OMRON

Machine Automation Controller NJ-series

EtherCAT(R) Connection Guide

HMS Industrial Networks

Anybus Communicator

SYSMAC
always in control

P560-E1-03

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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 and Precautions for Safe Use of manuals for each device which is used in the system.

Cat. No.	Model	Manual name
W500	NJ501-□□□□ NJ301-□□□□	NJ-series CPU Unit Hardware User's Manual
W501	NJ501-□□□□ NJ301-□□□□	NJ-series CPU Unit Software User's Manual
W505	NJ501-□□□□ NJ301-□□□□	NJ-series CPU Unit Built-in EtherCAT(R) Port User's Manual
W504	SYSMAC-SE2□□□	Sysmac Studio Version 1 Operation Manual
HMSI-168-95	AB7061	User Manual Anybus (R) Communicator™ for EtherCAT
SP0991	AB7061	Anybus Communicator-EtherCAT Interface Installation Sheet

2. Terms and Definitions

Term	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 NJ-series Machine Automation Controller uses the PDO 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 Machine Automation Controller in the following ways. ・With device variables for EtherCAT slave I/O ・With Axis Variables for Servo Drive and encoder input slave 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 NJ-series Machine Automation Controller uses SDO Communications for commands to read and write data, such as for parameter transfers, at specified times. The NJ-series Machine Automation Controller can read/write the specified slave data (parameters and error information, etc.) with the EC_CoESDORead (Read CoE SDO) instruction or the EC_CoESDOWrite (Write CoE SDO) instruction.
Slave unit	There are various types of slaves such as Servo Drives that handle position data and I/O terminals that handle the bit signals. The slave unit receives output data sent from the master, and sends input data to the master.
Node address	A node address is an address to identify a unit connected to EtherCAT.
ESI file (EtherCAT Slave Information file)	The ESI files contain information unique to the EtherCAT slaves in XML format. Installing an ESI file enables the Sysmac Studio to allocate slave process data and make other settings.

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 safety circuit in order to ensure safety and minimize risks of abnormal occurrence.

(2) To ensure system safety, make sure to always read and heed 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 September 2014. It is subject to change without notice for improvement.

The following notations are used in this document.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

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

Precautions for Correct Use

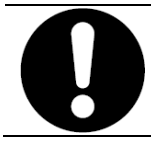
Precautions on what to do and what not to do to ensure proper operation and performance.

Additional Information

Additional information to read as required.

This information is provided to increase understanding or make operation easier.

Symbol



The 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.

4. Overview

This document describes the procedure for connecting Anybus Communicator for EtherCAT Slave (hereinafter referred to as Communicator) of HMS Industrial Networks (hereinafter referred to as HMS) to NJ-series Machine Automation Controller (hereinafter referred to as Controller) of OMRON Corporation (hereinafter referred to as OMRON) via EtherCAT and provides the procedure for checking their connection

Refer to *Section 6. EtherCAT Settings* and *Section 7. EtherCAT Connection Procedure* to understand the setting method and key points to operate PDO Communications of EtherCAT.

5. Applicable Devices and Device Configuration

5.1. Applicable Devices

The applicable devices are as follows:

Manufacturer	Name	Model
OMRON	NJ-series CPU Unit	NJ501-□□□□ NJ301-□□□□
HMS	Anybus Communicator for EtherCAT Slave	AB7061

Precautions for Correct Use

As applicable devices above, the devices with the models and versions listed in *Section 5.2.* are actually used in this document to describe the procedure for connecting devices and checking the connection.

You cannot use devices with versions lower than the versions listed in *Section 5.2.*

To use the above devices with versions not listed in *Section 5.2.* or versions higher than those listed in *Section 5.2.*, check the differences in the specifications by referring to the manuals before operating the devices.

Additional Information

This document describes the procedure to establish the network connection. Except for the connection procedure, it does not provide information on operation, installation or wiring method. It also does not describe the functionality or operation of the devices.

Refer to the manuals or contact the device manufacturer.

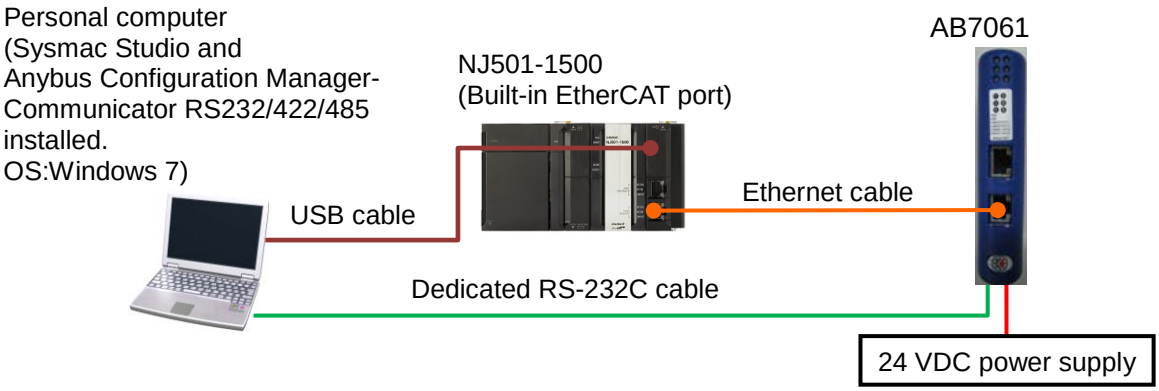
(HMS Industrial Networks　http://www.hms.se/)

This URL is the latest address at the time of this document creation.

Contact each device manufacturer for the latest information.

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	Ver.1.08
OMRON	Power Supply Unit	NJ-PA3001	
OMRON	Sysmac Studio	SYSMAC-SE2[][][]	Ver.1.09
-	Personal computer (OS: Windows 7)	-	
-	USB cable (USB 2.0 type B connector)	-	
OMRON	Ethernet cable (with industrial Ethernet connector)	XS5W-T421-[]M[]-K	
HMS	Anybus Communicator for EtherCAT Slave	AB7061	Ver.3.01
HMS	Dedicated RS-232C cable	(Included with Communicator)	
HMS	ESI file	XML_ABC_ECT_V_3_01_Fixed_PDO_256bytes_for_OMRON_1.xml	
HMS	Anybus Configuration Manager-Communicator RS232/422/485	ACM Communicator RS232/422/485	Ver.4.3.1.1
-	24 VDC power supply	-	

Precautions for Correct Use

Prepare the ESI file shown in this section beforehand. The ESI file can be downloaded from HMS Industrial Networks website.

(HMS Industrial Networks http://www.hms.se/)

Contact HMS Industrial Networks if the file is not available.

Precautions for Correct Use

The connection line of EtherCAT communications cannot be shared with other Ethernet networks. Do not use devices for Ethernet such as a switching hub.
Use the Ethernet cable (double shielding with aluminum tape and braiding) of Category 5 or higher, and use the shielded connector of Category 5 or higher.
Connect the cable shield to the connector hood at both ends of the cable.

Precautions for Correct Use

Update the Sysmac Studio to the version specified in this section or higher version using the auto update function.
If a version not specified in this section is used, the procedures described in *Section 7* and subsequent sections may not be applicable. In that case, use the equivalent procedures described in the *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504).

Additional Information

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

Additional Information

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

6. EtherCAT Settings

This section describes the specifications such as parameters and device variables that are set in this document.
Hereinafter, the Communicator is referred as "Destination Device" or the "Slave Unit" in some descriptions.

Precautions for Correct Use

Note that in this document communications between the Controller and Communicator are checked; however, no communications data after establishing the EtherCAT communications is checked.

6.1. Parameter Settings

The parameters required connecting the Controller and the Communicator via EtherCAT are given below.

Name	Setting item	Set value	Remarks
Communicator	Node address	1	The actual node address is set by Sysmac Studio.
	Fieldbus Type	EtherCAT	-
	Protocol Mode	Generic Data mode	-
	Producer Maximum Data Length	256 Byte	-
	Consumer Maximum Data Length	256 Byte	-

Additional Information

For details on EtherCAT-related parameters for Communicator, refer to *2.4. EtherCAT Communication Properties* of the *User Manual Anybus (R) Communicator™ for EtherCAT* (Cat. No. HMSI-168-95).

6.2. Device Variables

The PDO communications data for the Destination Device are allocated to the Controller's device variables.

The device variables and the data types are shown below.

■ Output area (from Controller to Destination Device)

Device variable name	Data type	Meaning
E001_Recieve_PDO_1_Mapping_Output_Byte_1_2100_01	USINT	Output byte 0000
・ ・ ・	・ ・ ・	・ ・ ・
E001_Recieve_PDO_1_Mapping_Output_Byte_128_2100_80	USINT	Output byte 0127
E001_Recieve_PDO_2_Mapping_Output_Byte_1_2101_01	USINT	Output byte 0128
・ ・ ・	・ ・ ・	・ ・ ・
E001_Recieve_PDO_2_Mapping_Output_Byte_128_2101_80	USINT	Output byte 0255

■ Input area (from Destination Device to Controller)

Device variable name	Data type	Meaning
E001_Transmit_PDO_1_Mapping_Input_Byte_1_2000_01	USINT	Input byte 0000
・ ・ ・	・ ・ ・	・ ・ ・
E001_Transmit_PDO_1_Mapping_Input_Byte_128_2000_80	USINT	Input byte 0127
E001_Transmit_PDO_2_Mapping_Input_Byte_1_2001_01	USINT	Input byte 0128
・ ・ ・	・ ・ ・	・ ・ ・
E001_Transmit_PDO_2_Mapping_Input_Byte_128_2001_80	USINT	Input byte 0255

Additional Information

For details on I/O formats, refer to *Section 3. CANopen Object Dictionary Implementation* of the *User Manual Anybus (R) Communicator™ for EtherCAT* (Cat. No. HMSI-168-95).

Additional Information

The device variables are named automatically from a combination of the device names and the port names.

The default device names are “E" followed by a serial number that starts from 001.

7. EtherCAT Connection Procedure

This section describes the procedure for connecting the Controller to the Communicator via EtherCAT.

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

7.1. Work Flow

Take the following steps to perform PDO Communications of EtherCAT.

7.2. Setting Up HMS Communicator	Set up HMS Communicator.
↓	
7.2.1. Hardware Settings	Connect a cable to the Communicator.
↓	
7.2.2. Parameter Settings	Set the parameters for the Communicator.
↓	
7.3. Setting Up the Controller	Set up the Controller.
↓	
7.3.1. Starting the Sysmac Studio and Installing the ESI File	Install the ESI file for the Communicator in the Sysmac Studio.
↓	
7.3.2. Setting Up the EtherCAT Network Configuration	Set up the EtherCAT network configuration.
↓	
7.3.3. Setting the Device Variables	Set the device variables used for the EtherCAT Slave Unit.
↓	
7.3.4. Transferring the Project Data	Transfer the project data from the Sysmac Studio to the Controller.
↓	
7.4. Checking the EtherCAT Communications	Confirm that the PDO Communications of EtherCAT are performed normally.
↓	
7.4.1. Checking the Connection Status	Check the connection status of the EtherCAT network.

