Fuji Electric Corporation

MICREX-F Series SIO Driver

Introduction

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

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

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

| 2 | Selection of External Device
Select a model (series) of the External Device to be connected and connection method. | ☞"2 Selection of External Device" (page 7) |

| 3 | Example of Communication Settings
This section shows setting examples for communicating between the Display and the External Device. | ☞"3 Example of Communication Setting" (page 8) |

| 4 | Setup Items
This section describes communication setup items on the Display.
Set communication settings of the Display with GP-Pro Ex or in off-line mode. | ☞"4 Setup Items" (page 24) |

| 5 | Cable Diagram
This section shows cables and adapters for connecting the Display and the External Device. | ☞"5 Cable Diagram" (page 29) |

Operation

1　　System Configuration

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

Series	CPU	Link I/F	SIO Type	Setting Example		Cable Diagram
				File	Switch	
MICREX-F	F80H F120H F250	RS232C interface on FFU120B	RS232C	Setting Example 1 (page 8)	Setting Example 2 (page 11)	Cable Diagram 1 (page 29)
		RS485 interface on FFU120B	RS422/485 (4wire)	Setting Example 3 (page 13)	Setting Example 4 (page 16)	Cable Diagram 2 (page 31)
	F30 [*1] F50 [*1] F60 F70 F70S F80 F80H F81 F120 F120H F120S F200 F250	RS232C interface on FFK120A-C10	RS232C	Setting Example 1 (page 8)	Setting Example 5 (page 18)	Cable Diagram 1 (page 29)
		RS485 interface on FFK120A-C10	RS422/485 (4wire)	Setting Example 3 (page 13)	Setting Example 6 (page 20)	Cable Diagram 2 (page 31)
		FFK100A-C10 [*2]	RS232C	---	Setting Example 7 (page 22)	Cable Diagram 3 (page 39)
	F70 F70S	NC1L-RS2 [*2] [*3]	RS232C	Setting Example 1 (page 8)	Setting Example 2 (page 11)	Cable Diagram 4 (page 40)

*1　When you use F30 or F50 for T link connection, T link master adaptor (FTM050A) is necessary.

*2　You cannot use FFK100A-C10 or NC1L-RS2 in 1:n configuration.

*3　When you install 2 link units on the extension base unit created by T link function based on the basic base unit of the External Device, you can connect the Display on either of 2 link units (simultaneous connection on both 2 link units are not available). When you install 2 basic base units, simultaneous connection on both 2 link units are available.
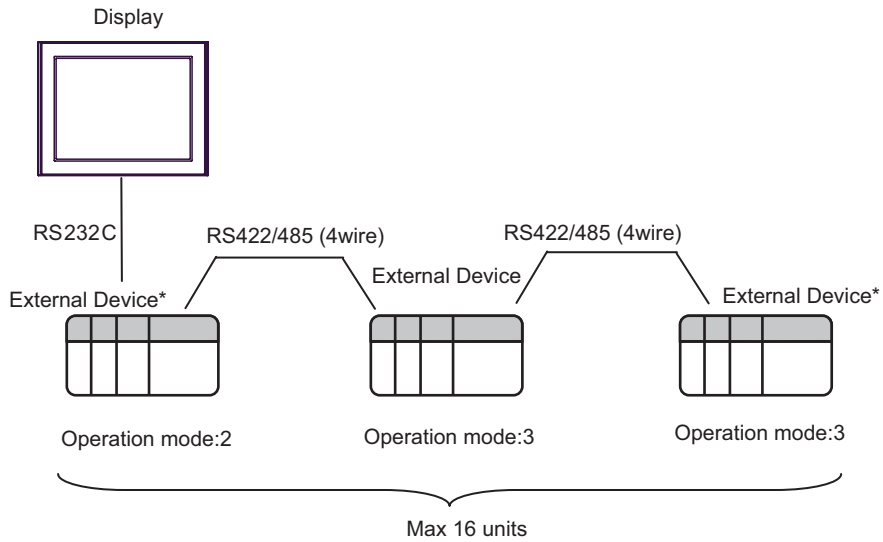
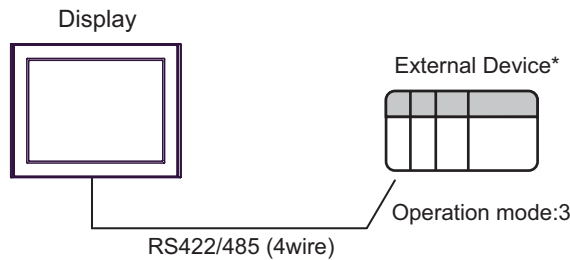## ■ Connection Configuration

◆ RS232C

- 1:1 Connection
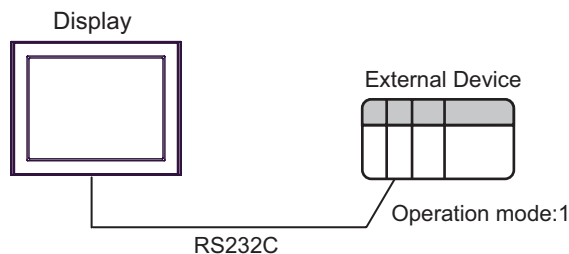
• 1:n Connection

* Turn ON the termination resistance switch on the interface which terminates the RS422 connection.
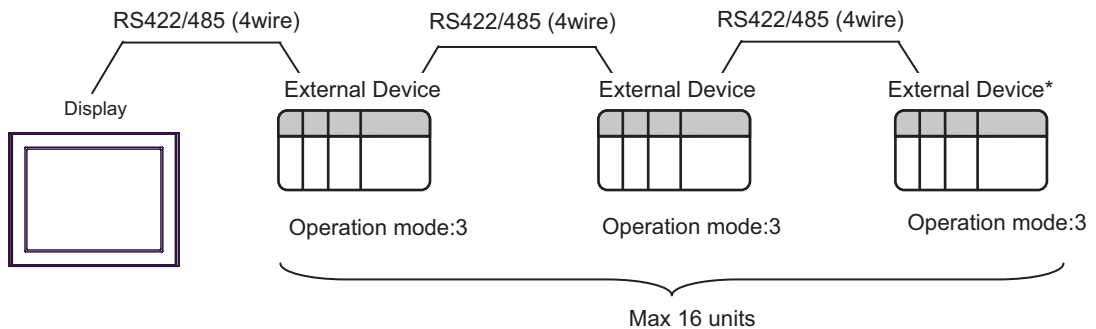
◆ RS422/485 (4wire)

• 1:1 Connection

* Turn ON the termination resistance switch on the External Device interface.

• 1:n Connection

* Turn ON the termination resistance switch on the interface which terminates the RS422 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, 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.
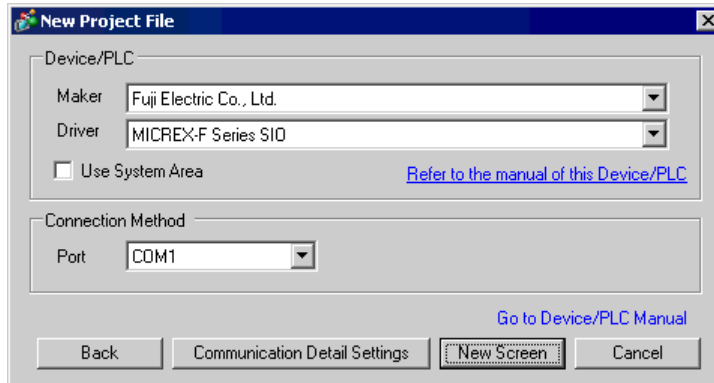
DIP switch setting: RS-422/485 (4 wire)

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 Selection of External Device

Select the External Device to be connected to the Display.

Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "Fuji Electric Corporation".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "MICREX-F Series SIO". Check the External Device which can be connected in "MICREX-F Series SIO" in system configuration.)"1 System Configuration" (page 3)
Use System Area	Check this option when you synchronize the system data area of Display and the device (memory) of External Device. When synchronized, you can use the ladder program of External Device to switch the display or display the window on the display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (Direct Access Method)" This can be also set with GP-Pro EX or in off-line mode of Display. Cf. GP-Pro EX Reference Manual " 5.17.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. Maintenance/Troubleshooting "2.15.1 Settings common to all Display models◆System Area Settings"
Port	Select the Display port to be connected to the External Device.

3   Example of Communication Setting

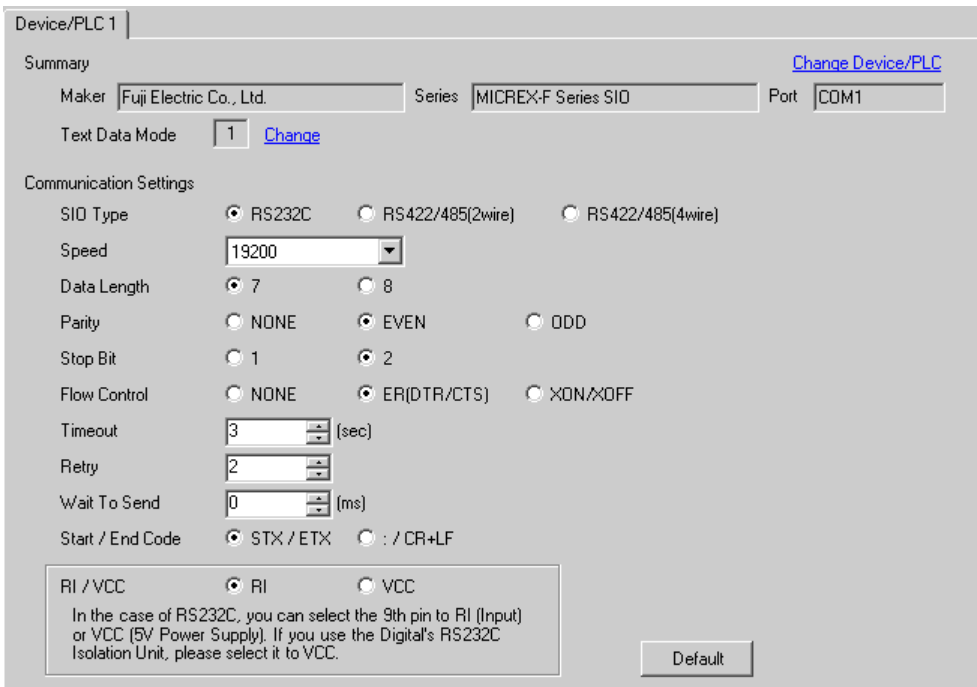Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

When you use the MICREX-F Series, use GP-Pro EX and the ladder software to set as below.

3.1   Setting Example 1
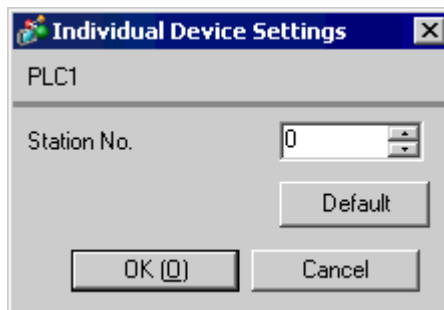
■ Settings of GP-Pro EX

◆ Communication Settings

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

◆ Device Setting

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

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

■ Setting of External Device

(1) Turn OFF the DIP switch No.8 "Initialization method" on the rear panel of general-purpose interface module of the External Device. Other settings are not necessary. The DIP switch setting will be effective after restart. Use the rotary switch for MODE setting.

No.	Setup Items	Setup Description
1	No need	Unused
2	No need	
3	No need	
4	No need	
5	No need	
6	No need	
7	No need	
8	OFF	Initial file setting effective

(2) Set the mode switch key of the External Device body to [TERM].

(3) Startup the ladder software. Execute [New File] from the [File] menu.

(4) Select the model of the External Device to use.

(5) Create the default file in the data table. Please refer to the manual of the External Device for the default file number or the setting method. When you select MODE2 or 3, use the rotary switch to specify the same number as the station No. in the device setting. The setting is not necessary for MODE1 (RS232C 1:1 connection). Please refer to the connection configuration diagrams for more details.

Setup Items	Setup Description	Notes
MODE switch	Depending on connection type	Set by the rotary switch
Station No.	Depending on connection type	
Transmission Procedure	No procedure	Set by the initial file
Mode	Settings	
Baud rate	19200	
Data Bit	7	
Parity Bit	Even	
Stop Bit	2	
DCE/DTE	DCE	
CTS/RTS	Always ON	
DSR/DTR	Always ON	
Send Condition	None	
PK Access	Enable	
Transmission Code	JIS	
Code Conversion	Enable	
Head Code	STX	
End Code	ETX	
Head Code 1, 2	0	
End Code 1, 2	0	
BCC	None	

(6) Select [Transfer] from the [File] menu to transfer to the External Device body.

(7) After the transfer is completed, restart the External Device.

3.2 Setting Example 2

■ Settings of GP-Pro EX

◆ Communication Settings

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

| Device/PLC 1 |

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	0 (ms)		
Start / End Code	○ STX / ETX	⦿ / CR+LF	

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 Setting

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

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

Individual Device Settings

PLC1

| Station No. | 0 |

Default

OK (O)   Cancel

■ Setting of External Device

Turn ON the DIP switch No.8 "Initialization method" on the rear panel of general-purpose interface module of the External Device. When you perform the settings with the switch, the head code, end code and send condition will be fixed. Use the rotary switch for MODE setting. When you select MODE2 or 3, use the rotary switch to specify the same number as the station No. in the device setting. The setting is not necessary for MODE1 (RS232C 1:1 connection). Please refer to the connection configuration diagrams for more details.

No.	Setup Items	Setup Description
1	OFF	
2	ON	Baud rate = 19200
3	ON	
4	OFF	Stop bit length = 2
5	ON	Data bit length = 7
6	ON	Parity bit = Even
7	ON	Parity bit = Enable
8	ON	Switch setting effective

Setup Items	Setup Description	Notes
MODE switch	Depending on connection type	Set by the rotary switch
Station No.	Depending on connection type	
Send Condition	None	Fixed
Head Code	:	
End Code	CR/LF	

3.3   Setting Example 3

■ Settings of GP-Pro EX

◆ Communication Settings

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

◆ Device Setting

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

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

■ Setting of External Device

(1) Turn OFF the DIP switch No.8 "Initialization method" on the rear panel of general-purpose interface module of the External Device. Other settings are not necessary. The DIP switch setting will be effective after restart. Use the rotary switch for MODE setting.

No.	Setup Items	Setup Description
1	No need	
2	No need	
3	No need	
4	No need	Unused
5	No need	
6	No need	
7	No need	
8	OFF	Initial file setting effective

(2) Set the mode switch key of the External Device body to [TERM].

(3) Startup the ladder software. Execute [New File] from the [File] menu.

