2026/6/30 Discontinued

OMRON

Machine Automation Controller NJ/NX-series

EtherNet/IP™ Connection Guide

CKD Corporation

ABSODEX Driver
(AX9000TS/TH-U6)

Network Connection Guide

SYSMAC always in control

P713-E1-01

2026/6/30 Discontinued

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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 in the manuals for each device which is used in the system.
The table below lists the manuals provided by CKD Corporation (hereinafter referred to as "CKD") and OMRON Corporation (hereinafter referred to as "OMRON"), which pertain to this guide.

Manufacturer	Cat. No.	Model	Manual name
OMRON	W500	NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	NJ-series CPU Unit Hardware User's Manual
OMRON	W535	NX701-□□□□	NX-series CPU Unit Hardware User's Manual
OMRON	W593	NX102-□□□□	NX-series NX102 CPU Unit Hardware User's Manual
OMRON	W578	NX1P2-□□□□	NX-series NX1P2 CPU Unit Hardware User's Manual
OMRON	W501	NX701-□□□□ NX102-□□□□ NX1P2-□□□□	NJ/NX-series CPU Unit Software User's Manual
OMRON	W506	NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	NJ/NX-series CPU Unit Built-in EtherNet/IP™ Port User's Manual
OMRON	W504	SYSMAC-SE2□□□	Sysmac Studio Version 1 Operation Manual
OMRON	0969584-7	W4S1-05□ W4S1-03B	Switching Hub W4S1-series Users Manual
CKD	SMF-2006-A	AX9000TS/TH/XS	INSTRUCTION MANUAL ABSODEX AX SERIES TS TYPE TH TYPE XS TYPE
CKD	SMF-2012-A	AX9000TS/TH-U6	Instruction Manual ABSODEX AX Series TS type TH type EtherCAT specification EtherNet/IP specification
CKD	SMF-2005-A	–	INSTRUCTION MANUAL ABSODEX AX Tools for Windows® Common for TS-Type, TH-Type, MU-Type and XS-Type Drivers

2. Terms and Definitions

The terms and definitions used in this guide are given below.

Term	Explanation and Definition
node	A node refers to a relay point, a junction point or an end point on an EtherNet/IP network made up of devices having an EtherNet/IP port. A device with one EtherNet/IP port is recognized as one node and two EtherNet/IP ports as two nodes on an EtherNet/IP network.
tag	A tag is a unit that is used to exchange data with tag data links. Data is exchanged between the local network variables and remote network variables specified in the tags or between specified I/O memory areas.
tag set	When a connection is established, from 1 to 8 tags (including Controller status) is configured as a tag set. Each tag set represents the data that is linked for a tag data link connection. Tag data links are therefore created through a connection between one tag set and another tag set. A tag set name has to be set for each tag set.
tag data links	The standard EtherNet/IP implicit communications are called tag data links. Tag data links enable cyclic tag data exchanges on an EtherNet/IP network between Controllers or between Controllers and other devices.
connection	A connection is used to exchange data as a unit within which data concurrency is maintained.
connection type	There are two kinds of connection types for tag data links. One is a multi-cast connection, and the other is a unicast (point-to-point) connection. The multi-cast connection sends an output tag set in one packet to more than one node. The unicast connection separately sends one output tag set to each node. Therefore, the multi-cast connection can reduce the communications load if one output tag set is sent to more than one node.
originator and target	To perform tag data links, it is necessary to open connections between nodes that perform tag data links. The node that requests the connection is called the originator, and the node that receives the request is called the target.
tag data link parameters	The information that is set to perform tag data links, including tags, tag sets and connections, is called tag data link parameters.
EDS file	A file that describes information unique to a device such as the number of I/O points for an EtherNet/IP device.

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 in the 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 guide without the permission of OMRON Corporation.

(5) The information contained in this guide is current as of October 2018. It is subject to change for improvement without notice.

The following notations are used in this guide.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, may 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 the text.
This example shows a general precaution for something that you must do.

4. Overview

This guide describes procedures for connecting a CKD ABSODEX Driver AX9000TS/TH-U6 (hereinafter referred to as the "ABSODEX Driver") to an OMRON NJ/NX-series Machine Automation Controller (hereinafter referred to as the "Controller") via EtherNet/IP and for checking the communication status.
Refer to *Section 6. EtherNet/IP Settings* and *Section 7. EtherNet/IP Connection Procedure* to understand setting methods and key points to operate EtherNet/IP tag data links.

5. Applicable Devices and Device Configuration

5.1. Applicable Devices

The applicable devices are as follows:

Manufacturer	Name	Model
OMRON	NJ/NX-series CPU Unit	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□
CKD	ABSODEX Driver	AX9000TS-U6 AX9000TH-U6
CKD	Actuator	AX-T Series

Precautions for Correct Use

In this guide, 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 connection.
You cannot use devices with versions lower than those 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

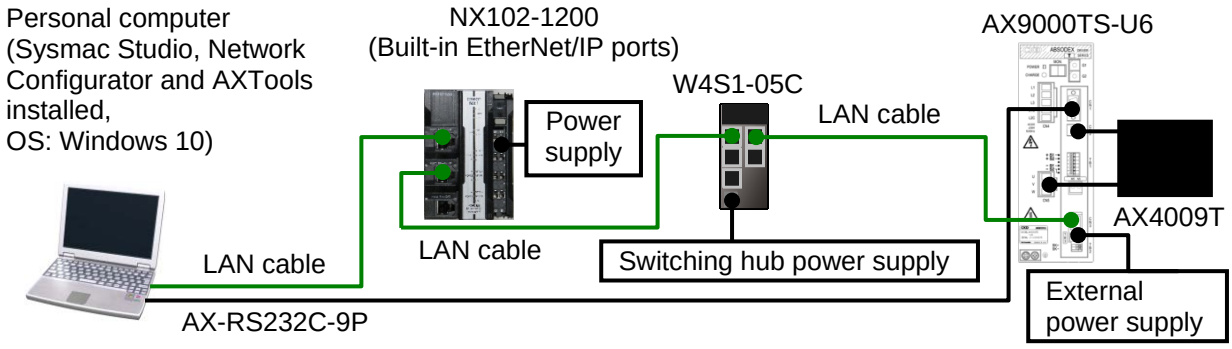
This guide describes the procedures for establishing the network connection.
It does not provide information on operation, installation, wiring method, device functionality, or device operation, which is not related to the connection procedures.
Refer to the manuals or contact the device manufacturer.

Additional Information

Contact the device manufacturer for information on Actuators connectable to the ABSODEX Drivers.

5.2. Device Configuration

The hardware components to reproduce the connection procedures in this guide are as follows:



Manufacturer	Name	Model	Version
OMRON	NX series CPU Unit (Built-in EtherNet/IP ports)	NX102-1200	Ver.1.31
–	Power supply (24 VDC for the Controller)	–	
OMRON	Switching hub	W4S1-05C	Ver.1.0
–	Switching hub power supply (24 VDC)	–	
OMRON	Sysmac Studio	SYSMAC-SE2□□□	Ver.1.24
OMRON	Network Configurator	(provided in Sysmac Studio package)	Ver.3.65
–	Personal computer (OS: Windows 10)	–	
–	LAN cable (STP (shielded, twisted-pair) cable of Ethernet category 5 or higher)	–	
CKD	ABSODEX Driver	AX9000TS-U6	Ver.10.01
CKD	RS-232C cable	AX-RS232C-9P	
CKD	Actuator	AX4009T	
CKD	AXTools	–	Ver.2.22
CKD	EDS file	AX9000TS-U6.eds	Ver.1.4
–	External power supply (24 VDC for the ABSODEX Driver)	–	

Precautions for Correct Use

Prepare beforehand the EDS file specified above.
To obtain the EDS file, contact CKD Corporation. Please note that you need the EDS file relevant to your device. If you use the other model of the ABSODEX Driver (not the one specified above), contact CKD Corporation and obtain the relevant EDS file.

Precautions for Correct Use

Update Sysmac Studio and Network Configurator to the versions specified above or to higher versions. If you use a version higher than the one specified, the procedures and related screenshots described in *Section 7.* and the subsequent sections may not be applicable.
In that case, use the equivalent procedures described in this guide by referring to the *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504) and *Network Configurator Online Help*.

Additional Information

For information on power supply specifications of the Controller, refer to the *NX-series NX102 CPU Unit Hardware User's Manual* (Cat. No. W593).

Additional Information

For information on power supply specifications of the switching hub, refer to the *Switching Hub W4S1-series Users Manual* (Cat. No. 0969584-7).

Additional Information

For information on external power supply specifications for the ABSODEX Driver, refer to the *Instruction Manual ABSODEX AX Series TS type TH type EtherCAT specification EtherNet/IP specification* (SMF-2012-A).

6. EtherNet/IP Settings

This section describes the parameters, global variables and tag sets that are all defined in this guide.

6.1. Parameters

The following parameters are required to connect the ABSODEX Driver and the Controller via EtherNet/IP.

Setting item	Controller PORT2 (EtherNet/IP) (Node 1)	ABSODEX Driver (Node 2)
IP address	192.168.1.1	192.168.1.2
Subnet mask	255.255.255.0	255.255.255.0

6.2. Global Variables

The Controller treats data in tag data links as global variables.
The following tables show the global variables and the related settings.

Name	Data type	Network publish	ABSODEX Driver data allocation	Data size (byte)
EIP002_InputSignal_OUT	BYTE[8]	Output	Input signal from Controller to ABSODEX Driver	8
EIP002_MonitorCode_OUT	DINT[3]	Output	Monitor codes 1 to 3	12
EIP002_Command_OUT	DINT[3]	Output	Command data	12
EIP002_OutputSignal_IN	BYTE[8]	Input	Output signal from ABSODEX Driver to Controller	8
EIP002_MonitorData_IN	DINT[3]	Input	Monitor data 1 to 3	12
EIP002_Response_IN	DINT[3]	Input	Response data	12

Additional Information

For information on monitor codes and monitor data, refer to *3.4.1. Monitor Code* of the *Instruction Manual ABSODEX AX Series TS type TH type EtherCAT specification EtherNet/IP specification* (SMF-2012-A).

ABSODEX Driver input signal

Global variable	Bit	Description
EIP002_InputSignal_OUT[0]	0 to 3	Program number selection input (bits 0 to 3)
	4	Program number setting input, second digit / Program number selection input (bit 4)
	5	Program number setting input, first digit / Program number selection input (bit 5)
	6	Reset input
	7	Origin return command input
EIP002_InputSignal_OUT[1]	0	Start input
	1	Servo-on input / Program stop input
	2	Ready return input / Continuous rotation stop input
	3	Answer input / Position deviation counter reset input
	4	Emergency stop input
	5	Brake off input
	6	Jog operation input (CW direction)
	7	Jog operation input (CCW direction)
EIP002_InputSignal_OUT[2]	0 and 1	Reserved / Travel unit selection input (bits 0 and 1)
	2	Reserved / Travel speed unit selection input
	3	Table operation, data input operation Switching input
	4 to 7	Reserved
EIP002_InputSignal_OUT[3]	–	Reserved
EIP002_InputSignal_OUT[4]	0	Monitor output execution request
	1	Command code execution request
	2 to 7	Reserved
EIP002_InputSignal_OUT[5] to EIP002_InputSignal_OUT[7]	–	Reserved

Command data

Global variable	Description
EIP002_Command_OUT[0]	Command code
EIP002_Command_OUT[1]	Written data / A code or P code
EIP002_Command_OUT[2]	Data designation / F code

ABSODEX Driver output signal

Global variable	Bit	Description
EIP002_OutputSignal_IN[0]	0 to 7	M code output (bits 0 to 7)
EIP002_OutputSignal_IN[1]	0	In-position output
	1	Positioning completion output
	2	Start input wait output
	3 and 4	Alarm output 1 and 2
	5	Indexing-in-progress output 1 / Origin position output
	6	Indexing-in-progress output 2 / Servo state output
	7	Ready state output
EIP002_OutputSignal_IN[2]	0	Segment position strobe output
	1	M code strobe output
	2 to 7	Reserved
EIP002_OutputSignal_IN[3]	–	Reserved
EIP002_OutputSignal_IN[4]	0	Monitoring
	1	Command code execution complete
	2 to 7	Reserved
EIP002_OutputSignal_IN[5] ～ EIP002_OutputSignal_IN[7]	–	Reserved

Response data

Global variable	Description
EIP002_Response_IN[0]	Response code
EIP002_Response_IN[1]	Loaded data
EIP002_Response_IN[2]	Reserved

Additional Information

For more information on the allocations of the input and output areas, refer to *3.2. Input/Output* of the *Instruction Manual ABSODEX AX Series TS type TH type EtherCAT specification EtherNet/IP specification* (SMF-2012-A).

Additional Information

With Sysmac Studio, two methods can be used to specify an array for a data type.
After specifying, (1) is converted to (2), and the data type is always displayed as (2).
(1)BOOL[16] / (2) ARRAY[0..15] OF BOOL
In this guide, the data type is simplified by displaying BOOL[16].
(The example above means a BOOL data type with sixteen array elements.)

6.3. Tag Sets

The tag sets to perform tag data links are shown below.

The data in the tag sets are assigned in ascending order of the following OUT No. and IN No.

Output area (Controller to ABSODEX Driver)

Tag set name		Data size (byte)
EIP002_OUT		32
OUT No.	Tag name (global variable name)	Data size (byte)
1	EIP002_InputSignal_OUT	8
2	EIP002_MonitorCode_OUT	12
3	EIP002_Command_OUT	12

Input area (ABSODEX Driver to Controller)

Tag set name		Data size (byte)
EIP002_IN		32
IN No.	Tag name (global variable name)	Data size (byte)
1	EIP002_OutputSignal_IN	8
2	EIP002_MonitorData_IN	12
3	EIP002_Response_IN	12

7. EtherNet/IP Connection Procedure

This section describes the procedures for connecting the ABSODEX Driver and the Controller via EtherNet/IP. The procedures for setting up the ABSODEX Driver and the Controller in this guide are based on the factory default settings.
For information on initialization, refer to *Section 8. Initialization Method*.

7.1. Work Flow

Take the following steps to connect the ABSODEX Driver and the Controller via EtherNet/IP and perform tag data links.

7.2. CKD ABSODEX Driver Setup	Set up the CKD ABSODEX Driver.
↓	
7.2.1. Cable Connection	Connect the cables to the ABSODEX Driver.
↓	
7.2.2. Parameter Settings	Set the IP address of the ABSODEX Driver.
↓	
7.3. Controller Setup	Set up the Controller.
↓	
7.3.1. IP Address Settings	Start Sysmac Studio and set the IP address of the Controller.
↓	
7.3.2. Setting Global Variables	Set global variables to use for tag data links, and create and export a CSV file in order to use the variables as tags in Network Configurator.
↓	
7.3.3. Transferring the Project Data	Go online with Sysmac Studio and transfer the project data to the Controller.
↓	
7.4. Network Settings	Set EtherNet/IP tag data links.
↓	
7.4.1. Starting Network Configurator and Installing the EDS File	Start Network Configurator and install the EDS file.
↓	
7.4.2. Uploading the Network Configuration	Go online with Network Configurator and upload the network configuration.
↓	

7.4.3. Tag Registration	Import the created CSV file for use with Network Configurator, and register tags and tag sets.
↓	
7.4.4. Setting Connections	Set connections to associate the tag sets of the target device with the tag sets of the originator device.
↓	
7.4.5. Transferring the Tag Data Link Parameters	Transfer the tag data link parameters to the Controller.
↓	
7.5. EtherNet/IP Communication Status Check	Confirm that the EtherNet/IP tag data links are performed normally.
↓	
7.5.1. Checking the Connection Status	Check the EtherNet/IP connection status.
↓	
7.5.2. Checking Sent and Received Data	Check that correct data is sent and received.

7.2. CKD ABSODEX Driver Setup

Set up the CKD ABSODEX Driver.

7.2.1. Cable Connection

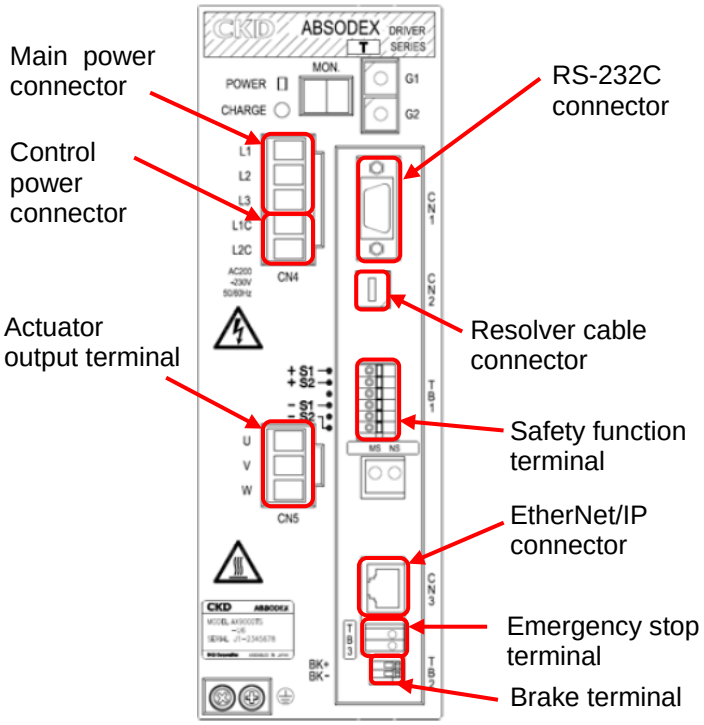
Connect the cables to the ABSODEX Driver.

