# X-SEL Controller Driver

## Introduction

This manual describes how to connect the Display and the External Device.

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

| | | |
|---|---|---|
| 1 | System Configuration<br>This section shows the types of External Devices that can be connected and SIO type. | ☞ "1 System Configuration" (page 3) |
| 2 | Selection of External Device<br>Select the model (series) of the External Device to be connected and its connection method. | ☞ "2 Selection of External Device" (page 7) |
| 3 | Example of Communication Settings<br>This section shows setting examples for communicating between the Display and the External Device. | ☞ "3 Example of Communication Setting" (page 8) |
| 4 | Setup Items<br>This section describes communication setup items on the Display.<br>Set the communication settings of the Display with GP-Pro EX or in offline mode. | ☞ "4 Setup Items" (page 10) |
| 5 | Cable Diagram<br>This section shows cables and adapters for connecting the Display and the External Device. | ☞ "5 Cable Diagram" (page 15) |

Operation

# 1 System Configuration

The following shows the system configuration in which the External Device of IAI Corporation and the Display are connected.

| Series | CPU | Link I/F | SIO Type | Setting Example | Cable Diagram |
|---|---|---|---|---|---|
| X-SEL (Linear Actuator Controller) | XSEL-J | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 1 (page 15) |
| | XSEL-K<br>XSEL-KE<br>XSEL-KT<br>XSEL-KET | Serial port on the CPU unit (PC connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 2 (page 17) |
| | XSEL-P<br>XSEL-Q | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 1 (page 15) |
| X-SEL (SCARA Robot Controller) | XSEL-JX | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 1 (page 15) |
| | XSEL-KX<br>XSEL-KTX | Serial port on the CPU unit (PC connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 2 (page 17) |
| | XSEL-PX<br>XSEL-QX | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 1 (page 15) |
| SSEL | SSEL | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 3 (page 19) |
| ASEL | ASEL | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 3 (page 19) |
| PSEL | PSEL | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 3 (page 19) |
| Table-Top Actuator | TT | Serial port on the CPU unit (Teaching connector) | RS232C | Setting Example 1 (page 8) | Cable Diagram 1 (page 15) |

## ■ Connection Configuration

- 1:1 Connection

## ■ IPC COM Port

When connecting IPC with an External Device, the COM port used depends on the series and SIO type. Please refer to the IPC manual for details.

Usable port

| Series | Usable Port | | |
|---|---|---|---|
| | RS-232C | RS-422/485(4 wire) | RS-422/485(2 wire) |
| PS-2000B | COM1*1 , COM2, COM3*1, COM4 | - | - |
| PS-3450A, PS-3451A, PS3000-BA, PS3001-BD | COM1, COM2*1*2 | COM2*1*2 | COM2*1*2 |
| PS-3650A (T41 model), PS-3651A (T41 model) | COM1*1 | - | - |
| PS-3650A (T42 model), PS-3651A (T42 model) | COM1*1*2, COM2 | COM1*1*2 | COM1*1*2 |
| PS-3700A (Pentium®4-M) PS-3710A | COM1*1, COM2*1, COM3*2 , COM4 | COM3*2 | COM3*2 |
| PS-3711A | COM1*1, COM2*2 | COM2*2 | COM2*2 |
| PS4000*3 | COM1, COM2 | - | - |
| PL3000 | COM1*1*2, COM2*1, COM3, COM4 | COM1*1*2 | COM1*1*2 |

*1 The RI/5V can be switched. Use the IPC's switch to change if necessary.

*2 Set up the SIO type with the DIP Switch. Please set up as follows according to SIO type to be used.

*3 When making communication between an External Device and COM port on the Expansion slot, only RS-232C is supported. However, ER (DTR/CTS) control cannot be executed because of the specification of COM port.
For connection with External Device, use user-created cables and disable Pin Nos. 1, 4, 6 and 9.
Please refer to the IPC manual for details of pin layout.

DIP Switch setting: RS-232C

| DIP Switch | Setting | Description |
|---|---|---|
| 1 | OFF*1 | Reserved (always OFF) |
| 2 | OFF | SIO type: RS-232C |
| 3 | OFF | |
| 4 | OFF | Output mode of SD (TXD) data: Always output |
| 5 | OFF | Terminal resistance (220Ω) insertion to SD (TXD): None |
| 6 | OFF | Terminal resistance (220Ω) insertion to RD (RXD): None |
| 7 | OFF | Short-circuit of SDA (TXA) and RDA (RXA): Not available |
| 8 | OFF | Short-circuit of SDB (TXB) and RDB (RXB): Not available |
| 9 | OFF | RS (RTS) Auto control mode: Disabled |
| 10 | OFF | |

*1 When using PS-3450A, PS-3451A, PS3000-BA and PS3001-BD, turn ON the set value.

DIP Switch setting: RS-422/485 (4 wire)

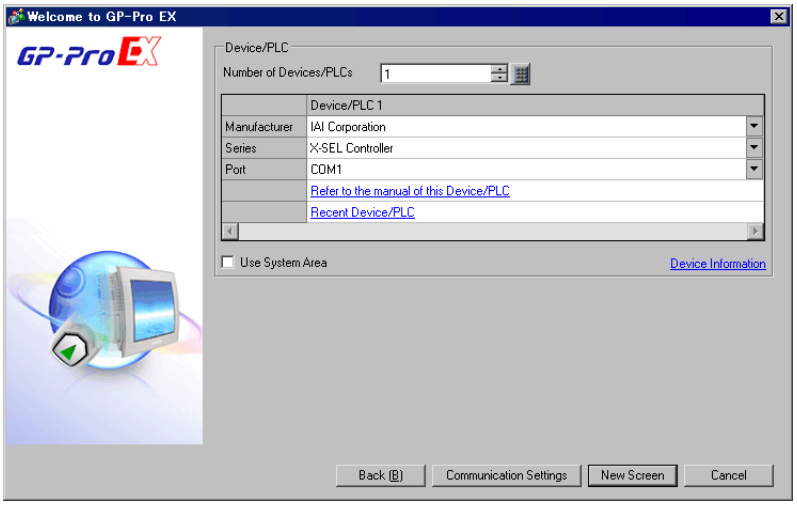
| DIP Switch | Setting | Description |
|---|---|---|
| 1 | OFF | Reserved (always OFF) |
| 2 | ON | SIO type: RS-422/485 |
| 3 | ON | |
| 4 | OFF | Output mode of SD (TXD) data: Always output |
| 5 | OFF | Terminal resistance (220Ω) insertion to SD (TXD): None |
| 6 | OFF | Terminal resistance (220Ω) insertion to RD (RXD): None |
| 7 | OFF | Short-circuit of SDA (TXA) and RDA (RXA): Not available |
| 8 | OFF | Short-circuit of SDB (TXB) and RDB (RXB): Not available |
| 9 | OFF | RS (RTS) Auto control mode: Disabled |
| 10 | OFF | |

DIP Switch setting: RS-422/485 (2 wire)

| DIP Switch | Setting | Description |
|---|---|---|
| 1 | OFF | Reserved (always OFF) |
| 2 | ON | SIO type: RS-422/485 |
| 3 | ON | |
| 4 | OFF | Output mode of SD (TXD) data: Always output |
| 5 | OFF | Terminal resistance (220Ω) insertion to SD (TXD): None |
| 6 | OFF | Terminal resistance (220Ω) insertion to RD (RXD): None |
| 7 | ON | Short-circuit of SDA (TXA) and RDA (RXA): Available |
| 8 | ON | Short-circuit of SDB (TXB) and RDB (RXB): Available |
| 9 | ON | RS (RTS) Auto control mode: Enabled |
| 10 | ON | |

# 2 Selection of External Device

Select the External Device to be connected to the Display.




| Setup Items | Setup Description |
|---|---|
| Number of Devices/ PLCs | Enter an integer from 1 to 4 to define the number of Devices/PLCs to connect to the display. |
| Manufacturer | Select the manufacturer of the External Device to connect. Select "IAI Corporation". |
| Series | Select the External Device model (series) and the connection method. Select "X-SEL Controller".<br>In System configuration, make sure the External Device you are connecting is supported by "X-SEL Controller".<br>☞ "1 System Configuration" (page 3) |
| Port | Select the port of the Display to be connected to the External Device. |
| Use System Area | Check this option to synchronize the system data area of the Display and the device (memory) of the External Device. When synchronized, you can use the External Device's ladder program to switch the display or display the window on the Display.<br>Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"<br>This feature can also be set in GP-Pro EX or in the Display's offline mode.<br>Cf. GP-Pro EX Reference Manual "System Settings [Display Unit] - [System Area] Settings Guide"<br>Cf. Maintenance/Troubleshooting Guide "Main Unit - System Area Settings" |

