

IO-Link Master Unit
for CC-Link IE Field

SC-LG2-CEF-P

User's Manual

(MEMO)

Thank you for purchasing an **SC-LG2-CEF-P** IO-Link Master Unit for CC-Link IE Field.
Before using this product, read and understand this User's Manual. Use the product correctly and in the optimum manner.
Keep this manual in a safe location for reference whenever necessary.

Please note

- | |
|--|
| <ol style="list-style-type: none">1) No part of this manual may be reproduced or reprinted in any form or by any means without prior written permission from Panasonic.2) The contents of this manual are subject to change without notice for future improvement.3) This manual has undergone strict quality control; but should you discover any dubious information, mistakes, misplaced pages, or missing pages, please contact your local dealer.4) CC-Link IE Field is a registered trademark of Mitsubishi Electric Corporation and a trademark managed by CC-Link Partner Association.5) GX Works3 is a registered trademark or trademark of Mitsubishi Electric Corporation.6) Ethernet is a registered trademark of Fuji Xerox Co., Ltd.7) IO-Link is a registered trademark of PROFIBUS User Organization.8) The ownerships of all other trademarks belong to their respective owners. |
|--|

Manual Configuration

1 Before Using This Product	This chapter explains precautions for safe use, terminology, package contents, and the name and function of each component.
2 System Configuration	This chapter explains the types and conditions of IO-Link compatible devices that can be connected to this product.
3 Installation and Setup	This chapter explains the procedures for installation, connection to external devices, and communication setup.
4 CC-Link IE Field Network Communication	This chapter explains the communication methods.
5 CC-Link IE Field Operating Procedure	This chapter explains the network configuration setup method and the procedure for operation after power ON.
6 Specification and Dimensions	This chapter explains the specifications and dimensions.
7 Warranty	This chapter explains warranty.
8 Maintenance	This chapter explains maintenance and inspection.
9 Troubleshooting	This chapter explains troubleshooting and error codes.

Contents

Manual Configuration	4
1 Before Using This Product	1-1
1.1 Safety Precautions	1-2
1.2 Handling Precautions	1-3
1.3 Terminology	1-5
1.4 Contents of Package	1-6
1.5 Name and Function of Each Component	1-7
2 System Configuration	2-1
2.1 System Configuration of This Product	2-2
2.2 Internal Circuits of This Product	2-3
2.3 IO-Link-compatible Devices	2-4
3 Installation and Setup	3-1
3.1 Preparation for Operation	3-2
3.2 Installation	3-3
3.2.1 Mounting and Removing the SC-LG2-CEF-P	3-3
3.2.2 Wiring Simple Wire-Press Connector CN-EP (Option)	3-4
3.2.3 Installing and Removing the SC-LG2-CEF-P and IO-Link Devices	3-6
3.2.4 Connecting and Disconnecting the Power Supply Connector	3-7
3.2.5 Connecting and Disconnecting the Ethernet Cable	3-10
3.3 Setup	3-12
3.3.1 Relationship between Network Number and Station Number	3-12
3.3.2 Setting Up the SC-LG2-CEF-P	3-13
4 CC-Link IE Field Network Communication	4-1
4.1 Communication Overview	4-2
4.2 Memory Map	4-3
4.2.1 Remote Input RX	4-3
4.2.2 Remote Register RWr	4-5
4.2.3 Remote Output RY	4-6
4.2.4 Remote Register RWw	4-7
4.3 Dedicated Instructions	4-8
4.3.1 Specifications of Dedicated Instructions	4-8
4.3.2 List of Instructions	4-8
5 CC-Link IE Field Operating Procedure	5-1
5.1 Network Configuration Setup Method (GX Works3 Setup)	5-2
5.2 Example of Operating Procedure after Power ON	5-7
5.2.1 Operation Flow	5-7
5.2.2 Operation Example	5-9
5.3 Checking Error Information	5-11
6 Specification and Dimensions	6-1
6.1. Specifications	6-2
6.2. Dimensions	6-4

7 Warranty	7-1
7.1 Important Information about Order and Use of This Product	7-2
8 Maintenance	8-1
8.1 Maintenance and Inspection	8-2
8.1.1 Maintenance Precautions	8-2
8.1.2 Main Inspection Items	8-2
9 Troubleshooting	9-1
9.1 Error Codes and Solutions	9-2
9.2 Indicators	9-4
9.3 Solutions to Problems	9-6

1 Before Using This Product

- 1.1 Safety Precautions 1-2
- 1.2 Handling Precautions 1-3
- 1.3 Terminology 1-5
- 1.4 Contents of Package 1-6
- 1.5 Name and Function of Each Component 1-7



1.1 Safety Precautions


1.1 Safety Precautions

Always observe

This section explains important rules that must be observed to prevent human injury and property damage.

- The hazards that may occur if the product is used incorrectly are described and classified by level of harm.







 WARNING	Risk of death or serious injury.
 CAUTION	Risk of minor injury or property damage.

 **WARNING**

- Never use this product as a sensing device for personnel protection.
- When using sensing devices for personnel protection, use products that meet the laws and standards for personnel protection that apply in each region or country, such as OSHA, ANSI and IEC.

1.2 Handling Precautions

■The following symbols are used to indicate safety information that must be observed.

	Indicates an action that is prohibited.
	Indicates an action that must be taken.
	Indicates a matter that requires caution.
 Information	Indicates supplemental information.
 Reference	Indicates reference to details about the subject in question.
 Caution	Indicates points to be noted when the product is operated.

Specifications

- This device has been developed / produced for industrial use only.
- Do not use this product outside the range of the specifications. Risk of an accident and product damage. There is also a risk of a noticeable reduction of service life.

Power

- Incorrect wiring damages the internal circuits, so check the wiring before turning on the power.
- Verify that fluctuations of power input supply voltage do not exceed the rating, including the connected devices.
- Note that there is a risk of damage and burning if a voltage greater than the rated voltage is applied or AC power is directly applied.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal is connected to an actual ground.
- Ensure that the power supply capacity is sufficient.
- Do not use this product during the initial transient time immediately after the power supply is switched ON.

When the product is ready to operate after the initial transient time is over, the remote ready flag is set during CC-Link IE Field network communication. Before using the product, always check the remote ready flag.

- For DC power supply, always use an isolation transformer. If an autotransformer is used, the main unit or power supply may become damaged.
- If surges occur in the power supply that is used, connect a surge absorber to the source of the surge occurrence to absorb surges.

1.2 Handling Precautions

Wiring

- Before wiring work, always turn the power OFF. Failure to do so may result in electric shock or damage.
- Take care that short-circuit of the load or wrong wiring may burn or damage the product.
- When noise generating devices (such as switching regulators and inverter motors) are used around this product, always ground the frame ground (F.G.) terminal of each device separately.
- To prevent electric shock and malfunction, ground the ground terminal (F.G.) of the product. Moreover, make the wiring as short as possible.
- Do not wire in parallel with a high-voltage line or power line, or run through the same conduit. Doing so may result in malfunctioning due to induction.
- Use Ethernet cables compatible with CC-Link IE Field networks.
- Do not apply stress such as excessive bending or pulling to the connector base of each cable such as the Ethernet cable, IO-Link connection cable, and power cable. Doing so may result in malfunctioning due to damage or connection failure.
- Consider grounding the devices on the master side of the CC-Link IE Field network, depending on the noise situation.
- For detailed connection specifications, refer to the CC-Link IE Field Network Cable Installation Manual published by the CC-Link Partner Association.

Usage environment

- This product is suitable for indoor use only.
- Avoid using the product in steamy or dusty locations or other similar locations.
- Avoid using the product in atmospheres that contain corrosive or other harmful gases.
- Ensure that the product does not come into contact with organic solvents such as thinner.
- Ensure that the product does not come into contact with strong acid or alkaline.
- Ensure that the product does not come into contact with oils or fats.
- This product cannot be used in an environment that contains flammable or explosive gases.
- Performance may not be satisfactory in a strong electromagnetic field.
- Do not drop the product or otherwise subject to shock. Doing so may result in failure.

Other matters

- Never attempt to disassemble, repair, or modify the product.
- When the product becomes unusable or unneeded, dispose the product appropriately as industrial waste.
- Design the system so that protection and safety circuits for protecting the system from problems are located outside.

1.3 Terminology

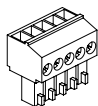
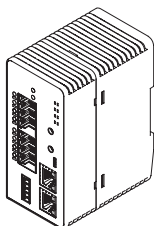
	Term	Description
System terms	CC-Link IE Field network	A high-speed and large-capacity open field network using Ethernet (1000BASE-T).
	IO-Link	A digital communications protocol that connects the controller to sensors or actuators.
	Transient transmission	A function that uses the read/write instructions of the program at the local station to read and write data from/to remote stations and communicate with remote stations via peripheral devices in the data link layer.
	Cyclic transmission	A function that periodically exchanges data between stations on the same network in the data link layer.
	Memory map	A memory map where the functions of this product are allocated to link devices. The master station can use the functions of this product by accessing the link devices allocated on the memory map.
	Network number	A unique number that is assigned to identify each network when multiple networks are created. The same network number cannot be set among all networks.
	Station number	A unique number that is assigned to identify each network unit that is connected to a network. Duplicate station numbers cannot be set within the same network.
	RX[*]	Remote input. Bit-based information that is input from a slave station to the master station. [*]: Indicates a bit number in hexadecimal notation.
	RY[*]	Remote output. Bit-based information that is output from the master station to a slave station. [*]: Indicates a bit number in hexadecimal notation.
	RWw[*]	Remote register (output). Word-based (16-bit) information that is output from the master station to a slave station. [*]: Indicates a word number in hexadecimal notation.
Unit names	RWr[*]	Remote register (input). Word-based (16-bit) information that is input from a slave station to the master station. [*]: Indicates a word number in hexadecimal notation.
	Master station	A station that controls the entire network. This station can perform cyclic transmission and transient transmission to all stations.
	Slave station	A generic name of all stations other than master stations (local stations, remote I/O stations, remote device stations, and intelligent device stations).
	Intelligent device station	A station that cyclically transmits bit-based I/O signals and word-based I/O data to the master station. This station returns responses to transient transmission requests from remote stations.
	IO-Link master	Plays a role as a gateway to receive data transmitted from IO-Link devices and send it to the systems connected to high-level buses.
	IO-Link devices	Performs one-to-one and point-to-point IO-Link communications with the IO-Link master.
	Ethernet cable	A cable recommended by the CC-Link Partner Association. Category 5e or higher Ethernet cables that satisfy the 1000BASE-T standard(Double shielded twisted pair cable or straight cable).
Other	End plate or commercially available fitting	Used to secure on a DIN rail.
	H**	Hexadecimal notation. **: Indicates a number.

1.4 Contents of Package

1.4 Contents of Package

The following items are included in the product package. Before using the product, make sure that no items are missing.

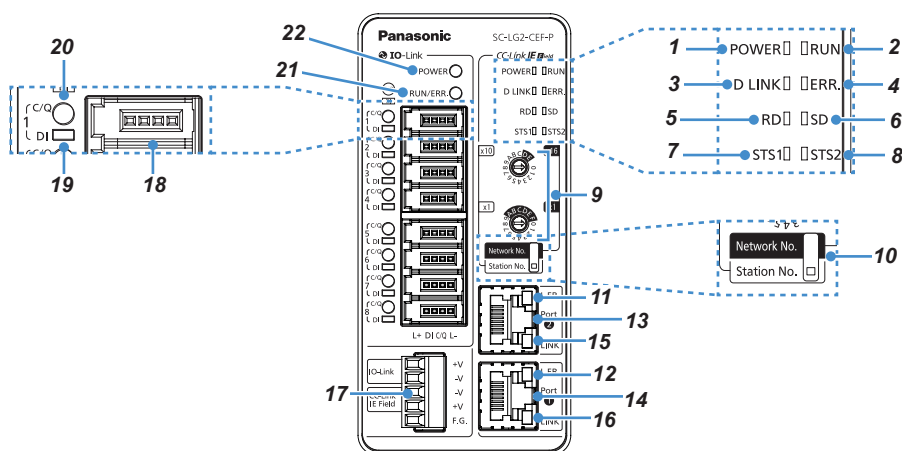
- ◆ Main unit: 1 pc.
- ◆ Power supply connector: 1 pc.
- ◆ Instruction manual



- ◆ General Information for Safety, Compliance, and Instructions

1.5 Name and Function of Each Component

1.5 Name and Function of Each Component



	Name	Function
1	POWER (Green)	Indicates the power supply status of CC-Link IE Field. Lit: Power ON Unlit: Power OFF
2	RUN (Green)	Indicates the operating status of CC-Link IE Field. Lit: While CC-Link IE Field is operating normally Unlit: When a CC-Link IE Field error occurs
3	D LINK (Green)	Indicates the data link status of CC-Link IE Field. Lit: During data link operation (when cyclic transmission is executed) Flashing: During data link operation (when cyclic transmission is stopped) Unlit: When data link is not operated (during disconnection)
4	ERR. (Red)	Indicates the error status of CC-Link IE Field. Lit: When a CC-Link IE Field communication error occurs Flashing: When the setting of the station No./network No. setting switch or mode setting switch is changed after the power supply is turned ON (If a station number is changed after the power supply is turned ON, the change will not be reflected.) Unlit: While CC-Link IE Field is operating normally
5	RD (Green)	Indicates the data reception status of CC-Link IE Field communication. Lit: While CC-Link IE Field data is being received Unlit: When no CC-Link IE Field data is received
6	SD (Green)	Indicates the data transmission status of CC-Link IE Field communication. Lit: While CC-Link IE Field data is being sent Unlit: While no CC-Link IE Field data is sent
7	STS1 (Green)	The behavior is switched by the mode set with the mode setting switch. • Normal mode Lit: While the system is operating normally Unlit: When a system error occurs • Network No. setting mode Lit: When network No. setting is completed Flashing: When the system is started in network No. setting mode (when preparation for network No. setting is completed)
8	STS2 (Red)	The behavior is switched by the mode set with the mode setting switch. • Normal mode Lit: When a system error occurs Unlit: While the system is operating normally • Network No. setting mode Lit: When an out-of-range network number is set Unlit: When network No. setting mode is running normally

