

**Programmable Controller CJ-series** 

# General Ethernet (TCP/IP) Connection Guide

# OMRON Corporation Auto Focus Multi Code Reader V330-F / V430-F-series

Network Connection Guide

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### 1. Related Manuals

The following manuals are related to this document.

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

Cat. No.	Model	Manual name		
W420	CS1W-ETN21	CJ-series		
	CJ1W-ETN21	Ethernet Units Operation Manual		
		Construction of Networks		
W421	CS1W-ETN21	CJ-series		
	CJ1W-ETN21	Ethernet Units Operation Manual		
		Construction of Applications		
W446	—	CX-Programmer Operation Manual		
W474	CJ2-CPU	CJ Series		
		Instructions Reference Manual		
Z432	V320-F/V330-F/V420-	MicroHAWK V320-F/V330-F/V420-F/V430-F		
	F/V430-F Series	Series Barcode Reader User Manual		
Z407	V320-F/V330-F/V420-	Autofocus Multicode Reader MicroHAWK V320-		
	F/V430-F Series	F/V330-F/V420-F/V430-F Series User Manual for		
		Communication Settings		

## 2. Terms and Definitions

Term	Description/Definition
IP Address	Ethernet uses IP addresses to achieve communications.
	Each IP address (specifically, Internet Protocol address) identifies a
	specific node (host computer, controller, etc.) on an Ethernet network,
	IP addresses must be set and managed so that they are not duplicated.
Socket	A socket is an interface that allows you to directly use TCP or UDP
	functions from the user program.
	CJ Series Programmable Controllers support socket services in the
	following ways.
	Manipulating dedicated control bits in the CPU Bus Unit Area in the
	CIO Area
	Sending FINS commands (CMND instructions) to the Ethernet Unit
	To use socket services, you need to establish a connection with a remote
	node and disconnect it after use. In this document, processing for
	establishing a connection is referred to as "TCP open" and for
	disconnecting it as "socket close" or "close". You can use the socket
	services to send and receive arbitrary data to and from the remote node.
Active and Passive	When you open a TCP socket connection with nodes, open processing is
	executed for each node.
	The method to open a connection differs depending on whether the node
	is to serve as a client or server.
	In this document, processing to open a connection as a server is referred
	to as "passive open" and as a client is referred to as "active open" or
	"active open processing".
keep-alive Function	When a remote node (server or client) does not respond for a set period
	of time or longer in TCP/IP socket services, the keep-alive function sends
	a communications frame to the node to check the connection status.
	If the node does not respond to it, the function performs this check at a
	certain interval, and closes the connection if it does not respond to all
	check frames.
linger function	This is a TCP socket option that sends RST data when the TCP socket is
	closed. This enables immediate open processing using the same port
	number, without waiting for the port to be opened.
	If the linger option is not specified, the controller issues FIN data when
	the TCP socket is closed and, after that, performs end control such as a
	send data arrival check with the remote node for approximately 1 minute.
	Therefore, TCP sockets with the same port number may not be used
	immediately.

Below is a list of terms used in this manual and their definitions.

#### **Restrictions and Precautions** 3.

- (1) Before building a system, understand the specifications of devices which are used in the system. Allow some margin for ratings and performance, and provide safety measures such as installing a safety circuit in order to minimize the risk in case of failure.
- (2) To ensure system safety, make sure to read and follow the information provided in all Safety Precautions and Precautions for Safe Use in the manuals for each device which is used in the system.
- (3) The user is encouraged to confirm the standards and regulations that the system must conform to.
- (4) It is prohibited to copy, to reproduce, and to distribute a part or the whole of this document without the permission of OMRON Corporation.
- (5) The information contained in this document is current as of February 2023. It is subject to change for improvement without notice.

The following notations are used in this document.



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.



Note

Additional information to read as required.

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

#### **Symbols**



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 procedures for connecting the OMRON code reader products (V330-F/V430-F Series) to a CJ Series Programmable Controller (hereinafter referred to as the controller) via Ethernet and for checking their connections.

You can establish an Ethernet communication connection by understanding the setting procedures and key points of setup through the Ethernet communications settings in the "CX-Programmer Project File" prepared in advance.

In this project file, the Ethernet connection is checked by sending a read trigger command to the code reader and receiving the read data from it.

Name	Filename	Version		
CX-Programmer Project File	OMRON_V330_V430_CJ_ETN	Ver. 1.00		
(Extension: cxp)	(TCP)_V1_00.cxp			

Obtain the latest version of the CX-Programmer Project File from OMRON in advance.

# Caution

The purpose of this document is to describe the wiring methods, communication settings, and setting procedures required to establish a connection for communications with applicable devices. In addition, the program used in this document is designed to check that the connection has been correctly performed (connection check). Since the program is not intended for permanent use on-site, full consideration is not given to functionality and performance. When configuring an actual system, please refer to the wiring methods, communication settings, and setting procedures described in this document to design and create a program that meets your purpose.

### 5. Applicable Products and Support Tools

#### 5.1. Applicable Products

The applicable devices that are required to ensure a connection are as follows:

Manufact	Name	Model	Version	
urer				
OMRON	Ethernet Unit	CJ1W-ETN21	Same or later	
OMRON	CJ2 Series CPU Unit		version as	
OMRON	Code reader	V330-F=======	indicated in	
		V430-Faaaaaa-aaa	section 5.2.	



#### Note

From among the above applicable devices, this document uses the devices listed in section 5.2 for the connection check. When using devices that are not described in section 5.2, check the connection according to this document.



#### Note

This document describes the procedures for establishing the communication connection of the device, and does not describe the operation, installation and wiring method of the device. For details on the above products (other than communication connection procedures), please refer to the instruction manual for the product or contact OMRON.



#### Precautions for Correct Use

The connection and connection check procedures described in this document use the devices listed in section 5.2, from among the above applicable devices.

You cannot use devices with versions earlier than the versions listed in section 5.2.

To use models that are not listed in section 5.2. or versions that are later than those listed in section 5.2., check the differences in the specifications according to their instruction manuals before operating the devices.

### 5.2. Device Configuration

The system components required for reproducing the connection procedures described in this document are as follows.

Config	uration with V330-F	V 330-FU	04IN I ZIVI-ININA
PC (OS: Wind CX-One In	stalled) CJ1W-ETN21	ning hub	onnor Heres
		1 -05C) LAN cable PoE injecte 24 VDC power supply	LAN cable
Manufact	Name	Model	Version
urer			
OMRON	CPU Unit	CJ2M-CPU11	Ver. 2.0
OMRON	Ethernet Unit	CJ1W-ETN21	Ver. 1.5
OMRON	Power Supply Unit	CJ1W-PA202	
OMRON	CX-One	CXONE-AL□□C-V4 /AL□□D-V4	Ver. 4.□□
OMRON	Switching hub	W4S1-05C	Ver. 1.00
	24 VDC power supply (for switching hub)		
OMRON	CX-Programmer	(Included with CX-One)	Ver. 9.72
OMRON	CX-Protocol	(Included with CX-One)	Ver. 2.03
OMRON	CX-Protocol Project File (Ladder Program)	OMRON_V330_V430_C J_ETN(TCP)_V1_00.cxp	Ver. 1.00
	PC (OS: Windows 10)		
	USB cable (USB 2.0-compliant B-type connector)		
	LAN cable (STP (shielded, twisted- pair) cable of Ethernet category 5 or higher)		
OMRON	Code reader	V330-F064N12M-NNX	Ver. 2.1.0
OMRON	PoE (Power over Ethernet) injector	Select one that can be	
		powered via Ethernet.	

PC (OS: Windows 10, CX-One Installed)	CJ2M-CPU11 CJ1W-ETN21		00M12M-SRX
USB cable		Switching hub (W4S1 -05C) Ethernet cable V430-WE-3M	24 VDC power supply
L	AN cable	24 VDC power	1/430 10/8 314

Manufact	Name	Model	Version
urer			
OMRON	CPU Unit	CJ2M-CPU11	Ver. 2.0
OMRON	Ethernet Unit	CJ1W-ETN21	Ver. 1.5
OMRON	Power Supply Unit	CJ1W-PA202	
OMRON	CX-One	CXONE-AL□□C-V4 /AL□□D-V4	Ver. 4.□□
OMRON	CX-Programmer	(Included with CX-One)	Ver. 9.72
OMRON	CX-Protocol	(Included with CX-One)	Ver. 2.03
OMRON	CX-Protocol Project File	OMRON_V330_V430_C	Ver. 1.00
	(Ladder Program)	J_ETN(TCP)_V1_00.cxp	
	PC (OS: Windows 10)		
	USB cable (USB 2.0-compliant B-type connector)		
	LAN cable (STP (shielded, twisted- pair) cable of Ethernet category 5 or higher)		
OMRON	Code reader	V430-F000M12M-SRX	Ver. 2.1.0
OMRON	I/O Cable	V430-W8-3M	
OMRON	Ethernet cable	V430-WE-3M	
	24 VDC power supply (for switching hub)		
	24 VDC power supply (for code reader)		

#### Precautions for Correct Use

M

Configuration with V430-F

Obtain the latest version of the above protocol macro data in advance. (Contact OMRON for information on how to obtain these files.)

#### Precautions for Correct Use

This document assumes that the USB is used to connect a CJ2 CPU Unit. For information on how to install the USB driver, refer to the *CX-Programmer Operation Manual* (Cat. No. W446).

#### 🗟 Note

Refer to the *Industrial Switching Hub W4S1 Series User Manual* (0969584-7) for power supply specifications that can be used for 24 VDC power supply (for the switching hub).



#### Note

Refer to the *MicroHAWK V320-F/V330-F/V420-F/V430-F Series Barcode Reader User Manual* (Cat. No. Z432) for the power supply specifications that can be used for 24 VDC power supply (for the code reader).

### 6. Ethernet Settings

This section shows the specifications of the communication parameter settings, variable names and other information provided in this document.



This document and the project file only cover the operations that you can perform using the settings and commands described in this section. To use communication settings that are not described here, you need to modify the project file.

#### 6.1. Ethernet Communication Settings

The settings required to perform Ethernet communications are as follows.

#### 6.1.1. Communications Settings for Setting PC and Code Reader

This document assumes that you use the settings below to set the code reader using a setting PC.

Parameter name	Setting PC	Code reader
IP address	192,168,188,100	192,168,188.2 (default)
Subnet mask	255.255.0.0	255.255.0.0 (default)
Gateway	Blank (default)	0.0.0.0 (default)

\* For the use cases in this document, setting the gateway is unnecessary because the devices are connected within the same segment of the network.

#### 6.1.2. Communication Settings for Ethernet Unit and Code Reader

It is assumed that you use the settings below to connect the Ethernet Unit and the code scanner.

	CJ1W-ETN21	Code reader
Unit number	0 (default)	
Node address	01 (default)	
Automatic setting		OFF
IP address	192.168.188.1	192.168.188.2
Subnet mask	255.255.0.0	255.255.0.0 (default)
Port number	(set by software part)	2001 (fixed)

\* For the use cases in this document, setting the gateway is unnecessary because the devices are connected within the same segment of the network.

#### 6.2. Example of Connection Check for Communications

This document assumes that you use a ladder program (also referred to as the software part) to execute "socket open", "send and receive", and "socket close" from the PLC to the code reader (V330/V430 Series).

The controller sends a "read trigger" command to the code reader. The code reader sends the read data back to the controller.

An overview of the operation is shown below.



### 7. Connection Procedure

This section describes the procedures for connecting the controller to an Ethernet network. In this document, it is assumed that the controller and the code reader use the factory default settings. For how to initialize the devices, refer to *Section 8. Initializing the System*.

#### 7.1. Operation Flow

The procedures for connecting and setting up the Ethernet Unit are as follows.



Set up the code reader.

Set the parameters for the code reader.

Set up the PLC.

Set the physical switches on the Ethernet Unit.

Start the programming tool "CX-Programmer", load the ladder program, and go online with the PLC.

Create the I/O table for the CPU Unit.

Set the parameters for the Ethernet Unit.

Transfer the ladder program to the CPU Unit.

Execute the transferred ladder program to check that Ethernet communications work correctly.

Execute the ladder program and, in the CX-Programmer, check that the correct data is written to the I/O memory of the PLC.

#### 7.2. Code Reader Setup

Set up the code reader.

#### Precautions for Correct Use

Use a PC (personal computer) to set the parameters for the code reader. Note that you may need to change the PC settings depending on the condition of your PC.

#### 7.2.1. Setting the Parameters

Set the parameters for the code reader.

Set the IP address of your PC to 192.168.188.100 and its subnet mask to 255.255.0.0.