# 3 Example of Communication Setting

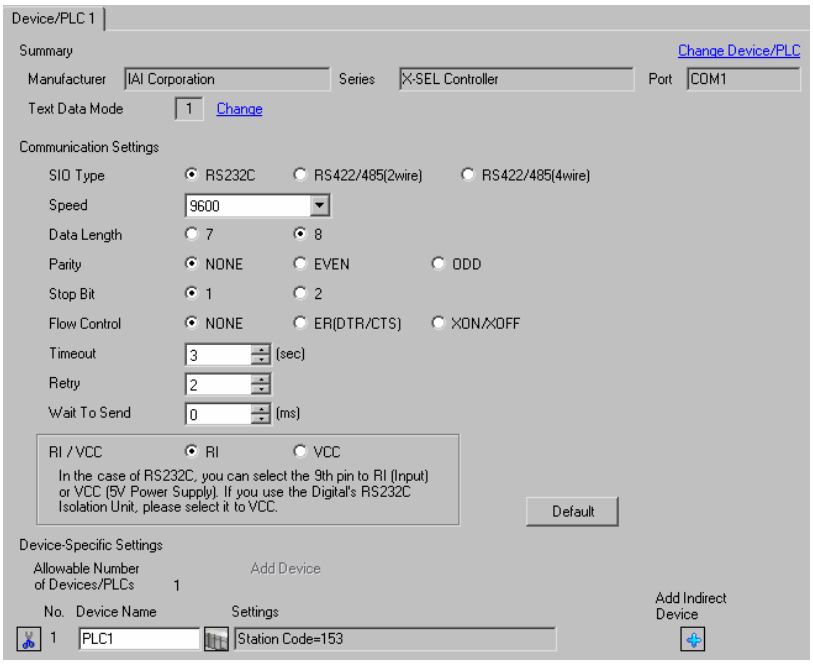
The following shows examples of communication settings for the Display and the External Device, which are recommended by Pro-face.

## 3.1 Setting Example 1

### ■ Settings of GP-Pro EX

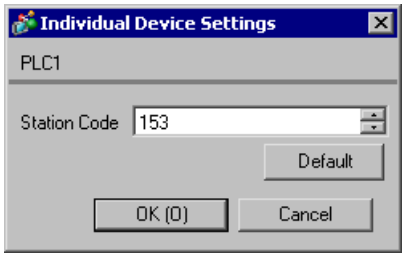
#### ◆ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].




#### ◆ Device Setting

To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] .



## ■ Settings of External Device

Use the mode switch and the ladder software (PC Software for X-SEL) to configure communication settings for the External Device. Refer to your External Device manual for details.

1 Set the mode switch to "MANU", and turn on the power.

2 Start up the ladder software.

3 From the [Parameter] menu, select [Edit] to display the [Edit Parameter] dialog box.

4 Click the [I/O] tab and set the following parameters.

| No | Parameter Name | Setting Value |
|---|---|---|
| 90 | Usage of SIO channel 1 opened to user (AUTO mode) | 2 |
| 91 | Station code of SIO channel 1 opened to user | 153 |
| 92 | Baud rate type of SIO channel 1 opened to user | 0 |
| 93 | Data length of SIO channel 1 opened to user | 8 |
| 94 | Stop bit length of SIO channel 1 opened to user | 1 |
| 95 | Parity type of SIO channel 1 opened to user | 0 |

5 Click the [Transfer to Controller] button and transfer the communication settings.

6 Set the mode switch to "AUTO".

The communication settings are completed.

# 4 Setup Items

Set the communication settings of the Display with GP-Pro Ex or in offline mode of the Display.

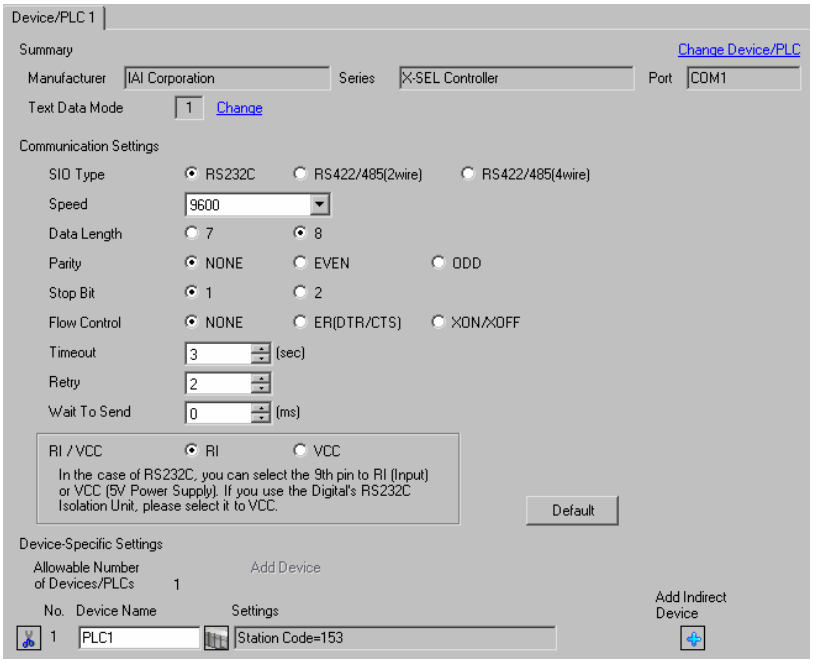
The setting of each parameter must match that of the External Device.

☞"3 Example of Communication Setting" (page 8)

## 4.1 Setup Items in GP-Pro EX

### ■ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].




| Setup Items | Setup Description |
|---|---|
| SIO Type | Select the SIO type for communicating with the External Device. |
| Speed | Select the communication speed between the External Device and the Display. |
| Data Length | Select a data length. |
| Parity | Select how to check parity. |
| Stop Bit | Select a 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 the Display waits for the response from the External Device. |
| Retry | In case of no response from the External Device, enter how many times the Display retransmits the command, from "0 to 255". |
| Wait To Send | Enter the standby time (ms) from when the Display receives packets until it transmits the next command, from "0 to 255". |

Continued to next page.

| Setup Items | Setup Description |
|---|---|
| RI/VCC | You can switch between RI/VCC of the 9th pin when you select RS232C for the SIO type. To connect to the IPC, you need to use the IPC selector switch to switch RI/5V. Refer to your IPC manual for details. |

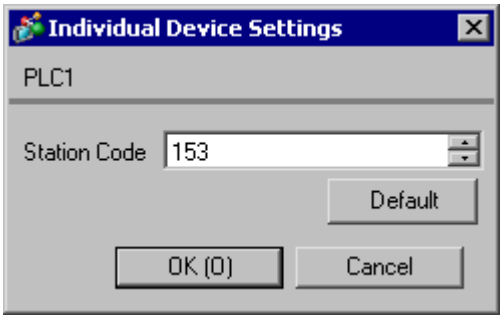
**NOTE**

- Refer to the GP-Pro EX Reference Manual for Indirect Device.

Cf. GP-Pro EX Reference Manual "Changing the Device/PLC at Runtime (Indirect Device)"

## ■ Device Setting

To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] .




| Setup Items | Setup Description |
|---|---|
| Station Code | Use an integer from 0 to 255 to enter the station code of the External Device. |

## 4.2 Settings in Offline Mode

**NOTE**

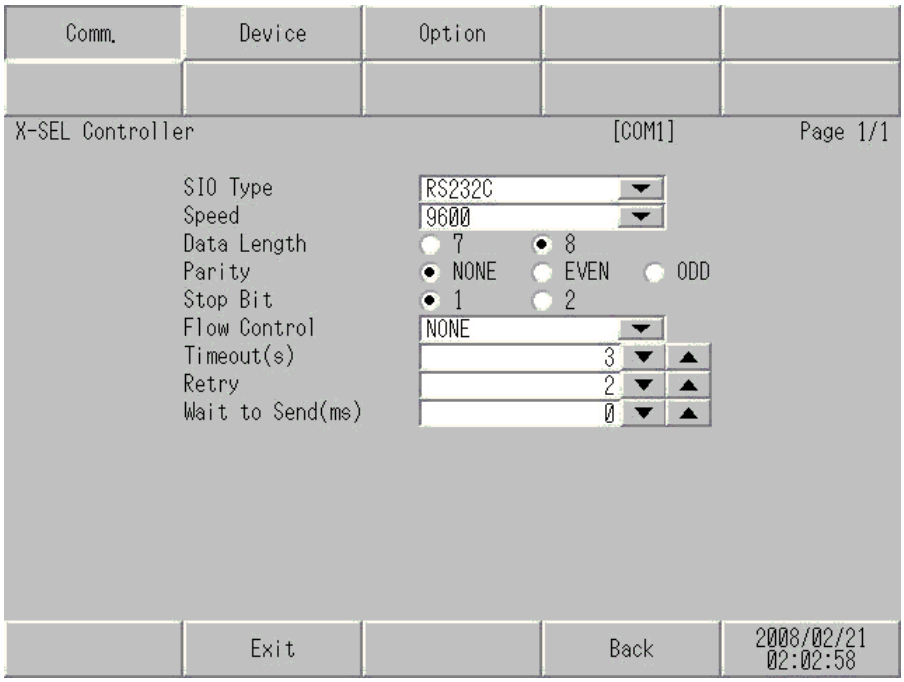
- Refer to the Maintenance/Troubleshooting guide for information on how to enter offline mode or about the operation.

  Cf. Maintenance/Troubleshooting Guide "Offline Mode"

- The number of the setup items to be displayed for 1 page in the offline mode depends on the Display in use. Please refer to the Reference manual for details.

