CoDeSys Automation Alliance

# CoDeSys SIO Driver

| 1. | System Configuration             | 3  |
|----|----------------------------------|----|
| 2. | Selection of External Device     | 7  |
| 3. | Example of Communication Setting | 8  |
| 4. | Setup Items                      | 10 |
| 5. | Cable Diagrams                   | 15 |
| 6. | Supported Device Address         | 18 |
| 7. | Device Code and Address Code     | 24 |
| 8. | Error Messages                   | 25 |

#### Introduction

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

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

| 1 | System Configuration<br>This section shows the types of<br>external devices which can be<br>connected  | ☞"1 System Configuration"                          |
|---|--|--|
|   |  |  |
| 2 | Selection of External Device<br>Select a model (series) of external to<br>be connected and connection method   | ∽"2 Selection of External<br>Device"               |
|   |  |  |
| 3 | Example of Communication Settings<br>This section shows setting examples<br>for communicating between the<br>display and the external device                                 | <sup>∽</sup> "3 Example of communication settings" |
|   |  |  |
| 4 | Setup Items<br>This section describes<br>communication setup items on the<br>Display.<br>Set communication settings of the<br>Display with GP-Pro Ex or in off-line<br>mode. | ∽"4 Setup Items"                                   |
|   |  |  |
|   | Operation  |  |

# 1. System Configuration

The system configuration for CoDeSys Automation Alliance devices and the display connected are shown as follows.

| Series           | CPU  | Link I/F       | SIO Type                      | Setting Example               | Cable Diagram               |
|------------------|--|----------------|-------------------------------|-------------------------------|-----------------------------|
|                  | Indra Control L20<br>CML20.1-NP-120-<br>NA-NNNN-NW | X3C<br>(RS232) | RS-232C                       | Setting Example 1<br>(page 8) | Cable Diagram 1<br>(page15) |
| BOSCH<br>Rexroth | Indra Control L40                                  | X31            | RS-232C                       | Setting Example 1<br>(page 8) | Cable Diagram 1<br>(page15) |
|                  | Indra Control PPC-<br>R22 SIO Port RS              | RS-232C        | Setting Example 1<br>(page 8) | Cable Diagram 1<br>(page15)   |                             |
| 3S SoftPLC       | Windows NT   | SIO Port       | RS-232C                       | Setting Example 1<br>(page 8) | Cable Diagram 1<br>(page15) |

#### Connection Configuration

1:1 Connection



#### IPC COM Port

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

#### Usable port

| Corios  | Usable Port  |  |  |  |
|---|--|--|--|--|
| Series  | RS-232C  | RS-422/485(4 wire)   | RS-422/485(2 wire)   |  |
| PS-2000B  | COM1 <sup>*1</sup> , COM2,<br>COM3 <sup>*1</sup> , COM4                | -  | -  |  |
| PS-3450A, PS-3451A,<br>PS3000-BA, PS3001-BD   | COM1, COM2*1*2   | COM2*1*2   | COM2*1*2   |  |
| PS-3650A (T41 model),<br>PS-3651A (T41 model)   | COM1 <sup>*1</sup>   | -  | -  |  |
| PS-3650A (T42 model),<br>PS-3651A (T42 model)   | COM1 <sup>*1*2</sup> , COM2  | COM1*1*2   | COM1*1*2   |  |
| PS-3700A (Pentium®4-M)<br>PS-3710A  | COM1 <sup>*1</sup> , COM2 <sup>*1</sup> ,<br>COM3 <sup>*2</sup> , COM4 | COM3*2   | COM3*2   |  |
| 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> ,<br>COM3, COM4              | COM1 <sup>*1*2</sup>   | COM1*1*2   |  |
| PE-4000B Atom N270  | COM1, COM2   | -  | -  |  |
| PE-4000B Atom N2600   | COM1, COM2   | COM3 <sup>*4</sup> , COM4 <sup>*4</sup> ,<br>COM5 <sup>*4</sup> , COM6 <sup>*4</sup> | COM3 <sup>*4</sup> , COM4 <sup>*4</sup> ,<br>COM5 <sup>*4</sup> , COM6 <sup>*4</sup> |  |
| PS5000 (Slim Panel Type<br>Core i3 Model) <sup>*5*6</sup>                                   | COM1, COM2 <sup>*4</sup>   | COM2 <sup>*4</sup>   | COM2 <sup>*4</sup>   |  |
| PS5000 (Slim Panel Type<br>Atom Model) <sup>*5*6</sup>                                      | COM1, COM2 <sup>*7</sup>   | COM2*7   | COM2 <sup>*7</sup>   |  |
| PS5000 (Enclosed Panel<br>Type) <sup>*8</sup>   | COM1   |  |  |  |
| PS5000 (Modular Type<br>PFXPU/PFXPP) <sup>*5*6</sup><br>PS5000 (Modular Type<br>PFXPL2B5-6) | COM1 <sup>*7</sup>   | COM1 <sup>*7</sup>   | COM1 <sup>*7</sup>   |  |
| PS5000 (Modular Type<br>PFXPL2B1-4)   | COM1, COM2 <sup>*7</sup>   | COM2*7   | COM2*7   |  |

