



Machine Automation Controller NJ-series

EtherCAT Connection Guide

OMRON Corporation

GX-series Digital I/O Terminal

Network
Connection
Guide

Table of Contents

1. Related Manuals	1
2. Terms and Definition	2
3. Remarks	3
4. Overview	5
5. Applicable Devices and Support Software.....	5
5.1. Applicable Devices.....	5
5.2. Device Configuration.....	6
6. EtherCAT Settings	7
6.1. EtherCAT Communications Settings	7
6.2. Allocating the Global Variables	7
7. Connection Procedure	9
7.1. Work Flow	9
7.2. Setting Up the Digital I/O Terminal	10
7.3. Setting Up the Controller.....	11
7.4. Connection Status Check.....	19
8. Initialization Method	23
8.1. Controller	23
9. Revision History	24

1. Related Manuals

The table below lists the manuals related to this document.

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

Cat.No.	Model	Manual name
W500	NJ501-□□□□	NJ-series CPU Unit Hardware User's Manual
W501	NJ501-□□□□	NJ-series CPU Unit Software User's Manual
W505	NJ501-□□□□	NJ-series CPU Unit Built-in EtherCAT Port User's Manual
W504	SYSMAC-SE2□□□	Sysmac Studio Version 1 Operation Manual
W488	GX-series	EtherCAT Slave Units User's Manual

2. Terms and Definition

Terms	Explanation and Definition
PDO Communications (Communications using Process Data Objects)	This method is used for cyclic data exchange between the master unit and the slave units. PDO data (i.e., I/O data that is mapped to PDOs) that is allocated in advance is refreshed periodically each EtherCAT process data communications cycle (i.e., the period of primary periodic task). The EtherCAT port built into the NJ-series CPU Unit uses process data communications for commands to refresh I/O data in a fixed control period, including I/O data for EtherCAT Slave Units, and the position control data for the Servomotors. It is accessed from the NJ-series CPU Unit in the following ways. •With device variables for EtherCAT slave I/O •With Axis Variables for Servo Drive and encoder input slaves to which assigned as an axis.
SDO Communications (Communications using Service Data Objects)	This method is used to read and write the specified slave unit data from the master unit when required. The EtherCAT port built into the NJ-series CPU Unit uses SDO communications for commands to read and write data, such as for parameter transfers, at specified times. You can read/write the following specified slave data with the EC_CoESDORead (Read CoE SDO) instruction or the EC_CoESDOWrite (Write CoE SDO) instruction. •SDO data in slave units (parameters, error information, etc.)
Slave Unit	There are various types of slaves such as Servo Drives that handle position data and I/O terminals that control the bit signals. The slave receives output data sent from the master, and transmits input data to the master.
Node address	An address to identify the unit connected to the EtherCAT network.
ESI file (EtherCAT Slave Information file)	The ESI files contain information unique to the EtherCAT slaves in XML format. Install an ESI file into the Sysmac Studio, to easily allocate slave process data and make other settings.

3. Remarks

- (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 safety circuit in order to ensure safety and minimize risks of abnormal occurrence.
- (2) To ensure system safety, always read and heed the information provided in all Safety Precautions, Precautions for Safe Use, and Precaution for Correct Use of manuals for each device which is used in the system.
- (3) The users are 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 of or whole part of this document without the permission of OMRON Corporation.
- (5) This document provides the latest information as of February 2013. The information contained in this document is subject to change for improvement without notice.

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Windows is a registered trademark of Microsoft Corporation in the USA and other countries.

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Company names and product names in this document are the trademarks or registered trademarks of their respective companies.

The following notation is used in this document.

 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.
--	--

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



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



Precautions for Safe Use

Indicates precautions on what to do and what not to do to ensure using the product safely.



Precautions for Correct Use

Indicates precautions on what to do and what not to do to ensure proper operation and performance.



Additional Information

Provides useful information.

Additional information to increase understanding or make operation easier.

4. Overview

This document describes the procedure for connecting the Digital I/O Terminal (GX Series) of OMRON Corporation (hereinafter referred to as OMRON) to the NJ-series Machine Automation Controller (hereinafter referred to as Controller) on EtherCAT and provides the procedure for checking their connection.

Refer to *Section 7 Connection Procedure* to understand the setting method and key points to connect the devices via EtherCAT.

5. Applicable Devices and Support Software

5.1. Applicable Devices

The following devices can be connected.

Manufacturer	Name	Model	Version
OMRON	NJ5-series CPU Unit	NJ501-□□□□	-
OMRON	Digital I/O Terminal	GX-□D16□1/OC1601 GX-ID16□2/OD16□2 /MD16□2 GX-□D16□8/□D32□8	1.1
OMRON	Expansion Unit	XWT-□D08(-1)/□D16(-1)	



Additional Information

As applicable devices above, the devices listed in Section 5.2. are actually used in this document to check the connection. When using devices not listed in Section 5.2, check the connection by referring to the procedure in this document.



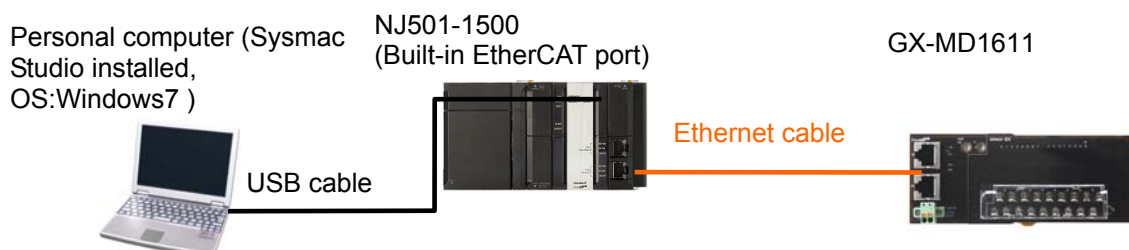
Additional Information

This document describes the procedure to establish the network connection. It does not provide information about operation, installation nor wiring method of each device.

For details on the above products (other than communication connection procedures), refer to the manuals for the corresponding products or contact your OMRON representative.

5.2. Device Configuration

The hardware components to reproduce the connection procedure of this document are as follows.



Manufacturer	Name	Model	Version
OMRON	CPU Unit (Built-in EtherCAT port)	NJ501-1500	
OMRON	Power Supply Unit	NJ1W-PA3001	
OMRON	Sysmac Studio	SYSMAC-SE2□□□	Ver.1.00
-	Personal computer (OS: Windows 7)		
-	USB cable (USB 2.0 type B connector)		
OMRON	Ethernet cable (with industrial Ethernet connector)	XS5W-T421-□M□-K	
OMRON	Digital I/O Terminal	GX-MD1611	V1.1



Precautions for Correct Use

The connection line of EtherCAT communication cannot be shared with other network, such as Ethernet or EtherNet/IP.

The switching hub for Ethernet cannot be used for EtherCAT.

Please use the cable of category 5 or higher, double-shielded with aluminum tape and braided shielding and the shielded connector of category 5 or higher.



Additional Information

For information on the specifications of the Ethernet cable and network wiring, refer to *Section 4 EtherCAT Network Wiring* in the *NJ-series CPU Unit Built-in EtherCAT Port User's Manual* (Cat. No. W505).