### ■ Communication Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings] in offline mode. Touch the External Device you want to set from the list that appears.



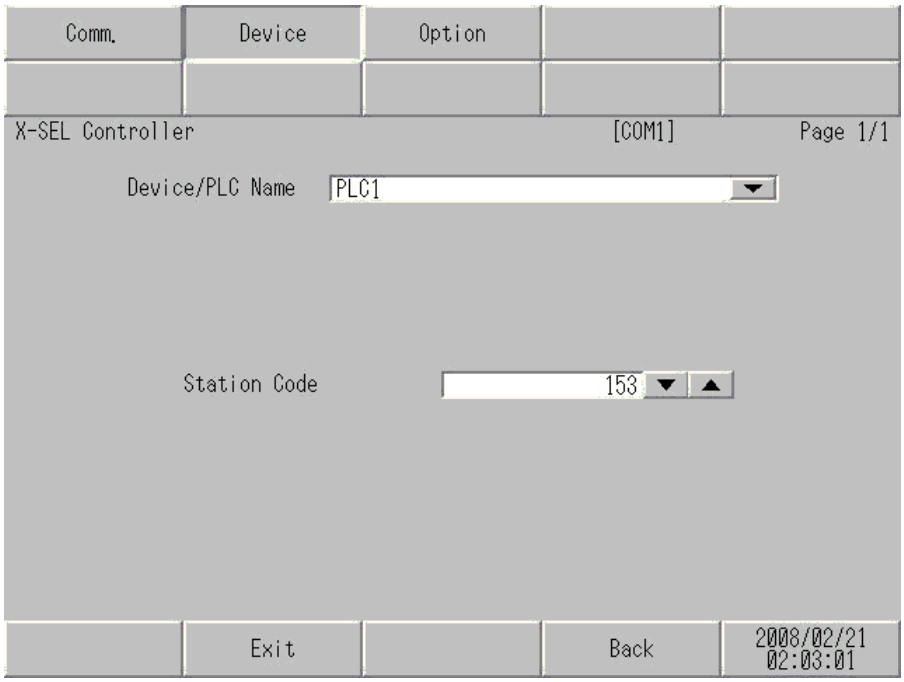

| Setup Items | Setup Description |
|---|---|
| SIO Type | Select the SIO type for communicating with the External Device.<br>**IMPORTANT**<br>In the communication settings, set [SIO Type] correctly according to the serial interface specifications of the Display.<br>If you select an SIO type that the serial interface does not support, proper operation cannot be guaranteed.<br>Refer to your Display manual for details on the serial interface specifications. |
| Speed | Select the communication speed between the External Device and the Display. |
| Data Length | Select a data length. |
| Parity | Select how to check parity. |

Continued to next page.

| Setup Items | Setup Description |
|---|---|
| Stop Bit | Select a 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 the Display waits for the response from the External Device. |
| Retry | In case of no response from the External Device, enter how many times the Display retransmits the command, from "0 to 255". |
| Wait To Send | Enter the standby time (ms) from when the Display receives packets until it transmits the next command, from "0 to 255". |

## ■ Device Setting

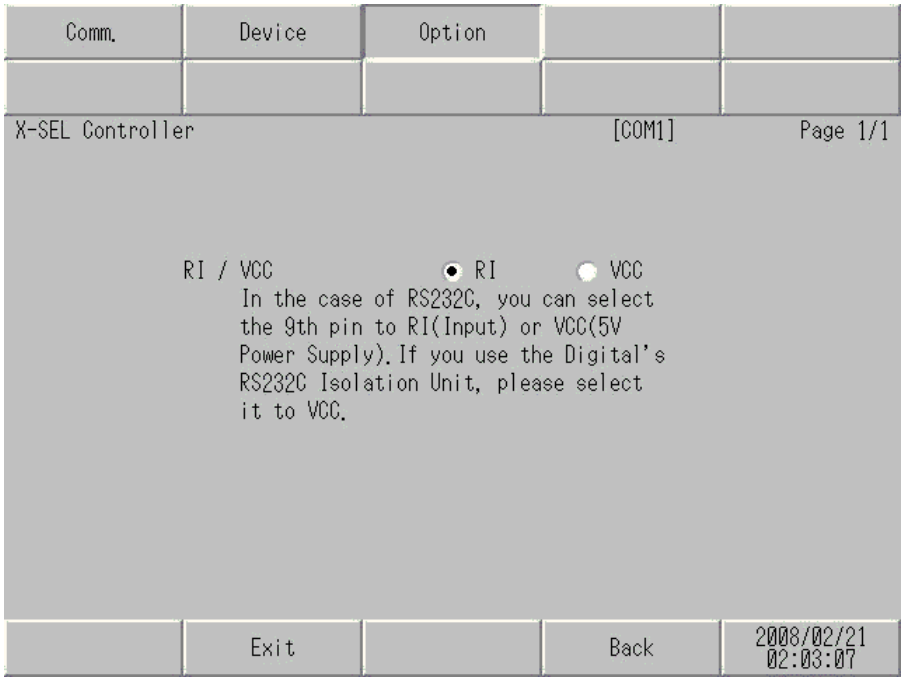
To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings]. Touch the External Device you want to set from the list that appears, and touch [Device].




| Setup Items | Setup Description |
|---|---|
| Device/PLC Name | Select the External Device to set. The device name is the title of the External Device set with GP-Pro EX. (Initial value [PLC1]) |
| Station Code | Use an integer from 0 to 255 to enter the station code of the External Device. |

## ■ Option

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




| Setup Items | Setup Description |
|---|---|
| RI/VCC | You can switch between RI/VCC of the 9th pin when you select RS232C for the SIO type. To connect to the IPC, you need to use the IPC selector switch to switch RI/5V. Refer to your IPC manual for details. |

**NOTE**

- GP-4100 series, GP-4*01TM and LT-4*01TM do not have the [Option] setting in the offline mode.

# 5 Cable Diagram

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

- The FG pin on the External Device must be D-class grounded. Refer to your External Device manual for details.
- The SG and FG are connected inside the Display. If you connect the External Device to the SG, do not form any short-circuit loop in the system design.
- If the communication is not stable because of noise or other factors, connect an isolation unit.

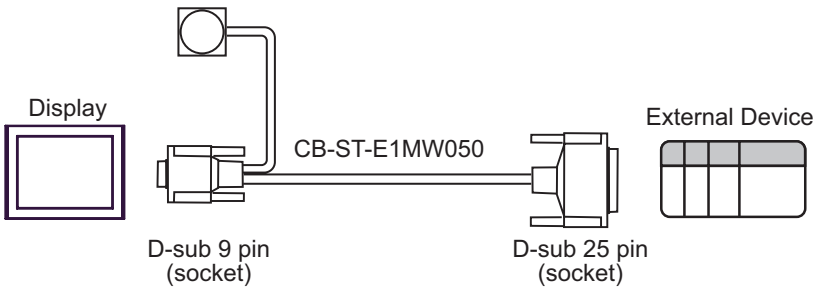
Cable Diagram 1

| Display (Connection Port) | Cable | | Remarks |
|---|---|---|---|
| GP3000 (COM1)<br>GP4000*1 (COM1)<br>ST (COM1)<br>LT3000 (COM1)<br>IPC*2<br>PC/AT | 1A | Connection cable by IAI Corporation<br>CB-ST-E1MW050 | |
| GP-4105 (COM1) | 1B | User-created cable<br>+<br>Connection cable by IAI Corporation<br>CB-ST-E1MW050 | The cable length must be 10m or less. |

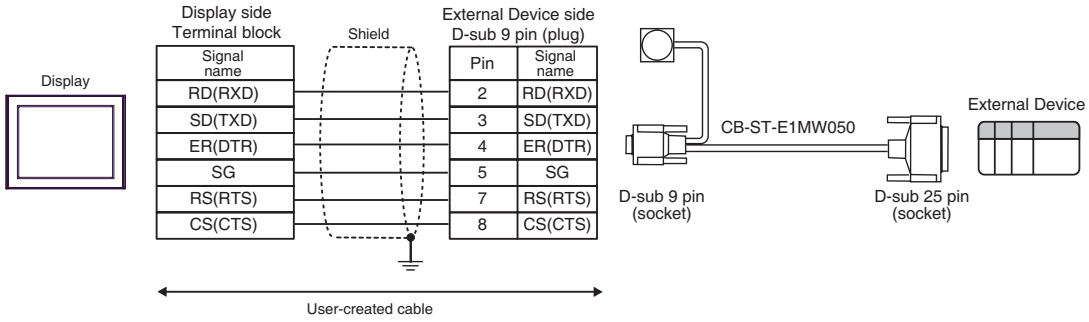
*1 All GP4000 models except GP-4100 Series and GP-4203T

*2 Available only with a COM port that supports RS232C.
☞ ■ IPC COM Port (page 5)

1A)



1B)


Display side
Terminal block
Shield
External Device side
D-sub 9 pin (plug)
Display
Signal name
RD(RXD)
SD(TXD)
ER(DTR)
SG
RS(RTS)
CS(CTS)
Pin
Signal name
2
3
4
5
7
8
CB-ST-E1MW050
External Device
D-sub 9 pin (socket)
D-sub 25 pin (socket)
User-created cable

