

Edge Computing Software

**iQ** Edgecross

# CC-Link IE TSN Data Collector User's Manual

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-SW1DNN-DCCCIET-M



# SAFETY PRECAUTIONS

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(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the MELSEC iQ-R Module Configuration Manual.

In this manual, the safety precautions are classified into two levels: "⚠️ WARNING" and "⚠️ CAUTION".



## WARNING

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

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## CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

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Under some circumstances, failure to observe the precautions given under "⚠️ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

## [Design Precautions]

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## WARNING

- To perform an operation, such as data change or operating status change, to running devices, such as a programmable controller, servo, robot, or server, from an industrial PC equipped with this product, configure an interlock circuit outside of the devices so that the entire system always operates to the safety side. Additionally, read this manual carefully and ensure the safety before operations. Especially, in the above mentioned operations that are performed from external devices through network, any problems on devices may not be dealt with promptly due to an abnormal data communication.
  - Configure a safety circuit outside of an industrial PC equipped with this product so that the entire system operates to the safely side even when a fault occurs in the PC. Failure to do so may result in an accident due to an incorrect output or malfunction.
- 

## [Design Precautions]

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## CAUTION

- During application of each setting, do not perform the operation that forcibly turns the industrial PC equipped with this product OFF. Otherwise, the data will be undefined and resetting and re-registering data will be required. Additionally, doing so may cause the malfunction of this product.
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## [Security Precautions]

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### **WARNING**

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- To maintain the security (confidentiality, integrity, and availability) of this product and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.
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# CONDITIONS OF USE FOR THE PRODUCT

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- (1) This software shall be used under the following conditions;
  - i) that any failure occurred in this software, if any, shall not lead to any serious accident.
  - ii) that the backup and/or fail-safe functions are systematically performed outside the devices in the cases of any failure occurred in this software.
- (2) Mitsubishi Electric assumes no responsibility and liability (including but not limited to, default liability, defect liability, quality assurance responsibility, tort liability, product liability) for the quality, performance, and safety of both this software and products using this software.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving this software and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

## INTRODUCTION

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Thank you for your patronage. We appreciate your purchase of CC-Link IE TSN Data Collector.

This manual describes the specifications, procedures before operation, and troubleshooting of this product.

Before using this product, please read this manual and the relevant manuals carefully, and develop familiarity with the functions and performance of this product to handle correctly.

Please make sure that the end users read this manual.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version.

When reading this manual, replace the names and procedures with the applicable ones as necessary.

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# RELEVANT MANUALS

Manual name [manual number]	Description	Available form
CC-Link IE TSN Data Collector User's Manual [SH-082275ENG] (this manual)	Specifications, procedure before operation, and troubleshooting of CC-Link IE TSN Data Collector	e-Manual PDF
CC-Link IE TSN Communication Software for Windows User's Manual [SH-082271ENG]	Specifications, procedures before operation, functions, and troubleshooting of CC-Link IE TSN Communication Software	e-Manual PDF

## Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.



# TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Cyclic transmission	A function that exchanges data periodically between stations on a network by using link devices
Data model management	A function that abstracts devices, equipment, and lines in the production site and hierarchically manages them
Edge application	Software that performs various processing for data utilization in production sites using the functions provided by Edgecross in the edge computing area
Edge computing	An information processing method and area, for not only collecting and analyzing data in production sites in real-time, and feed backing the data, but summarizing the production site data and sharing information with IT systems efficiently with the hardware and software in production sites
Edgecross	A software platform that implements specifications and concepts for realizing manufacturing solutions by the FA-IT collaboration centering on the edge computing
Edgecross Basic Software	The name of the software product that implements the Edgecross function
Industrial PC	A PC specialized for industrial use with features such as high reliability, environmental resistance, and long-term supply
Location	Device memory that can be accessed by CC-Link IE TSN Data Collector
Location parameter	A parameter for setting the device memory that can be accessed by CC-Link IE TSN Data Collector
Management Shell	The name of the Windows version product that implements the data model management function
Management Shell Explorer	Software that sets and references data models managed by Management Shell
Real-time data processing	A function that realizes the real-time diagnosis and feedback of the production site data
Real-time Flow Designer	The name of the software component that performs operation setting of Real-time Flow Manager
Real-time Flow Manager	The name of the Windows version software component that implements the real-time data processing


# 1 CC-Link IE TSN Data Collector

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CC-Link IE TSN Data Collector (SW1DNN-DCCCIET-M) is a software component that performs the data collection and data reading functions in cyclic transmission to a device connected via CC-Link IE TSN.

Data in a device can be collected by using CC-Link IE TSN Data Collector in combination with Edgecross Basic Software.

For details on Edgecross Basic Software, refer to the following:


 Edgecross Basic Software for Windows User's Manual

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## Point


- CC-Link IE TSN Data Collector (SW1DNN-DCCCIET-M) is designed for the CC-Link IE TSN Communication Software for Windows (SW1DND-CCIETCT-M).

For details, refer to the following:

( CC-Link IE TSN Communication Software for Windows User's Manual)

- Data is collected by best effort functions.

Since the data collection processing time varies depending on the load on a network and the status of connected devices, data may not be collected at a certain collection interval. Run the system by fully verifying the processing time of each function when constructing the system.

The data missing status acquired by CC-Link IE TSN Data Collector can be checked using the data missing information in CC-Link IE TSN Communication Software. ( CC-Link IE TSN Communication Software for Windows User's Manual)

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## Precautions

The data writing function cannot be used for this product. When performing the device instruction feedback function of Real-time Flow Manager and updating the current value of an external data tag resource in Management Shell, use another data collector that supports the data writing function.



# 2 SPECIFICATIONS


This chapter shows the functional specifications, operational specifications, and accessible devices (locations) and their ranges of CC-Link IE TSN Data Collector.

## 2.1 Functional Specifications


This section shows the functional specifications of CC-Link IE TSN Data Collector.

Item	Specification	
Connectable route	CC-Link IE TSN	
Supported type by Data Collector	<ul style="list-style-type: none"> <li>Data collection function</li> <li>Data reading function</li> </ul>	
Data collection function	Maximum number of flow settings	No limitation for Data Collector <sup>*1</sup>
	Maximum number of units of data for one flow	256
	Maximum collectible size for one flow	8192 (word)
	Collection interval	0.5 to 10000.0 (ms)
	Input data type <sup>*2*3</sup>	<ul style="list-style-type: none"> <li>BOOL (Bit value)</li> <li>INT (Signed 16-bit integer value)</li> <li>UINT (Unsigned 16-bit integer value)</li> <li>DINT (Signed 32-bit integer value)</li> <li>UDINT (Unsigned 32-bit integer value)</li> <li>LINT (Signed 64-bit integer value)</li> <li>ULINT (Unsigned 64-bit integer value)</li> <li>REAL (32-bit real number value)</li> <li>LREAL (64-bit real number value)</li> <li>STRING (Character string: UTF-8 (1 to 32 characters))</li> <li>WSTRING (Wide-character string: Unicode (UTF-16LE) (1 to 16 characters))</li> </ul>
	Accessible devices (locations)	RX, RY, RWr, RWw, LB, LW, SB, SW
	Time information source for a time stamp	CC-Link IE TSN time (grandmaster)
Data reading function	Maximum number of settings	No limitation for Data Collector <sup>*1</sup>
	Maximum number of units of data for one setting	256
	Maximum collectible size for one setting	8192 (word)
	Input data type <sup>*2*3</sup>	<ul style="list-style-type: none"> <li>BOOL (Bit value)</li> <li>INT (Signed 16-bit integer value)</li> <li>UINT (Unsigned 16-bit integer value)</li> <li>DINT (Signed 32-bit integer value)</li> <li>UDINT (Unsigned 32-bit integer value)</li> <li>LINT (Signed 64-bit integer value)</li> <li>ULINT (Unsigned 64-bit integer value)</li> <li>REAL (32-bit real number value)</li> <li>LREAL (64-bit real number value)</li> <li>STRING (Character string: UTF-8 (1 to 32 characters))</li> <li>WSTRING (Wide-character string: Unicode (UTF-16LE) (1 to 16 characters))</li> </ul>
	Accessible devices (locations)	RX, RY, RWr, RWw, LB, LW, SB, SW

\*1 For details, refer to the following:

 Edgecross Basic Software for Windows User's Manual

\*2 For details on data types, refer to the following:

 Edgecross Basic Software for Windows User's Manual

\*3 Only UINT, UDINT, and ULINT can be specified for link special registers.



The performance of this product may be improved depending on the settings of the master station on CC-Link IE TSN and CC-Link IE TSN Communication Software.

## 2.2 Operational Specifications

This section shows the operational specifications of CC-Link IE TSN Data Collector.

### Operating status

The status of CC-Link IE TSN Data Collector varies for each access target and is determined according to the communication status with the targets.

The communication status with access targets can be checked in Edgecross Basic Software.

Status of CC-Link IE TSN Data Collector	Description	Communication status with an access target
Data is being read from an access target.	Data Collector and the access target are connected normally. (It will be in this state when the connection processing succeeds.)	Connected
Data is not being read from an access target. (Reconnection is in progress.)	Data Collector and the access target are disconnected. (It will be in this state when the connection processing fails.)	Disconnected

### Behavior when an error occurs

When CC-Link IE TSN Data Collector detects an error, the following operations are performed according to the error type.

Error type	Status of CC-Link IE TSN Data Collector	Behavior of CC-Link IE TSN Data Collector
Data collector operation stop error	<ul style="list-style-type: none"> <li>Operations according to the specifications cannot be guaranteed due to a hard disk error in an industrial PC of the installation destination or a failure of resource securing.</li> <li>An error cannot be corrected even by changing the network configuration due to an incorrect parameter setting (device type out of range, for example).</li> </ul>	<ul style="list-style-type: none"> <li>Discards collected data when this error occurs during data collection.</li> <li>Stops the data collection or data reading function and reports this error to Edgecross Basic Software.</li> </ul>
Data collector operation continuation error	<ul style="list-style-type: none"> <li>Operations such as a program execution or data communication cannot be continued due to temporary network failure.</li> <li>An error may be corrected by changing the network configuration even though there is no communication due to a mismatch between the parameter settings and the network configuration.</li> </ul>	<ul style="list-style-type: none"> <li>Discards collected data when this error occurs during data collection.</li> <li>Continues the data collection or data reading function even after reporting this error to Edgecross Basic Software.</li> </ul>



The error types reported to Edgecross Basic Software are as follows:

- Data collector operation stop error: Moderate error
- Data collector operation continuation error: Minor error

## 2.3 Accessible Devices (Locations) and their Ranges

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This section shows the accessible devices (locations) and their ranges.

### Accessible devices (locations)

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The following table shows the accessible devices (locations).

Device name (device)	Range
Remote input (RX)	0 to 3FFF
Remote output (RY)	0 to 3FFF
Remote register (RWw)	0 to 1FFF
Remote register (RWr)	0 to 1FFF
Link relay (LB)	0 to 7FFF
Link register (LW)	0 to 3FFF
Link special relay (SB)	0 to 1FFF
Link special register (SW)	0 to 1FFF

# 3 PROCEDURE BEFORE OPERATION

This chapter shows the procedure from start-up to operation of CC-Link IE TSN Data Collector.

## Operating procedure

1. Install CC-Link IE TSN Data Collector on a personal computer.\*1

\*1 Before the installation, install CC-Link IE TSN Communication Software and Edgexross Basic Software.

2. Connect the personal computer to CC-Link IE TSN.

☞ Page 14 Access Target Device Setting

3. Set parameters of CC-Link IE TSN Communication Software.

☞ Page 15 CC-Link IE TSN Communication Software Setting

4. Set parameters of CC-Link IE TSN Data Collector.

☞ Page 34 PARAMETER SETTING

### Point

Data is collected by best effort functions.

Since the data collection processing time varies depending on the load on a network and the status of connected devices, data may not be collected at a certain collection interval. Run the system by fully verifying the processing time of each function when constructing the system.

The data missing status acquired by CC-Link IE TSN Data Collector can be checked using the data missing information in CC-Link IE TSN Communication Software. (☞CC-Link IE TSN Communication Software for Windows User's Manual)

## Precautions

### ■ Activating other applications

To use CC-Link IE TSN Data Collector, do not activate applications which increase the load on an Ethernet driver.

### ■ Antivirus software installation

When running Data Collector on an industrial PC where an antivirus software is installed, an exceeded collection cycle or data missing may occur due to an operation of the antivirus software. Exclude the following folders from the monitoring targets in the antivirus software settings. For the setting methods, refer to the manual for each antivirus software.

- Data Collector installation destination folder
- Following files and folders of Windows®

Pagefile.sys

\*.pst

%systemroot%\System32\Spool

%systemroot%\SoftwareDistribution\Datastore

%windir%\Security\Database

%allusersprofile%\NTUser.pol

%systemroot%\system32\GroupPolicy\Machine\registry.pol


%systemroot%\system32\GroupPolicy\User\registry.pol

# 3.1 Access Target Device Setting

This section describes the setting items of RJ71GN11-T2 (master station) required for operations of CC-Link IE TSN Data Collector and CC-Link IE TSN Communication Software.

Each setting item of RJ71GN11-T2 (master station) can be set in GX Works3.

For details on the setting items, refer to the following:


 MELSEC iQ-R CC-Link IE TSN User's Manual (Application)

## Point

- It is assumed that the information required for network operation such as the network configuration for CC-Link IE TSN has already been set.
- The collection time of collected data is added according to the time zone setting and daylight saving time setting of an industrial PC on which CC-Link IE TSN Data Collector runs. To match the time information between collected data and CC-Link IE TSN, be sure to match the time zone setting and daylight saving time setting between CC-Link IE TSN and the industrial PC in advance.


## Communication cycle interval

Set a communication cycle interval in "Communication Period Setting" for the master station.

 [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ target module ⇒ [Basic Settings]


## Station-based block data assurance

Select "Enable" for "Station-based Block Data Assurance" for the master station.

 [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ target module ⇒ [Application Settings] ⇒ [Supplementary Cyclic Settings]

## Communication mode

Select "Multicast" for "Communication Mode" for the master station.


 [Navigation window] ⇒ [Parameter] ⇒ [Module Information] ⇒ target module ⇒ [Application Settings]



## 3.2 CC-Link IE TSN Communication Software Setting

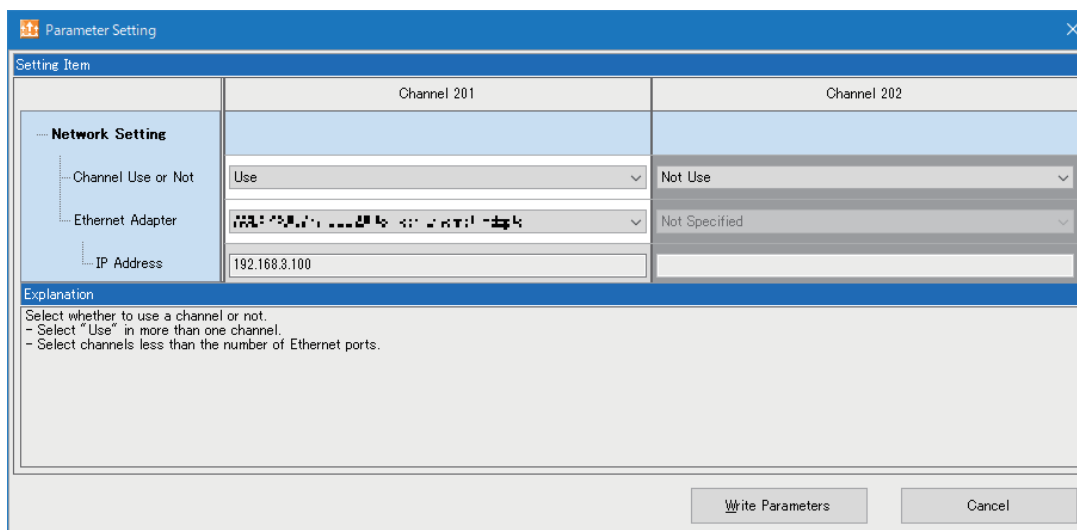
This section shows the procedure for using CC-Link IE TSN Communication Software.