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

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

\*3 When making communication between an External Device and COM port on the Expansion slot, only RS-232C is supported. However, ER (DTR/CTS) control cannot be executed because of the specification of COM port.

For connection with External Device, use user-created cables and disable Pin Nos. 1, 4, 6 and 9. Please refer to the IPC manual for details of pin layout.

- \*4 Set up the SIO type with the BIOS. Please refer to the IPC manual for details of BIOS.
- \*5 When setting up communication between an External Device and the RS-232C/422/485 interface module, use the IPC (RS-232C) or PS5000 (RS-422/485) cable diagrams. However, when using PFXZPBMPR42P2 in a RS-422/485 (4-wire) configuration with no flow control, connect 7.RTS+ and 8.CTS+, and connect 6.RTS- and 9.CTS-. When using RS-422/485 communication with External Devices, you may need to reduce the transmission speed and increase the TX Wait time.
- \*6 To use RS-422/485 communication on the RS-232C/422/485 interface module, the DIP Switch setting is required. Please refer to "Knowledge Base" (FAQs) on the support site. (http://www.pro-face.com/trans/en/manual/1001.html)

| Settings                                   | FAQ ID   |
|--|----------|
| PFXZPBMPR42P2, RS422/485 change method     | FA263858 |
| PFXZPBMPR42P2 termination resistor setting | FA263974 |
| PFXZPBMPR44P2, RS422/485 change method     | FA264087 |
| PFXZPBMPR44P2 termination resistor setting | FA264088 |

\*7 Set up the SIO type with the DIP Switch. Please refer to the IPC manual for details of DIP Switch.

The BOX Atom has not a switch to set the RS-232C, RS-422/485 mode. Use the BIOS for the setting.

\*8 For the connection with the External Device, on the user-created cable read as if the connector on the Display-side is a M12 A-coding 8 pin socket. The pin assignment is the same as described in the cable diagram. For the M12 A-coding connector, use PFXZPSCNM122.

#### DIP Switch settings (PL3000 / PS3000 Series)

| DIP Switch | Setting           | Description   |  |
|------------|-------------------|---|--|
| 1          | OFF <sup>*1</sup> | Reserved (always OFF)   |  |
| 2          | OFF               | SIO torres DS 2220  |  |
| 3          | OFF               | SIO type: RS-232C   |  |
| 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         |  |
| 8          | OFF               | Short-circuit of SDB (TXB) and RDB (RXB): Not available         |  |
| 9          | OFF               | DS (DTS) Auto control moder Dischlod                            |  |
| 10         | OFF               | KS (K1S) Auto control mode: Disabled                            |  |

#### RS-232C

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

## RS-422/485 (4 wire)

| DIP Switch | Setting | Description   |  |
|------------|---------|---|--|
| 1          | OFF     | Reserved (always OFF)   |  |
| 2          | ON      | SIO tomos DS 422/485  |  |
| 3          | ON      | SIO type: KS-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          | 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     |   |  |

## RS-422/485 (2 wire)

| DIP Switch | Setting | Description   |
|------------|---------|---|
| 1          | OFF     | Reserved (always OFF)   |
| 2          | ON      | SIQ trans DS 422/495  |
| 3          | ON      | SIO type: KS-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             |
| 8          | ON      | Short-circuit of SDB (TXB) and RDB (RXB): Available             |
| 9          | ON      | PS (PTS) Auto control model Enchlad                             |
| 10         | ON      | K5 (K15) Auto control mode. Enabled                             |

