



***CC-Link* *IE* TSN**

CC-Link IE TSN Firmware Update Tool Reference Manual

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1. CC-Link IE TSN FIRMWARE UPDATE TOOL

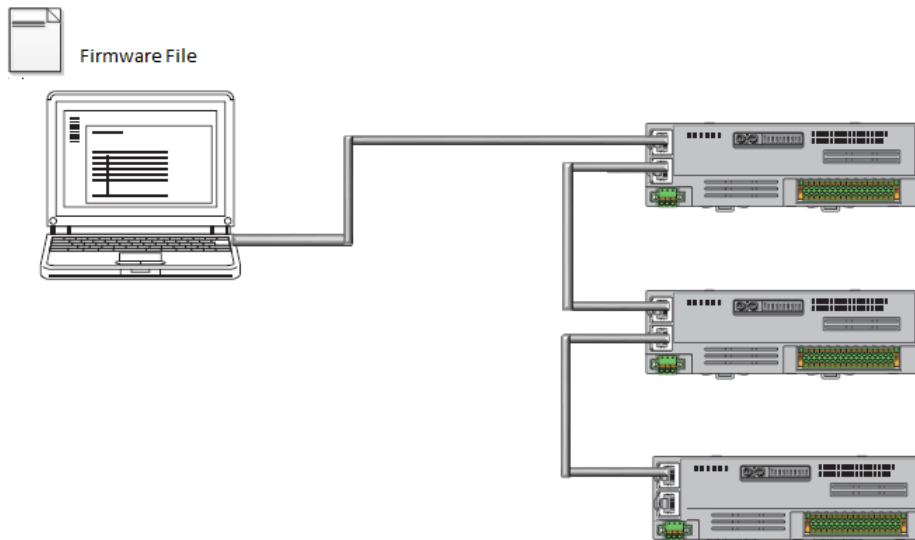
CC-Link IE TSN Firmware Update Tool is a tool that allows you to update firmware of a CC-Link IE TSN device from a personal computer via Ethernet.

This manual describes the overview and use of CC-Link IE TSN Firmware Update Tool. For the availability of the firmware update function in each device and error details, refer to the manual for the device whose firmware is to be updated.

1.1. Overview of CC-Link IE TSN Firmware Update Tool

CC-Link IE TSN Firmware Update Tool operates in Windows environment on personal computers. Firmware update for a CC-Link IE TSN device is performed by connecting an Ethernet cable between a personal computer, on which CC-Link IE TSN Firmware Update Tool has been installed, and the Ethernet port of the CC-Link IE TSN device directly or via hub.

