# Pro-face

# Device/PLC Connection Manuals

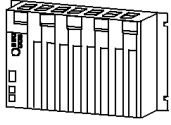**About the Device/PLC Connection Manuals**
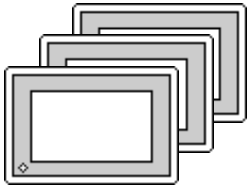
Prior to reading these manuals and setting up your device, be sure to read the "Important: Prior to reading the Device/PLC Connection manual" information. Also, be sure to download the "Preface for Trademark Rights, List of Units Supported, How to Read Manuals and Documentation Conventions" PDF file. Furthermore, be sure to keep all manual-related data in a safe, easy-to-find location.

## 10.2 Slave I/O

### 10.2.1 System Structure

The following table shows the system structure for connecting the GP to PLCs supporting Device Net.

| CPU | Link I/F | Cable Diagram | Link I/F | GP |
|---|---|---|---|---|
|  |  |  |  |  |
| PLC units compatible with Device Net | Device Net Master Unit | Cable Diagram 1 | Device Net I/F Unit (GP070-DN41) | GP Series *1 |

*1 The following table lists the GPs units that can be connected and used with DeviceNet.

| Series Name | | Product Name | Unit |
|---|---|---|---|
| GP70 Series | GP-470 Series | GP-470E | |
| | GP-570 Series | GP-570S | |
| | | GP-570T | |
| | | GP-57JS | |
| | | GP-570VM | |
| | GP-571 Series | GP-571T | |
| | GP-675 Series | GP-675S | |
| | | GP-675T | |
| | GP-870 Series | GP-870VM | |
| GP77R Series | GP-477R Series | GP-477RE | DeviceNet Unit (GP070-DN41) *1 |
| | GP-577R Series | GP-577RS | |
| | | GP-577RT | |
| GP2000 Series | GP-2500 Series | GP-2500L | |
| | | GP-2500S | |
| | | GP-2500T | |
| | GP-2501 Series | GP-2501L | |
| | | GP-2501S | |
| | | GP-2501T | |
| | GP-2600 Series | GP-2600T | |
| | GP-2601 Series | GP-2601T | |
| GLC2000 Series | GLC2600 Series | GLC2600T | |

*1 When using GP2000/GLC2000 series units, a bus conversion unit (PSL-CONV00) is required.

**Note:**
- **For the cable used, refer to <10.2.2 Cable Diagram> ◆ List of Cables Dedicated to DeviceNet.**

■ **Slave I/O**

Slave I/O is the feature that converts I/O data automatically between the PLC in-stalled with the master unit and GP unit.
Slave I/O uses a special link method that does not allow a user to access a PLC directly.

When using Device Net Connection the GP series unit performs like an I/O terminal (Remote terminal). The GP's LS area will be used as a device which inputs/outputs data with the host (PLC).

The master (host PLC) unit Output area is allocated to GP's Input area, and the master's Input area is allocated to GP's Output area. The LS area's Input area is followed in sequence by the Output area. (See below)
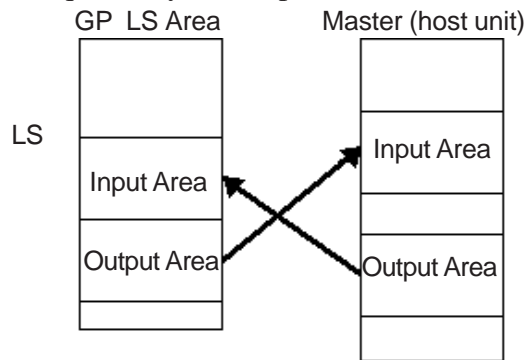


- **Only the LS Area's User Area (from LS20 to LS1999) is used for this communication.**

- **The System Area (from LS0 to LS19) and Reading Area settings cannot be used for PLC communication.**