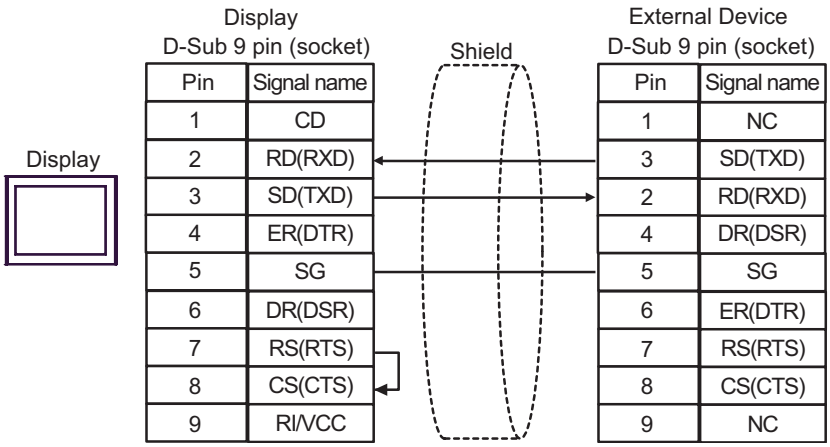
Cable Diagram 2

| Display (Connection Port) | Cable | | Remarks |
|---|---|---|---|
| GP3000 (COM1)<br>GP4000*1 (COM1)<br>ST (COM1)<br>LT3000 (COM1)<br>IPC*2<br>PC/AT | 2A | User-created cable | The cable length must be 10m or less. |
| GP-4105 (COM1) | 2B | User-created cable | |
| LT-4*01TM (COM1) | 2C | RJ45 RS-232C Cable (5m) by Pro-face<br>PFXZLMCBRJR21 | |

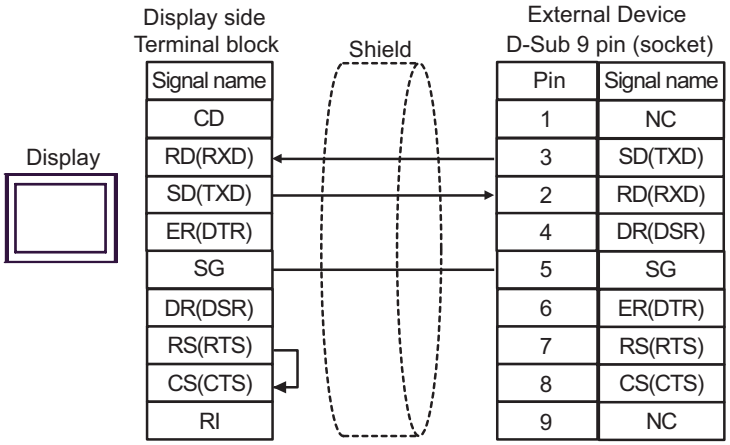
*1 All GP4000 models except GP-4100 Series and GP-4203T

*2 Available only with a COM port that supports RS232C.
☞ ■ IPC COM Port (page 5)

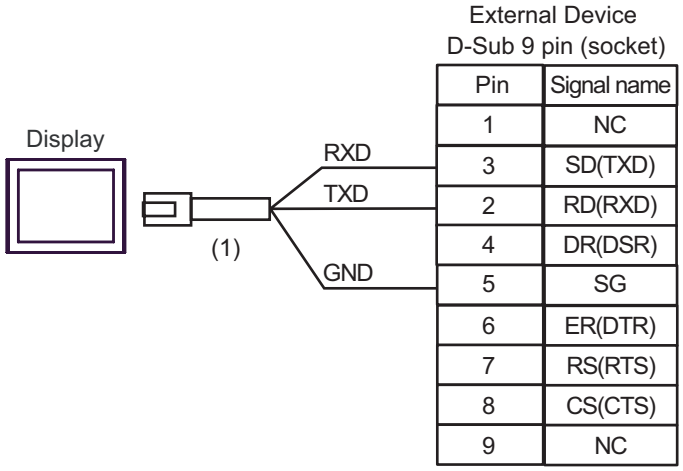
2A)



2B)




2C)




| Number | Name | Notes |
|---|---|---|
| (1) | RJ45 RS-232C Cable (5m) by Pro-face<br>PFXZLMCBRJR21 | |

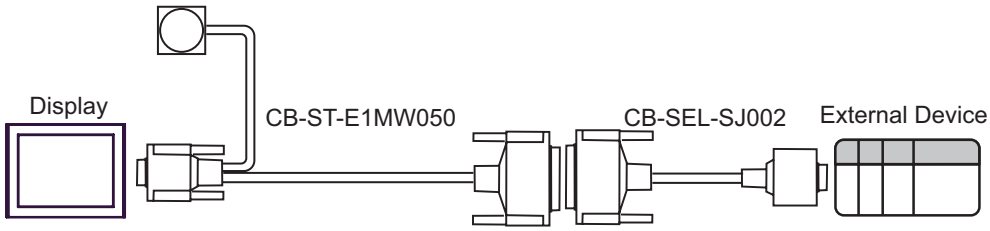
Cable Diagram 3

| Display (Connection Port) | Cable | | Remarks |
|---|---|---|---|
| GP3000 (COM1)<br>GP4000*1 (COM1)<br>ST (COM1)<br>LT3000 (COM1)<br>IPC*2<br>PC/AT | 3A | Connection cable by IAI Corporation<br>CB-ST-E1MW050<br>+<br>Connector conversion cable by IAI Corporation<br>CB-SEL-SJ002 | |
| GP-4105 (COM1) | 3B | User-created cable<br>+<br>Connection cable by IAI Corporation<br>CB-ST-E1MW050<br>+<br>Connector conversion cable by IAI Corporation<br>CB-SEL-SJ002 | |

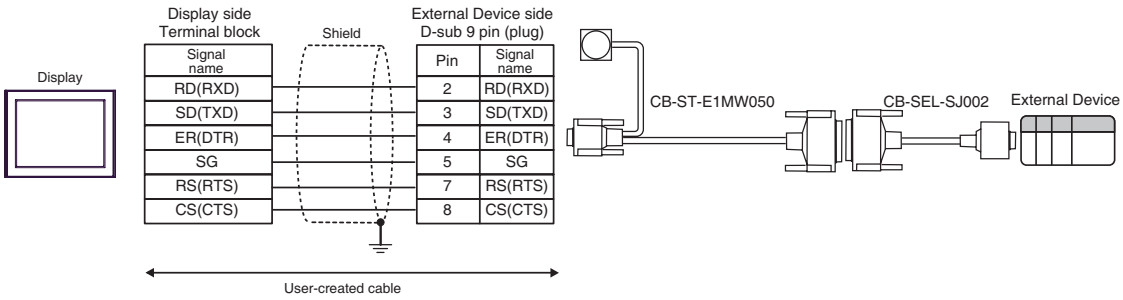
*1 All GP4000 models except GP-4100 Series and GP-4203T

*2 Available only with a COM port that supports RS232C.
☞ ■ IPC COM Port (page 5)

3A)




3B)



# 6 Supported Device

The following table shows the range of supported device addresses. Available type and range of device may vary depending on the CPU. Consult the appropriate CPU manual before use.
To avoid the External Device malfunction, do not access an out-of-range address.

: This address can be specified as system data area.

| Device | Bit Address | Word Address | Double Word Address | 32 bits | Remarks |
|---|---|---|---|---|---|
| Input Port | IP000 - IP299 | IP000 - IP272 | ------ | L/H | ÷16 *1 |
| Output Port | OP300 - OP599 | OP300 - OP572 | ------ | | ÷16 |
| Flag | FG000.600 - FG000.899 FG001.900 - FG128.999 | FG000.600 - FG000.872 FG001.900 - FG128.980 | ------ | | ÷16 *2 |
| Point Data Total Count | ------ | PDT0 | ------ | ------ | *1 |
| Integer | ------ | ------ | INT000.0200 - INT000.1299, INT001.0001 - INT128.1099 | | *3 |
| Real | ------ | ------ | RL000.0300 - RL000.1399, RL001.0100 - RL128.1199 | | *4 |
| String | ------ | STR000.300 - STR000.998 STR001.001 - STR128.299 | ------ | | ÷2 *5 |
| Axis Status | ------ | AXST00 - AXST47 | ------ | L/H | *1 *6 |
| Scara Axis Status | ------ | SAXS000 - SAXS3FF | ------ | | *1 *7 |
| Version | ------ | VR000 - VR3FF | ------ | | *1 *8 |
| Error Detail 0 | ------ | ------ | ER00000000 - ER0FFFFFFF | | *1 *9 |
| Error Detail 1 | ------ | ------ | ER10000000 - ER1FFFFFFF | | *1 *9 |
| Error Detail 2 | ------ | ------ | ER20000000 - ER2FFFFFFF | | *1 *9 |
| Error Detail 3 | ------ | ------ | ER30000000 - ER3FFFFFFF | | *1 *9 |

Continued to next page.

