ROC Plus
Ethernet Driver

Introduction

This manual describes how to connect the display unit and the external device (target controller).

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

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

| 2 | External Device Selection
Select a model (series) of the external device and its connection method. | ☞ "2 External Device Selection" (page 4) |

| 3 | Communication Settings
This section shows setting examples for communicating between the display unit and the external device. | ☞ "3 Communication Settings" (page 5) |

| 4 | Setup Items
This section describes communication setup items on the display unit.
Set the display unit's communication settings in GP Pro-EX or in off-line mode. | ☞ "4 Setup Items" (page 6) |

Operation

1 System Configuration

The following table lists system configurations for connecting Emerson Process Management external devices to display units.

Series	CPU	Link I/F	Communication Method	Setting Example
ROC	ROC800 (809, 827) ROC100	Ethernet port	Ethernet (TCP)	"Setting Example 1" (page 5)

• 1:1 Connection

Display   External Device

• 1:n Connection

Display   Maximum number of External Devices: 16
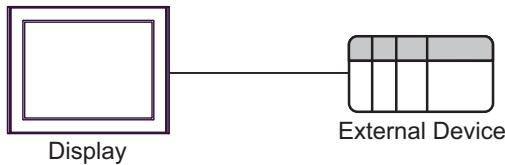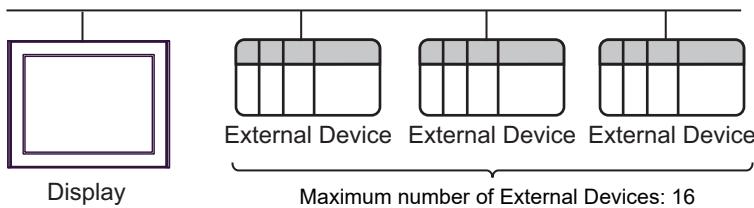
2 External Device Selection

Select the External Device to be connected to the display unit.
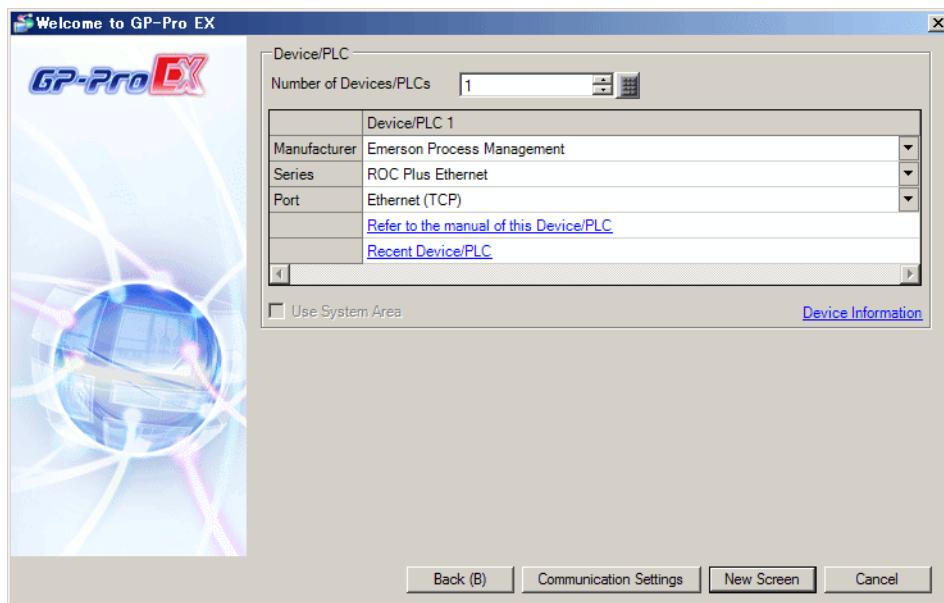
| Setup Items	Setup Description
Number of Devices/PLCs	Select the number of external devices to be connected.
Manufacturer	Select "Emerson Process Management", the manufacturer of the external device to be connected.
Series	Select the series of the external device to be connected and connection method. Select "ROC Plus Ethernet". Check to make sure the external device to which you are connecting is supported by the driver. ☞ "1 System Configuration" (page 3)
Port	Select the display unit port to be connected to the external device.
Use System Area	Not available in this driver.

3 Communication Settings

This section provides examples of communication settings recommended by Pro-face for the display unit and the external device.