For details on CC-Link IE TSN Communication Software, refer to the following:

 CC-Link IE TSN Communication Software for Windows User's Manual

### Operating procedure

1. Start CC IE TSN Communication Software Utility.
2. Set parameters of CC-Link IE TSN Communication Software.



Setting Item	Channel 201	Channel 202
<b>Network Setting</b>		
Channel Use or Not	Use	Not Use
Ethernet Adapter	Realtek USB GbE Family Controller #2	Not Specified
IP Address	192.168.3.100	

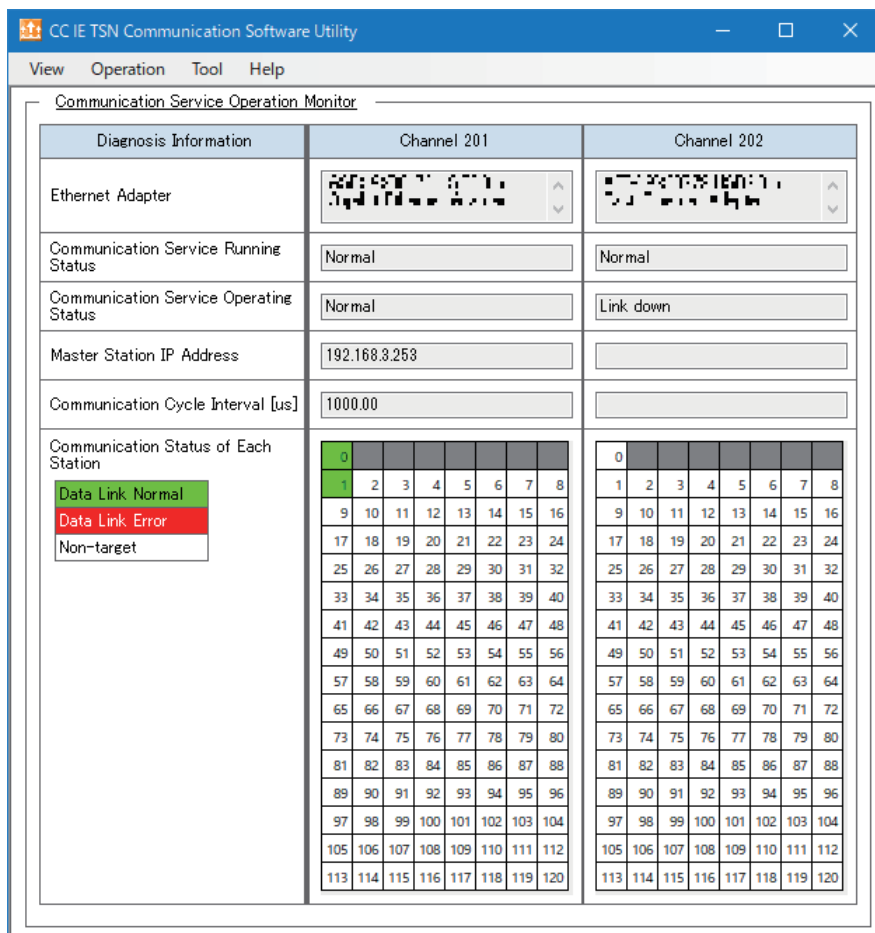
**Explanation**  
Select whether to use a channel or not.  
- Select "Use" in more than one channel.  
- Select channels less than the number of Ethernet ports.

Write Parameters      Cancel

- Channel Use or Not: Select "Use."
- Ethernet Adapter: Select an adapter to use.
- IP Address: The IP address assigned to the selected adapter is displayed.

3. Click the [Write Parameters] button.

4. Check the running status of CC-Link IE TSN Communication Software in the communication service operation monitor screen.



## Precautions

When writing parameters to CC-Link IE TSN Communication Software, stop CC-Link IE TSN Data Collector if it is running.

# 3.3 Procedures for Using CC-Link IE TSN Data Collector

This section shows the procedures for using CC-Link IE TSN Data Collector in Real-time Flow Manager and Management Shell.

For details, refer to the following:

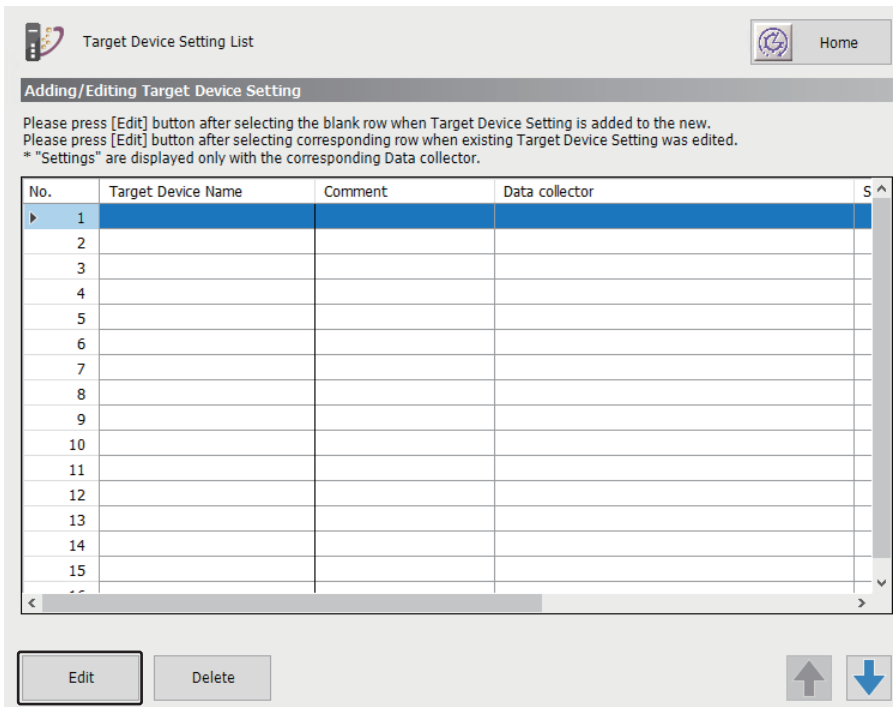
📖 Edgecross Basic Software for Windows User's Manual

## Real-time Flow Manager

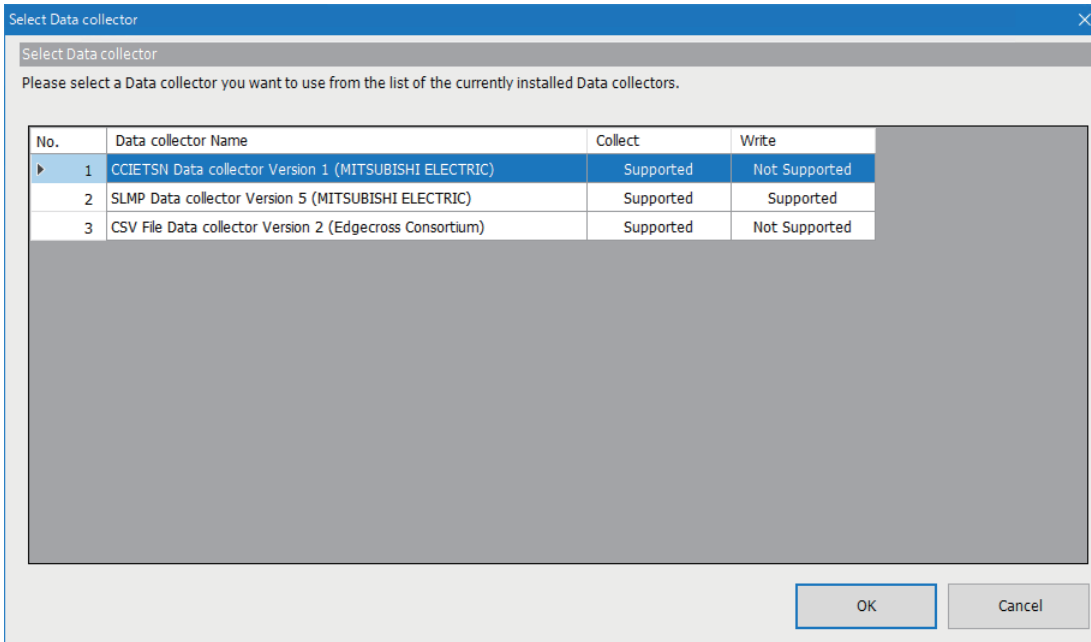
The following shows the procedure for using CC-Link IE TSN Data Collector in Real-time Flow Manager.

### Operating procedure

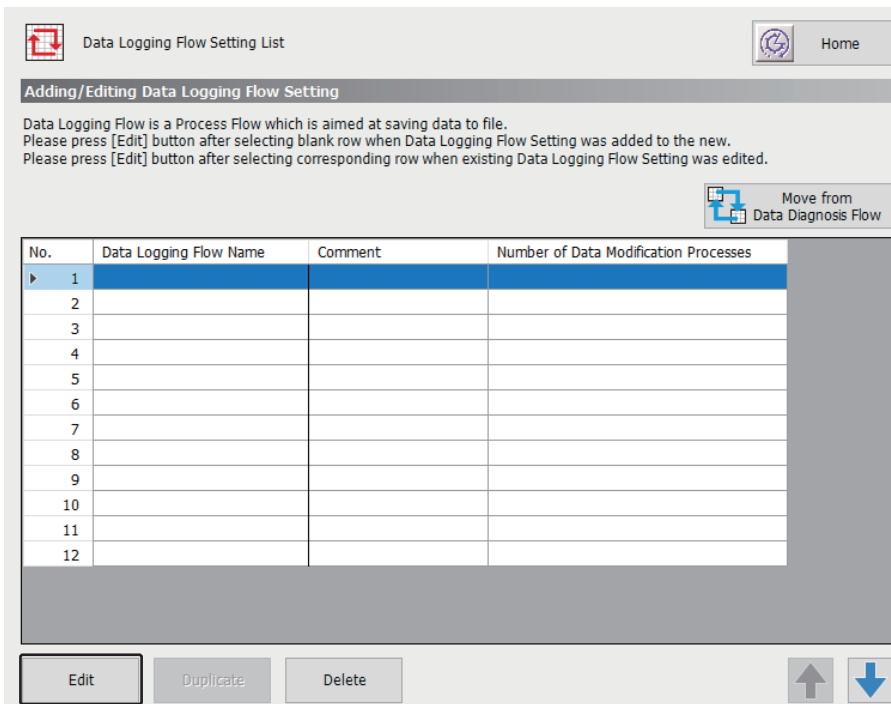
1. Start Real-time Flow Designer.
2. Select "Target Device Setting" in the edit item tree.
3. Select a blank row in the access target device setting list, and click the [Edit] button.



- Select CC-Link IE TSN Data Collector in the "Select Data collector" screen, and click the [OK] button.



- Set communication parameters. (☞ Page 34 Communication Parameter)
- Click the [OK] button.
- Click "Data Logging Flow Setting" in the edit item tree.
- Select a blank row in the data logging flow setting list, and click the [Edit] button.



9. Click the button in the "Detailed Setting" column.

Data Logging Flow Setting No. [1]

Setting Name:

Comment:

**Data Logging Flow Setting**

Please add processes to the list and set processing contents.  
Execute the Process Flow according to the order of the list.  
A maximum of 4 processes can be executed in one flow.

No.	Process Type	Function Type	Process Name	Detailed Setting	Data Storing	Data Distribution
▶ 1	Data Collection	-	Data Collection	Not Set	Do not execute	Do not execute
2	Data Modification	No Processing				

Buttons: Add Row, Delete Row, Up Arrow, Down Arrow, OK, Cancel

3

10. Select the access target device set in steps 3 to 6 for "Target Device."

Data Collection Setting

Please select the Target Device for data collection and specify the collection option.

Target Device:

Developer:


Data collector Name:

Data collector Version:

**11.** Set location parameters in the [Collection Data] tab. (  Page 36 Real-time Flow Designer)

No.	Data Name	Constant	Location (top)		Location (end)	Data Type	Length	Setting Value
▶ 1		<input type="checkbox"/>		...				
2		<input type="checkbox"/>		...				
3		<input type="checkbox"/>		...				
4		<input type="checkbox"/>		...				
5		<input type="checkbox"/>		...				
6		<input type="checkbox"/>		...				
7		<input type="checkbox"/>		...				
8		<input type="checkbox"/>		...				
9		<input type="checkbox"/>		...				
10		<input type="checkbox"/>		...				
11		<input type="checkbox"/>		...				
12		<input type="checkbox"/>		...				

**Point** 

To collect data missing information, set link special registers of a collection target station.  
For operations of CC-Link IE TSN Data Collector when data missing occurs, refer to the following:  
 Page 26 Collected data missing

**12.** Set collection parameters in the [Collection Option] tab. (  Page 35 Collection Parameter)


**13.** Click the [OK] button in the "Data Collection Setting" screen.

**14.** Click the [OK] button in the "Data Logging Flow Setting" screen.

A data logging flow setting is created.

**15.** Change the operating status of Real-time Flow Manager to RUN, and execute the created process flow.

For changing the operating status of Real-time Flow Manager, refer to the following:

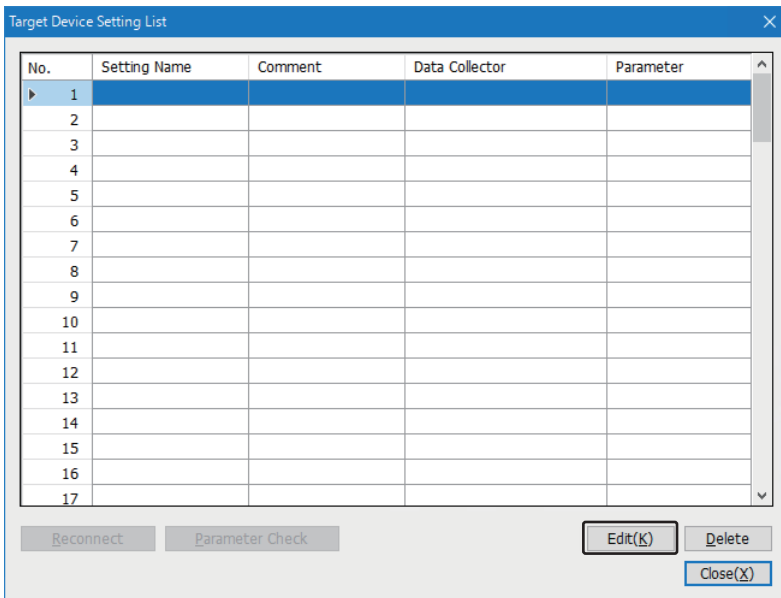
 Edgexross Basic Software for Windows User's Manual

# Management Shell

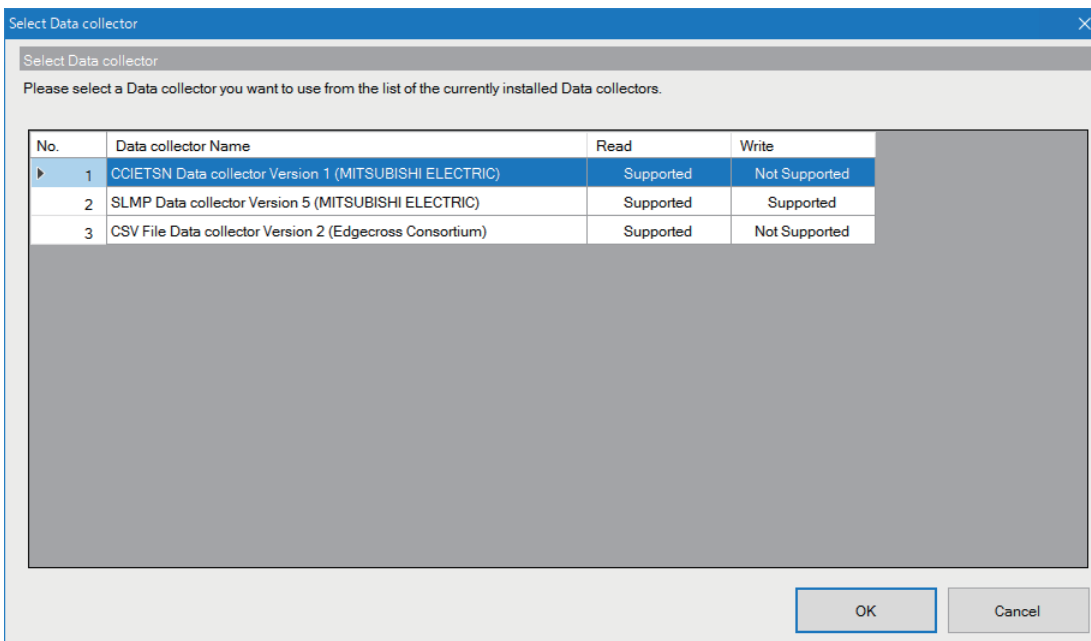
The following shows the procedure for using CC-Link IE TSN Data Collector in Management Shell. In this procedure, the data tag resource monitor window of Management Shell Explorer is used.