Additional Information

The system configuration in this document uses USB for the connection between the personal computer and the NJ-series CPU Unit. For information on how to install a USB driver, refer to *A-1 Driver Installation for Direct USB Cable Connection* of the *Sysmac Studio Operation Manual* (Cat.No. W504).

6. EtherCAT Settings

This section provides specifications such as communications parameters and variable names that are set in this document.

6.1. EtherCAT Communications Settings

The following is the setting of the destination device.

	GX-MD1611
Node address	01

6.2. Allocating the Global Variables

The device variables of the destination device are allocated to the Controller's global variables.

The relationship between the device data and the global variables is shown below.

•Output area (Controller → Destination device)

Destination device data		Global variable name	Data type
Write output bits (units of 2 bytes)		E001_Write_output_1st_word	WORD
	Output bit 00	E001_Out_Bit00	BOOL
	Output bit 01	E001_Out_Bit01	BOOL
	Output bit 02	E001_Out_Bit02	BOOL
	Output bit 03	E001_Out_Bit03	BOOL
	Output bit 04	E001_Out_Bit04	BOOL
	Output bit 05	E001_Out_Bit05	BOOL
	Output bit 06	E001_Out_Bit06	BOOL
	Output bit 07	E001_Out_Bit07	BOOL

•Input area (Controller ← Destination device)

Destination device data		Global variable name	Data type
Read input bits (units of 2 bytes)		E001_Read_input_1st_word	WORD
	Input bit 00	E001_In_Bit00	BOOL
	Input bit 01	E001_In_Bit01	BOOL
	Input bit 02	E001_In_Bit02	BOOL
	Input bit 03	E001_In_Bit03	BOOL
	Input bit 04	E001_In_Bit04	BOOL
	Input bit 05	E001_In_Bit05	BOOL
	Input bit 06	E001_In_Bit06	BOOL
	Input bit 07	E001_In_Bit07	BOOL

▪Details of the status allocation (Controller ← Destination device)

Destination device data		Global variable name	Data type
Sysmac Error Status		E001_Sysmac_Error_Status	BYTE
	Error information at observation level	E001_Observation	BOOL
	Error information at minor fault level	E001_Minor_Fault	BOOL

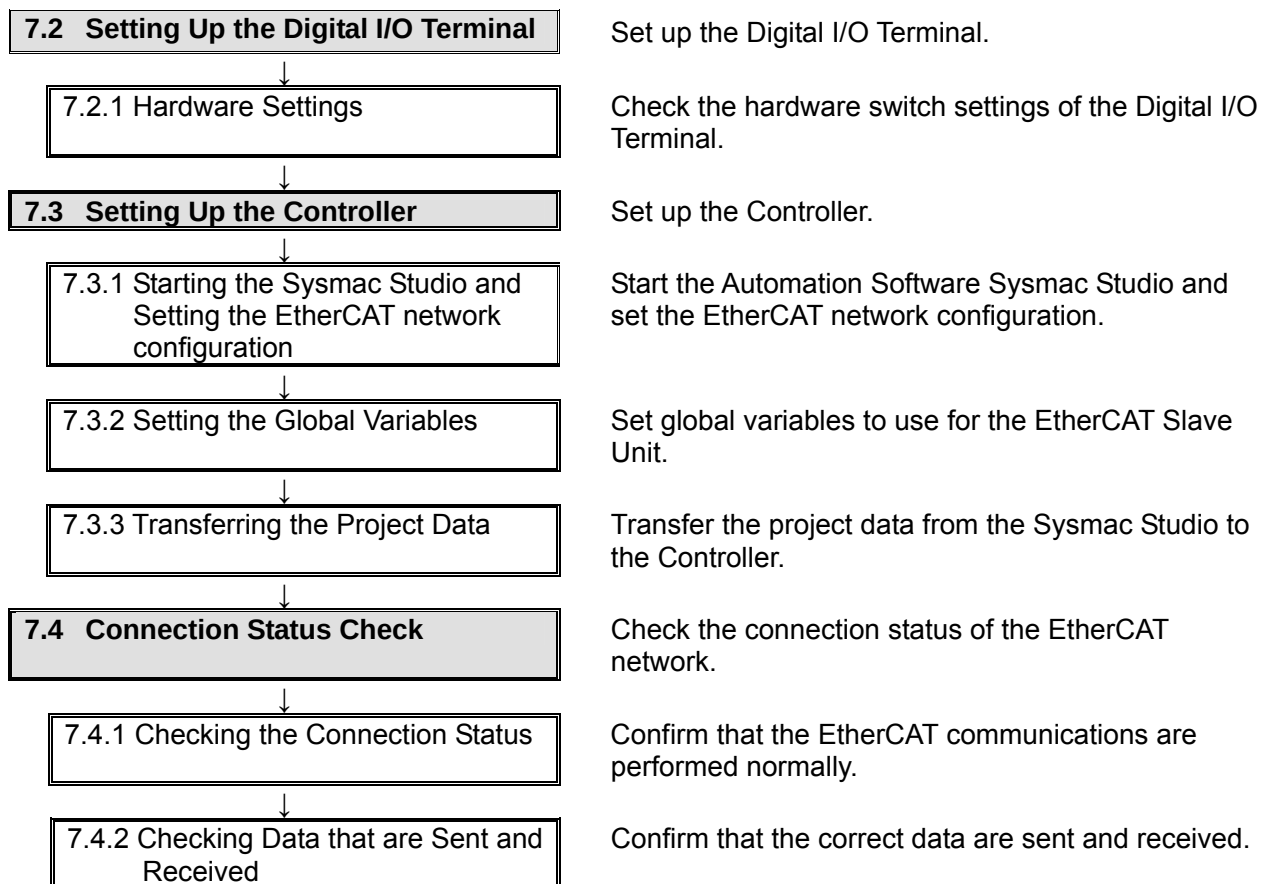
7. Connection Procedure

This section describes how to connect the Controller via EtherCAT.

This document explains the procedures for setting up the Controller and Digital I/O Terminal from the factory default setting. For the initialization, refer to *Section 8 Initialization Method*.

7.1. Work Flow

The following is the procedure for connecting to the EtherCAT.



7.2. Setting Up the Digital I/O Terminal

Set up the Digital I/O Terminal.

7.2.1. Hardware Setting

Check the hardware switch settings of the Digital I/O Terminal.



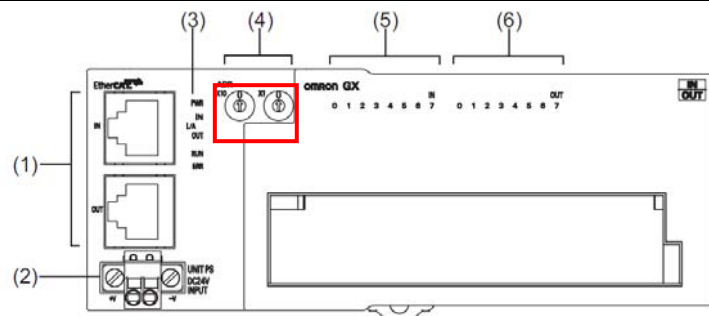
Precautions for Correct Use

Make sure that the power supply is OFF when you perform the settings.

- 1 Confirm that the power supply to the Digital I/O Terminal is OFF.

