MP Series SIO (Extension) Driver

Introduction

This manual describes how to connect the Display and the External Device (target PLC).

In this manual, the connection procedure will be described by following the below sections:

| 1 | System Configuration
This section shows the types of External Devices which can be connected and SIO type. | ☞ "1 System Configuration" (page 3) |

| 2 | Selection of External Device
Select a model (series) of the External Device to be connected and connection method. | ☞ "2 Selection of External Device" (page 4) |

| 3 | Example of Communication Settings
This section shows setting examples for communicating between the Display and the External Device. | ☞ "3 Example of Communication Setting" (page 5) |

| 4 | Setup Items
This section describes communication setup items on the Display.
Set communication settings of the Display with GP-Pro Ex or in off-line mode. | ☞ "4 Setup Items" (page 7) |

| 5 | Cable Diagram
This section shows cables and adapters for connecting the Display and the External Device. | ☞ "5 Cable Diagram" (page 12) |

Operation

1 System Configuration

The system configuration in the case when the External Device of YASKAWA Electric Corporation and the Display are connected is shown.

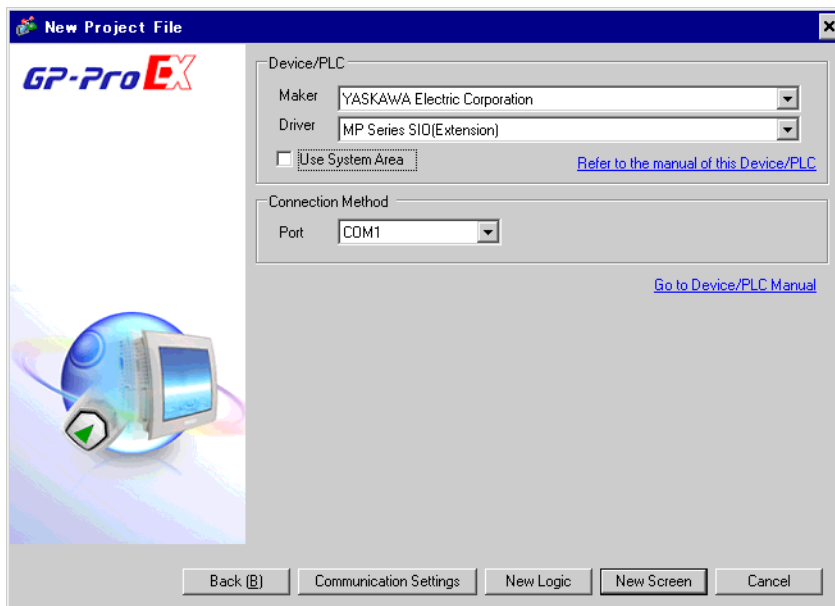| Series	CPU	Link I/F	SIO Type	Setting Example	Cable Diagram
MP2000	MP2300 MP2200	Serial port on 218IF-01	RS232C	"3.1 Setting Example 1" (page 5)	" Cable Diagram 1" (page 13)
		Serial port on 260IF-01	RS232C	"3.1 Setting Example 1" (page 5)	" Cable Diagram 1" (page 13)
		Serial port on 261IF-01	RS232C	"3.1 Setting Example 1" (page 5)	" Cable Diagram 1" (page 13)
		Serial port on 217IF-01	RS232C	"3.1 Setting Example 1" (page 5)	" Cable Diagram 1" (page 13)

■ Connection Configuration

• 1:1 Connection

2   Selection of External Device

Select the External Device to be connected to the Display.

Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "YASKAWA Electric Corporation".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "MP Series SIO (Extension)". Check the External Device which can be connected in "MP Series SIO (Extension)" in system configuration.)"1 System Configuration" (page 3)
Use System Area	Check this option when you synchronize the system data area of Display and the device (memory) of External Device. When synchronized, you can use the ladder program of External Device to switch the display or display the window on the display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)" This can be also set with GP-Pro EX or in off-line mode of Display. Cf. GP-Pro EX Reference Manual " 5.14.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. Maintenance/Troubleshooting "2.14.1 Settings common to all Display models ◆System Area Settings"
Port	Select the Display port to be connected to the External Device.

3 Example of Communication Setting

Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

3.1 Setting Example 1

■ Settings of GP-Pro EX

◆ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

◆ Device Setting

To display the setting screen, click ([Setting]) of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

When you connect multiple External Device, click from [Device-Specific Settings] of [Device/PLC Settings] to add another External Device.

■ Settings of External Device

Communication setting of communication module by ladder software (MPE720).

Please refer to the manual of external device for more detail.