- **GP will be used as a slave unit.**

- **Explicit Message Communication is not supported.**

- **The Contents in System Area are programless.**

> **10.2.2**  **Cable Diagram**

**<Cable Diagram 1>**
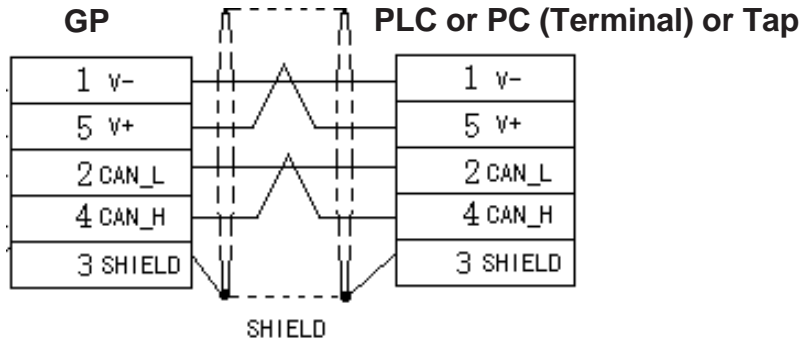


| Pin No. | Wire Cover Color | Comment |
|---|---|---|
| 1 | Black | Power Supply (V-) |
| 2 | Blue | Communication Data [Low side] (CAN_L) |
| 3 | None | Shield |
| 4 | White | Communication Data [High side] (CAN_H) |
| 5 | Red | Power Supply (V+) |
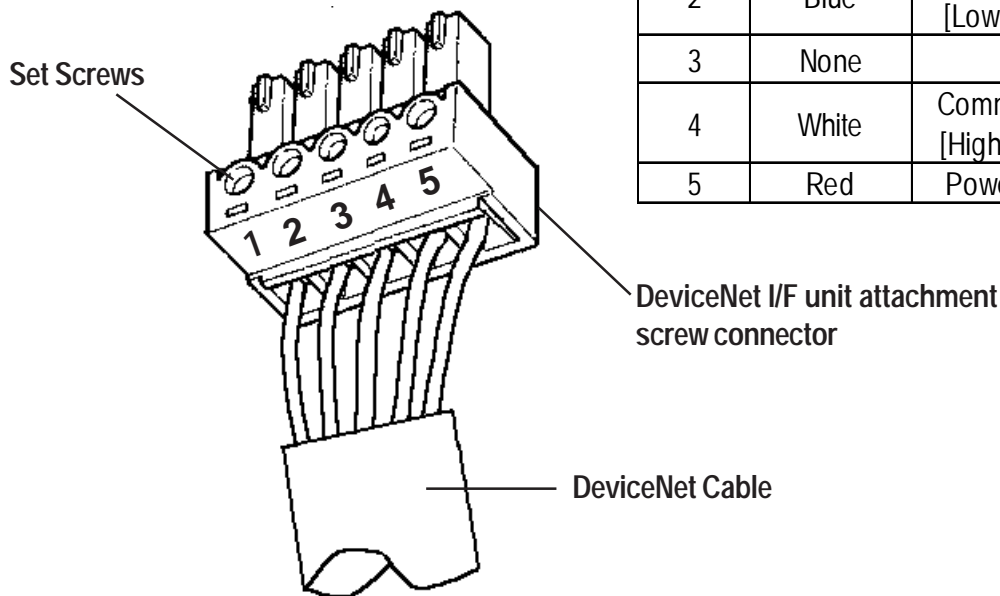
⚠️ *Important*  After all connector wires are attached to the connector, connect the connector to the Device Net I/F Unit (5-wire type).

Be sure to connect Terminating Resistors (121Ω1/4W) to both sides of the cable.

■ **List Device Net Cables**

There are two types of cable, thick and thin, for the Device Net unit.

Be sure to use only cables that meet the Device Net specifications.  The following two cables are recommended.