(4) Select the model of the External Device to use.

(5) Create the default file in the data table. Please refer to the manual of the External Device for the default file number or the setting method.

Use the rotary switch to specify the same number as the station No. in the device setting. Please refer to the connection configuration diagrams for more details.

Setup Items	Setup Description	Notes
MODE switch	3	Set by the rotary switch
Station No.	Depending on connection type	
Transmission Procedure	No procedure	Set by the initial file
Mode	Settings	
Baud rate	19200	
Data Bit	7	
Parity Bit	Even	
Stop Bit	2	
DCE/DTE	DCE	
CTS/RTS	Always ON	
DSR/DTR	Always ON	
Send Condition	None	
PK Access	Enable	
Transmission Code	JIS	
Code Conversion	Enable	
Head Code	STX	
End Code	ETX	
Head Code 1, 2	0	
End Code 1, 2	0	
BCC	None	

(6) Select [Transfer] from the [File] menu to transfer to the External Device body.

(7) After the transfer is completed, restart the External Device.

3.4   Setting Example 4

■ Settings of GP-Pro EX

◆ Communication Settings

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

Device/PLC 1		
Summary		Change Device/PLC
Maker Fuji Electric Co., Ltd.	Series MICREX-F Series SIO	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	0 ÷ (ms)		
Start / End Code	○ STX / ETX	⊙ : / CR+LF	

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 Setting

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

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

Individual Device Settings   ✕

PLC1

Station No.	0 ÷
	Default
OK (O)	Cancel

■ Setting of External Device

Turn ON the DIP switch No.8 "Initialization method" on the rear panel of general-purpose interface module of the External Device. When you perform the settings with the switch, the head code, end code and send condition will be fixed. Use the rotary switch for MODE setting. Use the rotary switch to specify the same number as the station No. in the device setting. Please refer to the connection configuration diagrams for more details.

No.	Setup Items	Setup Description
1	OFF	Baud rate = 19200
2	ON	
3	ON	
4	OFF	Stop bit length = 2
5	ON	Data bit length = 7
6	ON	Parity bit = Even
7	ON	Parity bit = Enable
8	ON	Switch setting effective

Setup Items	Setup Description	Notes
MODE switch	3	Set by the rotary switch
Station No.	Depending on connection type	
Send Condition	None	Fixed
Head Code	:	
End Code	CR/LF	

3.5　　Setting Example 5

■ Settings of GP-Pro EX

◆ Communication Settings

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

◆ Device Setting

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

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

■ Setting of External Device

Turn ON the DIP switch No.8 "Initialization method" on the rear panel of general-purpose interface module of the External Device. When you perform the settings with the switch, the head code, end code and send condition will be fixed. Use the rotary switch for MODE setting. When you select MODE2 or 3, use the rotary switch to specify the same number as the station No. in the device setting. The setting is not necessary for MODE1 (RS232C 1:1 connection). Please refer to the connection configuration diagrams for more details.

◆ Settings of Character Configuration Switch

No.	Setup Items	Setup Description
1	OFF	Unused
2	OFF	
3	OFF	
4	OFF	Stop bit length = 2
5	ON	Data bit length = 7
6	ON	Parity bit = Even
7	ON	Parity bit = Enable
8	ON	Switch setting effective

◆ Baud Rate Setting Switch

No.	Setup Items	Setup Description
1	OFF	Always set to OFF.
2	OFF	
3	OFF	
4	OFF	
5	OFF	
6	OFF	
7	ON	Baud rate = 19200
8	OFF	Unused

Setup Items	Setup Description	Notes
MODE switch	Depending on connection type	Set by the rotary switch
Station No.	Depending on connection type	
Send Condition	None	Fixed
Head Code	:	
End Code	CR/LF	

3.6 Setting Example 6

■ Settings of GP-Pro EX

◆ Communication Settings

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

◆ Device Setting

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

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

■ Setting of External Device

Turn ON the DIP switch No.8 "Initialization method" on the rear panel of general-purpose interface module of the External Device. When you perform the settings with the switch, the head code, end code and send condition will be fixed. Use the rotary switch for MODE setting. Use the rotary switch to specify the same number as the station No. in the device setting. Please refer to the connection configuration diagrams for more details.

◆ Settings of Character Configuration Switch

No.	Setup Items	Setup Description
1	OFF	Unused
2	OFF	
3	OFF	
4	OFF	Stop bit length = 2
5	ON	Data bit length = 7
6	ON	Parity bit = Even
7	ON	Parity bit = Enable
8	ON	Switch setting effective

◆ Baud Rate Setting Switch

No.	Setup Items	Setup Description
1	OFF	Always set to OFF.
2	OFF	
3	OFF	
4	OFF	
5	OFF	
6	OFF	
7	ON	Baud rate = 19200
8	OFF	Unused

Setup Items	Setup Description	Notes
MODE switch	3	Set by the rotary switch
Station No.	Depending on connection type	
Send Condition	None	Fixed
Head Code	:	
End Code	CR/LF	

3.7   Setting Example 7

■ Settings of GP-Pro EX

◆ Communication Settings

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

◆ Device Setting

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

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

■ Setting of External Device

Perform the communication settings of the External Device in the default file. Create the default file in the data table. Please refer to the manual of the External Device for the default file number or the setting method.

Setup Items	Setup Description	Notes
Transmission Procedure	No procedure	Set by the initial file
Mode	Settings	
Baud rate	9600	
Data Bit	7	
Parity Bit	Even	
Stop Bit	2	
DCE/DTE	DCE	
CTS/RTS	Always ON	
DSR/DTR	Always ON	
Send Condition	None	
PK Access	Disabled	
Transmission Code	JIS	
Code Conversion	Enable	
Head Code	STX	
End Code	ETX	
BCC	None	
Position	TEXT	
Formula	Sum	
Code	Transmission Code	

4   Setup Items

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

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

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

4.1   Setup Items in GP-Pro EX

■ Communication Settings

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

Setup Items	Setup Description
SIO Type	Select the SIO type to communicate with the External Device.
Speed	Select speed between the External Device and the Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.
Timeout	Use an integer from 1 to 127 to enter the time (s) for which 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.
Start/End Code	Select the start/end code for data.
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for SIO type. It is necessary to change RI/5V by changeover switch of IPC when connect with IPC. Please refer to the manual of the IPC for more detail.

■ Device Setting

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

When [Allowable No. of Device/PLCs] is multiple, click ░ from [Device-Specific Settings] of [Device/PLC Settings] to add another External Device.
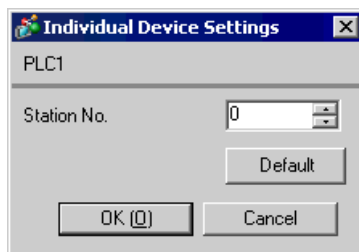
Setup Items	Setup Description
Station No.	Enter a station number of the External Device, using 0 to 99.

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 "2.2 Off-line Mode"

■ Communication Settings

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

Setup Items	Setup Description
SIO Type	Select the SIO type to communicate with the External Device. IMPORTANT To make the communication settings correctly, confirm the serial interface specifications of Display unit for [SIO Type]. We cannot guarantee the operation if a communication type that the serial interface does not support is specified. For details concerning the serial interface specifications, refer to the manual for Display unit.
Speed	Select speed between the External Device and the Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.
Timeout (s)	Use an integer from 1 to 127 to enter the time (s) for which 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.

Setup Items	Setup Description
Wait To Send (ms)	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.
Start/End Code	Select the start/end code for data.