## Operating procedure

1. Start Management Shell Explorer.
2. Select [Setting] ⇒ [Target Device Setting].
3. Select a blank row in the access target device setting list, and click the [Edit] button.

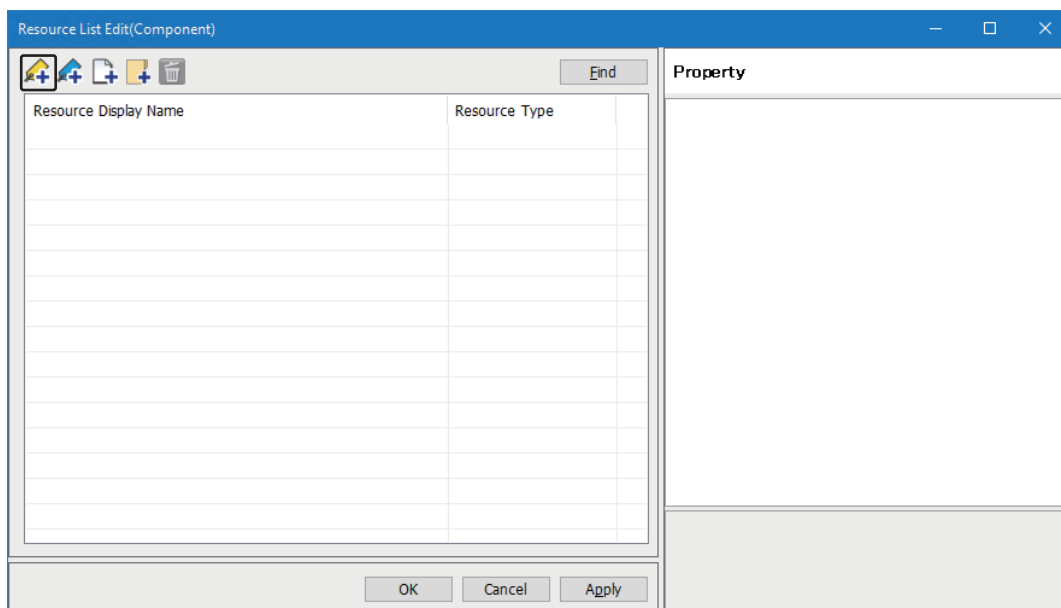


4. Select CC-Link IE TSN Data Collector in the "Select Data collector" screen, and click the [OK] button.



5. Set communication parameters. (☞ Page 34 Communication Parameter)
6. Click the [OK] button.

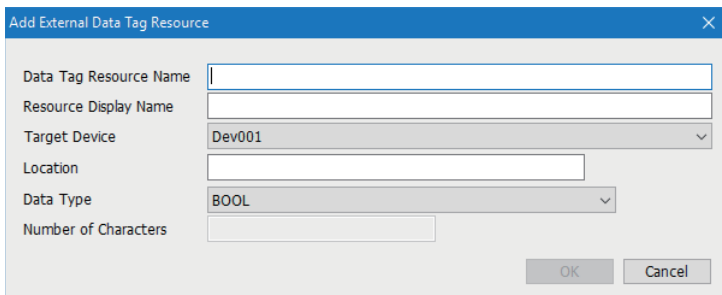
7. Select [Window] ⇒ [Resource List Edit].
8. Select the icon for adding an external data tag resource (🏠).



**Point**

To read the data missing information, set link special registers of a data reading target station.  
 For operations of CC-Link IE TSN Data Collector when data missing occurs, refer to the following:  
 ↩ Page 32 Data missing

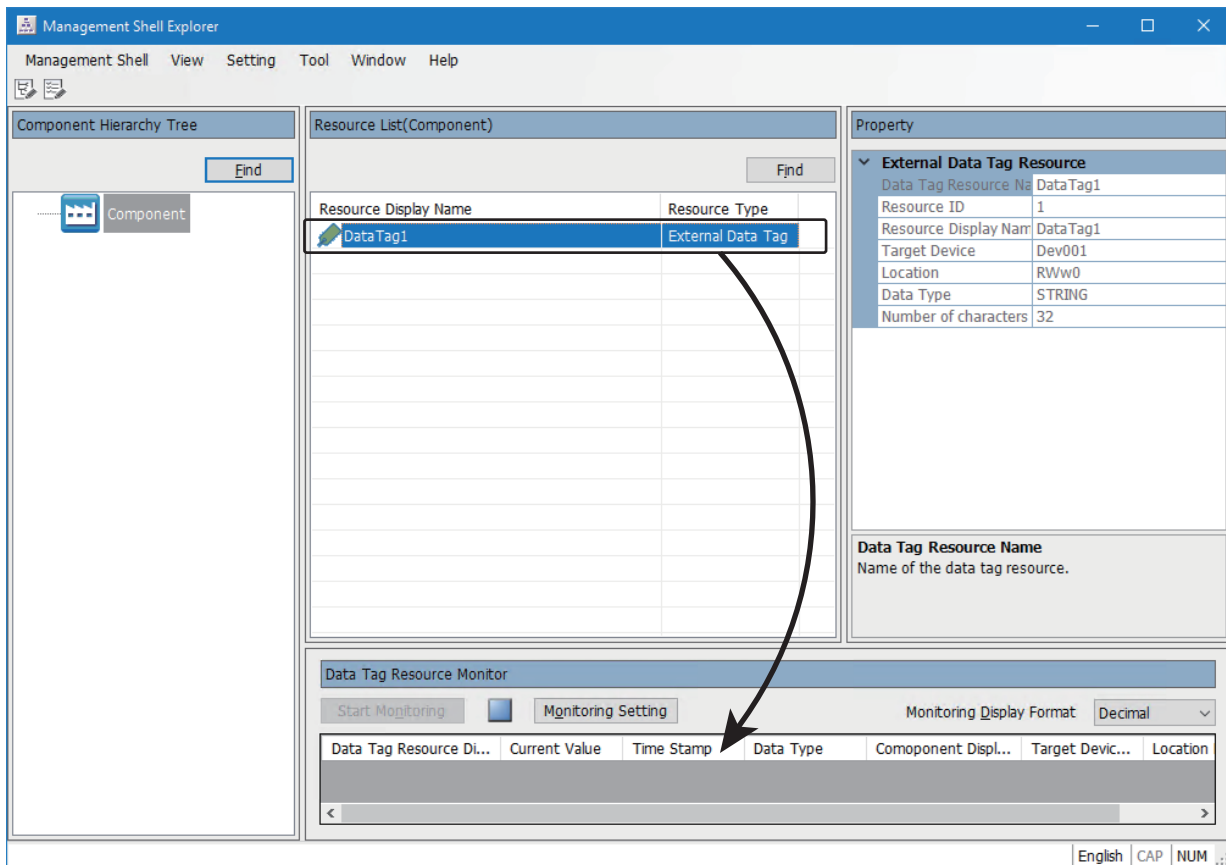
9. Set location parameters. (↩ Page 37 Management Shell)  
 Select the access target device set in steps 3 to 6 for "Target Device."



10. Click the [OK] button.



- 11.** Drag and drop the data tag resource onto the data tag resource monitor window.  
The data tag resource is registered, and monitoring starts.



# 4 FUNCTIONS

This chapter shows the functions of CC-Link IE TSN Data Collector.

## 4.1 Data Collection Function

This function collects data in the interval of the set collection cycle.

### Precautions

When using this function from the execution control function for each flow of Real-time Flow Designer, use CC-Link IE TSN Data Collector with data collector version '3' or later.

### Data collection by using the buffering data reading function

Link device data sent in cyclic transmission from a device connected via CC-Link IE TSN is collected.

The collection method which can be set is as follows:

Collection method	Overview	Reference
Communication cycle interval collection	Data is collected by accessing a link device in a communication cycle of CC-Link IE TSN after a collection interval set in Data Collector elapses.	Page 24 Communication cycle interval collection

### Communication cycle interval collection

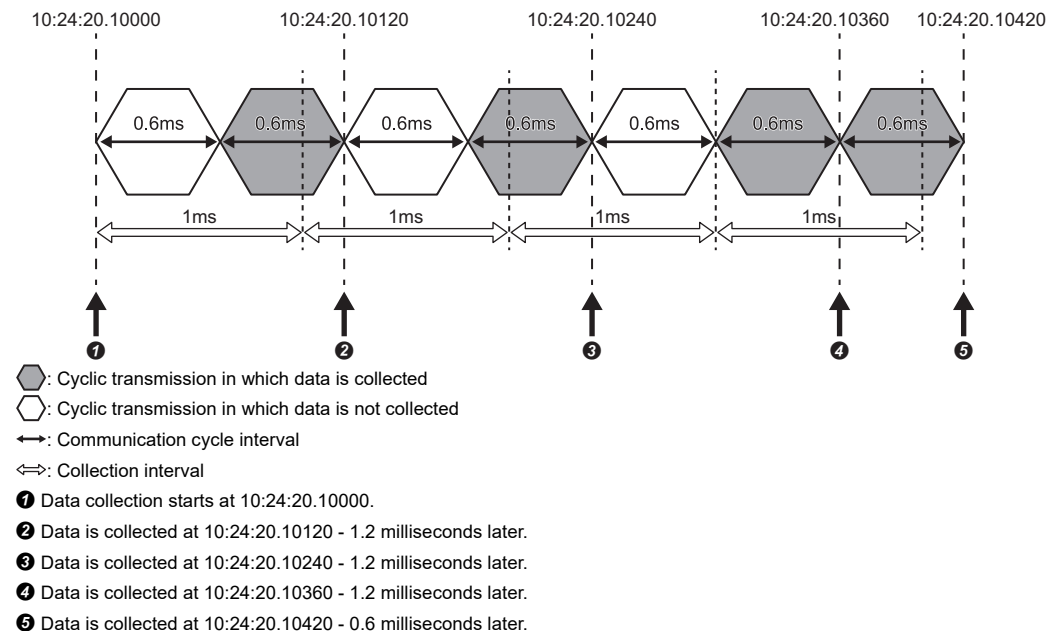
Link device data is collected for each communication cycle interval of CC-Link IE TSN after a set collection interval elapses.

**Ex.**

The following shows a collection timing of communication cycle interval collection.

Communication cycle interval: 0.6 ms

Collection interval: 1 ms



## Collection processing time report

When an enabled data collection setting is included in Edgexross Basic Software and the operating status of the software switches from RUN to STOP, the maximum and minimum collection processing times in the RUN state are reported to the software.

The collection processing time is reported as follows:

- Unit: 0.1 ms
- Range: 0.0 to 9999.9 ms

### Point

- The collection processing time per collection is a time to acquire all link device data stored in the buffering area.
- The collection processing time is rounded down to 0.1 milliseconds.
- The collection processing time less than 0.1 milliseconds is regarded as 0.1 milliseconds.
- When no data is collected while Edgexross Basic Software is in the RUN state, the maximum and minimum collection processing times are reported as '0.0.'

## Time information of collected data

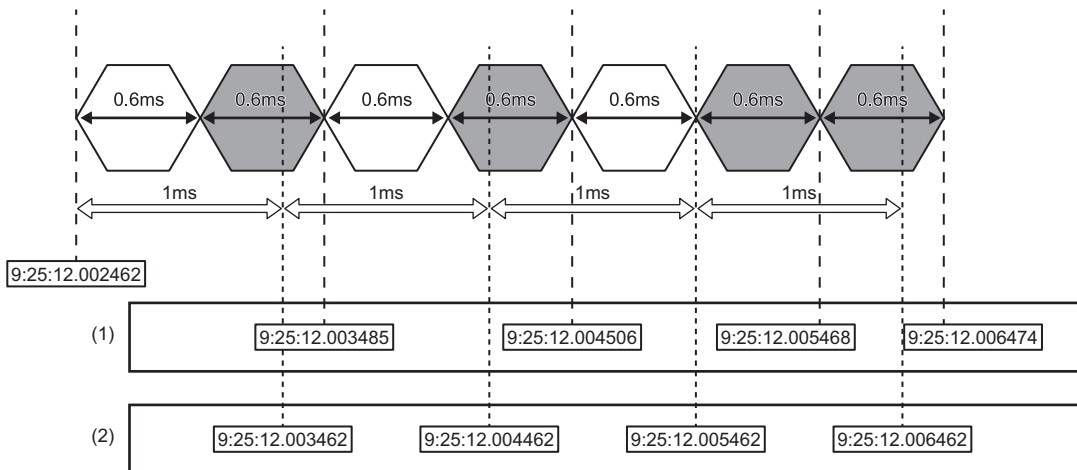
Time information (time stamp) added to collected data is the time in CC-Link IE TSN; therefore, changing the time in an industrial PC does not affect the collection time.

The time in CC-Link IE TSN is synchronized with that of a time synchronization source module; however, the time zone and daylight saving time follow the settings of an industrial PC on which Edgexross Basic Software is running.

If a change in time information in CC-Link IE TSN is detected while CC-Link IE TSN Data Collector is running, a time change event occurs.

### ■ Output setting option for time information (time stamp)

Time information is output at regular intervals by selecting the checkbox of "Correct the timestamp to the set collection interval." for "Timestamp output setting."



- ⬡: Cyclic transmission in which data is collected
- ⬢: Cyclic transmission in which data is not collected
- ↔: Communication cycle interval
- ⇔: Collection interval

- (1) The checkbox is not selected (time information is output at communication cycle intervals).
- (2) The checkbox is selected (time information is output at collection intervals).

If the checkbox is not selected, time information of collected data is a timing of cyclic transmission; therefore, there may be a difference equivalent to the communication cycle interval in maximum. This may cause an incorrect diagnosis in data diagnosis that requires time information for regular intervals (such as in Real-time Data Analyzer).