■ Direct Ethernet cable connection



■ Hub connection

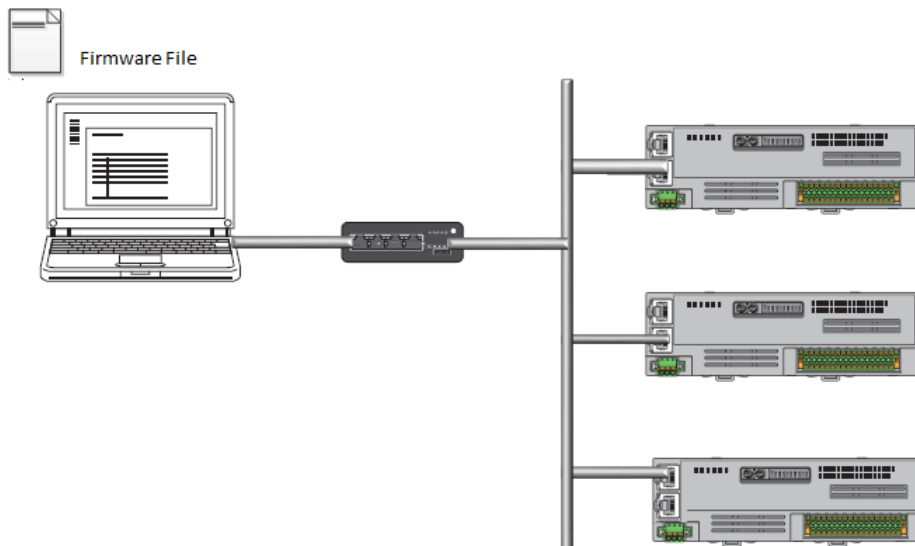


Figure 1.1-1 Operation of CC-Link IE TSN Firmware Update Tool

Point

- CC-Link IE TSN Firmware Update Tool cannot be connected to a CC-Link IE TSN device whose firmware is to be updated via the built-in Ethernet port of a programmable controller CPU module. Connect a personal computer (CC-Link IE TSN Firmware Update Tool) and the CC-Link IE TSN device using an Ethernet cable either directly or via hub.
- Execute the "Firmware Update via Engineering Tool" to update the firmware of the MELSEC iQ-R series CC-Link IE TSN master/local module (RJ71GN11-T2).
- Execute the "Basic System Software Update" to update the firmware of the MELSEC iQ-R series Motion module (RD78G(H)).
- An FTP username and an FTP password of the CC-Link IE TSN device need to be set on CC-Link IE TSN Firmware Update Tool in advance to enable FTP communications with the CC-Link IE TSN device. To set the FTP username and FTP password, refer to the manual for the device.

1.2. Use of CC-Link IE TSN Firmware Update Tool

This section describes how to use CC-Link IE TSN Firmware Update Tool.

1.2.1. Items to be prepared

The following table lists the items to be prepared for updating the firmware of the CC-Link IE TSN devices.

Table 1.2-1 Items to be Prepared

No.	Item	Description
1	CC-Link IE TSN Firmware Update Tool	The tool used for updating the firmware of the CC-Link IE TSN devices
2	Windows personal computer	A personal computer on which CC-Link IE TSN Firmware Update Tool has been installed
3	Firmware file	A firmware file which is to be updated. A firmware file of a CC-Link IE TSN device which needs to be updated is required.
4	File decompression tool	Software which decompresses the zip compressed file
5	Ethernet cable	A cable which connects a CC-Link IE TSN device whose firmware is to be updated or hub to a personal computer
6	Target device	A CC-Link IE TSN device whose firmware is to be updated
7	Hub	A hub which is used when the firmware update is performed via it

1.2.2. Operating environment

CC-Link IE TSN Firmware Update Tool can operate with the following operating environments.

Table 1.2-2 Operating Environment of CC-Link IE TSN Firmware Update Tool

No.	Item	Description
1	Personal computer	A personal computer on which Microsoft® Windows® runs
	CPU	Intel® Core™2Duo 2GHz or higher is recommended.
	Required memory capacity	64-bit operating system: 2GB or more is recommended. 32-bit operating system: 1GB or more is recommended.
2	Free space in hard disk	At installation: 10MB or more During operation: 64MG or more in virtual memory
3	Display	Resolution of 1024 × 768 dots or higher
4	Operating system (Japanese)	<ul style="list-style-type: none"> · Windows 10 (Home, Pro, Enterprise, Education, IoT Enterprise 2016 LTSP^{*1}) · Windows 8.1 (Windows 8.1 Pro, Windows 8.1 Enterprise) · Windows 8 (Windows 8 Pro, Windows 8 Enterprise) · Windows 7 (Home Premium, Professional, Ultimate, Enterprise)
5	Communication interface	Ethernet port

^{*1} IoT Enterprise 2016 LTSP is supported only by 64-bit operating systems.

- If .NET Framework 4.0 or higher has yet to be installed on a personal computer, on which CC-Link IE TSN Firmware Update Tool is to be installed, for its installation, approximately 500MB free space in the system drive is required.
- When any of the following functions is used, CC-Link IE TSN Firmware Update Tool may not operate properly.
 - Application launch in Windows compatibility mode
 - Fast user switching
 - Remote desktop
 - Windows XP mode
 - Windows touch or Touch
 - Modern UI
 - Client Hyper-V
 - Tablet mode
 - Virtual desktop
 - Unified Write Filter (UWF)
- Under any of the following conditions, CC-Link IE TSN Firmware Update Tool may not operate properly.
 - When sizes of texts or other items displayed on the windows are not the specified values such as 96DPI, 100%, and 9pt
 - When the resolution of a window is changed during operation
 - When a Windows theme is changed during operation
 - When multiple displays are set
- Execute CC-Link IE TSN Firmware Update Tool on Windows 10, Windows 8.1, Windows 8, or Windows 7 as a standard user or an administrator.
- When Windows Firewall is on, CC-Link IE TSN Firmware Update Tool may not operate properly. In this case, turn off the Windows Firewall.

1.2.3. Installation/uninstallation

CC-Link IE TSN Firmware Update Tool is the zip compressed file and does not have a setup program. Install and uninstall CC-Link IE TSN Firmware Update Tool by following the installation and uninstallation methods.