7.2. Setting Up HMS Communicator

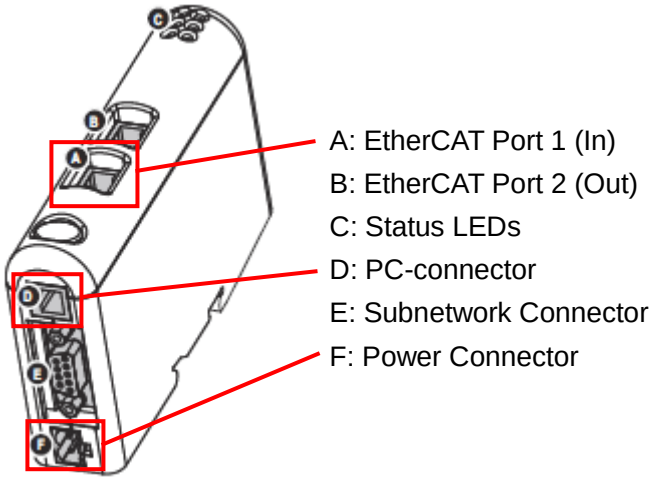
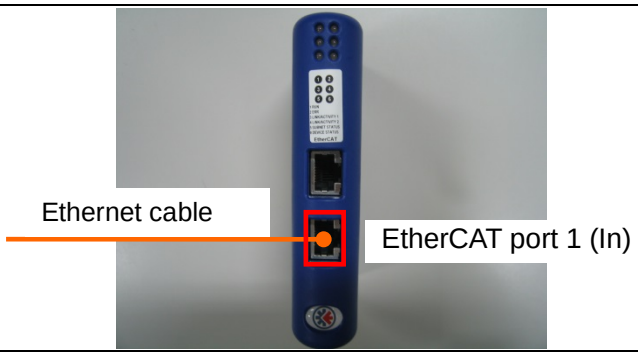
Set up HMS Communicator.

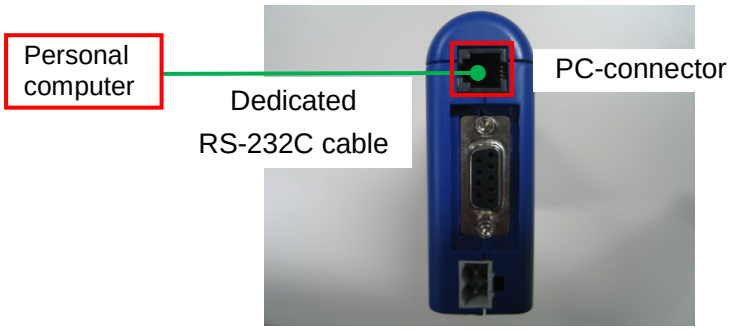
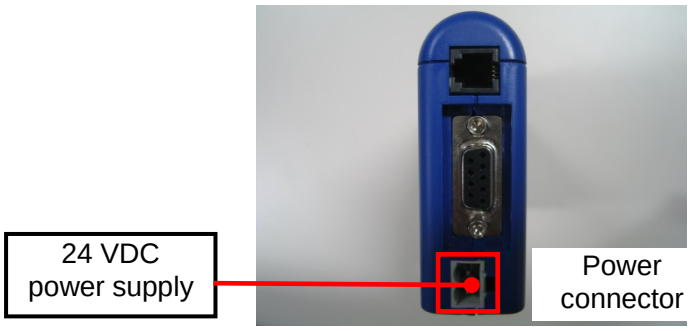
7.2.1. Hardware Settings

Connect a cable to the Communicator.

Precautions for Correct Use

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

1	Make sure that the power supply to the Communicator is OFF. *If the power supply is turned ON, settings may not be applicable as described in the following procedures.
2	Check the position of the connectors on the Communicator by referring to the right figure.  A: EtherCAT Port 1 (In) B: EtherCAT Port 2 (Out) C: Status LEDs D: PC-connector E: Subnetwork Connector F: Power Connector
3	Connect the Ethernet cable to the EtherCAT port 1 (In).  Ethernet cable EtherCAT port 1 (In)

4	Connect the PC-connector and the Personal computer with the Dedicated RS-232C cable.	
5	Connect the 24 VDC power supply to the Power connector. *For details on power supply wirings, refer to the *User Manual Anybus (R) Communicator™ for EtherCAT* (Cat. No. HMSI-168-95).	
6	Turn ON the 24 VDC power supply.	

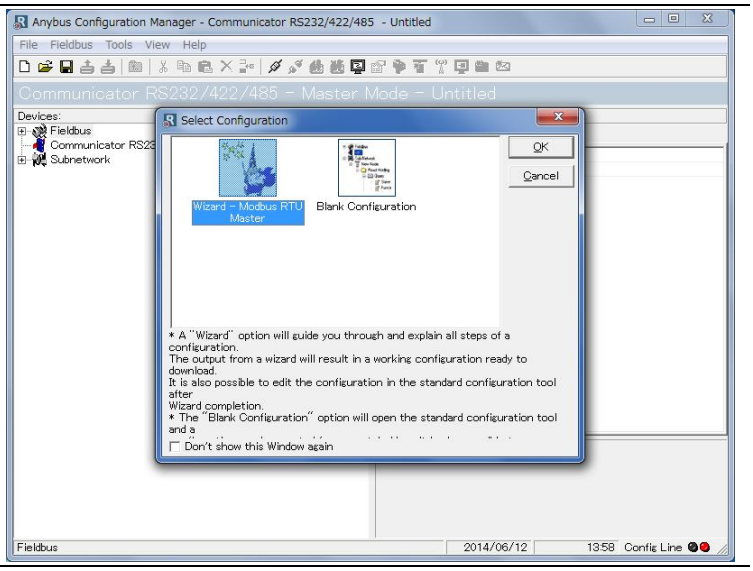
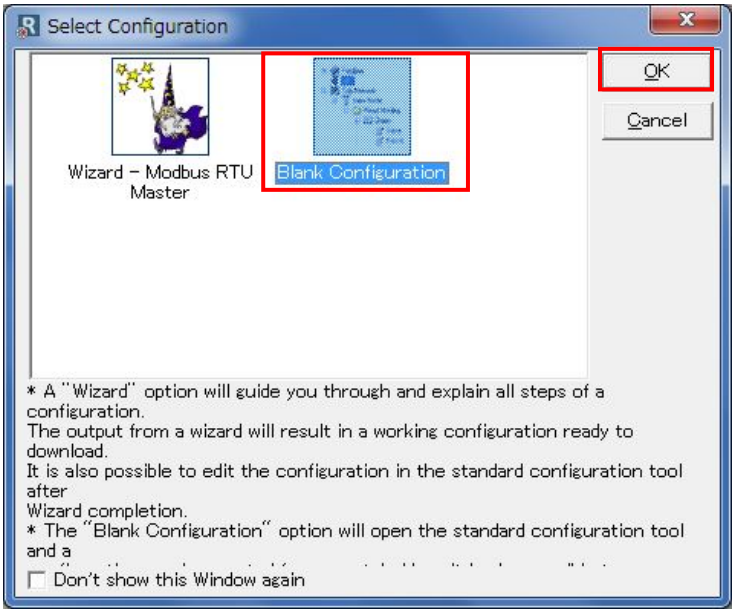
7.2.2. Parameter Settings

Set the parameters for the Communicator.

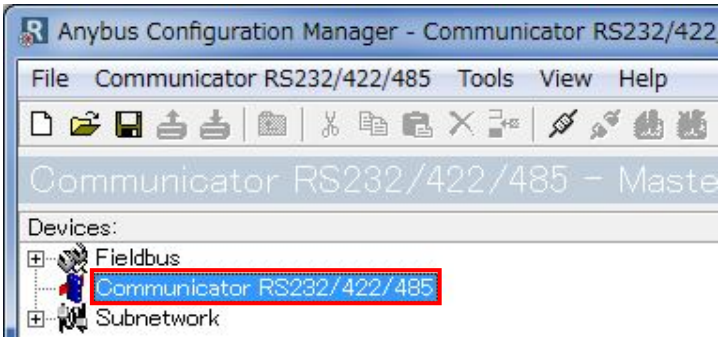
Install the Anybus Configuration Manager-Communicator RS232/422/485 in the Personal computer beforehand to set parameters.

Additional Information

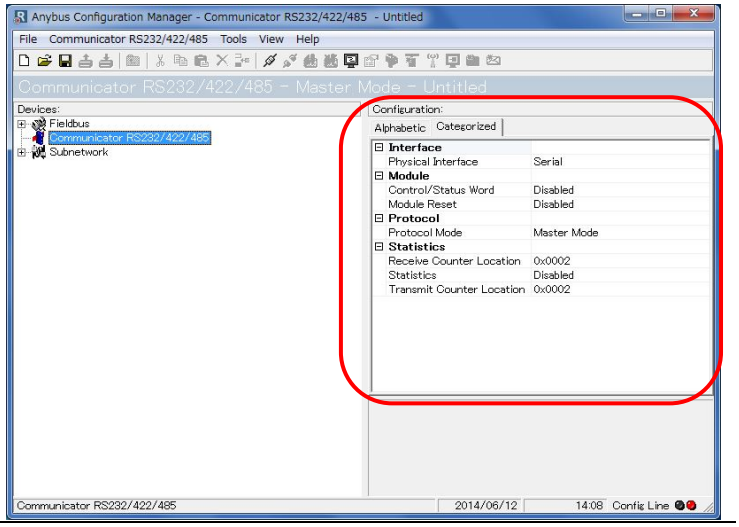
For how to install the software, refer to the *User Manual Anybus (R) Communicator™ for EtherCAT* (Cat. No HMSI-168-95).

1	Start the Anybus Configuration Manager-Communicator RS232/422/485.	
2	The Anybus Configuration Manager Dialog Box is displayed as shown in the right figure.	
3	Select *Blank Configuration* on the Select Configuration Dialog Box and click the **OK** Button. The Select Configuration Dialog Box is automatically closed.	

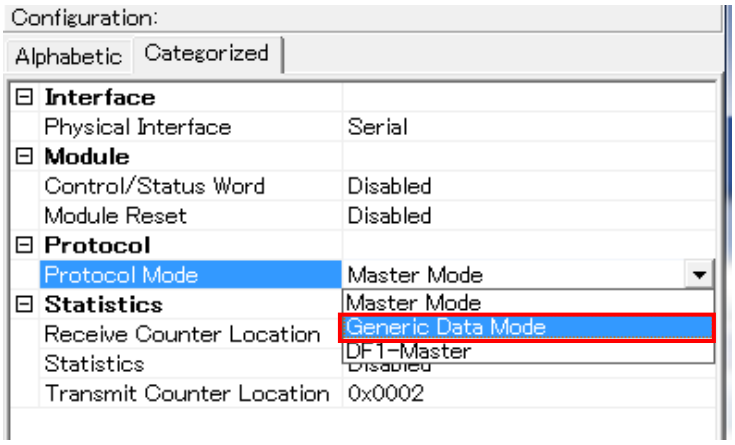
4 Click **Communicator RS232/422/485** in Devices: that is shown on the left side of the Anybus Configuration Manager Dialog Box.