If the WebLink startup screen does not appear, it means that communications are not 7 established between the code reader and the PC. Please check the following. • The code reader and the PC have a proper physical (cable) connection.  $\rightarrow$  Refer to steps 1 and 2 to check the connection. The IP Addresses of the PC and code reader are set correctly.  $\rightarrow$  Refer to step 4 for setting the IP address of the PC. For other measures that can be taken, please refer to When unable to access by WebLink in Q&A in Appendices of the MicroHAWK V320-F/V330-F/V420-F/V430-F Series Barcode Reader User Manual (Cat. No. Z432). The WebLink screen appears. Microscan WebLink × + → C ▲ 保護されていない通信 | http 8 e x = 1 = 1 Start 🔊 Setup 🕨 Run 80\$ OMRON V430-F3A9200 192,168,188,2 Create a New S Load a Setu Click on the Setup Tab and, in 9 Read Cycle Sequence, set Start 3 Setup Run Cycle to Triggered. Read Cycle Sequenc Cycle Triggered Serial Trigger Character <SP> Trigger Delay 0 µs Timeout after 500 ms 10 Click on the gear icon on the MRON upper right of the screen and select Advanced. H ŻA Advance Beeper mage Storage Tou

11	The Advanced Settings Screen	Advanced Settings	
••	appears.	■ <b>コ</b> 5 職	л 👸
	Select the Communications	Camera Setup Communications Read Cycle Symbologies	I/O Symbol Quality
	Tab and check the settings	Search for settings	
	shown in the red frame for	4	
	Ethernet.	▼ R\$232	
	Ethemet.	☆ Baud Rate	115.2K
		☆ Parity	None
	To use the defaults, you do not	☆ Stop Bits	One
	need to change the settings.	☆ Data Bits	Eight
	If you need to change the IP	Ethernet	Enabled
	address, for example when	P Address	192.168.188.2
	connecting multiple code	Subnet	255.255.0.0
	readers, change the IP Address	🔂 Gateway	0.0.0.0
	setting as necessary.	☆ IP Address Mode	Static
		☆ TCP Port 1	2001
		☆ TCP Port 2	2003
		Search and Configure Mode	Enabled
		☆ EtherNet/IP	Enabled
		☆ EtherNet/IP Byte Swapping	Disabled
		PROFINET	Disabled
		☆ PROFINET Byte Swapping	Disabled
12	Click on the icon shown in the		ED out
	red frame to save the settings to	OMRON	
	the code reader.		
		Save Save	New Load
		Advanced	Language Terminal
		Beeper	Guided Image Tour Storage



#### 7.3. PLC Setup

Set up the PLC.

#### 7.3.1. Setting the Hardware

Set the physical switches on the Ethernet Unit.

#### Precautions for Correct Use

Turn OFF the power supply before setting the hardware.



#### 7.3.2. Loading the Ladder Program and Going Online with the PLC

Start the programming tool "CX-Programmer", load the ladder program, and go online with the PLC.

Install the Tool Software and USB driver on the PC beforehand.

Please consult your OMRON representative and obtain the ladder program to use.

1	Connect the PC and the PLC with a USB cable, and turn ON the power supply to the PLC.				
2	Start the CX-Programmer.	] < K Q Q       <b>3</b>	▲ ▲ ▲   ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●		
3	Select <b>Open</b> from the <b>File</b> Menu.	File View New C Dem.		Ctrl+N Ctrl+O	
4	Select the CX-Programmer Project File of the version specified in <i>5.2. Device</i> <i>Configuration</i> (OMRON_V330_V430 _CJ_ETN (TCP)_V1_00.cxp) and click Open. * Please consult your OMRON representative and obtain the CX-Programmer Project File (Ladder Program) to use.	Look in:	Programmer Project ProjectFile V330_V430_CJ_ETN(TCP)_V1_00.cxp OMRON_V330_V430_CJ_ETN(TCP)_V1_00 CX-Programmer Project Files (*.cxp)	← € ☆ ∰ ▼ Date modified 3/11/2022 2:08 PM ∞∞	X Type CX-Program Open Cancel

<b>5</b> After the loading of the ladder program is completed, select <b>Programs</b> in the project workspace.	<ul> <li>NewProject</li> <li>新規PLC1[CJ2M] Offline</li> <li>□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□</li></ul>
6 Select Change Model from the PLC Menu.	(Project Workspace)         Image: Settings         Image: Set
<b>7</b> The Change PLC Dialog Box is displayed. Select the PLC type (CJ2M in the figure on the right) from the Device Type pull-down menu, and click Settings.	Change PLC X Device Name NewPLC1 Device Type CJ2M CJ2M CJ2M CP1L CP1L CP1L CP1L CP1L CP1L CP1L CP1L

<b>8</b> The <b>Device Type Settings</b> Dialog Box is displayed. Select	Device Type Settings [CJ2M]	×
the CPU type ( <b>CPU11</b> in the figure on the right) from the <b>CPU</b> <b>Type</b> pull-down menu, and click <b>OK</b> .	General  CPU Type  CPU 1  CPU 1  CPU 1  COPU 2  CPU 3  CPU	P

	the Change PLC Dialog Box,	Change PLC X
se	lect the network type ( <b>USB</b> in effigure on the right) from the	Device Name
	twork Type pull-down menu,	NewPLC1
	d click <b>OK</b> .	Device Type
		CJ2M Settings
		Network Type
		USB
		EtherNet/IP
		Comment
		×
		OK Cancel Help
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	f you change the PLC type in step 7 or CPU type in step. 8, a confirmation dialog box as shown in the figure on the right will appear. Click <b>Yes</b> . Then, confirm that the program has been correctly converted. (Although the figure on the right shows <b>Duplicated</b> <b>Dutput</b> warnings, there is no particular problem.)	CX-Programmer v9.7 × The program(s) and the PLC Settings need to be converted for the new PLC type. Since the behaviour of the program(s) and the PLC Settings may change after conversion, please confirm the program and the PLC Settings functionality before downloading. Do you wish to continue? Yes No
( 2	you change the device type to <b>CJ1</b> , a timer-related dialog box appears. Make a selection according to your operating environment.	WARNING: Duplicated output - MOV(021) H403 at rung 6 (6, 11) WARNING: Duplicated output - MOV(021) H402 at rung 6 (6, 14) WARNING: Duplicated output - MOV(021) H402 at rung 6 (6, 17) [Ladder Section Name : ウーズ処理] WARNING: Duplicated output - MOV(021) H404 at rung 4 (6, 2) WARNING: Duplicated output - MOV(021) H404 at rung 4 (6, 5) WARNING: Duplicated output - MOV(021) H404 at rung 4 (6, 8) WARNING: Duplicated output - MOV(021) H404 at rung 4 (6, 8) WARNING: Duplicated output - MOV(021) H404 at rung 4 (6, 11) [Ladder Section Name : END] 新規PLC1 - 0 errors, 25 warnings. The programs have been checked with the program check option set

10	Select <b>Programs</b> in the project workspace, and select <b>Work</b> <b>Online</b> from the <b>PLC</b> Menu.	File       Edit       View       Insert       PLC       Program       Simulation       Tools       Window         Image: Imag	
		正常電量       Compile All PLC Programs       F7         Program Check Options       Program Assignments         Data Types       Memory Allocation         Symbols       Transfer         Settings       Partial Transfer         Programs       Clear All Memory Areas	
11	A dialog box as shown in the figure on the right appears. Click <b>Yes</b> .	CX-Programmer v9.7 × About to connect to the PLC. Do you wish to continue ? NewPLC1[CJ2M] - USB	
		Yes No	
12	Confirm that the CX- Programmer is online with the PLC. * The CX-Programmer is online if the icon appears to be depressed.	File Edit View Insert PLC Program Simulation Tools Window Help □ □ ☞ ■   №   ☞ @   ※ ☜ @   @   오 오   ₩ ╦ ╦ ☆   ① ? №   ▲   ▲   ∞ ■   □ □ ☞ ■   №   ◎ ♥ №   ▲   ※ ☜ @   @   ∞ 오   ₩ ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	2

#### Note

If you cannot go online with the PLC, check the physical cable connections, etc.

If the physical cable connections are correct, return to step 6 and check the device type and other settings in steps 7 to 9.

For details, refer to the CX-Programmer Operation Manual (Cat. No. W446).



#### Note

Some of the dialog boxes shown in this document may not be displayed depending on the environment settings of the CX-Programmer.

For details on the environment settings of the CX-Programmer, refer to the *CX-Programmer Operation Manual* (Cat. No. W446).

This document assumes that the check box for **Confirm all operations affecting the PLC** is selected.

#### 7.3.3. Creating the I/O Table

Create the I/O table for the PLC.



3	In the <b>PLC IO Table</b> Window, select <b>Create</b> from the <b>Options</b> Menu.	IPLC IO Table - NewPLC1 − □ ×     File Edit View Options Help
		Transfer from the PLC
		Inner Board Compare with PLC
	A dialog box as shown in the	
	figure on the right appears. Click	🕀 🛶 [0000] Racl Verify
	Yes.	🗄 🛶 [0000] Racl Delete
		PLC IO Table
	A dialog box as shown in the figure on the right appears. Click <b>Yes</b> .	Are you sure you want to create the IO Table ?
		Yes No
		PLC IO Table ×
		Initialise CPU Bus settings ?
		Yes No
4	The Transfer from PLC Dialog	Transfer from PLC
-	Box is displayed. Select the check boxes for <b>IO Table</b> and <b>SIO Unit Parameters</b> and click	Select the transfer target data and press the [Transfer] button. Comment information is deleted if IO Table is transferred.
	Transfer.	
		🔽 IO Table
		🔽 SIO Unit Parameters
		Transfer Cancel
		Transfer from PLC
	When the transfer is completed,	Transferring
	the <b>Transfer Results</b> Dialog Box	
	appears. Check the messages in this	
	dialog box to confirm that the	
	transfer process is successfully	Cancel
	completed.	
	The figure on the right shows	
	Transfer Success: 1 Unit	
	Transfer Unsuccessful: 0 Unit,	
	which means I/O table creation is	

successfully comple	eted. Transfer Results
Click <b>OK</b> .	IV Table>         Transfer Success <special settings="" units="">         CPU Bus Unit00: Transfer Success         Transfer Success:1 Unit         Transfer Success:1 Unit</special>
	ОК

### 7.3.4. Editing the Parameters

Set the parameters for the Ethernet Unit.

1	In the PLC IO Table Window,	🗊 PLC IO Table - NewPLC1 - 🗆 🗙
	double-click [0000] Main Rack	File Edit View Options Help
	to open the tree.	
		CJ2M-CPU11
		🕀 👞 Inner Board
		🖨 📲 [0000] Main Rack
		🔤 🧊 00 [1500] CJ1W-ETN21(ETN21Mode)(Ethernet Unit)
		🕤 01 [0000] Empty Slot
		👖 02 [0000] Empty Slot
2	Right-click on 00 [1500] CJ1W-	CJ2M-CPU11
_	ETN21(ETN21Mode) and select	🕀 🛶 Inner Board
	Unit Setup from the menu.	🖻 🍓 [0000] Main Rack
		👖 00 [1500] CI1W-ETN21/ETN21Mode)/Ethernet Unit).
		🕤 01 [0000]   Add Unit
		👔 02 [0000] I Change / Confirm Units
		👔 03 [0000] I Change Unit No
		05 [0000]      SYSMAC BUS Master

3	The Edit Parameters Dialog Box is displayed. Select the Setting Tab Page, and enter 192.168.188.1 in the IP Address field and 255.255.0.0 in the Sub-net Mask field. After entering the above values, click Transfer [PC to Unit].	CJIW-ETN21(ETN21Mode) [Edit Parameters]       ? ×         Settine       FINS/TOP       DNS       SMTP       POP       Mail Address       Mail Send       Mail Receive       Clock Auto Adjustment • •         Broadcest       FINS/UDP Port       FINS/TOP Port       TOP/IP keep-alive       Image: Clock Auto Adjustment • •         © All (4.2BSD)       © Default (600)       © User defined       Image: Clock Auto Adjustment • •         IP Address       ©       Onversion       Baud Rate       FINS/UDP Option         Issue-net Mask       ©       Auto (dynamic)       © Auto (dynamic)       © Destination IP is changed dynamically         255 . 255 . 0 . 0       ©       Combined       © Auto (dynamic)       © Destination IP is Not changed dynamically         Enable CIDR       IP Address Table       IP Address Table       PRouter Table         Part No.       Ins       Dei       Ins       Dei         Transfer[Ubrit to PD]       Transfer[PC to Unit]       Compare       SoftSW       Restart
		Set Defaults OK Cancel
4	A confirmation dialog box as shown in the figure on the right appears. Confirm that there is no problem and click <b>Yes</b> .	Edit Parameters X Parameters will be transferred to Unit. Do you want to continue? Yes No
		Edit Parameters
		Close
	ConfirmthatTransfersuccessfulisdisplayedand	
	click <b>Close</b> .	