- Installation method

Right-click the zip compressed file (CC-Link IE TSN Firmware Update Tool). Specify a location where the file is unzipped, and unzip the file. A folder can be created at the specified location by a user.

* If a personal computer does not have zip compatible software, obtain a file decompression tool, and then unzip the file.

- Uninstallation method

Delete the folder in which CC-Link IE TSN Firmware Update Tool has been installed.

1.2.4. Startup

When executing CC-Link IE TSN Firmware Update Tool, a user is required to execute it as a Windows administrator. To start CC-Link IE TSN Firmware Update Tool, double-click "FWUpdate.exe" in the folder which CC-Link IE TSN Firmware Update Tool has been installed. When the "User Account Control" window appears as shown below, click the [Yes] button.

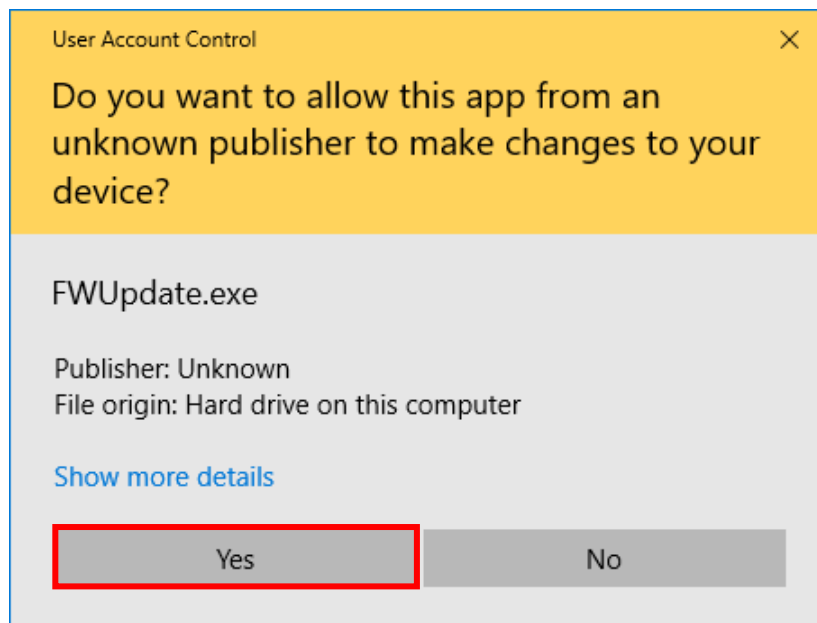


Figure 1.2-1 Startup of CC-Link IE TSN Firmware Update Tool

1.2.5. Menu

The following figure shows the menus and commands of CC-Link IE TSN Firmware Update Tool.

