Hitachi IES Co., Ltd.

Inverter MODBUS RTU Driver

Introduction

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

In this manual, the connection procedure is described in the sections identified below:

| 1 | System Configuration
This section lists the types of External Devices and SIO that you can connect. | ☞ "1 System Configuration" (page 3) |

| 2 | External Device Selection
Select a model (series) of the External Device and its connection method. | ☞ "2 External Device Selection" (page 6) |

| 3 | Communication Settings
This section shows setting examples for communicating between the Display and the External Device. | ☞ "3 Communication Settings" (page 7) |

| 4 | Setup Items
This section describes communication setup items on the Display.
Set the Display's communication settings in GP Pro-EX or in off-line mode. | ☞ "4 Setup Items" (page 17) |

| 5 | Cable Diagrams
This section shows cables and adapters for connecting the Display and the External Device. | ☞ "5 Cable Diagrams" (page 21) |

Operation

1　　　System Configuration

The following table lists system configurations for connecting Hitachi IES Co., Ltd. External Devices and the Display.

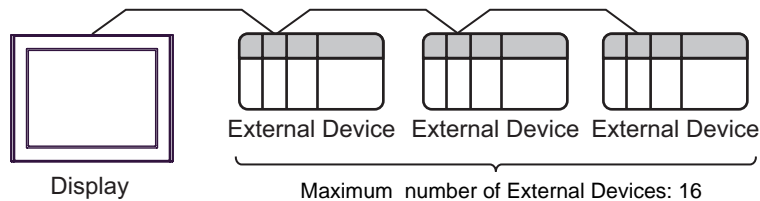| Series	Inverter[*1]	Link I/F	SIO Type	Setting Example	Cable Diagram
X200	X200-□□□□F□□	Serial port connector on the inverter	RS-422/485 (2 wire)	"Setting Example 1" (page 7)	" Cable Diagram 1" (page 21)
SJ700	SJ700-□□□■□F■F	RS485 port on the inverter	RS-422/485 (2 wire)	"Setting Example 2" (page 9)	" Cable Diagram 2" (page 30)
SJ700-2	SJ700-□□□■□F■F2	RS485 port on the inverter	RS-422/485 (2 wire)	"Setting Example 3" (page 11)	" Cable Diagram 2" (page 30)
SJ200	SJ200-□□□□F□□	Serial port connector on the inverter	RS-422/485 (2 wire)	"Setting Example 4" (page 13)	" Cable Diagram 1" (page 21)
L200	L200-□□□□F□□	Serial port connector on the inverter	RS-422/485 (2 wire)	"Setting Example 5" (page 15)	" Cable Diagram 1" (page 21)

*1　　■ is not added as an option. □ differs depending on the option.

■ Connection Configuration

• 1:1 Connection

Display　　　　　　　External Device

• 1:n Connection (when using either COM1 or COM2)

Display　　　　　External Device　External Device　External Device

Maximum number of External Devices: 16

■ 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, PS-3651A	COM1[*1]	-	-
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]
PL-3000B, PL-3600T, PL-3600K, PL-3700T, PL-3700K, PL-3900T	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.

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　External Device Selection

Select the External Device to be connected to the Display.
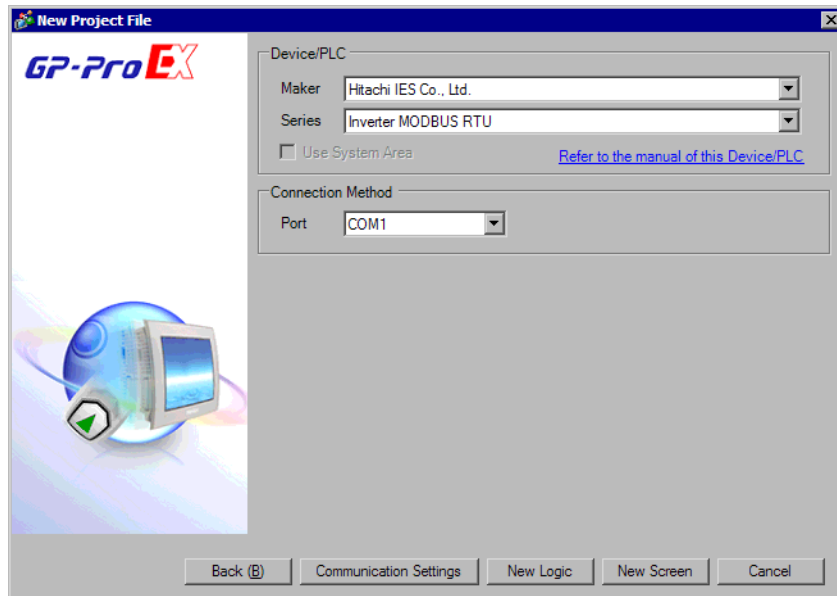
Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "Hitachi IES Co., Ltd.".
Series	Select a model (series) of the External Device to be connected and connection method. Select "Inverter MODBUS RTU". In System configuration, check to make sure the external device to which you are connecting is supported in "Inverter MODBUS RTU".)"1 System Configuration" (page 3)
Use System Area	Not available in this driver.
Port	Select the Display port to be connected to the External Device.

3 Communication Settings

This section provides examples of communication settings recommended by Pro-face for the Display and the External Device.

3.1 Setting Example 1

■ GP Pro-EX Settings

◆ Communication Settings

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

◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.

■ External Device Settings

For External Device communication settings, use the FUNC key, Up key, Down key, and STR key located in the keypad of the External Device.

Refer to your External Device manual for details.

1 Set OPE/485 switch to "485" position.
2 Turn ON the External Device.
3 Press FUNC key.
4 Press and hold Down key to display [C---].
5 Press FUNC key.
6 Press Up key to display the setting function code.
7 Press FUNC key.
8 Press Up key or Down key to select the setting value.
9 Press STR key.
10 Reboot the External Device.

◆ Setting Value

Function Code	Setting Value	Setup Description
C070	03	Selection of OPE/ModBus
C071	06	Communication speed selection
C072	1.	Node allocation
C074	00	Communication parity selection
C075	1	Communication stop bit selection
C076	02	Communication error select
C077	0.00	Communication error time-out
C078	0.	Communication wait time
A001	03	Frequency source setting
A002	03	Run command source setting

3.2 Setting Example 2

■ GP Pro-EX Settings

◆ Communication Settings

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

Device/PLC 1

Summary   Change Device/PLC

Maker   Hitachi IES Co., Ltd.   Series   Inverter MODBUS RTU   Port   COM1

Text Data Mode   1   Change

Communication Settings

SIO Type   ○ RS232C   ● RS422/485(2wire)   ○ RS422/485(4wire)

Speed   19200

Data Length   ○ 7   ● 8

Parity   ● NONE   ○ EVEN   ○ ODD

Stop Bit   ● 1   ○ 2

Flow Control   ● NONE   ○ ER(DTR/CTS) ○ XON/XOFF

Timeout   3   (sec)

Retry   2

Wait To Send   2   (ms)   ☑ Default Value

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.   Default

Device-Specific Settings
Allowable Number of Devices/PLCs   16
Number   Device Name   Settings
     1   PLC1   Series=SJ700,Slave address=1

◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.

Individual Device Settings

PLC1

Series   SJ700
If you change the series, please
reconfirm all address settings.

Slave address   1

Default

OK (O)   Cancel

■ External Device Settings

For External Device communication settings, use the FUNC key, Up key, Down key, and STR key located in the keypad of the External Device.

Refer to your External Device manual for details.

1 Turn ON the External Device.
2 Press FUNC key for 3 seconds or longer.
3 Press FUNC key to display [d001].
4 Press and hold Down key to display [C---].
5 Press FUNC key.
6 Press Up key to display the setting function code.
7 Press FUNC key.
8 Press Up key or Down key to select the setting value.
9 Press STR key.
10 Reboot the External Device.

◆ Setting Value

Function Code	Setting Value	Setup Description
C071	06	Communication speed selection
C072	1.	Node allocation
C073	8	Communication data length selection
C074	00	Communication parity selection
C075	1	Communication stop bit selection
C076	02	Selection of operation after communication error
C077	0.00	Communication trip limit time setting
C078	0.	Communication wait time
C079	01	Communication mode selection
A001	03	Frequency source setting
A002	03	Run command source setting

3.3   Setting Example 3

■ GP Pro-EX Settings

◆ Communication Settings

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

◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.

■ External Device Settings

For External Device communication settings, use the FUNC key, Up key, Down key, and STR key located in the keypad of the External Device.

Refer to your External Device manual for details.

1 Turn ON the External Device.
2 Press FUNC key for 3 seconds or longer.
3 Press FUNC key to display [d001].
4 Press and hold Down key to display [C---].
5 Press FUNC key.
6 Press Up key to display the setting function code.
7 Press FUNC key.
8 Press Up key or Down key to select the setting value.
9 Press STR key.
10 Reboot the External Device.

◆ Setting Value

Function Code	Setting Value	Setup Description
C071	06	Communication speed selection
C072	1.	Node allocation
C073	8	Communication data length selection
C074	00	Communication parity selection
C075	1	Communication stop bit selection
C076	02	Selection of operation after communication error
C077	0.00	Communication trip limit time setting
C078	0.	Communication wait time
C079	01	Communication mode selection
A001	03	Frequency source setting
A002	03	Run command source setting

3.4　　　Setting Example 4

■ GP Pro-EX Settings

◆ Communication Settings

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

Device/PLC 1

Summary　　　　　　　　　　　　　　　　　　　　　　　　　Change Device/PLC

Maker　Hitachi IES Co., Ltd.　　　Series　Inverter MODBUS RTU　　Port　COM1

Text Data Mode　　1　Change

Communication Settings

SIO Type　　　　○ RS232C　　● RS422/485(2wire)　　○ RS422/485(4wire)

Speed　　　　　19200

Data Length　　○ 7　　　　● 8

Parity　　　　　● NONE　　　○ EVEN　　　　○ ODD

Stop Bit　　　　● 1　　　　　○ 2

Flow Control　　● NONE　　　○ ER(DTR/CTS)　○ XON/XOFF

Timeout　　　　3　　(sec)

Retry　　　　　2

Wait To Send　　2　　(ms)　☑ Default Value

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.　　　　　　Default

Device-Specific Settings

Allowable Number of Devices/PLCs　16

Number　Device Name　　　　Settings

1　PLC1　　　　　Series=SJ200,Slave address=1

◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.