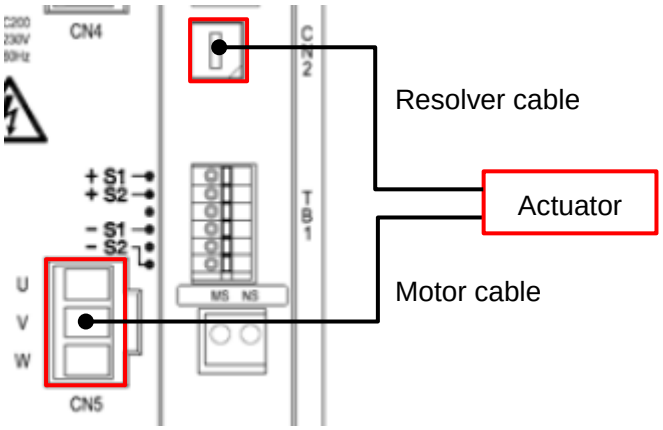
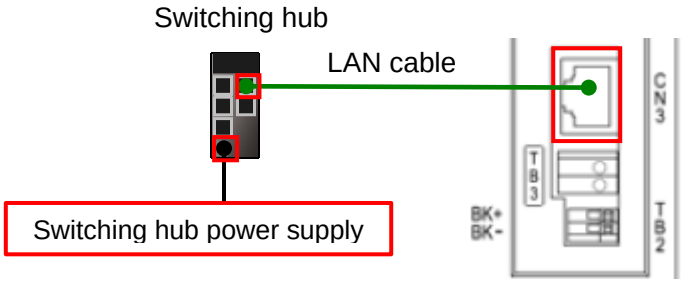
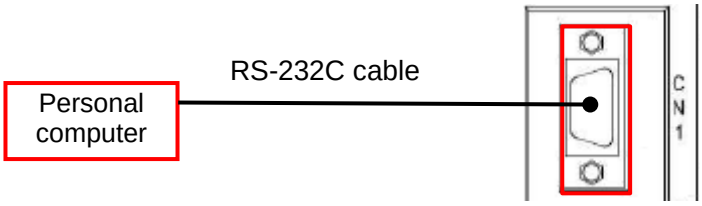
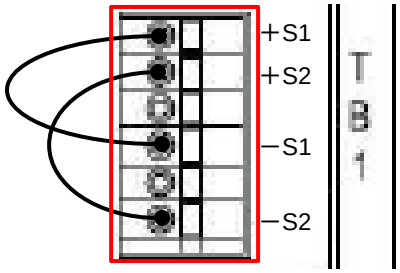
Precautions for Correct Use

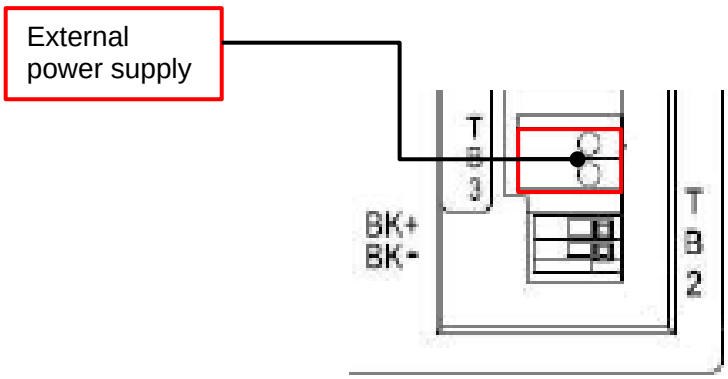
Before following the steps below, check the capacities of the main and control power supplies and wire them by referring to the *INSTRUCTION MANUALABSODEX AX SERIES TSTYPE TH TYPE XS TYPE* (SMF-2006-A).

Precautions for Correct Use

Make sure that the power supplies are all OFF before setting up.
If any of them are ON, the settings described in the following steps and subsequent procedures may not be applicable.

1	Make sure that the following power supplies are all OFF. - Main and control power supplies to ABSODEX Driver - External power supply for ABSODEX Driver	
2	Check the position of the connectors on ABSODEX Driver by referring to the figure on the right.	

3	Connect Actuator and Resolver cable connector with a Resolver cable. Connect Actuator and Actuator output terminal with a Motor cable.	
4	Connect Switching hub and EtherNet/IP connector with a LAN cable. Connect Switching hub power supply to Switching hub.	
5	Connect the serial connector on Personal computer and RS-232C connector with an RS-232C cable.	
6	Check that the safety function is invalidated. Check that jumpers are connected to Safety function terminal. *Since the intention of this guide is to verify the network connection, the safety function is left invalid. *Refer to *3.2.6. Wiring for Safety Function* of the *INSTRUCTION MANUAL ABSODEX AX SERIES TS TYPE TH TYPE XS TYPE* (SMF-2006-A) for wiring to Safety function terminal.	 *A jumper is connected to Safety function terminal to invalidate the safety function when ABSODEX Driver is shipped from the factory.

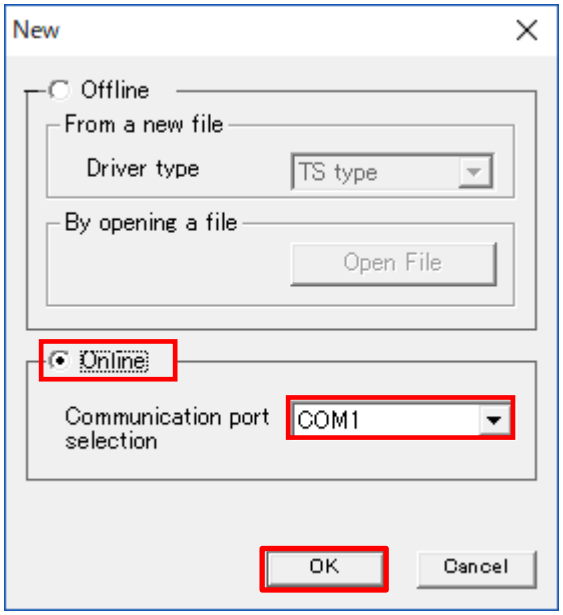
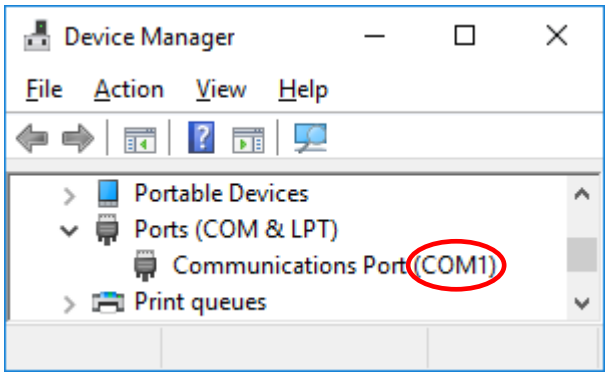
7	Connect External power supply to Emergency stop terminal, thereby disabling the emergency stop of ABSODEX Driver. *Refer to *2.3.1. Wiring of Emergency Stop Input (TB3)* of the *Instruction Manual ABSODEX AX Series TS type TH type EtherCAT specification EtherNet/IP specification* (SMF-2012-A) for wiring of Emergency stop terminal.	

7.2.2. Parameter Settings

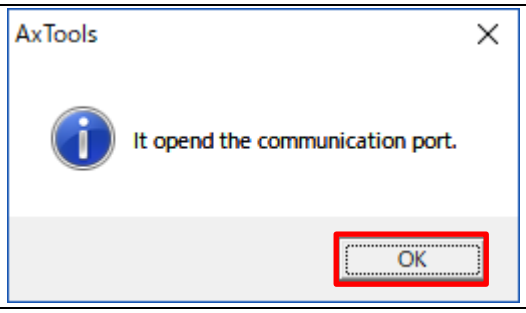
Set the IP address of the ABSODEX Driver.
The IP Address is set with AXTools.

Precautions for Correct Use

Refer to *5.5.4. Main Power Supply Sequence* of the *INSTRUCTION MANUAL ABSODEX AX SERIES TS TYPE TH TYPE XS TYPE* (SMF-2006-A) for information on the turn-on sequence of the main and control power supplies to the ABSODEX Driver.

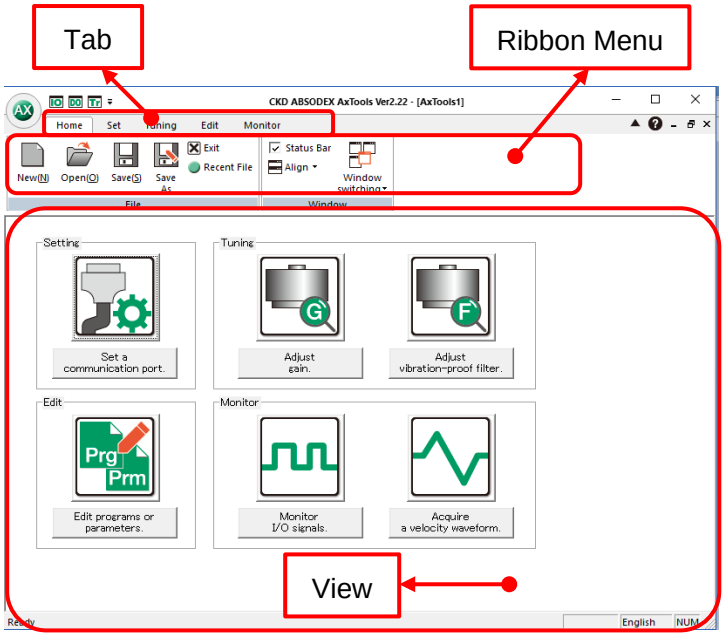
1	Turn ON the main and control power supplies to ABSODEX Driver.	
2	Start AXTools.	
3	The New Dialog Box is displayed. Select *Online*. Select the communication port number to be used from the pull-down list of Communication port selection. Click **OK**.	
	*If there is more than one serial port on Personal computer, display Windows Device Manager and select the same port number as the communications port (displayed under Ports (COM &LPT)) where ABSODEX Driver is connected (example: COM1).	

4 The dialog box on the right is displayed.
Check the contents and click **OK**.

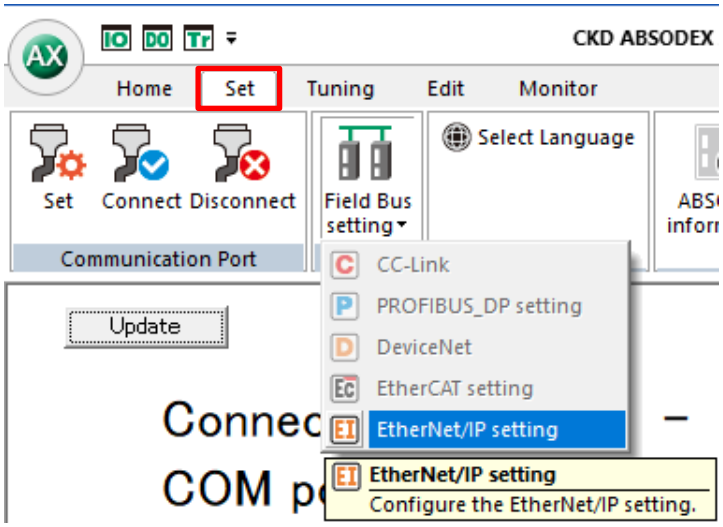


5 AXTools starts up.

The figure on the right shows the elements displayed in the window.
- Tab
- Ribbon Menu
- View

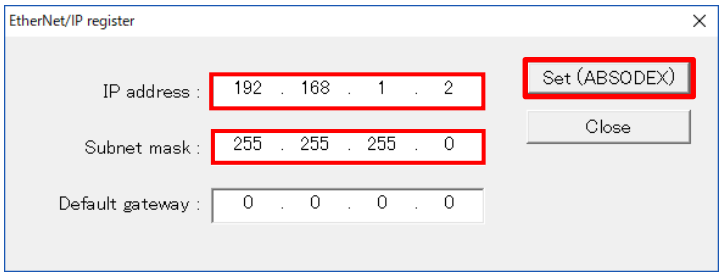


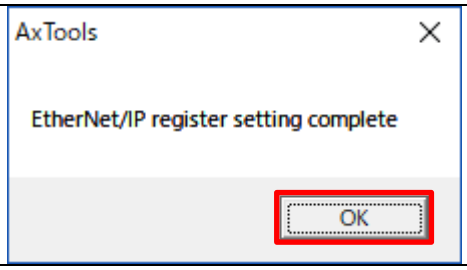
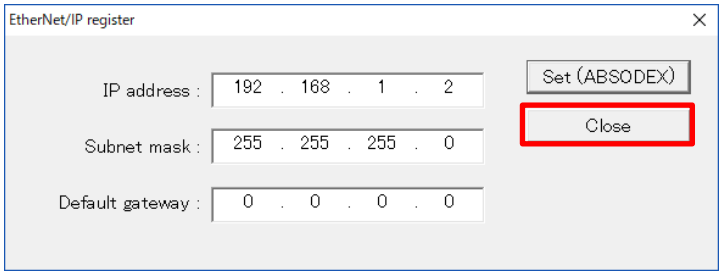
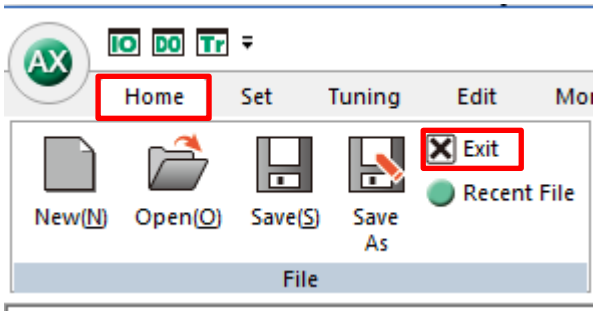
6 Select the **Set** Tab.
The View of the Set Tab is displayed.
Select ***Field Bus setting*** from the Ribbon Menu, then select ***EtherNet/IP setting***.



7 The EtherNet/IP register Dialog Box is displayed.
Set the following parameters.
IP address: *192.168.1.2*
Subnet mask: *255.255.255.0*

Click **Set (ABSODEX)**.



8	The dialog box on the right is displayed. Check the contents and click **OK**.	
9	Click **Close** to close the EtherNet/IP register Dialog Box.	
10	Select the **Home** Tab. The View of the Home Tab is displayed. Select ***Exit*** from the Ribbon Menu to exit AXTools.	
11	Turn OFF the main and control power supplies to ABSODEX Driver.	

7.3. Controller Setup

Set up the Controller.

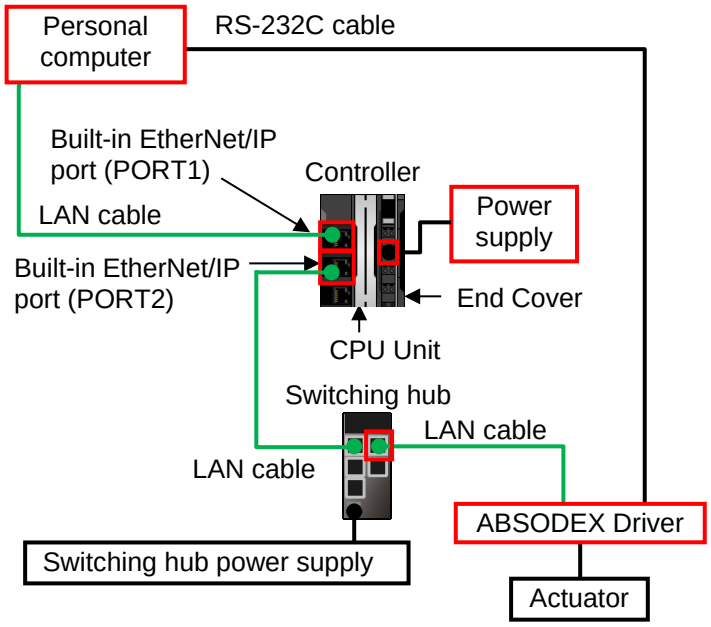
7.3.1. IP Address Settings

Start Sysmac Studio and set the IP address of the Controller.

1 Make sure that the following power supplies are all OFF.
- Switching hub power supply
- Controller power supply
- Main, control and external power supplies to ABSODEX Driver

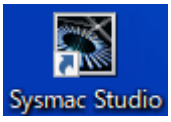
2 Connect LAN cables between Personal computer and Built-in EtherNet/IP port (PORT1) on Controller and between Switching hub and Built-in EtherNet/IP port (PORT2) on Controller.
Connect Power supply to Controller.