◆ Ladder Software Setting

1 Start ladder software, make an order folder and a PLC folder in a root folder.

2 Click the right button of the PLC which select logon in the displayed menu.

> | MEMO | • Logon after confirming that a check does not begin [online] of a displayed menu.
> • Refer to User's Manual of the PLC about a method of logon.

3 Double-click the [Definition folder]-[Module constitution] of the PLC folder, and display [Engineering Manager].

4 Select the rack classification and communication module, the pull-down menu in [Controller] of [Engineerring Manager].

Set the number corresponding to the slot number that a communication module uses.

Select the communication module, setting contents are displayed to [Module details] of [Enginnering Manager].

5 Double-click the number part at No. in [Module details].

Double-click the slot number connecting the ethernet unit.

Setup Items	Setup Description
Transmission Protocol	MEMOBUS
Master/Slave	Slave
Device Address	Device address of the External Device
Serial I/F	RS-232C
Transmission Mode	RTU
Data Length	8Bit
Parity Bit	even
Stop Bit	1Stop
Baud Rate	19.2K
Sending	Disable
Automatically Reception	Disable

6 Double-click the "No.1", and set serial communication.

Use serial communication setting to forward communication setting and the ladder program to the PLC.

7 Save setting content and finish [Engineering Manager].

8 DIP switch "INIT" of a communication module is ON and spend a power supply.

9 Forward communication setting to a communication module.

10 Logon the PLC at online and write in the data which transferred at flash memory.

11 Power supply of PLC is OFF and DIP switch of the INIT is OFF, after spend the power supply of PLC.

4 Setup Items

Set communication settings of the Display with GP-Pro EX or in off-line mode of the Display.

The setting of each parameter must be identical to that of External Device.

)"3 Example of Communication Setting" (page 5)

4.1 Setup Items in GP-Pro EX

■ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Setup Items	Setup Description
SIO Type	Display the SIO type to communicate with the External Device.
Speed	Select speed between External Device and Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.
Timeout	Use an integer from 1 to 127 to enter the time (s) for which Display waits for the response from External Device.
Retry	In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the Display retransmits the command.
Wait To Send	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for SIO type.

◆ Device Setting
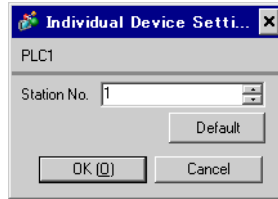
Setup Items	Setup Description
Station No.	Enter a station number of the External Device, using 1 to 63.

4.2   Setup Items in Off-Line Mode

MEMO	• Please refer to Maintenance/Troubleshooting for more information on how to enter off-line mode or about operation.

　　　　　Cf.   Maintenance/Troubleshooting "2.2 Offline Mode"

◆ Communication Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings] in off-line mode. Touch the External Device you want to set from the displayed list.

```
┌──────────┬──────────┬──────────┬──────────┬──────────┐
│  Comm.   │  Device  │  Option  │          │          │
├──────────┼──────────┼──────────┼──────────┼──────────┤
│          │          │          │          │          │
└──────────┴──────────┴──────────┴──────────┴──────────┘

 MP Series SIO(Extension)                    [COM1]        Page 1/1


            SIO Type          RS232C
            Speed             19200                    ▼
            Data Length        ○ 7      ● 8
            Parity             ○ NONE    ● EVEN    ○ ODD
            Stop Bit           ● 1      ○ 2
            Flow Control      ER(DTR/CTS)              ▼

            Timeout(s)                          3   ▼  ▲
            Retry                               2   ▼  ▲
            Wait To Send(ms)                    0   ▼  ▲




┌──────────┬──────────┬──────────┬──────────┬──────────┐
│          │  Exit    │          │  Back    │2038/08/01│
│          │          │          │          │ 14:40:07 │
└──────────┴──────────┴──────────┴──────────┴──────────┘
```