1.5 Name and Function of Each Component

Name			Function		
9	Station No./network No. setting switch		Rotary switch for setting a station number or network number. [Factory settings: Station No. 1, Network No. 1] The function is switched by the operation mode set with the mode setting switch.		
10	Mode setting switch		Sets the operation mode. [Factory setting: Normal mode]		
			Switch setting	Operation mode	
			Network No.	Network No. setting mode	
		Station No.	Normal mode		
11	Port 2 L ER indicator (Yellow)		Lit: When abnormal data is received during CC-Link IE Field communication. Unlit: When normal data is received during CC-Link IE Field communication.		
12	Port 1 L ER indicator (Yellow)				
13	CC-Link IE Field Port 2		RJ45 connector for CC-Link IE Field connection.		
14	CC-Link IE Field Port 1		There are no restrictions on the order of Port 1 and Port 2 wiring.		
15	Port 2 LINK indicator (Green)		Lit: During link-up Unlit: During link-down		
16	Port 1 LINK indicator (Green)				
17	Power supply connector		Supplies power		
			Pin name		Function
			IO-Link	+V	24-V power input terminal for IO-Link system
				-V	0-V power input terminal for IO-Link system
			CC-Link IE Field	-V	0-V power input terminal for CC-Link IE Field system
				+V	24-V power input terminal for CC-Link IE Field system
F.G.		Ground terminal			
18	IO-Link port (x 8)		Pin name	Function	
			L+	Device power supply +V	
			DI	Digital input (only PNP output type is supported)	
			C/Q	IO-Link mode	IO-Link communication signal
				SIO mode	• Digital input (only PNP output type is supported) • Digital output (push-pull type)
			L-	Device power supply 0 V	
19	DI indicator (x 8) (Orange)		Indicates the status of digital input (DI). (Note) Lit: When HI level is detected Unlit: When LO level is detected		
20	C/Q indicator (x8) (Green/Red/Orange)		Indicates the status of IO-Link port. The behavior is switched according to C/Q settings. (Note) • IO-Link mode Lit in green: While IO-Link communication is in progress Flashing in green: When no IO-Link device is connected Lit in red: When there is a port error Flashing in red: When there is an IO-Link communication error • SIO mode • Digital input setting Lit in orange: When HI level is detected Unlit: When LO level is detected Lit in red: When there is a port error • Digital output setting Lit in orange: When HI level is output Unlit: When LO level is output Lit in red: When there is a port error		
21	IO-Link operation indicator	RUN/ERR. (Green/Red)	Indicates the operating status of IO-Link. Lit in green: While IO-Link is running normally Lit in red: When an IO-Link error occurs		
22		POWER (Green/Red)	Indicates the power supply status of IO-Link. Lit in green: When IO-Link power supply voltage is normal Lit in red: When IO-Link power supply voltage drops below the warning level (18V or lower) Unlit: When IO-Link power supply is OFF (11V or lower)		

1.5 Name and Function of Each Component

Note : Operation settings for digital I/O (C/Q) and digital input (DI) must be configured with CC-Link IE Field. If operation settings are not configured, they will not operate.
Setting the port for digital I/O (C/Q) enables the operation to be switched to "IO-Link communication terminal", "SIO mode digital input", or "SIO mode digital output".

Reference

- For details on how to set network and station numbers for CC-Link IE Field, refer to “**3.3.2 Setting Up the SC-LG2-CEF-P**”.
- For details on how to configure operation settings for CC-Link IE Field, refer to “**4.3 Dedicated Instructions**”.

(MEMO)

2 System Configuration

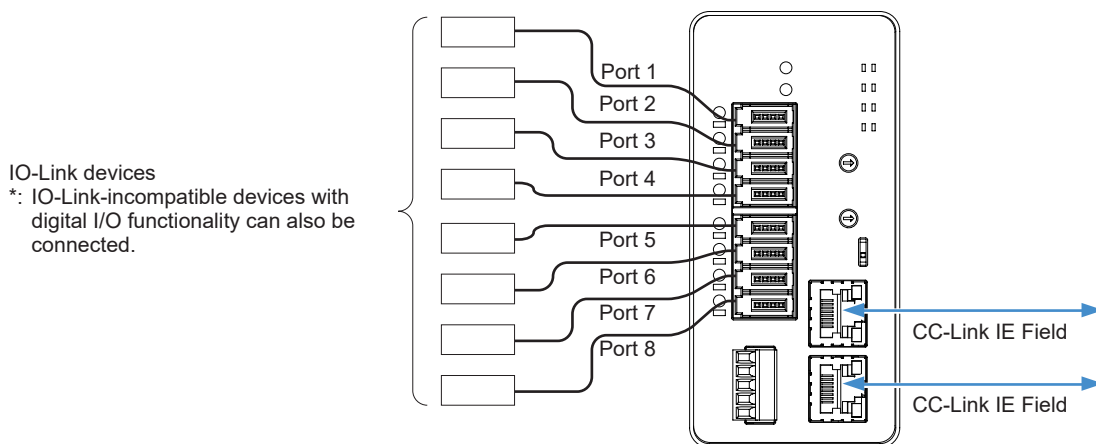
2.1 System Configuration of This Product.....	2-2
2.2 Internal Circuits of This Product.....	2-3
2.3 IO-Link-compatible Devices	2-4

2.1 System Configuration of This Product

2.1 System Configuration of This Product

When connected to IO-Link-compatible devices, this product can collect measurement data and set and get parameter values via CC-Link IE Field network communication.

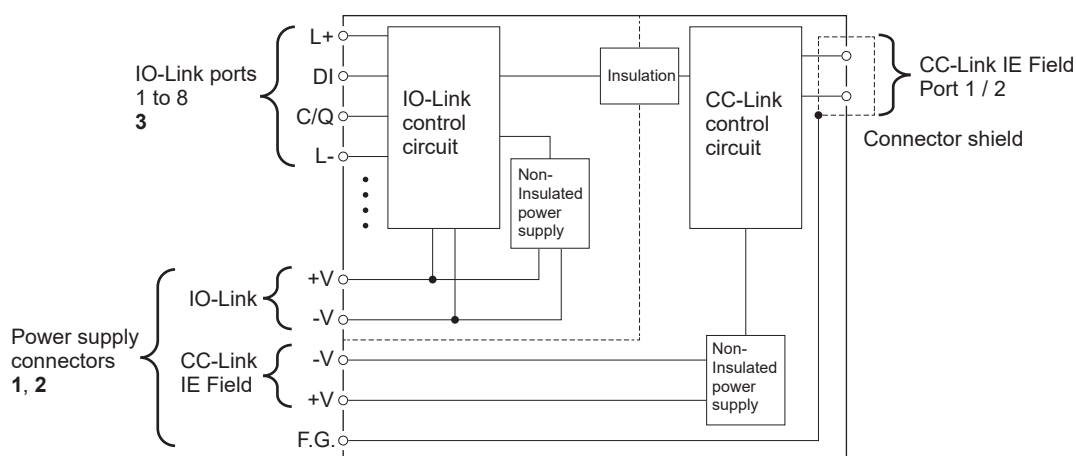
This product can also connect to IO-Link-incompatible devices equipped with digital I/O functionality (ON/OFF signals). It can get the input states of ON/OFF signals for IO-Link-incompatible devices via CC-Link IE Field network communication and output ON/OFF signals to IO-Link-incompatible devices.



Information

Non-Panasonic products can also be connected as IO-Link-compatible devices or IO-Link-incompatible devices.

2.2 Internal Circuits of This Product



1. In this product, the power supply of the CC-Link IE Field system and the power supply of the IO-Link system are separated so that the power supplies can be used separately for CC-Link IE Field on the higher-level communication side and IO-Link on the lower-level communication side.

Because the power supply is separated, even if an error occurs on the lower-level communication side and causes the power supply to turn OFF, the occurrence of the power supply error on the lower-level communication side can be checked on the higher-level communication side.

If there is no need to separate the power supply for the CC-Link IE Field system and the power supply for the IO-Link system, supply electric power to the power input terminal of each system from the same power supply.

2. The frame ground terminal is internally connected to the shield of the RJ45 connector for CC-Link IE Field.

To prevent electric shock and malfunction due to noise, ground the frame ground terminal.

3. Signals to IO-Link ports "device power supply (L+ and L-)", "digital I/O (C/Q)", and "digital input (DI)" are supplied from IO-Link +V and -V on the power supply connector.

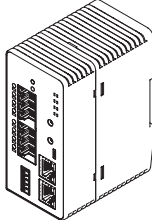
Caution

- Make sure that the total of the current used by the IO-Link ports and the current consumed by IO-Link does not exceed 3 A (between +V and -V of IO-Link).
- The current values of IO-Link ports "device power supply (L+ and L-)", "digital I/O (C/Q)", and "digital input (DI)" must also be within their respective specification ranges.

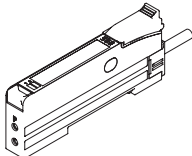
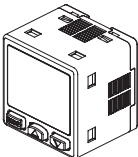
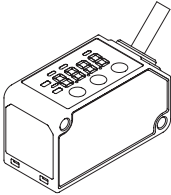
2.3 IO-Link-compatible Devices

2.3 IO-Link-compatible Devices

This product

Product name	Appearance	Model
IO-Link Master Unit for CC-Link IE Field		SC-LG2-CEF-P

IO-Link-compatible devices

Series	Type		Appearance	Model	Output
Digital Fiber Sensor FX-550L series	Discrete wire type			FX-551L3-P-C2	PNP open-collector transistor
Dual Display Digital Pressure Sensor [For Gas] DP-100L series	Discrete wire cable attachment type	For low pressure		DP-101ZL3-M-P	
		For high pressure		DP-102ZL3-M-P	
CMOS type Micro Laser Distance Sensor HG-C1000L series	Discrete wire type	Measurement center 30mm type		HG-C1030L3-P	
		Measurement center 50mm type		HG-C1050L3-P	
		Measurement center 100mm type		HG-C1100L3-P	
		Measurement center 200mm type		HG-C1200L3-P	
		Measurement center 400mm type		HG-C1400L3-P	

3 Installation and Setup

3.1 Preparation for Operation	3-2
3.2 Installation	3-3
3.2.1 Mounting and Removing the SC-LG2-CEF-P	3-3
3.2.2 Wiring Simple Wire-Press Connector CN-EP □ (Option)	3-4
3.2.3 Installing and Removing the SC-LG2-CEF-P and IO-Link Devices	3-6
3.2.4 Connecting and Disconnecting the Power Supply Connector	3-7
3.2.5 Connecting and Disconnecting the Ethernet Cable	3-10
3.3 Setup	3-12
3.3.1 Relationship between Network Number and Station Number	3-12
3.3.2 Setting Up the SC-LG2-CEF-P	3-13

3.1 Preparation for Operation

3.1 Preparation for Operation

The procedure up to operation is shown below.

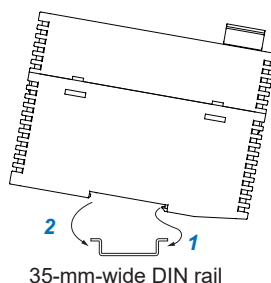
Check column		Reference section
<input type="checkbox"/>	<div>Mounting the unit</div> <div>Mount this product on a DIN rail according to the system configuration.</div>	"3.2.1 Mounting and Removing the SC-LG2-CEF-P"
<input type="checkbox"/>	<div>Connecting IO-Link devices</div> <div>Connect IO-Link devices to this product.</div>	"3.2.2 Wiring Simple Wire-Press Connector CN-EP□ (Option)" "3.2.3 Installing and Removing the SC-LG2-CEF-P and IO-Link Devices"
<input type="checkbox"/>	<div>Connecting the power cable</div> <div>Connect the power supply to this product.</div>	"3.2.4 Connecting and Disconnecting the Power Supply Connector"
<input type="checkbox"/>	<div>Setting a network number</div> <div>Set a network number for this product according to the setup method.</div>	"3.3.1 Relationship between Network Number and Station Number" "3.3.2 Setting Up the SC-LG2-CEF-P"
<input type="checkbox"/>	<div>Setting a station number</div> <div>Set a station number for this product according to the setup method.</div>	"3.3.1 Relationship between Network Number and Station Number" "3.3.2 Setting Up the SC-LG2-CEF-P"
<input type="checkbox"/>	<div>Connecting the Ethernet cable</div> <div>Connect the Ethernet cable to this product.</div>	"3.2.5 Connecting and Disconnecting the Ethernet Cable"
<input type="checkbox"/>	<div>Setting up network parameters</div> <div>Connect the configuration tool to the master station of the CC-Link IE field network and set up each parameter.</div>	"5.1 Network Configuration Setup Method (GX Works3 Setup)"
<input type="checkbox"/>	<div>Programming</div> <div>Create a program that enables the master station to control the IO-Link devices connected to this product.</div>	"4 CC-Link IE Field Network Communication"

3.2 Installation

3.2.1 Mounting and Removing the SC-LG2-CEF-P

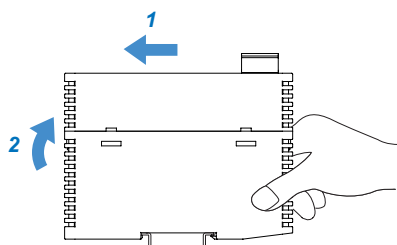
- **Mounting on a DIN rail**

1. Hook the rear of the mounting part onto the 35-mm-wide DIN rail.
2. While pressing down on the rear of the mounting part, insert the front of the mounting part into the DIN rail.