• Rockwell (Allen Bradley)        Thick type 1485C-PI-A***

• Rockwell (Allen Bradley)        Thin type 1485C-PI-C***
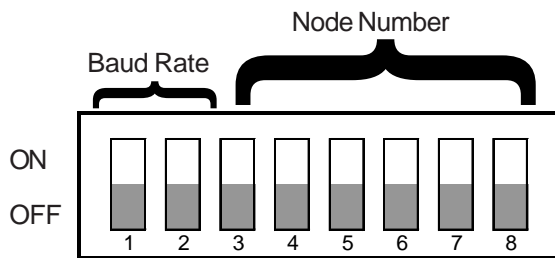
**10.2.3** **Environment Setup**

The following lists Digital's recommended GP settings.

## Baud Rate and Node Number Settings

### ◆ GP Unit

For setting the baud rate and the node number, use the Dip Swith (8 positions) on the rear side of the Device Net expansion unit (Model: GP070-DN41). The normal SIO communication setting cannot be used. Node number is available from 0 to 63 on the GP.

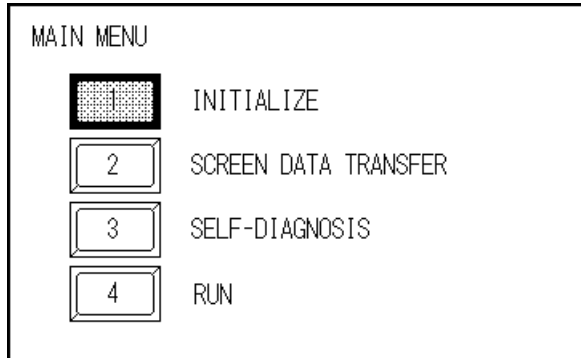| Node No. | D3 | D4 | D5 | D6 | D7 | D8 |
|----------|----|----|----|----|----|----|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| : | : | : | : | : | : | : |
| 61 | 1 | 1 | 1 | 1 | 0 | 1 |
| 62 | 1 | 1 | 1 | 1 | 1 | 0 |
| 63 | 1 | 1 | 1 | 1 | 1 | 1 |

| Baud Rate | DIPSW1 | DIPSW2 |
|-----------|--------|--------|
| 125K | 0 | 0 |
| 250K | 0 | 1 |
| 500K | 1 | 0 |
| Reserved | 1 | 1 |

### ◆ PLC Unit

For PLC settings, refer to each company's Device Net communication unit's manual.
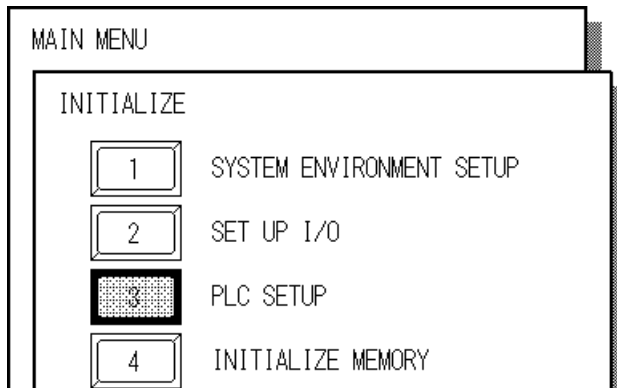
### Input / Output area Settings

Enter the GP's communication settings via the SET UP OPERATION SURROUND-INGS menu.

**< GP Example screen >**

```
MAIN MENU

    1      INITIALIZE

    2      SCREEN DATA TRANSFER

    3      SELF-DIAGNOSIS

    4      RUN
```

① Touch the INITIALIZE selection. The INITIALIZE menu will appear.

```
MAIN MENU

  INITIALIZE

    1      SYSTEM ENVIRONMENT SETUP

    2      SET UP I/O

    3      PLC SETUP

    4      INITIALIZE MEMORY
```

