Machine Automation Controller NJ-series

EtherNet/IP™ Connection Guide

OMRON Corporation

Displacement Sensor(Confocal Fiber Type)

(ZW-CE1)

Network

Connection

Guide

sysmac
always in control

Table of Contents

1. Related Manuals

The table below lists the manuals related to this document.

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

Cat. No.	Model	Manual name
W500	NJ501-[][][][] NJ301-[][][][]	NJ-series CPU Unit Hardware User's Manual
W501	NJ501-[][][][] NJ301-[][][][]	NJ-series CPU Unit Software User's Manual
W506	NJ501-[][][][] NJ301-[][][][]	NJ-series CPU Unit Built-in EtherNet/IP™ Port User's Manual
W504	SYSMAC-SE2[][][]	Sysmac Studio Version 1 Operation Manual
Z332	ZW-CE1[]	ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual

2. Terms and Definitions

Term	Explanation and Definition
Tag data link	A function that enables cyclic tag data exchanges on an EtherNet/IP network between Controllers or between Controllers and other devices without using a user program in the Controllers.
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.
Connection	A connection is used to exchange data as a unit within which data synchronicity is maintained. Thus, data concurrency is maintained for all the data exchanged for a tag or multiple tags in one data set.
Originator and Target	One node requests the opening of a communications line called "connection" to perform tag data links. The node that requests opening the connection is called "originator", and the node that receives the request is called "target".
Node	With EtherNet/IP network, 1 node is 1 EtherNet/IP port.
Tag data link parameter	The tag data link parameter is the setting data to perform the tag data link. It includes the data to set tags, tag sets, and connections.
EDS file	A file that contains the I/O points of EtherNet/IP devices and the parameters that can be set via EtherNet/IP.

3. Remarks

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

(2) To ensure system safety, always read and heed the information provided in all Safety Precautions, Precautions for Safe Use, and Precaution for Correct Use of manuals for each device used in the system.

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

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

(5) This document provides the latest information as of May 2013. The information on this document is subject to change without notice for improvement.

The following notation is used in this document.

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

Precautions for Safe Use

Precautions on what to do and what not to do to ensure safe usage of the product.

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.

Symbols

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

❶ 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 the Displacement Sensor (ZW series) of OMRON Corporation (hereinafter referred to as OMRON) to NJ-series Machine Automation Controller (hereinafter referred to as the Controller) via EtherNet/IP and provides the procedure for checking their connection.

Specifically, it describes the procedure for connecting EtherNet/IP using the EtherNet/IP settings of the project file that was prepared beforehand (hereinafter referred to as the "procedure for using the configuration files").

Section 9 A-1 and Section 10 A-2 describe the procedures for setting parameters with software without using files (hereinafter referred to as the "procedure for setting parameters from beginning".

To follow the "procedure for using configuration files", obtain the latest "Sysmac Studio project file" and "Network Configurator v3 network configuration file" (they are referred to as "configuration files") from OMRON in advance.

Name	File name	Version
Sysmac Studio project file (extension: smc)	OMRON_ZW_EIP_EV100.smc	Ver.1.00
Network Configurator v3 network configuration (extension: nvf)	OMRON_ZW_EIP_EV100.nvf	Ver.1.00

5. Applicable Products and Support Software

5.1. Applicable Products

The applicable devices are as follows:

Manufacturer	Name	Model
OMRON	NJ-series CPU Unit	NJ501-[][][][]
		NJ301-[][][][]
OMRON	Confocal Fiber Type Displacement Sensor Controller	ZW-CE1[] ZW-CE1[]T
OMRON	Sensor Head	ZW-S[][]

📝 **Additional Information**

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 function or operation of the devices. Refer to the manuals or contact your OMRON representative.

5.2. Device Configuration

The hardware components to reproduce the connection procedure of this document are as follows:
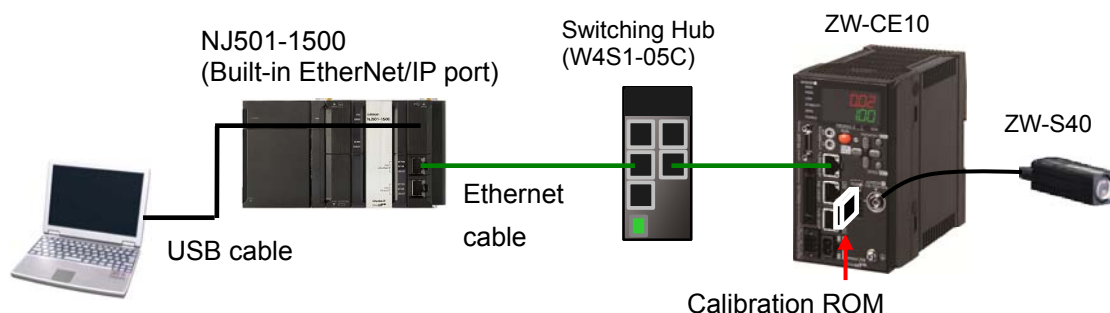
Manufacturer	Name	Model	Version
OMRON	NJ-series CPU Unit (Built-in EtherNet/IP port)	NJ501-1500	Ver.1.03
OMRON	Power Supply Unit	NJ-PA3001	
OMRON	Switching Hub	W4S1-05C	Ver.1.0
OMRON	Sysmac Studio	SYSMAC-SE2[][][]	Ver.1.05
OMRON	Network Configurator	(Included in Sysmac Studio.)	Ver.3.55
OMRON	Sysmac Studio project file	OMRON_ZW_EIP_EV100.smc	Ver.1.00
OMRON	Network Configurator v3 network configuration file	OMRON_ZW_EIP_EV100.nvf	Ver.1.00
-	Personal computer (OS: Windows7)	-	
-	USB cable (USB 2.0 type B connector)	-	
OMRON	Ethernet cable (with industrial Ethernet connector)	XS5W-T421-[]M[]-K	
OMRON	Displacement Sensor Controller	ZW-CE10	Ver.1.110
OMRON	Displacement Sensor Sensor Head	ZW-S40	
OMRON	Calibration ROM	(Included with Sensor Head.)	
OMRON	Recommended power supply: DC24V 2.5A 60W	S8VS-06024	

Precautions for Correct Use

Prepare the latest "Sysmac Studio project file" and "Network Configurator v3 network configuration file" from OMRON in advance.
(To obtain the files, contact your OMRON representative.)

Additional Information

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) and Network Configurator's Online Help.

> **Additional Information**
>
> In this document, a USB is used to connect with 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. EtherNet/IP Settings

This section describes the specifications such as communication parameters and variables that are defined in this document.

Hereinafter, the Displacement Sensor is referred to as the "destination device" in some descriptions.

6.1. EtherNet/IP Communications Settings

The Controller settings are as follows:

	Controller (node 1)	Displacement Sensor (node 2)
IP address	192.168.250.1	192.168.250.2
Subnet mask	255.255.255.0	255.255.255.0 (default)
MEMLNK (Memory link function)	-	EIP (EtherNet/IP)

6.2. Tag Data Link Allocation

6.2.1. Data Types

The following data types are used for the data in the tag data links of the destination device.

■Definition of the data type to access the signals (Union)

This data type is used to access the control signals and status signals.

Data type name	Data type
U_EIPFlag	UNION
F	BOOL[32]
W	DWORD

■Definition of the data type to access the command area (Structure)

This data type is used to access the command area

Data type name	Data type	Destination device data	
S_EIPOutput	STRUCT	-	
CommonControlFlag	U_EIPFlag	Sensor head common control signal (32 bits)	
SensorHead1ControlFlag	U_EIPFlag	Sensor head 1 control signal (32 bits)	
SensorHead2ControlReserve	U_EIPFlag	Sensor head 2 control signal (32 bits) (reserved)	
CommandCode	DWORD	Command code (CMD-CODE)	
CommandParam1	UINT	Command parameter (CMD-PARAM)	
CommandParam2	UINT		
CommandParam3	DINT		

■Definition of the data type to access the response/output areas (Structure)

This data type is used to access the response/output areas.

Data type name	Data type	Destination device data	
S_EIPInput	STRUCT	-	
CommonStatusFlag	U_EIPFlag	Sensor head common status signal (32 bits)	
SensorHead1StatusFlag	U_EIPFlag	Sensor head 1 status signal (32 bits)	
SensorHead2StatusReserve	U_EIPFlag	Sensor head 2 status signal (32 bits) (reserved)	
CommandCodeEcho	DWORD	Command code (CMD-CODE)	
ResponseCode	UDINT	Response code (RES-CODE)	
ResponseData	UDINT	Response data (RES-DATA)	
MeasurementValueofTask1	DINT	Measurement Value of Task1	Output data 0 to 7 (OutData 0 to 7)
MeasurementValueofTask2	DINT	Measurement Value of Task2	
MeasurementValueofTask3	DINT	Measurement Value of Task3	
MeasurementValueofTask4	DINT	Measurement Value of Task4	
MeasurementValueReserve	DINT[4]	Reserved	

📝 **Additional Information**

For details on the structure and union, refer to *Tag Data Link Setting Methods* in *6-3 Ethernet/IP Connection* in *Chapter 6 Communications with External Devices* of the *ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual* (Cat. No. Z332).

📝 **Additional Information**

With the Sysmac Studio, the data type is expressed as ARRAY[0..2] OF WORD when an array is specified for a data type. However, the data type of an array is simplified in this document (e.g. WORD[3]).
It is possible to set either of the following to specify an array for a data type with the Sysmac Studio.
　•ARRAY[0..2] OF WORD
　•WORD [3]
In the example above, 3 WORD array elements are secured.

6.2.2. Data Allocation

The data in the tag data links of the destination device are allocated to the global variables of the Controller. The relationship between the device data and the global variables is shown below.

The following global variables are set in the "Configuration file".

■Output area (Controller → Displacement Sensor)

Variable	Data type	Data size
EIPOutput	S_EIPOutput	24 bytes

Offset (word)	Destination device data	Name	Data type
+0 and +1	Control output 1 [*1] (32 bits) (Data type: U_EIPFlag)	EIPOutput.CommonControlFlag.F [*4]	BOOL[32]
		EIPOutput.CommonControlFlag.W [*4]	DWORD
+2 and +3	Control output 2 [*2] (32 bits) (Data type: U_EIPFlag)	EIPOutput.SensorHead1ControlFlag.F [*5]	BOOL[32]
		EIPOutput.SensorHead1ControlFlag.W [*5]	DWORD
+4 and +5	Control output 3 [*3] (32 bits) (Data type: U_EIPFlag)	EIPOutput.SensorHead2ControlReserve.F [*6]	BOOL[32]
		EIPOutput.SensorHead2ControlReserve.W [*6]	DWORD
+6 and +7	Command code (CMD-CODE)	EIPOutput.CommandCode	DWORD
+8	Command parameter (CMD-PARAM)	EIPOutput.CommandParam1	UINT
+9		EIPOutput.CommandParam2	UINT
+10 and +11		EIPOutput.CommandParam3	DINT

*1: Sensor head common control signal

*2: Sensor head 1 control signal

*3: Sensor head 2 control signal (reserved)

*4: Details on allocation of sensor head common control signal

Allocation of *EIPOutput.CommonControlFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+0															SYNC	EXE
+1																ERCLR

EXE: Control command execution bit: Turns ON when the Controller instructs execution of control commands to the displacement sensor.

SYNC: Measurement synchronous start bit: Turns ON when the Controller instructs measurement synchronization to the displacement sensor.

ERCLR: Error clear bit: Turns ON when the displacement sensor ERR signal turns OFF.

Allocation of *EIPOutput.CommonControlFlag.W* variable

Offset (word)	15	14	13	...	2	1	0
+0	15	14	13	...	2	1	0
+1	31	30	29	...	18	17	16

Bits 31 to 0: *EIPOutput.CommonControlFlag.W* uses DWORD data from the offset +0 word.

*5: Details on allocation of sensor head 1 control signal

Allocation of *EIPOutput.SensorHead1ControlFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+2														LIGHT OFF	RESET1	TIMING1
+3									ZEROCLR_T4	ZEROCLR_T3	ZEROCLR_T2	ZEROCLR_T1	ZERO1_T4	ZERO1_T3	ZERO1_T2	ZERO1_T1

TIMING1: Timing bit: Turns ON when the Controller instructs start of hold sampling to the displacement sensor.

RESET1: Reset bit: Turns ON when the Controller resets judgment processing and output of the displacement sensor. If the hold function is used, the state before the hold function was set will be restored.

LIGHTOFF1: Light metering OFF bit: Turns ON when the Controller instructs logical beam OFF to the displacement sensor.

ZERO1_T1 to 4: Zero reset execution bit: Turns ON when the Controller instructs execution of zero reset of TASK1 to 4 to the displacement sensor.

ZEROCLR1_T1 to 4: Zero reset cancel bit: Turns ON when the Controller instructs zero reset cancel of TASK1 to 4 to the displacement sensor.

Allocation of *EIPOutput.SensorHead1ControlFlag.W* variable

Offset (word)	15	14	13	…	2	1	0
+2	15	14	13	…	2	1	0
+3	31	30	29	…	18	17	16

Bits 31 to 0: *EIPOutput.SensorHead1ControlFlag.W* uses DWORD data from offset +2 words.

*6: Details on allocation of sensor head 2 control signal (reserved)

Allocation of *EIPOutput.SensorHead2ControlReserve.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+4																
+5																

Allocation of *EIPOutput.SensorHead2ControlReserve.W* variable

Offset (word)	15	14	13	…	2	1	0
+4	15	14	13	…	2	1	0
+5	31	30	29	…	18	17	16

Bits 31 to 0: *EIPOutput.SensorHead2ControlReserve.W* uses DWORD data from offset + 4 word.

■Input area (Controller ← Displacement Sensor)

Variable	Data type	Data size
EIPInput	S_EIPInput	56 bytes

Offset (word)	Destination device data	Name	Data type
+0 and +1	Control output 1 [*1] (32 bits)	EIPInput.CommonStatusFlag.F [*4]	BOOL[32]
	(Data type: U_EIPFlag)	EIPInput.CommonStatusFlag.W [*4]	DWORD
+2 and +3	Control output 2 [*2] (32 bits)	EIPInput.SensorHead1StatusFlag.F [*5]	BOOL[32]
	(Data type: U_EIPFlag)	EIPInput.SensorHead1StatusFlag.W [*5]	DWORD
+4 and +5	Control output 3 [*3] (32 bits)	EIPInput.SensorHead2StatusReserve.F [*6]	BOOL[32]
	(Data type: U_EIPFlag)	EIPInput.SensorHead2StatusReserve.W [*6]	DWORD
+6 and +7	Command code (CMD-CODE)	EIPInput.CommandCodeEcho	DWORD
+8 and +9	Response code (RES-CODE)	EIPInput.ResponseCode	UDINT
+10 and +11	Response data (RES-DATA)	EIPInput.ResponseData	DINT
+12 and +13	Output data 0 (DATA0)	EIPInput.MeasurementValueofTask1	DINT
+14 and +15	Output data 1 (DATA1)	EIPInput.MeasurementValueofTask2	DINT
+16 and +17	Output data 2 (DATA2)	EIPInput.MeasurementValueofTask3	DINT
+18 and +19	Output data 3 (DATA3)	EIPInput.MeasurementValueofTask4	DINT

+20 and +21	Output data 4 (DATA4)		
+22 and +23	Output data 5 (DATA5)	EIPInput.MeasurementValueReserve	DINT[4]
+24 and +25	Output data 6 (DATA6)		
+26 and +27	Output data 7 (DATA7)		

*1: Sensor head common status signal

*2: Sensor head 1 status signal

*3: Sensor head 2 status signal (reserved)

*4: Details on allocation of sensor head common status signal

Allocation of *EIPInput.CommonStatusFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+0	BANK1_E	BANK1_D	BANK1_C	BANK1_B	BANK1_A							RUN		READY	SYNCFLG	FLG
+1																ERR

FLG: Control command completion bit: Turns ON when the displacement sensor completes control command execution.

SYNCFLG: Measurement synchronization completion bit: Turns ON when the displacement sensor executes measurement synchronization processing and the state changes to one where normal measured values can be output.

READY: Ready bit: Turns ON when the displacement sensor can execute control commands or measurement synchronization processing.

RUN: Run screen bit: Turns ON when the displacement sensor is in the RUN mode.

BANK1_A to E (BANKOUT1_A to E): Current bank number bit: Outputs the currently specified bank number. It expresses the bank number in combinations of BANKOUTx_A to E.

ERR: Error bit: Turns ON when a displacement sensor error is detected.

Allocation of *EIPInput.CommonStatusFlag.W* variable

Offset (word)	15	14	13	…	2	1	0
+0	15	14	13	…	2	1	0
+1	31	30	29	…	18	17	16

Bits 31 to 0: *EIPInput.CommonStatusFlag.W* uses DWORD data from offset + 0 word.

*5: Details on allocation of sensor head 1 status signal

Allocation of *EIPOutput.SensorHead1StatusFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+2										OR1	GATE1	ENABLE1	STABLITY1	LIGHT1	RESETSTAT1	HOLDSTAT1
+3	LOW1_T4	PASS1_T4	HIGH1_T4	LOW1_T3	PASS1_T3	HIGH1_T3	LOW1_T2	PASS1_T2	HIGH1_T2	LOW1_T1	PASS1_T1	HIGH1_T1	ZEROSTAT_T4	ZEROSTAT_T3	ZEROSTAT_T2	ZEROSTAT_T1

HOLDSTAT1: Hold execution status bit: Turns ON when the displacement sensor is in the hold sampling period.

RESETSTAT1: Reset execution state bit: Turns ON when the displacement sensor is in the reset execution state.

LIGHT1: Logical beam lighting state bit: Turns ON when the logical beam is lit.

STABILITY1: Measurement position bit: Turns ON when the measured value is in the measuring range.

ENABLE1: Measurement state bit: Turns ON when the displacement sensor is ready for measurement.

GATE1: Data output completed bit: Turns ON when the displacement sensor completes control data output when hold is set.

OR1: Overall judgment result bit: Turns ON when even one of the judgment result of the displacement sensor TASK1 to 4 is other than PASS.

ZEROSTAT1_T1 to 4: Zero reset bit: Turns ON when the displacement sensor TASK1 to 4 is in the zero reset execution state.

HIGH1_T1 to 4: HIGH output bit: Turns ON when the judgment result of the displacement sensor TASK1 to 4 is HIGH (HIGH threshold < measured value).

PASS1_T1 to 4: PASS output bit: Turns ON when the judgment result of the displacement sensor TASK1 to 4 is PASS (LOW threshold ≤ measured value ≤ HIGH threshold).

LOW1_T1 to 4: LOW output bit: Turns ON when the judgment result of the displacement sensor TASK1 to 4 is LOW (LOW threshold > measured value).

Allocation of *EIPOutput.SensorHead1StatusFlag.W* variable

Offset (word)	15	14	13	...	2	1	0
+2	15	14	13	...	2	1	0
+3	31	30	29	...	18	17	16

Bits 31 to 0: *EIPOutput.SensorHead1StatusFlag.W* uses DWORD data from offset + 2 words.

*6: Details on allocation of sensor head 2 control signal (reserved)

Allocation of *EIPOutput.SensorHead2StatusReserve.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+4																
+5																

Allocation of *EIPOutput.SensorHead2StatusReserve.W* variable

Offset (word)	15	14	13	…			2	1	0
+4	15	14	13	…			2	1	0
+5	31	30	29	…			18	17	16

Bits 31 to 0: *EIPOutput.SensorHead2StatusReserve.W* uses DWORD data from offset + 4 words.

Additional Information

For details on the command codes and response codes, refer to *6-3 Ethernet/IP Connection* in *Chapter 6 Communications with External Devices* of the *ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual* (Cat. No. Z332).

Additional Information

With the Sysmac Studio, the data type is expressed as ARRAY[0..2] OF WORD when an array is specified for a data type. However, a data type of an array is simplified in this document (e.g. WORD[3]).

It is possible to set either of the following to specify an array for a data type with the Sysmac Studio.

•ARRAY[0..2] OF WORD
•WORD[3]

In the example above, 3 WORD array elements are secured.

7. Connection Procedure

This section describes the procedure for connecting the Controller on the EtherNet/IP network using the "procedure for using configuration files".

This document explains the setting procedure of the Controller and the Displacement Sensor with their default settings. For information on how to initialize each device, refer to *Section 8 Initialization Method*.

