

**SYSMAC CS and CJ Series**

**CS1W-EIP21S (100Base-TX)**

**CJ1W-EIP21S (100Base-TX)**

**EtherNet/IP™ Units**

**Firmware Update**

**USER'S MANUAL**

**OMRON**

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# Introduction

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Thank you for purchasing a CS/CJ-series EtherNet/IP Unit.

This manual contains information that is necessary to update the firmware of CS/CJ-series EtherNet/IP Unit.

Please read this manual and make sure you understand the firmware update before you attempt to use it in a control system.

Keep this manual in a safe place where it will be available for reference during operation.

## Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of introducing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of installing and maintaining FA systems.
- Personnel in charge of managing FA systems and facilities.

Note that this manual is intended for those who have a knowledge of the CS/CJ-series PLCs and experience in designing equipment that uses the products.

## Applicable Products

This manual covers the following products.

CJ Series

- CJ1W-EIP21S

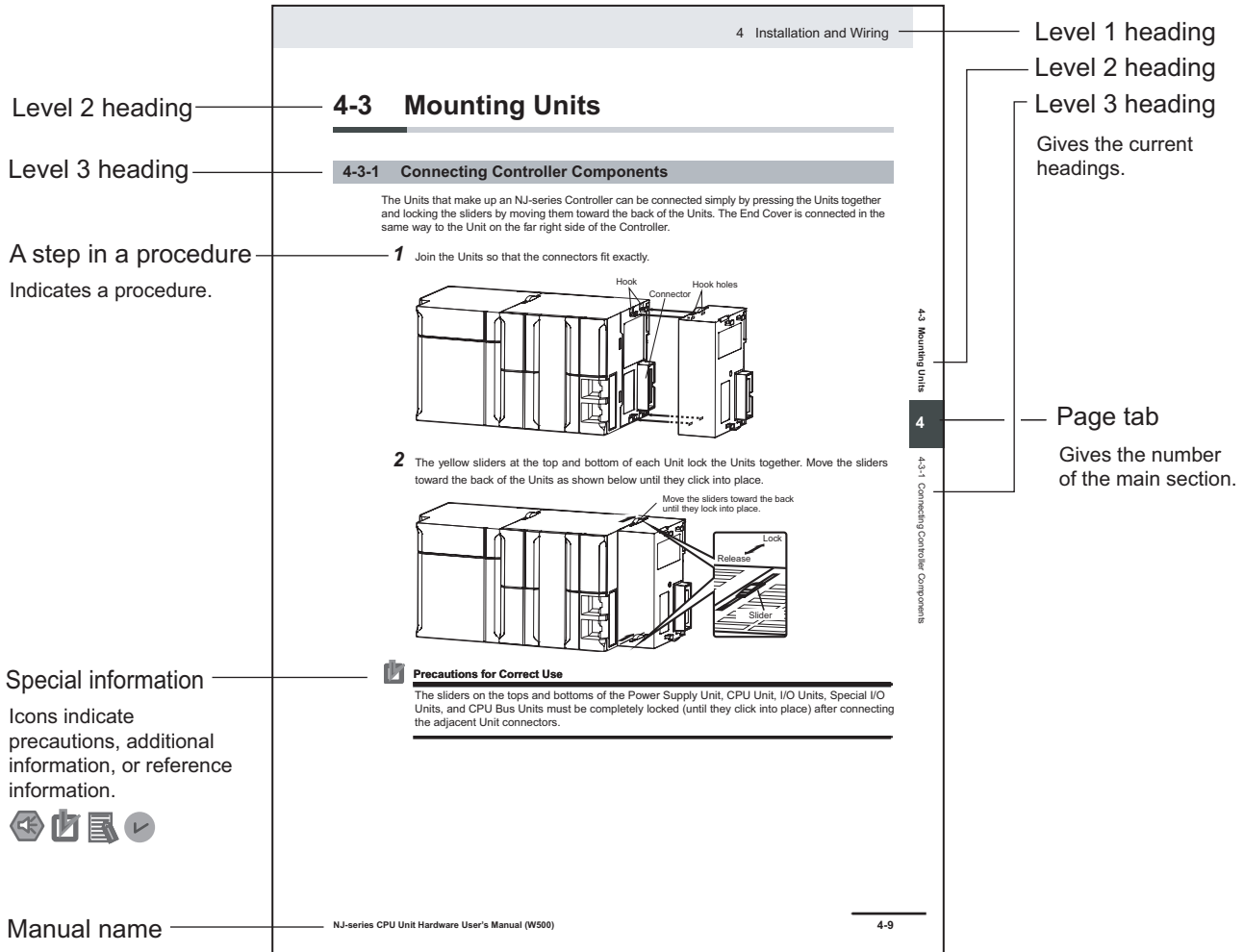
CS Series

- CS1W-EIP21S

# Manual Structure

## Page Structure

The following page structure is used in this manual.