- **Removing from a DIN rail**

1. Grasp the product and push forward.
2. Lifting the front of the product removes it from the DIN rail.



Caution

If you attempt to lift the front without pushing the product forward, you will break the hook on the rear of the mounting part.

3.2 Installation

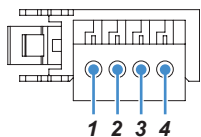
3.2.2 Wiring Simple Wire-Press Connector CN-EP□ (Option)

- ⊘

 - Do not pull the connector or cable forcefully. Doing so may damage the connector or break the wires.
 - Do not apply any stress (such as excessive bending or pulling) to the wires near the portion where the wires are inserted into the connector.
 - Do not use any tools (such as pliers) to extract wires from the connector.
 - Firmly hold the connector when performing wiring work. Do not forcibly push wires into the connector. Doing so may result in injury.
 - Do not reuse any connectors that have been wire-pressed once. The performance of re-used wire-pressed connectors cannot be guaranteed.
- !

 - Before wiring work, always turn the power OFF.
 - Insert a single wire into each insertion hole. Inserting two or more wires into an insertion hole may result in problems.
 - Make sure that there is no short circuit due to protruding wires or for some other reason.

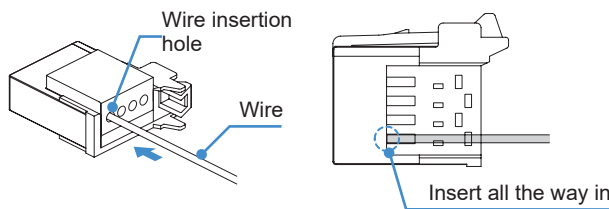
• Pin assignment diagram of simple wire-press connector CN-EP□ (option)



Pin name		Function
1	L+	Device power supply +V
2	DI	Digital input (only PNP output type is supported)
3	C/Q	IO-Link mode
		IO-Link communication signal
		SIO mode
		Digital input (only PNP output type is supported)
		Digital output (push-pull type)
4	L-	Device power supply 0 V

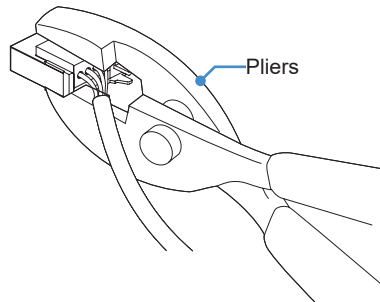
• Wiring simple wire-press connector CN-EP□ (option)

1. Insert the wire into the wire insertion hole in the connector until the tip of the wire reaches the end of the hole.



- Notes: 1) Do not remove the insulation of the wire
2) Check the pin layout of the connection destination and then perform wiring correctly.

2. Crimp the connector with pliers or other similar tools.

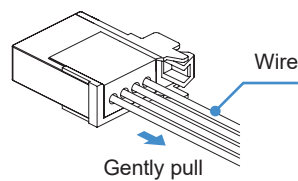


Notes: 1) Be sure to position the mouth of the pliers in parallel to the connector from the direction indicated in the figure above and then crimp the connector.
2) Crimp the connector while taking care not to allow any wires to come off.

Caution

When crimping the connector, take care not to scratch any wires with the pliers.

3. Pull on the wire gently to ensure that it does not come out.



3.2 Installation

3.2.3 Installing and Removing the SC-LG2-CEF-P and IO-Link Devices

This product can connect up to eight devices.

For the connectors for connecting devices to this product, purchase simple wire-press connector (e-CON) **CN-EP2** (5-piece set) or **CN-EP3** (5-piece set) or the recommended product shown later in this manual.



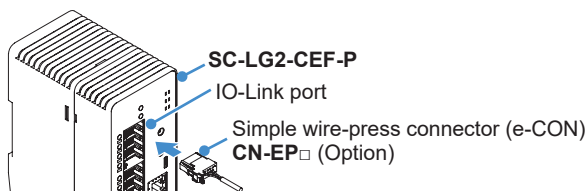
- Do not use the connector with the lock release lever broken. Doing so may cause the connector to come off or result in malfunctioning.



- The communication distance must be within the specified range.
- The connector does not have a waterproof structure.

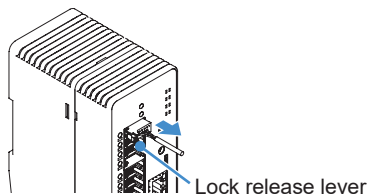
• Mounting simple wire-press connectors (e-CON)

1. Insert a simple wire-press connector (e-CON) into the IO-Link port of this product until it snaps in.



• Removing simple wire-press connectors (e-CON)

1. While holding down the lock release lever on the simple wire-press connector (e-CON), extract the connector from this product.



Caution

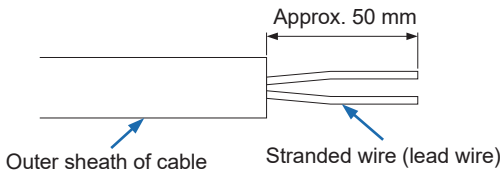
Be sure to hold down the lock release lever when extracting the simple wire-press connector (e-CON) from this product. Extracting the simple wire-press connector (e-CON) without holding down the lock release lever may damage the connector or break the cable.

3.2.4 Connecting and Disconnecting the Power Supply Connector

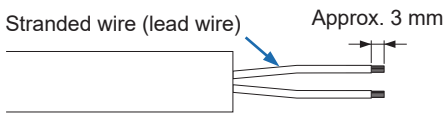
Solid wires or stranded wires (lead wires) with a cross-sectional area of 0.2 to 1.3 mm² (AWG24 to 16) are recommended.

• Cable treatment method

1. Peel off the sheath from the cable as shown in the figure below.

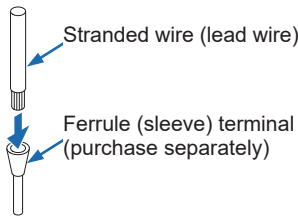


2. Peel off the sheath from the stranded wires (lead wires) as shown in the figure below.

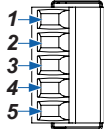


<Reference>

A ferrule (sleeve) terminal (to be prepared separately) may be used for each stranded wire (lead wire).



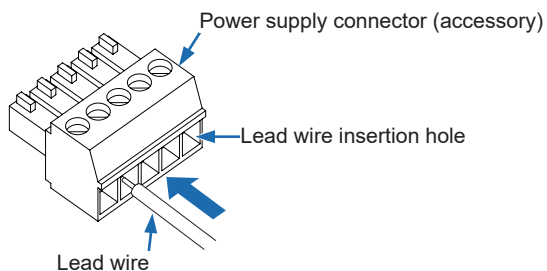
• Pin assignment diagram for the power supply connector

	Pin name	Function
	1	+V 24-V power input terminal for IO-Link
	2	-V 0-V power input terminal for IO-Link
	3	-V 0-V power input terminal for CC-Link IE Field
	4	+V 24-V power input terminal for CC-Link IE Field
	5	F.G. Ground terminal

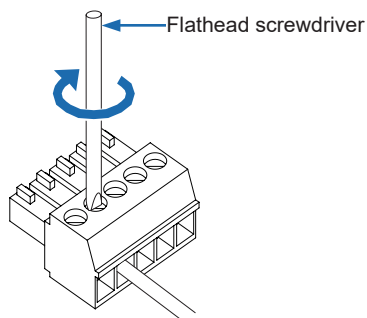
3.2 Installation

■ Connecting to the power supply connector

1. Insert the stranded wire (lead wire) all the way into the connection hole.



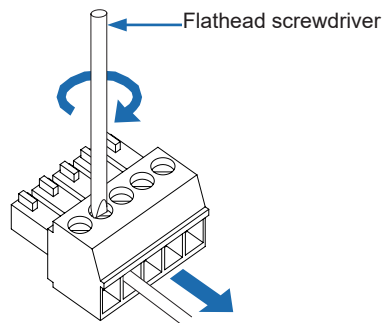
2. Tighten the screws of the power supply connector clockwise, using a flathead screwdriver (blade width 0.4 x 2.5mm). (Tightening torque: 0.22 to 0.25N·m)



3. When inserted correctly, the wire is locked. Confirm that the wire does not come out by pulling it. Take care not to pull with excessive force, as the wire may break.

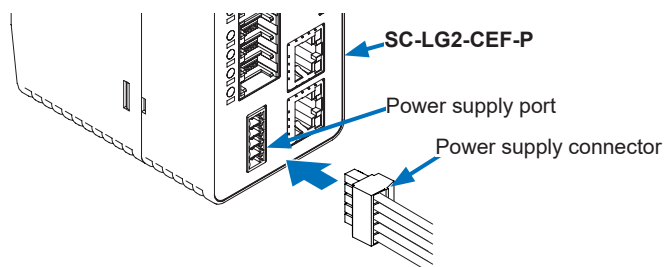
■ Disconnecting from the power supply connector

To disconnect the stranded wire (lead wire), loosen the screws of the power supply connector counterclockwise, using a flathead screwdriver (blade width 0.4 x 2.5mm), and pull out the stranded wire (lead wire).



■ Attaching the power supply connector to this product

1. Insert the power supply connector into the power supply port of this product.



3.2 Installation

3.2.5 Connecting and Disconnecting the Ethernet Cable

• Connecting the Ethernet cable

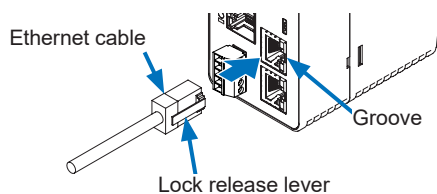


- For the Ethernet cable, use a cable recommended by the CC-Link Partner Association.
- The communication distance must be within the specified range.
- Always run the Ethernet cable through a duct or secure the cable with clamps. Failure to do so may affect the contact state of the connectors due to vibration or impact, resulting in malfunction.

▼ Reference

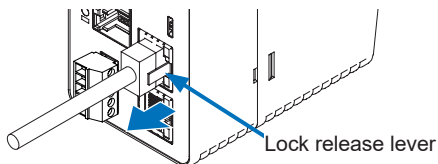
For detailed connection specifications of CC-Link IE Field, refer to the CC-Link IE Field Network Cable Installation Manual published by the CC-Link Partner Association.

1. Hold the connector of the Ethernet cable and align the lock release lever of the Ethernet cable with the groove in CC-Link IE Field Port 1 or Port 2.
2. Insert the connector until it snaps in.



• Disconnecting the Ethernet cable

1. Press on the lock release lever on the Ethernet cable and pull it out.



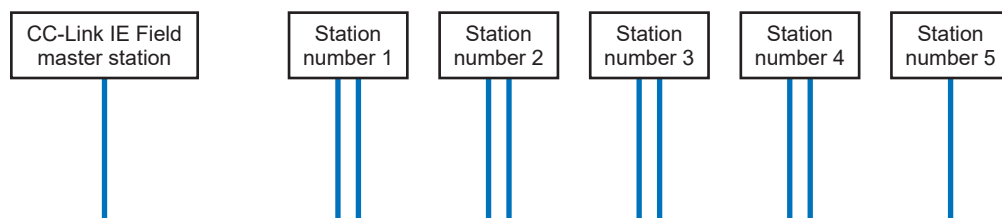
▶ Caution

Attempting to pull out the connector without pressing the lock release lever may break the lock release lever. Do not use an Ethernet cable whose lock release lever is broken. Do not grasp the cable to pull, as this may cause wire breakage in the cable.

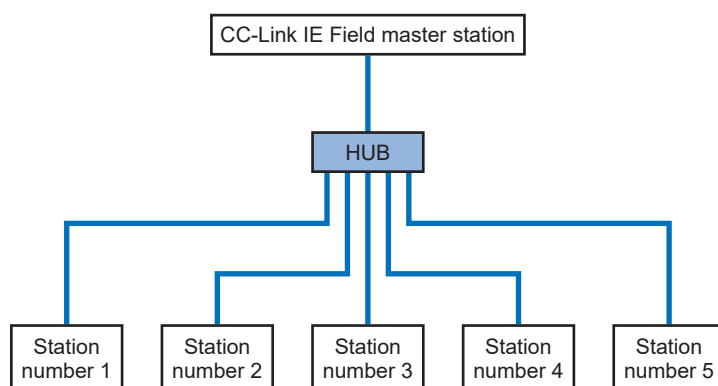
- **Network connection configuration for CC-Link IE Field**

The network connection configuration for CC-Link IE Field is classified into line, star, and ring types. Networks can also be configured by mixing the line and star types.