7.1. Overview of Setting Tag Data Links

The following figure shows the relationship between the processes to operate the tag data links using the "procedure for using configuration files".
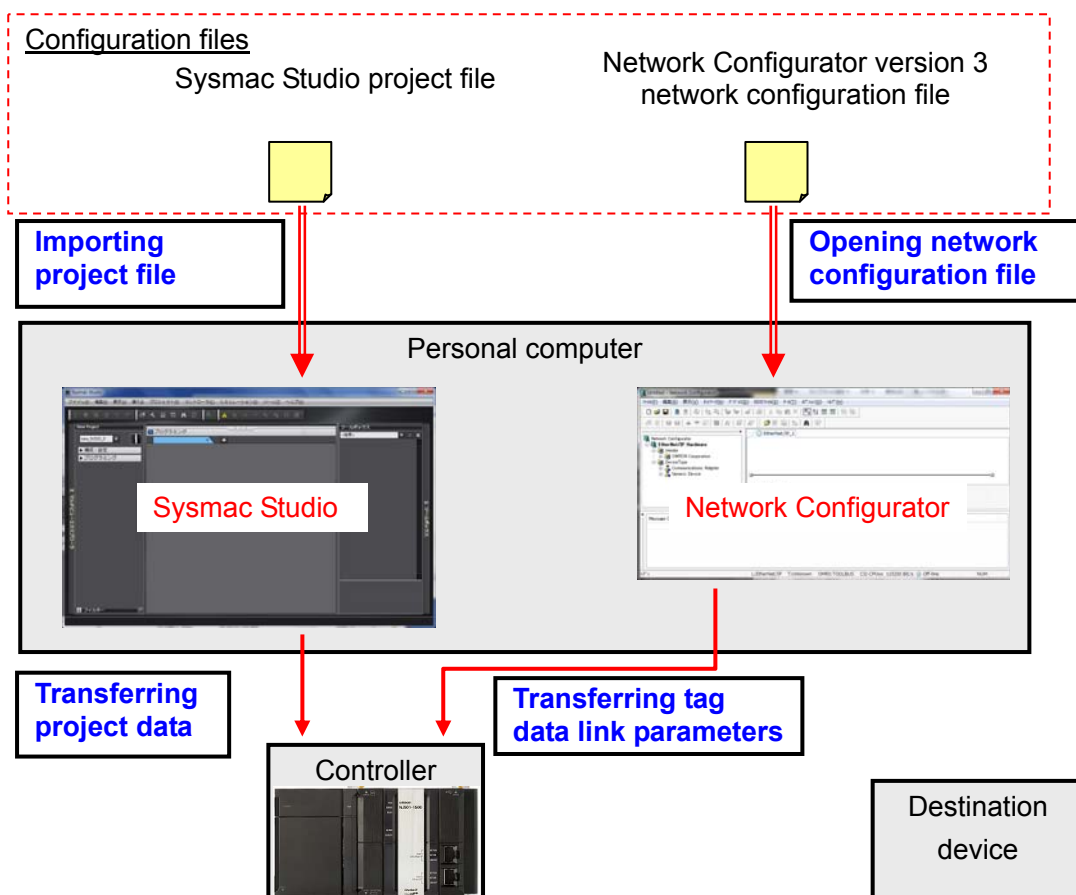
Precautions for Correct Use

Prepare the latest "Sysmac Studio project file" and "Network Configurator v3 network configuration file" from OMRON in advance.

(To obtain the file, contact your OMRON representative.)

7.2. Work Flow

Take the following steps to set the tag data link for EtherNet/IP.

7.3 Setting Up the Displacement Sensor	Set up the Displacement Sensor.
↓	
7.3.1 Parameter Settings	Set the parameters for the Displacement Sensor.
↓	
7.4 Setting Up the Controller	Set up the Controller.
↓	
7.4.1 Starting the Sysmac Studio and Importing the Project File	Start the Sysmac Studio, and import the Sysmac Studio project file.
↓	
7.4.2 Connecting Online and Transferring Project Data	Connect online with the Sysmac Studio and transfer the project data to the Controller.
↓	
7.5 Setting Up the Network	Set tag data links for EtherNet/IP.
↓	
7.5.1 Starting the Network Configurator and Opening the Network Configuration File	Start the Network Configurator and open the Network Configurator v3 network configuration file.
↓	
7.5.2 Transferring the Tag Data Link Settings	Connect the Network Configurator online and transfer the tag data link settings to the Controller.
↓	
7.6 Checking the EtherNet/IP Communications	Confirm that the EtherNet/IP communications are performed normally.
↓	
7.6.1 Checking the Connection Status	Check the connection status of the EtherNet/IP network.
↓	
7.6.2 Checking Data that are Sent and Received	Confirm that the correct data are sent and received.

18

7.3. Setting Up the Displacement Sensor

Set up the Displacement Sensor.

7.3.1. Parameter Setting

Set the parameters for the Displacement Sensor.

1	Check the keys and display used to set parameters for the Displacement Sensor. Connect the Controller to the Sensor Head and insert the Calibration ROM. Connect the Ethernet cable. Turn ON the power supply to the Displacement Sensor.	 Main display (red) Sub-display (green) RUN indicator (green) ZERORST/ESC key ← (LEFT) Key ↑ (UP) Key → (RIGHT)Key ↓ (DOWN) Key ZERO/SET Key Mode switching Key Sensor Head Calibration ROM 24 V power supply Ethernet cable
2	After the startup screen is displayed, the RUN mode screen is displayed. The RUN indicator is lit as shown on the right. Hold down the **Mode switching** Key for two seconds.	 Hold down the **Mode switching** Key for two seconds.
3	A confirmation screen for mode switching is displayed. Press the **ZERO/SET** Key.	 Press the **ZERO/SET** Key once.
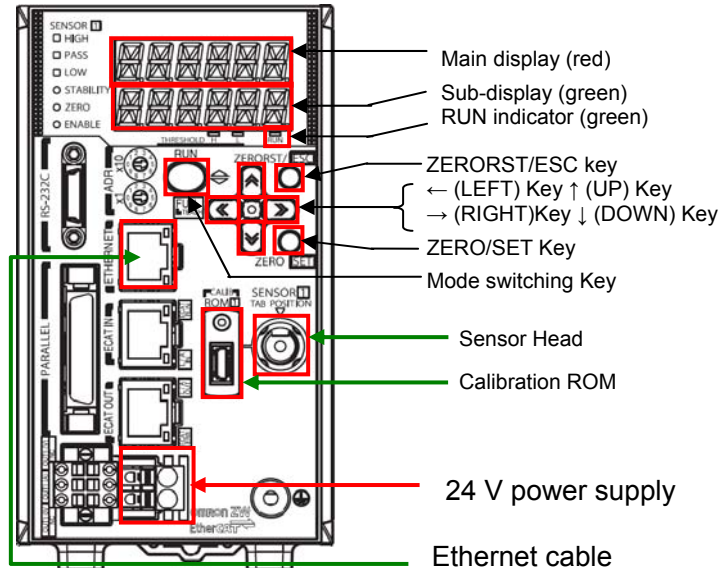
4 The FUN mode screen is displayed.
The RUN indicator is not lit as shown on the right.

Press → (RIGHT) or ← (LEFT) Key and change the main display content from SENS to SYSTEM.

Press the **ZERO/SET** Key.

— Press the → (RIGHT) or ← (LEFT) Key.

— Press the **ZERO/SET** Key once.

5 SAVE is displayed on the main display.

Press → (RIGHT) or ← (LEFT) key and change the main display content from SAVE to COM.

Press the **ZERO/SET** Key.

— Press the → (RIGHT) or ← (LEFT) Key.

— Press the **ZERO/SET** Key once.

6 RS232C is displayed on the main display.

Press the → (RIGHT) Key and change the main display content from RS232C to ETN.

Press the **ZERO/SET** Key.

— Press the → (RIGHT) Key once.

— Press the **ZERO/SET** Key once.

7

IPADDR is displayed on the main display.

Press the **ZERO/SET** Key.

Press the **ZERO/SET** Key once.

8

IP1 is displayed on the main display.

Press the **ZERO/SET** Key.

Confirm that 192 is displayed on the sub-display.
*If the setting value is different, change the value by referring to step 11 and step 12.
*In this step, you set 192 that is the first octet of IP address 192.168.250.2.

Press the **ZERORST/ESC** Key once. The first screen in this step is displayed again.
Press the → (RIGHT) Key once.

Press the **ZERO/SET** Key.

Press the **ZERORST/ESC** Key.

IP1 is displayed.

Press the → (RIGHT) Key once.

9

IP2 is displayed on the main display.

Press the **ZERO/SET** Key.

Confirm that 168 is displayed on the sub-display.
*If the setting value is different, change the value by referring to step 11 and step 12.
*In this step, you set 168 that is the second octet of IP address 192.168.250.2.

Press the **ZERORST/ESC** Key once. The first screen in this step is displayed again.
Press the → (RIGHT) Key once.

Press the **ZERO/SET** Key once.

Press the **ZERORST/ESC** Key once.

IP2 is displayed.

Press the → (RIGHT) Key once.

10 IP3 is displayed on the main display.

Press the **ZERO/SET** Key.

Confirm that 250 is displayed on the sub-display.
*If the setting value is different, change the value by referring to step 11 and step 12.
*In this step, you set 250 that is the third octet of IP address 192.168.250.2.

Press the **ZERORST/ESC** Key once. The first screen in this step is displayed again.
Press the → (RIGHT) Key once.

Press the **ZERO/SET** Key once.

Press the **ZERORST/ESC** Key once.

IP3 is displayed.

Press the → (RIGHT) key once.

11 IP4 is displayed on the main display.

Press the **ZERO/SET** Key.

Press the **ZERO/SET** Key once.

The default value is displayed on the sub-display.

Press the **ZERO/SET** Key.

Press the **ZERO/SET** Key once.

The sub-display content changes, allowing you to change the value.
Select a digit you want to change the value by pressing the → (RIGHT) or ← (LEFT) Key. You can change the value of a blinking digit.
Change the value by pressing the ↑ (UP) or ↓ (DOWN) Key.
Change to 000002.

Press the → (RIGHT) or ← (LEFT) Key.
Press the ↑ (UP) or ↓ (DOWN) Key.

12	000002 is displayed on the sub-display.	
	Press the **ZERO/SET** Key.	
	2 is displayed on the sub-display.	
	*In this step, you set 2 that is the fourth octet of IP address 192.168.250.2.	Press the **ZERO/SET** Key once.
	Press **ZERORST/ESC** Key once. The first screen in step 11 is displayed again.	
	Press the **ZERORST/ESC** Key once.	Press the **ZERORST/ESC** Key once.
		IP4 is displayed.
		Press the **ZERORST/ESC** Key once.

13	IPADDR is displayed on the main display.	
	Press the → (RIGHT) Key once and change the main display to SUBNET.	Press the → (RIGHT) Key once.
	Press the **ZERO/SET** Key.	Press the **ZERO/SET** Key once.

14	The main display content changes to SUB1.	
	Press the **ZERO/SET** Key.	Press the **ZERO/SET** Key once.
	255 is displayed on the sub-display.	
	Press the **ZERORST/ESC** Key once.	Press the **ZERORST/ESC** Key once.

15 Press the → (RIGHT) Key and change the main display content to SUB2 to SUB4.
Press the **ZERO/SET** Key to check the setting values.
Confirm that the values of SUB2 to SUB4 are as follows:
  •SUB2, SUB3: 255
  •SUB4: 0

*In steps 14 and 15, you set subnet mask 255.255.255.0.

After checking, press the **ZERORST/ESC** Key three times.

Press the **ZERORST/ESC** Key three times.

16 ETN is displayed on the main display.

Press the → (RIGHT) Key and change the main display content to DELIMI.

Press the → (RIGHT) Key once.

Press the → (RIGHT) Key and change the main display content to MEMKNK.

Press the → (RIGHT) Key once.

Press the **ZERO/SET** Key.

Press the **ZERO/SET** Key once.

17	E-CAT is displayed on the sub-display.	
	Press the ↑ (UP) Key once and blink EIP on the sub-display. Press the **ZERO/SET** Key. *The memory link function setting changes to EtherNet/IP. Hold down the **Mode switching** Key for two seconds.	Press the ↑ (UP) Key once. EIP is blinking. Press the **ZERO/SET** Key. \<Setting range\> None/EIP/E-CAT Default: E-CAT Hold down the **Mode switching** Key for two seconds.

18	The confirmation screen for mode switching is displayed.	
	Press the **ZERO/SET** Key.	Press the **ZERO/SET** Key once.
	The save confirmation screen is displayed. Press the **ZERO/SET** Key.	 Press the **ZERO/SET** Key once.
	The RUN mode screen displayed.	

19	Cycle the power supply to the Displacement Sensor. *The new settings will take effect after restarting.

7.4. Setting Up the Controller

Set up the Controller.

7.4.1. Starting the Sysmac Studio and Importing the Project File

Start the Sysmac Studio and import the Sysmac Studio project file.

Install the software and USB driver in the personal computer beforehand.

1	Connect the LAN cable to the built-in EtherNet/IP port (PORT1) of the Controller and connect the USB cable to the peripheral (USB) port. Then connect Controller, personal computer, Switching Hub, and Displacement Sensor, by referring to *5.2. Device Configuration*. Turn ON the power supply to the Controller.	
2	Start the Sysmac Studio. Click the **Import** Button. *If a confirmation dialog for an access right is displayed at start, select to start.	
3	The Import File Dialog Box is displayed. Select OMRON_ZW_EIP_EV100.smc (Sysmac Studio project file) and click the **Open** Button. *Obtain the Sysmac Studio project file from OMRON.	
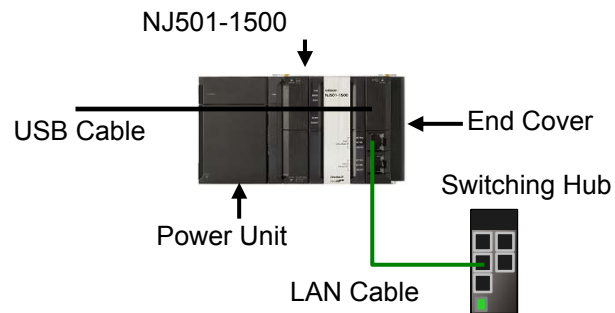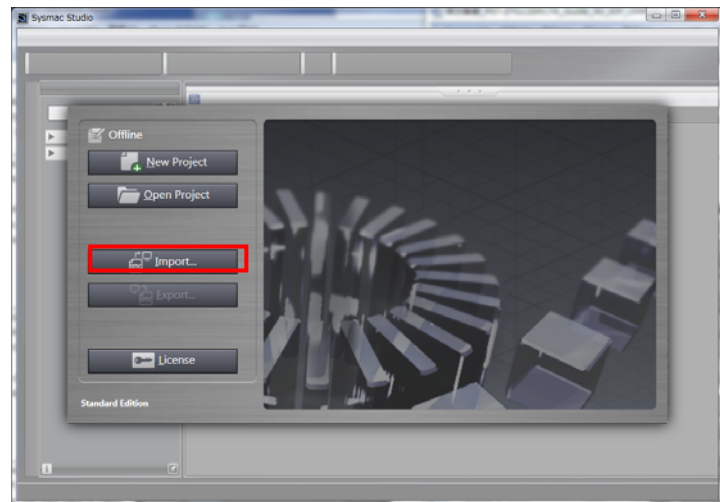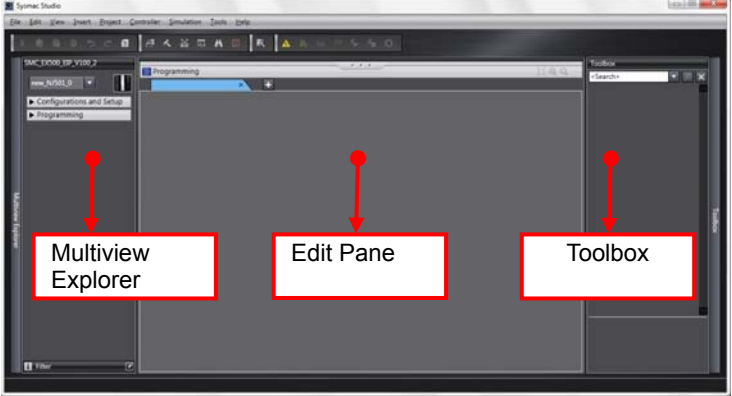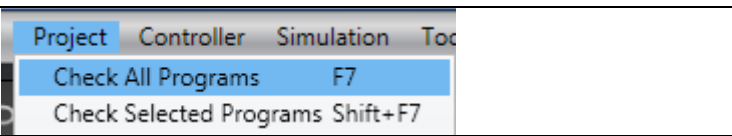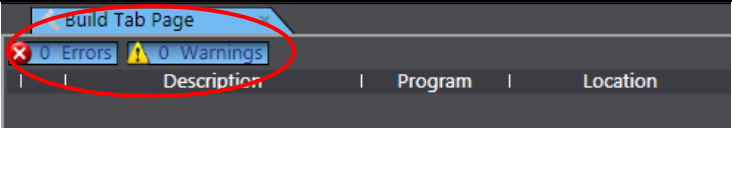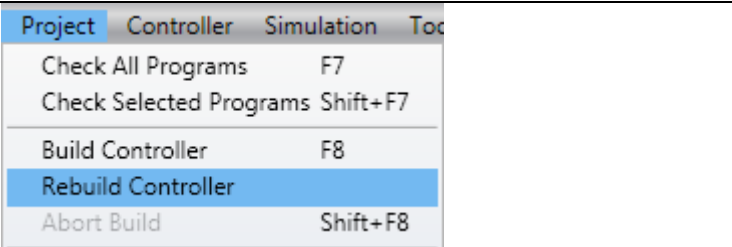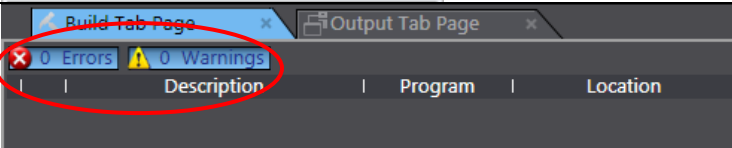
4	OMRON_ZW_EIP_EV100 project is displayed. The left pane is called Multiview Explorer, the right pane is called Toolbox and the middle pane is called Edit Pane. *If an error message is displayed stating "Failed to Load Descendants", change the version of the Sysmac Studio to the version specified in 5.2. Device Configuration or higher version.	 Multiview Explorer Edit Pane Toolbox
5	Select **Check All Programs** from the Project Menu.	
6	The Build Tab Page is displayed in the Edit Pane. Confirm that "0 Errors" and "0 Warnings" are displayed.	
7	Select **Rebuild Controller** from the Project Menu.	
8	Confirm that "0 Errors" and "0 Warnings" are displayed in the Build Tab Page.	

7.4.2. Connecting Online and Transferring the Project Data

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

<table>
<tr><td colspan="2">⚠ WARNING</td></tr>
<tr><td>Always confirm safety at the destination node before you transfer a user program, configuration data, setup data, device variables, or values in memory used for CJ-series Units from the Sysmac Studio.
The devices or machines may perform unexpected operation regardless of the operating mode of the CPU Unit.</td><td>❗</td></tr>
</table>

1	Select **Change Device** from the Controller Menu.	Controller Simulation Tools Help Communications Setup… Change Device
2	The Change Device Dialog Box is displayed. Confirm that Device and Version to use are set as shown on the right. *If the settings are not correct, select the setting items from the pull-down list. Click the **OK** Button.	Change Device ✕ Select Device Category Controller Device NJ501 ▼ - 1500 ▼ Version 1.03 ▼ OK Cancel
3	If the settings were changed in step 2, the Build Dialog Box is displayed. Click the **Yes** Button.	Build ? Do you want to execute the build? Yes No
4	Select **Communications Setup** from the Controller Menu.	Controller Simulation Tools Help Communications Setup… Online Ctrl+W Offline Ctrl+Shift+W
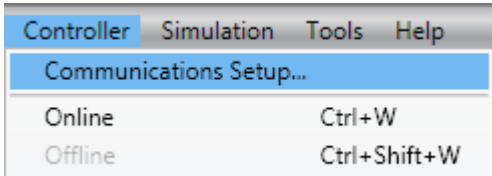
5 The Communications Setup Dialog Box is displayed.

Select the *Direct Connection via USB* Option for Connection Type.
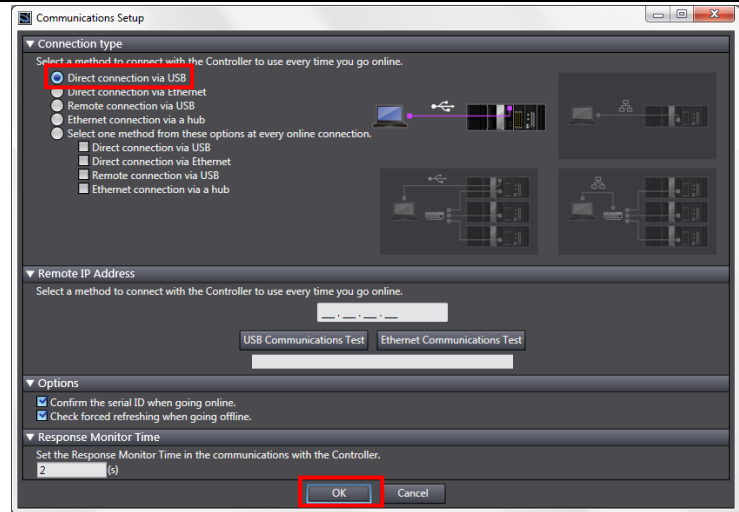
Click the **OK** Button.