## 2. Selection of External Device

Select the External Device to be connected to the Display.

| 💰 Welcome to GP-Pro EX |                              |   | ×     |
|------------------------|------------------------------|---|-------|
| 67-7ro <b>E</b> X      | Device/PLC<br>Number of Devi | ces/PLCs 1  |       |
|                        |                              | Device/PLC 1  |       |
|                        | Manufacturer                 | CoDeSys Automation Alliance                         | -     |
|                        | Series                       | CoDeSys SIO   | -     |
|                        | Port                         | COM1  | -     |
|                        |                              | Refer to the manual of this Device/PLC              |       |
|                        |                              | Recent Device/PLC                                   |       |
|                        |                              |   |       |
|                        | Use System                   | Area Device Informs                                 | ation |
|                        | Back ( <u>B</u>              | ) Communication Settings New Logic New Screen Cance | :     |

| Setup Items     | Setup Description   |
|-----------------|---|
| Manufacturer    | Select the maker of the External Device to be connected. Select<br>"CoDeSys Automation Alliance"  |
| Series          | Select a model (series) of the External Device to be connected and connection method. Select "CoDeSys SIO".<br>Check the External Device which can be connected in system configuration.  |
| Port            | Select the Display port to be connected to the External Device.<br>(Select COM1)  |
| Use System Area | <ul> <li>Check this option to synchronize the system data area of the Display and the device (memory) of the External Device. When synchronized, you can use the External Device's ladder program to switch the display or display the window on the Display.</li> <li>Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"</li> <li>This feature can also be set in GP-Pro EX or in the Display's offline mode.</li> <li>Cf. GP-Pro EX Reference Manual "System Settings [Display Unit] - [System Area] Settings Guide"</li> <li>Cf. Maintenance/Troubleshooting Guide "Main Unit - System Area Settings"</li> </ul> |

## 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

#### • Setting of GP-Pro EX

#### Communication Settings

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

| Manufacturer CoDeS  | ys Automation Allia  | nce Series CoDeSys SID   | Port COM1 |  |  |
|---|--|--|-----------|--|--|
| Text Data Mode  | 2 Change   |  |           |  |  |
| Communication Settings  |  |  |           |  |  |
| SIO Type  | • RS232C   | C RS422/485(2wire) C RS422/485(4wire)                          |           |  |  |
| Speed   | 38400  |  |           |  |  |
| Data Length   | O 7  | • 8  |           |  |  |
| Parity  | NONE   | O EVEN O ODD   |           |  |  |
| Stop Bit  | • 1  | O 2  |           |  |  |
| Flow Control  | • NONE   | O ER(DTR/CTS) O XON/XOFF                                       |           |  |  |
| Timeout   | 3 🕂 (  | sec)   |           |  |  |
| Retry   | 2 🔅  |  |           |  |  |
| Wait To Send  | 0 🕂 (  | ns)  |           |  |  |
| RI / VCC  | • RI   | © VCC  |           |  |  |
| In the case of RS2<br>or VCC (5V Power<br>Isolation Unit, pleas | 32C, you can selec<br>Supply). If you use<br>select it to VCC. | t the 9th pin to RI (Input)<br>the Digital's RS232C<br>Default |           |  |  |
| Device-Specific Settings  |  |  |           |  |  |
| Allowable Number of   | Devices/PLCs   | 1  |           |  |  |
| Number Device N   | ame  | Settings   |           |  |  |
|   |  | HULL ACCESS-Direct Address, Motoroid Byteorder=NO              |           |  |  |

#### Device Settings

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

| Individual Device Setting:                                 | s                                  | ×  |
|--|------------------------------------|----|
| PLC1   |                                    |    |
|  |                                    |    |
| Access   | Direct Address                     | -  |
| (Please reconfirm all address<br>have changed the access.) | settings that you are using if you |    |
| Motorola Byteorder   | No                                 | •  |
|  |                                    |    |
|  |                                    |    |
|  |                                    |    |
|  | 0K ( <u>0)</u> Cance               | el |

#### Setting of External Device

Please refer to CoDeSys software and/or external Device user manual for more details about how to setup serial parameters (speed, data length etc.) of External Device.