*If the power supply is turned ON, settings may not be applicable as described in the following procedure.

- 2 Refer to the right figure and check the hardware switches.

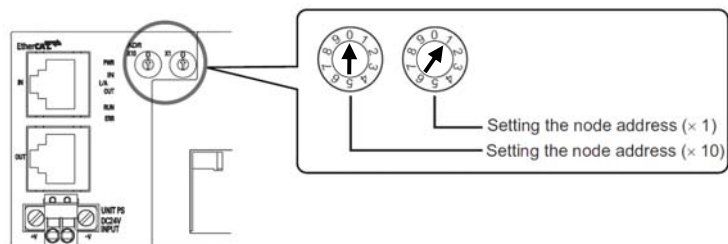


No.	Name
(1)	Communications connectors
(2)	Unit power supply connector
(3)	Status indicators
(4)	Node Address setting Switches
(5)	Input indicators (0 to 7)
(6)	Output indicators (0 to 7)

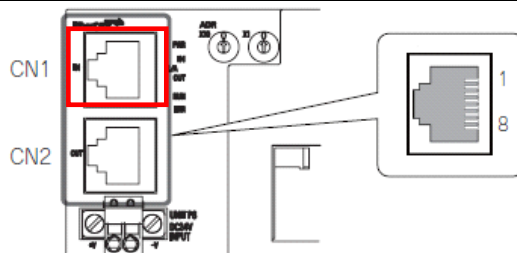
- 3 Set the node address switches as follows:

x10: 0, x1: 1

*Set the node address to "01".



- 4 Connect the Ethernet cable to communication connector CN1 and turn ON the power supply.



7.3. Setting Up the Controller

Set up the Controller.

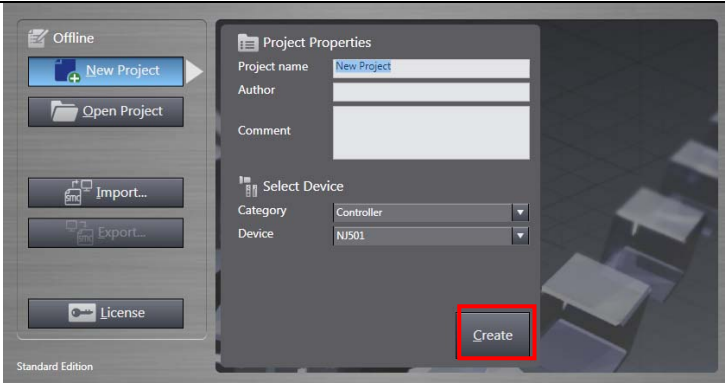
7.3.1. Starting the Sysmac Studio and Setting the EtherCAT Network Configuration

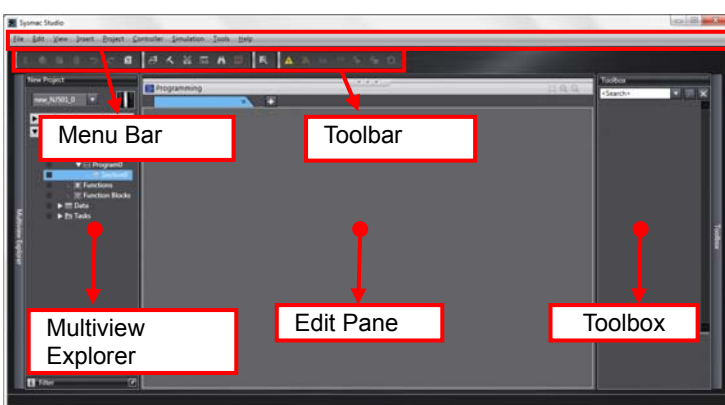
Start the Automation Software Sysmac Studio and set the EtherCAT network configuration. Install the software and USB driver beforehand.

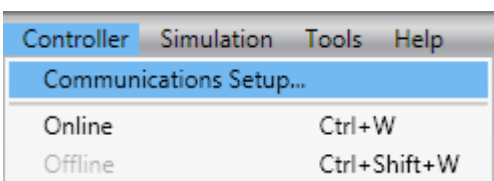
- 1 Start the Sysmac Studio.
Click the **New Project** Button.


- 2 The Project Properties Dialog Box is displayed. Click the **Create** Button.

*In this document, New Project is set as the project name.

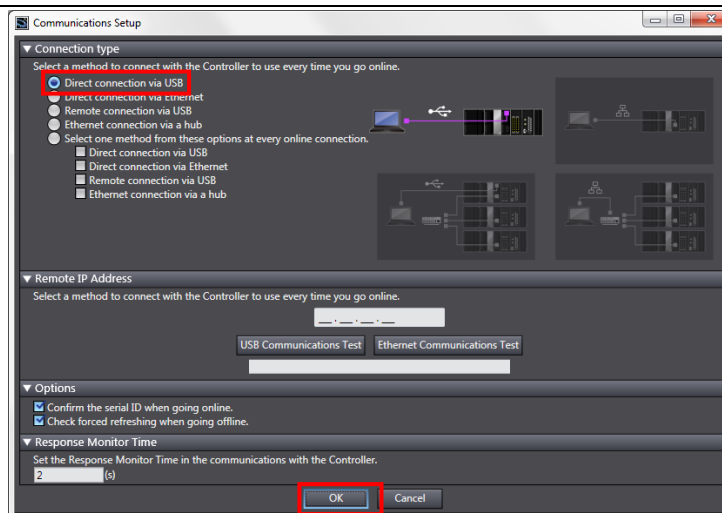

- 3 The New Project Pane is displayed.
There are Menu Bar and Toolbar in the upper part of the pane.
The left pane is called Multiview Explorer, the right pane is called Toolbox and the middle pane is called Edit Pane.


- 4 Select **Communications Setup** from the Controller Menu.



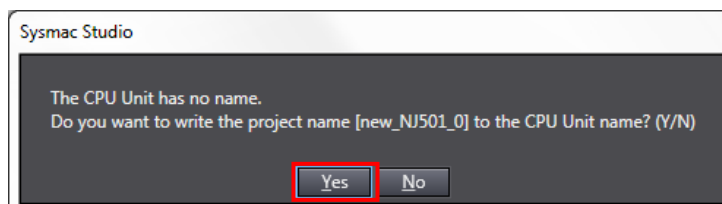
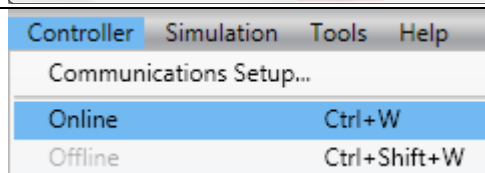
- 5 The Communications Setup Dialog Box is displayed. Select the *Direct connection via USB* Option in the Connection Type Field.

Click the **OK** Button.

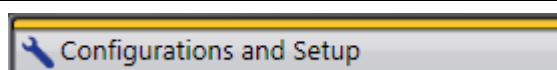


- 6 Select **Online** from the Controller Menu.

A confirmation dialog is displayed. Click the **Yes** Button.
 *A displayed dialog depends on the status of the Controller used. Select the **Yes** Button or other button to proceed with the processing.