**Note** This illustration is provided only as a sample. It may not literally appear in this manual.

## Special Information

Special information in this manual is classified as follows:



### **Precautions for Safe Use**

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



### **Precautions for Correct Use**

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



### **Additional Information**

Additional information to read as required.

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



### **Version Information**

Information on differences in specifications and functionality for applicable products with different unit versions and for different versions of the Support Software is given.



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# Terms and Conditions Agreement

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## Warranty, Limitations of Liability

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# Safety Precautions

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Refer to the following manuals for safety precautions.

- CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)
- CX-Programmer Ver. 9.□ Operation Manual (Cat. No. W446)

# Precautions for Safe Use

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Refer to the following manuals for precautions for safe use.

- CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)
- CX-Programmer Ver. 9.□ Operation Manual (Cat. No. W446)

# Precautions for Correct Use

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Refer to the following manuals for precautions for correct use.

- CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)
- CX-Programmer Ver. 9.□ Operation Manual (Cat. No. W446)

## When Updating Firmware

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- When you update the firmware of CS1W/CJ1W-EIP21S EtherNet/IP Unit, the settings in the Unit are initialized.
- Do not turn OFF the power supply to PLC and computer during the firmware update of CS1W/CJ1W-EIP21S EtherNet/IP Unit.  
If the power supply to PLC is turned OFF, the Unit may not start normally the next time the power is turned ON.
- When you update the firmware of CS1W/CJ1W-EIP21S EtherNet/IP Unit, set the CPU Unit to PROGRAM mode.

# Versions

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The unit version of CS1W-EIP21S/CJ1W-EIP21S EtherNet/IP Unit and supporting versions of the CX-One and EIP21S Firmware Update Tool are shown below.

Unit version of CS1W-EIP21S/CJ1W-EIP21S	CX-One version	EIP21S Firmware Update Tool version
Ver.1.0	Ver.4.61	Ver.1.00



# Related Manuals

The following table shows the manuals related to this product. Use these manuals for reference.

Manual name	Cat.No.	Model numbers	Application	Description
CX-Programmer Ver. 9.□ Operation Manual	W446	CXONE-AL□□D- V4	Learning how to operate the CX-Programmer, i.e., a programming tool for Windows computers.	Describes the operating procedures of the CX-Programmer.
CX-One Setup Manual	W463	CXONE-AL□□D- V4/LT□□□-V4	Installing the CX-One software.	Provides an overview of the CX-One FA Integrated Tool Package and describes how to install the CX-One.
CS/CJ-series EtherNet/IP™ Units Operation Manual	W465	CS1W-EIP21 CJ1W-EIP21 CJ2H-CPU6□-EIP CJ2M-CPU3□ CS1W-EIP21S CJ1W-EIP21S	Learning how to use the EtherNet/IP Unit.	Provides information on using an EtherNet/IP Unit that is connected to a CS/CJ-series CPU Unit. The basic setup, tag data links, and FINS communications are described.

# Revision History

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A manual revision code appears as a suffix to the catalog number on the front and back covers of the manual.

<b>Cat. No.</b>	<b>W628-E1-01</b>
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↑  
Revision code

Revision code	Date	Revised content
01	July 2023	Original production

# 1

## Advance Preparations

This section describes advance preparations before performing the firmware update.

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# 1-1 Preparations

This section describes the preparations that are required to update the firmware.

The following preparations are required when you update the firmware of CS1W-EIP21S/CJ1W-EIP21S (hereafter may be abbreviated as EIP21S Unit).

Item	
Required device	<ul style="list-style-type: none"> <li>• An EIP21S Unit to update the firmware</li> <li>• A CPU Unit and a Power Supply Unit to connect the EIP21S Unit</li> <li>• A firmware update file</li> <li>• EIP21S Firmware Update Tool</li> <li>• EIP21S User Management Tool*<sup>1</sup></li> <li>• Computer*<sup>2</sup></li> </ul>
User authentication setting	A personnel with an administrator operation authority or a personnel who is planned to have an administrator operation authority
Backup* <sup>3</sup>	Simple backup function* <sup>4</sup> , or PLC Backup Tool

\*1. Required to update the firmware of a new EIP21S Unit.

\*2. Use a computer with an operating system version of Windows 10 1803 or later.

\*3. Required if you want to reuse the settings in the EIP21S Unit.

\*4. When you use the simple backup function, a Memory Card must be inserted in the CPU Unit.