3.1 Setting Example 1

■ GP Pro-EX Settings

◆ Communication Settings

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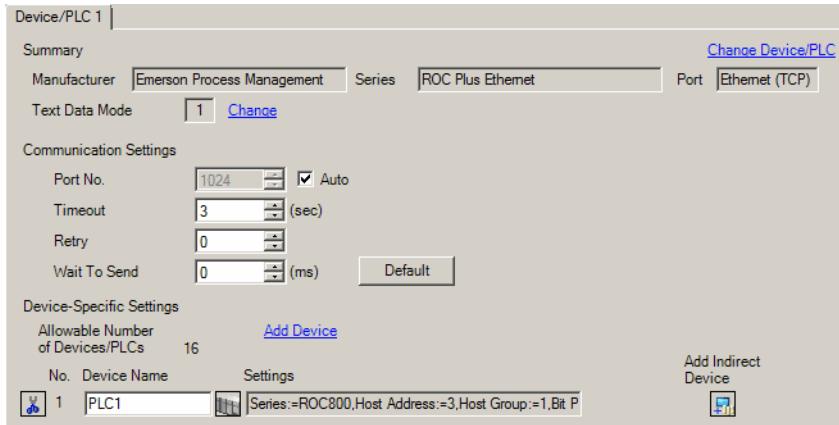
◆ Device Settings

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

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.
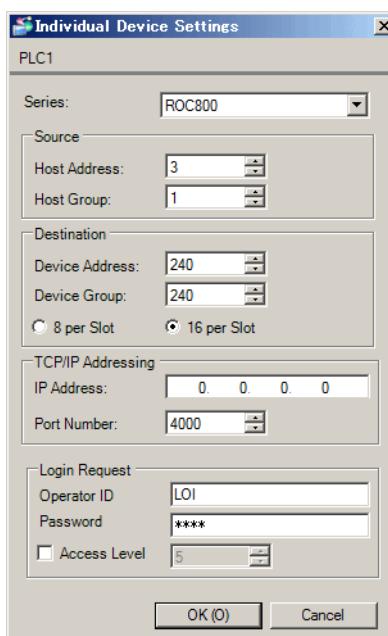
4 Setup Items

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

The setting of each parameter must match that of the external device.

4.1 Setup Items in GP Pro-EX

■ Communication Settings

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

Setup Items	Setup Description
Port No.	Select display unit's Ethernet port number when communicating with the external device. If you select the Auto check box, an available port is assigned for communication.
Timeout	Use an integer from 1 to 127 to enter how many seconds the display unit waits for a response from the external device.
Retry	If there is no response from the external device, use an integer from 0 to 255 to enter how many times the display unit retransmits the command.
Wait To Send	Use an integer from 0 to 255 to enter the amount of time in milliseconds the display unit waits after receiving a transmission before it sends again. When the Default button is selected and confirmed, the Wait To Send setting is returned to the default value, "0".

■ Ethernet 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] ⬚ .

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.
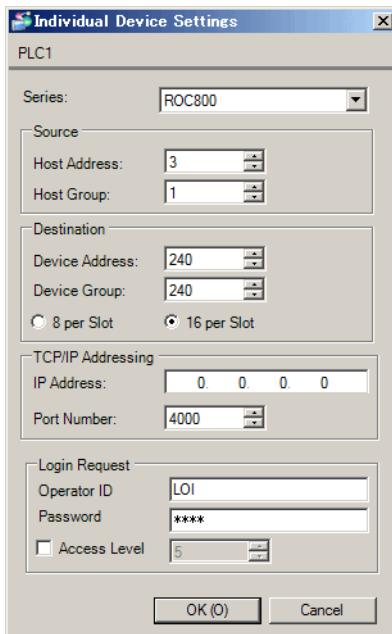
Setup Items		Setup Description
Series		Select the series of the external device.
Source	Host Address	Use an integer from 1 to 255 to enter the address of the host display unit.
	Host Group	Use an integer from 0 to 255 to enter the address of the host display unit.
Destination	Device Address	Use an integer from 1 to 255 to enter the address of the destination device.
	Device Group	Use an integer from 0 to 255 to enter the group of the destination device.
	Bits per Slot	Select to set 8 bits per slot on the device.
		Select to set 16 bits per slot on the device.
TCP/IP Addressing	IP Address	Use an integer from 0 to 255 to enter in each of the four address segments.
	Port Number	Use an integer from 1 to 65535 to enter the port number
Login Request[*1]	Operator ID	Use three alphanumeric characters to identify the current operator. The ID should use ASCII characters only, and is case-sensitive.
	Password	Use an integer from 0000 to 9999 for the operator password.
	Access Level	Select the check box to define the security access level for the operator with an integer from 0 to 5.