| Device | Bit Address | Word Address | Double Word Address | 32 bits | Remarks |
|---|---|---|---|---|---|
| Error Detail 4 | ------ | ------ | ER40000000 - ER4FFFFFFF | L/H | *1 *9 |
| Error Detail 5 | ------ | ------ | ER50000000 - ER5FFFFFFF | | *1 *9 |
| Error Detail 6 | ------ | ------ | ER60000000 - ER6FFFFFFF | | *1 *9 |
| Error Detail 7 | ------ | ------ | ER70000000 - ER7FFFFFFF | | *1 *9 |
| Program Status | ------ | PGST000 - PGST511 | ------ | | *1 *10 |
| System Status | ------ | SYST0 - SYST6 | ------ | | *1 *11 |
| Program Control | ------ | PRG000 - PRG128 | ------ | | *12 *13 |
| Alarm Reset | ------ | AR0 | ------ | ------ | *12 |
| Software Reset | ------ | SR0 | ------ | | *12 *14 |
| Drive-Source Recovery | ------ | DSR0 | ------ | | *12 |
| Operation-Pause Reset | ------ | OPR0 | ------ | | *12 |
| Point Data Clear | PCLR001 - PCLRFA0 PCLR0001 - PCLR4E20 | PCLR001 - PCLRF91 PCLR0001 - PCLR4E11 | ------ | L/H | *12 *15 |
| Absolute Coordinate Movement | ------ | ------ | ACM0 - ACMC | | *16 |
| Relative Coordinate Movement | ------ | ------ | RCM0 - RCMC | | *17 |
| Jogging/Inching Movement | ------ | ------ | JIM0 - JIM6 | | *18 |
| Point Number Movement | ------ | PNM0 - PNM5 | ------ | | *19 |
| Point Data | ------ | ------ | PD00 - PD9E | | *20 |
| Servo | ------ | SV0 - SV2 | ------ | | *21 |
| Return to Origin | ------ | RO0 - RO3 | ------ | | *22 |
| Operation Stop/Cancel | ------ | OSC0 - OSC2 | ------ | | *23 |
| Coordinate Affiliate Data | ------ | ------ | CD0000 - CD1FFF | | *1 *24 |
| Simple Interference Check Zone Data | ------ | ------ | SD010 - SDFFF | | *1 *25 |

Continued to next page.

| Device | Bit Address | Word Address | Double Word Address | 32 bits | Remarks |
|---|---|---|---|---|---|
| Scara Absolute Coordinate Movement | ------ | ------ | SACM0 - SACMD | L / H | *26 |
| Scara Relative Coordinate Movement | ------ | ------ | SRCM0 - SRCMD | | *27 |
| Scara Point Number Movement | ------ | SPNM0 - SPNM6 | ------ | | *28 |
| Feedback Current*29 | ------ | FC0 - FCA | ------ | | *1 *30 |
| Task Status | ------ | TAST00 - TAST80 | ------ | | Bit 15 *1 *31 |
| Flash ROM | ------ | FR0 | ------ | | Bit 15 *12*32 |

*1 Write disable

*2 The flag device descriptions are shown below.

FG 000 600

- 600: Flag number:
  Global area (600 to 899)
  Local area (900 to 999)
- 000: Program number:
  Global area (000)
  Local area (001 to 128)

*3 The integer valuables device descriptions are shown below.

INT 000 0200

- 0200: Variable number:
  Global area (0200 to 0299,1200 to 1299)
  Local area (0001 to 0099,1001 to 1099)
- 000: Program number:
  Global area (000)
  Local area (001 to 128)

*4 The real valuables device descriptions are shown below.

RL 000 0300

- 0300: Variable number:
  Global area (0300 to 0399,1300 to 1399)
  Local area (0100 to 0199,1100 to 1199)
- 000: Program number:
  Global area (000)
  Local area (001 to 128)

*5 The string valuables device descriptions are shown below.

STR000 300

- 300: Variable number:
  - Global area (300 to 998 (only even))
  - Local area (001 to 299 (only odd))
- 000: Program number:
  - Global area (000)
  - Local area (001 to 128)

*6 The axis status device descriptions are shown below.

AXST 00

- 00: Obtained data:

AXST00 to AXST05: Single-axis status
00: Axis status
Bit 7 (Reserved for system use)
Bit 6 (Reserved for system use)
Bit 5 (Push error detection): 0 = Not detected / 1 = Detected
Bit 4 (Operation command successful completion): 0 = Not yet complete / 1 = Completed successfully
* Can be used only for completion check after an operation command.
Bit 3 (Servo): 0 = OFF / 1 = ON
Bit 1-2 (Origin return): 0 = Not yet performed / 1 = Returning to origin / 2 = Completed
Bit 0 (Servo axis in use): 0 = Not in use / 1 = In use (moving, etc.)
* "Servo axis in use" indicates that a given task has the right to use the applicable axis. Therefore, this bit will turn ON in the following conditions:
- When an operation command involving axis movement is in progress (including when an axis is moving)
- Servo is starting up from an OFF state
- Servo is shutting down from an ON state (excluding emergency stop)
- Operation axis is paused

01: Axis sensor input status
Bit 3 (Reserved for system use)
Bit 2 (Origin sensor): 0 = OFF / 1 = ON
Bit 1 (Overrun sensor): 0 = OFF / 1 = ON
Bit 0 (Creep sensor): 0 = OFF / 1 = ON
02: Axis error code
03: Encoder status
Bit 7 (Battery alarm (BA))
Bit 6 (Battery error (BE))
Bit 5 (Multi-rotation error (ME))
Bit 4 (Reserved for system use)
Bit 3 (Counter overflow (OF))
Bit 2 (Count error (CE))
Bit 1 (Full absolute status (FS))
Bit 0 (Overspeed (OS))
04: Current position (L) unit (0.001mm)
Indicates the lower 16 bits of the current position in Hex.
05: Current position (H) unit (0.001mm)
Indicates the upper 16 bits of the current position in Hex.
AXST06 to AXST11: Double axes status
...
AXST42 to AXST47: Eight axes status

*7 The Scara axis status device descriptions are shown below.

SAXS 0 00

Obtained data:

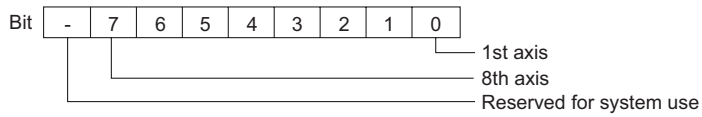
00: Work coordinate system selection number

01: Tool coordinate system selection number

02: Common axis status

Bit 7 (Reserved for system use)
Bit 6 (Reserved for system use)
Bit 5 (Reserved for system use)
Bit 4 (Reserved for system use)
Bit 2-3 (Scara axis current position coordinate system type): 0 = Base coordinate system / 1 = Selected work coordinate system / 2 = Reserved for system use / 3 = Each axis system
Bit 0-1: (Scara axis current arm system): 0 = Right arm system / 1 = Left arm system / 2 = Indeterminable / 3 = Reserved for system use

03: Axis pattern




04 to 09: Single-axis status

04: Axis status

Bit 7 (Reserved for system use)
Bit 6 (Reserved for system use)
Bit 5 (Push error detection): 0 = Not detected / 1 = Detected
Bit 4 (Operation command successful completion): 0 = Not yet complete / 1 = Completed successfully
* Can be used only for completion check after an operation command.
(For positioning that includes any of the X, Y and R axes, be sure to check completion for all of the X, Y and R axes.)
Bit 3 (Servo): 0 = OFF / 1 = ON
Bit 1-2 (Origin return): 0 = Not yet performed / 1 = Returning to origin / 2 = Completed
Bit 0 (Servo axis in use): 0 = Not in use / 1 = In use (moving, etc.)
* "Servo axis in use" indicates that a given task has the right to use the applicable axis. Therefore, this bit will turn ON in the following conditions:
- When an operation command involving axis movement is in progress (including when an axis is moving)
- Servo is starting up from an OFF state
- Servo is shutting down from an ON state (excluding emergency stop)
- Operation axis is paused

05: Axis sensor input status

Bit 3 (Reserved for system use)
Bit 2 (Origin sensor): 0 = OFF / 1 = ON
Bit 1 (Overrun sensor): 0 = OFF / 1 = ON
Bit 0 (Creep sensor): 0 = OFF / 1 = ON

06: Axis error code

07: Encoder status

Bit 7 (Battery alarm (BA))
Bit 6 (Battery error (BE))
Bit 5 (Multi-rotation error (ME))
Bit 4 (Reserved for system use)
Bit 3 (Counter overflow (OF))
Bit 2 (Count error (CE))
Bit 1 (Full absolute status (FS))
Bit 0 (Overspeed (OS))

08: Current position (L) unit (0.001mm or 0.001deg)

Indicates the lower 16 bits of the current position in Hex.

09: Current position (H) unit (0.001mm or 0.001deg)

Indicates the upper 16 bits of the current position in Hex.

0A to 0F: Double axes status

...

2E to 33: Eight axes status

34 to FF: Reserved for system use

Unit type (0 to F)

Bit 3 (Reserved for system use) Fixed to 0
Bit 2 (Reserved for system use) Fixed to 0
Bit 0-1 (Scara axis current position type): 0 = Base coordinate system / 1 = Selected work coordinate system / 2 = Reserved for system use / 3 = Each axis system

*8 The version device descriptions are shown below.