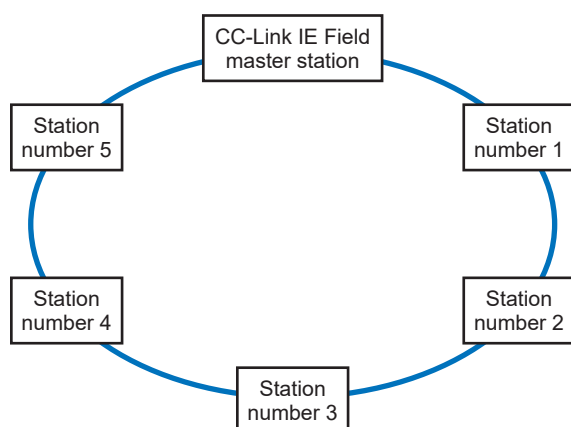
<Line type>



<Star type>



<Ring type>



3.3 Setup

3.3 Setup

3.3.1 Relationship between Network Number and Station Number



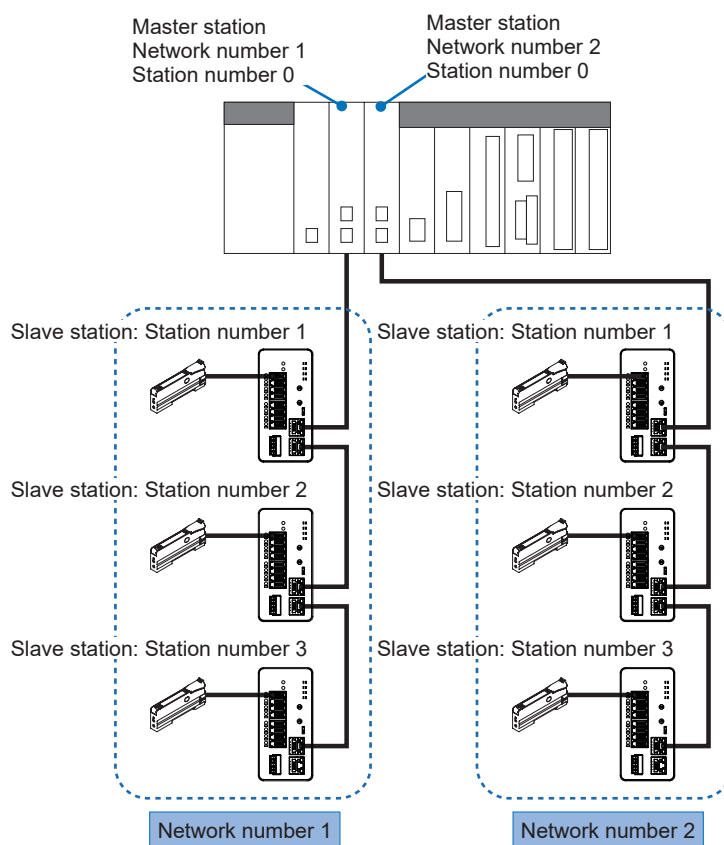
- Set the network number of each slave station to the same network number as the master station.
- Make sure that there is no duplication when setting station numbers.

Each CC-Link IE Field network is identified with their respective network numbers.
Network numbers can be set to any decimal number between 1 and 239.
Station numbers can be set to any decimal number between 1 and 120.

▼ Reference

For details, refer to the CC-Link IE Field Network Cable Installation Manual published by the CC-Link Partner Association.

<Network configuration example>



3.3.2 Setting Up the SC-LG2-CEF-P

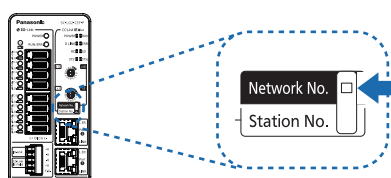
To connect this product to the CC-Link IE Field network, set a network number and station number. Always set a network number first and then a station number.

! After changing the settings, always turn the power OFF and then ON.

• Setting a network number

The network number is factory set to "1". Set the network number to the same network number as the master station to communicate with. Follow the procedure below to configure settings.

1. With the power turned OFF, set the mode setting switch to "Network No." to enable network No. setting mode.



2. Turn the power ON. Starting the unit flashes CC-Link IE Field operation indicator "STS1" (green).

STS1 indicator (Green)



3.3 Setup

- Use the station No./network No. setting switch to set the network number to the same network number as the master station.

The setting range for network numbers is 1 to 239 (decimal). (0 and 240 or higher cannot be set.)

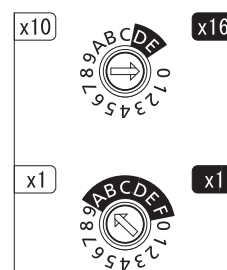
Set a network number that is converted to a hexadecimal number.

- The "x1" switch sets the first digit of the network number. 0 to F (hex) are valid.
- The "x16" switch sets the second digit of the network number. 0 to E (hex) are valid.

<Example 1>

To set to "10" (decimal), set to "0A" (hex).

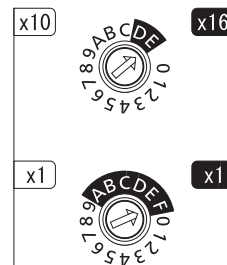
Station No./network No. setting switch



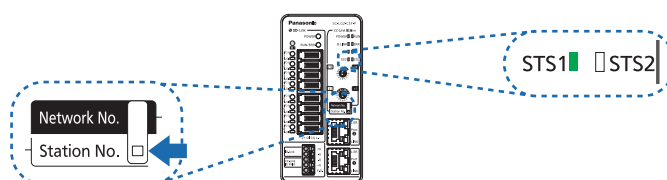
<Example 2>

To set to "239" (decimal), set to "EF" (hex).

Station No./network No. setting switch



- Set the mode setting switch to "Station No.". The network number will be written to this product. When the network number is saved in the product, CC-Link IE Field operation indicator "STS1" (green) stops flashing and remains lit. At this time, the network number is still not valid.



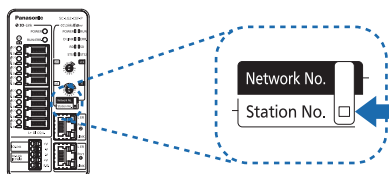
Note: If a network number outside the setting range is set, the network number will be handled as an error without being saved and the STS2 indicator (red) will light up. In such a case, start the procedure again from the beginning.

- Turn the power OFF. This completes the network number setting procedure and the set network number takes effect the next time the power is turned ON. Once a network number is saved in this product, it will be started by automatically using the network number when the power is turned ON. There is no need to set a network number every time.

• Setting a station number

Follow the procedure below to configure settings.

1. With the power turned OFF, set the mode setting switch to "Station No." to enable normal mode.



2. Set a station number with the station No./network No. setting switch. The setting range for station numbers is 1 to 120 (decimal). (0 and 121 or higher cannot be set.)

Unlike network number settings, station numbers are set as decimal numbers, but if a station number is set to a value between 100 and 120, A to C in the "x10" switch are used.

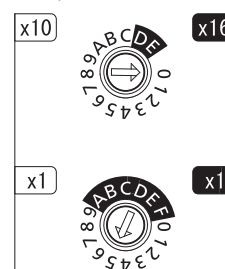
- The "x1" switch sets the first digit of the station number. 0 to 9 are valid.
- The "x10" switch sets the second and following digits of the station number. 0 to C are valid.

(A=10, B=11, C=12)

<Example 1>

To set to "5", set to "05".

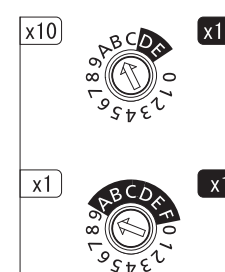
Station No./network No. setting switch



<Example 2>

To set to "119", set to "B9".

Station No. / Network No. setting switch



This completes the station number setting procedure.

Note: For station numbers, the value of the station No./network No. setting switch is set when the power is turned ON in normal mode.

After setting the station number, do not change the settings of the station No./network No. setting switch.

3. If the power is turned ON with the mode setting switch set to normal mode, CC-Link IE Field network communication will be started with the network number and station number that have been set.

(MEMO)

4 CC-Link IE Field Network Communication

4.1 Communication Overview	4-2
4.2 Memory Map	4-3
4.2.1 Remote Input RX	4-3
4.2.2 Remote Register RWr	4-5
4.2.3 Remote Output RY	4-6
4.2.4 Remote Register RWw	4-7
4.3 Dedicated Instructions	4-8
4.3.1 Specifications of Dedicated Instructions	4-8
4.3.2 List of Instructions	4-8

4.1 Communication Overview

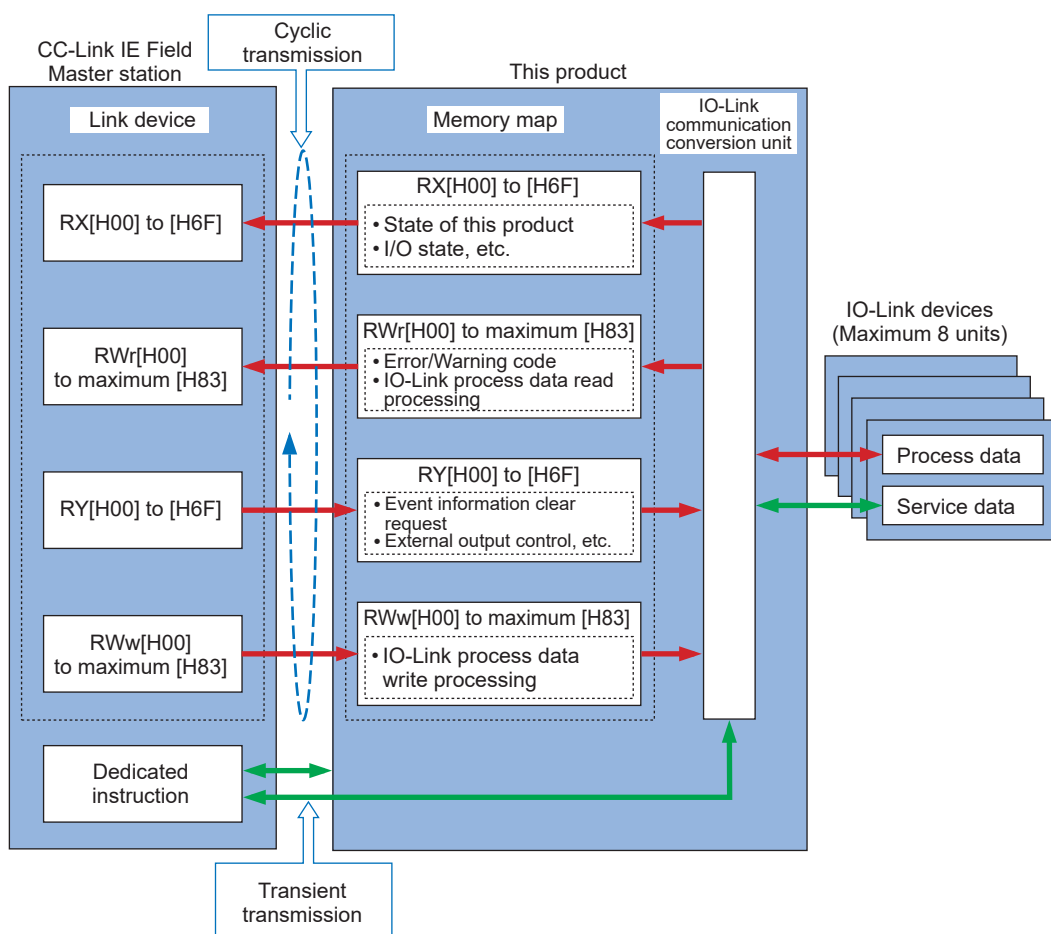
4.1 Communication Overview

- Process data for IO-Link devices is updated at the master station via cyclic transmission. Cyclic transmission exchanges data using link devices. Link devices are classified into the following four types: remote input RX, remote output RY, remote register RWr, and remote register RWw.

Reference

For the relationship between the functions of this product and the allocation of link devices, refer to “4.2 Memory Map”.

- Transient transmission is used to set up service data of IO-Link devices and this product. Transient transmission uses dedicated instructions.



4.2 Memory Map

4.2.1 Remote Input RX

Remote input RX is a read-only register that is used to input bit-based data to the master station from this product.

No value can be written to this register.

<Remote input RX>

RX	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+00	Unused				System area					Unused						
					Re- mote ready	Error flag	Unused		Warn- ing flag							
+10	External input															
	Port8		Port7		Port6		Port5		Port4		Port3		Port2		Port1	
	DI	C/Q	DI	C/Q	DI	C/Q	DI	C/Q	DI	C/Q	DI	C/Q	DI	C/Q	DI	C/Q
+20	Digital I/O C/Q short-circuit detection															
	Port8		Port7		Port6		Port5		Port4		Port3		Port2		Port1	
	Un- used	C/Q	Un- used	C/Q	Un- used	C/Q	Un- used	C/Q	Un- used	C/Q	Un- used	C/Q	Un- used	C/Q	Un- used	C/Q
	Unused							Power sup- ply voltage anomaly detection		Device power supply L+ short-circuit detection						
11V or less								18V or less	Port8							
+40	IO-Link event flag notification								IO-Link mode in process							
	Port8	Port7	Port6	Port5	Port4	Port3	Port2	Port1	Port8	Port7	Port6	Port5	Port4	Port3	Port2	Port1
+50	Unused								IO-Link process data enabled flag							
Port8									Port7	Port6	Port5	Port4	Port3	Port2	Port1	
+60	Unused								IO-Link validation error flag							
									Port8	Port7	Port6	Port5	Port4	Port3	Port2	Port1

<Details of each setting>

	Name	Device No.	Description
System area	Warning flag	RX[+07]	This bit turns ON when an operation-continuable minor error occurs. "Remote ready" does not turn OFF when a minor error occurs. This bit turns OFF when the cause of the minor error is eliminated.
	Error flag	RX[+0A]	When an operation-non-continuable moderate or fatal error occurs, "Remote ready" turns OFF and this bit turns ON. Once this bit turns ON, the ON state is held.
	Remote ready	RX[+0B]	This bit turns ON when a data link is normally established with the device and the device is ready to operate correctly in response to a request to the local station. This bit turns OFF when the device is not ready to operate correctly in response to a request to the local station.
External input		RX[+10 to +1F]	This bit turns ON when the input voltage of C/Q or DI is HI. This bit turns OFF when the input voltage of C/Q or DI is LO. For C/Q, this bit takes effect only when Port Mode is set to SIO mode input. For DI, this bit takes effect when Port Mode is enabled.