*1 Login Request settings (Operator ID, Password, and Access Level) must match the settings on the device/ PLC. If the settings do not match, the PLC will return error 083. For a list of errors, see 6 Error Messages.

4.2　　Setup Items in Off-line Mode

NOTE

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

Cf.　Maintenance/Troubleshooting Manual "2.2 Off-line Mode"

■ Communication Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings] in offline mode. Touch the External Device you want to set from the list that appears.
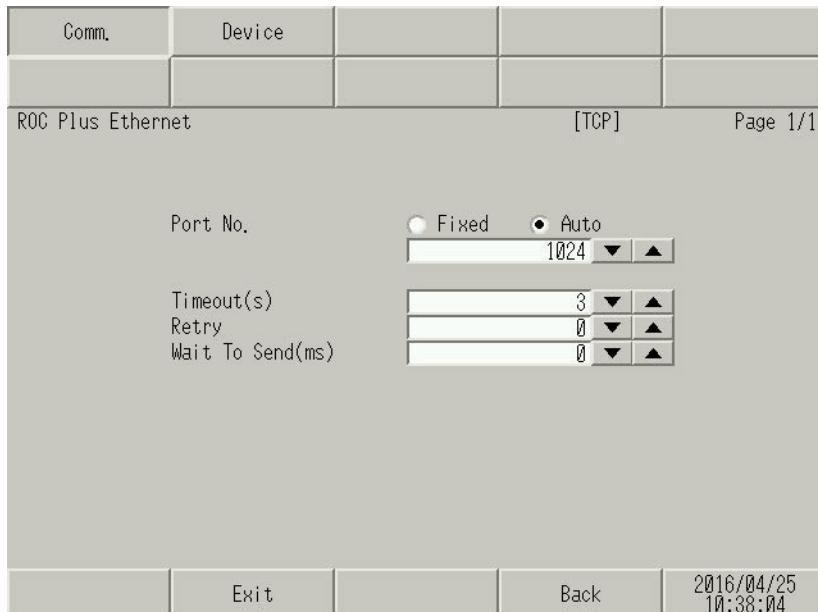
Setup Items	Setup Description
Port No.	Select display unit's Ethernet port number when communicating with the external device. If you select the Fixed option, the entered port number will be used. If you select the Auto option, any available port is used.
Timeout	Use an integer from 1 to 127 to enter how many seconds the display unit waits for a response from the external device.
Retry	If there is no response from the external device, use an integer from 0 to 255 to enter how many times the display unit retransmits the command.
Wait To Send	Use an integer from 0 to 255 to enter the amount of time in milliseconds the display unit waits after receiving a transmission before it sends again.