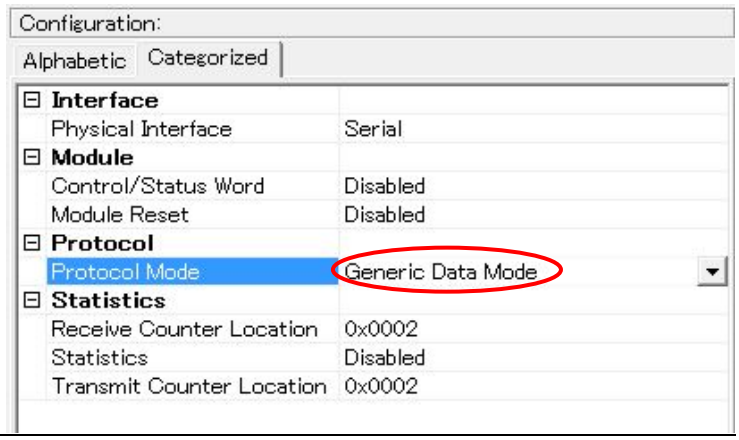
The Configuration Pane that is shown on the right side of the Anybus Configuration Manager Dialog Box changes as shown on the right.



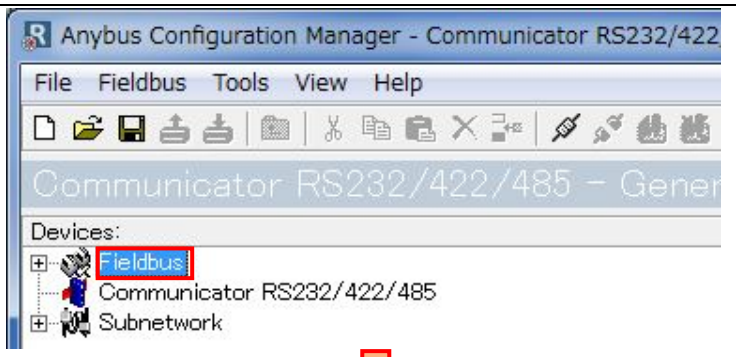
5 Select ***Generic Data Mode*** from the pull-down list of the Protocol Mode in the Configuration Pane.



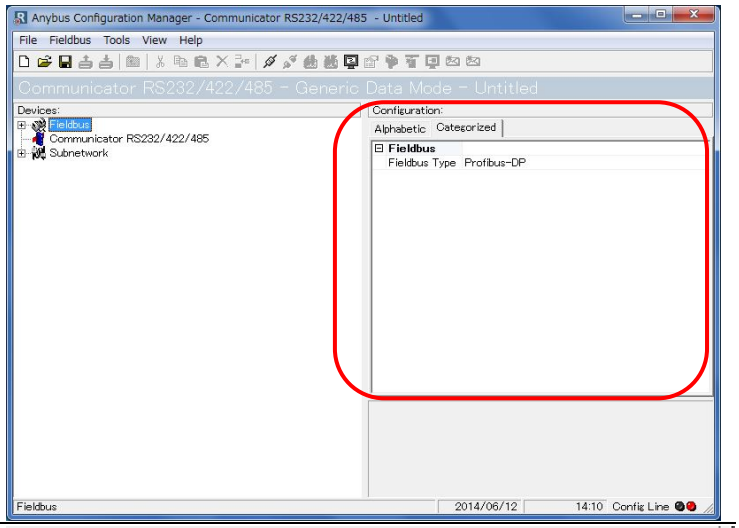
Check that Protocol Mode is set to Generic Data Mode.



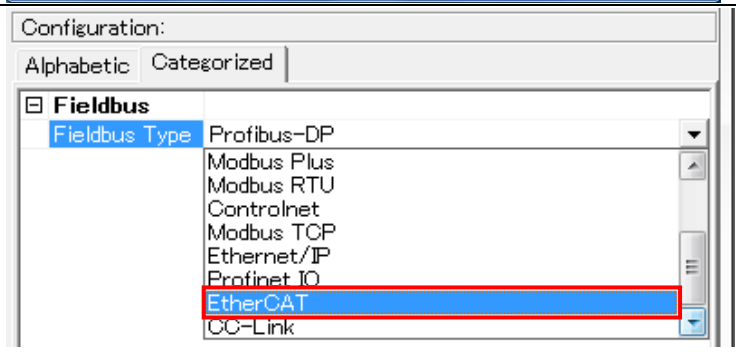
6 Click **Fieldbus** in Devices: that is shown on the left side of the Anybus Configuration Manager Dialog Box.



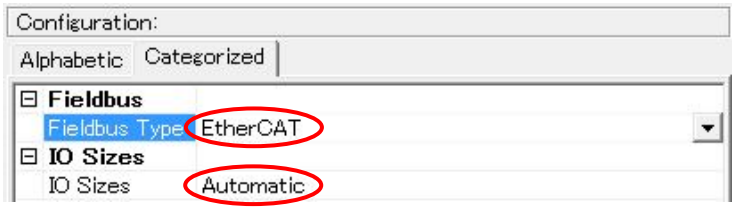
The Configuration Pane that is shown on the right side of the Anybus Configuration Manager Dialog Box changes as shown on the right.



7 Select ***EtherCAT*** from the pull-down list of the Fieldbus Type in the Configuration Pane.

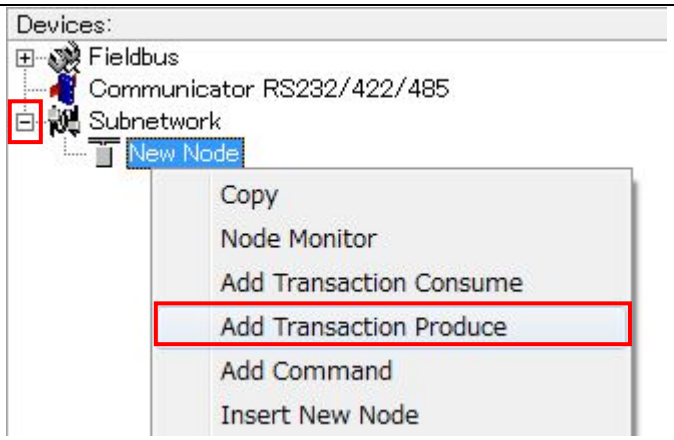


Check that Filedbus Type is set to EtherCAT.
Check that IO Sizes is set to Automatic.

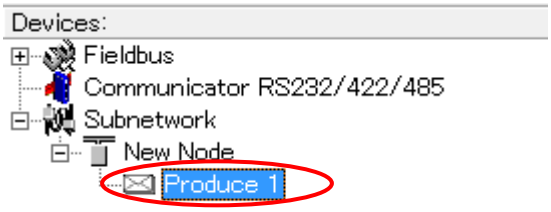


8 Click **+** Button to open Subnetwork in Devices.

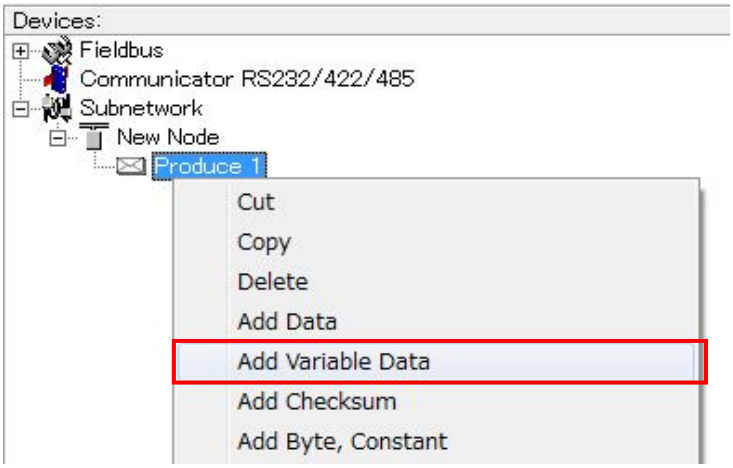
Right-click **New Node** and select ***Add Transaction Produce***.



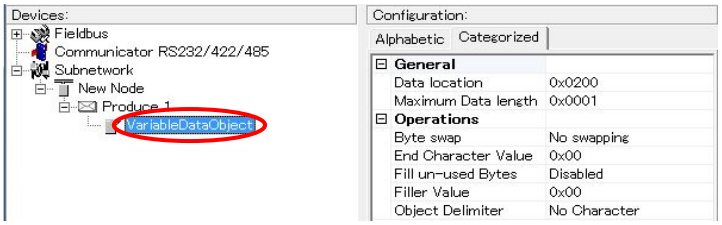
Check that Produce 1 is added to Devices.



9 Right-click **Produce 1** and select ***Add Variable Data***.



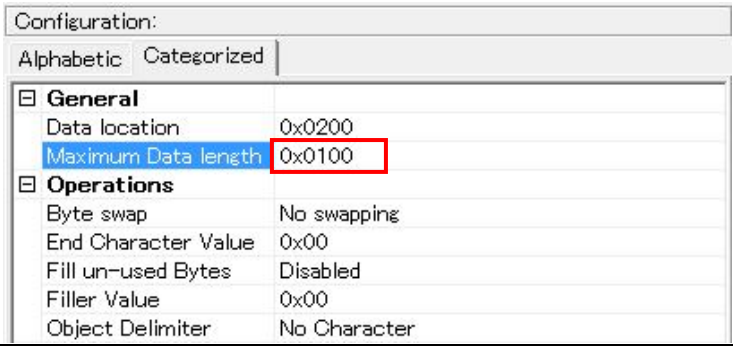
Check that VariableDataObject is added to Devices.



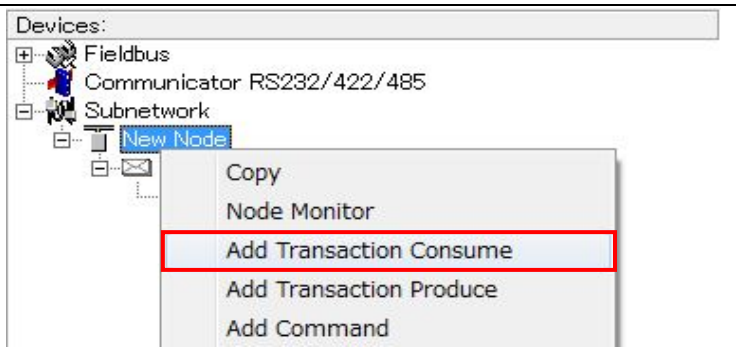
Set Maximum Data length to *0x0100* in the Configuration Pane.

