# CJ Series
# DeviceNet™ Connection Guide

# Janome Sewing Machine Co., Ltd.
# Desktop Robot
# (JR3000 Series)

P637-E1-01

**Table of Contents**

# 1. Related Manuals

To ensure system safety, make sure to always read and follow the information provided in all Safety Precautions and Precautions for Safe Use of manuals for each device which is used in the system.
The table below lists the manuals provided by Janome Sewing Machine Co., Ltd. (hereinafter referred to as JANOME) and OMRON Corporation (hereinafter referred to as OMRON), which pertain to this document.

| Manufacturer | Cat. No. | Model | Manual name |
|---|---|---|---|
| OMRON | W472 | CJ2M-CPU[][]<br>CJ2H-CPU6[]<br>CJ2H-CPU6[]-EIP | CJ-series CJ2 CPU Unit<br>Hardware User´s Manual |
| OMRON | W473 | CJ2M-CPU[][]<br>CJ2H-CPU6[]<br>CJ2H-CPU6[]-EIP | CJ-series CJ2 CPU Unit<br>Software User's Manual |
| OMRON | W267 | - | DeviceNet™ Operation Manual |
| OMRON | W380 | CJ1W-DRM21 | CJ-series DeviceNet Units Operation Manual |
| OMRON | W446 | - | CX-Programmer OPERATION MANUAL |
| OMRON | W464 | - | CX-Integrator Ver.2.[]<br>OPERATION MANUAL |
| JANOME | 170806107 | JR3000 Series<br>JC-3 Series | JANOME DESKTOP ROBOT JR3000 Series<br>JANOME CARTESIAN ROBOT JC-3 Series<br>Operation Manual Basic Instructions |
| JANOME | 170808109 | JR3000 Series<br>JC-3 Series | JANOME DESKTOP ROBOT JR3000 Series<br>JANOME CARTESIAN ROBOT JC-3 Series<br>Operation Manual Teaching Pendant Operation |
| JANOME | 170809100 | JR3000 Series<br>JC-3 Series | JANOME DESKTOP ROBOT JR3000 Series<br>JANOME CARTESIAN ROBOT JC-3 Series<br>Operation Manual PC Operation |
| JANOME | 170810104 | JR3000 Series | JANOME DESKTOP ROBOT JR3000 Series<br>Operation Manual External Control<br>(I/O / Fieldbus) |
| JANOME | 170814108 | JR3000 Series<br>JC-3 Series | JANOME DESKTOP ROBOT JR3000 Series<br>JANOME CARTESIAN ROBOT JC-3 Series<br>Operation Manual Functions III<br>(All Program Common Settings / PLC Programs) |

# 2. Terms and Definitions

| Term | Explanation and Definition |
|---|---|
| Master/Slave | A master is a unit that controls the DeviceNet communications.<br>A slave is a unit that executes a process requested from a master by using the DeviceNet communications.<br>A master sends output data and receives input data to/from multiple slaves. |
| Remote I/O communications | Remote I/O communications are functions that constantly transfer input and output data between a master and slaves. A user can use input and output data for slaves without a program for sending and receiving. |
| Scan list | A scan list is a list configured by slave information necessary to perform remote I/O communications via DeviceNet.<br>A master communicates with slaves according to the scan list settings. |
| EDS file | An EDS file is a file that contains parameters for such as I/O points of DeviceNet slave units. |
| Node address (MAC ID) | A node address is an address to identify a unit connected to DeviceNet. With DeviceNet, a MAC (Media Access Control) ID is used as a node address. Thus, a node address is a MAC ID. |

# 3. Precautions

(1) Understand the specifications of devices which are used in the system. Allow some margin for ratings and performance. Provide safety measures, such as installing a safety circuit, in order to ensure safety and minimize the risk of abnormal occurrence.

(2) To ensure system safety, make sure to always read and follow the information provided in all Safety Precautions and Precautions for Safe Use of manuals for each device which is used in the system.

(3) The user is encouraged to confirm the standards and regulations that the system must conform to.

(4) It is prohibited to copy, to reproduce, and to distribute a part or the whole of this document without the permission of OMRON Corporation.

(5) The information contained in this document is current as of November 2015. It is subject to change for improvement without notice.

The following notations are used in this document.

| | |
|---|---|
| ⚠ Caution | Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage. |

**Precautions for Correct Use**

Precautions on what to do and what not to do to ensure proper operation and performance.

**Additional Information**

Additional information to read as required.
This information is provided to increase understanding or make operation easier.

**Symbol**

The triangle symbol indicates precautions (including warnings).
The specific operation is shown in the triangle and explained in the text.
This example indicates a general precaution.

The filled circle symbol indicates operations that you must do.
The specific operation is shown in the circle and explained in the text.
This example shows a general precaution for something that you must do.

# 4. Overview

This document describes the procedures for connecting JANOME JR3000 Series Desktop Robot (hereinafter referred to as Robot) to OMRON CJ-series Programmable Controller + DeviceNet Unit (hereinafter referred to as PLC) via DeviceNet and the procedures for checking their connections.
Refer to *Section 6 DeviceNet Settings* and *Section 7. DeviceNet Connection Procedure* to understand the setting methods and key points to connect the devices via DeviceNet.

# 5. Applicable Devices and Device Configuration

## 5.1. Applicable Devices

The applicable devices are as follows:

| Manufacturer | Name | Model |
|---|---|---|
| OMRON | CJ2 CPU Unit | CJ2[]-CPU[][] |
| OMRON | DeviceNet Unit (master) | CJ1W-DRM21 |
| JANOME | Desktop Robot | JR320[][]-[][]<br>JR330[][]-[][]<br>JR340[][]-[][]<br>JR350[][]-[][]<br>JR360[][]-[][] |

**Precautions for Correct Use**

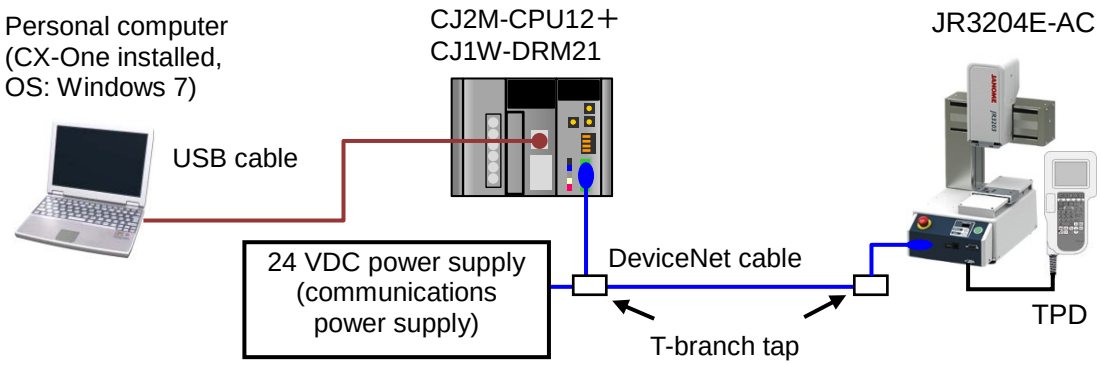
In this document, the devices with models and versions listed in *5.2. Device Configuration* are used as examples of applicable devices to describe the procedures for connecting the devices and checking their connections.
You cannot use devices with versions lower than the versions listed in *5.2*.
To use the above devices with models not listed in *5.2.* or versions higher than those listed in *5.2.*, check the differences in the specifications by referring to the manuals before operating the devices.

**Additional Information**

This document describes the procedures for establishing the network connections. It does not provide information on operation, installation, wiring method, device functionality, or device operation, which is not related to the connection procedures. Refer to the manuals or contact the device manufacturer.

## 5.2. Device Configuration

The hardware components to reproduce the connection procedures of this document are as follows:




| Manufacturer | Name | Model | Version |
|---|---|---|---|
| OMRON | DeviceNet Unit (master) | CJ1W-DRM21 | Ver.1.1 |
| OMRON | CJ2 CPU Unit | CJ2M-CPU12 | Ver.2.0 |
| OMRON | Power Supply Unit | CJ1W-PA202 | |
| OMRON | DeviceNet cable | DCA1-5C10 | |
| OMRON | T-branch tap | DCN1-1C | |
| OMRON | CX-One | CXONE-AL[][]C-V4/AL[][]D-V4 | Ver.4.[][] |
| OMRON | CX-Programmer | (Included in CX-One) | Ver.9.54 |
| OMRON | CX-Integrator | (Included in CX-One) | Ver.2.60 |
| - | Personal computer<br>(OS: Windows 7) | - | |
| - | USB cable<br>(USB 2.0 type B connector) | - | |
| - | 24 VDC power supply<br>(communications power supply) | - | |
| JANOME | Desktop Robot | JR3204E-AC | Ver.3.03-02 |
| JANOME | Teaching Pendant | TPD | |
| JANOME | EDS file | 005A000000620200.eds | Ver.2.3 |

**Precautions for Correct Use**

Prepare the EDS file listed above beforehand.
To obtain the file, contact Janome Sewing Machine Co., Ltd.

**Precautions for Correct Use**

When there is an icon file specific to the device, the icon file and the EDS file must be stored in the same folder.

**Precautions for Correct Use**

Update CX-Programmer and CX-Integrator to the version specified in this clause *5.2.* or to a higher version. If you use a version higher than the one specified, the procedures and related screenshots described in *Section 7.* and subsequent sections may not be applicable. In that case, use the equivalent procedures by referring to the *CX-Programmer OPERATION MANUAL* (Cat. No. W446) and *CX-Integrator Ver.2.[] OPERATION MANUAL* (Cat. No. W464).

**Additional Information**

For information on DeviceNet cables and network wiring, refer to *SECTION 2 Network Configuration and Wiring* of the *DeviceNet™ Operation Manual* (Cat. No. W267).
Connect a terminating resistor to each end of the DeviceNet network trunk line.

**Additional Information**

The system configuration in this document uses USB for the connection between Personal computer and PLC. For information on how to install a USB driver, refer to *A-5 Installing the USB Driver* of the *CJ-series CJ2 CPU Unit Hardware User's Manual* (Cat. No. W472).

# 6. DeviceNet Settings

This section describes specifications of parameters and the allocation for remote I/O communications that are set in this document.

## 6.1. Parameters

The parameters required for connecting PLC and Robot via DeviceNet are given below.

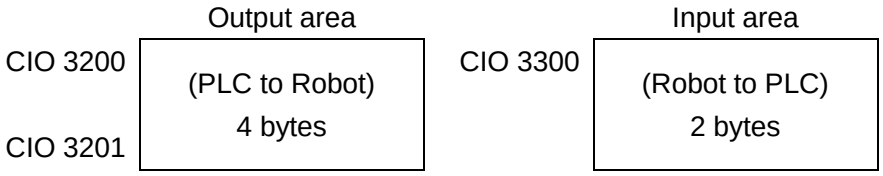
| Item | PLC (DeviceNet Unit) | Robot |
|---|---|---|
| Unit number | 0 | - |
| Node address (MAC ID) | 63 | 0 |
| Baud rate (bps) | 500kbps | AutoBaud |

**Additional Information**

If Robot starts running via DeviceNet, you need to set the start channel for Robot to "Fieldbus". For information on how to set the start channel to "Fieldbus", refer to *1.1 Start Channel* of the *JANOME DESKTOP ROBOT JR3000 Series / JANOME CARTESIAN ROBOT JC-3 Series Operation Manual Functions III (All Program Common Settings / PLC Programs)* (170814108).

## 6.2. Allocation for Remote I/O Communications

The I/O memory areas of PLC are allocated for the DeviceNet remote I/O communications of Robot as shown below.




■Details of output area

| Controller | | Robot | |
|---|---|---|---|
| Address | Bit | Relay number | Function |
| CIO 3200 | 0 | 1000 | Start / Free (Performs in External Run Mode only.) |
| | 1 | 1001 | Free / Start Inhibition / Stop-Start Inhibition / Software Interlock / Urgent Stop |
| | 2 | 1002 | Program Number LOAD / Free |
| | 3 | 1003 | Free |
| | 4 | 1004 | Free |
| | 5 | 1005 | Free |
| | 6 | 1006 | Free |
| | 7 | 1007 | Free |
| | 8 | 1008 | Free |
| | 9 | 1009 | Free |
| | 10 | 100A | Last Work / Error Reset / Free |
| | 11 | 100B | Temporary Stop / Free |
| | 12 | 100C | Free |
| | 13 | 100D | Free / Start Inhibition / Stop-Start Inhibition / Software Interlock / Urgent Stop |
| | 14 | 100E | Free |
| | 15 | 100F | Free |
| CIO 3201 | 0 to 15 | 1010-101F | Program Number (word) / Free |

■Details of input area

| Controller | | Robot | |
|---|---|---|---|
| Address | Bit | Relay number | Function |
| CIO 3300 | 0 | 1800 | Ready For Start / Free |
| | 1 | 1801 | Robot Stopped / Free |
| | 2 | 1802 | Program Number ACK / Free |
| | 3 | 1803 | Program Number Error / Free |
| | 4 | 1804 | Running / Free |
| | 5 | 1805 | Error / Free |
| | 6 | 1806 | Emergency Stop / Free |
| | 7 | 1807 | Position Error / Free |
| | 8 | 1808 | Free |
| | 9 | 1809 | Free |
| | 10 | 180A | Free |
| | 11 | 180B | Free / Finish Initialize |
| | 12 | 180C | Free |
| | 13 | 180D | Free |
| | 14 | 180E | Free |
| | 15 | 180F | Free |

**Additional Information**

For details on the I/O format, refer to *2. SYSTEM INPUT/OUTPUT FUNCTIONS* and *4. FIELDBUS FUNCTION ASSIGNMENT* of the *JANOME DESKTOP ROBOT JR3000 Series Operation Manual External Control (I/O / Fieldbus)* (170810104).

# 7. DeviceNet Connection Procedure

This section describes the procedures for connecting PLC to Robot via DeviceNet.
In this document, the explanations of procedures for setting up PLC and Robot are based on the factory default settings. For the initialization, refer to *Section 8. Initialization Method*.

## 7.1. Work Flow

Take the following steps to perform DeviceNet remote I/O communications.

| | |
|---|---|
| **7.2. Network Wiring** | Connect the DeviceNet cable. |
| ↓ | |
| 7.2.1 Hardware Settings for DeviceNet Unit | Set the hardware switches on DeviceNet Unit and wire the network. |
| ↓ | |
| **7.3. JANOME Robot Setup** | Set up JANOME Robot. |
| ↓ | |
| 7.3.1. Parameter Settings | Set the parameters for Robot. |
| ↓ | |
| **7.4. PLC Setup** | Set up PLC. |
| ↓ | |
| 7.4.1. Starting CX-Programmer and Connecting Online with PLC | Start CX-Programmer and connect online with PLC. |
| ↓ | |
| 7.4.2. Creating the I/O Table | Create the I/O table for PLC. |
| ↓ | |
| **7.5. Network Setup** | Set up DeviceNet remote I/O communications. |
| ↓ | |
| 7.5.1. Starting CX-Integrator and Installing the EDS File | Start CX-Integrator and install the EDS file. |
| ↓ | |
| 7.5.2. Creating the Network Configuration | Create the network and device configuration offline. |
| ↓ | |
| 7.5.3. Setting the Device | Set the device and register it in DeviceNet Unit. |
| ↓ | |
| 7.5.4. Connecting Online and Transferring the Scan List | Connect online with PLC and transfer the device setting to DeviceNet Unit. |
| ↓ | |
| **7.6. DeviceNet Communication Status Check** | Check that the DeviceNet remote I/O communications perform normally. |
| ↓ | |

| | |
|---|---|
| 7.6.1. Checking the Connection Status | Check the connection status of DeviceNet. |
| ↓ | |
| 7.6.2. Checking the Sent and Received Data | Check that the correct data are sent and received. |

## 7.2. Network Wiring

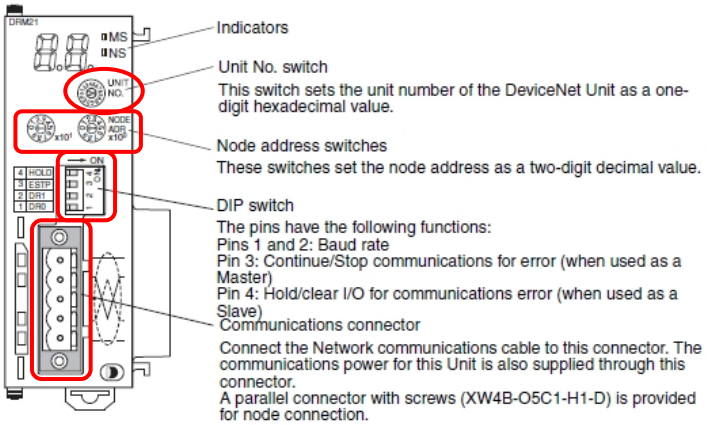
Connect the DeviceNet cable.