Individual Device Settings

PLC1

Series　SJ200

If you change the series, please
reconfirm all address settings.

Slave address　1

Default

OK (O)　　Cancel

■ External Device Settings

For External Device communication settings, use the FUNC key, Up key, Down key, and STR key located in the keypad of the External Device.

Refer to your External Device manual for details.

1 Set OPE/485 switch to "485" position.
2 Turn ON the External Device.
3 Press FUNC key.
4 Press and hold Down key to display [C---].
5 Press FUNC key.
6 Press Up key to display the setting function code.
7 Press FUNC key.
8 Press Up key or Down key to select the setting value.
9 Press STR key.
10 Reboot the External Device.

◆ Setting Value

Function Code	Setting Value	Setup Description
C071	06	Communication speed selection
C072	1.	Node allocation
C074	00	Communication parity selection
C075	1	Communication stop bit selection
C078	0.	Communication wait time
A001	03	Frequency source setting
A002	03	Run command source setting

3.5   Setting Example 5

■ GP Pro-EX Settings

◆ Communication Settings

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

◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.

■ External Device Settings

For External Device communication settings, use the FUNC key, Up key, Down key, and STR key located in the keypad of the External Device.

Refer to your External Device manual for details.

1 Set OPE/485 switch to "485" position.
2 Turn ON the External Device.
3 Press FUNC key.
4 Press and hold Down key to display [C---].
5 Press FUNC key.
6 Press Up key to display the setting function code.
7 Press FUNC key.
8 Press Up key or Down key to select the setting value.
9 Press STR key.
10 Reboot the External Device.

◆ Setting Value

Function Code	Setting Value	Setup Description
C071	06	Communication speed selection
C072	1.	Node allocation
C074	00	Communication parity selection
C075	1	Communication stop bit selection
C078	0.	Communication wait time
A001	03	Frequency source setting
A002	03	Run command source setting

4   Setup Items

Set up the Display's communication settings in GP Pro-EX or in the Display's off-line mode.

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

☞ "3 Communication Settings" (page 7)

4.1   Setup Items in GP Pro-EX

■ Communication Settings

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

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

Setup Items	Setup Description
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, 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. When the default value check box is selected, the Wait To Send value automatically changes in the formula below by changing each value for Speed/Data Length/Parity/Stop Bit. $$\text{Wait To Send (ms)} = \frac{3500 \times (1 + \text{Data Length} + \text{Stop Bit} + \text{Parity})}{\text{Speed (bps)}}$$ Value for the parity setting is shown below. No Parity = 0 Parity Even = 1 Parity Odd = 1 **NOTE** • After changing the Wait To Send value for the project, of which [Default Value] is checked, in the off-line mode, the Wait To Send value will be recalculated when the project is received and communication settings are displayed.

■ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click ⬚ [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click ⬚ from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.
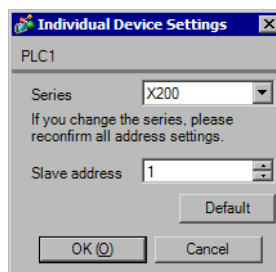
Setup Items	Setup Description
Series	Select the series of the External Device.
Slave address	Use an integer from 1 to 32 to enter the address of the External Device.

4.2　　　　Setup Items in Off-line Mode

NOTE

• Refer to the Maintenance/Troubleshooting manual for information on how to enter off-line mode or about the operation.

　　Cf.　Maintenance/Troubleshooting Manual "Off-line Mode"

• The number of the setup items to be displayed for 1 page in the off-line 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 Equipment Settings] in off-line mode. Touch the External Device you want to set from the displayed list.