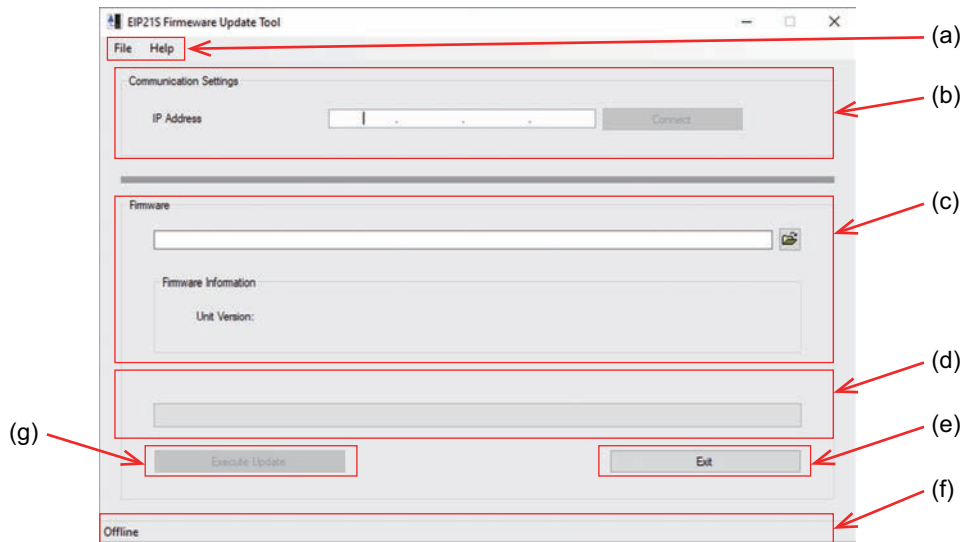
## Version Information

Refer to *Versions* on page 14 for the unit versions of EIP21S Unit and CX-One versions that support the EIP21S Firmware Update Tool.

Refer to the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* for other versions such as CX-Programmer that support the EIP21S Unit.

## 1-2 EIP21S Firmware Update Tool

This section describes the EIP21S Firmware Update Tool.



Letter	Name	Description
(a)	Tool menu	Menu of this tool.
(b)	Communication Settings	Enter the IP address.
(c)	Firmware	Select the firmware update file, then the firmware information is displayed.
(d)	Update status	Displays the status while updating.
(e)	Exit Button	Exits from this tool.
(f)	Status bar	Displays various information.
(g)	Execute Update Button	Performs the update.

### Tool Menu

This section describes the tool menu of the EIP21S Firmware Update Tool.

Category	Menu name	Description
File	Exit	Exits from this tool.
Help	Version Information	Displays the version information of this tool.

### Communication Settings

Enter the IP address of the EIP21S Unit to connect to, then press the **Connect** Button to connect online.



#### Additional Information

You cannot edit the IP address while online.

### **Firmware**

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Click the **Select File** Button and select the firmware update file to update, then the firmware information is displayed.

### **Update Status**

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Displays the status during update.

### **Status Bar**

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Displays offline and online status, user name, and unit version, etc.

## 1-3 Obtaining Firmware Update Files

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Download the firmware update file by using an Internet browser.  
Save the downloaded firmware update file in any folder.

**Note** For the URL to download the file, contact your OMRON representative.

The firmware update file name depends on the unit version for firmware update.  
For example, if the unit version for firmware update is version 3.21, the name of the firmware update file is as follows.

<b>Firmware update file name</b>	EIP21S_0321.sfm
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## 1-4 Precautions on Update

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This section describes the precautions on updating the firmware.

- When you update the firmware, use a computer with an operating system version of Windows 10 1803 or later. Secure communications cannot be performed on a computer with a version earlier than Windows 10 1803.
- When you update the firmware, set the CPU unit to PROGRAM mode.  
In addition, do not set the CPU unit to RUN mode while the *Firmware Update Mode* is ON.
- When you update the firmware, make sure that the EIP21S Unit is visible.  
If an error occurs during firmware update, you need to check the indicators on EIP21S Unit.
- Updating firmware initializes the existing various settings in the Unit shown below.
  - a) Special Unit settings, tag data link settings, and user authentication settings
  - b) Operation logTherefore, if you are updating an operating EIP21S Unit, you must back up the setting data of EIP21S Unit using the simple backup function or the PLC Backup Tool.
- Do not perform the following operations while updating, as the EIP21S Unit may fail to start.
  - a) Disconnect the connected communications cables.
  - b) Turn off the power supply to CPU Unit or computer.
  - c) Exit the EIP21S Firmware Update Tool.
- You need to turn OFF and ON the power supply to EIP21S Unit after you update the firmware.



# 2

## Performing Firmware Update

This section describes the procedures to update the firmware and how to perform it.