<b>5</b> A confirmation dialog box as shown in the figure on the right appears. Read the information and click <b>Yes</b> .	Edit Parameters × It is necessary to restart the unit to do the transferred setting effectively. Do you wish to restart the unit? Yes No
After you restart the unit, another dialog box as shown in the figure on the right appears. Read the information and click <b>OK</b> .	Edit Parameters X The unit was restarted.
6 Click Compare to confirm that the IP address is correctly changed.	C/IW-ETN21(ETN21Mode) [Edit Parameters] ? × Setting FINS/TOP DNS SMTP POP Mail Address Mail Send Mail Receive Clock Auto Adjustment • • Froadcast FINS/UDP Port TOP/IP keep-alive O min. [0: de fault (1 20)] C All (1 42BSD) C Default (9600) C User de fined 2001 Performance of socket service 192.168.188.1 Conversion Baud Rate FINS/UDP Option Sub-net Mask C Auto (dynamic) 255.255.0.0 C Combined FINS/UDP Option Password Port No. 0 [0: De fault(21)] IP Address Table Performance of socket service FINS/UDP Option IP Address Table FINS/UDP Option FINS/UDP Option Password Port No. 0 [0: De fault(21)] IP Address Table Performance of socket service FINS/UDP Option FINS/UDP Option FINS/UDP Option FINS/UDP Option Combined FITP Login IP Socket Combined FITP Login Service Combined FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Combined FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Login C Default(21)] IP Address Table Performance of socket service FITP Set Defaults OK Cancel
7 Confirm that Compare successful is displayed and click Close.	Edit Parameters
8 Click OK in the Edit Parameters Dialog Box.	CJ1W-ETN21(ETN21Mode) [Edit Parameters]       ? X         Settine       FINS/TOP       DNS       SMTP       POP       Mail Address       Mail Seed Mail Receive       Clock Auto Adjustment •         Broadcast       FINS/TOP       DNS       SMTP       POP       Mail Address       Mail Seed Mail Receive       Clock Auto Adjustment •         If Address       FINS/TOP Port       FINS/TOP Port       TOP/IP keep-alive       0       min. [0: default (120)]         If P Address       Image: Conversion       Baud Rate       0       Performance of socket service       High Speed         Sub-net Mask       Onoversion       Baud Rate       FINS/UDP Option       Operation in Pis changed dynamically         Sub-net Mask       O       Conversion       Baud Rate       FINS/UDP Option       Operation in Pis changed dynamically         Sub-net Mask       O       Conversion       Baud Rate       FINS/UDP Option       Operation in Pis changed dynamically         [255:255:0:0       O       IP Address Table       IDEASE-T       FINS/UDP Option       Operation in Pis is Not changed dynamically         [260       IP Address Table       IP Address Table       IP Router Table       IP Router Table         [200       Ins       Ims       Ims       Ims       Ims

### 7.3.5. Transferring the Ladder Program

Transfer the ladder program to the CPU Unit.

<ul> <li>In the CX-Programmer, select</li> <li>Programs in the project workspace, and select Transfer</li> <li>To PLC from the PLC Menu.</li> </ul>	File Edit View Insert       PLC       Program       Simulation       Tools       Window       Help         ●
<ul> <li>2 Select the check boxes for Program(s), Comments, and Program index, and click the OK Button.</li> <li>* Do not select IO table and Special Unit Setup since you have set these data in 7.3.3. and 7.3.4.</li> <li>* Comments and Program index may not be shown depending on the PLC model. If so, transfer the project data with only Program(s) selected.</li> </ul>	Download Options       ×         PLC: NewPLC1       OK         Include:       Cancel         Image: Settings       Cancel         Image: Settings       Transfer All         Image: Symbols       Transfer All         Image: Symbols       Transfer All         Image: Symbols       Transfer All         Image: Symbols       Transfer Idex         Image: Symbols       Tr
<b>3</b> A dialog box as shown in the figure on the right appears. Click <b>Yes</b> .	CX-Programmer v9.7 × This command will affect the state of the connected PLC. Do you wish to continue ? Yes No

4	If the PLC is not in PROGRAM Mode, a dialog box as shown in the figure on the right appears. Click <b>Yes</b> .	CX-Programmer v9.7 × Make sure that there aren't any problems if the PLC is stopped. Do you wish to switch the PLC into program mode? Yes No Download × Program Download to PLC NewPLC1
	( <b>Download successful</b> is displayed) as shown on the right, and then click <b>OK</b> .	Download successful
6	Select <b>Programs</b> in the project workspace, and select <b>Transfer</b> – <b>Compare with PLC</b> from the <b>PLC</b> Menu.	File       Edit       View       Inset       PLC       Program       Simulation       Tools       Window       Help         Image: Second
7	Select the check box for <b>Program(s)</b> , and click the <b>OK</b> Button.	Compare Options X PLC: NewPLC1 Include: Cancel Cancel
8	Confirm that <b>Compare</b> <b>successful</b> is displayed as shown on the right, and click the <b>OK</b> Button.	CX-Programmer v9.7 X Compare successful

#### 7.4. Checking the Connection Status

Execute the transferred ladder program to check that Ethernet communications work correctly.

#### Precautions for Correct Use

Before performing the following steps, confirm that the LAN cable is connected securely. If it is not connected, first turn OFF the power supply to the device and then connect the LAN cable.

#### 7.4.1. Executing the Ladder Program and Checking the I/O Memory Data

Execute the ladder program and, in the CX-Programmer, check that the correct data is written to the I/O memory of the PLC.



Confirm the system safety before you execute the ladder program.

The connected devices may malfunction regardless of the operating mode of the unit, resulting in injury.



4	A dialog box as shown in the figure on the right appears. Click <b>Yes</b> . Confirm that the operating mode	CX-Programmer v9.7 × This command will affect the state of the connected PLC. Do you wish to continue ? Yes No
	indication has changed to <b>Monitor Mode</b> .	NewProject  NewPLC1[CJ2M Monitor Mode  Data Types  Symbols  IO Table and Unit Setup
6	In the Ladder Window, right-click Input_Start in Block 0 and select Set – On from the menu.	Image: Program Name : NewProgram I]         [Section Name : Start_and_Setup]         1.Start_and_Setup         Internal         Set         Set         Internal         Paste         Internal         R Address Incremental Copy         Pelete         Invert (NOT)         Immediate Refresh         Differentiate         Force         Set         On         Off
7	Confirm that the <i>Input_Start</i> contact is ON.	1. Start and Setup 1.1. Start Processing 5000.00 Input_Start



12	The Monitor Memory Area Dialog Box is displayed. Select the check box next to D and click Monitor.	Monitor Memory Areas × Monitor Cancel
13	Check the received data in <b>D</b> Window shown in the figure on the right.	Start Address:         10000         On         Off         SetValue           ChangeOrder         ForceOn         ForceOff         ForceCanc           +0         +1         +2         +3         +4         +5         +6         +7         +8         +9
	* In word <b>D10000</b> , the number of bytes of receive data is stored. It is 0013 in hex (19 in decimal), which is equivalent to 9.5 words. This means that the received data is stored in words <b>D10001</b> to <b>D10009</b> and the upper bytes of word <b>D10010</b> .	D1 0000       0008       31 32       3334       3536       0D0A       0000       0000       0000       0000         D1 0010       0000
	Select <b>Display</b> – <b>Text</b> from the <b>View</b> Menu. The receive data is now displayed in ASCII text as shown in the figure on the right, indicating that the communications have ended normally.	
## 8. Initializing the System

In this document, it is assumed that the Ethernet Unit and the code reader use the factory default settings.

If you change their settings from the defaults, you may not be able to perform various setting procedures as described.

## 8.1. Ethernet Unit

To initialize the Ethernet Unit, open the **PLC I/O Table** Window in the CX-Programmer. Then, right-click on the Ethernet Unit **00 [1500] CJ1W-ETN21** and select **Unit Setup** from the menu. as described in step 2 of the procedure in *7.3.4. Editing Parameters*.

The Edit Parameters Dialog Box is displayed. Click Set Defaults to proceed.

CJ1W-ETN21(ETN21Mode)	[Edit Parameters]		?	×
Setting         FINS/TOP         DNS           Broadcast         (*)         All 1 (4.2BSD)           C         All 0 (4.2BSD)         (*)           IP Address         [192.168.188.1]           Sub-net Mask         [255.255.0.0]         0	SMTP POP 1 FINS/UDP Port © Default (3600) © User defined © Conversion © Auto (dynamic) © Auto (Static) © Combined	Mail Address   Mail S FINS/TOP Port - C Default (3600) © User defined 2001 Baud Rate (© Auto C 10BASE-T		
Enable CIDR FTP Login Password	IP address table     IP Address Table		C ETNI 1 compatible mode	-
Port No. 0 [0: De fault(21 )]	Ins	Del	Ins	
Transfer[Unit to PC]	ransfer[PC to Unit]	Compare	SoftSW Restart	
Set Defaults			OK Cancel	

## 8.2. Code Reader

For information on initializing the code reader, please refer to *How to initialize the settings*? in *Q&A* in *Appendices* of the *MicroHAWK V320-F/V330-F/V420-F/V430-F Series Barcode Reader User Manual* (Cat. No. Z432).

## 9. Software Part

## 9.1. Overview

This section describes the specifications and functions of the software part used for connecting a code reader (V330/V430 Series) to a PLC (Ethernet Unit).

The software part refers to a ladder program for the PLC.

The software part performs TCP socket communications by manipulating dedicated control bits (using the socket service function of the Ethernet Unit) to get the software version from the code reader and judge whether the TCP socket communications have ended normally or abnormally. In the software part, "normal end" means that TCP socket communications have ended normally. "Error end" means that TCP socket communications have ended abnormally, or that an error has occurred in the code reader (judged by response data from the code reader).

In the software part, timers are executed in BCD mode. It is assumed they operate with the default settings of OMRON CJ1 Series PLCs (CPU Units).

The software part does not use the keep-alive and linger functions (TCP socket options) since their use is determined individually at the time of building the system.

In this section, if it is necessary to distinguish between decimal data and hexadecimal data, add "&" to the beginning of decimal data and "#" to the beginning of hexadecimal data. (Example: "&1000" for decimal data, "#03E8" for hexadecimal data)



#### Note

We have verified in our test configuration that the software part enables communications for the product versions and product lot used for evaluation.

However, we do not guarantee its operations where there are electrical noise or other disturbances, or variations in the performance of the devices themselves.



## Note

Contact OMRON for information on how to obtain the software part.

## 9.1.1. Communications Data Flow

This is the flow from issuing a TCP socket communications command from the PLC (Ethernet Unit) to the code reader and receiving response data from the code reader. The software part executes a processing sequence of TCP open to TCP close in a continuous manner. If response data is divided and arrives as multiple pieces of receive data, receive processing will be repeated. Also, there are cases where there is no response data depending on the code reader or send command. In such as case, receive processing can be skipped by setting the receive processing required/not required setting to "receive processing not required" in advance.

\* If the receive processing required/not required setting is set to "receive processing required", in send processing, the program waits for the arrival of receive data before going to receive processing. If the setting is "receive processing not required", the program goes to close processing



## 9.1.2. TCP Socket Communications by Manipulating Dedicated Control Bits

This section provides an overview of TCP socket communications by manipulating dedicated control bits and the general movement of send and receive messages.

🐧 Note

For details, refer to Section 6 Socket Services in the CS/CJ-series Constructions of Applications Operation Manual (Cat. No. W421).

Socket Services by Manipulating Dedicated Control Bits

To use socket services by manipulating dedicated control bits, store the required parameters in Socket Service Parameter Areas in the CPU Bus Unit Area and then turn ON socket service request switches.

Socket Service Parameter Areas (Allocated DM Area)

The socket service parameters used for socket service requests are allocated in the DM Area as shown below. (The first word m is calculated as m = D30000 + (100 x Unit number).)



The following description uses Socket Service Parameter Area 1 as an example.

(1) m+18: Socket option and TCP socket number

- To use the keep-alive function, set bit 08 to 1 (ON).
- To use the linger function, set bit 09 to 1 (ON).
- Specify the TCP Socket number to use as &1 to &8 in bits 00 to 07.