| Comm. | Device | Option | | |

Inverter MODBUS RTU　　　　　　　　　　　　　　　　[COM1]　　　　Page 1/1

```
SIO Type          RS422/485(2wire)  ▼
Speed             19200             ▼
Data Length       8
Parity            ● NONE    ○ EVEN    ○ ODD
Stop Bit          ● 1       ○ 2
Flow Control      NONE              ▼

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

| | Exit | | Back | 2008/07/15 13:25:55 |

Setup Items	Setup Description
SIO Type	Select the SIO type to communicate with the External Device. IMPORTANT In the communication settings, set [SIO Type] correctly according to the serial interface specifications of the Display. If you select an SIO type that the serial interface does not support, proper operation cannot be guaranteed. 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	Display 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.

Setup Items	Setup Description
Timeout (s)	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, 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.

■ Device Setting

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

Comm.	Device	Option		

Inverter MODBUS RTU   [COM1]   Page 1/1

Device/PLC Name   PLC1 ▼

Series   X200

Slave address   1 ▼ ▲

	Exit		Back	2008/07/15 13:25:58

Setup Items	Setup Description
Device/PLC Name	Select the External Device to set. Device name is a title of the External Device set with GP-Pro EX. (Initial value [PLC1])
Series	Display the series of the External Device.
Slave address	Use an integer from 1 to 32 to enter the address of the External Device.

5 Cable Diagrams

The following cable diagrams may be different from cable diagrams recommended by Hitachi IES Co., Ltd.

Please be assured there is no operational problem in applying the cable diagrams shown in this manual.

- The FG pin of the External Device body must be D-class grounded. Refer to your External Device manual for more details.
- The SG and FG are connected inside the Display. When connecting the External Device to the SG, design your system to avoid short-circuit loops.
- Connect an isolation unit if the communication is not stable due to noise or other factors.

Cable Diagram 1

Display (Connection Port)		Cable	Notes
GP3000[1] (COM1) AGP-3302B (COM2) ST[2] (COM2) LT (COM1)	1A	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	Cable length: 250m or less
	1B	User-created cable	
GP3000[3] (COM2)	1C	Online adapter by Pro-face CA4-ADPONL-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	
	1D	Online adapter by Pro-face CA4-ADPONL-01 + User-created cable	
IPC[4]	1E	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	
	1F	User-created cable	