4.2 Memory Map

Name		Device No.	Description
Digital I/O C/Q short-circuit detection (Note)		RX[+20 to +2F] Only even-numbered bits are used	This bit turns ON when digital I/O C/Q is in a short-circuit state. This bit turns OFF when C/Q is released from a short-circuit state.
Device power supply L+ short-circuit detection		RX[+30 to +37]	This bit turns ON when short-circuit protection for device power supply L+ is activated. Once this bit turns ON, the ON state is held. L+ for which short-circuit protection has been activated cannot be reset until the power supply is restarted.
Power supply voltage anomaly detection	Voltage: 18V or less	RX[+38]	This bit turns ON when the voltage of the IO-Link power supply is 18V or less. This bit turns OFF when the voltage of the IO-Link power supply exceeds 18V.
	Voltage: 11V or less	RX[+39]	This bit turns ON when the voltage of the IO-Link power supply is 11V or less. This bit turns OFF when the voltage of the IO-Link power supply exceeds 11V.
IO-Link mode in process		RX[+40 to +47]	This bit is ON when IO-Link mode is running. This bit is OFF when any mode other than IO-Link mode is running.
IO-Link event flag notification		RX[+48 to +4F]	This bit turns ON when an event occurs in an IO-Link device. This bit turns OFF when an IO-Link event clear request (RY[+38 to +3F]) is set or an event that has occurred is read.
IO-Link process data valid flag		RX[+50 to +57]	This bit turns ON when process data received from an IO-Link device is valid. This bit turns OFF when process data received from an IO-Link device is invalid or any mode other than IO-Link mode is set.
IO-Link validation error flag		RX[+60 to +67]	This bit turns ON if the connected IO-Link device does not match the Vendor ID, Device ID, or IO-Link version registered with the Validation & Backup function when the Validation & Backup function is enabled. This bit turns OFF when the Validation & Backup is disabled, the connected IO-Link device matches the above registered information, or any mode other than IO-Link mode is set.

*1: The value of each unused area is indeterminate.

Note: C/Q short-circuit detection is enabled only when C/Q is set to SIO mode output.

Reference

For digital I/O (C/Q) and digital input (DI), Port Mode must be set as a dedicated instruction. Unless Port Mode is set, digital I/O (C/Q) and digital input (DI) will not operate. For details on how to set Port Mode, refer to “**4.3 Dedicated Instructions**”.

4.2.2 Remote Register RWr

Remote register RWr is a read-only register that is used to input word-based (16-bit) data to the master station from this product.

No value can be written to this register.

The size of the memory map and the process data starting address of each port change according to the setting of the process data length.

<Remote register RWr>

RWr	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	Error code															
+1	Warning code															
+2	Unused															
+3	Unused															
+4 to +(4+N1/2-1)	[Port 1] IO-Link process data input															
+(L+1) to +[(L+1)+N2/2-1]	[Port 2] IO-Link process data input															
+(L+1) to +[(L+1)+N3/2-1]	[Port 3] IO-Link process data input															
+(L+1) to +[(L+1)+N4/2-1]	[Port 4] IO-Link process data input															
+(L+1) to +[(L+1)+N5/2-1]	[Port 5] IO-Link process data input															
+(L+1) to +[(L+1)+N6/2-1]	[Port 6] IO-Link process data input															
+(L+1) to +[(L+1)+N7/2-1]	[Port 7] IO-Link process data input															
+(L+1) to +[(L+1)+N8/2-1]	[Port 8] IO-Link process data input															

L: Ending address of process data at the previous port

N1 to N8: Process data length at each port (in bytes)

Digits after the decimal point are round up to the nearest integer.

<Details of each setting>

Name	Device No.	Description
Error code	RWr[+0]	An error code is stored when the error state flag (RX[+0A]) turns ON. The error code is retained.
Warning code	RWr[+1]	A warning code is stored when the warning state flag (RX[+07]) turns ON. A warning code is cleared when the warning state flag (RX[+07]) turns OFF.
[Ports 1 to 8] IO-Link process data input	RWr[+4 to +{(L+1)+N8/2-1}]	Process data for the IO-Link device connected to each port is stored. The size of the memory map and the process data starting address of each port change according to the setting of Process Data Size.

*1: The value of each unused area is indeterminate.

▼ Reference

Process Data Size must be set as a dedicated instruction. For details on how to set Process Data Size, refer to “**4.3 Dedicated Instructions**”.

4.2 Memory Map

4.2.3 Remote Output RY

Remote Output RY is a write-only register that is used to output bit-based data to this product from the master station.

This register is rewritten when data is written to the link device of the master station.

<Remote output RY>

RY	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+00	Unused															
+10	External output															
	Port8		Port7		Port6		Port5		Port4		Port3		Port2		Port1	
	Un-used	C/Q	Un-used	C/Q	Un-used	C/Q	Un-used	C/Q	Un-used	C/Q	Un-used	C/Q	Un-used	C/Q	Un-used	C/Q
+20	Unused															
+30	IO-Link event flag clear request								Unused							
	Port8	Port7	Port6	Port5	Port4	Port3	Port2	Port1								
+40	Unused															
+50	Unused															
+60	Unused															

<Details of each setting>

Name	Device No.	Description
External output	RY[+10 to +1F] Only even-numbered bits are used	This bit turns ON when the output voltage of C/Q is set to HI. This bit turns OFF when the output voltage of C/Q is set to LO. Before this bit is manipulated, Port Mode of C/Q must be set to SIO mode output.
IO-Link event flag clear request	RY[+38 to +3F]	This bit turns ON when IO-Link event flag notification (RX[+48 to +4F]) is cleared. This bit turns OFF when IO-Link event flag notification (RX[+48 to +4F]) is not cleared.

*1: If data must be written to an unused area, set the bit to OFF.

▼ Reference

For digital I/O (C/Q), Port Mode must be set as a dedicated instruction. Unless Port Mode is set, digital I/O (C/Q) will not operate. For details on how to set Port Mode, refer to “**4.3 Dedicated Instructions**”.

4.2.4 Remote Register RWw

Remote register RWw is a write-only register that is used to output word-based (16-bit) data to this product from the master station.

This register is rewritten when data is written to the link device of the master station.

The size of the memory map and the process data starting address of each port change according to the setting of the process data length.

<Remote register RWw>

RWw	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	Unused															
+1	Unused															
+2	Unused															
+3	Unused															
+4 to +(4+N1/2-1)	[Port 1] IO-Link process data output															
+(L+1) to +[(L+1)+N2/2-1]	[Port 2] IO-Link process data output															
+(L+1) to +[(L+1)+N3/2-1]	[Port 3] IO-Link process data output															
+(L+1) to +[(L+1)+N4/2-1]	[Port 4] IO-Link process data output															
+(L+1) to +[(L+1)+N5/2-1]	[Port 5] IO-Link process data output															
+(L+1) to +[(L+1)+N6/2-1]	[Port 6] IO-Link process data output															
+(L+1) to +[(L+1)+N7/2-1]	[Port 7] IO-Link process data output															
+(L+1) to +[(L+1)+N8/2-1]	[Port 8] IO-Link process data output															

L: Ending address of process data at the previous port

N1 to N8: Process data length at each port (in bytes)

Digits after the decimal point are round up to the nearest integer.

<Details of each setting>

Name	Device No.	Description
[Ports 1 to 8] IO-Link process data output	RWw[+4 to +[(L+1)+N8/2-1]]	A value is written to this register when process data for an IO-Link device is manipulated. The size of the memory map and the process data starting address of each port change according to the setting of Process Data Size.

*1: If data must be written to an unused area, set the bit to OFF.

▼ Reference

Process Data Size must be set as a dedicated instruction. For details on how to set Process Data Size, refer to “**4.3 Dedicated Instructions**”.

4.3 Dedicated Instructions

4.3 Dedicated Instructions

4.3.1 Specifications of Dedicated Instructions

Use the JP.RIRD or GP.RIRD command to read dedicated instructions and the JP.RIWT or GP.RIWT command to write dedicated instructions.

Dedicated instructions can be executed only from the CC-Link IE Field master station. They cannot be executed from CC-Link IE Field local stations, standby master stations, or intelligent device stations.

▼ Reference

For details on each command, refer to the instruction manual of the PLC that you use.

4.3.2 List of Instructions

Name	Read / Write	Control data				Flash memory save operation	Function
		Attribute code	Access code	Device number	Number of read/write data points (in words)		
Identification	Read	H05 fixed	H01	H00 fixed	392		Reads model information
Port Mode	Read / Write		H02	H00 to H08	1 or 8	○	Sets the behavior of the IO-Link port (C/Q or DI) or reads the settings
Process Data Size	Read / Write		H03	H00 to H08	1 or 4	○	Sets the length of process data or reads the settings
Validation & Backup	Read / Write		H04	H00 to H08	3 or 24	○	<ul style="list-style-type: none">• Sets up the Validation function for the connected IO-Link device or reads the settings• Sets up the backup/restoration function for the parameters of the IO-Link device or reads the settings
Data Storage	Read		H05	H01 to H08	342		Reads the parameters of the IO-Link device that are saved with the Validation & Backup function
			H06		342		
			H07		340		
Port / Device Status	Read		H0D	H00 to H08	5 or 40		Reads the operating status of the IO-Link port
ISDU(Indexed Service Data Unit)	Read / Write		H10	H01 to H08	2 to 118	△	Writes and reads service data (SD) for the IO-Link device
Event	Read		H20	H01 to H08	2 to 12		Reads event information for the IO-Link device

○: Saved when write is executed

△: Saved if backup data (Data Storage) rewrite operation is executed when Validation & Backup is enabled

Caution

- "Process Data Size" and "Validation & Backup" can write and read settings in both IO-Link and SIO modes. However, the function is enabled only in IO-Link mode.
- "Port Mode", "Process Data Size", and "Validation & Backup" can write and read settings in both IO-Link and SIO modes. However, if settings are written while IO-Link mode is in process, Busy response (code H8209) may be returned as the completion status when settings are written or IO-Link mode is restarted (IO-Link mode execution flag or IO-Link process data enabled flag is ON → OFF → ON, IO-Link process data input is acquired value → 0 → acquired value, or IO-Link digital input is ON → OFF → ON).
- Write settings without running IO-Link mode. We recommend that settings be not repeatedly written while IO-Link mode is in process.
- Changing the value of "Port Mode", "Process Data Size", or "Validation & Backup" involves restarting the port, so it may take five to eight seconds for the dedicated instruction to output a normal completion response.
- Ensure that the execution of transient transmission / reception (such as CC-Link IE Field diagnosis operation test, remote operation, memory access, or other operations using the communication protocol called "SLMP") from an engineering tool (or another similar tool) to a relevant station does not overlap with the execution of the dedicated Instructions described in this manual. Transient transmission/reception from an engineering tool (or another similar tool) to a relevant station must be executed while the CPU of the PLC is stopped or any of the dedicated Instructions described in this manual is not being executed.

4.3 Dedicated Instructions

• Identification

Name	Description
Function	Reads model information for this product
Read /Write	Read
Attribute code	H05
Access code	H01
Device number	H00
Number of read data points	392 words

• Read data

Read data	Number of read data points		Stored data (ASCII code)
	Individual	Total	
Vendor Name	56 words	392 words	Panasonic Industrial Devices SUNX Co., Ltd.
Vendor Text	56 words		https://www2.panasonic.co.jp/id/pidsx/global
Product Name	56 words		SC-LG2-CEF-P
Product ID	56 words		F00002
Product Text	56 words		IO-Link Master for CC-Link IE Field
Serial Number	56 words		Serial number
Hardware Revision	56 words		Hardware version

• Port Mode

Name	Description
Function	Sets the behavior of the IO-Link port (C/Q or DI) or reads the settings
Read / Write	Read / Write
Attribute code	H05
Access code	H02
Device number (Command execution target)	H00: All IO-Link ports H01: IO-Link port 1 to H08: IO-Link port 8
Number of read/write data points	When device number is set to H00: 8 words When device number is set to H01 to H08: 1 word

• Read/write data

- When the device number (command execution target) is set to H00 (all IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	IO-Link port 1: DI								IO-Link port 1: C/Q							
	Inactive Mode								Inactive Mode						IO-Link Mode	SIO Output Mode
to									to							
+7	IO-Link port 8: DI								IO-Link port 8: C/Q							
	Inactive Mode								Inactive Mode						IO-Link Mode	SIO Output Mode

- When the device number (command execution target) is set to H01 to H08 (individual IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	DI								C/Q							
	Inactive Mode								Inactive Mode						IO-Link Mode	SIO Output Mode

<Details of each setting>

If C/Q is set to SIO mode digital input operation (SIO Input Mode), set all three bits H0, H1, and H7 to OFF.