■ Device Setting

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

Setup Items	Setup Description
Device/PLC Name	Select the External Device for device setting. Device name is a title of External Device set with GP-Pro EX.(Initial value [PLC1])
Station No.	Enter a station number of the External Device, using 0 to 99.

■ Option

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

Comm.	Device	Option		

MICREX-F Series SIO   [COM1]   Page 1/1

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

	Exit		Back	2005/09/02 13:21:02

Setup Items	Setup Description
RI/VCC	Switch the 9th pin setting when you select RS232C for SIO type. It is necessary to change RI/5V by changeover switch of IPC when connect with IPC. Please refer to the manual of the IPC for more detail.

5　　Cable Diagram

The cable diagram shown below may be different from the cable diagram recommended by Fuji Electric

Corporation. Please be assured there is no operational problem in applying the cable diagram shown in this

manual.

- The FG pin of the External Device body must be D-class grounded. Please refer to the manual of the External Device for more details.
- SG and FG are connected inside the Display. When connecting SG to the External Device, design the system not to form short-circuit loop.
- Connect the isolation unit, when communication is not stabilized under the influence of a noise etc.

Cable Diagram 1

Display (Connection Port)		Cable	Notes
GP (COM1) ST (COM1) IPC[*1] PC/AT	A	RS232C cable by Pro-face CA3-CBL232/5M-01 (5m)	For 1:1 connection, set the operation mode on the interface to 1. For 1:n connection, set the operation mode for the External Device connected to the Display with RS232C to 2, and for other Devices to 3.
	B	Your own cable	

*1　Only the COM port which can communicate by RS-232C can be used.
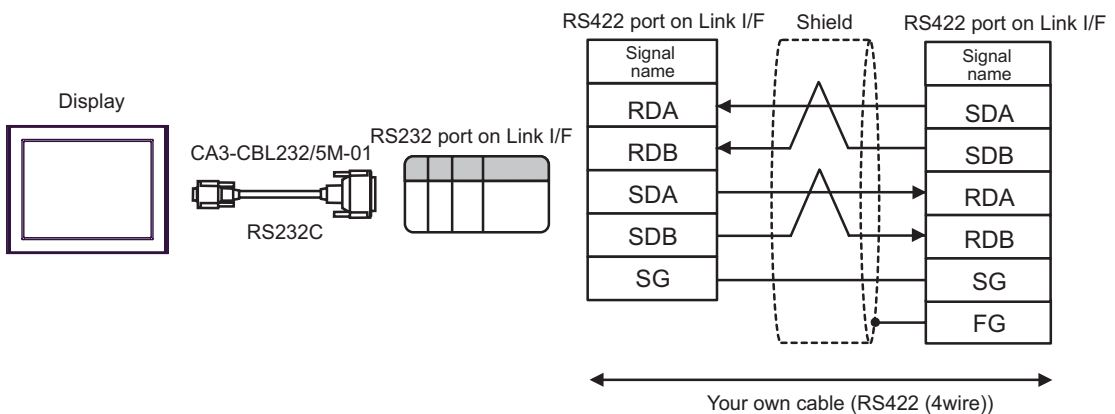
☞ ■ IPC COM Port (page 5)

A)　When using the RS232C cable (CA3-CBL232/5M-01) by Pro-face

- 1:1 Connection
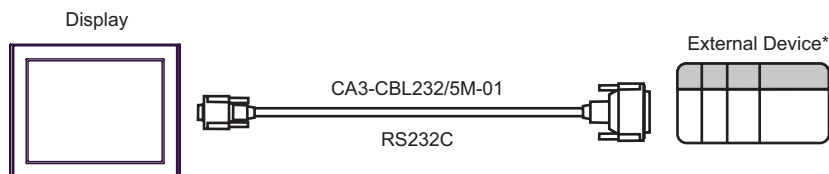
*　Set the operation mode on the External Device interface to 1.
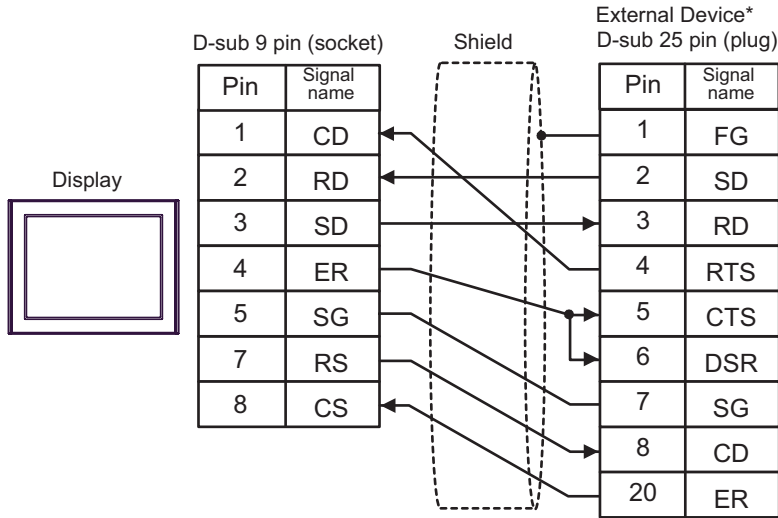
- 1:n connection

Your own cable (RS422 (4wire))

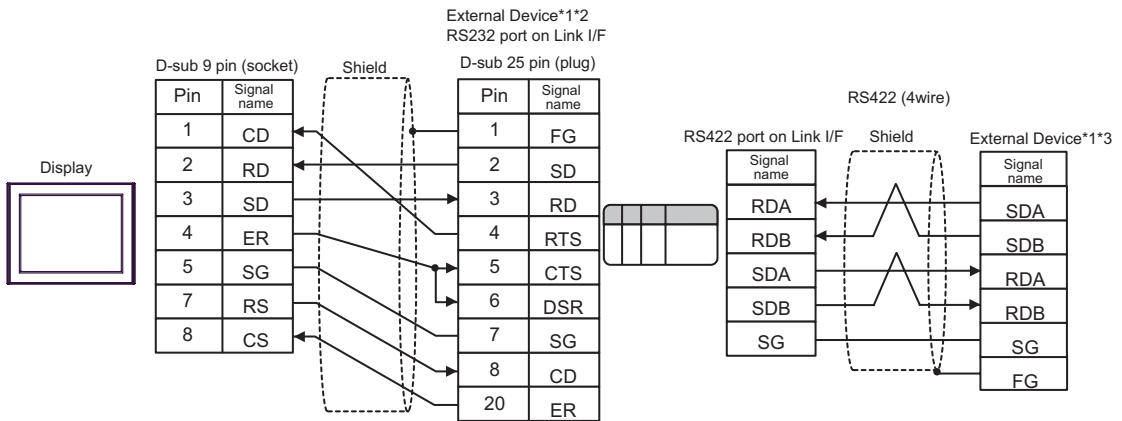| NOTE	• Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.
	• For the 1st External Device connected with RS232C and RS422, set the operation mode on the Link I/F to 2. For the following External Devices connected with RS422, set it to 3.

B) When using your own cable

• 1:1 Connection

D-sub 9 pin (socket) — External Device* D-sub 25 pin (plug)

Pin	Signal name		Pin	Signal name
1	CD		1	FG
2	RD		2	SD
3	SD		3	RD
4	ER		4	RTS
5	SG		5	CTS
7	RS		6	DSR
8	CS		7	SG
			8	CD
			20	ER

*   Set the operation mode on the External Device interface to 1.

