Fuji Electric Co., Ltd.

# MICREX-SX Series SIO Driver

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#### 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 6)
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 7)
4	Setup Items This section describes communication setup items on the Display. Set communication settings of the Display with GP-Pro Ex or in offline mode.	উি "4 Setup Items" (page 10)
5	Cable Diagram This section shows cables and adapters for connecting the Display and the External Device.	<sup>ক্লে</sup> "5 Cable Diagram" (page 14)
	Operation	

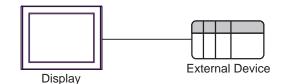
# 1 System Configuration

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

Series	CPU	Link I/F	SIO Type	Setting Example	Cable Diagram
	SPH200 (NP1PH-08 / NP1PH-16) SPH300 (NP1PS-32 / NP1PS-32R / NP1PS-74 / NP1PS-74R / NP1PS-117 / NP1PS-117R) SPH2000 (NP1PM-48E)	Loader Connection Connector on CPU unit	RS232C	"Setting Example 1" (page 7)	"Cable Diagram 1" (page 14)
		NP1L-RS1	RS232C	"Setting Example 2" (page 8)	"Cable Diagram 2" (page 15)
SPH			RS422/485 (4wire)	"Setting Example 3" (page 9)	"Cable Diagram 3" (page 17)
		NPIL-RS2	RS232C	"Setting Example 2" (page 8)	"Cable Diagram 2" (page 15)
		NP1L-RS4	RS422/485 (4wire)	"Setting Example 3" (page 9)	"Cable Diagram 3" (page 17)

# Connection Configuration

1:1 Connection



## NOTE

• Only one Display can be connected to one CPU or one Link I/F's SIO port.

When 2 or more displays are connected to 2 or more CPUs and Link I/F's SIO ports, the error below may be displayed when 2 or more Displays are activated simultaneously.
"Error has been responded for initial communication command (Error Code: [Hex])" If an error occurs, wait for 5 or more seconds to activate the Display.

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

\*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.

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 <sup>*1</sup>	Reserved (always OFF)	
2	OFF	SIO type: RS-232C	
3	OFF	510 type. K5-252e	
4	OFF	Output mode of SD (TXD) data: Always output	
5	OFF	Terminal resistance (220 $\Omega$ ) insertion to SD (TXD): None	
6	OFF	Terminal resistance (220 $\Omega$ ) insertion to RD (RXD): None	
7	OFF	Short-circuit of SDA (TXA) and RDA (RXA): Not available         Short-circuit of SDB (TXB) and RDB (RXB): Not available         RS (RTS) Auto control mode: Disabled	
8	OFF		
9	OFF		
10	OFF		

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

4

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	510 type. K5-422/485	
4	OFF	Output mode of SD (TXD) data: Always output	
5	OFF	Terminal resistance (220 $\Omega$ ) insertion to SD (TXD): None	
6	OFF	Terminal resistance (220Ω) insertion to RD (RXD): NoneShort-circuit of SDA (TXA) and RDA (RXA): Not available	
7	OFF		
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	- 510 type. K5-422/485	
4	OFF	Output mode of SD (TXD) data: Always output	
5	OFF	Terminal resistance (220 $\Omega$ ) insertion to SD (TXD): None	
6	OFF	Terminal resistance (220 $\Omega$ ) insertion to RD (RXD): None	
7	ON	Short-circuit of SDA (TXA) and RDA (RXA): Available         Short-circuit of SDB (TXB) and RDB (RXB): Available         RS (RTS) Auto control mode: Enabled	
8	ON		
9	ON		
10	ON		

# 2 Selection of External Device

Select the External Device to be connected to the Display.

💰 New Project File	×
67-7ro 🕅	Device/PLC Maker Fuji Electric Co., Ltd. Series MICREX-SX Series SIO Use System Area Refer to the manual of this Device/PLC
	Connection Method Port CDM1   Go to Device/PLC Manual
Back (	Communication Settings New Logic New Screen Cancel

Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "Fuji Electric Co., Ltd.".
Series	Select a model (series) of the External Device to be connected and connection method. Select "MICREX-SX Series SIO". Check the External Device which can be connected in "MICREX-SX Series SIO" in system configuration. "I System Configuration" (page 3)
Check this option when you synchronize the system data area of Display a (memory) of External Device. When synchronized, you can use the ladder External Device to switch the display or display the window on the Displa Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Meth This can also be set in GP-Pro EX or in the Display's offline mode. Cf. GP-Pro EX Reference Manual "Display Unit (System Area) S Cf. Maintenance/Troubleshooting Manual "Main Unit - System Area	
Port	Select the Display port to be connected to the External Device.