*The total size of the data on EtherCAT is 256 bytes, which includes the size of Control Word.

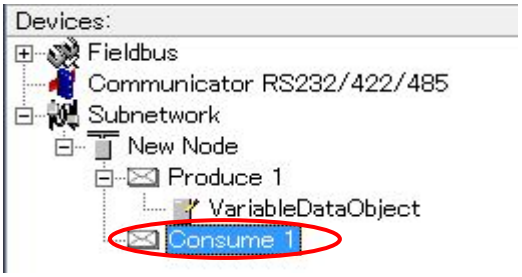
*Control Word is set to Disable by default.



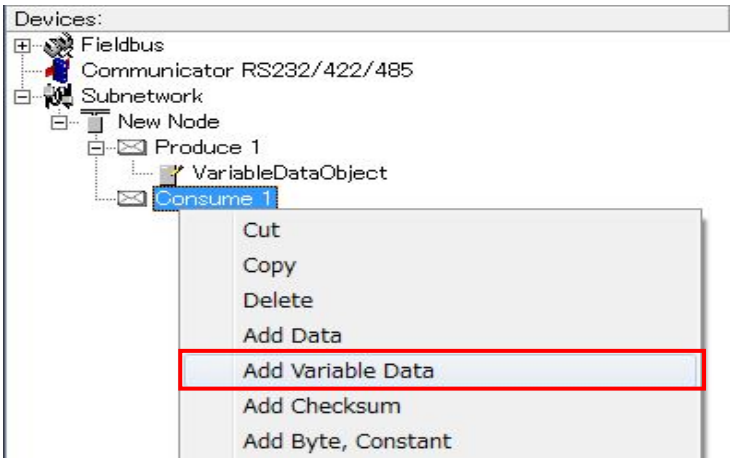
10 Right-click **New Node** and select ***Add Transaction Consume***.



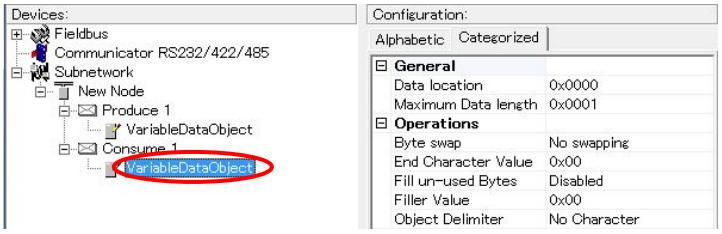
Check that Consume 1 is added to Devices.



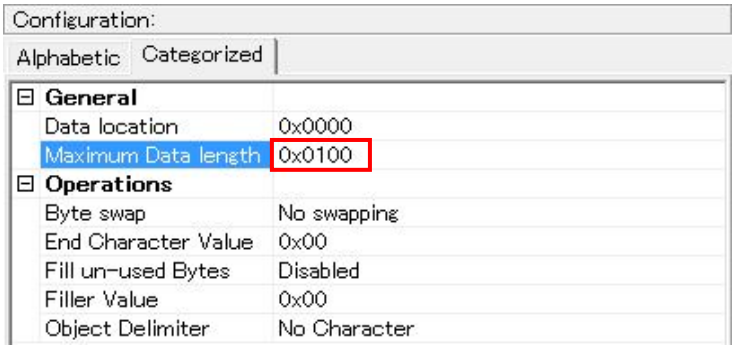
11 Right-click **Consume 1** and select ***Add Variable Data***.



Check that VariableDataObject is added to Devices.



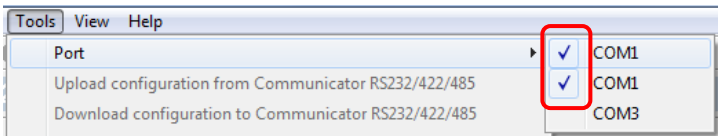
Set Maximum Data length to *0x0100* in the Configuration Pane.



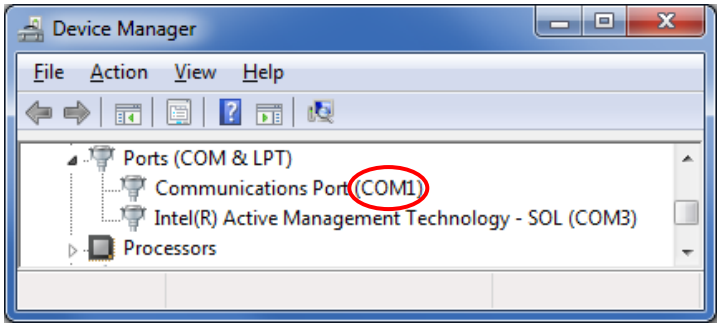
*The total size of the data on EtherCAT is 256 bytes, which includes the size of Status Word.

*Status Word is set to Disable by default.

12 Select ***Port*** from the Tools Menu. Check that the port No., where the Communicator is connected, is selected.

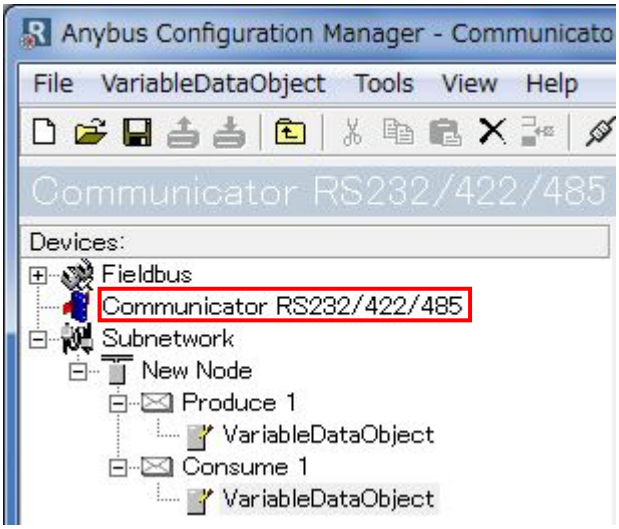


*If there are multiple serial ports on the Personal computer, display the Windows Device Manager. Then select the same port as the communications port No. where the Communicator is connected under Ports (COM & LPT)(COM1 in this example).

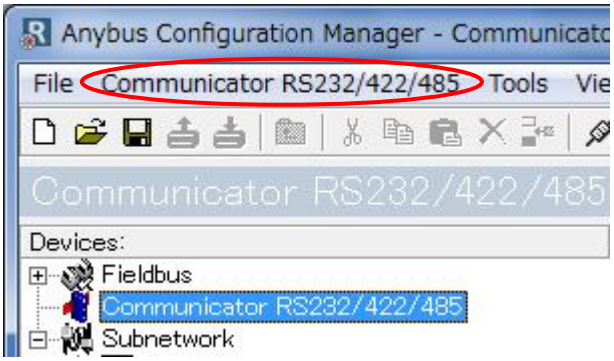


*To display the Device Manager, right-click **Computer**, select ***Properties***, and then click **Device Manager**.

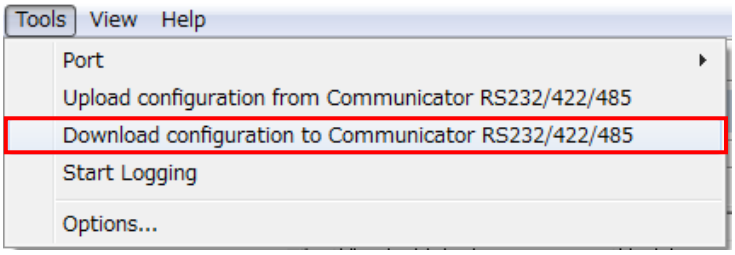
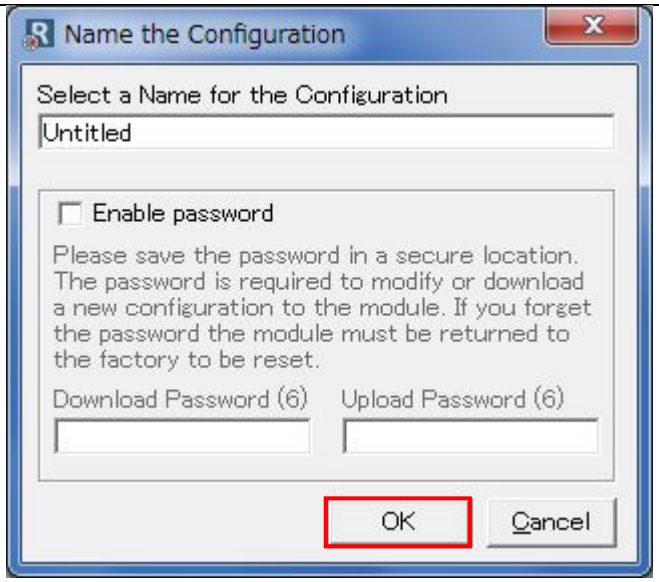
13 Select **Communicator RS232/422/485** in Devices.



Communicator RS232/422/485 is added to the menu.



14 Select ***Connect*** from the Communicator RS232/422/485 Menu.

15	Config Line shown on the right bottom of the window is lit green.	
16	Select ***Download configuration to Communicator RS232/422/485*** from the Tools Menu.	
17	The Name the Configuration Dialog Box is displayed. Check the contents and click the **OK** Button.	
	The Download Dialog Box is displayed and download is executed. When the download is complete, the dialog box is closed.	

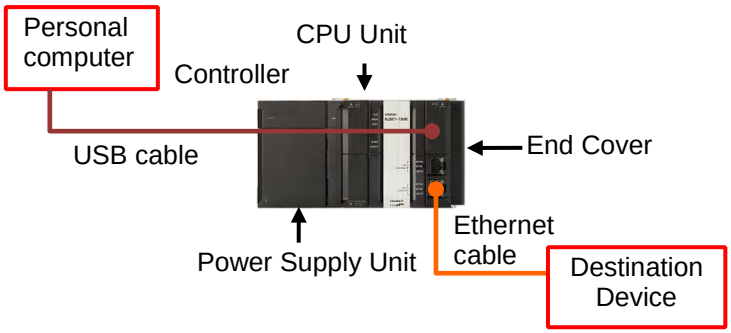
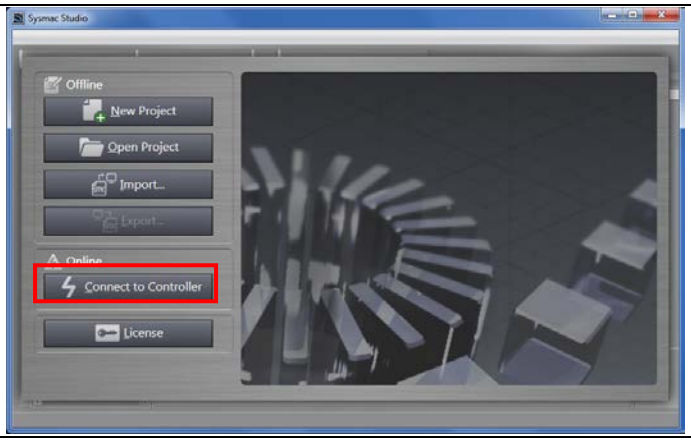
7.3. Setting Up the Controller

Set up the Controller.