• 1:n Connection

*1   Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

*2   Set the operation mode on the External Device interface to 2.

*3   Set the operation mode on the External Device interface to 3.

Cable Diagram 2

Display (Connection Port)		Cable	Notes
GP*1 (COM1) AGP-3302B (COM2) ST*2 (COM2) IPC*3	A	RS422 cable by Pro-face CA3-CBL422/5M-01 (5m)	Turn ON the termination resistance switch on the External Device which terminates the RS422 connection. Set the operation MODE to 3.
	B	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + Your own cable	
	C	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + 422 cable for GP by Pro-face CA3-CBL422-01 (5m)	
	D	Your own cable	
GP*4 (COM2)	E	Online adapter by Pro-face CA4-ADPONL-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + Your own cable	
	F	Online adapter by Pro-face CA4-ADPONL-01 + 422 cable by Pro-face CA3-CBL422-01 (5m)	
	G	Online adapter by Pro-face CA4-ADPONL-01 + Your own cable	

*1   All GP models except AGP-3302B

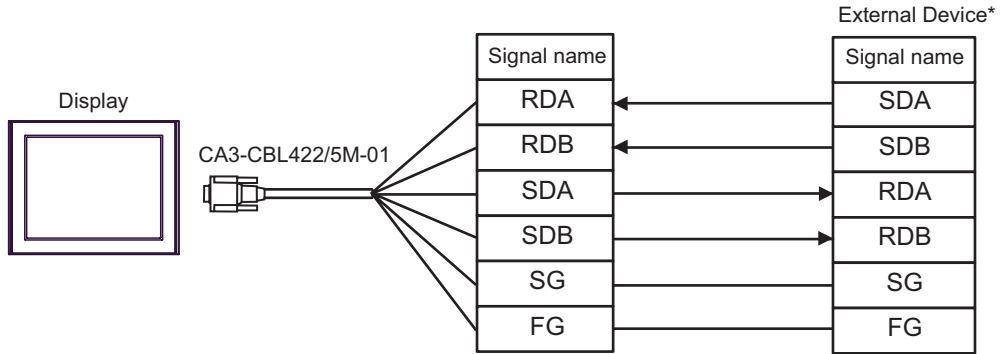*2   All ST models except AST-3211A

*3   Only the COM port which can communicate by RS-422/485 (4 wire) can be used.
     ☞ ■ IPC COM Port (page 5)

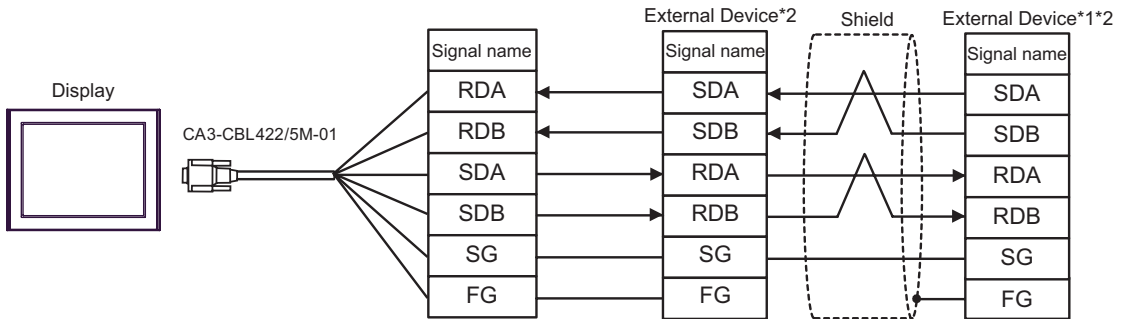*4   All GP models except GP-3200 series and AGP-3302B

A) When using the RS422 cable (CA3-CBL422/5M-01) by Pro-face

• 1:1 Connection

*Turn On the termination resistance switch of the External Device, and set the operation mode to 3.
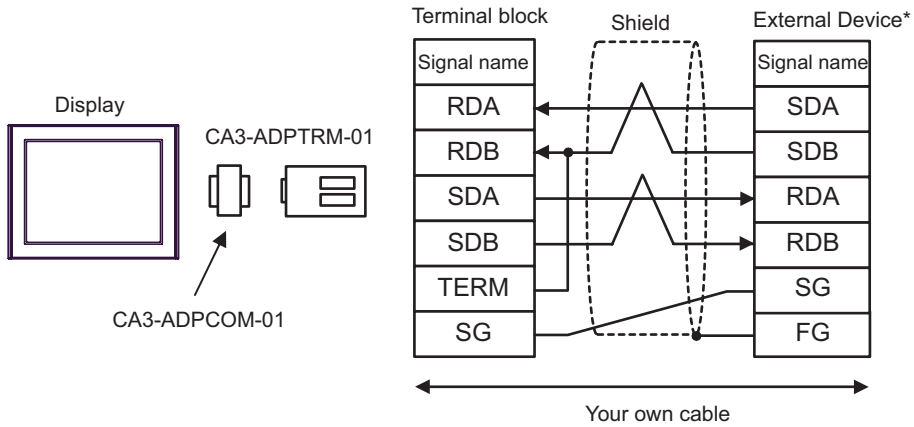
• 1:n Connection

*1   Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

*2   Set the operation mode on the External Device interface to 3.

B) When using the COM port conversion adapter (CA3-ADPCOM-01), the terminal block conversion adapter (CA3-ADPTRM-01) by Pro-face and your own cable

• 1:1 Connection

* Turn On the termination resistance switch of the External Device, and set the operation mode to 3.

• 1:n Connection

*1 Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

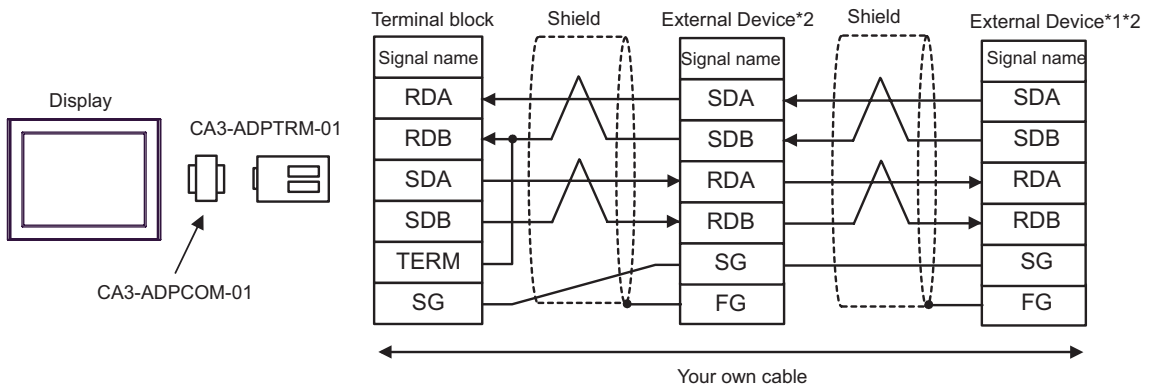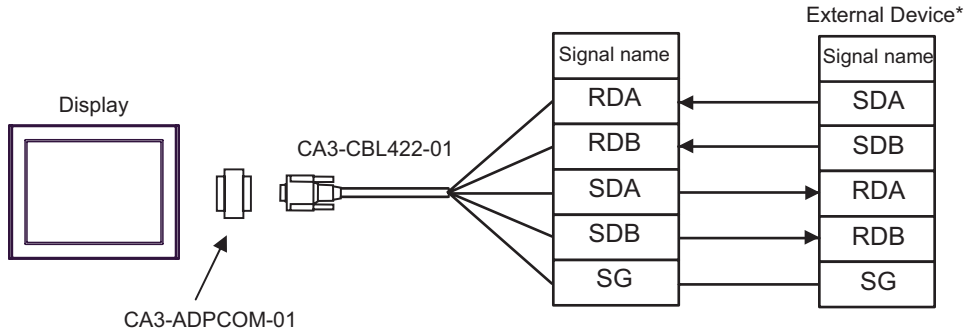*2 Set the operation mode on the External Device interface to 3.