■ Ethernet Device Settings

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

```
┌─────────────┬─────────────┬─────────────┬─────────────┬─────────────┐
│    Comm.    │   Device    │             │             │             │
├─────────────┼─────────────┼─────────────┼─────────────┼─────────────┤
│             │             │             │             │             │
├─────────────┴─────────────┴─────────────┴──────┬──────┴─────────────┤
│ ROC Plus Ethernet                               │ [TCP]     Page 1/1 │
│                                                                       │
│      Device/PLC Name    │PLC1                          │▼│           │
│                                                                       │
│         IP Address         │  0    0    0    0 │                     │
│         Port No.           │             4000 │▼│▲│                  │
│                                                                       │
│         Host Address       │                3 │▼│▲│                  │
│         Host Group         │                1 │▼│▲│                  │
│                                                                       │
│         Device Address     │              240 │▼│▲│                  │
│         Device Group       │              240 │▼│▲│                  │
│                                                                       │
│         Operator ID        │LOI                │                     │
│         Use Access Level   │ ● No      ○ Yes  │                     │
│         Access Level       │                5 │▼│▲│                  │
│                                                                       │
├─────────────┬─────────────┬─────────────┬──────────────┬────────────┤
│             │    Exit     │             │    Back      │ 2016/04/25 │
│             │             │             │              │  10:38:09  │
└─────────────┴─────────────┴─────────────┴──────────────┴────────────┘
```
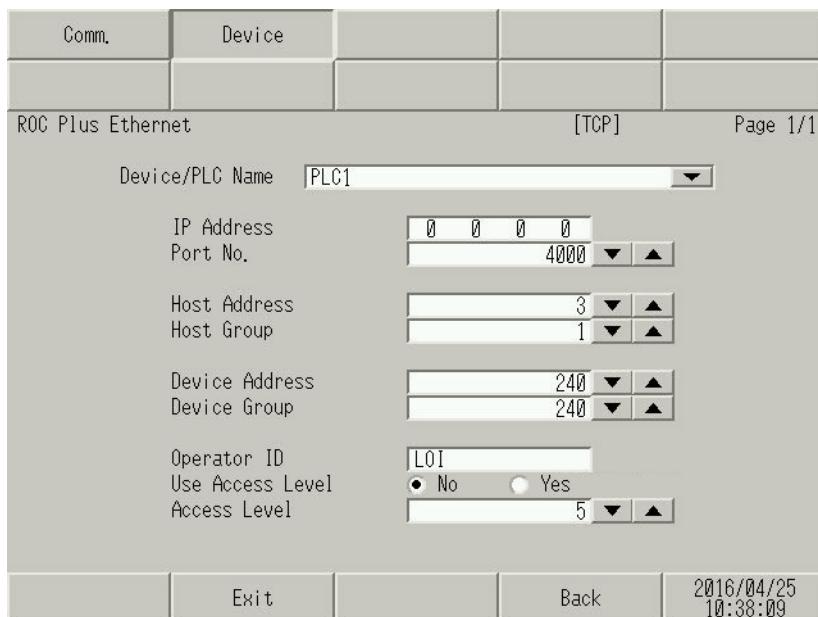
Setup Items	Setup Description
Device/PLC Name	Select the external device/PLC.
IP Address	Use an integer from 0 to 255 to enter in each of the four address segments.
Port No.	Use an integer from 1 to 65535 to enter the port number of the connected device.
Host Address	Use an integer from 1 to 255 to enter the address of the host (display unit).
Host Group	Use an integer from 0 to 255 to enter the address of the host (display unit).
Device Address	Use an integer from 1 to 255 to enter the address of the destination device.
Device Group	Use an integer from 0 to 255 to enter the group of the destination device.
Operator ID	Use 3 alphanumeric characters to identify the current operator. The ID is case-sensitive, and can use ASCII characters only.
Use Access Level	Set Use Access Level to Yes to define the security access level for the operator with an integer from 0 to 5.

5 Supported Devices

The entire range of Type, Logical, Parameter (TLP) settings are supported for all Emerson Process Management models/series listed in this manual.

In the following example TLP address, [PLC1]92,0,3:UINT8 the address components are described in the table below.

TLP Component		Description
[PLC1]	=	External device
92	=	Point Type value for 92 Logon Parameters (LOGON)
0	=	Logical (location) value for 1
3	=	Parameter value for keypad Security Level - Write Enabled
UINT8	=	Data type

Details on each TLP can be found in the in the ROC/FloBoss user manuals and the ROC Plus Protocol Reference from Emerson Process Management.

Custom TLPs are also supported for point types and parameters outside the standard set.

NOTE

• If specify the address within the address range in the Text Display of the Data Display, it may display an error. However, when the address is within the address range, send the address to the Display and can be used.

• The Summary of alarm does not operate normally.

5.1 Input Address Settings

NOTE
• The ROC Plus driver does not support the GP-Pro EX indirect addressing feature.