7.3.1. Starting the Sysmac Studio and Installing the ESI File

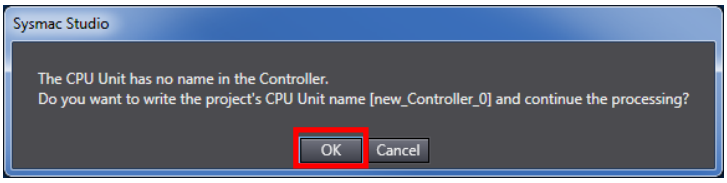
Install the ESI file for the Communicator in the Sysmac Studio.

Install the Sysmac Studio and USB driver in the Personal computer beforehand.

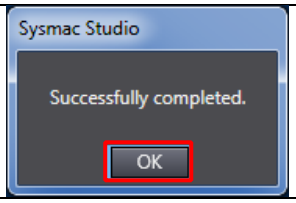
1	Connect the Ethernet cable to the built-in EtherCAT port (PORT2) of the Controller and connect the USB cable to the peripheral (USB) port. As shown in *5.2. Device Configuration*, connect the Personal computer, the Destination Device, and the Controller.	
2	Turn ON the power supply to the Controller.	
3	Start the Sysmac Studio. *If a confirmation dialog for an access right is displayed at start, execute a selection to start.	
4	The Sysmac Studio starts. Click the **Connect to Controller** Button.	
5	The Connect to Controller Dialog Box is displayed. Select the *Direct connection via USB* Option of Connection type. Uncheck both the *Upload the project* Check Box and the *Display the Troubleshooting Dialog Box* Check Box of Operation after Connection. Click the **Connect** Button.	

6 Check the contents and click the **OK** Button if a confirmation dialog box on the right is displayed.

*The displayed dialog depends on the status of the Controller used. Check the contents and click the **OK** or **Yes** Button to proceed with the processing.



7 A dialog box on the right is displayed. Check the contents and click the **OK** Button.



8 The Auto Connect Project Dialog Box is displayed online. When an online connection is established, a yellow bar is displayed on the top of the Edit Pane.

This window consists of the following panes.

Left: Multiview Explorer

Top right: Toolbox

Bottom right: Controller Status Pane

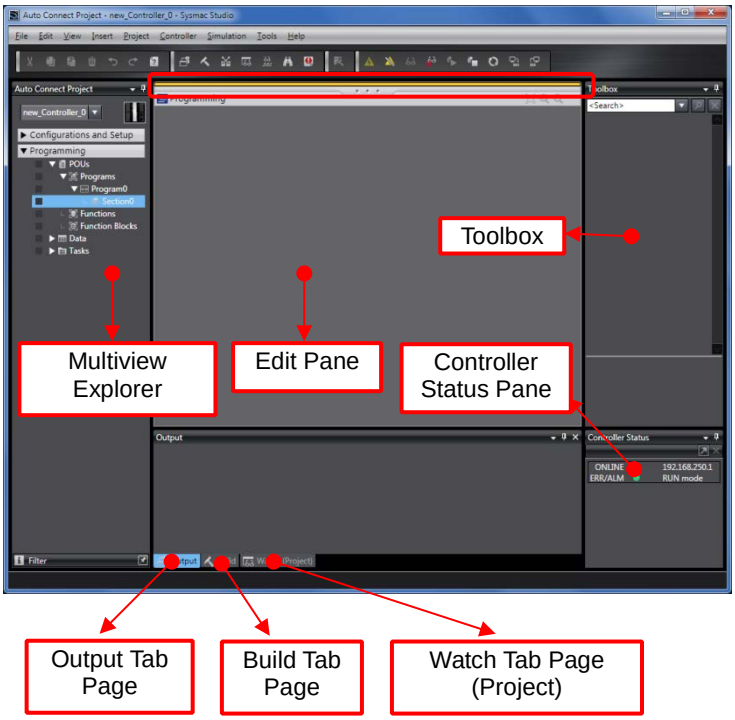
Middle top: Edit Pane

The following tab pages are displayed at the middle bottom of the window.

Output Tab Page

Build Tab Page

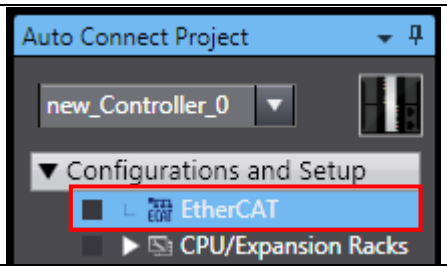
Watch Tab Page (Project)

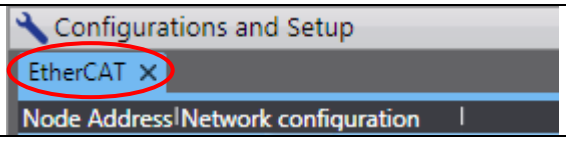
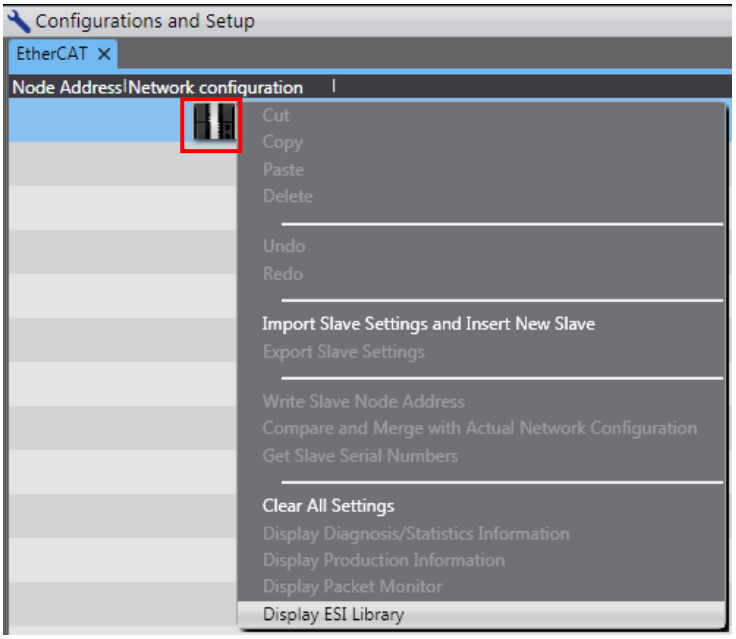
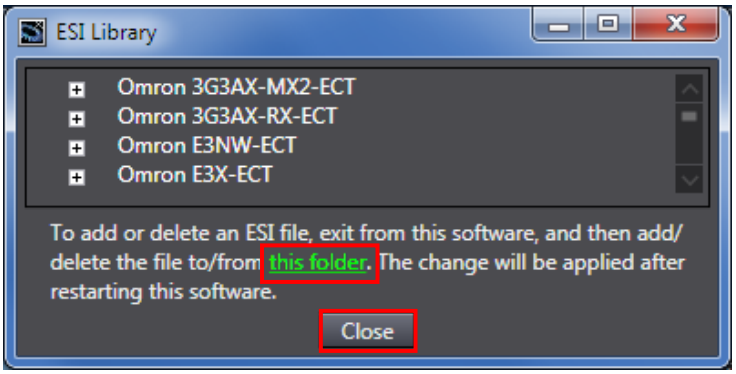
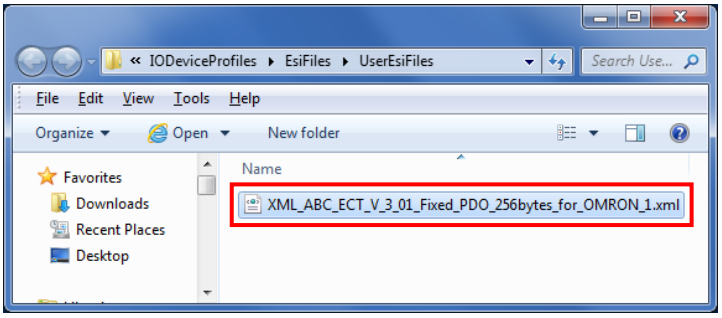


Additional Information

For details on online connections to a Controller, refer to *Section 6. Online Connections to a Controller* of the *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504).

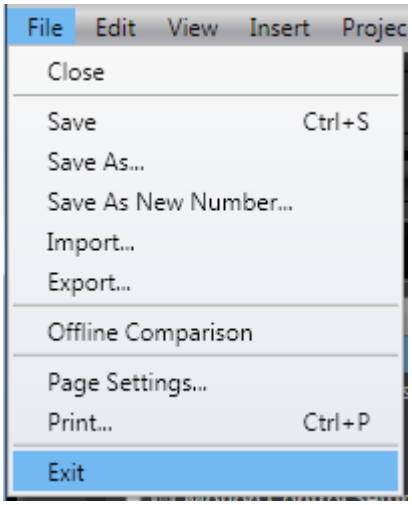
9 Double-click **EtherCAT** under **Configurations and Setup** in the Multiview Explorer.



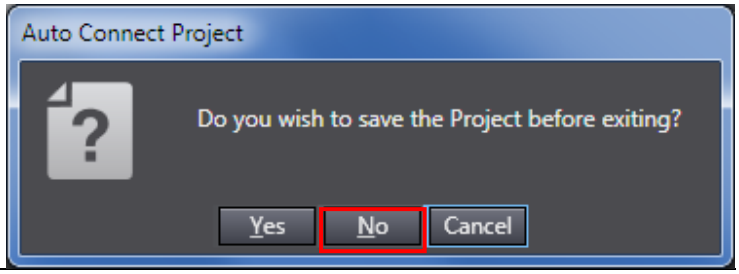
10	The EtherCAT Tab Page is displayed in the Edit Pane.	
11	Right-click **Master** and select ***Display ESI Library***.	
12	The ESI Library Dialog Box is displayed. Click the **this folder** link. When the Explorer starts, close the dialog box by clicking the **Close** Button.	
13	The Explorer starts and a folder for installing the ESI fine is opened. Copy the prepared ESI file *XML_ABC_ECT_V_3_01_Fixed _PDO_256bytes_for_OMRON_ 1.xml* to this folder.	

14 Select ***Exit*** from the File Menu to exit the Sysmac Studio.

* After installing the ESI file, the Sysmac Studio needs to be restarted.



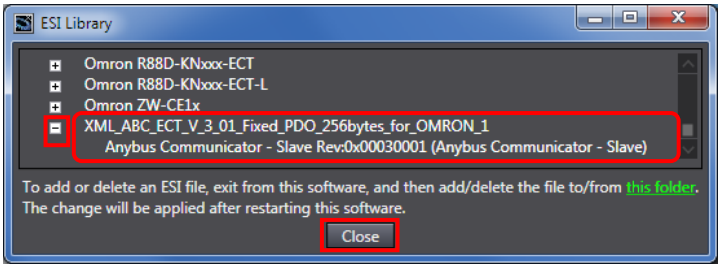
A dialog box is displayed confirming whether to save the project. If you do not need to save it, click the **No** Button.