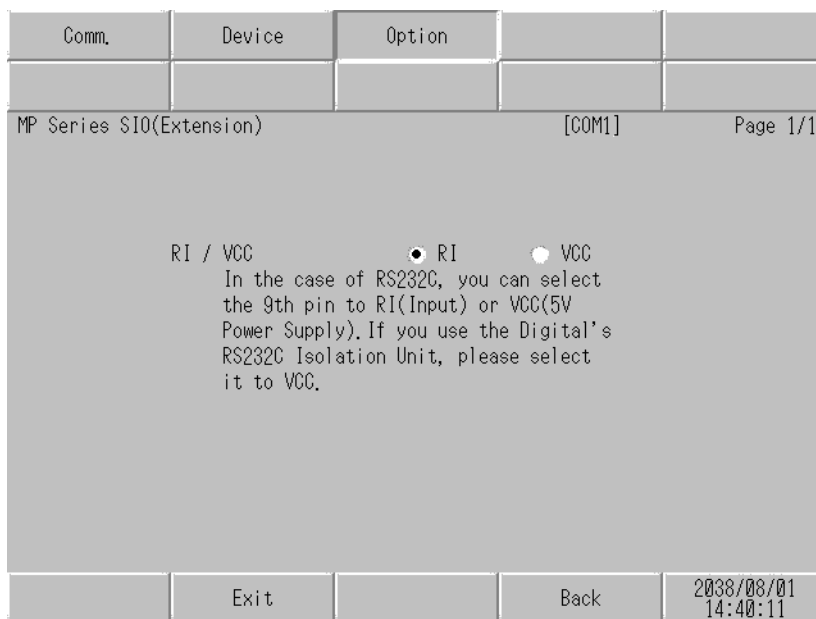| Setup Items	Setup Description
SIO Type	Display the SIO type to communicate with the External Device.
Speed	Select speed between External Device and Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.
Timeout (s)	Use an integer from 1 to 127 to enter the time (s) for which Display waits for the response from External Device.
Retry	In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the Display retransmits the command.
Wait To Send (ms)	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.

■ Device Setting

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings]. Touch the External Device you want to set from the displayed list, and touch [Device].

Comm.	Device	Option		

MP Series SIO(Extension)   [COM1]   Page 1/1

Device/PLC Name   PLC1   ▼

Station No.   1 ▼ ▲

| | Exit | | Back | 2038/08/01 14:40:09 |

Setup Items	Setup Description
Device/PLC Name	Select the External Device for device setting. Device name is a title of External Device set with GP-Pro EX.(Initial value [PLC1])
Station No.	Enter a station number of the External Device, using 1 to 63.

◆ Option

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings]. Touch the External Device you want to set from the displayed list, and touch [Option].

Comm.	Device	Option		

MP Series SIO(Extension)   [COM1]   Page 1/1

RI / VCC   ● RI   ○ VCC
In the case of RS232C, you can select
the 9th pin to RI(Input) or VCC(5V
Power Supply). If you use the Digital's
RS232C Isolation Unit, please select
it to VCC.

	Exit		Back	2038/08/01 14:40:11

Setup Items	Setup Description
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for SIO type.

5   Cable Diagram

The cable diagram shown below may be different from the cable diagram recommended by Fuji Electric Corporation. Please be assured there is no operational problem in applying the cable diagram shown in this manual.

- The FG pin of the External Device body must be D-class grounded. Please refer to the manual of the External Device for more details.
- SG and FG are connected inside the Display. When connecting SG to the External Device, design the system not to form short-circuit loop.
- Connect the isolation unit, when communication is not stabilized under the influence of a noise etc..
- When connecting IPC with External Device by RS-232C, the COM port which can be used changes with series. The change of RI/5V is set up with a slide switch. Please refer to the manual of IPC for details.
  Usable port

Series	Usable port
PS-2000B	COM1[*1] , COM2, COM3[*1], COM4
PS-3650A, PS-3651A	COM1[*1]
PS-3700A (Pentium®4-M)	COM1[*1], COM2[*1], COM3[*2] , COM4

*1   The RI/5V can be switched. Please switch with the change switch of IPC.

*2   It is necessary to set up the SIO type with the Dip switch.

- When connecting to the COM3 of PS-3700A (Pentium®4-M) with External Device, it is necessary to set up the SIO type of COM3 with a Dip switch. Please refer to the manual of PS-3700A (Pentium®4-M) for details.

Dip switch setting: RS-232C

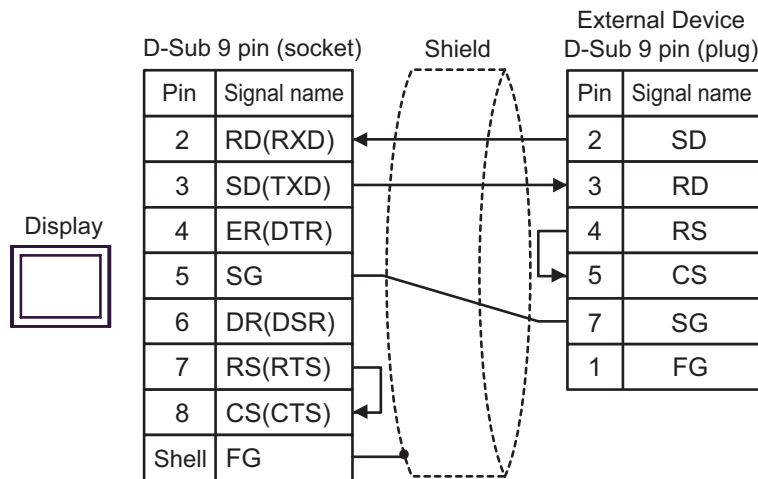| Dip switch	Setting	Description
1	OFF	Reserve (always OFF)
2	OFF	SIO type of COM3: RS-232C
3	OFF	
4	OFF	Output mode of TX data: Always output
5	OFF	Terminal resistance insertion to TX: None
6	OFF	Terminal resistance insertion to RX: None
7	OFF	Short-circuit of TXA and RXA: Does not Exist
8	OFF	Short-circuit of TXB and RXB: Does not Exist
9	OFF	Auto Detection: Disable
10	OFF	