*For information on power supply connection to Controller, refer to *5-4-1 Wiring the Unit Power Supply* of the *NX-series NX102 CPU Unit Hardware User's Manual* (Cat. No. W593).

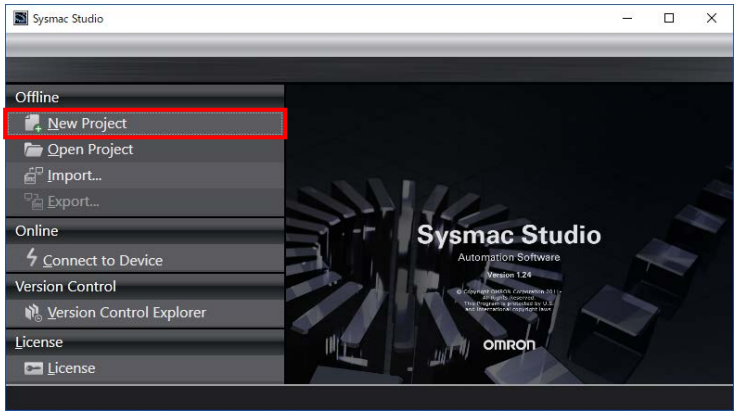


3 Start Sysmac Studio.

*If the User Account Control Dialog Box is displayed at start, make a selection to start Sysmac Studio.



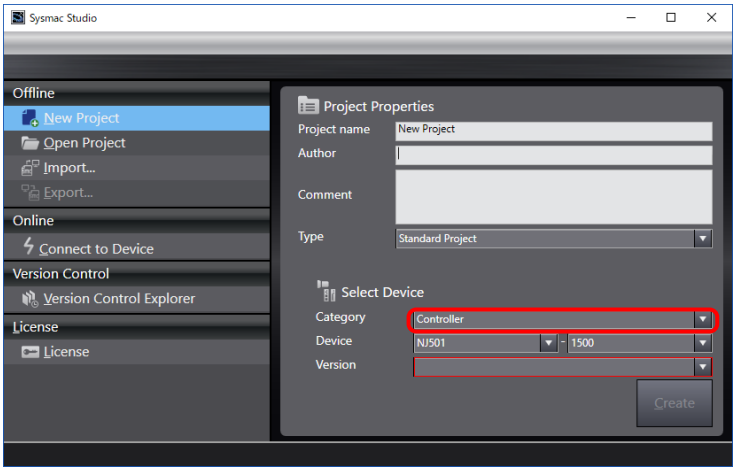
4 Sysmac Studio starts up.
Click **New Project**.



5 The Project Properties Dialog Box is displayed.

*In this guide, "New Project" is used as the project name.

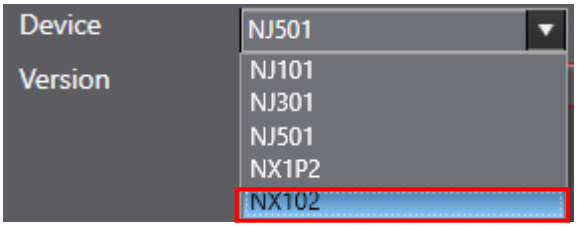
Check that Controller is selected in the *Category* Field of Select Device.

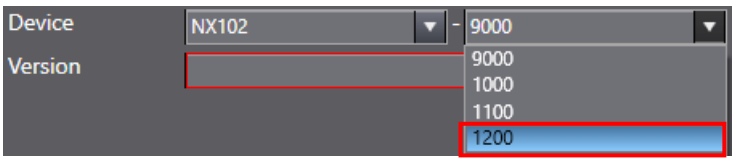


Select the device from the pull-down list of Device.

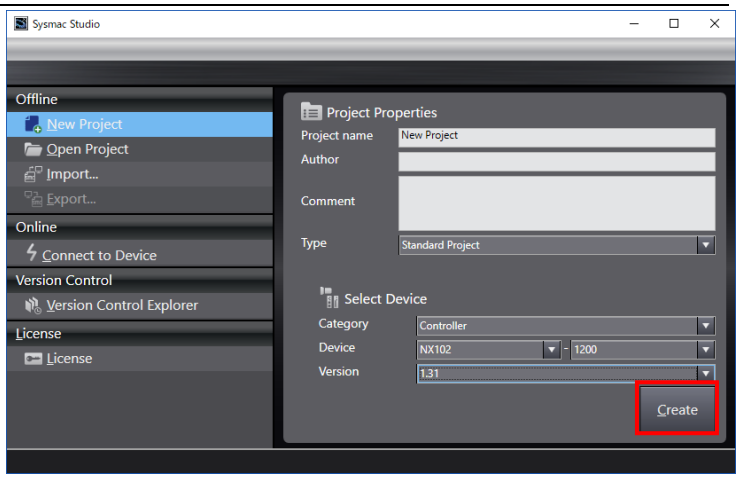
Select the version from the pull-down list of Version.

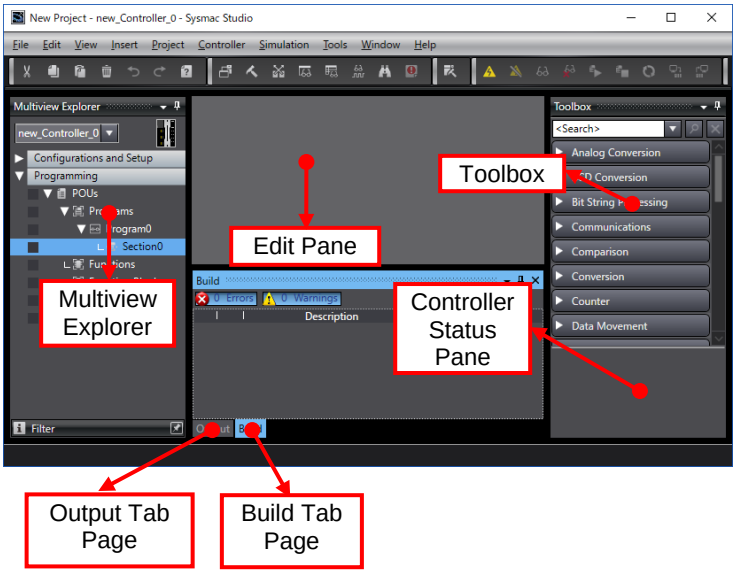
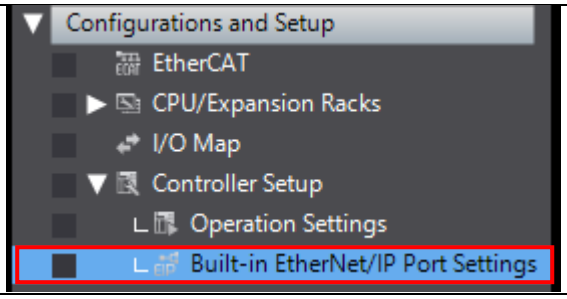
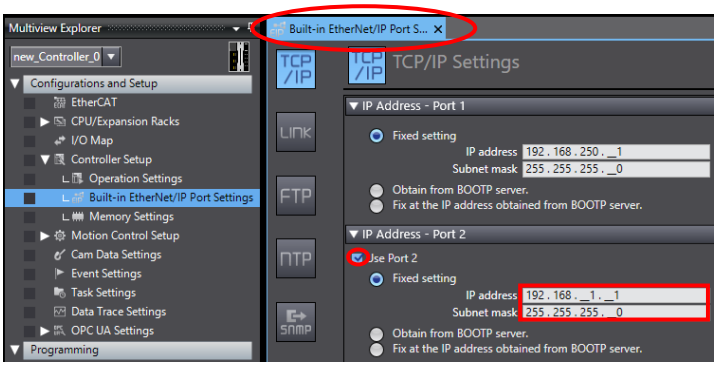
*Although the following Controller is selected as an example in this guide, select Controller to be used.
Device: ***NX102-1200***
Version: ***1.31***





6 Click **Create**.

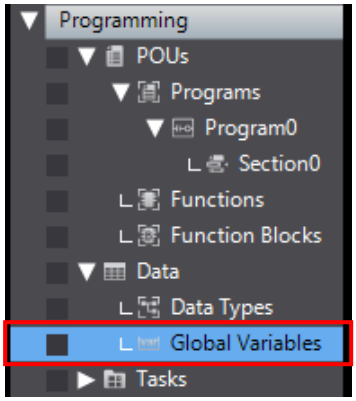


7	The New Project is displayed. The following panes are displayed in the window. Left: Multiview Explorer Top right: Toolbox Bottom right: Controller Status Pane Top middle: Edit Pane The following tabs are displayed in the bottom middle of the window. Output Tab Page Build Tab Page	
8	Double-click **Built-in EtherNet/IP Port Settings** under **Configurations and Setup** – **Controller Setup** in the Multiview Explorer.	
9	The Built-in EtherNet/IP Port Settings Tab Page is displayed in the Edit Pane. Check that the check box of Use Port 2 is selected. Enter the following IP address in the IP Address - Port 2. IP address: *192.168.1.1* Subnet mask: *255.255.255.0*	

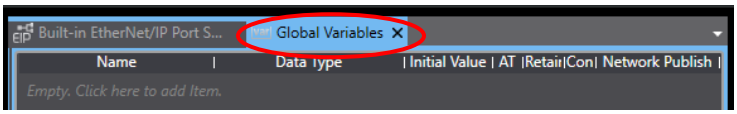
7.3.2. Setting Global Variables

Set global variables to use for tag data links, and create and export a CSV file in order to use the variables as tags in Network Configurator.

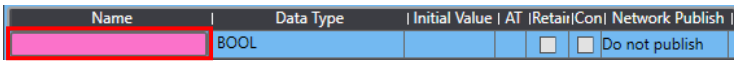
1 Double-click **Global Variables** under **Programming** – **Data** in the Multiview Explorer.



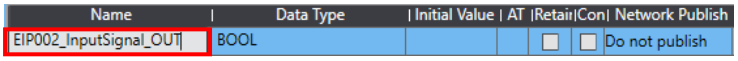
2 The Global Variables Tab Page is displayed in the Edit Pane.



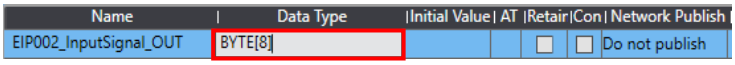
Click on a space to enter a variable in the *Name* Column.



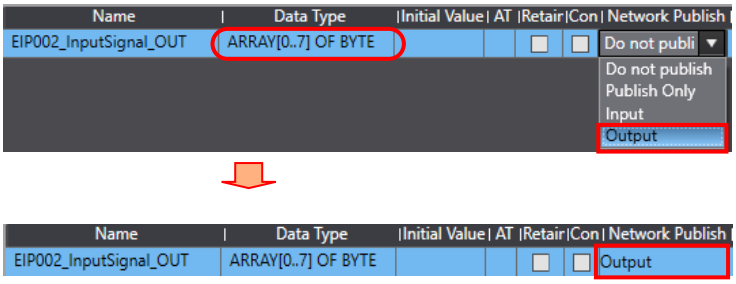
Enter *EIP002_InputSignal_OUT* in the *Name* Column.



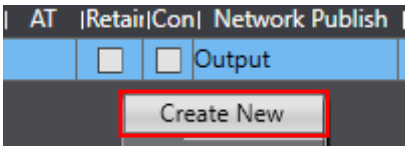
Enter *BYTE[8]* in the *Data Type* Column.

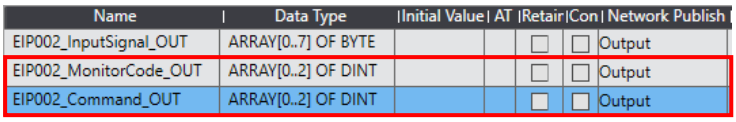
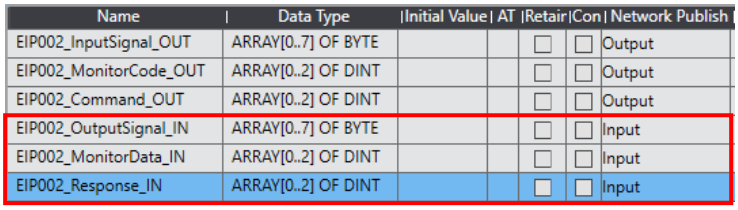
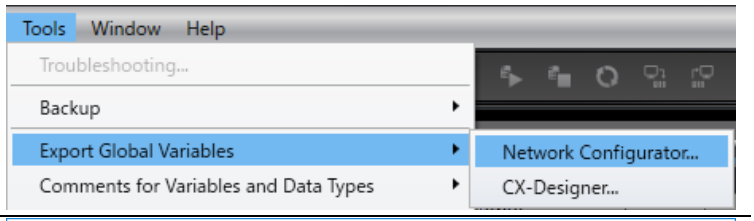
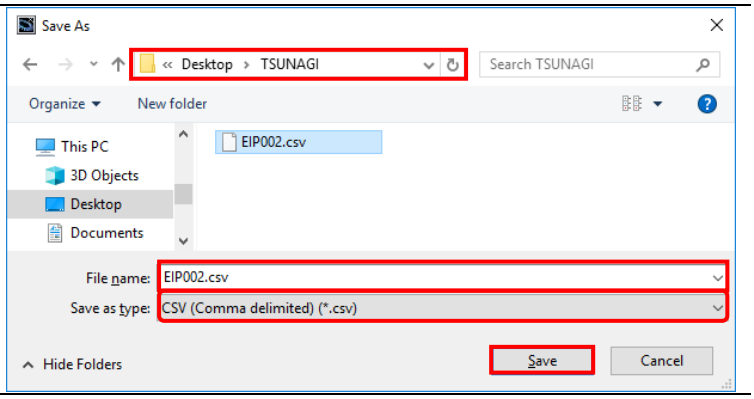


After entering, check that the data type changes to ARRAY[0..7] OF BYTE. Select ***Output*** from the pull-down list of Network Publish.

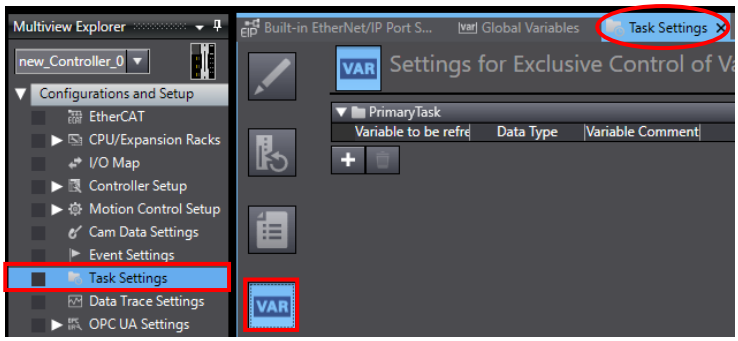


3 Right-click on a space under the entered variable, and select ***Create New*** from the menu to add a new row.

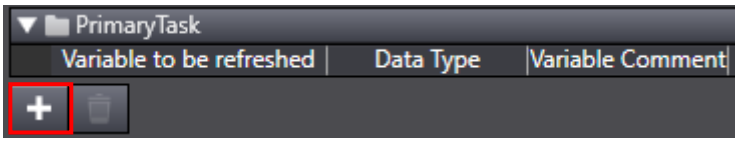


4	In the same way as steps 2 and 3, enter the following data in newly added rows. - Name: *EIP002_MonitorCode_OUT* Data Type: *DINT[3]* Network Publish: ***Output*** - Name: *EIP002_Command_OUT* Data Type: *DINT[3]* Network Publish: ***Output***	
5	In the same way as steps 2 and 3, enter the following data in newly added rows. - Name: *EIP002_OutputSignal_IN* Data Type: *BYTE[8]* Network Publish: ***Input*** - Name: *EIP002_MonitorData_IN* Data Type: *DINT[3]* Network Publish: ***Input*** - Name: *EIP002_Response_IN* Data Type: *DINT[3]* Network Publish: ***Input***	
6	Select ***Export Global Variables*** – ***Network Configurator*** from the Tools Menu.	
7	The Save As Dialog Box is displayed. Select a location to save the file, and enter a file name (example: EIP002). Check that the file type is CSV (Comma delimited) (*.csv). Click **Save**.	

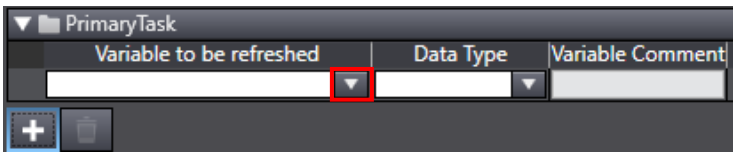
8 Double-click **Task Settings** under **Configurations and Setup** in the Multiview Explorer. The Task Settings Tab Page is displayed in the Edit Pane. Click **VAR**.