6 Select *Online* from the Controller Menu.
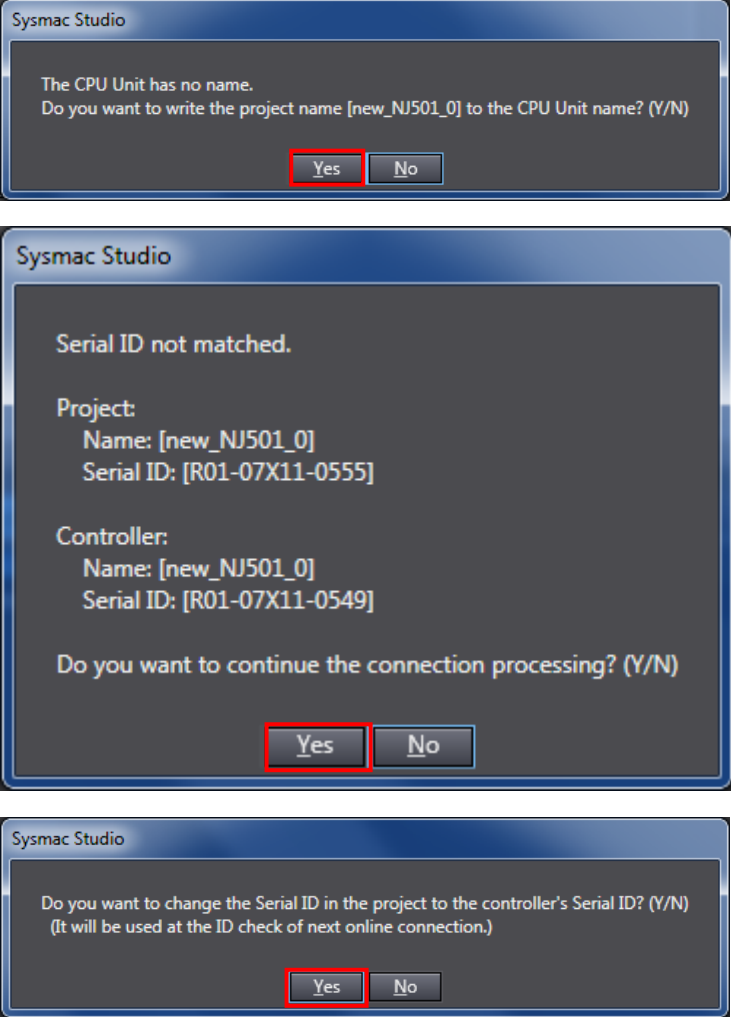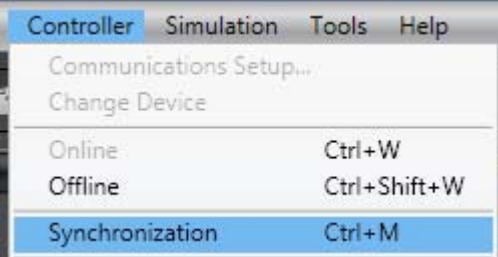
*If the dialog on the right is displayed, the model or version of the Controller does not match that of the project file. Check the settings of the project file, repeat from step 1. Click the **OK** Button to close the dialog box.

*The model and version displayed on the confirmation dialog box differ depending on the Controller used and the device setting of the project file.

Controller   Simulation   Tools   Help

Communications Setup...
Change Device

Online   Ctrl+W
Offline   Ctrl+Shift+W

Sysmac Studio

The device 'version' set in the project does not match the device 'version' that has been transferred to the connected Controller. Please note that there may be some restrictions on the functions.

Device version set in the project: 1.02
Device version transferred to the connected Controller: 1.03

OK

Sysmac Studio

Controller model not matched.
  Project: NJ501-1300
  Controller: NJ501-1500

Check the following:
- Check the controller to connect (connection method) in the communications settings.
- Is the controller model set in the project matched with the target controller model?

OK

📖 **Additional Information**

Refer to *Section 5 Online Connections to a Controller* in the *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504) for details on online connections to a Controller.

7	A confirmation dialog box is displayed. Click the **Yes** Button.	Sysmac Studio The CPU Unit has no name. Do you want to write the project name [new_NJ501_0] to the CPU Unit name? (Y/N) Yes No

	*The displayed dialog depends on the status of the Controller used. Click the **Yes** Button to proceed with the processing.
	
	*The displayed serial ID differs depending on the device.
		Sysmac Studio
		
		Serial ID not matched.
		
		Project:
		    Name: [new_NJ501_0]
		    Serial ID: [R01-07X11-0555]
		
		Controller:
		    Name: [new_NJ501_0]
		    Serial ID: [R01-07X11-0549]
		
		Do you want to continue the connection processing? (Y/N)
		
		Yes No

		Sysmac Studio Do you want to change the Serial ID in the project to the controller's Serial ID? (Y/N) (It will be used at the ID check of next online connection.) Yes No
8	When an online connection is established, a yellow bar is displayed on the top of the Edit Pane.	Programming × +
9	Select *Synchronization* from the Controller Menu.	Controller Simulation Tools Help Communications Setup... Change Device Online Ctrl+W Offline Ctrl+Shift+W Synchronization Ctrl+M

10	The Synchronization Dialog Box is displayed. Confirm that the data to transfer (NJ501 in the right figure) is selected. Then, click the **Transfer to Controller** Button. *By executing Transfer to Controller, the data in the Sysmac Studio is transferred to the Controller and the data are compared.	
11	A confirmation dialog is displayed. Click the **Yes** Button.	
	A screen stating "Synchronizing" is displayed.	
	A confirmation dialog is displayed. Click the **No** Button.	
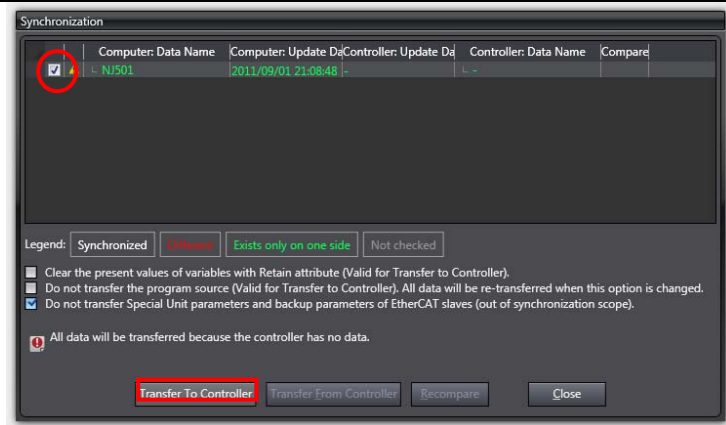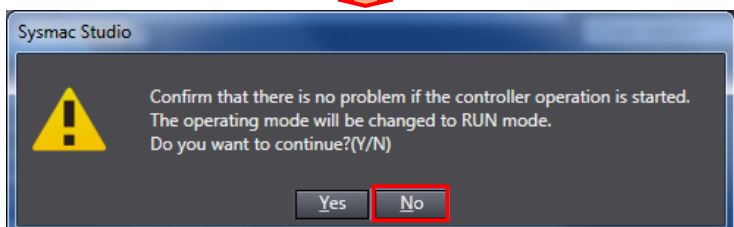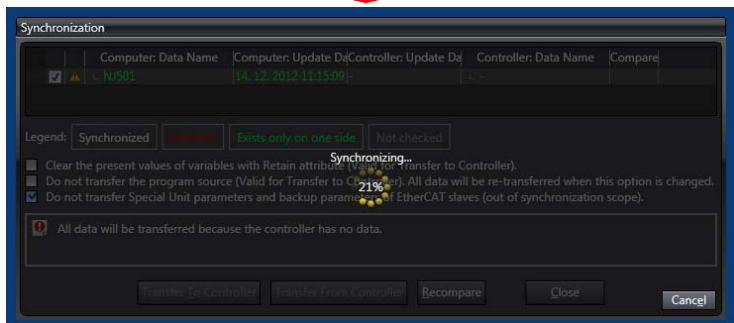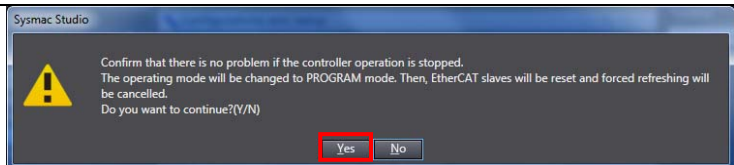
12 Confirm that the synchronized data is displayed with the color specified by "Synchronized" and that a message is displayed stating "The synchronization process successfully finished". If there is no problem, click the **Close** Button.
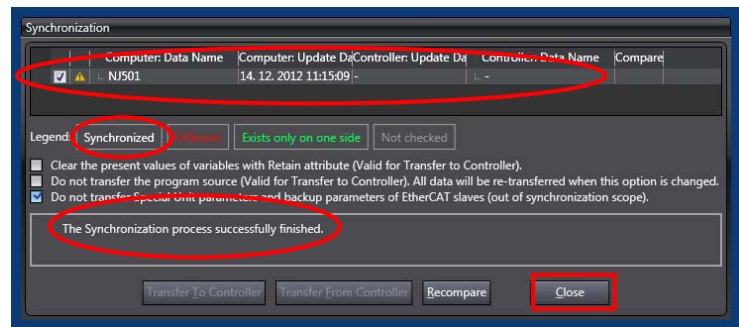
*A message stating "The synchronization process successfully finished" is displayed if the Sysmac Studio project data and the data in the Controller match.

*If the synchronization fails, check the wiring and repeat from step 1.

7.5. Setting Up the Network

Set the tag data links for EtherNet/IP.

7.5.1. Starting the Network Configurator and Opening the Network Configuration File

Start up the Network Configurator and open the Network Configurator v3 network configuration file.
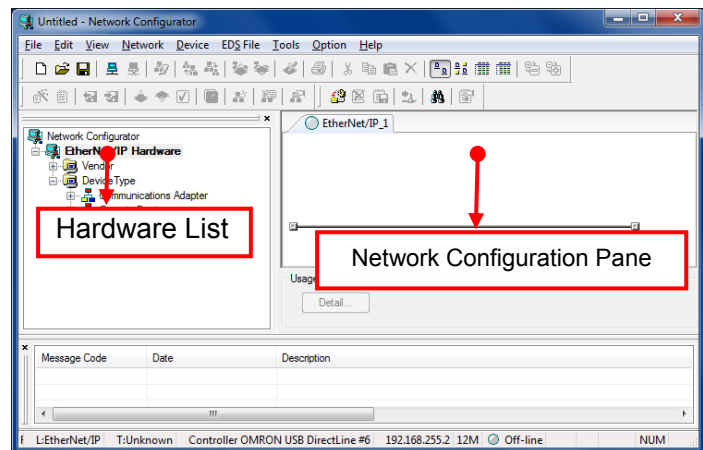
1	Start the Network Configurator.	 Hardware List Network Configuration Pane
2	Select *Open* from the File Menu.	
3	The Open Dialog Box is displayed. Select OMRON_ZW_EIP_EV100.nvf (Network Configurator v3 network configuration file) and click the **Open** Button. *Obtain the Network Configurator v3 network configuration file from OMRON.	
4	The following devices are displayed in the Network Configuration Pane as shown in the right figure. IP address of node 1: 192.168.250.1 IP address of node 2: 192.168.250.2	
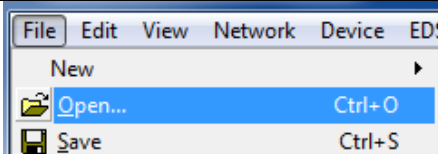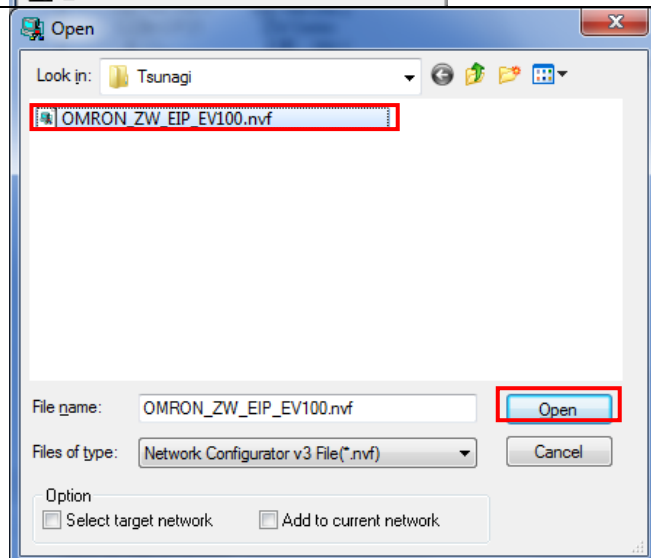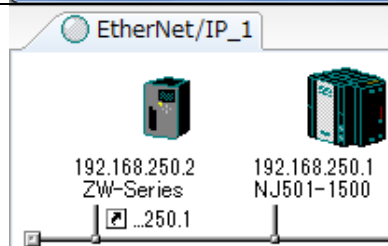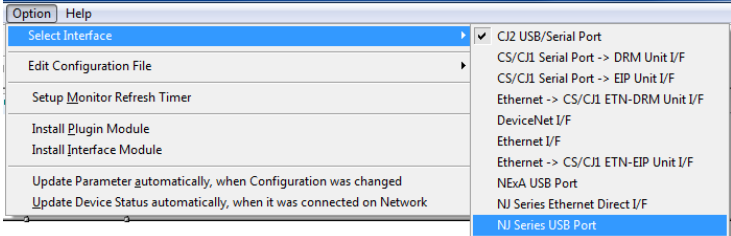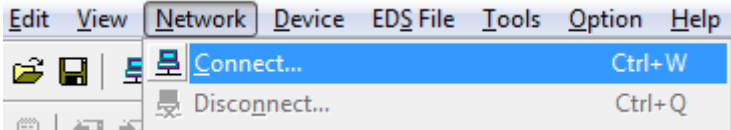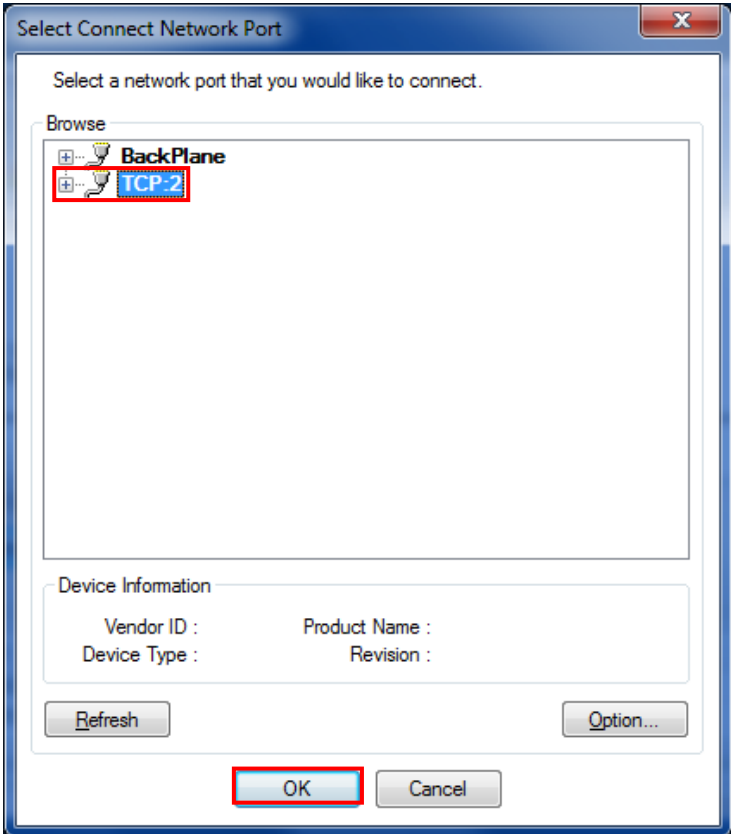
7.5.2. Transferring the Tag Data Link Parameters

Connect the Network Configurator online and transfer the tag data link parameters to the Controller.

Precautions for Correct Use

Please confirm that the LAN cable is connected before performing the following procedures. When it is not connected, turn OFF the power supply to each device and then connect the LAN cable.

1	Select **Select Interface** - **NJ Series USB Port** from the Option Menu.	
2	Select **Connect** from the Network Menu.	
3	The Select Connect Network Port Dialog Box is displayed. Select **TCP:2** and click the **OK** Button.	

Precautions for Correct Use

If an online connection cannot be made to the Controller, check the cable connection. Or, return to step 4 and check the settings such as a connection type and try again.

Additional Information

For details on the online connections to a Controller, refer to *7-2-8 Connecting the Network Configurator to the Network* in *Section 7 Tag Data Link Functions* of the *NJ-series CPU Unit Built-in EtherNet/IP Port User's Manual* (Cat. No. W506).
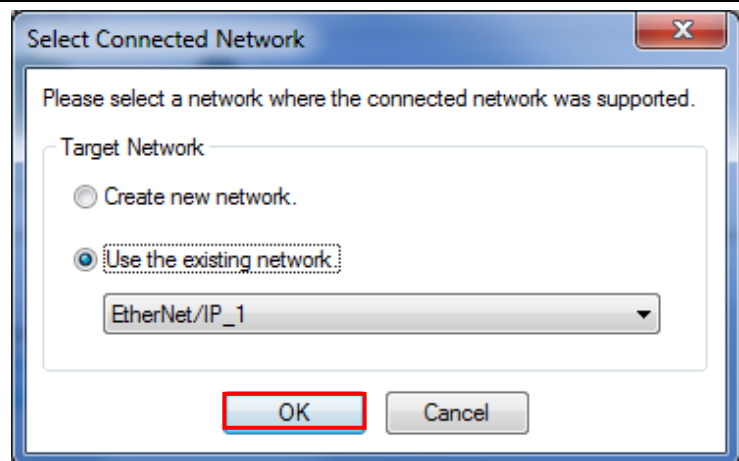
4	The Select Connected Network Dialog Box is displayed. Click the **OK** Button.	
5	When an online connection is established normally, the color of the icon on the figure changes to blue.	
6	Right-click node 1 device on the Network Configuration Pane and select *Parameter* - *Download*.	
	The dialog box on the right is displayed. Click the **Yes** Button.	

35

7	Tag data link parameters are downloaded from the Network Configurator to the Controller.	Resetting Device (192.168.250.1)... [green progress bar] Abort
8	The dialog box on the right is displayed. Click the **Yes** Button.	Network Configurator ⓘ Download of device parameter was completed. OK

7.6. Checking the EtherNet/IP Communications

Confirm that the EtherNet/IP communications are performed normally.

7.6.1. Checking the Connection Status
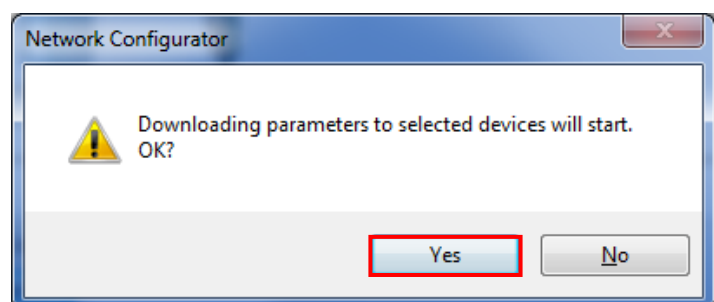
Check the connection status of the EtherNet/IP network.