- (2) m+19: Local TCP port number
  - Specify the TCP port number used by the socket to send and receive data. Normally,
     specify 1024 or higher. When 0 is specified, an unused TCP port number is automatically assigned.

- (3) m+20 and m+21: Remote IP address
  - Specify the IP address of the remote node.

The first and second octets of the remote IP address are stored in m+20. The third and fourth octets of the remote IP address are stored in m+21.



(4) m+22: Remote TCP port number

Specify the TCP port number of the remote node.

(5) m+23: Number of send/bytes of receive data

Specify the number of bytes of send data or receive data for a send request or receive

request.

- (6) m+24 and m+25: Send/Receive data address
  - Specify the first word of the source that sends send data for a send request, or the first word of the destination that receives receive data for a reception request.

<u> </u>	(m+24) (m+25)						
**	** **		00				
Area Wo designation addre			Bit No. Nways 00)				

- (7) m+26: Timeout
  - Specify the time limit in increments of 0.1 s within which the Socket Service Request Switch is turned ON and then OFF (reception is complete) for a receive request.
  - When 0 is specified, timeout monitoring for the receive request will not be performed.
- (8) m+27: Response code
  - The execution result of an open request, send request, receive request, or close request will be stored as a response code.

#### Socket Service Request Switches (CIO Area)

To issue socket service requests by manipulating dedicated control bits, manipulate Socket Service Request Switches. Socket Service Request Switches are allocated to the CIO Area words for each socket number as shown below.

(The first word n is calculated as n = 1500 + (25 x Unit number).)



• Send and Receive Messages



#### • Communications Sequence

The figure below shows the processing flow of TCP communications between the code reader (server) and the PLC (client).



## 9.2. Code Reader Command

This section describes the code reader command of the software part.

## 9.2.1. Command Overview

The software part uses a "read trigger" (< >) command to read the software version information from the code reader.

Command	Description
<>	Read trigger



#### Note

For more information, please refer to *Communications* in *Appendices* of the MicroHAWK *V320-F/V330-F/V420-F/V430-F* Series Barcode Reader User Manual (Cat. No. Z432).

### 9.2.2. Detailed Description of Command

This section describes in detail the read trigger (< >) command to read information from the code reader.

• Send Data (Command) Settings (D9000)

Code Reader Specifications:

- The command must be entered in ASCII code.
- · Uppercase alphabetical characters must be used in the command.

Word	Setting (Data format)	Data description
D9000	Number of bytes of send data (4-digit hex)	#0003 (or &3) (4 bytes of D9001 to D9002)
D9001	1st and 2nd bytes of send data (4-digit hex)	#3C20 ('< ')
D9002	3rd and 4th bytes of send data (4-digit hex)	#3E00 ('> ')

• Stored Contents of Receive Data (Response) (D10000)

Code Reader Specifications:

- The response is stored in ASCII code.
- If obtained data is followed by an OK response, the obtained data and response are received and stored as separate packets.

Word	Setting (Data format)	Data description
D10000	Number of bytes of receive data (4-digit hex)	Stores the number of bytes of receive data (2 × n bytes).
D10001	Receive data 1 (4-digit hex)	Stores the 1st and 2nd bytes of receive data in ASCII code.
D10002	Receive data 2 (4-digit hex)	Stores the 3rd and 4th bytes of receive data in ASCII code.
:	:	:
Dxxxxx	Receive data n (4-digit hex)	Stores the n-1th and nth bytes of receive data in ASCII code.

#### • Send and Receive Messages

Send message	3C	20	3E	00
Send message	'<'		'>'	

(Normal processing)

1 0	,							
Receive	31	32	33	34	35	36	0D	0A
message 1	'1'	'2'	'3'	'4'	'5'	'6'	[CR]	[LF]

#### (Error processing)

No response message will be returned in error processing.

## 9.3. Error Judgment Processing

This section describes error judgment processing by the software part.

## 9.3.1. Error Judgment by the Software Part

This software part performs error judgment processing for the following four types of errors (1) to (4). Refer to 9.7. *Error Code List* for information on error codes.



① Communications error during TCP socket communications by manipulating dedicated control bits

An error that occurred in TCP socket communications, such as main unit error, command format error, or parameter error, is judged as a "communications error". The judgment is made based on the response codes in the allocated DM Area for TCP socket communications by manipulating dedicated control bits.

#### ② Timeout error during communications with the code reader

An error that occurred due to abnormal open, send, receive, or close processing that failed to complete within the monitoring time is judged as a timeout error. This judgment is made based on timer monitoring in the software part. Refer to 9.3.2. *Time Monitoring Function* for information on time monitoring using the internal timers of the software part.

#### ③ Code reader error

An error such as a command error, parameter error, or inexecutable error on the code scanner is judged as a "code reader error". The judgment is made based on the response data returned from the code reader.

\* This error judgment is not supported by V430 Series because it does not return a response in the event of an error.

#### ④ TCP connection status error at end of processing

The software part uses a procedure in which the overall processing ends after the last close processing is done, regardless of whether the open to receive processing steps have ended normally or abnormally. Therefore, judgment of whether close processing has ended normally is made according to the TCP Connection Status words in the allocated DM Area. If there is an error in close processing, the next open processing may not be performed correctly. Refer to *9.3.3. TCP Connection Status Error Situation and Correction* for information on how to correct a TCP connection status error.

## 9.3.2. Time Monitoring Function

This section describes the time monitoring function of the software part.

#### • Time Monitoring Using Internal Timers of the Software Part

Assuming that processing has the executing status and does not end due to an error, the software part uses its internal timers to interrupted the processing (i.e., timeout). The timeout is set to 5 s (default) for each processing phase from open to close.

Processing	Monitoring description	Timeout
Open processing	Time from start to end of open processing	5 s (default)
Send Processing	<ul> <li>Time from start to end of send processing</li> <li>* When "receive processing required" is set, the software part checks the arrival of the first receive data to judge that the end of processing.</li> </ul>	5 s (default)
Receive Processing	<ul><li>Time from start to end of receive processing</li><li>* If receive processing is repeated, the software part monitors the time for each repetition of receive processing.</li></ul>	5 s (default)
Close Processing	Time from start to end of close processing * The software part checks that the TCP connection status is normal after close processing to judge the end of the processing.	5 s (default)

#### Time Monitoring Using Internal Timers of the Software Part

#### • Time Monitoring Using the Ethernet Unit (Socket Services)

The Ethernet Unit has the time monitoring function as a socket service, which monitors the arrival of receive data. This is set as a socket service parameter for receive processing. In the software part, the parameter is named **Receive Standby Time**, which is set to *300* ms (default). If receive data does not arrive from the code reader within this time, it judges that the receive processing has ended.



#### Note

For information on time monitoring using socket services, refer to 6-7 Using Socket Services by Manipulating Dedicated Control Bits in the CS/CJ-series Constructions of Applications Operation Manual (Cat. No. W421).

• Resending and Time Monitoring Using the Ethernet Unit (TCP/IP)

If a communications error occurs, TCP/IP automatically resends data and monitors the processing time if there is no problem with the Ethernet Unit. If processing abnormally ends in the middle of it, the software part stops the resending and time monitoring via TCP/IP in the close processing. However, if the close processing shows a TCP connection status error, the resending and time monitoring via TCP/IP may continue to be active in the Ethernet Unit. Refer to 9.3.3. TCP Connection Status Error Situation and Correction for information on the error situation and correction.

#### Resending and Time Monitoring via TCP/IP

\* The number of seconds indicates the time elapsed since the first request after the occurrence of the error.

## 9. Software Part

Processing	First resend	Times of resend	Last resend	Last timeout	
Open request (TCP active)	After approx. 5 s	3	After approx. 41 s	After approx. 75 s	
Send request	Within 1 s	12	After approx. 446 s	After approx. 510 s	
Receive request	Resending and time monitoring via TCP/IP not supported				
Close request	Within 1 s	12	After approx. 446 s	After approx. 510 s	

#### 9.3.3. TCP Connection Status Error and Correction

This section describes the situation and corrections if a TCP connection status error occurs.

#### • Effect of a TCP Connection Status Error

If, after the occurrence of a TCP connection status error, you execute the software part again without taking any corrective action or without noticing the error, a state of "code reader not passive open" (hereinafter referred to as "open processing error") can occur. This is considered as the effect of the TCP connection status error at the end of the previous communications processing. You can determine what error occurred in the Error Code Storage Area.

#### Error Code Storage Area

Address: Stored content	Error description
H400: Code indicating the end status of open	004A: Code reader not passive open
processing	
H404: Code indicating the end status of close	F402: TCP connection status error
processing	

#### • Situation When a TCP Connection Status Error Occurs

Both a TCP connection status error after close processing and an open processing error in the next communications processing due to the effect of the TCP connection status error can occur because the close processing has not completed in the code reader. In this situation, despite that the Ethernet Unit has ended all processing steps (up to close processing) in the software part, it has not received the close completion notification from the code reader (i.e., the completion of the close processing in the code reader is not confirmed).

#### Correction

Check whether the communications port of the code reader is closed since the close processing may not be completed in the code reader. As a result, if the communications port of the code reader is not closed or its state cannot be confirmed, the communications port must be reset. To reset the communications port of the code reader, you can use software restart or turn OFF and then ON the power supply. For details, refer to the manual for the code reader.

#### Precautions for Correct Use

Reset the communication port of the code reader after confirming that it is not connected to another device.

- Situation When a TCP Connection Status Error Occurs in the PLC (Ethernet Unit)
   When a TCP connection status error occurs, the software part has ended its processing, but resending and time monitoring by the Ethernet Unit (TCP/IP function) may be active, as described in 9.3.2. *Time Monitoring Function*. However, this resending will stop under the
  - The software part is started and an open processing request is issued again.

following situations, so there is no particular need to consciously stop it.

· A communications problem such as cable disconnection is resolved during resending.

- Resend processing is ended by the TCP/IP time monitoring (timeout) function.
- · The Ethernet Unit is restarted or turned OFF.

## 9.4. Memory Map

This section describes the memory map of the software part.

## 9.4.1. List of Used Bits

The tables below show bits, words, and timers that are required to execute the software part. You can change the following allocations to any addresses.



## **Precautions for Correct Use**

When you change the address allocations, be careful not to cause address duplication.

#### Input Bits

Address	Data type	Variable name	Description
5000.00	BOOL	Input_Start	Turns from OFF to ON to start the software part.
5010	UINT _BCD	Input_OpenMonitorTime_BCD	Sets the monitoring time for open processing in increments of 10 ms. (This is set to #500 (5 s).)
5011	UINT _BCD	Input_SendMonitorTime_BCD	Sets the monitoring time for send processing in increments of 10 ms. (This is set to #500 (5 s).)
5012	UINT _BCD	Input_ReceiveMonitorTime_BCD	Sets the monitoring time for receive processing in increments of 10 ms. (This is set to #500 (5 s).)
5013	UINT _BCD	Input_CloseMonitorTime_BCD	Sets the monitoring time for close processing in increments of 10 ms. (This is set to #500 (5 s).)
5014	UINT	Input_ReceiveStandbyTime_BIN	Sets the arrival standby time for receive data in increments of 100 ms. (This is set to &3 (300 ms).)

The following bits are used to operate the software part.

## 9. Software Part

Address	Data type	Variable name	Description
5020	UINT	Input_ReceiveProcessingRequired/NotRequired	Sets whether or not receive processing is required, taking into account whether the code reader returns a response to the command sent from the PLC. * If receive processing is not required: Set &0. The program will skip receive processing and go to close processing without waiting for receive data in send processing. Specify this value when response data is not sent back to the command sent.
			* If receive processing is required: Set &1. The program will wait for the arrival of receive data in send processing. The program will go to receive processing after checking the arrival of receive data. Specify this value when response data is sent back to the command sent.
D9000	UINT	Input_NumberOfSendDataBytes	Sets the number of bytes of send data.
D9001 D9002 to D9128	WORD [128]	Input_SendData[0] Input_SendData[1] to Input_SendData[127]	Send data storage area to set the send command. (An area of 128 words is secured.)

## • Output Bits

The following bits reflect the execution results of the software part.

	-		
Address	Data	Variable name	Description
	type		
D10000	INT	Output_NumberOfReceive DataBytes	Stores the number of bytes of receive data.
D10001	WORD	Output_ReceiveData[0]	Stores receive data (response). (An area of 2000
D10002	[2000]	Output_ReceiveData[1]	words is secured.)
to		to	
D12000		Output_ReceiveData[1999]	
H400	WORD	Output_OpenErrorCode	Stores the error code for a communications error or timeout error detected in open processing. "#0000" is stored when the processing ends normally.
H401	WORD	Output_SendErrorCode	Stores the error code for a communications error or timeout error detected in send processing. "#0000" is stored when the processing ends normally.

