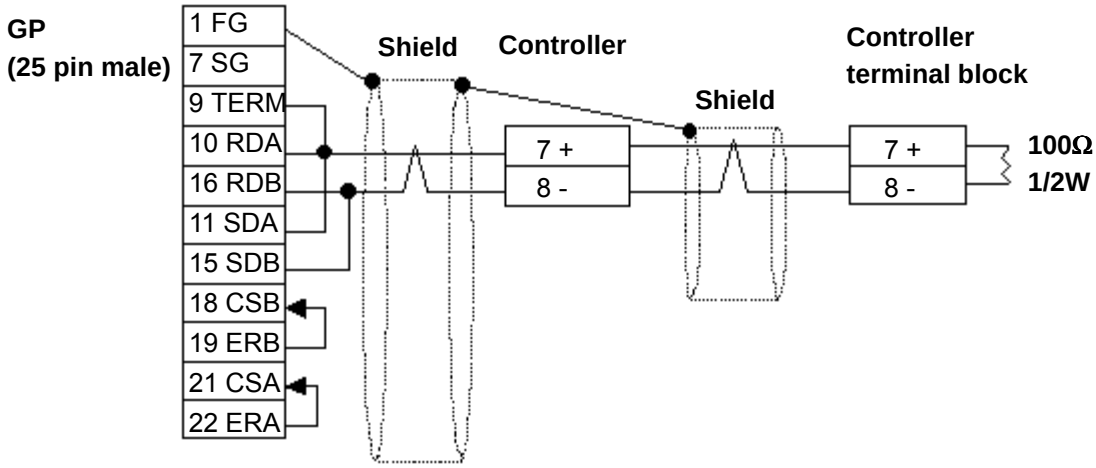
• Using Digital's RS-422 cable, GP230-IS11-0



• Be sure that RDA - SDA and RDB - SDB are both connected to the Controller terminal block.

• Since the SG line cannot be connected to the controller terminal block, be sure to cover them with insulating tape.

• When making your own cable connections



12.7.3 Supported Devices

The following list shows the range of devices supported by the GP/GLC.

■ Micro-Controller X Series (Model:PXR)

Device	Bit Address	Word Address	Comments	
Parameter	00001	————	*1	H/L
	10001 ~ 10016	10001	*2	
	3000100 ~ 3001515	30001 ~ 30015	Internal Calculation Value *2	
	4000100 ~ 4011315	40001 ~ 40113	Internal Calculation Value *1	
	3100100 ~ 3101515	31001 ~ 31015	Engineering Unit *2	
	4100100 ~ 4111315	41001 ~ 41113	Engineering Unit *1	

**1 Addresses 00001, 40001 and 41001 are used to store write commands (FIX Processing) in non-volatile memory. The non-volatile memory's write is performed via the writing of "Write Value 1". FIX processing lasts approximately 5 seconds. The Display Communication cannot be performed for 5 seconds if there are any Read-out Tags on the same screen.*

Reference *Instruction Manual for Fuji Electric Corporation's MICRO CONTROLLER X COMMUNICATION FUNCTION (RS-485 MODBUS), "FIX Processing"*

STOP
- **During the writing of data to non-volatile memory, do not turn off the Controller's power. If the Controller's power is cut, the data in non-volatile memory will be destroyed, thereby disabling the Controller.**

**2 Data write is not possible.*

Note:
- **In the GP, the Controller's parameters are set via the Coil No. and Register No. For each Coil No. (00001~, 10001~) the last digit is recognized as the device. For Register No.s (30001~, 40001~, 31001~, 41001~) the last two digits are recognized as the device.**
- **For information about data item types and numbers, refer to the Instruction Manual for Fuji Electric Co., Ltd.'s MICRO CONTROLLER X COMMUNICATION FUNCTION (RS-485 MODBUS), "CHAPTER 7 ADDRESS MAP AND DATA FORMAT"**
- **The GP supports two types of Address Maps, the "Engineering Unit Address Map" and the "Internal Calculation Value Address Map".**

The following data shows the memory maps for each paprameter.

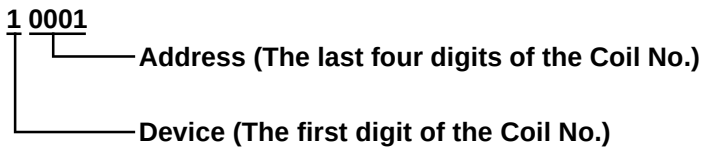
• When using Bit Data

Bit Data (Read Only) : Function [02H]

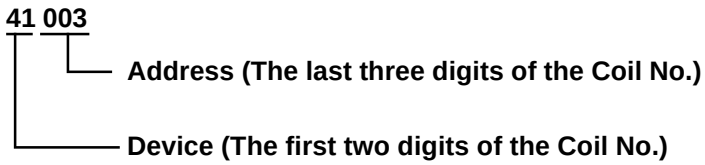
Relative Address	Coil No.	Type	Memory Contents	Read-out Data
0000H	10001	Bit	Alarm1 ON/OFF	0:Alarm1 OFF, 1:Alarm1 ON
0001H	10002		(Reserved)	
0002H	10003		(Reserved)	
0003H	10004		(Reserved)	
0004H	10005	Bit	Alarm2 ON/OFF	0:Alarm2 OFF, 1:Alarm2 ON
0005H	10006		(Reserved)	
:	:	:	:	:

The item Nos. here are the GP addresses.

Ex. For the parameter “Alarm1 ON/OFF” of Coil No. 10001, the GP’s designated address is as follows. Use the first digit of the Coil No. (00001~, 10001~) to designate the device.



Ex. For the parameter “front surface control SV data” of Register No. 41003, the GP’s designated address is as follows. Use the first two digits of the Register No.s 30001~, 40001~, 31001~ and 41001~ to designate the device.



Note:

- **The Controller’s parameter data, when data transfer is performed, will have no decimal places. Thus, in the GP, processing must be performed to correct the data. For example, if a numeric display (N-tag) is used that in includes decimal places, the “Data Type” and “No. of Decimals” settings must be used. Also, when writing data to a Controller, it is necessary to write decimal values as integers.**

Ex. Register No. 41025’s “Output 1 Lower Limit”

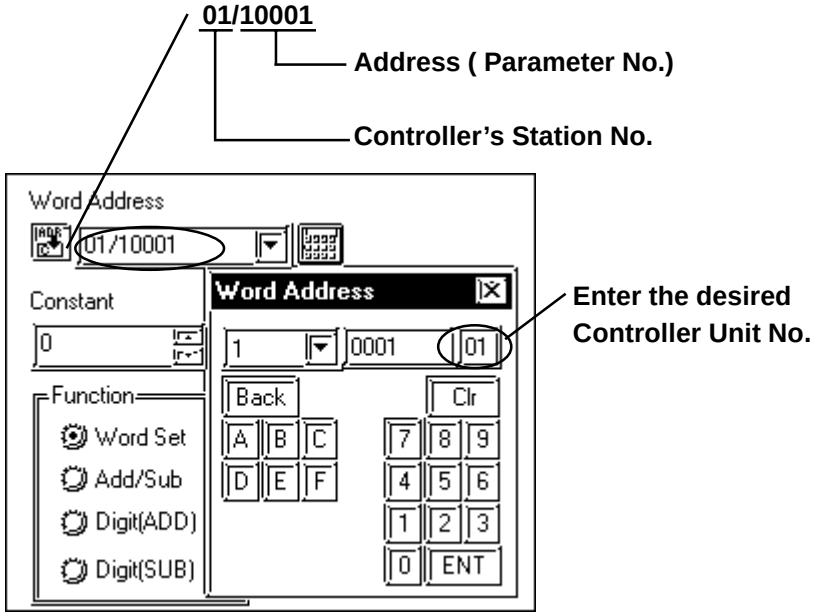
Controller Display/Setting Value : 3.00%

GP value/setting : 300

Reference *Also, refer to “Instruction Manual for Fuji Electric Co., Ltd.’s MICRO CONTROLLER X COMMUNICATION FUNCTIONS (RS-485 MODBUS)” for details (with/without a decimal point) about data item setting value ranges.*

Note:

- **When setting Parts or Tags in the screen editor software, the Controller communication unit No. can be specified during address input. If a communication unit No. is not indicated, the previously entered communication unit No. is automatically used. (The default value is 1)**



Important

- ***GP/GLC's System Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP's screen editor software or via the GP/GLC's OFFLINE screen, it is impossible to actually allocate the system area to the Controller's data area.

12.7.4 Environment Setup

The following table lists the recommended Controller and GP/GLC communication settings.

■ Micro-Controller X Series (Model:PXR)

GP/GLC Settings		Controller Settings	
Baud Rate	9600 bps (Fixed)	--------	--------
Data Length	8 bits (Fixed)	--------	--------
Stop Bit	1 bit (Fixed)	--------	--------
Parity Bit	Odd	**Parity Settings (CoM)**	0 : Odd
Data Flow control	ER	--------	--------
Communication Format (using RS-422)	2-wire type	--------	--------
Unit No. *1	1	**Unit Station No. (Stno)**	1

**1 It is possible to set a Controller communication unit No.from 0 to 255, however, the GP/GLC can only be set from 1 to 32. Zero cannot be used because it means "Communication function stop". The Read-in area can be used in the Controller that has set the Unit No. here.*

12.7.5 Error Code

Controller error codes are displayed by the " Host Communication Error (02:**:##)", and indicated in the left lower corner of the GP screen ** indicates the Controller's error code, and ## indicates the number of the Controller unit. However, when the PLC is not correctly connected (02:FF), the unit number will not be shown.

Erro Code	Meaning
01	Illegal function
02	Illegal data address
03	Illegal data value

For more details about error codes, see

Reference *Instruction Manual for Fuji Electric Co,. Ltd.'s MICRO CONTROLLER X COMMUNICATION FUNCTION (RS485 MODBUS)*


MEMO

12.8 Toho Electronics Inc. Controllers

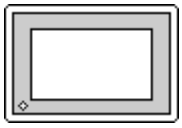
12.8.1 System Structure

The following describes the system configuration used when connecting the GP/GLC to this Controller.

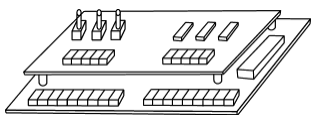
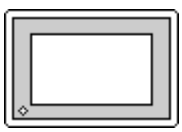
Important

- ***After the Controller's power is turned ON, no communication is performed for about four seconds. As a result, note that it may take several seconds to start communication when the GP/GLC and the Controller are turned ON at the same time.***
- ***When a save request command is sent to the Controller (STR write command), it can take up to six seconds for the controller to respond. At this time, note that the communication speed may slow significantly, which is indicated by the slowing of the update frequency of the GP/GLC display, as the GP or GLC enters the standby state.***

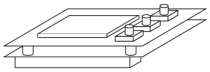
■TTM-004/X04

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-004-□-A□□□ TTM-X04-□-□□□□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

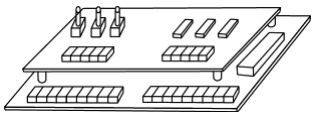
■TTM-00B

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-00B-□-□□□□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

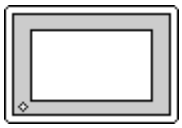
■TTM-10L

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-10L-☐-☐-☐	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC Series
	RS-232C <Cable diagram 2>	
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

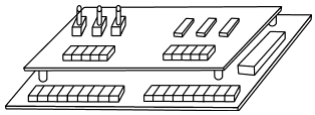
■TTM-100B

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-100B4-☐ ☐-☐ ☐ ☐ ☐-☐☐☐ TTM-100B8-☐ ☐-☐ ☐ ☐ ☐-☐☐☐	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC Series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

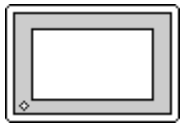
■TTM-110 Series

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-114-☐-☐ ☐-☐☐☐☐☐☐-☐ TTM-115-☐-☐ ☐-☐☐☐☐☐☐-☐ TTM-117-☐-☐ ☐-☐☐☐☐☐☐-☐ TTM-119-☐-☐ ☐-☐☐☐☐☐☐-☐	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC Series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

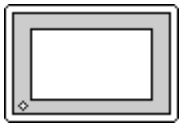
■ TTM-110B Series

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-110B-□-□ □-□□□□□□-□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

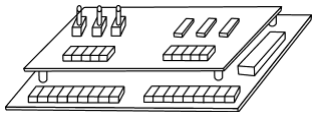
■ TTM-120 Series

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-124-□-□ □-□□□□□□-□ TTM-125-□-□ □-□□□□□□-□ TTM-127-□-□ □-□□□□□□-□ TTM-129-□-□ □-□□□□□□-□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

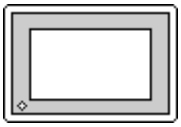
■TTM-300 Series

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-304-□-□N-□□□□-□ TTM-305-□-□N-□□□□-□ TTM-309-□-□N-□□□□-□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

■ TTM-300B

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-300B-□-□N-□□□□-□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC Series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

■ TTM-1020 Series

Temperature Controller	Cable Diagram	GP/GLC
		
TTM-1520-□ □-□ □-□□□-□ TTM-1521-□ □-□ □-□□□-□ TTM-1522-□ □-□ □-□□□-□ TTM-1523-□ □-□ □-□□□-□ TTM-1524-□ □-□ □-□□□-□ TTM-1525-□ □-□ □-□□□-□ TTM-1920-□ □-□ □-□□□-□ TTM-1921-□ □-□ □-□□□-□ TTM-1922-□ □-□ □-□□□-□ TTM-1923-□ □-□ □-□□□-□ TTM-1924-□ □-□ □-□□□-□ TTM-1925-□ □-□ □-□□□-□	RS-422 (2-wire type) <Cable diagram 1>	GP or GLC Series
	RS-422 (2-wire type, 1:n) <Cable diagram 3>	

12.8.2 Cable Diagrams

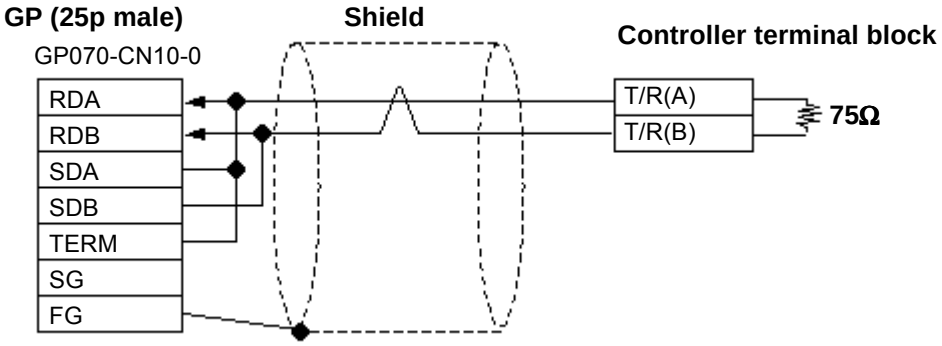
The cable diagrams shown below and the cable diagrams recommended by Toho Electronics Inc. may differ, however, using these cables for your Controller's operations will not cause any problems.

Important

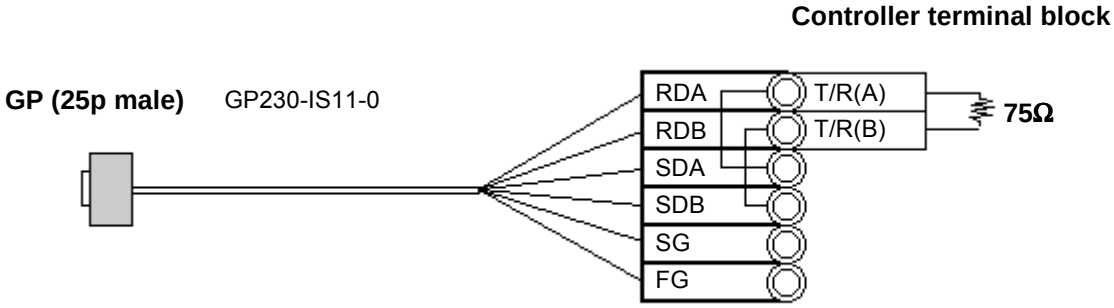
- ***RS-422 connector terminal numbers will differ depending on the controller model. Prior to performing wiring, refer to your controller's User Manual.***
- ***When using RS-232C format, all cables should be no more than 15 meters long and also using RS-422 format, all cables should be no more than 50 meters long.***

■Cable Diagram 1 (1:1) RS-422 (2-wire type)

• Using Digital's RS-422 connector terminal adapter GP070-CN10-0



• Using Digital's RS-422 Cable GP230-IS11-0



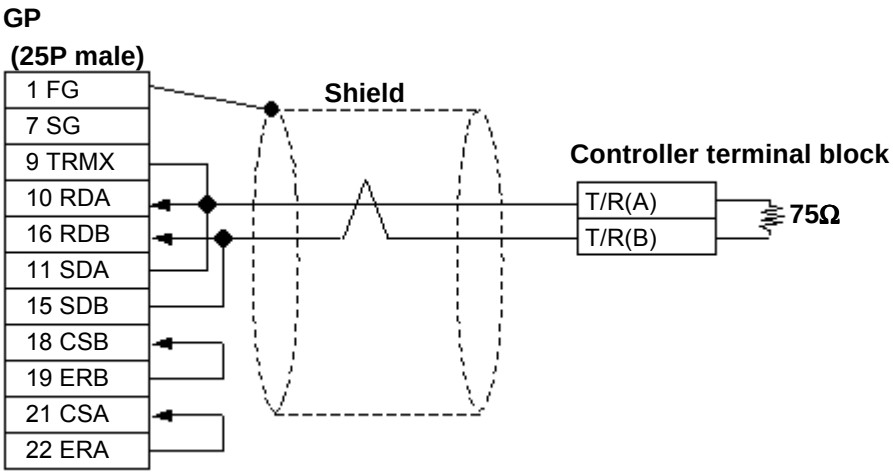
Note:

Be sure that RDA - SDA and RDB - SDB are both connected to the Controller terminal block.

Important

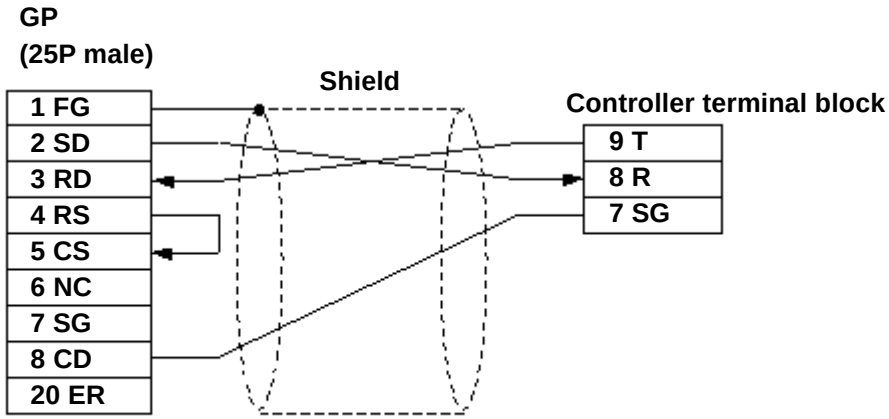
Since the SG and FG lines cannot be connected to the controller terminal block, be sure to cover them with insulating tape.

• **When making your own cables**



Note: **When connecting the No.9 pin and No.10 pin in the GP Serial I/F, a termination resistance of 100W is added between RDA and RDB.**

■ Cable Diagram 2 RS-232C



■ Cable Diagram 3 (1:n) RS-422

Important

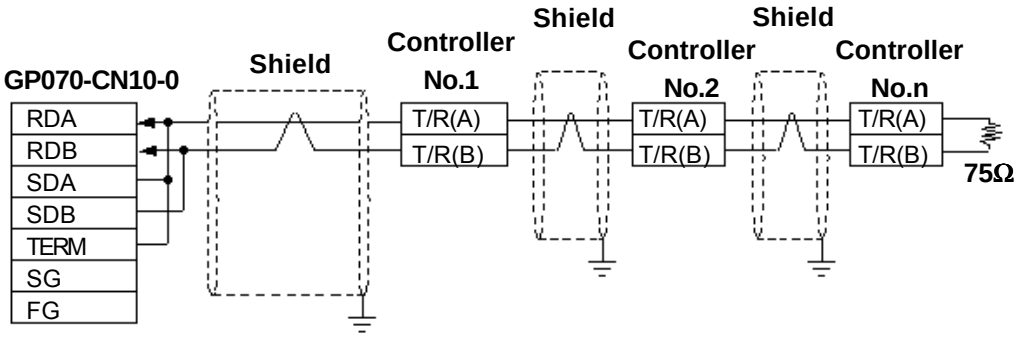
Ground a shielded cable in accordance with the electrical requirements of your system, using one of the following three methods.

(1) Distributed grounding (as shown below)

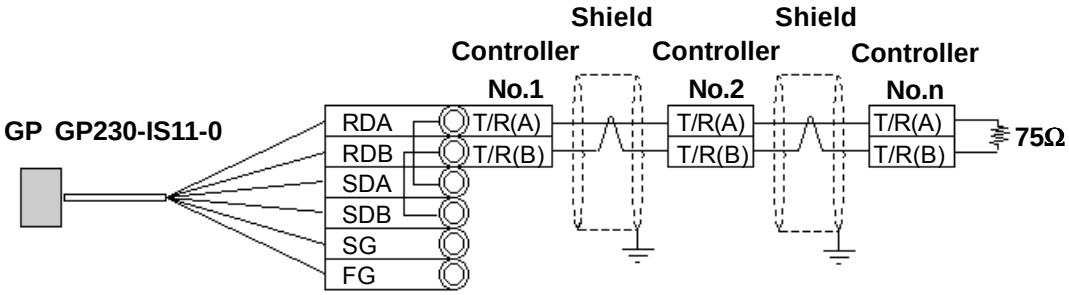
(2) Parallel grounding, or

(3) Serial grounding.

• Using Digital's RS-422 connector terminal adapter GP070-CN10-0



• Using Digital's RS-422 cable, GP230-IS11-0



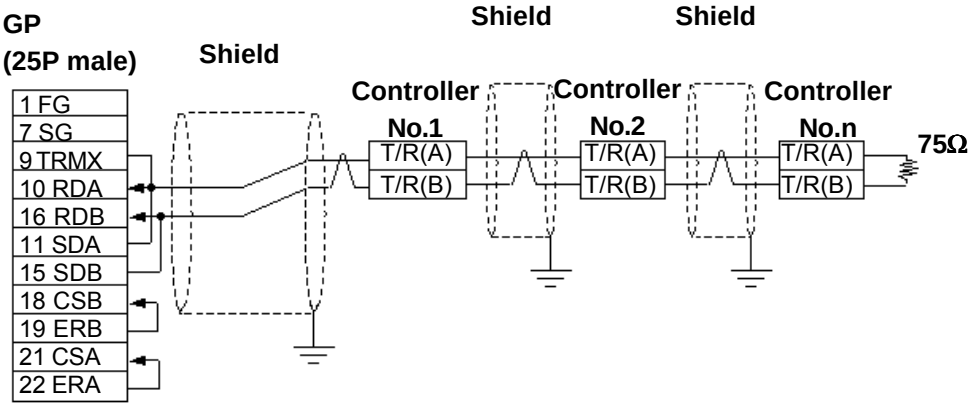
Note:

- **Be sure that RDA - SDA and RDB - SDB are both connected to the Controller terminal block.**

Important

Since the SG and FG lines cannot be connected to the controller terminal block, be sure to cover them with insulating tape.

• **When making your own cable connections**



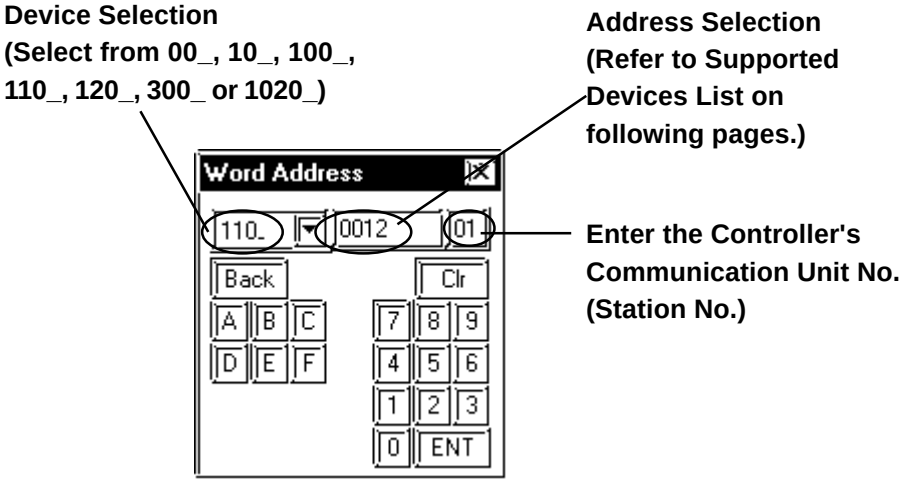
Note: • **When connecting the No.9 pin and No.10 pin in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

12.8.3 Supported Devices

The following list shows the range of devices supported by the GP/GLC.

Important

- ***The Controller identifiers "1" and "2" (refer to your Controller's User Manual) are assigned to predefined addresses and devices. As a result, when you enter devices on the GP screen editor software, do so as shown below.***



- ***Each identifier has read and write limitations detailed information, refer to your Controller's Instruction Manual. For details about precautions when using identifier "2" with GP-PRO/PBIII, refer to TTM-300 Series Supported Device's *1 or *2.***
- ***GP/GLC's System Area (LS0 to LS19) Settings***

  The GP/GLC's system area (20 words) cannot be allocated to the Controller's own data area. Even though you can enter the system area settings via the GP's screen editor software or via the GP/GLC's OFFLINE screen, it is impossible to actually allocate the system area to the Controller's data area.
- ***When you save data to your Controller's EEPROM (send a Save request), write it in the device address corresponding to symbol STR or identifier STR. For the TTM-300 series, this procedure is not needed since it saves data directly to the EEPROM.***
- ***When saving data to the EEPROM, write the data to the device address that corresponds to your Controller's STR identifier.***

Important

- ***In the Read Area, only the devices "00_","10_","100_", "110_", "120_ ,"300_" and "1020_" can be set. All other devices, "SSV" ,"END", "STI", "SOK", "SWZ", "SWT", "SON", "SOF", "SRN" and "SEO" cannot be used.***
- ***Depending on the Controller's setting conditions, the GP and GLC's pre-set setting values may be used. Refer to the table as shown below.***

Model	Address	Identifier	Controller Condition	Decimal marked values using onGP/GLC (Hex)
TTM-004/X04/00B (00_)	0	PV1	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
	2 ~ 10	PR1 ~ PR9	When an arbitrary identifier has been assigned to the priority screen. (When the display of PR1 to PR9 on the temperature controller is not OFF.)	0011 ~ 0077 *1
			In the case where no setting has been assigned to the priority screen. (When the display of PR1 to PR9 on the temperature controller is OFF.)	-32768(0x8000)
			In the case where the identifier COM has been assigned to the priority screen.	32767(0x7FFF) *2
			In the case where the identifier BPS has been assigned to the priority screen.	32766(0x7FFE) *2
			In the case where the identifier ADR has been assigned to the priority screen.	32765(0x7FFD) *2
			In the case where the identifier AWT has been assigned to the priority screen.	32764(0x7FFC) *2
			In the case where the identifier MOD has been assigned to the priority screen.	32763(0x7FFB) *2
TTM-10L (10_)	0	PV1	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
	22	□CJ	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
	23	PV2	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
TTM-100B (100_)	0	PV1	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
TTM-110/110B (110_)	0	PV1	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
TTM-120 (120_)	0	PV1	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
TTM-300/300B (300_)	0	PV1	Over Scale	32767(0x7FFF)
			Under Scale	-32768(0x8000)
	4	□TI	When the Operation has finished	-32768(0x8000)

**1 Addresses allocated to each identifier*

Reference *12.8.3 Supported Devices ■TTM-004/X04/00B*

**2 This identifier cannot be registered as the priority screen function setting (PR1 to PR9) via a GP/GLC Write command. To register this function, use the front panel of the temperature controller.*

- ***You cannot use this device as a 32-bit device, since each identifier's addresses are not consecutive.***

■ TTM-004/X04/00B

Device	Bit Address	Word Address	Controller Setting item	Identifiers	Others
00_	000000 ~ 000015	0000	Process value PV	PV1	
	000100 ~ 000115	0001	Setting value SV	SV1	
	000200 ~ 000215	0002	Priority display set 1	PR1	
	000300 ~ 000315	0003	Priority display set 2	PR2	
	000400 ~ 000415	0004	Priority display set 3	PR3	
	000500 ~ 000515	0005	Priority display set 4	PR4	
	000600 ~ 000615	0006	Priority display set 5	PR5	
	000700 ~ 000715	0007	Priority display set 6	PR6	
	000800 ~ 000815	0008	Priority display set 7	PR7	
	000900 ~ 000915	0009	Priority display set 8	PR8	
	001000 ~ 001015	0010	Priority display set 9	PR9	
	001100 ~ 001115	0011	Set/select of input	INP	
	001200 ~ 001215	0012	Gain for PV correction	PVG	
	001300 ~ 001315	0013	Zero point for PV correction	PVS	
	001400 ~ 001415	0014	Filter input	PDF	
	001500 ~ 001515	0015	Decimal position	□DP	
	001600 ~ 001615	0016	Function by FUNC Key	□FU	
	001700 ~ 001715	0017	Lock	LOC	
	001800 ~ 001815	0018	SV H limit	SLH	
	001900 ~ 001915	0019	SV L limit	SLL	
	002000 ~ 002015	0020	Control mode	□MD	
	002100 ~ 002115	0021	Control type	CNT	
	002200 ~ 002215	0022	Set/select of normal or reverse	DIR	
	002300 ~ 002315	0023	Output1, manipulated value	MV1	
	002400 ~ 002415	0024	Tuning type	TUN	
	002500 ~ 002515	0025	AT coefficient	ATG	
	002600 ~ 002615	0026	AT sensitivity	ATC	
	002700 ~ 002715	0027	Output 1, proportional band	□P1	
	002800 ~ 002815	0028	Integral time	□I1	
	002900 ~ 002915	0029	Derivative time	□D1	
	003000 ~ 003015	0030	Output 1, proportional cycle	□T1	
	003100 ~ 003115	0031	Anti reset wind-up	ARW	
	003200 ~ 003215	0032	Setting of H limit for Output 2 MV limitter	MH1	
	003300 ~ 003315	0033	Setting of L limit for Output 2 MV limitter	ML1	
	003400 ~ 003415	0034	Output 1, control sensitivity	□C1	
	003500 ~ 003515	0035	Output 1, OFF position	CP1	
	003600 ~ 003615	0036	Output 2, manipulated value	MV2	
	003700 ~ 003715	0037	Output 2, proportional band	□P2	
	003800 ~ 003815	0038	Output 2, proportional cycle	□T2	
	003900 ~ 003915	0039	Setting of H limit for Output 2 MV limitter	MH2	
	004000 ~ 004015	0040	Setting of L limit for Output 2 MV limitter	ML2	
	004100 ~ 004115	0041	Manual reset	PBB	
	004200 ~ 004215	0042	Output 2, control sensitivity	□C2	
	004300 ~ 004315	0043	Output 2, OFF position	CP2	
	004400 ~ 004415	0044	Dead band	□DB	
	004500 ~ 004515	0045	EV 1, function	E1F	
	004600 ~ 004615	0046	EV 1, H limit	E1H	
	004700 ~ 004715	0047	EV 1, L limit	E1L	
	004800 ~ 004815	0048	EV 1, sensitivity	E1C	
	004900 ~ 004915	0049	EV 1, delay timer	E1T	

Device	Bit Address	Word Address	Controller Setting item	Identifier	other
00_	005000 ~ 005015	0050	Abnormal SV/heater function	E1B	
	005100 ~ 005115	0051	EV 1, polarity	E1P	
	005200 ~ 005215	0052	CT input	CM1	
	005300 ~ 005315	0053	EV 1, abnormal current of heater	CT1	
	005400 ~ 005415	0054	EV 2, function	E2F	
	005500 ~ 005515	0055	EV 2, H limit	E2H	
	005600 ~ 005615	0056	EV 2, L limit	E2L	
	005700 ~ 005715	0057	EV 2, sensitivity	E2C	
	005800 ~ 005815	0058	EV 2, delay timer	E2T	
	005900 ~ 005915	0059	EV 2, abnormal SV/ heater function	E2B	
	006000 ~ 006015	0060	EV 2, polarity	E2P	
	006100 ~ 006115	0061	CT input	CM2	
	006200 ~ 006215	0062	EV 2, abnormal current of heater	CT2	
	006300 ~ 006315	0063	DI input	DIF	
	006400 ~ 006415	0064	Polarity of DI	DIP	
	006500 ~ 006515	0065	Control setting 2	SV2	
	006600 ~ 006615	0066	Timer output	TMO	
	006700 ~ 006715	0067	Timer function	TMF	
	006800 ~ 006815	0068	Timer unit switch	H/M	
	006900 ~ 006915	0069	Allowable width for timer SV start	TSV	
	007000 ~ 007015	0070	Time setting	TIM	
	007100 ~ 007115	0071	Monitor of remaining time	TIA	
	————	0072	Timer start/stop	TST	Bit 5
	007300 ~ 007315	0073	Output monitor	OM1	
	007400 ~ 007415	0074	AT start/stop	□AT	
	————	0075	Data store	STR	Bit 5

■ TTM-10L

Device	Bit Address	Word Address	Controll Setting Item	Identifier	Other
10_	000000 ~ 000015	0000	Process Variable (PV)	PV1	
	000100 ~ 000115	0001	Control Setting Value (SV)	□SV	
	000200 ~ 000215	0002	EV L. Limit Set	1L1	
	000300 ~ 000315	0003	EV H. Limit Set	1H1	
	000400 ~ 000415	0004	Auto-Tuning Start/Release	□AT	
	000500 ~ 000515	0005	Proportional Band	□P1	
	000600 ~ 000615	0006	Integral Time	□I1	
	000700 ~ 000715	0007	Derivative Time	□D1	
	000800 ~ 000815	0008	P-cycle Time	□T1	
	000900 ~ 000915	0009	Control Sensitivity	□C1	
	001000 ~ 001015	0010	Set/Select of Input/Output	□IO	
	001100 ~ 001115	0011	L. Limit of SV Limiter	SLL	
	001200 ~ 001215	0012	H. Limit of SV Limiter	SLH	
	001300 ~ 001315	0013	Control Type	CNT	
	001400 ~ 001415	0014	PV Correction	PVS	
	001500 ~ 001515	0015	Manual Reset	PBB	
	001600 ~ 001615	0016	OFF Position	□CP	
	001700 ~ 001715	0017	EV Function	A1F	
	001800 ~ 001815	0018	EV Sensitivity	ALC	
	001900 ~ 001915	0019	Decimal Point Position	□DP	
	002000 ~ 002015	0020	Selection of C/F	□CF	
	002100 ~ 002115	0021	Setting of Lock Function	LOC	
	002200 ~ 002215	0022	Temperature of cooling contact compensation	□CJ	
	002300 ~ 002315	0023	Process Variable (PV) with decimal point	PV2	
	002400 ~ 002415	0024	Output state monitor	OM1	
	————————	0025	Data store	STR	Bit 5

■ TTM-110Series (TTM-114, 115, 117, 119)/110B

Device	Bit Address	Word Address	Controll Setting Item	PV	Other
10_	000000 ~ 000015	0000	Process value (PV)	PV1	
	000100 ~ 000115	0001	Control set value (SV)	□SV	
	000200 ~ 000215	0002	Main control MV (OUT1)	MV1	
	000300 ~ 000315	0003	Main control MV (OUT2)	MV2	
	000400 ~ 000415	0004	Auto-tuning start/release	□AT	
	000500 ~ 000515	0005	Alarm 1 L limit set	1L1	
	000600 ~ 000615	0006	Alarm 1 H limit set	1H1	
	000700 ~ 000715	0007	Main control P-band	□P1	
	000800 ~ 000815	0008	Integral time	□I1	
	000900 ~ 000915	0009	Derivative time	□D1	
	001000 ~ 001015	0010	Output 1 P-cycle time	□T1	
	001100 ~ 001115	0011	Output 1 sensitivity	□C1	
	001200 ~ 001215	0012	Output 2 P-band	PC1	
	001300 ~ 001315	0013	Output 2 P-cycle time	TC1	
	001400 ~ 001415	0014	Output 2 sensitivity	CC1	
	001500 ~ 001515	0015	Dead Band	DB1	
	001600 ~ 001615	0016	Cooling Point of Contact Compensation	□CJ	
	001700 ~ 001715	0017	Set/Select of Input/Output	□IO	
	001800 ~ 001815	0018	Setting of L limit for OUT1 MV Limiter	MLL	
	001900 ~ 001915	0019	Setting of H limit for OUT1 MV Limiter	MLH	
	002000 ~ 002015	0020	Setting of L limit of SV Limiter	SLL	
	002100 ~ 002115	0021	Setting of H limit of SV Limiter	SLH	
	002200 ~ 002215	0022	Control action select	CNT	
	002300 ~ 002315	0023	Setting of sensor value correction	PVS	
	002400 ~ 002415	0024	Manual reset value	PBB	
	002500 ~ 002515	0025	Alarm 1 function	A1F	
	002600 ~ 002615	0026	AL output sensitivity	ALC	
	002700 ~ 002715	0027	Heater abnormal current	□CT	
	002800 ~ 002815	0028	Selection of data transmission function	TR1	
	002900 ~ 002915	0029	Selection of C/F	□CF	
	003000 ~ 003015	0030	Output state monitor	OM1	
	003100 ~ 003115	0031	Response Delay Speed	AWT	
	————————	0032	Data store	STR	Bit 15

■TTM-110Series(TTM-114, 115, 117, 119)/110B

Device	Bit Address	Word Address	Controller Setting Item	Identifier	Other
110_	000000 ~ 000015	0000	Process Value (PV)	PV1	
	000100 ~ 000115	0001	Controll Set Value (SV)	□SV	
	000200 ~ 000215	0002	Main Control MV (OUT 1)	MV1	
	000300 ~ 000315	0003	Sub-Control MV (OUT 2)	MV2	
	000400 ~ 000415	0004	Timer Remainder Time	TIA	
	000500 ~ 000515	0005	Auto-Tuning Start/Release	□AT	
	000600 ~ 000615	0006	Time Setting On Timer	TIM	
	000700 ~ 000715	0007	Alarm 1 L. Limit Set	1L1	
	000800 ~ 000815	0008	Alarm 1 H. Limit Set	1H1	
	000900 ~ 000915	0009	Alarm 2 L. Limit Set	2L1	
	001000 ~ 001015	0010	Alarm 2 H. Limit Set	2H1	
	001100 ~ 001115	0011	Main Control P-band	□P1	
	001200 ~ 001215	0012	Integral Time	□I1	
	001300 ~ 001315	0013	Derivative Time	□D1	
	001400 ~ 001415	0014	Output 1 P-cycle Time	□T1	
	001500 ~ 001515	0015	Output 1 Sensitivity	□C1	
	001600 ~ 001615	0016	Output 2 P-band	PC1	
	001700 ~ 001715	0017	Output 2 P-cycle Time	TC1	
	001800 ~ 001815	0018	Output 2 Sensitivity	CC1	
	001900 ~ 001915	0019	Dead Band	DB1	
	002000 ~ 002015	0020	Set/Select of Input/Output Type	□IO	
	002100 ~ 002115	0021	Setting of L. Limit For Out 1 MV Limiter	MLL	
	002200 ~ 002215	0022	Setting of H. Limit For Out 1 MV Limiter	MLH	
	002300 ~ 002315	0023	Setting of H. Limit of SV Limiter	SLL	
	002400 ~ 002415	0024	Setting of L. Limit of SV Limiter	SLH	
	002500 ~ 002515	0025	Control Action Select	CNT	
	002600 ~ 002615	0026	Setting of Sensor Value Correction	PVS	
	002700 ~ 002715	0027	Manual Reset Value	PBB	
	002800 ~ 002815	0028	Timer Operation Mode	TMM	
	002900 ~ 002915	0029	Alarm 1 Function	A1F	
	003000 ~ 003015	0030	Alarm 2 Function	A2F	
	003100 ~ 003115	0031	AL Output Sensitivity	ALC	
	003200 ~ 003215	0032	Heater Abnormal Current	□CT	
	003300 ~ 003315	0033	Selection of Data Transmission Function	TR1	
	003400 ~ 003415	0034	Decimal Point Position	□DP	
	003500 ~ 003515	0035	Selection of C/F	□CF	
	003600 ~ 003615	0036	Buzzer Sound Setting	□BU	
	003700 ~ 003715	0037	Setting of Lock Function	LOC	
	003800 ~ 003815	0038	Output State Monitor	OM1	
	————	0039	Timer Reset	TMS	Bit [5]
	004000 ~ 004015	0040	Run/Ready Status	RUN	
	————	0041	Data Store	STR	Bit [5]

■TTM-120 Series (TTM-124, 125, 127, 129)

Device	Bit Address	Word Address	Controller Setting Item	Identifier	Other
120_	000000 ~ 000015	0000	Process Value (PV)	PV1	
	000100 ~ 000115	0001	Control Set Value (SV)	□AV	
	000200 ~ 000215	0002	Control Mode	MD1	
	000300 ~ 000315	0003	Main Control MV (OUT1)	MV1	
	000400 ~ 000415	0004	Sub-Control MV (OUT2)	MV2	
	000500 ~ 000515	0005	Auto-Tuning Start/Release	□AT	
	000600 ~ 000615	0006	Alarm 1L Limit Set	1L1	
	000700 ~ 000715	0007	Alarm 1H Limit Set	1H1	
	000800 ~ 000815	0008	Alarm 2L Limit Set	2L1	
	000900 ~ 000915	0009	Alarm 2H Limit Set	2H1	
	001000 ~ 001015	0010	Output 1 P-band	□P1	
	001100 ~ 001115	0011	Integral Time	□I1	
	001200 ~ 001215	0012	Derivative Time	□D1	
	001300 ~ 001315	0013	Output 1 P-cycle Time	□T1	
	001400 ~ 001415	0014	Output 1 Senstivity	□C1	
	001500 ~ 001515	0015	Main Control OFF Position	□CP	
	001600 ~ 001615	0016	Output 2 P-band	PC1	
	001700 ~ 001715	0017	Output 2 P-cycle Time	TC1	
	001800 ~ 001815	0018	Output 2 Sensitivity	CC1	
	001900 ~ 001915	0019	Output 2 OFF Position	CCP	
	002000 ~ 002015	0020	Dead Band	DB1	
	002100 ~ 002115	0021	Set/Select of Input/Output Type	□I0	
	002200 ~ 002215	0022	Setting of L. Limit for Out1 MV Limiter	MLL	
	002300 ~ 002315	0023	Setting of H. Limit for Out1 MV Limiter	MLH	
	002400 ~ 002415	0024	Setting of L. Limit of SV Limiter	SLL	
	002500 ~ 002515	0025	Setting of H. Limit of SV Limiter	SLH	
	002600 ~ 002615	0026	Control Action Select	CNT	
	002700 ~ 002715	0027	Rump Time of SV1	RP1	
	002800 ~ 002815	0028	Setting of Sensor Value correction	PVS	
	002900 ~ 002915	0029	Digital PV Filter	PDF	
	003000 ~ 003015	0030	Manual Reset Value	PBB	
	003100 ~ 003115	0031	Swiching for Balanceless Bumpless	□BB	
	003200 ~ 003215	0032	Alarm 1 Function	A1F	
	003300 ~ 003315	0033	Alarm 2 Function	A2F	
	003400 ~ 003415	0034	AL Output Sensitivity	ALC	
	003500 ~ 003515	0035	Heater Abnormal Current	□CT	
	003600 ~ 003615	0036	Selection of Data Transmission Function	TR1	
	003700 ~ 003715	0037	DI Function	□DI	
	003800 ~ 003815	0038	Decimal Point Position	□DP	
	003900 ~ 003915	0039	Selection of C/F	□CF	
	004000 ~ 004015	0040	Buzzer Sound Setting	□BU	
	004100 ~ 004115	0041	Setting of Lock	LOC	
	004200 ~ 004215	0042	Output State Monitor	OM1	
	————————	0043	Data Store	STR	BIT 15

■TTM-300 Series (TTM-304, 305, 309)/300B

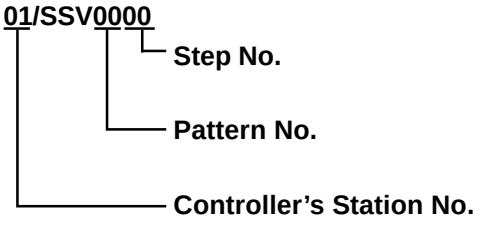
Device	Bit Address	Word Address	Controller Setting Item	Identifier	Other
300_	000000 ~ 000015	0000	Process Value (PV)	PV1	
	000100 ~ 000115	0001	Mode change	□MD	
	000200 ~ 000215	0002	Control Setting Value (SV)	□SV	
	000300 ~ 000315	0003	Run Step Setting Value (SV)	OSV	
	000400 ~ 000415	0004	The time elapsed	□TI	
	000500 ~ 000515	0005	Run step setting time	OTI	
	000600 ~ 000615	0006	Count numbers of time executed	SRR	
	————	0007	Step forward function execution	ADV	Bit 5
	000800 ~ 000815	0008	Pattern number	□PT	
	000900 ~ 000915	0009	Step number	□ST	
SSV	000000 ~ 204715	0000 ~ 2047 *1	Step temperature setting	SSV	
END	000000 ~ 204715	0000 ~ 2047 *1	Final step setting	END	
STI	000000 ~ 204715	0000 ~ 2047 *1.	Step time setting	STI	
SOK	000000 ~ 204715	0000 ~ 2047 *1	Final step finish condition setting	SOK	
SWZ	000000 ~ 204715	0000 ~ 2047 *1	Step wait zone	SWZ	
SWT	000000 ~ 204715	0000 ~ 2047 *1	Step wait time	SWT	
SON	000000 ~ 204715	0000 ~ 2047 *1	Time signal ON time	SON	
SOF	000000 ~ 204715	0000 ~ 2047 *1	Time signal OFF time	SOF	
SRN	000000 ~ 200015	0000 ~ 2000 *2	Execution time	SRN	
SEO	000000 ~ 200015	0000 ~ 2000 *2	End signal ON time	SEO	
300_	001000 ~ 001015	0010	Pattern numbers	PAT	
	001100 ~ 001115	0011	Step numbers	STP	
	001200 ~ 001215	0012	PV correction	PVS	
	001300 ~ 001315	0013	Change C/ F	□CF	
	001400 ~ 001415	0014	Type of Control	CNT	
	001500 ~ 001515	0015	Type of Input/Output	□IO	
	001600 ~ 001615	0016	Select decimal position	□DP	
	001700 ~ 001715	0017	Mainipulated value limiter Low	MLL	
	001800 ~ 001815	0018	Manipulated value limiter High	MLH	
	001900 ~ 001915	0019	Setting of L. limit of SV limiter	SLL	
	002000 ~ 002015	0020	Setting of H. limit of SV limiter	SLH	
	002100 ~ 002115	0021	Select PV start or SV start	PSV	
	002200 ~ 002215	0022	SV start setting value	SVS	
	002300 ~ 002315	0023	Select Start at Power ON	PON	
	002400 ~ 002415	0024	Event Output 1 function	DO1	
	002500 ~ 002515	0025	PV Event Output 1 function	A1F	
	002600 ~ 002615	0026	Event Output 1 Low limit	A1L	
	002700 ~ 002715	0027	Event Output 1 High limit	A1H	
	002800 ~ 002815	0028	Event Output 1 sensitivity	A1C	
	002900 ~ 002915	0029	Time signal 1 Output mode	TF1	
	003000 ~ 003015	0030	Time signal 1 ON time	ON1	
	003100 ~ 003115	0031	Time signal 1 OFF time	OF1	
	003200 ~ 003215	0032	Event output 1 unusual looping time	LT1	
	003300 ~ 003315	0033	Event Output 2 function	DO2	
	003400 ~ 003415	0034	PV Event Output 2 function	A2F	
	003500 ~ 003515	0035	Event Output 2 Low limit	A2L	

Device	Bit Address	Word Address	Controller Setting Item	Identifier	Other
300-	003600 ~ 003615	0036	Event Output 2 High limit	A2H	
	003700 ~ 003715	0037	Event Output 2 sensitivity	A2C	
	003800 ~ 003815	0038	Time signal 2 Output mode	TF2	
	003900 ~ 003915	0039	Time signal 2 ON time	ON2	
	004000 ~ 004015	0040	Time signal 2 OFF time	OF2	
	004100 ~ 004115	0041	Event output 2 unusual looping time	LT2	
	004200 ~ 004215	0042	Key lock function	LOC	
	004300 ~ 004315	0043	Output condition monitor	OM1	
	004400 ~ 004415	0044	[Low temperature] Proportional	□P1	
	004500 ~ 004515	0045	[Low temperature] Integrated time	□I1	
	004600 ~ 004615	0046	[Low temperature] Differential time	□D1	
	004700 ~ 004715	0047	Middle point 1 setting	PM1	
	004800 ~ 004815	0048	[Middle temperature] Proportional	□P2	
	004900 ~ 004915	0049	[Middle temperature] Integrated	□I2	
	005000 ~ 005015	0050	[Middle temperature] Differential	□D2	
	005100 ~ 005115	0051	Middle point 2 setting	PM2	
	005200 ~ 005215	0052	[High temperature] Proportional	□P3	
	005300 ~ 005315	0053	[High temperature] Integrated time	□I3	
	005400 ~ 005415	0054	[High temperature] Differential time	□D3	
	005500 ~ 005515	0055	Proportional Cycle	□□T	
	005600 ~ 005615	0056	Fuzzy constant	FUZ	
	005700 ~ 005715	0057	Control sensitivity to [Low temperature]	□C1	
	005800 ~ 005815	0058	Control sensitivity to [Middle temperature]	□C2	
	005900 ~ 005915	0059	Control sensitivity to [High temperature]	□C3	
	006000 ~ 006015	0060	Auto-tuning setting value of [High temperature]	AT1	
	006100 ~ 006115	0061	Auto-tuning setting value of [Middle temperature]	AT2	
	006200 ~ 006215	0062	Auto-tuning setting value of [High temperature]	AT3	
	————————	0063	Auto-tuning execution of [Low temperature]	AP1	Bit 5
	————————	0064	Auto-tuning execution of [Middle temperature]	AP2	Bit 5
	————————	0065	Auto-tuning execution of [High temperature]	AP3	Bit 5
	————————	0066	Auto-tuning execution of [Low]->[Middle]->[High] temperature	AP4	Bit 5
	006700 ~ 006715	0067	Auto-tuning under execution	ATR	

1 When using identifiers from SSV to SOF with a TTM-300 series unit, use the Device Name as the identifier, and the Step No. and Pattern No. as the address. The maximum values available for the pattern number and the step number that can be set on a GP/GLC are 20 and 47, respectively. Specify them as shown below.

Ex.)