1	Confirm that the tag data links are normally in operation by checking the LED indicators on each device. •Controller (Built-in EtherNet/IP port) LED indicators in normal status: 　[NET RUN]: Lit green 　[NET ERR]: Not lit 　[LINK/ACT]: Flashing yellow 　(Flashing while packets are being 　sent and received) •Displacement Sensor During normal operation, the red and green indicators on the ETHERNET connector are lit.	 (Controller) (Displacement Sensor　Controller)
2	Confirm that the tag data links are normally in operation by checking the status information on the Device Monitor Window of the Network Configurator. Right-click node 1 device icon on the Network Configuration Pane, and select ***Monitor***.	
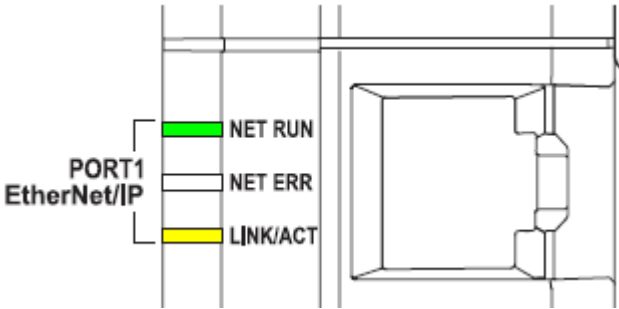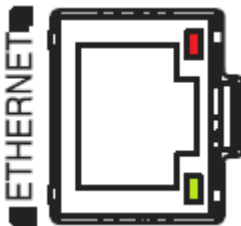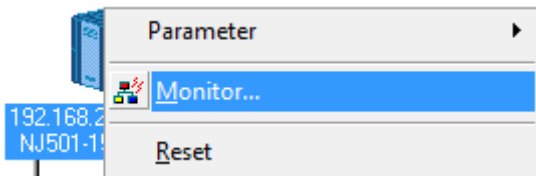
3	The dialog on the right displays the Status 1 Tab Page of the Device Monitor Dialog Box. When the items in the right dialog are selected, the data links are normally in operation. Click the **Close** Button.	
4	Select **Disconnect** from the Network Menu to go offline. The color of the icon on the figure changes from blue. Select **Exit** from the File Menu to exit the Network Configurator.	
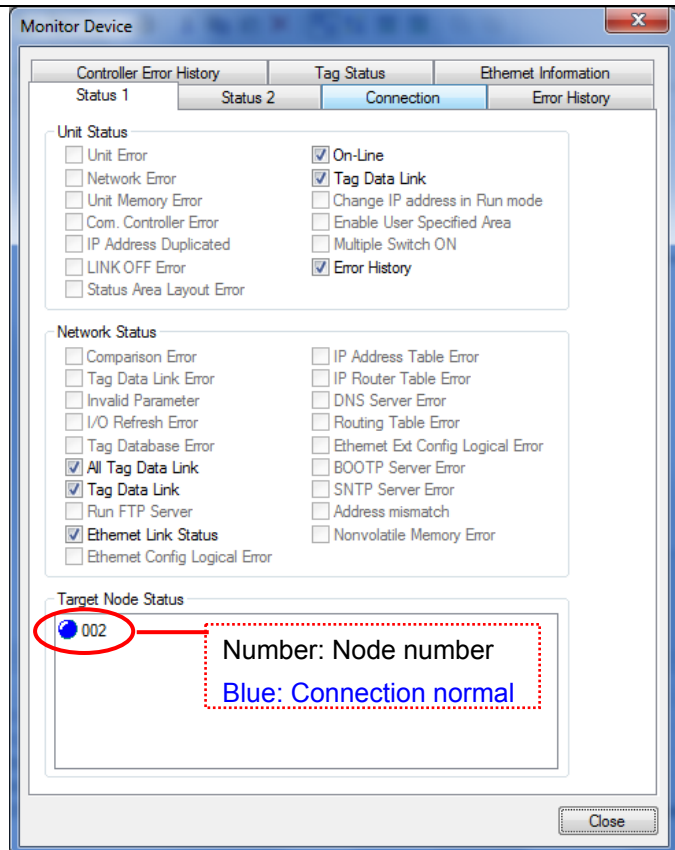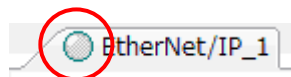
7.6.2. Checking Data That Are Sent and Received

Confirm that the correct data are sent and received.

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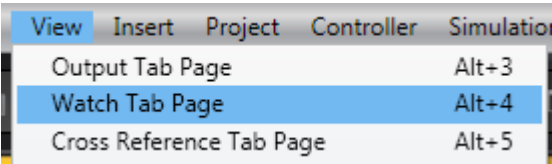
Always confirm safety at the destination node before you transfer a user program, configuration data, setup data, device variables, or values in memory used for CJ-series Units from the Sysmac Studio.

The devices or machines may perform unexpected operation regardless of the operating mode of the CPU Unit.
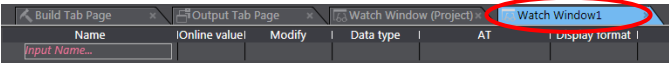
1	Select **Watch Tab Page** from the View Menu.	
2	The Watch Tab Page 1 is displayed in the lower section of the Edit Pane.	

3	The following names are entered in the Watch Tab Page 1 for monitoring.
	EIPOutput.CommonControlFlag
	  .F[0](EXE)
	EIPOutput.CommandCode
	EIPOutput.CommandParam1
	EIPInput.CommonStatusFlag
	  .F[0](FLG)
	EIPInput.CommandCodeEcho
	EIPInput.ResponseCode
	EIPInput.ResponseData	
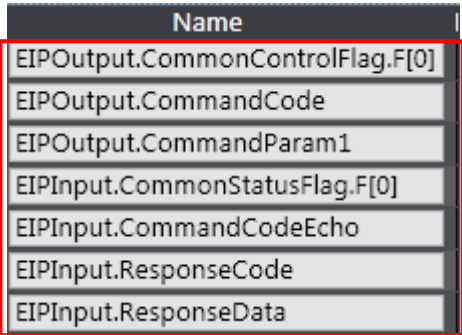
4 Enter 00404000 in the Modify Column of *EIPOutput.CommandCode.*
(Command code[0040](+ 7 words) [4000] (+ 6 words): (System data acquisition)

Name	IOnline value	Modify	Data type
EIPOutput.CommonControlFlag.F[0]	False	TRUE FALSE	BOOL
EIPOutput.CommandCode	0000 0000	00404000	DWORD
EIPOutput.CommandParam1	0	900	UINT
EIPInput.CommonStatusFlag.F[0]	False	TRUE FALSE	BOOL
EIPInput.CommandCodeEcho	0000 0000		DWORD
EIPInput.ResponseCode	0		UDINT
EIPInput.ResponseData	0		DINT

Enter 900 in the Modify Column of *EIPOutput.CommandParam1.*
(Data number[900]: The number of decimal places)

By pressing the Enter Key, the value is set and the online value of *EIPOutput.CommandCode* changes to 00404000.

Name	IOnline value	Modify	Data type
EIPOutput.CommonControlFlag.F[0]	False	TRUE FALSE	BOOL
EIPOutput.CommandCode	0040 4000	0404000	DWORD
EIPOutput.CommandParam1	900	900	UINT
EIPInput.CommonStatusFlag.F[0]	False	TRUE FALSE	BOOL
EIPInput.CommandCodeEcho	0000 0000		DWORD
EIPInput.ResponseCode	0		UDINT
EIPInput.ResponseData	0		DINT

Click **TRUE** in the Modify Column of *EIPOutput.CommonControlFlag.F[0]*(EXE).
The online value changes to True.
(*EIPOutput.CommonControlFlag.F[0]*(EXE): Control command execution bit)

Name	IOnline value	Modify	Data type
EIPOutput.CommonControlFlag.F[0]	True	TRUE FALSE	BOOL
EIPOutput.CommandCode	0040 4000	00404000	DWORD
EIPOutput.CommandParam1	900	900	UINT
EIPInput.CommonStatusFlag.F[0]	True	TRUE FALSE	BOOL
EIPInput.CommandCodeEcho	0040 4000		DWORD
EIPInput.ResponseCode	0		UDINT
EIPInput.ResponseData	1		DINT

5 The values of *EIPInput.CommonStatusFlag.F[0](FLG), EIPInput.CommandCodeEcho and EIPInput.ResponseCode* are as follows:
 • EIPInput.CommonStatusFlag.F[0](FLG): [TRUE]
 • EIPInput.CommandCodeEcho: [00404000]
   (The sent command code is returned.)
 • EIPInput.ResponseCode: 0
   (The execution result of the command (0: OK, -1(FFFFFFFF): NG) is reflected.)
 • EIPInput.ResponseData:1
   (The number of decimal places)

Name	IOnline value	Modify	Data type
EIPOutput.CommonControlFlag.F[0]	True	TRUE FALSE	BOOL
EIPOutput.CommandCode	0040 4000	00404000	DWORD
EIPOutput.CommandParam1	900	900	UINT
EIPInput.CommonStatusFlag.F[0]	True	RUE FALSE	BOOL
EIPInput.CommandCodeEcho	0040 4000		DWORD
EIPInput.ResponseCode	0		UDINT
EIPInput.ResponseData	1		DINT

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 Controller, you need to initialize the CPU Unit and EtherNet/IP port. Change to the PROGRAM mode before the initialization.

8.1.1. EtherNet/IP port

Delete the connection information and tag information that are set for the EtherNet/IP port. Follow the procedure below to set blank connection information and blank tag information and delete them using the Network Configurator.

(1) Deleting connection information

In the Connections Tab Page of the Edit Device Parameters Dialog Box, move all devices registered in the Register Device List to the Unregister Device List.

If a confirmation dialog is displayed when you remove devices from the registration list, click the **Yes** Button.
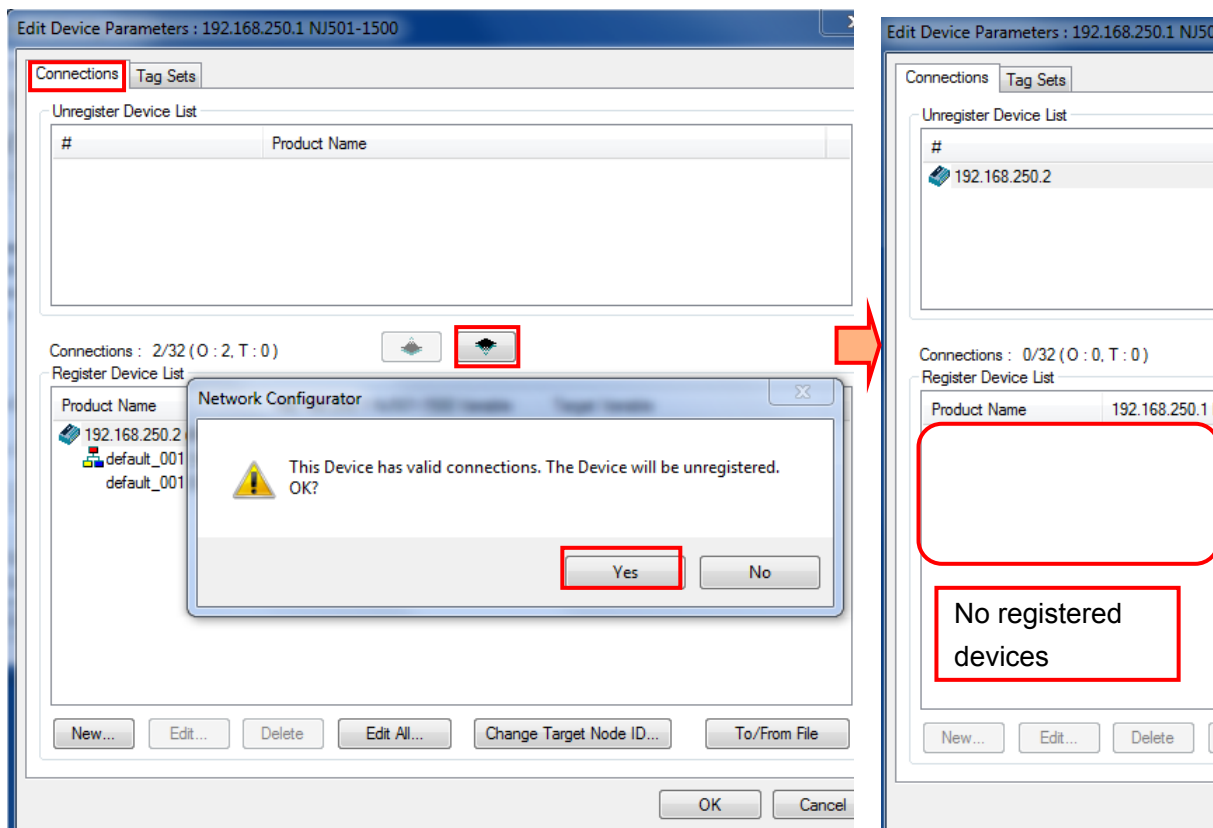
(2)Deleting tag information

In the Tag Sets Tab Page of the Edit Parameters Dialog Box, click the **Delete all of unused Tag Sets** Button.

If a confirmation dialog box is displayed when deleting, click the **Yes** Button.
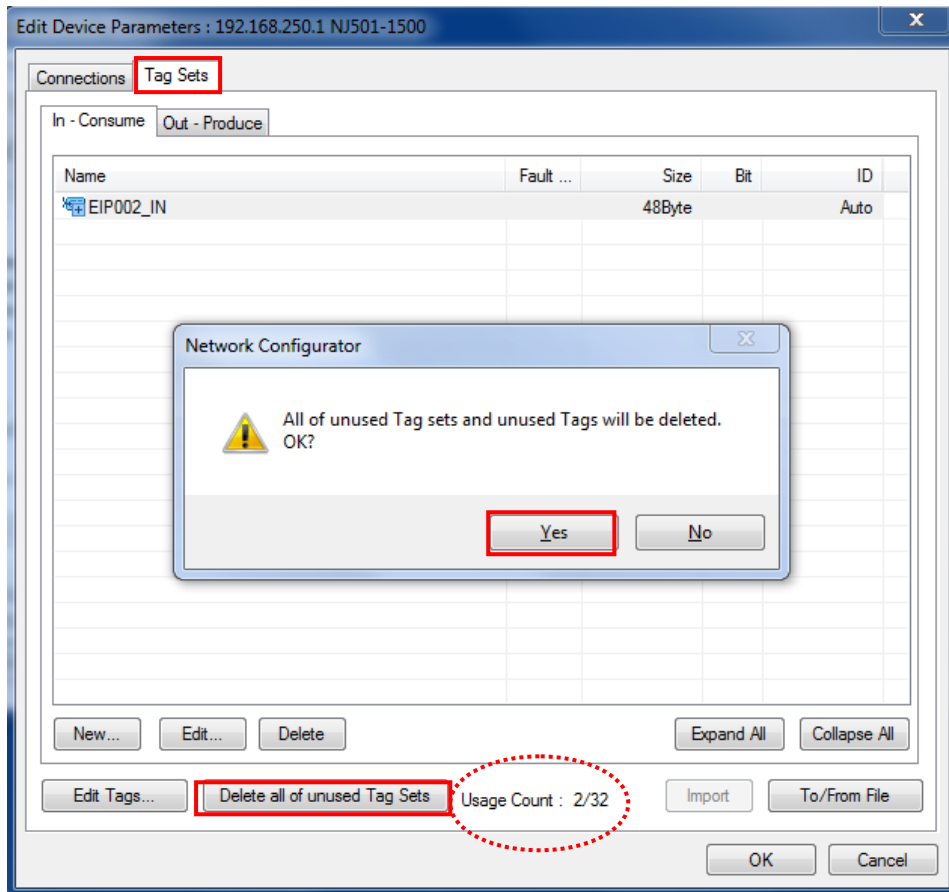
(3)Download

Right-click the Controller and select *Parameter* - *Download* from the menu that is displayed.
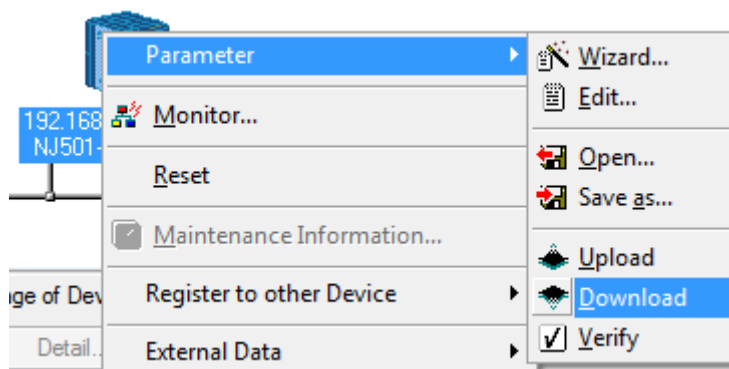
8.1.2. CPU Unit

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. Click the **OK** Button.
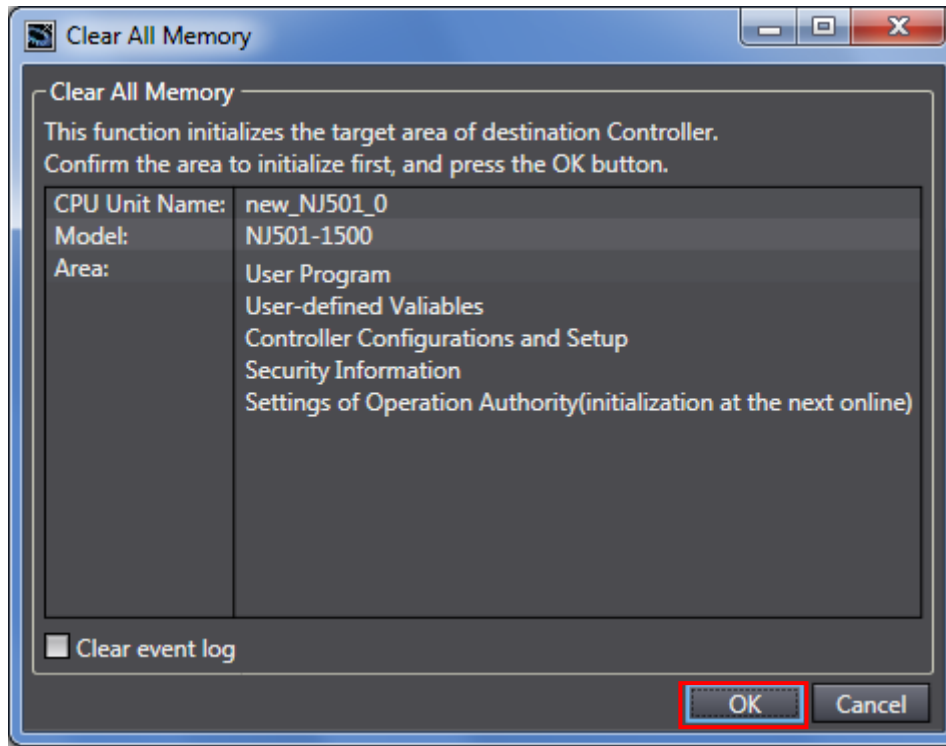
8.2. Initializing the Displacement Sensor

For the initialization of the Displacement Sensor, refer to *Initializing Settings* in 9-11 Setting the System of the *ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual* (Cat. No. Z332).

9. Appendix 1 Detailed Settings of the Tag Data Links

This section provides the detailed settings necessary to execute tag data links which are set in this document.

9.1. Global Variable Table

The Controller accesses the data in tag data links as global variables. The following are the settings of the global variables. Use the Sysmac Studio to register a global variable table.

Name	Data type	Network publish	Destination device allocation
EIPOutput	S_EIPOutput	Output	Output data (24 bytes)
EIPInput	S_EIPInput	Input	Input data (56 bytes)

📓 **Additional Information**

For details on the command code and response code, refer to *6-3 Ethernet/IP Connection* under in *6 Communications with External Devices* of the *ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual* (Cat. No. Z332).

9.1.1. Data Types

The following data types are used for the data in the tag data links of the destination device.

■Definition of the data type to access the signals (Union)

This data type is used to access the control signals and status signals.

Data type name	Data type
U_EIPFlag	UNION
F	BOOL[32]
W	DWORD

■Definition of the data type to access the command area (structure)

This data type is used to access the command area

Data type name	Data type	Destination device data
S_EIPOutput	STRUCT	-
CommonControlFlag	U_EIPFlag	Sensor head common control signal (32 bits)
SensorHead1ControlFlag	U_EIPFlag	Sensor head 1 control signal (32 bits)
SensorHead2ControlReserve	U_EIPFlag	Sensor head 2 control signal (32 bits) (reserved)
CommandCode	DWORD	Command code (CMD-CODE)
CommandParam1	UINT	
CommandParam2	UINT	Command parameter (CMD-PARAM)
CommandParam3	DINT	

■Definition of the data type to access the response/output areas (structure)

This data type is used to access the response/output areas

Data type name	Data type	Destination device data	
S_EIPInput	STRUCT	-	
CommonStatusFlag	U_EIPFlag	Sensor head common status signal (32 bits)	
SensorHead1StatusFlag	U_EIPFlag	Sensor head 1 status signal (32 bits)	
SensorHead2StatusReserve	U_EIPFlag	Sensor head 2 status signal (32 bits) (reserved)	
CommandCodeEcho	DWORD	Command code (CMD-CODE)	
ResponseCode	UDINT	Response code (RES-CODE)	
ResponseData	UDINT	Response data (RES-DATA)	
MeasurementValueofTask1	DINT	Measurement Value of Task1	Output data 0 to 7 (OutData 0 to 7
MeasurementValueofTask2	DINT	Measurement Value of Task2	
MeasurementValueofTask3	DINT	Measurement Value of Task3	
MeasurementValueofTask4	DINT	Measurement Value of Task4	
MeasurementValueReserve	DINT[4]	Reserved	

Additional Information

For details on the structure and union, refer to *Tag Data Link Setting Methods* in *6-3 Ethernet/IP Connection* in *Chapter 6 Communications with External Devices* of the *ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual* (Cat. No. Z332).