### 7.2.1. Hardware Settings for DeviceNet Unit

Set the hardware switches on DeviceNet Unit and wire the network.

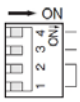
**Precautions for Correct Use**

Make sure that the power supply is OFF when you set up.

| | | |
|---|---|---|
| 1 | Make sure that the power supply to each device is OFF.<br><br>*If the power supply is turned ON, settings may not be applicable as described in the following procedure. | |
| 2 | Check the positions of hardware switches on the front panel of DeviceNet Unit by referring to the right figure. |  |
| 3 | Set Unit No. switch to *0*. |  <br><br>Setting method: One-digit hexadecimal<br>Setting range:0 to F<br>Note: The unit number is set to 0 at the factory. |
| 4 | Set Node address setting switches as follows:<br>NODE ADRx$10^1$: *6*<br>NODE ADRx$10^0$: *3*<br><br>*Set the node address (MAC ID) to *63*. |  <br>Setting method: Two-digit decimal<br>Setting range:0 to 63<br>Note: The node address is set to 63 at the factory. |

5 Set pin 1 of DIP switch to *OFF* and pin 2 to *ON*.

*Set the baud rate to *500 kbps*.




| Pin | Function | Setting |
|---|---|---|
| 1 | Baud rate | See the next table. |
| 2 | | |
| 3 | Continue/stop remote I/O communications for communication errors (when used as a master) | OFF: Continue communications<br>ON: Stop communications |
| 4 | Hold/clear remote outputs for communications error (when used as a slave) | OFF: Clear remote outputs<br>ON: Hold remote outputs |

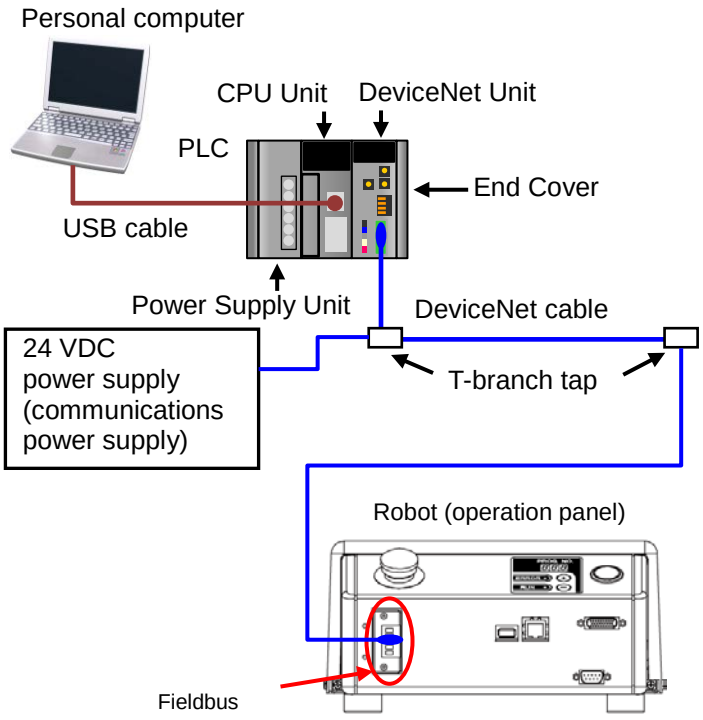
| Pin 1 | Pin 2 | Baud rate |
|---|---|---|
| OFF | OFF | 125 kbps |
| ON | OFF | 250 kbps |
| OFF | ON | 500 kbps |
| ON | ON | Not allowed. |

All pins are set to OFF at the factory.

6 Connect DeviceNet Unit to CPU Unit, and then connect Personal computer to PLC with a USB cable.

Connect Communications connector on DeviceNet Unit, connector for Fieldbus on Robot, and 24 VDC power supply (communications power supply) with a DeviceNet cable and T-branch taps as shown in the figure on the right.

*Enable the terminating resistors of T-branch taps at both ends of the cable.



## 7.3. JANOME Robot Setup

Set up JANOME Robot.

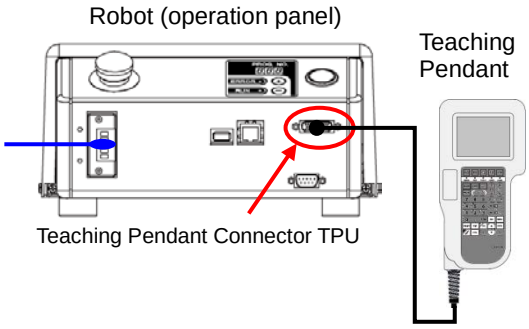
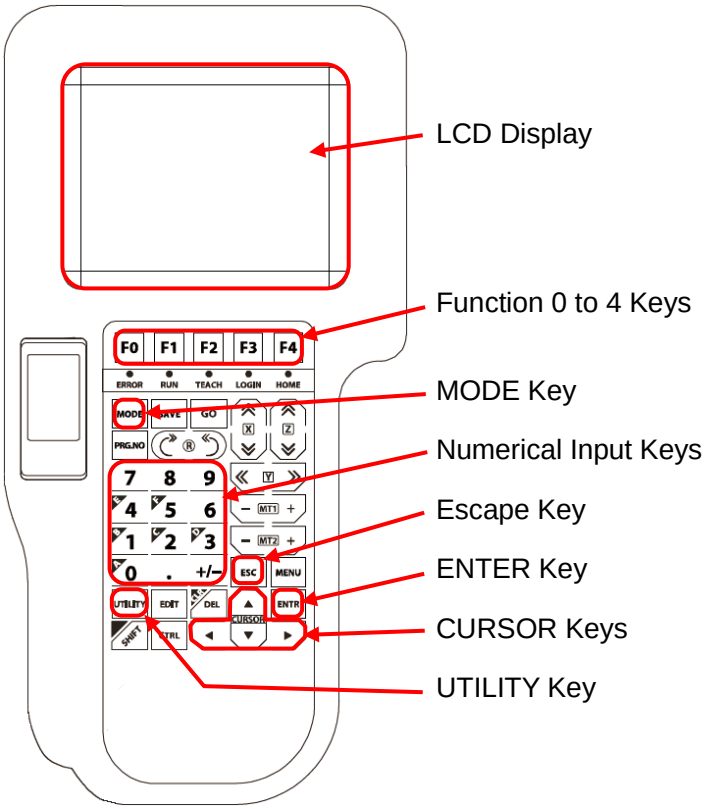
### 7.3.1. Parameter Settings

Set the parameters for Robot.

The parameters are set using Teaching Pendant.

**Additional Information**

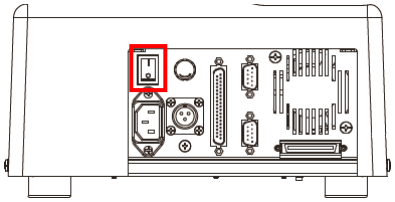
The parameters can also be set by using JANOME PC software JR C-Points II.
For information on how to use JR C-Points II, refer to the *JANOME DESKTOP ROBOT JR3000 Series / JANOME CARTESIAN ROBOT JC-3 Series Operation Manual PC Operation* (170809100).

| | | |
|---|---|---|
| 1 | Make sure that the power supply to Robot is OFF. | |
| 2 | Connect Teaching Pendant to Teaching Pendant Connector TPU on Robot. |  |
| 3 | Check the positions of LCD display and keys on Teaching Pendant that are used in this document by referring to the figure on the right. |  |

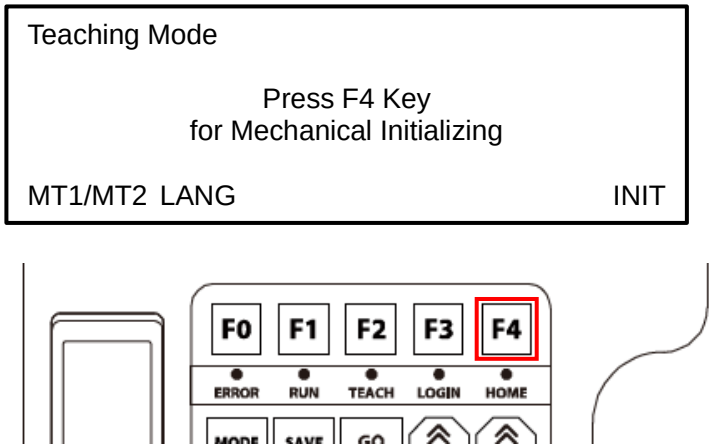
**4** Turn ON Robot.

*The power switch of Robot is on the operation panel rear.

Robot (operation panel rear)

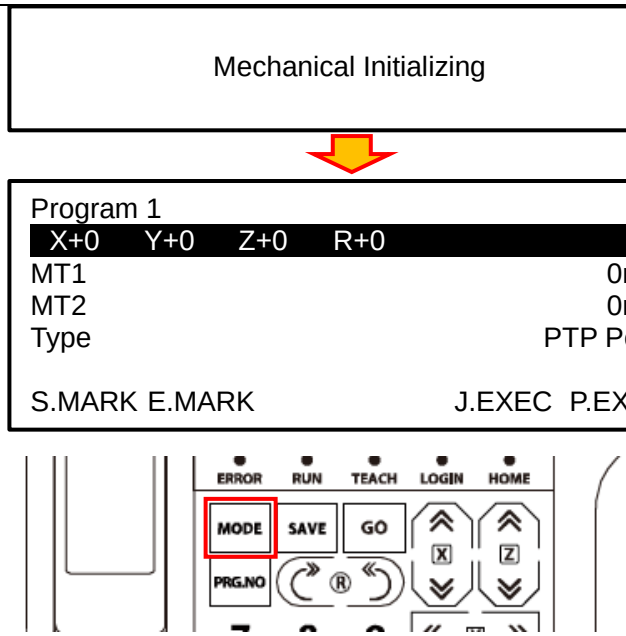


**5** Teaching Mode is displayed on LCD Display.
Check the contents and press **F4**.

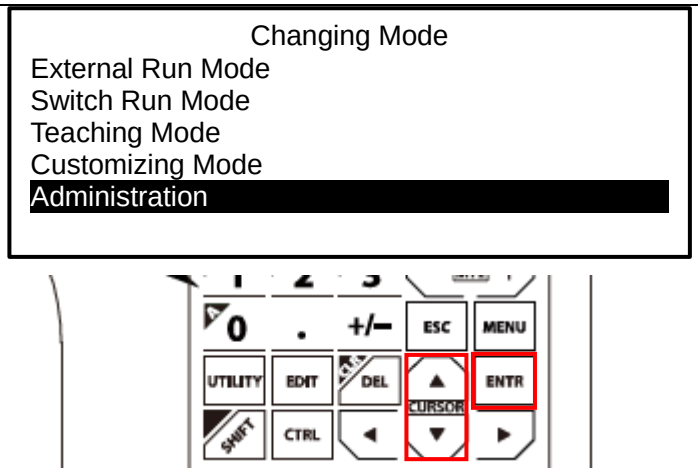


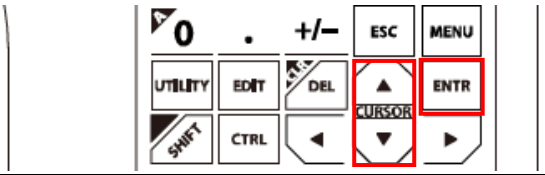
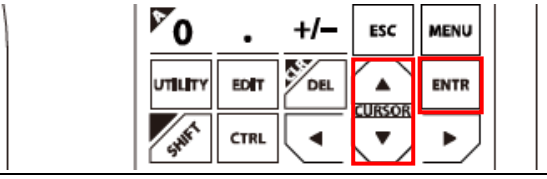
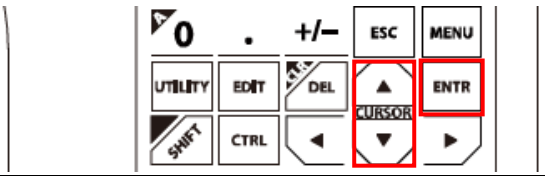

**6** The mechanical initialization executes.

After completing the initialization, Program 1 is displayed. Press **MODE**.

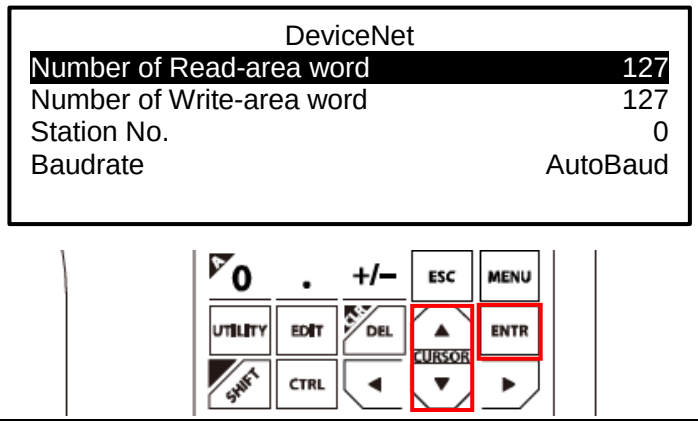



**7** Changing Mode is displayed.
Select ***Administration*** by using the **UP** and **Down CURSOR** Keys.
Press **ENTR**.



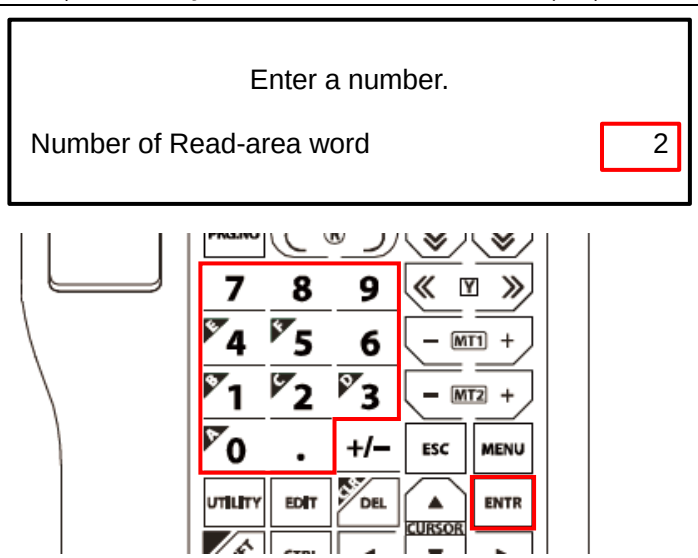
| | | |
|---|---|---|
| 8 | Administration is displayed. Select ***Administration Settings Mode*** by using the **Up** and **Down CURSOR** Keys. Press **ENTR**. | Administration<br>Administration Settings Mode<br>Diagnostic Mode<br>Mechanical Adjustment Mode<br>Version Information<br>Error History<br>  |
| 9 | The caution screen shown on the right is displayed. Check the contents and press any key. | Caution<br><br>Admin Settings can be set here.<br>The robot's system resets when you exit Administration Settings Mode.<br><br>Please initialize after the reset.<br><br>Press any Key |
| 10 | Administration Settings Mode is displayed. Select ***Fieldbus Settings*** by using the **Up** and **Down CURSOR** Keys. Press **ENTR**. | Administration Settings Mode 1/2<br>Start Channel I/O-SYS<br>Change Program Number<br>COM Settings<br>Ethernet Settings<br>Fieldbus Settings<br>Auxiliary Axis Configuration<br>MEMORY Port Settings<br>Back Light Auto OFF<br>Clock Settings<br>Clear Error History<br>Clear All C&T Data<br>Reset Teaching Environment Settings<br>  |
| 11 | Fieldbus Settings is displayed. Select ***DeviceNet*** by using the **Up** and **Down CURSOR** Keys. Press **ENTR**. | Fieldbus Settings<br>DeviceNet<br>Profibus<br>CC-Link<br>  |

**12** DeviceNet is displayed.
Select ***Number of Read-area word*** by using the **Up** and **Down CURSOR** Keys.
Press **ENTR**.