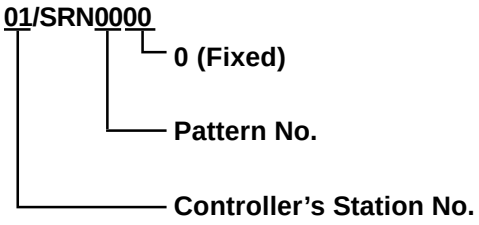
Device	Bit Address	Word Address	Control Setting Item	Identifier
SSV	000000 ~ 204715	0000 ~ 2047	Step Temperature Setting	SSV



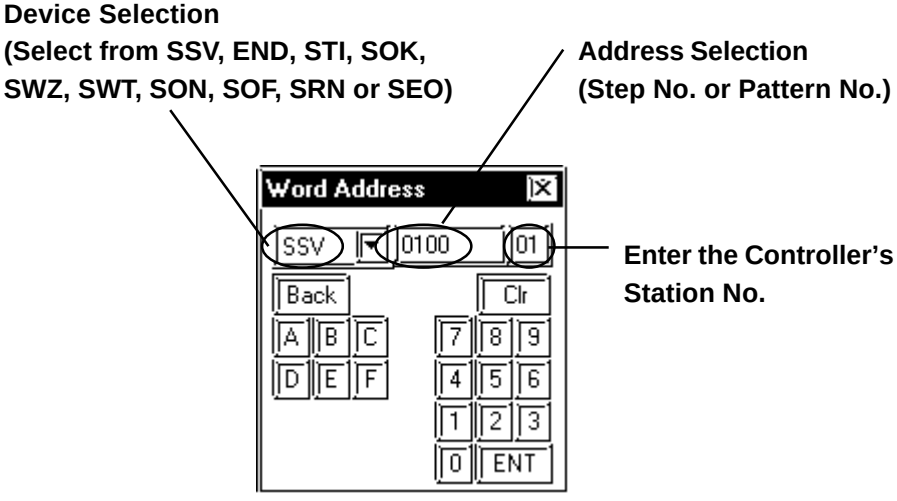
2 When using identifier SRN or SEO with the TTM-300 series unit, use the Device Name as the identifier, and the Step No. and Pattern No. as the address. The maximum values available for the pattern number and the step number that can be set on a GP/GLC is 20, respectively. Specify them as shown below.

Ex.)

Device	Bit Address	Word Address	Controller Setting Item	Identifier
SRN	000000 ~ 200015	0000 ~ 2000	Excution Time	SRN



*When entering addresses for identifiers SSV to SEO with a TTM-300 series unit, be sure to refer *1 or *2 above.*



■ TTM-1020 Series(TTM-1520, 1521, 1522, 1523, 1524, 1525, 1920, 1921, 1922, 1923, 1924, 1925)

Device	Bit Address	Word Address	Controller Setting Item	Identifier	Other
1020_	000000 ~ 000015	0000	Process Value (PV)	PV1	
	000100 ~ 000115	0001	CH No.	□CH	
	000200 ~ 000215	0002	Control Setting Value (SV)	□SV	
	000300 ~ 000315	0003	SV1	SV1	
	000400 ~ 000415	0004	Set/Select of Auto/Manual	MD1	
	000500 ~ 000515	0005	Set/Select of Remote/Local	REM	
	000600 ~ 000615	0006	Main Control MV (Out 1)	MV1	
	000700 ~ 000715	0007	Main Control MV (Out 2)	MV2	
	000800 ~ 000815	0008	Auto-Tuning Start/Release	□AT	
	000900 ~ 000915	0009	SV2	SV2	
	001000 ~ 001015	0010	SV3	SV3	
	001100 ~ 001115	0011	SV4	SV4	
	001200 ~ 001215	0012	SV5	SV5	
	001300 ~ 001315	0013	SV6	SV6	
	001400 ~ 001415	0014	SV7	SV7	
	001500 ~ 001515	0015	SV8	SV8	
	001600 ~ 001615	0016	Set/Select of Input/Output Type	□IO	
	001700 ~ 001715	0017	Setting of Sensor Value Correction	PVS	
	001800 ~ 001815	0018	Decimal Point Position	□DP	
	001900 ~ 001915	0019	Selection of C/F	□CF	
	002000 ~ 002015	0020	Setting of L. Limit of SV Limiter	SLL	
	002100 ~ 002115	0021	Setting of H.Limit of SV Limiter	SLH	
	002200 ~ 002215	0022	Setting of Lock Function	LOC	
	002300 ~ 002315	0023	Control Action Select	CNT	
	002400 ~ 002415	0024	Proportional band	□P1	
	002500 ~ 002515	0025	Integrated time	□I1	
	002600 ~ 002615	0026	Differential time	□D1	
	002700 ~ 002715	0027	Output 1 P-cycle Time	□T1	
	002800 ~ 002815	0028	Control sensitivity	□C1	
	002900 ~ 002915	0029	Manual Reset Value	PBB	
	003000 ~ 003015	0030	Setting of L. Limit for Out 1 MV Limiter	MLL	
	003100 ~ 003115	0031	Setting of H. Limit for Out 1 MV Limiter	MLH	
	003200 ~ 003215	0032	Setting for unusual	FAL	
	003300 ~ 003315	0033	Cooling P-band	PC1	
	003400 ~ 003415	0034	Cooling P-cycle time	TC1	
	003500 ~ 003515	0035	Cooling Sensitivity	CC1	
	003600 ~ 003615	0036	Dead Band	DB1	
	003700 ~ 003715	0037	Setting of L limit of cooling output	MCL	
	003800 ~ 003815	0038	Setting of H limit of cooling output	MCH	
	003900 ~ 003915	0039	L limit of cascade scaling	CSL	

Device	Bit Address	Word Address	Controll Setting Item	Identifier	Other
1020_	004000 ~ 004015	0040	H limit of cascade scalling	CSH	
	004100 ~ 004115	0041	Event 1 Function	EV1	
	004200 ~ 004215	0042	PV Event 1 Function	P1F	
	004300 ~ 004315	0043	PV Event 1 Low Limit	P1L	
	004400 ~ 004415	0044	PV Event 1 High Limit	P1H	
	004500 ~ 004500	0045	DI 1 Function	D1F	
	004600 ~ 004615	0046	Event 2 Function	EV2	
	004700 ~ 004715	0047	PV Event 2 Function	P2F	
	004800 ~ 004815	0048	PV Event 2 Low Limit	P2L	
	004900 ~ 004915	0049	PV Event 2 High Limit	P2H	
	005000 ~ 005015	0050	DI2 Function	D2F	
	005100 ~ 005115	0051	Event 3 Function	EV3	
	005200 ~ 005215	0052	PV Event 3 function	P3F	
	005300 ~ 005315	0053	PV Event 3 Low Limit	P3L	
	005400 ~ 005415	0054	PV Event 3 Hight Limit	P3H	
	005500 ~ 005515	0055	DI3 Function	D3F	
	005600 ~ 005615	0056	Event 4 Function	EV4	
	005700 ~ 005715	0057	PV Event 4 Function	P4F	
	005800 ~ 005815	0058	PV Event 4 Low Limit	P4L	
	005900 ~ 005915	0059	PV Event 4 High Limit	P4H	
	006000 ~ 006015	0060	DI4 Function	D4F	
	006100 ~ 006115	0061	Evet 5 Function	EV5	
	006200 ~ 006215	0062	PV Event 5 Function	P5F	
	006300 ~ 006315	0063	PV Event 5 Low Limit	P5L	
	006400 ~ 006415	0064	PV Event 5 High Limit	P5H	
	006500 ~ 006515	0065	DI5 Function	D5F	
	006600 ~ 006615	0066	Selection of Data Transmission 1 Function	TR1	
	006700 ~ 006715	0067	L limit of transmission 1 scalling	T1L	
	006800 ~ 006815	0068	H limit of transmission 2 scalling	T1H	
	006900 ~ 006915	0069	Selection of Data Transmission 2 Function	TR2	
	007000 ~ 007015	0070	L limit of transmission 2 scalling	T2L	
	007100 ~ 007115	0071	H limit of transmission 2 scalling	T2H	
	007200 ~ 007215	0072	Close feedback resistance control	CLS	
	007300 ~ 007315	0073	Open feedback resistance controll	OPN	
	007400 ~ 007415	0074	quota of function	FNC	
	007500 ~ 007515	0075	Output State Monitor	OM1	
	007600 ~ 007615	0076	Event condition monitor	EM1	
	————————	0077	Data Store	STR	Bit 15

12.8.4 Environment Setup

The following table lists the recommended Controller and GP/GLC communication settings.

GP/GLC Settings		Controller Settings	
Baud Rate	9600 bps	Baud Rate	9600 bps
Data Length	8 bit	Data Length	8 bit
Stop Bit	2 bit	Stop Bit	2 bit
Parity Bit	None	Parity Bit	None
Data Flow Control	ER	————	————
Communication Format (using RS-422) *1	RS-422 (2-line)	————	————
Communication Format (using RS-232C) *1	RS-232C	————	————
Unit No. *2	1 to 32	Communication Unit No.	1 to 32
————	————	Mode Setting *3	Communication Mode
————	————	Mode Setting *4	Read/Write

**1 Controller cannot switch the Communication Format. When purchasing the Controller, select either an RS-422 or RS-232C.*

**2 Although the settable range for a machine number on the temperature controllers is 1 to 99, the range for GP/GLC is 1 to 32.*

**3 This setting is required for models other than the TTM-004/X04 series. When you perform communication between the Controller and GP/GLC, be sure to set your Controller to Data Transfer mode.*

**4 This setting is required only for the TTM-004/X04 series. When the Controller is set to read-only, rewritable devices will become read-only.*

12.8.5 Error Code

Controller error codes are displayed by the " Host Communication Error (02:**:##)", and indicated in the left lower corner of the GP/GLC screen ** indicates the Controller's error code, and ## indicates the number of the Controller unit.

Error Code	Error Message	Meaning
00	Flat of the instrument (Memory error or A/D conversion error)	———
01	Numeric data out of "the setting range respectively specified in each of setting items".	Data written to an arbitrary device is out of the range for writing.
02	Change of an item prohibited, or no item to be read out.	No device exists in the address specified for the temperature controller connected to GLC or GP. Or, data was written to the specified device, even though that device is write protected.
03	An ASCII code other than the numeric data is specified in the place. Or, an ASCII code other than "0" or "-" is specified in the place for the sign.	———
04	Format error	The format of the command from the GP/GLC is incorrect due to noise, etc.
05	BCC error	The format of commands sent from GP/GLC is erroneous due to noise or the like.
06	Overrun error	———
07	Framing error	Machine Numbers for temperature controllers are overlapping. Or, the format of commands sent from GP/GLC is erroneous due to noise or the like.
08	Parity error	The current Data Transfer Parity setting is incorrect. Or, the format of commands sent from GP/GLC is erroneous due to noise or the like.
09	Trouble has happened on PV in process of AT. Or, AT does not be finalized in 3 hours.	———

Careful! *Depending on the specification of the Controller, if two errors occur at the same time, the larger error number will be displayed.*

Reference *For more details about error codes, refer to the TOHO ELECTRONICS INC.'s COMMUNICATIONS FUNCTION Instructon Manual.*


MEMO

12.9 Fenwal Controllers

12.9.1 System Structure

This section describes the system structure in which the temperature controller made by Fenwal and the GP/GLC are connected.

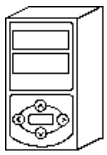
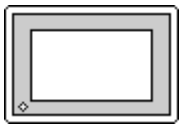
Important

- ***The GP/GLC data area ranging from LS0 through LS19 (20 words) cannot be allocated to the data area available for control and measurement. Even if the system area is set for this using GP-PRO/PBIII or when the GP/GLC is offline, this allocation is not possible.***
- ***Read Area Information:***

  The GC, GA, and GP devices specified at the first address of the system area are exclusively for reads. When they are used as read areas, take care not to write data to those areas. Otherwise, a host communication error (02:FA) will be generated.

■ AL series

◆1:1 connection

Temperature controller	Cable Diagram	GP/GLC
		
AL24R-□□□-□□□-□□□*1*2	RS-422 <Cable Diagram1 >	GP Series GLC Series
	RS-422 (1:n communication) <Cable Diagram2 >	

**1 The "□ " indicates that that temperature controller model number varies depending upon the options specified. For further model information, refer to the AL series catalog.*

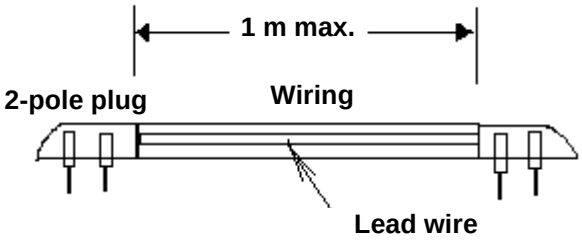
**2 The production number of the temperature controller should be 02010023 or later and the serial number 0204 or later.*

12.9.2 Cable Diagram

The following cable diagram may differ from the one recommended by Fenwal. However, using this cable diagram will not cause any problems.

Important

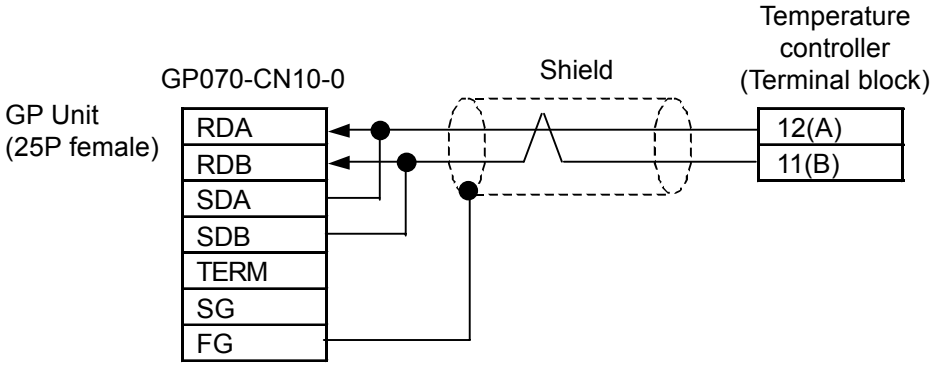
- ***Use a communication cable conforming to IEEE485.***
- ***For multi-drop connections, the wiring unit (model AL-W) made by Fenwal can be used for the transition wiring for RS-485 communication. The length of the wiring can be from 57 mm to 1 m.***



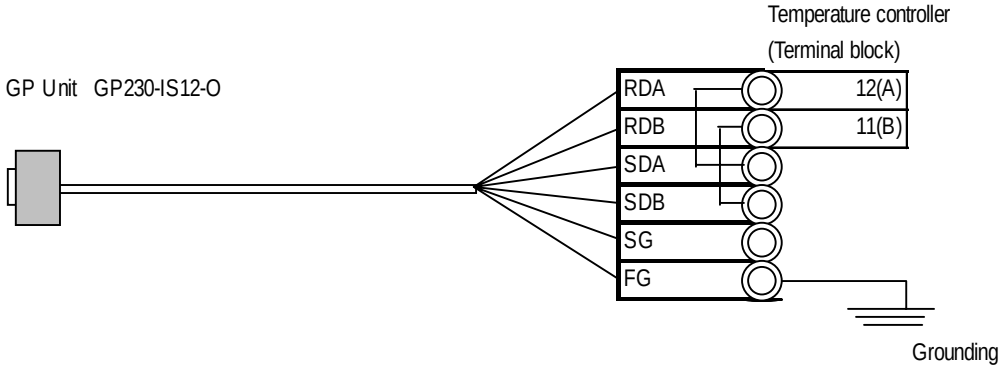
- ***The maximum transmission distance is 600 m.***
- ***The FG of the GP-GLC should be grounded according to your country's specifications.***
- ***No terminating resistor is required for a temperature controller connected to a terminator.***

Cable Diagram 1 1:1 RS-422 2-wire type

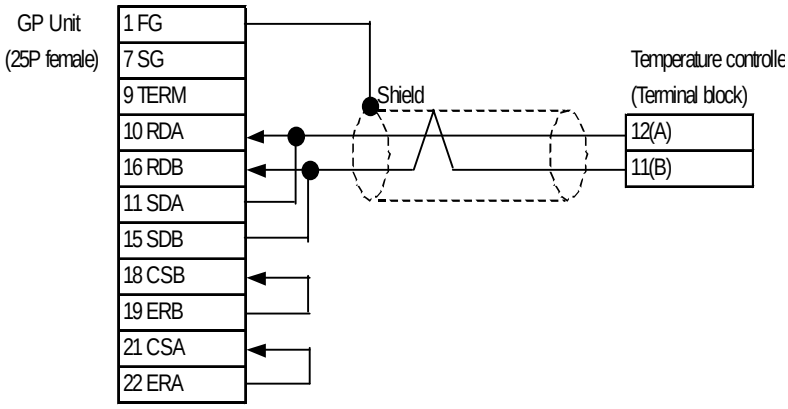
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When using Digital's RS-422 cable, GP230-IS12-O

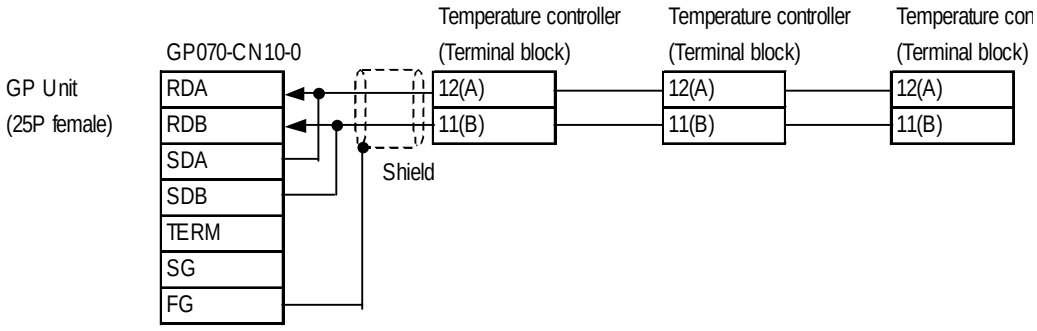


• When making your own cable connections

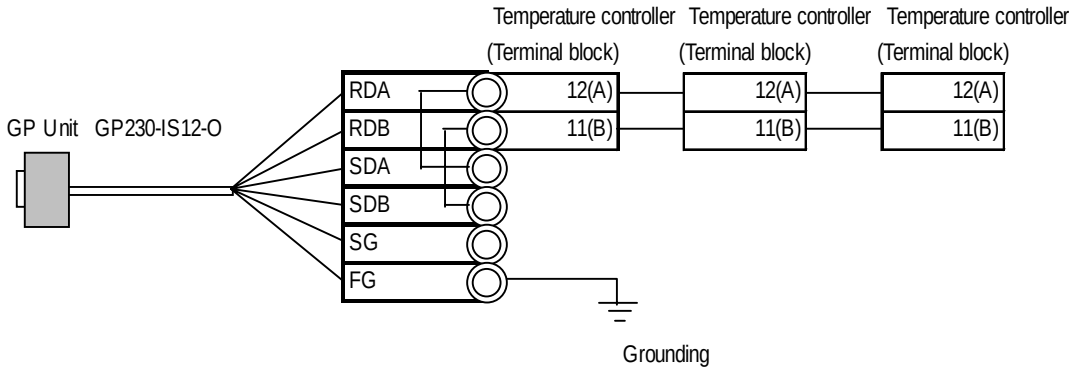


Cable Diagram 2 1:n RS-422 2-wire type

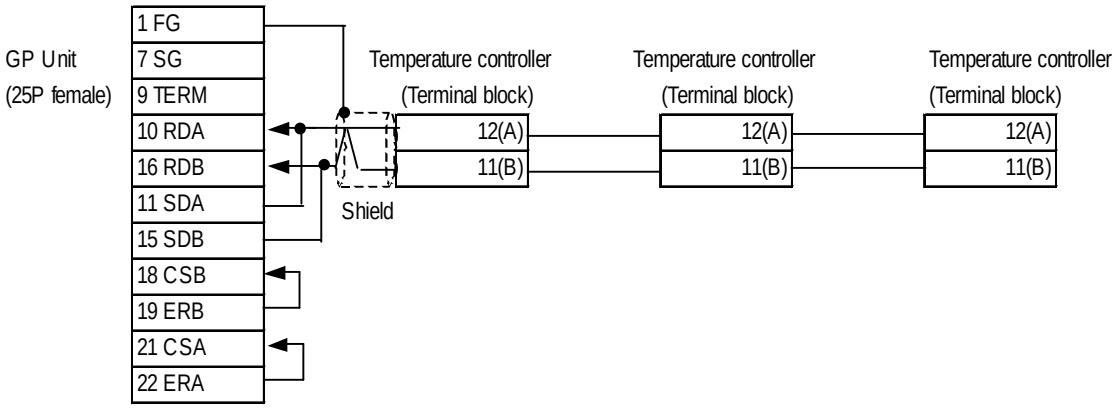
• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When using Digital's RS-422 cable, GP230-IS12-O



• When making your own cable connections



12.9.3 Supported Devices

The following table describes the range of devices supported by the GP/GLC.

■ AL series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input signal	——	IN1	Bit 15	H/L
Decimal place in linear input	——	UN1	Bit 15	
With or without IRr/c 2-point correction	——	IR1	Bit 15	
Control mode	——	CM1	Bit 15	
Filter constant	——	FS1	Bit 15	
Control LED illumination direction	——	OD1	Bit 15	
Control output direction	——	OA1	Bit 15	
Burnout direction	——	BO1	Bit 15	
Output limit method	——	LT1	Bit 15	
Warning type	——	AK1	Bit 15	
Warning 1: Alarm warning code	——	HA1	Bit 15	
Warning 1: Temperature warning code	——	A11	Bit 15	
Warning 2: Temperature warning code	——	A21	Bit 15	
Warning 3: Temperature warning code	——	A31	Bit 15	
Warning LED illumination direction	——	LE1	Bit 15	
CT type	——	CT1	Bit 15	
Upper and lower limits of setting range	——	HL1 ~ HL2	Bit 15 *3	
Linear input scaling H and L	——	L1 ~ L2	Bit 15 *3	
Upper and lower output limits	——	OL1 ~ OL2	Bit 15 *3	
Proportional time	——	PT1	Bit 15	
Proportional band	——	PB1	Bit 31 *1	
Integral action time	——	IT1	Bit 31 *1	
Derivative action time	——	DT1	Bit 31 *1	
ARW	——	AR1	Bit 15	
ON/OFF sensitivity	——	DI1	Bit 15	
Manual reset	——	RT1	Bit 15	
Sensor error correction	——	SA1	Bit 15	

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Temperature value before high-point correction for IRr/c 2-point correction value	——	IA1	Bit 15	
Temperature value after high-point correction for IRr/c 2-point correction value	——	IB1	Bit 15	
Temperature value after low-point correction for IRr/c 2-point correction value	——	IC1	Bit 15	
Temperature value after low-point correction for IRr/c 2-point correction value	——	ID1	Bit 15	
Transmission output scaling H and L	——	DS1 ~ DS2	Bit 15 *3	
Setting value for heater breakage current	——	CA1	Bit 15	
Warning sensitivity	——	AD1	Bit 15	
Main temperature setting	——	S1	Bit 15	
Warning 1: 1 point	——	SP1	Bit 31 *1	
Warning 1: Bands H and L	——	SB1 ~ SB2	Bit 31 *1*3	
Warning 2: 1 point	——	DP1	Bit 31 *1	H/L
Warning 2: Bands H and L	——	DB1 ~ DB2	Bit 31 *1*3	
Warning 3: 1 point	——	TP1	Bit 31 *1	
Warning 3: Bands H and L	——	TB1 ~ TB2	Bit 31 *1*3	
Output method	——	OU1	Bit 15 *2	
Number of warnings	——	AN1	Bit 15 *2	
RUN/STOP	——	RS1	Bit 15	
Auto tuning	——	AT1	Bit 15	
Key locking	——	KY1	Bit 15	
Mode locking	——	ML1	Bit 15	
POWER ON/OFF	——	ON1	Bit 15	
Current temperature	——	PV1	Bit 15 *2	
Operation panel	——	MV1	Bit 15 *2	
Temperature control	——	GC1 ~ GC8	Bit 15 *2*3	
Warning	——	GA1 ~ GA8	Bit 15 *2*3	
Panel data	——	GP1 ~ GP8	Bit 15 *2*3	

**1 This indicates a double-word device (all others without this mark are word devices)*

**2 No writes are possible.*

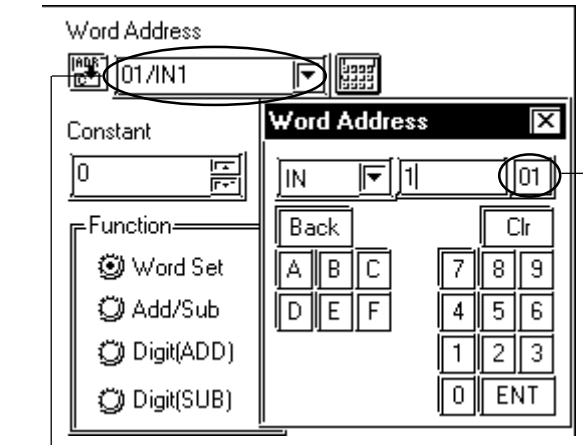
**3 If there are two device address ranges or more, refer to "Detailed List of Data Types for AL series ID Codes" for the definition of each address.*

Detailed List of Data Types for AL Series ID Codes

Item	ID code	Data type
Upper and lower limits of setting range	HL1	Lower limit of setting range
	HL2	Upper limit of setting range
Linear input scaling H and L	L1	Scaling L
	L2	Scaling H
Upper and lower output limits	OL1	Lower output limit
	OL2	Upper output limit
Transmission output scaling H and L	DS1	Scaling L
	DS2	Scaling H
Warning 1: Bands H and L	SB1	Band L
	SB2	Band H
Warning 2: Bands H and L	DB1	Band L
	DB2	Band H
Warning 3: Bands H and L	TB1	Band L
	TB2	Band H
Temperature control	GC1	Setting temperature
	GC2	Current temperature
	GC3	Operation amount
	GC4	Control output current value
	GC5	ON/OFF status of control LED
	GC6	ON/OFF status of control output
	GC7	Reserved
	GC8	Reserved
Warning	GA1	Error number
	GA2	Alarm list
	GA3	1, 2, and 3: ON/OFF status of LED
	GA4	Warnings 1, 2, and 3: ON/OFF status of output
	GA5	Setting value for heater breakage current
	GA6	Heater current value
	GA7	Reserved
	GA8	Reserved
Panel data	GP1	Setting temperature
	GP2	Current temperature
	GP3	ON/OFF status of control LED
	GP4	1, 2, and 3: ON/OFF status of LED
	GP5	Error number
	GP6	Reserved
	GP7	Reserved
	GP8	Reserved

Note:

- **To set up Parts and Tags in GP-PRO/PBIII, specify the unit number of the AL series unit when entering addresses. If no unit number is specified, the last unit number entered is assumed (the default value is 01). See the following:**



Important

- ***About the GP/GLC system data area***

  The GP/GLC system data area from LS0 to LS19 (20 words) cannot be allocated to the data area available for the temperature controller. Even if this system area is set up using GP-PRO/PBIII or when the GP/GLC is offline, this allocation is not possible.

- ***About the read area:***

  The GC, GA, and GP devices that may be specified at the first address of the system area are exclusively for reads. When they are used as read areas, take care not to write data to those areas. Otherwise, a host communication error (02:FA) will be generated.

12.9.4 Environment Setup

The following table lists Digital's recommended temperature controller and GP/GLC communication setup.

■ AL series

GP Setup		Temperature Controller Setup	
Baud Rate	19200 bps (fixed)	———	
Data Length	8 bits (fixed)	———	
Stop Bit	2 bits (fixed)	———	
Parity Bit	Even (fixed)	———	
Data Flow Control	ER Control (fixed)	———	
Communication Format	2-wire type	———	
Unit No.	1	Communication Address	01 *1

**1 Specify the communication address of the temperature controller from 01 to 31.*

Procedure: Select AdrS from Setup Parameter Display and then enter the desired 2-digit number (e.g., 01 for number 1).

12.9.5 Error Codes

<Temperature controller error codes>

The following lists error codes supported by the temperature controllers.

Each error message will display as "host communication error (02:**:##)" in the lower left corner of GP/GLC screen. "**" stands for an error code specific to the temperature controller and "##" the temperature controller number where the error has occurred.

Error code	Description	Details
01	The specified value is out of the range.	The data written with a write tag is out of the range specified for the temperature controller.
02	The setting is invalid.	The GP has tried to read or write when the specified device is invalid. Example: When the ON/OFF control is selected, the devices related to the PID control become invalid.
03	The execution is not possible.	When the temperature control is under special processing, any write for status change is not possible. This error code appears if the GP tries any write in the above state. Example: During the auto tuning of the PID control, any write for status change is not possible.

For the details of error codes, refer to the Communication Production Specification of Temperature Controller for AL Users by Fenwal.


MEMO

13 Inverters

This chapter shows examples of system configuration, supported devices and environment setup used when connecting the inverters to the GP.

Important

If communication is halted due to signal cable breakage, GP/GLC fault etc., the inverter does not detect such a fault.

13.1 Connectable Inverters

The following inverters can be connected to the GP.

Company	Series	Inverter *1	Link I/F or CPU direct connection	PLC Name in Pro/PB III
Mitsubishi Electric Corp.	FREQROL-A500	FR-A520-□K FR-A540-□K		MITSUBISHI FREQROL SERIES
	FREQROL-A500L	FR-A520L-□K FR-A540L-□K		
	FREQROL-E500	FR-E520-□K FR-E540-□K FR-E520S-□K FR-E510W-□K		
	FREQROL-F500	FR-F520-□K FR-F540-□K		
	FREQROL-F500L	FR-F520L-□K FR-F540L-□K		
	FREQROL-S500	FR-S510W-□K-R FR-S520-□K-R FR-S520S-□K-R		
	FREQROL-B,B3	FR-B-□K FR-B3-□□□K		
Fuji Electric Co., Ltd.	FRENICS5000G11S	FRN□□G11S-2		FUJI INVERTER
		FRN□□G11S-4		
	FRENICS5000P11S	FRN□□P11S-2		
		FRN□□P11S-4		
	FVR-E11S	FVR□□□E11S-2		
		FVR□□□E11S-7		
	FVR-C11S	FVR□□□C11S-2	Option OPC-C11S-RS□ *2	
		FVR□□□C11S-6		
		FVR□□□C11S-7		

**1 The "□□□" characters in the inverter model codes reflect available options.*

**2 The "□" character in the option card model code reflects the classification of the card type (either A, B, or C) according to this series inverter capacities.*

Company	Series	Inverter *1	Link I/F or CPU direct connection	PLC Name in Pro/PB III
Yaskawa	Varispeed G7/F7	CIMA-G7A□□□□ CIMA-F7A□□□□	Communication Connector on Inverter	Yaskawa Inverter
	VS mini V7/J7	CIMA-V7□A□□□□	Communication Connector on Inverter	
		CIMA-J7□A□□□□	RS-422/RS-485	

**1 The "□□□" characters in the inverter model codes reflect available options.*

13.2 Mitsubishi Electric Inverters

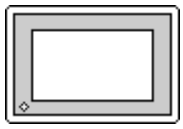
13.2.1 System Structure

The following table describes the system structure for connecting the Mitsubishi Electric inverters to the GP.

Important

If communication is halted due to signal cable breakage, GP/GLC fault etc., the inverter does not detet such a fault. Use its Communication retry or Communication check to diagnose the problem and prevent an accident.

■ FREQROL-A500 Series

Inverter	Cable Diagram	GP
		
FR-A520-□K FR-A540-□K	RS-422 (4-wire) (Cable Diagram 1)	GP or GLC Series
	RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	

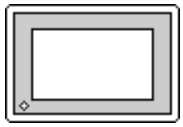
"□" indicates the capacity of each inverter.

■ FREQROL-A500L Series

Inverter	Cable Diagram	GP
		
FR-A520L-□K FR-A540L-□K	RS-422 (4-wire) (Cable Diagram 1)	GP or GLC Series
	RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	

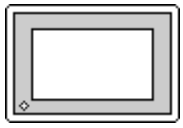
"□" indicates the capacity of each inverter.

■ FREQROL-E500 Series

Inverter	Cable Diagram	GP
		
FR-E520-□K FR-E540-□K FR-E520S-□K FR-E510W-□K	RS-422 (4-wire) (Cable Diagram 1) RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	GP or GLC Series

"□" indicates the capacity of each inverter.

■ FREQROL-F500 Series

Inverter	Cable Diagram	GP
		
FR-F520-□K FR-F540-□K	RS-422 (4-wire) (Cable Diagram 1) RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	GP or GLC Series

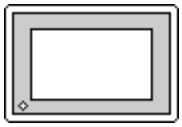
"□" indicates the capacity of each inverter.

■ FREQROL-F500L Series

Inverter	Cable Diagram	GP
		
FR-F520L-□K FR-F540L-□K	RS-422 (4-wire) (Cable Diagram 1) RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	GP or GLC Series

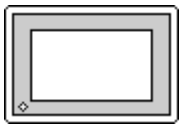
"□" indicates the capacity of each inverter.

■ FREQROL-S500 Series

Inverter	Cable Diagram	GP
		
FR-S520-☐K FR-S520S-☐K FR-S510W-☐K	RS-422 (4-wire) (Cable Diagram 1)	GP or GLC Series
	RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	

"☐" indicates the capacity of each inverter.

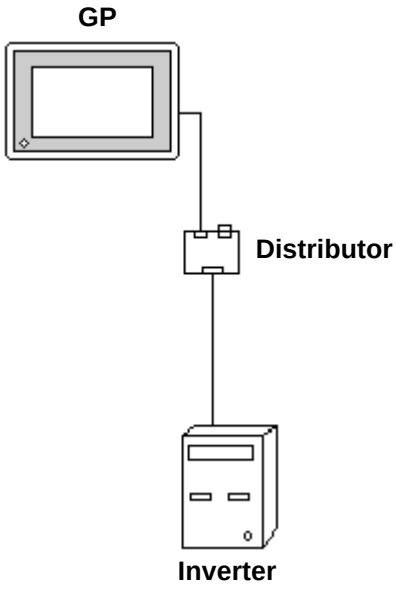
■ FREQROL-B/B3 Series

Inverter	Cable Diagram	GP
		
FR-B-☐K FR-B3-☐☐☐K	RS-422 (4-wire) (Cable Diagram 1)	GP or GLC Series
	RS-422 (4-wire, 1:n communication) (Cable Diagram 2)	

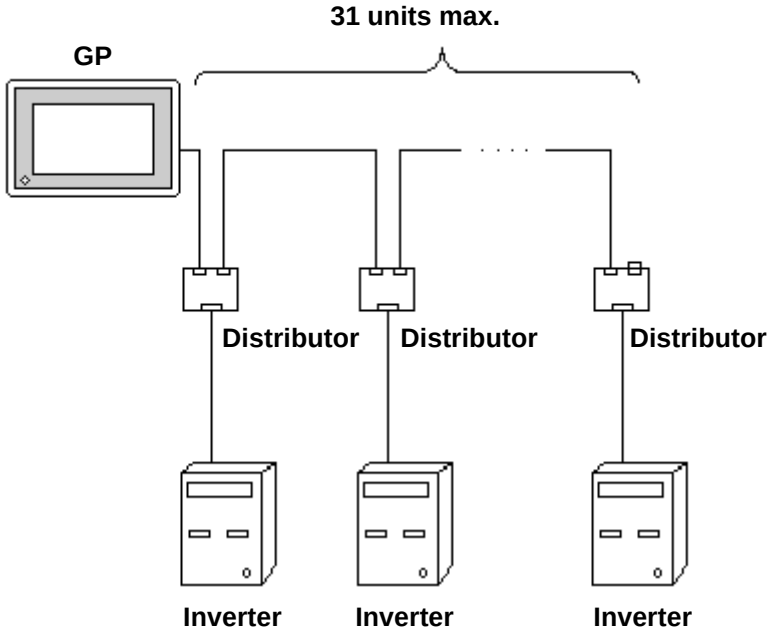
"☐" indicates the capacity of each inverter.

◆ **Connections**

- 1:1 connection



- 1:n connection



13.2.2 Cable Diagrams

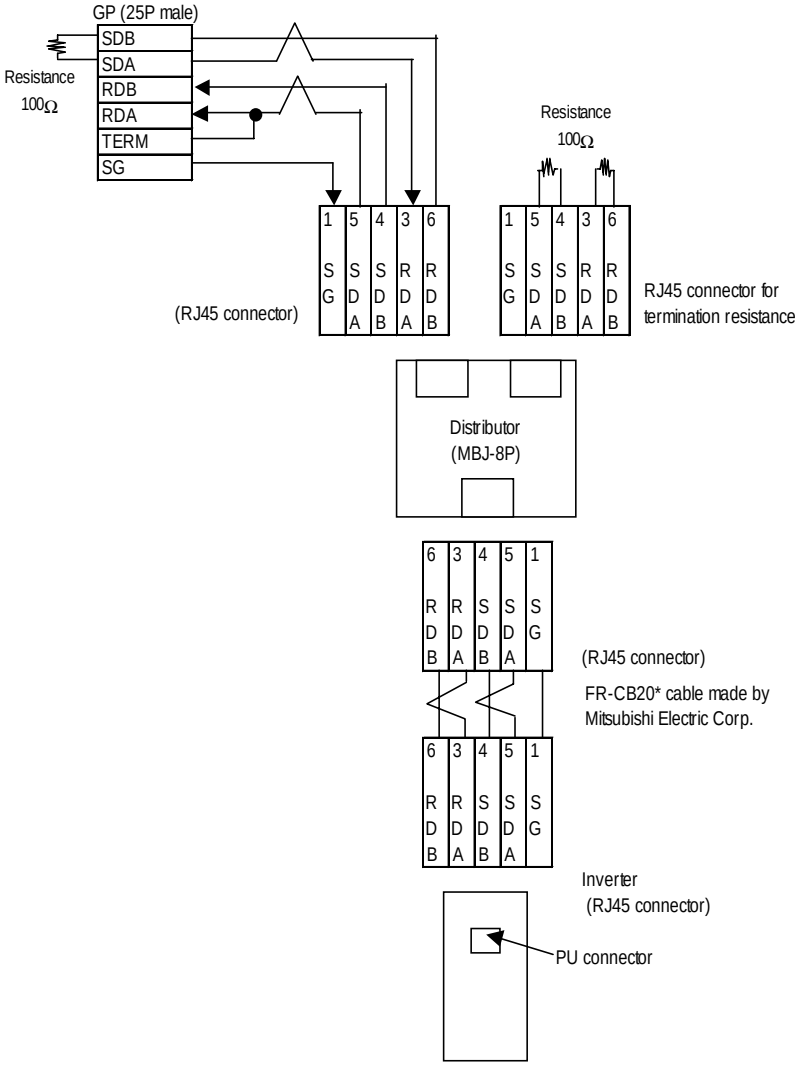
Recommended Cables

For connection of the GLC/GP and Mitsubishi Electric inverters, the following cables and cable manufcturers are recommended:

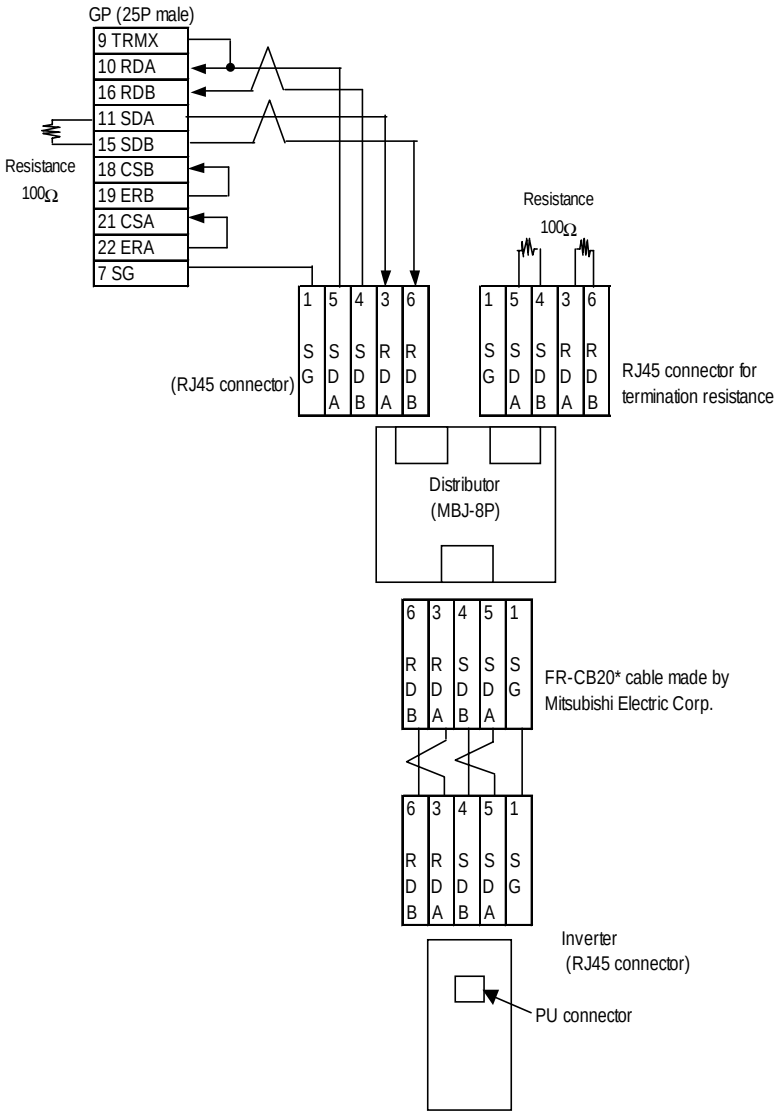
No.	Item	Model Code	Company	Remark
1	Cable (commercial type)	FR-CB201 (1m)	Mitsubishi Electric Corporation	Used between inverters
2		FR-CB203 (3m)	Mitsubishi Electric Corporation	Used between inverters
3		FR-CB205 (5m)	Mitsubishi Electric Corporation	Used between inverters
4	Wires	SGLPEV 0.5mm×4P	Mitsubishi Electric Corporation	
5	RJ45 connector	5-554720-3	Tyco Electronics AMP K.K.	
6	RS-485 distributor (commercial type)	MBJ-8	Hakko Electric Machine Works Co., Ltd.	Without termination resistance
		MBJ-8P		With termination resistance

Cable Diagram 1

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

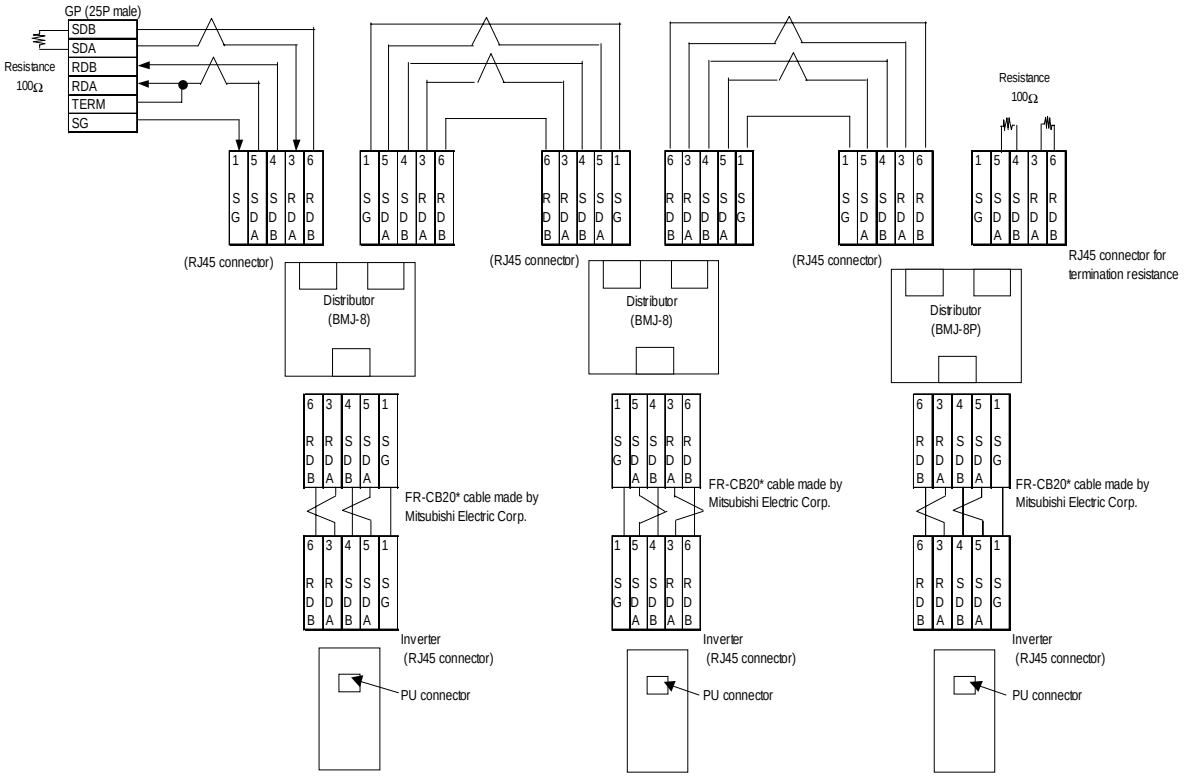


<When making your own cable>

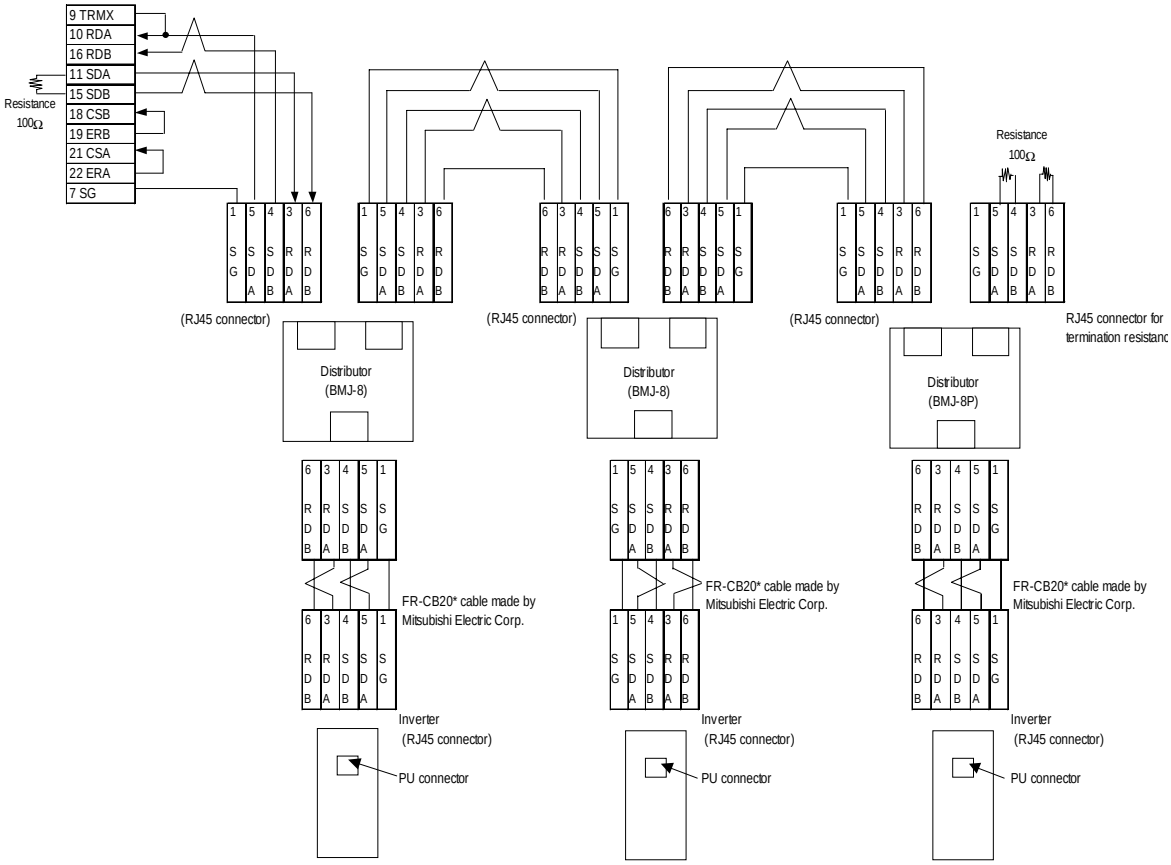


Cable Diagram 2

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When making your own cable>



13.2.3 Supported Devices

Device	Bit Addresses	Word Addresses	Remarks	
Parameter (except for Pr. 37 of FREQROL-S500 and FREQROL-E500)	000000 ~ 99315	0000 ~ 0993	*1	*3
Parameter (Pr.37 of FREQROL-S500 and FREQROL-E500)	P003700 ~ P003731	P0037	*2 *4	H/L
Operation mode	OPE000 ~ OPE015	OPE0		*3
Output frequency (rpm)	OUTF000 ~ OUTF015	OUTF0	*5	H/L
Output current	OUTC000 ~ OUTC015	OUTC0	*5	
Output voltage	OUTV000 ~ OUTV015	OUTV0	*5	
Special monitor	SPM000 ~ SPM015	SPM0	*5	
Special monitor selection no.	SSEL000 ~ SSEL015	SSEL0		
Output frequency	SOF000 ~ SOF015	SOF0	*5	
Output current	SOC000 ~ SOC015	SOC0	*5	
Output voltage	SOV000 ~ SOV015	SOV0	*5	
Set frequency value	FSET000 ~ FSET015	FSET0	*5	
Run speed	RUNS000 ~ RUNS015	RUNS0	*5	
Motor torque	MOT000 ~ MOT015	MOT0	*5	
Regenerative brake	RBRK000 ~ RBRK015	RBRK0	*5	
Electronic thermal load factor	ELOF000 ~ ELOF015	ELOF0	*5	
Output current peak value	OCPV000 ~ OCPV015	OCPV0	*5	
Converter output voltage peak value	COPK000 ~ COPK015	COPK0	*5	
Input power	IPOW000 ~ IPOW015	IPOW0	*5	
Output power	OPOW000 ~ OPOW015	OPOW0	*5	
Alarm (latest Nos. 1 & 2)	A12D000 ~ A12D015	A12D0	*5	H/L
Alarm (latest Nos. 3 & 4)	A34D000 ~ A34D015	A34D0	*5	
Alarm (latest Nos. 5 & 6)	A56D000 ~ A56D015	A56D0	*5	
Alarm (latest Nos. 7 & 8)	A78D000 ~ A78D015	A78D0	*5	
Run command	RUNC000 ~ RUNC015	RUNC0		
Inverter status monitor	INVS000 ~ INVS015	INVS0		
Run frequency write (E^2PROM)	RWRT000 ~ RWRT015	RWRT0	*6	
Set frequency write (RAM and E^2PROM)	SFWE000 ~ SFWE015	SFWE0	*6	
Set frequency write (only RAM)	SFWR000 ~ SFWR015	SFWR0	*6	
Set frequency read (E^2PROM)	SFRE000 ~ SFRE015	SFRE0	*5	
Set frequency read (RAM)	SFRR000 ~ SFRR015	SFRR0	*5	
Error all clear	ERCL000 ~ ERCL015	ERCL0	*6*7	
Inverter reset	RSET000 ~ RSET015	RSET0	*6*7	
Parameter all clear	ALLC000 ~ ALLC015	ALLC0	*6*7	
User clear	ALLC000 ~ ALLC015	ALLC0	*6*7	
Extended Setup of Link Parameters	LNKP000 ~ LNKP015	LNKP0		
Second Parameter Selection	SECP000 ~ SECP015	SECP0		

**1 For the detailed information about the parameters, refer to Mitsubishi Electric's multi-purpose inverter manuals.*

**2 For the parameter 37 of FREQROL-S500 and E500, specify "P0037" has the device.*

**3 This device cannot be used as 32-bit data.*

**4 This is a 32-bit device.*

**5 No data can be written.*

**6 Only for data write. When performing read out, use the each device corresponding to read out.*

**7 For the data to be written, refer to the instruction manuals for various models of Mitsubishi general-purpose inverters (e.g., User Clear H9669).*

- ***The following tables show the relations between data codes and settings as given in the instruction manuals for the above applicable devices and inverters.***

[Parameter read/write]

Address

Function	Parameter Number	Name	Data Code		
			Read	Write	Extended Set Value for Link Parameter (Data Code: 7F/FF)
Basic Functions	0	Torque boost	00	80	0
	1	Upper Frequency Limit	01	81	0
	2	Lower Frequency Limit	02	82	0
	3	Base Frequency	03	83	0

:

[Devices Other Than Parameters]

Select an applicable device from the supported device list.