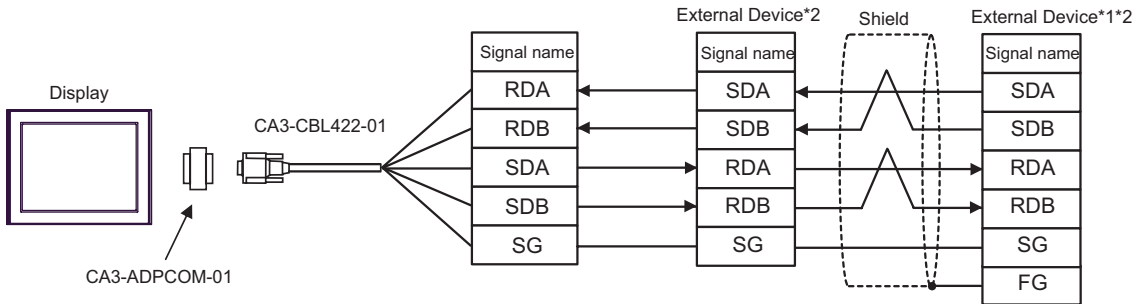C) When using the COM port conversion adapter (CA3-ADPCOM-01), the 422 cable (CA3-CBL422-01) by Pro-face

• 1:1 Connection

Do not connect the FG terminal of CA3-CBL422-01 to the External Device.

* Turn On the termination resistance switch of the External Device, and set the operation mode to 3.
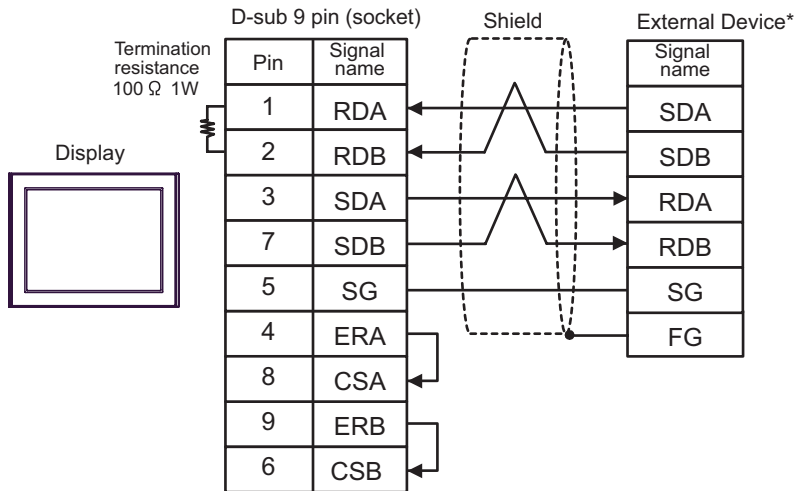
• 1:n Connection

Do not connect the FG terminal of CA3-CBL422-01 to the External Device.

*1 Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

*2 Set the operation mode on the External Device interface to 3.

D) When using your own cable

- 1:1 Connection

* Turn On the termination resistance switch of the External Device, and set the operation mode to 3.

1:n Connection

*1 Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

*2 Set the operation mode on the External Device interface to 3.

E) When using the online adapter (CA4-ADPONL-01), the 422 cable (CA3-CBL422-01) by Pro-face

• 1:1 Connection

* Turn On the termination resistance switch of the External Device, and set the operation mode to 3.

• 1:n Connection

*1 Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

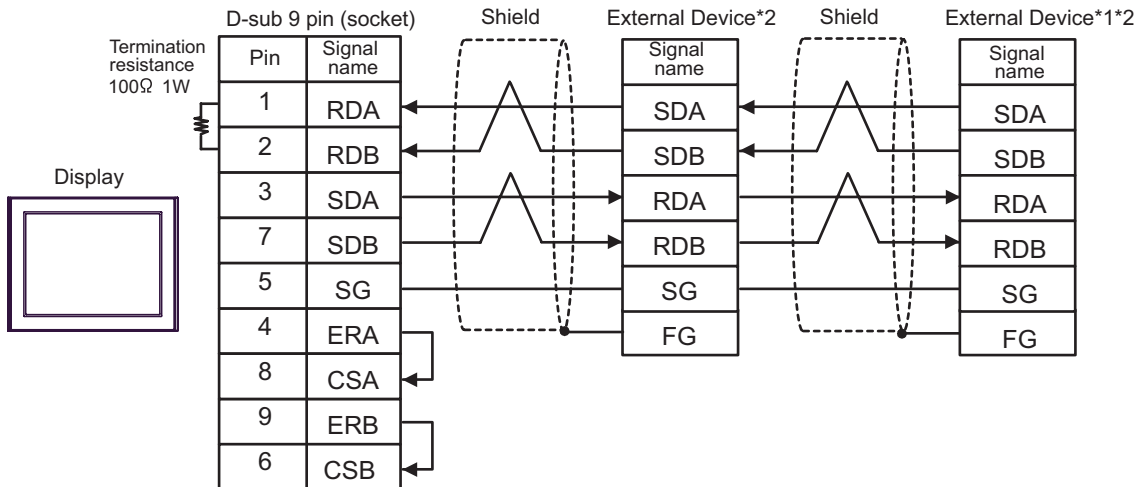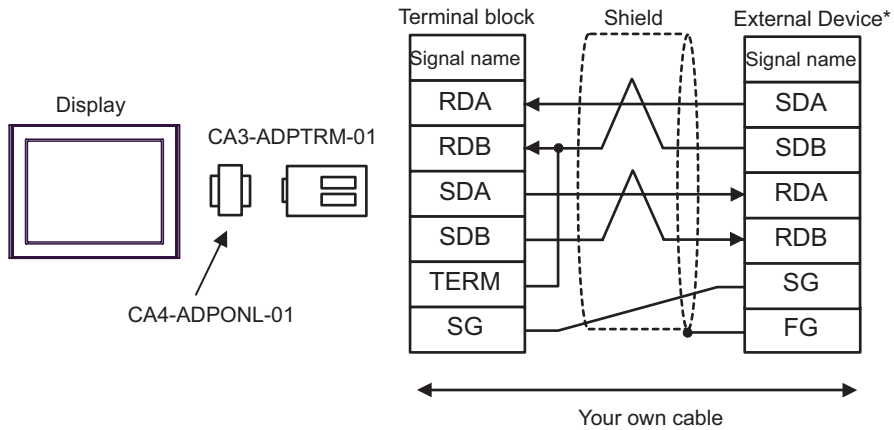*2 Set the operation mode on the External Device interface to 3.

F) When using the online adapter (CA4-ADPONL-01), the 422 cable (CA3-CBL422-01) by Pro-face

• 1:1 Connection

Do not connect the FG terminal of CA3-CBL422-01 to the External Device.