VR 0 0 0

- Obtained data:
  - 0: Model code
  - 1: Unit code
  - 2: Version number
  - 3: Time (year)
  - 4: Time (month)
  - 5: Time (day)
  - 6: Time (hour)
  - 7: Time (min)
  - 8: Time (sec)
  - 9 to F: Reserved for system use
- Device number (0 to F)
- Unit type (0 to 3)
  - 0= Main CPU application/1 = Main CPU core / 2= Driver CPU / 3 = Mount SIO

*9 The device descriptions of error detail 0 through error detail 7 are shown below.

ER0 00 000 00

- Obtained data:
  - 00: Error number
  - 01: Detail information 1
    - Other than system-down level error: Program number (Error source is indicated if the step number is not 0.)
    - System-down level error: System down type
  - 02: Detail information 2
    - Other than system-down level error: Step number (Error source)
    - System-down level error: System down error code
  - 03: Detail information 3
    - Other than system-down level error: Axis number
    - System-down level error: System down information 1
  - 04: Detail information 4
    - Other than system-down level error: Point number (Negative value at interpolation point)
    - System-down level error: System down information 2
  - 05: Detail information 5
  - 06: Detail information 6
  - 07: Detail information 7
  - 08: Detail information 8
  - 09: Message bytes
  - 0A: Message 1 (4 bytes)
  - 10: Message 2 (4 bytes)
  - ...
  - 49: Message 64 (4 bytes)
  - 50 to FF: Reserved for system use
- Reserved for system use
- Type 2 (0 to FF)
  - System error: 0 = Critical level error / 1 = Latest error
  - Axis-specific error: Axis number
  - Program-specific error: Program number
  - Error in error list record: Record number (1 to )
- Type 1
  - 0 = System error /1 = Axis-specific error / 2 = Program-specific error / 3 = Error in error list record / 4 or later = Reserved for system use

*10 The program status device descriptions are shown below.

PGST 000
- Obtained data:
  - 000 to 003: Program number 1 status
    - 000: Status
      - Bit 3 (Reserved for system use)
      - Bit 2 (Reserved for system use)
      - Bit 1 (Reserved for system use)
      - Bit 0 (Start): 0 = Not started / 1 = Started
    - 001: Execution program step number
    - 002: Program-dependent error code
    - 003: Error occurrence step number
  - 004 to 007: Program number 2 status
  - ...
  - 508 to 511: Program number 128 status

*11 The system status device descriptions are shown below.

SYST 0
- Obtained data:
  - 0: System mode
    - 0 = Indeterminable / 1 = AUTO mode / 2 = MANUAL mode / 3 = Slave update mode / 4 = Core update mode
  - 1 Critical level system error number
  - 2: Latest system error number
  - 3: System status byte 1
    - Bit 7 (Reserved for system use)
    - Bit 6 (Battery voltage error status) : 0 = No error / 1 = Error
    - Bit 5 (Battery voltage low warning status): 0 = No low / 1 = Low
    - Bit 4 (Power error status): 0 = Normal / 1 = Error
    - Bit 3 (Emergency stop switch status): 0 = No emergency stop / 1 = Emergency stop
    - Bit 2 (Safety gate status): 0 = CLOSE / 1 = OPEN
      - * X-SEL (P/Q Series) (Multi axes/Scara)/SSEL/ASEL/PSEL: Enable switch (Deadman switch / Enable switch) status is indicated.
    - Bit 1 (TP enable switch status): 0 = ON / 1 = OFF
      - * X-SEL (P/Q Series) (Multi axes/Scara)/SSEL/ASEL/PSEL: This bit is disabled (fixed to 0).
    - Bit 0 (Operation mode switch status): 0 = AUTO / 1 = MANUAL
  - 4: System status byte 2
    - Bit 7 (Reserved for system use)
    - Bit 6 (Reserved for system use)
    - Bit 5 (Program run status): 0 = Not run / 1 = Running
    - Bit 4 (Restart wait status): 0 = Not waiting / 1 = Waiting
    - Bit 3 (I/O interlock status): 0 = No interlock / 1 = Interlock
    - Bit 2 (Servo interlock status): 0 = No interlock / 1 = Interlock
    - Bit 1 (Slave parameter writing status): 0 = Not writing / 1 = Writing
    - Bit 0 (Application data flash ROM write status): 0 = Not writing/erasing / 1 = Writing/erasing
      - * When the core program is in operation (Application update mode), only Bit 0 is enabled. Data for System mode, Critical level system error number, Latest system error number, System status byte 1, System status byte 3 and System status byte 4 is disabled.
  - 5: System status byte 3
    - Bit 7 (Reserved for system use)
    - Bit 6 (Reserved for system use)
    - Bit 5 (Reserved for system use)
    - Bit 4 (Operation mode): 0 = Program mode / 1 = Position mode
    - Bit 3 (Reserved for system use)
    - Bit 2 (System ready status): 0 = Not ready / 1 = Ready
    - Bit 1 (System operation status): 0 = Not operating in AUTO mode / 1 = Operating in AUTO mode
    - Bit 0 (Drive-source cutoff status): 0 = Not cut off / 1 = Cut off
  - 6: System status byte 4
    - Reserved for system use

*12 Read disable

*13 The program control device sends different commands depending to write data.
Other write data than the following is processed as Private Error (0x80) inside the Display.

Write Data 0: Program Execution Command(0x253)
Write Data 1: Program Exit Command(0x254)
Write Data 2: Program Pause Command(0x255)
Write Data 3: Program 1 Step Execution Command(0x256)
Write Data 4: Program Restart Command(0x257)

For the word addresses from PRG001 to PRG128, the above-shown commands are sent to the program numbers from 1 to 128, respectively.
For PRG000, commands are sent to all the running program numbers. However, "Program Execution Command" and "Program 1 Step Execution Command" cannot be used for PRG000.

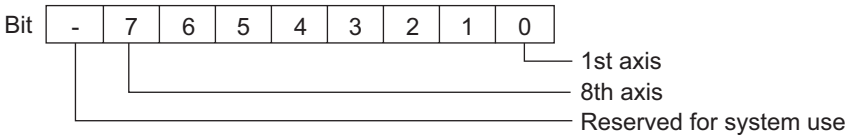
*14 In the event of SR (Software Reset), displays no response error after no communication for 20 seconds, and restarts communication.

*15 Specifies the word address only for the value of which the last one digit is 1.

*16 The absolute coordinate movement device descriptions are shown below.

ACM 0

Obtained data:
0: Command trigger
1 =Write / 4 =Clear
1: Axis pattern




2: Acceleration unit (0.01G)
The parameter value becomes enabled when it is zero.
3: Deceleration unit (0.01G)
The parameter value becomes enabled when it is zero.
4: Speed unit (mm/sec)
The parameter value becomes enabled when it is zero.
(Safety limit is applied depending on the mode.)
5 to C: Absolute coordinate data unit (0.001mm)

*17 The relative coordinate movement device descriptions are shown below.

RCM 0

Obtained data:

0: Command trigger
1 =Write / 4 =Clear

1: Axis pattern

| Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

1st axis
8th axis
Reserved for system use

2: Acceleration unit (0.01G)
The parameter value becomes enabled when it is zero.

3: Deceleration unit (0.01G)
The parameter value becomes enabled when it is zero.

4: Speed unit (mm/sec)
The parameter value becomes enabled when it is zero.
(Safety limit is applied depending on the mode.)

5 to C: Relative coordinate data unit (0.001mm)

*18 The jogging/inching movement device descriptions are shown below.

JIM 0

Obtained data:

0: Command trigger
1 =Write / 4 =Clear

1: Axis pattern
Only single Scara axis can be specified for the Scara type
(Multipule axes can be specified).
For the Scara type, a jogging/inching command can be issued only when
none of the servo axes are operating.
X-SEL-PX/QX Series: The Scara and translation axes cannot be specified
simultaneously.

| Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

1st axis
8th axis
Reserved for system use

2: Acceleration unit (0.01G [for each axis, in %])
The parameter value becomes enabled when it is zero.

3: Deceleration unit (0.01G [for each axis, in %])
The parameter value becomes enabled when it is zero.

4: Speed unit (mm/sec [for each axis, in %])
The parameter value becomes enabled when it is zero.
(Safety limit is applied depending on the mode.)

5: Inching distance unit (0.001mm [for each axis, in 0.001deg])
Specify with the absolute value. Distance is not specified if it is zero (=jogging).

6: Operation type
Bit 3 (Reserved for system use) Fixed to 0
Bit 1-2 (Jogging/inching coordinate system (Scara only)): 0 = Base coordinate system
/ 1 = Selected work coordinate system / 2 = Selected tool coordinate system / 3 = Each axis system
Bit 0 (Jogging/inching direction): 0 = Negative direction on coordinate axis / 1 = Positive direction on coordinate axis

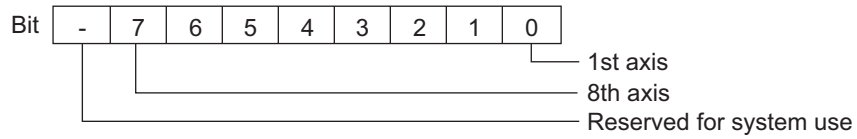
*19 The point number movement device descriptions are shown below.