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## 2-1 Workflow

This section describes an overview of the firmware update procedures.

The procedures differ depending on whether the existing various settings in the EIP21S Unit are reused after firmware update or a new EIP21S Unit that is not yet configured is updated.

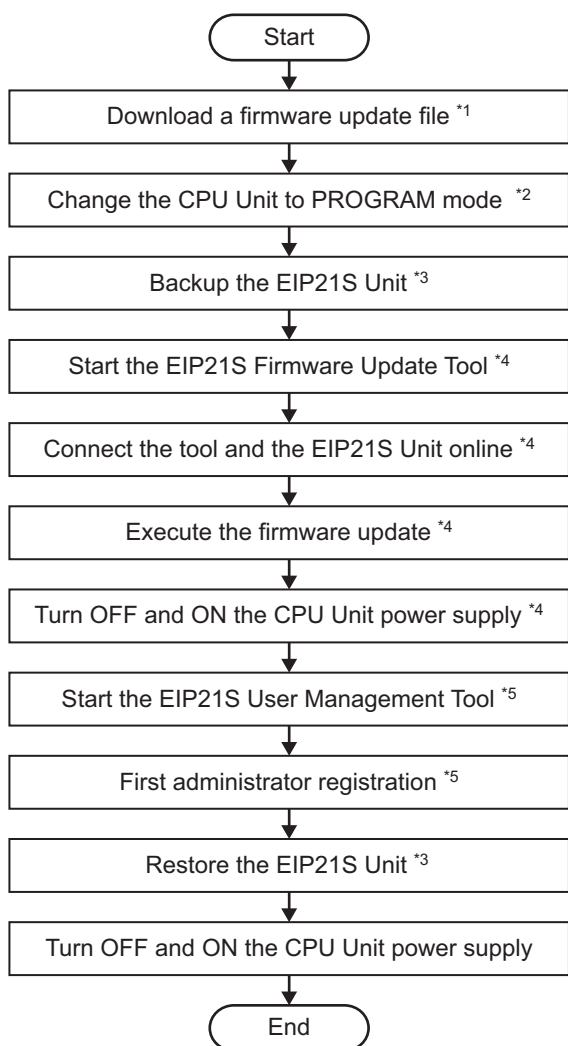
The various settings in the EIP21S Unit are as follows.

- Special Unit settings
- Tag data link settings
- User authentication settings

When you want to reuse the existing various settings, use the simple backup function or the PLC Backup Tool to perform backup and restore.

When you update a new EIP21S Unit that is not yet configured, you do not need to back up the settings, but you must register the first administrator with the EIP21S User Management Tool.

### 2-1-1 Reusing the Existing Various Settings

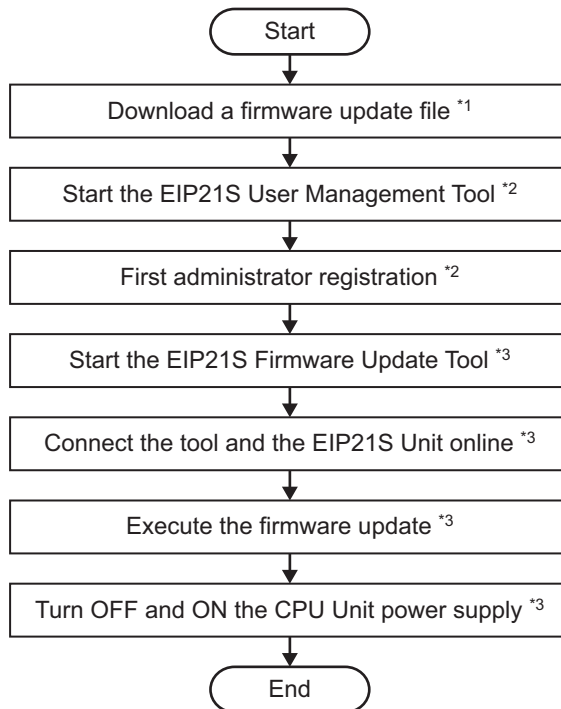


\*1. Refer to 1-3 *Obtaining Firmware Update Files* on page 1-5 for downloading the firmware update file.

\*2. If the Unit is already in PROGRAM mode, no change is required.

- \*3. Refer to *Maintenance and Unit Replacement* in the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* for information on how to operate backup and restore.
- \*4. Refer to *2-2 Performing Update* on page 2-4.
- \*5. This procedure is necessary when backup is performed by the PLC Backup Tool. This procedure is not necessary if the backup was performed by the simple backup function. Refer to the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* and *CX-Programmer Ver. 9.□ Operation Manual (Cat. No. W446)* for information on user authentication and tool operation using the EIP21S User Management Tool.