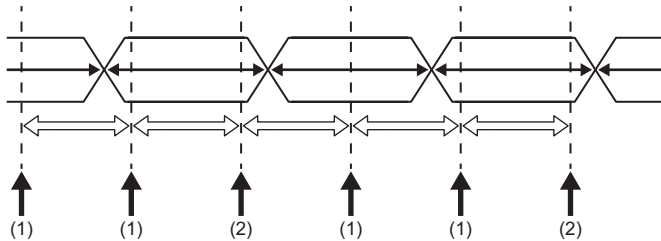
In addition, if data missing occurs during data collection and the data missing status is resolved, a time stamp is added starting from the time when the status is resolved.

## Precautions

When selecting the checkbox of "Correct the timestamp to the set collection interval." for "Timestamp output setting," set a value equal to or greater than two times of the communication cycle interval for a collection interval in order to reduce a difference between an output time stamp and an actual data collection time.

## Outputting the first value of collected data

If a data collection interval is shorter than a communication cycle interval, data may be collected twice during the communication cycle interval. In this case, the first value is output to Edgewise Basic Software as collected data.



○: Cyclic transmission

↔: Communication cycle interval

↔: Collection interval

(1) Data collection

(2) Data collection (The first value collected during the same communication cycle interval is output.)

## Collected data missing

If data missing occurs in a collection target station, CC-Link IE TSN Data Collector will perform the following operations.

- Factors of data missing and operations when it occurs

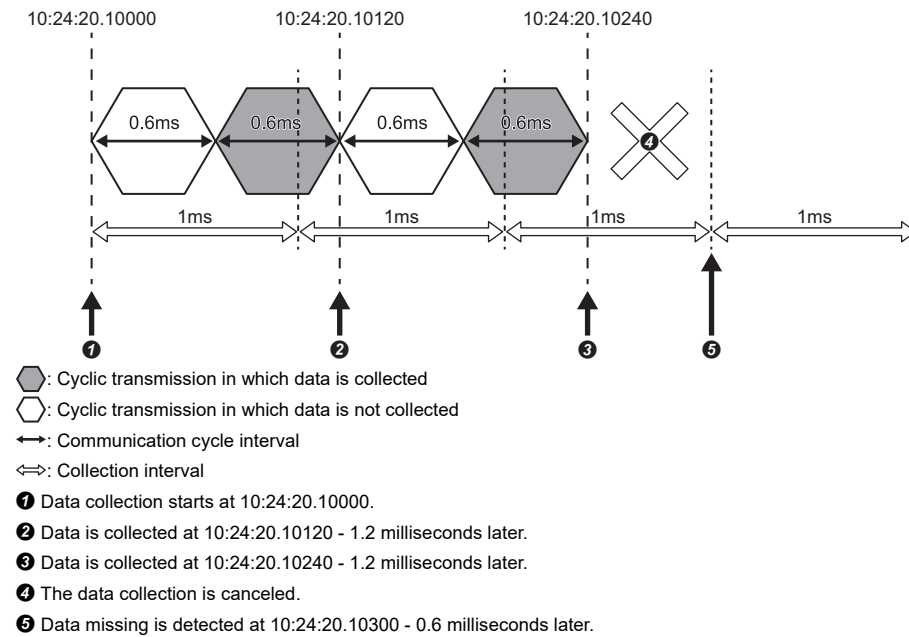
Factor	Operation
Data collection is canceled.	<ul style="list-style-type: none"> <li>■ Collected data <ul style="list-style-type: none"> <li>• Data will be missing. (Data will not be collected.)*1</li> </ul> </li> <li>■ Errors and events <ul style="list-style-type: none"> <li>• A CC-Link IE TSN Communication Software data collection cancellation error (3105H) will be reported.</li> </ul> </li> </ul>
Buffering area overflows.	<ul style="list-style-type: none"> <li>■ Collected data <ul style="list-style-type: none"> <li>• Data will be missing. (Data will not be collected.)*1</li> </ul> </li> <li>■ Errors and events <ul style="list-style-type: none"> <li>• An exceeded collection cycle event (A002H) will be reported.</li> </ul> </li> </ul>
Data missing occurs in a collection target station.	<p>When "Option setting for missing detection" is disabled (not selecting the checkbox)</p> <ul style="list-style-type: none"> <li>■ Collected data <ul style="list-style-type: none"> <li>• Data will be collected.</li> </ul> </li> <li>■ Errors and events <ul style="list-style-type: none"> <li>• A link device data missing event (A004H) will be reported.</li> <li>• When disconnection occurs in a collection target station, a data link error event (A006H) will be reported.</li> </ul> </li> </ul> <p>When "Option setting for missing detection" is enabled (selecting the checkbox)</p> <ul style="list-style-type: none"> <li>■ Collected data <ul style="list-style-type: none"> <li>• Data will be missing. (Data will not be collected.)</li> </ul> </li> <li>■ Errors and events <ul style="list-style-type: none"> <li>• A link device data missing event (A004H) will be reported.</li> <li>• A data missing event (A005H) will be reported.</li> <li>• When disconnection occurs in a collection target station, a data link error event (A006H) will be reported.</li> </ul> </li> </ul>

\*1 Collected data will be treated as data missing regardless of the "Option setting for missing detection" setting. (Page 34 Communication Parameter)

## ■ If data collection is canceled

Data missing is detected by CC-Link IE TSN Data Collector at the timing of the next collection interval.

In this case, a CC-Link IE TSN Communication Software data collection cancellation error is reported to Edgecross Basic Software.



Data collection being performed is canceled (temporarily stopped) in any of the following cases:

- Data link is stopped.
- All stations on CC-Link IE TSN are disconnected.
- Parameters of the master station on CC-Link IE TSN are changed.

The data collection restarts when the first cyclic transmission is performed after the data collection is canceled.

For details on canceling data collection, refer to the following:

📖 CC-Link IE TSN Communication Software for Windows User's Manual

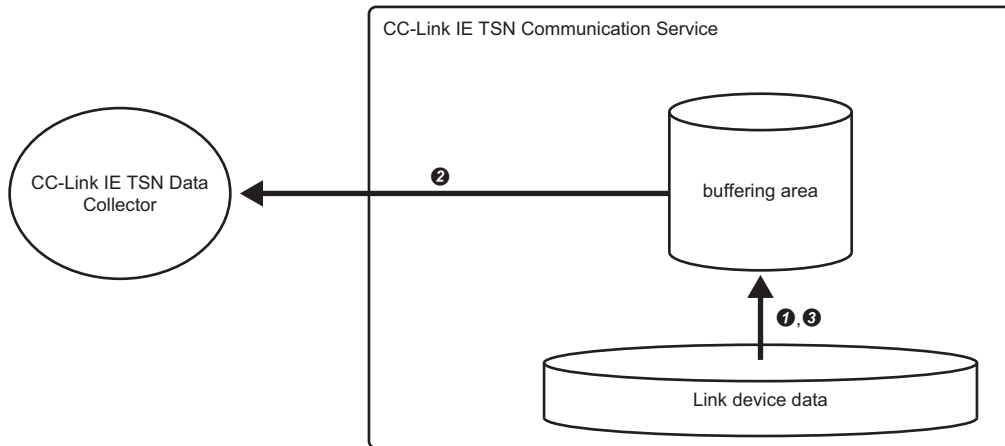
## ■ If the buffering area overflows

If the buffering area for storing link device data overflows, link device data cannot be stored in the buffering area by CC-Link IE TSN Communication Software and data missing is detected by CC-Link IE TSN Data Collector.

In this case, an exceeded collection cycle event is reported to Edgexross Basic Software.

For details on storing data in the buffering area, refer to the following:

📖 CC-Link IE TSN Communication Software for Windows User's Manual



- ❶ Link device data is stored in the buffering area.
- ❷ The stored link device data is collected.
- ❸ If the buffering area overflows, link device data cannot be stored (data missing occurs).

### Point

- An exceeded collection cycle event is output only once between the start and end of data collection.
- An event is output by CC-Link IE TSN Data Collector at the timing of polling the buffering area periodically. This may cause a mismatch between the time information of missing data and the date and time when the event occurred.

## ■ If data missing occurs in a collection target station

In this case, a link device data missing event (A004H) is reported to Edgexross Basic Software.

Data missing occurs even if disconnection occurs in a collection target station. In such case, a data link error event (A006H) is reported to Edgexross Basic Software.

The operation for collecting data when data missing occurs varies depending on "Operation setting for missing detection" of the communication parameter. (📖 Factors of data missing and operations when it occurs)

### Checking data missing occurred in a collection target station

Data missing occurred in a collection target station can be checked by any of the following methods.

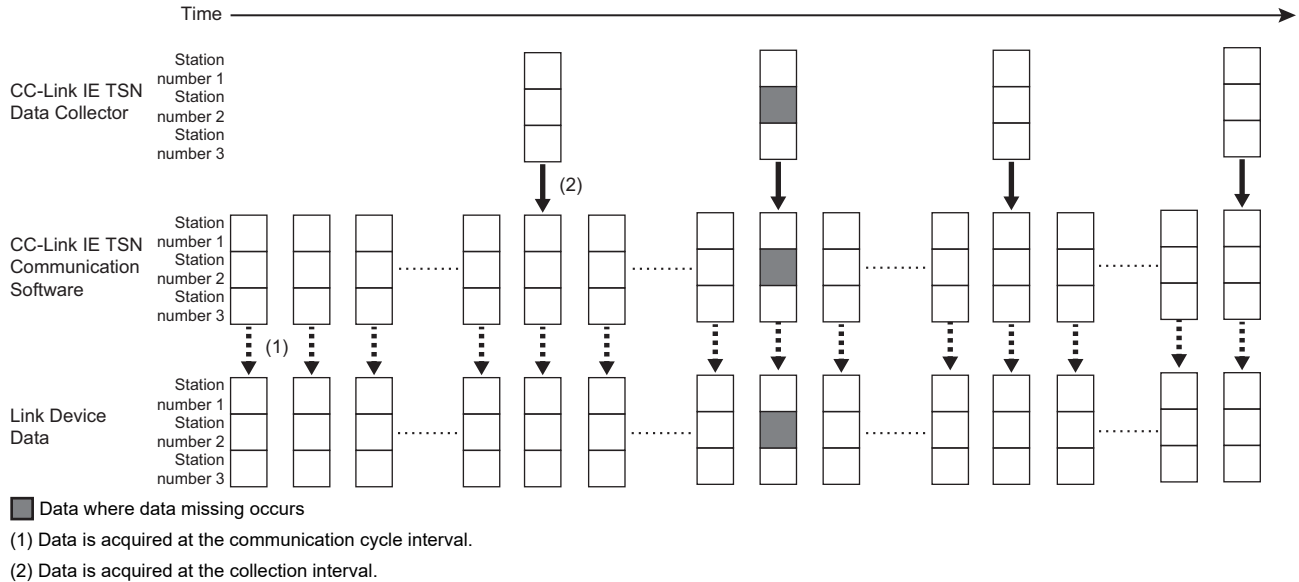
Item	Description
Real-time Flow Manager	Set the following link special registers for collected data. (📖 Page 36 Real-time Flow Designer) <ul style="list-style-type: none"> <li>• For collecting data missing information: Link device data reception status (SW1010 to SW1017)</li> <li>• For collecting data link error: Data link status of each station (SW00B0 to SW00B7)</li> </ul> For details on link special registers, refer to the following: 📖 CC-Link IE TSN Communication Software for Windows User's Manual
CC-Link IE TSN Communication Software	For methods for checking data missing information, refer to the following: 📖 CC-Link IE TSN Communication Software for Windows User's Manual

**Ex.**

When data missing occurs in the station number 2 of a collection target station

- Collection target device setting for data logging flow 1: RX0, RWr0, and LW0
- Collection target station: RX0 (station number 1), RWr0 (station number 2), and LW0 (station number 3)

If data missing occurs at the collection timing set in CC-Link IE TSN Data Collector (when "Option setting for missing detection" is disabled)

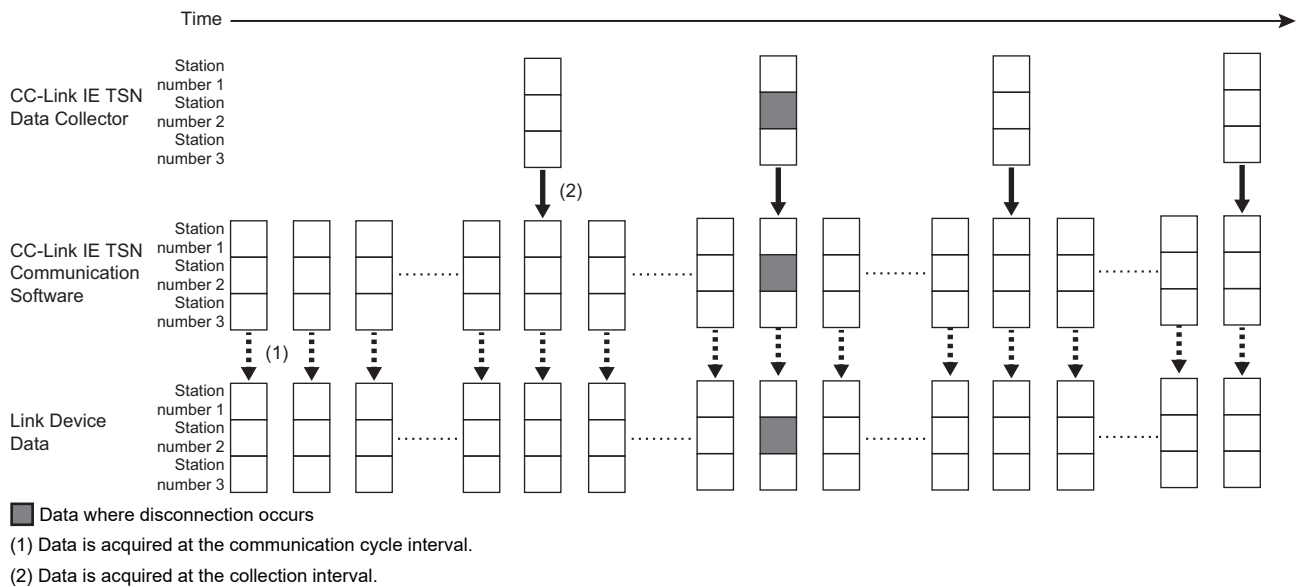


CC-Link IE TSN Data Collector determines that data of the station number 2 is missing.

CC-Link IE TSN Data Collector which detects the data missing reports a link device data missing event (A004H) to Edgecross Basic Software.

In addition, it collects data where data missing occurs.