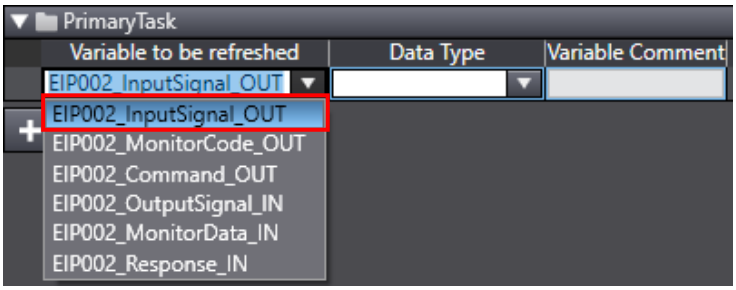
9 Click the **+** Button.



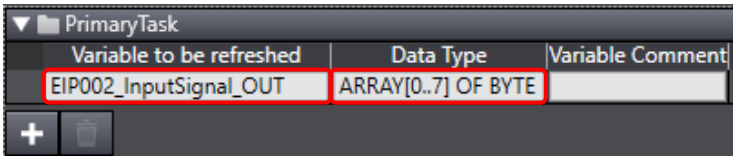
A row for new entry is added. Click the **Down Arrow** Button in the entry cell of the *Variable to be refreshed* Column.



The variables set in the previous steps are listed. Select ***EIP002_InputSignal_OUT***.

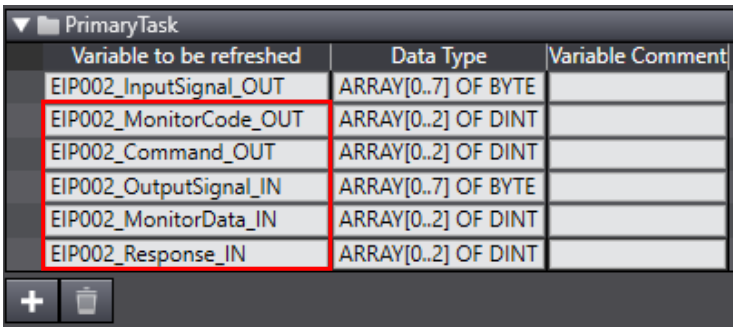


EIP002_InputSignal_OUT is added.



*The relevant data types are automatically set for each variable.

10 In the same way as step 9, add all the variables set in the previous steps to the *Variable to be refreshed* Column.



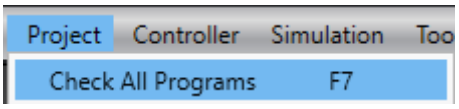
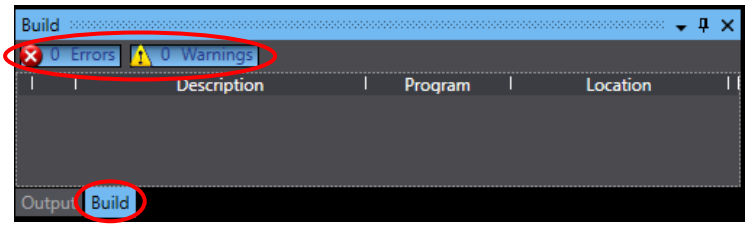
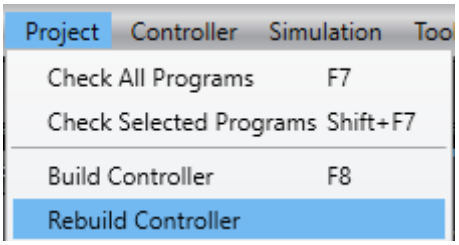
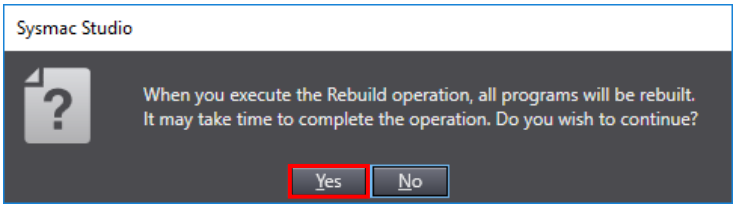
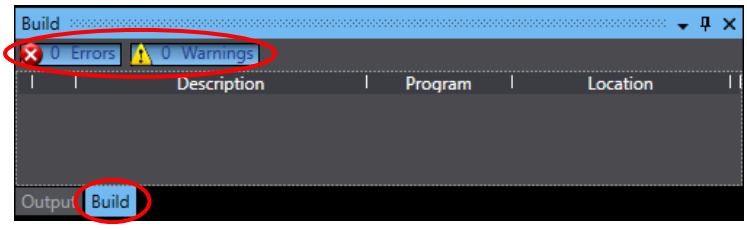
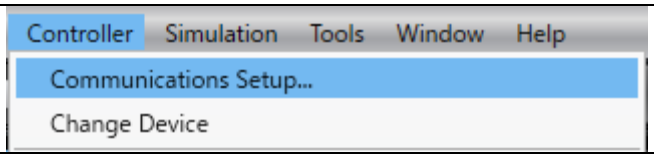
* The relevant data types are automatically set for each variable.

7.3.3. Transferring the Project Data

Go online with Sysmac Studio and transfer the project data to the Controller.

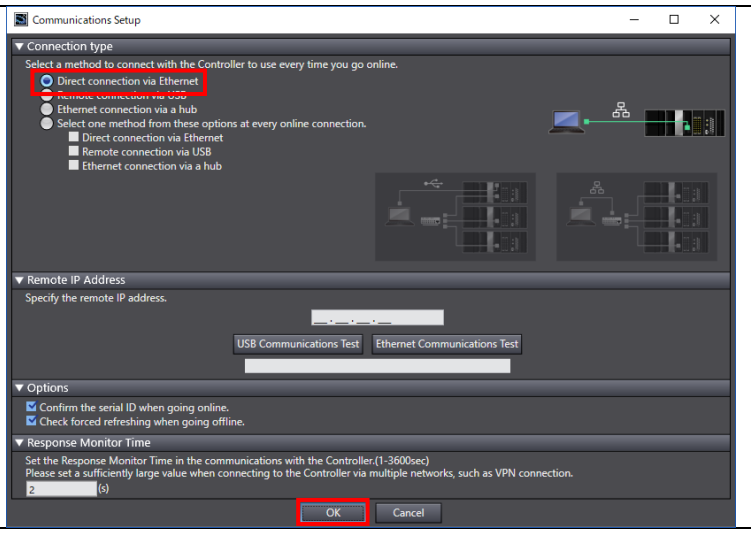
⚠ WARNING

Regardless of the operating mode of the CPU Unit, devices or machines may perform unexpected operation when you transfer any of the following data from Sysmac Studio: a user program, configuration data, setup data, device variables or values in memory used for CJ-series Units.
Always confirm safety at the destination node before you transfer the project data.

1	Turn ON Controller.	
2	Select ***Check All Programs*** from the Project Menu.	
3	The Build Tab Page is displayed. Check that "0 Errors" and "0 Warnings" are displayed.	
4	Select ***Rebuild Controller*** from the Project Menu.	
5	The dialog box on the right is displayed. Check the contents and click Yes.	
6	Check that "0 Errors" and "0 Warnings" are displayed on the Build Tab Page.	
7	Select ***Communications Setup*** from the Controller Menu.	

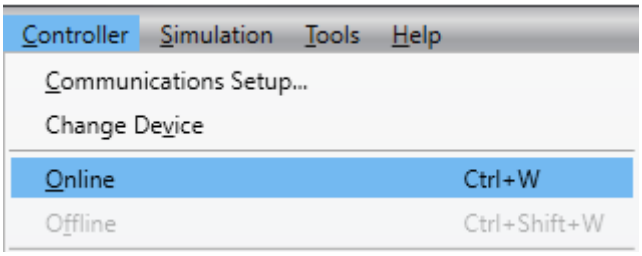
8 The Communications Setup Dialog Box is displayed.
Check that *Direct connection via Ethernet* is selected in the *Connection type* Field.

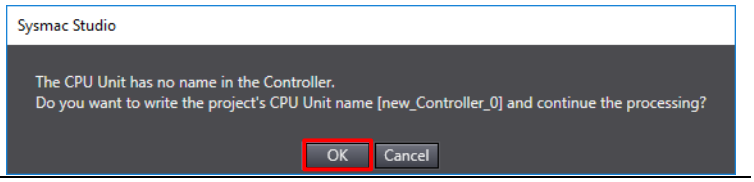
Click **OK**.



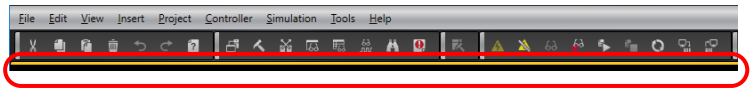
9 Select ***Online*** from the Controller Menu.
If a confirmation dialog box is displayed, check the contents and click **Yes**.

*The contents of the dialog box vary depending on the status of Controller. Check the contents and click on an appropriate button to proceed with the processing.





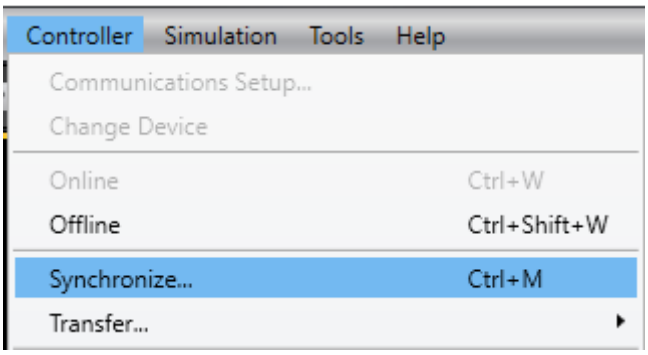
10 When an online connection is established, a yellow line is displayed under the toolbar.

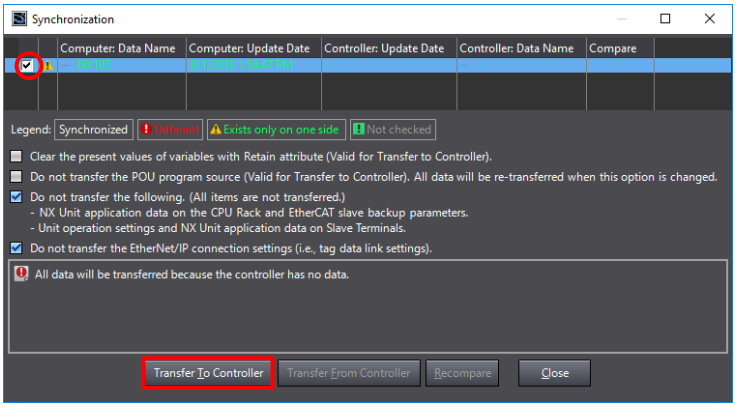
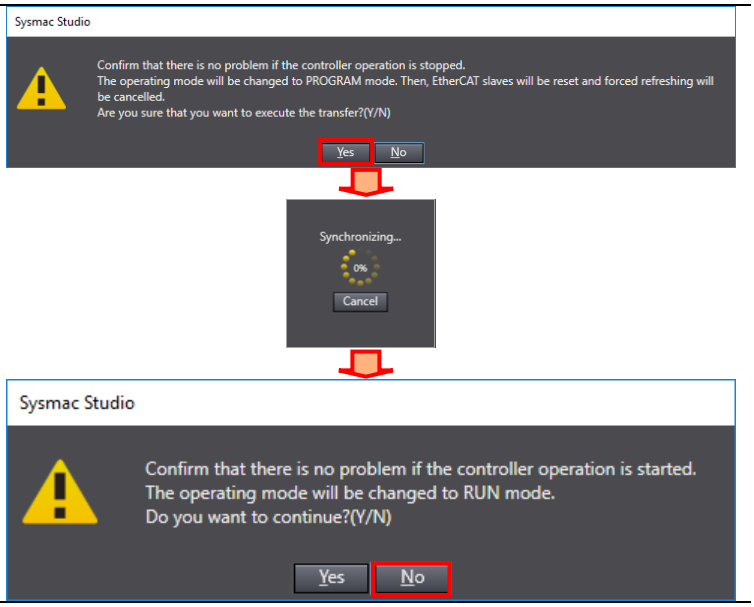


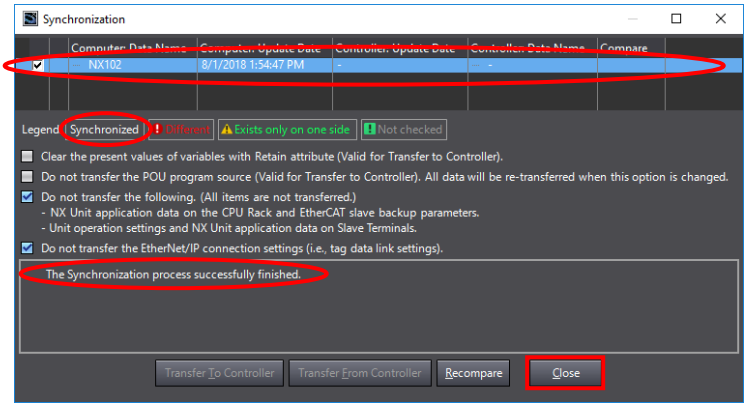
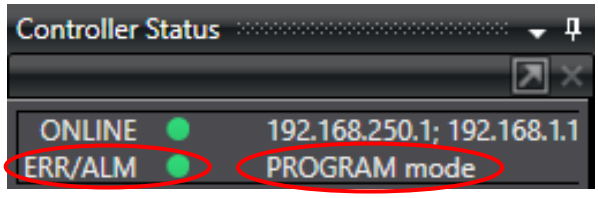
Additional Information

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

11 Select ***Synchronize*** from the Controller Menu.



12	The Synchronization Dialog Box is displayed. Check that the data to transfer (example: NX102) is selected. Click **Transfer To Controller**. *After executing "Transfer To Controller", the Sysmac Studio data is transferred to Controller, and the data is synchronized.	
13	The dialog box on the right is displayed. Confirm that there is no problem, and click **Yes**. A screen is displayed stating "Synchronizing". The dialog box on the right is displayed. Confirm that there is no problem, and click **No**. *Do not return to RUN mode.	

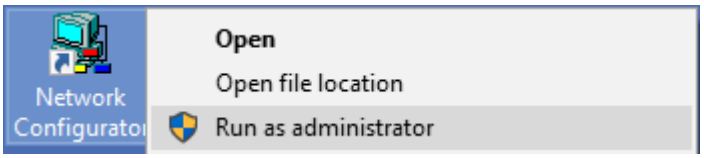
14	As shown in the figure on the right, the font color that is used to display the synchronized data changes to the same color as the one used to specify "Synchronized". Check that a message is displayed stating "The Synchronization process successfully finished". Confirm that there is no problem, and click **Close**. *When the Sysmac Studio project data matches the Controller data, a message is displayed stating "The Synchronization process successfully finished". *If the synchronization fails, check the wiring and repeat from step 1.	
15	Check that the ERR/ALM indicator in the Controller Status Pane changes to a green color and that PROGRAM mode is displayed.	

7.4. Network Settings

Set EtherNet/IP tag data links.

7.4.1. Starting Network Configurator and Installing the EDS File

Start Network Configurator and install the EDS file.

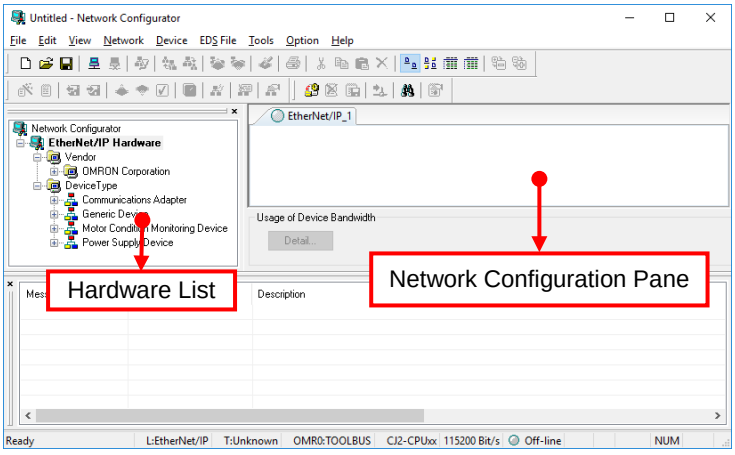
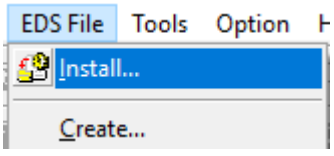
1	Right-click the Network Configurator shortcut icon and select ***Run as administrator*** from the menu.	