## 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 7)

NOTE • Set the Display's IP address in off-line mode.

Cf. Maintenance/Troubleshooting Manual "2.5 Ethernet Settings"

## 4.1. Setup Items in GP-Pro EX

#### **Communication Settings**

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

| Device/PLC 1   |
|--|
| Summary Change Device/PLC  |
| Manufacturer CoDeSys Automation Alliance Series CoDeSys SIO Port COM1  |
| Text Data Mode 2 Change  |
| Communication Settings   |
| SIO Type © RS232C © RS422/485(2wire) © RS422/485(4wire)  |
| Speed 38400 💌  |
| Data Length C 7 🕞 8  |
| Parity © NONE O EVEN O ODD   |
| Stop Bit   |
| Flow Control   O NONE O ER(DTR/CTS) O XON/XOFF   |
| Timeout 3 😴 (sec)  |
| Retry 2  |
| Wait To Send 0 👘 (ms)  |
| RI/VCC IRI OVCC  |
| In the case of RS232C, you can select the 9th pin to RI (Input)<br>or VCC (5V Power Supply). If you use the Digital's RS232C |
| Isolation Unit, please select it to VCC. Default   |
| Device-Specific Settings   |
| Allowable Number Add Device<br>of Devices/PLCs 1   |
| No. Device Name Settings   |
| 1 PLC1 Access=Direct Address,Motorola Byteorder=No   |
| Setup Items Setup Description  |

| Setup Items | Setup Description   |
|-------------|---|
| SIO Type    | Select the SIO type to communicate with the External Device.            |
| Speed       | Select communication speed between the External Device and the Display. |
| Data Length | Select a data length.   |
| Parity      | Select how to check parity.   |

| Setup Items     | Setup Description   |  |  |  |
|-----------------|---|--|--|--|
| 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<br>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.<br>It is necessary to change RI/5V by changeover switch of IPC when connect<br>with IPC. Please refer to the manual of the IPC for more detail. |  |  |  |

#### **Device Setting**

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

| 🍰 Individual Device Setting:                               | s 🔀                                |
|--|------------------------------------|
| PLC1   |                                    |
| Access   | Direct Address                     |
| (Please reconfirm all address<br>have changed the access.) | settings that you are using if you |
| Motorola Byteorder   | No                                 |
|  |                                    |
|  |                                    |
|  | OK ( <u>D</u> ) Cancel             |

| Setup Items           | Setup Description  |
|-----------------------|--|
| Access                | Select displays access type (Direct Address) of the External Device. |
| Motorola<br>Byteorder | Set the Motorola Byteorder of the External Device.                   |

## NOTE

Please make sure the above settings match with "Online – Communication Parameters" of Device/PLC programming software, otherwise communication error will occur.

## 4.2. Settings in Off-Line Mode

 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 Equipment Settings] in the off-line mode. Touch the External Device you want to set from the displayed list.

| Comm        | Device  | Option                                       |  |   |  |
|-------------|---|--|--|---|--|
|             |   |  |  |   |  |
| CoDeSys SIO |   |  | [COM1]   | Page 1/1  |  |
|             | SIO Type<br>Speed<br>Data Length<br>Parity<br>Stop Bit<br>Flow Control<br>Timeout(s)<br>Retry<br>Wait To Send(ms) | RS2321<br>38400<br>7<br>• NON<br>• 1<br>NONE | C<br>E 8<br>EVEN<br>2<br>3<br>2<br>2<br>2<br>2 | <ul> <li>♥</li> <li>♥</li> <li>● 0DD</li> <li>♥</li> <li>●</li> <li>●</li> <li>●</li> <li>2014/06/10</li> </ul> |  |
|             | Exit  |  | Back   | 03:48:14  |  |
| Setup Items | Setup Description   |  |  |   |  |
| SIO Type    | Select the SIO type to communicate with the External Device.  |  |  |   |  |
| Sneed       | Select communication speed between the External Device and the Display  |  |  |   |  |

| SIO Type            | Select the SIO type to communicate with the External Device.   |
|---------------------|--|
| Speed               | Select communication speed between the External Device and the Display.  |
| Data Length         | Select a 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<br>Send(ms) | Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.              |