Additional Information

With the Sysmac Studio, the data type is expressed as ARRAY[0..2] OF WORD when an array is specified for a data type. However, a data type of an array is simplified in this document (e.g. WORD[3]).

It is possible to set either of the following to specify an array for a data type with the Sysmac Studio.

•ARRAY[0..2] OF WORD

•WORD[3]

In the example above, 3 WORD array elements are secured.

9.2. Relationship between the Destination Device and the Global Variables

Global variables must be sorted in order of offsets of the destination device when setting the tag data link parameters.

The relationship between the memory allocation (offset) of the destination device and the global variables are shown below.

■Output area (Controller → Displacement Sensor)

Variable	Data type	Data size
EIPOutput	S_EIPOutput	24 bytes

Offset (word)	Destination device data	Name	Data type
+0 and +1	Control output 1 [*1] (32 bits) (Data type: U_EIPFlag)	EIPOutput.CommonControlFlag.F [*4]	BOOL[32]
		EIPOutput.CommonControlFlag.W [*4]	DWORD
+2 and +3	Control output 2 [*2] (32 bits) (Data type: U_EIPFlag)	EIPOutput.SensorHead1ControlFlag.F [*5]	BOOL[32]
		EIPOutput.SensorHead1ControlFlag.W [*5]	DWORD
+4 and +5	Control output 3 [*3] (32 bits) (Data type: U_EIPFlag)	EIPOutput.SensorHead2ControlReserve.F [*6]	BOOL[32]
		EIPOutput.SensorHead2ControlReserve.W [*6]	DWORD
+6 and +7	Command code (CMD-CODE)	EIPOutput.CommandCode	DWORD
+8	Command parameter (CMD-PARAM)	EIPOutput.CommandParam1	UINT
+9		EIPOutput.CommandParam2	UINT
+10 and +11		EIPOutput.CommandParam3	DINT

*1: Sensor head common control signal

*2: Sensor head 1 control signal

*3: Sensor head 2 control signal (reserved)

*4: Details on the allocation of sensor head common control signal

Allocation of *EIPOutput.CommonControlFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+0															SYNC	EXE
+1																ERCLR

EXE: Control command execution bit: Turns ON when the Controller instructs execution of control commands to the displacement sensor.

SYNC: Measurement synchronous start bit: Turns ON when the user Controller instructs measurement synchronization to the displacement sensor.

ERCLR: Error clear bit: Turns ON when the displacement sensor ERR signal turns OFF.

Allocation of *EIPOutput.CommonControlFlag.W* variable

Offset (word)	15	14	13	…	2	1	0
+0	15	14	13	…	2	1	0
+1	31	30	29	…	18	17	16

Bits 31 to 0: EIPOutput.CommonControlFlag.W uses DWORD data from offset + 2 words.

*5: Details on allocation of sensor head 1 control signal

Allocation of *EIPOutput.SensorHead1ControlFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+2														LIGHT OFF	RESET1	TIMING1
+3									ZEROCLR_T4	ZEROCLR_T3	ZEROCLR_T2	ZEROCLR_T1	ZERO1_T4	ZERO1_T3	ZERO1_T2	ZERO1_T1

TIMING1: Timing bit: Turns ON when the Controller instructs start of hold sampling to the displacement sensor.

RESET1: Reset bit: Turns ON when the Controller resets judgment processing and output of the displacement sensor. If the hold function is used, the state before the hold function was set will be restored.

LIGHTOFF1: Light metering OFF bit: Turns ON when the Controller instructs logical beam OFF to the displacement sensor.

ZERO1_T1 to 4: Zero reset execution bit: Turns ON when the Controller instructs execution of zero reset of TASK1 to 4 to the displacement sensor.

ZEROCLR1_T1 to 4: Zero reset cancel bit: Turns ON when the Controller instructs zero reset cancel of TASK1 to 4 to the displacement sensor.

Allocation of *EIPOutput.SensorHead1ControlFlag.W* variable

Offset (word)	15	14	13	…	2	1	0
+2	15	14	13	…	2	1	0
+3	31	30	29	…	18	17	16

Bits 31 to 0: *EIPOutput.SensorHead1ControlFlag.W uses DWORD* data from offset + 2 words.

*6: Details on allocation of sensor head 2 control signal (reserved)

Allocation of *EIPOutput.SensorHead2ControlReserve.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+4																
+5																

Allocation of *EIPOutput.SensorHead2ControlReserve.W* variable

Offset (word)	15	14	13	…			2	1	0
+4	15	14	13	…			2	1	0
+5	31	30	29	…			18	17	16

Bits 31 to 0: *EIPOutput.SensorHead2ControlReserve.W* uses DWORD data from offset + 2 words.

■Input area (Controller ← Displacement Sensor)

Variable	Data type	Data size
EIPInput	S_EIPInput	56 bytes

Offset (word)	Destination device data	Name	Data type
+0 and +1	Control output 1 [*1] (32 bits) (Data type: U_EIPFlag)	EIPInput.CommonStatusFlag.F [*4]	BOOL[32]
		EIPInput.CommonStatusFlag.W [*4]	DWORD
+2 and +3	Control output 2 [*2] (32 bits) (Data type: U_EIPFlag)	EIPInput.SensorHead1StatusFlag.F [*5]	BOOL[32]
		EIPInput.SensorHead1StatusFlag.W [*5]	DWORD
+4 and +5	Control output 3 [*3] (32 bits) (Data type: U_EIPFlag)	EIPInput.SensorHead2StatusReserve.F [*6]	BOOL[32]
		EIPInput.SensorHead2StatusReserve.W [*6]	DWORD
+6 and +7	Command code (CMD-CODE)	EIPInput.CommandCodeEcho	DWORD
+8 and +9	Response code (RES-CODE)	EIPInput.ResponseCode	UDINT
+10 and +11	Response data (RES-DATA)	EIPInput.ResponseData	DINT
+12 and +13	Output data 0 (DATA0)	EIPInput.MeasurementValueofTask1	DINT
+14 and+15	Output data 1 (DATA1)	EIPInput.MeasurementValueofTask2	DINT
+16 and +17	Output data 2 (DATA2)	EIPInput.MeasurementValueofTask3	DINT
+18 and +19	Output data 3 (DATA3)	EIPInput.MeasurementValueofTask4	DINT
+20 and +21	Output data 4 (DATA4)	EIPInput.MeasurementValueReserve	DINT[4]
+22 and +23	Output data 5 (DATA5)		
+24 and +25	Output data 6 (DATA6)		
+26 and + 27	Output data 7 (DATA7)		

*1: Sensor head common status signal

*2: Sensor head 1 status signal

*3: Sensor head 2 status signal (reserved)

*4: Details on allocation of sensor head common status signal

Allocation of *EIPInput.CommonStatusFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+0	BANK1_E	BANK1_D	BANK1_C	BANK1_B	BANK1_A							RUN		READY	SYNC FLG	FLG
+1																ERR

FLG: Control command completion bit: Turns ON when the displacement sensor completes control command execution.

SYNCFLG: Measurement synchronization completion bit: Turns ON when the displacement sensor executes measurement synchronization processing and the state changes to one where normal measured values can be output.

READY: Ready bit: Turns ON when the displacement sensor can execute control commands or measurement synchronization processing.

RUN: Run screen bit: Turns ON when the displacement sensor is in the RUN mode.

BANK1_A to E (BANKOUT1_A to E): Current bank number bit: Outputs the currently specified bank number. It expresses the bank number in combinations of BANKOUTx_A to E.

ERR: Error bit: Turns ON when a displacement sensor error is detected.

Allocation of *EIPInput.CommonStatusFlag.W* variable

Offset (word)	15	14	13	…	2	1	0
+0	15	14	13	…	2	1	0
+1	31	30	29	…	18	17	16

Bits 31 to 0: *EIPInput.CommonStatusFlag.W* uses DWORD data from offset + 2 words.

*5: Details on allocation of sensor head 1 status signal

Allocation of *EIPOutput.SensorHead1StatusFlag.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+2										OR1	GATE1	ENABLE1	STABLITY1	LIGHT1	RESETSTAT1	HOLDSTAT1
+3	LOW1_T1	PASS1_T1	HIGH1_T1	LOW1_T1	PASS1_T1	HIGH1_T1	LOW1_T1	PASS1_T1	HIGH1_T1	LOW1_T1	PASS1_T1	HIGH1_T1	LOW1_T1	PASS1_T1	HIGH1_T1	LOW1_T1

HOLDSTAT1: Hold execution status bit: Turns ON when the displacement sensor is in the hold sampling period.

RESETSTAT1: Reset execution state bit: Turns ON when the displacement sensor is in the reset execution state.

LIGHT1: Logical beam lighting state bit: Turns ON when the logical beam is lit.

STABILITY1: Measurement position bit: Turns ON when the measured value is in the measuring range.

ENABLE1: Measurement state bit: Turns ON when the displacement sensor is ready for measurement.

GATE1: Data output completed bit: Turns ON when the displacement sensor completes control data output when hold is set.

OR1: Overall judgment result bit: Turns ON when even one of the judgment result of the displacement sensor TASK1 to 4 is other than PASS.

ZEROSTAT1_T1 to 4: Zero reset bit: Turns ON when the displacement sensor TASK1 to 4 is in the zero reset execution state.

HIGH1_T1 to 4: HIGH output bit: Turns ON when the judgment result of the displacement sensor TASK1 to 4 is HIGH (HIGH threshold < measured value).

PASS1_T1 to 4: PASS output bit: Turns ON when the judgment result of the displacement sensor TASK1 to 4 is PASS (LOW threshold ≤ measured value ≤ HIGH threshold).

LOW1_T1 to 4: LOW output bit: Turns ON when the judgment result of the displacement sensor TASK1 to 4 is LOW (LOW threshold > measured value).

Allocation of *EIPOutput.SensorHead1StatusFlag.W* variable

Offset (word)	15	14	13	…			2	1	0
+2	15	14	13	…			2	1	0
+3	31	30	29	…			18	17	16

Bits 31 to 0: *EIPOutput.SensorHead1StatusFlag.W* uses DWORD data from offset + 2 words.

*6: Details on allocation of sensor head 2 control signal (reserved)

Allocation of *EIPOutput.SensorHead2StatusReserve.F* variable

Offset (word)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
+4																
+5																

Allocation of *EIPOutput.SensorHead2StatusReserve.W* variable

Offset (word)	15	14	13	…			2	1	0
+4	15	14	13	…			2	1	0
+5	31	30	29	…			18	17	16

Bits 31 to 0: *EIPOutput.SensorHead2StatusReserve.W* uses DWORD data from offset + 2 words.

📝 **Additional Information**

For details on the structure and union, refer to *6-3 Ethernet/IP Connection* in *Chapter 6 Communications with External Devices* of the *ZW Series Displacement Sensor (Confocal Fiber Type) User's Manual* (Cat. No. Z332).

📓 **Additional Information**

With the Sysmac Studio, the data type is expressed as ARRAY[0..2] OF WORD when an array is specified for a data type. However, a data type of an array is simplified in this document (e.g. WORD[3]).

It is possible to set either of the following to specify an array for a data type with the Sysmac Studio.

•ARRAY[0..2] OF WORD

•WORD[3]

In the example above, 3 WORD array elements are secured.

9.3. Associating the Tag Data Links

Tag data link parameters are required to perform tag data links with a destination device.

Follow the procedures below to associate the tag data links.

(1) Define the global variables to publish on the network by using the Sysmac Studio.

   Store the created global variables in a CSV file to use in the Network Configurator.

(2) Read the CSV file (tag list) created in step 1 to the Network Configurator.

(3) Install the EDS file for the destination device in the Network Configurator.

(4) Make a single tag set that includes the tag lists.

(5) Link the tag set with the destination device information and create tag data link parameters.

The numbers shown in the tables below correspond to the steps above.

■Output area (Controller → Displacement Sensor)

Controller setting (Set with Sysmac Studio.)		Data link table setting (Set with Network Configurator.)			Destination device information (EDS file setting contents)	
(1)			Tag set: EIPOutput	24 bytes (5)	← (3)	Output_100-[24 Byte]
Global variable (Data type)		(4)	Tag list			*For details, refer to *Section 9.2*.
EIPOutput	S_EIPOutput	→ (2)	EIPOutput	(24 bytes)		

■Input area (Controller ← Displacement Sensor)

Controller setting (Set with Sysmac Studio.)		Data link table setting (Set with Network Configurator.)			Destination device information (EDS file setting contents)	
(1)			Tag set: EIPInput	56 bytes (5)	← (3)	Input_101-[56Byte]
Global variable (Data type)		(4)	Tag list			*For details, refer to *Section 9.2*.
EIPInput	S_EIPInput	→ (2)	EIPInput	(56 bytes)		

10. Appendix 2 Setting the Tag Data Links Using the Software

This section describes the procedure for setting the Controller using the software without using the configuration files (procedure for setting the parameters from the beginning).

You can refer to this section when you want to change the parameters of the configuration files.

10.1. Overview of Tag Data Links Settings Using the Software

The following is the relationship of the processes to operate the tag data links using the "procedure for setting parameters from the beginning".

Settings made with Sysmac Studio
•Setting parameters (IP address, etc.)
•Setting global variables (name, network setting and task setting, etc.)
•Exporting global variables
•Building
•Settings in the Watch Tab Page

Settings made with Network Configurator
•Uploading network configuration
•Importing CSV file (tag name)
•Tag registration
•Connection setting (associating tags with the EDS file of destination device)

Personal computer

Sysmac Studio

Global variable (CSV file)

Network Configurator

Transferring project data

Transferring tag data link parameters

Controller

Destination device
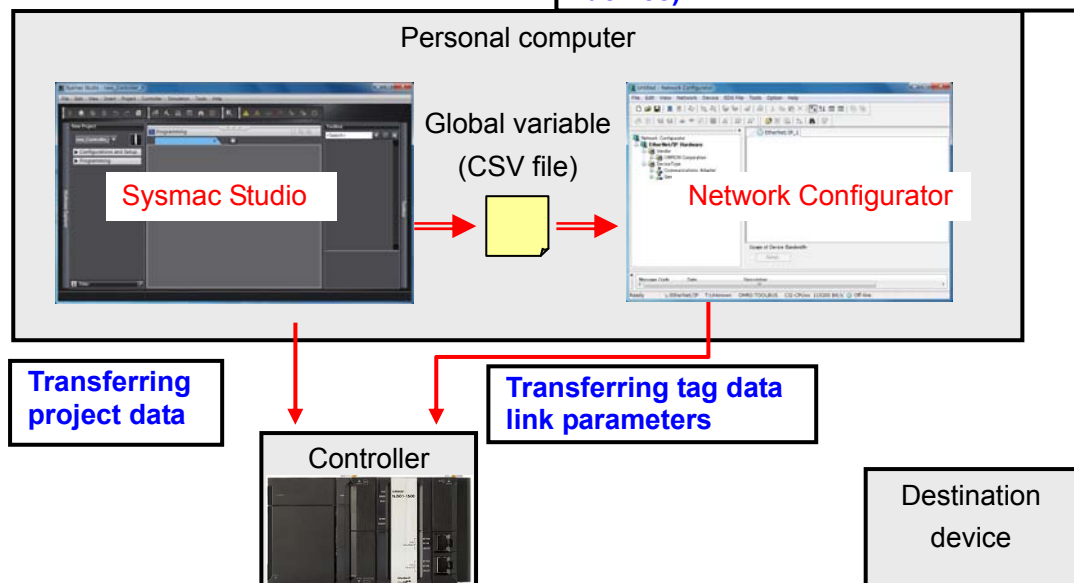
10.2. Work Flow of "Procedure for Setting Parameters from the Beginning"

Use the following procedure to make connection settings for tag data links of the EtherNet/IP using the "procedure for setting parameters from the beginning".

This section describes the detailed procedures for "10.3 Setting the Controller Using Software" and "10.4 Setting the Network Using Software" (in red frames below) without using the "configuration files".

The procedures for 7.3 Setting the Displacement Sensor and 7.6 Checking the Connection Status" are the same as the "procedure for using the configuration files". Refer to the procedures in Section 7.

7.3. Setting Up the Displacement Sensor	Set up the Displacement Sensor.
↓	
7.3.1. Parameter Setting	Set the parameters for the Displacement Sensor.
↓	
10.3. Setting Up the Controller Using the Software	Set up the Controller using the software.
↓	
10.3.1. Starting the Sysmac Studio and Setting the Parameters for the Controller	Start the Sysmac Studio and set the parameters for the Controller.
↓	
10.3.2. Setting the Global Variables	Set the global variable to use for the tag data links.
↓	
10.3.3. Exporting the Global Variables	Export the global variables in a CSV file to use as tags in the Network Configurator.
↓	
10.3.4. Connecting Online and Transferring the Project Data	Connect online with the Sysmac Studio and transfer the project data to the Controller.
↓	
10.3.5. Settings in Watch Tab Page	To check data that is sent and received, make settings in the Watch Tab Page.
↓	

10.4. Setting Up the Network Using the Software	Set the tag data links for EtherNet/IP using the software.
↓	
10.4.1. Starting the Network Configurator and Uploading the Configuration	Start up the Network Configurator, connect online with the Controller, and upload the network configuration.
↓	
10.4.2. Importing Files and Registering Tags	Import the CSV file that was saved, and register tags of the originator's send area and receive area.
↓	
10.4.3. Setting the Connection	Associate the tags of target device with the tags of originator.
↓	
10.4.4. Transferring the Tag Data Link Parameters	Transfer the tag data link settings that were set to the Controller.
7.6. Checking the EtherNet/IP Communications	Confirm that the EtherNet/IP communications are performed normally.
↓	
7.6.1. Checking the Connection Status	Check the connection status of the EtherNet/IP network.
↓	
7.6.2. Checking Data that are Sent and Received	Confirm that the correct data are sent and received.

10.3. Setting Up the Controller Using the Software

Set up the Controller using the software.

10.3.1. Starting the Sysmac Studio and Setting the Parameters for the Controller

Start the Sysmac Studio and set the parameters for the Controller.