PNM 0

Obtained data:

0: Command trigger
1 =Write / 4 =Clear

1: Axis pattern




2: Acceleration unit (0.01G)
The applicable setting value in the position data becomes enabled when the acceleration setting is zero.
If both above setting values are zero, the parameter setting value is enabled.

3: Deceleration unit (0.01G)
The applicable setting value in the position data becomes enabled when the deceleration setting is zero.
If both above setting values are zero, the parameter setting value is enabled.

4: Speed unit (mm/sec)
The applicable setting value in the position data becomes enabled when the speed setting is zero.
If both above setting values are zero, the parameter setting is enabled.
(Safety limit is applied depending on the mode.)

5: Point number

*20 The point data device descriptions are shown below.

PD 00

Obtained data:

00: Command trigger
1 =Write / 2 =Read / 4 =Clear

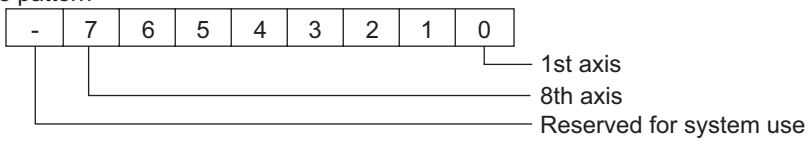
01: Starting point number

02: Number of point data

03 to 0F: Point data 1

03: Point number

04: Axis pattern




05: Acceleration unit (0.01G)

06: Deceleration unit (0.01G)

07: Speed unit (mm/sec)

08 to 0F: Position data unit (0.001 mm)

08: 1st axis position data

...

0F: 8th axis position data

10 to 1C: Point data 2

...

92 to 9E: Point data 12

*21 The servo device descriptions are shown below.

SV 0

Obtained data:

0: Command trigger

1 =Write / 4 =Clear

1: Axis pattern

| Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

1st axis

8th axis

Reserved for system use

2: Operation type

Bit 3 (Reserved for system use) Fixed to 0

Bit 2 (Reserved for system use) Fixed to 0

Bit 1 (Reserved for system use) Fixed to 0

Bit 0 (Servo ON/OFF): 0 = OFF / 1 = ON

*22 The return to origin device descriptions are shown below.

RO 0

Obtained data:

0: Command trigger

1 =Write / 4 =Clear

1: Axis pattern

X-SEL-PX/QX Series: Specify the translation axis only.

| Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

1st axis

8th axis

Reserved for system use

2: End search speed unit (mm/sec)

The parameter value becomes enabled when it is zero.

3: Creap speed unit (mm/sec)

The parameter value becomes enabled when it is zero.

*23 The operation stop/cancel device descriptions are shown below.

OSC 0

Obtained data:

0: Command trigger

1 =Write / 4 =Clear

1: Stop axis pattern

* Including servo command cancellation while interlock is pending.

2: Appended command byte

Bit 7 (Reserved for system use) Fixed to 0

Bit 6 (Reserved for system use) Fixed to 0

Bit 5 (Reserved for system use) Fixed to 0

Bit 4 (Reserved for system use) Fixed to 0

Bit 3 (Reserved for system use) Fixed to 0

Bit 2 (Reserved for system use) Fixed to 0

Bit 1 (Reserved for system use) Fixed to 0

Bit 0 (Specification of output cancellation while interlock is pending (OUT port)
(when all operations are paused))
:0 = Not canceled / 1 = Canceled tentatively

*24 The coordinate affiliate data device descriptions are shown below.

CD 0 00 0

- Obtained data:
  - 0: X axis coordinate offset
  - 1: Y axis coordinate offset
  - 2: Z axis coordinate offset
  - 3: R axis coordinate offset
  - 4 to F: Reserved for system use
- Coordinate system definition data number (00 to FF)
  - Work/tool coordinate system definition data number (0 to )
- Type 1 (0 to 1)
  - 0 = Work coordinate system definition data
  - / 1 = Tool coordinate system definition data

*25 The device descriptions of simple interference check zone data are shown below.

SD 01 0

- Obtained data:
  - 0: Effective axis pattern
  - 1 to 4: Simple interference check zone definition coordinate 1 unit
    (0.001 mm (R axis: 0.001 deg))
    - 1: X-axis definition coordinate
    - 2: Y-axis definition coordinate
    - 3: Z-axis definition coordinate
    - 4: R-axis definition coordinate
  - 5 to 8: Simple interference check zone definition coordinate 2 unit
    (0.001 mm (R axis: 0.001 deg))
  - 9: Physical output port number or global flag number for output upon entry
  - A: Entry error type specification
    - 0 = No error handling / 1 = Message-level error
    - / 2 = Operation-cancellation level error
  - B to F: Reserved for system use
- Definition data number (1 to FF)

*26 The device descriptions of Scara absolute coordinate movement are shown below.

SACM 0

Obtained data:

0: Command trigger
1 =Write / 4 =Clear

1: Axis pattern
X-SEL-PX/QX Series: The Scara and translation axes cannot be specified simultaneously (the translation axis can be specified).

| Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

1st axis
8th axis
Reserved for system use

2: Acceleration unit (% or 0.01G)
The parameter value becomes enabled when it is zero.
* Unit: Movement control = PTP: [%] / Movement control = CP: [0.01G]

3: Deceleration unit (% or 0.01G)
The parameter value becomes enabled when it is zero.
* Unit: Movement control = PTP: [%] / Movement control = CP: [0.01G]

4: Speed unit (% or mm/sec)
The parameter value becomes enabled when it is zero.
(Safety limit is applied depending on the mode.)
* Unit: Movement control = PTP: [%] / Movement control = CP: [mm/sec]

5: Positioning operation type (No Scara axis disabled)
Bit 7 (Reserved for system use) Fixed to 0
Bit 6 (Reserved for system use) Fixed to 0
Bit 5 (Reserved for system use) Fixed to 0
Bit 3-4 (PTP target arm system specification type (Always move current arm system if CP))
: 0 = Current arm system (Movement of opposite arm system prohibited if unfeasible)
/ 1 = Current arm system (Movement of opposite arm system permitted if unfeasible)
/ 2 = Right arm system (Movement of opposite arm system prohibited if unfeasible)
/ 3 = Left arm system (Movement of opposite arm system prohibited if unfeasible)
Bit 1-2 (Movement coordinate system): 0 = Reserved for system use / 1 = Selected work coordinate system
/ 2= Reserved for system use / 3 = Reserved for system use
Bit 0 (Movement control): 0 = PTP / 1 = CP

6 to D: Absolute coordinate data unit (0.001mm)

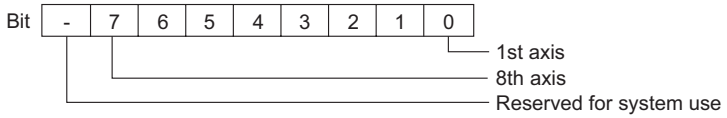
*27 The device descriptions of Scara relative coordinate movement are shown below.

SRCM 0

Obtained data:

0: Command trigger
1 =Write / 4 =Clear

1: Axis pattern
X-SEL-PX/QX Series: The Scara and translation axes cannot be specified simultaneously (the translation axis can be specified).




2: Acceleration unit (% or 0.01G)
The parameter value becomes enabled when it is zero.
* Unit: Movement control = PTP: [%] / Movement control = CP: [0.01G]

3: Deceleration unit (% or 0.01G)
The parameter value becomes enabled when it is zero.
* Unit: Movement control = PTP: [%] / Movement control = CP: [0.01G]

4: Speed unit (% or mm/sec)
The parameter value becomes enabled when it is zero. (Safety limit is applied depending on the mode.)
* Unit: Movement control = PTP: [%] / Movement control = CP: [mm/sec]

5: Positioning operation type (No Scara axis disabled)
Bit 7 (Reserved for system use) Fixed to 0
Bit 6 (Reserved for system use) Fixed to 0
Bit 5 (Reserved for system use) Fixed to 0
Bit 3-4 (PTP target arm system specification type (Always move current arm system if CP))
: 0 = Current arm system (Movement of opposite arm system prohibited if unfeasible)
/ 1 = Current arm system (Movement of opposite arm system permitted if unfeasible)
/ 2 = Right arm system (Movement of opposite arm system prohibited if unfeasible)
/ 3 = Left arm system (Movement of opposite arm system prohibited if unfeasible)
Bit 1-2 (Movement coordinate system): 0 = Reserved for system use / 1 = Selected work coordinate system
/ 2= Reserved for system use / 3 = Reserved for system use
Bit 0 (Movement control): 0 = PTP / 1 = CP

6 to D: Relative coordinate data unit (0.001mm)

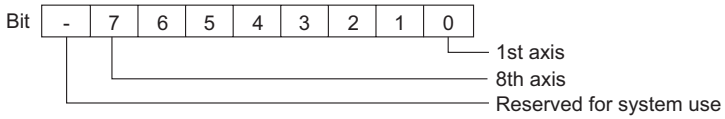
*28 The device descriptions of Scara point number movement are shown below.