If disconnection occurs at the collection timing set in CC-Link IE TSN Data Collector (when "Option setting for missing detection" is disabled)

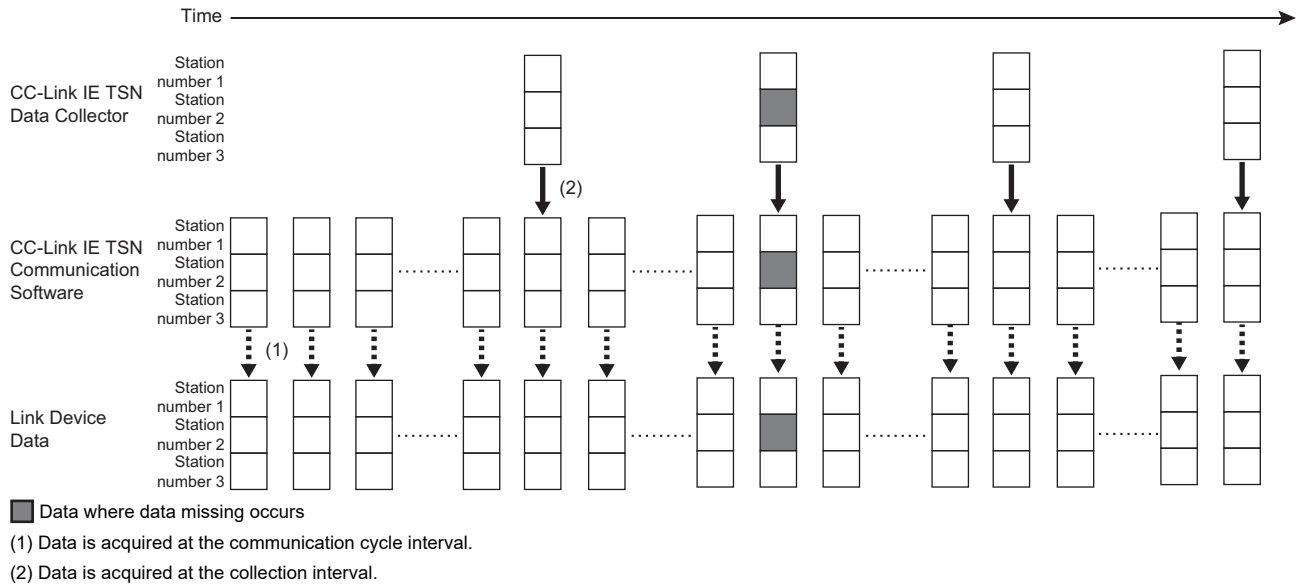


CC-Link IE TSN Data Collector determines that data of the station number 2 is missing.

CC-Link IE TSN Data Collector which detects the data missing reports a link device data missing event (A004H) and data link error event (A006H) to Edgecross Basic Software.

In addition, it collects data where data missing occurs.

If data missing occurs at the collection timing set in CC-Link IE TSN Data Collector (when "Option setting for missing detection" is enabled)

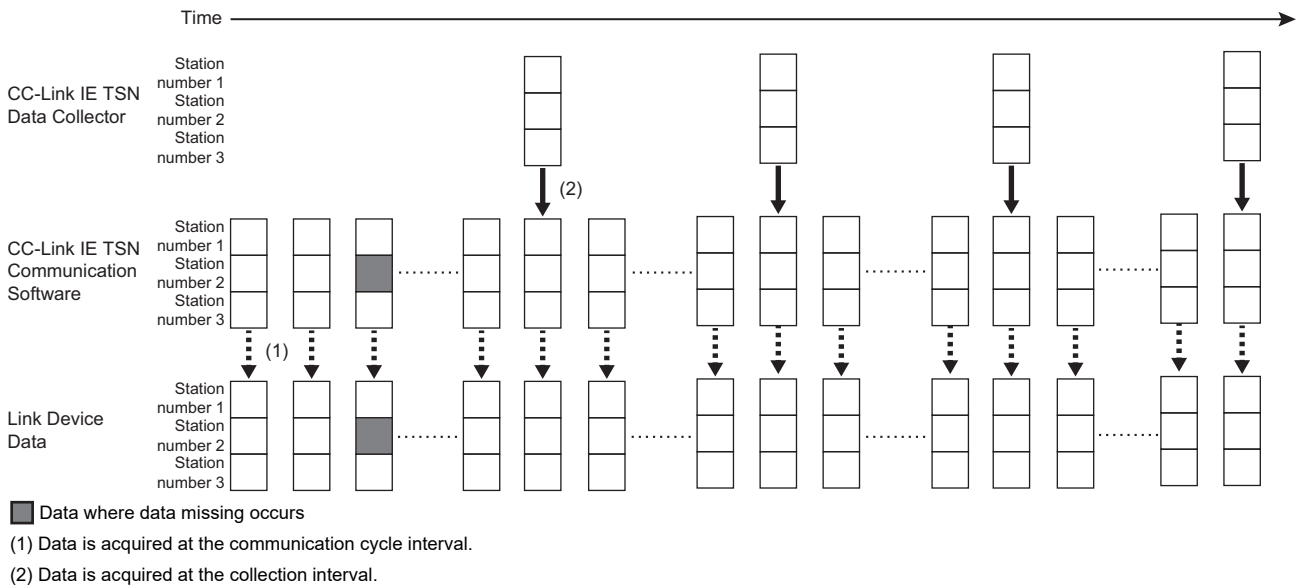


CC-Link IE TSN Data Collector determines that data of the station number 2 is missing.

CC-Link IE TSN Data Collector that detects the data missing reports a link device data missing event (A004H) and data missing event (A005H) to Edgecross Basic Software.

In addition, it does not collect data where data missing occurs. (Data will be missing.)

If data missing does not occur at the collection timing set in CC-Link IE TSN Data Collector



CC-Link IE TSN Data Collector does not determine data which is acquired from CC-Link IE TSN Communication Software as missing data.



## Considerations

The following shows the considerations for the data collection function.

### ■ WSTRING type data collection

The operations when collecting WSTRING type data are as follows:

- For non-surrogate characters, one word is collected from a target device.
- For surrogate characters, two words are collected from a target device.

**Ex.**

Setting of data to be collected

WSTRING type data [Number of characters = 4] (D0-D7)

Setting of a value to be collected

D0: 'A'

D1: 'B'

D2-D3: '□'

D4: 'C'

D5: 'D'

D6: 'E'

D7: 'F'

Collection result

"AB□C"

□ indicates a surrogate character.

### ■ Setting change during data collection

When the collection setting is changed and updated from Edgexross Basic Software during data collection, the data collection being performed is stopped and it is restarted according to the new setting.

### ■ CC-Link IE TSN configuration

When changing the CC-Link IE TSN configuration, the communication cycle interval may be longer.

After changing the network configuration, check the communication cycle interval. If it is longer due to the change, set the collection interval to be longer than the communication cycle interval.

### ■ Parameter writing to CC-Link IE TSN Communication Software

When writing parameters to CC-Link IE TSN Communication Software while Data Collector is running, a CC-Link IE TSN Communication Software access error may occur.

To write parameters to CC-Link IE TSN Communication Software, perform the following procedure:

1. Switch the operating status of Real-time Flow Manager to STOP in Real-time Flow Designer.
2. Write parameters.\*1

\*1 Click the [Write Parameters] button in the "Parameter Setting" screen of CC IE TSN Communication Software Utility to write parameters.

3. Switch the operating status of Real-time Flow Manager to RUN in Real-time Flow Designer.

## 4.2 Data Reading Function

This function sends a data reading request to a device according to a request from Edgexross Basic Software and reads data.

### Data reading by using the snapshot data reading function

Link device data is read according to a request from Edgexross Basic Software.

#### Read processing time report

When reconnecting to an access target device in Edgexross Basic Software, the maximum and minimum read processing times during the operation are reported to the software.

The read processing time is reported as follows:

- Unit: 0.1 ms
- Range: 0.0 to 9999.9 ms

#### Point

- The read processing time per collection is a time to acquire link device data stored in the snapshot data storage area.
- The read processing time is rounded down to 0.1 milliseconds.
- The read processing time less than 0.1 milliseconds is regarded as 0.1 milliseconds.
- When no data is read while Edgexross Basic Software is in the RUN state, the maximum and minimum read processing times are reported as '0.0.'

#### Data missing

If data missing occurs in a data reading target station, CC-Link IE TSN Data Collector will perform the following operations.

- Factors of data missing and operations when it occurs

Factor	Operation
Data missing occurs in a data reading target station.	When "Option setting for missing detection" is disabled (not selecting the checkbox) <ul style="list-style-type: none"> <li>■Read data               <ul style="list-style-type: none"> <li>• Data will be acquired.</li> </ul> </li> <li>■Errors and events               <ul style="list-style-type: none"> <li>• A link device data missing event (A004H) will be reported.</li> <li>• When disconnection occurs in a data reading target station, a data link error event (A006H) will be reported.</li> </ul> </li> </ul>
	When "Option setting for missing detection" is enabled (selecting the checkbox) <ul style="list-style-type: none"> <li>■Read data               <ul style="list-style-type: none"> <li>• Data will be missing. (Data will not be acquired.)*1</li> </ul> </li> <li>■Errors and events               <ul style="list-style-type: none"> <li>• A data read error (3008H) will be reported.</li> <li>• A link device data missing event (A004H) will be reported.</li> <li>• A data missing event (A005H) will be reported.</li> <li>• When disconnection occurs in a data reading target station, a data link error event (A006H) will be reported.</li> </ul> </li> </ul>

\*1 'N/A' is displayed in the data tag resource monitor of Management Shell.

#### Checking data missing occurs in a data reading target station

Data missing that is occurred in a data reading target station can be checked by any of the following methods.

Item	Description
Real-time Flow Manager	Set the following link special registers for an external data tag resource. (☞ Page 37 Management Shell) <ul style="list-style-type: none"> <li>• For reading data missing information: Link device data reception status (SW1010 to SW1017)</li> <li>• For reading data link error: Data link status of each station (SW00B0 to SW00B7)</li> </ul> For details on link special registers, refer to the following: ☞ CC-Link IE TSN Communication Software for Windows User's Manual
CC-Link IE TSN Communication Software	For methods for checking data missing information, refer to the following: ☞ CC-Link IE TSN Communication Software for Windows User's Manual

## Operation when a data link error occurs in the own station

If a data link error occurs in the own station on CC-Link IE TSN, a data read error (data link stopped) is reported to Edgecross Basic Software.

## Considerations

The following shows the considerations for the data reading function.

### ■ WSTRING type data reading

The operations when reading WSTRING type data are as follows:

- For non-surrogate characters, one word is read from a target device.
- For surrogate characters, two words are read from a target device.

**Ex.**

Setting of data to be read

WSTRING type data [Number of characters = 4] (D0-D7)

Setting of a value to be read

D0: 'A'

D1: 'B'

D2-D3: '□'

D4: 'C'

D5: 'D'

D6: 'E'

D7: 'F'

Reading result

"AB□C"

□ indicates a surrogate character.

### ■ Parameter writing to CC-Link IE TSN Communication Software

When writing parameters to CC-Link IE TSN Communication Software while Data Collector is running, a CC-Link IE TSN Communication Software access error may occur.

To write parameters to CC-Link IE TSN Communication Software, perform the following procedure:

**1.** Stop the operation of Management Shell in Management Shell Explorer.

**2.** Write parameters.\*1

\*1 Click the [Write Parameters] button in the "Parameter Setting" screen of CC IE TSN Communication Software Utility to write parameters.

**3.** Start the operation of Management Shell in Management Shell Explorer.

# 5 PARAMETER SETTING

This chapter shows the parameters of CC-Link IE TSN Data Collector that can be set in Edgecross Basic Software. For the display of the setting screens for each parameter, refer to Edgecross Basic Software User's Manual.

Edgecross Basic Software for Windows User's Manual

## 5.1 Communication Parameter

This section shows the screen for setting on the connection between CC-Link IE TSN Data Collector and a device.

### Window

- The "Target Device Setting" screen of Real-time Flow Designer
- The "Target Device Setting" screen of Management Shell Explorer

### Displayed items

Item	Description
Channel No.	Set a channel number (201 to 202). <sup>*1</sup>
Channel No. access test	Click this to perform an access test for the network adapter to which the specified channel number is assigned.
Initial Access Delay Time	Set the waiting time from when the initialization processing of an access target device is completed until data collection can be performed (0 to 255 seconds). <sup>*2</sup>
Option setting for missing detection	Set whether or not to acquire data when data missing occurs in CC-Link IE TSN Communication Software.
[Start CC IE TSN Communication Software Utility] button	Click this to start CC IE TSN Communication Software Utility.

\*1 Check the channel number which is set for the target adapter in the communication service operation monitor screen of CC IE TSN Communication Software Utility.

For the method for checking the channel number, refer to the following:  
 CC-Link IE TSN Communication Software for Windows User's Manual

\*2 If the access target device is connected, data collection starts without waiting the delay time.

### Point

By enabling "Option setting for missing detection" (selecting the checkbox), CC-Link IE TSN Data Collector does not acquire data with missing data and treats the data as missing. To acquire data with missing data, disable the setting (unselecting the checkbox).

- To collect data missing information, set link special registers of a collection target station for collected data. ( Page 36 Real-time Flow Designer)
- To read data missing information, set link special registers of a data reading target station for an external data tag resource. ( Page 37 Management Shell)

For details on link special registers, refer to the following:

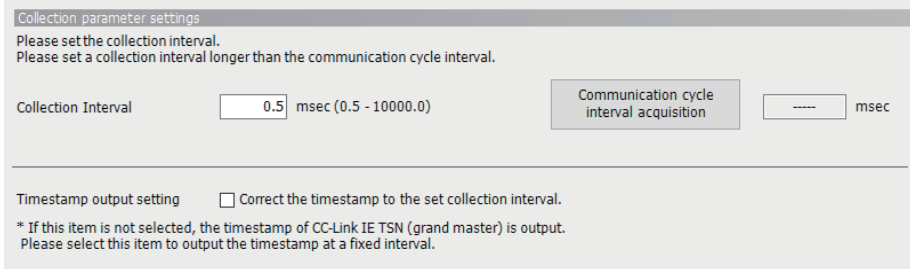
CC-Link IE TSN Communication Software for Windows User's Manual

# 5.2 Collection Parameter

This section shows the screen for setting on data collection in CC-Link IE TSN Data Collector.

## Window

The [Collection Option] tab in the "Data Collection Setting" screen of Real-time Flow Designer



## Displayed items

Item	Description
Collection Interval	Set an interval for collecting data.*1
[Communication cycle interval acquisition] button	Click this to acquire the communication cycle interval of CC-Link IE TSN.*2
Timestamp output setting	Correct the timestamp to the set collection interval. Select the checkbox to correct the time stamp to a set collection interval. (☞ Page 25 Output setting option for time information (time stamp))

\*1 Set a value greater than the communication cycle interval of CC-Link IE TSN.

\*2 Acquire the communication cycle interval while cyclic transmission is started by the master and slave stations that configure CC-Link IE TSN.

## 5.3 Location Parameter

This section shows the screens for setting target devices for CC-Link IE TSN Data Collector.

### Real-time Flow Designer

#### Window

The [Collection Data] tab in the "Data Collection Setting" screen of Real-time Flow Designer

No.	Data Name	Constant	Location (top)	Location (end)	Data Type	Length	Setting Value
1		<input type="checkbox"/>	...				
2		<input type="checkbox"/>	...				
3		<input type="checkbox"/>	...				
4		<input type="checkbox"/>	...				
5		<input type="checkbox"/>	...				
6		<input type="checkbox"/>	...				
7		<input type="checkbox"/>	...				
8		<input type="checkbox"/>	...				
9		<input type="checkbox"/>	...				
10		<input type="checkbox"/>	...				
11		<input type="checkbox"/>	...				
12		<input type="checkbox"/>	...				

#### Displayed items

Item	Description
Data Name	Set a data name (up to 32 characters).
Constant	Select the checkbox to add a constant value or fixed character string to collection data.
Location (top)	Set an access target device memory.
Location (end)	It is automatically set according to the settings in "Location (top)" and "Data Type." When selecting "STRING" or "WSTRING" for "Data Type," it is also affected by a value set in "Length."
Data Type	Select the data type of a location to access.
Length	Set the number of characters within the following ranges when selecting "STRING" or "WSTRING" for "Data Type." • STRING: 1 to 32 • WSTRING: 1 to 16
Setting Value	Set a constant value or fixed character string to add to collection data.

#### Location setting

In CC-Link IE TSN Data Collector, a screen for setting location parameters is not included.

Enter an accessible device (location) directly.