# 3 Example of Communication Setting

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

## 3.1 Setting Example 1

## Settings of GP-Pro EX

#### Communication Settings

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

Device/PLC1		
Summary	<u>Cha</u>	ange Device/PLC
Maker Fuji Electric Co.,	, Ltd. Series MICREX-SX Series SIO Port CO	OM1
Text Data Mode 1	Change	
Communication Settings		
SIO Type 💿 F	RS232C 🔘 RS422/485(2wire) 🔘 RS422/485(4wire)	
Speed 384	400 💌	
Data Length 🛛 🖸	7 🕫 8	
Parity O f	NONE 💿 EVEN 🔿 ODD	
Stop Bit 💿 1	1 0 2	
Flow Control C 1	NONE 💿 ER(DTR/CTS) 🔿 XON/XOFF	
Timeout 3	(sec)	
Retry 2	*	
Wait To Send 0	(ms)	
RI / VCC 🔍 F	RI O VCC	
	ou can select the 9th pin to RI (Input) y). If you use the Digital's RS232C ct it to VCC. Default	
Device-Specific Settings		
Allowable Number of Device		
Number Device Name	Settings	

#### Device Setting

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

💰 Individual Device Settings 🛛 🗙					
PLC1	PLC1				
Variable Data	🗖 Use Variable	Data			
	New	Edit			
	OK ( <u>D</u> )	Cancel			

# Settings of External Device

Communication setting of External Device is fixed, so setting is not necessary.

# 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.

Summary       Change Device/PLC         Maker       Fuji Electric Co., Ltd.       Series       MICREX-SX Series SIO       Port       COM1         Text Data Mode       1       Change       Communication Settings       Port       COM1         Communication Settings       Silo Type       RS232C       RS422/485(2wire)       RS422/485(4wire)       Speed       38400       Image: Speed       38400       Image: Speed       38400       Image: Speed       Speed <td< th=""><th>Device/PLC 1</th><th></th></td<>	Device/PLC 1	
Text Data Mode       1       Change         Communication Settings       SIO Type       RS232C       RS422/485(2wire)       RS422/485(4wire)         Speed       38400       •       •       •         Data Length       7       6       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)         RI / VCC       RI       VCC       In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (Is V Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.       Default	Summary	Change Device/PLC
Communication Settings         SID Type          •         RS232C          RS422/485(2wire)          RS422/485(4wire)          Speed          38400             Data Length          7           8          Data Length          7           8          Parity          NONE          EVEN           ODD          Stop Bit          1           2            Flow Control          NONE           ER(DTR/CTS)           XON/XOFF          Timeout          3           (sec)             Kit          Retry          2           (ms)           Ket           Default          Retry          2           (ms)           Let           Default          Retry          2           (ms)           Default           Default	Maker Fuji Electri	c Co., Ltd. Series MICREX-SX Series SIO Port COM1
SID Type          • RS232C          · RS422/485(2wire)          · RS422/485(4wire)          Speed          38400            Data Length          7           ·       8          Data Length          7           ·       8          Parity          NONE          EVEN           ODD          Stop Bit          1           2            Flow Control          NONE           ER[DTR/CTS)           XON/XOFF          Timeout              (sec)            Retry              (ms)          Retry            (ms)            Retry          2             (ms)          Retry          2           (ms)           (ms)          Retry          0           (ms)           (ms)          Retry          (ms)           (ms)           (ms)          Retry          (ms)           (ms)           (ms	Text Data Mode	1 Change
Speed       38400         Data Length       7         Data Length       7         Parity       NONE         Stop Bit       1         2         Flow Control       NONE         C NONE       ER(DTR/CTS)         Stop Bit       1         2       ER(DTR/CTS)         Retry       2         Wait To Send       0         Pl / VDC       RI         No VDC       In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (IsV Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.	Communication Settings	
Data Length       0       7       6       8         Parity       NONE       6       EVEN       0 DD         Stop Bit       1       0       2         Flow Control       NONE       6       ER(DTR/CTS)       XON/XOFF         Timeout       3       5       (sec)         Retry       2       5         Wait To Send       0       6       (ms)         RI / VCC       RI       VCC       In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (ISV Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.       Default	SIO Type	RS232C C RS422/485(2wire) C RS422/485(4wire)
Parity     C     NDNE     ©     EVEN     ©     DDD       Stop Bit     ©     1     ©     2       Flow Control     NDNE     ©     ER(DTR/CTS)     XDN/X0FF       Timeout     3     (sec)       Retry     2     (ms)       RI     VCC     In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (SV Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.     Default	Speed	38400 💌
Stop Bit     I     I     I       Stop Bit     I     I     I       Flow Control     NDNE     ER(DTR/CTS)     XDN/XDFF       Timeout     Image: stop Stop Stop Stop Stop Stop Stop Stop S	Data Length	07 08
Flow Control     C     NONE     C     ER(DTR/CTS)     C     XON/XOFF       Timeout     3     (sec)       Retry     2     (ms)       Wait To Send     0     (ms)       RI / VCC     RI     C       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	Parity	O NONE O EVEN O ODD
Timeout     3     1     (sec)       Retry     2     1       Wait To Send     0     1       RI / VCC     RI     VCC       In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (SV Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.     Default	Stop Bit	© 1 © 2
Retry     2       Wait To Send     0       BI / VCC     RI       C 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.	Flow Control	O NONE O ER(DTR/CTS) O XON/XOFF
Wait To Send     Image: Constraint of the sense of RS232C, you can select the 9th pin to RI (Input) or VCC (SV Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.	Timeout	3 📑 (sec)
RI / VCC     Image: The set 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.	Retry	2 .
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.	Wait To Send	0 <u>*</u> (ms)
or VCC (5V Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.	RI / VCC	© RI O VCC
Device-Specific Settings	or VCC (5V Power 9	Supply). If you use the Digital's RS232C
	Device-Specific Settings	
Allowable Number of Devices/PLCs 1		
Number Device Name Settings		

#### Device Setting

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

💰 Individual Device Settings		
PLC1		
Variable Data	Use Variable Data	
	OK ( <u>0</u> )	Cancel

## Settings of External Device

Communication setting of External Device is fixed, so setting is not necessary. Set the [Mode] switch of the link I/F unit to "1" (loader mode).