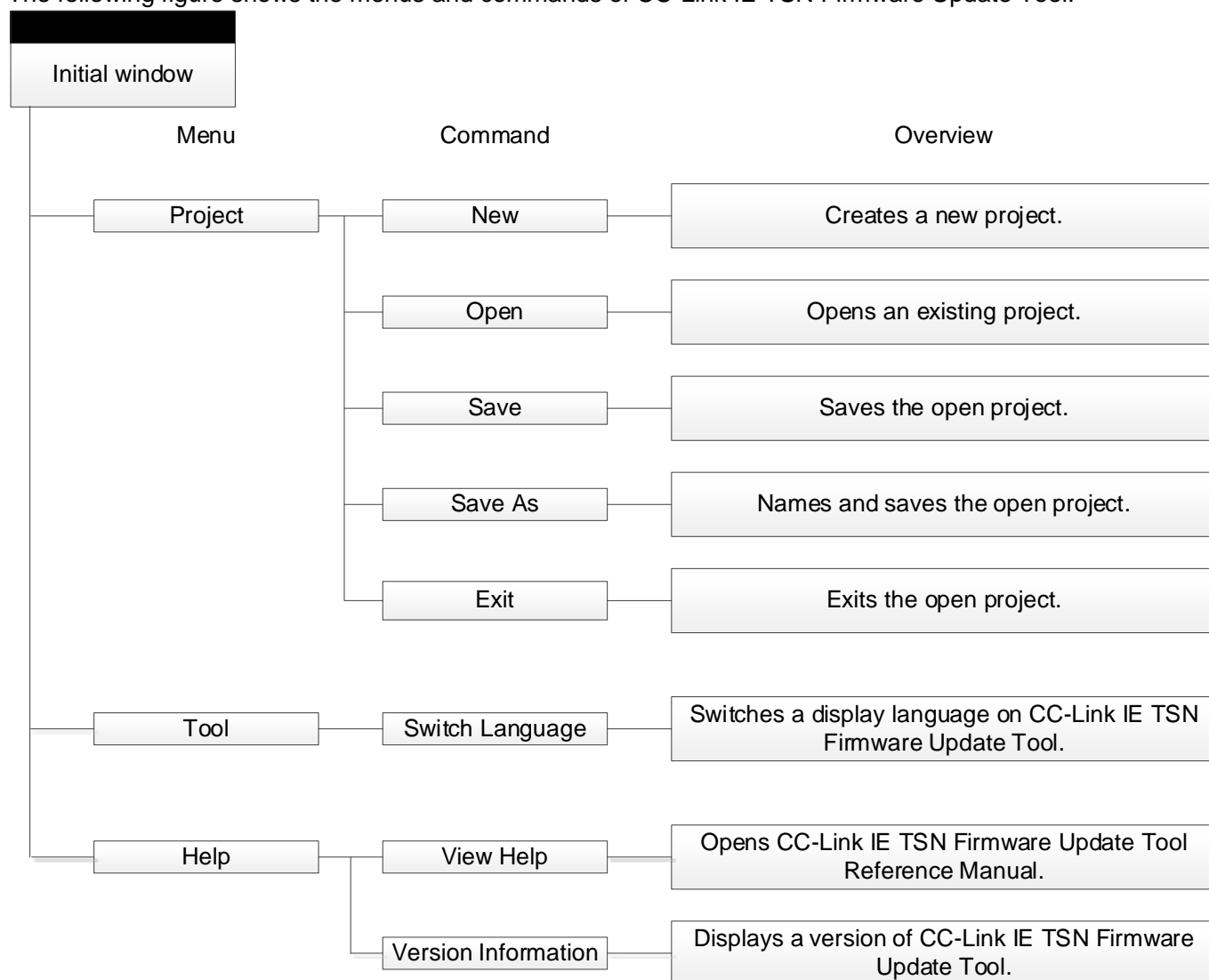


Figure 1.2-2 Overview of Menus and Commands

1.2.6. Windows of CC-Link IE TSN Firmware Update Tool

The section describes the windows of CC-Link IE TSN Firmware Update Tool.

Network Configuration Settings window

When CC-Link IE TSN Firmware Update Tool is started, the "Network Configuration Settings" window is displayed as shown below.

On this window, target devices are selected and listed to update the firmware. Multiple devices can be set if they are the CC-Link IE TSN devices which can be accessed via Ethernet. The target devices are set by selecting the "Select" checkboxes.

No.	Select	Module Name	IP Address	Device Name	FTP Username	FTP Password
1	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.1	Molten1	CCIET_DIO	*****
2	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.2	Molten2	CCIET_DIO	*****
3	<input type="checkbox"/>	CCIET_AD	192.168.3.3	Molten3	CCIET_AD	*****

Figure 1.2-3 Network Configuration Settings Window

Table 1.2-3 Setting Items

No.	Item	Description
1	Select	Select the checkbox of a target device whose firmware is to be updated. Multiple target devices are selectable. In this case, select the target devices of the same model name. * One firmware file is selected for the firmware update. If the devices of different model names are selected, the firmware cannot be updated.
2	Module Name	Set module names. * Enter the module names correctly. If incorrect module names are entered, the firmware update may not be performed properly.
3	IP Address	Set IP addresses for the target devices.
4	Device Name	Enter the device names for the target devices if required. The entered device names are displayed in the "Device Name" column on the "Firmware Update Information" window so that individual target devices can be identified.
5	FTP Username	Set usernames for FTP servers of the target devices.
6	FTP Password	Set passwords for FTP servers of the target devices.

Table 1.2-4 Operation Buttons

No.	Button	Description
1	Check Network Confituration	Checks whether the items set on the "Network Configuration Settings" window are correct.
2	Display Firmware Update Information	After the items set on the "Network Configuration Settings" window are checked, if there are no problems, displays the "Display Firmware Update Information" window.

Application Settings window

On this window, the items, such as IP address and port number for a personal computer and mode and timeout(s) for FTP, are set. The items to be set are as shown in the following figure. For details, refer to Table 1.2-5.