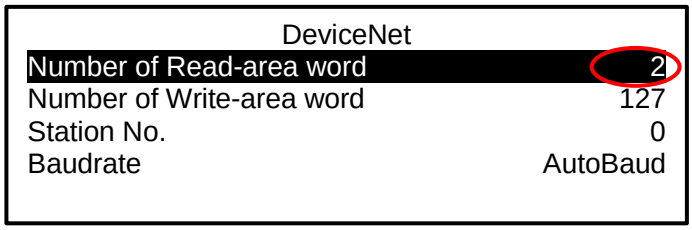



**13** The Number of Read-area word entry screen is displayed.
Enter *2* by pressing **Numerical Input** Keys.
Press **ENTR**.

*"127" is being entered by default for Number of Read-area word. Overwrite the existing default value.



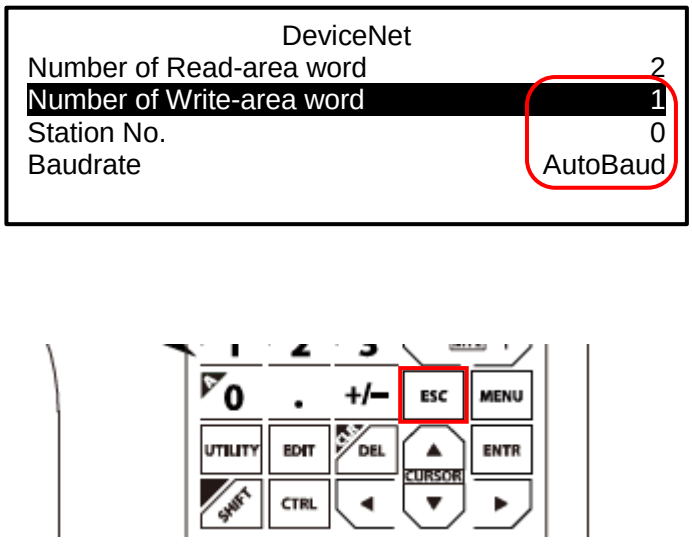

**14** DeviceNet is displayed again.
Check that Number of Read-area word is set to "2".

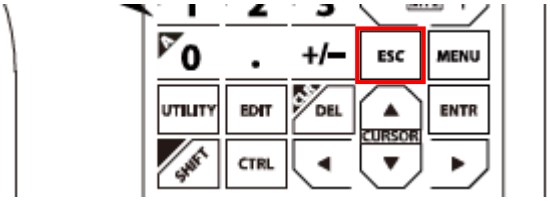
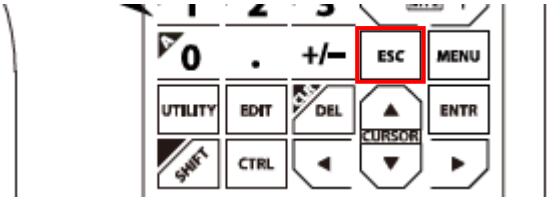



**15** Enter *1* for Number of Write-area word in the same way as steps 12 and 13.
Check that Station No. is set to 0 and that Baudrate is set to AutoBaud.

*If the setting value is different, select the item and change its setting value in the same way as step 12.

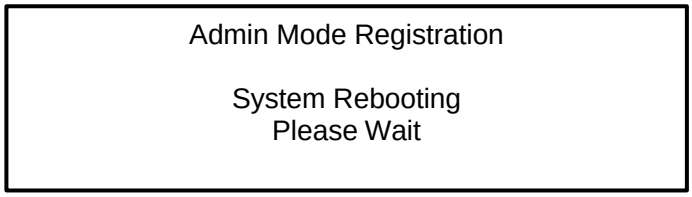
Press **ESC**.



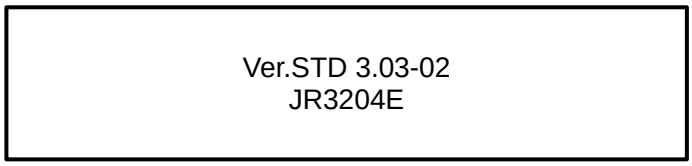
| | | |
|---|---|---|
| 16 | Fieldbus Settings is displayed again.<br>Press **ESC**. | Fieldbus Settings<br>DeviceNet<br>Profibus<br>CC-Link<br>  |
| 17 | Administration Settings Mode is displayed again.<br>Press **ESC**. | Administration Settings Mode 1/2<br>Start Channel I/O-SYS<br>Change Program Number<br>COM Settings<br>Ethernet Settings<br>Fieldbus Settings<br>Auxiliary Axis Configuration<br>MEMORY Port Settings<br>Back Light Auto OFF<br>Clock Settings<br>Clear Error History<br>Clear All C&T Data<br>Reset Teaching Environment Settings<br>  |

**18**

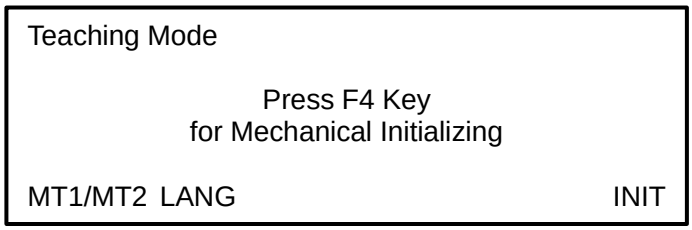
The Robot automatically executes system rebooting after Administration Settings Mode exits.

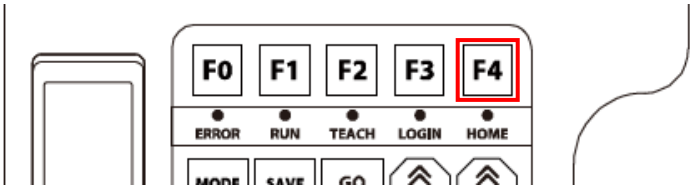



The system program version and model type of Robot are displayed.



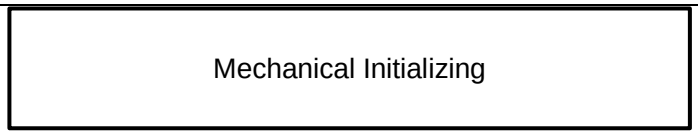

After completing the system rebooting, Teaching Mode is displayed. Check the contents and press **F4**.



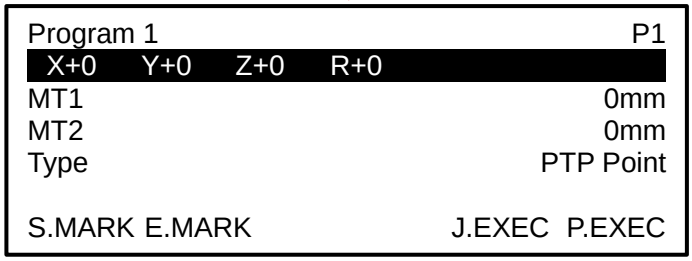




**19**

The mechanical initialization executes.




After completing the initialization, Program 1 is displayed.



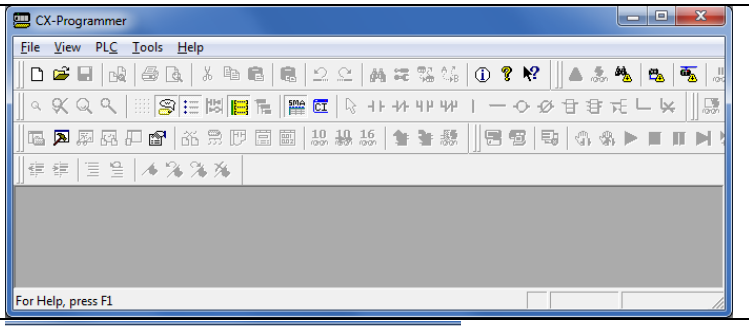
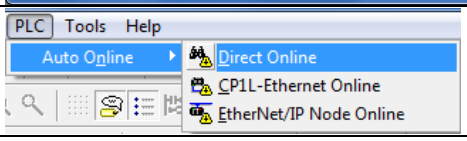
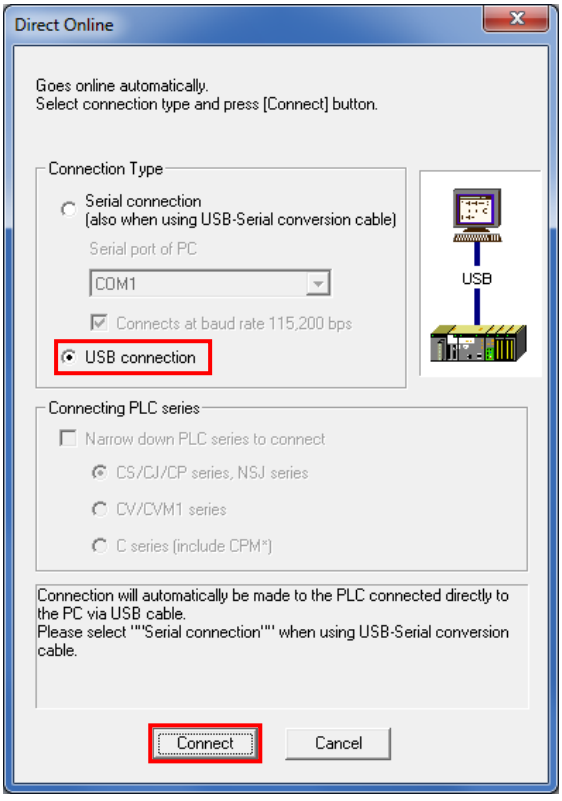
## 7.4. PLC Setup

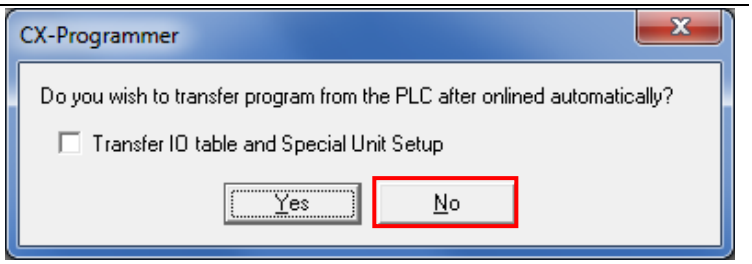
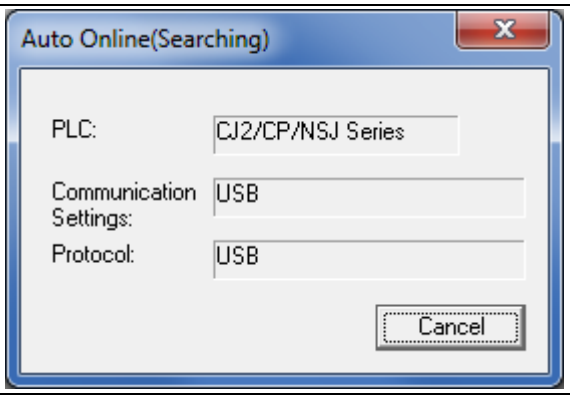
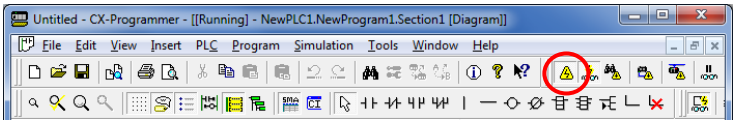
Set up PLC.

### 7.4.1. Starting CX-Programmer and Connecting Online with PLC

Start CX-Programmer and connect online with PLC.

Install CX-One and a USB driver on Personal computer beforehand.

| | | |
|---|---|---|
| 1 | Turn ON the power supplies to PLC and 24 VDC power supply (communications power supply). | |
| 2 | Start CX-Programmer.<br><br>* If the User Account Control Dialog Box is displayed at start, make a selection to start CX-Programmer. |  |
| 3 | CX-Programmer starts. |  |
| 4 | Select ***Auto Online*** - ***Direct Online*** from the PLC Menu. |  |
| 5 | The Direct Online Dialog Box is displayed.<br>Select *USB connection* for Connection Type.<br><br>Click **Connect**. |  |

| | | |
|---|---|---|
| 6 | The dialog box on the right is displayed. Check the contents and click **No**. |  |
| 7 | The dialog box on the right is displayed. CX-Programmer and PLC are automatically connected. |  |
| 8 | Check that CX-Programmer and PLC are normally connected online.<br><br>*The  icon is pressed down during online connection. |  |

**Additional Information**

If PLC cannot be connected online, check the cable connection.
Then, return to step 3, check the settings, and repeat each step.
For details, refer to *Connecting Directly to a CJ2 CPU Unit Using a USB Cable* of the *CX-Programmer OPERATION MANUAL (Cat. No. W446).*

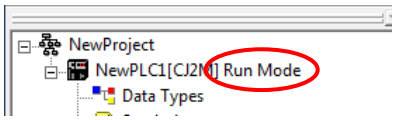
**Additional Information**

The dialog boxes explained in the following procedures may not be displayed depending on the environmental settings of CX-Programmer.
For details on the environmental settings, refer to *Options and Preferences* in *CHAPTER 3 Project Reference* in *PART 1: CX-Programmer* of the *CX-Programmer OPERATION MANUAL* (Cat. No. W446).
This document explains the setting procedures when "Confirm all operations affecting the PLC" is selected.

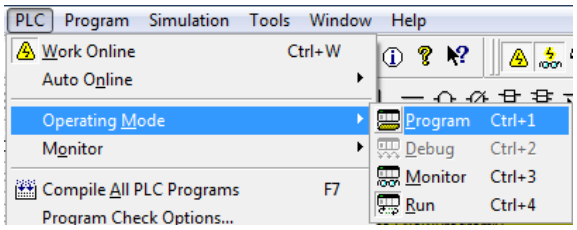
### 7.4.2. Creating the I/O Table

Create the I/O table for PLC.

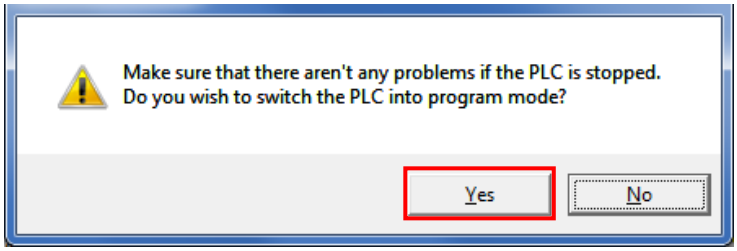
**1** If the operating mode of PLC is Run Mode or Monitor Mode, change it to Program Mode by following the steps below.



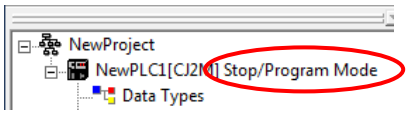

(1)Select ***Operating Mode*** - ***Program*** from the PLC Menu of CX-Programmer.




(2)A confirmation dialog box on the right is displayed. Check that there is no problem and click **Yes**.
*Refer to *Additional Information* on the previous page for the settings concerning the dialog display.

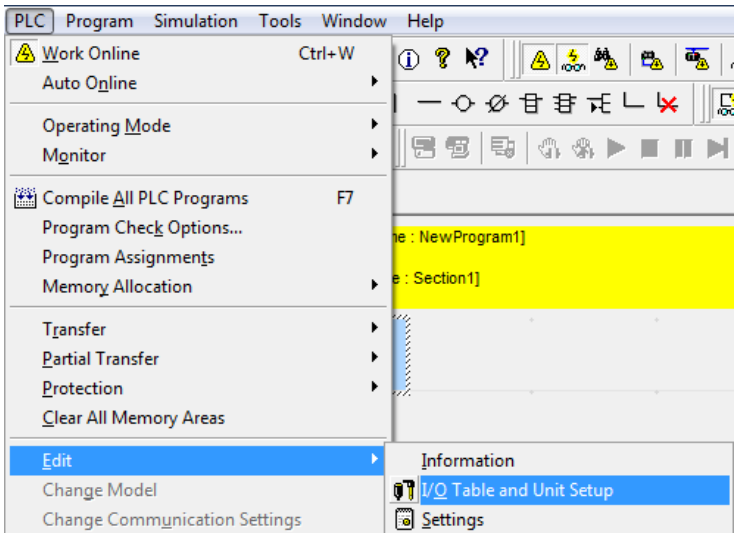



(3)Check that Stop/Program Mode is displayed on the right of the PLC model in the project workspace of CX-Programmer.