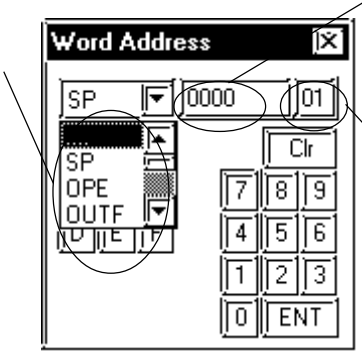
No.	Item		Command Code	Details of Data	Number of Data Digits
1	Run Mode	Read	H7B	H0000: Communication Option Operation H0001: External Operation H0002: Communication Operation (PU Connector)	4 digits
		Write	HFB	H0000: Communication Option Operation H0001: External Operation H0002: Communication Operation (PU Connector)	
2	Monitor	Output Frequency [rpm]	H6F	H0000 to HFFFF: Output Frequency (Hexadecimal) Unit: 0.01 Hz	4 digits

:

Device Input Method

The device address input method on the GP screen creation software is described below:

Device
To read/write parameters, select "...." or "SP".



Address
For a parameter, enter the parameter number. For a P-device, the address is fixed to 0037. In other cases, the address is fixed to 0.

Inverter unit No.

Important

- ***As shown in the following table, you may need to enter "9999" (meaning an invalid parameter setting or the like) depending upon the parameter types. In this case, the data written and read from the GLC/GP is as follows:***

No.	Inverter Model	Inverter Setting	Written Data	Read Data
1	Other than FR-S500	9999	-1 (0xFFFF)	-1 (0xFFFF)
2		8888	-16 (0xFFF0)	-16 (0xFFF0)
3	FR-S500	———	-1 (0xFFFF)	-1 (0xFFFF)
4		888	-16 (0xFFF0)	-16 (0xFFF0)

- ***The system area (20 words) on the GP/GLC unit cannot be used. When the GP/GLC unit is offline, or when using the screen editor software, it seems that the data is being entered and used normally. However, even if the system area is selected, it will remain disabled.***

13.2.4 Environment Setup

The following tables show Digital's recommended Mitsubishi Electric inverter communication settings and their corresponding settings on the GP.

GP/GLC Settings		Inverter Settings	
Baud Rate	19200bps	Baud Rate	19200bps
Data Length	8bit	Data Length	8bit
Stop Bit	2bit	Stop Bit	2bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	———	———
Communication Format When using RS-422	RS-422 (4-wire)	———	———
Unit No.*1	0 ~ 31	Unit No.	0 ~ 31

■ Setting Method

Use the inverter's front keys to enter communication settings.

Use parameters 117 to 124 for the inverter communication settings, as follows:

No.	Parameter No.	Name	Inverter Setting Range
1	117	Station number	0 ~ 31
2	118	Communication Speed	48…4800bps 96…9600bps 192…1920bps
3	119	Stop bit length/Data length	0…8/1 1…8/2 10…7/1 11…7/2
4	120	Parity check Presence/Absence	0: OFF 1: Even 2: Odd
5	121	Number of communication retries	0 ~ 10,9999 or --- *1
6	122	Communication check time internal	except 0 *2
7	123	Waiting time settings	9999 or ---
8	124	CR, LF Presence/Absence selection	0: CR/LF OFF 1: CR ON 2: CR/LF ON

**1 Depending on the environment, change the setting range.*

**2 Depending on the environment, set any number except 0.*

13.2.5 Error Codes

<Error Codes Specific to Inverters>

The following error numbers are supported by the inverters. Each error number (format = 02:OO:ΔΔ) will be displayed on the left bottom of the GLC/GP screens. (The "OO" characters reflect an error number displayed on the GLC/GP (shown in the table below) and the "ΔΔ" characters reflect an inverter unit number where the error occurs.)

Reference *Mitsubishi Electric Corporation; Each inverter series' Operation Manual*

Error No.	Error Name	Causes
00	Computer NAK error	———
01	Parity error	The GLC/GP parity settings are incorrect.
02	Sum check error	An error occurred on communication data due to noise, etc.
03	Protocol error	———
04	Flaming error	An error occurred on communication data due to noise, etc., or the stop bit settings are incorrect.
05	Overrun error	———
06	———	———
07	Character error	———
08	———	———
09	———	———
0A	Mode error	Parameter write was attempted when the mode is not the computer link operation mode or while the inverter is operating.
0B	Instruction code error	A non-existent address has been designated during screen creation.
0C	Data range error	When parameter or operation frequency data was written, the designated data was exceeded the correct setting range.
0D	———	———
0E	———	———
0F	———	———

Depending on the inverter specifications, when multiple errors occurred simultaneously, the larger error number will be displayed.

13.3 Fuji Electric Inverters

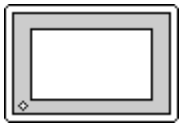
13.3.1 System Structure

The following describes the system configuration used when connecting the Fuji Electric inverters to the GP.

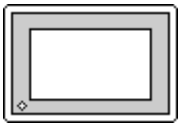
Important

- **If a communication error occurs while the unit is operating via RS-485, a stop command may not be recognized via RS-485. To prevent any accidents, be sure to use the inverter external signal terminal's forced stop function so that emergency stop will always be effective.**
- **If an alarm is reset with a run command sent via RS-485, the unit will suddenly restart. To prevent accidents, be sure to confirm that the run command is no longer being sent anymore.**

■ FRENICS5000G11S Series

Inverter *1	Cable Diagram	GP
		
FRN□□G11S-2 FRN□□G11S-4	RS-485 (1:1) (Cable Diagram 1) RS-485(1:n) (Cable Diagram 2)	GP Series GLC Series

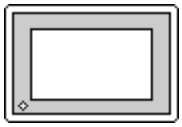
■ FRENICS5000P11S Series

Inverter *1	Cable Diagram	GP
		
FRN□□P11S-2 FRN□□P11S-4	RS-485 (1:1) (Cable Diagram 1) RS-485(1:n) (Cable Diagram 2)	GP Series GLC Series

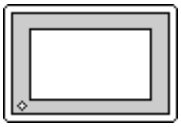
**1 The "□□□" characters in the inverter model codes reflect applicable standard generator capacities.*

**2 The "□" character in the option card model code reflects the classification of the card type (either A, B, or C) according to this series inverter capacities.*

■ FVR-E11S Series

Inverter *1	Cable Diagram	GP
		
FVR□□□E11S-2 FVR□□□E11S-7	RS-485 (1:1) (Cable Diagram 3) RS-485(1:n) (Cable Diagram 4)	GP Series GLC Series

■ FVR-C11S Series (Optional for Communication)

Inverter *1	Communication I/F	Cable Diagram	GP
			
FVR□□□C11S-2 FVR□□□C11S-6 FVR□□□C11S-7	Option: OPC-C11S-RS□ *2	RS-485 (1:1) (Cable Diagram 1) RS-485(1:n) (Cable Diagram 2)	GP Series GLC Series

**1 The "□□□" characters in the inverter model codes reflect applicable standard generator capacities.*

**2 The "□" character in the option card model code reflects the classification of the card type (either A, B, or C) according to this series inverter capacities.*

13.3.2 Cable Diagrams

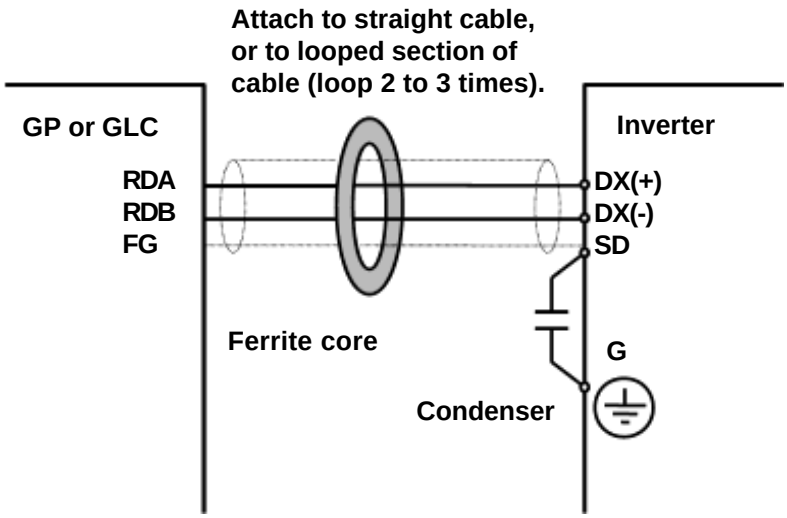
Important

- ***The following cables are recommended:***

  <For G11S, P11S, C11S>
  Furukawa Electric UL AWM2789 1/0.65 mm² long distance braided shield cable

  < For E11S>
  Cable conforming to EIA568 standard (for 10BASE-T), as well as RJ45 connector

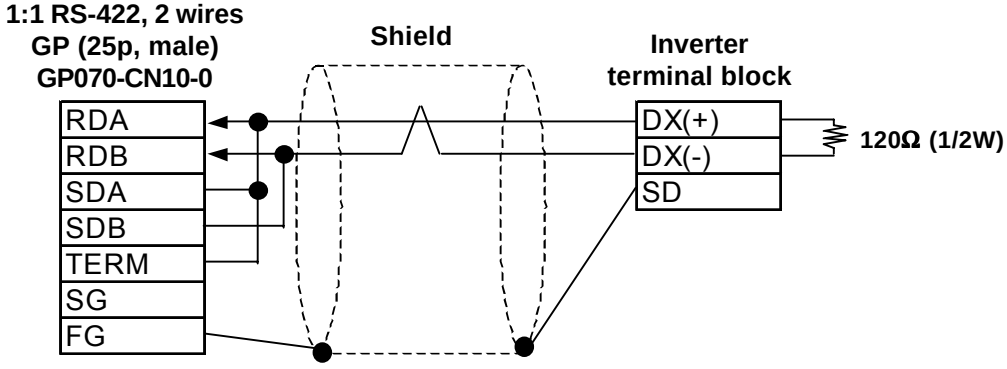
- ***The maximum length of a cable (transmission distance) is 500m.***
- ***Depending on the usage environment, a unit may malfunction due to the noise generated from the inverter. In such a case, connect a ferrite core or condenser to the cable.***



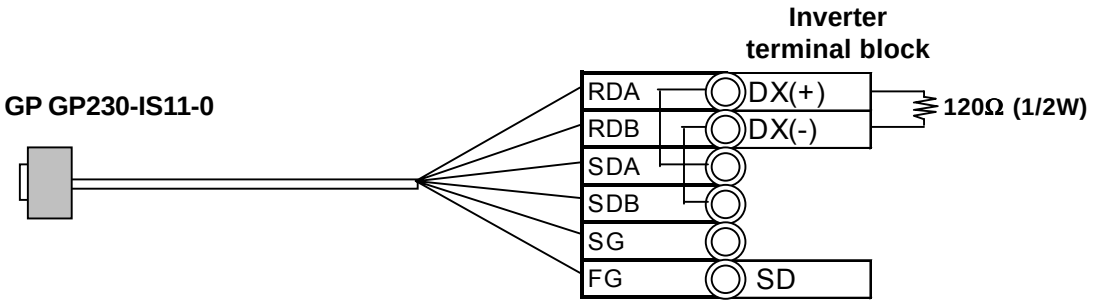
- ***A terminating resistor (100Ω) has been embedded in the E11S. When connecting the inverter to the end of the cable, turn ON SW2 located below the connector.***

Cable Diagram 1 (1:1)

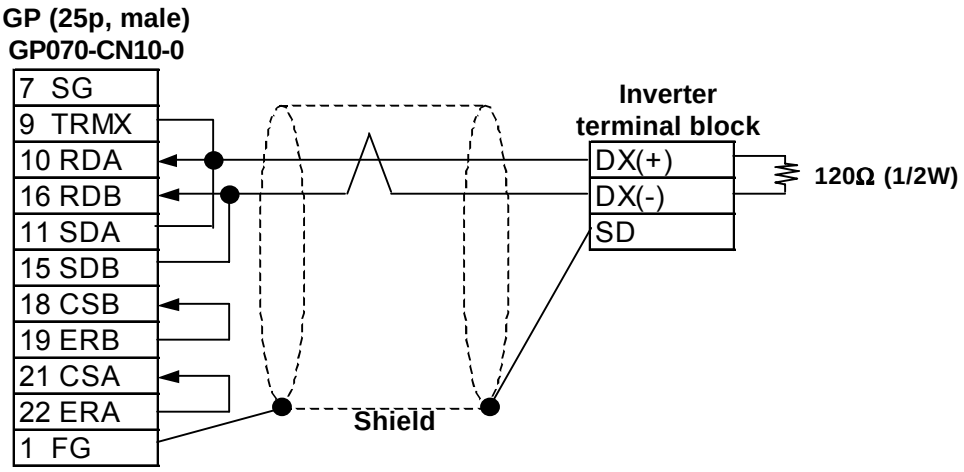
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

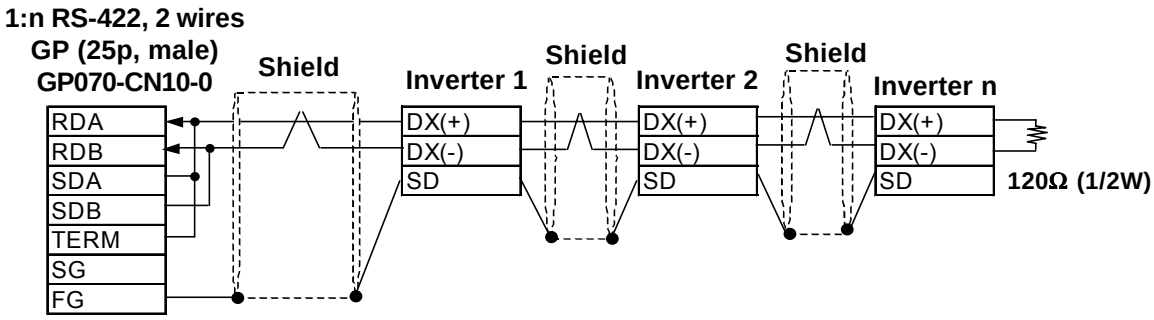


<When making your own cable>

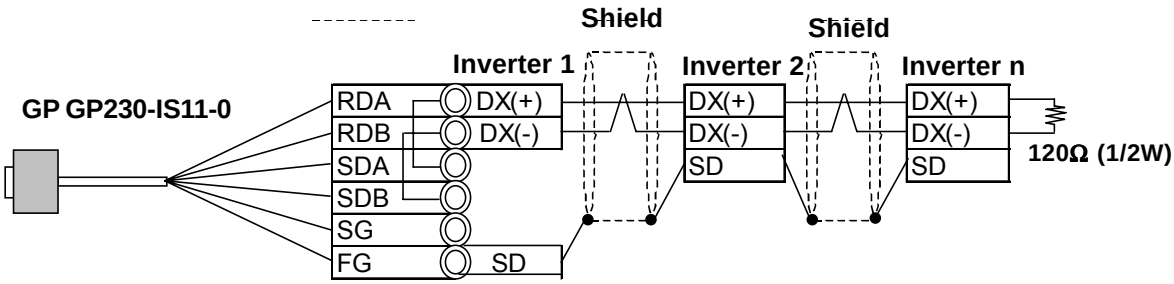


Cable Diagram 2 (1:n)

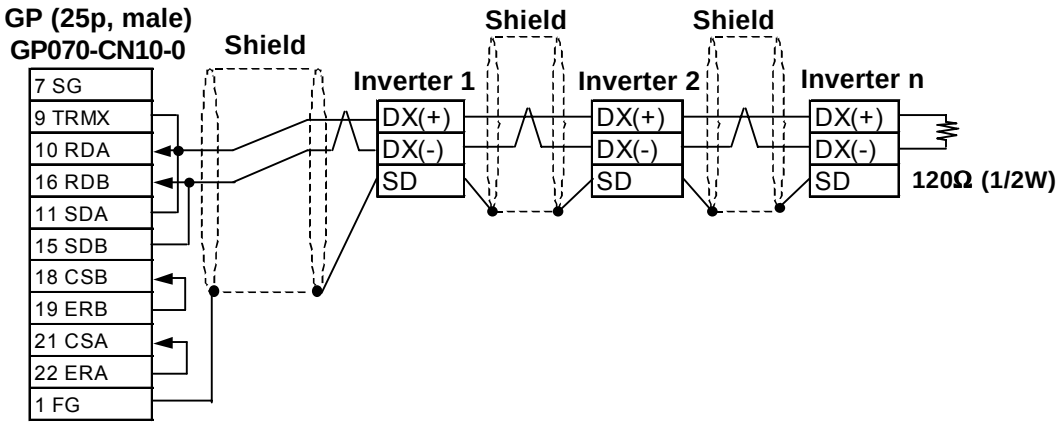
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When making your own cable>

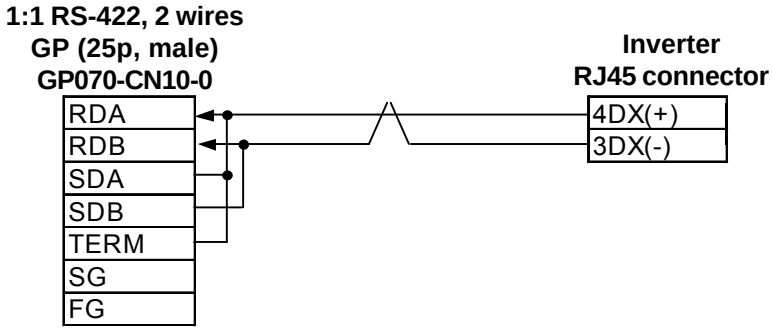


<When making your own cable>

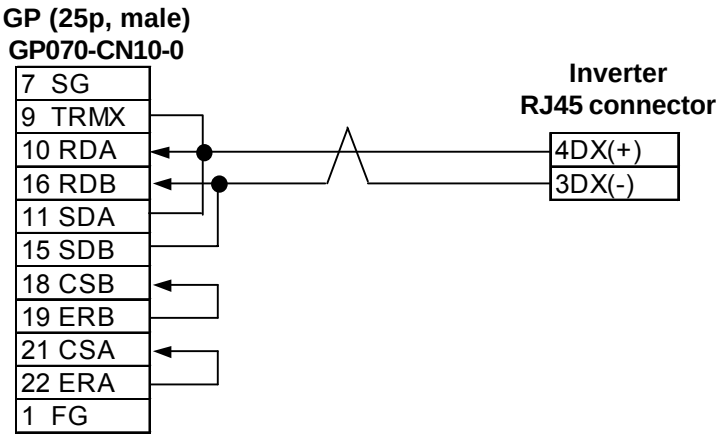


Cable Diagram 3 (1:1)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



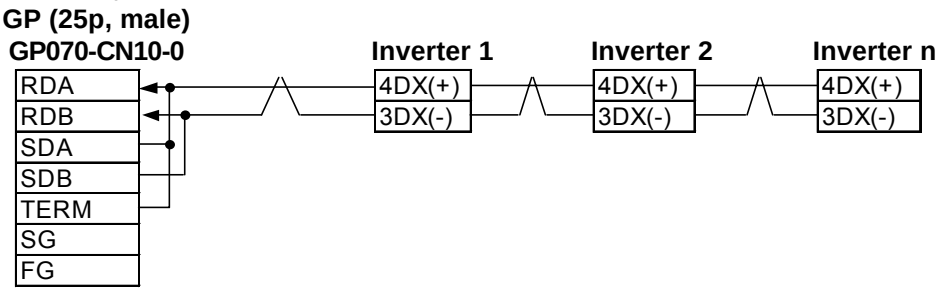
<When making your own cable>



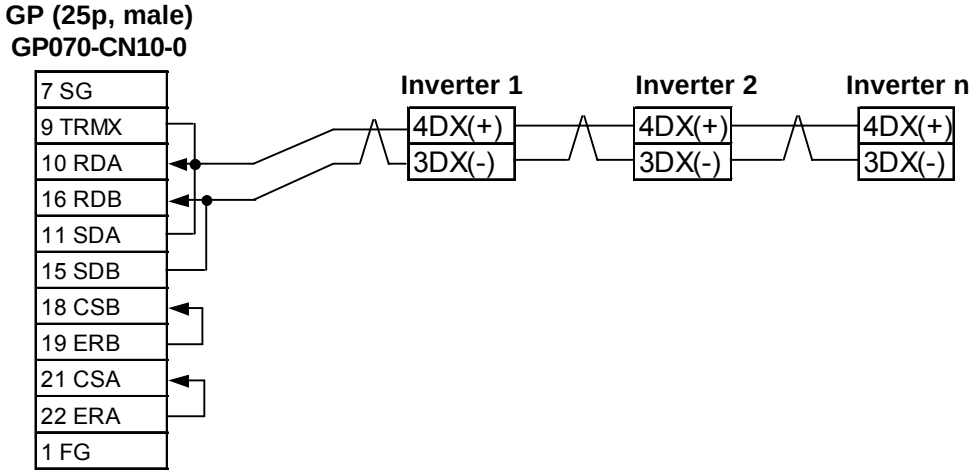
Cable Diagram 4 (1:n)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

1:n RS-422, 2 wires



<When making your own cable>



13.3.3 Supported Devices

■ FRENICS5000G11S/FRENICS5000P11S Series

Device	Bit Addresses	Word Addresses	Remarks	
Basic function	F0000 ~ F4215	F00 ~ F42		L/H
Terminal function	E0100 ~ E4715	E01 ~ E47		
Controlling function	C0100 ~ C3315	C01 ~ C33		
Motor 1	P0100 ~ P0915	P01 ~ P09		
High level function	H0300 ~ H3915	H03 ~ H39		
Motor 2	A0100 ~ A1815	A01 ~ A18		
Option	o0000 ~ o2915	o00 ~ o29		
Command data	S0100 ~ S1115	S01 ~ S11		
Monitor data	M0100 ~ M4815	M01 ~ M48	*1	
Alarm reset	————	m00	*2	————

**1 Data write cannot be performed.*

**2 "m00" is a virtual device and is used to reset the history of alarms occurred on the inverter.*
Writing any data to "m00" will reset the alarm. However, data read cannot be performed.

■ FRENICS5000E11S Series

Device	Bit Addresses	Word Addresses	Remarks	
Basic function	F0000 ~ F4215	F00 ~ F42		L/H
Terminal function	E0100 ~ E4215	E01 ~ E42		
Controlling function	C0100 ~ C3315	C01 ~ C33		
Motor 1	P0100 ~ P1015	P01 ~ P10		
High level function	H0100 ~ H4615	H01 ~ H46		
Motor 2	A0100 ~ A1915	A01 ~ A19		
Command data	S0100 ~ S1115	S01 ~ S11		
Monitor data	M0100 ~ M4815	M01 ~ M48	*1	
Alarm reset	————	m00	*2	————

**1 Data write cannot be performed.*

**2 "m00" is a virtual device and is used to reset the history of alarms occurred on the inverter.*
Writing any data to "m00" will reset the alarm. However, data read cannot be performed.

■ FRENICS5000G11S/FRENICS5000P11S Series

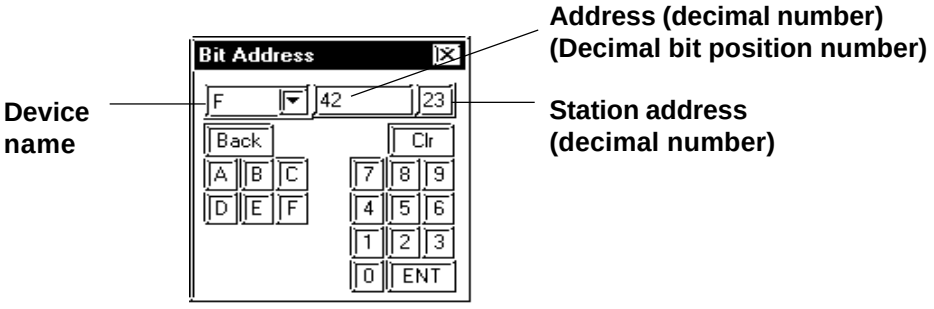
Device	Bit Addresses	Word Addresses	Remarks	
Basic function	F0000 ~ F3615	F00 ~ F36		L/H
Terminal function	E0100 ~ E0315	E01 ~ E03		
Controlling function	C0100 ~ C0715	C01 ~ C07		
Motor 1	P0000 ~ P0015	P00		
High level function	H0100 ~ H2515	H01 ~ H25		
Option	O0000 ~ O1115	o00 ~ o11	*1	
Command data	S05 ~ S06	S05 ~ S06		
Monitor data	M0100 ~ M4815	M01 ~ M48	*1	
Alarm reset	————	m00	*2	————

**1 Data write cannot be performed.*

**2 "m00" is a virtual device and is used to reset the history of alarms occurred on the inverter.*
Writing any data to "m00" will reset the alarm. However, data read cannot be performed.

Caution

- **The system area (20 words) cannot be used. Also, on the GP/GLC offline screens and the screen editor software's system area selection screen, the protocol display and operation will be the same as that which appears when the system area can be used. Even if the system area is selected on these screens, however, it will automatically be designated as not selected.**
- **Depending on the inverter series, supported functions and ranges will vary. For more detailed information, refer to each inverter series' operation manual.**
- **On GP-PRO/PB III, enter the device address and station address as follows:**



13.3.4 Environment Setup

■ FRENICS5000G11S/FRENICS5000P11S Series

GP/GLC Settings		Inverter Settings		Setting Function
Baud Rate	9600bps	Baud rate	9600bps	H34
Data Length	8bit	Data Length	8bit	H35
Stop Bit	2bit	Stop Bit	2bit	H37
Parity Bit	None	Parity Bit	None	H36
Data Flow Control	ER	———	———	———
Communication Format	2-wire type	———	———	———
Station Address	1 ~ 31	Station Address	1 ~ 31	H31

■ FVR-E11S Series

GP/GLC Settings		Inverter Settings		Setting Function
Baud Rate	9600bps	Baud rate	9600bps	H34
Data Length	8bit	Data Length	8bit	H35
Stop Bit	1bit	Stop Bit	1bit	H37
Parity Bit	None	Parity Bit	None	H36
Data Flow Control	ER	———	———	———
Communication Format	2-wire type	———	———	———
Unit No.	1 ~ 31	Station Address	1 ~ 31	H31

■ FVR-C11S Series

GP/GLC Settings		Inverter Settings		Setting Function
Baud Rate	9600bps	Baud rate	9600bps	o04
Data Length	8bit	Data Length	8bit	o05
Stop Bit	2bit	Stop Bit	2bit	o07
Parity Bit	None	Parity Bit	None	o06
Data Flow Control	ER	———	———	———
Communication Format	2-wire type	———	———	———
Unit No.	1 ~ 31	Station Address	1 ~ 31	o01
———	———	Optional selection	1	o00

Caution

- **The FVR-C11S Series requires a communication card (Model: OPC-C11S-RS*). Be sure to set “o00” to 1 to enable the RS-485 communication option.**

13.3.5 Error Codes

<Error Codes Specific to Inverters>

The error codes specific to the inverters will appear on the GP screen's left bottom, as "Host Communication Error (02:**:##)". (The "**" characters indicate an error code specific to the inverter, and the "##" characters indicate the station address of the inverter on which an error occurred.)

■ Error Codes

Error Code	Error Name	Description
4AH	Format error	・ Data transmission request statement characters are incorrect. ・ The last character of the request statement is not in the correct position.
4BH	Command error	・ A non-existent command has been sent.
4CH	Link priority error	・ It was attempted to write command or operation command data, with the link option installed. (When the link option has been installed, the command and operation command data cannot be written via RS-485.)
4DH	No write authorization error	・ It was attempted to write new function data during data write from the link option.
4EH	Function code error	・ A non-existent function code has been requested.
4FH	Write inhibit error	・ It was attempted to write an operation inhibit function or write inhibit during run function while the unit was operating.
50H	Data error	・ Data that has been written was exceeded an effective range.
51H	Write error	・ It was attempted to write new function data during writing another function.

Note:

- **The latest communication error code has been stored in M26.**
- **Alarms occurred on the inverter will have either code numbers M16, M17, M18, or M19.**

  M16: Latest alarm

  M17: Previous alarm

  M18: Alarm before the previous alarm

  M19: Alarm before the two old alarms

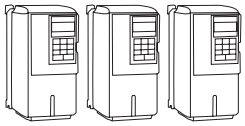
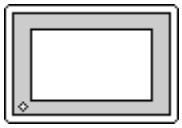
For more detailed information, refer to your inverter's operation manual.

13.4 Yaskawa Inverters

13.4.1 System Structure

This section explains the system structure for the connection between an inverter made by Yaskawa and the GP/GLC.

■ Varispeed G7/F7 Series

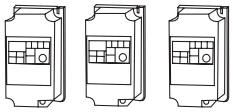
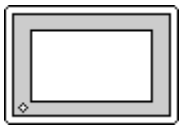
Inverter *1	Link I/F	Cable Diagram	GP/GLC
			
CIMR-G7A□□□□ CIMR-F7A□□□□	Communication connector on inverter	RS-422 (1:1 connection, 4-wire type) <Cable Diagram 1> RS-422 (1:n connection, 4-wire type) <Cable Diagram 2> RS-422 (1:1 connection, 2-wire type) <Cable Diagram 3> RS-422 (1:n connection, 2-wire type) <Cable Diagram 4>	GP Series *2 GLC Series *3

**1 The • in the inverter model differs depending upon the maximum applicable motor capacity.*

**2 This inverter cannot be used with the GP70 series except for the GP377 series.*

**3 This inverter cannot be used with the GLC100 series.*

■ Vs mini V7/J7 Series

Inverter *1	Link I/F	Cable Diagram	GP/GLC
			
CIMR-V7□A□□□□	Communication connector on inverter	RS-422 (1:1 connection, 4-wire type) <Cable Diagram 1> RS-422 (1:n connection, 4-wire type) <Cable Diagram 2>	GP Series *2 GLC Series *3
CIMR-J7□A□□□□	RS-422/RS-485 I/F card (S1-485/J7)	RS-422 (1:1 connection, 2-wire type) <Cable Diagram 3> RS-422 (1:n connection, 2-wire type) <Cable Diagram 4>	

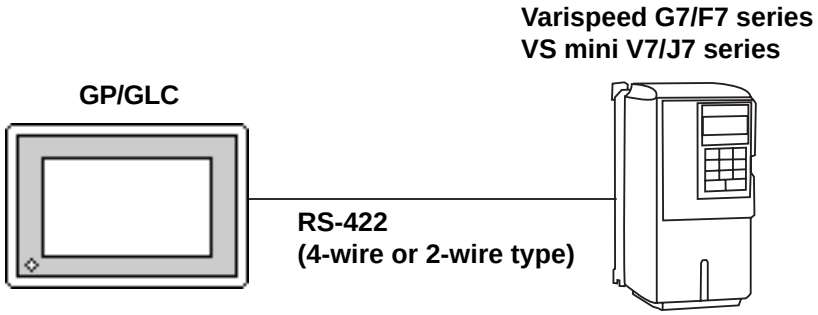
**1 The • in the inverter model differs depending upon the maximum applicable motor capacity.*

**2 This inverter cannot be used with the GP70 series except for the GP377 series.*

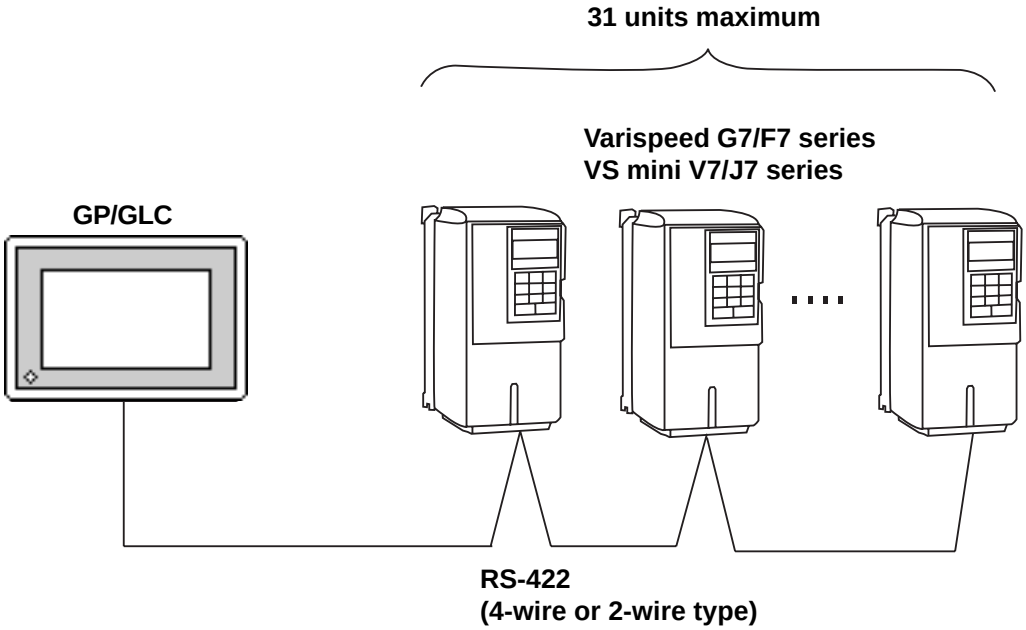
**3 This inverter cannot be used with the GLC100 series.*

■ Connection Structure

◆ 1 : 1 connection



◆ 1 : n connection



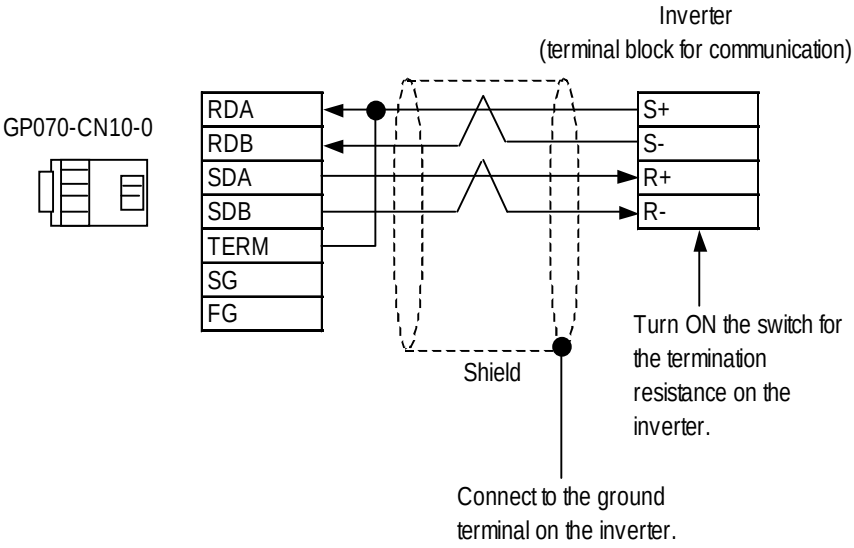
13.4.2 Cable Diagrams

Important

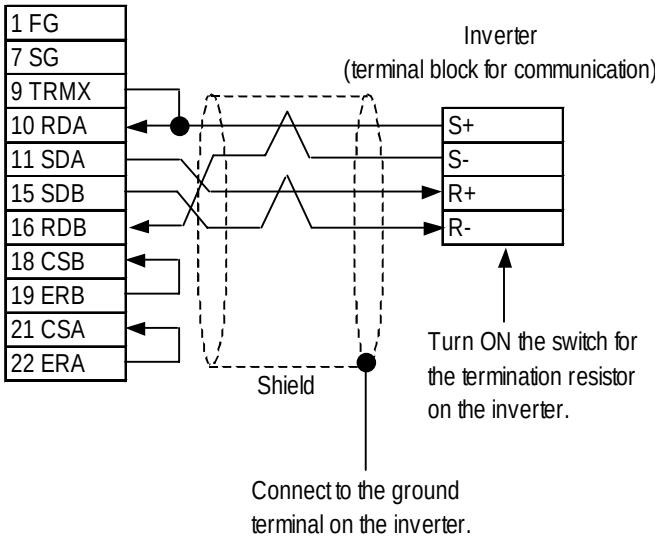
- ***Separate the communication wiring from the main circuit wiring and other power line.***
- ***Ground the FG according to your country's applicable standards.***
- ***When the RS-422 port is used, limit the cable length to 500 meters.***
- ***To connect the shielded cable to the FG, use the ground terminal on the inverter rather than that on the GP.***

Cable Diagram 1 (1:1 RS-422, 4-wire type)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

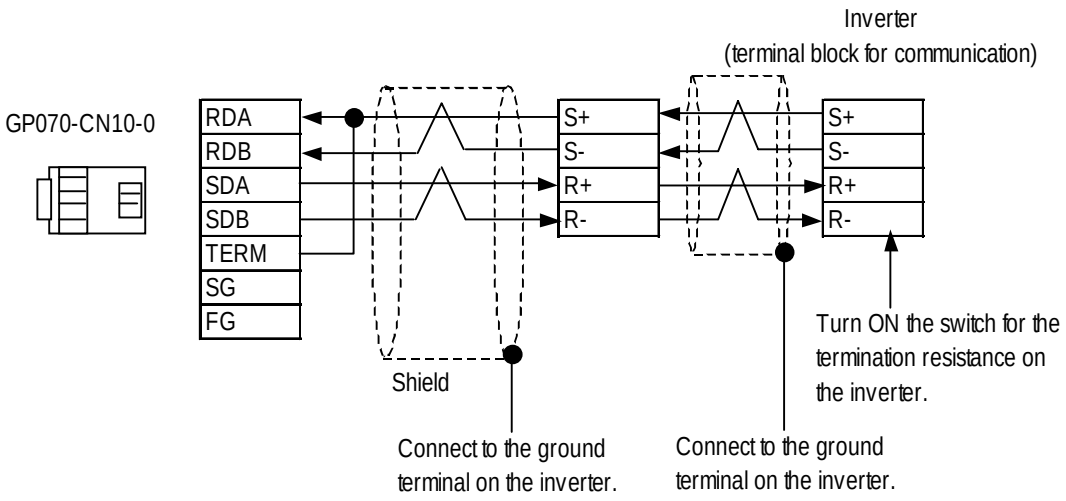


<When making your own connection>

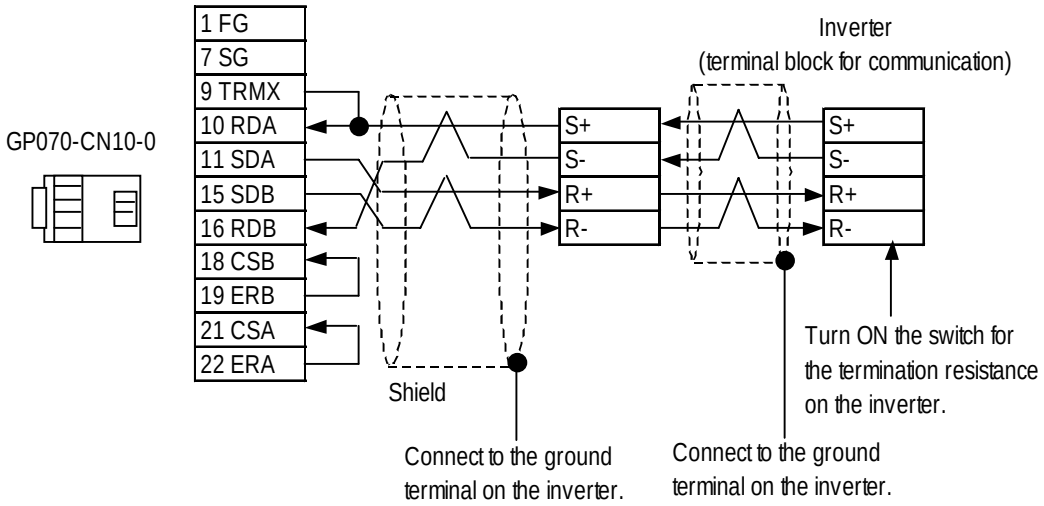


Cable Diagram 2 (1:n RS-422, 4-wire type)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

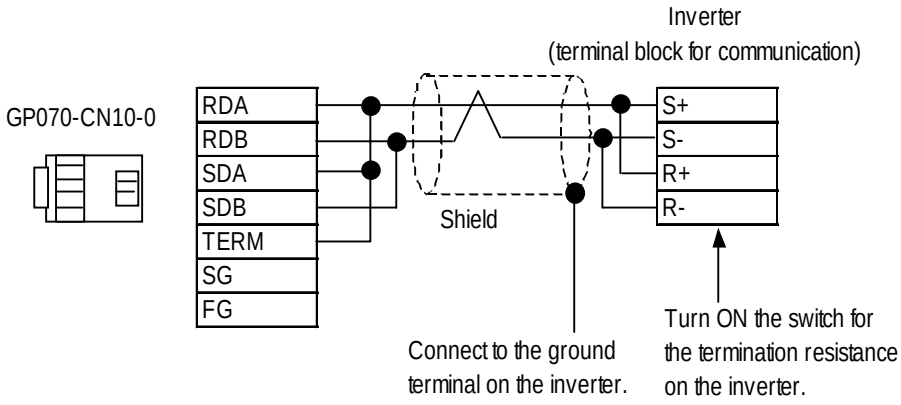


<When making your own connection>

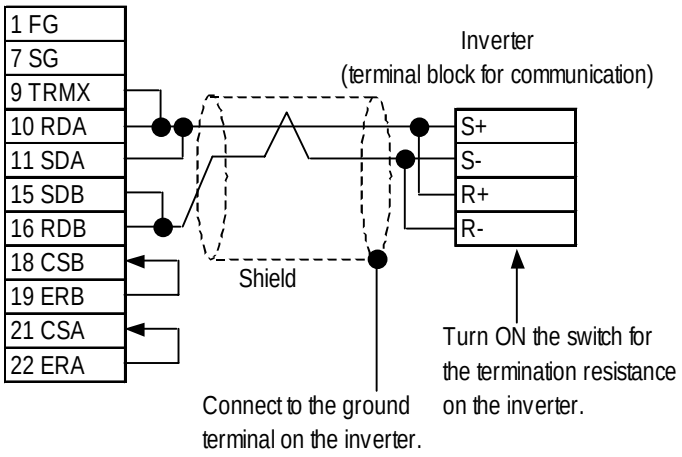


Cable Diagram 3 (1:1 RS-422, 2-wire type)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

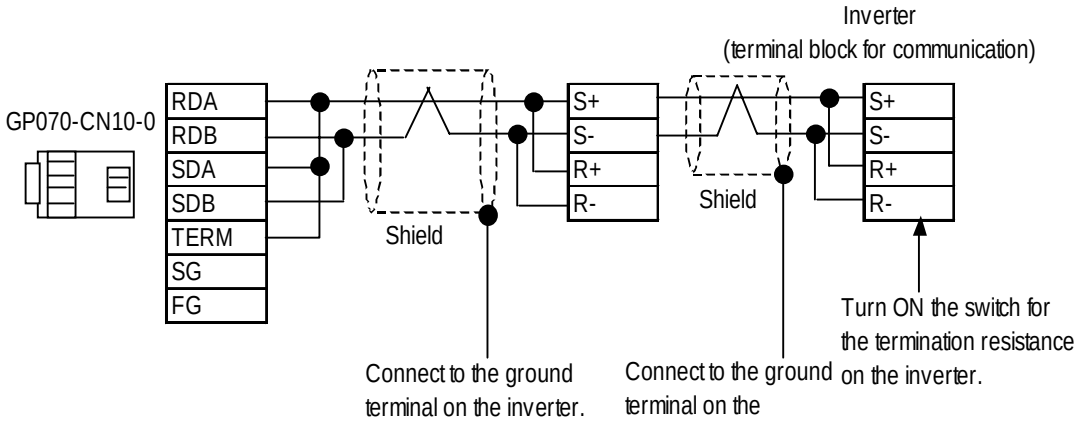


<When making your own connection>

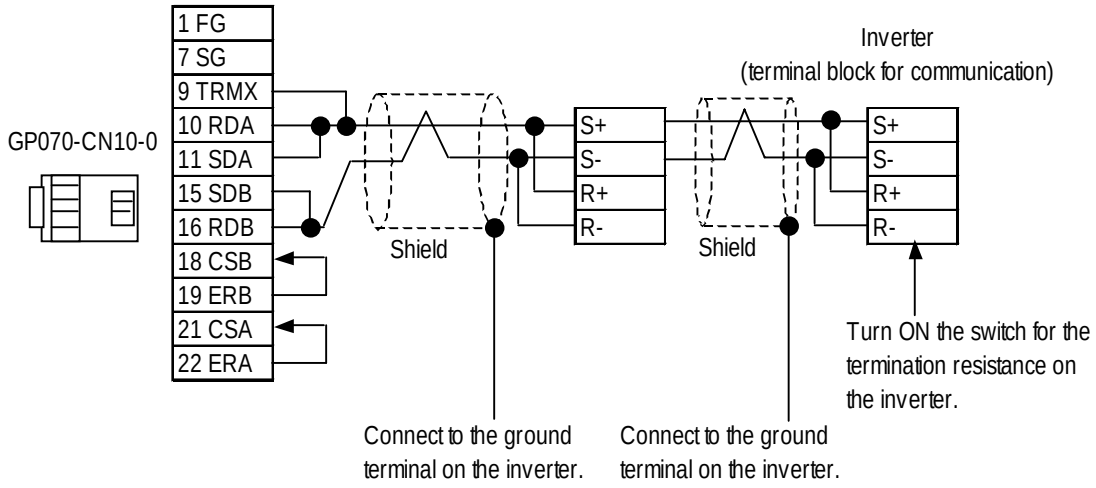


Cable Diagram 4 (1:n RS-422, 2-wire type)

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>



<When making your own connection>



13.4.3 Supported Devices

■ Varispeed G7/F7 Series vs. mini V7/J7 Series

Setup System Area here.

Device	Bit Addresses	Word Addresses	Remarks	
Bit Register	BR00000 ~ BR03FFF	————	*1*2*3*4	L/H
	BR04000 ~ BR07FFF	————		
	BR08000 ~ BR0BFFF	————		
Register	————	0000 ~ 03FF	*1*2 Bit F	
	————	0400 ~ 07FF		
	————	0800 ~ 0BFF		

**1 The available register numbers and the availability of read/write are different depending upon the inverter models. For further information, refer to the instruction manual for each inverter model.*

**2 Specify the MEMOBUS register number indicated in the instruction manual for your inverter. As an example, the correspondence of the constant numbers and names of the inverter to register numbers is shown below. For further information, refer to the instruction manual for each inverter model.*

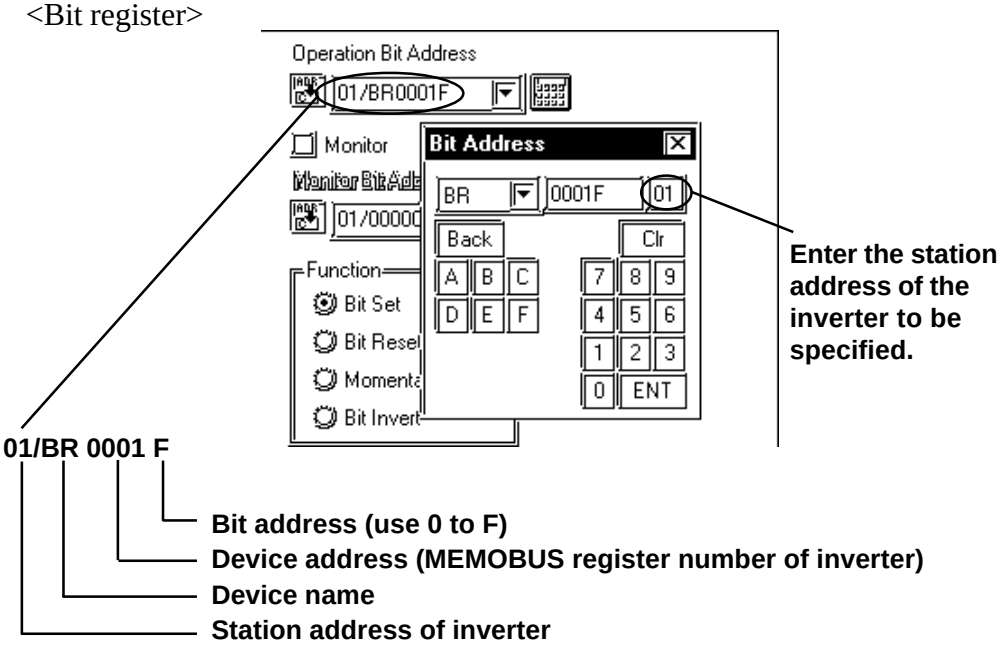
Ex) Inverter Constant Numbers, Names and Register Numbers

Constant No.	Name	Description	Setting Range	Default Value	Change during Operation	Control Mode			MEMOBUS Register
						V/f without PG	V/f with PG	Vector without PG	
A1-02	Selection of Control Mode	Select an inverter control mode. 0: V/f control without PG 1: V/f control with PG 2: Vector control without PG The control mode is not initialized by selecting INITIALIZE.	0 ~ 2	0	x	0	0	0	102H
b1-01	Selection of frequency command	Select a frequency command input method. 0: Digital operator 1: Control circuit terminal (analog input) 2: MEMOBUS communication 3: Optional card 4: Pulse column input	0 ~ 4	1	x	0	0	0	180H

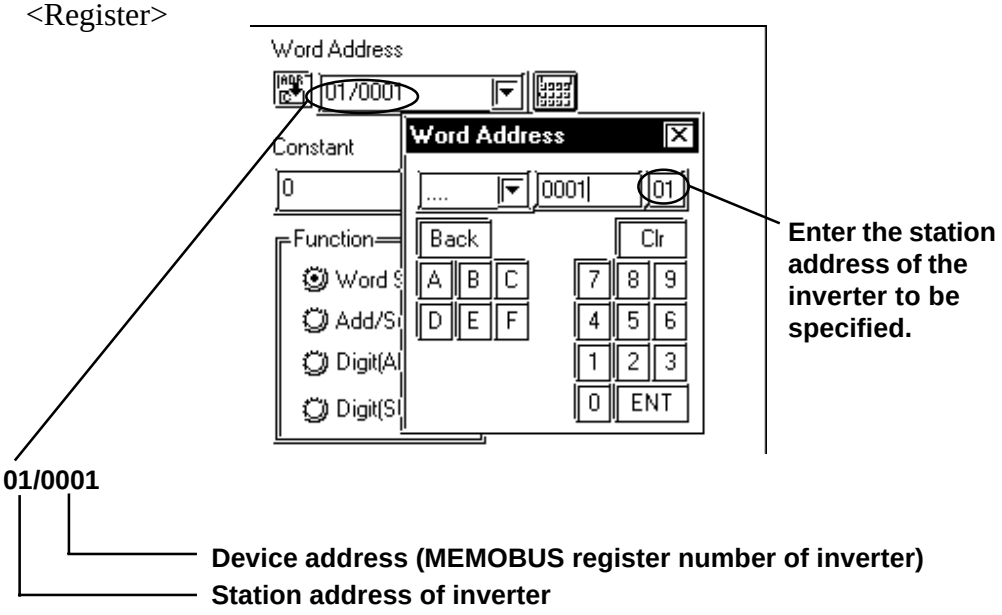
Register No.