**Ex.**

When setting RWw0 as the STRING type (32 characters)

No.	Data Name	Constant	Location (top)	Location (end)	Data Type	Length	Setting Value
1	RWw0	<input type="checkbox"/>	RWw0	RWw0F	STRING	32	

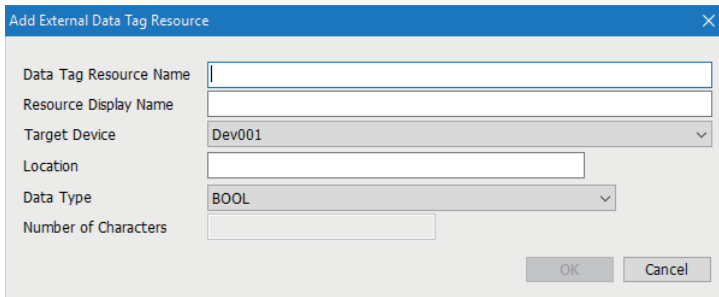
For accessible devices (locations), refer to the following:

☞ Page 12 Accessible devices (locations)

# Management Shell

## Window

The "Add External Data Tag Resource" or "Edit External Data Tag Resource" screen of Management Shell Explorer



## Displayed items

Item	Description
Data Tag Resource Name	Set the name of an external data tag resource (up to 32 characters).
Resource Display Name	Set the display name of an external data tag resource (up to 64 characters).
Target Device	Select an access target device for an external data tag resource.
Location	Set an access target device memory.
Data Type	Select the data type of a location to access.
Number of Characters	Set the number of characters within the following ranges when selecting "STRING" or "WSTRING" for "Data Type." <ul style="list-style-type: none"><li>• STRING: 1 to 32</li><li>• WSTRING: 1 to 16</li></ul>

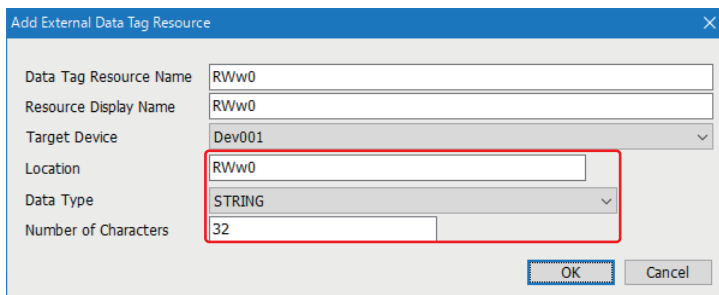
## Location setting

In CC-Link IE TSN Data Collector, a screen for setting location parameters is not included.

Enter an accessible device (location) directly.

**Ex.**

When setting RWw0 as the STRING type (32 characters)



For accessible devices (locations), refer to the following:



☞ Page 12 Accessible devices (locations)

# 6 TROUBLESHOOTING

This chapter explains the errors which may occur when using CC-Link IE TSN Data Collector and the troubleshooting.

## 6.1 Checking Method for Error Descriptions

The following are the methods for checking error descriptions.

Checking method	Details
Real-time Flow Designer	Error codes can be checked in the "Real-time Flow Manager Diagnostics" screen of Real-time Flow Designer. For details, refer to the following:  Edgexross Basic Software for Windows User's Manual
Management Shell Explorer	Error codes can be checked in the "Error Information List" screen of Management Shell Explorer. For details, refer to the following:  Edgexross Basic Software for Windows User's Manual

### Error type

There are two types of errors for CC-Link IE TSN Data Collector: moderate error and minor error.

## 6.2 Troubleshooting by Symptom

If a function of CC-Link IE TSN Data Collector does not perform properly, check the applicable items in the following and troubleshoot the error.

### Troubleshooting on the Data Collector startup





#### Data Collector is not recognized at the Edgexross Basic Software start.

Check item	Corrective action
Does a signed-in user who started Edgexross Basic Software have the access right to a folder in which CC-Link IE TSN Data Collector is stored?	<ul style="list-style-type: none"><li>• Sign in as a user with the access right to the folder in which CC-Link IE TSN Data Collector is stored, and start Edgexross Basic Software.</li><li>• Grant the user access to the folder in which CC-Link IE TSN Data Collector is stored.</li></ul>







# Troubleshooting on data collection

## Data collection cannot be performed.

Check item	Corrective action
Has a data link error occurred on CC-Link IE TSN?	Solve the data link error by performing a CC-Link IE TSN diagnosis of GX Works3. (  MELSEC iQ-R CC-Link IE TSN User's Manual (Application))
Is the initial access delay time set?	<ul style="list-style-type: none"> <li>• Wait until the set initial access delay time elapses.</li> <li>• Set the initial access delay time shorter.</li> </ul>
Is a module other than a master/local module (RJ71GN11-T2) set as the master station on CC-Link IE TSN?	Change the module to a master/local module (RJ71GN11-T2).
Are IP filter settings set to the master station?	Check the IP filter settings of the master station, and assign an accessible IP address to the Ethernet adapter used.
Is an item other than "Normal" displayed for "Communication Service Running Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions.  CC-Link IE TSN Communication Software for Windows User's Manual
Is an item other than "Normal" displayed for "Communication Service Operating Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions.  CC-Link IE TSN Communication Software for Windows User's Manual
Has data missing or disconnection occurred in the collection target station monitored in the device monitor of CC IE TSN Communication Software Utility?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (  CC-Link IE TSN Communication Software for Windows User's Manual)
Is a process flow started or stopped for each flow?	Use CC-Link IE TSN Data Collector with data collector version '3' or later.

## No change is detected in the collected data.

Check item	Corrective action
Has a data link error occurred on CC-Link IE TSN?	Solve the data link error by performing a CC-Link IE TSN diagnosis of GX Works3. (  MELSEC iQ-R CC-Link IE TSN User's Manual (Application))
Is a slave station on CC-Link IE TSN disconnected?	Restore the connection with the slave station on CC-Link IE TSN.
Is an item other than "Normal" displayed for "Communication Service Running Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions.  CC-Link IE TSN Communication Software for Windows User's Manual
Is an item other than "Normal" displayed for "Communication Service Operating Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions.  CC-Link IE TSN Communication Software for Windows User's Manual
Has a link device data missing event (A004H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (  CC-Link IE TSN Communication Software for Windows User's Manual)
Has a data missing event (A005H) occurred?	
Has a data link error event (A006H) occurred?	
Has data missing or disconnection occurred in the collection target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

## Data missing occurs in collected data.

Check item	Corrective action
Is the checkbox of "Option setting for missing detection" in the communication parameter selected?	<ul style="list-style-type: none"> <li>• Unselect the checkbox of the setting.</li> <li>• Refer to the troubleshooting on data collection in the following manual and take a corrective action. (☞ CC-Link IE TSN Communication Software for Windows User's Manual)</li> </ul>
Is there any setting exceeding the processing performance? (☞ Page 49 Processing Performance and Processing Time)	<ul style="list-style-type: none"> <li>• Increase the collection interval.</li> <li>• Reduce the number of units of data to be collected.</li> <li>• Reduce the number of process flows.</li> </ul>
Has an exceeded collection cycle (A002H) occurred?	<ul style="list-style-type: none"> <li>• Increase the collection interval.</li> <li>• Reduce the number of units of data to be collected.</li> <li>• Reduce the number of process flows.</li> <li>• Increase the communication cycle interval.</li> <li>• Delete an unnecessary channel number set in CC-Link IE TSN Communication Software.</li> </ul>
Has a link device data missing event (A004H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (☞ CC-Link IE TSN Communication Software for Windows User's Manual)
Has a data missing event (A005H) occurred?	
Has a data link error event (A006H) occurred?	
Has data missing or disconnection occurred in the collection target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

## Data inconsistency occurs in collected data.

Check item	Corrective action
Is "Disable" selected for "Station-based Block Data Assurance" in the network parameter of CC-Link IE TSN?	Change the network parameter of CC-Link IE TSN and select "Enable" for "Station-based Block Data Assurance" in GX Works3. (☞ MELSEC iQ-R CC-Link IE TSN User's Manual (Application))

## Unintended data is collected.

Check item	Corrective action
Is the same channel number set for both the communication parameter and CC-Link IE TSN Communication Software?	Set the same channel number for both the communication parameter and CC-Link IE TSN Communication Software.

## A link device data missing event occurs.

Check item	Corrective action
Has a link device data missing event (A004H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (☞ CC-Link IE TSN Communication Software for Windows User's Manual)
Has data missing or disconnection occurred in the collection target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

## A data missing event occurs.

Check item	Corrective action
Is the checkbox of "Option setting for missing detection" in the communication parameter selected?	<ul style="list-style-type: none"> <li>• Unselect the checkbox of the setting.</li> <li>• Refer to the troubleshooting on data collection in the following manual and take a corrective action. (☞ CC-Link IE TSN Communication Software for Windows User's Manual)</li> </ul>
Has data missing occurred in the collection target station monitored in the device monitor of CC IE TSN Communication Software Utility?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (☞ CC-Link IE TSN Communication Software for Windows User's Manual)

## A data link error event occurs.

Check item	Corrective action
Has a data link error event (A006H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (☞ CC-Link IE TSN Communication Software for Windows User's Manual)
Has disconnection occurred in the collection target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

## The time stamp of collected data does not match the time in an industrial PC.

Check item	Corrective action
Does the time (including the time zone setting and daylight saving time setting) match between the industrial PC on which CC-Link IE TSN Data Collector runs and CC-Link IE TSN?	Match the time between them.

## A time stamp is not output at a set collection interval.

Check item	Corrective action
Is collected data missing?	<ul style="list-style-type: none"> <li>■ If data is missing Refer to the following section for the corrective actions. ☞ Page 40 Data missing occurs in collected data.</li> <li>■ If data is not missing Select the checkbox of "Correct the timestamp to the set collection interval." for "Timestamp output setting" in the collection parameter.*1</li> </ul>

\*1 A difference equivalent to the communication cycle interval is caused in maximum for the time stamp of collected data. To avoid this, select the checkbox of "Correct the timestamp to the set collection interval." in the time stamp output setting. (☞ Page 25 Output setting option for time information (time stamp))

# Troubleshooting on data reading

## Data cannot be read.

Check item	Corrective action
Has a data link error occurred on CC-Link IE TSN?	Solve the data link error by performing a CC-Link IE TSN diagnosis of GX Works3. ( <a href="#">MELSEC iQ-R CC-Link IE TSN User's Manual (Application)</a> )
Is the initial access delay time set?	<ul style="list-style-type: none"> <li>• Wait until the set initial access delay time elapses.</li> <li>• Set the initial access delay time shorter.</li> </ul>
Is a module other than a master/local module (RJ71GN11-T2) set as the master station on CC-Link IE TSN?	Change the module to a master/local module (RJ71GN11-T2).
Is an item other than "Normal" displayed for "Communication Service Running Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions. <a href="#">MELSEC iQ-R CC-Link IE TSN Communication Software for Windows User's Manual</a>
Is an item other than "Normal" displayed for "Communication Service Operating Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions. <a href="#">MELSEC iQ-R CC-Link IE TSN Communication Software for Windows User's Manual</a>
Has data missing or disconnection occurred in the data reading target station monitored in the device monitor of CC IE TSN Communication Software Utility?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. ( <a href="#">MELSEC iQ-R CC-Link IE TSN Communication Software for Windows User's Manual</a> )

## No change is detected in the read data.

Check item	Corrective action
Has a data link error occurred on CC-Link IE TSN?	Solve the data link error by performing a CC-Link IE TSN diagnosis of GX Works3. ( <a href="#">MELSEC iQ-R CC-Link IE TSN User's Manual (Application)</a> )
Is a slave station on CC-Link IE TSN disconnected?	Restore the connection with the slave station on CC-Link IE TSN.
Is an item other than "Normal" displayed for "Communication Service Running Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions. <a href="#">MELSEC iQ-R CC-Link IE TSN Communication Software for Windows User's Manual</a>
Is an item other than "Normal" displayed for "Communication Service Operating Status" in the communication service operation monitor screen of CC IE TSN Communication Software Utility?	If it is not "Normal," refer to the following manual to take corrective actions. <a href="#">MELSEC iQ-R CC-Link IE TSN Communication Software for Windows User's Manual</a>
Has a link device data missing event (A004H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. ( <a href="#">MELSEC iQ-R CC-Link IE TSN Communication Software for Windows User's Manual</a> )
Has a data missing event (A005H) occurred?	
Has a data link error event (A006H) occurred?	
Has data missing or disconnection occurred in the data reading target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

## Data inconsistency occurs in read data.

Check item	Corrective action
Is "Disable" selected for "Station-based Block Data Assurance" in the network parameter of CC-Link IE TSN?	Change the network parameter of CC-Link IE TSN and select "Enable" for "Station-based Block Data Assurance" in GX Works3. ( <a href="#">MELSEC iQ-R CC-Link IE TSN User's Manual (Application)</a> )

## Unintended data is read.

Check item	Corrective action
Is the same channel number set for both the communication parameter and CC-Link IE TSN Communication Software?	Set the same channel number for both the communication parameter and CC-Link IE TSN Communication Software.

## A link device data missing event occurs.

Check item	Corrective action
Has a link device data missing event (A004H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (CC-Link IE TSN Communication Software for Windows User's Manual)
Has data missing or disconnection occurred in the data reading target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

## A data missing event occurs.

Check item	Corrective action
Is the checkbox of "Option setting for missing detection" in the communication parameter selected?	<ul style="list-style-type: none"><li>• Unselect the checkbox of the setting.</li><li>• Refer to the troubleshooting on data collection in the following manual and take a corrective action. (CC-Link IE TSN Communication Software for Windows User's Manual)</li></ul>
Has data missing occurred in the data reading target station monitored in the device monitor of CC IE TSN Communication Software Utility?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (CC-Link IE TSN Communication Software for Windows User's Manual)

## A data link error event occurs.

Check item	Corrective action
Has a data link error event (A006H) occurred?	Refer to the troubleshooting on data collection in the following manual and take a corrective action. (CC-Link IE TSN Communication Software for Windows User's Manual)
Has disconnection occurred in the data reading target station monitored in the device monitor of CC IE TSN Communication Software Utility?	

# Troubleshooting on Edgecross Basic Software

## An error caused by CC-Link IE TSN Data Collector has been detected.

Check item	Corrective action
Has a data collector startup error been detected in Edgecross Basic Software?	Reinstall CC-Link IE TSN Data Collector since the file may have been moved or deleted.

## Device instruction feedback cannot be set.

Check item	Corrective action
An access target device created by using CC-Link IE TSN Data Collector cannot be selected in the device instruction feedback setting of Real-time Flow Designer.	Use another data collector that supports the data writing function. The access target device cannot be set for device instruction feedback because CC-Link IE TSN Data Collector does not support the data writing function.

## The current value of an external data tag resource cannot be changed.

Check item	Corrective action
The current value of an external data tag resource created by using CC-Link IE TSN Data Collector cannot be changed in Management Shell Explorer.	Use another data collector that supports the data writing function. The current value of an external data tag resource cannot be changed because CC-Link IE TSN Data Collector does not support the data writing function.

# Troubleshooting on screens

## Contents in the screen are not displayed properly.

Check item	Corrective action
Is the size of the text and other items in the screen set to a value other than 100% (96 DPI, 9 pt etc.) in Windows settings?	<ul style="list-style-type: none"> <li>• Set the value to 100% (96 DPI, 9 pt etc.).</li> <li>• For Windows 10 (version 1703 or later)<sup>*1</sup>, the screen can be displayed with high DPI scaling by using a Windows 10 function.<sup>*2</sup> <ol style="list-style-type: none"> <li>❶ Select 'ProcessDesigner.exe'<sup>*3</sup>, then select [Properties] on the right-click menu.</li> <li>❷ Select the checkbox of "Override high DPI scaling behavior. Scaling performed by:" in the [Compatibility] tab, then select "System" from the pull-down list.</li> <li>❸ Click the [OK] button.</li> </ol> </li> </ul>

\*1 The Windows version can be checked by the following procedure.