For easier entry of the device address, click the ⊞ icon beside the Address field. The following dialog appears.
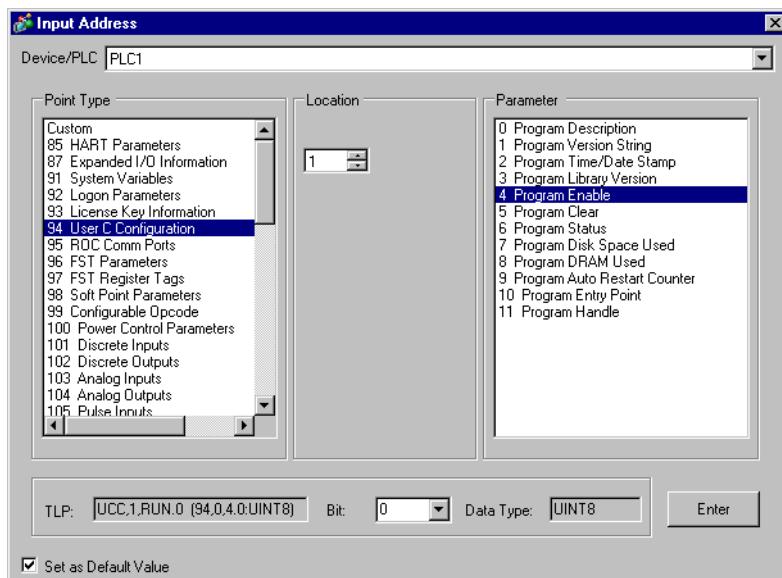
Setup Items		Setup Description
Device/PLC		Select the external device with the desired TLP.
Point Type		Select a point type.
Location		Use an integer from 0 to 255 to enter a value for a point type location.
	Slot	For physical point types, enter an integer from 0 to 255 as the slot number for this point type.
	Channel	For physical point types, enter an integer from 0 to 255 as the channel number for this slot.
Parameter		Select a parameter for the point type. Parameters vary depending on point type selected.
TLP		A read-only field that indicates the TLP address string corresponding to selections above. If the Custom point type is selected, enter TLP here in numeric format.
Bit		Bit range, 0-7, 0-15, or 0-31. Available only for the following data types: BIN, INT8, INT16, INT32, UINT8, UINT16, UINT32.
Data Type		A read-only field that indicates the data type of the parameter selected above. If Custom point type is selected, select the data type here.
Set as Default Value		Sets the currently selected address as the default for next time an address is entered in Pro EX.

5.2　　　Custom Input Address Settings

You can also access your own custom TLP addresses by entering the numeric TLP data in an Address field or, in the Input Address dialog box, by selecting the Custom point type in the Point Type window. The TLP, Bit, and Data Type fields are enabled for data input.

| TLP: | 0,0,0.0:BIN | | Bit: | 0 | ▼ | Data Type: | BIN | ▼ | | Enter |

In the TLP field, enter the TLP. The following valid input formats are available:

* `[PLC1]TT,LL,PP:DATATYPE`
* `[PLC1]TT,LL,PP.BIT:DATATYPE`

The addresses represent the following components:

TLP Component		Description
[PLC1]	=	External device
TT	=	Point Type (range 0 to 255)
LL	=	Logical (range 0 to 255)
PP	=	Parameter
BIT		Bit range, 0-7, 0-15, or 0-31. Available only for the following data types: BIN, INT8, INT16, INT32, UINT8, UINT16, UINT32.
DATATYPE	=	Data type

> **NOTE**
> * If a custom TLP entered matches a TLP in the Emerson Database, it will revert to that address and data type.

Valid Data type strings which can be entered in the Address Field are:

Name	Description
AC1	ASCII 1 character
AC3	ASCII 3 characters
AC7	ASCII 7 characters
AC10	ASCII 10 characters
AC12	ASCII 12 characters
AC20	ASCII 20 characters
AC30	ASCII 30 characters
AC40	ASCII 40 characters
BIN	Binary 8 bit, or bit address 0-7*.
FL	Floating Point
INT8	8 bit signed integer, or bit address 0-7*.
INT16	16 bit signed integer, or bit address 0-15*.
INT32	32 bit signed integer, or bit address 0-31*.
TIME	32 bit signed integer.
TLP	24 bit integer in 32 bits
UINT8	8 bit unsigned integer, or bit address 0-7*.

Name	Description
UINT16	16 bit unsigned integer, or bit address 0-15*.
UINT32	32 bit unsigned integer, or bit address 0-31*.

* Read-modify-write. When you write to one of these bit addresses, the Display unit reads the entire word address, sets the defined bit, then returns the new value to the PLC. If the ladder program writes data to this word address during the bit read/write process, the resulting data may be incorrect.

6　　Error Messages

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

Item	Description
No.	Error No.
Device Name	Name of the external device where an error has occurred. The 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.
Error Occurrence Area	Displays the IP address or device address of the External Device where an error has occurred, or error codes received from the External Device. **NOTE** • Device address is displayed as "Address: Device address". • Received error codes are displayed as "Decimal [Hex]". • IP address is displayed as "IP address (Decimal): MAC address (Hex)".

Error message example: `RAA150:92,1,7:UINT16 Invalid type number`

Error message list

Item	Description
083	Socket Error
128	General error code
129	Too many data bytes
130	Too few data bytes
136	Invalid parameter range
145	Invalid min/max request
146	Invalid time
147	Unknown error
148	Invalid parameter number
149	Invalid logical/point number
150	Invalid type number