GP-4106 (COM1)	1G	User-created cable	
GP-4107 (COM1)	1H	User-created cable	

*1   All GP3000 models except AGP-3302B

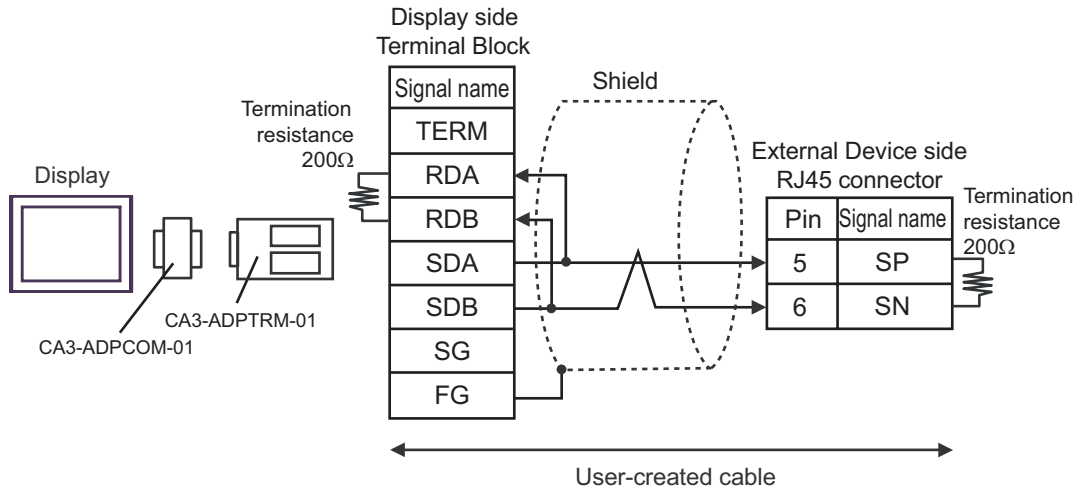*2   All ST models except AST-3211A and AST-3302B

*3   All GP3000 models except GP-3200 series and AGP-3302B

*4   Only the COM port which can communicate by RS-422/485 (2 wire) can be used.
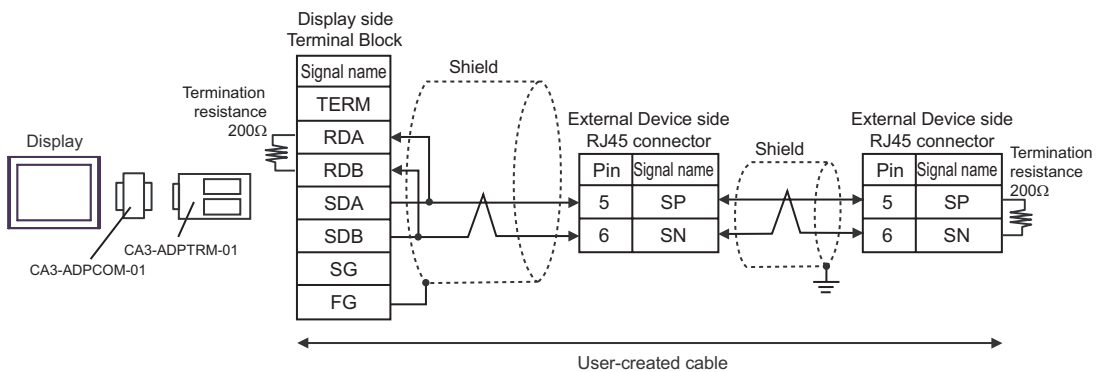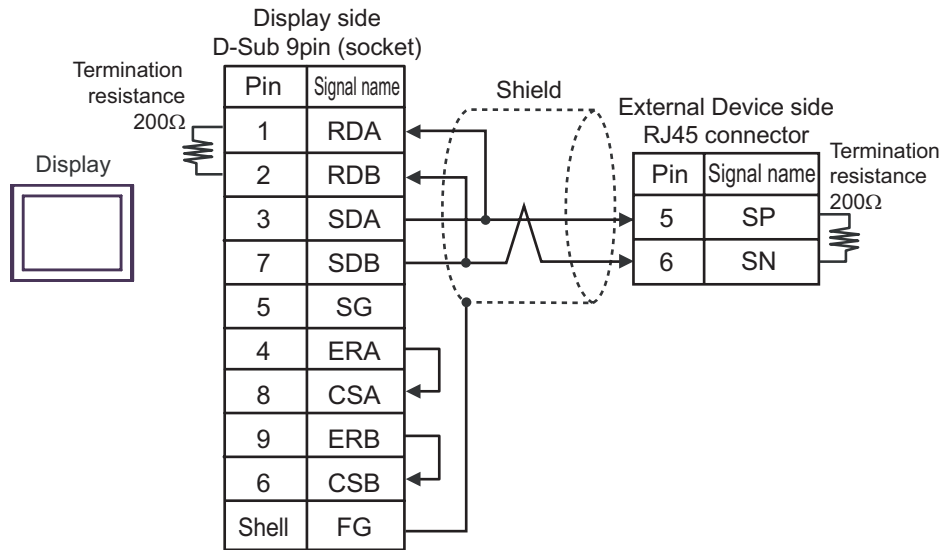   ☞ "■ IPC COM Port" (page 4)
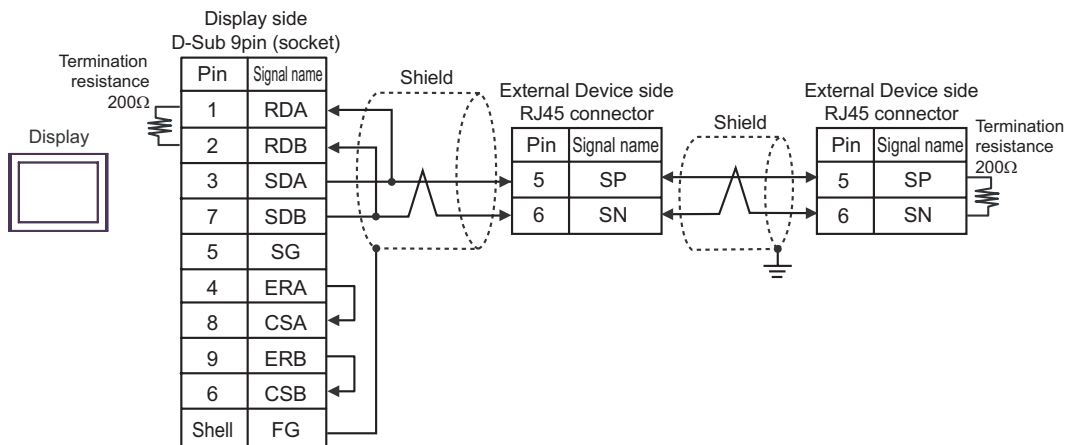
1A)

- 1:1 Connection

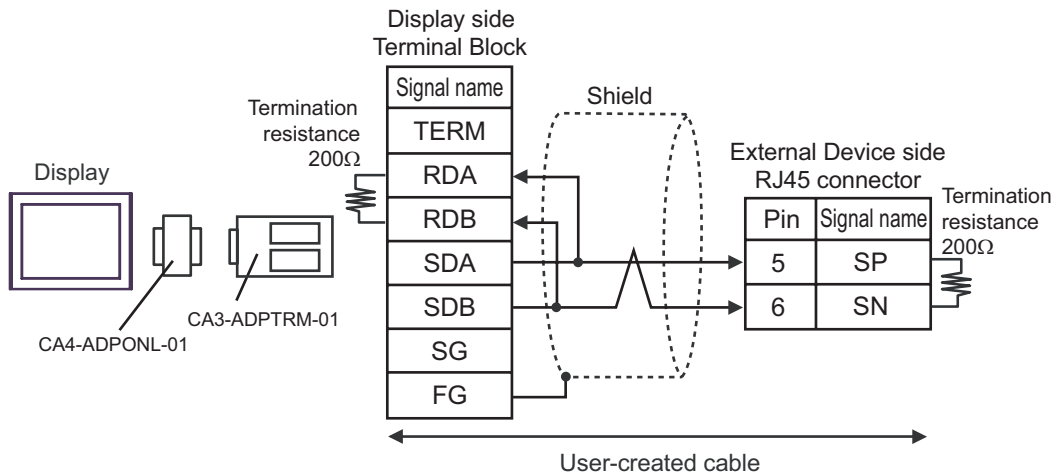- 1:n Connection

1B)

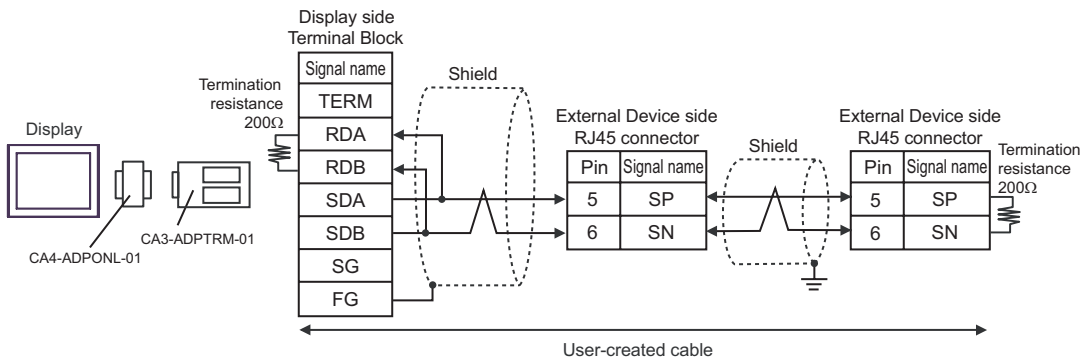• 1:1 Connection

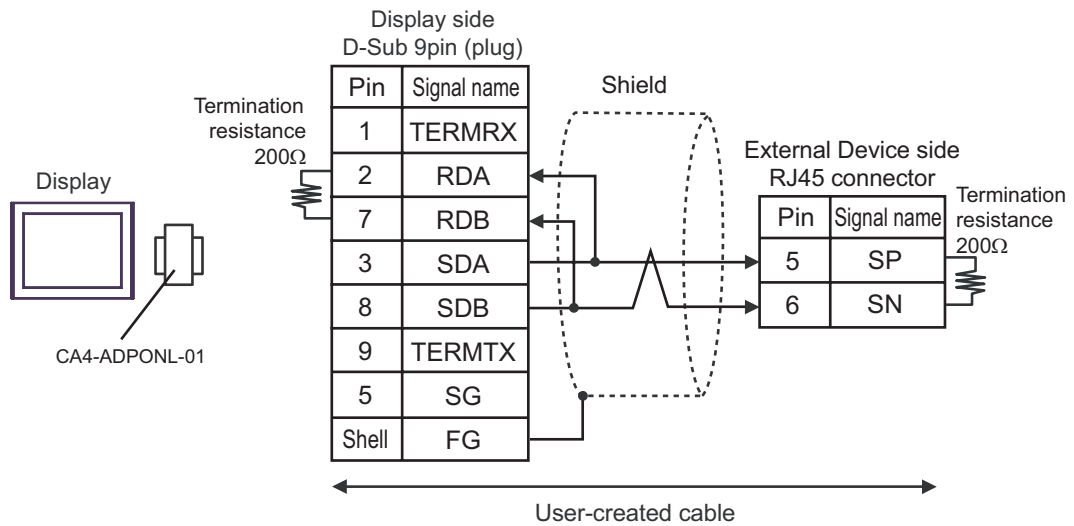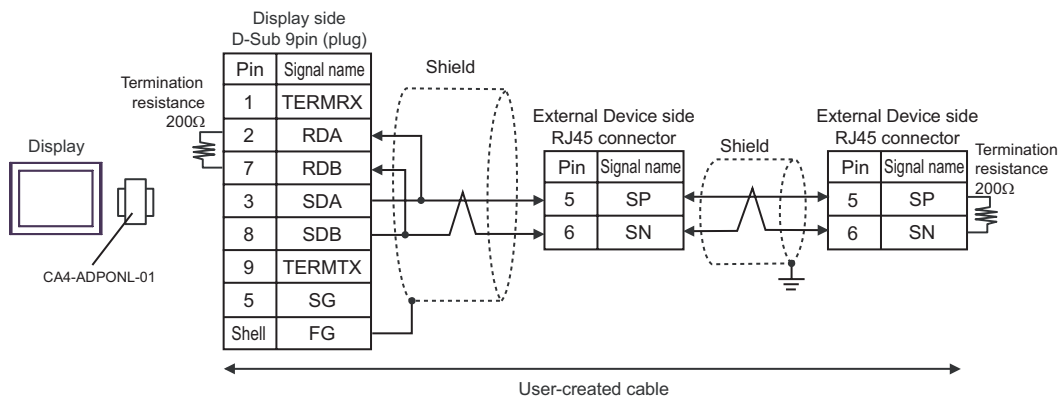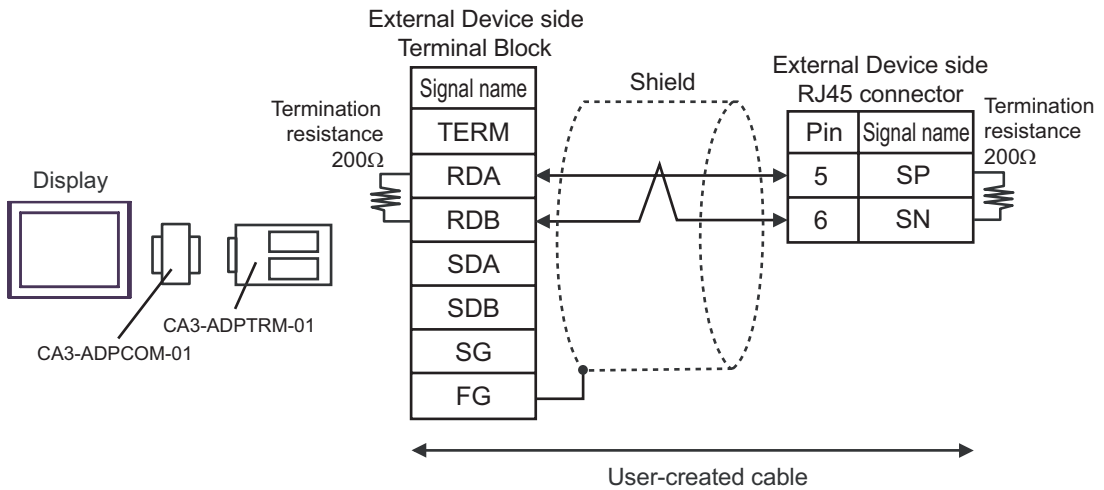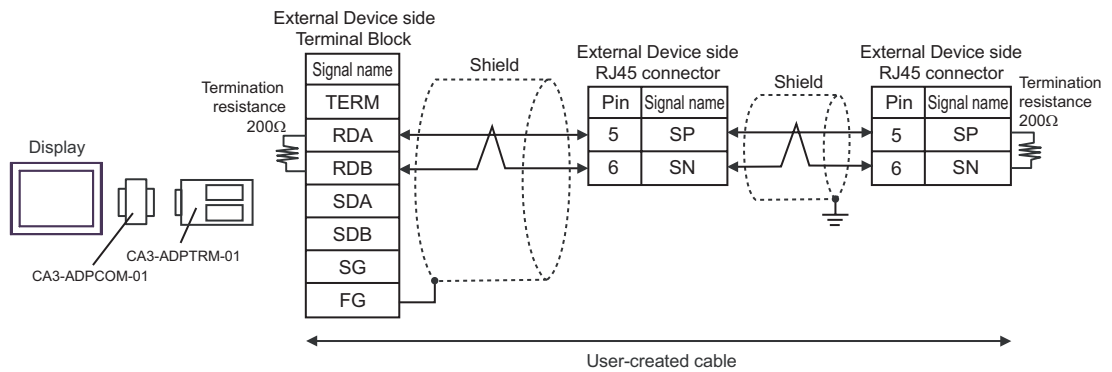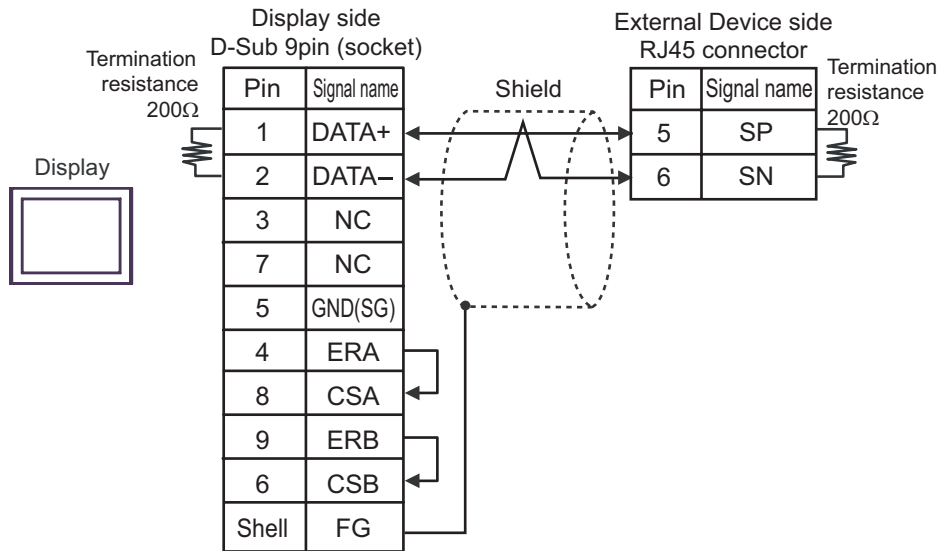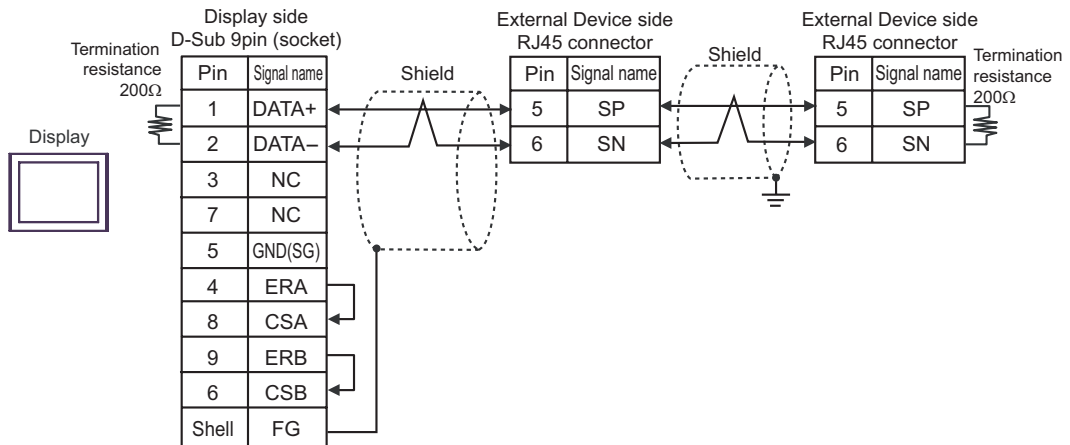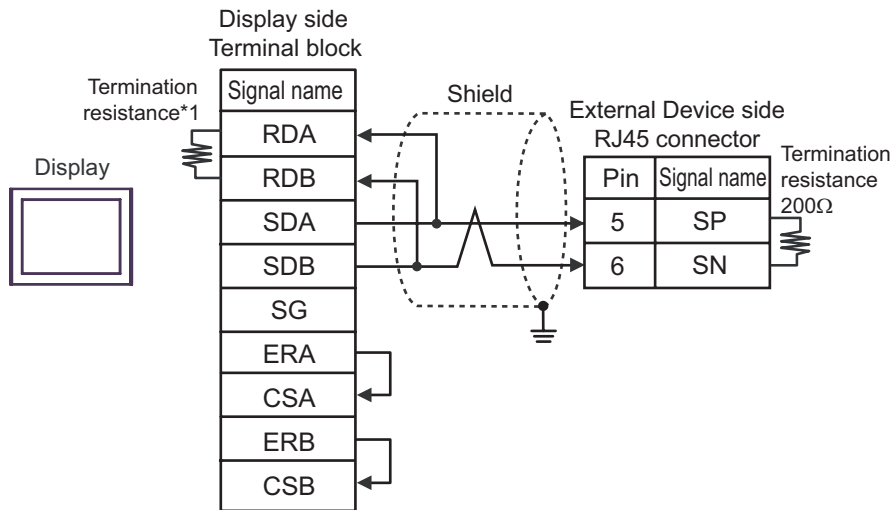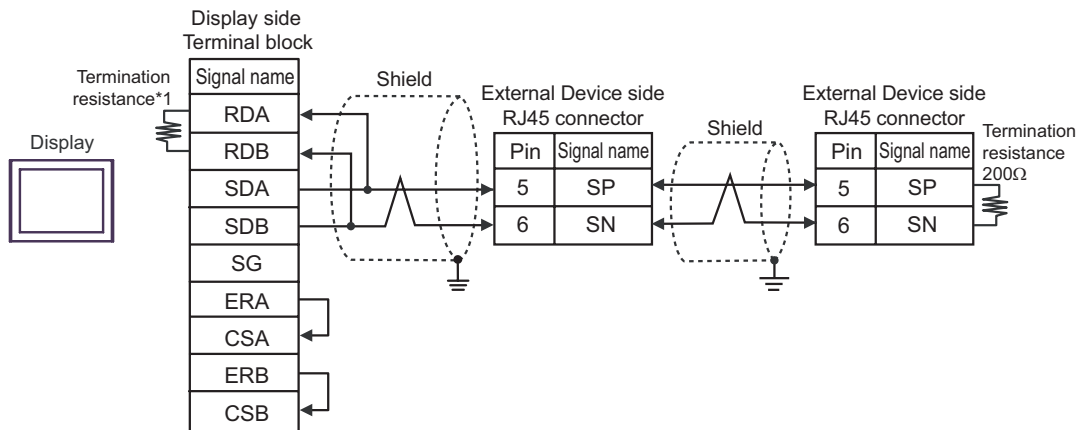• 1:n Connection

1C)

- 1:1 Connection

Display side
Terminal Block

Signal name
TERM
RDA
RDB
SDA
SDB
SG
FG

Shield

Termination resistance 200Ω

Display

CA3-ADPTRM-01

CA4-ADPONL-01

External Device side
RJ45 connector

Pin	Signal name
5	SP
6	SN

Termination resistance 200Ω

User-created cable

- 1:n Connection

Display side
Terminal Block

Signal name
TERM
RDA
RDB
SDA
SDB
SG
FG

Shield

Termination resistance 200Ω

Display

CA3-ADPTRM-01

CA4-ADPONL-01

External Device side
RJ45 connector

Pin	Signal name
5	SP
6	SN

Shield

External Device side
RJ45 connector

Pin	Signal name
5	SP
6	SN

Termination resistance 200Ω

User-created cable

1D)

• 1:1 Connection

Display side
D-Sub 9pin (plug)

Pin	Signal name
1	TERMRX
2	RDA
7	RDB
3	SDA
8	SDB
9	TERMTX
5	SG
Shell	FG

Termination
resistance
200Ω

Display

CA4-ADPONL-01

Shield

External Device side
RJ45 connector

Pin	Signal name
5	SP
6	SN

Termination
resistance
200Ω

User-created cable

• 1:n Connection

Display side
D-Sub 9pin (plug)

Pin	Signal name
1	TERMRX
2	RDA
7	RDB
3	SDA
8	SDB
9	TERMTX
5	SG
Shell	FG

Termination
resistance
200Ω

Display

CA4-ADPONL-01

Shield

External Device side
RJ45 connector

Pin	Signal name
5	SP
6	SN

Shield

External Device side
RJ45 connector

Pin	Signal name
5	SP
6	SN

Termination
resistance
200Ω

User-created cable

1E)

• 1:1 Connection

• 1:n Connection

1F)

• 1:1 Connection

Display side
D-Sub 9pin (socket)

External Device side
RJ45 connector

Termination
resistance
200Ω

Pin	Signal name
1	DATA+
2	DATA−
3	NC
7	NC
5	GND(SG)
4	ERA
8	CSA
9	ERB
6	CSB
Shell	FG

Shield

Pin	Signal name
5	SP
6	SN

Termination
resistance
200Ω

Display

• 1:n Connection

Display side
D-Sub 9pin (socket)