1	Connect the LAN cable and the USB cable to the Controller, and turn ON the power supply to the Controller. *For details, refer to step 1 of 7.4.1. Starting the Sysmac Studio and Importing the Project File.	
2	Start the Sysmac Studio. Click the **New Project** Button. *If a confirmation dialog for an access right is displayed at start, select to start.	
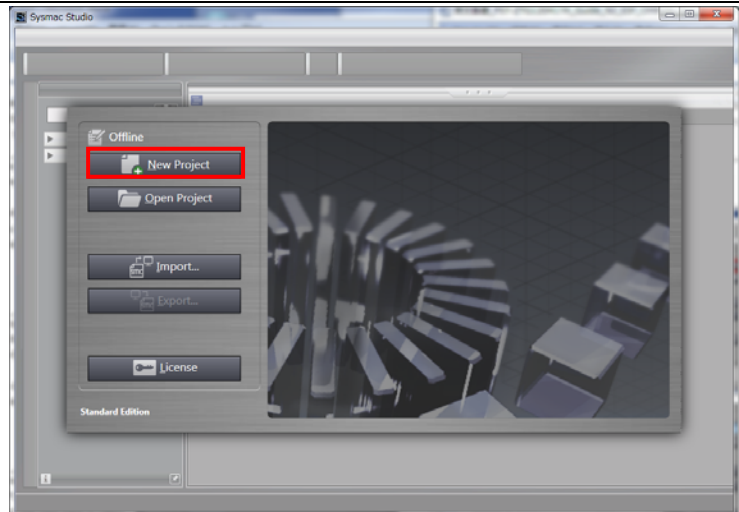
3	The Project Properties Dialog Box is displayed. *In this document, New Project is set as the project name. Confirm that Category and Device to use are set in the Select Device Field. Select version 1.03 from the pull-down list of Version. *Although 1.03 is selected in this document, select a version you actually use.	
4	Click the **Create** Button.	
5	The New Project is displayed. The left pane is called Multiview Explorer, the right pane is called Toolbox and the middle pane is called Edit Pane.	
6	Double-click **Built-in EtherNet/IP Port Settings** under **Configurations and Setup** - **Controller Setup** in the Multiview Explorer.	
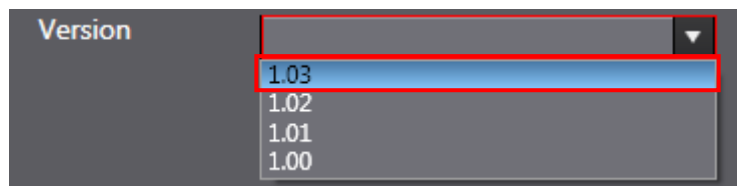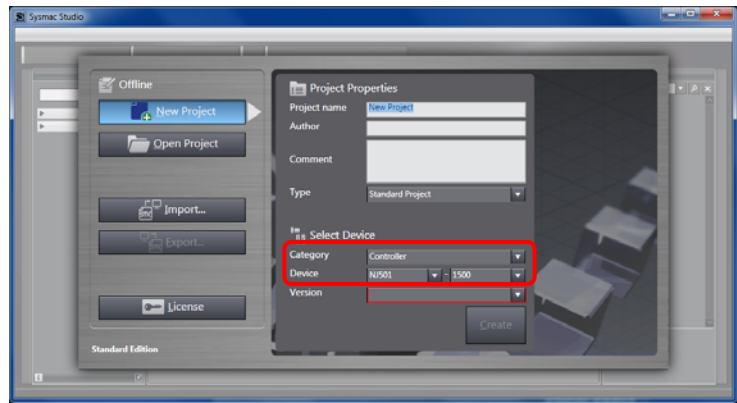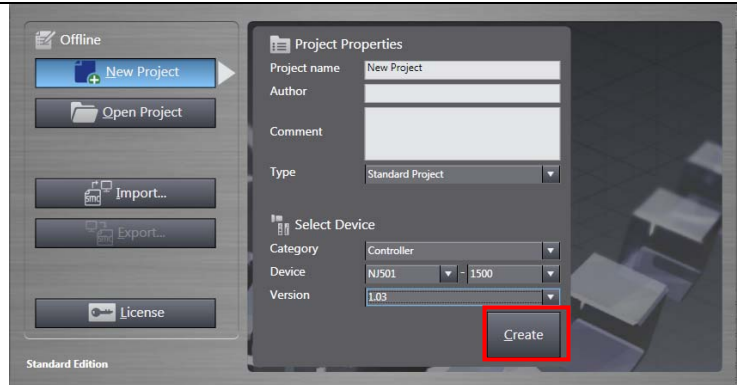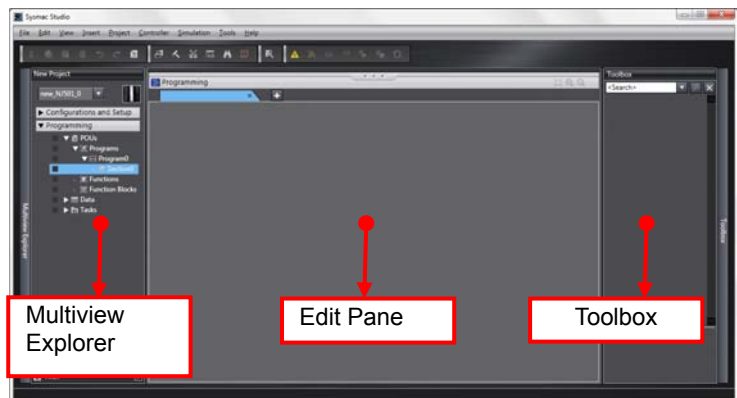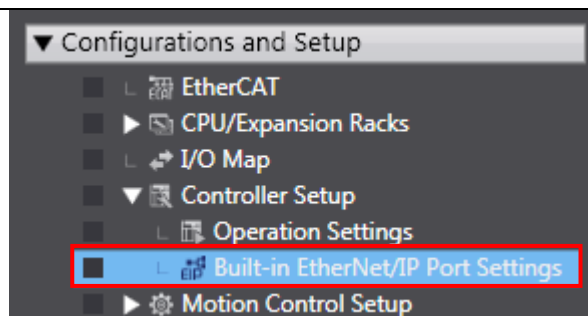
| 7 | The Built-in EtherNet/IP Port Settings Tab Page is displayed in the Edit Pane.

 Click the **TCP/IP Setting** Button, select the *Fixed Setting* Check Box in the IP Address Field, and make the following settings.
 IP address: 192.168.250.1
 Subnet mask: 255.255.255.0 | |
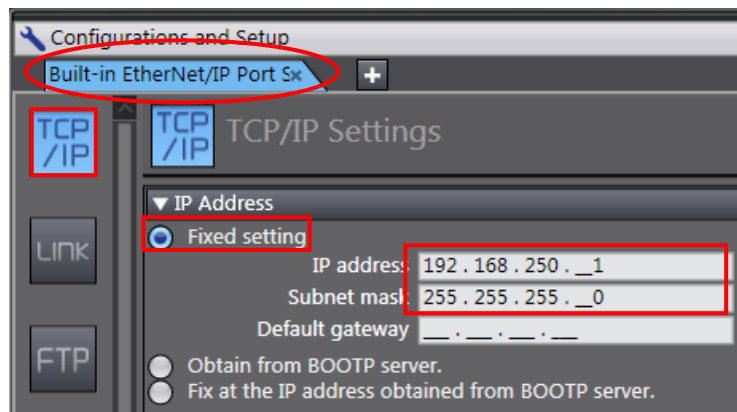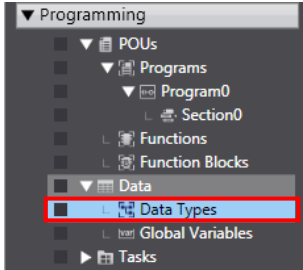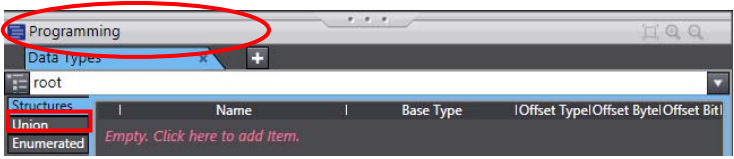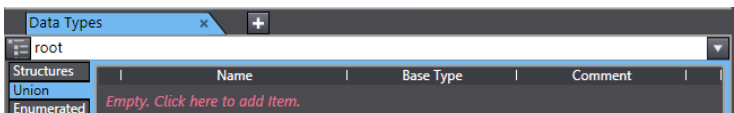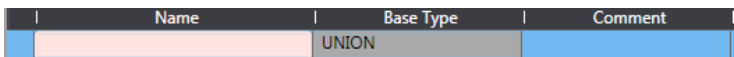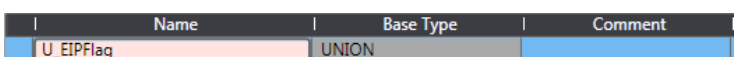
10.3.2. Setting the Global Variables

Set the global variable to use for the tag data links.

1	Double-click **Data Type** under **Programming** - **Data** in the Multiview Explorer.	
2	Click the Structures Tab and display the Union Tab on the Data Types Tab Page. Click a Name Column to enter a new data type. Enter *U_EIPFlag* in the Name Column.	
3	After entering, right-click and select **Create New Member** from the menu.	
4	Enter F in the Name Column. Enter BOOL[32] in the Base Type Column. *After entering, the value changes to ARRAY[0..31] OF BOOL as shown on the right.	
5	In the same way as steps 3 and 4, enter the following data in new columns. •Name: W Data type: DWORD	
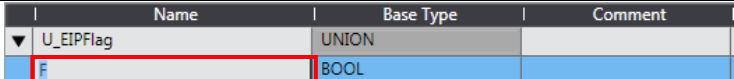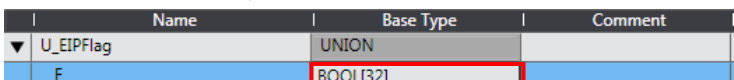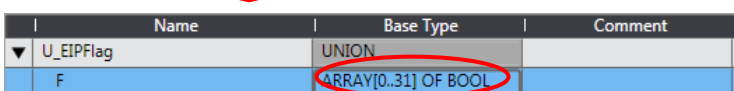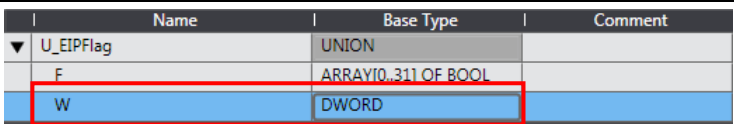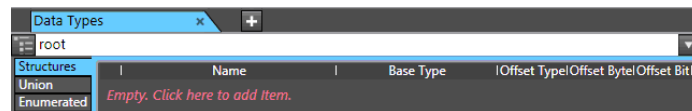
6	Click the Structures Tab in the Edit Pane. Display the Structures Tab on the Data Types. Click a Name Column to enter a new data type. Enter *S_EIPOutput* in the Name Column.	
7	After entering, right-click and select **Create New Member** from the menu.	
8	Enter *CommonControlFlag* in the Name Column. Enter *U_EIPFlag* in the Base Type Column.	
9	In the same way as steps 7 and 8, enter the following data in the new columns. •Name: SensorHead1ControlFlag Data type: U_EIPFlag •Name: SensorHead2ControlReserve Data type: U_EIPFlag •Name: CommandCode Data type: DWORD •Name: CommandParam1 Data type: UINT •Name: CommandParam2 Data type: UINT •Name: CommandParam3 Data type: DINT *Make sure that members are displayed in order of the offsets listed in Section 9.2.	
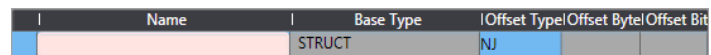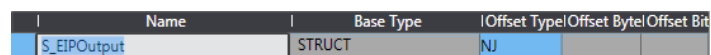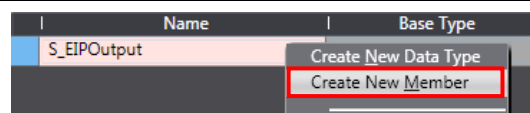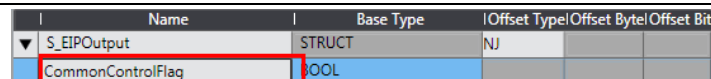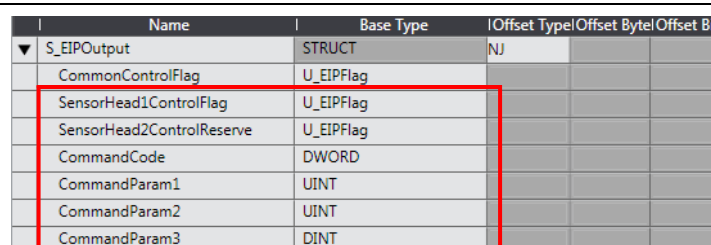
60

10	After entering, right-click and select **Create New Data Type** from the menu. Enter *S_EIPInput* in the Name Column.	

11	In the same way as steps 7 and 8, enter the following data in the new member columns.
	•Name: CommonStatusFlag
	  Data type: U_EIPFlag
	•Name: SensorHead1StatusFlag
	  Data type: U_EIPFlag
	•Name: SensorHead2StatusReserve
	  Data type: U_EIPFlag
	•Name: CommandCodeEcho
	  Data type: DWORD
	•Name: ResponseCode
	  Data type: UDINT
	•Name: ResponseData
	  Data type: DINT
	•Name: MeasurementValueofTask1
	  Data type: DINT
	•Name: MeasurementValueofTask2
	  Data type: DINT
	•Name: MeasurementValueofTask3
	  Data type: DINT
	•Name: MeasurementValueofTask4
	  Data type: DINT
	•Name: MeasurementValueReserve
	  Data type: DINT[4]
	
	*After entering, the value changes to ARRAY[0..7] OF DINT as shown on the right.
	*Make sure that members are displayed in order of the offsets listed in Section 9.2.	

12	Double-click **Global variables** under **Programming** - **Data** in the Multiview Explorer.	

13	The Global Variables Tab is displayed in the Multiview Explorer. Click a column under the Name Column to enter a new variable. Enter *EIPOutput* in the Name Column. Enter *S_EIPOutput* in the Data Type Column. Select **Output** for the Network Publish attribute from the list.	

14	After entering, right-click and select *Create New* from the menu.	
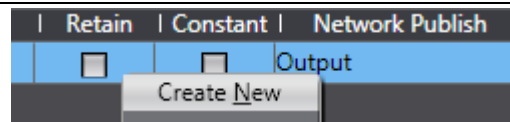
15	In the same way as step 13, enter the following data in the new columns. •Name: EIPInput Data type: S_EIPInput Network Publish: Input	

16	Double-click **Task Settings** under Configurations and Setup in the Multiview Explorer. The Task Settings Tab Page is displayed in the Edit Pane. Click the **Settings for Exclusive Control Variables in Tasks** Button. Click the **+** Button.	
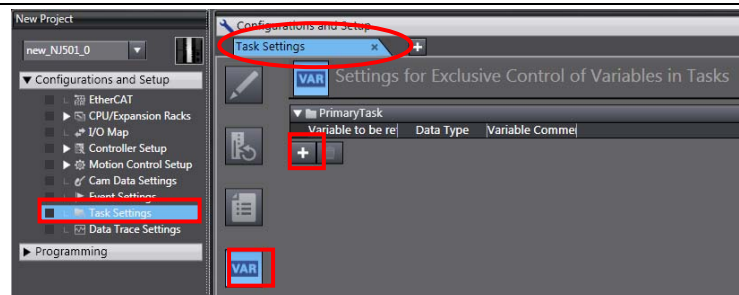
17	Click the Down Button under Variable to be refreshed. The variables set in steps 13 to 15 are displayed. Select *EIPOutput*.	
18	Click the **+** Button and select a variable to be refreshed. *The data types are displayed automatically, and you do not have to set them. Add all variables set in steps 13 and 15 as shown in the right figure.	
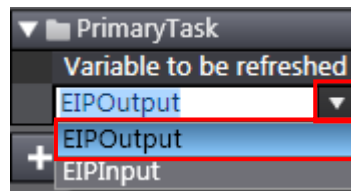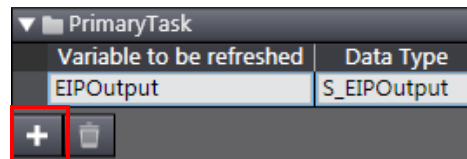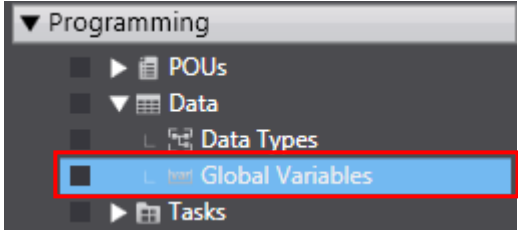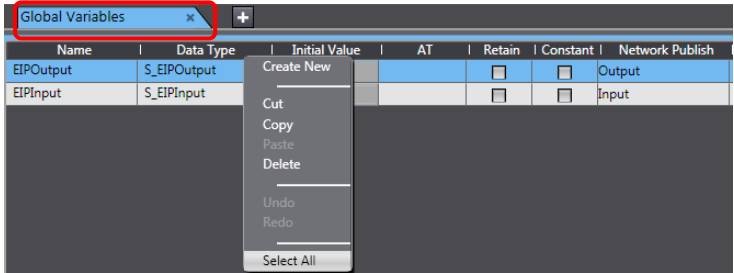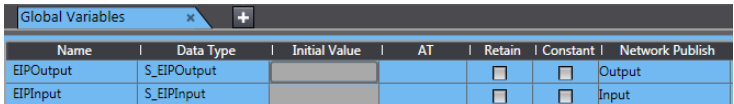
10.3.3. Exporting the Global Variable

Export the global variables in a CSV file to use as tags in the Network Configurator.
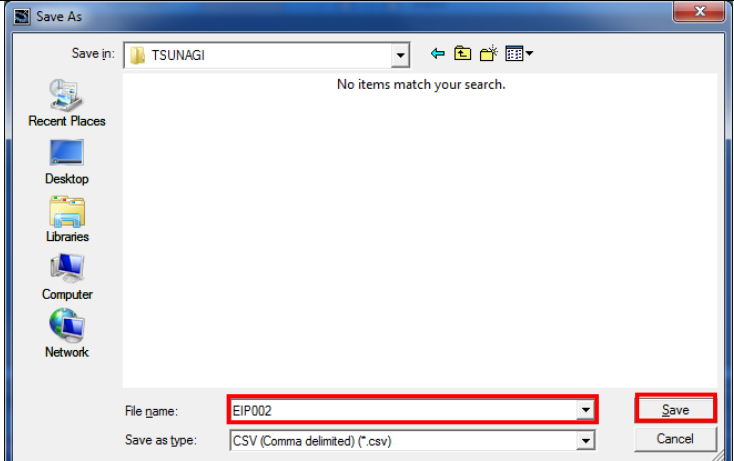
1	Double-click **Global Variables** under **Programming** - **Data** in the Multiview Explorer.	
2	The Global Variables Tab Page is displayed in the Edit Pane. Right-click on the pane and Select **Select All**. All the selected variables are highlighted.	
3	Select **Export Global Variables** - **Network Configurator** from the Tools Menu.	
4	The Save As Dialog Box is displayed. Enter EIP002 in the File name Field. Click the **Save** Button.	

10.3.4. Connecting Online and Transferring the Project Data
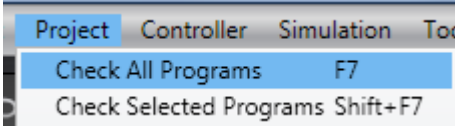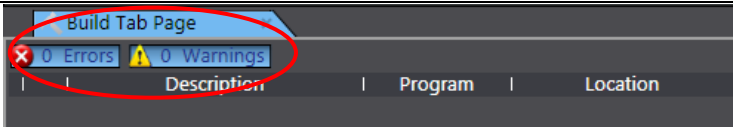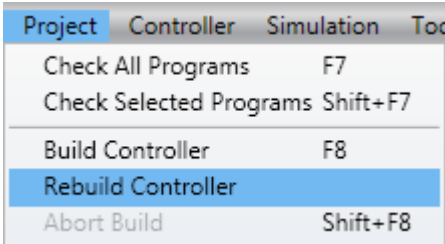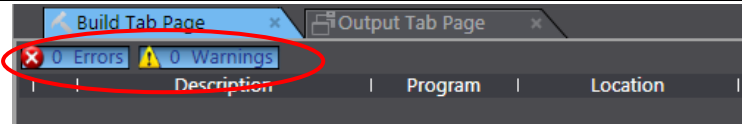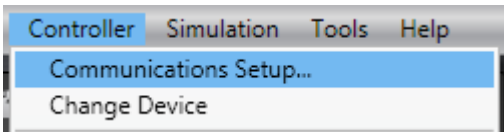
Connect online with the Sysmac Studio and transfer the project data to the Controller.
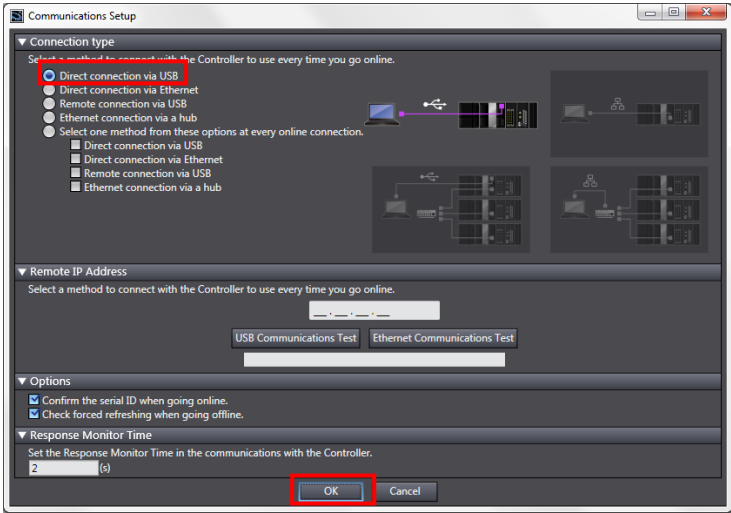
⚠ WARNING
Always confirm safety at the destination node before you transfer a user program, configuration data, setup data, device variables, or values in memory used for CJ-series Units from the Sysmac Studio. The devices or machines may perform unexpected operation regardless of the operating mode of the CPU Unit.
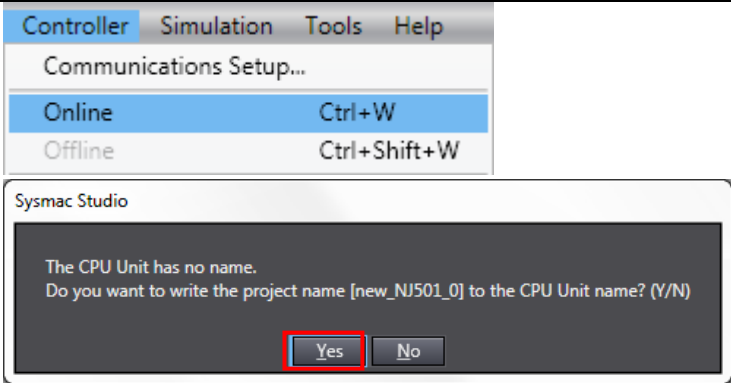
1	Select **Check All Programs** from the Project Menu.	
2	The Build Tab Page is displayed in the Edit Pane. Confirm that "0 Errors" and "0 Warnings" are displayed.	
3	Select **Rebuild Controller** from the Project Menu.	
4	Confirm that "0 Errors" and "0 Warnings" are displayed in the Build Tab Page.	
5	Select **Communications Setup** from the Controller Menu.	