- ❶ Enter "winver" in the search box of Windows, and select it from the menu.
- ❷ Check the version in the displayed screen.

\*2 The display of screen will be blurred by enlarging.

The following lists the setting values for "Change the size of text, apps, and other items" and the recommended display resolution for each setting value in Windows 10.

Setting value: 100%, display resolution: 1024 × 768 dots or more

Setting value: 125%, display resolution: 1900 × 1200 dots or more

Setting value: 150%, display resolution: 1900 × 1200 dots or more

Setting value: 175%, display resolution: 2880 × 1620 dots or more

Setting value: 200%, display resolution: 2880 × 1620 dots or more

Setting value: 225%, display resolution: 3840 × 2160 dots or more

Setting value: 250%, display resolution: 3840 × 2160 dots or more

\*3 'ProcessDesigner.exe' is stored in the folder in which Edgecross Basic Software is installed.

The following is an example of a storage location.

(Example) When setting the installation destination folder as the default

C:\Edgecross\Edgecross Basic Software\Real-timeFlowDesigner\ProcessDesigner.exe

## 6.3 Error Code List

This section shows the codes for errors that occur in CC-Link IE TSN Data Collector.

Error code	Error name	Error description	Corrective action
3000H	Communication parameter setting error	There is an error in the communication parameter.	Please review the communication parameter because there is an error.
3001H	Collection parameter setting error	There is an error in the collection parameter.	Please review the collection parameter because there is an error.
3002H	Location parameter setting error	There is an error in the location parameter.	Please review the location parameter because there is an error.
3003H	Out-of-specification location error	A location out of specification is specified.	Please review the location (top) input by a location parameter so that it is in the accessible area.
3004H	Insufficient memory error	There is not enough memory available to execute this operation.	<ul style="list-style-type: none"> <li>• Please reduce the number of collection points.</li> <li>• Please close other applications.</li> <li>• Please restart the Industrial PC running this product.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
3005H	Data Collector internal error	An unexpected error occurred inside this product.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please reinstall this product.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
3006H	Resource contention error	Resource contention has occurred between this product and other applications.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please close other applications.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
3007H	Data read error (Data link stopped)	Failed to read data because the data link is stopped.	<ul style="list-style-type: none"> <li>• Please check if there is any disconnected station in CC-Link IE TSN Communication Software. (For details, please refer to the manual "CC-Link IE TSN Communication Software for Windows".)</li> <li>• Please check if there is any problem in CC-Link IE TSN using the CC-Link IE TSN diagnosis of GX Works3.</li> <li>• Please review the network parameter of CC-Link IE TSN.</li> </ul>
3008H	Data read error (Data missing)	Missing of the data occurred at data reading.	<ul style="list-style-type: none"> <li>• Please check if there is any missing station in CC-Link IE TSN Communication Software. (For details, please refer to the manual "CC-Link IE TSN Communication Software for Windows".)</li> </ul>
300AH	Shared resource operation error	Failed to operate the shared resource.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please close other applications.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
300BH	Abnormal termination of internal process of Data Collector	Operation of the internal process of the Data Collector has stopped.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please close other applications.</li> <li>• Please review the number of Data Collector configurations.</li> <li>• If CC-Link IE TSN Communication Software is not installed, please reinstall it.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
300CH	Data collector internal process start error	Failed to start the internal process of Data Collector.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please reinstall this product.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
300DH	Abnormal communication between internal processes of Data Collector	Operation of the internal process of the Data Collector has stopped.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please close other applications.</li> <li>• Please review the number of Data Collector configurations.</li> <li>• If CC-Link IE TSN Communication Software is not installed, please reinstall it.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>



Error code	Error name	Error description	Corrective action
3100H	CC-Link IE TSN Communication Software access error	An error occurred during the access to CC-Link IE TSN Communication Software.	<ul style="list-style-type: none"> <li>• Please review the target device setting so that the channel No. of the communication parameter matches the one set with the CC-Link IE TSN Communication Software utility (CC IE TSN Communication Software Utility).</li> <li>• Please start or restart the CC-Link IE TSN Communication Software service. (For details, please refer to the manual "CC-Link IE TSN Communication Software for Windows".)</li> <li>• Start or restart the CC-Link IE TSN Communication Software service. When changing parameters, please perform the STOP operation with Real-time Flow Designer, and then perform the RUN operation again.</li> <li>• Please reduce the load on Windows by closing other applications.</li> <li>• Please restart the Industrial PC running this product.</li> </ul>
3101H	CC-Link IE TSN Communication Software I/F error	An error occurred during the access to CC-Link IE TSN Communication Software.	<ul style="list-style-type: none"> <li>• Please restart the Industrial PC running this product.</li> <li>• Please reinstall CC-Link IE TSN Communication Software. (For details, please refer to the manual "CC-Link IE TSN Communication Software for Windows".)</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
3102H	Number of available connections with CC-Link IE TSN Communication Software excess error	The upper limit of the number of available connections with CC-Link IE TSN Communication Software was exceeded.	<ul style="list-style-type: none"> <li>• Please close other applications using CC-Link IE TSN Communication Software.</li> <li>• Please restart the Industrial PC running this product.</li> </ul>
3103H	Memory reservation error/Insufficient resource memory error	There is not enough memory available to execute this operation.	<ul style="list-style-type: none"> <li>• Please reduce the number of collection points.</li> <li>• Please close other applications.</li> <li>• Please restart the Industrial PC running this product.</li> <li>• If the same error occurs again, please consult your local Mitsubishi representative.</li> </ul>
3104H	Data read error (First cyclic transmission not performed)	Failed to read data because the first cyclic transmission has not been performed.	<ul style="list-style-type: none"> <li>• Please check if there is any device which is disconnected from CC-Link IE TSN.</li> <li>• Please check if there is any problem in CC-Link IE TSN using the CC-Link IE TSN diagnosis of GX Works3.</li> <li>• Please review the network parameter of CC-Link IE TSN.</li> <li>• When changing parameters of the CC-Link IE TSN master station, please perform the STOP operation with Real-time Flow Designer, and then perform the RUN operation again.</li> </ul>
3105H	CC-Link IE TSN Communication Software data collection cancellation error	CC-Link IE TSN Communication Software canceled the data collection.	<p>Please start CC IE TSN Communication Software Utility of CC-Link IE TSN Communication Software and check if the communication service running status and communication service operation status are displayed as normal.</p> <p>When the communication service running status and communication service operation status are not displayed as normal, please check the event log with CC IE TSN Communication Software Utility and follow the displayed message.</p>

## 6.4 Event Code List

This section shows the codes for events that occur in CC-Link IE TSN Data Collector.

Event code	Event status	Event name	Event description
A000H	Information	Collection processing time	Measurement of collection processing time has been completed.
A001H	Information	Read processing time	Measurement of Read processing time has been completed.
A002H	Warning	Exceeded collection cycle	Collection process was not completed within the collection cycle.
A003H	Information	Time change	A time change was detected.
A004H	Information	Link Device Data Missing	Missing of the link device data in the target station occurred in CC-Link IE TSN Communication Software.
A005H	Warning	Data missing	Data Collector detected missing of data because missing of the link device data occurred in the target station in CC-Link IE TSN Communication Software.
A006H	Information	Data link error	A data link error occurred in CC-Link IE TSN Communication Software.

# APPENDIX

## Appendix 1 Processing Performance and Processing Time

This section shows the processing performance and processing time in data collection or data reading of CC-Link IE TSN Data Collector.

The processing performance of this product refers to the performance under the condition that data can be collected or read in CC-Link IE TSN Data Collector without any errors occur.

### Precautions

Depending on the system configuration used, CC-Link IE TSN Communication Software may detect data missing. The data missing status acquired by CC-Link IE TSN Data Collector can be checked using the data missing information in CC-Link IE TSN Communication Software. (📖 CC-Link IE TSN Communication Software for Windows User's Manual)

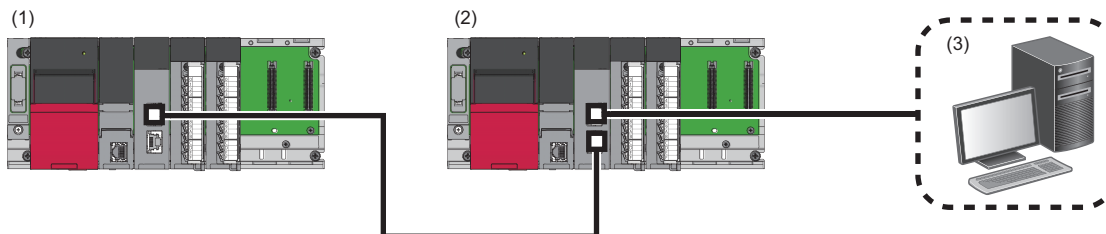
### Collection processing performance

The following shows the collection processing performance when executing a data logging flow only or when executing a data logging flow and data diagnosis flow.

The parameters other than those shown in this section are set to their defaults.

#### System configuration

Item	Description
Connection destination device	R16CPU
	RJ71GN11-T2
Connection method	CC-Link IE TSN connection



- (1) Master station
- (2) Local station
- (3) Industrial PC on which this product is installed

A

## Measurement conditions 1

### ■ Industrial PC

Item		Description
CPU		Intel® Core™ i7CPU 2.59 GHz
RAM		12.0 GB
OS		Windows 10 IoT Enterprise 2016 LTSB (64-bit)
Application		<ul style="list-style-type: none"> <li>• Applications (except for Edgecross compatible product family) which increase the load on an Ethernet driver are not activated.</li> <li>• CPU and memory usage rates are less than 60% on average.</li> </ul>
Ethernet	Interface	1000BASE-T
	Communication method	Full duplex
	Communication speed	1000 Mbps (1000BASE-T)

### ■ Parameter of CC-Link IE TSN Communication Software

Setting item	Setting content
Network setting	Setting according to the measurement environment

### ■ Parameters of Data Collector

Setting item	Setting content
Collection interval	Collection interval setting according to the measurement contents
Initial access delay time of an access target device <sup>*1</sup>	0
Data type of a collection target device	INT type

\*1 The access target device setting is set only for a measurement target.

### ■ Parameters of Real-time Flow Manager

Process flow type	Setting item	Setting content
Data logging flow	Data collection	<ul style="list-style-type: none"> <li>• Data storing (file saving): Execute (default)</li> <li>• Data distribution: Do not execute</li> </ul>
	Data modification	No processing
Data diagnosis flow	Data collection	<ul style="list-style-type: none"> <li>• Data storing (file saving): Do not execute</li> <li>• Data distribution: Do not execute</li> </ul>
	Data modification	No processing
	Data diagnosis	Real-time Data Analyzer (Similar Waveform Recognition Tool)
	Feedback <sup>*1*2</sup>	<ul style="list-style-type: none"> <li>• Feedback type: Instruction feedback</li> <li>• Deterrence period: 1 minute</li> <li>• Instruction target: 1 word device point</li> </ul>

\*1 Four pieces are set for one data diagnosis flow.



\*2 SLMP Data Collector is used.

## ■ Parameters of the master station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameters of a CC-Link IE TSN module

Setting item	Setting content
Station type	Master station
Network configuration	Configuration according to the number of word device collection points for one flow (  Network configuration)
Refresh setting	All word type link devices are assigned to any word device.
Communication cycle interval setting	Setting according to the number of word device collection points for one flow (  Communication cycle interval setting)
Station-based block data assurance	Enable

### Network configuration

Number of word device collection points	Network configuration
1 to 32	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-001F
33 to 64	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-003F
65 to 128	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-007F
129 to 256	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-00FF
257 to 512	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-01FF
513 to 1024	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-03FF
1025 to 2048	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-07FF
2049 to 4096	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-0FFF
4097 to 8192	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-1FFF

### Communication cycle interval setting

Number of word device collection points	Communication cycle interval setting [μs]
1 to 128	250
129 to 1024	500
1025 to 4096	1000
4097 to 8192	2000

A

## ■ Parameters of a local station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameter of a CC-Link IE TSN module

Setting item	Setting content
Station type	Local station

## Measurement conditions 2

### ■ Industrial PC

Item		Description
CPU		Intel® Core™ i3CPU 1.90 GHz
RAM		8.0 GB
OS		Windows 10 IoT Enterprise 2016 LTSB (64-bit)
Application		<ul style="list-style-type: none"> <li>• Applications (except for Edgecross compatible product family) which increase the load on an Ethernet driver are not activated.</li> <li>• CPU and memory usage rates are less than 60% on average.</li> </ul>
Ethernet	Interface	1000BASE-T
	Communication method	Full duplex
	Communication speed	1000 Mbps (1000BASE-T)

### ■ Parameter of CC-Link IE TSN Communication Software

Setting item	Setting content
Network setting	Setting according to the measurement environment

### ■ Parameters of Data Collector

Setting item	Setting content
Collection interval	Collection interval setting according to the measurement contents
Initial access delay time of an access target device <sup>*1</sup>	0
Data type of a collection target device	INT type

\*1 The access target device setting is set only for a measurement target.

### ■ Parameters of Real-time Flow Manager

Process flow type	Setting item	Description
Data logging flow	Data collection	<ul style="list-style-type: none"> <li>• Data storing (file saving): Execute (default)</li> <li>• Data distribution: Do not execute</li> </ul>
	Data modification	No processing
Data diagnosis flow	Data collection	<ul style="list-style-type: none"> <li>• Data storing (file saving): Do not execute</li> <li>• Data distribution: Do not execute</li> </ul>
	Data modification	No processing
	Data diagnosis	Real-time Data Analyzer (Similar Waveform Recognition Tool)
	Feedback <sup>*1*2</sup>	<ul style="list-style-type: none"> <li>• Feedback type: Instruction feedback</li> <li>• Deterrence period: 1 minute</li> <li>• Instruction target: 1 word device point</li> </ul>

\*1 Four pieces are set for one data diagnosis flow.

\*2 SLMP Data Collector is used.

## ■ Parameters of the master station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameters of a CC-Link IE TSN module

Setting item	Setting content
Station type	Master station
Network configuration	Configuration according to the number of word device collection points for one flow (☞ Network configuration)
Refresh setting	All word type link devices are assigned to any word device.
Communication cycle interval setting	Setting according to the number of word device collection points for one flow (☞ Communication cycle interval setting)
Station-based block data assurance	Enable

### Network configuration

Number of word device collection points	Network configuration
1 to 32	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-001F
33 to 64	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-003F
65 to 128	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-007F
129 to 256	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-00FF
257 to 512	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-01FF
513 to 1024	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-03FF
1025 to 2048	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-07FF
2049 to 4096	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-0FFF
4097 to 8192	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-1FFF

### Communication cycle interval setting

Number of word device collection points	Communication cycle interval setting [μs]
1 to 128	250
129 to 1024	500
1025 to 4096	1000
4097 to 8192	2000

A

## ■ Parameters of a local station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameter of a CC-Link IE TSN module

Setting item	Setting content
Station type	Local station

## Measurement conditions 3

### ■ Industrial PC

Item		Description
CPU		Intel® Atom™ E3826 1.46 GHz (Dual Core)
RAM		4.0 GB
OS		Windows 10 IoT Enterprise 2016 LTSB (64-bit)
Application		<ul style="list-style-type: none"> <li>• Applications (except for Edgecross compatible product family) which increase the load on an Ethernet driver are not activated.</li> <li>• CPU and memory usage rates are less than 60% on average.</li> </ul>
Ethernet	Interface	1000BASE-T
	Communication method	Full duplex
	Communication speed	1000 Mbps (1000BASE-T)

### ■ Parameter of CC-Link IE TSN Communication Software

Setting item	Setting content
Network setting	Setting according to the measurement environment

### ■ Parameters of Data Collector

Setting item	Setting content
Collection interval	Collection interval setting according to the measurement contents
Initial access delay time of an access target device*1	0
Data type of a collection target device	INT type

\*1 The access target device setting is set only for a measurement target.