NOTE

#### Device Setting

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

| Comm.                 | Device   | Option               |        |                        |  |
|-----------------------|--|----------------------|--------|------------------------|--|
|                       |  |                      |        |                        |  |
| CoDeSys SIO           |  |                      | [COM1] | Page 1/1               |  |
| De                    | vice/PLC Name PL   | C1                   |        | -                      |  |
|                       | Access<br>Motorola Byteoro   | Direct Ad<br>Jer ∫No | Idress |                        |  |
|                       | Exit   |                      | Back   | 2014/06/10<br>03:48:19 |  |
| Setup Items           | Setup Description  |                      |        |                        |  |
| Device<br>Name        | Select the device name for device setting. Device name is a title of the External Device set with GP-Pro EX. (Initial value[PLC1]) |                      |        |                        |  |
| Access                | Displays access type (Direct Address) of the External Device   |                      |        |                        |  |
| Motorola<br>Byteorder | Set the Motorola Byteorder of the External Device  |                      |        |                        |  |

#### 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        | Device  | Option   |   |                        |  |
|-------------|---|--|---|------------------------|--|
| CoDeSys SIO |   |  | [COM1]  | Page 1/1               |  |
|             | RI / VCC<br>In the case<br>the 9th pir<br>Power Suppl<br>RS232C Isol<br>it to VCC.  | <ul> <li>RI</li> <li>of RS232C, you</li> <li>to RI(Input) or</li> <li>y). If you use th</li> <li>ation Unit, pleation</li> </ul> | VCC<br>can select<br>VCC(5V<br>e Digital's<br>se select |                        |  |
|             | Exit  |  | Back  | 2014/06/10<br>03:48:23 |  |
| Setup Items | Setup Description   |  |   |                        |  |
| RI/VCC      | You can switch RI/VCC of the 9th pin when you select RS232C for SIO type<br>It is necessary to change RI/5V by changeover switch of IPC when connect<br>with IPC.<br>Please refer to the manual of the IPC for more detail. |  |   |                        |  |



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

## 5. Cable Diagrams

The following cable diagrams may be different from cable diagrams recommended by Control Techniques. Please be assured there is no operational problem in applying the cable diagrams shown in this manual.

- Please ground the FG pin of the External Device body. Use a grounding resistance of  $100\Omega \ 2 \ mm^2$  or thicker wire, or your country's applicable standard. Refer to your External Device manual for more details.
- The SG and FG are connected inside the Display. When connecting the External Device to the SG, design your system to avoid short-circuit loops.
- Connect an isolation unit if the communication is not stable due to noise or other factors.
- The connector type or signal name may vary depending on the External Device. Connect correctly corresponding to the External Device interface specifications.

| Display<br>(Connection Port)                          |    | Cable  | Remarks                              |
|---|----|--|--------------------------------------|
| GP3000 (COM1)<br>GP4000*1 (COM1)<br>SP5000*2 (COM1/2) | 1A | User created cable<br>(ER (DTR/CTS) control)         | The cohie length must                |
| ST (COM1)<br>LT3000 (COM1)<br>IPC*3<br>PC/AT          | 1B | User created cable<br>(No Flow Control)              | be 15m maximum.                      |
| GP-4105 (COM1)  | 1C | User created cable<br>(ER (DTR/CTS) control)         | The cable length must                |
| GP-4115T3 (COM1)                                      | 1D | User created cable<br>(No Flow Control)              | be 15m maximum.                      |
| LT-4*01TM (COM1)<br>LT-Rear Module 11<br>(COM1)       |    | RJ45 RS-232C Cable (5m) by Pro-face<br>PFXZLMCBRJR21 | The cable length must be 5m maximum. |

## 5.1. Cable Diagram 1

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

\*2 Except SP-5B00

\*3 Only the COM port which can communicate by RS-232C can be used.