# 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/PLC 1		
Summary		Change Device/PLC
Maker Fuji Elect	ric Co., Ltd.	Series MICREX-SX Series SIO Port COM1
Text Data Mode	1 Change	
Communication Settings		
SIO Type	C RS232C	C RS422/485(2wire) C RS422/485(4wire)
Speed	38400	<b>•</b>
Data Length	O 7	• 8
Parity	O NONE	EVEN     ODD
Stop Bit	● 1	© 2
Flow Control	O NONE	ER(DTR/CTS)     C XON/XOFF
Timeout	3 🕂	(sec)
Retry	2 ÷	
Wait To Send	0 .	(ms)
RI / VCC	🖲 BL	O VCC
		ect the 9th pin to RI (Input) se the Digital's RS232C
Isolation Unit, plea	se select it to VCC	C. Default
Device-Specific Settings		
Allowable Number of		1 📷
Number Device N	ame	Settings
👗 1 🛛 PLC1		

#### Device Setting

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

💣 Individual Device Settings		
PLC1		
Variable Data	Use Variable	e Data

# Settings of External Device

Communication setting of External Device is fixed, so setting is not necessary. Set the [Mode] switch of the link I/F unit to "2" (loader mode).

# 4 Setup Items

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

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

"3 Example of Communication Setting" (page 7)

# 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.

Devi	ce/PLC 1		
Sun	nmary		Change Device/PLC
	Maker Fuji Electri	ic Co., Ltd.	Series MICREX-SX Series SIO Port COM1
	Text Data Mode	1 <u>Change</u>	
Con	nmunication Settings		
	SIO Type	RS232C	O RS422/485(2wire) O RS422/485(4wire)
	Speed	38400	•
	Data Length	O 7	• 8
	Parity	C NONE	EVEN C ODD
	Stop Bit	1     1	0 2
	Flow Control	C NONE	ER(DTR/CTS)     C XON/XOFF
	Timeout	3 🔹 (s	sec)
	Retry	2 🔹	
	Wait To Send	n) 🗧 🛛	ms)
	RI / VCC	BI     BI     BI     C     BI     C    C	O VCC
		Supply). If you use	st the 9th pin to RI (Input) e the Digital's RS232C Default
Dev	vice-Specific Settings		
	Allowable Number of [		1
	Number Device Na	ime	Settings

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.	
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 I ([Setting]) of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

Set [Individual Device Settings] when using variable data.

<sup>(3)</sup> "6.4 When Using a Variable" (page 30)

💰 Individual Device Settings		
PLC1		
	🔽 Use Variable	Data
Variable Data	VARDATA01	-
	New	Edit
	OK ( <u>D</u> )	Cancel

Setup Items	Setup Description
Use Variable Data	Put a check in the box when using variable data.
Variable Data	Select variable data.

# 4.2 Setup Items 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 displayed list.

Comm.	Option			
MICREX-SX Serie	s SIO		[COM1]	Page 1/1
	SIO Type Speed Data Length Parity Stop Bit Flow Control Timeout(s) Retry Wait To Send(ms)	RS232C 38400 7 NONE 1 JER(DTR/C	• 8 • EVEN 2 TS) 3 ¥ • 0 ¥ •	
	Exit		Back	2007/08/01 21:03:20

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.		

Continues to the next page.

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Setup Items	Setup Description
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.

# Option

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 [Option].

Comm.	Option			
MICREX-SX Serie	s SIO		[COM1]	Page 1/1
	In the case the 9th pin Power Suppl	• RI of RS232C, you to RI(Input) or y). If you use th ation Unit, plea	can select VCC(5V e Digital's	
	Exit		Back	2007/08/01 21:03:23

Setup Items	Setup Description
RI/VCC	Switches RI/VCC of the 9th pin. 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.

NOTE

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

# 5 Cable Diagram

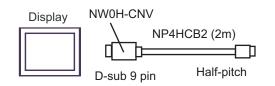
The cable diagram shown below may be different from the cable diagram recommended by Fuji Electric Co., Ltd.. Please be assured there is no operational problem in applying the cable diagram shown in this manual.

- 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.

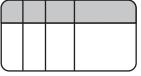
Cable Diagram 1

Display (Connection Port)		Cable	Notes
GP3000 (COM1) GP-4*01TM (COM1) ST (COM1) IPC <sup>*1</sup> PC/AT	1A	Connection adapter by Fuji Electric Co., Ltd. NW0H-CNV + Connection cable by Fuji Electric Co., Ltd. NP4HCB2 (2m)	
GP-4105 (COM1)	1B	User-created cable + Connection adapter by Fuji Electric Co., Ltd. NW0H-CNV + Connection cable by Fuji Electric Co., Ltd. NP4HCB2 (2m)	

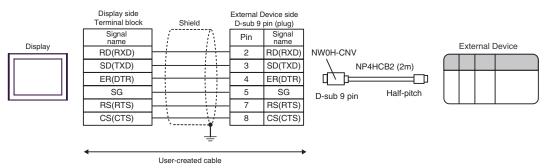
1A)