## 2-1-2 Updating a New EIP21S Unit



- \*1. Refer to *1-3 Obtaining Firmware Update Files* on page 1-5 for downloading the firmware update file.
- \*2. Refer to the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* and *CX-Programmer Ver. 9.□ Operation Manual (Cat. No. W446)* for information on user authentication and tool operation using the EIP21S User Management Tool.
- \*3. Refer to *2-2 Performing Update* on page 2-4.

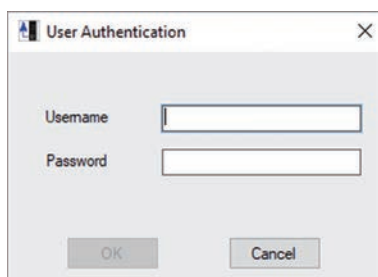
## 2-2 Performing Update

The EIP21S Firmware Update Tool must be connected directly to the EIP21S Unit.

- 1 Connect the EtherNet/IP port of EIP21S Unit and the computer.
- 2 Select **All Programs - OMRON - CX-One** from the **Start** Menu of the computer, then double-click the **EIP21S Firmware Update Tool** in the **EIP21S Tools** folder.  
The EIP21S Firmware Update Tool starts.
- 3 In **IP Address** in the **Communication Settings**, enter the IP address of the EIP21S Unit to connect to, and click the **Connect** Button.  
The Communication Settings view is shown below.

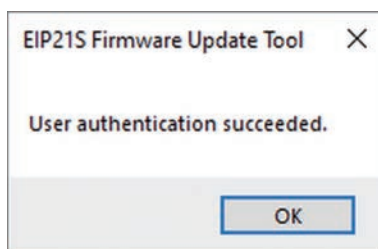


- 4 Enter the user name and password of the administrator to authenticate the user.

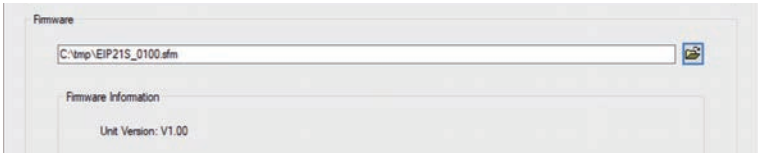


Only a user with administrator operation authority can place the tool online.

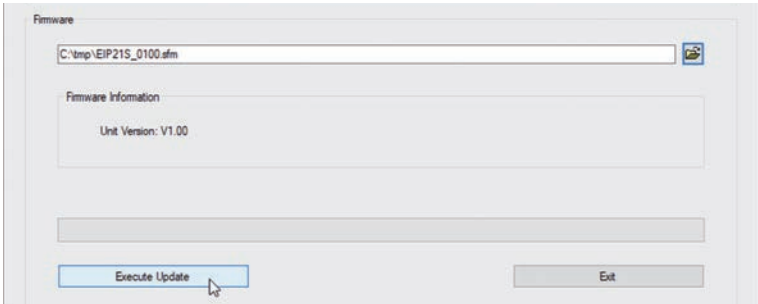
The following dialog box is displayed if the user authentication is successful, then click the **OK** Button.



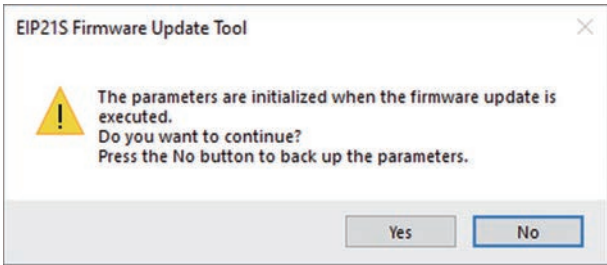
- 5 Select the firmware update file.  
The Firmware view is shown below.



6 Click the **Execute Update** Button to execute the firmware update.

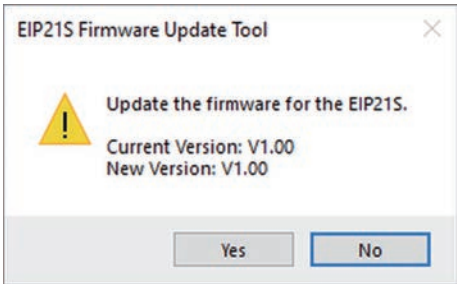


After clicking the **Execute Update** Button, a warning dialog box for backup confirmation is displayed.



- Click **Yes** to continue the update.
- Click **No** to cancel the update.

7 If you continue the update, the unit versions for firmware update before and after the update are displayed in the dialog box.