☞ ■IPC COM Port (page 4)

1A)

|         | Disj<br>D-Sub 9 | play side<br>) pin (socket | ) Shield                                | External Device side |
|---------|-----------------|----------------------------|---|----------------------|
| Display | Pin             | Signal name                | =                                       | Signal name          |
|         | 2               | RD(RXD)                    | •                                       | SD                   |
|         | 3               | SD(TXD)                    |   | RD                   |
|         | 4               | ER(DTR)                    |   | CTS                  |
|         | 5               | SG                         |   | SG                   |
|         | 8               | CS(CTS)                    | ← ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ | RTS                  |
|         | Shell           | FG                         | ······                                  | FG                   |

1B)

|         | Display side<br>D-Sub 9 pin (socket) |             | ) Shield      | External Device side |
|---------|--------------------------------------|-------------|---------------|----------------------|
| Display | Pin                                  | Signal name | =             | Signal name          |
|         | 2                                    | RD(RXD)     | <             | SD                   |
|         | 3                                    | SD(TXD)     |               | RD                   |
|         | 5                                    | SG          |               | SG                   |
|         | 7                                    | RS(RTS)     | ───_ ! ! ∲─── | FG                   |
|         | 8                                    | CS(CTS)     | -             |                      |
|         | Shell                                | FG          | <u> </u>      |                      |

1C)

|         | Display side<br>Terminal block | Shield                                  |          | External Device side |
|---------|--------------------------------|---|----------|----------------------|
|         | Signal name                    | ] / //                                  | \ [      | Signal name          |
| Display | RD(RXD)                        | <b>∖</b>                                | <u>+</u> | SD                   |
|         | SD(TXD)                        | ]                                       | <u></u>  | RD                   |
|         | ER(DTR)                        | }                                       | ÷→       | CTS                  |
|         | SG                             | ]                                       | ÷[       | SG                   |
|         | CS(CTS)                        | ] <b></b>                               | ÷        | RTS                  |
|         |                                | - · · · · · · · · · · · · · · · · · · · | :        | FG                   |

1D)

|         | Display side<br>Terminal block | Shield     | External Device side |
|---------|--------------------------------|------------|----------------------|
|         | Signal name                    |            | Signal name          |
| Display | RD(RXD)                        | <b></b>    | SD                   |
|         | SD(TXD)                        | }          | RD                   |
|         | SG                             |            | SG                   |
|         | RS(RTS)                        | ┣─┐╰シ┏́─── | FG                   |
|         | CS(CTS)                        | ┢─┘        |                      |

|               | External Device side |
|---------------|----------------------|
| Display       | Signal name          |
|               | SD                   |
|               | RD                   |
|               | SG                   |
| PFXZLMCBRJR21 | FG                   |

1E)

## 6. Supported Device Address

Range of supported device address is shown in the table below

| Device  | Bit Address                  | Word Address           | 32bits |  |
|---|------------------------------|------------------------|--------|--|
| Input   | %IX00000.00<br>~%IX65535.15  | %IW00000<br>~ %IW65535 |        |  |
| Output  | %QX00000.00<br>~%QX65535.15  | %QW00000<br>~ %QW65535 | L/H    |  |
| Marker  | %MX00000.00<br>~ %MX65535.15 | %MW00000<br>~ %MW65535 |        |  |
| This address can be specified for System data area. |                              |                        |        |  |

#### 6.1. **Direct Address**

This address can be specified for System data area.

NOTE

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

GP-Pro EXReference Manual "Appendix 1.4 LS Area (Direct Access Method)" Cf.

· Please refer to the precautions on manual notation for icons in the table.

"Manual Symbols and Terminology"