External Device



1B)



# Cable Diagram 2

Display (Connection Port)		Cable	Notes
GP3000 (COM1) GP-4*01TM (COM1) ST (COM1) IPC <sup>*1</sup> PC/AT	2A	User-created cable	The cable length must be 15m or less.
GP-4105 (COM1)	2B	User-created cable	

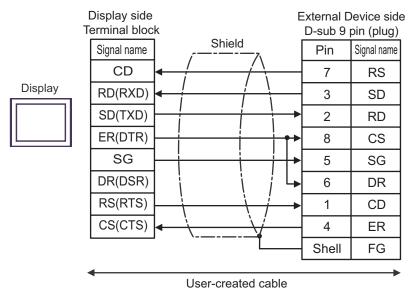
\*1 Only the COM port which can communicate by RS-232C can be used. <sup>(G)</sup> "■ IPC COM Port" (page 4)

2A)

Display

	ay side vin (socket	)		)evice side pin (plug)
Pin	Signal name	Shield	Pin	Signal name
1	CD		7	RS
2	RD(RXD)	< / / / · · · · · · · · · · · · · · · ·	3	SD
3	SD(TXD)		2	RD
4	ER(DTR)	i _ i +>	8	CS
5	SG		5	SG
6	DR(DSR)	\	6	DR
7	RS(RTS)		1	CD
8	CS(CTS)	<hr/>	4	ER
Shell	FG	······	Shell	FG

User-created cable



## Cable Diagram 3

Display (Connection Port)		Cable	Notes
GP3000 <sup>*1</sup> (COM1) AGP-3302B (COM2) GP-4*01TM (COM1) ST <sup>*2</sup> (COM2) IPC <sup>*3</sup>	3A	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	
	3B	User-created cable	The cable length must be 1000m
GP3000 <sup>*4</sup> (COM2)	3C	Online adapter by Pro-face CA4-ADPONL-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + User-created cable	or less. Termination resistance switch on the communication module should be set "3".
	3D	Online adapter by Pro-face CA4-ADPONL-01 + User-created cable	
GP-4106 (COM1)	3E	User-created cable	

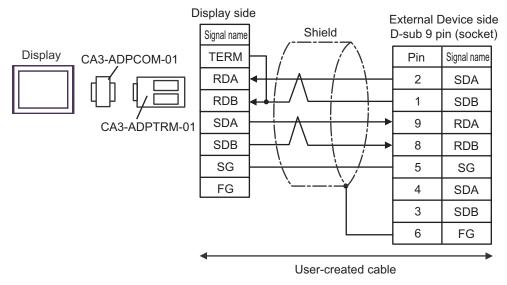
\*1 All GP3000 models except AGP-3302B

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

\*4 All GP3000 models except GP-3200 series and AGP-3302B

#### 3A)

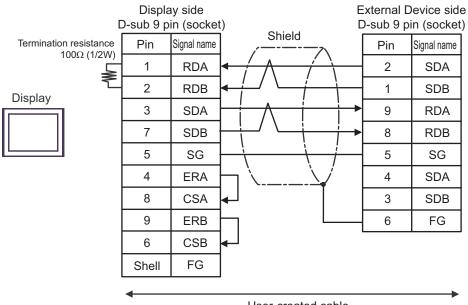
• 1:1 Connection



\* Termination resistance switch on the communication module should be set "3".

#### 3B)

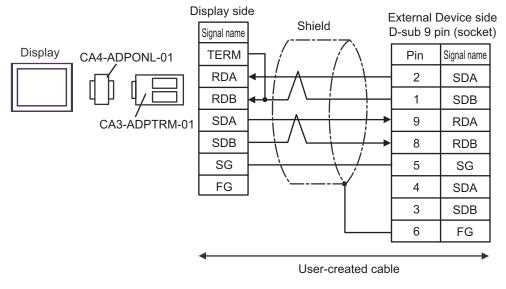
• 1:1 Connection



- User-created cable
- \* Termination resistance switch on the communication module should be set "3".

#### 3C)

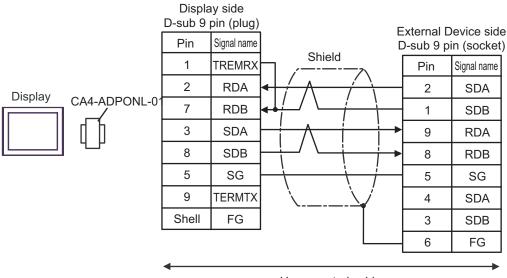
• 1:1 Connection



\* Termination resistance switch on the communication module should be set "3".

#### 3D)

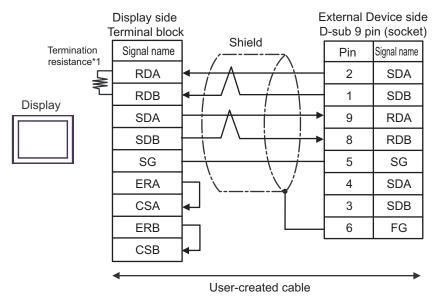
• 1:1 Connection



- User-created cable
- \* Termination resistance switch on the communication module should be set "3".