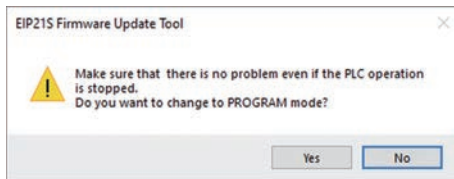


- Click **Yes** to continue the update.
- Click **No** to cancel the update.



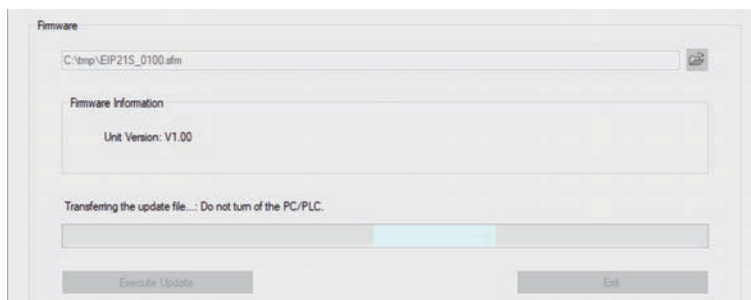
### Additional Information

If the PLC is in RUN mode, the following warning message is displayed when the above update is continued.



- Click **Yes** to change the PLC to PROGRAM mode and continue the update.
- Click **No** to avoid changing the PLC from RUN mode and cancel the update.

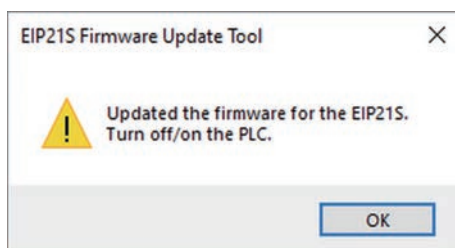
**8** If you continue the update, the update status displays the message of progressing update.



### Precautions for Correct Use

Do not turn OFF the power supply to the CPU Unit or the computer while updating, doing so may prevent the EIP21S Unit to start.

When the firmware update is completed normally, a dialog box with messages of successful update and instruction to turn OFF and ON the power to PLC are displayed.



**9** Click the **OK** Button to go offline.

**10** Click the **Exit** Button to exit from the EIP21S Firmware Update Tool.



### Additional Information

If you want to continue to update the firmware of the second and subsequent EIP21S Units, go back to step 1 without exiting from the EIP21S Firmware Update Tool.

**11** Turn OFF and ON the CPU Unit power.

The firmware update is completed with the above.

## 2-3 Operations after Update

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After the firmware update is complete, restore the settings if you want to reuse them.

Refer to *Maintenance and Unit Replacement* in the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* for information on how to operate restore.

Refer to *Installation and Initial Setup* in the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* for information on setting up a new Unit.



# 3

## Troubleshooting

This section describes troubleshooting by checking the EIP21S Firmware Update Tool and the indicators on EIP21S Unit.

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<b>3-1</b>	<b>Checking the EIP21S Firmware Update Tool .....</b>	<b>3-2</b>
<b>3-2</b>	<b>Checking the Indicators on EIP21S Unit .....</b>	<b>3-4</b>
3-2-1	Errors during Update .....	3-5
3-2-2	Errors during Restart after Update .....	3-6

## 3-1 Checking the EIP21S Firmware Update Tool

The table below describes troubleshooting problems indicated by the messages from the EIP21S Firmware Update Tool.

Error	Cause	Countermeasure
Invalid update file	<ul style="list-style-type: none"> <li>The file was not obtained from the official OMRON route.</li> <li>The update file is corrupted.</li> </ul>	Obtain an update file again from the official OMRON route.
Unable to update	The user is trying to update the EIP21S Unit with a unit version not supported by the EIP21S Firmware Update Tool.	Use the EIP21S Firmware Update Tool which support the unit version.
	The update file cannot be applied to the EIP21S Unit which the user tries to update.	Replace with an EIP21S Unit with an applicable unit version.
Communications error	The following error occurred in the CPU Unit. <ul style="list-style-type: none"> <li>I/O bus error</li> <li>CPU Unit WDT error</li> </ul>	Check the error in the CPU Unit, take corrective action, and then execute the update.
	A communications error with the EIP21S Unit occurred.	Check the following and take corrective action. <ul style="list-style-type: none"> <li>Communication cable disconnection, looseness, and poor contact</li> <li>Noise</li> </ul>
Update failed	An error occurred in the EIP21S Unit during update.	Check the error of the EIP21S Unit and take corrective action. *1

\*1. Refer to 3-2-1 *Errors during Update* on page 3-5 for detail.

### Errors in Connecting the EIP21S Firmware Update Tool

The table below describes troubleshooting problems that occur when connecting the EIP21S Firmware Update Tool and an EIP21S Unit.