Target	Function	Description
C/Q (Note 2)	Inactive Mode	ON: C/Q operation stop
	IO-Link Mode	ON: C/Q IO-Link operation
	SIO Output Mode	ON: C/Q SIO mode digital output operation
DI	Inactive Mode	ON: DI operation stop OFF: DI digital input operation

Notes: 1) If data must be written to an unused bit, set the bit to OFF.

2) For bits H0, H1, and H7 of C/Q, turn ON only the bit corresponding to the mode to be set. Do not turn ON multiple bits at the same time.





4.3 Dedicated Instructions

• Process Data Size

Name	Description
Function	Sets the length of process data or reads the settings
Read / Write	Read / Write
Attribute code	H05
Access code	H03
Device number (Command execution target)	H00: All IO-Link ports H01: IO-Link port 1 to H08: IO-Link port 8
Number of read/write data points	When device number is set to H00: 4 words When device number is set to H01 to H08: 1 word

• Read/write data

- When the device number (command execution target) is set to H00 (all IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0																	
+0	IO-Link port 2								IO-Link port 1																								
	Swap								Process Data Size								Swap								Process Data Size								
to																	to																
+3	IO-Link port 8								IO-Link port 7																								
	Swap								Process Data Size								Swap								Process Data Size								

- When the device number (command execution target) is set to H01 to H08 (individual IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0									Swap		Process Data Size					

<Details of each setting>

Function	Description
Process Data Size	H00 to H20 (Note 1): • Process data length is stored. • Values are set in bytes. • If the process data length is set to an odd byte count, the process data starting position of the next port is assigned by shifting it by one byte. However, the process data length remains the same as the specified odd byte count.
Swap	ON: Swaps the high-order and low-order bytes of process data

Notes: 1) For Process Data Size, write only values between H00 and H20 inclusive.
2) If data must be written to an unused bit, set the bit to OFF.

• Validation & Backup

Name	Description
Function	<ul style="list-style-type: none"> • Sets up the Validation & Backup function for the connected IO-Link device or reads the settings • Enables the user to set up the functions for backing up parameters for IO-Link devices (saving device data on Data Storage) and restoring them (writing data to devices from Data Storage)
Read / Write	Read / Write
Attribute code	H05
Access code	H04
Device number (Command execution target)	H00: All IO-Link ports H01: IO-Link port 1 to H08: IO-Link port 8
Number of read/write data points	When device number is set to H00: 24 words When device number is set to H01 to H08: 3 words

• Read / write data

- When the device number (command execution target) is set to H00 (all IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	IO-Link port 1															
	Vendor ID (high-order byte)								Type							
+1	Device ID (high-order byte)								Vendor ID (low-order byte)							
+2	Device ID (low-order byte)								Device ID (middle-order byte)							
to	to															
+21	IO-Link port 8															
	Vendor ID (high-order byte)								Type							
+22	Device ID (high-order byte)								Vendor ID (low-order byte)							
+23	Device ID (low-order byte)								Device ID (middle-order byte)							

- When the device number (command execution target) is set to H01 to H08 (individual IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	Vendor ID (high-order byte)								Type							
+1	Device ID (high-order byte)								Vendor ID (low-order byte)							
+2	Device ID (low-order byte)								Device ID (middle-order byte)							

4.3 Dedicated Instructions

<Details of each setting>

Set "Type" according to the version of the connected IO-Link device.

Function	Description
Type (Note)	H00: Disables the function H01: Enables the Validation function (IO-Link version 1.0) H02: Enables the Validation function (IO-Link version 1.1) H03: Enables the Validation function (IO-Link version 1.1) Enables the Backup + Restore function H04: Enables the Validation function (IO-Link version 1.1) Enables the Restore function
Vendor ID	Stores the Vendor ID used for IO-Link device validation in big endian format
Device ID	Stores the Device ID used for IO-Link device validation in big endian format

Note: Set "Type" according to the version of the connected IO-Link device. If you write a Type setting that does not match the version of the IO-Link device, even if you writes the correct Type setting later, the IO-Link device may be unable to return to normal operation unless the power supply of the IO-Link device is restarted. For Type, write only values between H00 and H04 inclusive.

• Validation function

- This function validates (compares) the IO-Link device information (Vendor ID and Device ID) stored in this product and the device information read from the IO-Link device connected to the port through communication.

*1: IO-Link device information for each port is stored in this product. If device information validation (comparison) fails, a validation error occurs.

• Backup + Restore function

- Enabling this function stores the parameters of the connected IO-Link device into the Data Storage of this product.
- If you change the parameters of the IO-Link device locally during operation, the parameters in Data Storage will be updated to the changed parameters.
- When the connected IO-Link device is started, if the parameters of the IO-Link device differ from the parameters in Data Storage, the parameters of the IO-Link device will be updated to the parameters in Data Storage.
- If the IO-Link port is set to SIO mode, "Type" is set to H00 to H02, or "Vendor ID" or "Device ID" is changed, the parameters in Data Storage will be cleared.

*1: If the Validation function confirms that the connected IO-Link device does not match the IO-Link device information stored in this product, the Backup + Restore function will not be executed.

• Restore function

- Enabling this function stores the parameters of the connected IO-Link device into the Data Storage of this product.
- If you change the parameters of the IO-Link device locally during operation, the parameters of the IO-Link device will be updated to the parameters in Data Storage.
- When the connected IO-Link device is started, if the parameters of the IO-Link device differ from the parameters in Data Storage, the parameters of the IO-Link device will be updated to the parameters in Data Storage.
- If the IO-Link port is set to SIO mode, "Type" is set to H00 to H02, or "Vendor ID" or "Device ID" is changed, the parameters in Data Storage will be cleared.

*1: If the Validation function confirms that the connected IO-Link device does not match the IO-Link device information stored in this product, the Restore function will not be executed.

• Data Storage

Name	Description
Function	Reads the parameters of the IO-Link device that are saved with the Validation & Backup function
Read / Write	Read
Attribute code	H05
Access code	Data1: H05
	Data2: H06
	Data3: H07
Device number (Command execution target)	H01: IO-Link port 1 to H08: IO-Link port 8
Number of read data points	When access code is set to H05 (Data1) or H06 (Data2): Maximum 342 words
	When access code is set to H07 (Data3): Maximum 340 words

• Read data

Parameters are stored sequentially starting from Data1.

Parameter data can be read from Data Storage only when IO-Link mode is running with Validation & Backup set to the Backup + Restore function enabled or the Restore function enabled or when parameter data is stored in Data Storage during standby after IO-Link mode is executed once. If parameter data is read in any state other than the above, the read value will be 0.

4.3 Dedicated Instructions

• Port / Device Status

Name	Description
Function	Reads the operating status of an IO-Link port
Read / Write	Read
Attribute code	H05
Access code	H0D
Device number (Command execution target)	H00: All IO-Link ports H01: IO-Link port 1 to H08: IO-Link port 8
Number of read data points	When device number is set to H00: 40 words When device number is set to H01 to H08: 5 words

• Read data

- When the device number (command execution target) is set to H00 (all IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	IO-Link port 1															
	Port Mode DI				Port Mode C/Q				Port No.							
+1	COM Mode								Master Cycle							
+2	Vendor ID (high-order byte)								Sensor Connected							
+3	Device ID (high-order byte)								Vendor ID (low-order byte)							
+4	Device ID (low-order byte)								Device ID (middle-order byte)							
to	to															
+35	IO-Link port 8															
	Port Mode DI				Port Mode C/Q				Port No.							
+36	COM Mode								Master Cycle							
+37	Vendor ID (high-order byte)								Sensor Connected							
+38	Device ID (high-order byte)								Vendor ID (low-order byte)							
+39	Device ID (low-order byte)								Device ID (middle-order byte)							

- When the device number (command execution target) is set to H01 to H08 (individual IO-Link ports)

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	Port Mode DI				Port Mode C/Q				Port No.							
+1	COM Mode								Master Cycle							
+2	Vendor ID (high-order byte)								Sensor Connected							
+3	Device ID (high-order byte)								Vendor ID (low-order byte)							
+4	Device ID (low-order byte)								Device ID (middle-order byte)							

<Details of each setting>

Function	Description
Port No.	H01 to H08: Stores the IO-Link port number of stored data
Port Mode C/Q	Stores the operating status of C/Q H0: Inactive H1: IO-Link mode H3: SIO mode digital input H4: SIO mode digital output
Port Mode DI	Stores the operating status of DI H0: Inactive H1: Input operation
Master Cycle (Note)	Stores the master cycle time in units of 100 μ s (Example: 1,000 μ s \rightarrow H0A)
COM Mode (Note)	Stores the IO-Link communication baud rate H00: COM1(4.8kbps) H01: COM2(38.4kbps) H02: COM3(230.4kbps)
Sensor Connected (Note)	Stores the IO-Link connection/operating status H00: No IO-Link device connected H40: IO-Link device in abnormal state H80: Pre-operation state HFF: Operating state
Vendor ID (Note)	Stores the Vendor ID of the connected IO-Link device in big endian format
Device ID (Note)	Stores the Device ID of the connected IO-Link device in big endian format

Note: "H00" is stored when Port Mode is set to any mode other than IO-Link mode.

4.3 Dedicated Instructions

- **ISDU (Indexed Service Data Unit)**

Name	Description
Function	Writes or reads service data (SD) for IO-Link devices
Read / Write	Read / Write
Attribute code	H05
Access code	H10
Device number (Command execution target)	H01: IO-Link port 1 to H08: IO-Link port 8
Number of read/write data points	2 to 118 words *1: Changes with the Request / Response Data size

- **Read/write data**

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	Index (high-order byte)								Index (low-order byte)							
+1	Control								Sub Index							
+2 to +117	Request / Response Data															

<Details of each setting>

Function	Description
Index	Stores the Index value of an IO-Link device in little endian format
Sub Index	Stores the Sub Index value (0 to 255) of an IO-Link device
Control	<ul style="list-style-type: none"> For write processing <ul style="list-style-type: none"> H00: Set when the size of Request Data is an even-numbered byte count H80: Set when the size of Request Data is an odd-numbered byte count H01: Sets the data to be read: device number (command execution target), Index, and Sub Index <ul style="list-style-type: none"> * For details, refer to "Read operation". For read processing <ul style="list-style-type: none"> H00: Normal response data H01: Busy response data
Request / Response Data	<ul style="list-style-type: none"> Write request data <ul style="list-style-type: none"> The parameter to be written is set. If Control is set to "H01", no parameter is written. Read response data <ul style="list-style-type: none"> The data to be read is stored. If Control is set to "H01", no data to be read is stored.

Note: ISDU can perform write and read processing only when IO-Link mode is in process. If ISDU is executed in any mode other than IO-Link mode, code H8202 (indicating inability to use the function) will be returned as the completion status.

• Read operation

If this dedicated instruction is used in Read mode, Read processing must be performed using a different procedure from other dedicated instructions.

Use the following procedure to perform Read processing.

1. Set the IO-Link port number, Index, and Sub Index to be read.
Set "Control" to H01, "Number of read data points" to 2 words, and "Device number (command execution target)", "Index", and "Sub Index" to their respective values to be read, and then execute this instruction in Write mode. There is no need to set "Request Data". This sets the data to be read.
2. Execute this instruction in Read mode.
Before executing the instruction, make sure that "Device number (command execution target)" is set to the same value as in 1. The value read by ISDU will be stored in "Response Data".

Notes: 1) When executing this dedicated instruction in Read mode, always performs Steps 1 and 2 in this order.
If you perform a different operation after executing Step 1, the data to be read that you set in Step 1 will be cleared.

2) If you perform read operation immediately after writing the data to be read by ISDU, Busy response may be returned to "Control" or completion status, depending on the type or size of read data or the state of the IO-Link device. In such a case, leave sufficient time between write operation of data to be read and read operation.

4.3 Dedicated Instructions

• Event

Name	Description
Function	Reads event information for the IO-Link device
Read / Write	Read
Attribute code	H05
Access code	H20
Device number (Command execution target)	H01: IO-Link port 1 to H08: IO-Link port 8
Number of read data points	2 to 12 words Specify the number of read data points according to the number of read events (minimum 2 words for one event to maximum 12 words for 6 events).

• Read data

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
+0	Event 1															
+1	Event Code (high-order byte)								Event Qualifier							
to	to															
+10	Event 6															
+11	Event Code (high-order byte)								Event Qualifier							
	Event Code (low-order byte)								Event Code (low-order byte)							

<Details of each setting>

Function	Description
Event Qualifier (Note 1)	Stores event occurrence information
Event Code (Note 1)	Stores generated event code in little endian format

Notes: 1) If no event occurs, "H0000" is stored.
2) The read value of an unused bit is indeterminate.

• Event Qualifier

"Event Qualifier" contains the following information.

Bit	7	6	5	4	3	2	1	0
	Mode		Type		Device	Instance		
	00: Reserved 01: Event Single Shot 10: Event Disappear 11: Event Appear		00: Reserved 01: Notification 10: Warning 11: Error		0: Device 1: Master	000: Unknown 100: Application Other: Reserved		

▼ Reference

For details on "Event Qualifier", refer to the specifications of IO-Link.

5 CC-Link IE Field Operating Procedure

5.1 Network Configuration Setup Method (GX Works3 Setup)	5-2
5.2 Example of Operating Procedure after Power ON	5-7
5.2.1 Operation Flow	5-7
5.2.2 Operation Example	5-9
5.3 Checking Error Information	5-11

5.1 Network Configuration Setup Method (GX Works3 Setup)

5.1 Network Configuration Setup Method (GX Works3 Setup)

This section explains how to set up the parameters for this product.