The screenshot shows the 'Application Settings' window of the CC-Link IE TSN Firmware Update Tool. The window is titled 'CC-Link IE TSN Firmware Update Tool' and has a menu bar with 'Project(A)', 'Tool(T)', and 'Help(H)'. The left sidebar contains two tabs: 'Network Configuration Settings' and 'Application Settings', with the latter being the active tab. The main content area is organized into several sections:

- PC Settings:**
 - IP Address: 192.168.3.10 (dropdown menu)
 - Port Number: 0 (text input)
- FTP Settings:**
 - FTP Mode: Active Mode (dropdown menu)
 - FTP Timeout(s): 20 (text input)
- Monitoring Timer Settings:**
 - Firmware Update Timeout(s): 180 (text input)
- Explanation:** A section at the bottom with a blue header bar.

Figure 1.2-4 Network Configuration Settings Window

Table 1.2-5 Setting Items

No.	Category	Item	Description
1	PC Settings	IP Address	Set an IP address for a personal computer. * The IP address set in the personal computer is automatically detected. When multiple IP addresses are set in the personal computer, select the one which communicates with a target device. * If the personal computer is not connected with the target device, the IP address may not be detected. Connect the personal computer and the target device, and restart CC-Link IE TSN Firmware Update Tool. Then, enter the IP address manually to check whether it is automatically detected.
2		Port Number	Set a port number for the personal computer. * When 0 is set to the port number, an unused port number in the personal computer is automatically used.
3	FTP Settings	FTP Mode	"FTP Mode" is fixed to "Active Mode".
4		FTP Timeout	Set timeout time for FTP commands used by CC-Link IE TSN firmware update tool.
5	Monitoring Timer Settings	Firmware Update Timeout	Set timeout monitoring timer from the start until completion of the firmware update.

Point

Set an IP address for the personal computer to the same IP address class as the target device. Also, match the subnet mask setting with the subnet mask of the target device.

Firmware Update Information window

After clicking the [Firmware Update Information] button on the "Network Configuration Settings" window, the selected target devices in the "Select" column are displayed on the "Firmware Update Information" window.

Firmware Update Information

Firmware Update File: C:\Temp\CCJET_DIO.SYF

Firmware Update File Ver.: 01

No.	Select	Module Name	IP Address	Device Name	File Transfer Progress	Firmware Update Progress	Firmware Version	Result	Error Code
1	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.1	Molten1	0%	0%			
2	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.2	Molten2	0%	0%			

※After the firmware update is completed, power off and on or reset the target device and check that it starts normally.

Check Module Status Start Update

Figure 1.2-5 Firmware Update Information Window

Table1.2-6 Setting Items

No.	Item	Description
1	Select	Select the checkbox of a target device whose firmware is to be updated. Multiple target devices are selectable to update the firmware.
2	Module Name	Displays module names of the target devices.
3	IP Address	Displays IP addresses of the target devices.
4	Device Name	Displays device names of the target devices. * An device name is not displayed when it has not been set on the "Network Configuration Settings" window.
5	File Transfer Progress	Displays progress of firmware file transfer from the personal computer to the target devices using FTP.
6	Firmware Update Progress	Displays progress of firmware update executing on the target devices after the firmware file transfer is completed.
7	Firmware Version	Click the [Check Module Status] button to display a firmware version of each target device.
8	Result	Display a result as follows after the firmware update is completed. ○: Completed successfully ×: Completed with an error Click the [Check Module Status] button to display firmware update status of each target device as follows. Firmware Update is not available.: The firmware update cannot be performed due to a cause in the error code field. Firmware Update is available.: The firmware update is ready. Firmware Update is running.: The firmware update is being performed. Firmware Update completed successfully.: The firmware update is completed.
9	Error Code	Displays an error code of an error occurred.

Table 1.2-7 Operation Buttons

No.	Button	Description
1	Firmware Update File	Specifies a firmware file which is to be updated. * One firmware file is selected. To update firmware of multiple devices, select the devices of the same module name in the "Select" column on the "Network Configuration Settings" window. * Do not change the firmware file name.
2	Firmware Update File ver.	Displays a firmware version of a specified firmware file.
3	Check Module Status	Checks a firmware version, firmware update status of a target device.
4	Start Update	Starts firmware update for a target device.

While the check module status or the firmware update for a target device is being performed, the [Check Module Status] and [Start Update] buttons are disabled respectively.