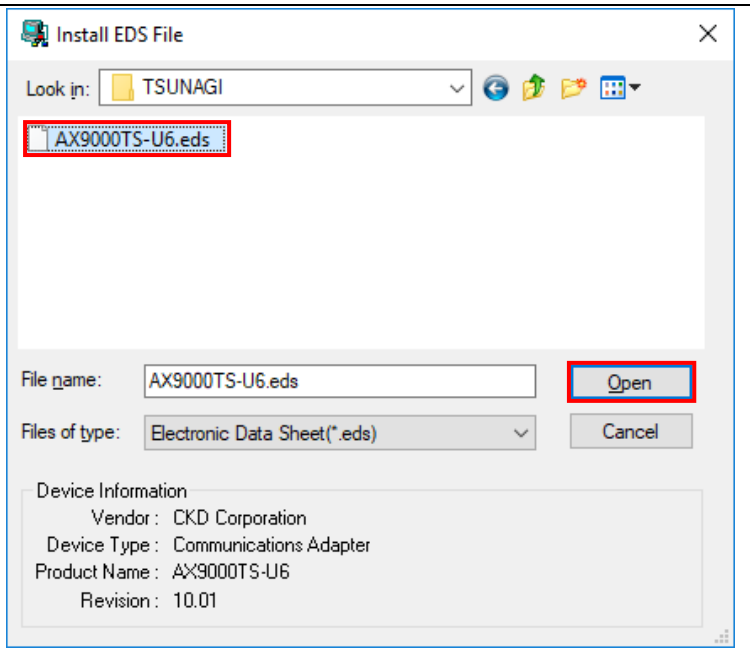
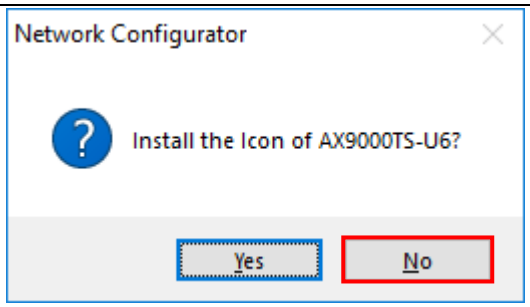
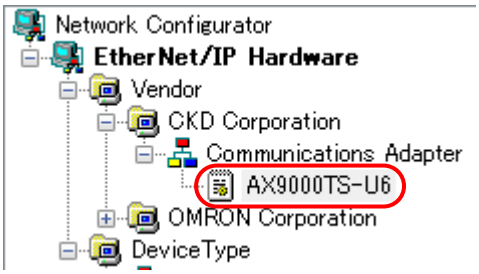
Precautions for Correct Use

To manipulate the EDS file, you must select "Run as administrator" as described in step 1 above to start Network Configurator.
Otherwise, if you login with other user accounts, the following operations listed in the EDS File Menu cannot be applied due to user management for Windows security functions.

EDS File Menu:

Install, Create, Delete and Creating EDS Index Files

2	Network Configurator starts up. The following panes are displayed in the window. Left: Hardware List Right: Network Configuration Pane	
3	Select ***Install*** from the EDS File Menu.	

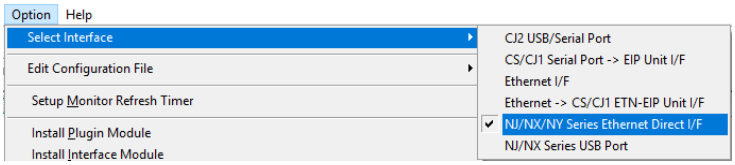
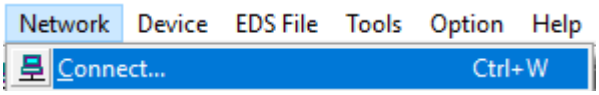
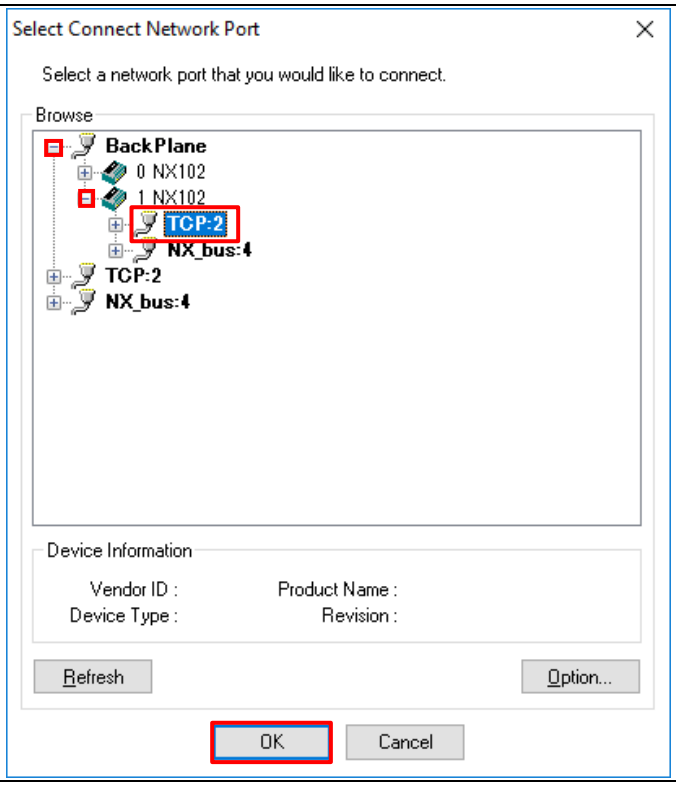
4	The Install EDS File Dialog Box is displayed. Select *AX9000TS-U6.eds* (EDS file) to install. Click **Open**. *For information on how to obtain the EDS file, refer to *Precautions for Correct Use* in *5.2. Device Configuration*.	
5	The dialog box on the right is displayed. Check the contents and click **No**.	
6	Check that AX9000TS-U6 is added to the Hardware List. *It indicates that the EDS file is properly installed.	

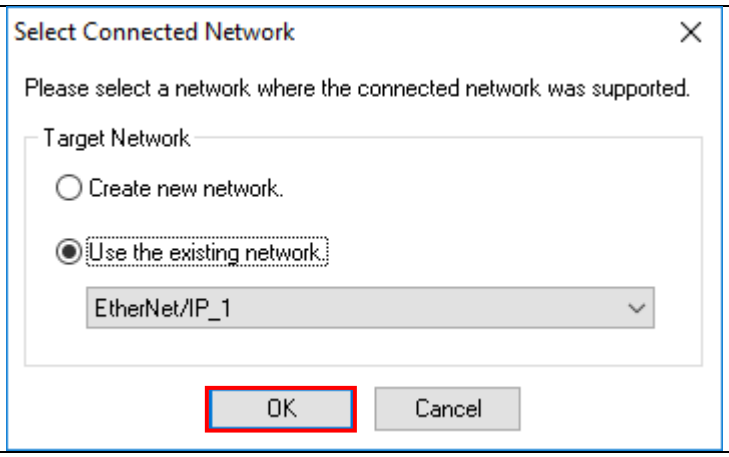
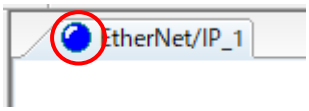
7.4.2. Uploading the Network Configuration

Go online with Network Configurator and upload the network configuration.

Precautions for Correct Use

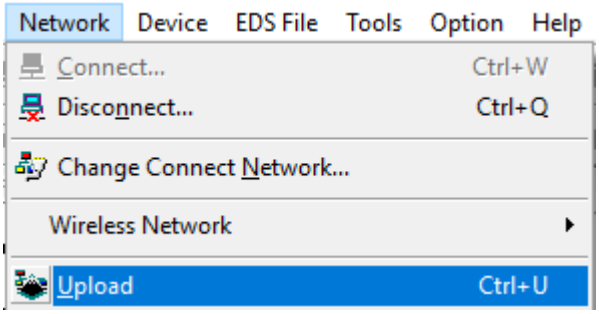
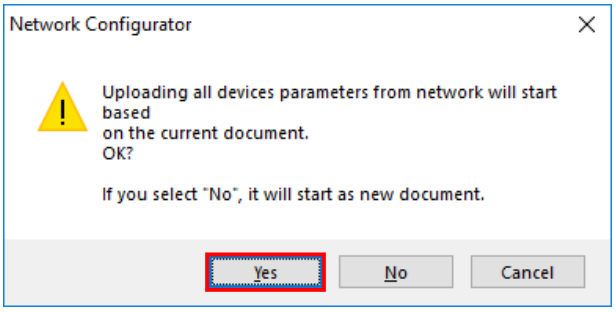
Make sure that the LAN cables are connected before performing the following steps.
If not, turn OFF the devices, and then connect the LAN cables.

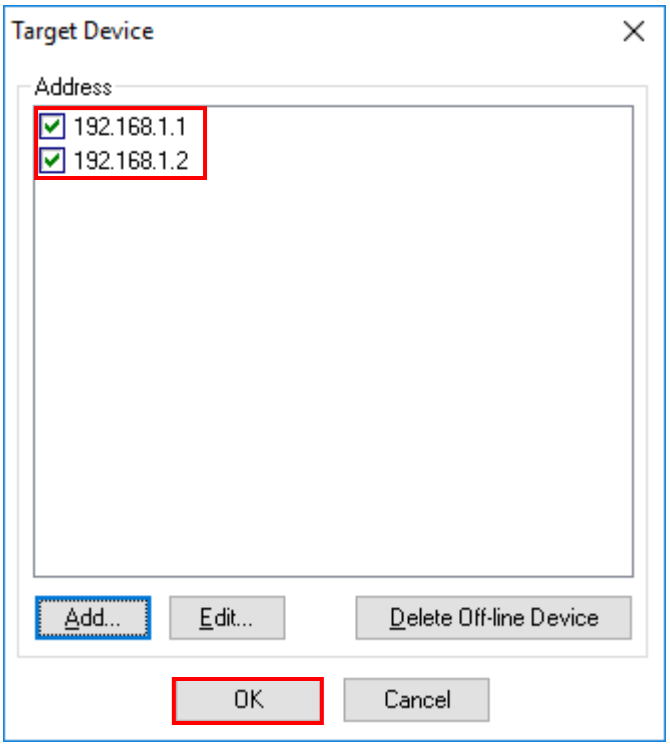
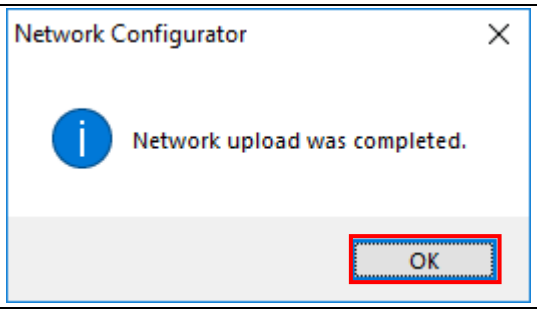
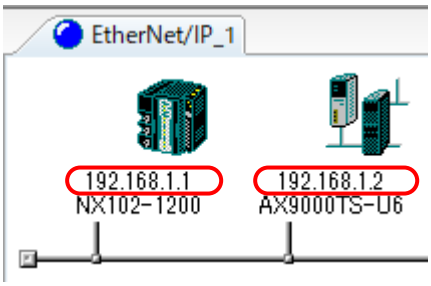
1	Turn ON the following power supplies. - Switching hub power supply - Main, control and external power supplies to ABSODEX Driver	
2	Select ***Select Interface*** – ***NJ/NX/NY Series Ethernet Direct I/F*** from the Option Menu. *The procedures with Network Configurator in this guide assume the online connection with Built-in EtherNet/IP port (PORT1) on Controller via Ethernet Direct I/F.	
3	Select ***Connect*** from the Network Menu.	
4	The Select Connect Network Port Dialog Box is displayed. Select **Back Plane** – **1 NX102** – **TCP:2**. Click **OK**.	

5	The Select Connected Network Dialog Box is displayed. Check the contents and click **OK**.	
6	Check that the color of the network connection icon changes to blue on the **EtherNet/IP_1** Tab displayed in the Network Configuration Pane. *It indicates that Network Configurator and Controller are online.	

Additional Information

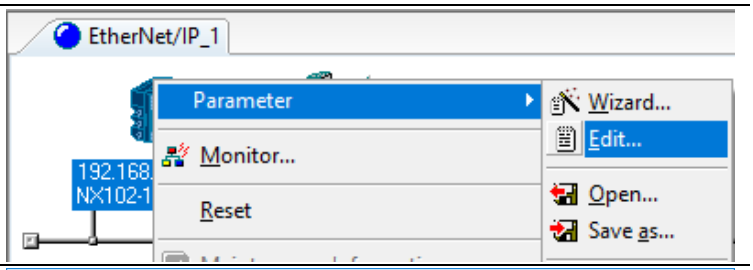
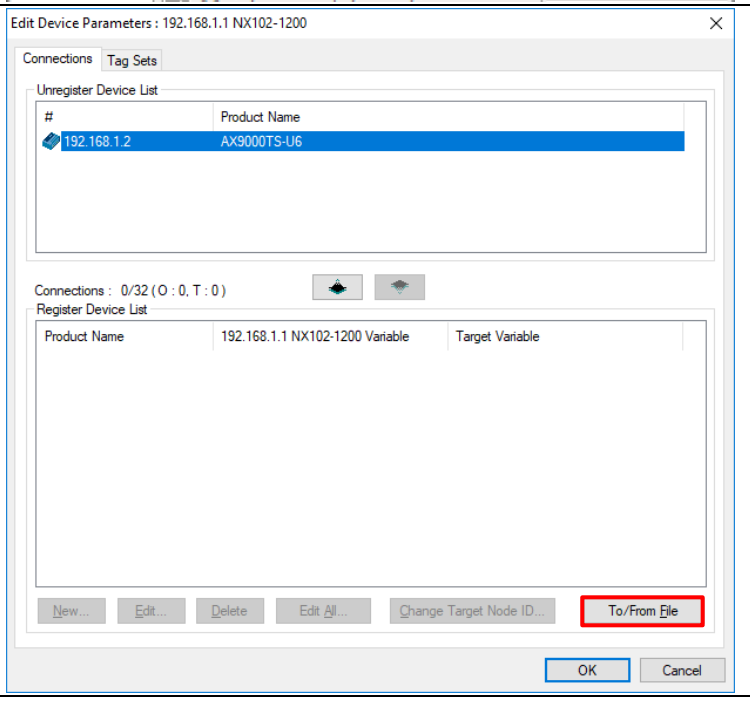
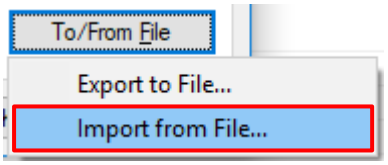
If the online connection to the Controller cannot be established, check the cable connection. Or, return to step 1, check the settings and repeat each step.
For more information, refer to *7-2-8 Connecting the Network Configurator to the Network* of the *NJ/NX-series CPU Unit Built-in EtherNet/IP™ Port User's Manual* (Cat. No. W506).

7	Select ***Upload*** from the Network Menu to upload the device parameters from the network.	
8	The dialog box on the right is displayed. Confirm that there is no problem, and click **Yes**.	

9	The Target Device Dialog Box is displayed. Select *192.168.1.1* and *192.168.1.2*. Click **OK**. *If 192.168.1.1 and 192.168.1.2 are not displayed in the dialog box, click **Add** to add the addresses. *The display of addresses may differ if any previously set addresses are remained in Network Configurator.	
10	The parameters of the connected devices are uploaded. After completing the upload, the dialog box on the right is displayed. Check the contents and click **OK**.	
11	Check that the nodes with the following IP addresses are configured in the Network Configuration Pane. - Controller (Node 1) IP address: 192.168.1.1 - ABSODEX Driver (Node 2) IP address: 192.168.1.2	

7.4.3. Tag Registration

Import the created CSV file for use with Network Configurator, and register tags and tag sets.

1	Right-click Controller (Node 1) in the Network Configuration Pane and select ***Parameter*** – ***Edit*** from the menu.	
2	The Edit Device Parameters Dialog Box is displayed. Click **To/From File**.	
3	Select ***Import from File***.	

4 The Import Connection Configuration Dialog Box is displayed.
Select *EIP002.csv* and click **Open**.

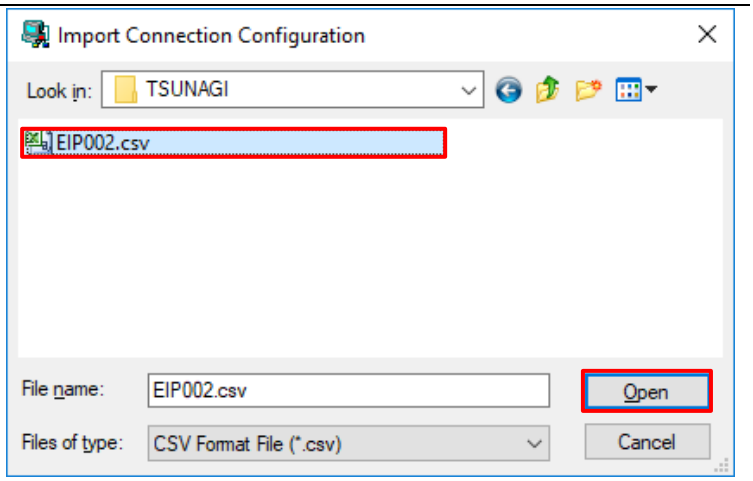
*"EIP002.csv" is the file created in step 7 of *7.3.2. Setting Global Variables*.

*If you have opened the Tag Sets Tab Page (not Connections) and have perform steps 2 to 4, the dialog boxes (1) and (2) shown on the right will be displayed.
Simply follow as below.