Cable Diagram 1

Display (Connection Port)	Cable	Remarks
GP (COM1) IPC[*1][*2]	Your own cable	The cable length must be 15m or less.

*1   Usable ports are different by the series.

☞Usable port (page 12)

*2   When use the COM3 of PS -3700A (Pentium®4-M), set the SIO type of COM3 with Dip switch.

☞Dip switch setting: RS-232C (page 12)

External Device
D-Sub 9 pin (socket)   Shield   D-Sub 9 pin (plug)

Pin	Signal name
2	RD(RXD)
3	SD(TXD)
4	ER(DTR)
5	SG
6	DR(DSR)
7	RS(RTS)
8	CS(CTS)
Shell	FG

Display

Pin	Signal name
2	SD
3	RD
4	RS
5	CS
7	SG
1	FG

6   Supported Device

Range of supported device address is shown in the table below. Please note that the actually supported range of the devices varies depending on the External Device to be used. Please check the actual range in the manual of your connecting equipment.

⬚⬚⬚⬚⬚ This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Notes
System registers	SB000000 - SB08191F	SW00000 - SW08191	⌐L / H⌐	
Input registers	IB00000 - IBFFFFF	IW0000 - IWFFFF		*1
Output registers	OB00000 - OBFFFFF	OW0000 - OWFFFF		*1
Data registers	MB000000 - MB65534F	MW00000 - MW65534		

*1   As for Input and Output registers, device 0x9000-0xFFFF cannot be written.

MEMO
- Please refer to the GP-Pro EX Reference Manual for system data area.
    - Cf.   GP-Pro EXReference Manual "Appendix 1.4 LS Area (only for direct access method)"
- Please refer to the precautions on manual notation for icons in the table.

    ☞ "Manual Symbols and Terminology"

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7   Device Code and Address Code

Use device code and address code when you select "Device Type & Address" for the address type in data displays.

Device	Device Name	Device Code (HEX)	Address Code
System registers	SW/SB	0080	Word address
Input registers	IW/IB	0001	Word address
Output registers	OW/OB	0081	Word address
Data registers	MW/MB	0000	Word address

8   Error Messages

Error messages are displayed on the screen of Display as follows: "No. : Device Name: Error Message (Error Occurrence Area)". Each description is shown below.

Item	Description
No.	Error No.
Device Name	Name of External Device where error occurs. Device name is a title of External Device set with GP-Pro EX.((Initial value [PLC1])
Error Message	Displays messages related to the error which occurs.
Error Occurrence Area	Displays IP address or device address of External Device where error occurs, or error codes received from External Device. **MEMO** • IP address is displayed such as "IP address (Decimal): MAC address (Hex)". • Device address is displayed such as "Address: Device address". • Received error codes are displayed such as "Decimal [Hex]".

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 2 [02])"

MEMO
• Please refer to the manual of External Device for more detail of received error codes.
• Please refer to "When an error message is displayed (Error code list)" of "Maintenance/ Troubleshooting" for a common error message to the driver.

■ Error Code Peculiar to PLC

The error code peculiar to PLC is as follows.

Error code	Description
0x90	Transfer error.
0x92	Illegal parameter.
0x96	Register No. over.
0x9C	File is modified.
0x9D	Data access error.

■ Error Messages Specific to the External Device

Message ID	Error Message	Description
RHxx128	"(Node Name):PLC is busy now(Error Code: [Hex])"	PLC is "Busy"
RHxx129	"(Node Name):Option module is not mounted(Error Code: [Hex])"	Option module not mount.
RHxx130	"(Node Name):Module is not ready(Error Code: [Hex])"	Module is not ready
RHxx131	"(Node Name):CPU is stopped(Error Code: [Hex])"	CPU is stopped
RHxx132	"(Node Name): Write protected(Error Code: [Hex])"	Write protected

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