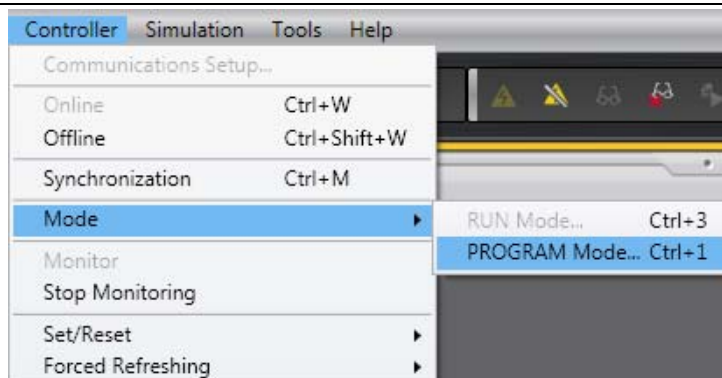
- 7 When an online connection is established, a yellow bar is displayed on the top of the Edit Pane.

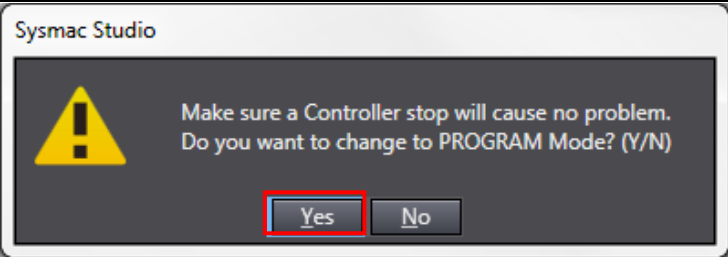
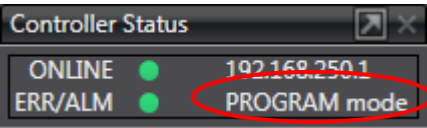
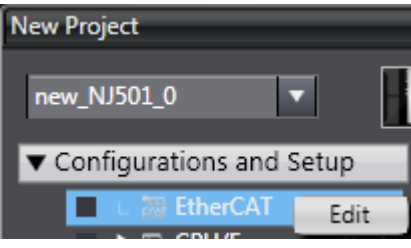
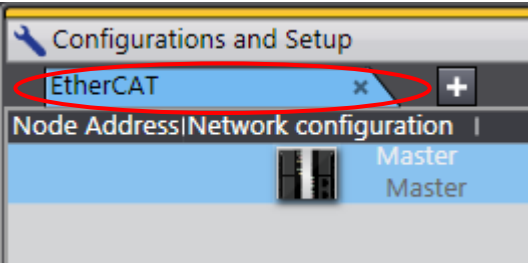
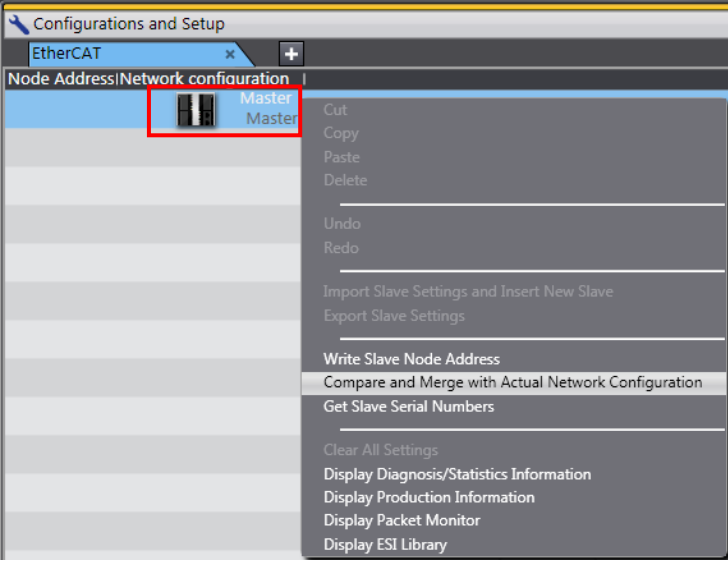
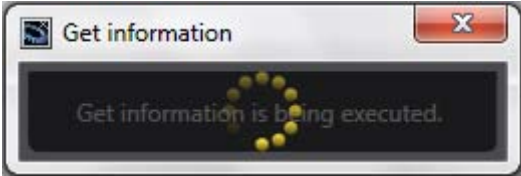


Additional Information

For details on the online connections to a Controller, refer to *Section 5 Going Online with a Controller* in the *Sysmac Studio Version 1.0 Operation Manual* (Cat. No. W504).

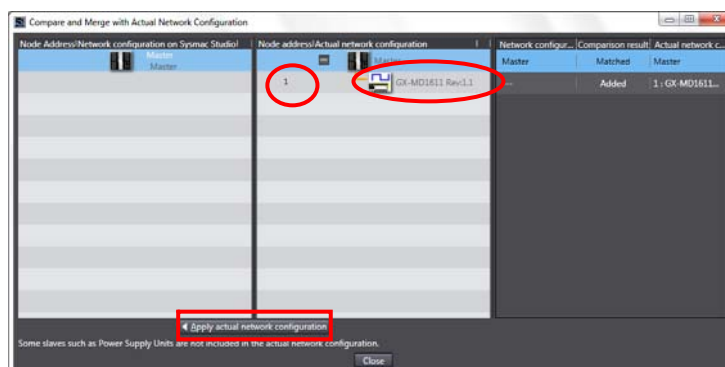
- 8 Select **Mode - PROGRAM Mode** from the Controller Menu.



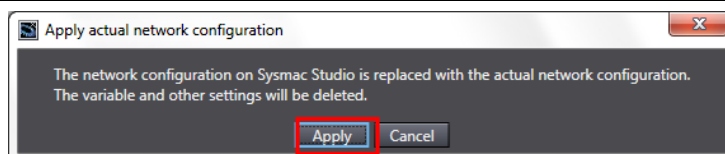
9	A confirmation dialog is displayed. Click the Yes Button. Confirm that the controller status on the Toolbox is changed to the PROGRAM mode.	 
10	Double-click EtherCAT under Configurations and Setup in the Multiview Explorer. Or, right-click EtherCAT under Configurations and Setup and select Edit.	
11	The EtherCAT Tab Page is displayed in the Edit Pane.	
12	Right-click the Master Icon and select Compare and Merge with Actual Network Configuration. A screen is displayed stating "Get information is being executed".	 

- 13 The Compare and Merge with Actual Network Configuration Pane is displayed. Node address 1 and GX-MD1611 Rev.1.1 are added to the actual network configuration of the comparison result.

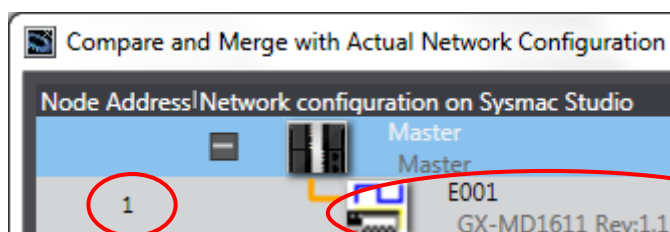
Click the **Apply actual network configuration** Button.