Settings on GP-PRO/PBIII for Windows

<Bit register>



<Register>



*3 When data is written, the values other than those for the specified bits of the selected register are retained. (Immediately before data is written, the data on the selected register is temporarily read out, and then written with only the specified bits rewritten.

*4 To write bits to a write-only register, use the register device instead. Trying to write data to a write-only register will result in a host communication error (02:02:##) (## stands for the station address at which the error has occurred). Refer to "15.4.5 Error Codes."

- ***The system data area (20 words) of the GP/GLC cannot be allocated to the data area available on the inverter. Even if the system data area is set using the GP-PRO/PBIII or the offline GP/GLC, this allocation cannot be made. To use the read-in area, specify the first address of the system area.***

13.4.4 Environment Setup

■ Varispeed G7/F7 Series

GP/GLC/LT Settings		Inverter Settings	
Baud Rate	9600bps	Port Transmission Rate	9600bps
Data Length	8bit	Data Length	8 bits (fixed)
Stop Bit	2bit	Stop Bit	1 bit (fixed)
Parity Bit	Even	Parity Bit *1	Even Parity
Control Method	ER Control	RTS Control	Provided
Communication Format	2-wire/4-wire type	————	————
Station No. (DEC)	1	Station Address (HEX)	1 ~ 1F
————		Selection of Frequency Command *2	MEMOBUS Communication
		Selection of Operation Command *3	MEMOBUS Communication

**1 The default value is Parity Invalid.*

**2 Make this selection when issuing the frequency command from the GP/GLC.*

**3 Make this selection when issuing the operation command from the GP/GLC.*

■ VS mini V7/J7 Series

GP/GLC/LT Settings		Inverter Settings	
Baud Rate	9600bps	Port Transmission Rate	9600bps
Data Length	8bit	Data Length	8 bits (fixed)
Stop Bit	2bit	Stop Bit	1 bit (fixed)
Parity Bit	Even	Parity Bit	Even Parity
Control Method	ER Control	RTS Control	Provided
Communication Format	2-wire/4-wire type	————	————
Station No. (DEC)	1	Station Address (DEC)	1 ~ 31
————		Selection of Frequency Command *1	MEMOBUS Communication
		Selection of Operation Command *2	MEMOBUS Communication

**1 Make this selection when issuing the frequency command from the GP/GLC.*

**2 Make this selection when issuing the operation command from the GP/GLC.*

13.4.5 Error Codes

<Inverter Error Codes>

An error code specific to the inverter is displayed in the lower left corner of the GP screen such as "Host communication error (02:**:##)." ** stands for the error code specific to the PLC. ## stands for the station address of the inverter where the error has occurred.

■ Error Codes

Error Code	Error Name	Description
01	Function code error	A function code that is not available on the inverter was used.
02	Wrong register number	The register you tried to access is not used. A register that is not used was specified at the start address for continuous read-out.
03	Wrong number of registers	The number of read-out data is not within a range between 1 and 16. When data was written, the number of data in the message is not the number of registers multiplied by 2.
21	Setting error	When any control data or constant was written, it was outside the allowable setting range.
22	Write mode error	When the inverter is protected from write (e.g., during its operation), you tried to write data. Data was written to a read-only register.
23	Write during UV operation	Data was written when the main circuit was at low voltage (UV).
24	Write during processing of constants	You tried to write data when the inverter was processing constants.

14 Servos

This chapter describes system configurations using the GP/GLC and each manufacturer's servo, as well as applicable devices for those configurations. It also gives examples of environment setup.

14.1 Connectable Servos

The following table lists the servos that can be connected to the GP:

Company	Series	CPU *1	PLC Type on PRO/PB III
Matsushita Electric Industrial Co.	MINAS-A	M□DA□□□□□□	Matsushita Electric Industrial Co.'s MINAS-A/S Series
	MINAS-S	MUDS□□□□□□	

**1 □□□□□□ varies depending upon the servo types.*

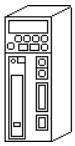
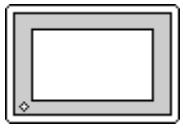

MEMO

14.2 Matsushita Electric Industrial Servo

14.2.1 System Structure

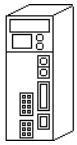
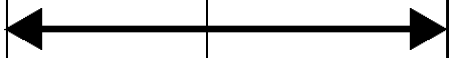
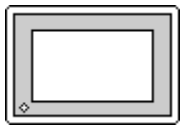
This subsection describes system configurations where the GP unit is connected to Matsushita Electric Industrial Co.'s servo.

■ MINAS-A Series

Servo	Cable Diagram	Applicable Cable	GP/GLC
			
M□DA□□□□□□ *1	RS-232C (1:1)	DV0P1160 made by Matsushita Electric Industrial Co.	GP/GLC series
	RS-232C (1:n)	DV0P1160 made by Matsushita Electric Industrial Co.	

**1 □□□□□□ varies depending upon the servo types. For detailed information, refer to the manual or catalog of the servo used.*

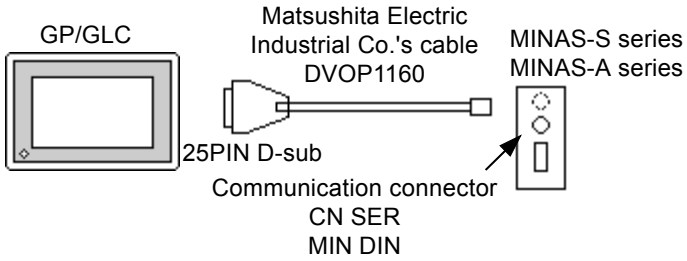
■ MINAS-S Series

Servo	Cable Diagram	Applicable Cable	GP/GLC
			
MUDS□□□□□□ *1	RS-232C (1:1)	DV0P1160 made by Matsushita Electric Industrial Co.	GP/GLC series

**1 □□□□□□ varies depending upon the servo types. For detailed information, refer to the manual or catalog of the servo used.*

◆ **Connections**

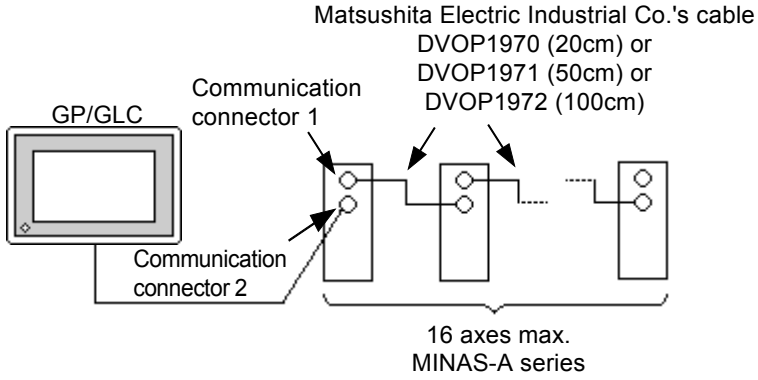
• 1:1 connection



• Connect a MINAS-S series servo to the communication connector CN SER.

• Connect a MINAS-A series servo to the communication connector 2 CN SER.

• 1:n connection (MINAS-A series only)



Note: • **In the case of 1:n connection, if the tag setup specifies that the parameter information on multiple servos is read or written on the same screen, it may take several seconds for display updating or other operations. If the parameter information from more than one servo is read out on the same screen, it will take, normally, approximately 0.5 seconds before the parameter information on each servo has been read out. It is recommended that the parameters for multiple servos be set on their respective screens. This will allow more efficient data checking and be useful for other purposes.**

14.2.2 Supported Devices

The following table shows the range of devices that are supported by the GP:

■ MINAS-S/A Series

may be specified at the first address of the system area.

Device	Bit Addresses	Word Addresses	Remarks	
Driver model readout	————	05_00 ~ 05_05	*1	
Status readout (control mode)	————	20_00	Bit 15 *1 *4	
Status readout (status)	————	20_21	Bit 15 *1 *4	
Command pulse counter readout	————	21_00	Bit 31 *1 *3	L/H
FB pulse counter readout	————	22_00	Bit 31 *1 *3	L/H
Current speed readout	————	24_00	Bit 15 *1	
Current torque output readout	————	25_00	Bit 15 *1	
Current deviation counter readout	————	26_00	Bit 31 *1 *3	L/H
Input signal readout	————	27_00	Bit 31 *1 *3	L/H
Output signal readout (data)	————	28_00	Bit 31 *1 *3	L/H
Output signal readout (warning data)	————	28_01	Bit 15 *1	
Current speed readout	————	29_00	Bit 15 *1	
Current torque readout	————	29_01	Bit 15 *1	
Current deviation counter readout	————	29_02	Bit 31 *1 *3	L/H
Status, input signal, and output signal readout (control mode)	————	2A_00	Bit 15 *1 *4	
Status, input signal, and output signal readout (status)	————	2A_-01	Bit 15 *1 *4	
Status, input signal, and output signal readout (input signal)	————	2A_02	Bit 31 *1 *3	L/H
Status, input signal, and output signal readout (output signal)	————	2A_03	Bit 31 *1 *3	L/H
Status, input signal, and output signal readout (warning data)	————	2A_04	Bit 15 *1	
Absolute encoder readout (encoder ID)	————	2D_00	Bit 15 *1 *6	
Absolute encoder readout (status)	————	2D_01	Bit 15 *1 *6	
Absolute encoder readout (1-rotation data)	————	2D_02	Bit 31 *1 *5 *6	L/H
Absolute encoder readout (multi-rotation data)	————	2D_03	Bit 15 *1 *6	
Individual readout/write of parameter	————	80_00 ~ 80_7F	Bit F *1	
Write of parameter to EEPROM	————	84_00	*2 *7	
Current alarm data readout	————	90_00	Bit 15 *1 *4	
Individual readout of user alarm history (history No.)	————	91_00 ~ 91_0F	Bit F *1 *4	
Individual readout of user alarm history (alarm No.)	————	91_11 ~ 91_1F	Bit F *1 *4	
Batch readout of user alarm history	————	92_01 ~ 92_14	Bit 15 *1 *4	

Device	Bit Addresses	Word Addresses	Remarks
Clearing of user alarm history (also in EEPROM)	————	93_00	*2 *7
Clearing of alarm	————	94_00	*2 *7
Clearing of absolute encoder	————	9B_00	*2 *6 *7
Individual readout of user parameter (parameter value)	————	B0_00 ~ B0_07F	Bit *1
Individual readout of user parameter (MIN value)	————	B0_100 ~ B0_17F	Bit *1
Individual readout of user parameter (MAX value)	————	B0_200 ~ B0_27F	Bit *1
Individual readout of user parameter (attribute)	————	B0_300 ~ B0_37F	Bit *1
Individual readout of user parameter page (parameter value)	————	B1_000 ~ B1_07F	Bit *1
User parameter page readout (MIN value)	————	B1_010 ~ B1_17F	Bit *1
User parameter page readout (MAX value)	————	B1_020 ~ B1_27F	Bit *1
User parameter page readout (attribute)	————	B1_030 ~ B1_37F	Bit *1
User parameter page write	————	B2_000 ~ B2_07F	Bit *2

**1 Exclusively for readout*

**2 Exclusively for write*

**3 32-bit device*

**4 Handled as byte data by the AC servo, but as word data by the GP.*

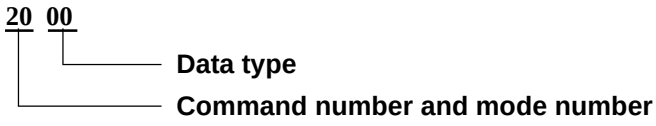
**5 Used as 24-bit data by the AC servo, but as a double-word device by the GP.*

**6 Only the MINAS-A series is supported.*

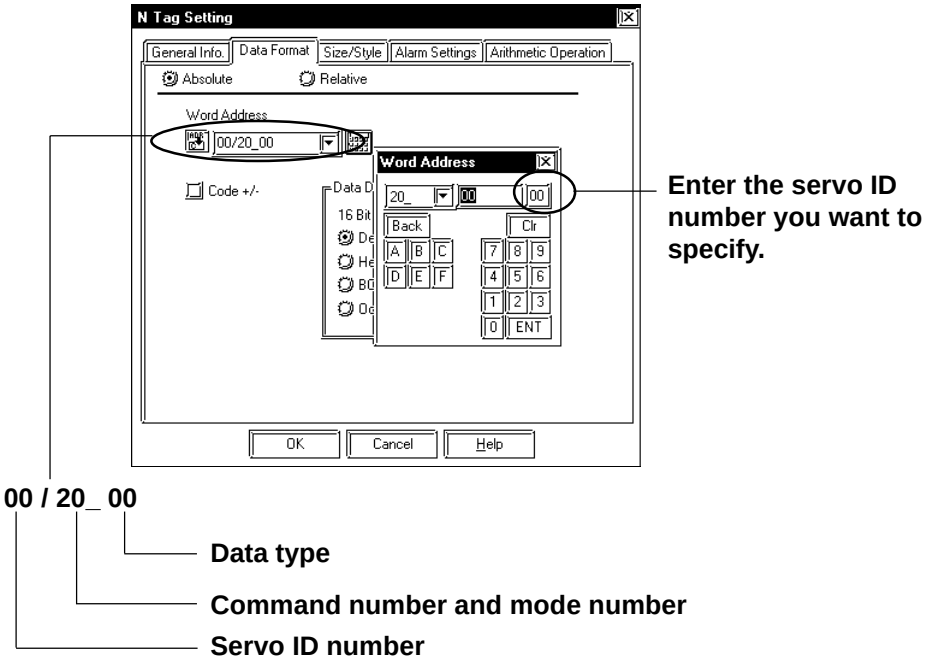
**7 Writing arbitrary data executes the command.*

Note:

- **Assign the parameters and other similar AC servo data to device codes and addresses as follows. For the command numbers and mode numbers, refer to "Lists of MINAS-A and MINAS-S series command numbers and mode numbers."**



- **When creating part or tag on the screen creation software, specify the controller unit number when entering an address. If not, the last entered unit number is assumed. (The default value at startup is 00.)**



■ Lists of MINAS-A and MINAS-S series command numbers and mode numbers

AC Servo Motor Driver		GP/GLC	Description	Item	R/W	Particulars
Command	Mode	Device				
0	5	05_00 ~ 05_05	Driver model readout	————	R	*1
2	0	20_00	Status readout	Control mode	R	*2 *5
		20_21		Status	R	*2 *5
	1	21_00	Command pulse counter readout	————	R	*3
	2	22_00	FB pulse counter readout	————	R	*3
	4	24_00	Current speed readout	————	R	*1
	5	25_00	Current torque output readout	————	R	*1
	6	26_00	Current deviation counter readout	————	R	*3
	7	27_00	Input signal readout	————	R	*3
	8	28_00	Output signal readout	Data	R	*3 *5
		28_01		Warning data	R	*1 *5
	9	29_00	Current speed/torque/deviation counter readout	Data (speed)	R	*1 *5
		29_01		Data (torque)	R	*1 *5
		29_02		Data (deviation)	R	*3 *5
	A	2A_00	Status/input signal/output signal readout	Control mode	R	*2 *5
		2A_-01		Status	R	*2 *5
		2A_02		Input signal	R	*3 *5
		2A_03		Output signal	R	*3 *5
		2A_04		Warning data	R	*1 *5
	D	2D_00	Absolute encoder readout	Encoder ID	R	*1 *5
		2D_01		Status	R	*1 *5
		2D_02		1-rotation data	R	*4 *5
		2D_03		Multi-rotation data	R	*1 *5
8	0 and 1	80_00 ~ 80_7F	Individual readout/write of parameter	————	R/W	*1 *8
	4	84_00	Write of parameter to EEPRPM	————	W	*1
9	0	90_00	Current alarm data readout	————	R	*2
	1	91_00 ~ 91_0F	Individual readout of user alarm history	History No.	R	*2 *5
		91_11 ~ 91_1F		Alarm No.	R	*2 *5
	2	92_01 ~ 92_14	Batch readout of user alarm history	————	R	*2
	3	93_00	Clearing of user alarm history	————	W	*1
	4	94_00	Clearing of alarm	————	W	*1
	B	9B_00	Clearing of absolute encoder	————	W	*1 *11

AC Servo Motor Driver		GP/GLC	Description	Item	R/W	Particulars
Command	Mode	Device				
B	0	B0_00 ~ B0_07F	Individual readout of user parameter	Parameter value	R	*1 *7 *9
		B0_100 ~ B0_17F		MIN value	R	*1 *7 *9
		B0_200 ~ B0_27F		MAX value	R	*1 *7 *9
		B0_300 ~ B0_37F		Attribute	R	*1 *7 *9
	1	B1_000 ~ B1_07F	User parameter page readout	Parameter value	R	*1 *7 *10
		B1_010 ~ B1_17F		MIN value	R	*1 *7 *10
		B1_020 ~ B1_27F		MAX value	R	*1 *7 *10
		B1_030 ~ B1_37F		Attribute	R	*1 *7 *10
	2	B2_000 ~ B2_07F	User parameter page write	————	W	*1 *8

*1 *Word device*

*2 *Used as byte data by the AC servo motor driver, but as a double-word device by the GP.*

*3 *Double-word device*

*4 *Used as 24-bit data by the AC servo motor driver, but as a double-word device by the GP.*

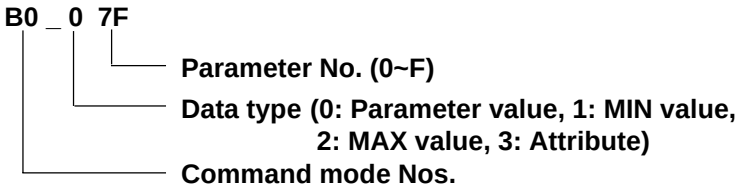
*5 *The device names are same, but the device codes are different for each address.*

*6 *Use the same command when reading out the driver model. Therefore, the data that can be read out from this device is the same as the driver model readout.*

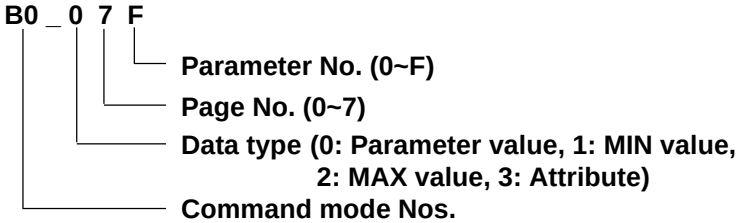
*7 *For the parameter numbers and other detailed information, refer to the organization and list of parameters in the instruction manual for the AC servo driver.*

*8 *Specify a device as follows:*

*9 *Specify a device as follows:*



*10 *Specify a device as follows:*



*11 *Only the MINAS-A series is supported.*

14.2.3 Environment Setup

The following tables show the communication settings for the servo and the corresponding settings for the GP, which are recommended by Digital:

■ MINAS-A Series

GP Setup		Servo Setup	
Baud Rate	19200bps	Baud Rate	9600bps
Data Length	8 bits (fixed)	———	———
Stop Bit	1 bit (fixed)	———	———
Parity Bit	None (fixed)	———	———
Data Flow Control	ER Control	———	———
Communication Format (RS-232C)	RS-232C	———	———
Unit No.	0	ID Rotary Switch *1	0

**1. Set the ID No. to 0.*

■ MINAS-S Series

GP Setup		Servo Setup	
Baud Rate	19200bps	Baud Rate	9600bps
Data Length	8 bits (fixed)	———	———
Stop Bit	1 bit (fixed)	———	———
Parity Bit	None (fixed)	———	———
Data Flow Control	ER Control	———	———
Communication Format (RS-232C)	RS-232C	———	———
Unit No.	0	———	———

14.2.4 Error Codes

■ Servo Error Codes

An error code specific to the servo is displayed as "Host communication error (02:**:##)" in the lower left part of the GP screen. "**" stands for the error code specific to the servo, and "##" stands for the servo unit number where the error has occurred.

Error No.	Description	Causes
0x90	RS485 error	The unit that has been specified in the 1:n connection cannot be found.
0xA0	Command error	A command that is not supported has been transmitted.
0xC0	Data error	The written data exceeds the specified range.


MEMO

15 Analyzers

This chapter describes the system structure with a specific company's servo and the GP/GLC, lists the supported devices, and shows an example of environment set-ups.

15.1 Connectable Analyzers

The following analyzer can be connected.

Manufacturer	Series Name	Moisture Analyzer	PLC type as in GP-PRO/PBIII
JT Engineering	JE-70	JE-70	JTE analyzer


MEMO

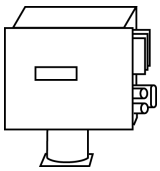
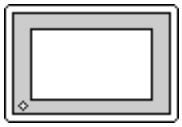
15.2 JT Engineering Inc. Analyzers

15.2.1 System Structure

This section describes the system structure using JT Engineering Inc. JE-70 series analyzer and the GP/GLC.

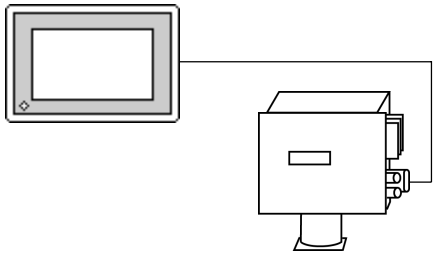
For the connection diagram, see "15.1.2 Connection diagram."

■ JE-70 Series

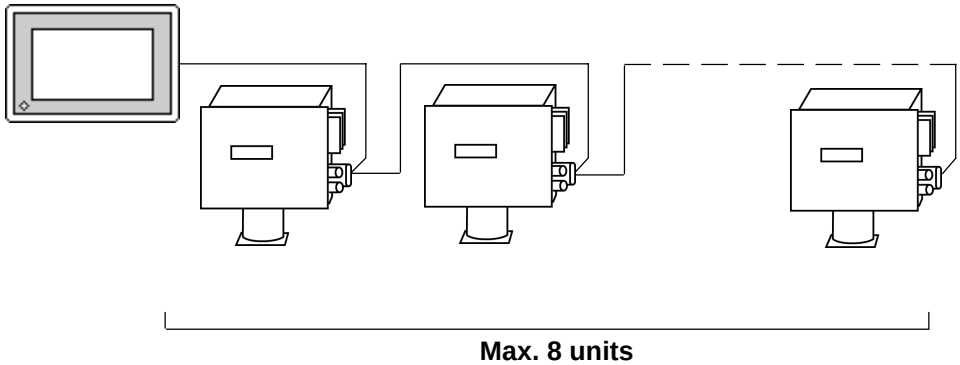
Analyzer	Cable Diagram	GP/GLC
		
JE-70	RS-232C <Cable Diagram1 >	GP/GLS Series *1
	RS-422 (2-wire type) 1:1 <Cable Diagram 2>	
	RS-422 (2-wire type) 1:n <Cable Diagram 3>	

**1 For connectable GP/GLCs, see "15.1 Connectable Analyzers."*

◆1:1 RS-232C, RS-422



◆1:n RS-422



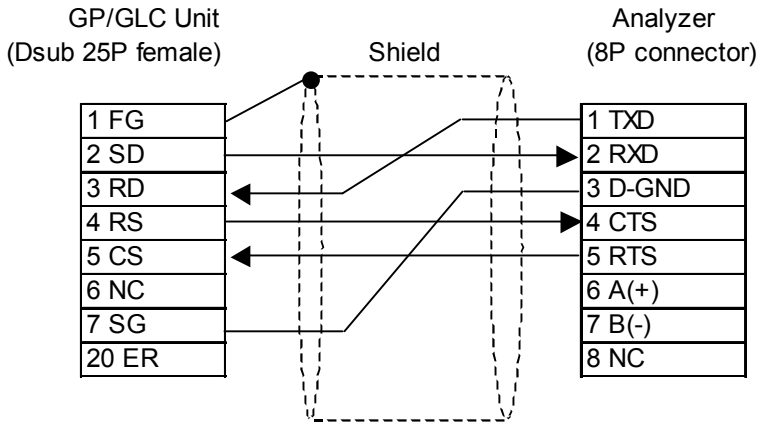
15.2.2 Cable Diagram

The following cable diagram may differ from the one recommended by JT Engineering, but using this design will not cause any operation problems.

Important

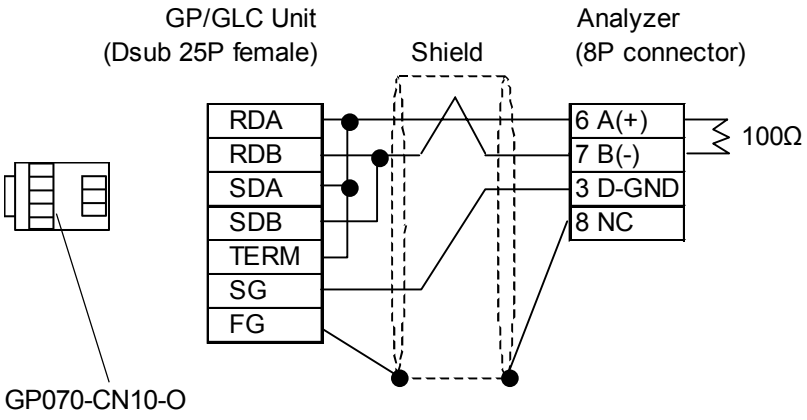
- ***Connect the GP/GLC side of the FG to a shielded cable.***
- ***The cable connected to the RS-232C port should be within 15 meters.***
- ***The cable connected to the RS-422 port should be within 500 meters.***
- ***To use a communication cable, be sure connect the SG.***

Cable Diagram 1 RS-232C

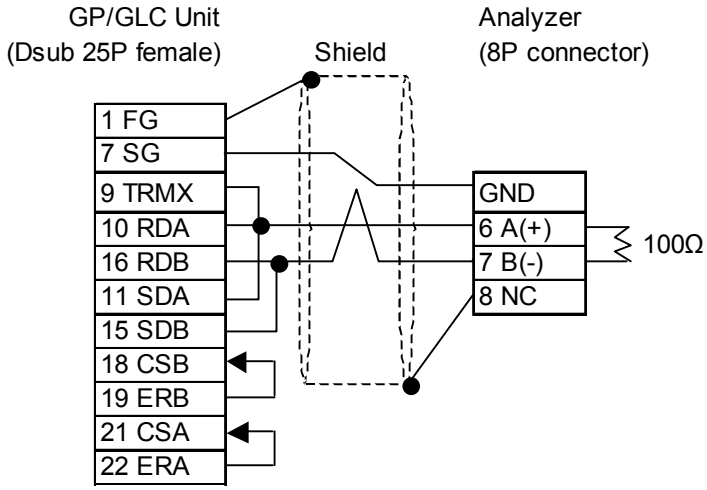


Cable Diagram 2 1:1 RS-422

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When making your own cable connections

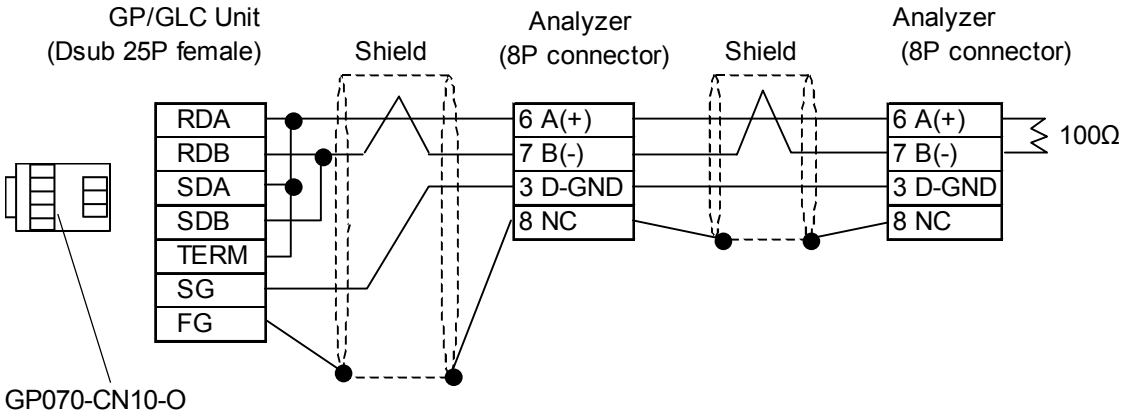


Note:

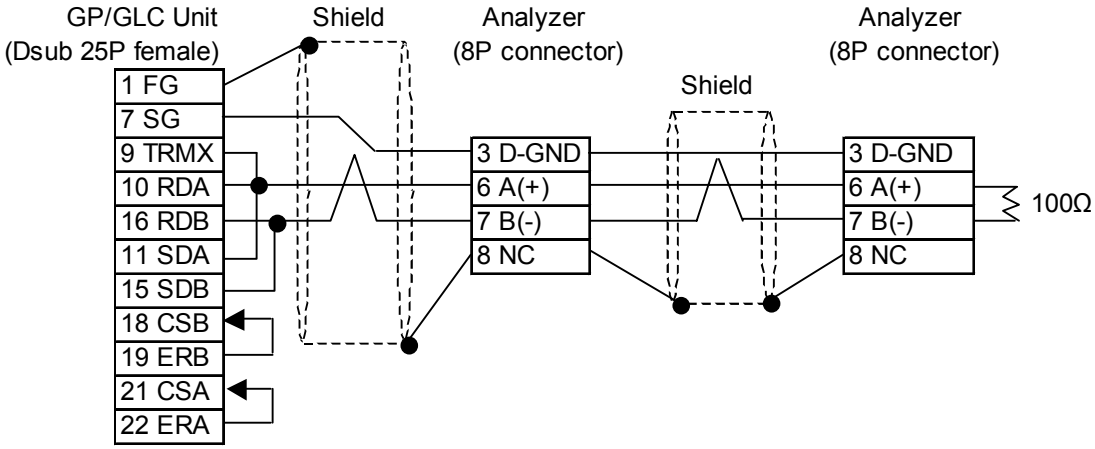
- **When Pin Nos. 9 and 10 on the serial interface on the LT/GLC/GP side are connected to each other, a termination resistance of 100Ω is created between RDA and RDB.**
- **Use a shielded twisted-pair cable AWG#20 or larger.**

Cable Diagram 3 1:n RS-422

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O



• When making your own cable connections



Important

- ***Up to 8 analyzers can be connected.***

Note:

- **When Pin Nos. 9 and 10 on the serial interface on the GP/GLC side are connected to each other, a termination resistance of 100Ω is created between RDA and RDB.**
- **Use a shielded twisted-pair cable AWG#20 or larger.**

15.2.3 Supported Device

The following table describes the range of devices supported by the GP/GLC.

■ JE-70 Series

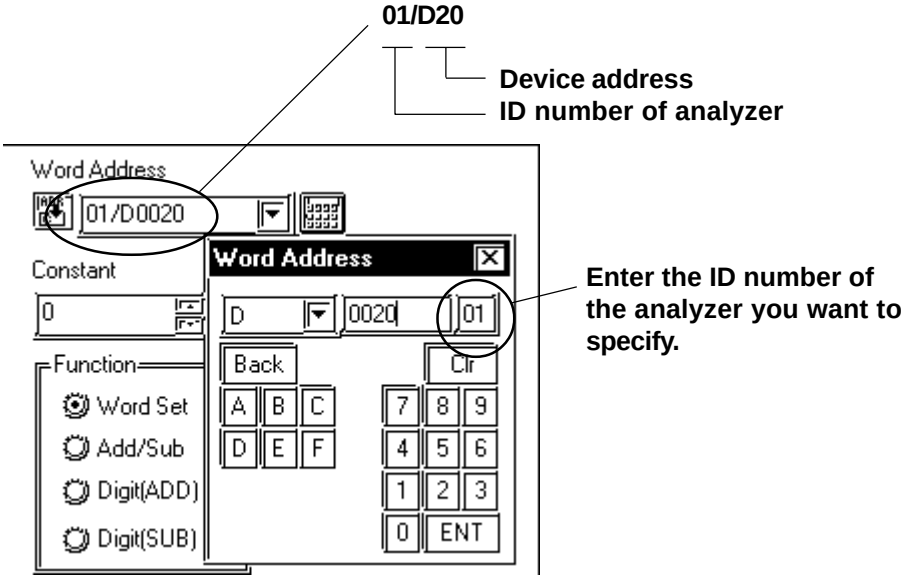
Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Status Error	M0000 ~ M0031	M000 ~ M0016	÷16	L/H
Error	M0032 ~ M0079	M0032 ~ M0064	÷16	
Current Value	——	D0000 ~ D0160	Bit 15	
Common Constant	——	R0000 ~ R0098	Bit 15	
Recipe Constant	——	R0100 ~ R2098	Bit 15	
Equipment-specific Data	——	R2100 ~ R2130	Bit 15	
Filter Constant	——	R2132 ~ R2198	Bit 15	
Correction Parameter	——	R2200 ~ R2346	Bit 15	

- *For the details of each device, refer to the manual for JT Engineering's analyzer.*

Example of device settings

When setting up Parts and Tags in GP-PRO/PBIII, specify the ID number of the analyzer when entering addresses.



Note:

- **If no ID number is specified, the last entered ID number is assumed (the default value is 01).**

15.2.4 Environment Setup

The following lists Digital's recommended analyzer and GP/GLC communication setup.

■ JE-70 Series

GP/GLC Setup		Analyzer Setup	
Baud Rate	38400 bps (fixed)	————	————
Data Length	8 bits (fixed)	————	————
Stop Bit	1 bit (fixed)	————	————
Parity Bit	Non (fixed)	————	————
Data Flow Control	ER Control (fixed)	————	————
Communication Format (using RS-232C)	RS-232C	DSN on the bassis board	RS-232C
Communication Format (using RS-422)	RS-422 2-wire type	DSN on the bassis board	RS-422
Unit No.	Analyzer Setup	ID number *1	1 ~ 8
Send Wait	20 msec or more	————	————

**1 The ID number of the analyzer may be specified in a range between 1 and 10. When the analyzer is used with the GP/GLC, specify the ID number in a range between 1 and 8.*

Note:

- **To communicate with the JE-70 series, specify 20 ms or more for the transmission wait time of the GP/GLC.**

  The transmission wait time should be specified using System Setup in GP-PRO/PBIII. Choose Extended Setup from Communication Setup and then specify the transmission wait time.

15.2.5 Error Code

■ Analyzer error codes

◆JE-70 Series

An error message such as "Host communication error (02:**:##)" will display the lower left corner of GP/GLC screen (** stands for an error code specific to the analyzer).

Host communication error (02..##)**

ID number of analyzer that has caused the error

Analyzer error code

Error code	Description	Details
01	Checksum code error	The checksum code sent by the host is wrong.
02	Command error	The command (symbol) sent by the host is other than BR, WR, BW, WW, JR, QR, JW, QW, and TT.
03	Device number too large	The device number sent by the host is too large.
04	Word-based write to M-device	The host has issued a write request to the M-device using the WW or QW command.
05	Number of word devices is odd	When the host has issued a word-based write or read to word devices, the number of word devices is odd.
06	First address for word device is odd	When the host has issued a write or read request to a word device, the first address for the word address is odd.
07	Measurement recipe number is not registered yet	When the host has requested changing the recipe number for the measured components, that recipe number is not registered yet (the host has not written the recipe number).
08	Recipe number for display is not registered yet	When the host has requested changing the recipe number for display, that recipe number is not registered yet (the host has not written the recipe number).
09	Recipe number for output is not registered yet	When the host has requested changing the recipe number for output, that recipe number is not registered yet (the host has not written the recipe number).
0A	Recipe number of display is not measured yet	The host has requested changing the recipe number for display, but the recipe number after the change is not under measurement.
0B	Recipe number for output is not measured yet	The host has requested changing the recipe number for output, but the recipe number after the change is not under measurement.


MEMO

16 Connecting to the Handy Type GP

The following describes the System Design and Cable Diagram used when conecting a PLC and a Handy Type GP.

16.1 Connecting a GP-H70 Series Unit

16.1.1 Connecting a GP-H70 Series Unit

■ GP-H70 Optional Items

The following optional cables and cable conversion adapters can be used to connect a PLC to a GP-H70.

ITEM	DESCRIPTION
GP-H70 Option Cable [RS-232C type] GPH70-C232-0 (3m) GPH70-C232-MS (10m)	Included in this cable are the power line to the GP-H70; the communications lines(RS-232C) used with various Host (PLC)s; the GP-H70's DOUT signal line, as well as other lines.This cable has no PLC connector attached so the user can set up the cable's PLC side wires to suit any type or PLC connector.
GP-H70 Option Cable [RS-422 type] GPH70-C422-0 (3m) GPH70-C422-MS (10m)	Included in this cable are the power line to the GP-H70; the communications lines(RS-422) used with various Host (PLC)s; the GP-H70's DOUT signal line, as well as other lines.This cable has no PLC connector attached so the user can set up the cable's PLC side wires to suit any type or PLC connector.
GP-H70 Option Cable [RS-232C type] GPH70-D232 (3m) GPH70-D232-MS (10m)	Included in this cable are the power line to the GP-H70; the commnications lines (RS-232C) used with various Host (PLC)s; the GP-H70's DOUT signal line, as well as other lines. This cable's PLC side connector is a standard Dsub25 pin type.
GP-H70 Option Cable [RS-422 type] GPH70-D422 (3m) GPH70-D422-MS (10m)	Included in this cable are the power line to the GP-H70; the commnications lines (RS-422) used with various Host (PLC)s; the GP-H70's DOUT signal line, as well as other lines. This cable's PLC side connector is a standard Dsub25 pin type.
GP-H70 Conversion Adapter [RS-232C type] GPH70-AP232-0	This adapter is used to convert the wiring from the GP-H70 to either a Dsub25 or a standard terminal block connector. Digital's 232C cable (GP410-IS00-O) can be connected to the D-sub25 connector, and Digital's GPH70-D232 and GPH70-D232-MS cable can be used to connect the adapter to the GP-H70 unit.
GP-H70 Conversion Adapter [RS-422 type] GPH70-AP422-0	This adapter is used to convert the wiring from the GP-H70 to a standard terminal block connector. Digital's GPH70-D422 and GPH70-D422-MS cable can be used to connect the adapter to the GP-H70 unit.

■ Connection Methods

The optional cable (GPH70-C232-0/MS, GPH70-C422-0/MS) will require some preparation before it can be used. This Manual "Chapter 2. Connecting Each PLC with the GP" includes connection diagram(s) of the wiring connections used between the GP and PLC. However, the pin number assigned to each connector pin on the Handy Type GP's interface will differ from that of other GP series unit. Therefore, be sure to use Connector Pin Comparison Tables 1 and 2 below when creating a cable used between the GP-H70 and the PLC. An additional cable will be required to supply electric power to the GP-H70.

Comparison Tables 1 and 2 correspond to option cables <GPH70-C232-0/MS> and <GPH70-C422-0/MS>, respectively.

Comparison Table 1 GPH70-C232-0/MS (RS-232C)

GPH70 Pin No.	Signal name	Wire Color	Mark Band Color/Q'ty	Non-GPH70 Pin No.
1	RS	Purple	White (1band)	Pin 4
2	CS	Orange	White (2bands)	Pin 5
3	CD	Brown	White (2 bands)	Pin 8
19	SD	White	Blue (1band)	Pin 2
20	RD	Blue	Red (2bands)	Pin 3
21	ER	Green	white (2 bands)	Pin 20
22	SG	Black	——	Pin 7
case	FG	Outer Shield	——	Pin 1

Comparison Table 2 GPH70-C422-0/MS (RS-422)

GPH70 Pin No.	Signal name	Wire Color	Mark Band Color/Q'ty	Non-GPH70 Pin No.
5	TRMX	Pink	——	Pin 9
6	RDA	White	——	Pin 10
7	SDA	Orange	White (1bands)	Pin 11
8	CSA	Brown	White (1bands)	Pin 21
9	ERA	Red	White (1bands)	Pin 22
24	RDB	Blue	Red (1 bands)	Pin 16
25	SDB	Green	White (1bands)	Pin 15
26	CSB	Gray	White (1bands)	Pin 18
27	ERB	Black	White (1bands)	Pin 19
22	SG	Black	——	Pin 7
Case	FG	Outer Shield	——	Pin1

Note:

- **Be sure to connect this unit's SG/GND (Signal Ground) terminal to the other unit's Signal Ground terminal.**
- **When making a cable, please be aware of the following:**

<For RS-422 Connection>

- **The following pairs of pin #'s must be connected to each other**
  ...#26 (CBS) <->#27 (ERB)
  ...#8 (CSA) <-> #9 (ERA)
- **When connecting the RS-422 cable and the #5 (TRMX) and #6 (RDA) points, a termination resistance of 100Ω is added between RDA and RDB.**

Note:

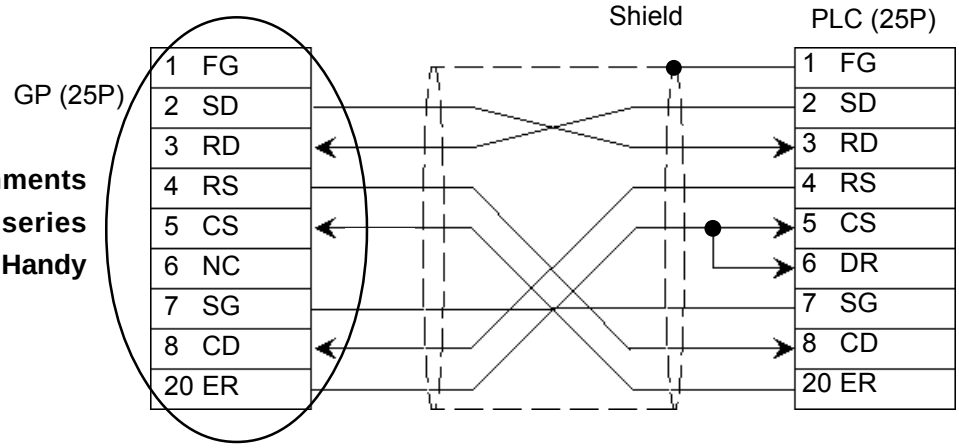
- **When the GP is set as a Memory Link type and the cable type is RS-422, a 4-wire system must be used.**

<For RS-232C Connection>

- **Do not connect #5 (TRMX), #6 (RDA), #7 (SDA), #25 (SDB), #24 (RDB), #26 (CBS), #27 (ERB), #8 (CSA), #9 (ERA).**

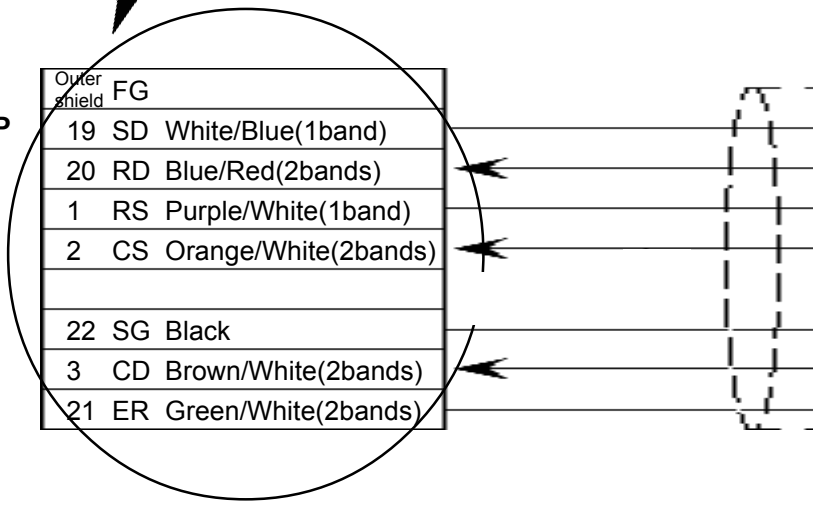
The following describes an example of converting the pin assignments for other GP series to those on the Handy Type GP. The following example connects a GP-H70 with a Mitsubishi PLC (p.2-1-10 <Cable Diagram 1>).

Pin assignments for all GP series except the Handy Type GP



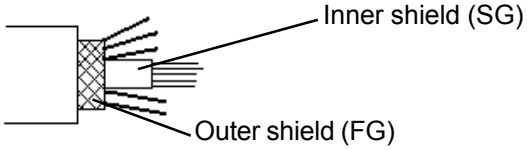
When using GP-H70 optional cable (GPH70-C232-0)

Pin assignments for the GP-H70 converted from those of other GP series



Important

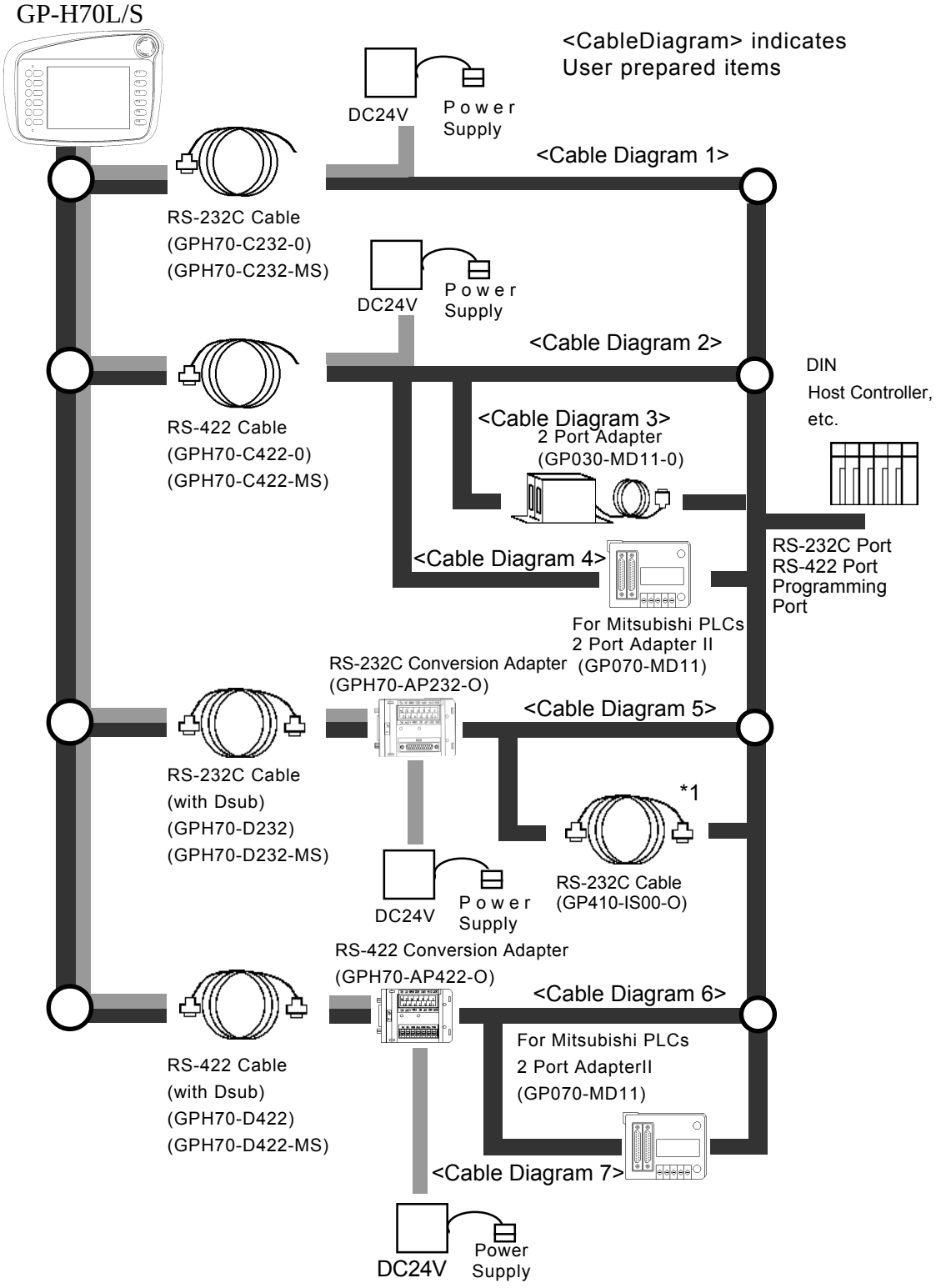
- ***If any wires in the above table's "Wire Color" column are not used, be sure those wires do not touch other signal wires or the connector case.***
- ***Be sure to connect the cable's outer shield to the FG wire (field ground).***



- ***Be sure to connect the inner shield to the external device's signal ground, in the same way as the Pin 22's SG connection.***

16.1.2 GP-H70 System Design

The diagram below shows the GP unit's peripheral equipment.



In the above system design diagram, the ▬ line indicates power supply routes. Be sure to supply electricity through conversion adapters or cables.

**1 This cable may not be able to be connected to some PLCs. Be sure to check compatibility before connecting.*

16.1.3 Cable Diagrams

The connection diagram of wiring connections used between the equipment described in "15.1.2 GP-H70 System Design" is shown below. This connection diagram only shows those sections used for connecting to the PLC.

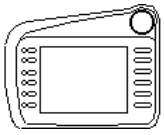
Important

- ***Be sure to connect this cable while the GP-H70's power is turned OFF, otherwise an electrical shock may occur.***
- ***When live lines are either connected or disconnected, if a difference in potential is created between the GP-H70 and the connected device(s), the driver IC may be damaged. Therefore, be sure to connect this cable while the GP-H70's power is turned OFF.***
- ***Since the GP-H70 interface signal wires and the GP power supply wires are contained inside a single cable, power supply noise may occur. Therefore, be sure to take appropriate precautions to prevent the connected device(s) from being interrupted by noise. (i.e. install a noise filter, etc.)***

<Cable Diagram 1>

• When connecting GP-H70 to PLC with GPH70-C232-O (3m) or GPH70-C232-MS (10m)

GP-H70

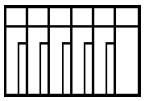


GP Series other than Handy Type GP Pin No.