15 In the same way as steps 3 to 11, restart the Sysmac Studio and display the ESI Library Dialog Box.
Click the **+** Button of XML_ABC_ECT_V_3_01_Fixed_PDO_256bytes_for_OMRON_1 to confirm that the Anybus Communicator - Slave Rev:0x00030001 device is displayed.

Confirm that an exclamation mark (warning) is not displayed.

Click the **Close** Button.



Precautions for Correct Use

If an exclamation mark (warning) is displayed for the ESI file, check the name of the ESI file and obtain the ESI file with a correct name. If an exclamation mark (warning) is displayed even when the name of the ESI file is correct, the file may be corrupted.
Contact the device manufacturer.

7.3.2. Setting Up the EtherCAT Network Configuration

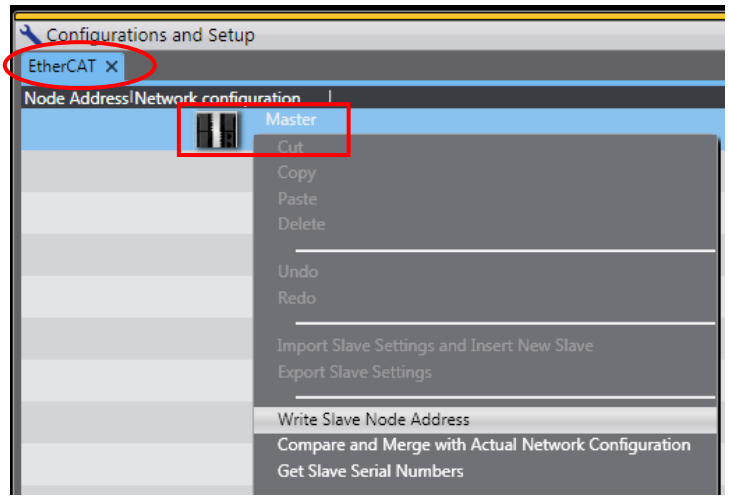
Set up the EtherCAT network configuration.

⚠ Caution

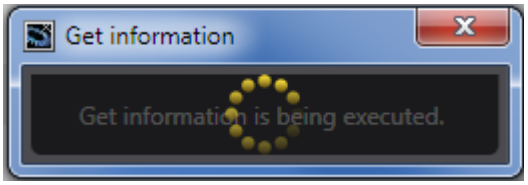
Cycle the power supply to the Slave Unit in step 6. Always confirm safety before you cycle the power supply.

1 Right-click **Master** on the EtherCAT Tab Page of the Edit Pane, and select ***Write Slave Node Address***.

*If the EtherCAT Tab Page is not displayed on the Edit Pane, take step 9 in *7.3.1. Starting the Sysmac Studio and Installing the ESI file* to display.

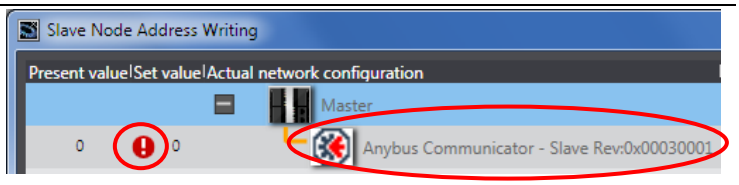


A screen is displayed stating "Get information is being executed".

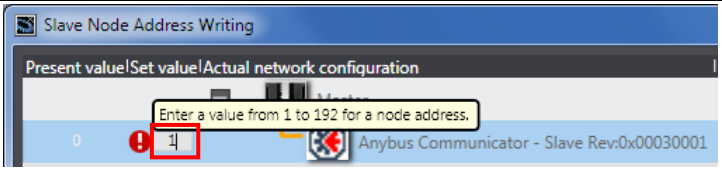


2 The Slave Node Address Writing Dialog Box is displayed. Anybus Communicator - Slave Rev:0x00030001 is displayed in the Actual network configuration.

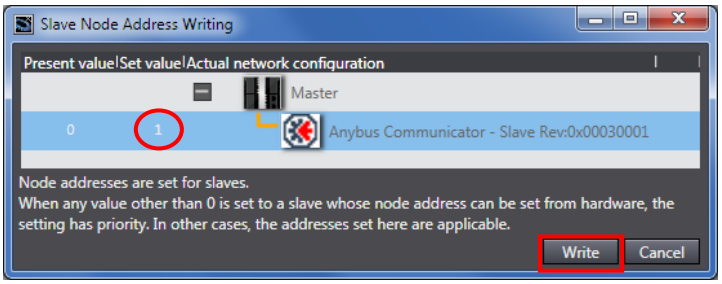
*If the present value of the node address is 0, an error is displayed.



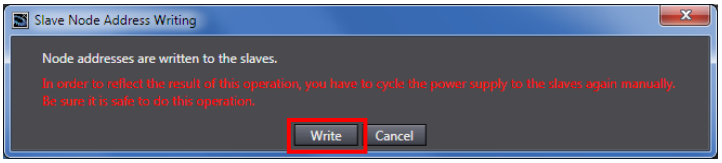
3 Enter *1* in the *Set value* Field for a node address.



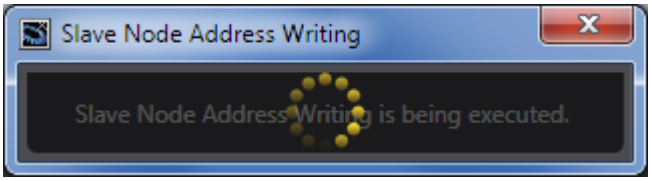
4 Confirm that no error is displayed and the set value is 1. Click the **Write** Button.



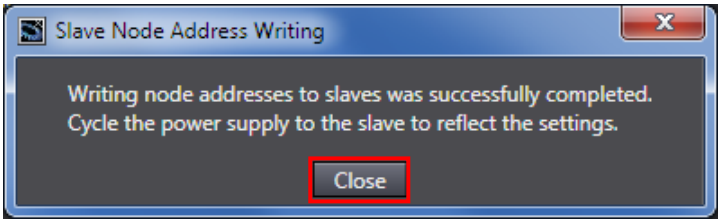
5 The Slave Node Address Writing Dialog Box is displayed. Check the contents and click the **Write** Button.



A screen is displayed stating "Slave Node Address Writing is being executed".

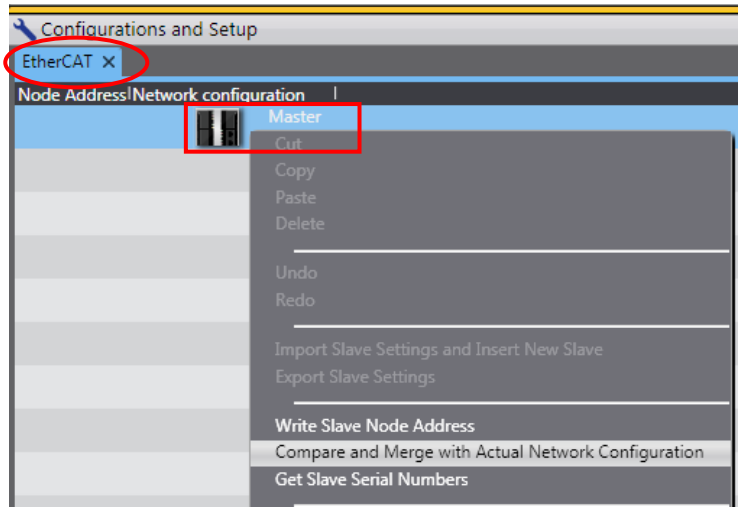


The dialog box on the right is displayed. Check the contents and click the **Close** Button.

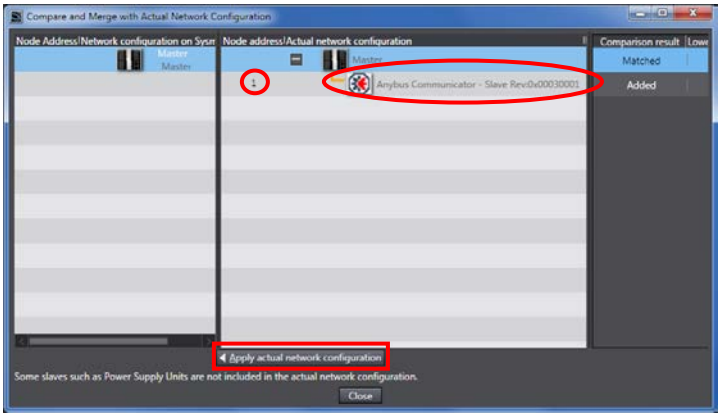
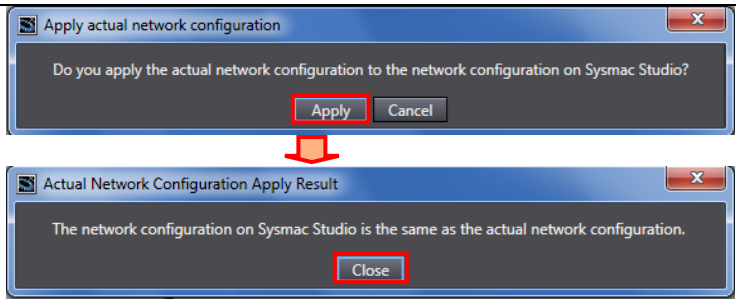
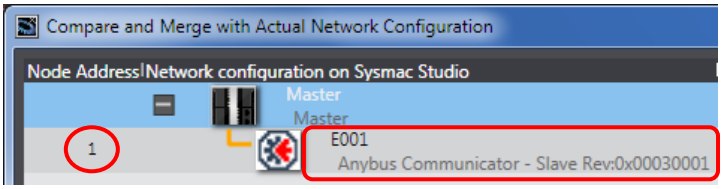
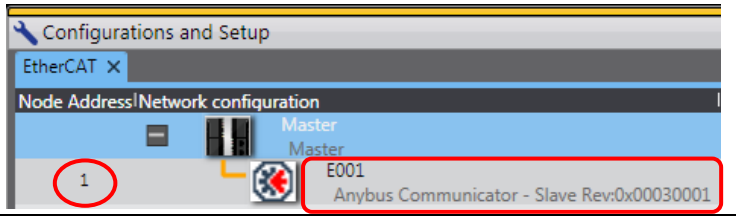