3E)

• 1:1 Connection



- \* Termination resistance switch on the communication module should be set "3".
- \*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	ON
4	ON

# 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 External Device.

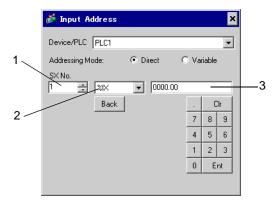
Enter the External Device address in the dialog below.

NOTE

• When the communication unit and the Input/Output unit are used at the same time, Input/ Output Memory cannot be used.

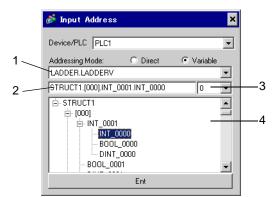
For address settings in GP-Pro EX, use Standard Memory and synchronize the Standard Memory address with Input/Output Memory address in External Device.

# ■ When [Addressing Mode] is "Direct"



- 1 Enter [SX No.] (Input/Output Memory) or [CPU NO.] (Standard/Retain/System Memory).
- 2 Select a device.
- $\mathbf{3}$  Enter the address.

■ When [Addressing Mode] is "Variable"



- 1 Select a worksheet.
- 2 Enter the address.
- $\mathbf{3}$  When inputting a bit address, select the bit position of bit address.
- 4 Variable data is displayed. The address can be entered by double-clicking the displayed variable.
  - ☞ " Making New Variable Data" (page 35)

• The variables where derived data type of 3 or more hierarchies are defined will not be displayed.

# Ladder Software

There are SX-Programmer Expert (D300win) and SX-Programmer Standard in the ladder software to be used for setting the External Device. The device name differs respectively as follows.

Device Name		SX-Programmer Expert (D300wIn)	SX-Programmer Standard
I/O Memory	Input	%I	Х
1/O Memory	Output	%Q	Y
Standard Memo	ory (fast)	%MW1.0 - %MW1.2047	WM0 - WM2047
Standard Memory <sup>*1</sup>		%MW1.2048 - %MW1.262143	WM2048 - WM262143
Retain Memory <sup>*1</sup>		%MW3.0 - %MW3.260095	WL0 - WL260095
System Memory		%MW10.0 - %MW10.511	WSM0 - WSM511

\*1 The number of device items can be increased or decreased by the ladder tool. This table shows the number of default items.

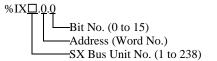
## 6.1 SPH200

This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Remarks
Input Memory	%IX□.0000.00 - %IX□.0511.15	%IW□.0000 - %IW□.0511		*1
Output Memory	%QX□.0000.00 - %QX□.0511.15	%QW□.0000 - %QW□.0511		*1
Standard Memory	%MX□.1.0000000.00 - %MX□.1.0008191.15	%MW□.1.0000000 - %MW□.1.0008191	<u>[[] H</u>	*2 *3
Retain Memory	%MX□.3.000000.00 - %MX□.3.004095.15	%MW□.3.000000 - %MW□.3.004095		*2 *3
System Memory	%MX□.10.000000.00 - %MX□.10.008191.15	%MW□.10.000000 - %MW□.10.008191	2	*2

\*1 Input/Output Memory Address Designation is as shown below.

• Bit Designation



• Word Designation

%

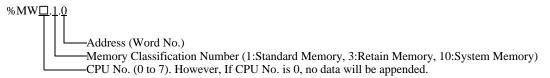
- \*2 Standard/Retain/System Memory Address Designation is as shown below.
  - Bit Designation



Bit No. (0 to 15)
Address (Word No.)
Memory Classification Number (1:Standard Memory, 3:Retain Memory, 10:System Memory)
CPU No. (0 to 7). However, If CPU No. is 0, no data will be appended.

details in the manual of External Device.

Word Designation



\*3 Standard and Retain Memory sizes can be changed. However, the total memory size is fixed. (For details, refer to the manual of External Device).

#### NOTE

When specifying the address of the Eternal Device directly, always use a setting within the specified AT range of the ladder software. We recommend using an AT-specified- variable for the External Device used on the Display. Please refer to the Micrex-SX Series D300Win
 <Reference> Users Manual by Fuji Electric Co., Ltd. for details of specifying the AT range and how to set it. When using a variable that is not AT-specified, variable needs to be imported again and screen transfer needs to be executed if ladder program or variable is changed.

- Always use a system area and reading area within the specified AT range.
- Use high performance CPU system area with an address of %MW1.2048 or later.
- Please refer to the GP-Pro EX Reference Manual for system data area.
  - Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.
  - "Manual Symbols and Terminology"

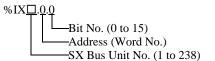
## 6.2 SPH300

This address can be specified as system data area.

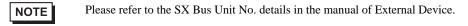
Device	Bit Address	Word Address	32bits	Remarks
Input Memory	%IX□.0000.00 - %IX□.0511.15	%IW□.0000 - %IW□.0511		*1
Output Memory	%QX□.0000.00 - %QX□.0511.15	%QW□.0000 - %QW□.0511		*1
Standard Memory	%MX□.1.0000000.00 - %MX□.1.0262143.15	%MW□.1.0000000 - %MW□.1.0262143	[ <b>L / H</b> ]	*2 *3
Retain Memory	%MX□.3.000000.00 - %MX□.3.130047.15	%MW□.3.000000 - %MW□.3.130047		*2 *3
System Memory	%MX□.10.000000.00 - %MX□.10.065535.15	%MW□.10.000000 - %MW□.10.065535	-	*2

\*1 Input/Output memory Address Designation is as shown below.