* Turn On the termination resistance switch of the External Device, and set the operation mode to 3.
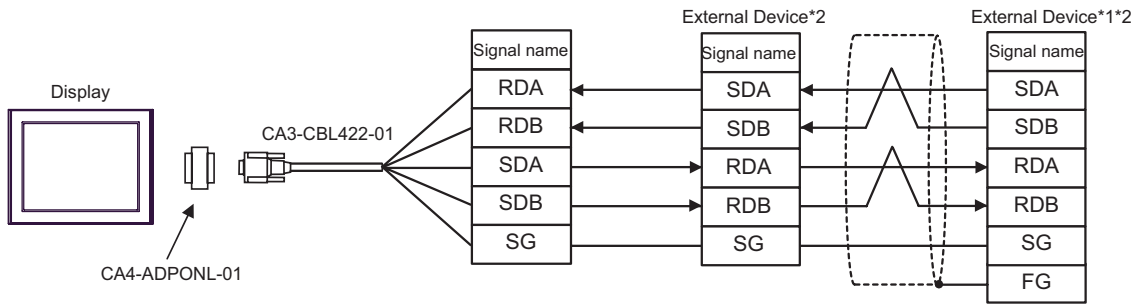
• 1:n Connection

Do not connect the FG terminal of CA3-CBL422-01 to the External Device.

*1   Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

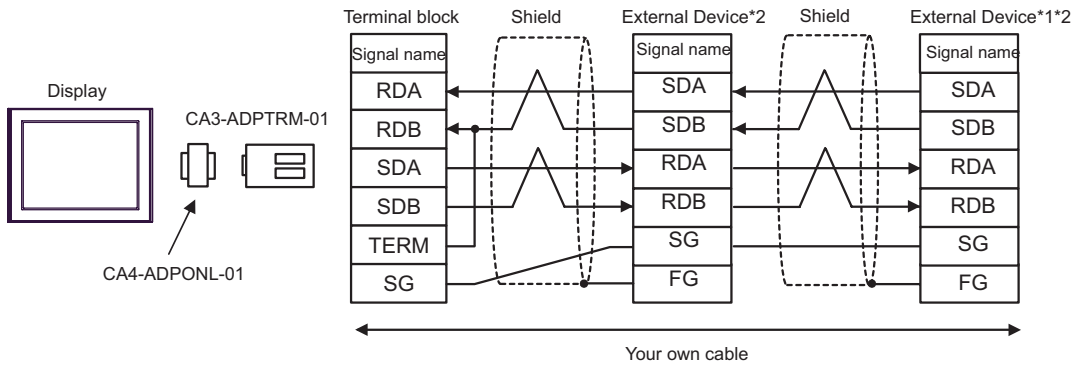*2   Set the operation mode on the External Device interface to 3.

G) When using the online adapter (CA4-ADPONL-01) by Pro-face and your own cable
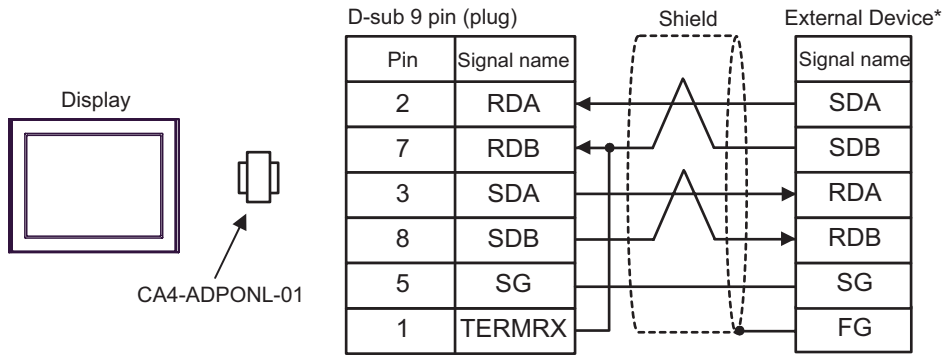
- 1:1 Connection

D-sub 9 pin (plug) Shield External Device*

Display

CA4-ADPONL-01

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

* Turn On the termination resistance switch of the External Device, and set the operation mode to 3.

1:n Connection

D-sub 9 pin (plug) Shield External Device*2 Shield External Device*1*2

Display

CA4-ADPONL-01

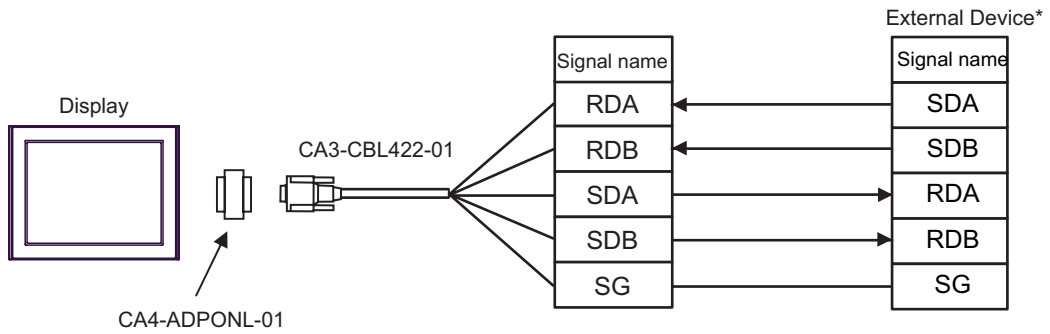| Pin	Signal name		Signal name		Signal name
2	RDA		SDA		SDA
7	RDB		SDB		SDB
3	SDA		RDA		RDA
8	SDB		RDB		RDB
5	SG		SG		SG
1	TERMRX		FG		FG
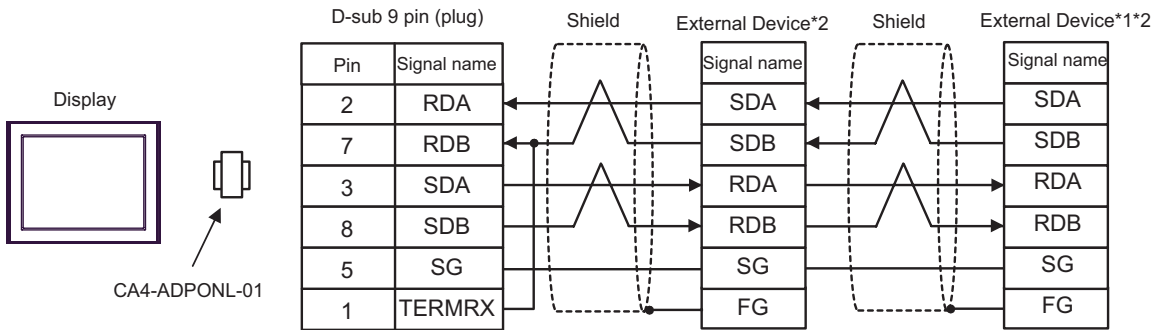
*1 Turn ON the termination resistance switch on the External Device which terminates the RS422 connection.

*2 Set the operation mode on the External Device interface to 3.

Cable Diagram 3

Display (Connection Port)	Cable	Notes
GP (COM1) ST (COM1) IPC[*1] PC/AT	Your own cable	

*1   Only the COM port which can communicate by RS-232C can be used.