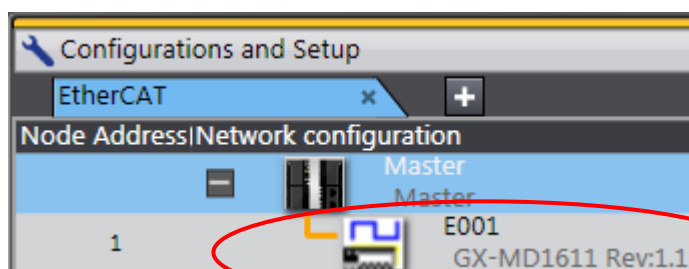
- 14 A confirmation dialog box is displayed. Click the **Apply** Button.



Confirm that node address 1 and E001 GX-MD1611 Rev.1.1 are added to the network configuration of the Sysmac Studio. Click the **Close** Button.



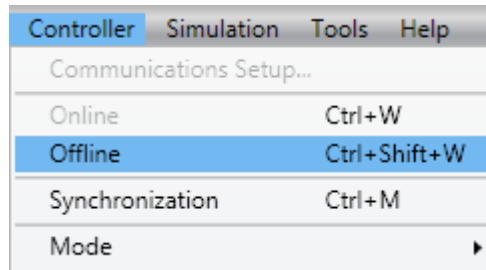
- 15 Node address 1 and E001 GX-MD1611 Rev:1.1 are added to the EtherCAT Tab Page in the Edit Pane.



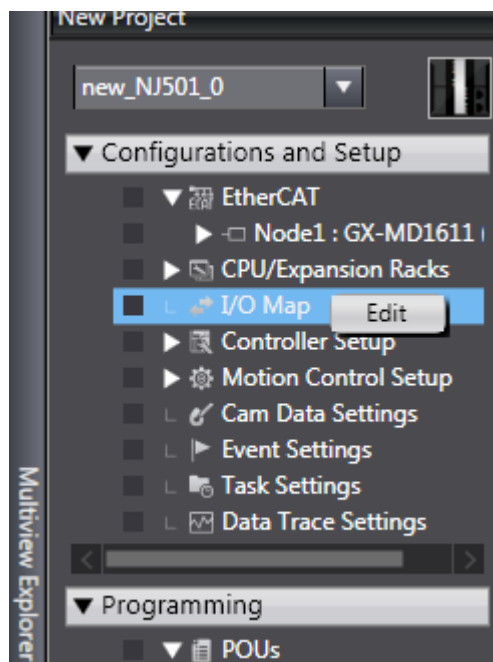
7.3.2. Setting Global Variables

Set global variables to use for the EtherCAT Slave Unit.

- 1 Select **Offline** from the Controller Menu.



- 2 Double-click **I/O Map** under Configurations and Setup on the Multiview Explorer, or right-click it and select **Edit**.

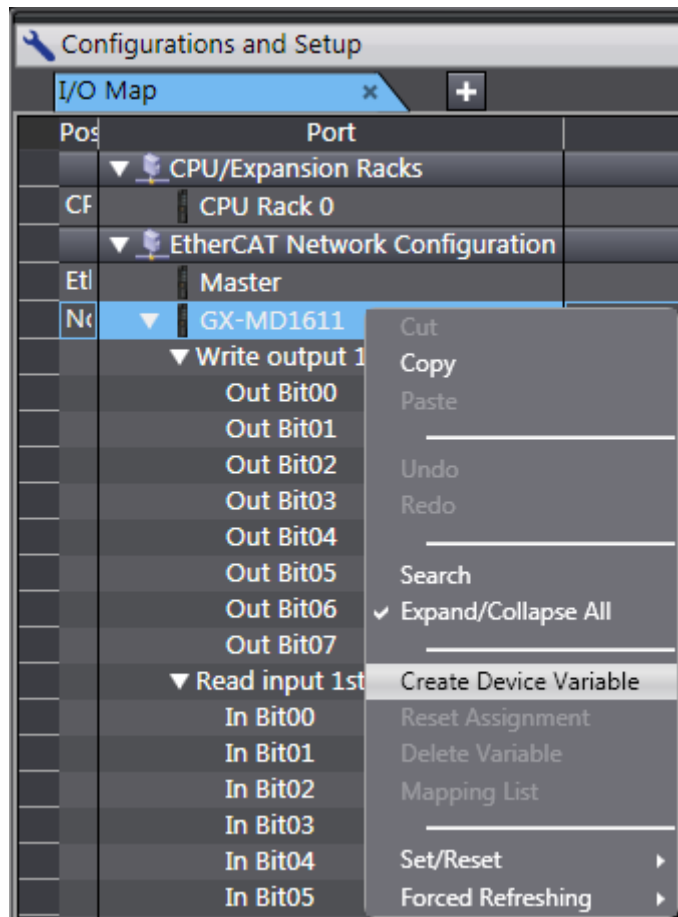


- 3 The I/O Map Tab Page is displayed on the Edit Pane.

Click a column under Variable to enter a new variable.

Configurations and Setup								File Edit View	
IO Map									
Port	Port	Description		R/W	Data Type	Variable	Variable Comment	Variable Type	
EXP1 EXP2 EXP3 EXP4 EXP5 EXP6 EXP7 EXP8 EXP9 EXP10 EXP11 EXP12 EXP13 EXP14 EXP15 EXP16 EXP17 EXP18 EXP19 EXP20 EXP21 EXP22 EXP23 EXP24 EXP25 EXP26 EXP27 EXP28 EXP29 EXP30 EXP31 EXP32 EXP33 EXP34 EXP35 EXP36 EXP37 EXP38 EXP39 EXP40 EXP41 EXP42 EXP43 EXP44 EXP45 EXP46 EXP47 EXP48 EXP49 EXP50 EXP51 EXP52 EXP53 EXP54 EXP55 EXP56 EXP57 EXP58 EXP59 EXP60 EXP61 EXP62 EXP63 EXP64 EXP65 EXP66 EXP67 EXP68 EXP69 EXP70 EXP71 EXP72 EXP73 EXP74 EXP75 EXP76 EXP77 EXP78 EXP79 EXP80 EXP81 EXP82 EXP83 EXP84 EXP85 EXP86 EXP87 EXP88 EXP89 EXP90 EXP91 EXP92 EXP93 EXP94 EXP95 EXP96 EXP97 EXP98 EXP99 EXP100									
CI	EXP1	EXP1							
EXP1 EXP2 EXP3 EXP4 EXP5 EXP6 EXP7 EXP8 EXP9 EXP10 EXP11 EXP12 EXP13 EXP14 EXP15 EXP16 EXP17 EXP18 EXP19 EXP20 EXP21 EXP22 EXP23 EXP24 EXP25 EXP26 EXP27 EXP28 EXP29 EXP30 EXP31 EXP32 EXP33 EXP34 EXP35 EXP36 EXP37 EXP38 EXP39 EXP40 EXP41 EXP42 EXP43 EXP44 EXP45 EXP46 EXP47 EXP48 EXP49 EXP50 EXP51 EXP52 EXP53 EXP54 EXP55 EXP56 EXP57 EXP58 EXP59 EXP60 EXP61 EXP62 EXP63 EXP64 EXP65 EXP66 EXP67 EXP68 EXP69 EXP70 EXP71 EXP72 EXP73 EXP74 EXP75 EXP76 EXP77 EXP78 EXP79 EXP80 EXP81 EXP82 EXP83 EXP84 EXP85 EXP86 EXP87 EXP88 EXP89 EXP90 EXP91 EXP92 EXP93 EXP94 EXP95 EXP96 EXP97 EXP98 EXP99 EXP100									
CI	EXP2	EXP2							
CI	EXP3	EXP3							
CI	EXP4	EXP4							
CI	EXP5	EXP5							
CI	EXP6	EXP6							
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CI	EXP96	EXP96							
CI	EXP97	EXP97							
CI	EXP98	EXP98							
CI	EXP99	EXP99							
CI	EXP100	EXP100							

- Right-click the row for Node1 and GX-MD1611. Then, select **Create Device Variable**.