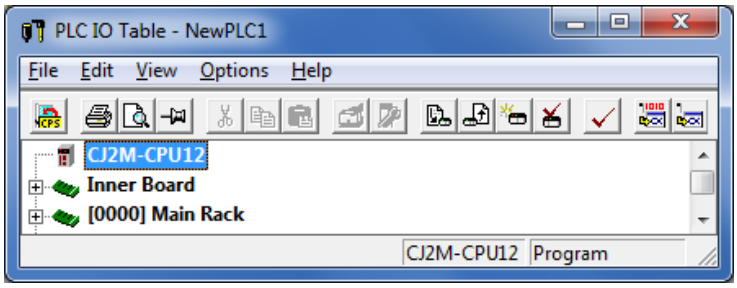



(Project workspace)

**2** Select ***Edit*** - ***I/O Table and Unit Setup*** from the PLC Menu of CX-Programmer.



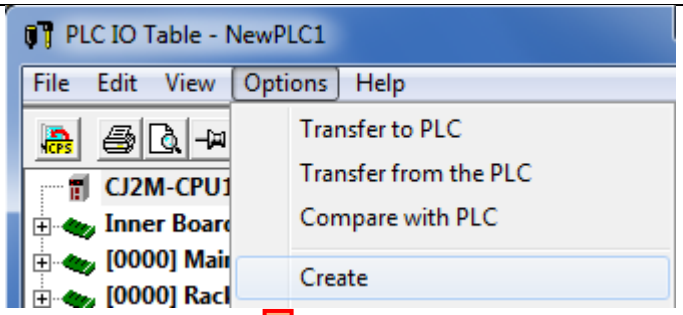

The PLC IO Table Window is displayed.



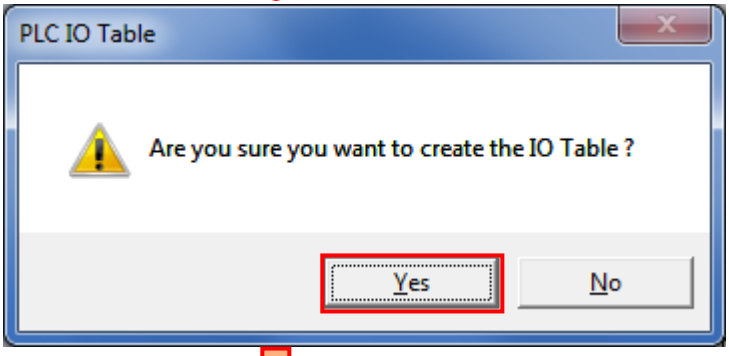
**Precautions for Correct Use**

The PLC will be reset after creating and transferring the I/O table in step 3 and subsequent steps. Always confirm safety before creating and transferring the I/O table.

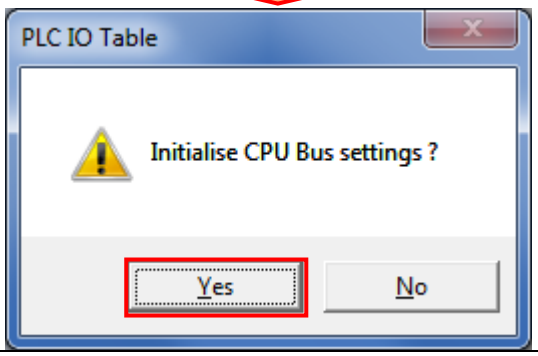
3 Select ***Create*** from the Options Menu in the PLC IO Table Window.



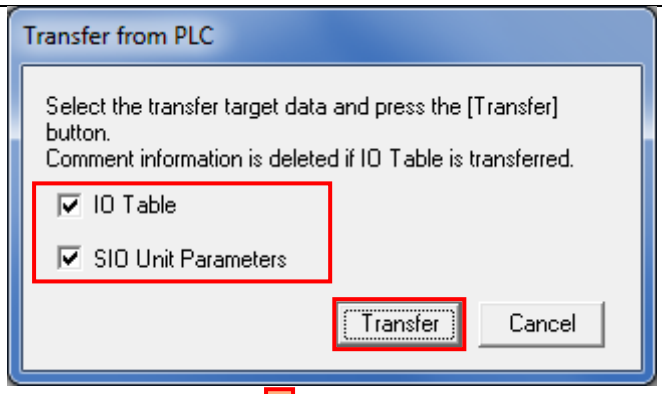

A confirmation dialog box on the right is displayed. Check that there is no problem and click **Yes**.




A confirmation dialog box on the right is displayed. Check that there is no problem and click **Yes**.



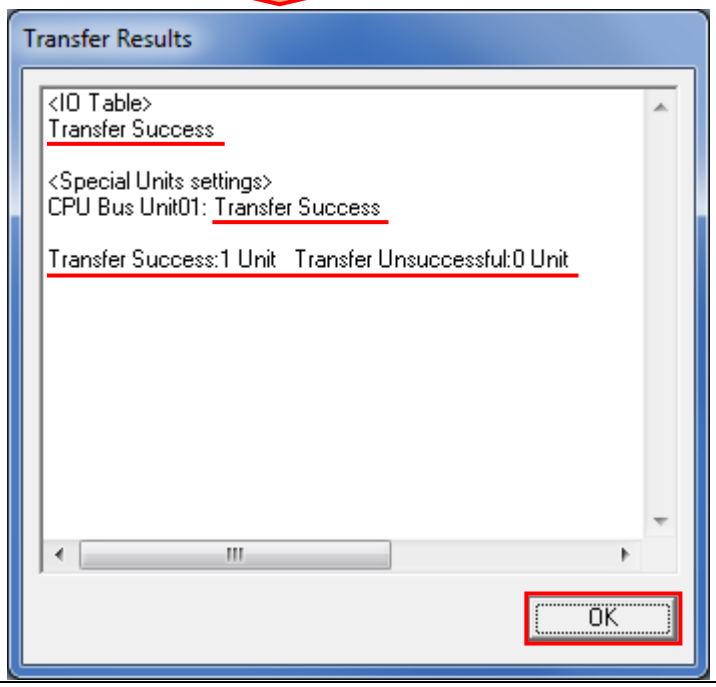
**4** The Transfer from PLC Dialog Box is displayed. Select *IO Table* and *SIO Unit Parameters*. Click **Transfer**.




When the transfer is completed, the Transfer Results Dialog Box is displayed.
Check that the transfer was normally executed by referring to the message in the dialog box.

When the I/O table is created normally, the dialog box displays as follows:
Transfer Success: 1 Unit
Transfer Unsuccessful: 0 Unit

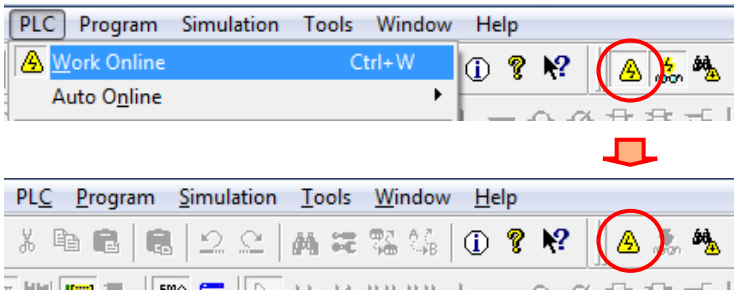
Click **OK**.



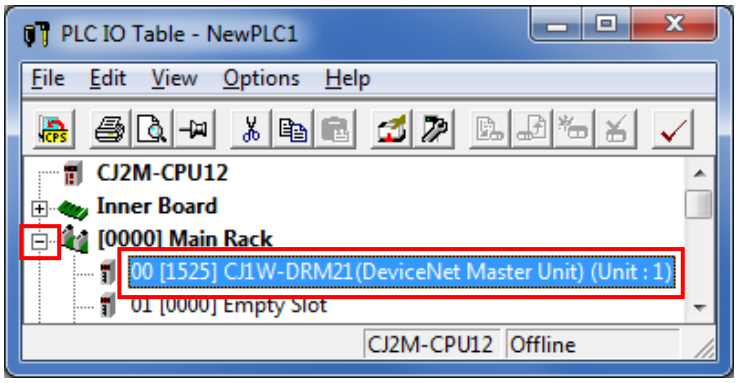

**5** Go offline with CX-Programmer.
Select ***Work Online*** from the PLC Menu.

Check that CX-Programmer and PLC go offline.

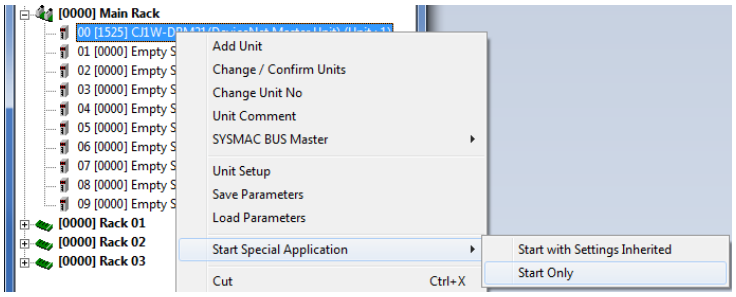
*The  icon is not pressed down during the offline connection.



6 On the PLC IO Table Window, click **+** to the left of [0000] Main Rack to display CJ1W-DRM21.




Right-click **CJ1W-DRM21** in the PLC IO Table Window, and select ***Start Special Application*** - ***Start Only***.



## 7.5. Network Setup

Set up DeviceNet remote I/O communications.

### 7.5.1. Starting CX-Integrator and Installing the EDS File

Start CX-Integrator and install the EDS file.

1 The CX-Integrator starts.

The following windows are displayed.

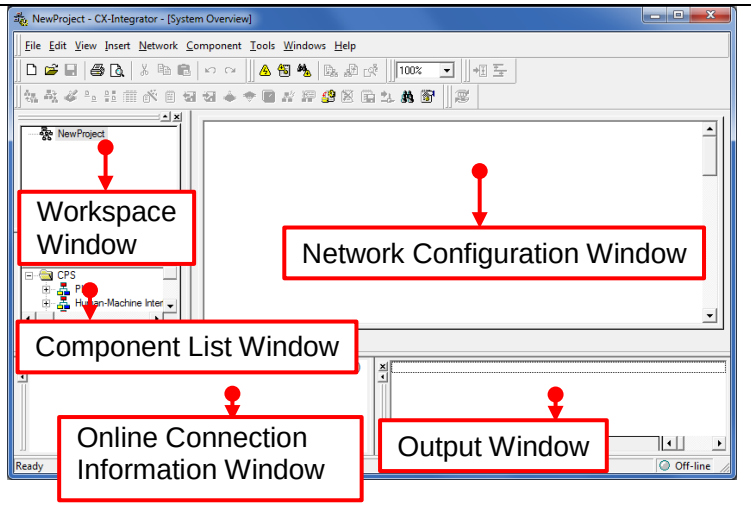
Top left: Workspace Window

Middle left: Component List Window

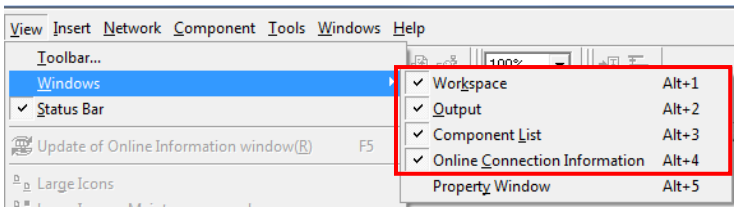
Bottom left: Online Connection Information Window

Bottom right: Output Window

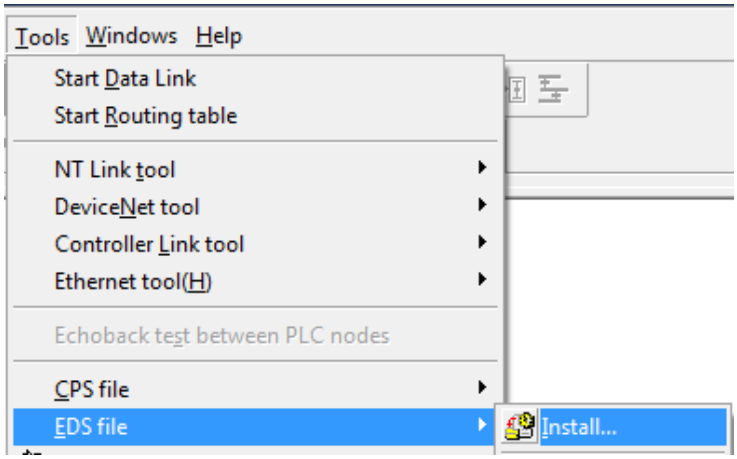
Top right: Network Configuration Window




*If the five windows above are not displayed, select ***Windows*** from the View Menu. Then, select the desired window that is not displayed. If the five windows above are all displayed, the selection is set as shown in the right figure.

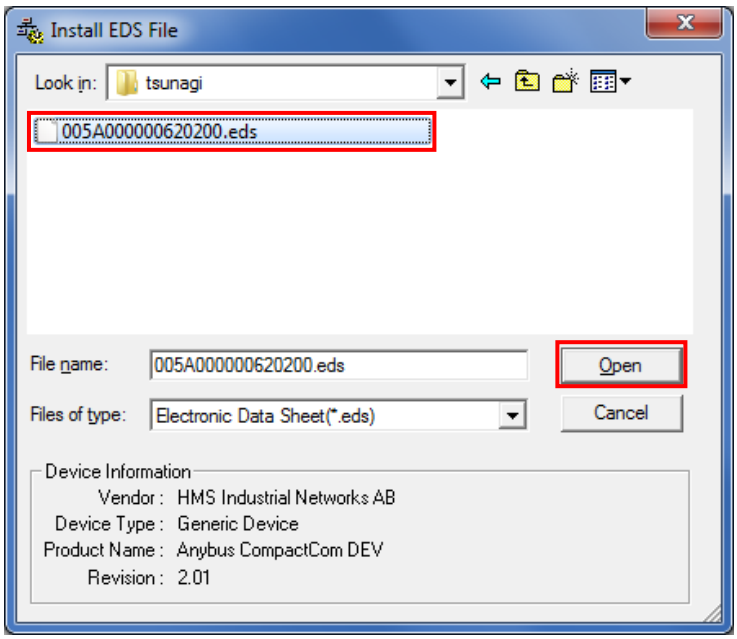



2 Select ***EDS file*** - ***Install*** from the Tools Menu.

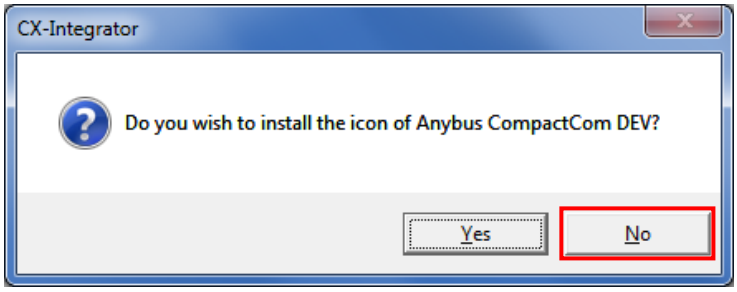


3 Select the EDS file *005A000000620200.eds* and click **Open**.

*For information on how to obtain the EDS file, refer to *Precautions for Correct Use* in *5.2. Device Configuration*.