6 Cycle the power supply to the Slave Unit.

7 Right-click **Master** on the EtherCAT Tab Page, and select ***Compare and Merge with Actual Network Configuration***.

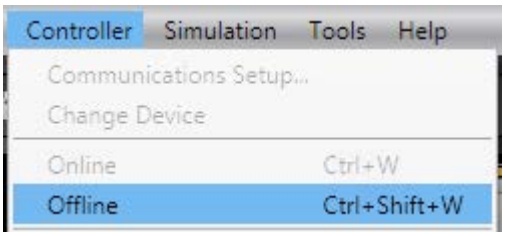
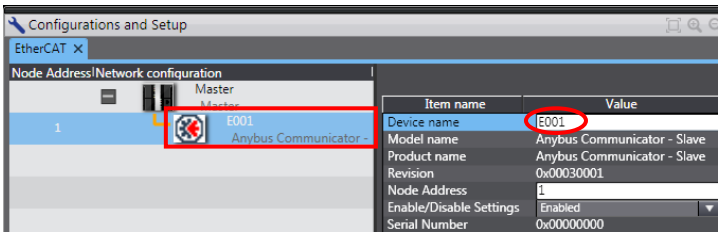
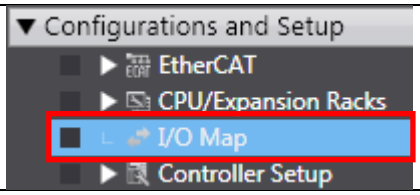
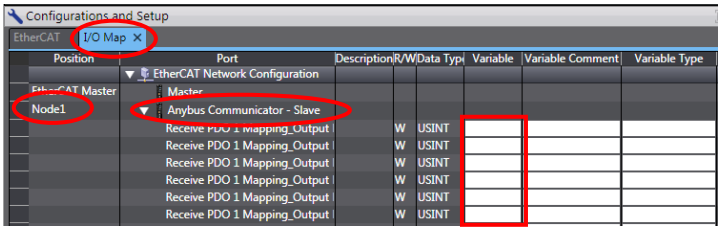
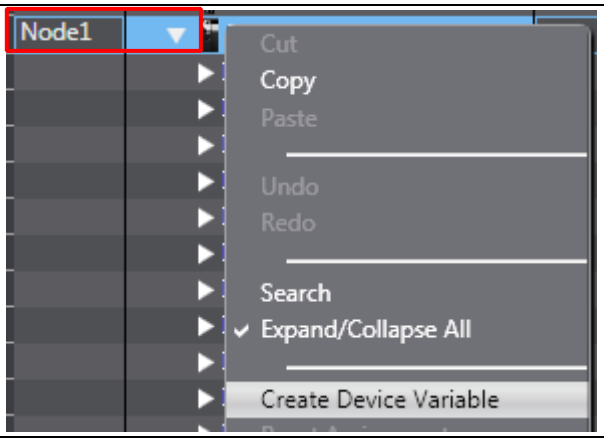


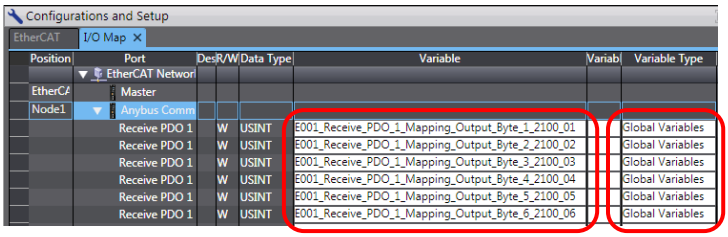
A screen is displayed stating "Get information is being executed".

8	The Compare and Merge with Actual Network Configuration Dialog Box is displayed. Node address 1 and Anybus Communicator - Slave Rev:0x00030001 are added to the Actual network configuration after the comparison. Click the **Apply actual network configuration** Button.	
9	A confirmation dialog box is displayed. Check the contents and click the **Apply** Button. The dialog box on the right is displayed. Click the **Close** Button.	
10	Node address 1, E001 and Anybus Communicator - Slave Rev:0x00030001 are added to the Network configuration on Sysmac Studio. Confirm that the data above are added, and click the **Close** Button.	
11	Node address 1, E001, and Anybus Communicator - Slave Rev:0x00030001 slave are added to the EtherCAT Tab Page on the Edit Pane.	

7.3.3. Setting the Device Variables

Set the device variables used for the EtherCAT Slave Unit.

1	Select ***Offline*** from the Controller Menu. The yellow bar on the top disappears.	
2	Select **Anybus Communicator** added in the previous section on the EtherCAT Tab Page. Confirm that the Device name is E001. *Device name can be changed as desired.	
3	Double-click **I/O Map** under **Configurations and Setup** in the Multiview Explorer.	
4	The I/O Map Tab Page is displayed on the Edit Pane. Confirm that Node1 is displayed in the *Position* Column and the Slave Unit added in the *Port* Column is displayed. *To manually set a variable name for the Slave Unit, click a column under the *Variable* Column and enter a name.	
5	Right-click **Node1** and select ***Create Device Variable***.	

6	The variable names and variable types are set.	

Additional Information

The device variables are named automatically from a combination of the device names and the port names.
The default device names are “E" followed by a serial number that starts from 001.

Additional Information

In this document, device variables are automatically named for a unit (a slave).
Device variables can also be manually named for ports.

7.3.4. Transferring the Project Data

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

⚠ WARNING

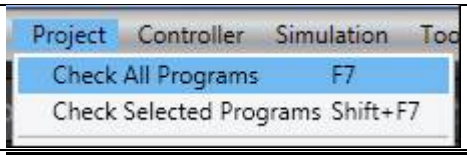
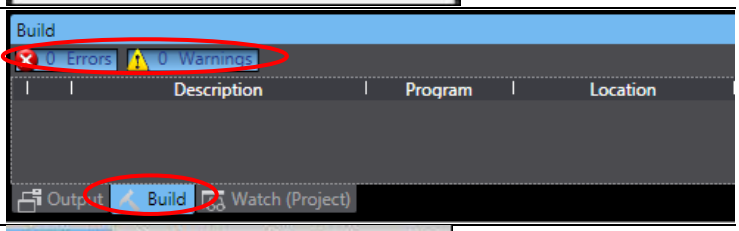
Always confirm safety at the Destination Device before you transfer a user program, configuration data, setup data, device variables, or values in memory used for CJ-series Units from the Sysmac Studio.
The devices or machines may perform unexpected operation regardless of the operating mode of the CPU Unit.

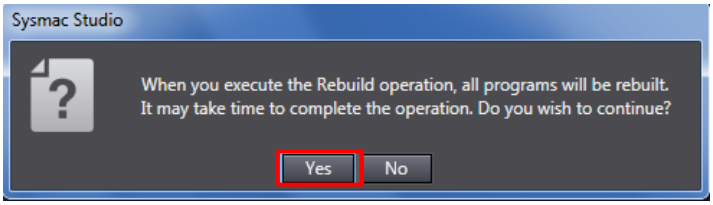
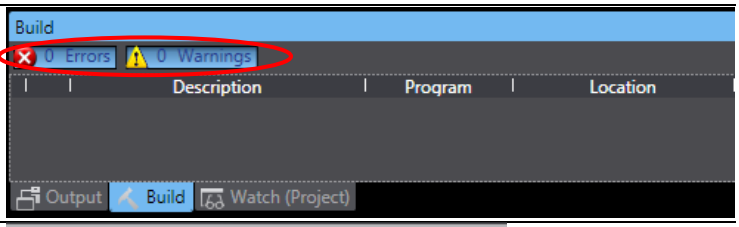
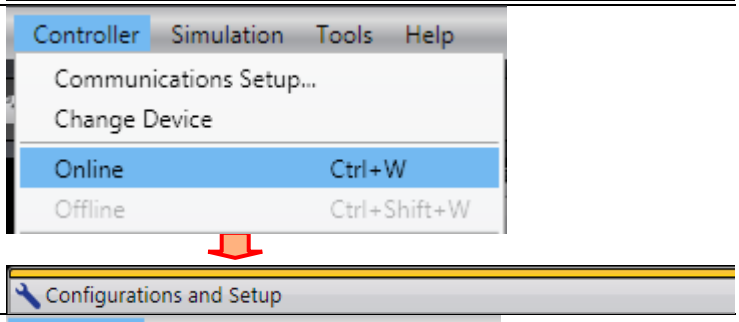
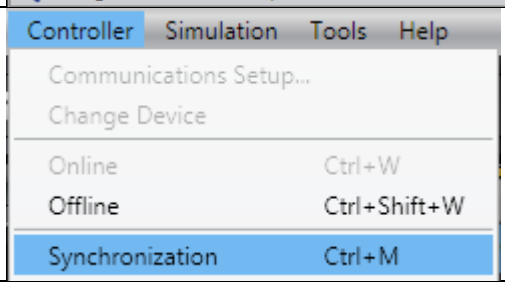
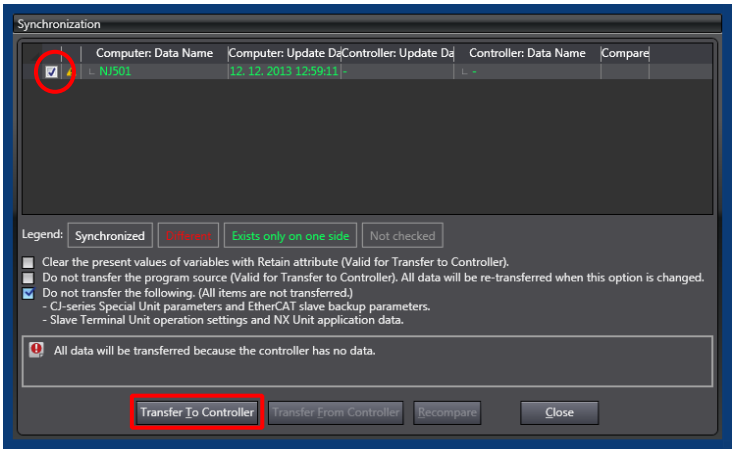
⚠ Caution