• Bit Designation



Word Designation

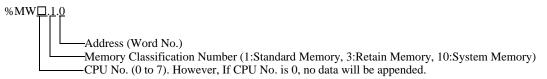


- \*2 Standard/Retain/System Memory Address Designation is as shown below.
  - Bit Designation



Bit No. (0 to 15) —Address (Word No.) —Memory Classification Number (1:Standard Memory, 3:Retain Memory, 10:System Memory) —CPU No. (0 to 7). However, If CPU No. is 0, no data will be appended.

Word Designation



\*3 Standard and Retain Memory sizes can be changed. However, the total memory size is fixed. (For details, refer to the manual of External Device).

#### NOTE

When specifying the address of the Eternal Device directly, always use a setting within the specified AT range of the ladder software. We recommend using an AT-specified- variable for the External Device used on the Display. Please refer to the Micrex-SX Series D300Win
 <Reference> Users Manual by Fuji Electric Co., Ltd. for details of specifying the AT range and how to set it. When using a variable that is not AT-specified, variable needs to be imported again and screen transfer needs to be executed if ladder program or variable is changed.

- Always use a system area and reading area within the specified AT range.
- Use high performance CPU system area with an address of %MW1.2048 or later.
- Please refer to the GP-Pro EX Reference Manual for system data area.
  - Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.
  - "Manual Symbols and Terminology"

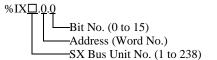
# 6.3 SPH2000

This address can be specified as system data area.

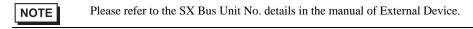
Device	Bit Address	Word Address	32bits	Remarks
Input Memory	%IX□.0000.00 - %IX□.0511.15	%IW□.0000 - %IW□.0511		*1
Output Memory	%QX□.0000.00 - %QX□.0511.15	%QW□.0000 - %QW□.0511		*1
Standard Memory	%MX□.1.0000000.00 - %MX□.1.1703935.15	%MW□.1.0000000 - %MW□.1.1703935	<u>[[] H</u>	*2 *3
Retain Memory	%MX□.3.000000.00 - %MX□.3.262143.15	%MW□.3.000000 - %MW□.3.262143		*2 *3
System Memory	%MX□.10.000000.00 - %MX□.10.065535.15	%MW□.10.000000 - %MW□.10.065535	-	*2

\*1 Input/Output memory Address Designation is as shown below.

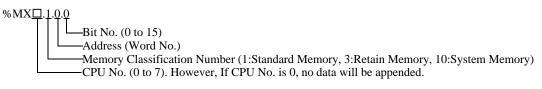
• Bit Designation



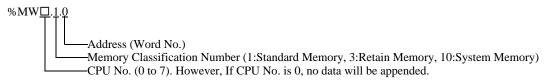
• Word Designation



- \*2 Standard/Retain/System Memory Address Designation is as shown below.
  - Bit Designation



Word Designation



\*3 Standard and Retain Memory sizes can be changed. However, the total memory size is fixed. (For details, refer to the manual of External Device).

NOTE	• When specifying the address of the Eternal Device directly, always use a setting within the
	specified AT range of the ladder software. We recommend using an AT-specified- variable for
	the External Device used on the Display. Please refer to the Micrex-SX Series D300Win
	<reference> Users Manual by Fuji Electric Co., Ltd. for details of specifying the AT range</reference>
	and how to set it. When using a variable that is not AT-specified, variable needs to be imported
	again and screen transfer needs to be executed if ladder program or variable is changed.
	• Always use a system area and reading area within the specified AT range.
	• Use high performance CPU system area with an address of %MW1.2048 or later.
	Please refer to the GP-Pro EX Reference Manual for system data area.
	Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
	• Please refer to the precautions on manual notation for icons in the table.
	"Manual Symbols and Terminology"

# 6.4 When Using a Variable

### Usable Device

The table below shows the Base Data Types of usable Variables.

Data 1	Гуре	Bit Address	Word Address	32bits	Remarks
	Single Var	<varname></varname>			
BOOL	1D Array	<varname>.[0] to <varname>.[x-1]</varname></varname>	-	-	*1 *2 *3
	2D Array	< VARNAME >.[0].[0] to < VARNAME >.[x-1].[y-1]	_		
	Single Tag	< VARNAME >.00 to < VARNAME >.15	< VARNAME >		*1 *2
INT UINT WORD	1D Array	< VARNAME >.[0].00 to < VARNAME >.[x-1].15	< VARNAME >.[0] to < VARNAME >.[x-1]	[L / H]	
	2D Array	< VARNAME >.[0].[0].00 to < VARNAME >.[x-1].[y-1].15	< VARNAME >.[0].[0] to < VARNAME >.[x-1].[y-1]		
DINT	Single Tag	< VARNAME >.00 to < VARNAME >.31	< VARNAME >		
DWORD :-	1D Array	< VARNAME >.[0].00 to < VARNAME >.[x-1].31	< VARNAME >.[0] to < VARNAME >.[x-1]	-	*1 *2
TIME	2D Array	< VARNAME >.[0].[0].00 to < VARNAME >.[x-1].[y-1].31	< VARNAME >.[0].[0] to < VARNAME >.[x-1].[y-1]		
STRING	Single Tag	-	<varname></varname>	-	*1 *4