Address	Data type	Variable name	Description
H402	WORD	Output_ReceiveErrorCode	Stores the error code for s communications error or timeout error detected in receive processing. "#0000" is stored when the processing ends normally.
H403	WORD	Output_CodeReaderErrorC ode	Stores the error code of a code reader error detected as a result of receive processing. "#0000" is stored when the processing ends normally.
H404	WORD	Output_CloseErrorCode	Stores the error code for a communications error, timeout error, or TCP connection status error detected in close processing. "#0000" is stored when the processing ends normally.

## • Work Bits

## The following bits are used only for the purpose of calculation by the software part.

Address	Data type	Variable name Description			
5000.01	BOOL	Internal_CommunicationsExecuting	Turns ON when the software part is running and turns OFF when not running.		
5000.02	BOOL	Internal_TCPReceiveProcessingRequired	Executes receive processing after send processing when ON.		
5000.03	BOOL	Internal_TCPReceiveProcessingNotRequired Executes close processingNotRequired skipping receive pro- after send processing ON.			
5000.04	BOOL	Internal_InitialSetupEnd	Turns ON when the initial setup ends.		
5001.00	BOOL	Internal_OpenExecuting	Turns ON when open processing is in executing state.		
5001.01	BOOL	Internal_OpenNormalEnd	Turns ON when open processing ends normally.		
5001.02	BOOL	Internal_OpenErrorEnd Turns ON when processing ends abn			
5001.03	BOOL	Internal_OpenResponseCodeError Turns ON when an err in the response code Socket Service Pa Area (allocated DM Are result of open process			
5001.04	BOOL	Internal_OpenTimeout Turns ON when processing times out			
5002.00	BOOL	Internal_SendExecuting Turns ON when processing is in exe state.			
5002.01	BOOL	Internal_SendNormalEnd	Turns ON when send processing ends normally.		
5002.02	BOOL	Internal_SendErrorEnd Turns ON when processing ends abnorm			

## 9. Software Part

Address	Data type	Variable name	Description		
5002.03	BOOL	Internal_SendResponseCodeError Turns ON when an er in the response coor Socket Service P Area (allocated DM A result send processir			
5002.04	BOOL	Internal_SendTimeout	Turns ON when send processing times out.		
5003.00	BOOL	Internal_ReceiveExecuting	Turns ON when receive processing is in executing state.		
5003.01	BOOL	Internal_ReceiveNormalEnd	Turns ON when receive processing ends normally.		
5003.02	BOOL	Internal_ReceiveErrorEnd Turns ON when processing ends abno			
5003.03	BOOL	Internal_ReceiveResponseCodeError in the response code Socket Service Para Area (allocated DM Area result receive processin			
5003.04	BOOL	Internal_ReceiveTimeout	Turns ON when receive processing times out.		
5003.05	BOOL	Internal_ReceiveCodeReaderError Turns ON when reader error is dete result of receive pro			
5003.06	BOOL	Internal_ReceiveRepetitionON Turns ON when receive proces required.			
5003.07	BOOL	Internal_ReceiveRequestON Used for mani dedicated control bit receive request. Tur and OFF repeatedly repeated receive pro- is required.			
5004.00	BOOL	Internal_CloseExecuting Turns ON when processing is in ex			
5004.01	BOOL	Internal_CloseNormalEnd Turns ON when processing ends normal			
5004.02	BOOL	Internal_CloseErrorEnd Turns ON when processing ends abnor			
5004.03	BOOL	Internal_CloseResponseCodeError Internal_CloseResponseCodeError In the response code Socket Service Para Area (allocated DM Area result of lose processing			
5004.04	BOOL	Internal_CloseTimeout	Turns ON when close processing times out.		
5004.05	BOOL	Internal_CloseStatusError         Turns         ON         when a connection status error as a result of processing.			

## 9. Software Part

Address	Data type	Variable name	Description
5005	UINT	Internal_TCPConnectionStatus	Extracts and sets the lower 4 bits of the TCP Connection Status in the allocated DM Area to determine the TCP connection status as a result of close processing.
5030	UINT	Internal_SendDataAddressType	Sets the address type of the send data storage area. (This is set to #82 (DM memory).)
5031	UINT	Internal_SendDataFirstWord	Sets the first word of the send data storage area. (This is set in D9001 together with &9001 (Address type).)
5110	UINT	Internal_ReceiveDataAddressType	Sets the address type stored in receive data storage area. (This is set to #82 (DM memory).)
5111	INT	Internal_ReceiveDataFirstWord	Sets the first word stored in receive data storage area. (This is set in D10001 together with &10001 (Address type).)
5112	INT	Internal_ReceiveDataFirstWordIncrement	Stores the offset value (increment) for the storage address when there are more than one set of receive data.
5113	INT	Internal_ReceiveDataFirstWordIncrementRemaining	Stores the adjustment value (increment) for calculating the receive data storage address if the previous data has an odd number of bytes.
5114	UINT	Internal_ReceiveDataJudgmentArea_UINT	This area is used for converting the data type of receive data from WORD to UINT for comparison and judgment.

#### Timers

The following timers are used for the software part.

	<u> </u>	· · ·	
Address	Data type	Variable name	Description
T1000	BOOL	Internal_OpenMonitorTimerON	Measures the monitoring time for open processing.
T1001	BOOL	Internal_SendMonitorTimerON	Measures the monitoring time for send processing.
T1002	BOOL	Internal_ReceiveMonitorTimerON	Measures the monitoring time for receive processing.
T1003	BOOL	Internal_CloseMonitorTimerON	Measures the monitoring time for close processing.

## 9.4.2. Fixed Allocated Bits

The tables below show bits that are required to execute the software part.

The following address allocations cannot be arbitrarily changed since they are fixed by the unit address (unit number) and used socket number settings for the Ethernet Unit.

This software part uses Socket No. 0, TCP Socket No. 8, and Socket Service Parameter Area 8.

#### CIO Area

Address	Data type	Variable name
1516.13	BOOL	ETN_DataReceived
1522.10	BOOL	ETN_OpenRequest
1522.11	BOOL	ETN_SendRequest
1522.12	BOOL	ETN_ReceiveRequest
1522.13	BOOL	ETN_CloseRequest

### Allocated DM Area

Address	Data type	Variable name
D30008	UINT	ETN_NumberOfTCPReceiveDataBytes
D30016	UINT	ETN_TCPConnectionStatus
D30088	UINT	ETN_SocketNo8
D30089	UINT	ETN_LocalPortNo
D30090	UINT	ETN_RemotePortIPAddress_1
D30091	UINT	ETN_RemotePortIPAddress_2
D30092	UINT	ETN_RemotePortNo
D30093	INT	ETN_NumberOfSend/ReceiveDataBytes
D30094	UINT	ETN_Send/ReceiveDataAddress_1
D30095	UINT	ETN_Send/ReceiveDataAddress_2
D30096	UINT	ETN_TimeoutValue
D30097	UINT	ETN_ResponseCode



#### Note

For information on the CIO Area and allocated DM Area, refer to Section 6 Socket Services in the CS/CJ-series Constructions of Applications Operation Manual (Cat. No. W421).

## 9.5. Ladder Program

## 9.5.1. Functional Components of Ladder Program

The functional components of the software part are as follows.

Category	Subcategory	Description
1: Start and Setup	<ul> <li>1.1. Start Processing</li> <li>1.2. Send Data Setting</li> <li>1.3. Control Data Setting</li> <li>1.4. Common Parameter Setting</li> <li>1.5. Receive Data Storage Area</li> <li>Setting</li> <li>1.6. Receive Processing <ul> <li>Required/Not Required Flag</li> <li>Setting</li> </ul> </li> <li>1.7. Error Code Storage Area <ul> <li>Initialization</li> </ul> </li> <li>1.8. Initial Setup End Processing</li> </ul>	Starts communications processing and initializes command settings, parameter settings, and error code storage area.
2. Open Processing	<ul> <li>2.1. Open Processing Start</li> <li>2.2. Socket Service Parameter Area Setting</li> <li>2.3. Open Request Switch ON</li> <li>2.4. Normal/Error Judgment Processing</li> <li>2.5. Error Code Storage Area Setting</li> </ul>	Executes TCP active open processing. Processing starts after communications processing is started and initial setup is done.
3. Send Processing	<ul> <li>3.1. Send Processing Start</li> <li>3.2. Socket Service Parameter Area Setting</li> <li>3.3. Send Request Switch ON</li> <li>3.4. Make Normal/Error Judgment</li> <li>3.5. Error Code Storage Area Setting</li> </ul>	Executes send processing. Processing starts if open processing ends normally.
4. Receive Processing	<ul> <li>4.1. Receive Processing Start</li> <li>4.2. Socket Service Parameter Area Setting</li> <li>4.3. Receive Request ON</li> <li>4.4. Receive Request Switch ON</li> <li>4.5. Normal/Error Judgment Processing</li> <li>4.6. Receive Processing Repetition Information Calculation</li> <li>4.7. Error Code Storage Area Setting</li> </ul>	Starts processing if "receive processing required" is set to "required" and send processing ends normally. If send data is divided and arrives as multiple pieces, receive processing is repeated.
5. Close Processing	<ul> <li>5.1. Close Processing Start</li> <li>5.2. Socket Service Parameter Area Setting</li> <li>5.3. Close Request Switch ON</li> <li>5.4. Normal/Error Judgment Processing</li> <li>5.5. Error Code Storage Area Setting</li> </ul>	<ul> <li>Executes close processing.</li> <li>Processing starts in the following cases.</li> <li>"Receive processing required" is set to "required" and send processing ends normally.</li> <li>Receive processing ends normally.</li> <li>Open processing ends abnormally.</li> <li>Send processing ends abnormally.</li> <li>Receive processing ends abnormally.</li> </ul>

#### **Detailed Description of Functional Components** 9.5.2.

The software part is shown on the following pages. To change the communications settings or send data (command) of the code reader, modify the data enclosed in the red frames.

## • 1: Start and Setup

Duran Mari	ie : NewProgram1	1					
		-					
[Section Name	e : Start_and_Setu	lb]					
1. Start and Se 1.1. Start Proc	etup						
5000.00	essing -	+	*	+	+	+	° 1
↑						KEEP(011)	) Кеер
Input_Start 5004.01	*	+	+	+	+	5000.01	Bit
Internal_Close						Internal_Com	Keeps ON status until end o
5004.02	-	+	+	+	+	+	J, .
Internal_Close	J						
	Setting	÷	.*	.*	.*	*	, •
(1) Send Data (2) Send Data (3) Number of (4) Send Data	Setting Storage Address Storage First Wo Bytes of Receive (Command)	Type rd Address e Data					
5000.01	• •		*	+	* *		· ·
Internal_Com						MOV(021)	Move
-	*		*	*	• •	#82	Source word
						5030 Internal_Send	Destination Send data address type
				*		_	
						MOV(021)	Move
			*	*		&9001	Source word
						\$3001	
			*	+		5031	Destination
						Internal_Send	Send data first word address
			+	+	• •		• •
						MOV(021)	Move
			+	+	• •	&03	Source word
						D9000 Input_Numbe	Destination Number of bytes of send data
				+			
						MOV(021)	Move
			*	+		#3C20	Source word
						#0020	Source Word
	+		+	+	• •	D9001	Destination
						Input_SendD	Send data
	•		*	+	• •		•
						MOV(021)	Move
			•	+	• •	#3E00	Source word
	• •		*	+	• •	D9002 Input SendD	Destination Send data
						Input_SendD	oenu data
	r *		-				°

			MOV(021)	Move
	 	 • •	#0000	Source word
	 	 		<b>B</b> 12 12
			D9003 Input_SendD	Destination Send data
			alpor_oendo	Ocha data
	 	 • •		
			MOV(021)	Move
	 	 • •	#0000	Source word
			#0000	oource word
			D9004 Input_SendD	Destination Send data
			input_senub	Senu uata
· · · · ·	 	 • •		r
			MOV(021)	Move
	 	 	#530D	Source word
			#0000	Source Woru
			D9005	Destination
			Input_SendD	Send data

No.	Overview	Description
1.1.	Start Processing	Turns ON the INPUT_START switch to start communications processing. The communications processing ends after the end of close processing.
1.2.	Send Data Setting	Sets the number of bytes of send data and send data (command).