External Device side
RJ45 connector

External Device side
RJ45 connector

Termination
resistance
200Ω

Pin	Signal name
1	DATA+
2	DATA−
3	NC
7	NC
5	GND(SG)
4	ERA
8	CSA
9	ERB
6	CSB
Shell	FG

Shield

Pin	Signal name
5	SP
6	SN

Shield

Pin	Signal name
5	SP
6	SN

Termination
resistance
200Ω

Display

1G)

• 1:1 Connection

• 1:n Connection

*1   The resistance in the Display is used as the termination resistance. Set the value of the DIP Switch on the rear of the Display as shown in the table below.

DIP Switch No.	Set Value
1	OFF
2	OFF
3	OFF
4	ON

1H)
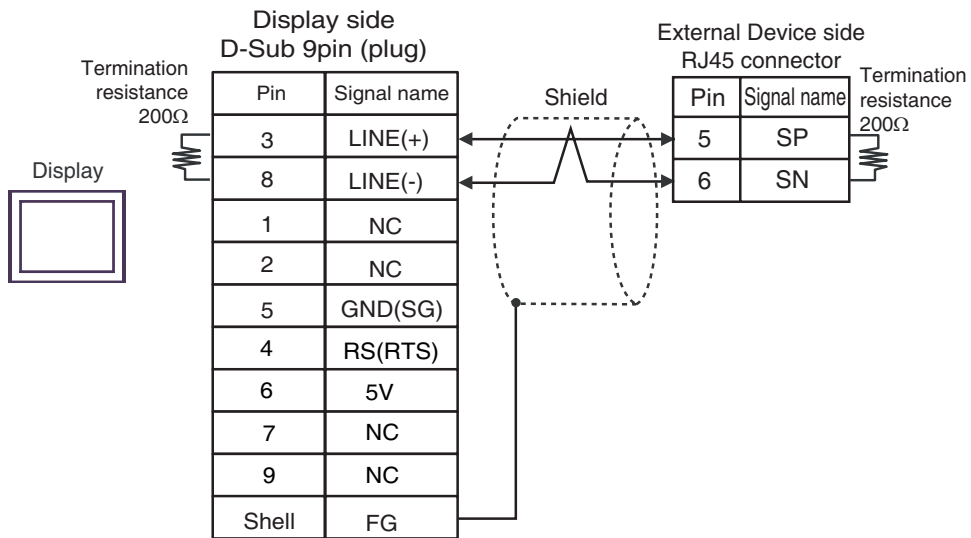
- 1:1 Connection

- 1:n Connection
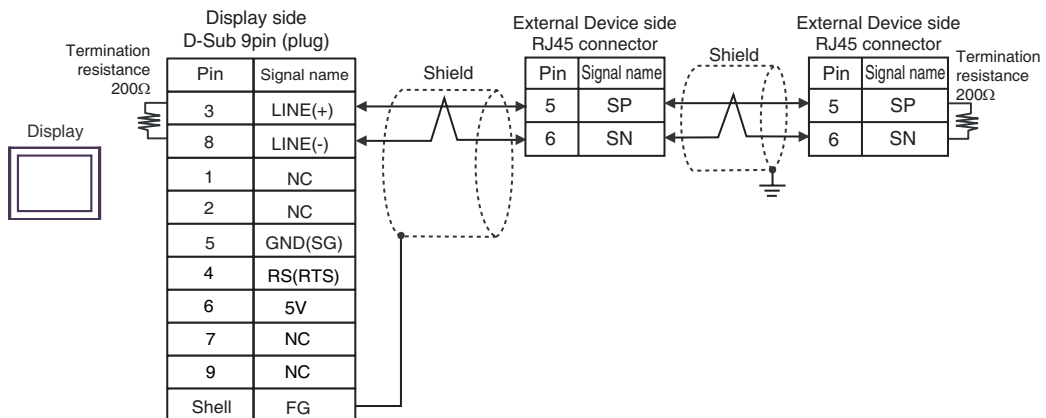
| IMPORTANT | • The 5V output (Pin #6) on the GP-4107 is the power for the Siemens AG's PROFIBUS connector. Do not use it for other devices. |

| NOTE | • In COM on the GP-4107, the SG and FG terminals are isolated. |

Cable Diagram 2

Display (Connection Port)		Cable	Notes
GP3000[*1] (COM1) AGP-3302B (COM2) ST[*2] (COM2) LT (COM1)	2A	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	
	2B	User-created cable	
GP3000[*3] (COM2)	2C	Online adapter by Pro-face CA4-ADPONL-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	Cable length: 250m or less
	2D	Online adapter by Pro-face CA4-ADPONL-01 + User-created cable	
IPC[*4]	2E	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	
	2F	User-created cable	
GP-4106 (COM1)	2G	User-created cable	
GP-4107 (COM1)	2H	User-created cable	

*1   All GP3000 models except AGP-3302B

*2   All ST models except AST-3211A and AST-3302B

*3   All GP3000 models except GP-3200 series and AGP-3302B

*4   Only the COM port which can communicate by RS-422/485 (2 wire) can be used.
)"■ IPC COM Port" (page 4)

2A)

• 1:1 Connection
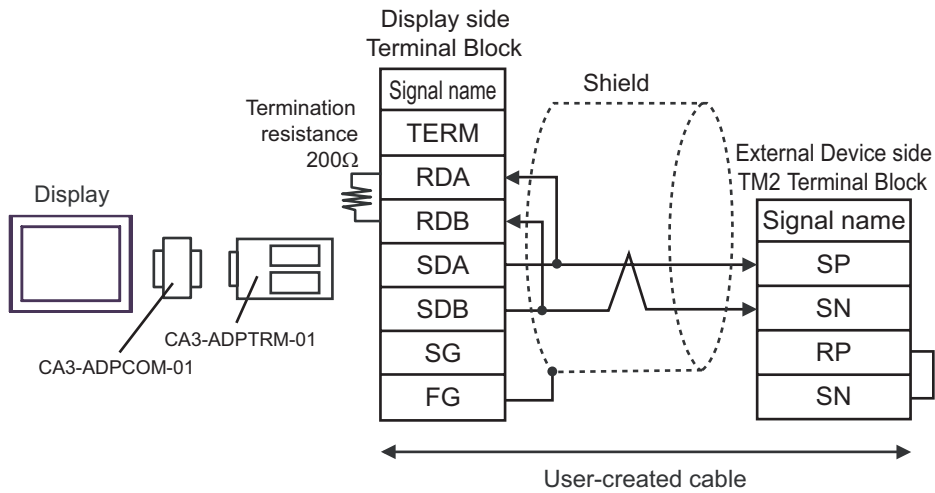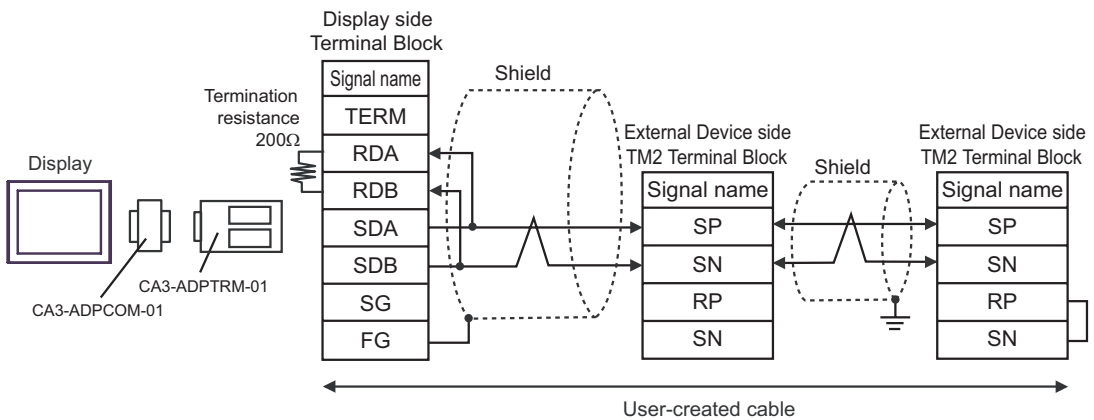
Display side
Terminal Block

User-created cable

• 1:n Connection

Display side
Terminal Block

User-created cable

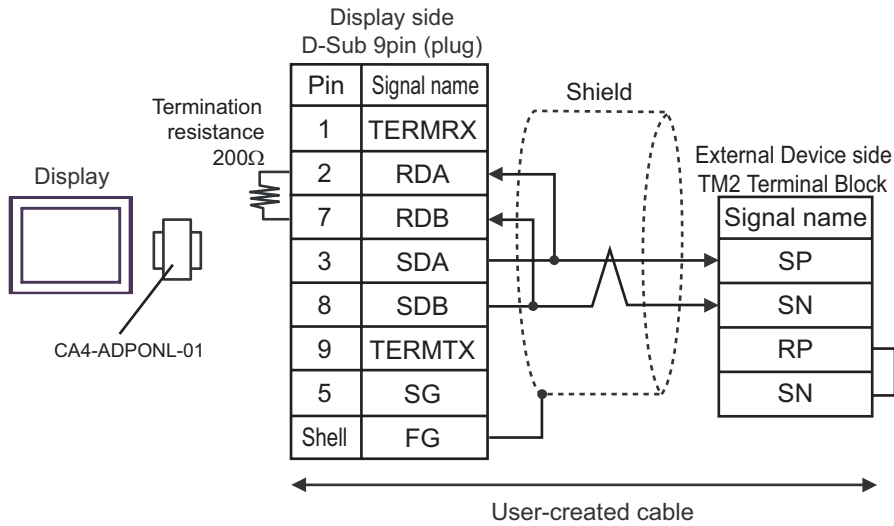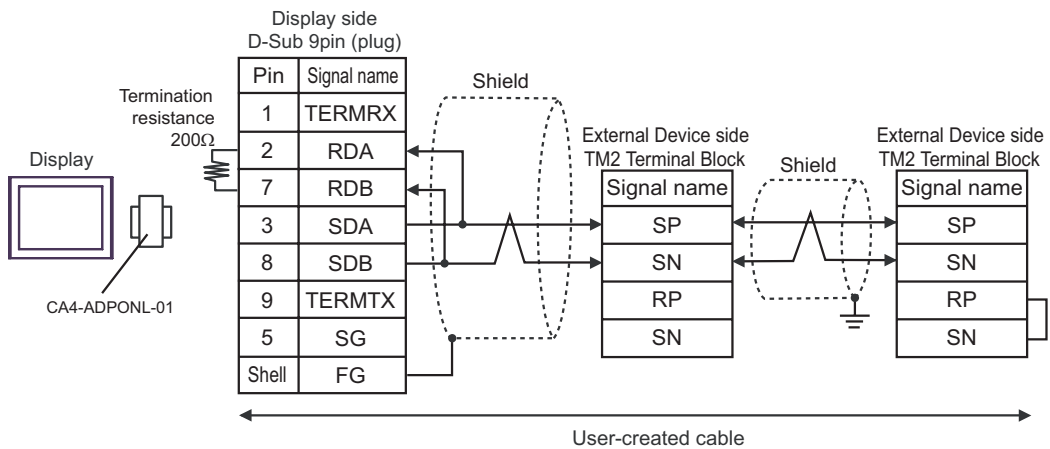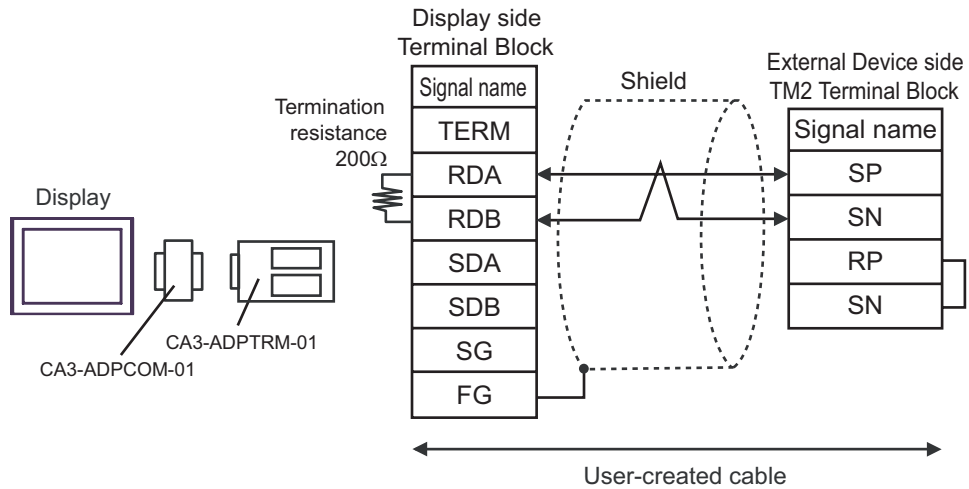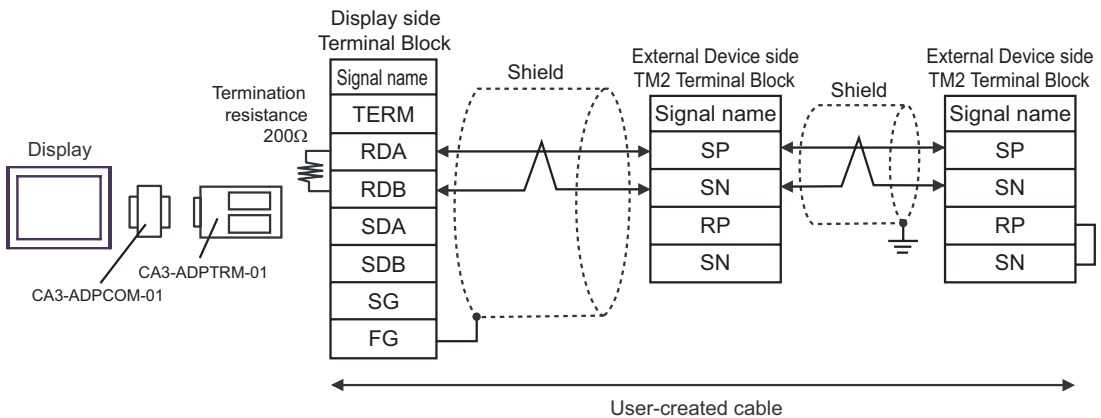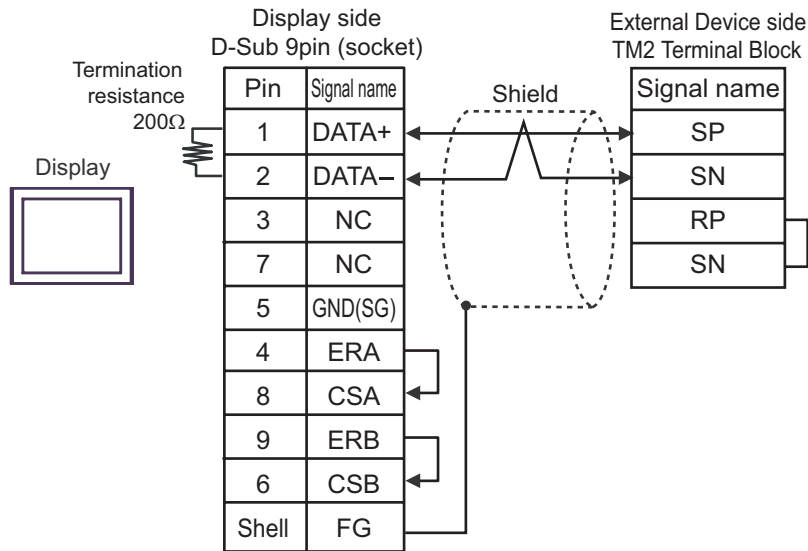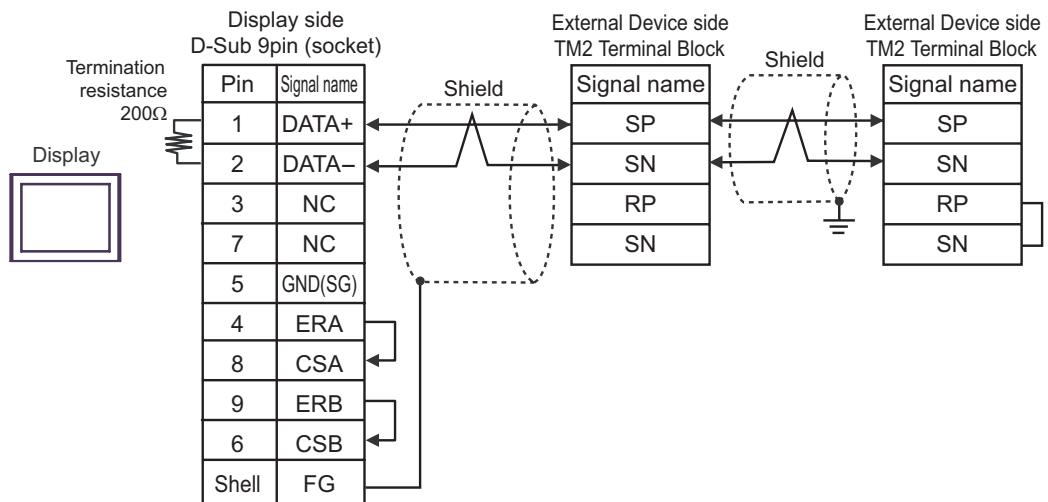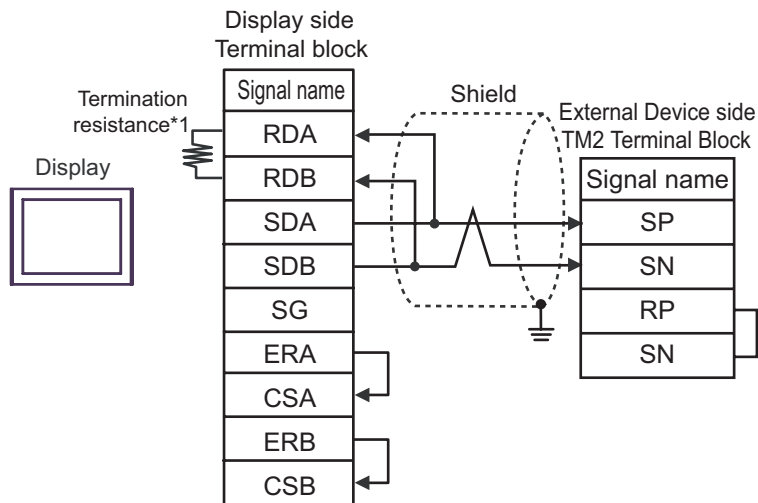| NOTE | • Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal. |

2B)

• 1:1 Connection
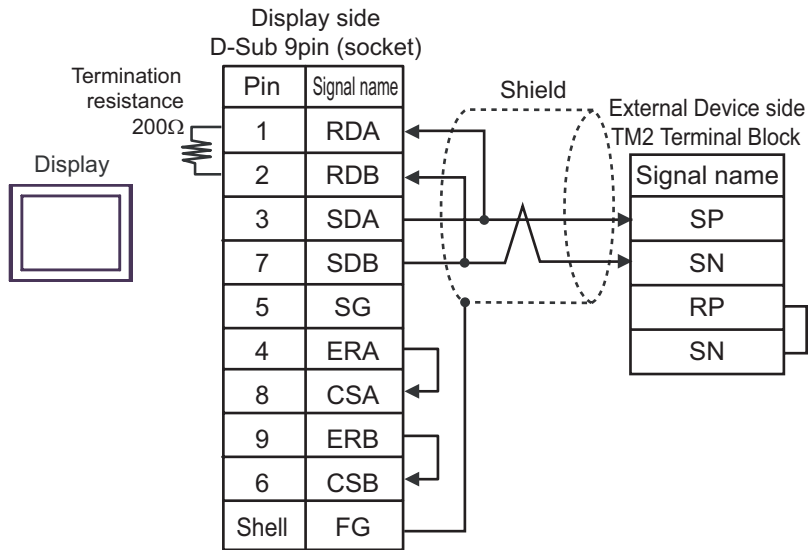
• 1:n Connection
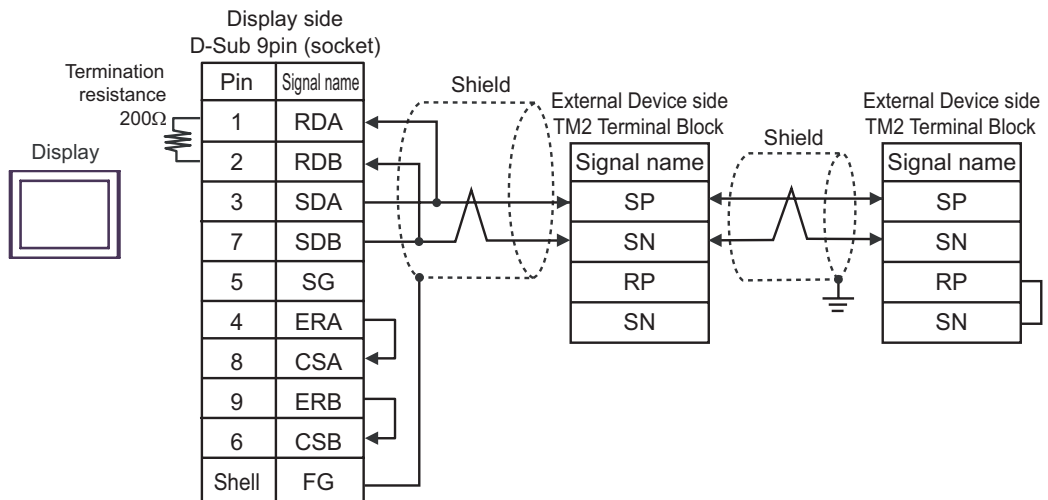
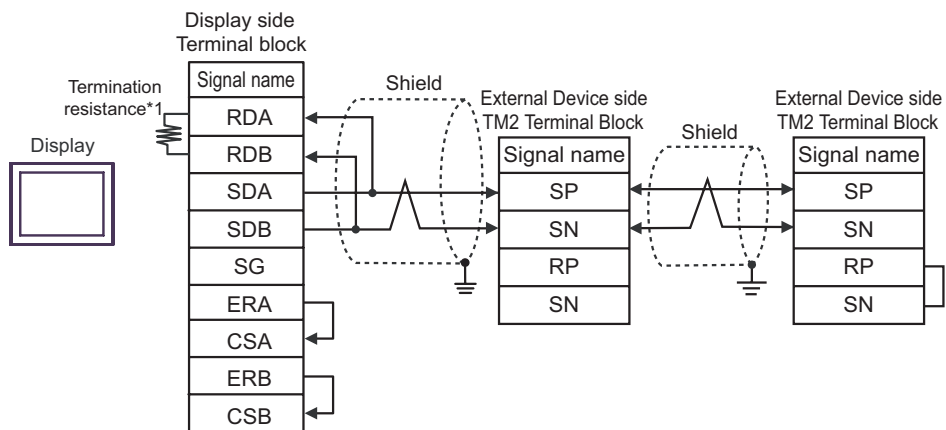| NOTE	• Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal.

2C)

- 1:1 Connection
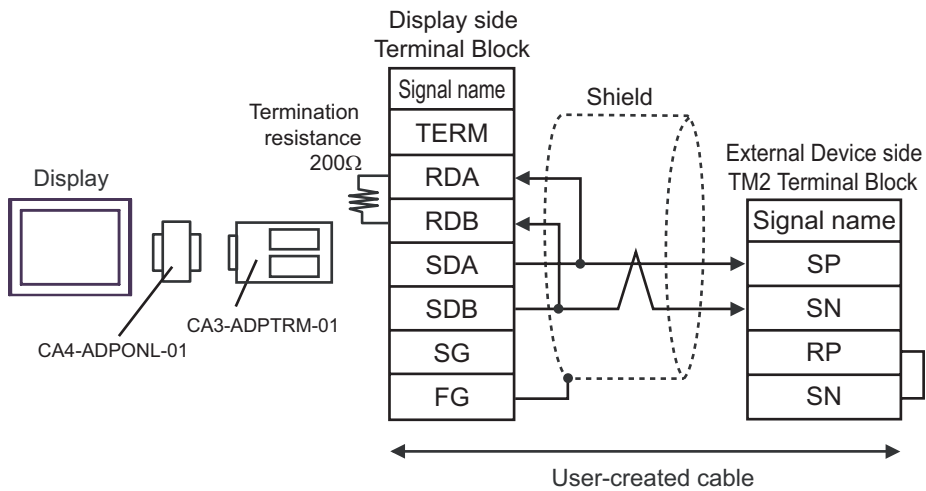
- 1:n Connection
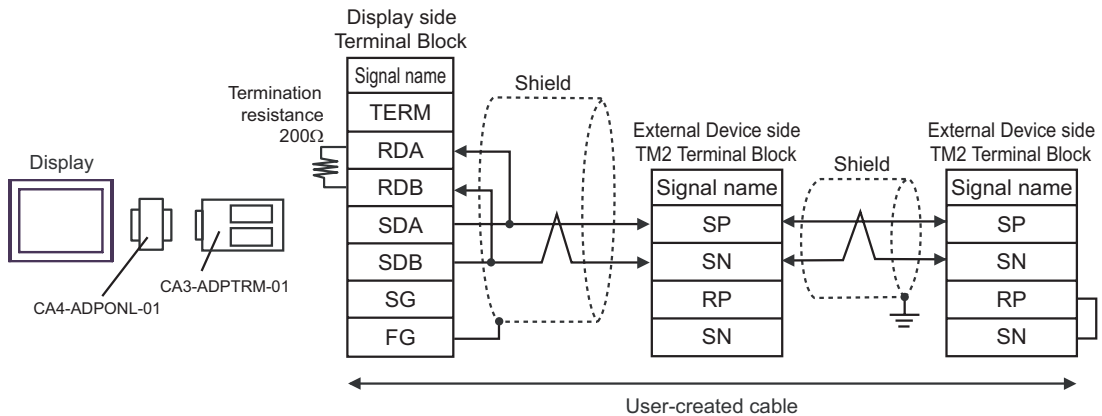