2. FIRMWARE UPDATE PROCEDURE

This chapter describes the procedure for the firmware update using CC-Link IE TSN Firmware Update Tool.

2.1. Connection with a Target Device

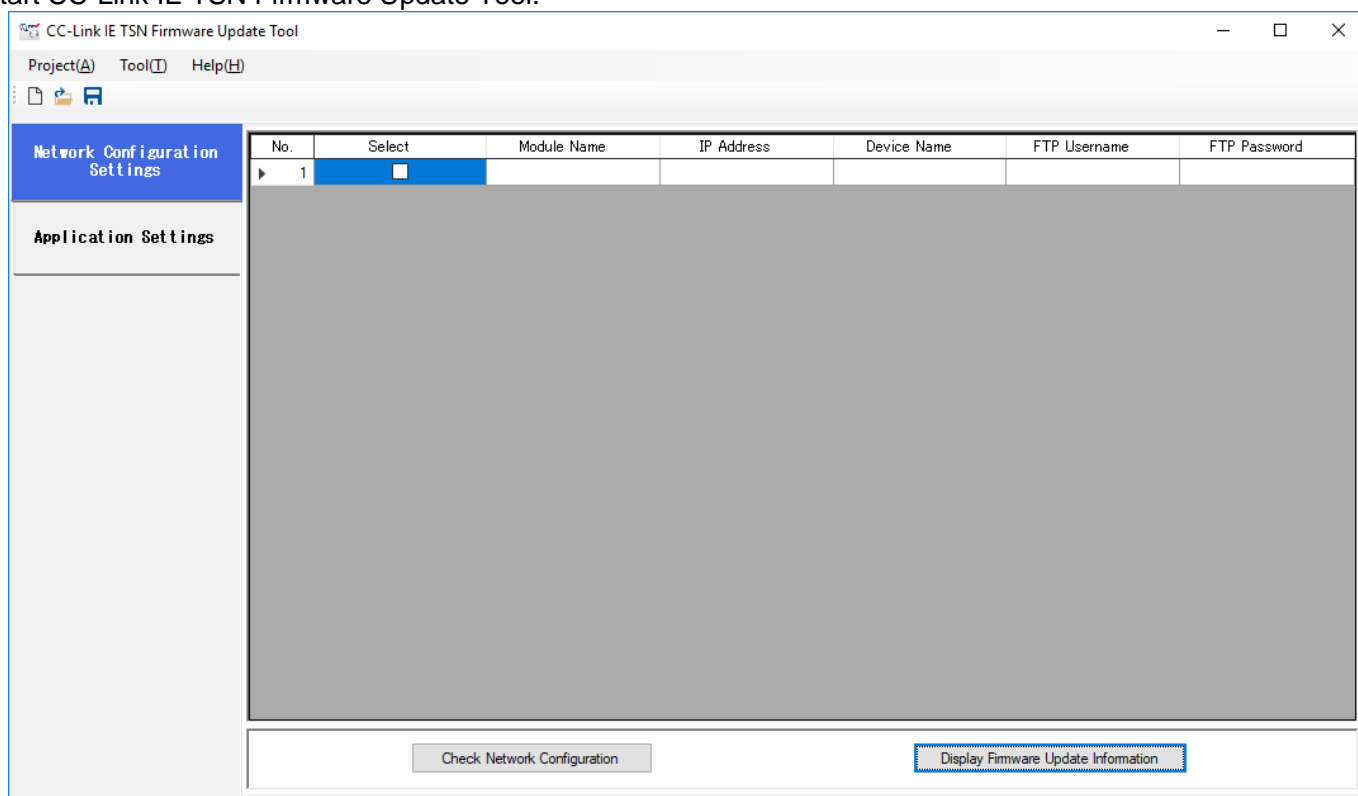
To perform communications with a target device, set an IP address for a personal computer. Stop the cyclic transmission and the transient communication between the target device and other stations. Connect the personal computer, on which CC-Link IE TSN Firmware Update Tool has been installed, and the target device. They can be connected by connecting the Ethernet cable either directly to the Ethernet port of the target device or via hub.

Point

The firmware update cannot be performed while the target device is communicating with other stations. Before starting the firmware update, power off the master station, and ensure that the cyclic transmission and transient communication are not performed between the target device and the master station.

2.2. Operation of CC-Link IE TSN Firmware Update Tool

Start CC-Link IE TSN Firmware Update Tool.