GPH70	Signal Name	Wire Color	Mark Band Color/Q'ty	DSUB25P	
case	FG	Outer Shield	-	1	*1
19	SD	White	Blue(1band)	2	
20	RD	Blue	Red(2bands)	3	
1	RS	Purple	White(1band)	4	
2	CS	Orange	White(2bands)	5	
	NC			6	
22	SG	Black	-	7	*2
		Inner Shield	-		
3	CD	Brown	White(2bands)	8	
	NC			9	
	NC			10	
	NC			11	
16	24V	Blue	-	12	*3
17		Green	-		
18		Gray	-		
34	0V	Orange	-	13	*4
35		Brown	-		
36		Red	-		
	NC			14	
10	DOUT1C	Pink	-	15	
28	DOUT1GND	Purple	-	16	
14	EMG A	Red	White(1band)	17	
11	DOUT 0 C	White	-	18	
29	DOUT 0 GND	Blue	Red(1band)	19	
21	ER	Green	White(2bands)	20	
12	OP.C	Orange	White(1band)	21	
30	OP.GND	Green	White(1band)	22	
31	BUZ GND	Gray	White(1band)	23	
32	EMG B	Black	White(1band)	24	
13	BUZ OUT	Brown	White(1band)	25	

*5

PLC



**1 Connect the cable's outer shield to Pin 1.*
**2 Connect the cable's inner shield and all black wires to Pin 7.*
**3 Connect all the blue, green, and gray wires to Pin 12.*
**4 Connect all the orange, brown, and red wires to Pin 13.*
5 Refer to the cable diagrams in* ***Chapter 2 PLC-GP Connection.*

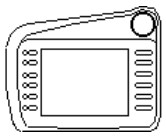
Note:

- **The wiring arrangement shown above cannot be used with the RS-232C cable's Conversion Adapter.**
- **To connect the Conversion Adapter, the wiring diagram in the GP-H70's RS-232 Conversion Adapter's Operation Instructions manual must be used.**
- **The customer will need to perform this cable's PLC connector wiring. The wires used this cable are AWG 28 (dia.=0.3mm/area-0.08mm^2). Using a solder cap tape connector is recommended.**
- **Be sure the wires do not touch other signal wires or connector case when they are not used.**

<Cable Diagram 2>

• When connecting GP-H70 to PLC with GPH70-C422-O (3m) or GPH70-C422-MS (10m)

GP-H70



GP Series other than Handy Type GP Pin No.

GPH70	Signal Name	Wire Color	Mark Band Color/Q'ty	DSUB25P	
case	FG	Shield	-	1	*1
10	DOUT 1C	Yellow	Black(1band)	2	
28	DOUT 1 GND	Pink	Black(1band)	3	
11	DOUT 0 C	Purple	White(1band)	4	
29	DOUT 0 GND	White	Blue(1band)	5	
12	OP. C	Blue	Red(2bands)	6	
22	SG	Black	-	7	
30	OP. GND	Orange	White(2bands)	8	
5	TRMX	Pink	-	9	
6	RDA	White	-	10	
7	SDA	Orange	White(1band)	11	
16	24V	Pink	Black(2bands)	12	
17		White	Blue(2bands)		*2 *4
18		Orange	Black(1band)		PLC
34	0V	Purple	White(2bands)	13	*3
35		Blue	Black(1band)		
36		Green	Black(1band)		
	NC		-	14	
25	SDB	Green	White(1band)	15	
24	RDB	Blue	Red(1band)	16	
14	EMG A	Gray	White(2bands)	17	
26	CSB	Gray	White(1band)	18	
27	ERB	Black	White(1band)	19	
	NC			20	
8	CSA	Brown	White(1band)	21	
9	ERA	Red	White(1band)	22	
31	BUZ GND	Brown	White(2bands)	23	
32	EMG B	Red	White(2bands)	24	
13	BUZ OUT	Green	White(2bands)	25	

**1 Connect the cable's outer shield to Pin 1.*

**2 Connect all the pink(black/1band), white(blue/2band) and orange(black/1band) wires to Pin 12.*

**3 Connect all the purple(white/2bands), blue(black/1band) and green(black/1band) wires to Pin 13.*

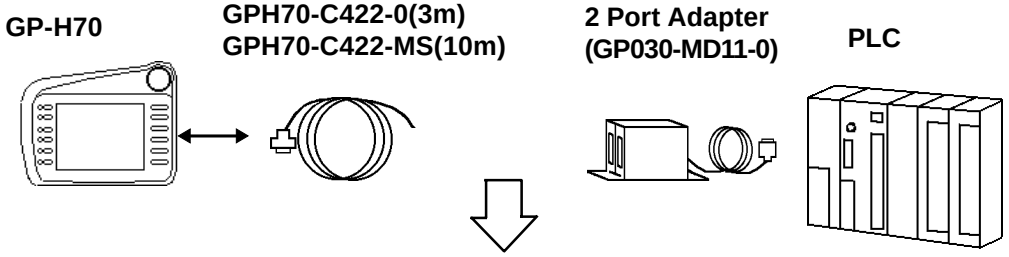
4 Refer to the cable diagrams in* ***Chapter 2 PLC-GP Connection.*

Note:

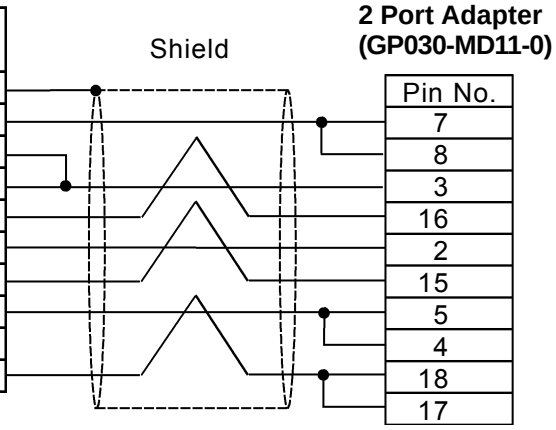
- **The wiring arrangement shown above cannot be used with the RS-232C cable's Conversion Adapter.**
- **To connect the Conversion Adapter, the wiring diagram in the GP-H70's RS-232 Conversion Adapter's Operation Instructions manual must be used.**
- **The customer will need to perform this cable's PLC connector wiring. The wires used for this cable are AWG 28 (dia.=0.3mm/area-0.08mm^2). Using a solder cap tape connector is recommended.**
- **Be sure these wires do not touch other signal wires or the connector case when they are not used.**

<Cable Diagram 3>

- When connecting GP-H70 to 2 Port Adapter (GP030-MD11-0) with GPH70-C422-O (3m) or GPH70-C422-MS (10m)



Signal Nane	Wire Color	Mark Band Color/Q'ty	Pin No.
Shield	Outer Shield	——	—
SG	Black	——	22
TRMX	Pink	——	5
RDA	White	——	6
RDB	Blue	Red(1band)	24
SDA	Orange	White(1band)	7
SDB	Green	White(1band)	25
CSA	Brown	White(1band)	8
—			—
CSB	Gray	White(1band)	26



[GP-H70 series]

Pin numbers shown here represent the GP-H70 unit's connection pins.

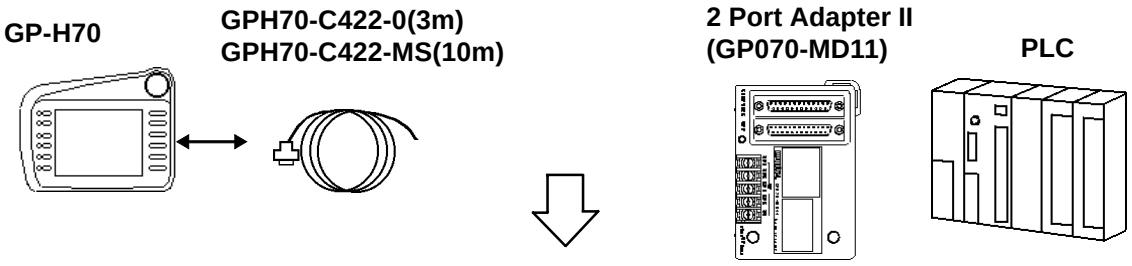
[2 Port Adapter]

Pin numbers shown here represent the Digital's 2 Port Adapter's (GP030-MD11-0) connection pins.

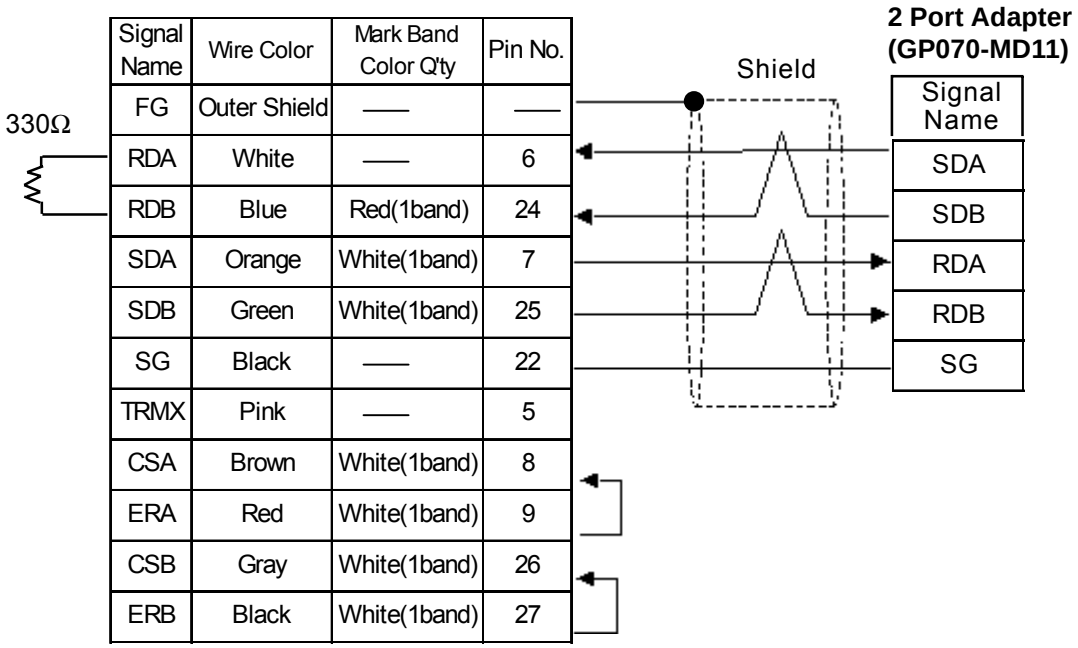
Note: Be sure the wires do not touch other signal wires or connector case when they are not used.

<Cable Diagram 4>

• When connecting GP-H70 to 2 Port Adapter II (GP070-MD11) with GPH70-C422-O (3m) or GPH70-C422-MS (10m)



Signal Name	Wire Color	Mark Band Color Q'ty	Pin No.
FG	Outer Shield	——	——
RDA	White	——	6
RDB	Blue	Red(1band)	24
SDA	Orange	White(1band)	7
SDB	Green	White(1band)	25
SG	Black	——	22
TRMX	Pink	——	5
CSA	Brown	White(1band)	8
ERA	Red	White(1band)	9
CSB	Gray	White(1band)	26
ERB	Black	White(1band)	27



[GP-H70 series]

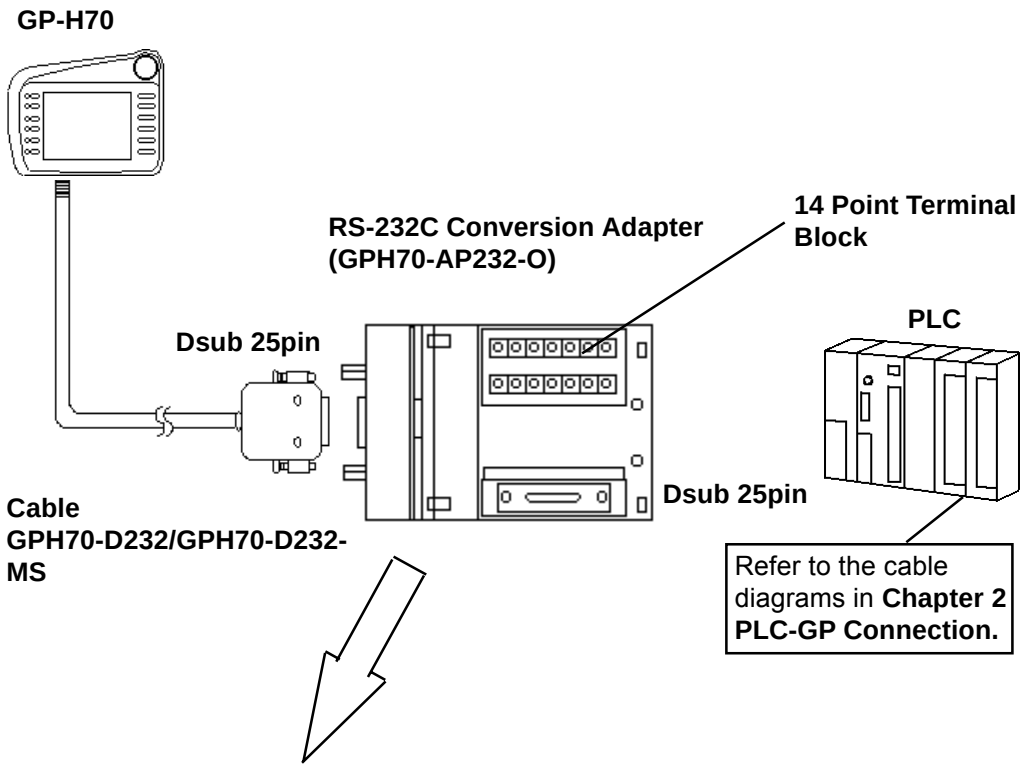
Pin numbers shown here represent the GP-H70 unit's connection pins.

Note:

- **Instead of the TRMX pin, connect the 2 Port Adapter II's 330 W termination resistor to the RDB and RDA pins.**
- **GP-PRO/PBIII for Windows Ver.3.0 or highr required. (Protocol version should be V3.20 or higher.)**
- **Select "2PORT+GPH" via "Adapter Mode/ CPU Direct Mode" on GP's offline screen.**
- **Be sure the wires do not touch other signal wires or connector case when they are not used.**
- **This cable diagram cannot be used for connection with the MELSEC-FX Series unit. When connecting the MELSEC-FX Series unit via the 2 Port Adapter II, refer to <Cable Diagram 7>.**

<Cable Diagram 5>

- When connecting GP-H70 to PLC with RS-232C Conversion Adapter (GPH70-AP232-0) with GPH70-D232 (3m) or GPH70-D232-MS (10m)



Dsub Connector

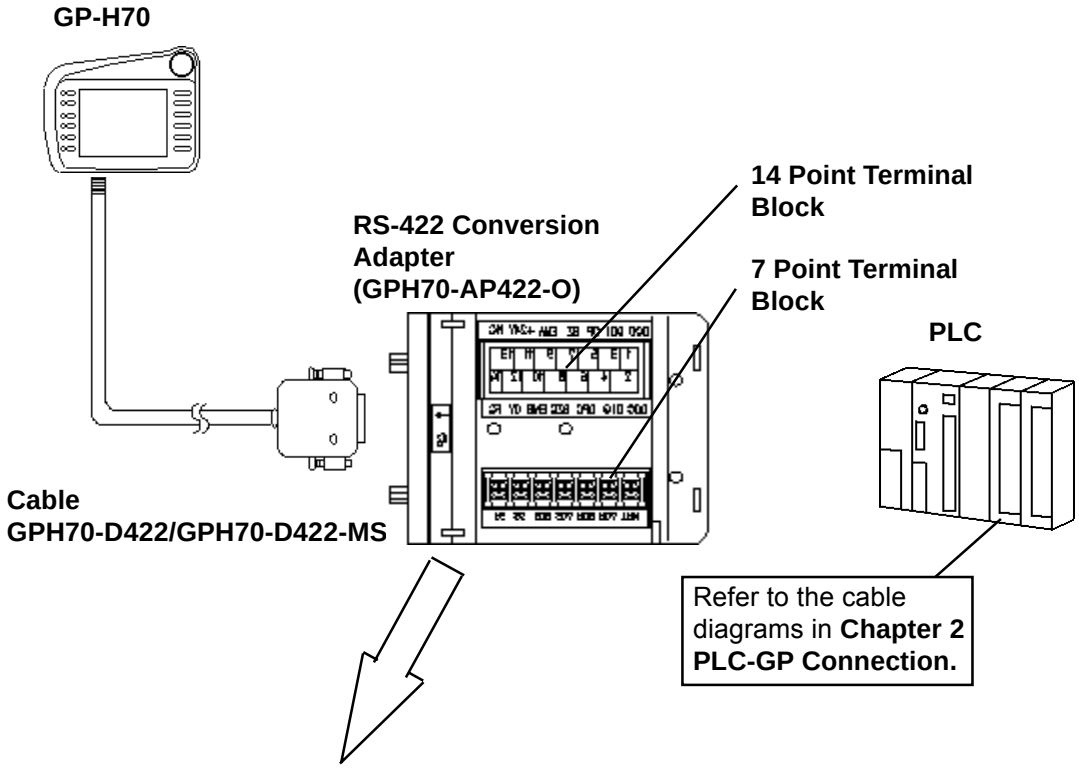
Pin No.	Signal Name
1	FG
2	SD
3	RD
4	RS
5	CS
7	SG
8	CD
14	+5V(out)
20	ER

14 Point Terminal Block

Pin No.	Signal Name(Drawing Name)	
1	DOUT0.C	(DO0)
2	DOUT0.GND	(D0G)
3	DOUT1.C	(D01)
4	DOUT1.GND	(D1G)
5	OP.C	(OP)
6	OP.GND	(OPG)
7	BUZZ OUT	(BZ)
8	BUZZ GND	(BZG)
9	EMG A	(EMA)
10	EMG B	(EMB)
11	+24V(in)	(+24V)
12	0V	(0V)
13	NC	(NC)
14	FG	(FG)

<Cable Diagram 6>

• When connecting GP-H70 to PLC via RS-422 Conversion Adapter (GPH70-AP422-0) with GPH70-D422 (3m) or GPH70-D422-MS (10m)



7 Point Terminal Block

Pin No.	Signal Name
1	FG
2	SG
3	SDB
4	SDA
5	RDB
6	RDA
7	TRMX(TRM)*1

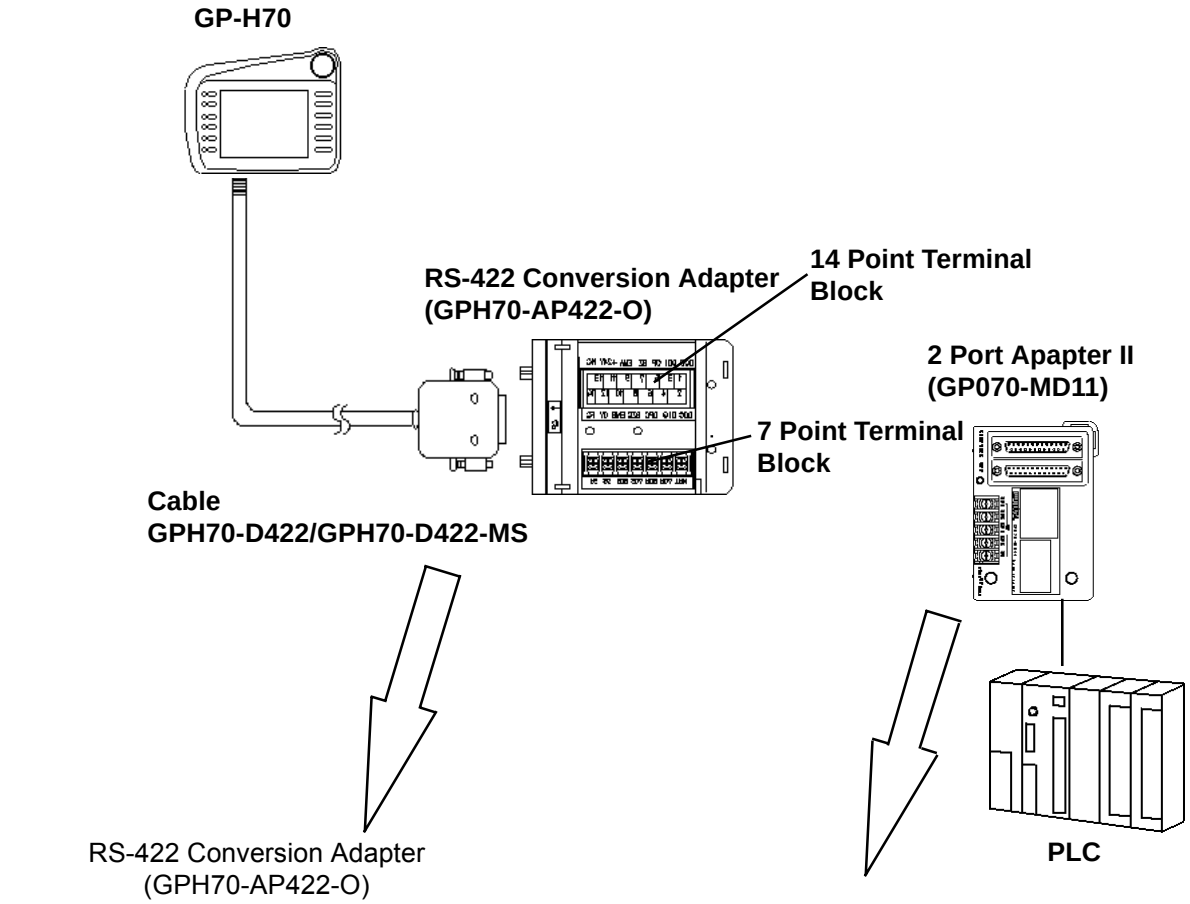
**1 Connecting (shorting) the TRMX and RDA pins provides 100Ω of terminating between pins RDA and RDB.*

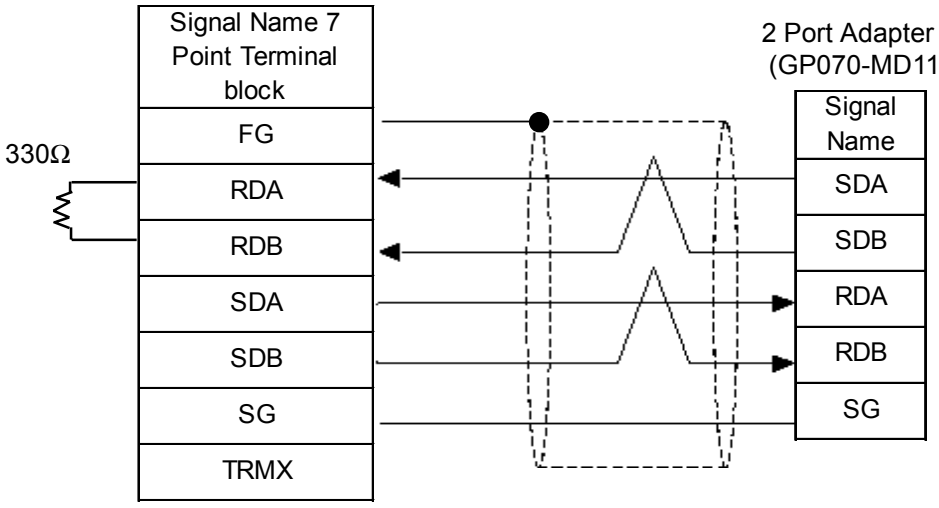
14 Point Terminal Block

Pin No.	Signal Name	(Drawing Name)
1	DOUT0.C	(DO0)
2	DOUT0.GND	(D0G)
3	DOUT1.C	(D01)
4	DOUT1.GND	(D1G)
5	OP.C	(OP)
6	OP.GND	(OPG)
7	BUZZ OUT	(BZ)
8	BUZZ GND	(BZG)
9	EMG A	(EMA)
10	EMG B	(EMB)
11	+24V(in)	(+24V)
12	0V	(0V)
13	NC	(NC)
14	FG	(FG)

<Cable Diagram 7>

• When connecting GP-H70 to PLC via RS-422 Conversion Adapter (GPH70-AP422-0) and 2 Port Adapter II with GPH70-D422 (3m) or GPH70-D422-MS (10m)





Note: **Instead of the TRMX pin, connect the 2 Port Adapter II's 330Ω termination resistor to the RDB and RDA pins.**

16.2 Connecting a GP2000H Series Unit

16.2.1 Connecting a GP2000H Series Unit

■ GP2000H Optional Items

The following optional cables and cable conversion adapters below can be used to connect a PLC to a GP2000H.

ITEM	DESCRIPTION
GP2000H Series Special Purpose RS-232C Cable GP2000H-C232-3M (3m) GP2000H-C232-10M (10m)	Included in this cable are the power line to the GP2000H; the communications lines(RS-232C) used with various Host (PLC)s; the GP2000H's DOUT signal line, as well as other lines.This cable has no PLC connector attached so the user can set up the cable's PLC side wires to suit any type or PLC connector.
GP2000H Series Special Purpose RS-422 Cable GP2000H-C422-3M (3m) GP2000H-C422-10M (10m)	Included in this cable are the power line to the GP2000H; the communications lines(RS-422) used with various Host (PLC)s; the GP2000H's DOUT signal line, as well as other lines.This cable has no PLC connector attached so the user can set up the cable's PLC side wires to suit any type or PLC connector.
GP2000H Series Special Purpose RS-232C Dsub Cable GP2000H-D232-3M (3m) GP2000H-D232-10M (10m)	Included in this cable are the power line to the GP2000H; the commnications lines (RS-232C) used with various Host (PLC)s; the GP2000H's DOUT signal line, as well as other lines. This cable's PLC side connector is a standard Dsub37 pin type.
GP2000H Series Special Purpose RS-422 Dsub Cable GP2000H-D422-3M (3m) GP2000H-D422-10M (10m)	Included in this cable are the power line to the GP2000H; the commnications lines (RS-422) used with various Host (PLC)s; the GP2000H's DOUT signal line, as well as other lines. This cable's PLC side connector is a standard Dsub37 pin type.
GP2000H Series RS-232C Conversion Adapter GP2000H-AP232	This adapter is used to convert the wiring from the GP2000H to either a Dsub37 or standard a terminal block connector. Digital's 232C cable (GP410-IS00-O) can be connected to the Dsub25 connector, and Digital's GP2000H-D232-3M/10M cable can be used to connect the adapter to the GP2000H unit.
GP2000H Series RS-422 Conversion Adapter GP2000H-AP422	This adapter is used to convert the wiring from the GP2000H to either a Dsub25 or standard a terminal block connector. Digital's GP2000H-D422-3M/10M cable can be used to connect the adapter to the GP2000H unit.
GP2000H Series Special Purpose RS-232C Cable for GP-70H Conversion Adapter GP2000H-AP70CB-D232-3M *1	This cable is connected to the GP2000H and GP-H70 unit's conversion adapter (GPH70-AP232-0).
GP2000H Series Special Purpose RS-422 Cable for GP-70H Conversion Adapter GP2000H-AP70CB-D422-3M *1	This cable is connected to the GP2000H and GP-H70 unit's conversion adapter (GPH70-AP422-0).

**1 When using this cable, some of the GP2000H unit's external output features are not available.*

■ Connection Methods

The optional cable (GP2000H-C232-3M/10M, GP2000H-C422-3M/10M) will require some preparation before it can be used. Digital's Connection Manual "Chapter 2. Connecting Each PLC with the GP" includes connection diagram(s) of the wiring connections used between the GP and PLC. However, the pin number assigned to each connector pin on the Handy Type GP's interface will differ from that of other GP series unit. Therefore, be sure to use Connector Pin Comparison Tables 1 and 2 below when creating a cable used between the GP2000H and the PLC. An additional cable will be required to supply electric power to the GP2000H.

Comparison Tables 1 and 2 correspond to option cables <GP2000H-C232-3M/10M> and <GP2000H-C422-3M/10M>, respectively.

Comparison Table 1 GP2000H-C232-3M/10M (RS-232C)

I/F	GP2000H Pin No.	Signal Name	Wire Color	Non-GP2000H Series Pin No.
DC24V I/F	3	FG	Shield	1
Serial I/F	1	RS	Red	4
	2	SD	Blue	2
	3	CS	Brown	5
	4	RD	Orange	3
	5	CD	Purple	8
	6	ER	Gray	20
	8	SG	White	7

Comparison Table 2 GP2000H-C422-3M/10M (RS-422)

I/F	GP2000H Pin No.	Signal Name	Wire Color	Non-GP2000H Series Pin No.
DC24V I/F	3	FG	Shield	1
Serial I/F	8	SG	Gray	7
	13	RDA	White	10
	14	REB	Black	16
	15	SDA	Yellow	11
	16	SDB	Green	15
	17	CSA	Red	21
	18	CSB	Blue	18
	19	ERA	Brown	22
	20	ERB	Orange	19

Note:

- **Be sure to connect this unit's SG/GND (Signal Ground) terminal to the other unit's Signal Ground terminal.**
- **When making a cable, please be aware of the following:**

<For RS-422 Connection>

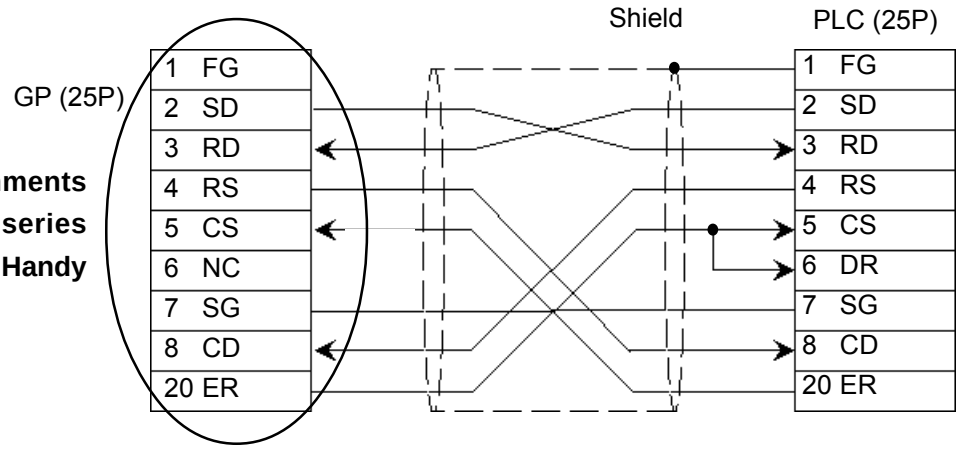
- **The following pairs of pin #'s must be connected to each other**
  ...#17 (CSA) <->#19 (ERA)
  ...#18 (CSB) <-> #20 (ERB)
- **When turning ON the switch inside the GP2000H rear-face's cable cover, a termination resistance of 100Ω is added between #13 (RDA) and #14 (RDB).**

Note:

- **When the GP is set as a Memory Link type and the cable type is RS-422, a 4-wire system must be used.**

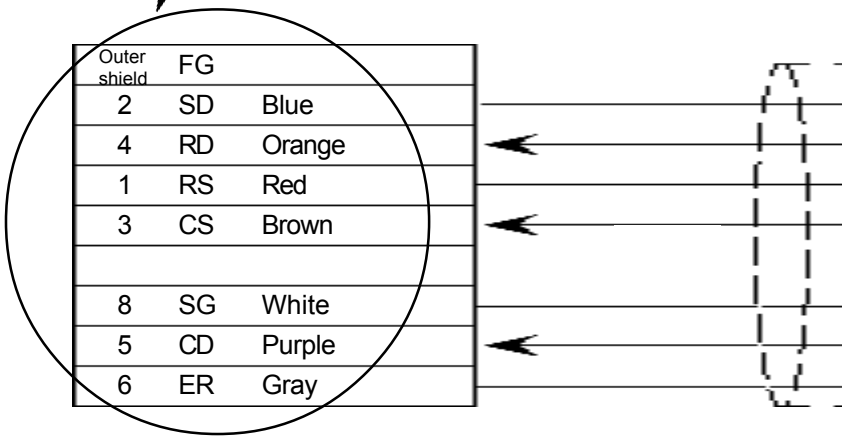
The following describes an example of converting the pin assignments for other GP series to those on the Handy Type GP. The following example connects a GP2000H with a Mitsubishi PLC (p.2-1-11 <Cable Diagram 1>).

Pin assignments for all GP series except the Handy Type GP.



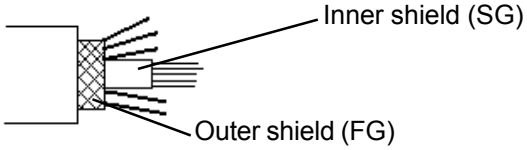
When using GP2000H optional cable (GP2000H-C232-3M/10M)

Pin assignments for the GP2000H converted from those of other GP series



Important

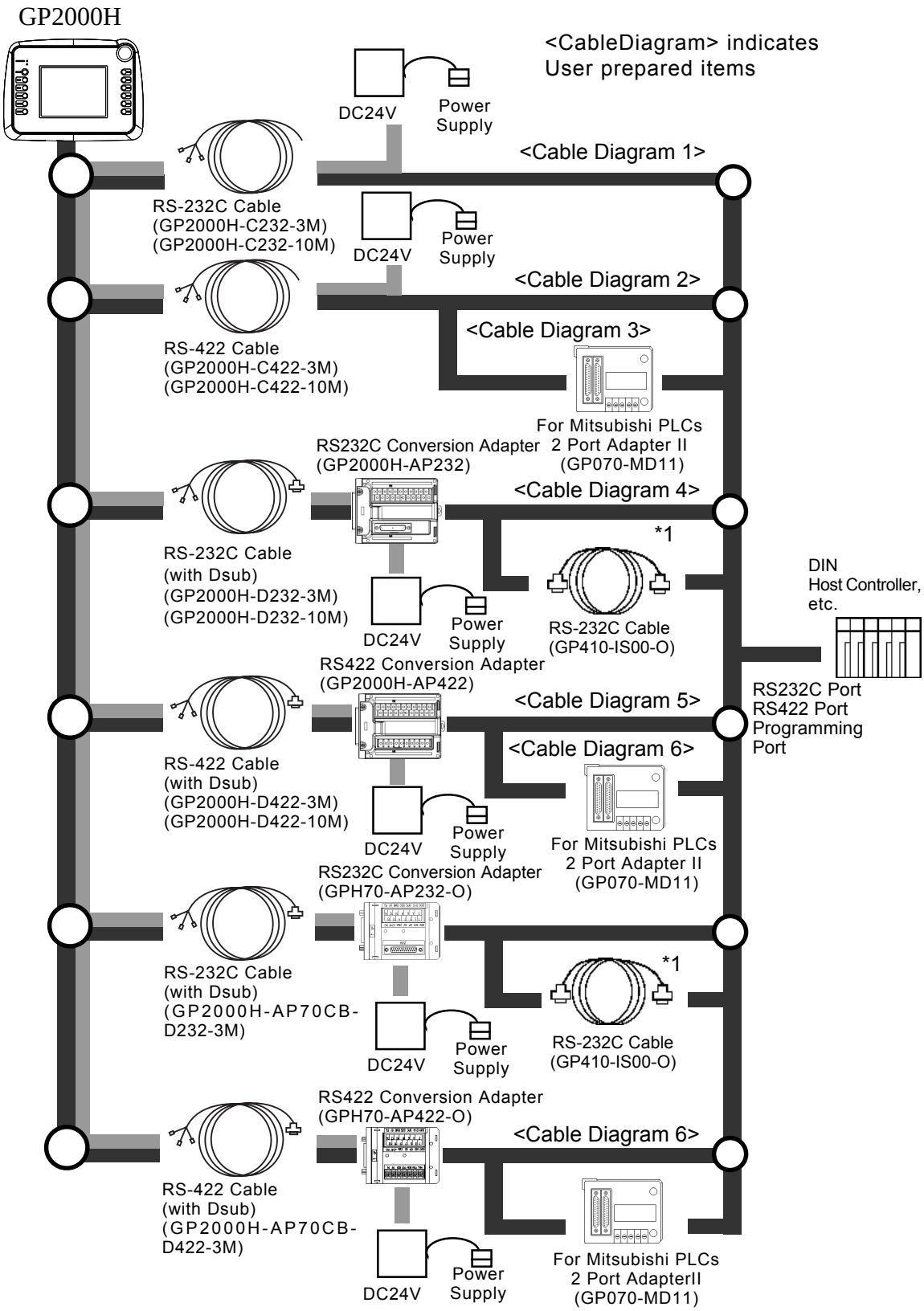
- ***If any wires in the above table's "Wire Color" column are not used, be sure those wires do not touch other signal wires or the connector case.***
- ***Be sure to connect the cable's outer shield to the FG wire (field ground).***



- ***Be sure to connect the inner shield to the external device's signal ground, in the same way as the Pin 8's SG connection.***

16.2.2 GP2000H System Design

The diagram below shows the GP unit's peripheral equipment.



**1 This cable may not be able to be connected to some PLCs. Be sure to check compatibility before connecting.*

Note: In the above system design diagram, the ▬▬ line indicates power supply routes. Be sure to supply electricity through conversion adapters or cables.

16.2.3 Cable Diagrams

The connection diagram of wiring connections used between the equipment described in "15.2.2 GP2000H System Design" is shown below. This connection diagram only shows those sections used for connecting to the PLC.

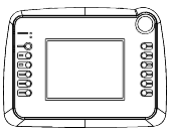
Important

- ***Be sure to connect this cable while the GP2000H's power is turned OFF, otherwise an electrical shock may occur.***
- ***When live lines are either connected or disconnected, if a difference in potential is created between the GP2000H and the connected device(s), the driver IC may be damaged. Therefore, be sure to connect this cable while the GP2000H's power is turned OFF.***
- ***Since the GP2000H interface signal wires and the GP power supply wires are contained inside a single cable, power supply noise may occur. Therefore, be sure to take appropriate precautions to prevent the connected device(s) from being interrupted by noise. (i.e. install a noise filter, etc.)***
- ***When connecting the RS-232C cable, the maximum cable length is 15m.***
- ***When connecting the RS-422 cable, the maximum cable length is 500m.***
- ***When connecting the communication cable, be sure to connect the SG.***
- ***The AWG22 is used for DC24V and external output wires.***

<Cable Diagram 1>

• When connecting GP2000H to PLC with GP2000H-C232-3M (3m) or GP2000H-C232-10M (10m)

GP2000H



GP series other than Handy Type GP Pin

Serial I/F

No.	Signal Name	Description	Wire Color	Dsub25P
2	SD	Send Data (RS-232C)	Blue	2
4	RD	Received Data (RS-232C)	Orange	3
1	RS	Request Send (RS-232C)	Red	4
3	CS	Clear Send (RS-232C)	Brown	5
8	SG	Signal Ground	White	7
5	CD	Carrier Detect (RS-232C)	Purple	8
6	ER	Enable Receive (RS-232C)	Gray	20
				1 *1

DC24V I/F

No.	Signal Name	Description	Wire Color
1	DC24V	+24V	Black/Green
2	0V	0V	Red/Green
3	FG	Frame Ground	Shield

PLC

*2

**1 Connect the cable's outer shield to Pin 1.*

2 Refer to the cable diagrams in **Chapter 2 PLC-GP Connection.*

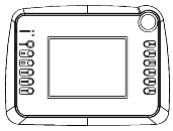
Note:

- **The wiring arrangement shown above cannot be used with the RS-232C cable's Conversion Adapter.**
- **To connect the Conversion Adapter, the wiring diagram in the GP2000H's RS-232 Conversion Adapter's Operation Instructions manual must be used.**
- **The customer will need to perform this cable's PLC connector wiring. The wires used this cable are AWG 28 (dia.=0.3mm/area-0.08mm^2). Using a solder cap tape connector is recommended.**
- **Be sure the wires do not touch other signal wires or connector case when they are not used.**

<Cable Diagram 2>

• When connecting GP2000H to PLC with GP2000H-C422-3M (3m) or GP2000H-C422-10M (10m)

GP2000H



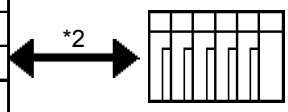
GP series other than Handy Type GP Pin No.

Serial I/F

No.	Signal Name	Description	Wire Color	Dsub25P
				1 *1
8	SG	Signal Ground	Gray	7
13	RDA	Received Data A (RS-422)	White	10
15	SDA	Send Data A (RS-422)	Yellow	11
16	SDB	Send Data B (RS-422)	Green	15
14	RDB	Received Data A (RS-422)	Black	16
18	CSB	Clear Send B (RS-422)	Blue	18
20	ERB	Enable Receive B (RS-422)	Orange	19
17	CSA	Clear Send A (RS-422)	Red	21
19	ERA	Enable Receive A (RS-422)	Red	22

DC24V I/F

No.	Signal Name	Description	Wire Color
1	DC24V	+24V	Black/Green
2	0V	0V	Red/Green
3	FG	Frame Ground	Shield



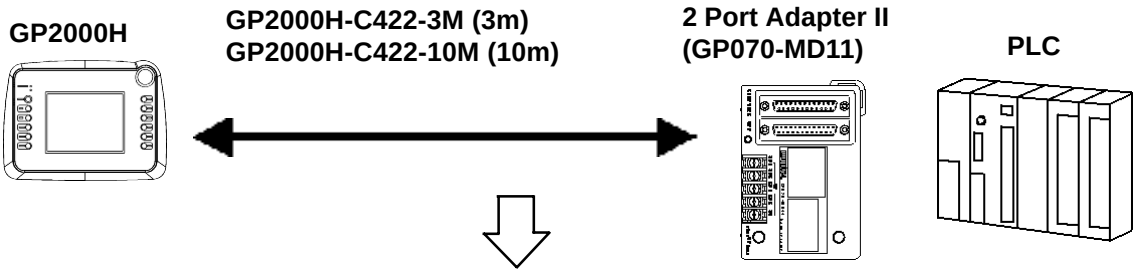
**1 Connect the cable's outer shield to Pin 1.*
2 Refer to the cable diagrams in* ***Chapter 2 PLC-GP Connection.*

Note:

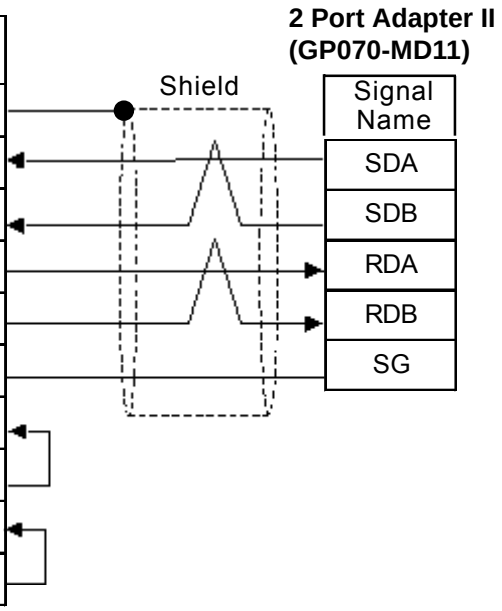
- **The wiring arrangement shown above cannot be used with the RS-232C cable's Conversion Adapter.**
- **To connect the Conversion Adapter, the wiring diagram in the GP2000H's RS-232 Conversion Adapter's Operation Instructions manual must be used.**
- **The customer will need to perform this cable's PLC connector wiring. The wires used for this cable are AWG 28 (dia.=0.3mm/area-0.08mm^2). Using a solder cap tape connector is recommended.**
- **Be sure these wires do not touch other signal wires or the connector case when they are not used.**

<Cable Diagram 3>

• When connecting GP2000H to 2 Port Adapter II (GP070-MD11) with GP2000H-C422-3M (3m) or GP2000H-C422-10M (10m)



Signal Name	Wire Color	Pin No.
FG	Outer Shield	——
RDA	White	13
RDB	Black	14
SDA	Yellow	15
SDB	Green	16
SG	Gray	8
CSA	Red	17
ERA	Brown	19
CSB	Blue	18
ERB	Orange	20



[GP2000H series]

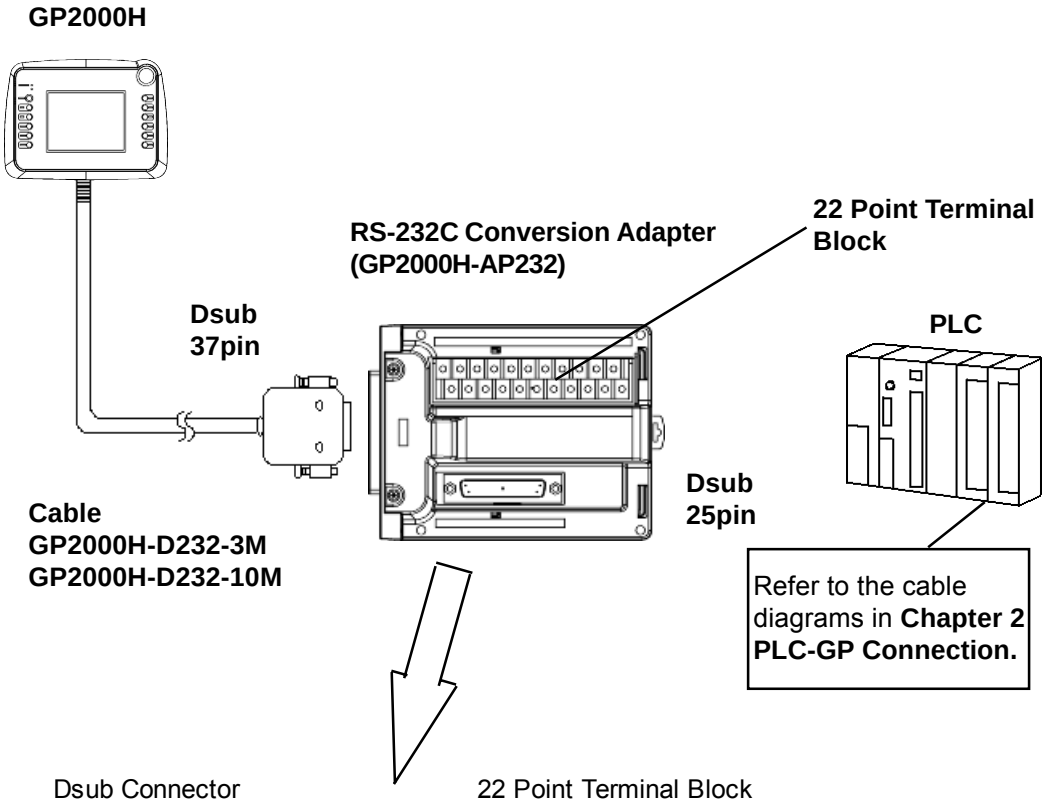
Pin numbers shown here represent the GP2000H unit's connection pins.

Note:

- **Select "Adapter+GPH" via "Adapter Mode/ CPU Direct Mode" on GP's offline screen.**
- **Be sure the wires do not touch other signal wires or connector case when they are not used.**
- **This cable diagram cannot be used for connection with the MELSEC-FX Series unit. When connecting the MELSEC-FX Series unit via the 2 Port Adapter II, refer to <Cable Diagram 6>.**

<Cable Diagram 4>

• When connecting GP2000H to PLC with RS-232C Conversion Adapter (GP2000H-AP232) with GP2000H-D232-3M (3m) or GP2000H-D232-10M (10m)



Dsub Connector

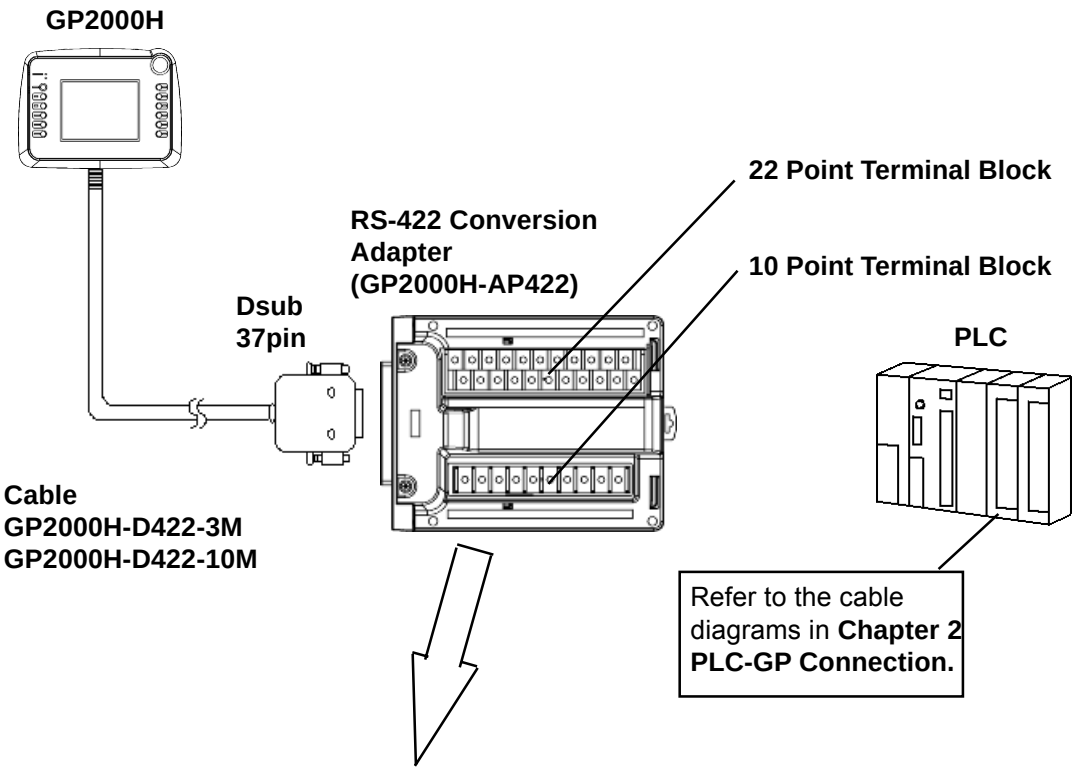
Pin No.	Signal Name
1	FG
2	SD
3	RD
4	RS
5	CS
7	SG
8	CD
14	+5V(out)
20	ER

22 Point Terminal Block

Pin No.	Signal Name(Drawing Name)	
1	DOUT0.C	(DO0)
2	Reserved	
3	DOUT1.C	(D01)
4	Reserved	
5	OP.C	(OP)
6	OP.GND	(OPG)
7	BUZZ OUT	(BZ)
8	DOUT.GND	(DOG)
9	EMG0A	(EM0A)
10	EMG0B	(EM0B)
11	EMG1A	(EM1A)
12	EMG1B	(EM1B)
13	EMG2A	(EM2A)
14	EMG2B	(EM2B)
15	ENB0A	(EN0A)
16	ENB0B	(EN0B)
17	ENB1A	(EN1A)
18	ENB1B	(EN1B)
19	+24V	(+24V)
20	0V	(0V)
21	NC	(NC)
22	FG	(FG)

<Cable Diagram 5>

• When connecting GP2000H to PLC via RS-422 Conversion Adapter (GP2000H-AP422) with GP2000H-D422-3M (3m) or GP2000H-D422-10M (10m)



10 Point Terminal Block

Pin No.	Signal Name
1	FG
2	SG
3	SDB
4	SDA
5	RDB
6	RDA
7	CSA
8	ERA
9	CSB
10	ERB

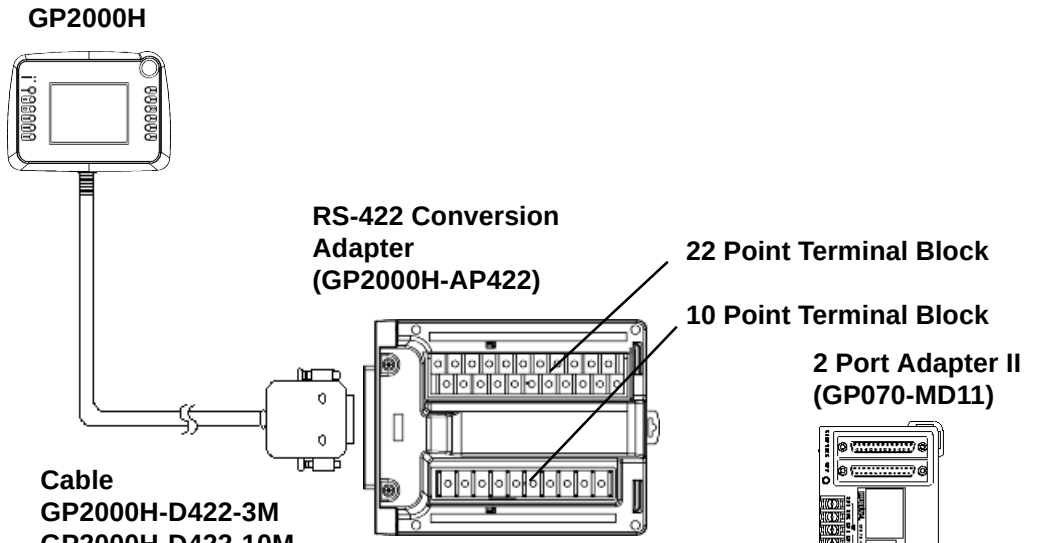
* *Pin Nos. 7 and 8; Nos. 9 and 10 are respectively shorted with connecting board. When it is not necessary to short on your PLC, remove the connecting board.*

22 Point Terminal Block

Pin No.	Signal Name(Drawing Name)	
1	DOUT0.C	(DO0)
2	Reserved	
3	DOUT1.C	(D01)
4	Reserved	
5	OP.C	(OP)
6	OP.GND	(OPG)
7	BUZZ OUT	(BZ)
8	DOUT.GND	(DOG)
9	EMG0A	(EM0A)
10	EMG0B	(EM0B)
11	EMG1A	(EM1A)
12	EMG1B	(EM1B)
13	EMG2A	(EM2A)
14	EMG2B	(EM2B)
15	ENB0A	(EN0A)
16	ENB0B	(EN0B)
17	ENB1A	(EN1A)
18	ENB1B	(EN1B)
19	+24V	(+24V)
20	0V	(0V)
21	NC	(NC)
22	FG	(FG)

<Cable Diagram 6>

• When connecting GP2000H to PLC via RS-422 Conversion Adapter (GP2000H-AP422) and 2 Port Adapter II with GP2000H-D422-3M (3m) or GP2000H-D422-10M (10m)



RS-422 Conversion Adapter (GP2000H-AP422)

Pin No.	Signal Name 10 Point Terminal block
1	FG
6	RDA
5	RDB
4	SDA
3	SDB
2	SG
7	CSA
8	ERA
9	CSB
10	ERB

2 Port Adapter II (GP070-MD11)

Signal Name
SDA
SDB
RDA
RDB
SG

* *Pins CSA and ERA; CSB and ERB are respectively shorted with connecting board*


MEMO

A1 Maximum Number of Consecutive PLC Addresses

The following lists the maximum number of consecutive addresses that can be read by each PLC. Refer to these tables to utilize *Block Transfer*.