6	The Communications Setup Dialog Box is displayed. Select the *Direct Connection via USB* Option for Connection Type. Click the **OK** Button.	
7	Select *Online* from the Controller Menu. A confirmation dialog is displayed. Click the **Yes** Button. *The displayed dialog depends on the status of the Controller used. Click the **Yes** Button to proceed with the processing.	
8	When an online connection is established, a yellow bar is displayed on the top of the Edit Pane.	
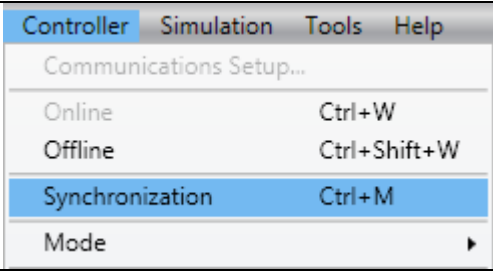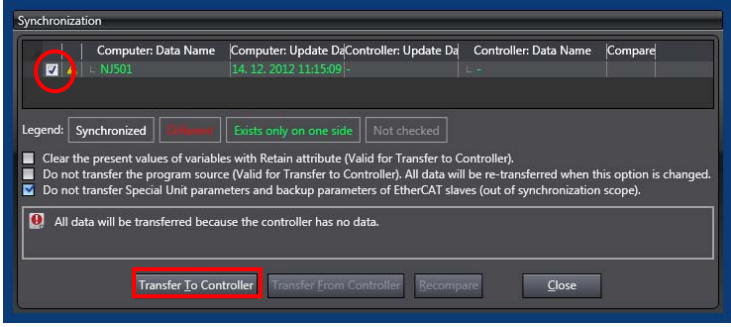
📖 **Additional Information**

Refer to *Section 5 Online Connections to a Controller* in the *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504) for details on online connections to a Controller.
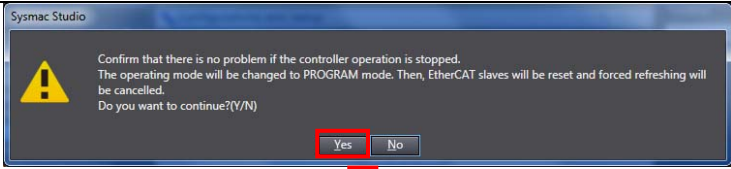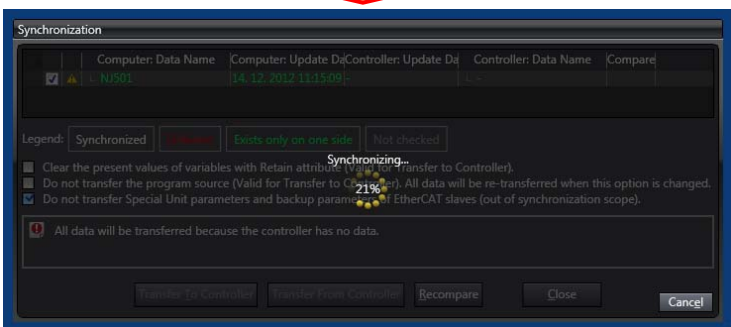
9	Select *Synchronization* from the Controller Menu.	
10	The Synchronization Dialog Box is displayed. Confirm that the data to transfer (NJ501 in the right figure) is selected. Then, click the **Transfer to Controller** Button. *After executing the Transfer to Controller, the Sysmac Studio project data is transferred to the Controller and the data are compared.	
11	A confirmation dialog is displayed. Click the **Yes** Button. A screen stating "Synchronizing" is displayed. A confirmation dialog is displayed. Click the **No** Button.	

12 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 when the project data
of Sysmac Studio matches that
of the Controller.

*If the synchronization fails,
check the wiring and repeat
from step 1.

10.3.5. Settings in the Watch Tab Page

To check data that is sent and received, make settings in the Watch Tab Page.

1	Select **Watch Tab Page** from the View Menu.	View Insert Project Controller Simulation Output Tab Page Alt+3 Watch Tab Page Alt+4 Cross Reference Tab Page Alt+5
2	The Watch Tab Page 1 is displayed in the lower section of the Edit Pane.	Build Tab Page Output Tab Page Watch Window (Project) Watch Window1 Name |Online value| Modify | Data type | AT | Display format | *Input Name...*
3	Enter the following names in the Name Column on the Watch Tab Page for monitoring. To enter a new name, click a column stating *Input Name*. EIPOutput.CommonControlFlag.F[0](EXE) EIPOutput.CommandCode EIPOutput.CommandParam1 EIPInput.CommonStatusFlag.F[0](FLG) EIPInput.CommandCodeEcho EIPInput.ResponseCode EIPInput.ResponseData	**Name** EIPOutput.CommonControlFlag.F[0] EIPOutput.CommandCode EIPOutput.CommandParam1 EIPInput.CommonStatusFlag.F[0] EIPInput.CommandCodeEcho EIPInput.ResponseCode EIPInput.ResponseData

10.4. Setting Up the Network Using the Software

Set the tag data links for EtherNet/IP using the software.
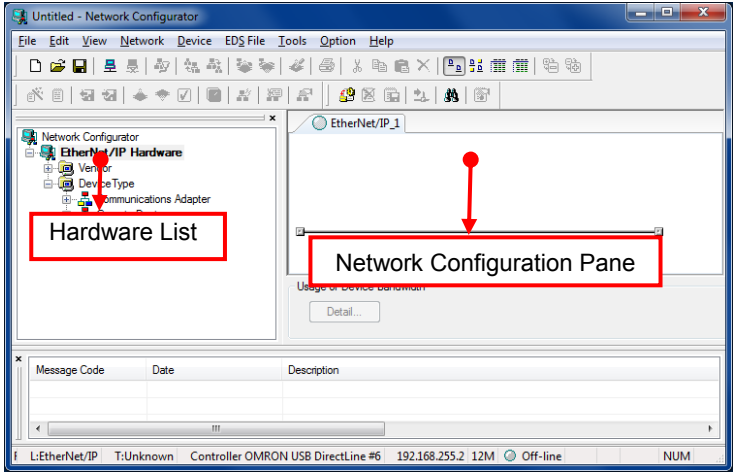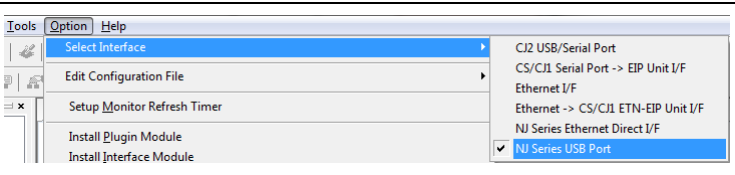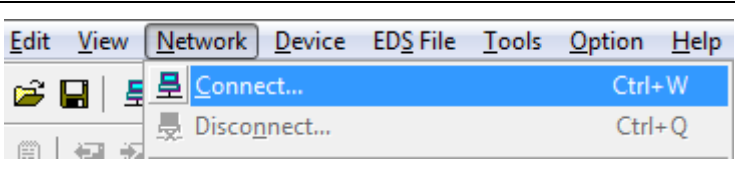
Precautions for Correct Use

Please confirm that the LAN cable is connected before performing the following procedures. When it is not connected, turn OFF the power supply to each device and then connect the LAN cable.

10.4.1. Start the Network Configurator and Uploading Configuration

Start the Network Configurator, connect online with the Controller, and upload the network configuration.

1	Start the Network Configurator.	 Hardware List Network Configuration Pane
2	Select *Select Interface* - *NJ Series USB Port* from the Option Menu.	
3	Select *Connect* from the Network Menu.	
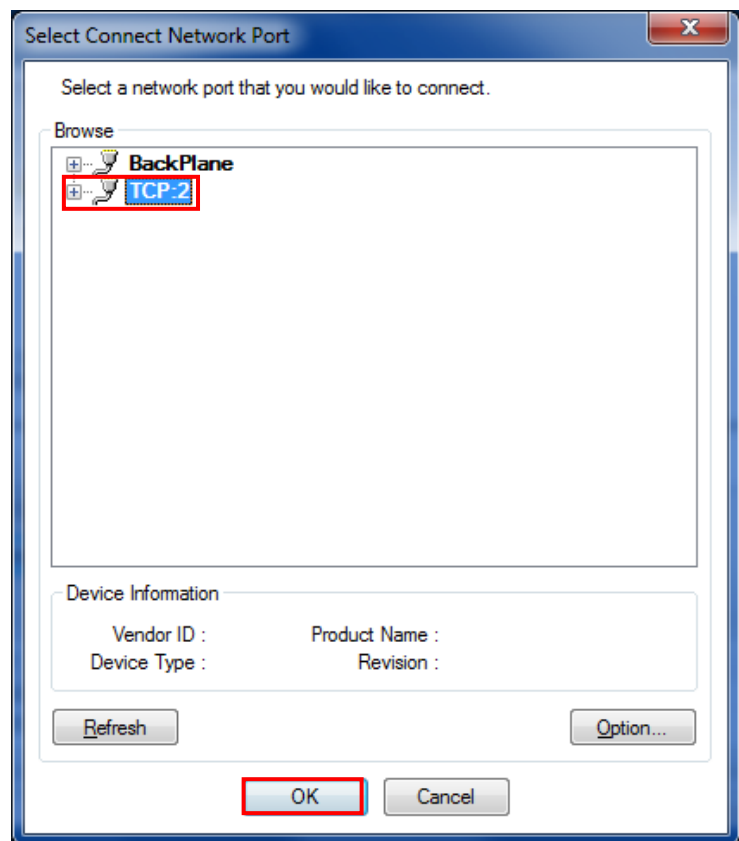
4	The Select Connect Network Port Dialog Box is displayed. Select **TCP:2** and click the **OK** Button.	
5	The Select Connected Network Dialog Box is displayed. Click the **OK** Button.	
6	When an online connection is established normally, the color of the icon on the figure changes to blue.	
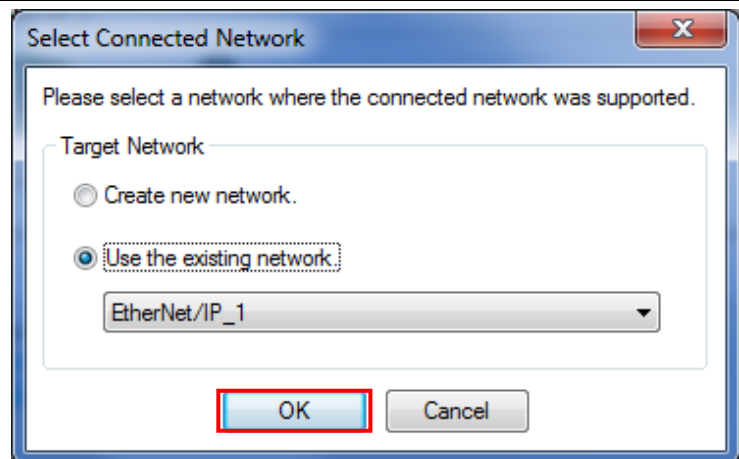
71
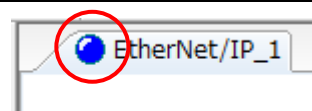
📝 **Additional Information**

If an online connection cannot be made to the Controller, check the cable connection. Or, return to step 1 and check the settings such as a connection type and try again.
For details on the online connections to a Controller, refer to *7-2-8 Connecting the Network Configurator to the Network* in *Section 7 Tag Data Link Functions* of the *NJ-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 information on the network.	
8	The dialog on the right is displayed. Click the **Yes** Button.	
9	The Target Device Dialog Box is displayed. Select the *192.168.250.1* Check Box and the *192.168.250.2* Check Box, and click the **OK** Button. *If the 192.168.250.1 Check Box and the 192.168.250.2 Check Box are not displayed on the dialog box, click the **Add** Button to add an address. *The addresses displayed depend on the status of the Network Configurator.	
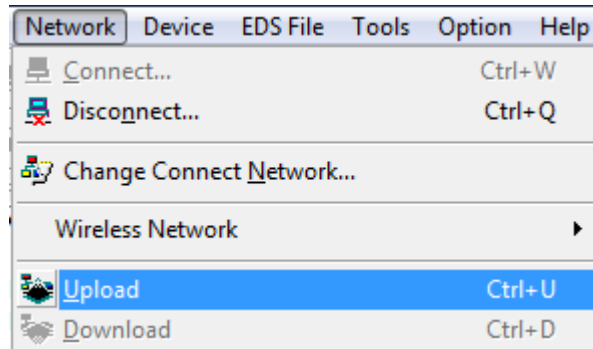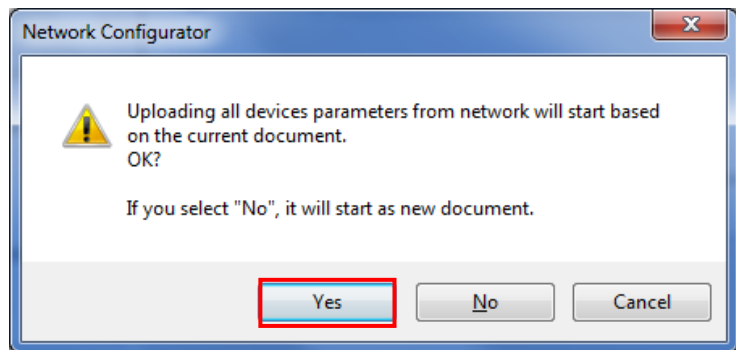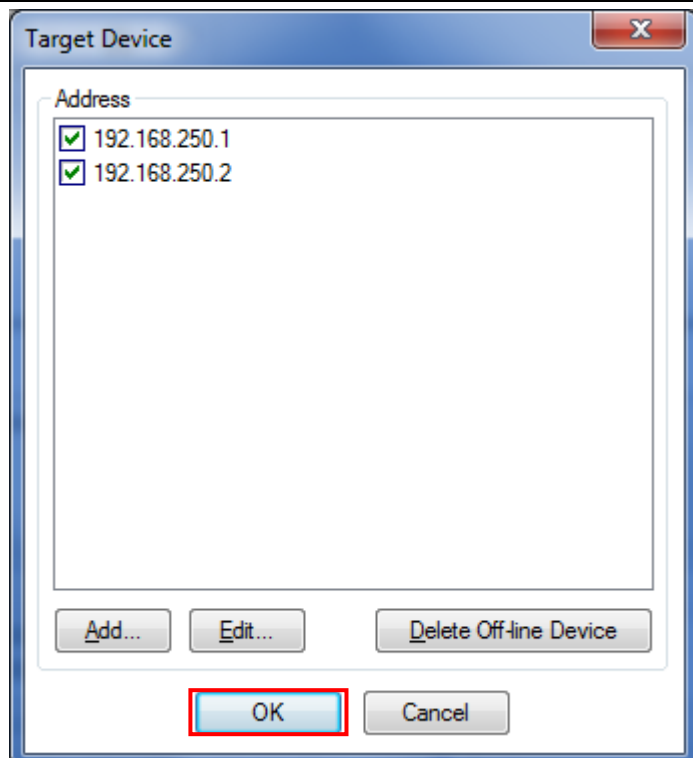
10	The device parameters are uploaded. When uploading is completed, the dialog box on the right is displayed. Click the **OK** Button.	
11	After uploading is completed, confirm that the Network Configuration Pane shows the updated IP Addresses of devices. IP address of node 1: 192.168.250.1 IP address of node 2 192.168.250.2	
12	Right-click the node 2 device and select *Parameter* - *Edit*.	
13	The Edit Device Parameters Dialog Box is displayed. Confirm that the values are set as follows and click the **OK** Button. Input Size :56 Output Size :24	
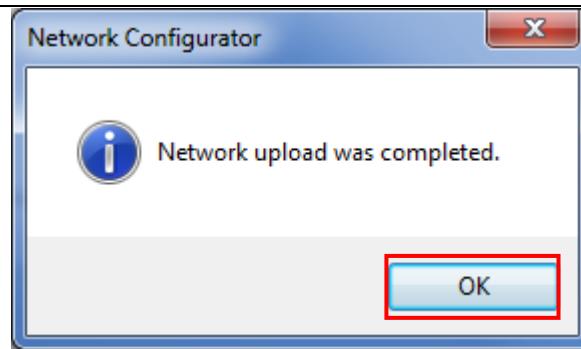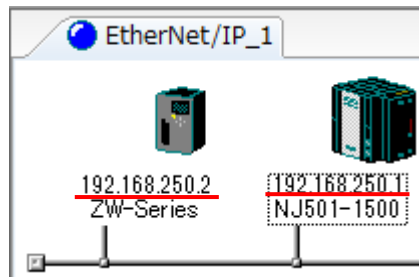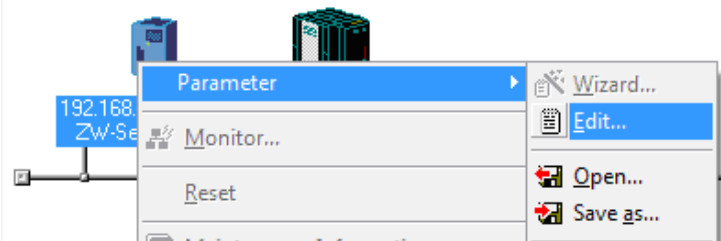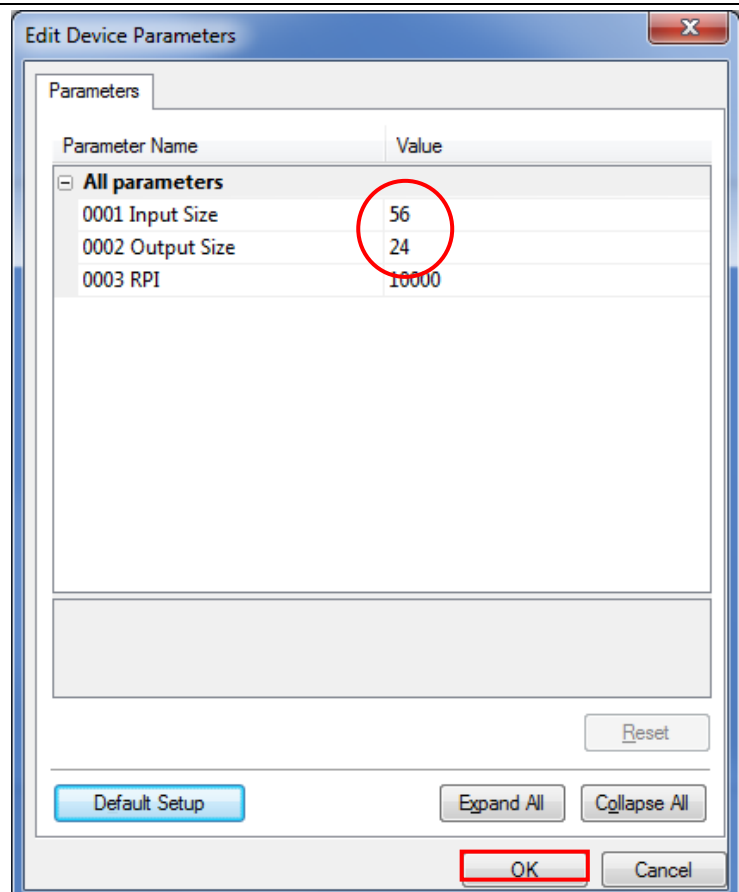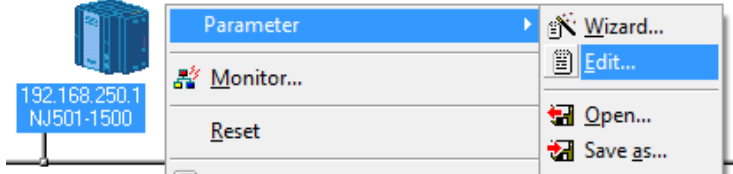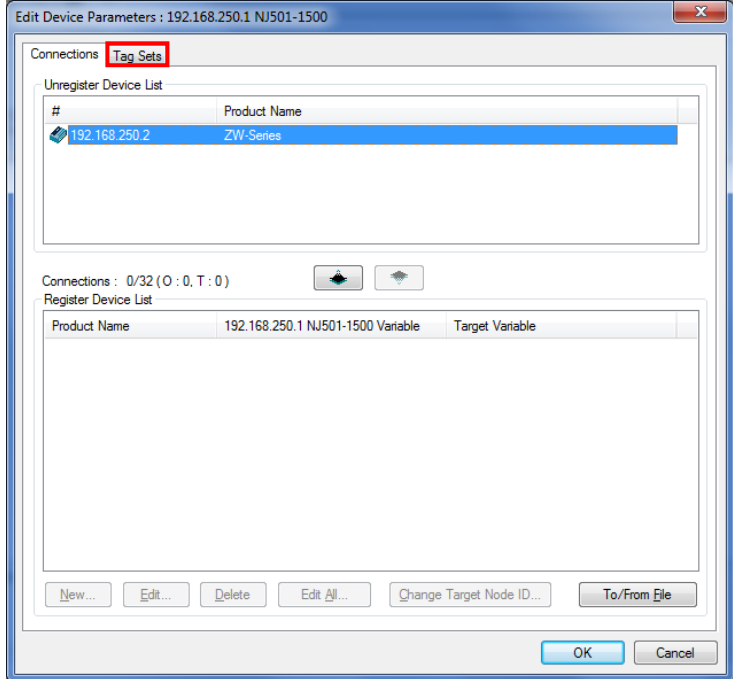
10.4.2. Importing the File and Registering the Tags
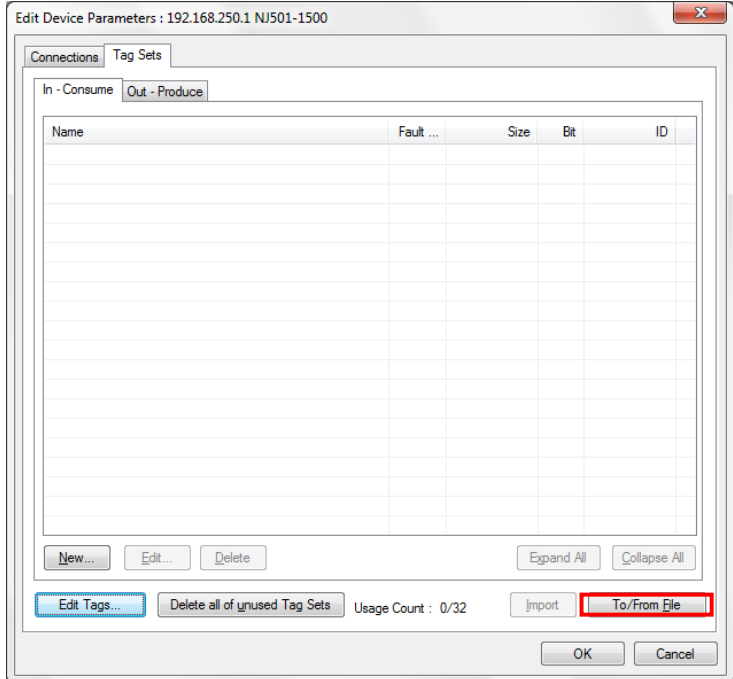
Import the CSV file that was saved, and register tags of the originator's send area and receive area.