Select the "Application Settings" and set the items in the "PC Settings", "FTP Settings", and "Monitoring Timer Settings" fields.

The screenshot shows the 'CC-Link IE TSN Firmware Update Tool' window. The left sidebar has two tabs: 'Network Configuration Settings' and 'Application Settings', with the latter being selected. The main area is divided into three sections: 'PC Settings', 'FTP Settings', and 'Monitoring Timer Settings'. In 'PC Settings', 'IP Address' is a dropdown menu showing '192.168.3.10' and 'Port Number' is a text box with '0'. In 'FTP Settings', 'FTP Mode' is a dropdown menu showing 'Active Mode' and 'FTP Timeout(s)' is a text box with '20'. In 'Monitoring Timer Settings', 'Firmware Update Timeout(s)' is a text box with '180'. At the bottom, there is a blue bar labeled 'Explanation'.

An IP address set in the personal computer is automatically displayed in the "IP Address". When multiple IP addresses are set, select the one which communicates with the target device from the drop-down menu. Alternatively, enter it manually in the "IP Address". When there is no need to change the "FTP Timeout(s)" and "Monitoring Timer Settings", the default values can be kept. When the timeout is performed due to line conditions or other reasons, change the default values, for example, extending the time.

Point

"FTP Mode" is fixed to "Active Mode".

On the "Network Configuration Settings" window, enter the module name, IP address, device name, FTP username, and FTP password of the target device. Then, select the "Select" checkbox. When multiple devices are registered, select only the device whose firmware is to be updated.

The screenshot shows the "CC-Link IE TSN Firmware Update Tool" window. The "Network Configuration Settings" tab is active, displaying a table with the following data:

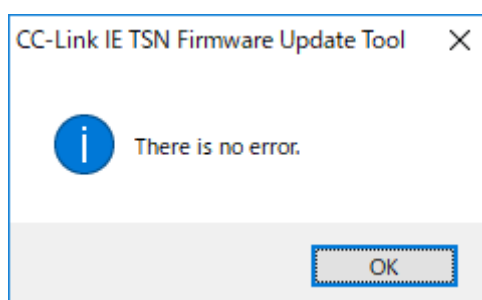
No.	Select	Module Name	IP Address	Device Name	FTP Username	FTP Password
1	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.1	Molten1	CCIET_DIO	*****
2	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.2	Molten2	CCIET_DIO	*****
3	<input type="checkbox"/>	CCIET_AD	192.168.3.3	Molten3	CCIET_AD	*****

Below the table, there are two buttons: "Check Network Configuration" and "Display Firmware Update Information".

Point

- Whether to use an device name for the target device is optional. When registering multiple target devices, using device names is helpful to distinguish them.
- To set the FTP username and FTP password, refer to the manual for the target device.
- To add or delete a line for a new device or an unnecessary device, select and right-click the line to display the drop-down menu. From the drop-down menu, select "Add" or "Delete".

After the settings on the "Network Configuration Settings" window are completed, click the [Check Network Configuration] button. When there is no error, click the [OK] button on the "CC-link IE TSN Firmware Update Tool" window to close it.



Click the [Display Firmware Update Information] button to display the "Firmware Update Information" window. When clicking the [Check Module Status] button on the "Firmware Update Information" window, a firmware version of the target device is displayed, and the communication status is checked to indicate whether the firmware can be updated or not in the "Result" column. Click the [Firmware Update File] button to browse and select a firmware file to be written.

No.	Select	Module Name	IP Address	Device Name	File Transfer Progress	Firmware Update Progress	Firmware Version	Result	Error Code
1	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.1	Molten1	0%	0%			
2	<input checked="" type="checkbox"/>	CCIET_DIO	192.168.3.2	Molten2	0%	0%			

※After the firmware update is completed, power off and on or reset the target device and check that it starts normally.

Check Module Status Start Update

Click the [Start Update] button to start the firmware update for the target device. After the firmware file is transferred, the firmware update is performed on the target device. Progress of the firmware update being performed is displayed in the "File Transfer Progress" and "Firmware Update Progress" columns.

Equipment Name	File Transfer Progress	Firmware Update Progress
Molten1	100%	90%
Molten2	0%	0%

When the "File Transfer Progress" and "Firmware Update Progress" reach 100% and "○" is displayed in the "Result" column, the firmware update is completed successfully.