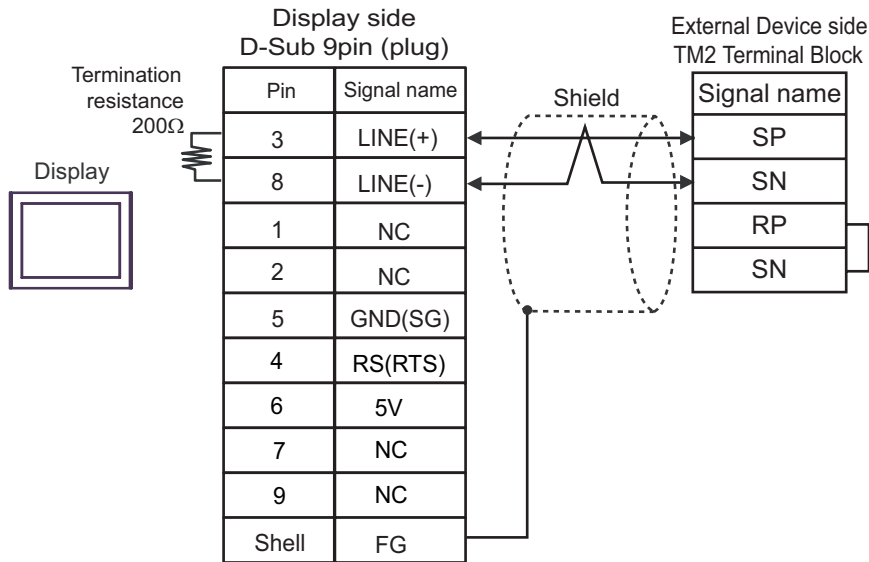| NOTE	• Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal.

2D)

• 1:1 Connection

Display side
D-Sub 9pin (plug)

Pin	Signal name
1	TERMRX
2	RDA
7	RDB
3	SDA
8	SDB
9	TERMTX
5	SG
Shell	FG

External Device side
TM2 Terminal Block

Signal name
SP
SN
RP
SN

User-created cable

• 1:n Connection

Display side
D-Sub 9pin (plug)

Pin	Signal name
1	TERMRX
2	RDA
7	RDB
3	SDA
8	SDB
9	TERMTX
5	SG
Shell	FG

External Device side
TM2 Terminal Block

Signal name
SP
SN
RP
SN

External Device side
TM2 Terminal Block

Signal name
SP
SN
RP
SN

User-created cable

NOTE	• Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal.

2E)

- 1:1 Connection

- 1:n Connection

| NOTE | • Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal. |

2F)

- 1:1 Connection

- 1:n Connection

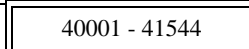| NOTE | • Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal. |

2G)

• 1:1 Connection

• 1:n Connection

| NOTE | • Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal. |

*1   The resistance in the Display is used as the termination resistance. Set the value of the DIP Switch on the rear of the Display as shown in the table below.

DIP Switch No.	Set Value
1	OFF
2	OFF
3	OFF
4	ON

2H)

- 1:1 Connection

- 1:n Connection
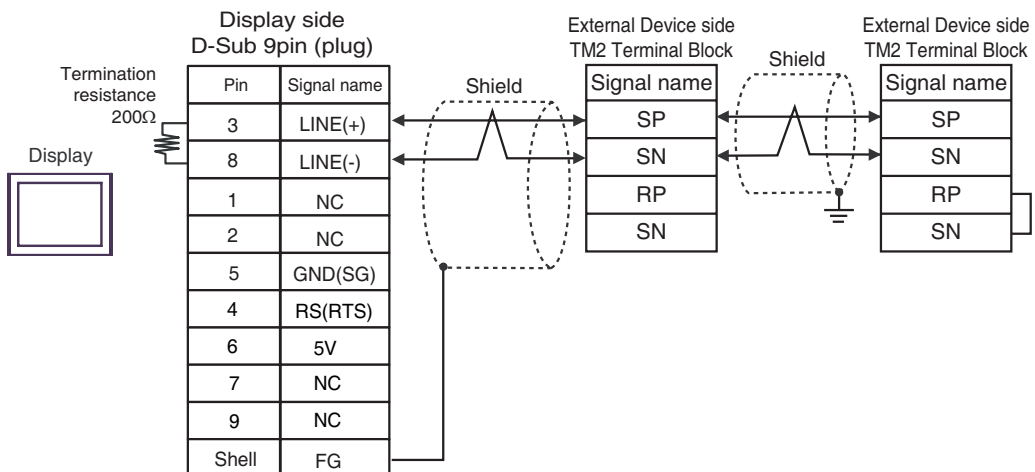
| IMPORTANT | • The 5V output (Pin #6) on the GP-4107 is the power for the Siemens AG's PROFIBUS connector. Do not use it for other devices. |

| NOTE | • Enable termination resistance by short-circuiting the terminatory External Device's RP terminal and the terminatory External Device's SN terminal.
• In COM on the GP-4107, the SG and FG terminals are isolated. |

6　　Supported Devices

The following table shows the range of supported device addresses. 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 External Device.

6.1　　X200 series

　　　　　　　　　　　　　　　This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Notes
Coil	00001 - 0001F	00001	H / L	*1
Holding register	-	40001 - 41544		Bit F

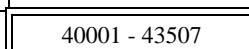*1　Specify only the word address whose last digit is "1" .

NOTE

- Holding register number 0900h is an address for the command (enter command) to write in nonvolatile memory. By writing "1" in 0900h, writing to nonvolatile memory is enabled.
- You can only set the Read Area Size for the system area available to use in the External Device. Please refer to the GP Pro-EX Reference Manual for Read Area Size.
  Cf.　GP Pro-EX Reference Manual "LS Area (Direct Access Method)"
- Refer to the precautions on manual notation for icons in the table.

  ☞ "Manual Symbols and Terminology"