### ■ Parameters of Real-time Flow Manager

Process flow type	Setting item	Setting content
Data logging flow	Data collection	<ul style="list-style-type: none"> <li>• Data storing (file saving): Execute (default)</li> <li>• Data distribution: Do not execute</li> </ul>
	Data modification	No processing





## ■ Parameters of the master station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameters of a CC-Link IE TSN module

Setting item	Setting content
Station type	Master station
Network configuration	Configuration according to the number of word device collection points for one flow (  Network configuration)
Refresh setting	All word type link devices are assigned to any word device.
Communication cycle interval setting	Setting according to the number of word device collection points for one flow (  Communication cycle interval setting)
Station-based block data assurance	Enable

### Network configuration

Number of word device collection points	Network configuration
1 to 32	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-001F
33 to 64	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-003F
65 to 128	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-007F
129 to 256	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-00FF
257 to 512	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-01FF
513 to 1024	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-03FF
1025 to 2048	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-07FF
2049 to 4096	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-0FFF
4097 to 8192	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-1FFF

### Communication cycle interval setting

Number of word device collection points	Communication cycle interval setting [ $\mu$ s]
1 to 128	250
129 to 1024	500
1025 to 4096	1000
4097 to 8192	2000

A

## ■ Parameters of a local station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameter of a CC-Link IE TSN module

Setting item	Setting content
Station type	Local station

## Processing performance

The following tables show the processing performance capable of collecting all data in a specified cycle per collection processing time.

### ■ Processing performance under measurement conditions 1

Processing performance when executing a data logging flow

Number of flows	Collection interval (ms)	Number of data setting items for one flow	CPU usage rate (%)	
			Minimum value	Maximum value
1	0.5	64	30	38
	0.5	128	36	48
	1.0	256	26	41
4	3.0	64	20	34
	4.0	128	21	27
	5.0	256	20	28
8	5.0	64	22	37
	7.0	128	26	43
	9.0	256	29	41
12	8.0	64	26	43
	10.0	128	28	56
	14.0	256	38	58

Processing performance when executing a data logging flow and data diagnosis flow

Number of flows	Collection interval (ms)	Number of data setting items for one flow	CPU usage rate (%)	
			Minimum value	Maximum value
1	0.5	4	32	35
	10	128	22	29
	30	256	25	31
4	0.5	4	39	42
	10	128	38	49
	30	256	41	53

### ■ Processing performance under measurement conditions 2

Processing performance when executing a data logging flow

Number of flows	Collection interval (ms)	Number of data setting items for one flow	CPU usage rate (%)	
			Minimum value	Maximum value
1	0.7	64	21	35
	0.8	128	22	32
	1.0	256	35	46
4	3.0	64	24	33
	4.0	128	27	35
	5.0	256	33	45
8	5.0	64	29	41
	7.0	128	33	53
	9.0	256	37	51
12	8.0	64	30	50
	10.0	128	36	58
	14.0	256	39	58

Processing performance when executing a data logging flow and data diagnosis flow

Number of flows	Collection interval (ms)	Number of data setting items for one flow	CPU usage rate (%)	
			Minimum value	Maximum value
1	0.5	4	25	28
	15	128	24	27
	30	256	26	31
4	1.0	4	37	42
	20	128	45	48
	50	256	46	55

■ Processing performance under measurement conditions 3

Processing performance when executing a data logging flow

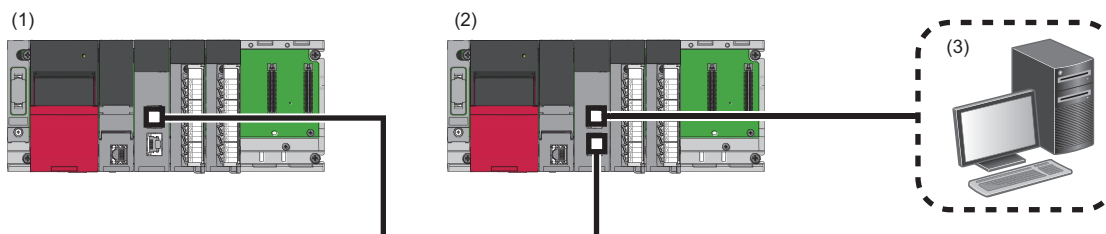
Number of flows	Collection interval (ms)	Number of data setting items for one flow	CPU usage rate (%)	
			Minimum value	Maximum value
1	10.0	64	44	54
	15.0	128	45	56
	20.0	256	45	53
4	50.0	64	50	59
	70.0	128	52	56
	90.0	256	51	58

# Read processing performance

The parameters other than those shown in this section are set to their defaults.

## System configuration

Item	Description
Connection destination device	R16CPU
	RJ71GN11-T2
Connection method	CC-Link IE TSN connection



- (1) Master station
- (2) Local station
- (3) Industrial PC on which this product is installed

## Measurement conditions 1

### Industrial PC

Item	Description	
CPU	Intel® Core™ i7CPU 2.59 GHz	
RAM	12.0 GB	
OS	Windows 10 IoT Enterprise 2016 LTSC (64-bit)	
Application	<ul style="list-style-type: none"> <li>• Applications (except for Edgexross compatible product family) which increase the load on an Ethernet driver are not activated.</li> <li>• CPU and memory usage rates are less than 60% on average.</li> </ul>	
Ethernet	Interface	1000BASE-T
	Communication method	Full duplex
	Communication speed	1000 Mbps (1000BASE-T)

### Parameter of CC-Link IE TSN Communication Software

Setting item	Setting content
Network setting	Setting according to the measurement environment

### Parameter of Data Collector

Setting item	Setting content
Initial access delay time of an access target device*1	0

\*1 The access target device setting is set only for a measurement target.

### Settings of Management Shell



Setting item	Setting content
Current value update interval	1 second
External data tag resource to register for monitoring	Device setting according to the number of word device read points (all INT type)

## ■ Parameters of the master station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameters of a CC-Link IE TSN module

Setting item	Setting content
Station type	Master station
Network configuration	Configuration according to the number of word device read points (  Network configuration)
Refresh setting	All word type link devices are assigned to any word device.
Communication cycle interval setting	Setting according to the number of word device read points (  Communication cycle interval setting)
Station-based block data assurance	Enable

### Network configuration

Number of word device read points	Network configuration
256	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-00FF
512	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-01FF
1024	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-03FF
2560	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-09FF
5120	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-13FF

### Communication cycle interval setting

Number of word device read points	Communication cycle interval setting [ $\mu$ s]
256	500
512	
1024	
2560	1000
5120	2000

## ■ Parameters of a local station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameter of a CC-Link IE TSN module

Setting item	Setting content
Station type	Local station

## Measurement conditions 2

### ■ Industrial PC

Item		Description
CPU		Intel® Core™ i3CPU 1.90 GHz
RAM		8.0 GB
OS		Windows 10 IoT Enterprise 2016 LTSB (64-bit)
Application		<ul style="list-style-type: none"> <li>• Applications (except for Edgecross compatible product family) which increase the load on an Ethernet driver are not activated.</li> <li>• CPU and memory usage rates are less than 60% on average.</li> </ul>
Ethernet	Interface	1000BASE-T
	Communication method	Full duplex
	Communication speed	1000 Mbps (1000BASE-T)

### ■ Parameter of CC-Link IE TSN Communication Software

Setting item	Setting content
Network setting	Setting according to the measurement environment

### ■ Parameter of Data Collector

Setting item	Setting content
Initial access delay time of an access target device *1	0

\*1 The access target device setting is set only for a measurement target.

### ■ Settings of Management Shell



Setting item	Setting content
Current value update interval	1 second
External data tag resource to register for monitoring	Device setting according to the number of word device read points (all INT type)

## ■ Parameters of the master station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameters of a CC-Link IE TSN module

Setting item	Setting content
Station type	Master station
Network configuration	Configuration according to the number of word device read points (  Network configuration)
Refresh setting	All word type link devices are assigned to any word device.
Communication cycle interval setting	Setting according to the number of word device read points (  Communication cycle interval setting)
Station-based block data assurance	Enable

### Network configuration

Number of word device read points	Network configuration
256	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-00FF
512	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-01FF
1024	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-03FF
2560	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-09FF
5120	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-13FF

### Communication cycle interval setting

Number of word device read points	Communication cycle interval setting [ $\mu$ s]
256	500
512	
1024	
2560	1000
5120	2000

## ■ Parameters of a local station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameter of a CC-Link IE TSN module

Setting item	Setting content
Station type	Local station

## Measurement conditions 3

### ■ Industrial PC

Item		Description
CPU		Intel® Atom™ E3826 1.46 GHz (Dual Core)
RAM		4.0 GB
OS		Windows 10 IoT Enterprise 2016 LTSB (64-bit)
Application		<ul style="list-style-type: none"><li>• Applications (except for Edgecross compatible product family) which increase the load on an Ethernet driver are not activated.</li><li>• CPU and memory usage rates are less than 60% on average.</li></ul>
Ethernet	Interface	1000BASE-T
	Communication method	Full duplex
	Communication speed	1000 Mbps (1000BASE-T)

### ■ Parameter of CC-Link IE TSN Communication Software

Setting item	Setting content
Network setting	Setting according to the measurement environment

### ■ Parameter of Data Collector

Setting item	Setting content
Initial access delay time of an access target device *1	0

\*1 The access target device setting is set only for a measurement target.

### ■ Settings of Management Shell

Setting item	Setting content
Current value update interval	1 second
External data tag resource to register for monitoring	Device setting according to the number of word device read points (all INT type)





## ■ Parameters of the master station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameters of a CC-Link IE TSN module

Setting item	Setting content
Station type	Master station
Network configuration	Configuration according to the number of word device read points (  Network configuration)
Refresh setting	All word type link devices are assigned to any word device.
Communication cycle interval setting	Setting according to the number of word device read points (  Communication cycle interval setting)
Station-based block data assurance	Enable

### Network configuration

Number of word device read points	Network configuration
256	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-00FF
512	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-01FF
1024	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-03FF
2560	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-09FF
5120	[Station number 1] RX/Ry/RWr/RWw/LB/LW setting: 0000-13FF

### Communication cycle interval setting

Number of word device read points	Communication cycle interval setting [ $\mu$ s]
256	500
512	
1024	
2560	1000
5120	2000

## ■ Parameters of a local station

### Parameters of a CPU module

The parameters are set to their defaults.

### Parameter of a CC-Link IE TSN module

Setting item	Setting content
Station type	Local station

## Processing performance

The following tables show the read processing performance.

### ■ Processing performance under measurement conditions 1

Number of word device read points	Performance value (ms)	CPU usage rate (%)	
		Minimum value	Maximum value
256	30	11	12
512	48	11	12
1024	108	12	14
2560	188	12	15
5120	347	17	18

### ■ Processing performance under measurement conditions 2

Number of word device read points	Performance value (ms)	CPU usage rate (%)	
		Minimum value	Maximum value
256	20	5	5
512	48	7	8
1024	91	7	12
2560	203	8	12
5120	378	12	12

### ■ Processing performance under measurement conditions 3

Number of word device read points	Performance value (ms)	CPU usage rate (%)	
		Minimum value	Maximum value
256	60	26	26
512	303	37	38
1024	556	39	47
2560	768	42	47
5120	2580	60	63

## Considerations

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- Processing of CC-Link IE TSN Data Collector may be delayed if interrupted by processing of other software or an operating system of Windows. Close unnecessary applications.
- Depending on the setting conditions of CC-Link IE TSN Communication Software, the load on the CPU is increased and processing of CC-Link IE TSN Data Collector may be delayed. Delete unnecessary settings in CC-Link IE TSN Communication Software (such as not using an unnecessary channel number). In addition, avoid using a user program that uses CC-Link IE TSN Communication Software as much as possible. If it is necessary to use this type of program, fully verify the performance impact and run the system.  
The data missing status acquired by CC-Link IE TSN Data Collector can be checked using the data missing information in CC-Link IE TSN Communication Software. (📖CC-Link IE TSN Communication Software for Windows User's Manual)
- When running each application<sup>\*1</sup> at the same time, it is recommended to set each application so that the CPU and memory usage rates of the whole industrial PC are limited to approximately 60% on average for each.

\*1 Edgexross Basic Software, a data collector, and an edge application

# Appendix 2 Data Assignment

This section shows the assignment availability and the number of points for data assignment.

## Data assignment availability

The following table shows the assignment availability of data for each data type.

○: Available, ×: Not available

Setting value	Data type										
	BOOL	UINT	UDINT	ULINT	INT	DINT	LINT	REAL	LREAL	STRING	WSTRIN G
Bit device	○	×	×	×	×	×	×	×	×	×	×
Word device	×	○	○	○	○	○	○	○	○	○	○
Bit device (Link special relay)	○	×	×	×	×	×	×	×	×	×	×
Word device (Link special register)	×	○	○	○	×	×	×	×	×	×	×

## Number of points for data assignment

The following table shows the number of points for data assignment for each data type.

Number: Fixed number of points for data assignment, ○: Calculation formula, ×: Not available

Setting value	Data type										
	1 bit	16 bit		32 bit			64 bit			Character string	
	BOOL	UINT	INT	UDINT	DINT	REAL	ULINT	LINT	LREAL	STRING	WSTRIN G
Bit device	1	×	×	×	×	×	×	×	×	×	×
Word device	×	1	1	2	2	2	4	4	4	○ (Number of characters ÷ 2) <sup>*1</sup>	○ ((Number of characters × 4) ÷ 2)

\*1 Round up digits after a decimal points of a value obtained by division.

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- ② msinttypes (Page 68 msinttypes)

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# Appendix 4 Version Specifications

This section shows the version specifications of CC-Link IE TSN Data Collector.

CC-Link IE TSN Data Collector version <sup>*1</sup>	Data collector version <sup>*2</sup>	Data collector specification version <sup>*2</sup>	Supported Edgecross Basic Software version <sup>*2</sup>
1.00A	1	1.00	1.00 or later
1.01B	2		
1.02C or later	3		

\*1 Can be checked in the screen displayed by selecting [Windows System] ⇒ [Control Panel] ⇒ [Programs] ⇒ [Programs and Features] from Windows Start.

\*2 For the checking method, refer to the following:  
 Edgecross Basic Software for Windows User's Manual

# Appendix 5 Added and Changed Function

This section shows the added and changed function of CC-Link IE TSN Data Collector.

Added/changed contents	Version	Reference
The execution control function for each flow of Real-time Flow Designer added in Edgecross Basic Software Ver.1.26 is supported.	1.02C	Page 24 Data Collection Function



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# MEMO

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# REVISIONS

\*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
February 2021	SH(NA)-082275ENG-A	First edition
November 2021	SH(NA)-082275ENG-B	■Added or modified parts Section 5.3, Appendix 4
December 2022	SH(NA)-082275ENG-C	■Added or modified parts Section 4.1, Section 6.2, Appendix 4, Appendix 5

Japanese manual number: SH-082274-C

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HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN  
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