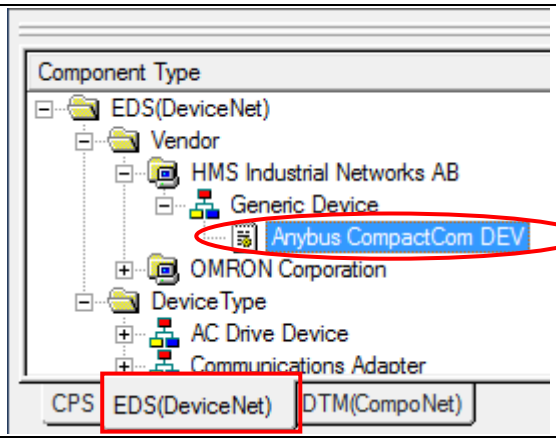



4 The dialog box on the right is displayed. Check the contents and click **No**.



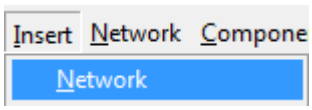
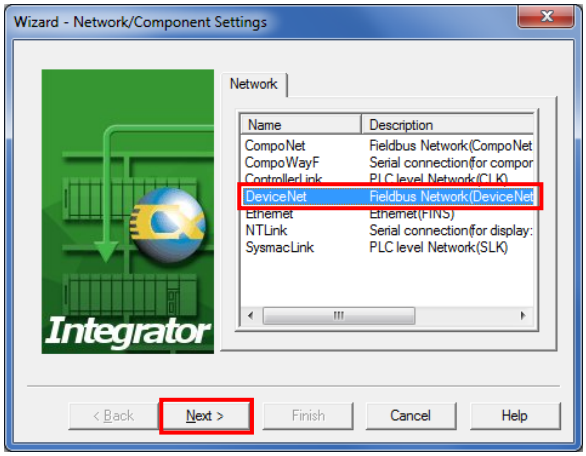
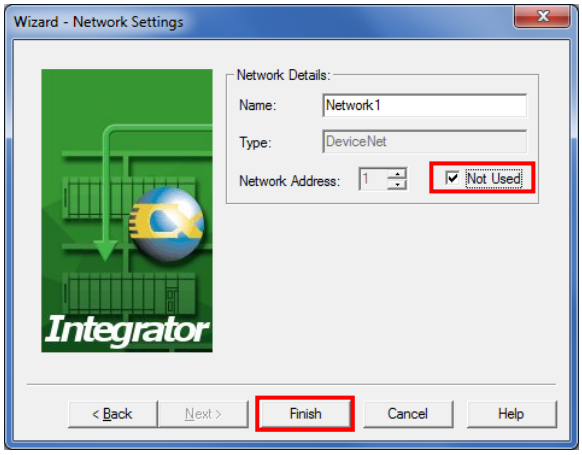
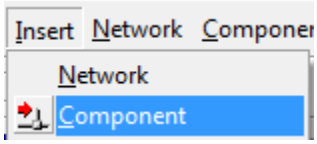
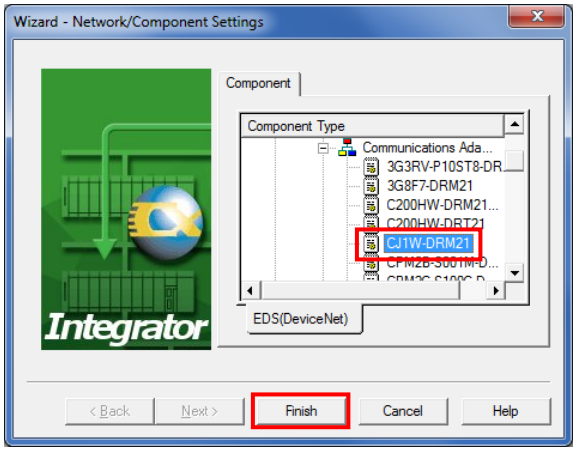

5 Select the **EDS(DeviceNet)** Tab in the Component List Window, and check that the installed device was added. (Anybus CompactCom DEV was added in the right figure.)

*When you install *005A000000620200.eds*, the Anybus CompactCom DEV device is registered.

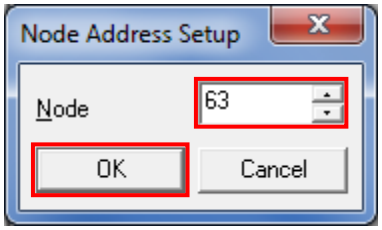


### 7.5.2. Creating the Network Configuration

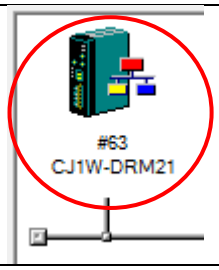
Create the network and device configuration offline.

| | | |
|---|---|---|
| 1 | Select ***Network*** from the Insert Menu of CX-Integrator. |  |
| 2 | Select *DeviceNet* and click **Next**. |  |
| 3 | Select *Not Used* for Network Address and click **Finish**. |  |
| 4 | Register DeviceNet Unit in the network.<br>Select ***Component*** from the Insert Menu. |  |
| 5 | Select **OMRON Corporation** - **Communications Adapter** - **CJ1W-DRM21** from the component list.<br>Click **Finish**. |  |

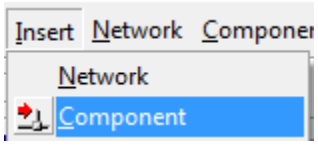
6 The Node Address Setup Dialog Box is displayed. Enter *63* for the node address and click **OK**.




7 Check that DeviceNet Unit is registered in the Network Configuration Window.

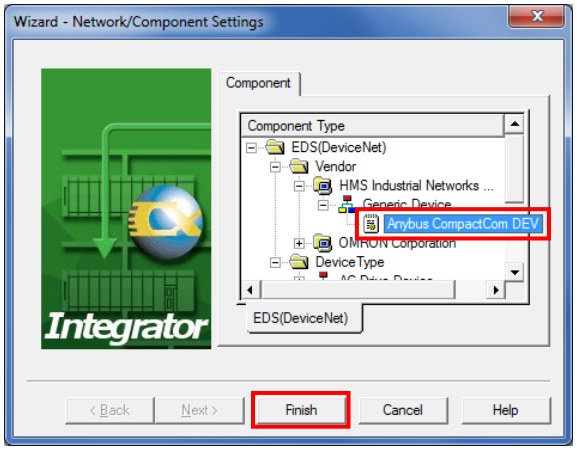



8 Register Robot in the network. Select ***Component*** from the Insert Menu.

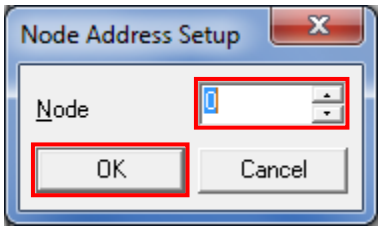



9 Select **Anybus CompactCom DEV** from the component list and click **Finish**.

*When you install *005A000000620200.eds*, the Anybus CompactCom DEV device is registered.

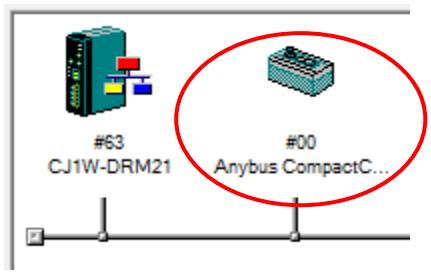



10 The Node Address Setup Dialog Box is displayed. Enter *0* for the node address and click **OK**.




11 Check that Robot is registered in the Network Configuration Window.

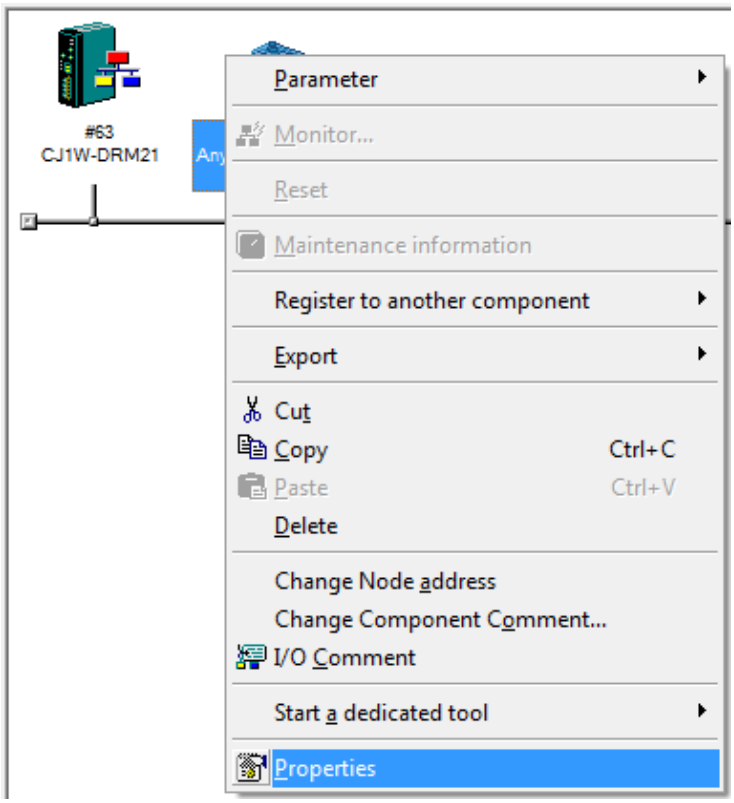
*An icon of Robot is shown as the Anybus CompactCom DEV device.



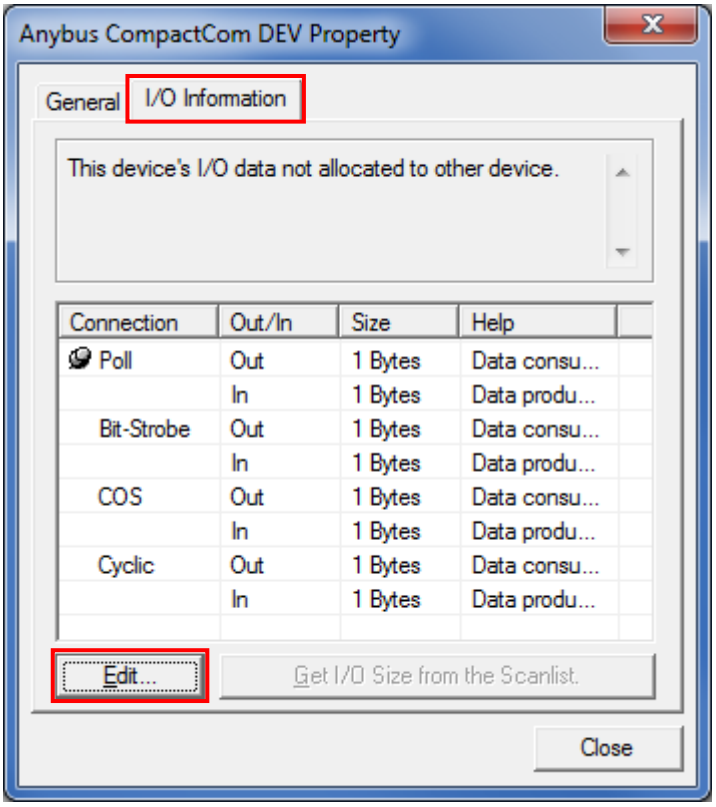
### 7.5.3. Setting the Device

Set the device and register it in DeviceNet Unit (create a scan list).

1 While the Robot icon is being selected, right-click and select ***Properties*** from the menu.

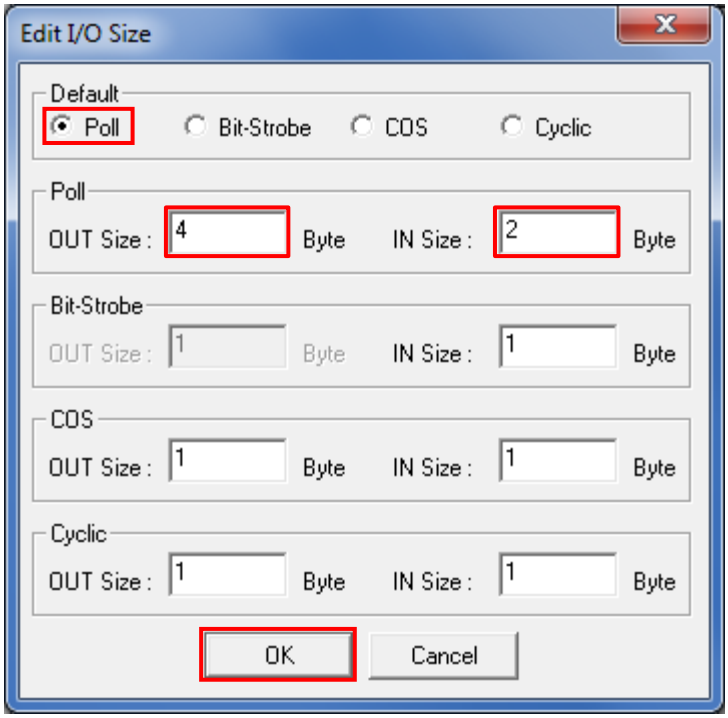



2 The Anybus CompactCom DEV Property Dialog Box is displayed.
Select the **I/O Information** Tab and click **Edit**.

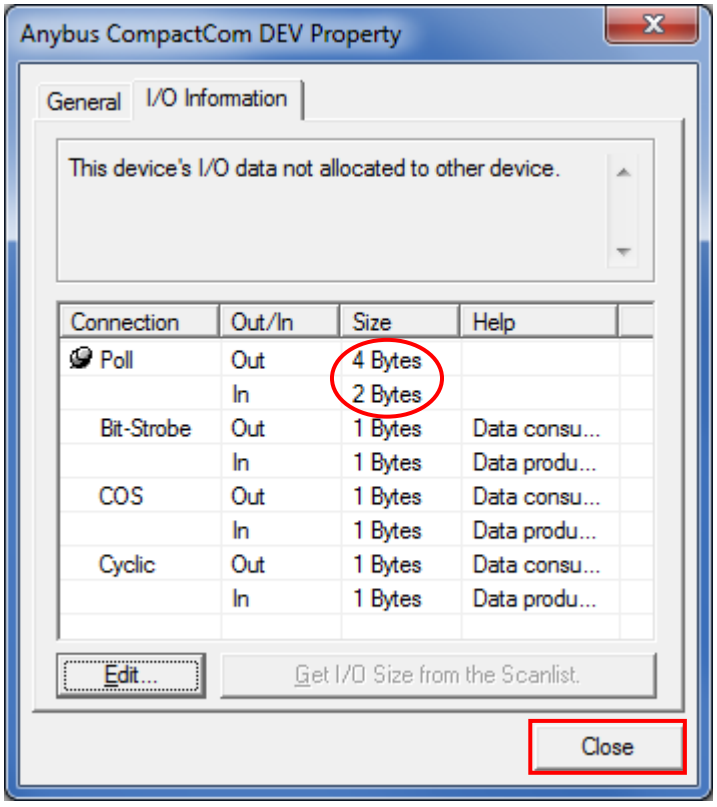


3 The Edit I/O Size Dialog Box is displayed.
Select *Poll* for Default and enter the following I/O sizes.
OUT Size : *4* Byte
IN Size : *2* Byte

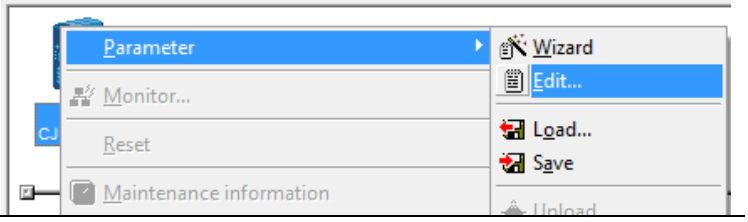
Click **OK**.




The Anybus CompactCom DEV Property Dialog Box is displayed.
Check that the sizes for Out and In are correctly set.
Click **Close**.

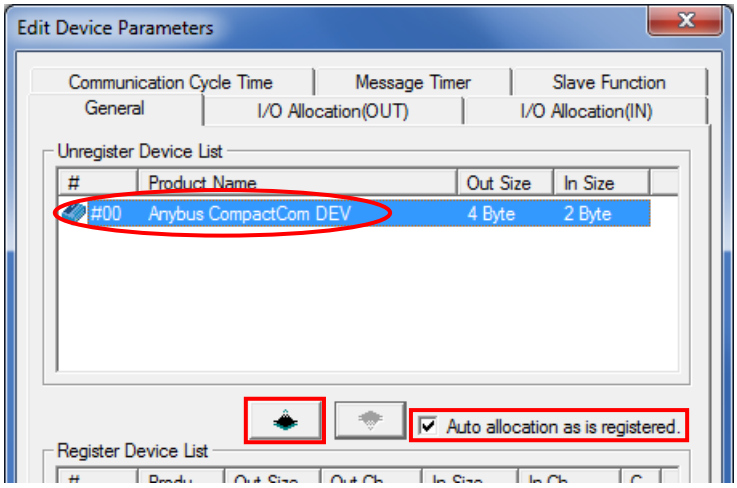



4 Right-click the **DeviceNet Unit** icon and select ***Parameter*** - ***Edit***.



5 The Edit Device Parameters Dialog Box is displayed.
The Robot (#00) is displayed in the *Unregister Device List* Field.

Select *Auto allocation as is registered*.
Click the ↓ Button.