This section explains the receive settings and then send settings of the target node.
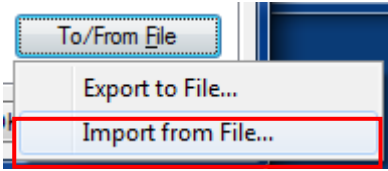
1	On the Network Configuration Pane of the Network Configurator, right-click the node 1 device and select *Parameter* - *Edit*.	
2	The Edit Device Parameters Dialog Box is displayed. Click the Tag Sets Tab.	
3	The Tag Sets Tab Page is displayed. Select **To/From File** Button.	
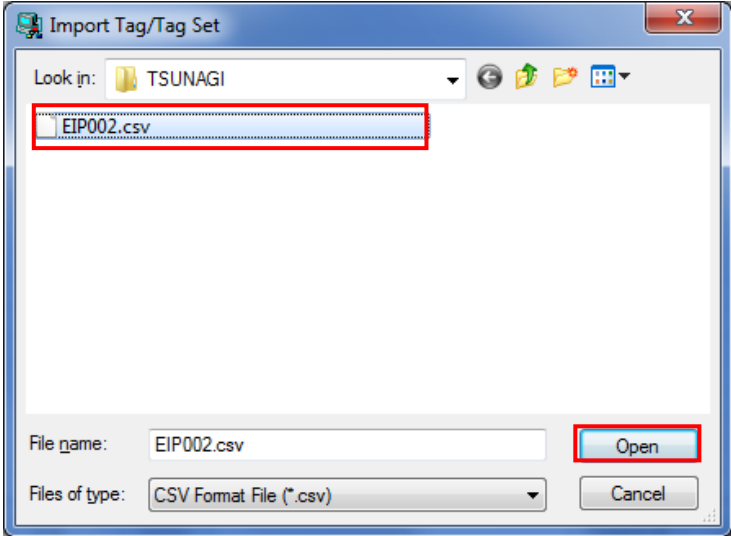
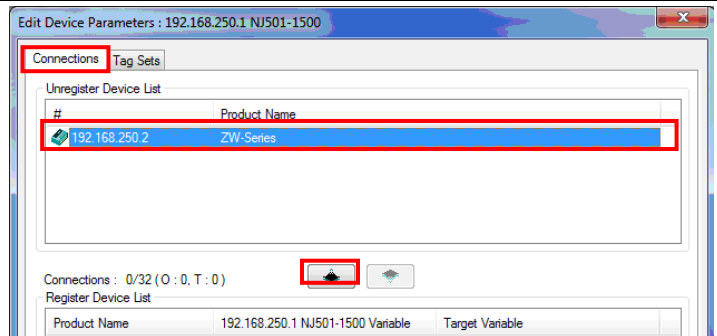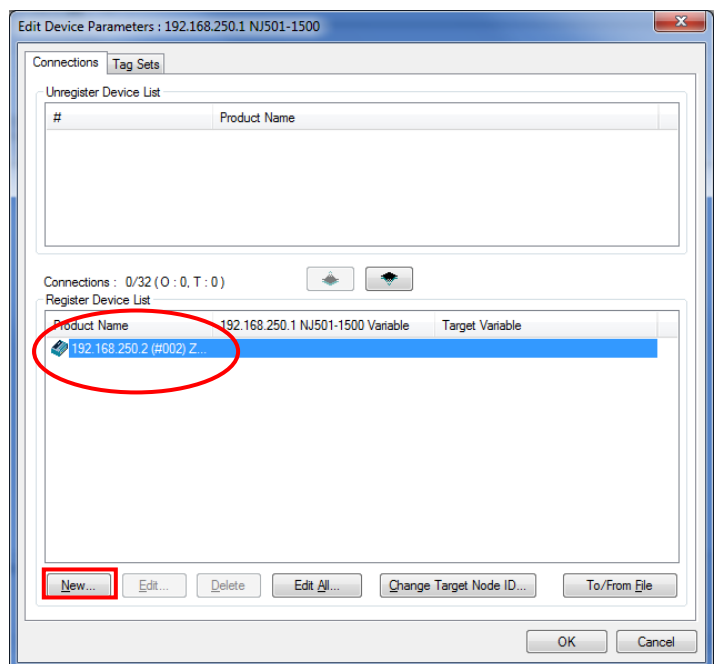|		
4	Select *Import from File*.	To/From File Export to File... Import from File...
5	The Import Connection Configuration Dialog Box is displayed. Select EIP002.csv and click the **Open** Button. *In the Look in Field, specify the folder saved in Section 10.3.4.	Import Tag/Tag Set Look in: TSUNAGI EIP002.csv File name: EIP002.csv — Open Files of type: CSV Format File (*.csv) — Cancel
6	The dialog boxes shown in this section may not be displayed depending on the status of Controller and software used. In such a case, proceed to the next step. Click the **Yes** Button in the right dialog. Click the **Yes** Button in the right dialog. Tag sets are created automatically.	Network Configurator All of the network variables will be imported. OK? Yes No Network Configurator New Tag sets will be created automatically from the Tags that will be imported. OK? Yes No
7	The Out-Produce Tab Page is displayed on the Edit Device Parameters Dialog Box. *EIPOutput* and 24Byte are displayed. After checking, select In-Consume Tab.	Edit Device Parameters : 192.168.250.1 NJ501-1500 Connections Tag Sets In - Consume Out - Produce Name / Fault... / Size / Bit / ID EIPOutput / 24Byte / Auto Connections Tag Sets In - Consume Out - Produce
8	The In-Consume Tab Page is displayed. *EIPInput* and 56Byte are displayed.	Edit Device Parameters : 192.168.250.1 NJ501-1500 Connections Tag Sets In - Consume Out - Produce Name / Fault... / Size / Bit / ID EIPInput / 56Byte / Auto
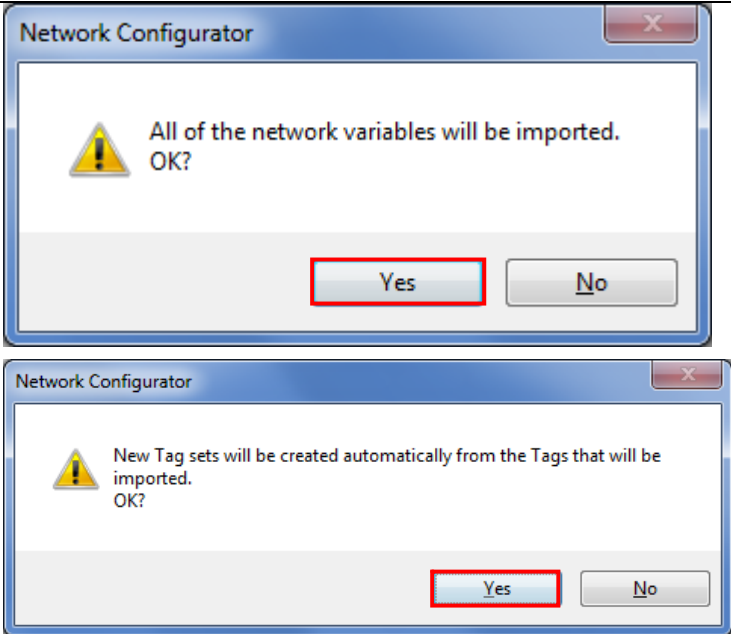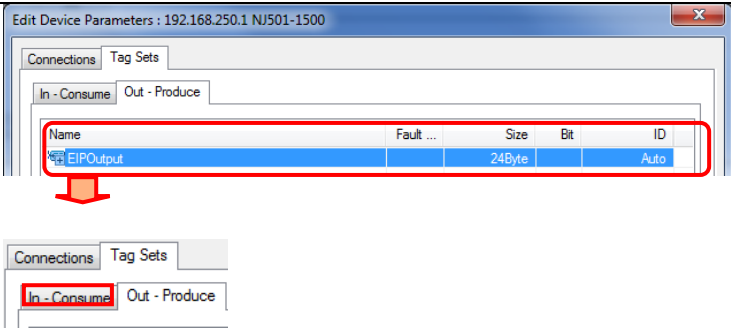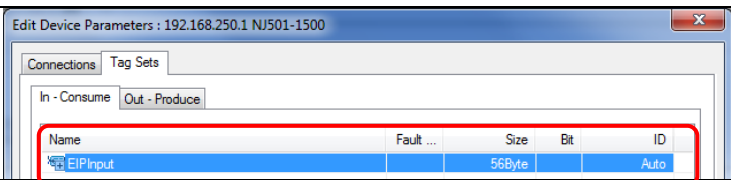
75

10.4.3. Setting the Connection

Associate the tags of the target device (that receives the open request) with the tags of the originator (that requests opening).

1	Select the Connections Tab in the Edit Device Parameters Dialog Box. Then, select *192.168.250.2* in the Unregister Device List Field. Click the Down Button that is shown in the dialog.	
2	192.168.250.2 is registered in the Register Device List. Select *192.168.250.2* and click the **New** Button.	
3	The Edit Connection Dialog Box is displayed. Select *Consume Data From/Produce Data To* from the Connection I/O Type Pull-down Menu. In the same way, in each field of Originator Device and Target Device, set the values listed in the following table.	
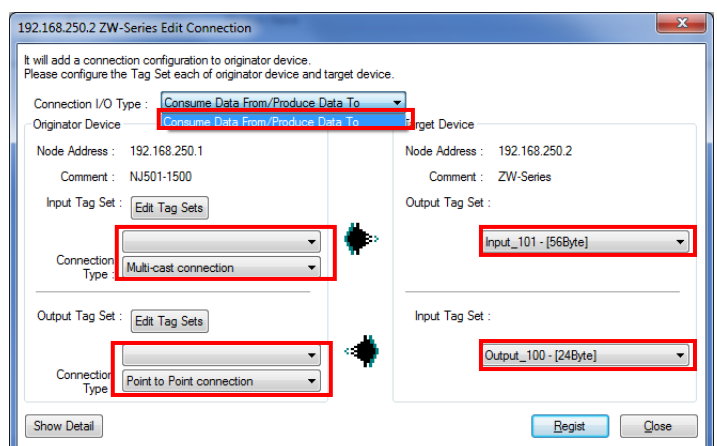
■Settings of Edit Connection

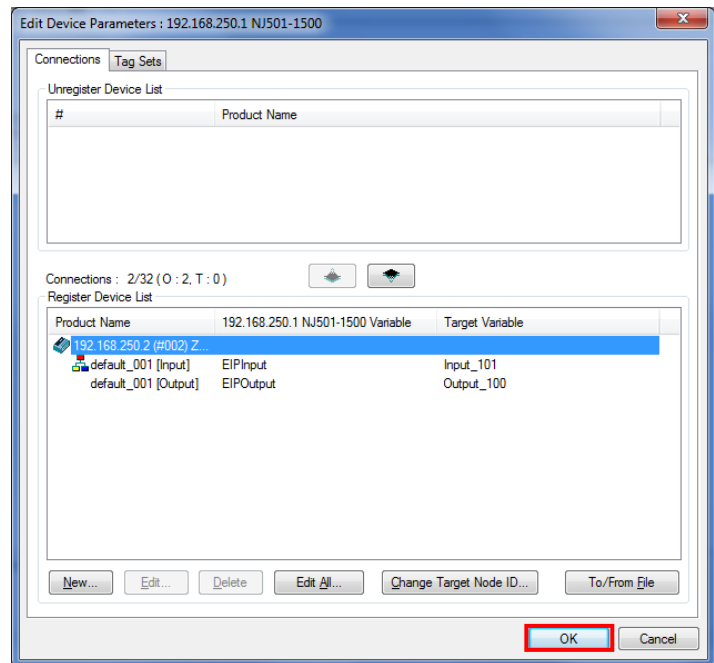| Connection I/O type		Consume Data From/Produce Data To
Originator device	Input Tag Set	EIPInput - [56Byte]
	Connection Type	Multi-cast connection
	Output Tag Set	EIPOutput - [24Byte]
	Connection Type	Point to Point connection
Target Device	Output Tag Set	Input_101 - [56Byte]
	Input Tag Set	Output_100 - [24Byte]

| 4	Confirm that settings are correct and click the **Regist** Button.	
5	The Edit Connection Dialog Box is displayed. Do not make any setting and click the **Close** Button.	
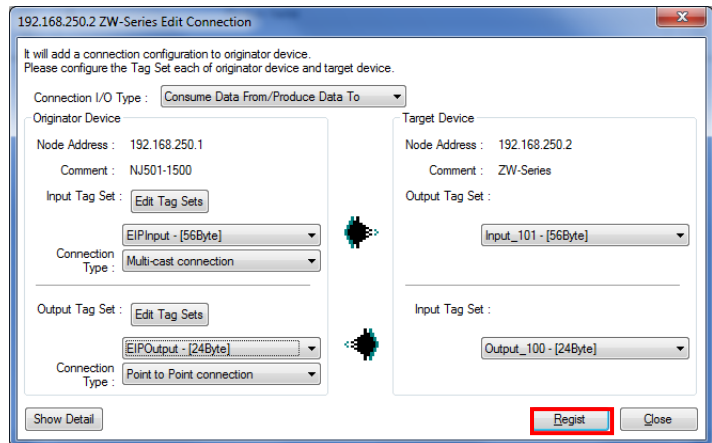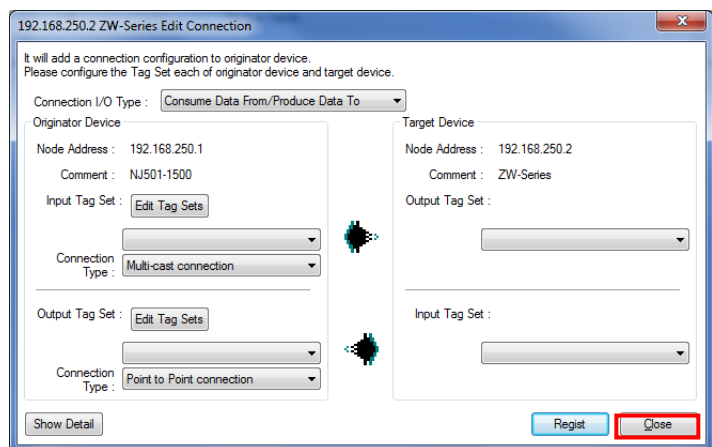
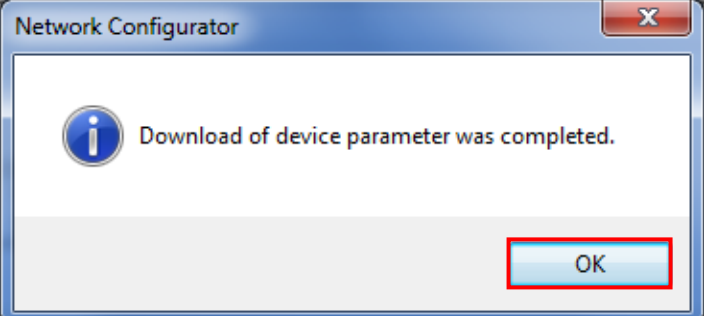| 6	The Edit Device Parameters Dialog Box is displayed again. Click the **OK** Button.	
7	When the connection setting is completed, the node address is displayed under the destination device icon on the Network Configuration Pane.	
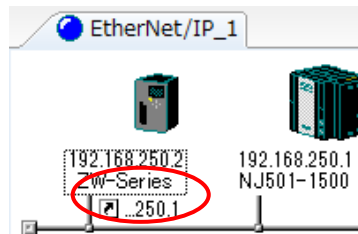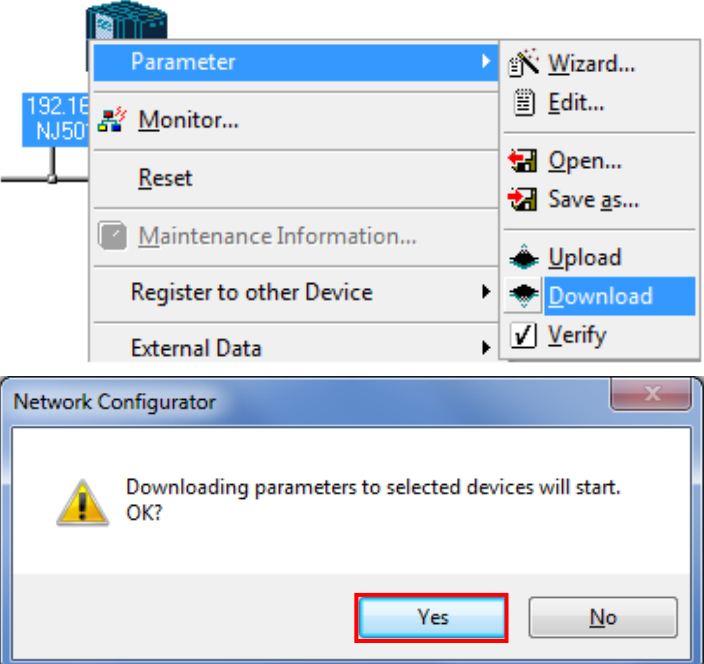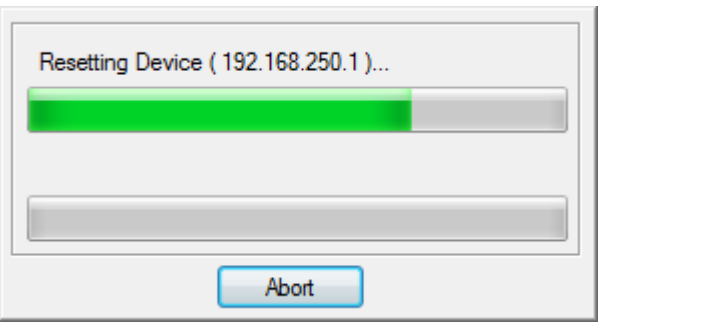
10.4.4. Transferring the Tag Data Link Parameters

Transfer the tag data link parameters that were set to the Controller.

1	Right-click node 1 device on the Network Configuration Pane and select *Parameter* - *Download*.	
	The dialog box on the right is displayed. Click the **Yes** Button.	
2	The tag data link parameters are downloaded from the Network Configurator to the Controller.	
4	The dialog box on the right is displayed. Click the **OK** Button.	

11. Revision History

Revision code	Date of revision	Revision reason and revision page
01	May 29, 2013	First edition