#### 6.2. Symbolic Address

| Device              |          | Bit Address   | Word Address  | 32<br>Bits | Notes |
|---------------------|----------|---|---|------------|-------|
|                     | Single   | <symname></symname>   |   |            |       |
|                     | 1D Array | <symname>[xl] ~<br/><symname>[xh]</symname></symname>                   |   |            |       |
| BOOL                | 2D Array | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>             | _   | -          | *1    |
|                     | 3D Array | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname>       |   |            |       |
|                     | Single   | <symname>.00 ~<br/><symname>.07</symname></symname>                     | <symname></symname>   |            |       |
| BYTE                | 1D Array | <symname>[x1].00 ~<br/><symname>[xh].07</symname></symname>             | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             | тлт        | *1 *0 |
| USINT               | 2D Array | <symname>[xl,yl].00 ~<br/><symname>[xh,yh].07</symname></symname>       | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | L/H        | *1 *2 |
|                     | 3D Array | <symname>[xl,yl,zl].00 ~<br/><symname>[xh,yh,zh].07</symname></symname> | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
| INT<br>UINT<br>WORD | Single   | <symname>.00 ~<br/><symname>.15</symname></symname>                     | <symname></symname>   |            |       |
|                     | 1D Array | <symname>[x1].00 ~<br/><symname>[xh].15</symname></symname>             | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             | тлт        | *1    |
|                     | 2D Array | <symname>[xl,yl].00 ~<br/><symname>[xh,yh].15</symname></symname>       | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | L/П        | .1    |
|                     | 3D Array | <symname>[xl,yl,zl].00 ~<br/><symname>[xh,yh,zh].15</symname></symname> | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |

| Dev    | vice       | Bit Address   | Word Address  | 32<br>Bits | Notes |
|--------|------------|---|---|------------|-------|
|        | Single     |   | <symname></symname>   |            |       |
|        | 1D Array   |   | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             |            |       |
| ENUM   | 2D Array   | -   | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       |            | *1    |
|        | 3D Array   |   | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
|        | Single     | <symname>.00 ~<br/><symname>.31</symname></symname>                     | <symname></symname>   |            |       |
|        | 1D Array   | <symname>[xl].00 ~<br/><symname>[xh].31</symname></symname>             | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             |            | *1    |
| UDINT  | 2D Array   | <symname>[xl,yl].00 ~<br/><symname>[xh,yh].31</symname></symname>       | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | -          | *1    |
|        | 3D Array   | <symname>[xl,yl,zl].00 ~<br/><symname>[xh,yh,zh].31</symname></symname> | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
|        | Single     |   | <symname></symname>   |            |       |
|        | 1D Array   |   | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             |            |       |
| REAL   | 2D Array   | -   | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | -          | *1    |
| TOD    | 3D Array   |   | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
|        | Single     | <symname>.00 ~<br/><symname>.31</symname></symname>                     | <symname></symname>   |            |       |
|        | 1D Array   | <symname>[xl].00 ~<br/><symname>[xh].31</symname></symname>             | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             | _          | *1*/  |
| ULINT  | 2D Array   | <symname>[x1,y1].00 ~<br/><symname>[xh,yh].31</symname></symname>       | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | -          | 1.4   |
|        | 3D Array   | <symname>[xl,yl,zl].00 ~<br/><symname>[xh,yh,zh].31</symname></symname> | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
|        | Single     |   | <symname></symname>   |            |       |
|        | 1D Array   |   | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             |            |       |
| LREAL  | 2D Array   | -   | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | -          | *1*4  |
|        | 3D Array   |   | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
|        | Single     |   | <symname></symname>   |            |       |
|        | 1D Array   |   | <symname>[xl] ~<br/><symname>[xh]</symname></symname>             |            |       |
| STRING | 2D Array   | -   | <symname>[xl,yl] ~<br/><symname>[xh,yh]</symname></symname>       | -          | *1*3  |
|        | 3D Array   |   | <symname>[xl,yl,zl] ~<br/><symname>[xh,yh,zh]</symname></symname> |            |       |
|        | This addre | ss can be specified for System data area.                               |   |            |       |

This address can be specified for System data area.

\*1 <SYMNAME>: Symbol Name including structure name in case of structure. The maximum number of characters for Symbol Name is 255 including delimiters and element number. The maximum number of characters when using D-Script is limited to 54. Example:

| BOOL type single symbol | "BOOLSYMBOL"          |
|-------------------------|-----------------------|
| BOOL type 1D Array      | "BOOL1D[10]           |
| WORD type 2D Array      | "WORD2D[10,10]        |
| UDINT type 3D Array     | "UDINT3D[0,1,2]       |
| STRING in User Defined  |                       |
| Structure [STRUCT001]   | "STRUCT001.STRINGSYM" |
|                         |                       |

- You cannot start names with any of the following text: LS, USR, SCR, PRT
- \*2 Handled as 8 bit devices in the External Device, but as 16-bit devices in GP-Pro EX. Upper byte is set to 0 in GP-Pro EX.
- \*3 For automatic address increment during screen part duplication, please set the number of address increment to the half of the character length of the string. Last character of a STRING can not be displayed / changed if STRING size is odd number of characters.