- 5 The Variable names and Variable Types are automatically set.

Configurations and Setup							
IO Map							
No.	Port	Description	R/W	Data Type	Variable	Variable Comment	Variable Type
CPU/Expansion Racks							
CPU Rack 0							
BMC/CAT Network Configuration							
Master							
No. 001 Read All							
Write output 1st word							
Out B000		Digital output values (Byte)	W	WORD	0001, Out_B000_1st_word	Global Variables	Global Variables
Out B001		The digital output value of output point of contact 00	W	WORD	0001, Out_B001	Global Variables	Global Variables
Out B002		The digital output value of output point of contact 01	W	WORD	0001, Out_B002	Global Variables	Global Variables
Out B003		The digital output value of output point of contact 02	W	WORD	0001, Out_B003	Global Variables	Global Variables
Out B004		The digital output value of output point of contact 03	W	WORD	0001, Out_B004	Global Variables	Global Variables
Out B005		The digital output value of output point of contact 04	W	WORD	0001, Out_B005	Global Variables	Global Variables
Out B006		The digital output value of output point of contact 05	W	WORD	0001, Out_B006	Global Variables	Global Variables
Out B007		The digital output value of output point of contact 06	W	WORD	0001, Out_B007	Global Variables	Global Variables
Read input 1st word							
In B000		Digital input values (Byte)	R	WORD	0001, Read_inp_1st_word	Global Variables	Global Variables
In B001		The digital input value of input point of contact 00	R	WORD	0001, In_B001	Global Variables	Global Variables
In B002		The digital input value of input point of contact 01	R	WORD	0001, In_B002	Global Variables	Global Variables
In B003		The digital input value of input point of contact 02	R	WORD	0001, In_B003	Global Variables	Global Variables
In B004		The digital input value of input point of contact 03	R	WORD	0001, In_B004	Global Variables	Global Variables
In B005		The digital input value of input point of contact 04	R	WORD	0001, In_B005	Global Variables	Global Variables
In B006		The digital input value of input point of contact 05	R	WORD	0001, In_B006	Global Variables	Global Variables
In B007		The digital input value of input point of contact 06	R	WORD	0001, In_B007	Global Variables	Global Variables
Symc Error Status							
Observation		Observation levels of information	R	BOOL	0001, Symc_Error_Status_Observation	Global Variables	Global Variables
Minor Fault		Minor Fault levels of information	R	BOOL	0001, Minor_Fault	Global Variables	Global Variables

Additional Information

The device variable names are created automatically from a combination of the device names and the I/O port names.

For slave units, the default device names start with an "E" followed by a sequential number starting from "001".

Additional Information

Although a device variable name is automatically created for each slave unit in the above example, they can also be automatically created for each I/O port.

Also, you can set any device variables.

7.3.3. Transferring Project Data

Transfer the project data from the Sysmac Studio to the Controller.

WARNING

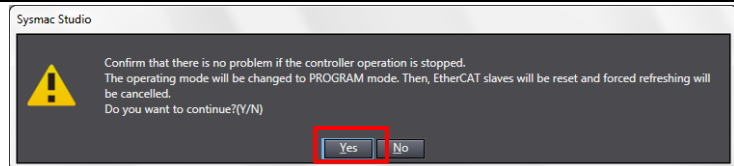
Always confirm safety at the destination node before you transfer a user program, configuration data, setup data, device variables, or values in memory used for CJ-series Units from the Sysmac Studio.

The devices or machines may perform unexpected operation regardless of the operating mode of the CPU Unit.



1	Select Online from the Controller Menu.	
2	When an online connection is established, a yellow bar is displayed on the top of the Edit Pane.	
3	Select Synchronization from the Controller Menu.	
4	The Synchronization Dialog Box is displayed. Confirm that the data to transfer (NJ501 in the right figure) is selected. Then, click the Transfer to Controller Button.	

- 5 A confirmation dialog is displayed. Click the **Yes** Button.



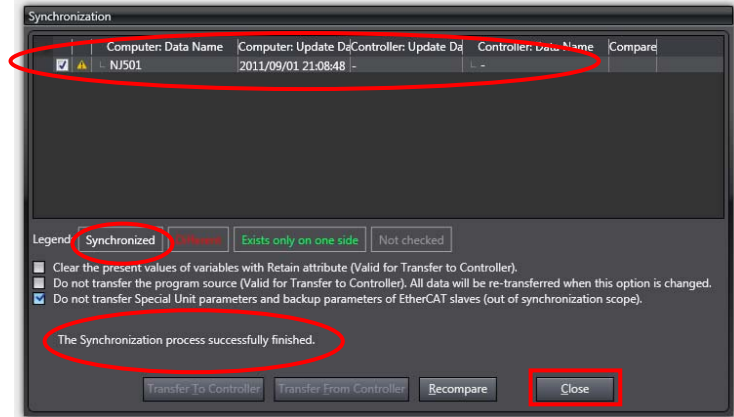
- A screen stating "Synchronizing" is displayed.



- 6 Confirm that the synchronized data is displayed with the color specified by "Synchronized", and that a message is displayed stating "The synchronization process successfully finished".

If there is no problem, click the **Close** Button.

*If the synchronization fails, check the wiring and repeat the procedure described in this section.

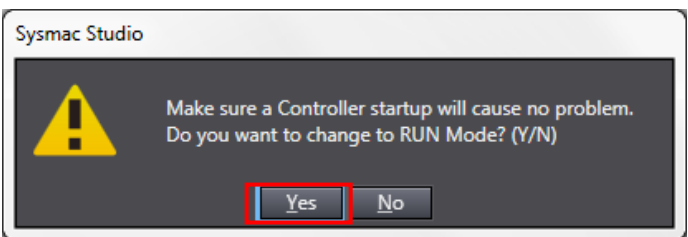
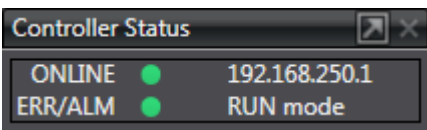
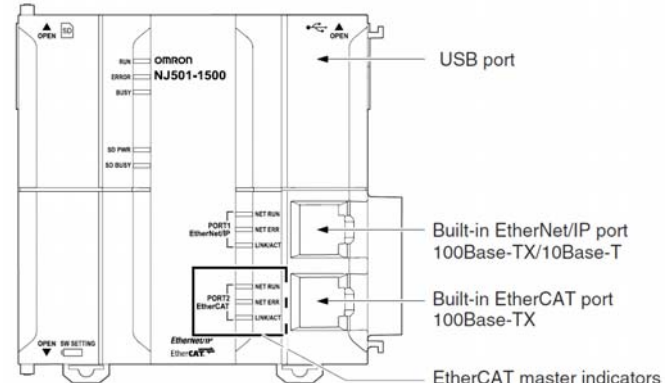


7.4. Connection Status Check

Check the connection status of the EtherCAT network.