6.2　　SJ700 series

　　　　　　　　　　　　　　　This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Notes
Coil	00001 - 0004E	00001 - 00031	H / L	*1
Holding register	-	40001 - 43507		Bit F

*1　Specify only the word address whose last digit is "1".

NOTE

- Holding register number 0900h is an address for the command (enter command) to write in nonvolatile memory. By writing "1" in 0900h, writing to nonvolatile memory is enabled.
- You can only set the Read Area Size for the system area available to use in the External Device. Please refer to the GP Pro-EX Reference Manual for Read Area Size.
  Cf.　GP Pro-EX Reference Manual "LS Area (Direct Access Method)"
- Refer to the precautions on manual notation for icons in the table.

  ☞ "Manual Symbols and Terminology"

6.3　　SJ700-2 series

☐ This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Notes
Coil	00001 - 00052	00001 - 00041	[H / L]	*1
Holding register	-	40001 - 43507		[Bit]F

*1　Specify only the word address whose last digit is "1".

NOTE
- Holding register number 0900h is an address for the command (enter command) to write in nonvolatile memory. By writing "1" in 0900h, writing to nonvolatile memory is enabled.
- You can only set the Read Area Size for the system area available to use in the External Device. Please refer to the GP Pro-EX Reference Manual for Read Area Size.
  Cf.　GP Pro-EX Reference Manual "LS Area (Direct Access Method)"
- Refer to the precautions on manual notation for icons in the table.

☞ "Manual Symbols and Terminology"

6.4　　SJ200 series

☐ This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Notes
Coil	00000 - 0001F	00000 - 00010	[H / L]	[***0]
Holding register	-	40000 - 40900		[Bit]F

NOTE
- Holding register number 0900h is an address for the command (enter command) to write in nonvolatile memory. By writing "1" in 0900h, writing to nonvolatile memory is enabled.
- You can only set the Read Area Size for the system area available to use in the External Device. Please refer to the GP Pro-EX Reference Manual for Read Area Size.
  Cf.　GP Pro-EX Reference Manual "LS Area (Direct Access Method)"
- Refer to the precautions on manual notation for icons in the table.

☞ "Manual Symbols and Terminology"

6.5 L200 series

This address can be specified as system data area.

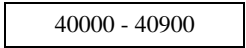| Device	Bit Address	Word Address	32bits	Notes
Coil	00000 - 0001F	00000 - 00010	H / L	$\boxed{***\textbf{0}}$
Holding register	-	40000 - 40900		$\boxed{\text{Bit}\,\textbf{F}}$

NOTE

- Holding register number 0900h is an address for the command (enter command) to write in nonvolatile memory. By writing "1" in 0900h, writing to nonvolatile memory is enabled.