The parameter setting method differs according to the master station unit.

The parameter setting method is explained below, using Mitsubishi Electric Corporation's RJ71EN71 as an example.

▼ Reference

For details, refer to the instruction manual of the master station unit that you use.

■ Example of RJ71EN71(CCIEF) unit parameter settings

Station type: Master station

Network No.: 1

<Network configuration settings>

Station number: 1

RX/RX settings (starting/ending): 0000/006F

RWw/RWr settings (starting/ending): 0000/0083

<Refresh settings>

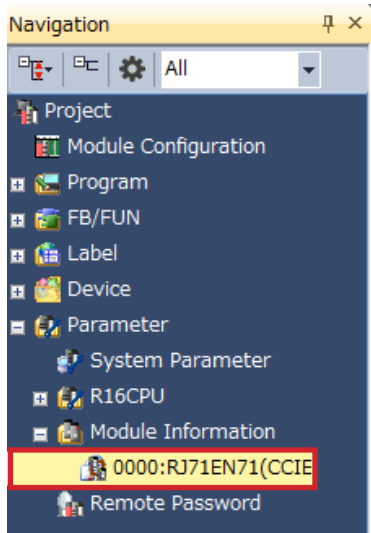
Link side				CPU side		
Device name	Starting address	Ending address		Device name	Starting address	Ending address
SB	00000	001FF	⇔	SB	00000	001FF
SW	00000	001FF	⇔	SW	00000	001FF
RX	00000	0006F	⇔	X	01000	0106F
RY	00000	0006F	⇔	Y	01000	0106F
RWr	00000	00083	⇔	W	00000	00083
RWw	00000	00083	⇔	W	01000	01083

5.1 Network Configuration Setup Method (GX Works3 Setup)

■ Setting up RJ71EN71(CCIEF) unit parameters

Set up parameters in the engineering software (GX Works3) at the master station.

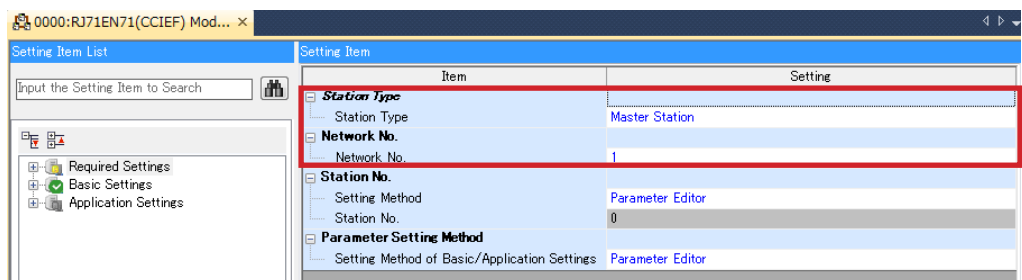
1. In the **Navigation** window, select **Module Information** and then **RJ71EN71(CCIEF)**.



▼ Reference

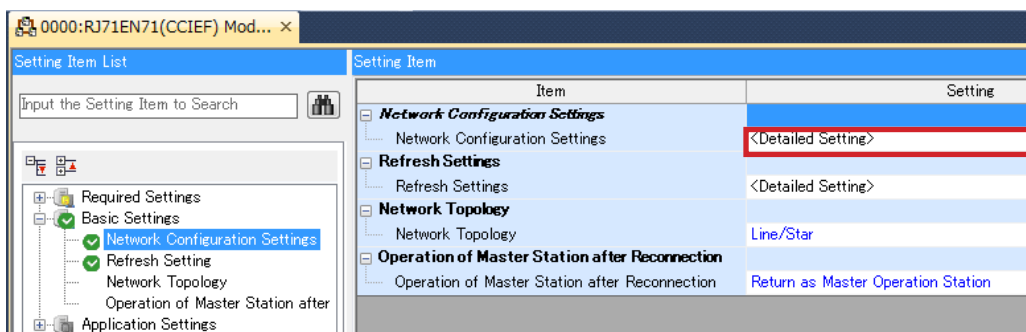
For details on how to set up the master station, refer to the instruction manual of the master station unit that you use.

2. Set up the contents of **Required Settings** for unit parameters as shown below.

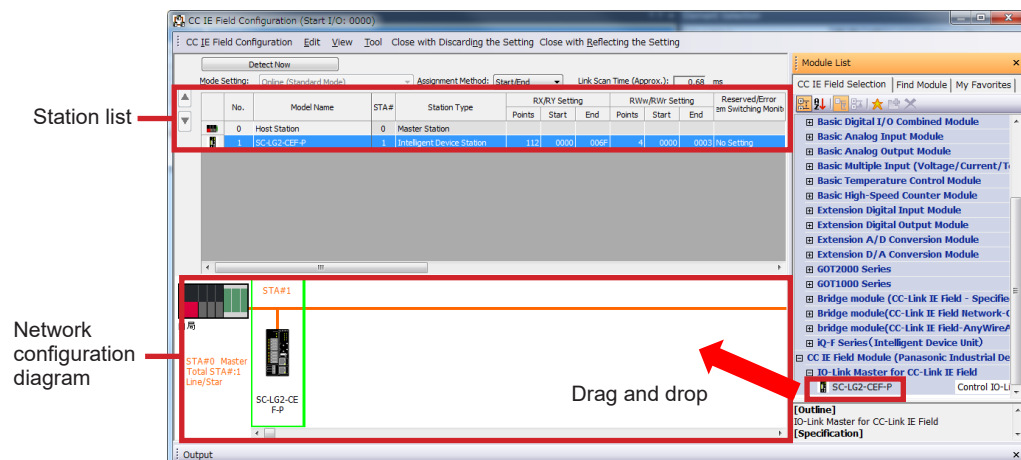


5.1 Network Configuration Setup Method (GX Works3 Setup)

3. Double-click <Detailed Setting> in Network Configuration Settings.



4. The CC IE Field Configuration dialog box will be displayed. In the **Module List**, select **SC-LG2-CEF-P** under **CC IE Field Module (Panasonic Industrial Device SUNX)** and drag and drop it into the station list or network configuration diagram. **SC-LG2-CEF-P** will be added.



If CSP+ for SC-LG2-CEF-P has not been registered, SC-LG2-CEF-P" will not be displayed in the **Module List**. Register CSP+ in advance.
If CSP+ for SC-LG2-CEF-P cannot be registered, use and set CSP+ for general intelligent device stations.

Information

CC-Link IE Field network communication can be easily set up by using CSP+ (CC-Link System Profile).

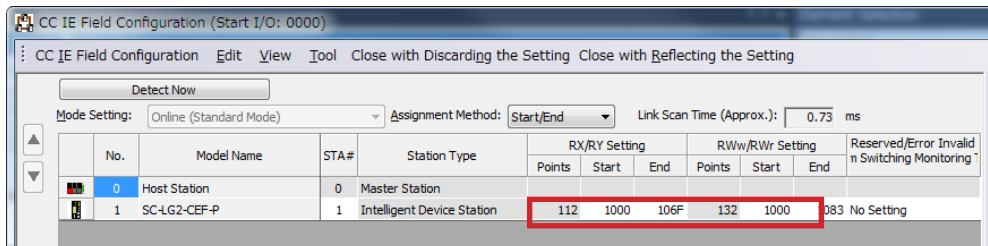
CSP+ for this product can be downloaded from the CC-Link Partner Association website.

Website of CC-Link Partner Association:

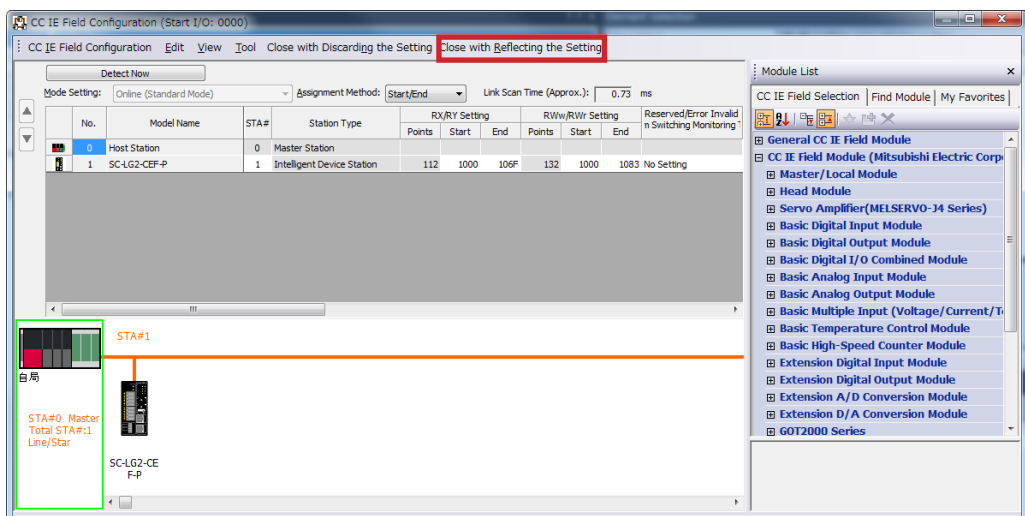
<https://www.cc-link.org/sch/c012List?userSeqNo=4&menuSeqNo=2>

5.1 Network Configuration Setup Method (GX Works3 Setup)

5. Set up a CC IE Field configuration as shown below.

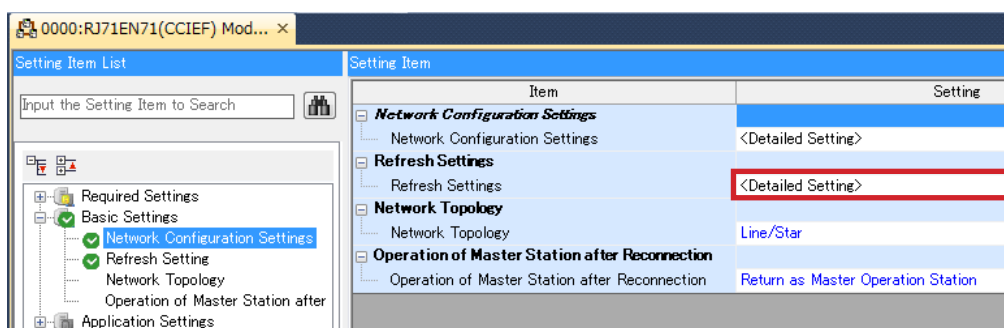


6. After setting up the configuration, click the **Close with Reflecting the Setting** menu to close the CC IE Field Configuration dialog box.



5.1 Network Configuration Setup Method (GX Works3 Setup)

7. Double-click <Detailed Setting> in Refresh Settings.



8. A refresh parameter setting window will be displayed. Specify settings as below.

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF	↔	Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF	↔	Specify Device	SW	512	00000	001FF
1	RX	112	01000	0106F	↔	Specify Device	X	112	01000	0106F
2	RY	112	01000	0106F	↔	Specify Device	Y	112	01000	0106F
3	RW _r	132	01000	01083	↔	Specify Device	W	132	01400	01483
4	RW _w	132	01000	01083	↔	Specify Device	W	132	00400	00483
5					↔					

5.2 Example of Operating Procedure after Power ON

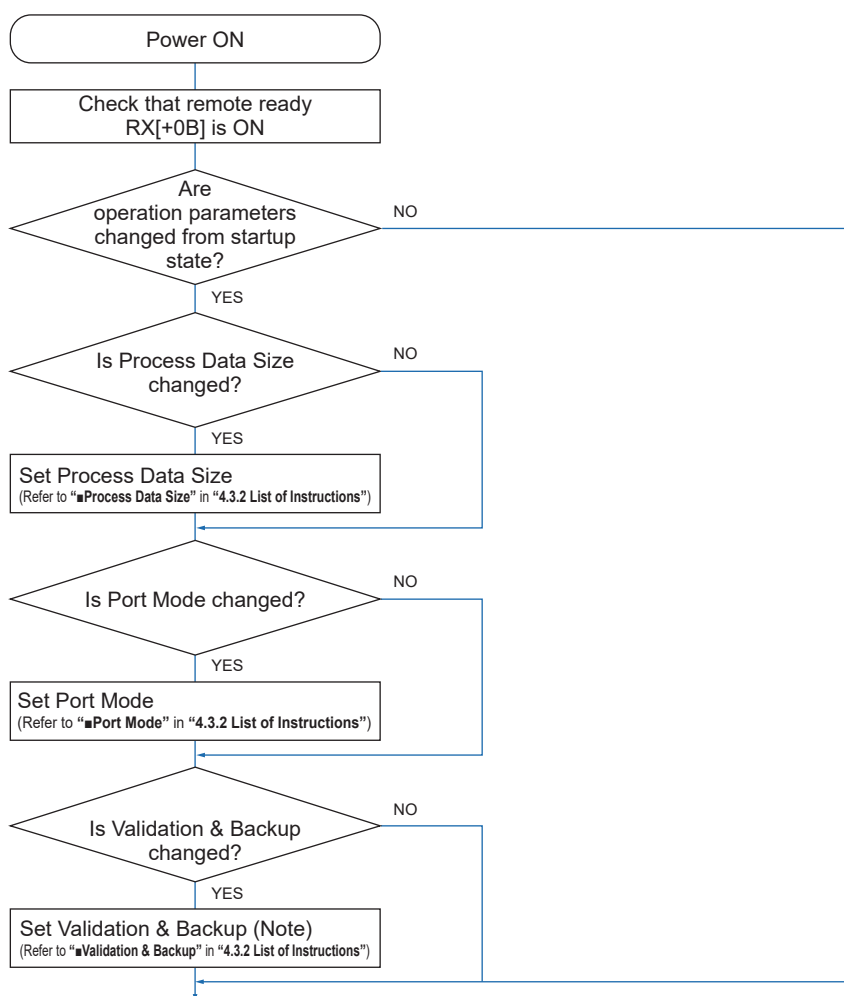
5.2 Example of Operating Procedure after Power ON