Error	Setting item factor	Cause	Countermeasure
EIP21S Firmware Update Tool indicated a timeout when online connection was executed.	IP filter settings in the IP packet filter settings	The IP address of the computer is not allowed in the source IP.	<ul style="list-style-type: none"> <li>When IP address setting of the computer is incorrect Change the IP address of the computer to one allowed by the IP packet filter.</li> <li>When the setting in the EIP21S Unit is incorrect Connect the CX-Programmer online to the USB/serial port of the CPU Unit to which the EIP21S Unit is mounted and allow the IP of the computer.</li> </ul>
	Protocol filter settings in the IP packet filter settings	TCP443 is not allowed for the destination port.	Connect the CX-Programmer online to the USB/serial port of the CPU Unit to which the EIP21S Unit is mounted and allow the destination port TCP443.
	---	A computer with an operating system version earlier than Windows 10 1803 is used.	Update the operating system version of the computer to Windows 10 1803 or later.

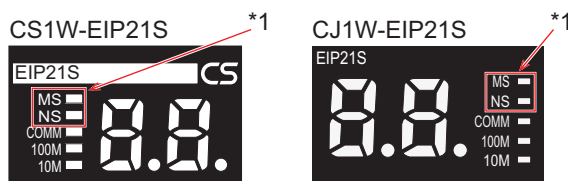
Error	Setting item factor	Cause	Countermeasure
A user authentication error occurred on the User Authentication Dialog Box.	User authentication settings	The values entered are different from the user name and password that are set for the EIP21S Unit.	Enter the correct user name and password that are set for the EIP21S Unit. If you do not know your user name or password, request your administrator to add an account or reset your password.
		Password has expired.	Change your password.

## 3-2 Checking the Indicators on EIP21S Unit

This section describes the status and error indications by the operation status indicators and 7-segment display on the EIP21S Unit.

### Checking the Operation Status Indicators

The operating statuses of EIP21S Unit that are indicated by the operation status indicators are shown as below.



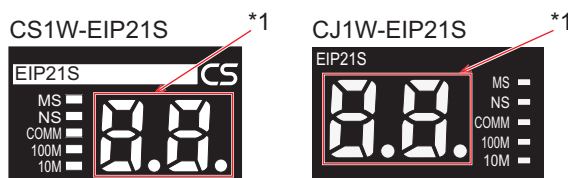
\*1. Operation status indicators

MS indicator	NS indicator	Description
Not lit	Not lit	The power is not on.
Flashing green	Not lit	The EIP21S Unit is in firmware update mode.
Lit green	Not lit	The firmware update is in progress.
Lit green	Lit green	The firmware update was completed normally.
Lit red	Not lit	An error occurred during the firmware update. *1

\*1. An error code is displayed on the 7-segment display. Refer to *Checking the Seven-Segment Display* on page 3-4 for details.

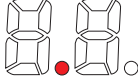
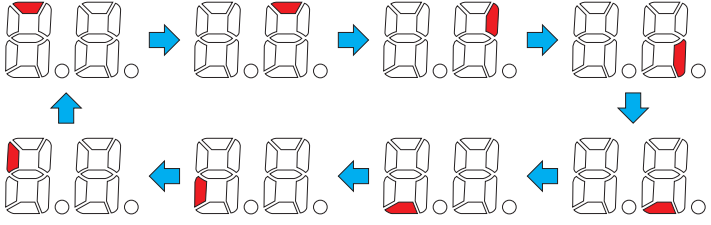
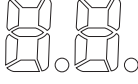
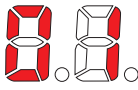
### Checking the Seven-Segment Display

The operating statuses of EIP21S Unit that are indicated by the 7-segment display are shown as below.



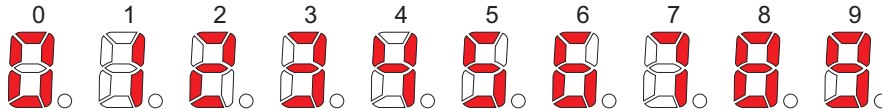
\*1. 7-segment display

Status	7-segment display
Default	

Status	7-segment display
Firmware update mode	
Firmware update in progress	<p>The display pattern switches every 100 ms.</p> 
Completed normally	
When an error occurred	<p>Displays the error code as a two-digit number. *1 Example: When an error code "01" occurred</p> 

\*1. Dot (.) is always not lit.

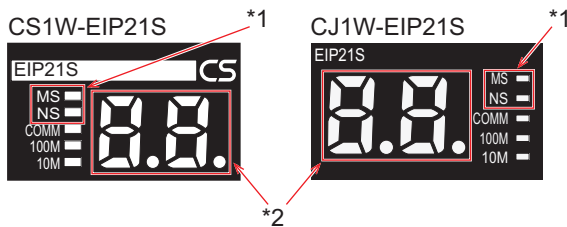
The indicator display patterns of number are as follows.