1.3. Control Da (1) Open Proce (2) Send Proce (3) Receive Pr (4) Close Proc (5) Receive Da (6) Receive Pr	ata Setting essing Max, Standby Time essing Max, Standby Time rocessing Max, Standby Ti essing Max, Standby Time rocessing Required/Not R	e (Unit: 10ms_BC e (Unit: 10ms_BC ime (Unit: 10ms_BC e (Unit: 10ms_BC (Unit: 100ms_BIN Vequired Setting)	:D) D) BCD) CD) V) for Command Se	nt (&0: Not Requir	red, &1: Required)	
5000.01	• •	*	+	+	*	· · ·
Internal_Com	÷		+	+	MOV(021)	Move
					#500	Source word
	•	+	+	+	· <u>5010</u>	Destination
					Input_OpenM	Open monitoring time (BCD)
	+	*	+	+	+	* *
					MOV(021)	Move
	* 	*	+	*	#500	Source word
	*		+		. 5011	
					Input_SendM	Destination Send monitoring time (BCD)
	*		+	+	*	
					MOV(021)	Move
	*	•	+	*	* #500	Source word
					5012 Input_Receiv	Destination Receive monitoring time (BCD)
			+	*		
					MOV(021)	Move
	*	+	+	+	#500	Source word
	*	*	+	*	5013	Destination
					Input_CloseM	Close monitoring time (BCD)

	. <sub>\$</sub>	+	+	+	MOV(021)	Move Source word			
					- 5014	Destination	·		
					Input_Receiv	Receive Standby 1	·		
	• •	+	+	+	MOV(021) &1	Move Source word			
					5020 Input_Receiv	Destination Sets whether or no	• ot receive processing	is required for sen	d processing
, .			•	*			· · · ·		
1.4. Commo (1) Use Soc (2) Use Soc (3) Local Po (4) Remote	n Parameter Setting sket No. 8 sket Service Parame ort No. Automatic A Node IP Address: 1 Port No.: According	: ater Area 8 Ilocation: &0 92.168.250.2							
5000.01	Port No: According	to Code Reader	' Specifications '	+	*	•	•	•	
Internal_Com	•••	•	+	*	+	MOV(021)	Move Source word	٠	
			*	÷	*	D <u>3008</u> 8 ETN_Socket	Destination Socket option for	r ETN Unit/Soci	ket No. 8
		•	*	+	*				
			•	*		MOV(021) &	Move Source word	•	
,			+	*	*	• D <u>3008</u> 9 ETN_LocalPo	Destination Local port numbe	。 er for ETN Unit	
	-	•	*	+	*	MOVD(083)	• Move Digit	+	
			*	+	*	&192	Source word	+	
			*	*	*	#210	Control word	•	
			*	*	*	D <u>3009</u> 0 ETN_Remote	Destination word Remote IP addre	ss for ETN Unit	
	-	•	*	+	*	- MOVD(083)	• Move Digit	*	
			*	*	*	&168	Source word	*	
			*	*	*	#10	Control word	•	
	-		*	•	*	* D <u>3009</u> 0 ETN_Remote	Destination word Remote IP addre		
			Ψ.	×.	*. 	MOVD(083)	Move Digit		
		*	*	•	•	&188	Source word		+
		*	*	*	•	* #210	Control word		
,		+	+	*	*	* D <u>3009</u> 1 ETN_Remote	Destination wor Remote IP addr	d ess for ETN Un	it
		*	+	+	+	- MOVD(083)	Move Digit		*
	-	*	*	*	*	. &2	Source word		
		+	÷	*	+	#10	Control word		+
		*	•	•	•	D <u>3009</u> 1 ETN_Remote	Destination wor Remote IP addr	d ess for ETN Un	it
		Ŧ	Ŧ	-	-	- MOV(021)	Move		
	*	+	*	*	*	&2001	Source word		*
	*	*	*	*	*	D <u>3009</u> 2 ETN_Remote	Destination Remote port nu	mber for ETN U	Init

No.	Overview	Description
1.3.	Control Data Setting	Sets the monitoring time for each processing phase.
		Set whether or not receive processing is required.
1.4.	Common Parameter Setting	Sets the common parameters for TCP socket communications.

	*	*	+	+		* *
<ol> <li>Receive Data Stor</li> <li>Receive Data Stor</li> <li>Receive Data Stor</li> <li>Receive Data Stor</li> <li>Clear Receive Dat</li> </ol>	rage Area Setting age Address Type age First Word Ad	dress				
<ol> <li>Clear Receive Dat 5000.01</li> </ol>	a Storage Area				· 1	· · ·
					MOV(021)	Move
rnal_Com	+	+	+		#82	Source word
					#02	
	*		+	•	. 5110	Destination
					Internal_Rec	Receive data address type
	*	*	+	*		* *
					MOV(021)	Move
					&10001	Source word
					. 5111	
					ة ا ا ا Internal_Rec	Destination Receive data first word address
	+	+	+	+		
					BSET(071)	Block Set
+	*	+	+	+	#0	Source word
+	+	*	+	•	D10000	Starting word
					Output_Numb	Number of bytes of receive data storage area
					D12000 Output Recei	End word Received data storage area
					carbar_r apple	

1.6. Receive Pri	ocessing Required/N	lot Required Flag Se	etting								
5000.01					5000.02	r •					
	<>(305)				O	Executes receive proce	essing after send	processing.			
nternal_Com	80				Internal_TOPR						
	αu										
	5020 Input Receiv										
Ī	5000.02				5000.03						
1	Internal_TCPR				Internal_TCPR	Executes send process	ing by skipping i	receive processin	ig after send proces		
No.		Overview			Description						
4.5			•								
1.5.	Receive L	Data Storag	je Area	Clear	Clears the receive area.						
	Setting										
	- U										
1.6.	Receive F	Processing		Sets t	the flag to refle	ect the receive	process	ing reguir	ed/not		
	Required/Not Required Flag		required setting.								
	Required/	Not Requir	eu riag	requir	rea seuing.						
	Setting										
	Jostang			1							



## Precautions for Safe Use

Check the customer specifications of the program before changing the receive data storage area. An unexpected memory area may be overwritten.

				*		· · · · · · · · · · · · · · · · · · ·	
5000.01	e Storage Area Initialization	۱ ۰	+	+	1 <sup>+</sup>	• •	+ +
					MOV(021)	Move	
Internal_Com	÷	+	+	+	#FFFF	Source word	• •
	÷	+	+	+	· H400	Destination	•
					Output_Open	Open processing response (	code/timeout code
		*	*	*	· ,	*	• •
					MOV(021)	Move	
	+	+	+	+	#FFFF	Source word	• •
	*	*	+	+	· H401	Destination	
					Output_Send	Send processing response of	ode/timeout code
•	*	+	+	*	,,	*	* *
					MOV(021)	Move	
	*	+	+	+	* #FFFF	Source word	* *
	÷	+	+	+	H402 Output_Recei	Destination Receive processing respons	e ande Aimenut ande
					Output_Recei	Neceive processing respons	e code/timeout code
	•	÷	*	*	· · · · · · · · · · · · · · · · · · ·	*	* *
					MOV(021)	Move	
	Ť.				#FFFF	Source word	
					H403 Output_Code	Destination Code reader end code/resp	onse code
						· · · · ·	
	• •	*	+	+	MOV(021)	Move	• •
					#FFFF	Source word	
			+			B I I I	
					0utput_Close	Destination Close processing response	code/timeout code
-	· · ·	+	÷			· · · ·	
	up End Processing		+		t manager f		
5000.01			-	-	5000.04	Ends initial setup. → To op	
Internal_Com		*			Internal_Initial	The second second second second	

No.	Overview	Description
1.7.	Error Code Storage Area Initialization	Initializes the error code storage area in the event of an error.
1.8.	Initial Setup End Processing	Turns ON the Initial Setup End Flag.

#### • 2. Open Processing

		sonig				
2. Open Proce 2.1. Open Pro	essing cessing Start					
5000.01	5000.04	÷ •	+			* * *
Internal Com 5000.01	Internal Initial	* *	+	4	 KEEP(011) 5001.00 Internal Ope	Keep Bit Keeps ON status until end of open processing.
Internal_Com 5002.00		* *			 anonia_ope	Recipision status unit and or open processing.
Internal_Send 5004.00		• •				
Internal_Close	-					
2.2. Socket S	ervice Parameter	Area Setting				
5001.00		• •				r • • •
Internal_Open					 MOV(021) &0	Move Source word
					&U	Source word
		* *			 D30097 ETN_Respon	Destination Response code for ETN Unit
-	uest Switch ON					r
5001.00	-				- 	
Internal_Open					TIMH(015)	10ms Timer (High Speed Timer) [BCD Type] Timer number
					1000	Open processing monitor timer
					5010	Set value
					Input_OpenM	Open monitoring time (BCD)
		- V			-	
					@SET 1522.10	Set Bit
					ETN_OpenRe	TCP Active Open Request Switch for ETN Unit

No.	Overview	Description
2.1.	Open Processing Start	Starts open processing. The open processing ends by moving to send or close processing.
2.2.	Socket Service Parameter Area Setting	Sets parameters required for open processing. <ul> <li>Clears the response code storage area.</li> </ul>
2.3.	Open Request Switch ON	Starts the open processing monitor timer and turns ON the dedicated control bit for open processing request.

2.4 Normal/Er	ror Judgment Pro	ocessing					
5001.00	1522.10	* -	•		+	5001.01	Normal end $\rightarrow$ To send processing
Internal_Open	ETN_OpenReq	=(300) #0			+	Internal_Open	,
		D <u>3009</u> 7 ETN_Respon			•		
		5001.01	Þ	•	+	5001.03	ResponseCodeError
	T1000	Internal_Open		,	÷	Internal_Open 5001.04	Timeout
P	Internal_Open 5001.03	+ .		,	÷	Internal_Open 5001.02	Error end → Close processing
	Internal_Open 5001.04				+	Internal_Open	end and a close processing
15 Error Code	Internal_Open Storage Area S	otting			÷		
5001.00	5001.01	*			÷	·	• • • •
Internal_Open	Internal_Open	÷ .			•	MOV(021) #0	Move Source word
		÷ ·			*	H400 Output_Open	Destination Open processing response code/timeout code
	5001.03	+	•	•	+		
•	Internal_Open	* ·			÷	MOV(021) D30097 ETN_Respon	Move Source word Response code for ETN Unit
		*			*	H400 Output_Open	Destination Open processing response code/timeout code
	5001.04	*			+		· · · · ·
	Internal_Open	* ·			+	MOV(021) #F101	Move Source word
	Þ	÷ · ·			*	Output_Open	Destination Open processing response code/timeout code

No.	Overview Description							
2.4.	Normal/Error Judgment Processing	Makes judgment of "normal/error end" or "timeout error" as a result of open processing. The processing goes to send processing if normal end or to close processing if error end.						
2.5.	Error Code Storage Area Setting	<ul> <li>Sets #0 in the error code storage area if the judgment in 2.4. Normal/Error Judgment Processing is "normal end".</li> <li>Sets the following values in the error code storage area if judgment in 2.4. Normal/Error Judgment Processing is "error end" .</li> <li>Response code error: Response code</li> <li>Timeout: #F101</li> <li>Refer to 9.7. Error Code List for details on error response codes.</li> </ul>						

3. Send Proces 3.1 Send Proces	ssing essing Start					
5000.01	5001.01		+	+	+	· · ·
nternal_Com	Internal_Open				KEEP(011)	Т Кеер
5000.01	anonial_open	+	*	+	5002.00	Bit and a state of the
nternal_Com					Internal_Send.	
5003.00	· •	+	+	+	+	
nternal_Recei						
5004.00	· ·					· · · ·
nternal_Close						
3.2. Socket Ser	vice Parameter Area Setti					
5002.00	+	+	+	+	·	• •
nternal_Send						Move
					D9000 Input_Numbe	Source word Number of bytes of send data
				*		
						Destination Number of byes of send/receive data for ETN
				+		· · ·
-					MOVD(083)	Move Digit
	*			+		Source word
						Send data address type
	+	+	+	+	4 <u>#210</u>	Control word
-	+	+	+	+		Destination word
					ETN_Send_R	Send/receive data address for ETN Unit
-	+	+	+	+		• •
ľ					MOVD(083)	Move Digit
1	*	+	•	+		Source word Send data first word address
					#12	Control word
			*	+		<b>N</b> 10 10 10 10
					D <u>3009</u> 4 ETN_Send_R	Destination word Send/receive data address for ETN Unit
	+	+	+	+		
					MOVD(083)	Move Digit
	•	+	+	+		Source word
					Internal_Send	Send data first word address
-	+	+	+	+	#210	Control word
	+	+	*	+	D30095	Destination word
					ETN_Send_R	Send/receive data address for ETN Unit
[	*	-	-	-		- · ·
	+			+		Move Digit
					#0	Source word
	+		+	+	#10	Control word
					#10	
	+			*	D30095	Destination word
						Send/receive data address for ETN Unit
1	1	t	*.	*.	· · · ·	*. *.
L					MOV(021)	Move
+	+	+	+	+	80	Source word
•	*	+	*	+	D30097	Destination
					ETN_Respon	Response code for ETN Unit
8.8. Send Requ	est Switch ON				,(	
5002.00	+	+			1	
					TIMH(015)	10ms Timer (High Speed Timer) [BCD Type]
	+	+	+	+	1001	Timer number
ternal_Send					1 11	Send processing monitor timer
temai_send						Send processing monitor timer
ternal_senu	٠	+		+	5011	Set value
ternar_senu	٠	+	٠		5011 Input_SendM	