- You can only set the Read Area Size for the system area available to use in the External Device. Please refer to the GP Pro-EX Reference Manual for Read Area Size.

  Cf. GP Pro-EX Reference Manual "LS Area (Direct Access Method)"
- Refer to the precautions on manual notation for icons in the table.

  ☞ "Manual Symbols and Terminology"

7   Device Code and Address Code

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

7.1   X200 series

Device	Device Name	Device Code (HEX)	Address Code
Coil	0	0080	Value of (word address -1) divided by 0x10
Holding register	4	0000	Value of (word address - 1)

7.2   SJ700 series

Device	Device Name	Device Code (HEX)	Address Code
Coil	0	0080	Value of (word address -1) divided by 0x10
Holding register	4	0000	Value of (word address - 1)

7.3   SJ700-2 series

Device	Device Name	Device Code (HEX)	Address Code
Coil	0	0080	Value of (word address -1) divided by 0x10
Holding register	4	0000	Value of (word address - 1)

7.4   SJ200 series

Device	Device Name	Device Code (HEX)	Address Code
Coil	0	0080	Value of word address divided by 0x10
Holding register	4	0000	Word Address

7.5   L200 series

Device	Device Name	Device Code (HEX)	Address Code
Coil	0	0080	Value of word address divided by 0x10
Holding register	4	0000	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 number
Device Name	Name of the External Device where an error has occurred. Device/PLC 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. **NOTE** • IP address is displayed as "IP address (Decimal): MAC address (Hex)". • Device address is displayed as "Address: Device address". • Received error codes are displayed as "Decimal [Hex]".

Examples of Error Messages

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

NOTE
- Refer to your External Device manual for details on received error codes.
- Refer to "When an error is displayed (Error Code List)" in "Maintenance/Troubleshooting Manual" for details on the error messages common to the driver.

■ Error Codes Unique to External Device

Error Code	Description
02h	The specified address does not exist.
21h	Invalid data is written in the inverter's holding register.
22h	These specified functions are not available to the inverter: • Attempted to change the content of a register that cannot be changed while the inverter is in service. • Attempted to use an ENTER command during running (UV). • Attempted to write in a register during tripping (UV). • Attempted to write in a register with software lock enabled.
23h[1]	Attempted to write in a register with software lock enabled.

[1]   The error code is only supported by X200 series.