☞ ■ IPC COM Port (page 5)
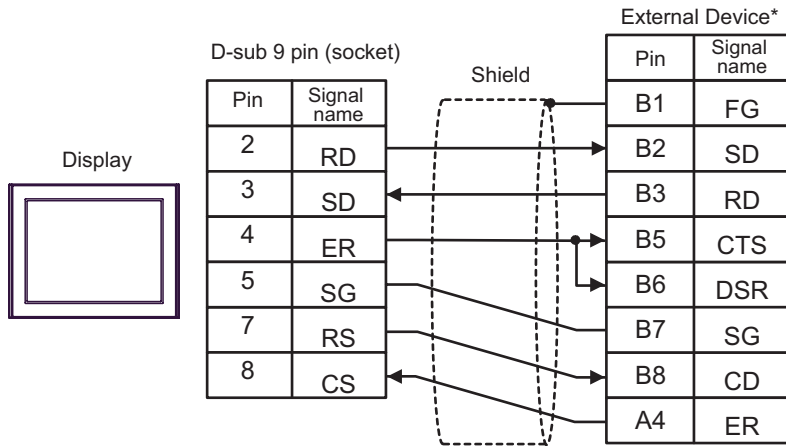
*   Set the operation mode on the External Device interface to 1.

Cable Diagram 4

Display (Connection Port)		Cable	Notes
GP (COM1) ST (COM1) IPC[*1] PC/AT	A	RS232C cable by Pro-face CA3-CBL232/5M-01 (5m)	Set the operation mode on the interface to 1.
	B	Your own cable	

*1   Only the COM port which can communicate by RS-232C can be used.
☞ ■ IPC COM Port (page 5)

A)   When using the RS232C cable (CA3-CBL232/5M-01) by Pro-face

Display

External Device*

CA3-CBL232/5M-01

RS232C
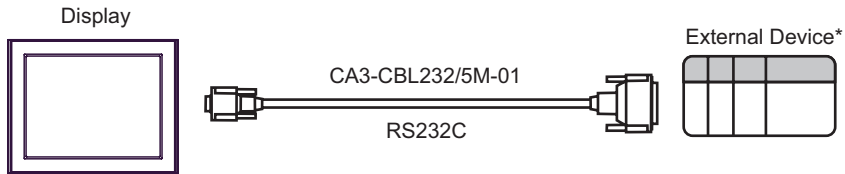
*   Set the operation mode on the External Device interface to 1.

B)   When using your own cable

D-sub 9 pin (socket)

Shield

External Device*
D-sub 25 pin (plug)

Pin	Signal name
1	CD
2	RD
3	SD
4	ER
5	SG
7	RS
8	CS

Display

Pin	Signal name
1	FG
2	SD
3	RD
4	RTS
5	CTS
6	DSR
7	SG
8	CD
20	ER
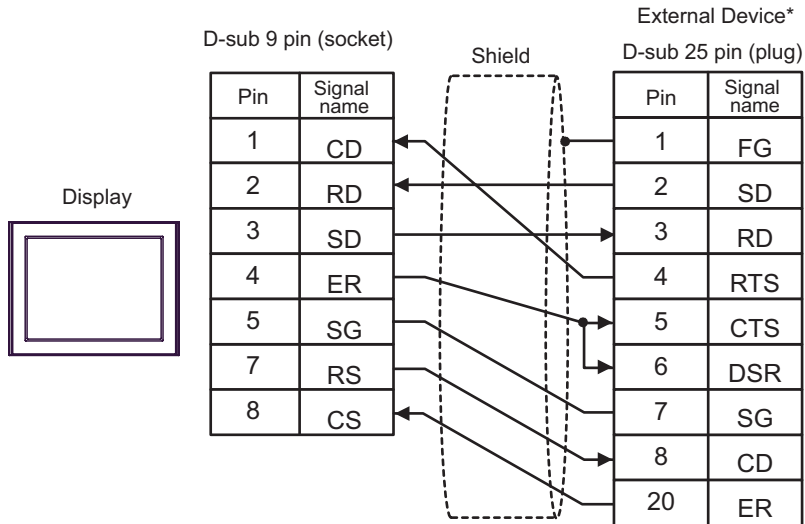
*   Set the operation mode on the External Device interface to 1.

6   Supported Device

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

▭ This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Notes
Input Relay	B00000 - B0511F	WB0000 - WB0511		*1
Direct I/O	---	W24.0000 - W24.0159		┌B i t┐15
Auxiliary Relay	M00000 - M0511F	WM0000 - WM0511		*1
Keep Relay	K00000 - K0063F	WK0000 - WK0063		*1
Differential Relay	D00000 - D0063F	WD0000 - WD0063		*1*2
Link Relay	L00000 - L0511F	WL0000 - WL0511		*1
Special Relay	F00000 - F4095F	WF0000 - WF4095		*1*2
Announce Relay	A00000 - A4095F	WA0000 - WA4095		*1*2
Timer 0.01 sec.	T0000 - T0511	---		
Timer 0.1 sec.	T0512 - T1023	---		
Counter	C0000 - C0255	---		
Timer 0.01 sec. (Current Value)	---	TR0000 - TR0511	┌H / L┐	
Timer 0.01 sec. (Setting Value)	---	TS0000 - TS0511		
Timer 0.1 sec. (Current Value)	---	W9.0000 - W9.0511		
Counter (Current Value)	---	CR0000 - CR0255		
Counter (Setting Value)	---	CS0000 - CS0255		
Data Memory	---	BD0000 - BD4095		┌B i t┐31
	---	DI0000 - DI4095		┌B i t┐31
	---	SI0000 - SI4095		┌B i t┐15
File Memory	---	W30.0000 - W30.4094		┌B i t┐15 *3
	---	W31.0000 - W31.4094		┌B i t┐15 *3
	---	W32.0000 - W32.4094		┌B i t┐15 *3
	---	W33.0000 - W33.4094		┌B i t┐31 *4
	---	W34.0000 - W34.4094		┌B i t┐31 *4

*1   The highest bit in the word device corresponds to the bit 0 in the bit device. The lowest bit in the word device corresponds to the bit F in the bit device.
     <Example> When writing Hex data "0001" in the address WB0002 (word device)

B002* (bit device)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
WB0002 (word device)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

*2   Write disable

*3   Always use in 16-bit data by user definition.

*4   Always use in 32-bit data by user definition.

NOTE
 • Please refer to the GP-Pro EX Reference Manual for system data area.
   Cf.   "GP-Pro EX Reference Manual "Appendix 1.4 LS Area (Direct Access Method)"
 • Please 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 select "Device Type & Address" for the address type in data displays.

Device	Device Name	Device Code (HEX)	Address Code
Input Relay	B	0080	Word Address
Direct I/O	W24.	0015	Word Address
Auxiliary Relay	M	0081	Word Address
Keep Relay	K	0084	Word Address
Differential Relay	D	0083	Word Address
Link Relay	L	0088	Word Address
Special Relay	F	0082	Word Address
Announce Relay	A	0085	Word Address
Timer 0.01 sec. (Current Value)	TR	0062	Word Address
Timer 0.01 sec. (Setting Value)	TS	0065	Word Address
Timer 0.1 sec. (Current Value)	W9.	0063	Word Address
Counter (Current Value)	CR	0061	Word Address
Counter (Setting Value)	CS	0064	Word Address
Data Memory	BD	0000	Word Address
	DI	0001	Word Address
	SI	0002	Word Address
File Memory	W30.	0010	Word Address
	W31.	0011	Word Address
	W32.	0012	Word Address
	W33.	0013	Word Address
	W34.	0014	Word Address

8   Error Messages

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

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

Display Examples of Error Messages

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