Note: **When the device is setup using the methods below, the Data Communication Speed declines by the number of times the device is read.**

- **When consecutive addresses exceed the maximum data number range**
- **When an address is designated for *division***
- **When device types are different**

To speed up data communication, plan the tag layout in screen units, as consecutive devices. (Includes the Alarm and Trend screens.)

A1.1 Maximum number of Consecutive PLC Addresses (by Maker)

■ Mitsubishi Electric Corporation

MELSEC-A Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	32 Words	Data Register D	64 Words
Output Relay Y		Link Register W	
Internal Relay M		File Register R	
Latch Relay L		Extended File Register R	
Latch Relay B		Timer (current value) TN	
Timer (contact) TS		Counter (current value) CN	
Timer (coil) TC			
Counter (contact) CS			
Counter (coil) CC			

MELSEC-FX Series

Device	Max. No. of Consecutive Address
Input Relay X	32 Words
Output Relay Y	
Internal Relay M	
State S	
Timer (contact) TS	
Counter (contact) CC	
Data Register D	
Timer (current value) TN	
Counter (current value) CN	

MELSEC-F_2 Series

Device	Max. No. of Consecutive Address
Input Relay	8 Words
Output Relay	
Timer (contact)	
Counter (contact)	
Auxiliary Relay	
Keep Relay	
State	
Data Register W	
Timer (current value) TC	
Timer (setup value) TS	
Counter (current value) CC	
Counter (setup value) CS	

MELSEC-FX Series (using Link I/F)

Device	Max. No. of Consecutive Address
Input Relay	32 Words
Output Relay	
Auxiliary Relay	
State	
Special Auxiliary Relay	
Timer (contact)	
Counter (contact)	
Timer (current value)	64 Words
Counter (current value)	
Data Register	
Special Data Register	

MELSEC-QnA Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	280 Words	Aggregate Timer (contact) SS	280 Words
Output Relay Y		Aggregate Timer (coil) SC	
Internal Relay M		Counter (contact) CS	
Special Relay SM		Counter (coil) CC	
Latch Relay L		Timer (current value) TN	
Annunciator F		Monostable Timer (current value) SW	
Edge Relay V		Counter (current value) CN	
Step Relay S		Data Regsiter D	
Link Relay B		Special Register SD	
Special Link Relay SB		Link Register W	
Timer (contact) TS		Special Link Register SW	
Timer (contact) TC		File Register R	

* For direct CPU connections, use 480 words for all devices.

MELSEC-Q Series (CPU Direct Connection)

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay	Total of 960 Words	Special Link Relay	Total of 960 Words
Output Relay		Timer (current value)	
Internal Relay		Aggregate Timer (current value)	
Special Relay		Counter (current value)	
Latch Relay		Data Register	
Annunciator		Special Data Register	
Edge Relay		Link Data Register	
Step Relay		Special Link Register	
Link Relay		File Register (normal)	
		File Register (serial) 0R-31R	

■ Omron

SYSMAC C Series (includes α Series)

Device	Max. No. of Consecutive Address
Input/Output Relay	19 Words
Internal Hold Relay	
Data Link Relay LR	10 Words
Latch Relay HR	
Auxilary Memory Relay AR	28 Words
Timer (contact) TIM	48 Words
Counter (contact) CNT	
Data Memory DM	64 Words
Timer (current value) TIM	48 Words
Counter (current value) CNT	

SYSMAC CV Series

Device	Max. No. of Consecutive Address
Input/Output Relay	19 Words
Internal Hold Relay	
SYSMAC BUS/2 Remote I/O Relay	
Data Link Relay	
Latch Relay	
SYSMAC Remote I/O Relay	
Special Auxilary Relay A	28 Words
Timer (contact) T	48 Words
Counter (contact) C	
Data Memory D	64 Words
Timer (current value) T	48 Words
Counter (current value) C	

SYSMAC CS1/CJ Series

Device	Max. No. of Consecutive Addresses
Channel I/O	255 Words
Internal Auxiliary Relay	
Hold Relay	
Special Auxiliary Relay	
Timer(Contact)	
Counter(Contact)	
Timer(Current)	
Counter(Current)	
Data Memory	
Exp. Data Memory (E0 to EX)	
Exp. Data Memory (Current Bank)	
Task Flag	16 Words
Index Register	32 Words
Data Register	16 Words

■ Fuji Electric

MICREX-F Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input/Output Relay B	48 Words	Timer 0.1 (current value) W9	24 Words
Auxilary Relay M		Counter (current value) CR	
Keep Relay K		Coutner (setup value) CS	
Differential Relay D		Data Memory BD	
Link Relay L		Data Memory DI	
Timer (0.01 sec) T	1 Word	Data Memory SI	48 Words
Timer (0.1 sec) T		File Memory (W30)	
Counter C		File Memory (W31)	
Direct Input/Output W	48 Words	File Memory (W32)	
Timer 0.01 (current value) TR	24 Words	File Memory (W33)	24 Words
Timer 0.01 (setup value) TS		File Memory (W34)	

FLEX-PC N Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	105 Words	Data Register D	105 Words
Output Relay Y		Special Register D	
Internal Relay M		Link Register W	
Extended Internal Relay M		File Register R	
Latch Relay L		Timer (current value) T	
Extended Latch Relay L		Timer (setup value) TS	
Special Relay M		Counter (current value) C	
Timer T		Coutner (setup value) CS	
Counter C			

■ Yaskawa Electric

Memocon-SC Series (includes Micro)

Device	Max. No. of Consecutive Address
Coil (Output/Internal)	250 Words
Input Relay	
Link Coil D	128 Words
Input Register	125 Words
Output/Latch Register	
Link Register R	
Constant Register	
Extended Register	

PROGIC-8 Series

Device	Max. No. of Consecutive Address
Output Coil O	250 Words
Input Relay I	
Internal Coil N	
Link Coil D	128 Words
Data Register W	125 Words
Input Register D	
Link Register R	

MP900/ CP-9200SH Series

Device	Max. No. of Consecutive Address
Output Coil	125 Words
Input Relay	
Special Latch Register	
Input Register	

Control Pack Series

Device	Max. No. of consecutive Address
Input Coil O	250 Words
Output Register	
System Register	
System Register	125 Words
Data Register	
Common Register	
Input Register	
Output Register	

GL130 Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Coil	125 Words	Link Register 1. 2	125 Words
Input Relay		MC Relay	16 Words
Link Coil 1. 2		MC Coil	
Input Register		CM Code Relay 1. 2	
Output Register		MC Control Relay 1. 2	
Special Register		MC Control Coil 1. 2	

■ Hitachi

HIDIC-S10α/S10mini Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	256 Words	Receive Register Q	256 Words
Output Relay Y		Extended Internal Register M	
Internal Relay R		On delay Timer (setup value) TS	
Global Link G		On delay Timer (calculated value) TC	
Event E		One shot Timer (setup value) US	
Keep Relay K		One shot Timer (calculated value) UC	
On Delay Timer T		Up/Down Counter (setup value) CS	
One-shot Timer U		Up/Down Counter (calculated value) CC	
Up/Down Counter C		Word Register FW	
E Word EW		Data Register DW	
Transfer Register J		Extended Register MS	

HIDIC H (HIZAC H) Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
External Input X	60 Words	Watch Dog Timer WD	60 Words
External Output Y		Monostable Timer MS	
Remote Input Relay X		Accumulation Timer TMR	
Remote Output Relay Y		Up Counter CU	
Internal Output R		Ring Counter RCU	
Level 1 CPU Link L		Up/Down Counter CT	
Level 2 CPU Link L		Word Internal Counter WR	
Data Area M		Timer/Counter elapsed value TC	
On delay Timer TD		Network Link Area WN	
Single Shot Timer SS			

HIZAC EC Series

Device		Max. No. of Consecutive Address	
		Address	Vertical Address
Bit Device	External Input X	16 Words	1 Word
	External Output Y		
	Internal Output M		
	Timer, or Counter TC000 ~ TC095		---
Word Device	External Input WX	8 Words	1 Word
	External Output WY		
	Internal Output WM		
	Timer, or Counter TC100 ~TC195 TC200 ~ TC295		---

■ Sharp

New Satellite JW Series

Device	Max. No. of consecutive Address
Relay	100 Words
Timer (contact) T	
Counter (contact) C	
Timer/Counter (current value) T	
Timer/Counter (current value) B	
Register	
File Register (File 1~3) (File 10~2C)	

■ Matsushita Electric Works

MEWNET Series

Device	Max. No. of consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	27 Words	Link Register Ld	27 Words
Output Relay Y		Data Register /Special Data Register DT	
Internal Relay R		File Register FL	
Link Relay L		Timer/Counter (setup value) SV	24 Words
Special Relay R		Timer/Counter (elapsed value) SV	
Timer (contact) T	8 Words		
Counter (contact) C			

■ Yokogawa Electric

FACTORY ACE Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	1 Words	Timer (current value) TP	63 Words
Output Relay Y		Timer (setup value) TS	
Internal Relay I	63 Words	Counter (current value) CP	
Joint Relay E		Counter (setup value) CS	
Timer (contact) T	16 Words	Data Register D	
Counter (contact) C		Common Register B *1	
Special Relay M	63 Words	File Register B *1	
Link Relay L		Special Register Z	
		Link Register W	

**1 Device B becomes the Common Register when the CPU is FA500, and becomes the File Register when the CPU is FA-M3.*

■ Toyota Machine Works

TOYOPUC-PC2 Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	128 Words	Timer (contact) T	128 Words
Output Relay Y		Counter (contact) C	
Internal Relay I		Data Register D	
Keep Relay K		Link Register R	
Link Relay L		File Register B	
Edge Detect P		Current Value Register N	

TOYOPUC-PC3J Series

Device	Max. No. of Consecutive Addresses
Input(X)	128 Word
Output(Y)	
Internal Relay(M)	
Keep Relay(K)	
Link Relay(L)	
Special Relay(V)	
Edge Detection(P)	
Timer(T)	
Counter(C)	
Data Register(D)	
Link Register(R)	
Special Register(S)	
Current Value Register(N)	
File Register(B)	
Exp. Input(EX)	
Exp. Output(EY)	
Exp. Internal Relay(EM)	
Exp. Keep Relay(EK)	
Exp. Link Relay(EL)	
Exp. Special Relay(EV)	
Exp. Edge Relay(EP)	
Exp. Timer(ET)	
Exp. Counter(EC)	
Exp. Special Register (ES)	
Exp. Current Value Register(EN)	
Exp. Setting Value Register(H)	
Exp. Data Register(U)	

■ Toshiba

PROSEC EX Series

Device	Max. No. of Consecutive Address
External Input X	32 Words
External Output Y	
Auxiliary Relay R	
Link Register Relay Z	
Timer (contact) T	
Counter (contact) C	
Data Register D	
Timer (current value) T	
Counter (current value) C	

PROSEC T Series

Device	Max. No. of Consecutive Address
External Input 1 X	32 Words
External Output 1 Y	
External Input 2 I	
External Output 2 O	
Internal Relay R	
Special Relay S	
Link Register Relay Z	
Link Relay L	
Timer (contact) T	
Counter (contact) C	
Data Register D	
Link Register W	
File Register F	
Timer (current value) T	
Counter (current value) C	

■ Toshiba Machine

PROVISOR B Series, PROVISOR TC200 Series (TCCUH)

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay X	16 Words	Edge Relay E	16 Words
Output Relay Y		Timer (contact) T	
Internal Relay M		Counter (contact) C	
Extended Internal Relay 1 G		Generic Register 1	
Extended Internal Relay 2 H		Generic Register 2	
Special Auxiliary Relay A		Timer/Counter (current value)	
Latch Relay L		Timer/Counter (current value)	
Shift Register S			

PROVISOR TC200 Series (TCCUHS/TCCUSS)

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay 1 X	64 Words	Shift Register S	64 Words
Input Relay 2 I		Edge Relay E	
Output Relay 1 Y		Timer (current value)	
OutPut Relay 2 O		Timer/Counter (current value)	
Internal Relay R		Time/Counter (setting value)	
Extended Internal Relay 1 G		Generic Register 1 D	
Extended Internal Relay 2 J		Generic Register 2 B	
Extended Internal Relay 3 H		Generic Register 3 U	
Extended Internal Relay 4 K		Generic Register 4 M	
Special Auxiliary Relay A		Generic Register 5 Q	
Latch Relay L			

■ Koyo Electronics Industries

KOSTAC SG Series

Device	Max. No. of Consecutive Address
Input Relay I	128 Words
Output Relay Q	
Internal Relay M	
Stage S	
Link Relay (input) GI	
Specified Transfer Relay (output) GQ	
Timer (contact) T	
Counter (contact) C	
Data Memory R	
Timer (elapsed value) R	
Counter (elapsed value) R	

KOSTAC SU Series

Device	Max. No. of Consecutive Address
Input Relay I	128 Words
Output Relay Q	
Internal Relay M	
Stage S	
Link Relay (input) GI	
Timer (contact) T	
Counter (contact) C	
Data Memory R	
Timer (elapsed value) R	
Counter (elapsed value) R	

KOSTAC SZ Series

Device	Max. No. of Consecutive Address
Input Relay I	128 Words
Output Relay Q	
Internal Relay M	
Timer (contact) T	
Counter (contact) C	
Data Memory R	
Stage S	
Timer (elapsed value) R	
Counter (elapsed value) R	

KOSTAC SR Series

Device	Max. No. of Consecutive Address
Input/Output	128 Words
Internal Relay	
Timer/Counter (contact) R	
Timer/Counter (elapsed value) R	
Variable Register R	

DL-405 Series

Device	Max. No. of Consecutive Address
Input Relay (X)	128 Words
Output Relay (Y)	
Internal Relay (C)	
Stage (S)	
Link Relay (GX)	
Timer (contact) (T)	
Counter (contact) (CT)	
Data Memory (V)	
Timer (elapsed value) (V)	
Counter (elapsed value) (V)	

DL-205 Series

Device	Max. No. of Consecutive Address
Input Relay (X)	128 Words
Output Relay (Y)	
Internal Relay (C)	
Timer (current) (T)	
Counter (current) (CT)	
Data Memory (V)	
Stage (S)	
Timer (elapsed value) (V)	
Counter (elapsed value) (V)	

DL-305 Series

Device	Max. No. of Consecutive Address
Input / Output	128 Words
Internal relay	
Timer / Counter (contact) (V)	
Timer / Counter (elapsed value) (V)	
Data Register (V)	

■ GE Fanuc Automation

SNP-X Protocol

Device	Max. No. of Consecutive Address
Input Relay I	128 Words
Output Relay Q	
Internal Relay M	
Global Relay G	
Momentary Relay T	
System Function Relay SA	
System Function Relay SB	
System Function Relay SC	
Register R	
Analog Input AI	
Analog Output AQ	

GE FANUC 90-30/90-70 SNP

Device	Max. No. of Consecutive Address
Input Relay I	250 Words
Output Relay Q	
Internal Relay M	
Global Relay G	
Temporary Relay T	
System Status Relay SA	
System Status Relay SB	
System Status Relay SC	
System Status Relay S	
Register R	
Analog Input AI	
Analog Input AQ	

■ Fanuc Motion Controller

FANUC Power Mate Series

Device	Max. No. of Consecutive Address
Input Relay X	128 Words
Output Relay Y	
Internal Relay	
Keep Relay K	
Data Table D	
Timer T	
Counter C	

■ IDEC Izumi

FA Series

Device	Max. No. of Consecutive Address
Input Relay XW	100 Words
Output Relay YW	
Internal Relay MW	
Shift Register RW	
Data Register D	
Control Register D	
Timer (setup value) TS	
Timer (current value) T	
Timer 10msec (current value) H	
Counter (setup value) CS	
Counter (current value) C	

MICRO³

Device	Max. No. of Consecutive Address
Input Relay X	2 Words
Output Relay Y	
Internal Relay M	13 Words
Shift Register R	4 Words
Timer (setup value) T	32 Words
Timer (calculated value) t	
Counter (setup value) C	
Counter (calculated value) c	
Data Register D	100 Words

MICROSmart FC4A Series/OpenNet Controller FC3 Series

Device	Max. No. of Consecutive Addresses
Input X	120 words
Output Y	
Internal Relay M	
Special Internal Relay M8	
Shift Register R	
Timer T	20 words
Timer t	
Counter C	
Counter c	
Data Register D	120 words
Special Data Register D8	
Link Register L	1 word

■ Siemens

SIMATIC S5 Series

Device	Max. No. of Consecutive Address
Input I	64 Words
Output Q	
Internal Relay F	
Timer T	
Counter C	
Data Word D	
Ext. Data Word X	

SIMATIC S7 200 (via PPI)

Device	Max. No. of Cosecutive Address
Input	64 Words
Output	
Internal	
Timer	
Counter	
Variable Memory	

SIMATIC S200 (via MPI)

Device	Max. No. of Cosecutive Address
Input	64 Words
Output	
Internal	
Timer	
Counter	
Data Block	

SIMATIC S7 300/400 (via MPI)

Device	Max. No. of Cosecutive Address
Input	64 Words
Output	
Internal	
Timer	
Counter	
Data Block	

SIMATIC S7 300/400 (via 3964/ RK512)

Device	Max. No. of Cosecutive Address
Data Block	64 Words

SIMATIC 505 Series

Device	Max. No. of Consecutive Addresses
Variable Memory V	15 Words *1
Word Input WX	15 Words
Word Output WY	15 Words
Loop Gain LKC	7 Words
Loop Reset LTI	7 Words
Loop Rate LTD	7 Words
Loop Alarm High Limit LHA	7 Words
Loop Low Alarm Limit LLA	7 Words
Loop Process Variable LPV	7 Words
Loop PV High Limit LPVH	7 Words
Loop PV Low Limit LPVL	7 Words
Loop Orange Deviation Limit LODA	7 Words
Loop Yellow Deviation Alarm Limit LYDA	7 Words
Loop Sample Rate LTS	7 Words
Loop Setpoint LSP	7 Words
Loop Output LMN	7 Words
Loop Error LERR	7 Words
Loop Bias LMX	7 Words
Loop Alarm High-High Limit LHHA	7 Words
Loop Low-Low Alarm Unit LLLA	7 Words
Loop Rate of Change Alarm Limit LRCA	7 Words
Loop Setpoint High Point LSPH	7 Words
Loop Setpoint Low Limit LSPL	7 Words

Device	Max. No. of Consecutive Addresses
Loop Alarm Deadband LADB	7 Words
Loop V-flags LVF	7 Words
Most Significant Word of Loop C-flags LCFH	7 Words
Least Significant Word of Loop C-flags LCFL	7 Words
Analog Alarm/Alarm Acknowledge Flags AADB	7 Words
Most Significant Word of Analog Alarm C-flags ACFH	7 Words
Least Significant Word of Analog Alarm C-flags ACFL	7 Words
Analog Alarm Error AERR	7 Words
Analog Alarm High Alarm Limit AHA	7 Words
Analog Alarm High-High Alarm Limit AHHA	7 Words
Analog Alarm Low Alarm Limit ALA	7 Words
Analog Alarm Low-Low Alarm Limit ALLA	7 Words
Analog Alarm Loop Orange Deviation Alarm Limit AODA	7 Words
Analog Alarm Process Variable APV	7 Words
Analog Alarm Rate of Change Alarm Limit ARCA	7 Words
Analog Alarm Setpoint ASP	7 Words
Analog Alarm SP High Limit ASPH	7 Words
Analog Alarm SP Low Limit ASPL	7 Words
Analog Alarm Sample Rate ATS	7 Words
Analog Alarm Yellow Deviation Alarm Limit AYDA	7 Words
Timer/Counter Preset TCP	7 Words
Timer/Counter Current TCC	7 Words
Drum Counter Preset DCP	7 Words
Drum Step Preset DSP	10 Words
Drum Step Current DSC	10 Words
Status Word STW	7 Words
Drum Count Current DCC	10 Words

**1 For device address V1024 or higher, use 7 words.*

■ Rockwell (Allen-Bradley)

SLC 500 Series

Device	Max. No. of Consecutive Address
Bit B	118 Words
Timer TP/TA	1 Word
Counter CP/CA	
Timer TT/TN	
Counter CU/CD/CN	
Integral Number N	118 Words
Float F	

PLC-5 Series

Device	Max. No. of Consecutive Address
Input Relay I	64 Words
Output Relay O	
Internal Relay B	
Data Register N/D/A	
Timer TP/TA	40 Words
Counter CP/CA	
Timer TT/TN	
Counter CU/CD	

SLC 500 DH485

Device	Max. No. of Consecutive Address
Status	40 Words
Bit	
Timer	
Counter	
Control	
Integer	

DH Plus

Device	Max. No. of Consecutive Address
Output	50 Words
Input	
Status	
Bit	
Timer	
Counter	
Control	
Integer	
Float	
Ascii	

Control Logix5000 Series

Device	Max No. of Consecutive Address
Bit (BOOL)	122 Words
8 bit integer (SINT)	
16 bit integer (INT)	
32 bit integer (DINT)	
32 bit float (REAL)	

■ Keyence

KZ-300/KZ-350 Series

Device	Max. No. of Consecutive Address
Input Relay	19 Words
Output Relay	
Auxiliary Relay	
Internal Hold Relay	
Special Auxilary Relay	
Timer T	48 Words
Counter C	
Data Memory DM	64 Words
Temporary Data Memory TM	10 Words

KV Series

Device	Max. No. of Consecutive Addresses
Input/Output Relay	16 Words
Internal AUX Relay	
Special AUX Relay	
Timer (contact)	1 Bit
Counter (contact)	
High-speed counter comparator (contact)	
Timer (set value)	16 Words
Timer (current value)	
Counter (set value)	
Counter (current value)	
Data Memory	
Temporary Data Memory	
Digital Trimmer	2 Words
High-Speed Counter (current value)	1 word
High-Speed Counter Comparator (set value)	

KZ-A500 Series

Device	Max. No. of Consecutive Addresses
Input Relay (X)	32 Words
Output Relay (Y)	
Internal Relay (M)	
Latch Relay (L)	
Link Relay (B)	
Annunciator Relay (F)	
Special Relay (M9)	
Timer (contact) TS	16 Words
Timer (coil) TC	
Counter (contact) CS	
Counter (coil) CC	
Timer(current value) TN	64 Words
Counter (current value) CN	
Data Register (D)	
Link Register (W)	
File Register (R)	
Special Register (D9)	

KV-700 Series

Device	Max No. of Consecutive Address
Input/Output Relay	124 Words
Internal AUX Relay	
Control Relay	40 Words
Timer (contact)	28 Bits
Counter (contact)	
High-Speed Counter Comparator (contact)	4 Bits
Timer (set value)	124 Words
Timer (current value)	
Counter (set value)	
Counter (current value)	
Data Memory	
Temporary Data Memory	
Digital Trimmer	16 Words
High-Speed Counter (current value)	4 Words
High-Speed Counter Comparator (set value)	8 Words
Control Memory	40 Words

■ Shinko Electric

SELMART Series

Device	Max. No. of Consecutive Address
Data Register	64 Words

■ Modicon

Modicon Modbus Master

Device	Max. No. of Consecutive Address
Output Bit	80 Words
Input Bit	
Output Register	
Input Register	

Modicon Modbus Plus

Device	Max. No. of Consecutive Address
Output Bit	80 Words
Input Bit	
Output Register	
Input Register	

Modicon Modbus Slave

Device	Max. No. of Consecutive Address
Output Register	125 Words

■ Matsushita Electric Industrial

Panadac P7000 series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input Relay	58 Words	Link Register	58 Words
Internal Relay		Timer (setup value)	
Link Relay		Counter (current value)	
Status Relay		Counter Value	29 Words
MC Status Relay		Position Data	
Timer State Relay		CPU Input Relay	58 Words
Timer-up Relay		CPU Output Relay	
Data Memory			

■ ORIM VEXTA

E1 Series

Device	Max. No. of Consecutive Addresses
I	64 Words
IU	
ID	
O	
M	
R	
RD	
B	
MS	
SY	
AD	
DA	
SL	
SH	
SR	
SD	
MP	

■ FATEK

Facon FB 20MC (using CPU Direct Connection)

Device	Max. No. of Consecutive Addresses
X (Input points)	1 Words
Y (Output Relays)	
M (Internal Relays)	
SM (Special Relays)	
S (Step Relays)	
T (Timer Registers)	
C (Counter Registers)	
WX (Input points)	32 Words
WY(Output Relays)	
WM (Internal Relays)	
WSM (Special Relays)	
WS (Step Relays)	
TMR (Timer Registers)	
CTR (Counter Registers)	
HR (Data Register)	
IR (Input Registers)	
OR (Output Registers)	
HSC (HSC Registers)	
RTC (Calendar Registers)	
SR (Special Register)	
ROR (Read-Only Registers)	

Using Ethernet Connection

■ Mitsubishi Electric

MELSEC-A Series

Device	Max. No. of Consecutive Address
Input Relay	128 Words
Output Relay	
Latch Relay	
Special Relay	
Annunciator	
Link Relay	
Timer (contact)	
Timer (coil)	
Counter (contact)	
Counter (coil)	
Timer (current value)	258 Words
Counter (current value)	
Data Register	
Special Register	
Link Register	
File Register	

MELSEC-Q/QnA Series

Device	Max. No. of Consecutive Address
Input Relay	480 Words
Output Relay	
Internal Relay	
Special Relay	
Latch Relay	
Annunciator	
Edge Relay	
Step Relay	
Link Realy	
Special Link Relay	
Timer (Current Value)	
Aggregate Timer (Current Value)	
Counter (Current Value)	
Data Register	
Special Register	
Link Register	
Special Link Register	
File Register (Normal)	
File Register (Serial) 0R ~ 31R	

■ Toshiba

PROSEC-T Series

Device	Max. No. of Consecutive Addresses
External Input Device	248 bits
External Output Device	
Auxiliary Relay	
Special Relay	
Link Register Relay	
Link Relay	
Timer (Contact)	
Counter (Contact)	
Timer (Currrent Value)	248 words
Counter (Current Value)	
Data Register	
Link Register	
File Register	

■ Yokogawa Electric

FACTORY ACE Series/FA-M3

Device	Max.No.of Consecutive Addresses
Input Relay	1 Word
Output Relay	
Internal Relay	64 words
Common Relay	
Special Relay	
Link Relay	
Timer (contact)	16 words
Counter (contact)	
Timer (current value)	64words
Counter (current value)	
Timer (setup value)	
Counter (setup value)	
Data Register	
File Register	
Common Register	
Special Register	
Link Register	

■ Meidensha

UNISEQUE Series

Device	Max. No. of Consecutive Address
Memory	128 Words

■ OMRON

SYSMAC CS1 Series

Device	Max.No.of Consecutive Addresses
Channal I/O	400 words
Internal Auxilary Relay	
Latch Relay	
Special Auxilary Relay	
Timer (Contact)	
Counter (Contact)	
Timer (Current Value)	
Counter (Current Value)	
Data Memory	
Extended Data Memory (E0 ~ EC)	
Extended Data Memory (Current Bank)	
Task Flag	16 words
Index Register	32 words
Data Register	16 words

Interbus-S connection

■ Siemens

Packet Transfer Mode

Device	Max. No. of Consecutive Address
Data Block DBxW	6 Words
Input IW	
Output OW	
Internal Memory MW	

Using CC-Link Intelligent Device Station

■ Mitsubishi Electric

MELSEC-A/QnA/Q Series

Device	Max. No. of Consecutive Address
Iput Relay	480 Words
Output Relay	
Internal Relay	
Special Relay	
Latch Relay	
Special Link Relay	
Timer (contact)	
Timer (coil)	
Aggregate Timer (contact)	
Aggregate Timer (coil)	
Counter (contact)	
Counter (coil)	
Timer (current value)	
Aggregate Timer (current value)	
Counter (current value)	
Data Register	
Special Register	
Link Register	
Special Link Register	
File Register	

Using Electronic Temperature Controller

■ Yokogawa/Yokogawa M&C Controllers

UT2000/UT3000/Green Series

Device	Max. No. of Consecutive Address
D	63 Words
I	63 Words

UT100

Device	Max. No. of Consecutive Address
D Register	32 Words

■ Yamatake Controllers

Device	Max. No. of Consecutive Address
Data	5 Words

■ RKC INSTRUMENT INC.Controllers

Device	Max. No. of Consecutive Address
————	125 Words

■ Omron Corporation Controllers

Device	Max. No. of Consecutive Address
C0	2 Double Words
C1	
C3	
A	1 Word

■ RKC INSTRUMENT INC.

CB Series/SR-MiniSeries

Device	Max. No. of Consecutive Address
DataItems	1 Word

■ Shinko Technos Corporation Controllers

C/FC/FIR/GC/FCL/PC-900 Series

Device	Max. No. of Consecutive Address
DataItems	1 Word
Setting Value Memory 1 to 7	1 Word
Channel 1 to 20	1 Word *1

**1 Although only a single word can be read at a time from a single controller, up to 20 channels can be read simulataneously.*

■ Fuji Electric Corporation Controller

Micro-Controller X Series (Model:PXR)

Device Address	Max. No. of Consecutive Address
00001 ~	1 bit
10001 ~	8 bit
30001 ~	15 words
40001 ~	60 words
31001 ~	15 words
41001 ~	60 words

■ TOHO ELECTORICS INC.

TTM Series

Device	Max. No. of Consecutive Addresses
00_	1 word
10_	
100_	
110_	
120_	
300_	
1020_	
Step Temperature Setting SSV	
Final Step Setting END	
Step time Setting STI	
Final Step Finish Condition Setting SOK	
Step Wait Zone SWZ	
Step Wait Time SWT	
Time Signal ON Time SON	
Time Signal OFF Time SOF	
Execution Time SRN	
End Signal ON Time SEO	

■ Fenwal

AL Series

Device	Max. No. of Consecutive Address	Device	Max. No. of Consecutive Address
Input signal IN	1 Word	Temperature value before high-point correction for IRr/c 2-point correction value IA	1 Word
Decimal place in linear input UN		Temperature value after high-point correction for IRr/c 2-point correction value IB	
With or without IRr/c 2-point correction IR		Temperature value after low-point correction for IRr/c 2-point correction value IC	
Control mode CM		Temperature value after low-point correction for IRr/c 2-point correction value ID	
Filter constant FS		Transmission output scaling H and L DS	2 Words
Control LED illumination direction OD		Setting value for heater breakage current CA	1 Word
Control output direction OA		Warning sensitivity AD	
Burnout direction BO		Main temperature setting S1	
Output limit method LT		Warning 1: 1 point SP	
Warning type AK		Warning 1: Bands H and L SB	2 Words
Warning 1: Alarm warning code HA		Warning 2: 1 point DP	1 Word
Warning 1: Temperature warning code A11		Warning 2: Bands H and L DB	2 Words
Warning 2: Temperature warning code A21		Warning 3: 1 point TP	1Word
Warning 3: Temperature warning code A31		Warning 3: Bands H and L TB	2 Words
Warning LED illumination direction LE		Output method OU	1 Word
CT type CT		Number of warnings AN	
Upper and lower limits of setting range HL	2 Words	RUN/STOP RS	
Linear input scaling H and L L		Auto tuning AT	
Upper and lower output limits OL		Key locking KY	
Proportional time PT	1 Word	Mode locking ML	
Proportional band PB		POWER ON/OFF ON	
Integral action time IT		Current temperature PV	
Derivative action time DT		Operation panel MV	
ARW AR		Temperature control GC	8 Words
ON/OFF sensitivity DI		Warning GA	
Manual reset RT		Panel data GP	
Sensor error correction SA			

Using Inverter

■ Mitsubishi Electric

Device	Max. No. of Consecutive Address
————	1 Words
P	1 Double Words
OPE	1 Words
OUTF	1 Double Words
OUTC	1 Words
OUTV	
SPM	
SSEL	
SOF	
SOC	
SOV	
FSET	
RUNS	
MOT	
RBRK	
ELOF	
OCPV	
COPK	
IPOW	
OPOW	
A12D	
A34D	
A56D	
A78D	
RUNC	
INVS	
RWRT	
SFWE	
SFWR	
SFRE	
SFRR	
ERCL	
RSET	
ALLC	
LNKP	
SECP	

■ Fuji Electric

Device	Max. No. of consecutive Address
Basic Function	1 Word
Terminal Function	
Control Function	
Motor 1	
High Level Function	
Motor 2	
Option	
Order Data	
Monitor Data	

■ Yasukawa

Device	Max. No. of Consecutive
Bit Register	16 Words
Register	

Using Servo

■ Matsushita Electric's Servo

Device	Max. No. of consecutive Address
05_	6 Words
20_	1 Word
21_	2 Words
22_	2 Words
24_	1 Word
25_	
26_	2 Words
27_	2 Words
28_	3 Words
29_	4 Words
2A_	6 Words
2D_	5 Words
80_	1 Word
90_	
91_	
92_	14 Words
B0_	4 Words
B1_	64 Words

Connection to Analyzer

■ JT Engineering Analyzer

JE-70 Series

Device	Max. No. of consecutive Address
Status Error and Error (M)	32 Words
Current Value (D)	64 Words
Common Constant, Recipe Constant, Station-specific Data, Filter Constant, and Compensation Parameter (R)	64 Words

A 2 Device Codes and Address Codes

Device codes and address codes are used to specify indirect addresses for the E-tags or K-tags.

The word addresses of data to be displayed are coded and stored in the word address specified by the E-tags and K-tags. (Code storage is done either by the PLC, or with T-tag and K-tags)

Example: MELSEC-A Series (Mitsubishi Electric Corp.)

When the GP-PRO/PBIII for Windows software has been used to set on E-tag's "Word Address" to "D0000", to display the M0016 interval relay's data on the GP, store the following code data:

D0000	9000	<- Device code
D0001	0001	<- Address code

The device code for the M0016 internal relay is “9000” and the address code is “0001” (0016/16).

A 2.1 PLC Devices and Address Codes (by Maker)

The codes used for each type of PLC are shown below. [LS Area] is the device inside the GP.

Codes marked with an X cannot be used to specify E-tag and K-tag indirect addresses.

■ Mitsubishi

MELSEC-A Series (AnA/AnU/A2US/A2USH-S1)

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000~	8000	Save as word address value, with the tenths position "0" removed.
	Output Relay	Y0000~	8800	Save as word address value, with the tenths position "0" removed.
	Internal Relay	M0000~	9000	Save as word address value divided by 16.
	Special Relay	M9000~	B000	Save as word address value minus 9000 divided by 16.
	Annuniciator	F0000~	B800	Save as word address value divided by 16.
Word Device	Timer (current value)	TN0000~	6000	Word Address
	Counter (current value)	CN0000~	7000	Word Address
	Data Register	D0000~	0000	Word Address
	Special Register	D9000~	0000	Word Address
	Link Register	W0000~	4800	Word Address
	File Register	R0000~	5800	Word Address
	LS area	LS0000~	4000	Word Address

MELSEC-A Series (AnN/A2C/A1S/A3H/A0J2/A1SJ/A2SH/A1SH/A2CJ-S3)

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000~	8000	Save as word address value, with the tenths position "0" removed.
	Output Relay	Y0000~	8800	Save as word address value, with the tenths position "0" removed.
	Internal Relay	M0000~	9000	Save as word address value divided by 16.
	Special Relay	M9000~	B000	Save as word address value minus 9000 divided by 16.
	Annuniciator	F000~	B800	Save as word address value divided by 16.
Word Device	Timer (current value)	TN000~	6000	Word Address
	Counter (current value)	CN000~	7000	Word Address
	Data Register	D0000~	0000	Word Address
	Link Register	W0000~	4800	Word Address
	File Register	R0000~	5800	Word Address
	LS area	LS0000~	4000	Word Address

MELSEC-F_2 Series

	Device	Word Address	Device code (HEX)	Address code
Word Device	Timer (current value)	TC050~ TC450~ TC550~ TC650~	X	X
	Timer (set value)	TS050~ TS450~ TS550~ TS650~	X	X
	Counter (current value)	CC060~ CC460~ CC560~ CC660~	X	X
	Counter (set value)	CS060~ CS460~ CS560~ CS660~	X	X
	Data Register	DW700 ~	0000	Save as word address value minus 700.
	LS area	LS0000 ~	4000	Word Address

MELSEC-FX Series (FX_0)

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X000~	8000	Word Address
	Output Relay	Y000~	8800	Word Address
	Internal Relay	M000~	9000	Save as word address value divided by 16.
	State	S000~	9800	Save as word address value divided by 16.
Word Device	Timer (current value)	TN000~	6000	Word Address
	Counter (current value)	CN000~	7000	Word Address
	Data Register	D000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

MELSEC-FX Series (FX_1/FX_2/FX_{2N}/FX_{0N})

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X000~	8000	Save as word address value, with the tenths position "0" removed.
	Output Relay	Y000~	8800	Save as word address value, with the tenths position "0" removed.
	Internal Relay	M0000~	9000	Save as word address value divided by 16.
	State	S000~	9800	Save as word address value divided by 16.
Word Device	Timer (current value)	TN000~	6000	Word Address
	Counter (current value)	CN000~	7000	Word Address
	Data Register	D000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

MELSEC-QnA Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000~	8000	Save as word address value, with the tenths position "0" removed.
	Output Relay	Y0000~	8800	Save as word address value, with the tenths position "0" removed.
	Internal Relay	M00000~	9000	Save as word address value divided by 16.
	Special Relay	SM0000~	B000	Save as word address value divided by 16.
	Latch Relay	L00000~	C000	Save as word address value divided by 16.
	Annuniciator	F00000~	B800	Save as word address value divided by 16.
	Edge Relay	V0000~	9800	Save as word address value divided by 16.
	Step Relay	S0000~	A800	Save as word address value divided by 16.
	Link Relay	B0000~	C800	Save as word address value, with the tenths position "0" removed.
	Special Link Relay	SB000~	A000	Save as word address value, with the tenths position "0" removed.
Word Device	Timer (current value)	TN00000~	6000	Word Address
	Aggregate Timer (current value)	SN00000~	5000	Word Address
	Counter (current value)	CN00000~	7000	Word Address
	Data Register	D0000~	0000	Word Address
	Special Register	SD0000~	6800	Word Address
	Link Register	W0000~	4800	Word Address
	Special Link Register	SW000~	7800	Word Address
	File Register (normal)	R00000~	5800	Word Address
	File Register (serial)	0R0000~	0600	Word Address
		1R0000~	0800	Word Address
	LS area	LS0000~	4000	Word Address

MELSEC-Q Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000 ~	8000	Save as word address value, with the tenths position "0" removed.
	Output Relay	Y0000 ~	8800	Save as word address value, with the tenths position "0" removed.
	Internal Relay	M0000 ~	9000	Save as word address value divided by 16.
	Special Relay	SM0000 ~	B000	Save as word address value divided by 16.
	Latch Relay	L0000 ~	C000	Save as word address value divided by 16.
	Annunciator	F0000 ~	B800	Save as word address value divided by 16.
	Edge Relay	V0000 ~	9800	Save as word address value divided by 16.
	Step Relay	S0000 ~	A800	Save as word address value divided by 16.
	Link Relay	B0000 ~	C800	Save as word address value, with the tenths position "0" removed.
	Special Link Relay	SB000 ~	A000	Save as word address value, with the tenths position "0" removed.
Word Device	Timer (current value)	TN00000 ~	6000	Word Address
	Aggregate Timer (Curren	SN00000 ~	5000	Word Address
	Counter (current value)	CN00000 ~	7000	Word Address
	Data Register	D00000 ~	0000	Word Address
	Special Data Register	SD0000 ~	6800	Word Address
	Link Data Register	W0000 ~	4800	Word Address
	Special Link Register	SW000 ~	7800	Word Address
	File Register (normal)	R0000 ~	5800	Word Address
	File Register (serial)	0R0000 ~	0600	Word Address
		1R0000 ~	0800	Word Address
		2R0000 ~	0A00	Word Address
		3R0000 ~	0C00	Word Address
		4R0000 ~	0E00	Word Address
		:	:	:
		29R0000 ~	4200	Word Address
		30R0000 ~	4400	Word Address
		31R0000 ~	4600	Word Address

■ Omron

SYSMAC C Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	000~	9100	Word Address
	Internal Auxilary Relay			
	Analog Setup Value Storage Area	220~	9100	Word Address
	Data Link Relay	LR00~	C900	Word Address
	Special Auxilary Relay	244~	9100	Word Address
	Auxilary Memory Relay	AR00~	B000	Word Address
	Latch Relay	HR00~	C100	Word Address
Word Device	Timer (current value)	TIM0000~	6000	Word Address
	Counter (current value)	CNT0000~	7000	Word Address
	Data Register	DM0000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

SYSMAC α Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	I/O Relay I	000~	9100	Word Address
	I/O Relay II	300~	9100	Word Address
	Internal Auxilary Relay I	030~	9100	Word Address
	Internal Auxilary Relay II	310~	9100	Word Address
	Special Auxilary Relay I	236~	9100	Word Address
	Special Auxilary Relay II	256~	9100	Word Address
	Latch Relay	HR00~	C100	Word Address
	Auxilary Memory Relay	AR00~	B000	Word Address
	Link Relay	LR00~	C900	Word Address
Word Device	Timer (current value)	TIM000~	6000	Word Address
	Counter (current value)	CNT000~	7000	Word Address
	Data Memory	DM0000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

SYSMAC CV Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	000~	9100	Word Address
	Internal Auxilary Relay			Word Address
	SYSMAC BUS/2 Remote I/O Relay	0200~	9100	Word Address
	Data Link Relay	1000~	9100	Word Address
	Special Auxilary Relay	A000~	B000	Word Address
	Latch Relay	1200~	9100	Word Address
	Internal Auxilary Relay	1900~	9100	Word Address
	SYSMAC BUS/2 Remote I/O Relay	2300~	9100	Word Address
Word Device	Timer (current value)	T0000~	6000	Word Address
	Counter (current value)	C0000~	7000	Word Address
	Data Memory	D0000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

SYSMAC CS1/CJ Series

Device	Word Address	Device Address	Particulars
Channel I/O	CIO000000 -	CIO9000	Word Address
Internal Auxiliary Relay	W00000 -	8200	Word Address
Hold Relay	H00000 -	C000	Word Address
Special Auxiliary Relay	A00000 -	B000	Word Address
Timer(Current)	T0000 -	6000	Word Address
Counter(Current)	C0000 -	7000	Word Address
Data Memory	D0000 -	0000	Word Address
Exp. Data Memory (E0 to EC)	E000000 -	9200	Word Address
	E100000 -	9400	Word Address
	E200000 -	9600	Word Address
	E300000 -	9800	Word Address
	E400000 -	9A00	Word Address
	E500000 -	9C00	Word Address
	E600000 -	9E00	Word Address
	E700000 -	A000	Word Address
	E800000 -	A200	Word Address
	E900000 -	A400	Word Address
	EA00000 -	A600	Word Address
	EB00000 -	A800	Word Address
	EC00000 -	AA00	Word Address
Exp. Data Memory (Current Bank)	EM00000 -	1000	Word Address
Task Flag	TK0 -	5000	Save as word address value divided by 2.
Index Register	IR0 -	2000	Word Address
Data Register	DR0 -	3000	Word Address
LS area	LS0000 -	4000	Word Address

CS1/CJ Series (Ethernet Communication)

E-tag or K-tag indirect addresses cannot be designated by a SYSMAC CS1/ CJ Series unit on an Ethernet network.