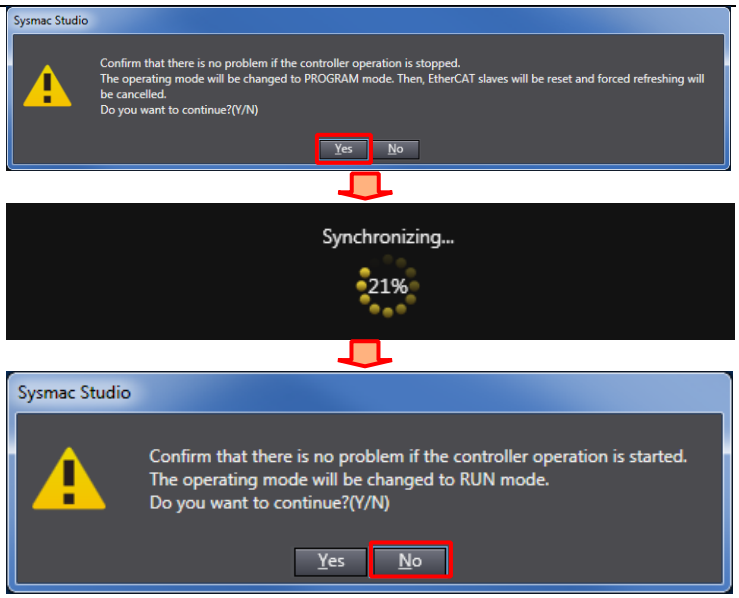
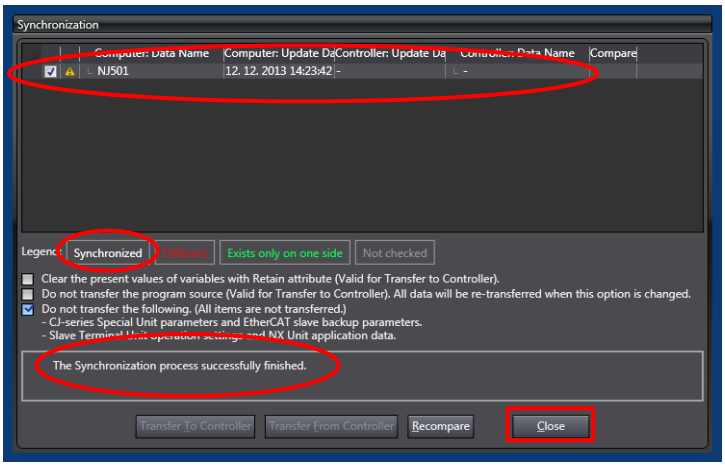
After you transfer the user program, the CPU Unit restarts and communications with the EtherCAT slaves are cut off. During that period, the slave outputs behave according to the slave settings. The time that communications are cut off depends on the EtherCAT network configuration.
Before you transfer the user program, confirm that it will not adversely affect the device.

⚠ Caution

A slave will be reset after performing the synchronization in step 7 and subsequent steps. Always confirm safety before performing the synchronization.

1	Select ***Check All Programs*** from the Project Menu.	
2	The Build Tab Page is displayed. Confirm that "0 Errors" and "0 Warnings" are displayed.	
3	Select ***Rebuild Controller*** from the Project Menu.	

4	A confirmation dialog box on the right is displayed. Confirm that there is no problem and click the **Yes** Button.	
5	Confirm that "0 Errors" and "0 Warnings" are displayed in the Build Tab Page.	
6	Select ***Online*** from the Controller Menu.	
7	Select ***Synchronization*** from the Controller Menu.	
8	The Synchronization Dialog Box is displayed. Confirm that the data to transfer (NJ501 in the right dialog box) is selected. Then, click the **Transfer To Controller** Button. *After executing the Transfer To Controller, the Sysmac Studio data is transferred to the Controller and the data is compared.	

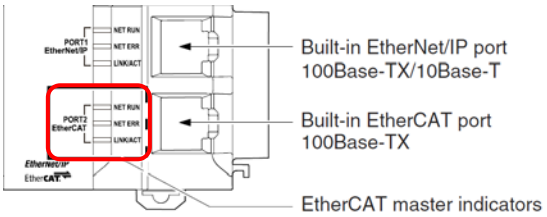
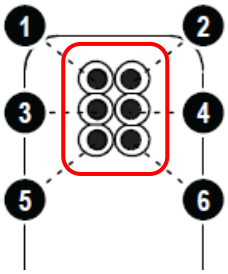
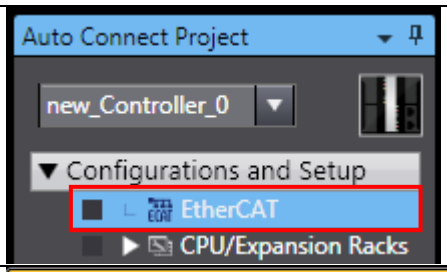
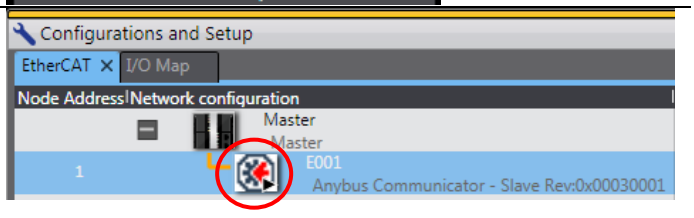
9	A confirmation dialog box on the right is displayed. Confirm that there is no problem and click the **Yes** Button. A screen stating "Synchronizing" is displayed. A confirmation dialog box on the right is displayed. Confirm that there is no problem and click the **No** Button. *Do not return to RUN mode.	
10	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. *A message stating "The synchronization process successfully finished" is displayed if the Sysmac Studio project data and the data in the Controller match each other. *If the synchronization fails, check the wiring and repeat from step 1.	

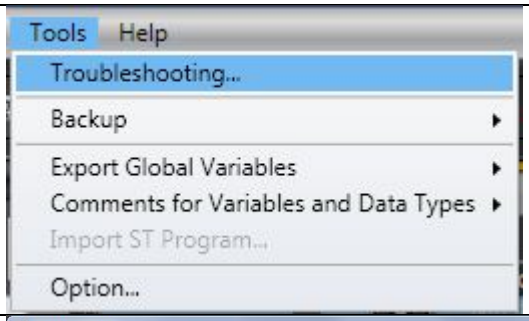
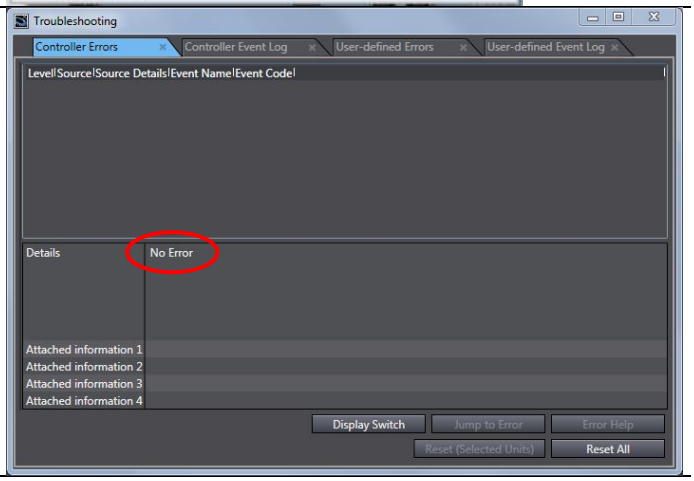
7.4. Checking the EtherCAT Communications

Confirm that the PDO Communications of EtherCAT are performed normally.

7.4.1. Checking the Connection Status

Check the connection status of the EtherCAT network.

1	Confirm that PDO Communications via EtherCAT are performed normally by checking the LED indicators on the Controller. The LED indicators in normal status are as follows: NET RUN: Green lit NET ERR: Not lit LINK/ACT: Yellow flashing	
2	Check the LED indicators on the Communicator. The LED indicators in normal status are as follows: [LED 1]: Green lit [LED 2]: Not lit [LED 3]: Green flickering [LED 4]: Not lit [LED 5]: Red lit [LED 6]: Green flashing *LED 5 is lit red because no device is connected to Subnetwork Connector in the procedure of this document. It does not affect EtherCAT communications.	
3	Double-click **EtherCAT** under **Configurations and Setup** in the Multiview Explorer.	
4	The icon for E001 is displayed on the Edit Pane. Confirm that the ▶ mark which indicates normal communications of EtherCAT is displayed.	

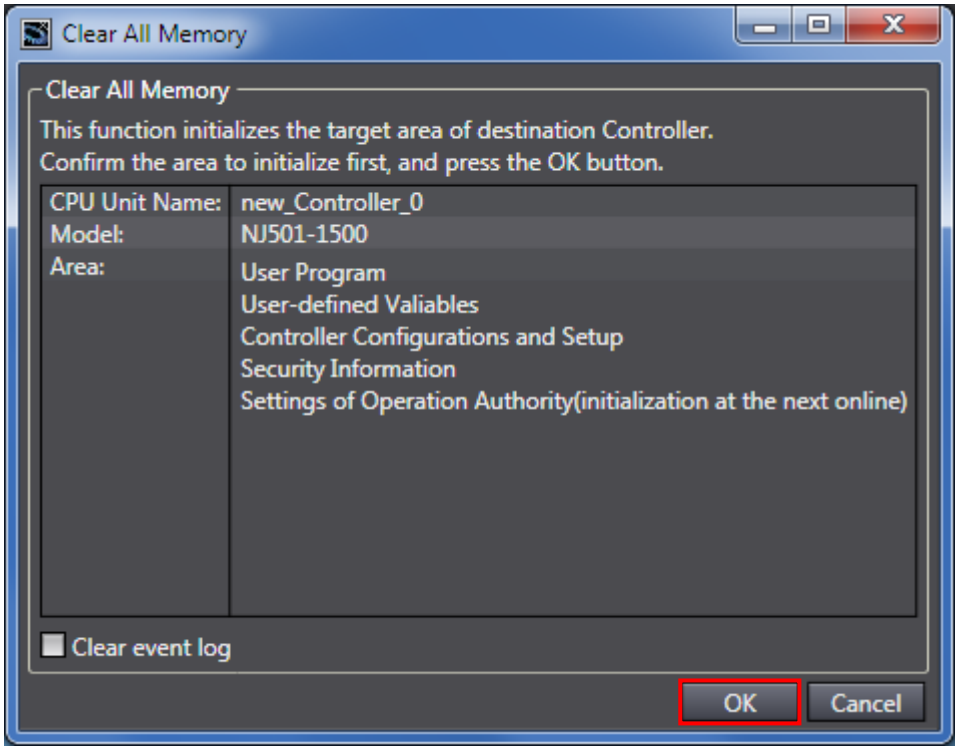
5	Select ***Troubleshooting*** from the Tools Menu.	
6	The Troubleshooting Dialog Box is displayed. Check that No Error is displayed in the *Details* Field in the Controller Errors Tab Page.	

8. Initialization Method

This document explains the setting procedure from the factory default setting.
Some settings may not be applicable as described in this document unless you use the devices with the factory default setting.

8.1. Initializing the Controller

To initialize the settings of the Controller, select ***Clear All Memory*** from the Controller Menu of the Sysmac Studio. The Clear All Memory Dialog Box is displayed. Check the contents and click the **OK** Button.



8.2. Initializing HMS Communicator

For how to initialize HMS Communicator, refer to *Section 4. Navigating the Anybus Configuration Manager* of the *User Manual Anybus (R) Communicator™ for EtherCAT* (Cat. No. HMSI-168-95).

9. Revision History

Revision code	Date of revision	Revision reason and revision page
01	August 7, 2013	First edition
02	March 3, 2014	Correction of device variable names for input area Correction of erroneous description
03	September 9, 2014	Corrections due to the updates of Controller, Sysmac Studio, Communicator, and Anybus Configuration Manager. Change of ESI file due to Communicator upgrade. The procedure of "7.2. Setting Up HMS Communicator" is divided into "7.2.1. Hardware Settings “ and "7.2.2. Parameter Settings ".

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