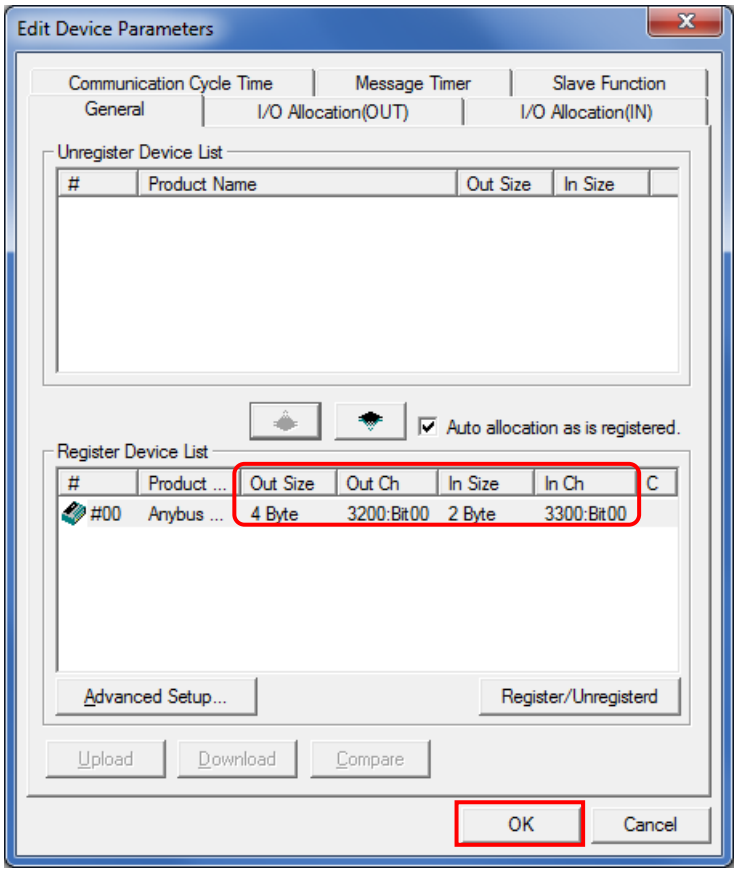



The Robot (#00) is registered in the *Register Device List* Field.

Check that the sizes and channels are set as shown below.

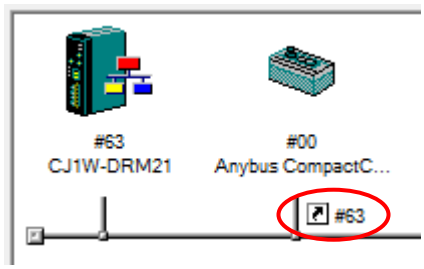
Out Size : 4 Byte
Out Ch : 3200:Bit00
In Size : 2 Byte
In Ch : 3300:Bit00

Click **OK**.




6 Check that the node address #63 is displayed under the Robot icon in the Network Configuration Window.

*A Robot icon is shown as the Anybus CompactCom DEV device.



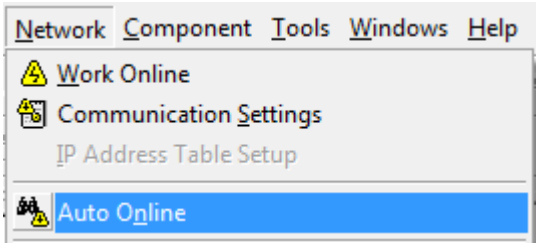
### 7.5.4. Connecting Online and Transferring the Scan List

Connect online with PLC and transfer the device setting (scan list) to DeviceNet Unit.
When the transfer is completed, the remote I/O communications start automatically.

**Precautions for Correct Use**

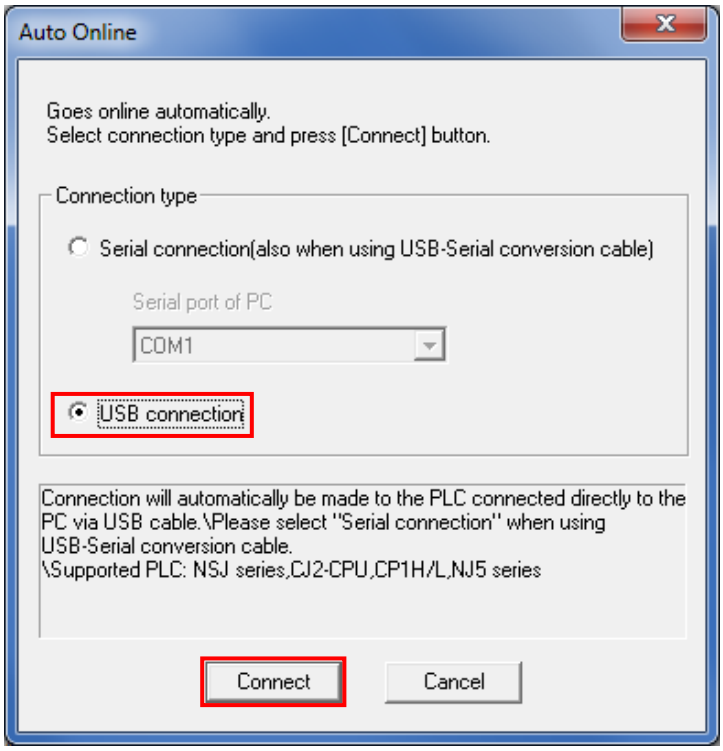
Check that a DeviceNet cable is connected before performing the following procedure.
If it is not connected, turn OFF the each device, and then connect a DeviceNet cable.

1 Select ***Auto Online*** from the Network Menu.

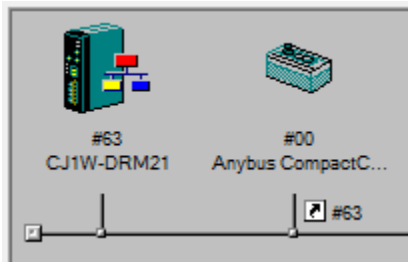



2 The Auto Online Dialog Box is displayed. Select *USB connection* for Connection type. Click **Correct**.

A confirmation dialog box is displayed indicating the connection is being established.

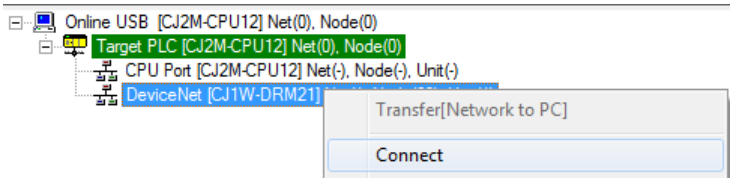
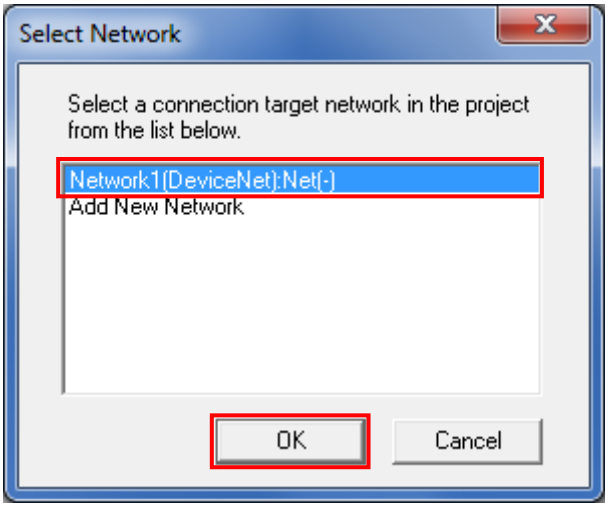
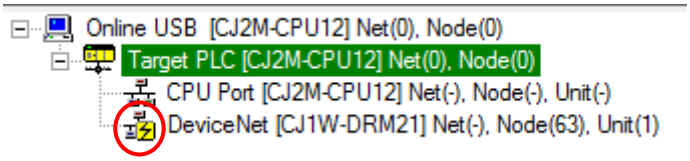
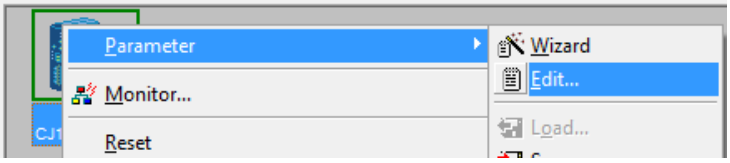



3 After an online connection is established, the background color of the Network Configuration Window changes as shown in the right figure.

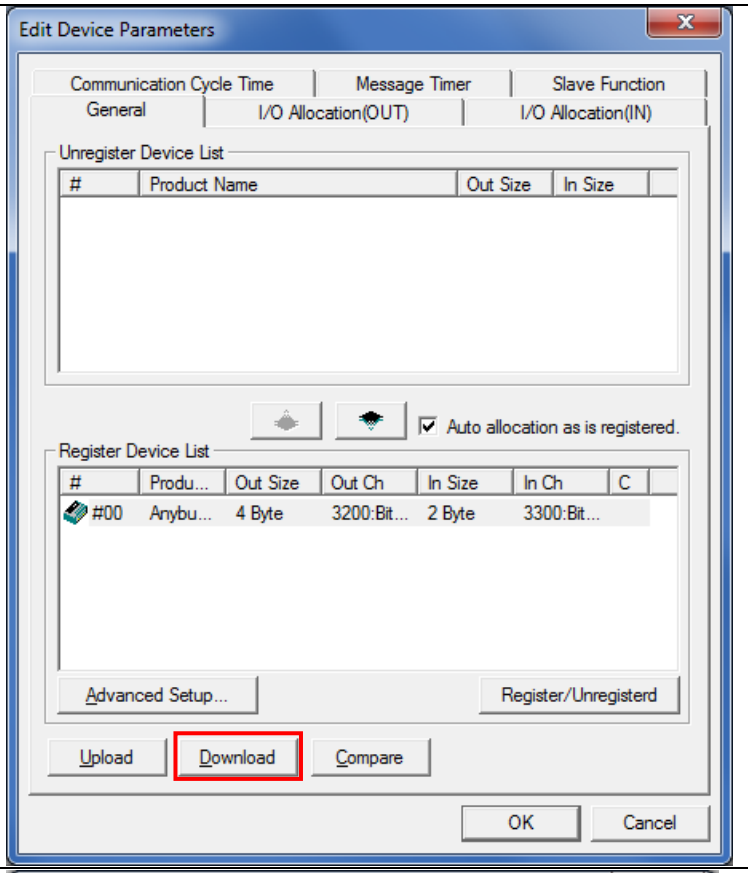


**Additional Information**

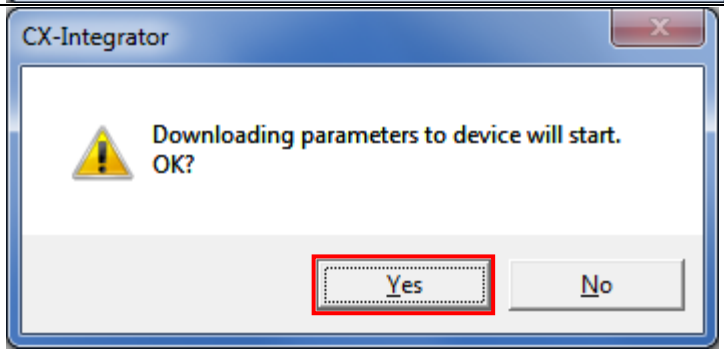
If PLC cannot be connected online, check the connection of the cable.
Then, return to step 1, check the settings, and repeat each step.
For details, refer to *2-1 Basic Procedures* in *Section 2 Basic Operations* of the *CX-Integrator Ver.2.[] OPERATION MANUAL* (Cat. No. W464).

| | | |
|---|---|---|
| 4 | Right-click **DeviceNet** in the Online Connection Information Window, and select ***Connect***. |  |
| 5 | The Select Network Dialog Box is displayed.<br>Select *Network1(DeviceNet)* and click **OK**. |  |
| 6 | Check that DeviceNet is in online status ( icon) in the Online Connection Information Window. |  |
| 7 | Right-click **CJ1W-DRM21** in the Network Configuration Window, and select ***Parameter*** - ***Edit***. |  |

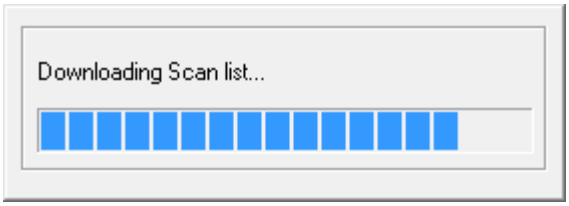
8 The Edit Device Parameters Dialog Box is displayed.
Click **Download**.



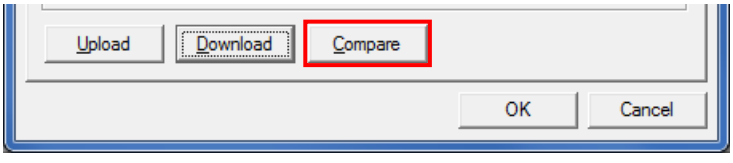

9 A download confirmation dialog box is displayed.
Check that there is no problem and click **Yes**.




A dialog box indicating the download is in progress is displayed.

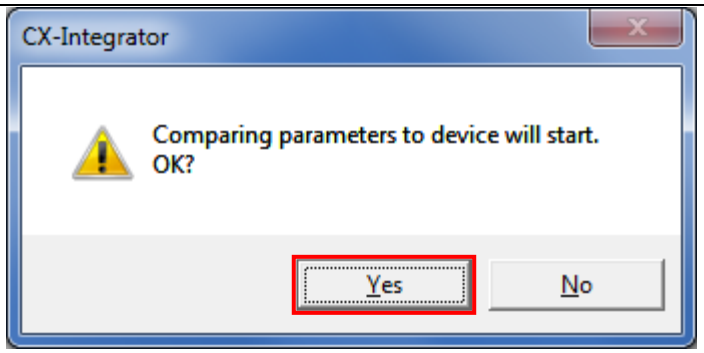



10 After the download is completed, click **Compare** in the Edit Device Parameters Dialog Box.

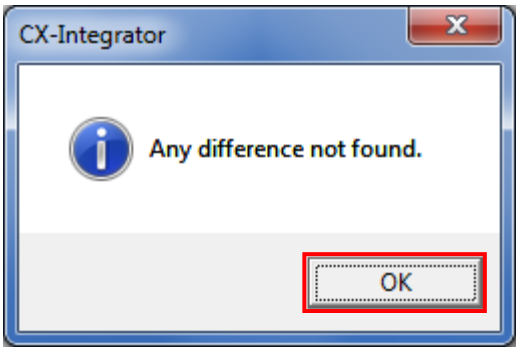


11

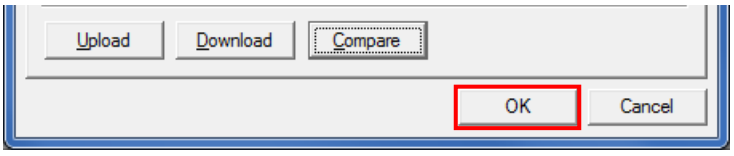
A dialog box shown on the right is displayed. Check that there is no problem.
Click **Yes**.




When the comparison is completed, a dialog box shown on the right is displayed.
Check the contents and click **OK**.




The Edit Device Parameters Dialog Box is displayed again.
Click **OK** to close the dialog box.

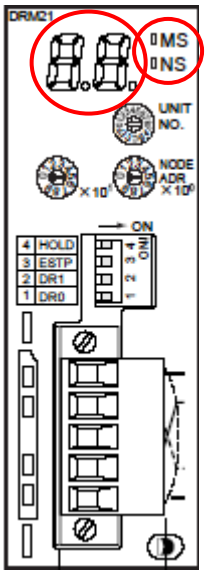
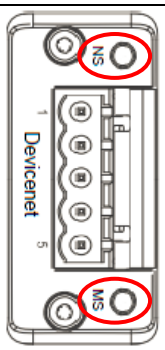
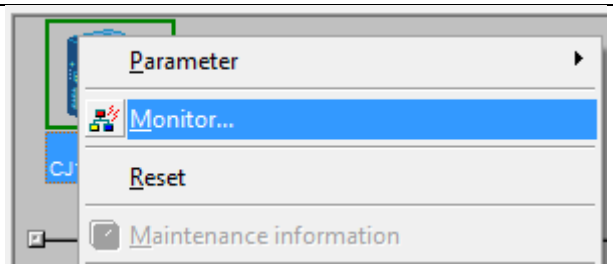


## 7.6. DeviceNet Communication Status Check

Check that the DeviceNet remote I/O communications perform normally.