7.4.1. Checking the Connection Status

Confirm that the EtherCAT communications are performed normally.

1	Select Mode - RUN Mode from the Controller Menu.																																	
2	A confirmation dialog is displayed. Click the Yes Button. RUN mode is displayed on the Controller Status Pane.	 																																
3	Check the LED indicators on the Controller to confirm if EtherCAT communication is normally performed. LED indicators in normal status. NET RUN: Green ON NET ERR: OFF [LINK/ACT]: Flickering	 <table border="1"> <thead> <tr> <th>Label</th> <th>Name</th> <th>Color</th> <th>Status</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td rowspan="3">EtherCAT NET RUN</td> <td rowspan="3">RUN</td> <td rowspan="3">Green</td> <td>Lit</td> <td>EtherCAT communications are in progress. • I/O data is being input and output.</td> </tr> <tr> <td>Flashing</td> <td>EtherCAT communications are established. Communications is in one of the following states. • Only message communications is functioning. • Only message communications and I/O data input operations are functioning.</td> </tr> <tr> <td>Not lit</td> <td>EtherCAT communications are stopped. • Power is OFF or the Unit is being reset. • There is a MAC address error, communications controller error, or other error.</td> </tr> <tr> <td rowspan="3">EtherCAT NET ERR</td> <td rowspan="3">ERROR</td> <td rowspan="3">Red</td> <td>Lit</td> <td>There is an unrecoverable error, such as a hardware error or an exception.</td> </tr> <tr> <td>Flashing</td> <td>There is a recoverable error.</td> </tr> <tr> <td>Not lit</td> <td>There is no error.</td> </tr> <tr> <td rowspan="3">EtherCAT LINK/ACT</td> <td rowspan="3">Link/Activity</td> <td rowspan="3">Yellow</td> <td>Lit</td> <td>The link is established.</td> </tr> <tr> <td>Flashing</td> <td>A link is established and data is being sent and received. The indicator flashes whenever data is sent or received.</td> </tr> <tr> <td>Not lit</td> <td>The link is not established.</td> </tr> </tbody> </table>	Label	Name	Color	Status	Meaning	EtherCAT NET RUN	RUN	Green	Lit	EtherCAT communications are in progress. • I/O data is being input and output.	Flashing	EtherCAT communications are established. Communications is in one of the following states. • Only message communications is functioning. • Only message communications and I/O data input operations are functioning.	Not lit	EtherCAT communications are stopped. • Power is OFF or the Unit is being reset. • There is a MAC address error, communications controller error, or other error.	EtherCAT NET ERR	ERROR	Red	Lit	There is an unrecoverable error, such as a hardware error or an exception.	Flashing	There is a recoverable error.	Not lit	There is no error.	EtherCAT LINK/ACT	Link/Activity	Yellow	Lit	The link is established.	Flashing	A link is established and data is being sent and received. The indicator flashes whenever data is sent or received.	Not lit	The link is not established.
Label	Name	Color	Status	Meaning																														
EtherCAT NET RUN	RUN	Green	Lit	EtherCAT communications are in progress. • I/O data is being input and output.																														
			Flashing	EtherCAT communications are established. Communications is in one of the following states. • Only message communications is functioning. • Only message communications and I/O data input operations are functioning.																														
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			Not lit	There is no error.																														
EtherCAT LINK/ACT	Link/Activity	Yellow	Lit	The link is established.																														
			Flashing	A link is established and data is being sent and received. The indicator flashes whenever data is sent or received.																														
			Not lit	The link is not established.																														

4 Check the indicators on the Digital I/O Terminal.

LED indicators in normal status.

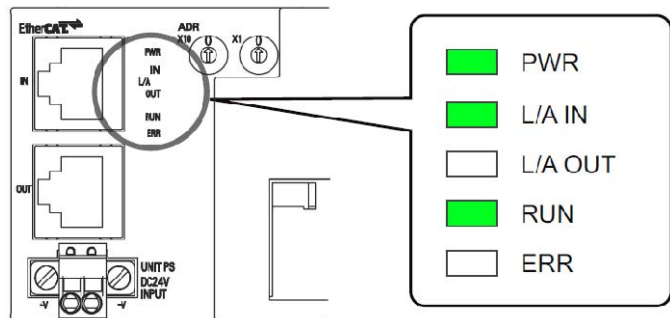
[PWR]: Green ON

[L/A IN]: Flickering

[RUN]: Green ON

[ERR]: OFF

The LED indicators flash at the same timing as those of the Controller.



[PWR] indicator

Indicates the unit power supply state.

Color	State	Contents
Green	OFF	Unit power OFF state
	ON	The unit power (24 VDC) is supplied to the Slave Unit.

[L/A IN] indicator

Indicates the communication state (input side).

Color	State	Contents
Green	OFF	Link not established in physical layer
	Flickering	In operation after establishing link
	ON	Link established in physical layer

[RUN] indicator

It indicates the operation state.

Color	State	Contents
Green	OFF	Init state
	Blinking	Pre-Operational state
	Single flash	Safe-Operational state
	ON	Operational state

For details on each state, refer to "5-3 Communications State Transitions" in page 5 - 4.

[ERR] indicator

It indicates the information of an error.

Color	State	Contents
Red	OFF	No error
	Blinking	Communications setting error
	Single flash	Synchronization error or communications data error
	Double flash	Application WDT timeout
	Flickering	Boot error
	ON	PDI WDT timeout

7.4.2. Checking Data That Are Sent and Received

Check if the correct data are sent and received.



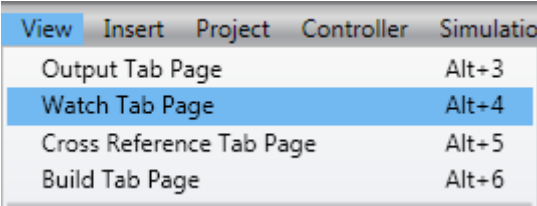
Caution

Sufficiently confirm safety before you change the values of variables on a Watch Tab Page when the Sysmac Studio is online with the CPU Unit. Incorrect operation may cause the devices that are connected to Output Units to operate regardless of the operating mode of the Controller.

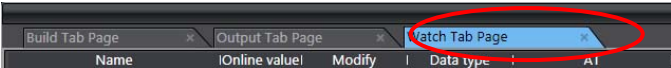


- 1

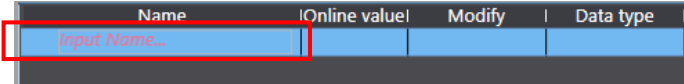
Select **Watch Tab Page** from the View Menu.