SPNM 0

Obtained data:

0: Command trigger
1 =Write / 4 =Clear

1: Axis pattern
Used under an AND conditions with the axis pattern of the point number
X-SEL-PX/QX Series: The Scara and translation axes cannot be specified simultaneously
(the translation axis can be specified).




2: Acceleration unit (% or 0.01G)
The applicable setting value in the position data becomes enabled when the acceleration setting is zero.
If both above setting values are zero, the parameter setting is enabled.
* Unit: Movement control = PTP: [%] / Movement control = CP: [0.01G]

3: Deceleration unit (% or 0.01G)
The applicable setting value in the position data becomes enabled when the deceleration setting is zero.
If both above setting values are zero, the parameter setting is enabled.
* Unit: Movement control = PTP: [%] / Movement control = CP: [0.01G]

4: Speed unit (% or mm/sec)
The applicable setting value in the position data becomes enabled when the speed setting is zero.
If both above setting values are zero, the parameter setting is enabled.
(Safety limit is applied depending on the mode.)
* Unit: Movement control = PTP: [%] / Movement control = CP: [mm/sec]

5: Positioning operation type (No Scara axis disabled)
Bit 7 (Reserved for system use) Fixed to 0
Bit 6 (Reserved for system use) Fixed to 0
Bit 5 (Reserved for system use) Fixed to 0
Bit 3-4 (PTP target arm system specification type (Always move current arm system if CP))
: 0 = Current arm system (Movement of opposite arm system prohibited if unfeasible)
/ 1 = Current arm system (Movement of opposite arm system permitted if unfeasible)
/ 2 = Right arm system (Movement of opposite arm system prohibited if unfeasible)
/ 3 = Left arm system (Movement of opposite arm system profibited if unfeasible)
Bit 1-2 (Movement coordinate system): 0 = Reserved for system use / 1 = Selected work coordinate system
/ 2= Reserved for system use / 3 = Reserved for system use
Bit 0 (Movement control): 0 = PTP / 1 = CP

6: Point number

*29 External Devices that support Feedback Current are shown below:

X-SEL-P/Q Controller (Main Application Ver.0.40 or later)
X-SEL-PX/QX Controller (Main Application Ver.0.17 or later), Axis 5 and 6 of Direct Movement Axis
SSEL Controller (Main Application Ver.0.08 or later)
ASEL Controller (Main Application Ver.0.06 or later)
PSEL Controller (Main Application Ver.0.06 or later)

*30 The device descriptions of Feedback current are shown below

FC 0
- Obtained data:
  - 0: Axis pattern
  - 1: System TICK (L)
  - 2: System TICK (H)
  - 3: Axis-1 Feedback current
  - 4: Axis-2 Feedback current
  - 5: Axis-3 Feedback current
  - 6: Axis-4 Feedback current
  - 7: Axis-5 Feedback current
  - 8: Axis-6 Feedback current
  - 9: Axis-7 Feedback current
  - A: Axis-8 Feedback current

*31 The device descriptions of Task status are shown below

TAST 0
- Obtained data:
  - 00: Executed task count
  - (01 to 05: Single-task status)
  - 01: Task status byte
    - Bit 7 (Reserved for system use)
    - Bit 6 (CANC input status)
    - Bit 5 (HOLD input status)
    - Bit 4 (WAIT progress)
    - Bit 3 (Stopping executed)
    - Bit 0-2 (Reserved for system use)
  - 02: Reserved for system use
  - 03: Executed No.
  - 04: Executed step No.
  - 05: Error generation step No.
  - …
  - (76 to 80: 16-task status)
  - 76: Task status byte
    - Bit 7 (Reserved for system use)
    - Bit 6 (CANC input status)
    - Bit 5 (HOLD input status)
    - Bit 4 (WAIT progress)
    - Bit 3 (Stopping executed)
    - Bit 0-2 (Reserved for system use)
  - 77: Reserved for system use
  - 78: Executed No.
  - 79: Executed step No.
  - 80: Error generation step No.

*32 The device descriptions of Flash ROM are shown below
When "0" is written for an address, the External Device processes Bit0 to Bit3 as "1" (Specified). Be sure to write "0" for an address in the case of Flash ROM8Mbit version. It takes 30 seconds (Max.) in the writing of Flash ROM. Do not turn off the power of the External Device during the writing. The Display does not communicate with the External Device that is in the writing process.
The unit code value of the VR device is "70H" in the model of the Flash ROM8Mbit version.

FR 0
└──── 0: Data type
Bit 3 (Parameter) : 0 = Not specified / 1= Specified
Bit 2 (Point-data, Coordinate system definition data (Scara only)): : 0 = Not specified / 1= Specified
Bit 1 (Symbol-definition table) : 0 = Not specified / 1= Specified
Bit 0 (SEL language program) : 0 = Not specified / 1= Specified

**NOTE**

- Refer to the GP-Pro EX Reference Manual for system data area.

  Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"

- Refer to the precautions on manual notation for icons in the table.

  ☞ "Manual Symbols and Terminology"

# 7 Device Code and Address Code

Use device code and address code when you set "Device Type & Address" for the address type of the data display or other devices.

| Device | Device Name | Device Code (HEX) | Address Code |
|---|---|---|---|
| Input Port | IP | 0080 | Value of word address divided by 16 |
| Output Port | OP | 0081 | Value of (word address - 300) divided by 16 |
| Flag | FG | 0082 | Global Area<br>Value of (flag number - 600) divided by 16<br>Local Area<br>Value of (flag number - 900) divided by 16 |
| Point Data Total Count | PDT | 0060 | Word Address |
| Integer | INT | 0000 | Double Word Address |
| Real | RL | 0001 | Double Word Address |
| String | STR | 0002 | Global Area<br>Value of (variable number - 300) divided by 2<br>Local Area<br>Value of (variable number - 1) divided by 2 |
| Axis Status | AXST | 0061 | Word Address |
| Scara Axis Status | SAXS | 0062 | Word Address |
| Version | VR | 0063 | Word Address |
| Error Detail 0 | ER0 | 0020 | Double Word Address |
| Error Detail 1 | ER1 | 0021 | Double Word Address |
| Error Detail 2 | ER2 | 0022 | Double Word Address |
| Error Detail 3 | ER3 | 0023 | Double Word Address |
| Error Detail 4 | ER4 | 0024 | Double Word Address |
| Error Detail 5 | ER5 | 0025 | Double Word Address |
| Error Detail 6 | ER6 | 0026 | Double Word Address |
| Error Detail 7 | ER7 | 0027 | Double Word Address |
| Program Status | PGST | 0064 | Word Address |
| System Status | SYST | 0065 | Word Address |

Continued to next page.

| Device | Device Name | Device Code (HEX) | Address Code |
|---|---|---|---|
| Program Control | PRG | 0066 | Word Address |
| Alarm Reset | AR | 0067 | Word Address |
| Software Reset | SR | 0068 | Word Address |
| Drive-Source Recovery | DSR | 0069 | Word Address |
| Operation-Pause Reset | OPR | 006A | Word Address |
| Point Data Clear | PCLR | 0083 | Value of word address from which 1 is deducted |
| Absolute Coordinate Movement | ACM | 006B | Double Word Address |
| Relative Coordinate Movement | RCM | 006C | Double Word Address |
| Jogging/Inching Movement | JIM | 006D | Double Word Address |
| Point Number Movement | PNM | 006E | Word Address |
| Point Data | PD | 006F | Double Word Address |
| Servo | SV | 0070 | Word Address |
| Return to Origin | RO | 0071 | Word Address |
| Operation Stop/Cancel | OSC | 0072 | Word Address |
| Coordinate Affiliate Data | CD | 0073 | Double Word Address |
| Simple Interference Check Zone Data | SD | 0074 | Double Word Address |
| Scara Absolute Coordinate Movement | SACM | 0075 | Double Word Address |
| Scara Relative Coordinate Movement | SRCM | 0076 | Double Word Address |
| Scara Point Number Movement | SPNM | 0077 | Word Address |
| Feedback Current | FC | 0078 | Word Address |
| Task Status | TAST | 0003 | Word Address |
| Flash ROM | FR | 0004 | Word Address |

# 8 Error Messages

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

| Item | Description |
|---|---|
| No. | Error No. |
| Device Name | Name of the External Device where an error has occurred. Device name is the title of the External Device set with GP-Pro EX. ((Initial value [PLC1]) |
| Error Message | Displays messages related to an error that has occurred. |
| Error Occurrence Area | Displays the IP address or device address of the External Device where an error has occurred, or error codes received from the External Device.<br>NOTE<br>• IP address is displayed as "IP address (Decimal): MAC address (Hex)".<br>• Device address is displayed as "Address: Device address".<br>• Received error codes are displayed as "Decimal [Hex]". |

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 1[01H])"

NOTE

- Refer to your External Device manual for details on received error codes.
- Refer to "Display-related errors" in "Maintenance/Troubleshooting Guide" for details on the error messages common to the driver.

## ■ Error Messages Specific to the External Device

| Error No. | Message | Description |
|---|---|---|
| RHxx128 | (Node Name): It was not possible to execute it by out of range data. | Data write beyond the data range was requested. |