### 7.6.1. Checking the Connection Status

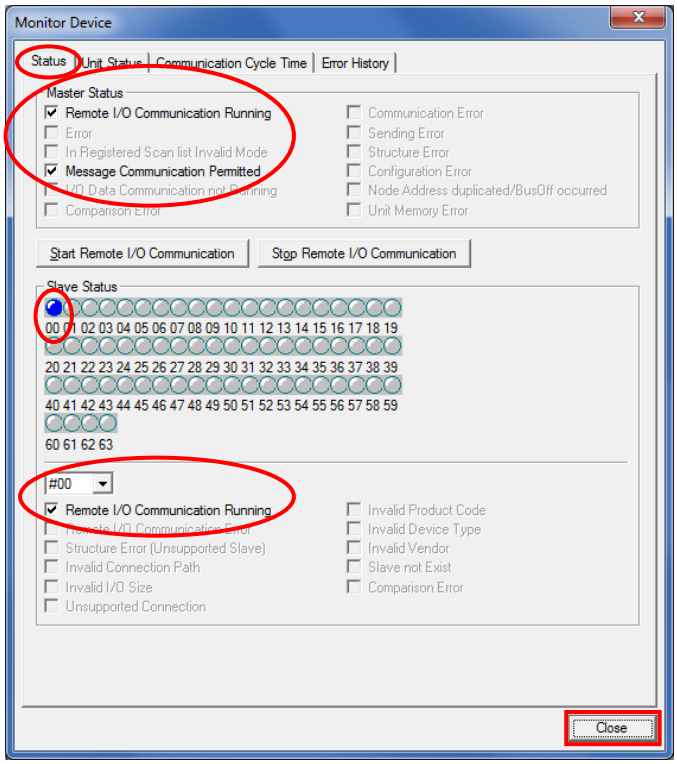
Check the connection status of DeviceNet.

| | | |
|---|---|---|
| 1 | Check with LED indicators on PLC (DeviceNet Unit) that the DeviceNet remote I/O communications are performed normally.<br><br>The LED indicators in normal status are as follows:<br>MS: Green lit<br>NS: Green lit<br>7-segment display: 63 lit<br>(Master node address, remote I/O communications active and normal) |  |
| 2 | Check the LED indicators on Robot.<br><br>The LED indicators in normal status are as follows:<br>MS: Green lit<br>NS: Green lit |  |
| 3 | Check that the DeviceNet remote I/O communications are performed normally from CX-Integrator by referring to the status information in the Monitor Device Dialog Box.<br><br>Right-click the **DeviceNet Unit** icon in the Network Configuration Window, and select ***Monitor***. |  |

4 The figure on the right displays the Status Tab Page in the Monitor Device Dialog Box.

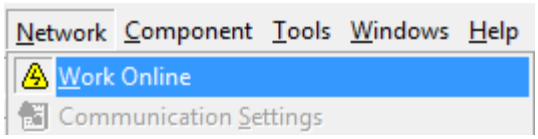
Check that the same items as these on the right are selected in the *Master Status* Field.
Check that #00 is lit blue in the *Slave Status* Field and that the *Remote I/O Communication Running* Check Box is selected.
This state shows that the DeviceNet remote I/O communications are performed normally.

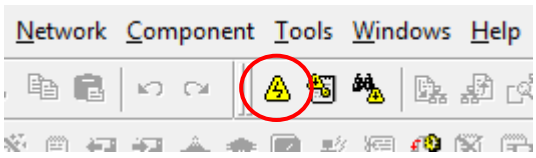
Click **Close**.




5 Go offline with CX-Integrator.
Select ***Work Online*** from the Network Menu.

*The  icon is not pressed down during the offline connection.



### 7.6.2. Checking the Sent and Received Data

Check that the correct data are sent and received.

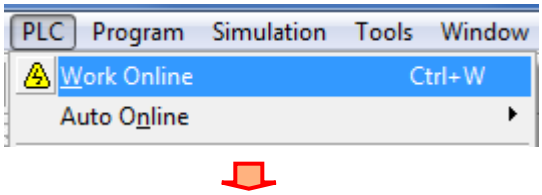
**⚠ Caution**

In this procedure, the Robot output is performed, which may be a risk of unexpected movements of Robot. Take adequate safety precautions before you proceed with this operation check. If safety is not ensured, follow the procedures up to *7.6.1. Checking the Connection Status*, and do not proceed with the operation check described here. When you proceed with this operation check, make sure to complete all the steps and make the Robot output safe.

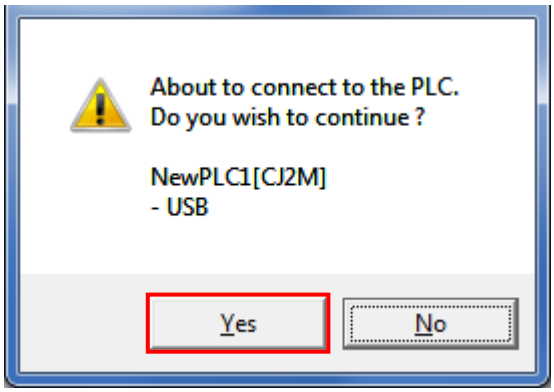
**⚠ Caution**

If the PLC memory is changed by malfunction during monitoring power flow and present value status in the Ladder Section Window or in the Watch Window, the devices connected to output units may malfunction, regardless of the operating mode of CPU Unit.
Confirm adequate safety before monitoring power flow and present value status in the Ladder Section Window or in the Watch Window.

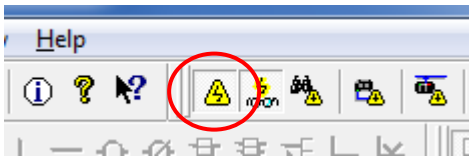
1 Select ***Work Online*** from the PLC Menu of CX-Programmer.




A confirmation dialog box is displayed. Check that there is no problem and click **Yes**.




The icon is pressed down.

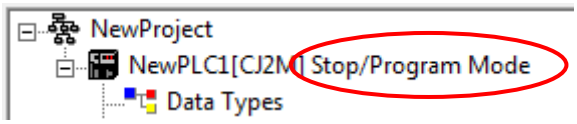


**Precautions for Correct Use**

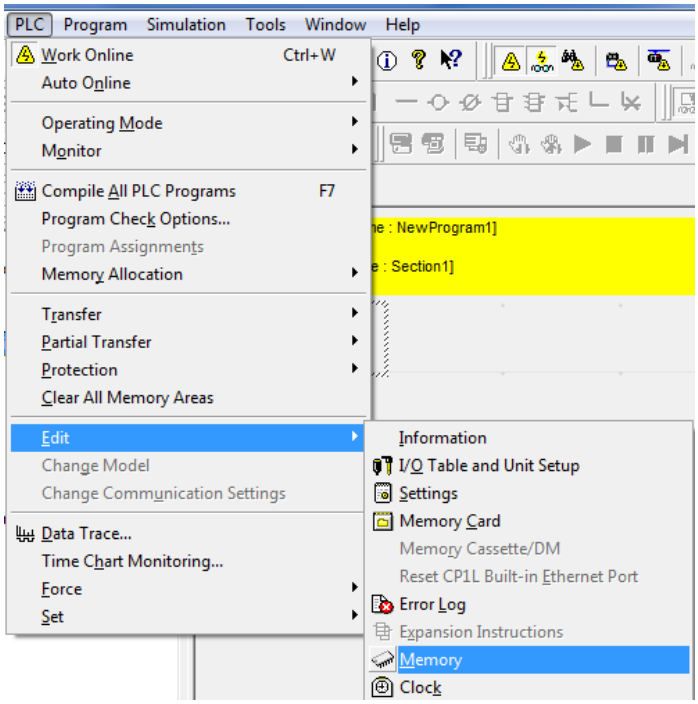
If an online connection of CX-Programmer cannot be established, check the CX-Integrator's connection status.
If it is online, disconnect it from PLC. Then, check the cable connection and connection settings.

2 Check that the operating mode of PLC is in Stop/Program Mode.

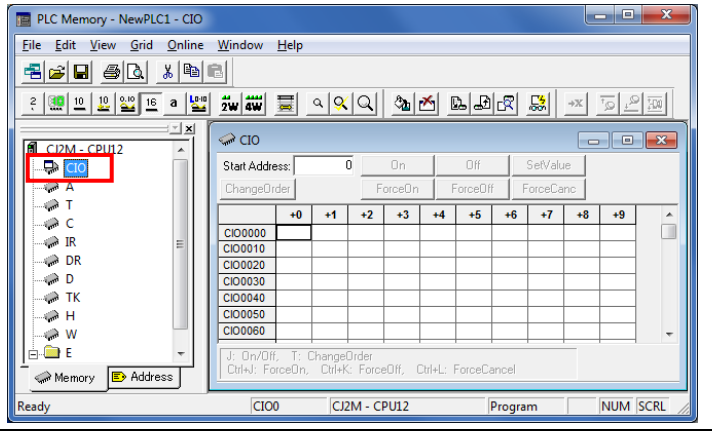
*If the operating mode of PLC is not Stop/Program Mode, change to Stop/Program Mode by referring to *step 1* of *7.4.2. Creating the I/O Table*.

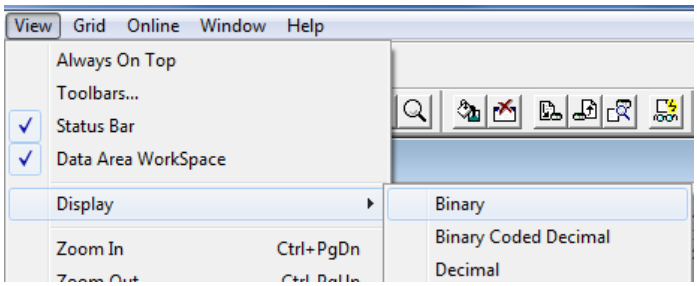
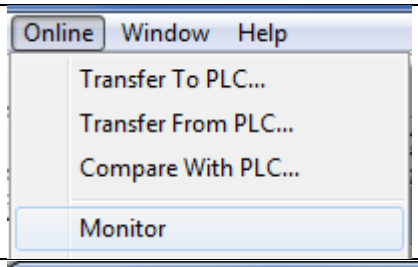
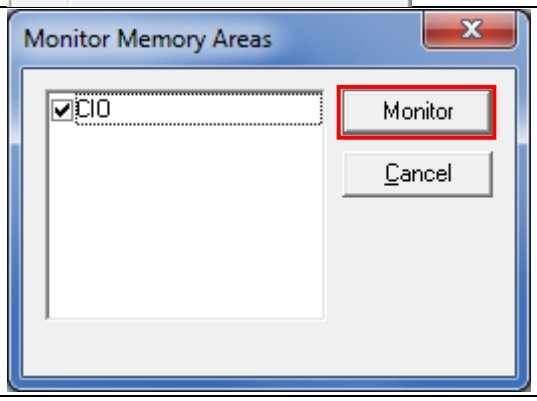
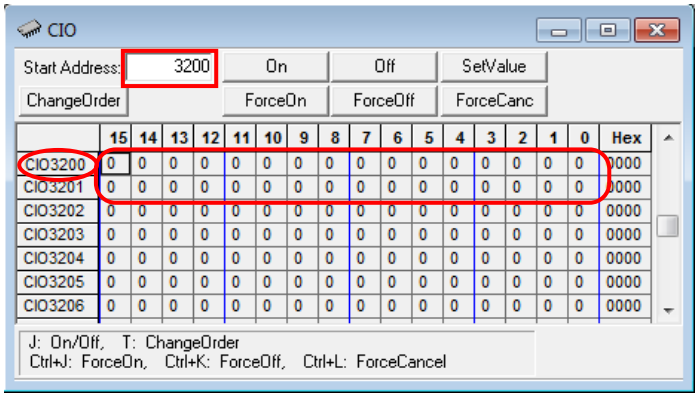
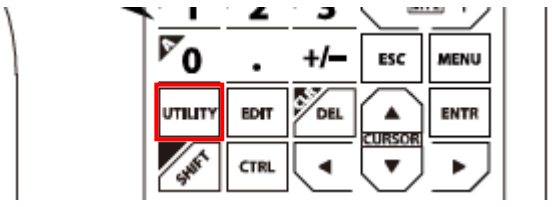



3 Select ***Edit*** - ***Memory*** from the PLC Menu.

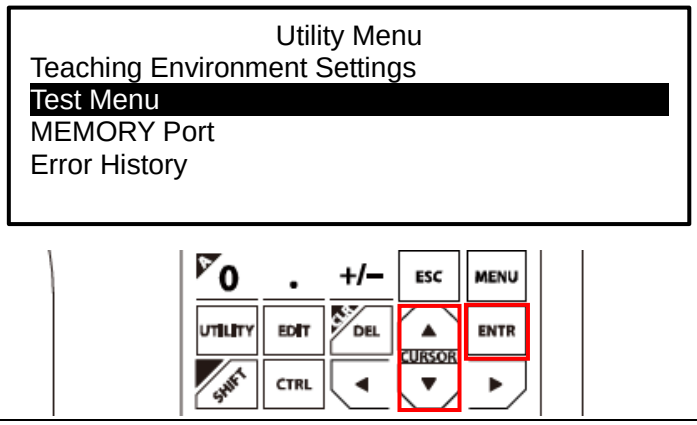



4 Double-click **CIO** from the list in the PLC Memory Window that is displayed.

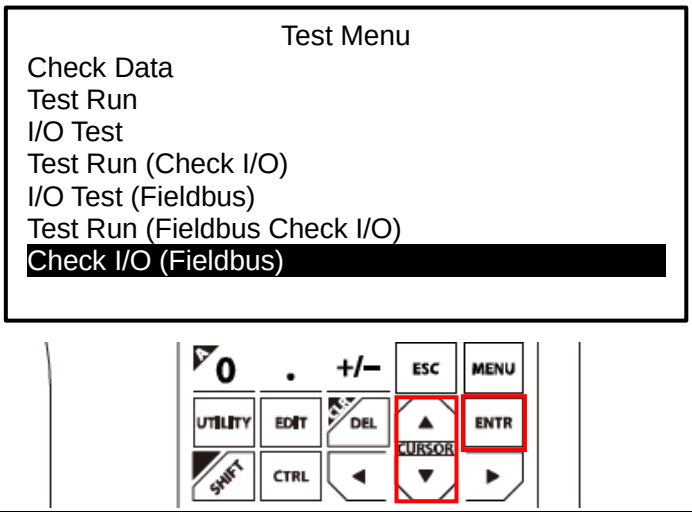


| | | |
|---|---|---|
| 5 | Select ***Display*** - ***Binary*** from the View Menu. |  |
| 6 | Select ***Monitor*** from the Online Menu. |  |
| 7 | The Monitor Memory Areas Dialog Box is displayed.<br>Check that CIO is selected, and click **Monitor**. |  |
| 8 | Enter *3200* in the *Start Address* Field of the CIO Window.<br>Check that the start address changes to CIO 3200 and that the values of all bits for CIO3200 and CIO3201 are "0". |  |
| 9 | Press **UTILITY** on Teaching Pendant for Robot. |  |

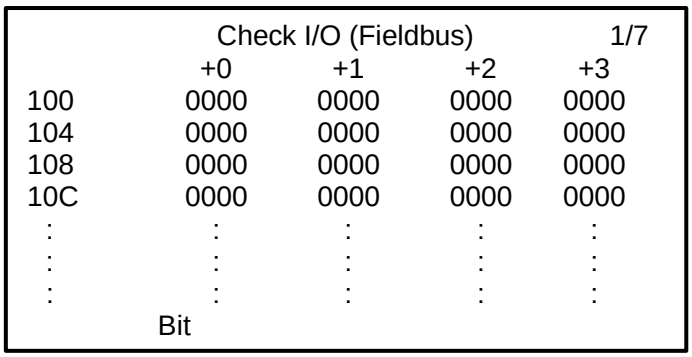
10 Utility Menu is displayed.
Select ***Test Menu*** by using the **Up** and **Down CURSOR** Keys.
Press **ENTR**.

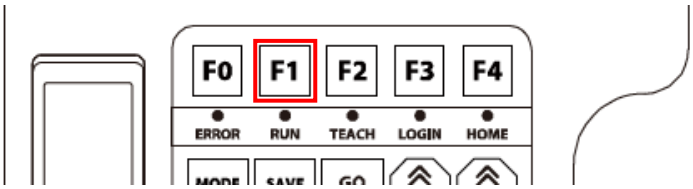



11 Test Menu is displayed.
Select ***Check I/O (Fieldbus)*** by using the **Up** and **Down CURSOR** Keys.
Press **ENTR**.