■ Fuji Electric

MICREX-F Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	WB0000~	8040	Word Address
	Direct I/O	W24.0000~	4840	Word Address
	Auxilary Relay	WM0000~	9040	Word Address
	Keep Relay	WK000~	C040	Word Address
	Differential Relay	WD000~	D040	Word Address
	Link Relay	WL000~	C840	Word Address
	Special Relay	WF0000~	B040	Word Address
	Announce Relay	WA0000~	B840	Word Address
Word Device	Timer 0.01 sec (current value)	TR0000~	6080	Word Address
	Timer 0.01 sec (set value)	TS0000~	6880	Word Address
	Timer 0.1 sec (current value)	W9.000~	6480	Word Address
	Counter (curent value)	CR0000~	7080	Word Address
	Counter (set value)	CS0000~	7880	Word Address
	Data Memory	BD0000~	0080	Word Address
		DI0000~	0880	Word Address
		SI0000~	0440	Word Address
	File Memory	W30.0000~	2040	Word Address
		W31.0000~	2240	Word Address
		W32.0000~	2440	Word Address
		W33.0000~	2680	Word Address
		W34.0000~	2880	Word Address
	LS area	LS0000~	4040	Word Address

FLEX-PC Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	WX000~	8040	Word Address
	Output Relay	WY000~	8840	Word Address
	Internal Relay	WM000~	9040	Word Address
	Extended Internal Relay	WM040~	9840	Word Address
	Latch Relay	WL000~	C040	Word Address
	Extended Latch Relay	WL040~	C840	Word Address
	Special Relay	WM800~	X	X
Word Device	Timer (current value)	T0000~	6000	Word Address
	Timer (set value)	TS0000~	6800	Word Address
	Counter (current value)	C0000~	7000	Word Address
	Counter (set value)	CS0000~	7800	Word Address
	Data Register	D0000~	0040	Word Address
	Special Register	D8000~	X	X
	Link Register	W0000~	0440	Word Address
	File Register	R0000~	4840	Word Address
	LS area	LS0000~	4040	Word Address

■ Yaskawa Electric

Memocon-SC Series (U84/84J/U84S/GL40S/GL60H/GL70H/GL60S)

	Device	Word Address	Device code (HEX)	Address code
Word Device	Input Register	30001~	1240	Save as word address value minus 30001.
	Output/Keep Register	40001~	0040	Save as word address value minus 40001.
	Link Register	R0001~	4840	Save as word address value minus 1.
	Constant Register	31001~	1440	Save as word address value minus 31001.
	Extended Register	A0000~	1040	Word Address
	LS area	LS0000~	4040	Word Address

Memocon-SC Series (GL120/GL130)

	Device	Word Address	Device code (HEX)	Address code
Word Device	Input Register	300001~	1240	Save as word address value minus 30001.
	Output Register	400001~	0040	Save as word address value minus 40001.
	Keep Register	400513~	0040	Save as word address value minus 40001.
	Constant Register	700001~	X	X
	LS area	LS0000~	4040	Word Address

PROGIC-8 Series

	Device	Word Address	Device code (HEX)	Address code
Word Device	Data Register	W1~	0040	Save as word address value minus 1.
	Input Register	Z1~	1240	Save as word address value minus 1.
	Link Register	R1~	4840	Save as word address value minus 1.
	LS area	LS0000~	4040	Word Address

Control Pack Series/MP900 Series

	Device	Word Address	Device code (HEX)	Address code
Word Device	Input Register	49744~	0040	Save as word address value minus 40001.
	Output Register	49872~	0040	Save as word address value minus 40001.
	System Register	30001~	1240	Save as word address value minus 30001.
	Data Register	31001~ (CP-9200H only)	1440	Save as word address value minus 3101.
		40001~	0040	Save as word address value minus 40001.
	Common Register	42049~	0040	Save as word address value minus 40001.
	LS area	LS0000~	4040	Word Address

Memocon Micro

	Device	Word Address	Device code (HEX)	Address code
Word Device	Input Register	30001~	1240	Save as word address value minus 30001.
	Output/Keep Register	40001~	0040	Save as word address value minus 40001.
	LS area	LS0000~	4040	Word Address

■ Hitachi

HIDIC S10 α/S10 mini Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	XW000~	8040	Save as word address value, with the tenths position "0" removed.
	Output Relay	YW000~	8840	Save as word address value, with the tenths position "0" removed.
	Internal Relay	RW000~	9040	Save as word address value, with the tenths position "0" removed.
	Global Link	GW000~	C840	Save as word address value, with the tenths position "0" removed.
	System Register	SW000~	B040	Save as word address value, with the tenths position "0" removed.
	E Word	EW400~	X	X
	Event	EW000~	A040	Save as word address value, with the tenths position "0" removed.
	Keep Relay	K0000~	C040	Save as word address value, with the tenths position "0" removed.
	On-Delay Timer	TW000~	E040	Save as word address value, with the tenths position "0" removed.
	One Shot Timer	UW000~	E240	Save as word address value, with the tenths position "0" removed.
	Up/Down Counter	CW000~	F040	Save as word address value, with the tenths position "0" removed.
	Transfer Register	JW000~	9240	Save as word address value, with the tenths position "0" removed.
	Receive Register	QW000~	9440	Save as word address value, with the tenths position "0" removed.
	Extended Internal Register	MW000~	B240	Save as word address value, with the tenths position "0" removed.
Word Device	On-Delay Timer (Calculated value)	TC000~	6000	Word Address
	On-Delay Timer (setup value)	TS000~	6800	Word Address
	One Shot Timer (Calculated value)	UC000~	6200	Word Address
	One Shot Timer (setup value)	US000~	6A00	Word Address
	Up/Down Counter (Calculated value)	CC000~	7000	Word Address
	Up/Down Counter (setup value)	CS000~	7800	Word Address
	Data Register	DW000~	0040	Word Address
	Word Register	FW000~	0840	Word Address
	Extended Register	MS000~	3040	Word Address
	LS area	LS0000~	4040	Word Address

HIDIC H (HIZAC H) Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	External Input	WX0000~	X	X
	External Output	WY0000~	X	X
	Remote Input Relay	WX1000~	X	X
	Remote Output Relay	WY1000~	X	X
	CPU Link Area 1	WL000~	C800	Word Address
	CPU Link Area 2	WL1000~	C800	Word Address
	Data Area	WM000~	9000	Word Address
Word Device	Timer/Counter (elapsed value)	TC000~	6000	Word Address
	Word Internal Output	WR0000~	0000	Word Address
	Network Link Area	WN0000~	5000	Word Address
	LS area	LS0000~	4000	Word Address

HIZAC EC Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	External Input	WX000~	8240	Word Address
		WX020~		
		WX040~		
		WX060~		
		WX080~		
		WX100~		
		WX120~		
		WX140~		
		WX160~		
		WX180~		
	External Output	WY200~	8A40	Save as word address value minus 200.
		WY220~		
		WY240~		
		WY260~		
		WY280~		
		WY300~		
		WY320~		
		WY340~		
		WY360~		
		WY380~		
	Internal Output	WM400~	9240	Save as word address value minus 400 divided by 2.
		WM700~	9240	Save as word address value minus 400 divided by 2.
		WM960~	9240	Save as word address value minus 400 divided by 2.
Word Device	Timer/Counter (elapsed value)	TC100~	6000	Save as word address value minus 100.
	Timer/Counter (set value)	TC200~	6400	Save as word address value minus 200.
	LS area	LS0000~	4040	Word Address

■ Sharp

New Satellite JW Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Relay	A0000~ (0000~)	9000	Save as word address value divided by 2.
Word Device	Timer/Counter (current value)	T0000~	6000	Word Address
		B0000~ (b0000~)	7000	Save as word address value divided by 2.
	Register	09000~	0000	Save as word address value divided by 2.
		19000~	0200	Save as word address value divided by 2.
		29000~	0400	Save as word address value divided by 2.
		39000~	0600	Save as word address value divided by 2.
		49000~	0800	Save as word address value divided by 2.
		59000~	0A00	Save as word address value divided by 2.
		69000~	0C00	Save as word address value divided by 2.
		79000~	0E00	Save as word address value divided by 2.
		89000~	1000	Save as word address value divided by 2.
		99000~	1200	Save as word address value divided by 2.
	File Register	1000000~	X	X
	LS area	LS0000~	4000	Word Address

■ Matsushita Electric Works

MEWNET Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	WX000~	8000	Word Address
	Output Relay	WY000~	8800	Word Address
	Internal Relay	WR000~	9000	Word Address
	Link Relay	WL000~	C800	Word Address
	Special Relay	WR900~	9000	Word Address
Word Device	Timer/Counter (elapsed value)	EV0000~	6000	Word Address
	Timer/Counter (elapsed value)	SV0000~	6800	Word Address
	Data Register/ Special Data Register	DT000~	0000	Word Address
	Link Register	Ld0000~	4800	Word Address
	File Register	FL00000~	5800	Word Address
	Special Data Register	DT90000~	7000	Word Address
	LS area	LS0000~	4000	Word Address

■ Yokogawa Electric

FA500 (1:1 communication)*

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X00201~	X	X
	Output Relay	Y00201~	X	X
	Internal Relay	I0001~	9000	Save as word address value minus 1 divided by 16.
	Joint Relay	E0001~	B800	Save as word address value minus 1 divided by 16.
	Special Relay	M001~	B000	Save as word address value minus 1 divided by 16.
	Link Relay	L0001~	C000	Save as word address value minus 1 divided by 16.
Word Device	Timer (current value)	TP001~	6000	Save as word address value minus 1.
	Timer (set velue)	TS001~	6800	Save as word address value minus 1.
	Coutner (current value)	CP001~	7000	Save as word address value minus 1.
	Counter (set value)	CS001~	7800	Save as word address value minus 1.
	Data Register	D0001~	0000	Save as word address value minus 1.
	Common Register	B0001~	2000	Save as word address value minus 1.
	Special Register	Z001~	5000	Save as word address value minus 1.
	Link Register	W0001~	5800	Save as word address value minus 1.
	LS area	LS0000~	4000	Word Address

* *Only CPU No. 1 is available.*

FA500 (1:n communication)*

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X00201~	X	X
	Output Relay	Y00201~	X	X
	Internal Relay	I0001~	9000	Save as word address value minus 1 divided by 16.
	Joint Relay	E0001~	B800	Save as word address value minus 1 divided by 16.
	Special Relay	M001~	B000	Save as word address value minus 1 divided by 16.
	Link Relay	L0001~	C000	Save as word address value minus 1 divided by 16.
Word Device	Timer (current value)	TP001~	6000	Save as word address value minus 1.
	Timer (set velue)	TS001~	6800	Save as word address value minus 1.
	Coutner (current value)	CP001~	7000	Save as word address value minus 1.
	Counter (set value)	CS001~	7800	Save as word address value minus 1.
	Data Register	D0001~	0000	Save as word address value minus 1.
	Common Register	B0001~	2000	Save as word address value minus 1.
	Special Register	Z001~	5000	Save as word address value minus 1.
	Link Register	W0001~	5800	Save as word address value minus 1.
	LS area	LS0000~	4000	Word Address

* *Only CPU No. 1 in station No.1 is available.*

FA-M3 (1:1 communication)*

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X00201~	X	X
	Output Relay	Y00201~	X	X
	Internal Relay	I0001~	9000	Save as word address value minus 1 divided by 16.
	Joint Relay	E0001~	B800	Save as word address value minus 1 divided by 16.
	Special Relay	M0001~	B000	Save as word address value minus 1 divided by 16.
	Link Relay	L00001~	C000	Save as word address value minus 1 divided by 16.
Word Device	Timer (current value)	TP0001~	6000	Save as word address value minus 1.
	Timer (set velue)	TS0001~	6800	Save as word address value minus 1.
	Coutner (current value)	CP0001~	7000	Save as word address value minus 1.
	Counter (set value)	CS0001~	7800	Save as word address value minus 1.
	Data Register	D0001~	0000	Save as word address value minus 1.
	File Register	B00001~	2000	Save as word address value minus 1.
		B65537~	2800	Save as word address value minus 65537.
		B131073~	1000	Save as word address value minus 131073.
		B196609~	1800	Save as word address value minus 196609.
	Joint Register	R0001~	0800	Save as word address value minus 1.
	Special Register	Z001~	5000	Save as word address value minus 1.
	Link Register	W00001~	5800	Save as word address value minus 1.
	LS area	LS0000~	4000	Word Address

* *Only CPU No. 1 is available.*

FA-M3 (1:n communication)*

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X00201~	X	X
	Output Relay	Y00201~	X	X
	Internal Relay	I00001~	9000	Save as word address value minus 1 divided by 16.
	Joint Relay	E0001~	B800	Save as word address value minus 1 divided by 16.
	Special Relay	M0001~	B000	Save as word address value minus 1 divided by 16.
	Link Relay	L00001~	C000	Save as word address value minus 1 divided by 16.
Word Device	Timer (current value)	TP0001~	6000	Save as word address value minus 1.
	Timer (set velue)	TS0001~	6800	Save as word address value minus 1.
	Coutner (current value)	CP0001~	7000	Save as word address value minus 1.
	Counter (set value)	CS0001~	7800	Save as word address value minus 1.
	Data Register	D0001~	0000	Save as word address value minus 1.
	File Register	B0001~	2000	Save as word address value minus 1.
	Joint Register	R0001~	0800	Save as word address value minus 1.
	Special Register	Z001~	5000	Save as word address value minus 1.
	Link Register	W0001~	5800	Save as word address value minus 1.
	LS area	LS0000~	4000	Word Address

* *Only CPU No. 1 in station No. 1 is available.*

FA-M3 (Ethenet communication)*

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X00201~	X	X
	Output Relay	Y00201~	X	X
	Internal Relay	I00001~	9000	Save as word address value minus 1 divided by 16.
	Joint Relay	E0001~	B800	Save as word address value minus 1 divided by 16.
	Special Relay	M0001~	B000	Save as word address value minus 1 divided by 16.
	Link Relay	L00001~	C000	Save as word address value minus 1 divided by 16.
Word Device	Timer (current value)	TP0001~	6000	Save as word address value minus 1.
	Timer (set velue)	TS0001~	6800	Save as word address value minus 1.
	Coutner (current value)	CP0001~	7000	Save as word address value minus 1.
	Counter (set value)	CS0001~	7800	Save as word address value minus 1.
	Data Register	D0001~	0000	Save as word address value minus 1.
	File Register	B0001~	2000	Save as word address value minus 1.
		B65537~	2800	Save as word address value minus 65537.
		B131073~	1000	Save as word address value minus 131073.
		B196609~	1800	Save as word address value minus 196609.
	Joint Register	R0001~	0800	Save as word address value minus 1.
	Special Register	Z001~	5000	Save as word address value minus 1.
	Link Register	W0001~	5800	Save as word address value minus 1.
	LS area	LS0000~	4000	Word Address

** Only CPU No. 1 is available*

<STARDOM standalone type controller>

	Image Register	Word Address	Device code	Address code
Bit Device	Internal Relay	I00001~	9000	Value of "(Word Address - 1) ÷ 16"
Word Device	Data Register	D0001~	0000	Value of "Word Address - 1"
	File Register	B00001~	2000	Value of "Word Address - 1"

■ Toyota Machine Works

TOYOPUC-PC2 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000~	8000	Word Address
	Output Relay	Y0000~	8800	Word Address
	Internal Relay	M0000~	9000	Word Address
	Keep Relay	K0000~	C000	Word Address
	Link Relay	L0000~	C800	Word Address
Word Device	Register (current value)	N0000~	6000	Word Address
	Data Register	D0000~	0000	Word Address
	Link Register	R0000~	4800	Word Address
	File Register	B0000~	7800	Word Address
	Special Register	S0000~	5000	Word Address
	LS area	LS0000~	4000	Word Address

TOYOPUC-PC3J Series

	Device	Word Address	Device Code	Address Code
Bit Device	Input	1X0000 ~	8000	Word Address
		2X0000 ~	8200	Word Address
		3X0000 ~	8400	Word Address
	Output	1Y0000 ~	8800	Word Address
		1Y0000 ~	8A00	Word Address
		1Y0000 ~	8C00	Word Address
	Internal Relay	1M0000 ~	9000	Word Address
		2M0000 ~	9200	Word Address
		3M0000 ~	9400	Word Address
	Keep Relay	1K0000 ~	C000	Word Address
		1K0000 ~	C200	Word Address
		1K0000 ~	C400	Word Address
	Link Relay	1L0000 ~	C800	Word Address
		2L0000 ~	CA00	Word Address
		3L0000 ~	CC00	Word Address
	Special Relay	1V0000 ~	B000	Word Address
		2V0000 ~	B200	Word Address
		3V0000 ~	B400	Word Address
	Timer	1T0000 ~	E000	Word Address
		2T0000 ~	E200	Word Address
		3T0000 ~	E400	Word Address
	Counter	1C0000 ~	F000	Word Address
		2C0000 ~	F200	Word Address
		3C0000 ~	F400	Word Address
	Exp. Input	EX0000 ~	8600	Word Address
	Exp. Output	EY0000 ~	8E00	Word Address
	Exp. Internal Relay	EM0000 ~	9600	Word Address
	Exp. Keep Relay	EK0000 ~	C600	Word Address
	Exp. Link Relay	EL0000 ~	CE00	Word Address
	Exp. Special Relay	EV0000 ~	B600	Word Address
	Exp. Timer	ET0000 ~	E600	Word Address
	Exp. Counter	EC0000 ~	F600	Word Address
Word Device	Data Register	1D0000 ~	0000	Word Address
		2D0000 ~	0200	Word Address
		3D0000 ~	0400	Word Address
	Link Register	1R0000 ~	4800	Word Address
		2R0000 ~	4A00	Word Address
		3R0000 ~	4C00	Word Address
	Special Register	1S0000 ~	5000	Word Address
		2S0000 ~	5200	Word Address
		3S0000 ~	5400	Word Address
	Current Value Register	1N0000 ~	6000	Word Address
		2N0000 ~	6200	Word Address
		3N0000 ~	6400	Word Address
	File Register	B0000 ~	7800	Word Address
	Exp. Special Register	ES0000 ~	5600	Word Address
	Exp. Current Value Register	EN0000 ~	6600	Word Address
	Exp. Setting Value Register	H0000 ~	7600	Word Address
	Exp. Data Register	U0000 ~	0600	Word Address
	LS Area	LS0000 ~	4000	Word Address

■ Toshiba

PROSEC EX Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	External Input	XW0000~	8040	Word Address
	External Output	YW0000~	8840	Word Address
	Auxiary Relay	RW0000~	9040	Word Address
	Link Register (relay)	ZW0000~	C840	Word Address
Word Device	Timer (current value)	T0000~	6000	Word Address
	Counter (current value)	C0000~	7000	Word Address
	Data Register	D00000~	0040	Word Address
	LS area	LS0000~	4040	Word Address

PROSEC T Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	External Input	XW000~	8000	Word Address
	External Output	YW000~	8800	Word Address
	Internal Output	RW000~	9000	Word Address
	Special Relay	SW000~	B000	Word Address
Word Device	Timer (current value)	T000~	6000	Word Address
	Counter (current value)	C000~	7000	Word Address
	Data Register	D0000~	0000	Word Address
	Link Register	W0000~	4800	Word Address
	File Register	F0000~	5800	Word Address
	LS area	LS0000~	4000	Word Address

PROVISOR B Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	XW00~	8000	Word Address
	Output Relay	YW00~	8800	Word Address
	Internal Relay	RW00~	9000	Word Address
	Extended Internal Relay-1	GW00~	9200	Word Address
	Extended Internal Relay-2	HW00~	9400	Word Address
	Special Auxilary Relay	AW00~	B000	Word Address
	Latch Relay	LW00~	C000	Word Address
	Shift Register	SW00~	C200	Word Address
	Edge Relay	EW00~	C400	Word Address
	Timer (contact)	TW00~	E000	Word Address
	Counter (contact)	CW00~	F000	Word Address
Word Device	Timer/Counter (current value)	P000~	6000	Word Address
	Timer/Counter (set value)	V000~	7000	Word Address
	Generic Register 1	D000~	0000	Word Address
	Generic Register 2	B000~	2000	Word Address
	LS area	LS0000~	4000	Word Address

■ Toshiba Machine

PROVISOR TC200 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	XW00~	8000	Word Address
	Output Relay	YW00~	8800	Word Address
	Internal Relay	RW00~	9000	Word Address
	Extended Internal Relay-1	GW00~	9200	Word Address
	Extended Internal Relay-2	HW00~	9400	Word Address
	Special Auxilary Relay	AW00~	B000	Word Address
	Latch Relay	LW00~	C000	Word Address
	Shift Register	SW00~	C200	Word Address
	Edge Relay	EW00~	C400	Word Address
	Timer (contact)	TW00~	E000	Word Address
	Counter (contact)	CW00~	F000	Word Address
Word Device	Timer/Counter (current value)	P000~	6000	Word Address
	Timer/Counter (set value)	V000~	7000	Word Address
	Generic Register 1	D000~	0000	Word Address
	Generic Register 2	B000~	2000	Word Address
	LS area	LS0000~	4000	Word Address

■ Koyo Electronics Industries

KOSTAC SG Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	R40400~	8100	Save as word address value minus 40400.
	Output Relay	R40500~	8900	Save as word address value minus 40500.
	Internal Relay	R40600~	9100	Save as word address value minus 40600.
	Stage	R41000~	A100	Save as word address value minus 41000.
	Link Relay (input)	R40000~	C900	Save as word address value minus 40000.
	Specified Transfer Relay (output)	R40200~	CD00	Save as word address value minus 40200.
	Timer (contact)	R41100~	E100	Save as word address value minus 41100.
	Counter (contact)	R41140~	F100	Save as word address value minus 41140.
Word Device	Timer (elapsed value)	R0000~	6000	Word Address
	Counter (elapsed value)	R1000~	7000	Save as word address value minus 1000.
	Data Memory 1	R400~	0800	Save as word address value minus 400.
	Data Memory 2	R1400~	0000	Save as word address value minus 1400.
	Data Memory 3	R10000~	5800	Save as word address value minus 10000.
	LS area	LS0000~	4000	Word Address

KOSTAC SU Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	R40400~	8100	Save as word address value minus 40400.
	Output Relay	R40500~	8900	Save as word address value minus 40500.
	Internal Relay	R40600~	9100	Save as word address value minus 40600.
	Stage	R41000~	A100	Save as word address value minus 41000.
	Link Relay/Link Input	R40000~	C900	Save as word address value minus 40000.
	Special Relay	R41200~ R41215~	B100	Save as word address value minus 41200.
	Timer (contact)	R41100~	E100	Save as word address value minus 41100.
	Counter (contact)	R41140~	F100	Save as word address value minus 41140.
Word Device	Timer (elapsed value)	R0000~	6000	Word Address
	Counter (elapsed value)	R1000~	7000	Save as word address value minus 1000.
	Data Register	R1400~	0000	Save as word address value minus 1400.
	Special Register	R700~ R7400~	X	X
	Extended Register	R10000~	5800	Save as word address value minus 10000.
	LS area	LS0000~	4000	Word Address

KOSTAC SZ Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	R40400~	8100	Save as word address value minus 40400.
	Output Relay	R40500~	8900	Save as word address value minus 40500.
	Internal Relay	R40600~	9100	Save as word address value minus 40600.
	Stage	R41000~	A100	Save as word address value minus 41000.
	Timer (contact)	R41100~	E100	Save as word address value minus 41100.
	Counter (contact)	R41140~	F100	Save as word address value minus 41140.
Word Device	Timer (elapsed value)	R0000~	6000	Word Address
	Counter (elapsed value)	R1000~	7000	Save as word address value minus 1000.
	Data Memory 2	R2000~	0000	Save as word address value minus 1400.
	LS area	LS0000~	4000	Word Address

KOSTAC SR Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input/Output	R000~	9000	Save as word address value divided 2.
		R070~	9000	Save as word address value divided 2.
	Internal Relay	R016~	9000	Save as word address value divided 2.
		R076~	9000	Save as word address value divided 2.
	Shift Register	R040~	9000	Save as word address value divided 2.
	Timer/Counter (contact)	R060~	9000	Save as word address value divided 2.
Word Device	Timer/Counter (elapsed value)	R600~	6000	Save as word address value minus 600.
	Data Register	R400~	0000	Save as word address value minus 400 divided by 2.
	LS area	LS0000~	4000	Word Address

DL-405 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	V40400~	8100	Save as word address value minus 40400.
	Output Relay	V40500~	8900	Save as word address value minus 40500.
	Internal Relay	V40600~	9100	Save as word address value minus 40600.
	Stage	V41000~	A100	Save as word address value minus 41000.
	Link Relay/Link Input	V40000~	C900	Save as word address value minus 40000.
	Special Relay	V41200~ V41215~	B100	Save as word address value minus 41200.
	Timer (contact)	V41100~	E100	Save as word address value minus 41100.
	Counter (contact)	V41140~	F100	Save as word address value minus 41140.
Word Device	Timer (elapsed value)	V0000~	6000	Word Address
	Counter (elapsed value)	V1000~	7000	Save as word address value minus 1000.
	Data Register	V1400~	0000	Save as word address value minus 1400.
	Special Register	V700~ V7400~	X	X
	Extended Register	V10000~	5800	Save as word address value minus 10000.
	LS area	LS0000~	4000	Word Address

DL-205 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	V40400~	8100	Save as word address value minus 40400.
	Output Relay	V40500~	8900	Save as word address value minus 40500.
	Internal Relay	V40600~	9100	Save as word address value minus 40600.
	Stage	V41000~	A100	Save as word address value minus 41000.
	Timer (contact)	V41100~	E100	Save as word address value minus 41100.
	Counter (contact)	V41140~	F100	Save as word address value minus 41140.
Word Device	Timer (elapsed value)	V0000~	6000	Word Address
	Counter (elapsed value)	V1000~	7000	Save as word address value minus 1000.
	Data Memory 2	V2000~	0000	Save as word address value minus 1400.
	LS area	LS0000~	4000	Word Address

DL-305 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input/Output	V000~	9000	Save as word address value divided 2.
		V070~	9000	Save as word address value divided 2.
	Internal Relay	V016~	9000	Save as word address value divided 2.
		V076~	9000	Save as word address value divided 2.
	Shift Register	V040~	9000	Save as word address value divided 2.
	Timer/Counter (contact)	V060~	9000	Save as word address value divided 2.
Word Device	Timer/Counter (elapsed value)	V600~	6000	Save as word address value minus 600.
	Data Register	V400~	0000	Save as word address value minus 400 divided by 2.
	LS area	LS0000~	4000	Word Address

■ GE Fanuc Automation

Series 90-70/90-30 (SNP-X protocol)

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay (I)	I00001~	8000	Save as word address value minus 1 divided by 16.
	Output Relay (Q)	Q00001~	8800	Save as word address value minus 1 divided by 16.
	Internal Relay (M)	M00001~	9000	Save as word address value minus 1 divided by 16.
	Global Relay (G)	G0001~	C200	Save as word address value minus 1 divided by 16.
	Momentary Relay (T)	T001~	9400	Save as word address value minus 1 divided by 16.
	System Function Relay (SA)	SA001~	A200	Save as word address value minus 1 divided by 16.
	System Function Relay (SB)	SB001~	A400	Save as word address value minus 1 divided by 16.
	System Function Relay (SC)	SC001~	A800	Save as word address value minus 1 divided by 16.
	System Function Relay (S)	S001~	AA00	Save as word address value minus 1 divided by 16.
Word Device	Register (R)	R00001~	0000	Save as word address value minus 1.
	Analog Input (AI)	AI0001~	0A00	Save as word address value minus 1.
	Analog Output (AQ)	AQ0001~	0C00	Save as word address value minus 1.
	LS area	LS0000~	4000	Word Address

Series 90-70/90-30 (SNP protocol)

	Device	Word Address	Device Code	Address Code
Bit Device	Input Relay (I)	I00001~	8000	Save as: word address value minus 1, then divided by 16
	Output Relay (Q)	Q00001~	8800	Save as: word address value minus 1, then divided by 16
	Internal Relay (M)	M00001~	9000	Save as: word address value minus 1, then divided by 16
	Global Relay (G)	G0001~	C200	Save as: word address value minus 1, then divided by 16
	Temporary Relay (T)	T001~	9400	Save as: word address value minus 1, then divided by 16
	System Status Relay (SA)	SA001~	A200	Save as: word address value minus 1, then divided by 16
	System Status Relay (SB)	SB001~	A400	Save as: word address value minus 1, then divided by 16
	System Status Relay (SC)	SC001~	A800	Save as: word address value minus 1, then divided by 16
	System Status Relay (S)	S001~	AA00	Save as: word address value minus 1, then divided by 16

	Device	Word Address	Device Code	Address Code
Word Device	Register (R)	R00001~	0000	Save as word address value minus 1
		R01025~	1000	Save as word address value minus 1025
		R02049~	1200	Save as word address value minus 2049
		R03073~	1400	Save as word address value minus 3073
		R04097~	1600	Save as word address value minus 4097
		R05121~	1800	Save as word address value minus 5121
		R06145~	1A00	Save as word address value minus 6145
		R07169~	1C00	Save as word address value minus 7169
		R08193~	1E00	Save as word address value minus 8193
		R09217~	2000	Save as word address value minus 9217
		R10241~	2200	Save as word address value minus 10241
		R11265~	2400	Save as word address value minus 11265
		R12289~	2600	Save as word address value minus 12289
		R13313~	2800	Save as word address value minus 13313
		R14337~	2A00	Save as word address value minus 14337
		R15361~	2C00	Save as word address value minus 15361
	Analog Input (AI)	AI0001~	0A00	Save as word address value minus 1
		AI1025~	3000	Save as word address value minus 1025
		AI2049~	3200	Save as word address value minus 2049
		AI3073~	3400	Save as word address value minus 3073
		AI4097~	3600	Save as word address value minus 4097
		AI5121~	3800	Save as word address value minus 5121
		AI6145~	3A00	Save as word address value minus 6145
		AI7169~	3C00	Save as word address value minus 7169
	Analog Output (AQ)	AQ0001~	0C00	Save as word address value minus 1
		AQ1025~	5000	Save as word address value minus 1025
		AQ2049~	5200	Save as word address value minus 2049
		AQ3073~	5400	Save as word address value minus 3073
		AQ4097~	5600	Save as word address value minus 4097
		AQ5121~	5800	Save as word address value minus 5121
		AQ6145~	5A00	Save as word address value minus 6145
		AQ7169~	5C00	Save as word address value minus 7169
	LS Area	LS0000~	4000	Save as word address value

■ Fanuc Motion Controller

FANUC Power Mate Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay (X)	X00000~ X01000~	8000	Save as word address value minus 1 divided by 2.
	Output Relay (Y)	Y00000~ Y01000~	9000	Save as word address value minus 1 divided by 2.
	Internal Relay (R)	R00000~	C000	Save as word address value minus 1 divided by 2.
	Keep Relay (K)	K0000~	D000	Save as word address value minus 1 divided by 2.
Word Device	Timer (T)	T0000~	6800	Save as word address value minus 1 divided by 2.
	Counter (C)	C0000~	7800	Save as word address value minus 1 divided by 2.
	Data Table (D)	D00000~	0000	Save as word address value minus 1 divided by 2.
	LS area	LS0000~	4000	Word Address

■ IDEC Izumi

FA Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	WX00~	8000	Save as word address value divided by 2.
	Output Relay	WY000~	8800	Save as word address value divided by 2.
	Internal Relay	WM000~	9000	Save as word address value divided by 2.
	Shift Register	WR000~	C000	Save as word address value divided by 16.
Word Device	Timer (set value)	TS000~	6800	Word Address
	Timer (current value)	T000~	6000	Word Address
	Timer 10msec (current value)	H000~	6400	Word Address
	Counter (set value)	CS000~	7800	Word Address
	Counter (current value)	C000~	7000	Word Address
	Data Register	D0000~	0000	Word Address
	Control Register	D3000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

MICRO³ (Micro Cube)

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000~	8000	Save as word address value divided by 2.
	Output Relay	Y0000~	8800	Save as word address value divided by 2.
	Internal Relay	M0000~	9000	Save as word address value divided by 2.
	Shift Register	R0000~	C000	Save as word address value divided by 16.
Word Device	Timer (set value)	T0000~	6800	Word Address
	Timer (current value)	t0000~	6000	Word Address
	Counter (set value)	C0000~	7800	Word Address
	Counter (current value)	c0000~	7000	Word Address
	Data Register	D0000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

MICROSmart FC4A Series/OpenNet Controller FC3 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input	X000 ~	8000	Save as word address value divided by 2
	Output	Y000 ~	8800	Save as word address value divided by 2
	Internal Relay	M000 ~	9000	Save as word address value divided by 2
	Special Internal Relay	M800 ~	9800	Save as word address value divided by 2
	Shift Register	R0000 ~	C000	Save as word address value divided by 16
Word Device	Timer (setup value)	T0000 ~	6800	Word Address
	Timer (setup value)	t0000 ~	6000	Word Address
	Counter (elapsed value)	C0000 ~	7800	Word Address
	Counter (elapsed value)	c0000 ~	7000	Word Address
	Data Register	D0000 ~	0000	Word Address
	Special Data Register	D8000 ~	5000	Word Address
	Link Register	L0100 ~	2000	Word Address
	Enter Timer/Counter Setting Value	Q0	3000	Word Address
	LS Area	LS0000 ~	4000	Word Address

■ Siemens

SIMATIC S5 Series (using Link I/F)*

	Device	Word Address	Device code (HEX)	Address code
Word Device	Data Register	D003000~	0040	Upper two digits: Value of "DB number minus 3" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	Extended Data Register	X0030000~	5840	Upper two digits: Value of "DB number minus 3" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	LS area	LS0000~	4040	Word Address

* *The address codes for Data Register and Extended Data Register are as follows:*

E.g. D019255

Data Word (DW) No.

Data Block (DB) No.

Address code

Upper two digits: 019-3=16 (DEC) ->10 (HEX)

Lower two digits: 255 (DEC) -> FF (HEX)

Address code is 10FF.

SIMATIC S5 Series (CPU Direct Connection)*

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	IW000~	8140	Save as address value divided by 2.
	Output Relay	QW000~	8940	Save as address value divided by 2.
	Internal Relay	FW000~	9140	Save as address value divided by 2.
Word Device	Timer	T000~	6000	Word Address
	Counter	C000~	7000	Word Address
	Data Register	D002000~	0040	Upper two digits: Value of "DB number minus 2" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	Extended Data Register	X002000~	5840	Upper two digits: Value of "DB number minus 2" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	LS area	LS0000~	4040	Word Address

* *The address codes for Data Register and Extended Data Register are as follows:*

E.g. D019 255

- 255 → Data Word (DW) No.
- D019 → Data Block (DB) No.

Address code

Upper two digits: 019-2=17 (DEC) ->11 (HEX)

Lower two digits: 255 (DEC) ->FF (HEX)

Address code is 11FF.

SIMATIC S7 300/400 (via MPI)

	Device		Word Address	Device Address	Address Code
Bit Device	Input	Node 1	EW000 ~	8000	Word Address devided by 2
		Node 2	EW000 ~	8200	Word Address devided by 2
		Node 3	EW000 ~	8400	Word Address devided by 2
		Node 4	EW000 ~	8600	Word Address devided by 2
	Output	Node 1	AW000 ~	8800	Word Address devided by 2
		Node 2	AW000 ~	8A00	Word Address devided by 2
		Node 3	AW000 ~	8C00	Word Address devided by 2
		Node 4	AW000 ~	8E00	Word Address devided by 2
	Internal	Node 1	MW000 ~	9000	Word Address devided by 2
		Node 2	MW000 ~	9200	Word Address devided by 2
		Node 3	MW000 ~	9400	Word Address devided by 2
		Node 4	MW000 ~	9600	Word Address devided by 2
Word Device	Timer		T000 ~	6000	Word Address
	Counter		Z00 ~	7000	Word Address
	Data Block		DB1W00000 ~ DB1W65534	0000	Word Address devided by 2
	Data Block		DB2W00000 ~ DB2W65534	0200	Word Address devided by 2
	Data Block		DB3W00000 ~ DB3W65534	0400	Word Address devided by 2
	:		:	:	:
	Data Block		DB32W00000 ~ DB32W65534	3E00	Word Address devided by 2
	Data Block		DB33W00000 ~ DB33W65534	4200	Word Address devided by 2
	:		:	:	:
	Data Block		DB47W00000 ~ DB47W65534	5E00	Word Address devided by 2
	Data Block		DB48W00000 ~ DB48W65534	6200	Word Address devided by 2
	:		:	:	:
	Data Block		DB54W00000 ~ DB54W65534	6E00	Word Address devided by 2
	Data Block		DB55W00000 ~ DB55W65534	7200	Word Address devided by 2
	:		:	:	:
	Data Block		DB60W00000 ~ DB60W65534	7C00	Word Address devided by 2
	Data Block		DB1.DBW0 ~ DB1.DBW65534	A000	Word Address devided by 2
	:		:	:	:
	Data Block		DB65535.DBW0 ~ DB65535.DBW65534	EE00	Word Address devided by 2
	LS area		LS0000 ~	4000	Word Address

SIMATIC S7 300/400 (via 3964/RK512)

	Device	Word Address	Device code (HEX)	Address Code
Word Device	Data Block	DB00W00000 ~	7C00	Save as word address value divided by 2.

SIMATIC S7 200 (via PPI)

	Device	Word Address	Device code (HEX)	Address Code
Bit Device	Input Bit	IW0 ~	9000	Save as word address value divided by 2.
	Output Bit	QW0 ~	8800	Save as word address value divided by 2.
	Internal Bit	MW00 ~	C800	Save as word address value divided by 2.
	Specioal Memory	SMW00 ~	B800	Save as word address value divided by 2.
	Variable Memory	VW0000 ~	D000	Save as word address value divided by 2.
Word Device	Timer Word	T000 ~	0400	Save as word address value divided by 2.
	Counter Word	C000 ~	0800	Save as word address value divided by 2.

SIMATIC S7 200 (via MPI)

	Device		Word Address	Device Address	Address Code
Bit Device	Input	Node 1	IW0 ~	9000	Word Address devided by 2
		Node 2	IW0 ~	9200	Word Address devided by 2
		Node 3	IW0 ~	9400	Word Address devided by 2
		Node 4	IW0 ~	9600	Word Address devided by 2
	Output	Node 1	QW0 ~	8800	Word Address devided by 2
		Node 2	QW0 ~	8A00	Word Address devided by 2
		Node 3	QW0 ~	8C00	Word Address devided by 2
		Node 4	QW0 ~	8E00	Word Address devided by 2
	Internal	Node 1	MW00 ~	C800	Word Address devided by 2
		Node 2	MW00 ~	CA00	Word Address devided by 2
		Node 3	MW00 ~	CC00	Word Address devided by 2
		Node 4	MW00 ~	CE00	Word Address devided by 2
Word Device	Timer	Node 1	T000 ~	0400	Word Address
		Node 2	T000 ~	0600	Word Address
		Node 3	T000 ~	1000	Word Address
		Node 4	T000 ~	1200	Word Address
	Counter	Node 1	C00 ~	0800	Word Address
		Node 2	C00 ~	0A00	Word Address
		Node 3	C00 ~	0C00	Word Address
		Node 4	C00 ~	0E00	Word Address
	Var. Memory	Node 1	VW0000 ~	D000	Word Address devided by 2
		Node 2	VW0000 ~	D200	Word Address devided by 2
		Node 3	VW0000 ~	D400	Word Address devided by 2
		Node 4	VW0000 ~	D600	Word Address devided by 2
	LS area		LS0000 ~	4000	Word Address

SIMATIC 505

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Variable Memory	V00001 ~	0000	Word Address minus 1
	Word Input	WX00001 ~	0C00	Word Address minus 1
	Word Output	WY00001 ~	0E00	Word Address minus 1
	Loop Gain	LKC0001 ~	1C00	Word Address minus 1
	Loop Reset	LTI0001 ~	1E00	Word Address minus 1
	Loop Rate	LTD0001 ~	2000	Word Address minus 1
	Loop Alarm High Limit	LHA0001 ~	2400	Word Address minus 1
	Loop Low Alarm Limit	LLA0001 ~	2800	Word Address minus 1
	Loop Process Variable	LPV0001 ~	2C00	Word Address minus 1
	Loop PV High Limit	LPVH0001 ~	2E00	Word Address minus 1
	Loop PV Low Limit	LPVL0001 ~	3000	Word Address minus 1
	Loop Orange Deviation Limit	LODA0001 ~	3400	Word Address minus 1
	Loop Yellow Deviation Alarm Limit	LYDA0001 ~	3800	Word Address minus 1
	Loop Sample Rate	LTS0001 ~	3A00	Word Address minus 1
	Loop Setpoint	LSP0001 ~	3E00	Word Address minus 1
	Loop Output	LMN0001 ~	4400	Word Address minus 1
	Loop Error	LERR0001 ~	4800	Word Address minus 1
	Loop Bias	LMX0001 ~	4E00	Word Address minus 1
	Loop Alarm High-High Limit	LHHA0001 ~	5000	Word Address minus 1
	Loop Low-Low Alarm Unit	LLLA0001 ~	5400	Word Address minus 1
	Loop Rate of Change Alarm Limit	LRCA0001 ~	5600	Word Address minus 1
	Loop Setpoint High Limit	LSPH0001 ~	5A00	Word Address minus 1
	Loop Setpoint Low Limit	LSPL0001 ~	6000	Word Address minus 1
	Loop Alarm Deadband	LADB0001 ~	6200	Word Address minus 1
	LS Area	LS0000 ~	4000	Word Address

SIMATIC 505 (From previous page)

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Loop V-flags	LVF0001 ~	6400	Word Address
	Most Significant Word of Loop C-flags	LCFH0001 ~	6600	Word Address
	Least Significant Word of Loop C-flags	LCFL0001 ~	6800	Word Address
	Analog Alarm/Alarm Acknowledge Flags	AADB0001 ~	6C00	Word Address
	Most Significant Word of Analog Alarm C-flags	ACFH0001 ~	6E00	Word Address
	Least Significant Word of Analog Alarm C-flags	ACFL0001 ~	7000	Word Address
	Analog Alarm Error	AERR0001 ~	7400	Word Address
	Analog Alarm High Alarm Limit	AHA0001 ~	7800	Word Address
	Analog Alarm High-High Alarm Limit	AHHA0001 ~	7C00	Word Address
	Analog Alarm Low Alarm Limit	ALA0001 ~	7E00	Word Address
	Analog Alarm Low-Low Alarm Limit	ALLA0001 ~	7A00	Word Address
	Analog Alarm Loop Orange Deviation Alarm Limit	AODA0001 ~	7600	Word Address
	Analog Alarm Process Variable	APV0001 ~	7200	Word Address
	Analog Alarm Rate of Change Alarm Limit	ARCA0001 ~	6A00	Word Address
	Analog Alarm Setpoint	ASP0001 ~	5E00	Word Address
	Analog Alarm SP High Limit	ASPH0001 ~	5800	Word Address
	Analog Alarm SP Low Limit	ASPL0001 ~	5200	Word Address
	Analog Alarm Sample Rate	ATS0001 ~	4C00	Word Address
	Analog Alarm Yellow Deviation Alarm Limit	AYDA0001 ~	4A00	Word Address
	Timer/Counter Preset	TCP0001 ~	2600	Word Address
	Timer/Counter Current	TCC0001 ~	2A00	Word Address
	Drum Counter Preset	DCP0101 ~	3200	Word Address
	Drum Step Preset	DSP0001 ~	3600	Word Address
	Drum Step Current	DSC0001 ~	3C00	Word Address
	Status Word	STW0001 ~	4600	Word Address
	Drum Count Current	DCC0001 ~	4200	Word Address
	LS Area	LS0000 ~	4000	Word Address

■ Rockwell (Allen-Bradley)

SLC500 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Bit	B003000~ B010000~	9040	Upper two digits: Value of "DB number minus 3" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
Word Device	Timer (PRE: set value)	TP004000~ TP010000~	6800	Upper two digits: Value of "DB number minus 4" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	Timer (ACC: current value)	TA004000~ TA010000~	6000	Upper two digits: Value of "DB number minus 4" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	Counter (PRE: set value)	CP005000~ CP010000~	7800	Upper two digits: Value of "DB number minus 5" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	Counter (ACC: current value)	CA005000~ CA010000~	7000	Upper two digits: Value of "DB number minus 5" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	Integral Number	N007000~ N010000~	0040	Upper two digits: Value of "DB number minus 7" is indicated in HEX. Lower two digits: Value that DB number is indicated in HEX.
	LS area	LS0000~	4040	Word Address

** The address codes for Data Register and Extended Data Register are as follows:*

Ex. B019 255

- 255 — Data Word (DW) No.
- B019 — Data Block (DB) No.

Address code

Upper two digits: 019-3=16 (DEC) -> 10 (HEX)

Lower two digits: 255 (DEC) -> FF (HEX)

Address code is 10FF.

PLC-5 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	I000~	8040	Word Address
	Output Relay	0000~	8840	Word Address
	Internal Relay	B3000~	9040	Save as word address value minus 3000.
Word Device	Timer (ACC: current value)	TA3000~	6000	Save as word address value minus 3000.
	Timer (PRE: set value)	TP3000~	6800	Save as word address value minus 3000.
	Counter (ACC: current value)	CA3000~	7000	Save as word address value minus 3000.
	Counter (PRE: set value)	CP3000~	7800	Save as word address value minus 3000.
	Data Register Integer	N3000~	0040	Save as word address value minus 3000.
	Data Register BCD	D3000~	0240	Save as word address value minus 3000.
	Data Register ASCII	A3000~	0440	Save as word address value minus 3000.
	LS area	LS0000~	4040	Word Address

Control Logix5000 Series

	Device	Word Address	Device Code	Address Code
Bit Device	Bit (BOOL)	BOOL000000~	8000	Double Word Address
		BOOL065000~	8200	
		BOOL130000~	8400	
		BOOL195000~	8600	
		BOOL260000~	8800	
		BOOL325000~	8A00	
		BOOL390000~	8C00	
		BOOL455000~	8E00	
		BOOL520000~	9000	
		BOOL585000~	9200	
		BOOL650000~	9400	
		BOOL715000~	9600	
		BOOL780000~	9800	
		BOOL845000~	9A00	
		BOOL910000~	9C00	
		BOOL975000~	9E00	
Word Device	8 bit integer (SINT)	SINT000000~	4C00	Word Address
		SINT100000~	4E00	
		SINT200000~	5000	
		SINT300000~	5200	
		SINT400000~	8400	
		SINT500000~	5600	
		SINT600000~	5800	
		SINT700000~	5A00	
		SINT800000~	5C00	
		SINT900000~	5E00	

	Device	Word Address	Device Code	Address Code
Word Device	16 bit integer (INT)	INT000000~	0000	Word Address
		INT065000~	0200	
		INT130000~	0400	
		INT195000~	0600	
		INT260000~	0800	
		INT325000~	0A00	
		INT390000~	0C00	
		INT455000~	0E00	
		INT520000~	1000	
		INT585000~	1200	
		INT650000~	1400	
		INT715000~	1600	
		INT780000~	1800	
		INT845000~	1A00	
		INT910000~	1C00	
		INT975000~	1E00	
	32 bit integer (DINT)	DINT000000~	2000	Double Word Address
		DINT065000~	2200	
		DINT130000~	2400	
		DINT195000~	2600	
		DINT260000~	2800	
		DINT325000~	2A00	
		DINT390000	2C00	
		DINT455000~	2E00	
		DINT520000~	3000	
		DINT585000~	3200	
		DINT650000~	3400	
		DINT715000~	3600	
		DINT780000~	3800	
		DINT845000~	3A00	
		DINT910000~	3C00	
		DINT975000~	3E00	
	32 bit float (REAL)	REAL000000~	6000	Double Word Address
		REAL065000	6200	
		REAL130000~	6400	
		REAL195000~	6600	
		REAL260000~	6800	
		REAL325000~	6A00	
		REAL390000~	6C00	
		REAL455000~	6E00	
		REAL520000~	7000	
		REAL585000~	7200	
		REAL650000~	7400	
		REAL715000~	7600	
		REAL780000~	7800	
		REAL845000~	7A00	
		REAL910000~	7C00	
		REAL975000~	7E00	
	LS area (LS)	LS0000~	4000	Word Address

■ Keyence

KZ-300/KZ-350 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	00~	9100	Word Address
		70~	9100	Word Address
	Output Relay	05~	9100	Word Address
		75~	9100	Word Address
	Internal Auxilary Relay	10~	9100	Word Address
	Special Auxilary Relay	20~	9100	Word Address
Word Device	Timer (current value)	T000~	6000	Word Address
	Counter (current value)	C000~	7000	Word Address
	Data Memory	DM0000~	0000	Word Address
	Temporary Data Memory	TM00~	C100	Word Address
	LS area	LS0000~	4000	Word Address

KZ-500 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	X0000 ~	8000	Word Address'last digit, exept "0"
	Output Relay	Y0000 ~	8800	Word Address'last digit, exept "0"
	Internal Relay	M0000 ~	9000	Save as Word Address value divided by 16
	Special Relay	M9000 ~	B000	Save as (Word Address value minus 9000) divided by 16
	Latch Relay	L0000 ~	C000	Save as Word Address value divided by 16
	Annunciator Relay	F0000 ~	B800	Save as Word Address value divided by 16
Word Device	Timer (current value)	TN0000 ~	6000	Word Address
	Counter (current value)	CN0000 ~	7000	Word Address
	Data Register	D0000 ~	0000	Word Address
	Special Register	D9000 ~	0000	Word Address
	Link Register	W0000 ~	4800	Word Address
	File Register	R0000 ~	5800	Word Address
	LS area	LS0000 ~	4000	Word Address

KV Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	0000 ~	9000	Word Address
	Internal Auxilary Relay			
	Special Auxilary Relay			
Word Device	Timer (setting value)	TC 000 ~	6000	Word Address
	Counter (setting value)	CC 000 ~	7000	Word Address
	Timer (current value)	TS 000 ~	6800	Word Address
	Counter (current value)	CS 000 ~	7800	Word Address
	Data Memory	DM 0000 ~	0000	Word Address
	Temporary Data Memory	TM 00 ~	4800	Word Address
	Digital Trimer	AT 0 ~	5800	Word Address
	High Speed Counter (current value)	CTH 0 ~	1000	Word Address
	High Speed Counter Comparator (setting value)	CTC 0 ~	2000	Word Address
	LS area	LS0000 ~	4000	Word Address

KV-700 Series

	Device	Word Address	Device Code	Address Code
Bit Device	Input/Output Relay	0000 ~	9000	Word Address
	Internal AUX Relay			
	Control Relay	CR000 ~	9200	
Word Device	Timer (set value)	TS000 ~	6000	Double Word Address
	Counter (set value)	CS000 ~	7000	Double Word Address
	Timer (current value)	TC000 ~	6800	Double Word Address
	Counter (current value)	CC000 ~	7800	Double Word Address
	Data Memory	DM0000 ~	0000	Word Address
	Temporary Data Memory	TM00 ~	4800	Word Address
	Control Memory	CM0000 ~	3800	Word Address
	Digital Trimmer	TRM0 ~	5800	Double Word Address
	High-Speed Counter (current value)	CTH0 ~	2000	Double Word Address
	High-Speed Counter Comparator (set value)	CTC0 ~	1000	Double Word Address
	LS area	LS0000 ~	4000	Word Address

■ Shinko Electric

SELMART Series

	Device	Word Address	Device code (HEX)	Address code
Word Device	Data Register	D00000~	0000	Word Address
	LS area	LS0000~	4000	Word Address

■ Matsushita Electric Industrial

Panadac P7000 Series

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Relay	IN0000~	8000	Word Address
	Output Relay	OT0000~	8800	Word Address
	Internal Relay	RL0000~	9000	Word Address
	Hold Relay	KR0000~	C000	Word Address
	Link Relay	LK0000~	C800	Word Address
	Status Relaly	ST0000~	9800	Word Address
	MC Status Relay	MS0000~	9A00	Word Address
	Timer State Relay	TS0000~	E200	Word Address
	Timer Up Relay	TU0000~	E000	Word Address
	Count Up Relay	CU0000~	F000	Word Address
	CPU Input Relay	CI0000~	8200	Word Address
	CPU Output Relay	CO0000~	8A00	Word Address
Word Device	Data Memory	M0000~	0000	Word Address
	Link Register	LM0000~	4800	Word Address
	Timer (setting value)	TM0000~	6800	Word Address
	Timer (current value)	CT0000~	6000	Word Address
	Counter value	TC0000~	7000	Word Address
	Position Data	PM0000~	0800	Word Address
	LS Area	LS0000~	4000	Word Address

■ Meidensha

UNISEQUE Series

Device	Word Address	Device Code	Address Code
Memory	0000 ~	8000	Word Address
LS area	LS0000 ~	4000	Word Address

■ ORIM VEXTA

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input Register	I0001 ~	8000	Word Address minus 1.
	ON Event Input Register	IU001 ~	8800	Word Address minus 1.
	OFF Event Input Register	ID001 ~	9000	Word Address minus 1.
	Output Register	O0001 ~	B000	Word Address minus 1.
	Position Register	M0001 ~	C800	Word Address minus 1.
	Universal Register Double-Length	RD001 ~	E000	Word Address minus 1.
	Base Register	B000 ~	F000	Word Address
	Current Motor Status	MS001 ~	A800	Word Address minus 1.
	SY Register	SY001 ~	D000	Word Address minus 1.
Word Device	Analog Input Register	AD001 ~	5800	Word Address minus 1.
	Analog Output Register	DA001 ~	4800	Word Address minus 1.
	Speed Register Low	SL001 ~	6800	Word Address minus 1.
	Speed Register High	SH001 ~	7000	Word Address minus 1.
	Speed Register Raise	SR001 ~	7800	Word Address minus 1.
	Speed Register Decrease	SD001 ~	1000	Word Address minus 1.
	Current Motor Position	MP001	3800	Word Address minus 1.
	Universal Register	R0001 ~	0000	Word Address minus 1.
	LS area	LS0000 ~	4000	Word Address

■ FATEK

Facon FB 20MC

	Device	Word Address	Device code (HEX)	Address code
Bit Device	Input points	WX000 ~	0400	Save as word address value divided by 16.
	Output Relays	WY000 ~	0800	Save as word address value divided by 16.
	Internal Relays	WM0000 ~	1000	Save as word address value divided by 16.
	Special Relays	WSM1912 ~	2000	Save as word address value divided by 16.
	Step Relays	WS000 ~	4200	Save as word address value divided by 16.
Word Device	Timer Registers	TMR000 ~	4400	Word Address
	Counter Registers	CTR000 ~	4800	Word Address
	Data Register	HR0000 ~	0000	Word Address
	Input Registers	IR3840 ~	5000	Word Address
	Output Registers	OR3904 ~	6000	Word Address
	HSC Register	HSC4096 ~	0600	Word Address
	Calendar Register	RTC4128 ~	0C00	Word Address
	Special Register	SR4136 ~	1800	Word Address
	Read-Only Registers	ROR5000 ~	3000	Word Address
	LS Area	LS0000 ~	4000	Word Address

■ Yokogawa M&C Controllers

UT2000/UT3000/Green Series

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	D	0001 ~	0000	Word Address -1
Bit Device	I	0001 ~	9000	Save as word address -1 value divided by 16
Word Device	LS Area	LS6000 ~	4000	Woord Address

UT100

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	D Register	d0001 ~	3000	Word Address -1
	LS Area	LS0000 ~	4000	Word Address

■ Yamatake Controllers

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Data	0000 ~	8000	Word Address
		1000 ~	8200	Word Address-1000
		2000 ~	8400	Word Address-2000
		3000 ~	8600	Word Address-3000
		4000 ~	8800	Word Address-4000
		5000 ~	9000	Word Address-5000
		6000 ~	9200	Word Address-6000
		7000 ~	9400	Word Address-7000
		8000 ~	9600	Word Address-8000
	LS Area	LS0000 ~	4000	Word Address

**Only unit No. 1 is available.*

■ RKC INSTRUMENT INC.Controllers

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	——	0000 ~ 02EE	8000	Word Address
	LS Area	LS0000 ~	4000	Word Address

■ Omron Corporation Controllers

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Variable Areas	C00000 ~	80E0	Word Address
		C10000 ~	82E0	Word Address
		C30000 ~	84E0	Word Address
	Operation Commands	A0000 ~	8660	Word Address
	LS Area	LS0000 ~	40E0	Word Address

■ Shinko Technos Corporation Controllers

C/FC/FIR/GC/FCL/PC-900 Series

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Data Items	0001 ~	8000	Word Address -1
		0401 ~	8200	Word Address -0x401
		0801 ~	8400	Word Address -0x801
		0C01 ~	8600	Word Address -0xC01
		1001 ~	8800	Word Address -0x1001
		1401 ~	8A00	Word Address -0x1401
		1801 ~	8C00	Word Address -0x1801
		1C01 ~	8E00	Word Address -0x1C01
		2001 ~	9000	Word Address -0x2001
		2401 ~	9200	Word Address -0x2401
		2801 ~	9400	Word Address -0x2801
		2C01 ~	9600	Word Address -0x2C01
		3001 ~	9800	Word Address -0x3001
		3401 ~	9A00	Word Address -0x3401
		3801 ~	9C00	Word Address -0x3801
		3C01 ~	9E00	Word Address -0x3C01
		4001 ~	A000	Word Address -0x4001
		4401 ~	A200	Word Address -0x4401
		4801 ~	A400	Word Address -0x4801
		4C01 ~	A600	Word Address -0x4C01
		5001 ~	A800	Word Address -0x5001
		5401 ~	AA00	Word Address -0x5401
		5801 ~	AC00	Word Address -0x5801
		5C01 ~	AE00	Word Address -0x5C01
		6001 ~	B000	Word Address -0x6001
		6401 ~	B200	Word Address -0x6401
		6801 ~	B400	Word Address -0x6801
		6C01 ~	B600	Word Address -0x6C01
		7001 ~	B800	Word Address -0x7001
		7401 ~	BA00	Word Address -0x7401
		7801 ~	BC00	Word Address -0x7801
		7C01 ~	BE00	Word Address -0x7C01
	Setting Value Memory 1	1S0001 ~	C000	Word Address -1
	Setting Value Memory 2	2S0001 ~	C200	Word Address -1
	Setting Value Memory 3	3S0001 ~	C400	Word Address -1
	Setting Value Memory 4	4S0001 ~	C600	Word Address -1
	Setting Value Memory 5	5S0001 ~	C800	Word Address -1
	Setting ValueMemory 6	6S0001 ~	CA00	Word Address -1
	Setting Value Memory 7	7S0001 ~	CC00	Word Address -1
	Channel 1	1CH01 ~	D000	Word Address -1
	Channel 2	2CH01 ~	D200	Word Address -1
	Channel 3	3CH01 ~	D400	Word Address -1
	Channel 4	4CH01 ~	D600	Word Address -1
	Channel 5	5CH01 ~	D800	Word Address -1
	Channel 6	6CH01 ~	DA00	Word Address -1
	Channel 7	7CH01 ~	DC00	Word Address -1
	Channel 8	8CH01 ~	DE00	Word Address -1
	Channel 9	9CH01 ~	E000	Word Address -1
	Channel 10	10CH01 ~	E200	Word Address -1
	Channel 11	11CH01 ~	E400	Word Address -1
	Channel 12	12CH01 ~	E600	Word Address -1
	Channel 13	13CH01 ~	E800	Word Address -1
	Channel 14	14CH01 ~	EA00	Word Address -1
	Channel 15	15CH01 ~	EC00	Word Address -1
	Channel 16	16CH01 ~	EE00	Word Address -1
	Channel 17	17CH01 ~	F000	Word Address -1
	Channel 18	18CH01 ~	F200	Word Address -1
	Channel 19	19CH01 ~	F400	Word Address -1
	Channel 20	20CH01 ~	F600	Word Address -1
	LS Area	LS0000 ~	4000	Word Address

■ Fuji Electric Corporation Controller

Micro-Controller X Series (Model:PXR)

	Device	Word Address	Device Code (HEX)	Address Code
Bit Device	Parameter	00001 ~	8000	Cannot be set
		10001 ~	8200	Word Address minus 1
Word Device		30001 ~	8400	Word Address minus 1
		40001 ~	8600	Word Address minus 1
		31001 ~	8800	Word Address minus 1
		41001 ~	8A00	Word Address minus 1
	LS Area	LS0000 ~	4000	Word Address

■ TOHO ELECTORICS INC.