### 3-2-1 Errors during Update

This section describes troubleshooting problems that occur during firmware update.

Errors during update are displayed on the operation status indicators and 7-segment display of the EIP21S Unit.



\*1. Operation status indicators

\*2. 7-segment display

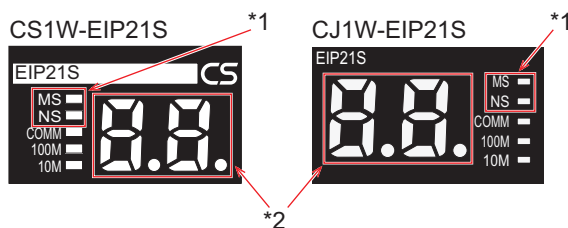
Operation status indicators		7-segment display	Description	Cause	Unit operation	Countermeasure
MS indicator	NS indicator					
Lit red	Not lit	01	Invalid update data	The data for update that was transferred from the EIP21S Firmware Update Tool is invalid.	Operation stop <sup>*1</sup>	Execute the update again after turning the power OFF and ON. If this error persists, it may be due to noise. Implement noise countermeasures.
Lit red	Not lit	02	Firmware overwrite failure	The hardware of EIP21S Unit is faulty.	Operation stop <sup>*1</sup>	Replace the EIP21S Unit.
Lit red	Not lit	03	Firmware overwrite failure	The hardware of EIP21S Unit is faulty.	Operation stop <sup>*1</sup>	Replace the EIP21S Unit.
Lit red	Not lit	04	Firmware overwrite failure	The hardware of EIP21S Unit is faulty.	Operation stop <sup>*1</sup>	Replace the EIP21S Unit.
Lit red	Not lit	Not lit	Unit error	An error occurred in the EIP21S Unit.	Operation stop	Execute the firmware update again after turning the power OFF and ON. If the firmware update cannot be executed, replace the EIP21S Unit.

\*1. The bit 12 *Firmware Update Mode* in Unit Status 2 turns ON, and the bit 13 *Firmware Update Executing* turns OFF.

### 3-2-2 Errors during Restart after Update

This section describes troubleshooting problems that occur during restart after the firmware was updated.

Errors during restart are displayed on the operation status indicators and 7-segment display of the EIP21S Unit.



\*1. Operation status indicators

\*2. 7-segment display

Operation status indicators		7-segment display	Description	Cause	Unit operation	Countermeasure
MS indicator	NS indicator					
Not lit	Not lit	Not lit	Cannot start	The firmware was damaged by turning off the power etc. while overwriting the firmware of the EIP21S Unit.	Operation stop	Replace the EIP21S Unit.







# Appendices

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This section describes how to install the EIP21S Firmware Update Tool and the operation log.

A

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A-1	Installing and Uninstalling the EIP21S Firmware Update Tool .....	A-2
A-2	Operation Log.....	A-3

# A-1 Installing and Uninstalling the EIP21S Firmware Update Tool

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CX-One version 4.61 or higher is required to install and uninstall the EIP21S Firmware Update Tool.

Refer to the *CX-One Setup Manual (Cat. No. W463)* for information on how to install and uninstall the software.

## A-2 Operation Log

The operation log function records important operations and results of users who connect the Support Software online using secure communications, along with information on the date and time, computer's IP address, and user name.

This section describes the operation log for online operation by the EIP21S Firmware Update Tool. Refer to the *CS/CJ-series EtherNet/IP Units Operation Manual (Cat. No. W465)* for details on the operation log function.

Description	Operation target	Operation log					
		Log code (hex)	Operation	Result*1	Attached Information	IP address	User-name
Online connection	EIP21S	02	Online Connection Started	Normal exit	None	*2	*3
End online connection.	EIP21S	55	Online Disconnection	Normal exit	None	*2	*3
Change to PROGRAM mode	CPU	0A	PLC Operation Mode (PROGRAM)	Normal exit Abnormal exit Cancel	None	*2	*3
Update the firmware of EIP21S Unit.	EIP21S	54	Change EIP21S Firmware Update	Normal exit Abnormal exit	When successful Attached Information 1: Unit version after update Attached Information 2: Unit version before update	*2	*3

\*1. Normal exit indicates that all operations were completed normally.

Abnormal exit indicates other than normal exit and cancel.

Cancel indicates that operation was canceled by a command.

\*2. Records the IP address of the operated computer.

\*3. Records the user name of the operated user account.

When the firmware update is completed normally, the operation log is initialized.

Therefore, only *Change EIP21S Firmware Update (54)* and *Online Disconnection (55)* are logged in the operation log.





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