 @SET
 Set

 1522.11
 Bit

 ETN\_SendRe...
 Send Request Switch for ETN Unit

No.	Overview	Description					
3.1.	Send Processing Start	Starts send processing. The send processing ends by moving to receive or close processing.					
3.2.	Socket Service Parameter Area Setting	<ul> <li>Sets parameters required for send processing.</li> <li>Sets the number of bytes of send data.</li> <li>Sets the address type of the send data storage area.</li> <li>Sets the first word of the send data storage area.</li> <li>Clears the response code storage area.</li> </ul>					
3.3.	Send Request Switch ON	Starts the send processing monitor timer and turns ON the dedicated control bit for send processing request.					

r		*			*		· · · ·
3.4. Normal/Er	ror Judgment Pi	rocessing					
5002.00	1522.11	5000.03	·	•		5002.01	
Internal_Send	ETN_SendReq.	Internal_TCPR 1516.13	=(300) #0	*	٠	Internal_Send	Normal end $\rightarrow$ To receive processing
•		ETN_DataRec	D <u>3009</u> 7 ETN_Respon	*	*	+	
		+	5002.01	] <sub>+</sub>	*	5002.03	ResponseCodeError
	T1001	+	Internal_Send	*	•	Internal_Send 5002.04	* *
	Internal_Send	*				Internal_Send	Timeout
	5002.03					5002.02	$Error \; end \to Close \; processing$
	5002.04			*	•	_internal_benu	• • •
	Internal_Send Storage Area S			*	*		· · · ·
3.5. Error Cod	e Storage Area a						
5002.00	5002.01	*		*	*	·	* *
Internal_Send	Internal_Send	*		*	*	MOV(021) #0	Move Source word
		*		*	*	H401 Output_Send	Destination Send processing response code/timeout code
	5002.03	*		*	*		• •
	Internal_Send	*	Þ.	+	+	MOV(021) D30097 ETN Respon	Move Source word Response code for ETN Unit
•		*		+	*	H401 Output Send	Destination Send processing response code/timeout code
	5002.04	+		•	•		Send processing response code/ mileout code
	Internal_Send	+	÷	+	+	MOV(021) #F201	Move Source word
	-	Ψ		Ψ		H401 Output_Send	Destination Send processing response code/timeout code
E Contraction of the second							

No.	Overview	Description
3.4.	Normal/Error Judgment Processing	Makes judgment of "normal/error end" or "timeout error" as a result of send processing. The processing goes to receive processing if normal end or to close
		processing if error end.
3.5.	Error Code Storage Area Setting	Sets #0 in the error code storage area if the judgment in 3.4. Normal/Error Judgment Processing is "normal end".
		Sets the following values in the error code storage area if judgment in 3.4. Normal/Error Judgment Processing is "error end".
		Response code error: Response code
		Timeout: # F201
		Refer to 9.7. Error Code List for details on error response codes.

#### • 4. Receive Processing

000.01	5002.01							
┥┝───		5000.02				KEEP(011)	Keen	
	Internal_Send	Internal_TCPR.	·.			5003.00	Keep Bit	
1/1						Internal_Rec	Keeps ON status until end of receive proce	essir
004.00		+	+	+	+	•	• • •	
al_Close								
	vice Parameter	Area Setting					ter se se	
03.00		+	+	+	•	·	* *	*
↑  al_Recei						MOV(021)	Move	
103.06  ↑						D30008 ETN_Number	Source word Number of byes of TCP receive data for ETN	N Ur
al_Recei		+	*		•	D30093	Destination	
						ETN_Number	Number of byes of send/receive data for ET	'N U
		+	+	+	•			
ŀ						MOVD(083)	Move Digit	
İ		+	*	•	•	5110 Internal_Rec	Source word Receive data address type	
		+	*	*				
						#210	Control word	
		+	+	+	+	D30094	Destination word	
						ETN_Send_R	Send/receive data address for ETN Unit	
t		+	+	*	+		• •	
ľ						MOVD(083)	Move Digit	
Ī					*	5111 Internal_Rec	Source word Receive data first word address	
		+	+					
						#12	Control word	
-		+	+	•	•	D30094	Destination word	
						ETN_Send_R	Send/receive data address for ETN Unit	
		+	+	+	•	-	* *	
Γ						MOVD(083)	Move Digit	
						5111 Internal_Rec	Source word Receive data first word address	
		+				#210	Control word	
						#210		
-		+	+	+	•	D30095	Destination word	
						ETN_Send_R	Send/receive data address for ETN Unit	
Ĺ		+	+	+	*		· • •	
		+	+	+	+	MOVD(083)	Move Digit	
						#0	Source word	
		*	+	*	•	· <u>#10</u>	Control word	
		+	+	*	•	D30095	Destination word Send/receive data address for ETN Unit	
		+	*	*		ETN_Send_R	Genurreceive data address for ETN Unit	
Ĺ						- <u> </u>		
ļ			*	+		MOV(021) 5014	Move Source word	
						Input_Receiv	Source word Receive Standby Time (BIN)	
			+	+	*	D30096	Destination	
						ETN_Timeout	Timeout value for ETN Unit	
			*	+	*		*	
ـــــــــــــــــــــــــــــــــــــ			*	*		MOV(021)	Move	
						0.8	Source word	
+					•	D30097	Destination	
						ETN_Respon	Response code for ETN Unit	

No.	Overview	Description
4.1.	Receive Processing Start	Starts receive processing when "Receiving processing required" is set. Receiving process is skipped when "Receiving process not required" is set.
		The receive processing ends by moving to close processing.
4.2.	Socket Service Parameter Area Setting	<ul> <li>Sets parameters required for receive processing.</li> <li>Sets the number of bytes of receive data.</li> <li>Sets the address type of the receive data storage area.</li> <li>Sets the first word of the receive data storage area.</li> <li>Sets the Receive Standby Time for receive data.</li> <li>Clears the response code storage area.</li> </ul>

					ι		
4.3. Receive Request ON							
5003.00 5003.07				*		+	
Internal_Recei Internal_Recei				KEEP(011)	Кеер		
5003.06		*	•	5003.07	Bit	+	
				Internal_Rec	ON-OFF bit for	receive request	repetition
Internal_Recei 5003.01		•		,	• •	+	
Internal Recei							
5003.02		*		+	• •	*	
Internal_Recei							
4.4. Receive Request Switch ON		•		*	l		
				+	r ·		
5003.07							
Internal_Recei				TIMH(015)	10ms Timer (Hi	igh Speed Timer)	[BCD Type]
		÷		1002	Timer number Receive proces	sing monitor tim	er
		•				+	
				5012 Input_Receiv	Set value Receive monito	ring time (BCD)	
*							
				@SET	Set		
* * *		*	•	1522.12	Bit	•	
				ETN_Receive	Receive Reque	st Switch for ET	N Unit
· · · · · ·				, <b>L</b>	ι		

No.	Overview	Description
4.3.	Receive Request ON	Turns ON the Receive Request Switch by manipulating "Receive Request ON". (Turns ON and OFF "Receive Request ON" to repeat receive processing.)
4.4.	Receive Request Switch ON	Starts the receive processing monitor timer and turns ON the dedicated control bit for receive processing request.

A F. Normal/En	ror Judgment Pro	*	* .	7	*	÷		*	÷	
		ocessing								
5003.00	1522.12					5003.06				
	ETN_Receive	TI =(300)					Receive reque	st repetition		
Internal_Recei	ETN_Receive	#0				Internal_Recei			+	
		#0								
		D30097	+ ·	•	+	+		+	+	+
		ETN_Respon								
						•			*	
		=(300)	1			MOV(021)	Move			
		#80				D10001	Source word			
						Output_Recei	Received data	storage area		
		D30097			+	5114	Destination	+	+	+
		ETN_Respon				0114 Internal Rec	Destination	onuert receive a	lata to UINT for	indemont
		E Inghesport				Internal_Nec				Judgment
						5003.01		•	+	+
							Normal end $\rightarrow$	To close proces	ssing	
			(305)			Internal_Recei				
			#4552			* =			*	
			5114							
			Internal_Rec							
			5003.01			5003.05			+	
						0008.00	Code reader e	ror		
			Internal Recei			Internal Recei	Code redder e	i oi		
•		5003.06	5003.01	5003.05	+	5003.03		•	+	+
			//	—— <u>1</u> /——			ResponseCode	Error		
		Internal_Recei	Internal_Recei	Internal_Recei		Internal_Recei				
	T1002				+	5003.04		*	+	+
							Timeout			
	Internal_Recei					Internal_Recei				
	5003.03					5003.02	Francisco de la C			
	Internal Recei					Internal Recei	Error end $\rightarrow 0$	lose processing		
	5003.04		• •		•	nernal_necel		•	+	+
	0000.04									
	Internal Recei									
	5003.05		+ ·	•	+	+		+	+	+
		J								
	Internal_Recei								-	

No.	Overview	Description						
4.5.	Normal/Error Judgment Processing	Makes judgment of "receive processing repetition", "normal/error end, timeout error", or "code reader error" as a result of receive processing.						
		The processing goes to close processing after the end of receive processing.						