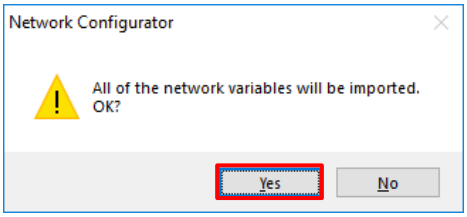
The dialog box (1) is displayed. Confirm that there is no problem, and click **Yes**.

The dialog box (2) is displayed. Confirm that there is no problem, and click **No**.

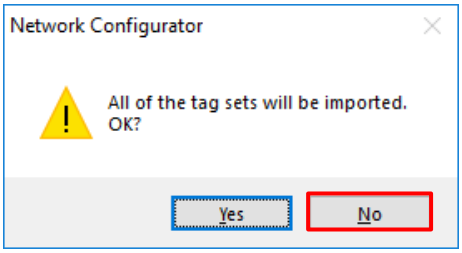
*Do not automatically create a tag set from the tags you import.



Dialog box (1)

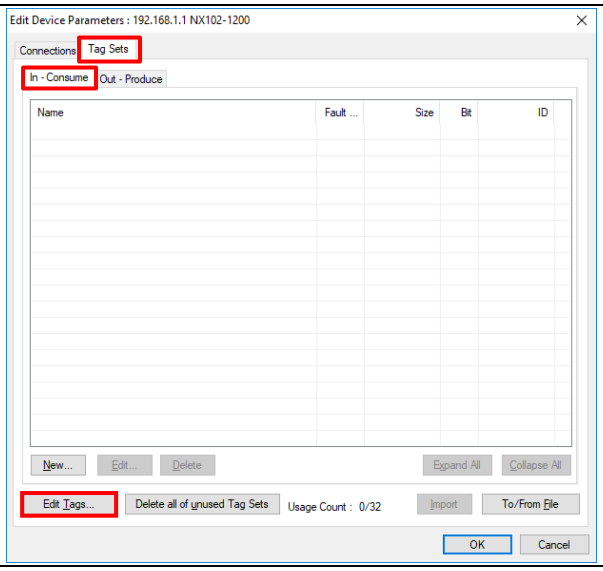


Dialog box (2)



5 Click the **Tag Sets** Tab in the Edit Device Parameters Dialog Box.
Click the **In - Consume** Tab, and then click **Edit Tags**.

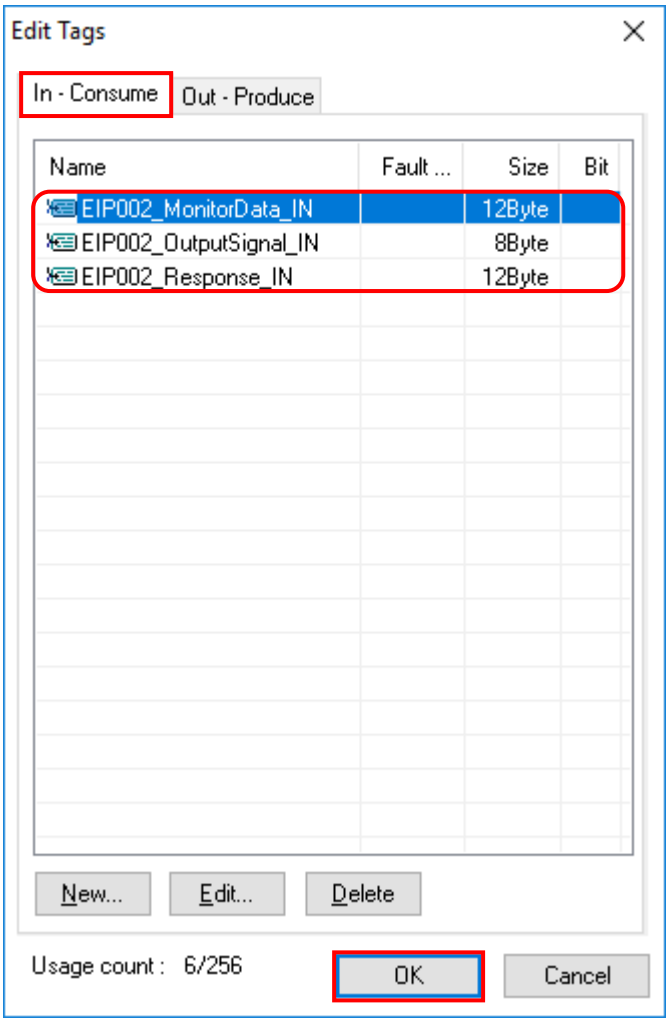
*Follow steps 5 to 12 to create and register an input tag set of Controller (Node 1).



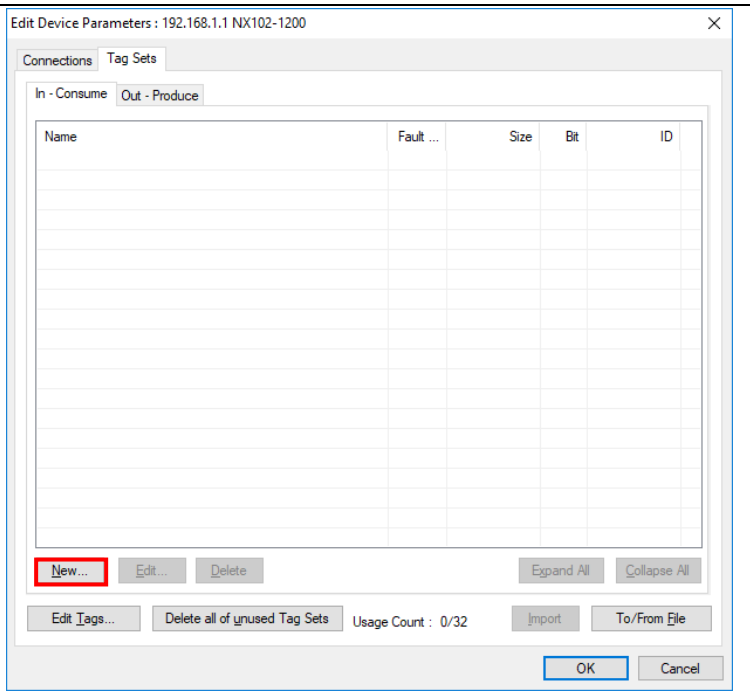
6 The Edit Tags Dialog Box is displayed.
Click the **In - Consume** Tab.

Check that the tab page shows the variable names that are described in *6.3. Tag Sets* and have been set in *7.3.2. Setting Global Variables*.

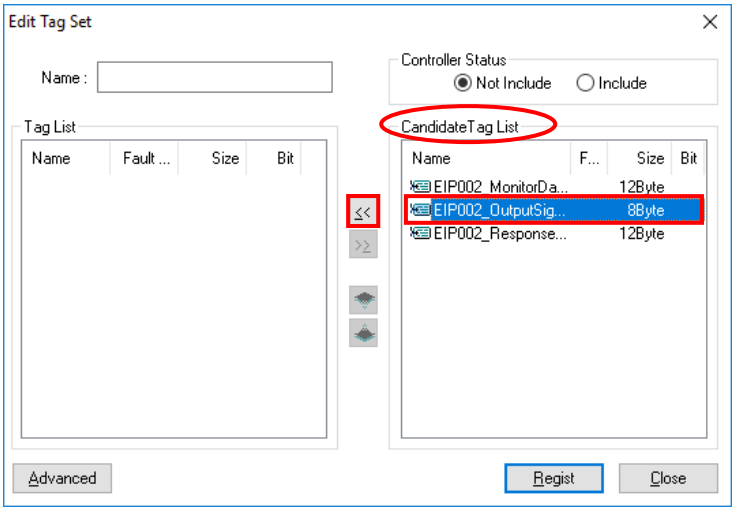
Click **OK**.



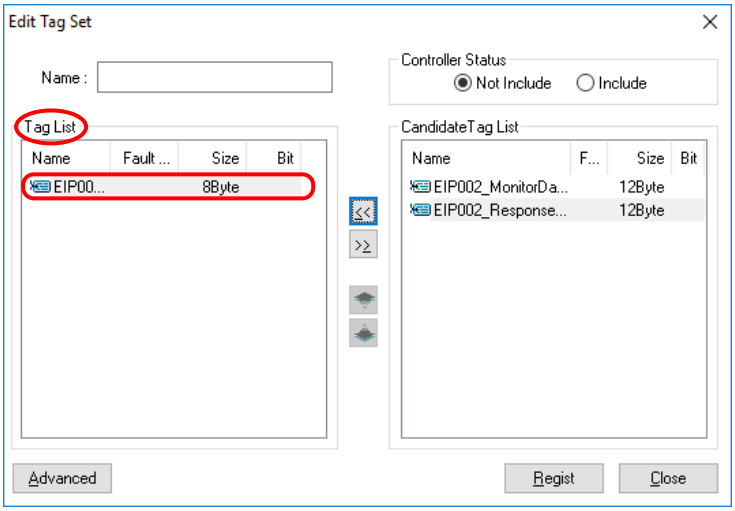
7 Click **New** in the Edit Device Parameters Dialog Box.



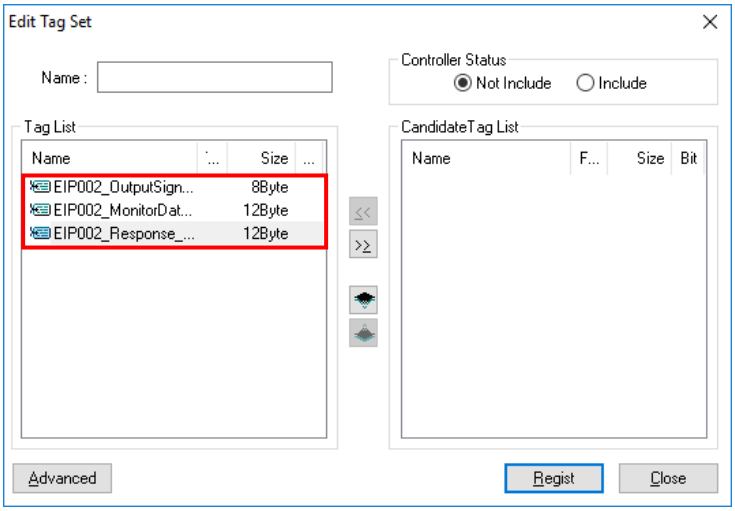
8 The Edit Tag Set Dialog Box is displayed.
Select *EIP002_OutputSignal_IN* from the Candidate Tag List.
Click the **<<** Button.

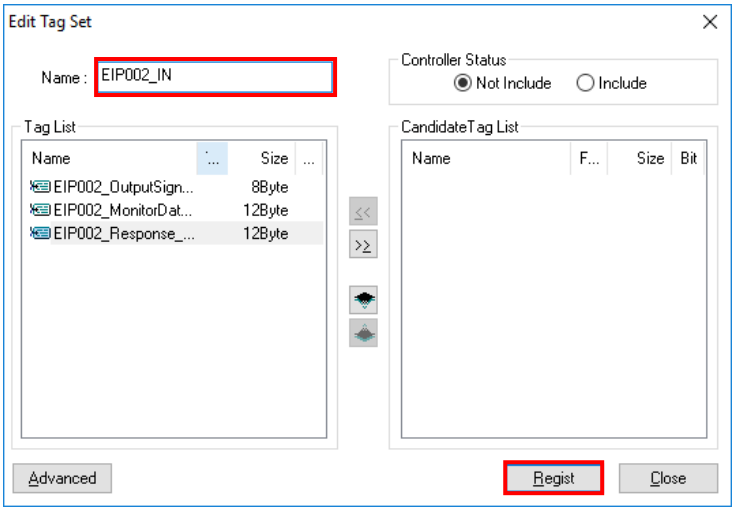
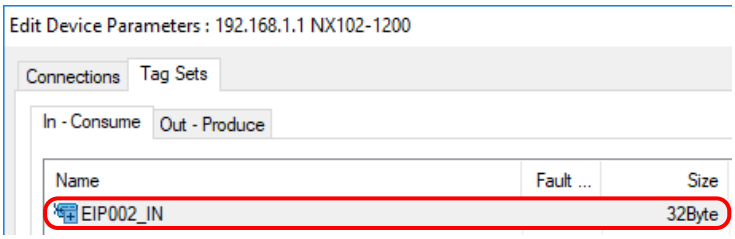
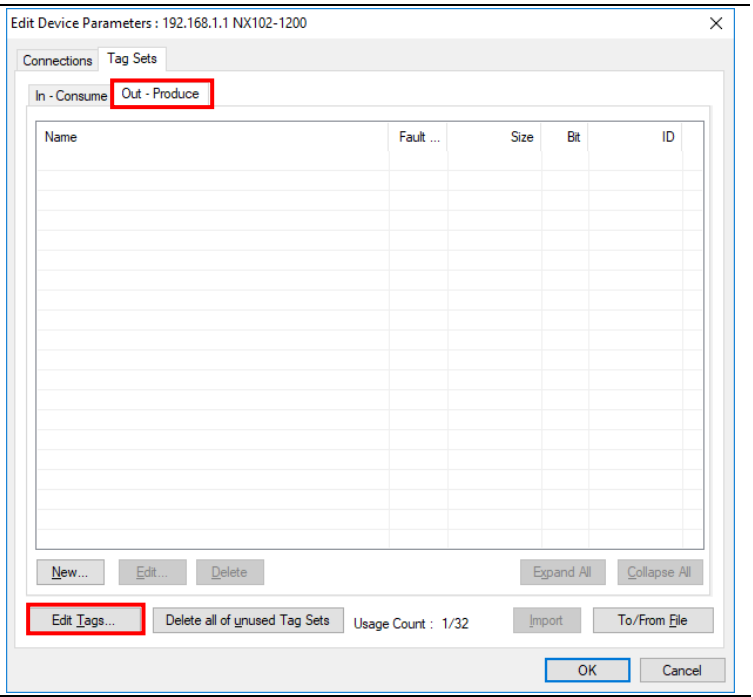


Check that *EIP002_OutputSignal_IN* is registered in the Tag List.



9 In the same way as step 8, individually select all the other variables displayed in the Candidate Tag List and register them in the Tag List in ascending order of IN No. listed in *6.3. Tag Sets*.

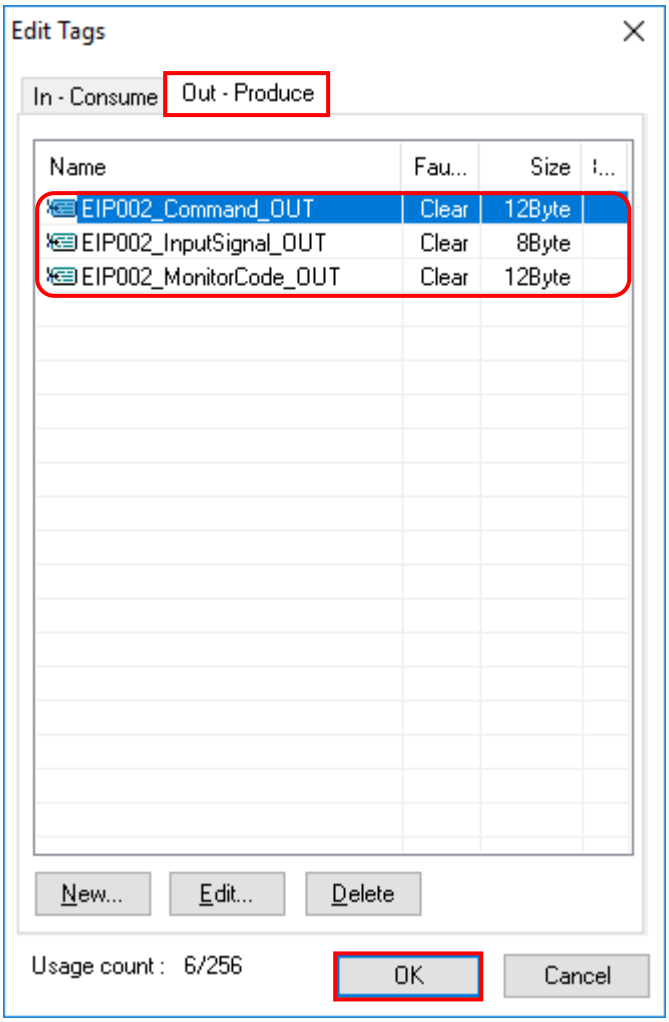


10	Enter *EIP002_IN* in the *Name* Field. Click **Regist**.	
11	The Edit Tag Set Dialog Box is displayed again. Click **Close**.	
12	Check that the following tag set information is displayed on the In - Consume Tab Page of the Edit Device Parameters Dialog Box. Name: EIP002_IN Size: 32 Byte	
13	Click the **Out - Produce** Tab in the Edit Device Parameters Dialog Box. Click **Edit Tags**. *Follow steps 13 to 19 to create and register an output tag set of Controller (Node 1).	