If number of Display Characters is set higher than STRING size, Runtime Error will occur. (Unknown/illegal Address)

\*4 Handled as 64 bit devices in the External Device, but as 32-bit devices in GP-Pro EX. Upper 32 bit information is discarded in GP-Pro EX.

**NOTE** • This driver cannot use the array of structure.

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"

#### Importing Symbols

1 In GP-Pro EX, open the [Individual Device Settings] dialog box, and from the [ACCESS] drop-down list, select "Symbolic Address".

| 🖆 Individual Device Settings 🛛 🔀   |                        |  |  |  |  |
|--|------------------------|--|--|--|--|
| PLC1   |                        |  |  |  |  |
|  |                        |  |  |  |  |
| Access   | Symbolic Address       |  |  |  |  |
| (Please reconfirm all address settings that you are using if you have changed the access.) |                        |  |  |  |  |
| Motorola Byteorder   | No                     |  |  |  |  |
| Symbol File  | <b>y</b>               |  |  |  |  |
|  | New Import Edit        |  |  |  |  |
|  | OK ( <u>0</u> ) Cancel |  |  |  |  |

2 Click [New].

| Symbol List | Project01 |      |    |        |
|-------------|-----------|------|----|--------|
| Show        |           | 7    |    |        |
| Name        |           | Туре |    | Import |
|             |           |      |    | Delete |
|             |           |      |    |        |
|             |           |      |    |        |
|             |           |      |    |        |
|             |           |      |    |        |
|             |           |      |    |        |
|             |           |      |    |        |
|             |           |      |    |        |
| 0 Symbols.  |           | _    |    |        |
|             |           |      | OK | Cancel |

#### 3 Click [Import].

| Select Symbols          |    |                |              |        |
|-------------------------|----|----------------|--------------|--------|
| Symbol File             |    |                |              | Import |
| ,                       |    |                |              |        |
| Available Items         |    | Selected Items |              | ]      |
|                         | >> |                |              |        |
|                         | >  |                |              |        |
|                         | <  |                |              |        |
|                         | ~  |                |              |        |
| Select All Unselect All |    | Select All     | Unselect All |        |
| Type Filter Option      |    |                | OK           | Cancel |
|                         |    |                |              |        |
|                         |    |                |              | lii    |

- 4 From the [Symbol File] field, click [Import].
- 5 Select the Symbol File to import.
- 6 In the [Available Items] area, select the symbols to import and click [>]. The symbols to import are added to the [Selected Items] area.



7 Click [OK] to import. Import results appear in the [Symbol List].

| Shov  | N          |           | -                |           |
|-------|------------|-----------|------------------|-----------|
|       |            | 1         |                  |           |
|       | Name       |           | Туре             | Import    |
| ۲.    | PLC_PRG.bo | olarray1D | ARRAY[010] OF B0 | DOL       |
|       | PLC_PRG.bo | olarray2D | ARRAY[05,05] OF  | BO Delete |
|       | PLC_PRG.bo | olarray3D | ARRAY[05,05,05   | 5]0       |
|       | PLC_PRG.bo | oMar      | BOOL             |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
|       |            |           |                  |           |
| 4 Sv  | mbols.     |           |                  |           |
| 4 Syr | mbols.     |           |                  |           |
| 4 Syr | mbols.     |           | ΟΚ               | Cancel    |

## NOTE

When there are symbols that failed to import, you can save the generated error log.

# 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 select [Symbolic Address] in series of the External Device, cannot use a device cord and the address code.

#### **Direct Address:**

| Device | Device<br>Name | Device<br>Code |
|--------|----------------|----------------|
| Input  | %I             | 0x0080         |
| Output | %Q             | 0x0081         |
| Marker | %M             | 0x0083         |

## 8. Error Messages

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

| Item                  | Requirements  |
|-----------------------|---|
| No.                   | Error No.   |
| Device Name           | Name of the External Device where error occurs. Device name is a title of the 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 the External Device where error occurs, or error<br>codes received from the 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 "[Hex]".</li> </ul> |

| 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.   |