\*1 <VARNAME>: This is the complete "Variable" name including "Worksheet" name and "Structure" name if it is a sub element of a structure. Maximum 255 characters including delimiters ('.') and address part (e.g. bit position and array information).

e.g. BOOL type single tag in a Global Worksheet:

"CONF.MainResource.Global\_Variables.BOOLVAR"

e.g. INT type single tag in a Local Worksheet:

"MainProgram.MainProgramV.INTVAR"

- e.g. DINT type bit address: "MainProgram.MainProgramV.DINTVAR.30"
- e.g. REAL type 2D array: "MainProgram.MainProgramV.REALARRAY[1].[2]"
- e.g. DINT from a TIMER structure:

"MainProgram.MainProgramV.TIMERVAR.PRE"

e.g. BOOL from a User Defined Structure :

"CONF.MainResource.Global\_Variables.USERSTRUCTURE\_A.MYTIMER.EN"

\*2 Array dimensions: Up to 2D arrays can be created. When a "Variable" is an array, the size is defined.

Range of array elements: -32728 to 32767

Number of array elements: 32768

Usable memory size for 1 variable: Less than 65535 words

- \*3 BOOL type arrays: The External Device address must start on bit 0. e.g. %MX1.100.0
- \*4 STRING type: Array access is not possible. Also the "STRING" cannot be used as part of a structure.

• The following derived data types are available for address input with GP-Pro EX.

- Array data type
   One-dimensional array
  - Two-dimensional array (an array of arrays)
- Structural data type Structure Array of structure Structure of array Structure of structure
- When specifying the address of the Eternal Device directly, always use a setting within the specified AT range of the ladder software. We recommend using an AT-specified- variable for the External Device used on the Display. Please refer to the Micrex-SX Series D300Win
   <Reference> Users Manual by Fuji Electric Co., Ltd. for details of specifying the AT range and how to set it. When using a variable that is not AT-specified, variable needs to be imported again and screen transfer needs to be executed if ladder program or variable is changed.
- Always use a system area and reading area within the specified AT range.
- Use high performance CPU system area with an address of %MW1.2048 or later.
- Please refer to the GP-Pro EX Reference Manual for system data area.
  - Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.

"Manual Symbols and Terminology"

To use a variable and Derived Data Type that were set by D300win with the GP-Pro EX, CSV file and IEC file need to be imported.

CSV file and IEC file are exported by D300win.

Imported data is saved as variable data.

NOTE	•	Defined variable data can be used only with this driver. Therefore, variable data defined with
		other drivers cannot be used with this driver. In the same way, variable data defined with this
		driver cannot be used with other drivers.
	•	When IEC file meets any of the following conditions, it cannot be imported. Correct
		inappropriate conditions and then import the file.
		• There are two or more definitions or keywords (e.g. TYPE and END_TYPE) in 1 row.
		(When a line break is inserted in the comment, the case is recognized that there are two or
		more definitions or keywords in 1 row.)

- There is a structure where array variables are defined.
- There is an Alias of basic data type.

# Setting Items of [Variable] List Dialog Box

Variable List	Enter the file name of the variable data.
Variable Data Name VarData01	Select data type to be listed.
Worksheet LADDER.LADDERV	Select a worksheet where the variable is registered.
BOOU_0000         ▲           DINT_0000         BOOL           HNT_0000         BOOL           B STRUCTI         BIXO           B (1)         Edit           B (2)         View           B (3)         E(4)           B (5)         Import	Operation buttons. After selecting the data in the [List], adding, deleting, or editing can be executed here. [View] indicates the content of data. [Import] imports variables and data type.
	—— The cursor is moved to the variable, and data type and comments are displayed.
⊕ [10]     ♥     [11]     ■     OK Cancel	Variable, data type, array, and worksheet that are registered in the variable data are displayed.

# ■ Importing Variable and Data Type

- 1 Set variable, data type, array, and worksheet with D300win. Version of D300win that is supported is V3.1.0.0 or later.
- 2 Select [Export] from the [File] menu and select the data to be exported.

Data below needs to be exported.

Data to be exported	Description	File type	
Cross reference	Variable and worksheet	CSV	
IEC 61131-3	Data type and array	IEC	

**3** Make [Individual Device Settings] dialog box displayed with the GP-ProEX, and put a check to [Use Variable Data]. Then click [New].

💣 Individual Device Settings						
PLC1						
Variable Data	Vise Variable Data					

4 Enter the name of variable data to save the setting in the [Variable Data Name].

Variable List			
Variable Data Name	VarData01		
List Type	Variables	•	
Worksheet		•	
			Add
			Delete
			Edit
			View
			Import
		ОК	Cancel

5 Click [Import] to import CSV file and IEC file that were exported in the Procedure 2.

Import IEC file first followed by CSV file.

Select File to In	nport Variables o	or Derived Data	Types From		? ×
Look in:	🔁 Database		•	(† 🖻 🔿	
My Recent Documents	datatype.iec				
Desktop					
My Documents					
My Computer					
	L				
My Network	File name:	datatype.iec		•	Open
Places	Files of type:	IEC files (*.iec)		•	Cancel

#### NOTE

• When CSV file including variable with the user-defined data type is imported prior to IEC file, an error, "Unknown Data Type was found" is displayed and variable is not imported. Import IEC file first in order to register the user-defined data type.