TTM Series

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	00_	00_0000 ~ 0075	8000	Word Address
	10_	10_0000 ~ 0025	B000	Word Address
	100_	100_0000 ~ 0032	B200	Word Address
	110_	110_0000 ~ 0041	8200	Word Address
	120_	120_0000 ~ 0043	8400	Word Address
	300_	300_0000 ~ 0067	8600	Word Address
	1020_	1020_0000 ~ 0077	8800	Word Address
	Step Temperature Setting	SSV0000 ~ 2047	9000	Word Address
	Final Step Setting	END0000 ~ 2047	9200	Word Address
	Step time Setting	STI0000 ~ 2047	9400	Word Address
	Final Step Finish Condition Setting	SOK0000 ~ 2047	9600	Word Address
	Step Wait Zone	SWZ0000 ~ 2047	9800	Word Address
	Step Wait Time	SWT0000 ~ 2047	A000	Word Address
	Time Signal ON Time	SON0000 ~ 2047	A200	Word Address
	Time Signal OFF Time	SOF0000 ~ 2047	A400	Word Address
	Execution Time	SRN0000 ~ 2000	A600	Word Address
	End Signal ON Time	SEO0000 ~ 2000	A800	Word Address
	LS area	LS0000 ~	4000	Word Address

■ Fenwal Temperature Controllers

AL Series

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Input signal	IN1	0000	Word Address-1
	Decimal place in linear input UN	UN1	0200	Word Address-1
	With or without IRr/c2 point correction	IR1	0400	Word Address-1
	Control mode	CM1	0600	Word Address-1
	Filter constant	FS1	0800	Word Address-1
	Control LED illumination direction	OD1	0A00	Word Address-1
	Control output direction	OA1	0C00	Word Address-1
	Burnout direction	BO1	0E00	Word Address-1
	Output limit method	LT1	1000	Word Address-1
	Warning type	AK1	1200	Word Address-1
	Warning 1: Alarm warning code	HA1	1400	Word Address-1
	Warning 1: Temperature warning code	A11	1600	Word Address-1
	Warning 2: Temperature warning code	A21	1800	Word Address-1
	Warning 3: Temperature warning code	A31	1A00	Word Address-1
	Warning LED illumination direction	LE1	1C00	Word Address-1
	CT type	CT1	1E00	Word Address-1
	Upper and lower limits of setting range	HL1 ~	2000	Word Address-1
	Linear input scaling	L1 ~	2200	Word Address-1
	Upper and lower output limits	OL1 ~	2400	Word Address-1
	Proportional time	PT1	2600	Word Address-1
	Proportional band	PB1	2800	Word Address-1
	Integral action time	IT1	2A00	Word Address-1
	Derivative action time	DT1	2C00	Word Address-1
	ARW	AR1	2E00	Word Address-1
	ON/OFF sensitivity	DI1	3000	Word Address-1
	Manual resetting	RT1	3200	Word Address-1
	Sensor error correction	SA1	3400	Word Address-1
	Temperature value before high-point correction for IRr/c2 point correction value	IA1	3600	Word Address-1
	Temperature value after high-point correction for IRr/c2 point correction value	IB1	3800	Word Address-1
	Temperature value after low-point correction for IRr/c2 point correction value	IC1	3A00	Word Address-1
	Temperature value after low-point correction for IRr/c2 point correction value	ID1	3C00	Word Address-1
	Transmission output scaling H and L	DS1 ~	3E00	Word Address-1
	Setting value for heater breakage current	CA1	4200	Word Address-1

	Device	Word Address	Device Code (HEX)	Address Code
Word Device	Warning sensitivity	AD1	4400	Word Address-1
	Main temperature setting	S1	4600	Word Address-1
	Warning 1: 1 point	SP1	4800	Word Address-1
	Warning 1: Bands H and L	SB1 ~	4A00	Word Address-1
	Warning 2: 1 point	DP1	4C00	Word Address-1
	Warning 2: Bands H and L	DB1 ~	4E00	Word Address-1
	Warning 3: 1 point	TP1	5000	Word Address-1
	Warning 3: Bands H and L	TB1 ~	5200	Word Address-1
	Output method	OU1	5400	Word Address-1
	Number of warnings	AN1	5600	Word Address-1
	RUN/STOP	RS1	5800	Word Address-1
	Auto tuning	AT1	5A00	Word Address-1
	Key locking	KY1	5C00	Word Address-1
	Mode locking	ML1	5E00	Word Address-1
	POWER ON/OFF	ON1	6000	Word Address-1
	Current temperature	PV1	6200	Word Address-1
	Operation panel	MV1	6400	Word Address-1
	Temperature control	GC1 ~	6600	Word Address-1
	Warning	GA1 ~	6800	Word Address-1
	Panel data	GP1 ~	6A00	Word Address-1
	LS area	LS0000 ~	4000	Word Address

■ Memory Link Method

	Word Address	Device code (HEX)	Address code
Word Device	0~	4040	Word Address

■ Device Net

	Device	Word Address	Device code (HEX)	Address code
Word Device	LS area	LS0000 ~	4000	Word Address

■ CC-Link

	Device	Word Address	Device code (HEX)	Address code
Word Device	LS area	LS0000 ~	4000	Word Address

■ CC-Link intelligent Device Station

E-tag or K-tag indirect addresses cannot be designated by CC-Link Intelligent Device Station.

■ Mitsubishi Electronic Corporation Inverter

	Device	Word Address	Device code (HEX)	Address code
Word Device	Parameter (except for Pr.37 of FREQROL-S500 and FREQROL-E500)	0000 ~	8000	Word Address
	Parameter (Pr.37 of FREQROL-S500 or FREQROL-E500)	P0037	8200	Word Address
	Operation mode	OPE0	8400	Word Address
	Output frequency (rpm)	OUTF0	8600	Word Address
	Output current	OUTC0	8800	Word Address
	Output voltage	OUTV0	9000	Word Address
	Special monitor	SPM0	9200	Word Address
	Output frequency	SOF0	9400	Word Address
	Output current	SOC0	9600	Word Address
	Output voltage	SOV0	9800	Word Address
	Set frequency value	FRS0	A000	Word Address
	Run speed	RUNS0	A200	Word Address
	Motor torque	MOT0	A400	Word Address
	Regenerative brake	RBRK0	A600	Word Address
	Electronic thermal load factor	ELOF0	A800	Word Address
	Output current peak value	OCPV0	B000	Word Address
	Converter output voltage peak value	COPK0	B200	Word Address
	Input power	IPOW0	B400	Word Address
	Output power	OPOW0	B600	Word Address
	Alarm (latest Nos. 1 & 2)	A12D0	B800	Word Address
	Alarm (latest Nos. 3 & 4)	A34D0	C000	Word Address
	Alarm (latest Nos. 5 & 6)	A56D0	C200	Word Address
	Alarm (latest Nos. 7 & 8)	A78D0	C400	Word Address
	Run command	RUNC0	C600	Word Address
	Inverter status monitor	INVS0	C800	Word Address
	Run frequency write (E2PROM)	RWRT0	D000	Word Address
	Set frequency write (RAM and E2PROM)	SFWE0	D200	Word Address
	Set frequency write (only RAM)	SFWR0	D400	Word Address
	Set frequency read (E2PROM)	SFRE0	D600	Word Address
	Set frequency read (RAM)	SFRR0	D800	Word Address
	Error all clear	ERCL0	E000	Word Address
	Inverter reset	RSET0	E200	Word Address
	Parameter all clear	ALLC0	E400	Word Address
	User clear			Word Address
	Link parameter extended settings	LNKP0	E600	Word Address
	No. 2 parameter change	SECP0	E800	Word Address
	LS area	LS0000 ~	4000	Word Address

■ Fuji Electronic Corporation Inverter

	Device	Word Address	Device code (HEX)	Address code
Word Device	Basic function	F00 ~	0000	Word Address
	Terminal function	E01 ~	1000	Word Address minus 1.
	Controlling function	C01 ~	2000	Word Address minus 1.
	Motor 1	P00 ~	3000	Word Address
	High level function	H01 ~	5000	Word Address minus 1.
	Motor 2	A01 ~	6000	Word Address minus 1.
	Option	o00 ~	7000	Word Address
	Command data	S01 ~	1200	Word Address minus 1.
	Monitor data	M01 ~	1400	Word Address minus 1.
	Alarm reset	m00	1600	Word Address
	LS Area	LS0000 ~	4000	Word Address

■ Yasukawa Inverter

	Device	Word Address	Device Code	Address Code
Bit Device	Bit Register	BR0000 ~ BR03FF	8200	Word Address
		BR0400 ~ BR07FF	8400	
		BR0800 ~ BR0BFF	8600	
Word Device	Register	0000 ~ 03FF	0200	
		0400 ~ 07FF	0400	
		0800 ~ 0BFF	0600	
	LS Area	LS0000 ~	4000	

■ Interbus-S

Direct I/O Mode

	Device	Word Address	Device code (HEX)	Address code
Word Device	LS area	LS0000 ~	4000	Word Address

Packet Transfer Mode

	Device	Word Address	Device code (HEX)	Address code
Word Device	Data Block	DB02W00000~	7C00	Same as word address value divided by 2
	Input Relay	IW00000~	8000	Same as word address value divided by 2
Bit Device	Output Relay	OW00000~	8800	Same as word address value divided by 2
	Internal Memory	Mw00000~	9000	Same as word address value divided by 2

Using Servo

■ Matsushita Electric's Servo

	Device	Word Address	Device code (HEX)	Address code
	05_	00	8600	Word Address
	20_	00	8E00	Word Address
	20_	01	9000	Word Address
	21_	00	9200	Double-Word Address
	22_	00	9400	Double-Word Address
	24_	00	9600	Word Address
	25_	00	9800	Word Address
	26_	00	9A00	Double-Word Address
	27_	00	9C00	Double-Word Address
	28_	00	9E00	Double-Word Address
	28_	00	A000	Word Address
	29_	00	A200	Word Address
	29_	01	A400	Word Address
	29_	02	A600	Double-Word Address
	2A_	00	A800	Word Address
	2A_	01	AA00	Word Address
	2A_	02	AC00	Double-Word Address
	2A_	03	AE00	Double-Word Address
	2A_	04	B000	Word Address
	2D_	00	B200	Word Address
	2D_	01	B400	Word Address
	2D_	02	B600	Double-Word Address
	2D_	03	B800	Word Address
	80_	000 ~ 0FF	BA00	Word Address
	81_	000 ~ 0FF	BC00	Word Address
	84_	00	BE00	Word Address
	90_	00	C000	Word Address
	91_	000 ~ 0FF	C200	Word Address
	91_	100 ~ 1FF	C400	Word Address
	92_	001 ~ 014	C600	Word Address
	93_	00	C800	Word Address
	94_	00	CA00	Word Address
	9B_	00	CC00	Word Address
	B0_	000 ~ 07F	CE00	Word Address
		100 ~ 17F	DA00	
		200 ~ 27F	DC00	
		300 ~ 37F	DE00	
	B1_	000 ~ 07F	D000	Word Address
		100 ~ 17F	D400	
		200 ~ 27F	D600	
		300 ~ 37F	D800	
	B2_	00	D200	Word Address
	LS area	0000 ~	4000	Word Address

■ JT Engineering Analyzer

JE-70 Series

	Device	Word Address	Device code	Address code
Bit Device	Status error Error	M0000~	9000	Word address/16
Word Device	Current value	D0000~	0000	Word address
	Recipe Common constant constant Equipment-specific data Filter constant Correction parameter	R0000~	5800	
	LS Area	LS0000 ~	4000	

MEMO

A 3 Device Monitor

Using the GP's device monitor function allows the PLC's arbitrary device memory to be monitored or changed. A device can be monitored or changed from the GP window regardless of the GP screen being displayed.

- All applicable devices used with the GP can be monitored or changed by the GP.
- I/O relays, data memory and other items can be displayed on the Device Monitor function's special window in random or block format.
- The bit device's ON/OFF status, and the word device's current numeric values (selectable as binary, octal, decimal or hexadecimal) can be displayed.

Applicable GPs:

GP2000/GP77R/GP70 (except GP-270 series and GP-H70 series' system version 1.20 or lower) series.

Applicable PLCs:

MELSEC-A series (CPU: A2A or A3A) direct CPU connection, by Mitsubishi Electric Co.

MELSEC-AnA series using Link I/F (applicable CPUs are listed in Section 1-3 "Connectable PLCs") link, by Mitsubishi Electric Co.

MELSEC-AnN series CPU Direct Connection (applicable CPUs are listed in Section 1-3 "Connectable PLCs") direct CPU connection, by Mitsubishi Electric Co.

MELSEC-AnN series using Link I/F (applicable CPUs are listed in Section 1-3 "Connectable PLCs") link, by Mitsubishi Electric Co.

MELSEC-QnA series CPU Direct Connection (applicable CPUs are listed in Section 1-3 "Connectable PLCs") direct CPU connected, by Mitsubishi Electric Co.

MELSEC-QnA series using Link I/F (applicable CPUs are listed in Section 1-3 "Connectable PLCs") link, by Mitsubishi Electric Co.

MELSEC-FX series (applicable CPUs are listed in Section 1-3 "Connectable PLCs"), by Mitsubishi Electric Co.

MELSEC-Q series CPU Direct Connection (applicable CPUs are listed in Section 1-3 "Connectable PLCs") direct CPU connected, by Mitsubishi Electric Co.

SYSMAC C Series (applicable CPUs are listed in Section 1-3 "Connectalbe PLCs")

SYSMAC a Series (applicable CPUs are listed in Section 1-3 "Connectalbe PLCs")

SYSMAC CS1/CJ Series (applicable CPUs are listed in Section 1-3 "Connectalbe PLCs")

Reference *To use the device monitor function, it must first be registered, using the GP-PRO/PBIII for Windows 95 software's Utility menu. (See Operation Manual's chapter **4.2.5** "**Device Monitor**".)*

This chapter explains the use of this function with a MELSEC-A series PLC, manufactured by Mitsubishi Electric Co.

Important

- ***The device monitor function uses approximately 90 reserved tags. Therefore, when the device monitor's special screen is displayed on the GP monitor, the total number of tags displayed may exceed the maximum number allowed. In this case, the device monitor may not operate correctly. (The message "Number of tags exceeded" will be displayed) at the bottom of the screen. If using the device monitor exceeds the maximum number of tags, do not use the device monitor with that screen.***
- ***It is possible in the interest of future expansion, to set a device address range which is outside the PLC's present device address range. However, when an attempt is made to display a non-existing range, the message "Host communication error" will be displayed. In this case, either adjust the device address range so it is inside the actual range, or delete it. Also, if a device address was written to outside the actual range, the message "Host communication error" will continue to be displayed. To erase this message, turn the GP's power OFF, and then ON again, or reset the GP while it is offline. Never try to write to device address that are outside of the PLC's actual range.***
- ***The device monitor can only monitor devices that are shown in "Supported Devices" section in each PLC.***
- ***User's Area from LS2096 to LS4095 will be reserved and cannot be used when using device monitor.***

■ Global Window Setup

The device monitor function uses the GP's global window function. This means that when the device monitor function is used, other global windows cannot be displayed.

With the GP in OFFLINE mode, select [1. INITIALIZE], then [1. SYSTEM ENVIRONMENT SETTINGS], and then [3. GLOBAL WINDOW SETUP]. In this window, input the following:

- Global window: Use
- Global window designation: Indirect
- Data format: BIN

A 3.1 Functions

(1) The Random Monitor can

- Monitor devices at eight arbitrary points.
- Designate bit and word devices monitored in single-bit units.
- Display the ON/OFF status for bit devices; display data in binary, octal, decimal, or hexadecimal notation for word devices.
- Write data to devices being monitored.

(2) The Block Monitor can

- Monitor devices at eight consecutive points.
- Specify the word device.
- Display data in binary, octal, decimal, or hexadecimal notation.
- Monitor devices in 8 point “pages”, (8 devices equal one page). Uses [NEXT] and [Previous] commands to move to next “page”.
- Specify the first device to be monitored.
- Write data to devices being monitored.

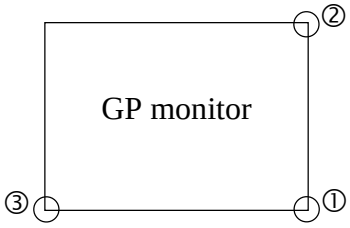
(3) To Write Data

- Write out the data for arbitrary devices regardless of the monitoring screen being used.
- Specify the bit device and word device.
- Change the ON/OFF status for bit devices, or input hexadecimal numeric values for the word device.

If any device monitor compatible with the MELSEC-FX made by Mitsubishi Electric Corp. is used, only the lower two bytes (16 bits) are displayed for any binary or octal number when a 32-bit device (CN200 to CN255) is monitored. For any hexadecimal or decimal number, all 32 bits are displayed.

A 3.2 Screen Operation

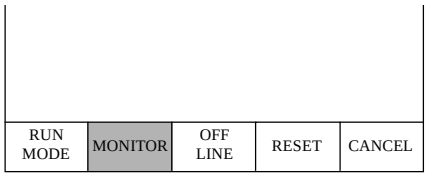
A 3.2.1 Starting Device Monitor



1) Touch the points shown by numbers ① and ②, then touch ③.

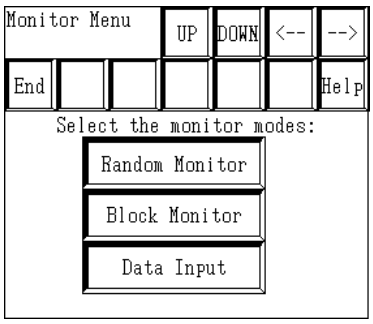
Reference *For details refer to "**I/O setup**" in each unit's User's Manual.*

Panel's Menu Bar will appear.



2) Select MONITOR from the menu bar.

The MONITOR MENU screen is then displayed. *1



Important ***If MONITOR is not displayed in the menu bar, check that the global window setting save correct.***

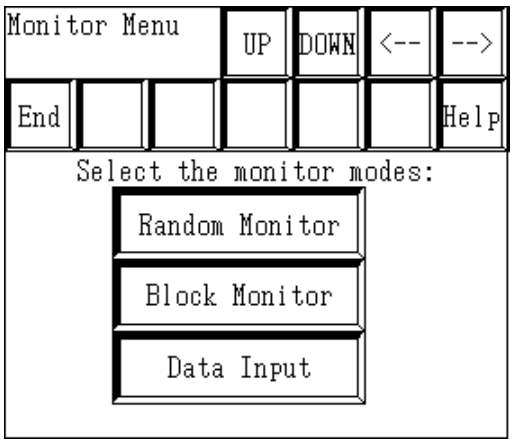
Reference *See "**Global Window Settings**".*

**1 If the device monitor function is not supported by the protocol, touching the MONITOR selection has no effect.*

A3.2.2 Monitor Menu

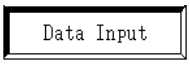
This menu can be used to monitor each PLC device.

In this window, please select the device monitor mode.

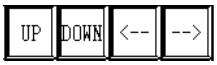


Monitors devices at eight arbitrary points.

Monitors devices at eight consecutive points.



Writes data to an arbitrary device.

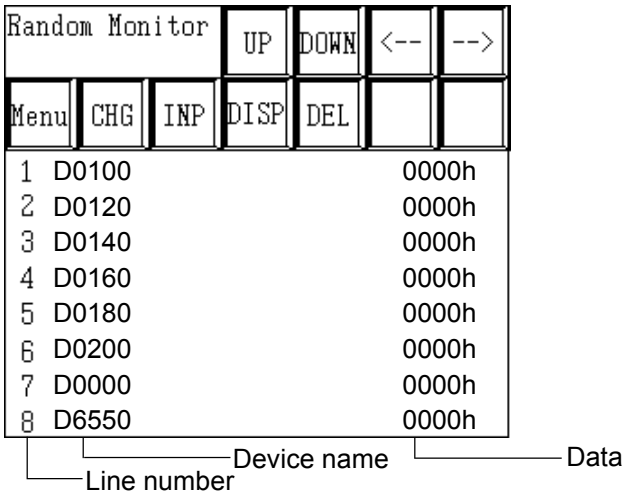


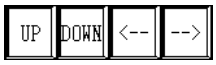
Changes the position of the device monitor's display window.

Ends Device Monitoring.

■ Random Monitor

Monitors devices at eight arbitrary points.





Moves the position of the display window.

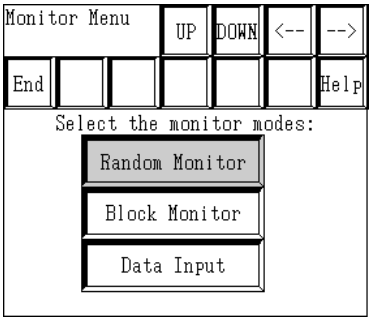
Returns to the MONITOR MENU.

Displays the title “Change Line Selection” and then changes to device and address change mode.

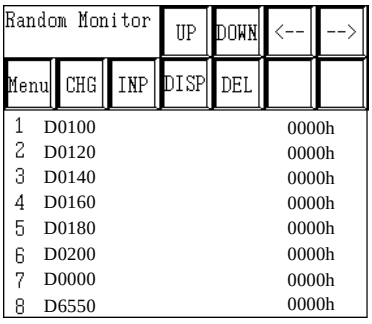
Displays the title “Write Line Selection” and then changes to data write mode.

Displays the title “Display Line Selection” and then changes to data display mode.

Displays the title “Delete Line Selection” and then deletes the Device data displayed at the selected line number.



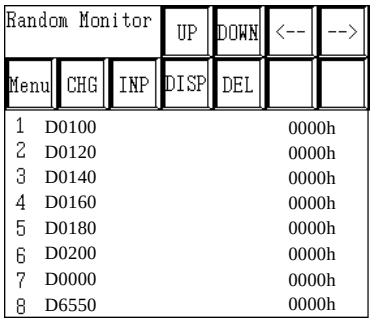
1) Select RANDOM MONITOR from the MONITOR MENU.



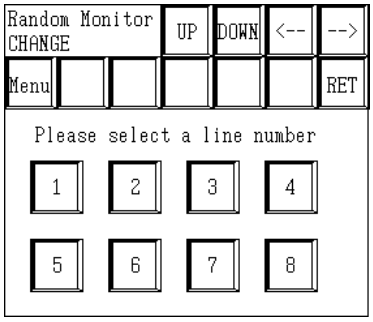
2) The RANDOM MONITOR screen will appear.

① Change

Both the device to be monitored and its address can be changed.

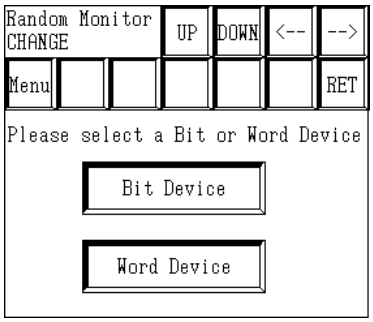


1) Select [CHG] on the RANDOM MONITOR screen, and the RANDOM MONITOR CHANGE LINE SELECTION screen will appear.



2) Select the line number of the line to be changed, and the RANDOM MONITOR CHANGE screen will appear.

You can also make the selection directly on the RANDOM MONITOR screen by touching the device or address to be changed with your fingertip.



3) Select the device to be changed.

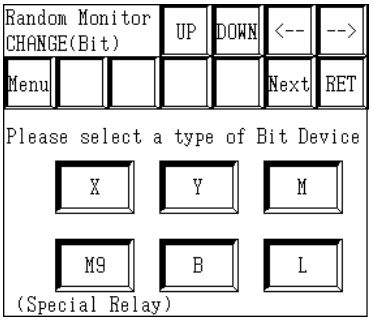
Select this when monitoring a bit device.

Select this when monitoring a word device.

Returns to the menu screen.

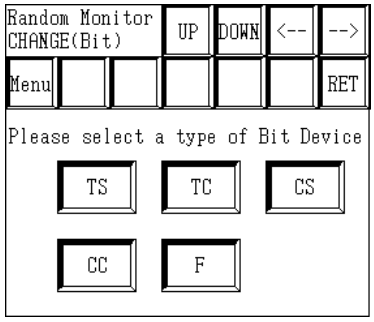
Returns to the previous screen.

When [BIT DEVICE] is selected:

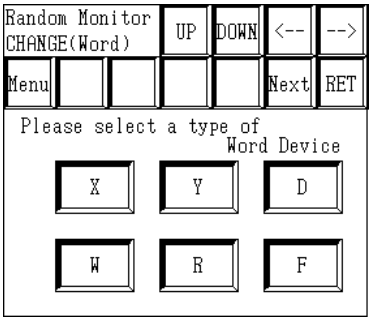


4) Select the type of device to be monitored on the RANDOM MONITOR CHANGE screen.

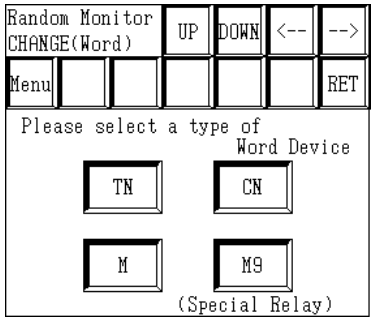
   Touch [NEXT] to display the remaining device types.

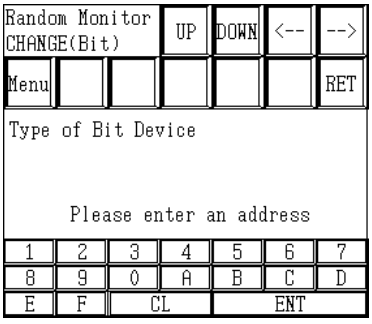


When [WORD DEVICE] is selected:



Touch [NEXT] to display the remaining device types.





5) Input the address of the device to be monitored, and touch [ENT].

   The address of the device being monitored is then changed.

Note:

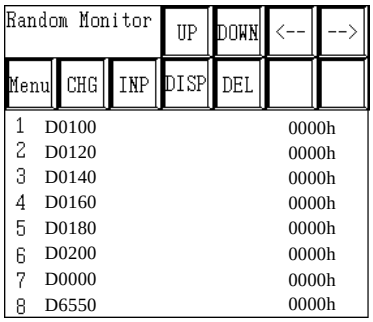
- **The types of devices displayed will vary depending on the PLC being used.**
- **In anticipation of future expansion, the device address input can exceed the actual device address range of the PLC being used.**

  However, if an attempt is made to monitor an address outside the device address range, the message "PLC COM. ERROR" will be displayed at the bottom of the screen.

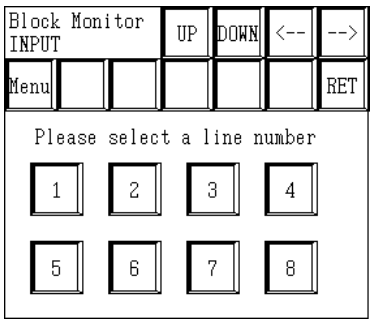
  In such a case, adjust the device address range being monitored so that it is within the actual device address range of the PLC being used.

② Writing

Data can be written either to the device to be monitored or to its address.



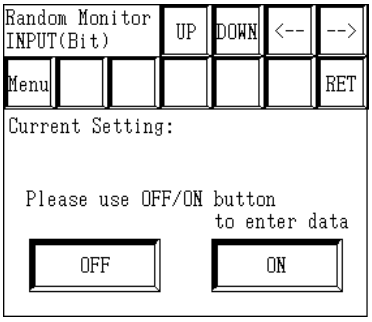
1) Select [WRITE] on the RANDOM MONITOR screen, and the RANDOM MONITOR WRITE LINE SELECTION screen will appear.



2) Select the line number of the device to be written to, and the RANDOM MONITOR WRITE screen will appear.

Note: **You can also make the selection directly on the RANDOM MONITOR screen by touching the device to be written to with your fingertip.**

When the selected line's device is a bit device:

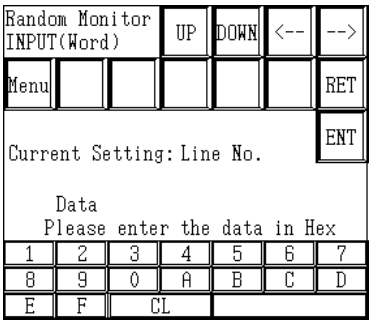


1) Select the data.

OFF — Turns the bit device OFF.

ON — Turns the bit device ON.

When the selected line's device is a word device:



1) Input the data in hexadecimal, and touch [ENT].

   The data will be written to the selected line's device.

Note: **The position of the [ENT] key is different from that on the RANDOM MONITOR CHANGE screen. (This is to prevent the accidental writing of data.)**

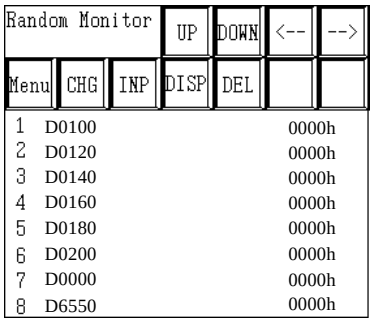
If input wrong, the message "Input error" will blink in the upper-left corner of the screen.

Reference *For information about input ranges, refer to devices listed in "**Supported Devices**" section in each PLC.*

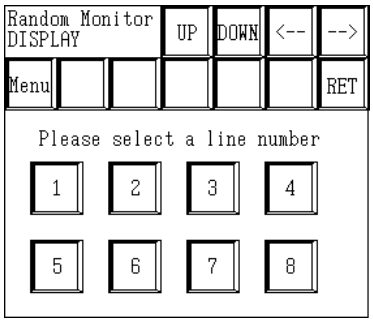
STOP **Do not attempt to write address data to a device that is outside the actual device address range of the PLC being used.**

③ Display format

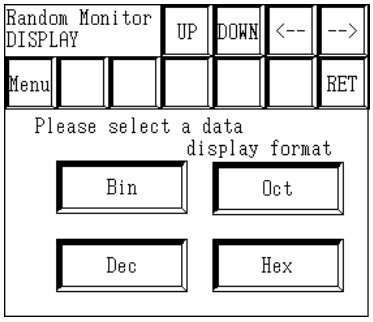
Here, the data's display format can be selected. While a bit device is actually being monitored, however, the display format cannot be changed.



1) Select [DISP] on the RANDOM MONITOR screen, and the RANDOM MONITOR DISPLAY LINE SELECTION screen will appear.



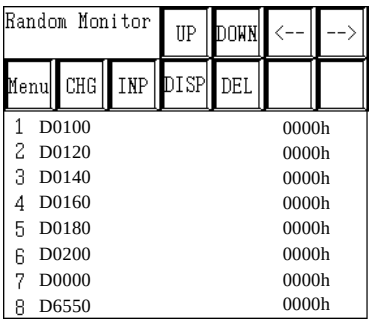
2) Select the line number of the line whose display format you wish to change, and the RANDOM MONITOR DISPLAY screen will appear.



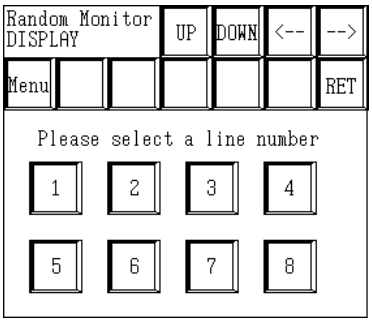
3) Select the data's display format.

④ Deleting

Here, a line of device data used for monitoring can be deleted.



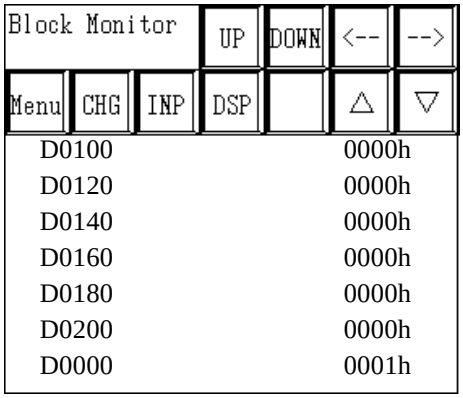
1) Select [DEL] on the RANDOM MONITOR screen, and the RANDOM MONITOR DELETE LINE SELECTION screen will appear.

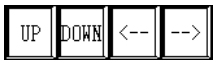


2) Select the line number of the line you with to delete, and the monitor of the selected line number will be deleted.

■ BLOCK MONITOR

Here, you can monitor up to eight consecutive word devices.





Moves the window's display position.

Returns to the MONITOR MENU screen.

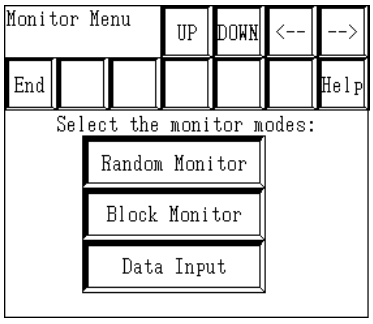
Displays the CHANGE LINE SELECTION and then switches to the Device and Address Change mode.

Displays the WRITE LINE SELECTION screen, and then switches to the Data Write mode.

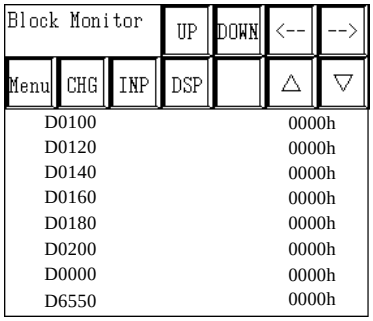
Displays the DISPLAY LINE SELECTION screen, and then switches to the Data Display mode.

Displays ("Pages" backwards to show) the previous 8 addresses.

Displays ("Pages" forwards to show) the next 8 addresses.



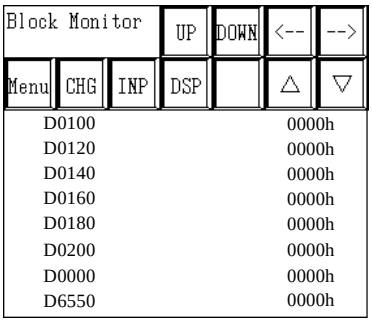
1) Select [BLOCK MONITOR] from the MONITOR MENU screen and then [BLOCK MONITOR] screen will be displayed.



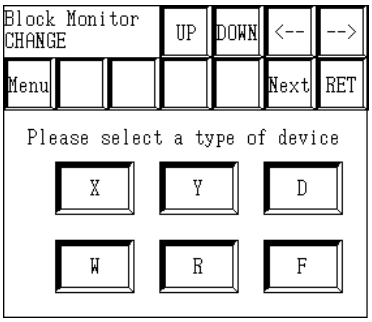
2) Use the [CHG] key to select the device to be monitored.

① Change

Both the device to be monitored and its address can be changed. First, change the device and address where you will start monitoring.



1) Select [CHG] from the BLOCK MONITOR screen's menu, and the BLOCK MONITOR CHANGE screen will appear.

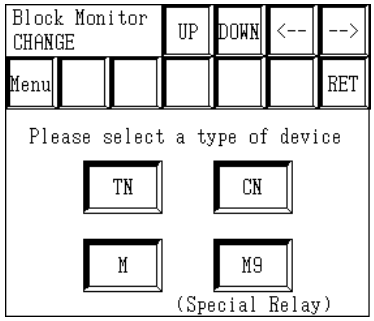


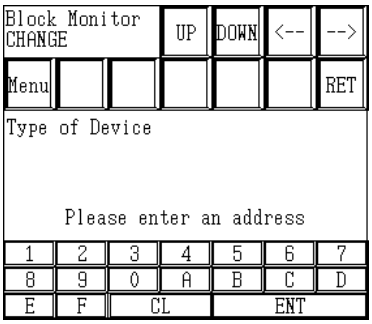
2) Select the type of device to be changed.

Returns to the menu screen.

Returns to the previous screen.

Displays the remaining device types.





3) Input the address to be monitored and touch the [ENT] key.

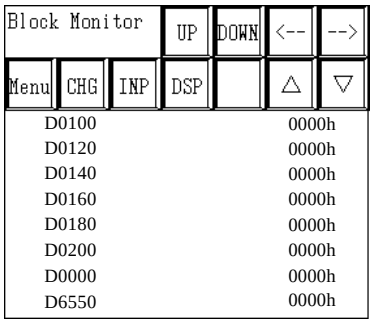
In anticipation of future expansion, the device address input can exceed the actual device address range of the PLC being used.

However, if an attempt is made to monitor an address outside the device address range, the message "Host Communication Error" will be displayed at the bottom of the screen.

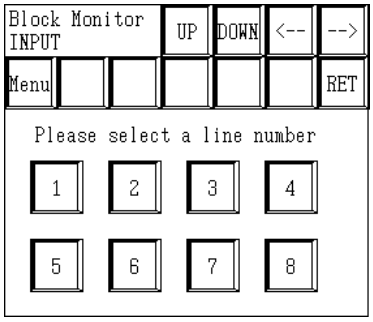
In such a case, adjust the device address range being monitored so that it is within the actual device address range of the PLC being used.

② Writing

Data can be written to either the device being monitored or to its address.

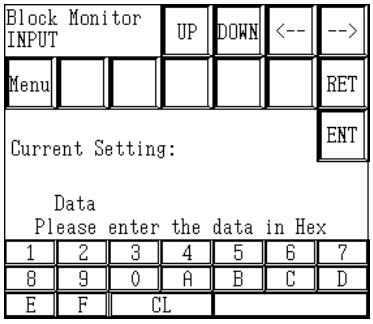


1) Select [INP] on the BLOCK MONITOR screen, and the BLOCK MONITOR INPUT LINE SELECTION screen will appear.



2) Select the line number of the device to be written to, and the BLOCK MONITOR INPUT screen will appear.

Note: **You can also make the selection directly on the BLOCK MONITOR screen by touching the device to be written to with your fingertip.**



3) Input the data in hexadecimal, and touch [ENT].

   The data will be written to the selected line's device.

Note: **The position of the [ENT] key is different from that on the BLOCK MONITOR CHANGE screen. (This is to prevent the accidental writing of data.)**

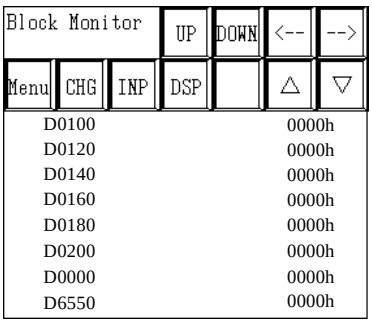
If input wrong, the message "Input error" will blink in the upper-left part of the screen.

Reference *For information about input ranges, refer to devices listed in "**Supported Devices**" section in each PLC.*

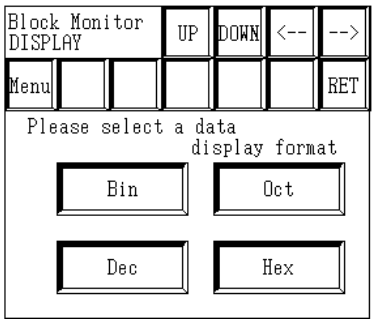
STOP **Do not attempt to write address data to a device that is outside the actual device address range of the PLC being used.**

③ Display format

Here, the data's display format can be selected.



1) Select [DISP] on the BLOCK MONITOR screen and the BLOCK MONITOR DISPLAY screen will appear.

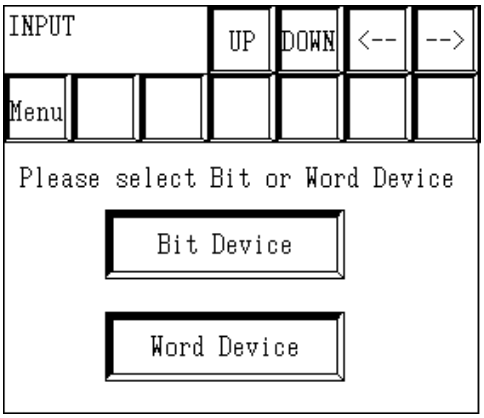


2) Select the data's display format.

A 3.2.3 Writing Data

Here, data can be written to the PLC's arbitrary (designated) device.

Do not attempt to write address data to a device that is outside the actual device address range of the PLC being used.

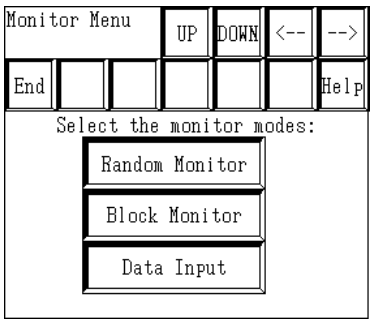


Select this when writing to a bit device.

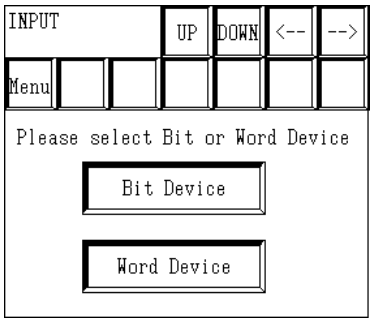
Select this when writing to a word device.

Moves the window's display position.

Returns to the menu screen.



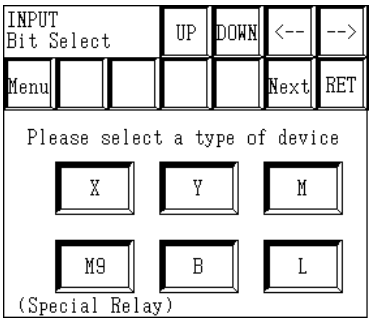
1) Select [Data Input] on the MONITOR MENU screen, and the WRITE screen will appear.



2) Select the (bit or word) device to be changed.

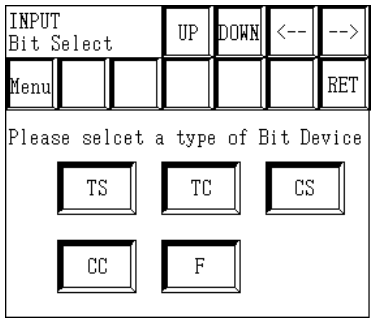
The following section explains the procedures used when either a bit or word device is selected.

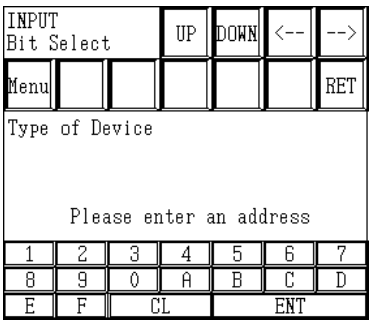
When [BIT DEVICE]is selected:



3) Select the type of the device to be written to.

   Touching [NEXT] displays the remaining device types.



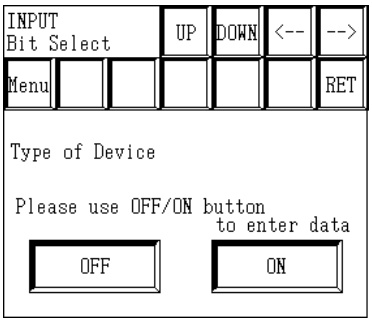


4) Input the address of the device to be written to, and touch [ENT].

In anticipation of future expansion, the device address input can exceed the actual device address range of the PLC being used.

However, if an attempt is made to monitor an address outside the device address range, the message "Host Communication Error" will be displayed at the bottom of the screen.

In such a case, adjust the device address range being monitored so that it is within the actual device address range of the PLC being used.



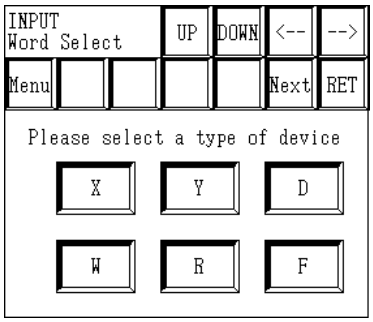
5) Input the data to be written to the PLC bit address.

OFF	Turns the bit OFF.
ON	Turns the bit ON.

If input wrong, the message "Input error" will blink in the upper-left corner of the screen.

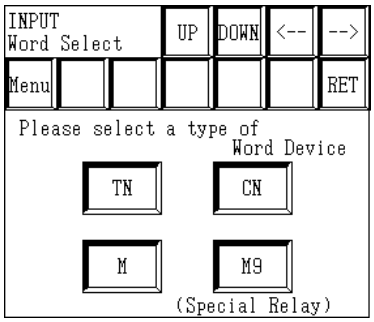
Reference *For information about input ranges, refer to devices listed in "**Supported Devices**" section in each PLC.*

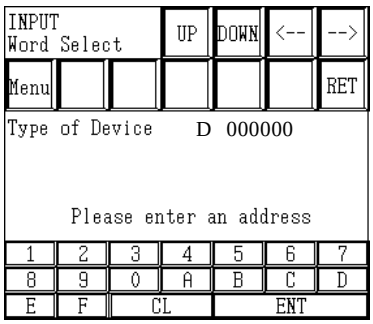
When [WORD DEVICE] is selected:



3) Select the type of the device to be written to.

   Touching [NEXT] displays the remaining device types.

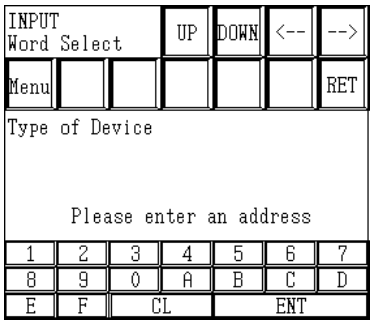




4) Input the address of the device to be written to, and touch [ENT].

If input wrong, the message “Input error” will blink in the upper-left corner of the screen.

Reference *For information about input ranges, refer to devices listed in "**Supported Devices**" section in each PLC.*



5) Input the data to be written to the PLC word address and touch [ENT].

Note: **The position of the [ENT] key is different from that on the RANDOM MONITOR CHANGE screen. (This is to prevent the accidental writing of data.)**


MEMO