	1						* * * *
	rocessing Repetit	ion Information	Calculation				
5003.06							
↑  Internal_Recei						+(400)	Signed Binary Add Without Carry
Internal_Necel	•		+	•		D30093	Augend word
						ETN_Number	Number of byes of send/receive data for ETN Unit
						_	· · · · · · · · · · · · · · · · · · ·
	· ·		*	*		D10000	Addend word
						Output_Numb	Number of bytes of receive data storage area
						D 10000	Development 1 1
						D10000 Output Numb	Result word Number of bytes of receive data storage area
						output_numb	Number of bytes of receive data storage area
	•		+	•			* * * *
						/(430)	Signed Binary Divide
						D30093 ETN Number	Dividend word
						ETIN_Number	Number of byes of send/receive data for ETN Unit
	•		+	•		82	Divisor word
	· · ·		+ ·	+		5112	Result word
						Internal_Rec	Receive data first word increment
						+(400)	Signed Binary Add Without Carry
			•	•		5112	Augend word
						Internal_Rec	Receive data first word increment
						_	
			•	•		5113	Addend word
						Internal_Rec	Receive data first word increment remaining
				•		<u></u>	
	l .					5112	Result word
						Internal_Rec	Receive data first word increment
						+(400)	Signed Binary Add Without Carry
	• •		•	•		5111	Augend word
						Internal Rec	Receive data first word address
						_	
	+ +		+ ·	+		5112	Addend word
						Internal_Rec	Receive data first word increment
						. <u></u>	
						5111	Result word
						Internal_Rec	Receive data first word address
4.7. Error Code	e Storage Area Se	etting					
5003.00	5003.01		+	+			
The second se	Internal_Recei						
Internal_Recei	arronnan_n soonan					MOV(021)	Move
Internal_Recei			*	•	• •	MOV(021) #0	Move Source word
Internal_Recei			*	•	• •		
Internal_Recei			* ·	• •	• •	#0	Source word
Internal_Recei			• •	• •	• •	#0 H402	Source word Destination
internal_Recei			• •	• •	• •	#0	Source word
Internal_Recei			• •	• •	• •	#0 H402	Source word Destination
Internal_kecel			• •	•	• •	#0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code
Internal_Recei			• •	• •	• •	#0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move
Internal_recel			• •	•	• • •	#0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code
Internal_recei			• •	•	• •	#0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move
Internal_recei			• •	• · · ·	· · ·	#0 H402 Output_Recei MOV(021) #0	Source word Destination Receive processing response code/timeout code Move Source word
Internal_rvecel			• · · ·	• • •	· · ·	#0 H402 Output_Recei MOV(021) #0 H403	Source word Destination Receive processing response code/timeout code Move Source word Destination
Internal_rvecel			• · · ·	• · · ·	· · ·	#0 H402 Output_Recei MOV(021) #0	Source word Destination Receive processing response code/timeout code Move Source word
	5003.05		• • •	• • •	· · ·	#0 H402 Output_Recei MOV(021) #0 H403	Source word Destination Receive processing response code/timeout code Move Source word Destination
Internal_rvecel	5008.05		• · · ·	• · · · · · · · · · · · · · · · · · · ·	· · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code
Internal_rvecel			• · · ·		· · · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move
Internal_rvecel	5008.05		• · · ·		· · · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code
Internal_rvecel	5008.05		• • • • • • • • • • • • • • • • • • •		· · · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move
Internal_rvecel	5008.05		• · · · · · · · · · · · · · · · · · · ·		· · · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #0	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word
Internal_rvecel	5008.05		• · · · · · · · · · · · · · · · · · · ·		· · · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code #0 H402	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination
Internal_rvecel	5008.05					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #0	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word
Internal_rvecel	5008.05		• · · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	#0 H402 Output_Recei MOV(021) #0 H403 Output_Code #0 H402	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination
Internal_rvecel	5008.05					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code
	5008.05					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code #0 H402	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination
	5008.05					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code
	5008.05					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #0 H402 Output_Recei MOV(021)	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move
	5008.05					#0 H402 Output_Recei MOV(021) #0 Utput_Code MOV(021) #0 Utput_Recei MOV(021) #7 0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word
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	5008.05					#0 H402 Output_Recei MOV(021) #0 Utput_Code MOV(021) #0 Utput_Recei MOV(021) #7 0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word
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	5008.05					#0 H402 Output_Recei MOV(021) #0 Utput_Code MOV(021) #0 H402 Output_Recei MOV(021) #7 0 H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code
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	5003.05 Internal_Recei					#0 H402 Output_Recei MOV(021) #0 Utput_Code MOV(021) #0 H403 Output_Code MOV(021) #F302 Utput_Code MOV(021)	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code
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	5003.05 Internal_Recei					#0 H402 Output_Recei MOV(021) #0 Output_Code MOV(021) #0 Output_Recei MOV(021) #F302 Output_Recei MOV(021) #F302 Output_Code MOV(021) #F302 Output_Code H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code
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	5003.05 Internal_Recei 5003.03 Internal_Recei					#0 H402 Output_Recei MOV(021) #0 Output_Code MOV(021) #0 Output_Recei MOV(021) #F302 Output_Recei MOV(021) #F302 Output_Code MOV(021) #F302 Output_Code H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code
	5003.05 Internal_Recei					#0 H402 Output_Recei MOV(021) #0 Output_Code MOV(021) #0 Output_Recei MOV(021) #F302 Output_Recei MOV(021) #F302 Output_Code MOV(021) #F302 Output_Code H403 Output_Code	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code
	5003.05 Internal_Recei 5003.03 Internal_Recei 5003.04					#0 H402 Output_Recei MOV(021) #0 Utput_Code MOV(021) #0 Output_Code MOV(021) #7 Output_Recei MOV(021) H403 Output_Code MOV(021) #7 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code
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	5003.05 Internal_Recei 5003.03 Internal_Recei 5003.04					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #7 Output_Recei MOV(021) #7 MOV(021) #7 MOV(021) H403 Output_Recei MOV(021) D30097 ETN_Respon H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code
	5003.05 Internal_Recei 5003.03 Internal_Recei 5003.04					#0 H402 Output_Recei MOV(021) #0 H403 Output_Code MOV(021) #7 Output_Recei MOV(021) #F302 Utput_Code MOV(021) #F301 MOV(021) #F301	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Code reader end code/response code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Response code for ETN Unit Destination Receive processing response code/timeout code
	5003.05 Internal_Recei 5003.03 Internal_Recei 5003.04					#0 H402 Output_Recei MOV(021) #0 Output_Code MOV(021) #0 H403 Output_Code MOV(021) #F302 Utput_Recei MOV(021) D30097 ETN_Respon H402 Output_Recei MOV(021) D30097 ETN_Respon H402 Output_Recei	Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Code reader end code/response code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Receive processing response code/timeout code Move Source word Nove Source word Response code for ETN Unit Destination Receive processing response code/timeout code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Receive processing response code/timeout code Move Source word Destination Receive processing response code/timeout code Move Source word Destination
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No.	Overview	Description
4.6.	Receive Processing Repetition Information Calculation	<ul> <li>Performs the processing below if judgment in <i>4.5. Normal/Error Judgment Processing</i> is "receive processing repetition".</li> <li>Adds the number of bytes of the receive data to the total number of bytes of receive data.</li> <li>Calculates the first word of the receive data for storage of the next received data.</li> </ul>
4.7.	Error Code Storage Area Setting	<ul> <li>Sets #0 in the error code storage area if the judgment in <i>4.5.</i> <i>Normal/Error Judgment Processing</i> is "normal end".</li> <li>Sets the following values in the error code storage area if judgment in <i>4.5. Normal/Error Judgment Processing</i> is "error end".</li> <li>Response code error: Response code</li> <li>Timeout: # F301</li> <li>Code reader error: #F302, or code reader end code converted to hex</li> <li>Refer to 9.7. Error Code List for details on error response codes.</li> </ul>

#### • 5. Close Processing

5. Close Proce 5.1. Close Proc	ssing cessing Start						
5000.01	5002.01	* 5000.03		+			· · · ·
Internal_Com	Internal_Send 5003.01	+		÷ .	· ·	KEEP(011) 5004.00 Internal_Clos	Keep Bit Keeps ON status until end of close processing.
	Internal_Recei 5001.02	+		• •			
	Internal_Open 5002.02	+		•			• • • •
	Internal_Send 5003.02	*		• •	· .		
5000.01	Internal_Recei	*	• •	• •			
Internal_Com		*		· · · · ·			*
5.2. Socket Se	rvice Parameter	Area Setting					
5004.00	+	*				·	* * *
↑  Internal_Close	•	÷ .	• •	• .		MOV(021) &	Move Source word
		•		•		<sup>*</sup> D <u>3009</u> 7 ETN_Respon	Destination Response code for ETN Unit
5.3. Close Reg	uest Switch ON	*		÷		,	* * *
5004.00	*			*		•	r • • •
Internal_Close		+		• .		TIMH(015)	10ms Timer (High Speed Timer) [BCD Type] Timer number
		•		•		5013	Close processing monitor timer Set value
		•		•		Input_CloseM	Close monitoring time (BCD)
		*	, · · ·	• .		@SET	Set
						1522.13 ETN_CloseR	Bit Close Request Switch for ETN Unit

No.	Overview	Description
5.1.	Start Close Processing	Starts close processing. Close processing ends when the communications processing ends (changes to non-executing state).
5.2.	Socket Service Parameter Area Setting	Sets parameters required for close processing. <ul> <li>Clears the response code storage area.</li> </ul>
5.3.	Close Request Switch ON	Starts the close processing monitor timer and turns ON the dedicated control bit for close processing request.



No.	Overview	Description
5.4.	Normal/Error Judgment Processing	Makes judgment of "normal/error end", "timeout error", or "close status error" as a result of close processing. The communications processing ends after the end of close processing.

r					
5.5. Error Code Storage Area Settin					
5004.00 5004.01	*	+	*	+	r * * *
Internal Close Internal Close				MOV(021)	Move
	+	*	+	#0	Source word
• •	+	+	+	· H404	Destination
				Output_Close	Close processing response code/timeout code
5004.03	+				
0004.00				MO1 ((00.1)	Maria
Internal_Close	*			MOV(021)	Move
				D30097 ETN_Respon	Source word Response code for ETN Unit
	*	*	*	H404	Destination
				Output_Close	Close processing response code/timeout code
5004,04	+	*	+	+	
Internal_Close				MOV(021)	Move
Internal_Close	+		+	#F401	Source word
	+	+	+	· H404	Destination
				Output_Close	Close processing response code/timeout code
5004.05	*				
5004.05					
Internal_Close				MOV(021)	Move
· · ·	•	Ŧ	•	#F402	Source word
· · ·	+	+	+	H404	Destination
				Output_Close	Close processing response code/timeout code
· · · · ·					· · · · · · · · · · · · · · · · · · ·

No.	Overview	Description
5.5.	Error Code Storage Area Setting	Sets #0 in the error code storage area if the judgment in 5.4. Normal/Error Judgment Processing is "normal end".
		Sets the following values in the error code storage area if judgment in <i>5.4. Normal/Error Judgment Processing</i> is "error end".
		Response code error: Response code
		Timeout: # F401
		Close processing status error: #F402
		Refer to 9.7. Error Code List for details on error response codes.

## 9.6. Timing Chart

The timing chart for the ladder program is shown below.

#### Start and Setup



Open processing



#### Send Processing





(Timeout: No receive data)

#### Receive Processing



(Timeout)

(Code Reader Error)

Close Processing



(Status Error)

## 9.7. Error Code List

#### Response Codes

The response codes for open processing, send processing, receive processing, and close processing are set in H400, H401, H402, and H404, respectively.

The table below shows the main response codes.

Response	0	s	R	С	Description	
code	0	3	Г	C	·	
0000	0	0	0	0	Normal end	
0105	0				Local IP address setting error	
0302	0	0	0	0	CPU Unit error	
1100	0	0	0		TCP socket number not 1 to 8, remote IP address 0 in open processing Number of bytes of send data out of allowable range in send processing Number of bytes of receive data out of allowable range in receive processing	
1101		0	0		Variable type for send/ receive data address out of allowable range	
1103		0	0		Bit address of send/receive data not 0	
110C	0	0	0		Request switch turned ON in another processing	
220F	0	0	0		Specified socket already open or in open processing executing state in open processing processing Specified socket in send processing executing state in send processing Specified socket in receive processing executing state in receive processing	
2210		0	0	0	Connection not established for specified socket	
2211	0	0	0	0	Service not executable because Unit is busy	
2606	0				Unable to open specified socket via TCP because already it is opened by UDP	
2607	0	0	0	0	Specified Socket Service Parameter Area in use by another socket	
000D	0				Remote IP address parameter error	
0020		0			Connection with remote socket lost in send processing	
003E	0	0	0		Unable to secure internal buffer because receive load is high	
0045	0				Local socket closed	
0049	0				Port number duplicated	
004A	0	0			Error or remoter device not in passive open state in open processing Communications error with remote node in send processing	
004B			0		Communications error with remote node	
004C	0				Remote IP address parameter error, incorrect parameter specification Active open request made to local TCP port of local node	
0053	0		0		Communications error with remote node, remote node not existing	
0066			0		Service not executable because memory for internal processing cannot be secured	
0080			0		A timeout occurred during receiving.	
0081	0	0	0		Socked closed in open processing Specified socket closed in send processing Specified socket closed in receive processing	
FFFF	0	0	0	0	Processing skipped for some reason	

(O: Open processing, S: Send processing, R: Receive processing, C: Close processing, o: Applicable processing)

#### Note

For details, refer to 6-7-6 Response Codes in Section 6 Socket Services in the CS/CJ-series Constructions of Applications Operation Manual (Cat. No. W421).



## Note

For details on the Ethernet Unit error and correction, refer to 8-4 troubleshooting Procedures in Section 8 Troubleshooting in the CS/CJ-series Constructions of Networks Operation Manual (Cat. No. W420).

• Timeout Error/TCP Connection Status Error

The timeout error codes for open processing, send processing, and receive processing are set in H400, H401, and H402, respectively. The timeout error code/TCP connection status error code for close processing is set in H404.

Error code	0	S	R	С	Description
0000	0	0	0	0	Normal end
F101	0				Open processing not completed within specified time
F201		0			Send processing not completed within specified time (This includes cases where response to be received was not received.)
F301			0		Receive processing not completed within specified time
F401				0	Close processing not completed within specified time
F402				0	Normal TCP connection status not shown within specified time after close processing
FFFF	0	0	0	0	Processing skipped for some reason

(O: Open processing, S: Send processing, R: Receive processing, C: Close processing, o: Applicable processing)

#### • Code Reader Error Code

The error codes of code reader errors detected in receive processing are set in H403.

(O: Open processing, S: Send processing, R: Receive processing, C: Close processing, o: Applicable processing)

Error code	0	S	R	С	Description	
0000			0		Normal end	
F302			0	Response from code reader is "ER"		
FFFF			0		Judgment of code reader error not made due to no response from code reader for some reason	

\* "ER" is the only error response supported for communications errors. For details, check the monitor information on the code reader.

# 10. Revision History

Revision Code	Revision Date	Revised Reason and Page
01	February 2023	First Publication

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Cat. No. Z431-E1-01 0223