Equipment Name	File Transfer Progress	Firmware Update Progress	Firmware Version	Result
Molten1	100%	100%		○
Molten2	100%	100%		○

When the firmware file transfer or the firmware update is completed with an error, "x" is displayed in the "Result" column and an error code is displayed in the "Error Code" column. In this case, perform troubleshooting by referring to "3. TROUBLESHOOTING" or the manual for the target device.

Result	Error Code
×	0x10010

Reset or power off and on the target device, and check that it starts normally.

Point

If the firmware update of a target device is interrupted by any of the following operations, its version cannot be updated to an intended version.

In this case, reset or power off and on the target device, and restart the update.

- Powering off the target device
- Powering off the personal computer
- Disconnecting the Ethernet cable between the personal computer and the target device
- Forcibly exiting CC-Link IE TSN Firmware Update Tool

3. TROUBLESHOOTING

This chapter describes troubleshooting of CC-Link IE TSN Firmware Update Tool when there is an error during the firmware update.

3.1. Error codes displayed on CC-Link IE TSN Firmware Update Tool

When there is an error during the firmware update, a corresponding error code is displayed in the "Error Code" column on the "Firmware Update information" window. Check error definition and cause and actions described in the following table and perform troubleshooting.

Point

The following table lists the error codes which are detected by CC-Link IE TSN Firmware Update Tool. There is a case that an error code which a target device responds to is displayed in the "Error Code" column. When an error code which is not listed in the table is displayed, refer to the manual for the target device and perform troubleshooting accordingly.

Table 3.1-1 Troubleshooting of CC-Link IE TSN Firmware Update Tool

No.	Error code	Error definition and cause	Action
1	0x10010	An SLMP timeout occurred.	<ul style="list-style-type: none"> • Check whether there is a failure in connection of a cable or a switching hub. • Check whether the IP address for the target device is correctly set. • Check whether the target device is powered on. • Check whether there is an error in the target device. • Check whether the IP address for the personal computer is correctly set. • Check whether the security setting for the target device is enabled. • After checking the above, reset the target device and execute the firmware update again.
2	0x10011	There is an SLMP communication error.	<ul style="list-style-type: none"> • Check whether there is a failure in connection of a cable or a switching hub. • Whether the specified port number is being used by another application. • Check whether there is an error in the target device. • After checking the above, reset the target device and execute the firmware update again.
3	0x10012	There is an FTP communication error.	<ul style="list-style-type: none"> • Check whether there is a failure in connection of a cable or a switching hub. • Check whether the FTP username and the FTP password are correct. • Check whether the firmware update file name has been unchanged. • Check whether the target device supports the selected execution mode. • Check whether the network communications load is appropriate (not high). • Check whether the FTP timeout value is appropriate (not too short). • Check whether the security setting for the target device is enabled. • Check whether there is an error in the target device. • After checking the above, reset the target device and execute the firmware update again.
4	0x10013	A firmware update timeout occurred.	<ul style="list-style-type: none"> • Check whether there is a failure in connection of a cable or a switching hub. • Check whether there is an error in the target device. • Check whether the network communications load is appropriate (not high). • Check whether the FTP timeout value is appropriate (not too short). • After checking the above, reset the target device and execute the firmware update again.
5	0x10014	Firmware update starts even if the firmware update of a target device is being performed or has been completed.	<ul style="list-style-type: none"> • Reset the target device and execute the firmware update again.

Point

When firmware update is performed using CC-Link IE TSN Firmware Update Tool, the firmware update may continue on the target device even if an error code is displayed on CC-Link IE TSN Firmware Update Tool. When an error occurs, check the firmware update status of the target device and determine whether to execute the firmware update again.

4. PRECAUTIONS

Before updating the firmware of the CC-Link IE TSN devices using CC-Link IE TSN Firmware Update Tool, check the following precautions.

1. Before using CC-Link IE TSN Firmware Update Tool, check the manual for each target device to confirm the firmware update procedure.
2. Stop the cyclic transmission and the transient communication between a target device and other stations.
3. Do not update firmware of the same device from multiple personal computers at the same time.
4. Do not change firmware file names.
5. If the firmware update of a target device is interrupted by any of the following operations, its version cannot be updated to an intended version. In this case, reset or power off and on the target device, and restart the update.
 - Powering off the target device
 - Powering off the personal computer
 - Disconnecting the Ethernet cable between the personal computer and the target device
 - Forcibly exiting CC-Link IE TSN Firmware Update Tool

REVISIONS

Revision date	Description
November 2019	First edition

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