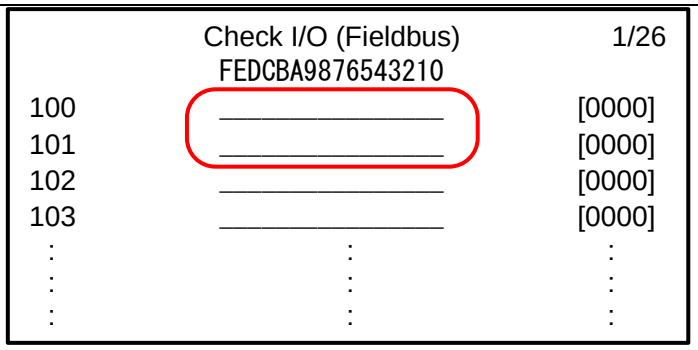

12 Check I/O (Fieldbus) is displayed.
Press **F1**.



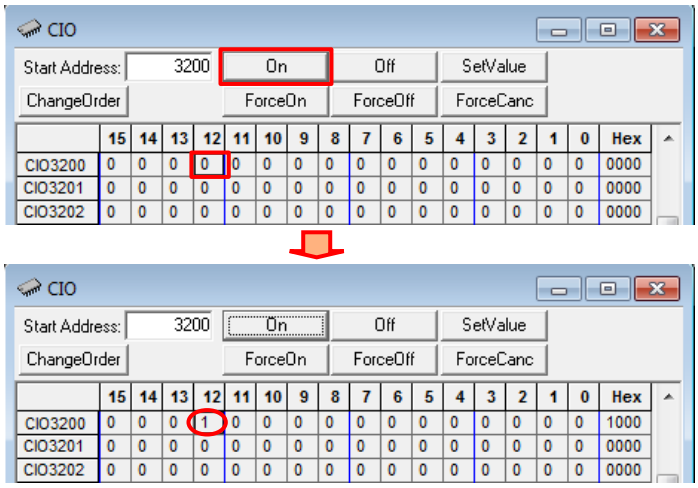
**13** The screen of Check I/O (Fieldbus) switches from word data units to bit data units.
Check that the 1000 to 101F relay numbers are all "_" (indicates "0").

*Check that the values are the same as the ones in the output area for the corresponding PLC (see step 8).

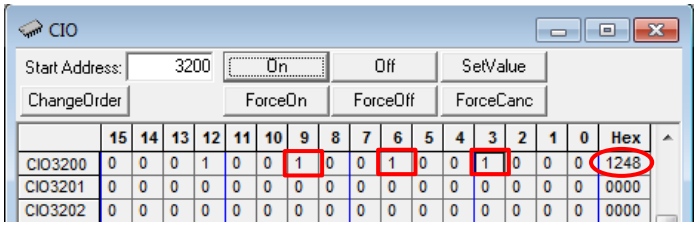



**14** Select the value of bit 12 for CIO3200 of PLC memory and click **On**.

"1" is set to the value of bit 12.

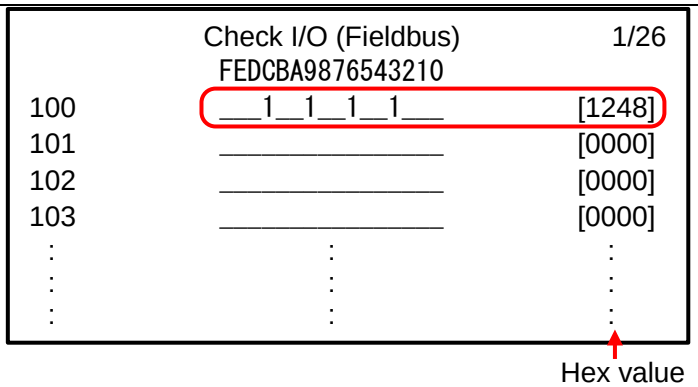



**15** In the same way as step 14, set the values of bits 9, 6, and 3 for CIO3200 to *1*.
Check that the hex value for CIO3200 changes to "1248".

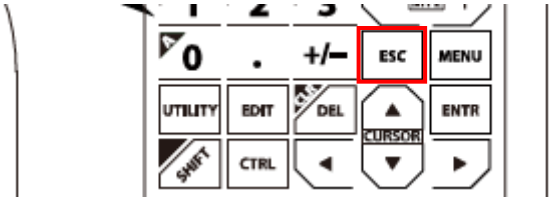



**16** Check the screen of Check I/O (Fieldbus) on Teaching Pendant.
The data are correctly sent when the screen shows that "1" is set to the values for Robot's relay numbers 100C, 1009, 1006, and 1003 corresponding to the bits for CIO3200 of which values are set to "1" in step 15 and that "1248" is set to the hex value for the relay numbers 1000 to 100F.

*The relay numbers 100C, 1009, 1006, and 1003 are free and are not related to the operations of Robot.

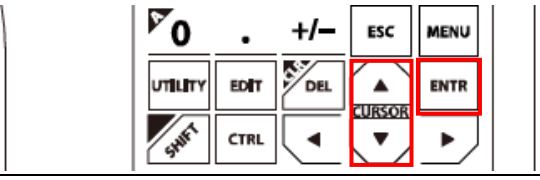


**17** Press **ESC** twice.




**18** Test Menu is displayed again.
Select ***I/O Test (Fieldbus)*** by using the **Up** and **Down CURSOR** Keys.
Press **ENTR**.

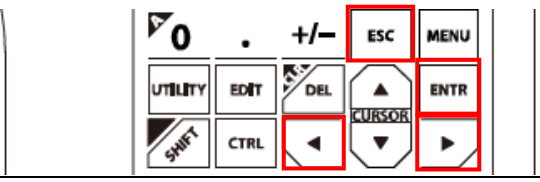
```
Test Menu
Check Data
Test Run
I/O Test
Test Run (Check I/O)
I/O Test (Fieldbus)
Test Run (Fieldbus Check I/O)
Check I/O (Fieldbus)
```




**19** I/O Test (Fieldbus) is displayed.
Move a cursor to the F position for Field-Bus OUT by using the **Right** and **Left CURSOR** Keys.
Press **ENTR**, and change the output from "_" to "*1*".

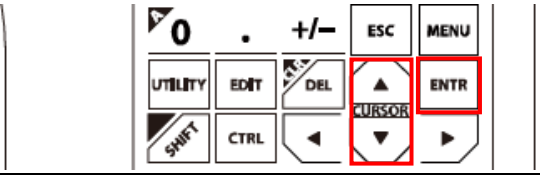
```
I/O Test (Fieldbus)
Module Status                    Valid
Connect Module                   DeviceNet

                    FEDCBA9876543210
Field-Bus IN        __1__1__1__1___
Field-Bus OUT       1_______________

Push [ENTR] Key to Change Output
```

Press **ESC**.

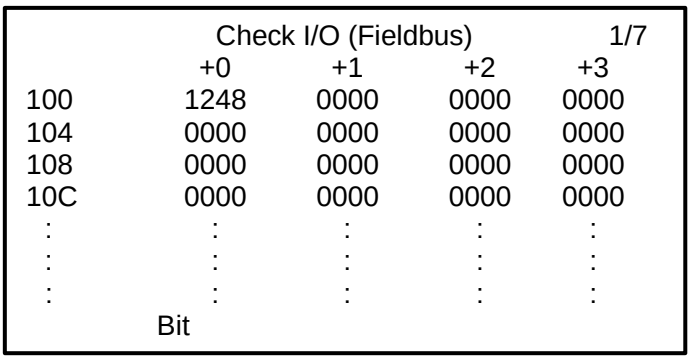


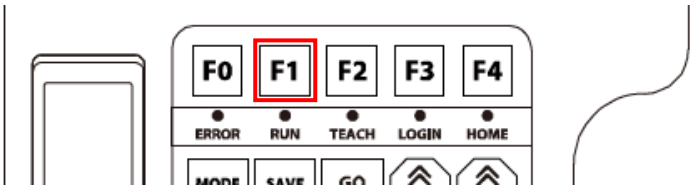

**20** Test Menu is displayed again.
Select ***Check I/O (Fieldbus)*** by using the **Up** and **Down CURSOR** Keys.
Press **ENTR**.

```
Test Menu
Check Data
Test Run
I/O Test
Test Run (Check I/O)
I/O Test (Fieldbus)
Test Run (Fieldbus Check I/O)
Check I/O (Fieldbus)
```



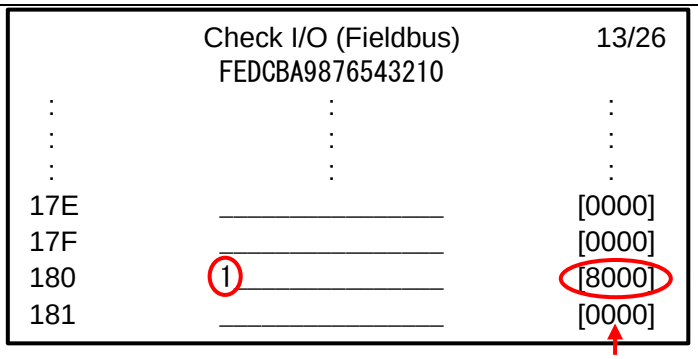
**21** Check I/O (Fieldbus) is displayed.
Press **F1**.

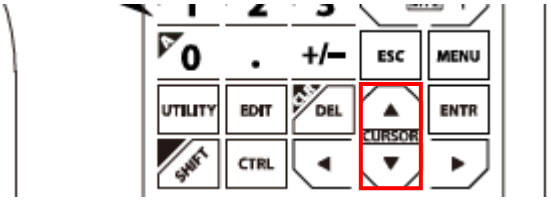


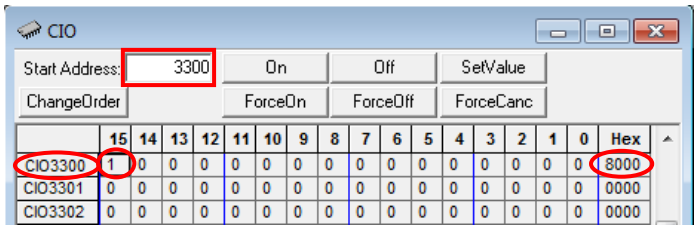

**22** The screen of Check I/O (Fieldbus) switches from word data units to bit data units.
Display the screen showing the relay numbers 1800 to 180F by using the **Up** and **Down CURSOR** Keys.
Check that the value for relay number 180F is "1" and that the hex value for relay numbers 1800 to 180F is "8000".

*The relay number 180F is free and is not related to the operations of Robot.




**23** Enter *3300* in the *Start Address* Field of the CIO Window of PLC memory. Check that the start address changes to CIO3300.
The data are correctly received when the screen shows that "1" is set to the value of bit 15 for CIO3300 corresponding to the Robot's relay number 180F, the value of which is checked in step 22, and that "8000" is set to the hex value for CIO3300.



# 8. Initialization Method

This document provides explanations of procedures based on the factory default settings. Some settings may not be applicable as described in this document unless you use the devices with the factory default settings.

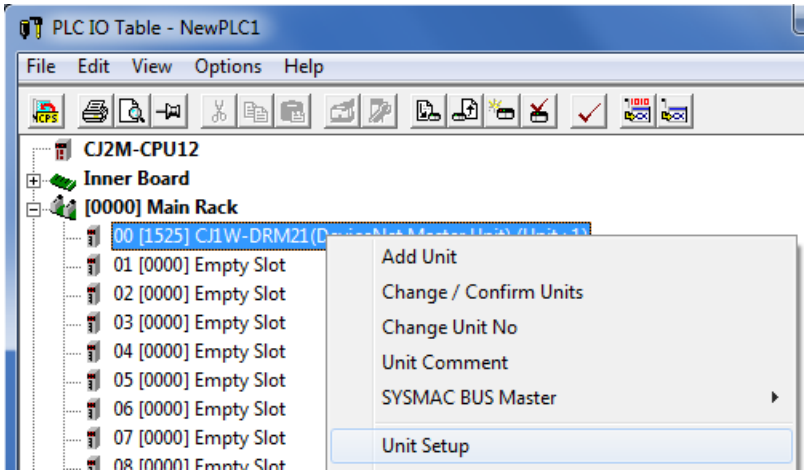
## 8.1. PLC Initialization

To return the PLC settings to their initial (factory default) settings, it is necessary to initialize CPU Unit and DeviceNet Unit. Change PLC to PROGRAM mode before the initialization.

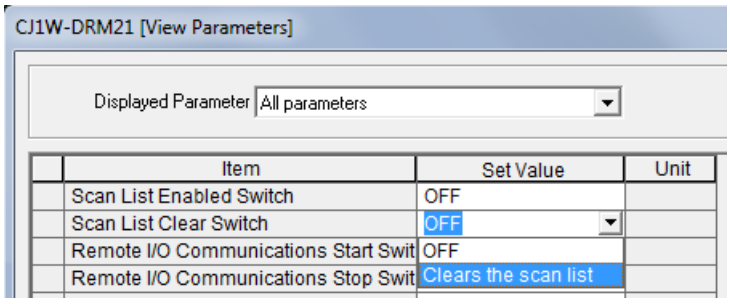
### 8.1.1. DeviceNet Unit

Use the following procedure for returning the DeviceNet settings to their initial (factory default) settings.

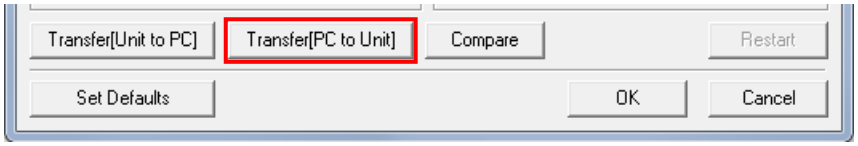
(1) Right-click **CJ1W-DRM21** on the PLC IO Table of CX-Programmer and select ***Unit Setup*** from the menu.




(2) On the CJ1W-DRM21 [View Parameters] Dialog Box, select ***Clears the scan list*** as the set value of Scan List Clear Switch.

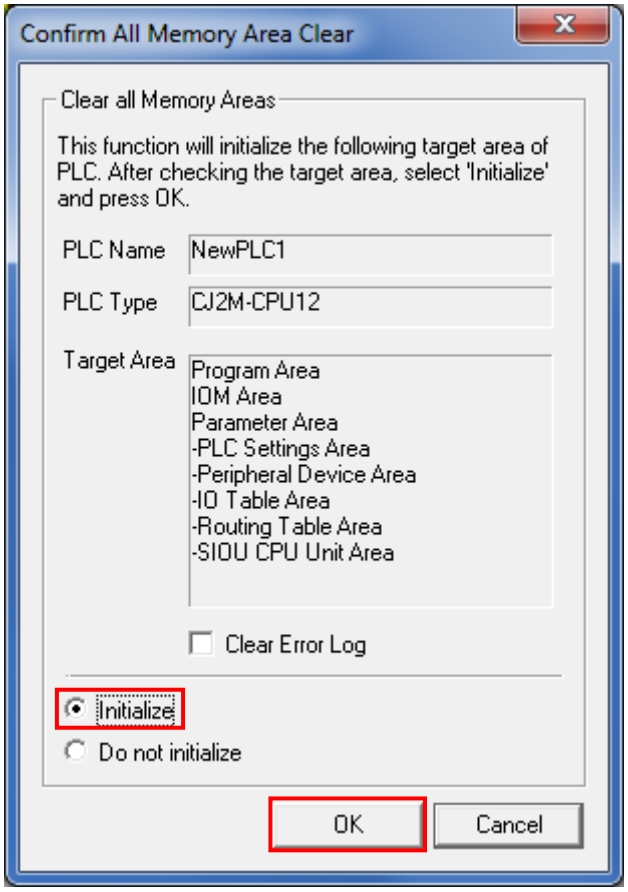



(3) Click **Transfer[PC to Unit]**.



### 8.1.2. CPU Unit

To return the CPU Unit settings to their initial (factory default) settings, select ***Clear All Memory Areas*** from the PLC Menu of CX-Programmer. Select *Initialize* on the Confirm All Memory Area Clear Dialog Box and click **OK**.




## 8.2. JANOME Robot Initialization

For information on the initialization of JANOME Robot, refer to *1.12 Reset Administration Settings* of the *JANOME DESKTOP ROBOT JR3000 Series / JANOME CARTESIAN ROBOT JC-3 Series Operation Manual Functions III (All Program Common Settings / PLC Programs)* (170814108).

# 9. Revision History

| Revision code | Date of revision | Revision reason and revised page(s) |
|---|---|---|
| 01 | November 6, 2015 | First edition |
| | | |
| | | |

**OMRON Corporation** **Industrial Automation Company**
Tokyo, JAPAN
**Contact: www.ia.omron.com**

*Regional Headquarters*
**OMRON EUROPE B.V.**
Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

**OMRON ELECTRONICS LLC**
2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

**OMRON ASIA PACIFIC PTE. LTD.**
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

**OMRON (CHINA) CO., LTD.**
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

**Authorized Distributor:**



**Cat. No. P637-E1-01** 1115- (1115)