- Arrays, structures and parameters whose name length exceeds 30 single-byte characters cannot be imported. Set the name length to 30 single-byte characters or less and then import them.
- 6 Confirm the registered data and click [OK].

Variable List			
Variable Data Name	VarData01		
List Type	Variables	•	
Worksheet	LADDER.LADDERV	•	
BOOL_0000			Add
- INT_0000 			Delete
. Smoch			Edit
			View
			Import
1		OK	Cancel

# Making New Variable Data

If variable data is not imported, make variable data using the following procedures.

#### Making Variable

Variable Data Name	VarData01		
Valiable D'ata Malile			
List Type	Variables	•	
Worksheet	Config.Res.WorkSheet	•	
			Add
			Delete
			Edit
			View
			Import

1 Select "Variables" from the [List Type] of the [Variable List] dialog box.

2 Click [Add] to display [Variable] dialog box.

NOTE

• To add a variable, the worksheet needs to be set.

Make the worksheet before making the variable.

☞ " ◆ Making a Worksheet" (page 38)

**3** Enter "Name", "Data Type", "Address" and "Comment" and click [OK].

/ar iable	
Name	
INT_0000	
Data Type	
INT 💌	
Comment	
%MW1	
Address	
%MW1.0000000	
OK Cancel	

# Making Derived Data Type

1 Select "Structures" from the [List Type] of the [Variable List] dialog box.

Variable List		
Variable Data Name 🔽	/arData01	
List Type	itructures	
Worksheet	<b>v</b>	
		Add
		Delete
		Edit
		View
		Import
,	ок	Cancel

- 2 Click [Add] to display [Derived Data Type (Structure)] dialog box.
- **3** Enter the "Name" of the member and "Data Type" to be included in "Derived Data Type Name" and data type and click [OK].

vler	mbers	
	Name	Data Type
	INT_0000	INT
	BOOL_0000	BOOL
►	DINT_0000	DINT
*		

# Making an Array

1 Select "Arrays" from the [List Type] of the [Variable List] dialog box.

Variable List			
Variable Data Name	VarData01		
List Type	Arrays	•	
Worksheet		-	
			Add
			Delete
			Edit
			View
			Import
1	OK		Cancel
			Lancel

- 2 Click [Add] to display [Derived Data Type (Array)] dialog box.
- **3** Enter "Array Name", "Data Type", "Start Element" and "End Element" and click [OK].

Derived Data Type (Array)		
Array Name		
WORD1_10_ARRAY		
Data Type		
WORD		
Start Element		
0		
End Element		
10		
OK Cancel		

# Making a Worksheet

1 Select "Worksheets" from the [List Type] of the [Variable List] dialog box.

Variable List			
Variable Data Name	VarData01		
List Type	Worksheets	•	
Worksheet		<b>v</b>	
			Add
			Delete
			Edit
			View
			Import
1		ОК	Cancel

- 2 Click [Add] to display [Worksheet] dialog box.
- 3 Enter "Configuration", "Resource/Program" and "Worksheet" and click [OK].

Worksheet	
Configuration	C_SX
Resource / Program	R_\$117
Worksheet	Global_Variables
_	OK Cancel

# 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.

NOTE

• When using a variable, device code and address code cannot be used.

Device	Device Name	Device Code (HEX)	Address Code
Input Memory	%IX/%IW	0083	SX Bus Unit No. × 0x1000000 + Word Address
Output Memory	%QX/%QW	0084	SX Bus Unit No. × 0x1000000 + Word Address
Standard Memory	%MX1./%MW1.	0080	CPU No. × 0x1000000 + Word Address
Retain Memory	%MX3./%MW3.	0081	CPU No. × 0x1000000 + Word Address
System Memory	%MX10./%MW10.	0082	CPU No. $\times$ 0x1000000 + 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.		
	Displays IP address or device address of External Device where error occurs, or error codes received from External Device.		
Error Occurrence Area	<ul> <li>NOTE</li> <li>IP address is displayed such as "IP address (Decimal): MAC address (Hex)".</li> <li>Device address is displayed such as "Address: Device address".</li> <li>Received error codes are displayed such as "Decimal [Hex]".</li> </ul>		

#### 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.
Please refer to "Display-related errors" of "Maintenance/Troubleshooting Guide" for a common error message to the driver.

# Error Code Unique for Driver

Error Code	Description	Comment
0x10	CPU Error	An error occurs in the CPU and a command cannot be executed.
0x12	Command cannot be executed.	Due to CPU's key switch condition, a command cannot be executed.
0x23	During transmission interlocking	Transmission is interlocked due to a loader command from another device.
0x28	During command processing	Requested command cannot be executed because other command is in process.
0x2B	During other loader processing	Request command cannot be executed because D300win loader is in process.
0x2F	Initialization incomplete	Requested command cannot be executed because system is initializing.
0x44	Memory addressing error	Specified address exceeds effective area.
0x45	Memory size over	Address + reading/the number of written words exceeds the effective area.

# Error Message Unique for Driver

Error Code	Error Message	Description
RHxx128	"(Node Name):The number of specified destination module is not existed.(Error Code: [Hex])"	Command destination specification error. Check module is present / online and that the configuration is correct.