- 2

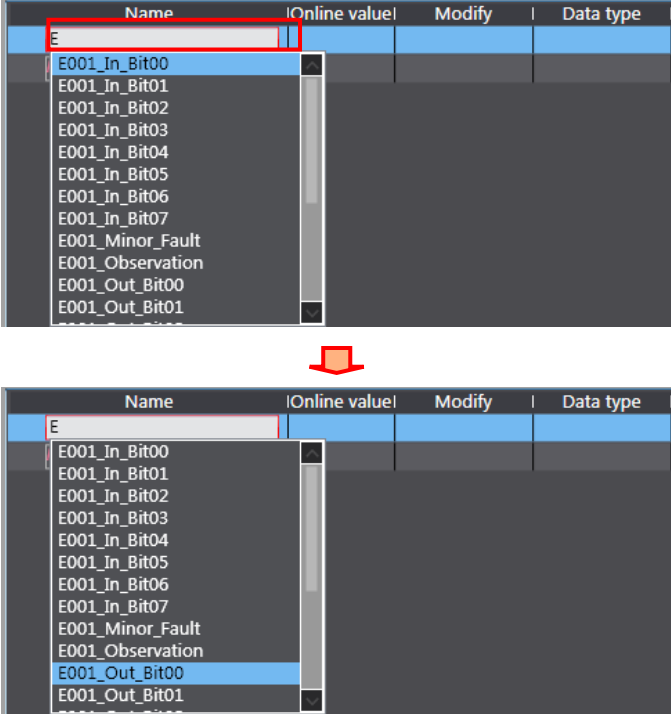
The Watch Tab Page is displayed in the lower section of the Edit Pane.


- 3

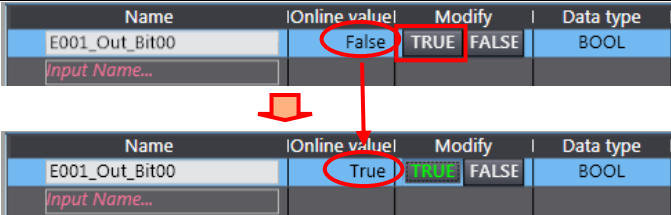
Click the cell that states Input Name at the bottom of the Watch Tab Page.


- 4

Now, characters can be entered. Enter the device variable name. Here, enter *E001_Out_Bit00* of bit 0 of the output port. Type the first character E. A list of device variables starting with E is displayed. Scroll the list and select *E001_Out_Bit00*. Double-click *E001_Out_Bit00*. *E001_Out_Bit00* is entered in the Name Column.

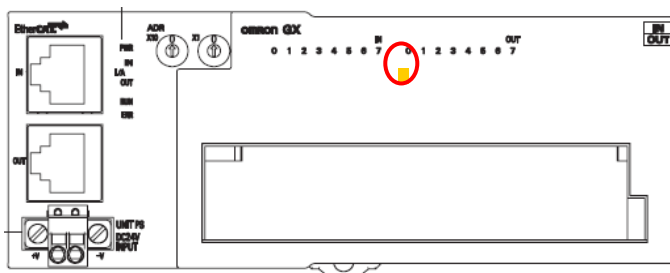

- 5

Confirm that the online value is False, and click **TRUE** on the Modify Column.



Confirm that the online value is changed to True.

- 6 Confirm that OUT No.0 of the Remote I/O Unit is turned ON (corresponding LED indicator is lit yellow).



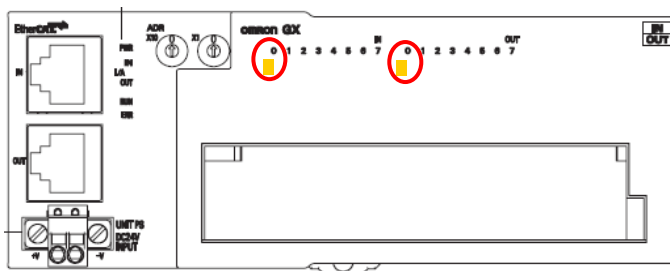
- 7 Click the cell that states Input Name at the bottom of the Watch Tab Page, and enter *E001_In_Bit00*.

Name	Online value	Modify	Data type
E001_Out_Bit00	True	TRUE FALSE	BOOL
E001_In_Bit00			
E001_In_Bit01			
E001_In_Bit02			
E001_In_Bit03			
E001_In_Bit04			
E001_In_Bit05			
E001_In_Bit06			
E001_In_Bit07			
E001_Minor_Fault			
E001_Observation			
E001_Out_Bit00			
E001_Out_Bit01			

- 8 Confirm that the online value of *E001_In_Bit00* is True.
*IN bit 0 of GX-MD1611 is connected with OUT bit 0.

Name	Online value	Modify	Data type
E001_Out_Bit00	True	TRUE FALSE	BOOL
E001_In_Bit00	True	TRUE FALSE	BOOL
Input Name...			

- 9 IN No.0 and OUT No.0 LED indicators of GX-MD1611 are turned ON as shown on the right.



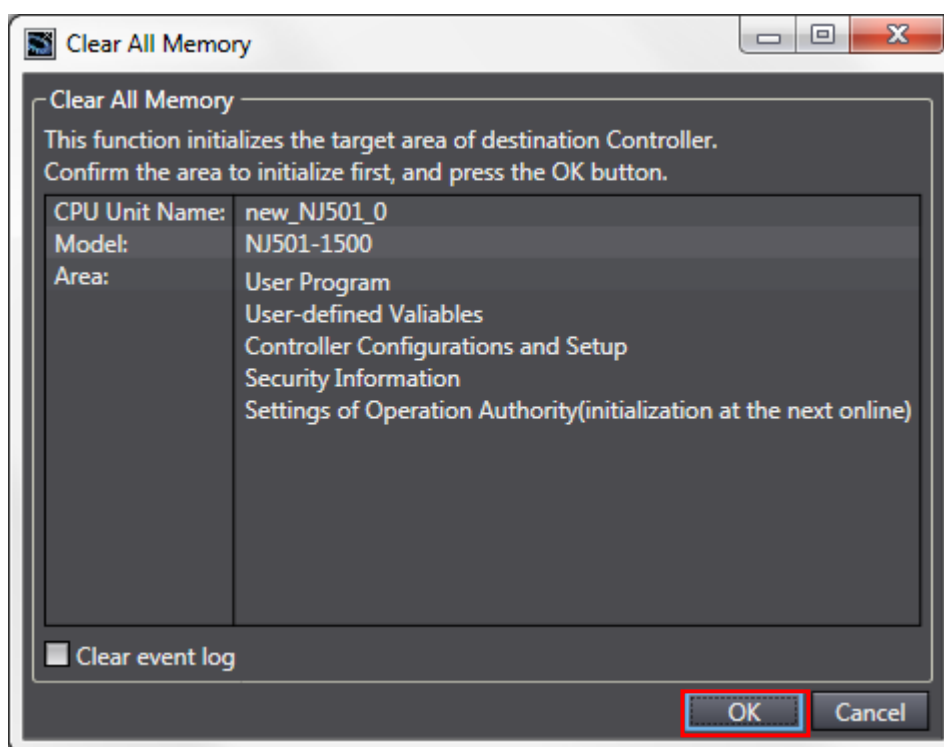
8. Initialization Method

This document explains the setting procedure from the factory default setting.

If the device settings have been changed from the factory default setting, some settings may not be applicable as described in this procedure.

8.1. Controller

To initialize the settings of the Controller, select **Clear All Memory** from the Controller Menu of the Sysmac Studio.



9. Revision History

Revision code	Date of revision	Revision reason and revision page
01	Feb. 28, 2013	First edition

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