② Touch the PLC SETUP selection. The SET UP OPERATION SURROUNDINGS menu will appear.
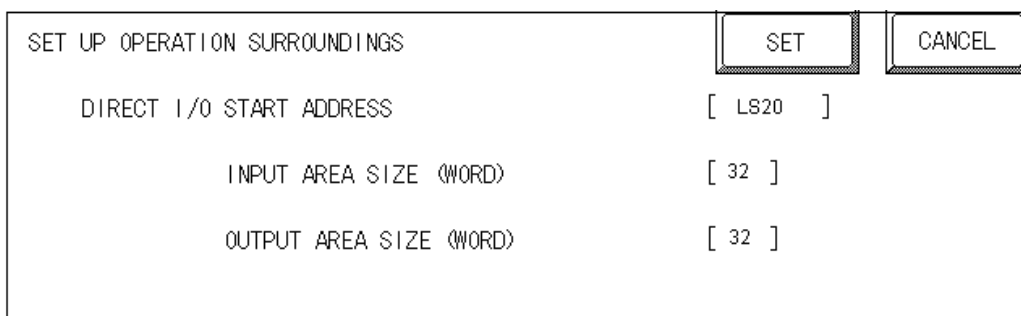
*Note:*    **The Initialize screen's SET UP I/O area's settings disabled.**

◆ **Enter the following settings to begin I/O communication.**

- In the DIO Start Address, enter a value from LS20-LS1999.
- In the Input Area Size, enter a value from 0-127 words.

  Set the word area size that is equal to the output area size of the DeviceNet master unit.

```
SET UP OPERATION SURROUNDINGS          [ SET ]   [ CANCEL ]

    DIRECT I/O START ADDRESS              [ LS20  ]

              INPUT AREA SIZE (WORD)      [ 32 ]

              OUTPUT AREA SIZE (WORD)     [ 32 ]
```

• In the Output Area Size, enter a value from 0-127 words.

Set a word area size equal to the input area size of the DeviceNet master unit.

> ⚠️ **Important** **The GP's SYSTEM DATA AREA(LS0 to LS19) cannot be allocated.**

### < PLC Settings >

For PLC settings, refer to each company's Device Net communication unit's manual.

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**10.2.4 ▶ Supported Devices**

| | Word Address | Particulars | |
|---|---|---|---|
| **Input Area Size (word)** | 0 to 127 | *1 | |
| **Output Area Size (word)** | 0 to 127 | *1 | L/H |
| **DIO Start Address** | LS20 to LS1999 | *2 | |

*\*1 Though the Input /Outpuut area size can be set from 0 to 127, the maximum I/O size used per slave will differ depending on each company's master unit specifications.*

*The I/O size that each company supports is shown as below.*

| PLC Series | Input Area Size (word) | Output Area Size (word) |
|---|---|---|
| Rockwell SLC500 | 0 to 64 | 0 to 64 |
| Rockwell PLC-5 | 0 to 64 | 0 to 64 |
| Rockwell ControllLogix 5000 | 0 to 127 | 0 to 127 |
| Rockwell MicroLogix 1500 | 0 to 127 | 0 to 127 |
| Omron SYSMAC CS1 | 0 to 32 | o to32 |
| Omron SYSMAC CJ | 0 to 100 | o to 100 |
| Omron SYSMAC CJ1M | 0 to 100 | o to 100 |
| HITACHI S10mini | 0 to 127 | 0 to 127 |
| YOKOGAWA FA-M3 | 0 to 127 | 0 to 127 |

*\*2 Designate the DIO Start Address within the range shown below.*

$$20 \leq DIO\ Start\ Address \leq 2000 - Input\ Area\ Size - Output\ Area\ Size$$

> *e.g: When Input Area Size =4, and Output Area Size =16,*
>
> *the setting range of the DIO  Start Address should be:*
>
> $$20 \leq DIO\ Start\ Address \leq 1980$$

## 10.2.5 Error Codes

The following list shows the error codes for the Device Net connection. These error codes will appear as "PLC COM.ERROR (02:**)" on the bottom left on the GP screen. (** stands for an error code.)

| Error Code | Details | Status |
|---|---|---|
| 14 | No reply from the hardware | Unit is not properly installed |
| | | Unit Error |
| 16 | A communication error occurred | Communication Setting Error |
| | | Communication Line Error |
| | | Node No. is duplicated |