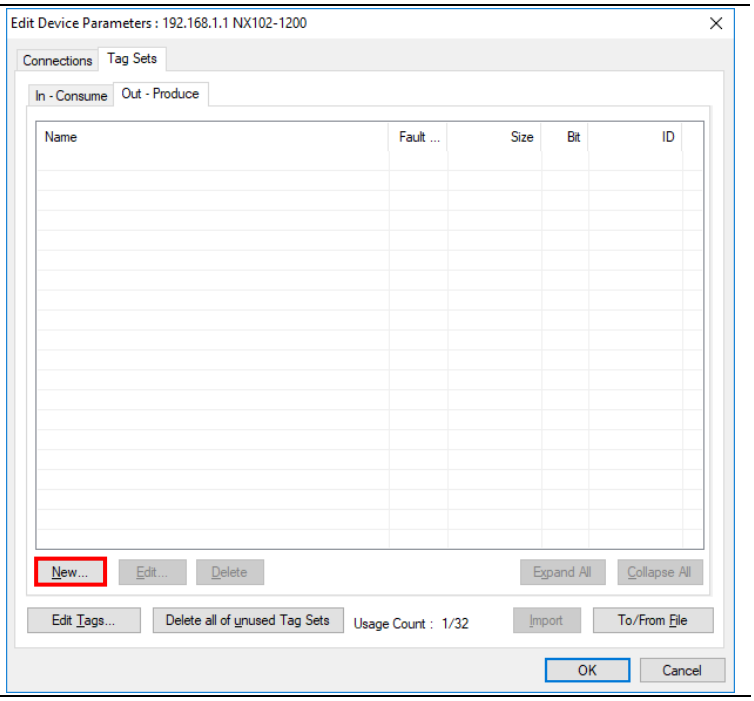
14 The Edit Tags Dialog Box is displayed.
Click the **Out - Produce** Tab.

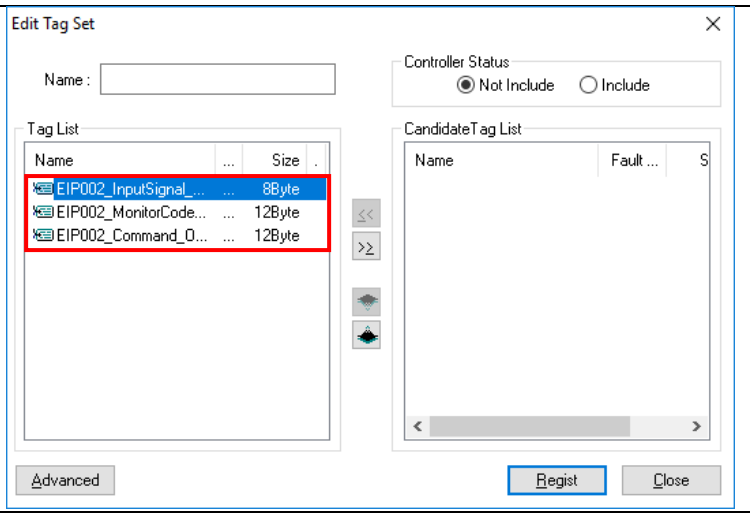
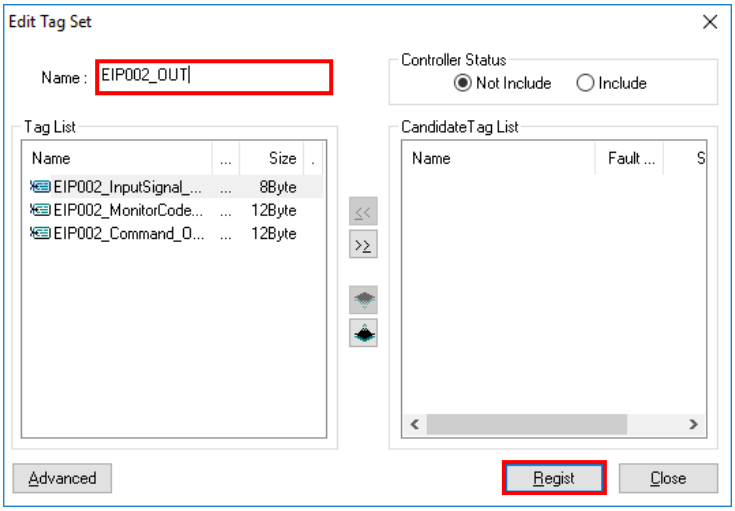
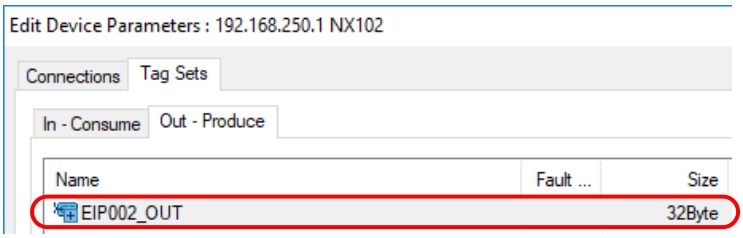
Check that the tab page shows the variable names that are described in *6.3. Tag Sets* and have been set in *7.3.2. Setting Global Variables*.

Click **OK**.



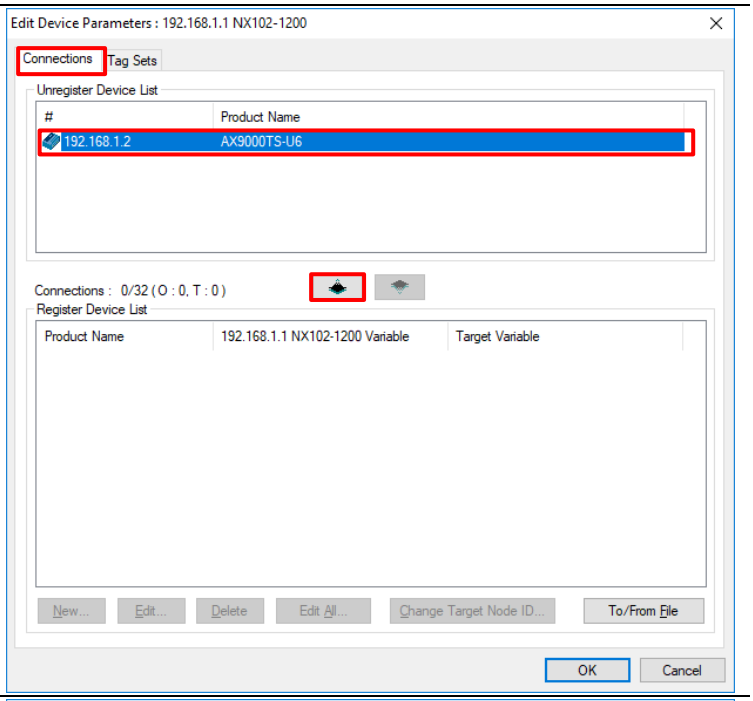
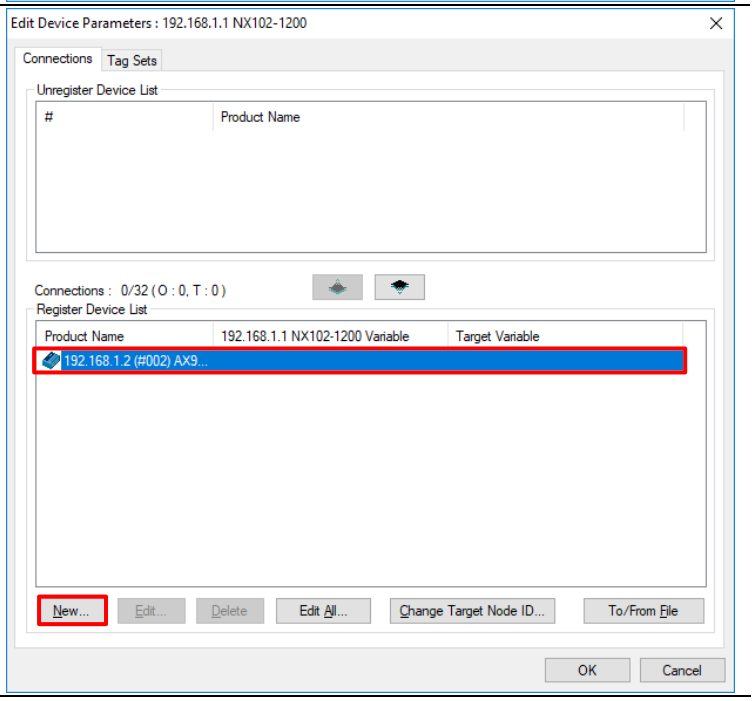
15 Click **New** in the Edit Device Parameters Dialog Box.



16	The Edit Tag Set Dialog Box is displayed. In the same way as steps 8 and 9, individually select all the variables displayed in the Candidate Tag List and register them in the Tag List in ascending order of OUT No. listed in *6.3. Tag Sets*.	
17	Enter *EIP002_OUT* in the *Name* Field. Click **Regist**.	
18	The Edit Tag Set Dialog Box is displayed again. Click **Close**.	
19	Check that the following tag set information is displayed on the Out - Produce Tab Page of the Edit Device Parameters Dialog Box. Name: EIP002_OUT Size: 32 Byte	

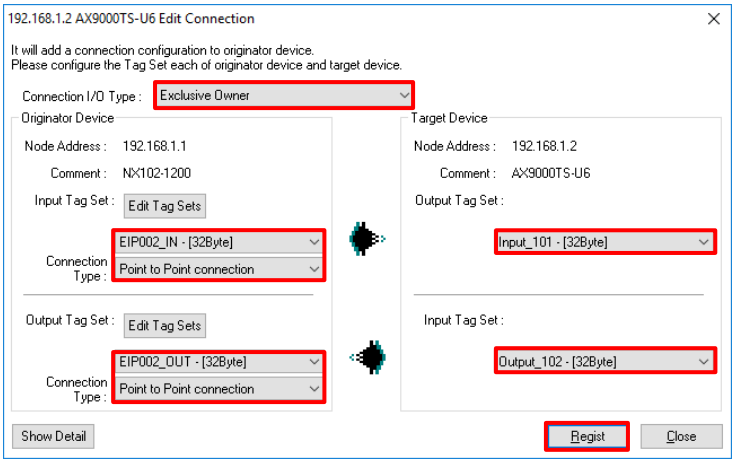
7.4.4. Setting Connections

Set connections to associate the tag sets of the target device with the tag sets of the originator device.

1	Click the **Connections** Tab in the Edit Device Parameters Dialog Box. Select *192.168.1.2* from the Unregister Device List and click  .	
2	192.168.1.2 is registered in the Register Device List. Select *192.168.1.2* and click **New**.	

3 The Edit Connection Dialog Box is displayed.
Set the values (listed in the following table) in the *Connection I/O Type*, *Originator Device* and *Target Device* Fields.

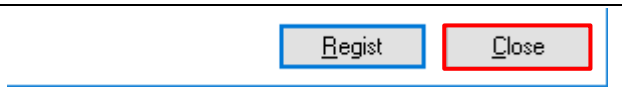
Click **Regist**.



Editing settings for connections

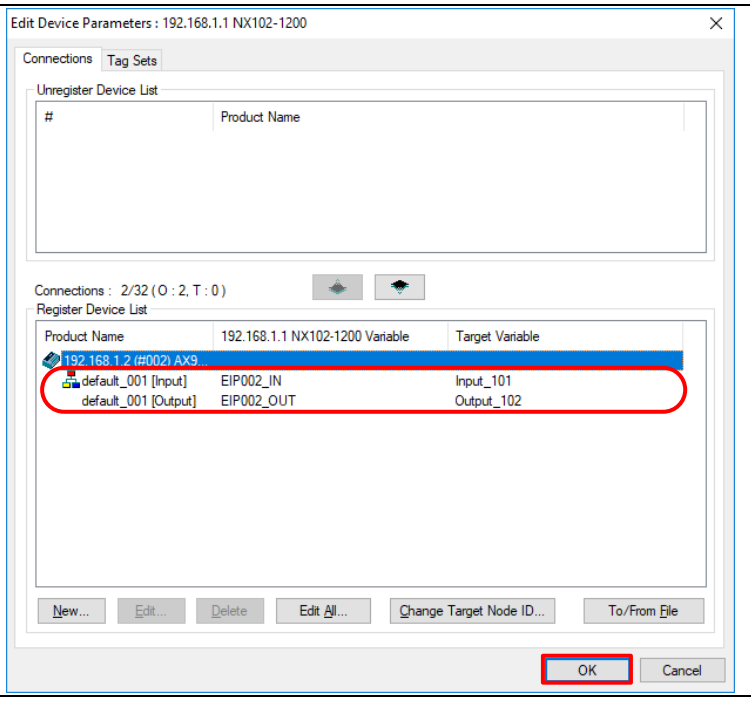
Setting item		Setting value
Connection I/O Type		Exclusive Owner
Originator Device	Input Tag Set	EIP002_IN-[32 Byte]
	Connection Type	Point to Point connection
	Output Tag Set	EIP002_OUT-[32 Byte]
	Connection Type	Point to Point connection
Target Device	Output Tag Set	Input_101-[32 Byte]
	Input Tag Set	Output_102-[32 Byte]

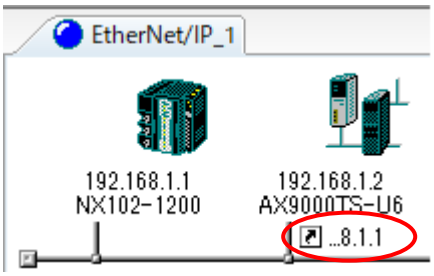
4 The Edit Connection Dialog Box is displayed again.
Click **Close**.



5 The Edit Device Parameters Dialog Box is displayed.
Check that the connections set for 192.168.1.2 are registered.

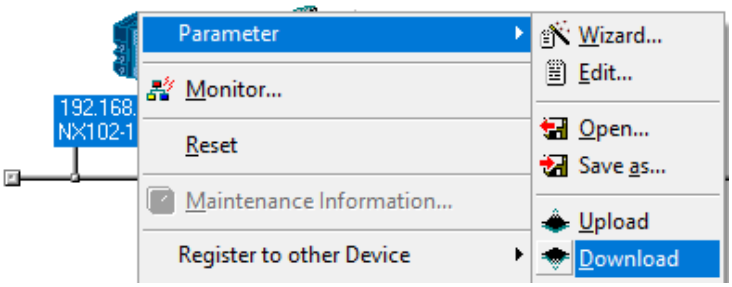
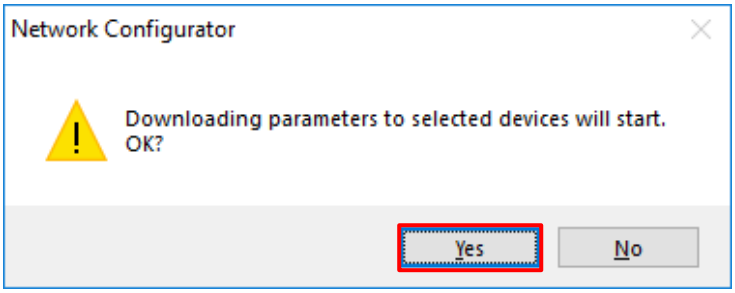
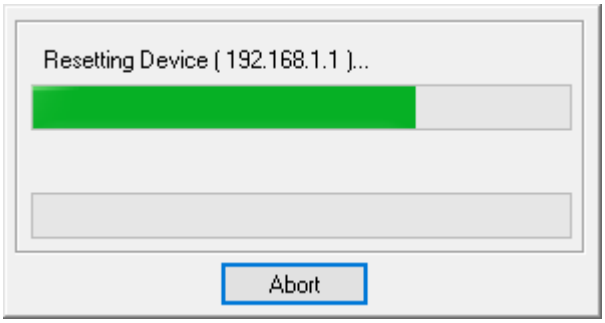
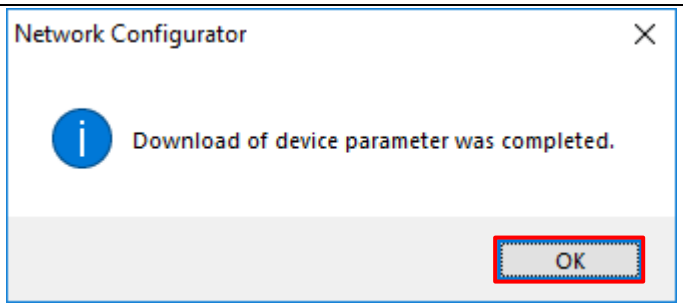
Click **OK**.



6	The IP address of Controller (Node 1) is displayed under ABSODEX Driver (Node 2) in the Network Configuration Pane. *It indicates that the connection settings are completed.	

7.4.5. Transferring the Tag Data Link Parameters

Transfer the tag data link parameters to the Controller.

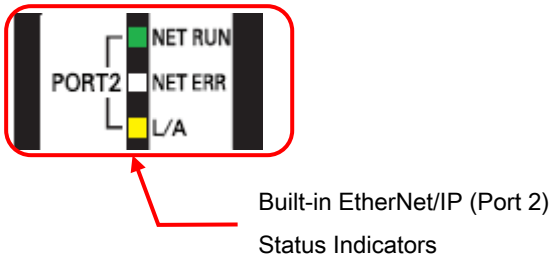
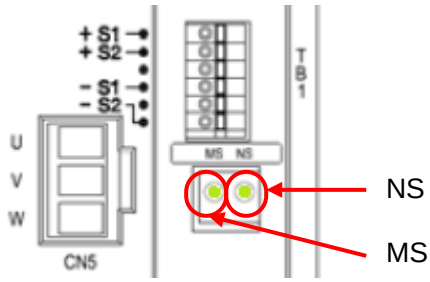
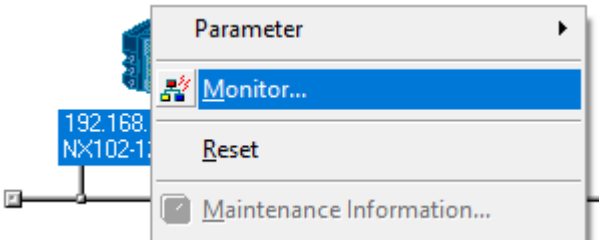
1	Right-click Controller (Node 1) in the Network Configuration Pane and select ***Parameter*** – ***Download*** from the menu.	
2	The dialog box on the right is displayed. Confirm that there is no problem, and click **Yes**.	
3	The tag data link parameters are downloaded from Network Configurator to Controller.	
4	The dialog box on the right is displayed. Check the contents and click **OK**.	

7.5. EtherNet/IP Communication Status Check

Confirm that the EtherNet/IP tag data links are performed normally.

7.5.1. Checking the Connection Status

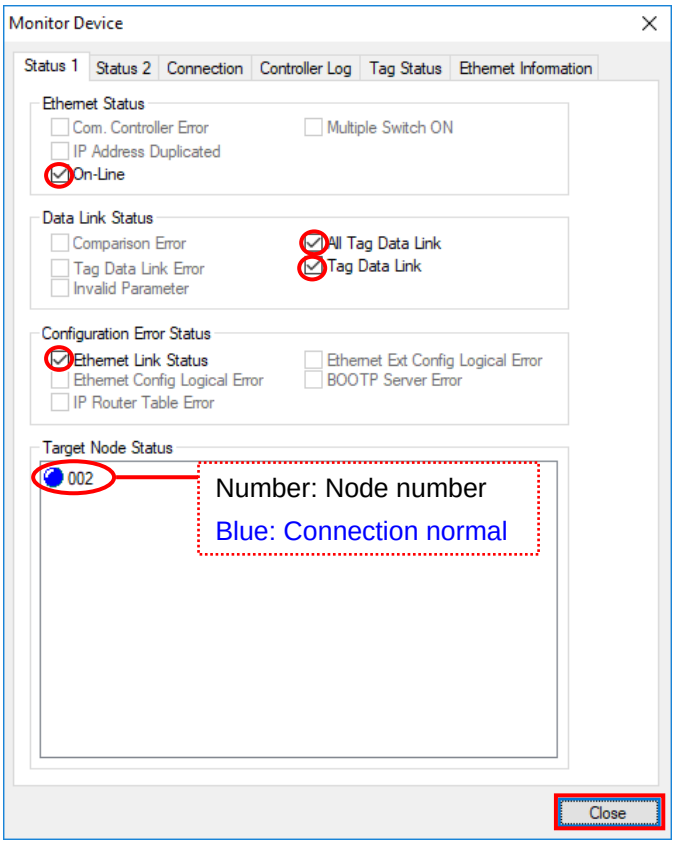
Check the EtherNet/IP connection status.

1	Check with LED indicators on Controller that the tag data links are performed normally. The LED indicators in normal status are as follows: NET RUN: Green lit NET ERR: Not lit LINK/ACT: Yellow flashing (Flashing while packets are being sent and received.) *The NJ-series Controllers also have the same LED indicator status.	
2	Check the LED indicators on ABSODEX Driver. The LED indicators in normal status are as follows: MS: Green lit NS: Green lit	
3	The normal performance of tag data links can be confirmed with the status information displayed in the Monitor Device Dialog Box of Network Configurator. Right-click Controller (Node 1) in the Network Configuration Pane and select ***Monitor***.	

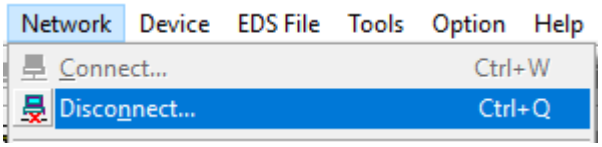
4 The Monitor Device Dialog Box is displayed.
Check that the following check boxes are selected on the Status 1 Tab Page.
- On-Line
- All Tag Data Link
- Tag Data Link
- Ethernet Link Status

Check that the target node status is displayed as shown on the right.

Click **Close**.

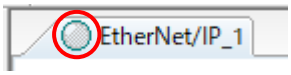


5 Select ***Disconnect*** from the Network Menu.

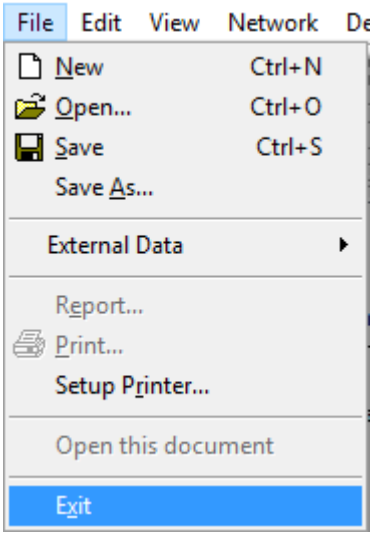


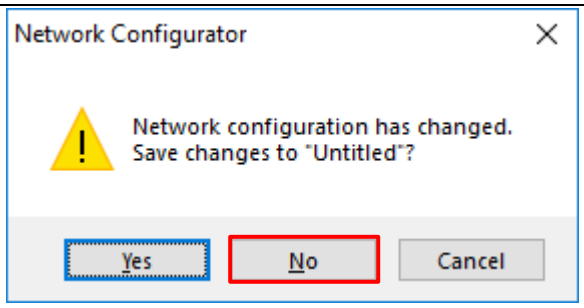
6 Check that the color of the network connection icon changes to grey on the **EtherNet/IP_1** Tab displayed in the Network Configuration Pane.

*It indicates that Network Configurator and Controller are offline.



7 Select ***Exit*** from the File Menu to exit Network Configurator.



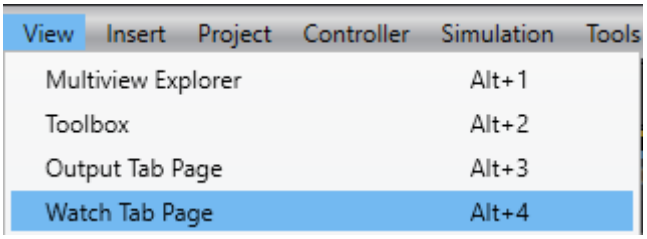
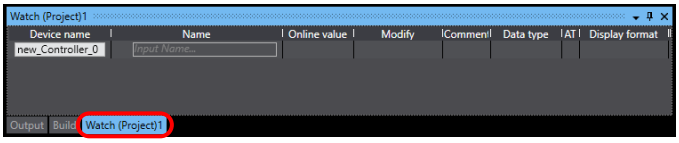
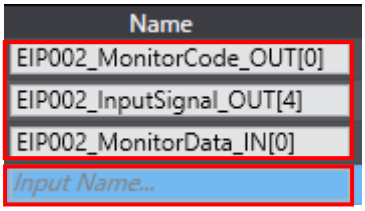
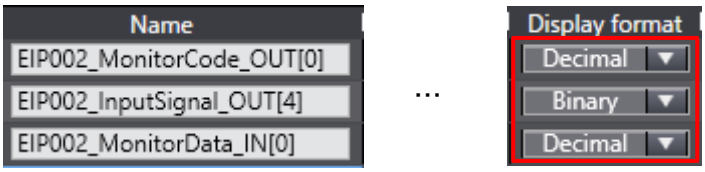
8	A confirmation dialog box is displayed asking whether to save the parameters in a network configuration file. Confirm that there is no problem, and click **No**. *If you wish to save the parameters in a network configuration file, click **Yes** to save the parameters.	

7.5.2. Checking Sent and Received Data

Check that correct data is sent and received.

⚠ Caution

If you change the variable values on a Watch Tab Page when Sysmac Studio is online with the CPU Unit, the devices connected to the Controller may operate regardless of the operating mode of the CPU Unit.
Always ensure safety before you change the variable values on a Watch Tab Page when Sysmac Studio is online with the CPU Unit.

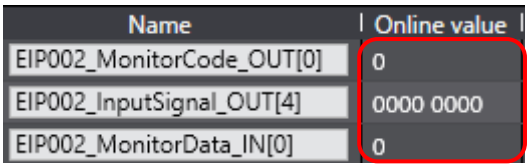
1	With Sysmac Studio, select ***Watch Tab Page*** from the View Menu.	
2	The Watch (Project)1 Tab Page is displayed.	
3	Click *Input Name* and enter the following variable names for monitoring. *EIP002_MonitorCode_OUT[0]* (Monitor code 1) *EIP002_InputSignal_OUT[4]* (Bit 0: Monitor output execution request) *EIP002_MonitorData_IN[0]* (Monitor data 1)	
4	Select the display format for each variable as follows: *EIP002_MonitorCode_OUT[0]*: ***Decimal*** *EIP002_InputSignal_OUT[4]*: ***Binary*** *EIP002_MonitorData_IN[0]*: ***Decimal***	

5 Check that the following online values of the variables are displayed.

EIP002_MonitorCode_OUT[0]: 0

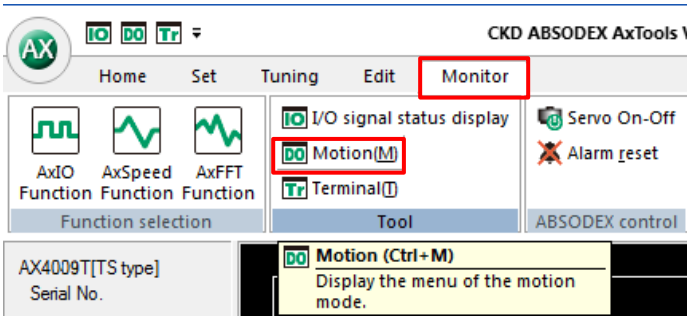
EIP002_InputSignal_OUT[4]: 0000 0000

EIP002_MonitorData_IN[0]: 0

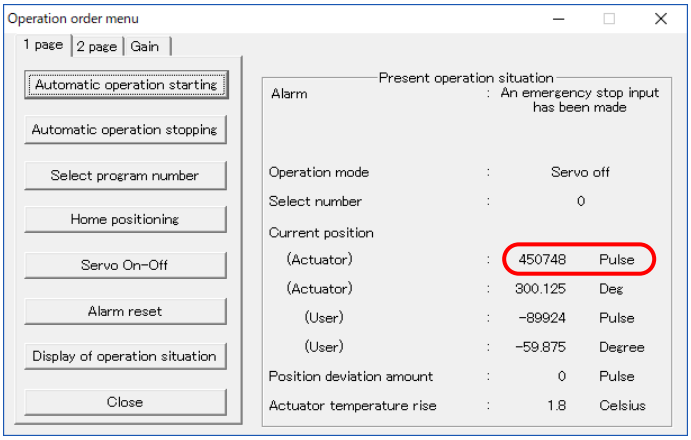


6 With AXTools, select the **Monitor** Tab. The View of the Monitor Tab is displayed. Select ***Motion*** from the Ribbon Menu.

*If AXTools is not started, refer to *7.2.2. Parameter Settings* to start AXTools, then connect to ABSODEX Driver again.



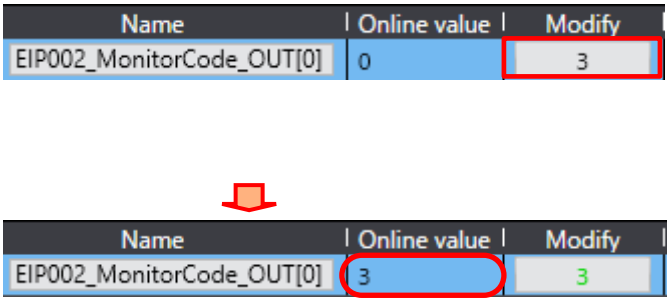
7 The Operation order menu Dialog Box is displayed.
Check the value of Current position (Actuator) in the Present operation situation.
(450748 pulses in this example)

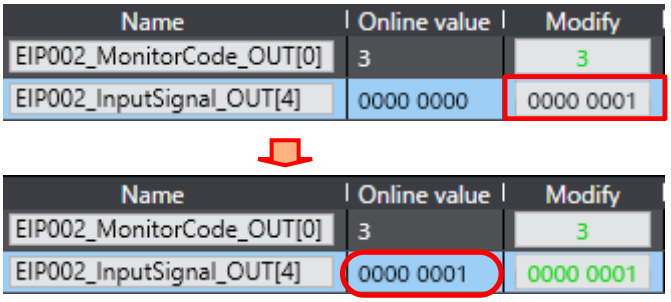
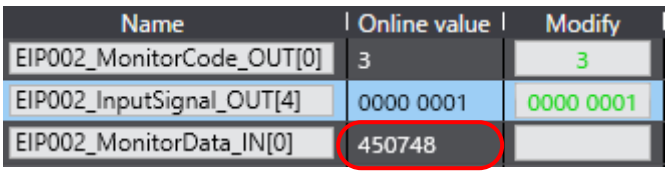


8 On the Watch Tab Page in Sysmac Studio, enter *3* in the *Modify* Column for *EIP002_MonitorCode_OUT[0]*.

The online value of *EIP002_MonitorCode_OUT[0]* changes to 3.

*For the above mentioned variable (Monitor code 1), set the code No. of the monitored item that is selected to be fetched into Monitor data 1.
Here, the code No. 3 is set as an example, which indicates the current position in full rotation (pulse).



9	Enter *0000 0001* in the *Modify* Column for *EIP002_InputSignal_OUT[4]*. *The value of the code No. 3 (current position in full rotation (pulse)) that is set in step 8 can be stored by changing bit 0 of the above mentioned variable to 1 (monitor output execution request ON).	
10	Check that the following online value is displayed. *EIP002_MonitorData_IN[0]* (Monitor data 1): 450748 *This indicates that Controller has received 450748 as the current position in full rotation (pulse) of ABSODEX Driver, which is the same as the value checked in step 7. *The value of the current position in full rotation (pulse) varies depending on ABSODEX Driver used.	

Additional Information

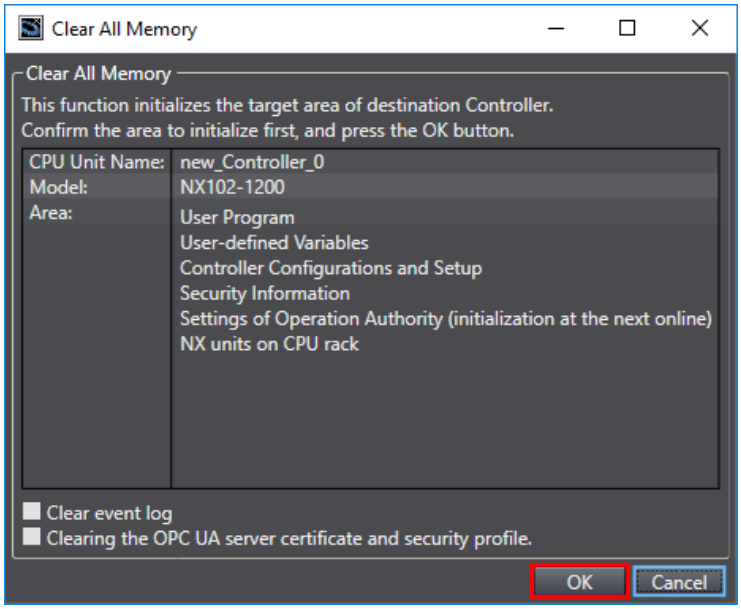
For more information on how to output monitor data using monitor codes, refer to *3.3. Monitor Code/Command Code* and *3.4.1. Monitor Code* of the *Instruction Manual ABSODEX AX Series TS type TH type EtherCAT specification EtherNet/IP specification* (SMF-2012-A).

8. Initialization Method

The setting procedures in this guide are based on the factory default settings.
Some settings may not be applicable unless you use the devices with the factory default settings.

8.1. Initializing a Controller

To initialize a Controller, clear all memory of a CPU Unit.
Change the operating mode of Controller to PROGRAM mode and select ***Clear All Memory*** from the Controller Menu in Sysmac Studio. The Clear All Memory Dialog Box is displayed.
Check the contents and click **OK**.



8.2. Initializing a CKD ABSODEX Driver

For information on how to initialize a CKD ABSODEX Driver, refer to *3-2-1-4 ABSODEX initialization* of the *INSTRUCTION MANUAL ABSODEX AX Tools for Windows® Common for TS-Type, TH-Type, MU-Type and XS-Type Drivers* (SMF-2005-A).

9. Revision History

Revision code	Date of revision	Description of revision
01	December 2018	First edition

2026/6/30 Discontinued

2026/6/30 Discontinued

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