5.2.1 Operation Flow

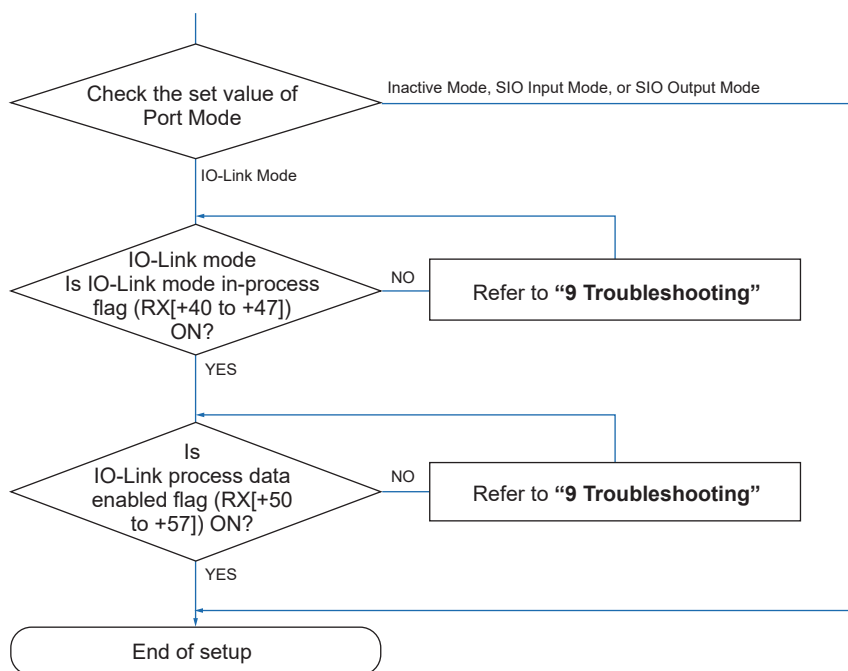
This section explains an example of the procedure for operating this product after turning the power ON.



- Finish setting a network number and station number beforehand.
- Port Mode and Process Data Size are factory set to Inactive mode and 4 bytes, respectively.



5.2 Example of Operating Procedure after Power ON



Note: Settings are optional. To enable the settings, the IO-Link device version, Vendor ID, and Device ID must match those of the connected IO-Link device.

▼ Reference

- For problems with transient transmission for Process Data Size, Validation & Backup, and Port Mode, refer to **"9 Troubleshooting"**.
- For the values that must be set for Process Data Size and Validation & Backup, refer to the manual of the IO-Link device.

▶ Caution

When using this product, perform error check processing in addition to operation. For details on how to check errors, refer to **"5.3 Checking Error Information"**.

5.2 Example of Operating Procedure after Power ON

5.2.2 Operation Example

This section explains an example of operating this product under the conditions below.

■ Setting a network number and station number

Network number: 1

Station number: 1

▼ Reference

For details on how to set network and station numbers, refer to “3.3.2 Setting Up the SC-LG2-CEF-P”.

■ Connecting IO-Link devices

Ports 1 to 3:

- Process data length: 4
- Settings for Validation & Backup function
 - Validation function: Enabled
 - Backup + Restore function: Enabled

Ports 4 to 6: Set to SIO mode output

Ports 7 and 8: Set to SIO mode input

FX-551L3-P-C2

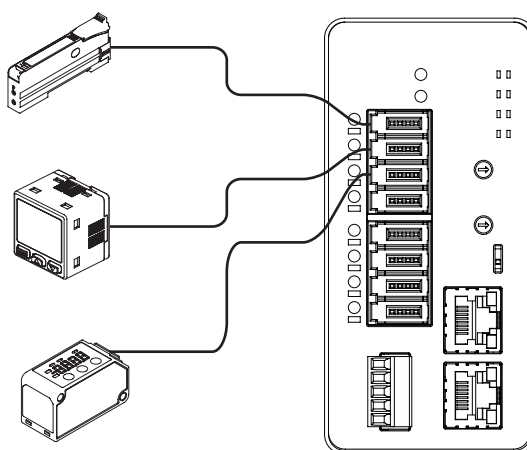
- Process data length: 4 bytes
- Vendor ID: H342(834)
- Device ID: H030000

DP-101ZL3-M-P

- Process data length: 4 bytes
- Vendor ID: H342(834)
- Device ID: H060000

HG-C1030L3-P

- Process data length: 4 bytes
- Vendor ID: H342(834)
- Device ID: H028000



5.2 Example of Operating Procedure after Power ON

■ Operating procedure

1. Check the remote ready flag.
RX[100B]=ON
2. Set the process data length for the IO-Link device to be connected. (Process Data Size settings)

JP.RIWT	Jn	S1			S2		D		
	Local station network number	J1	(S1)+0	Completion status	HFFFF	(S2)+0	H0404	(D)+0	Completion flag (Note)
			(S1)+1	Target station number	H0001	(S2)+1	H0004	(D)+1	Abnormal termination flag (Note)
			(S1)+2	Access code / Attribute code	H0305	(S2)+2	H0000		
			(S1)+3	Device number	H0000	(S2)+3	H0000		
			(S1)+4	Number of write points	H0004				

3. Set behaviors for C/Q and DI. (Port Mode settings)

JP.RIWT	Jn		S1			S2		D		
	Local station network number	J1	(S1)+0	Completion status	HFFFF	(S2)+0	H0002	(D)+0	Completion flag	(Note)
			(S1)+1	Target station number	H0001	(S2)+1	H0002	(D)+1	Abnormal termination flag	(Note)
			(S1)+2	Access code / Attribute code	H0205	(S2)+2	H0002			
			(S1)+3	Device number	H0000	(S2)+3	H0001			
			(S1)+4	Number of write points	H0008	(S2)+4	H0001			
						(S2)+5	H0001			
						(S2)+6	H0000			
						(S2)+7	H0000			

4. Set up the Validation & Backup function for the connected IO-Link device.

JP.RIWT	Jn		S1			S2		D			
	Local station network number	J1	(S1)+0	Completion status	HFFFF	(S2)+0	H0303	(D)+0	Completion flag	(Note)	
			(S1)+1	Target station number	H0001	(S2)+1	H0342	(D)+1	Abnormal termination flag	(Note)	
			(S1)+2	Access code / Attribute code	H0405	(S2)+2	H0000				
			(S1)+3	Device number	H0000	(S2)+3	H0303				
			(S1)+4	Number of write points	H0024	(S2)+4	H0642				
						(S2)+5	H0000				
						(S2)+6	H0303				
						(S2)+7	H0242				
						(S2)+8	H0080				
						(S2)+9 to +23	H0000				

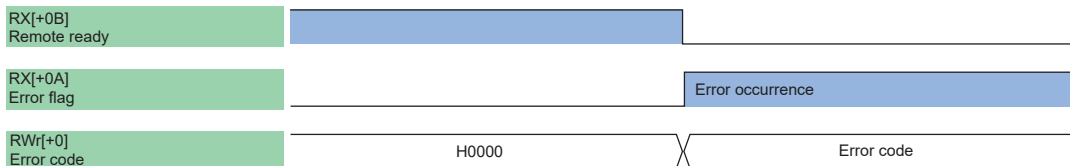
5. Check the IO-Link mode in-process flag.
RX[1040 to 1042]=ON
6. Check the IO-Link process data enabled flag.
RX[1050 to 1052]=ON

Note: Assign to an arbitrary contact.
Make sure that there is no duplication when assigning to contacts.

5.3 Checking Error Information

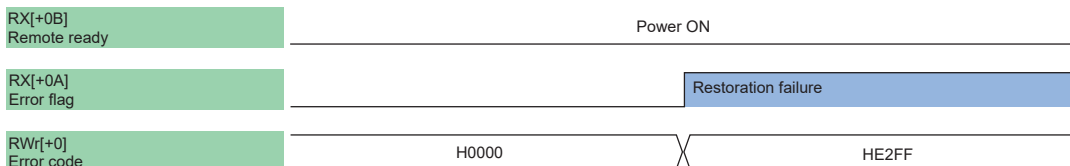
■ Error flag

- If an error occurs, it cannot be reset. Restart the power supply.
- Even if the problem cannot be resolved by restarting the power supply, it is very likely that the device is faulty. In such a case, replace the device.



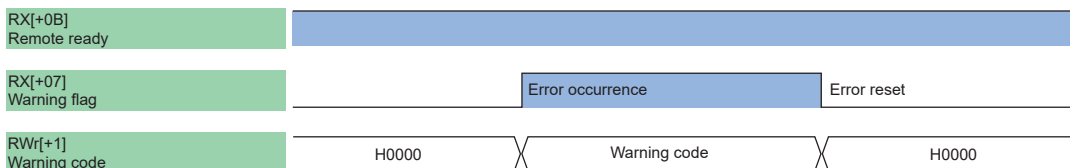
■ Error flag (indicating failure to restore parameter settings)

- This product stores settings and restores them when it starts. If settings fail to be restored, they cannot be reset. In such a case, restart the power supply.
- If the power supply is restarted after a restoration failure error occurs, the data to be restored will be initialized and operation will be started in factory default mode.



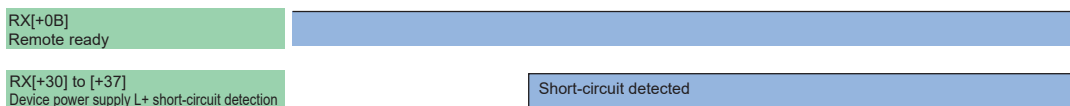
■ Warning flag

- Use the warning code to identify and eliminate the cause of the error. (There is no need to restart the power supply.)
- Even if a minor error occurs, device operation will continue, but the operation cannot be guaranteed when the device is in an error state. Before continuing operation, reset the warning.



■ Device power supply L+ short-circuit detection

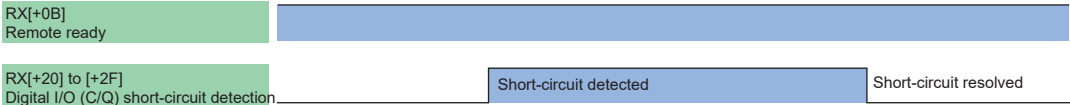
- The bit corresponding to the port at which a short-circuit occurs turns ON. If a short-circuit is detected, power supply to the relevant port will be stopped.
- After checking the wiring of the IO-Link device and e-CON connector, restart the power supply.



5.3 Checking Error Information

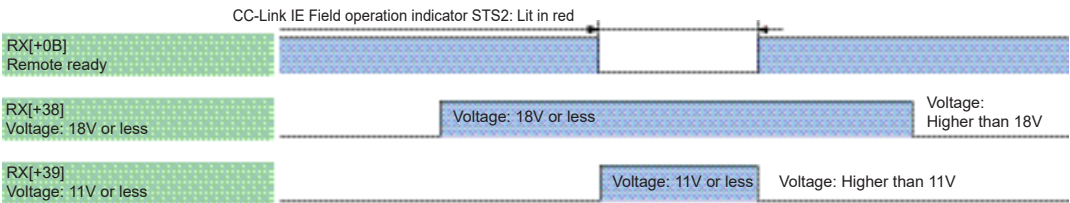
■ **Digital I/O (C/Q) short-circuit detection**

- The bit corresponding to the port at which a short-circuit occurs turns ON.
- Check whether the wiring of the e-CON connector that connects the IO-Link device and this product is correct.



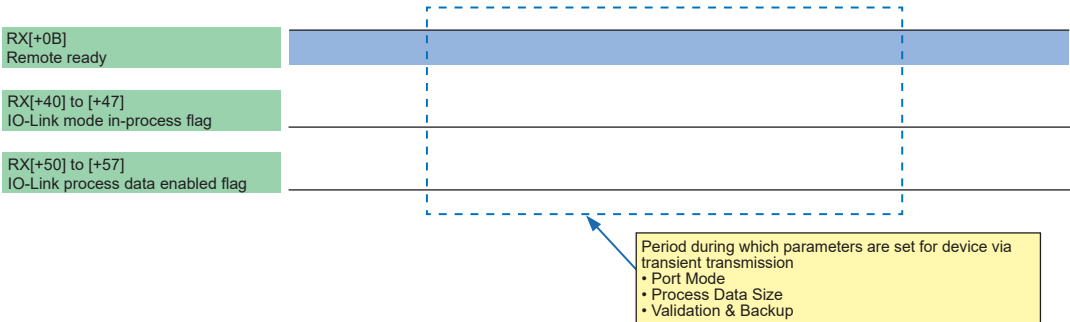
■ **Power supply voltage anomaly detection**

- The bit turns ON when the voltage of IO-Link drops below 18V. When the voltage exceeds 18V, the bit turns OFF.
- The bit turns ON when the voltage of IO-Link drops below 11V. When the voltage exceeds 11V, the bit turns OFF. If the voltage returns to the normal level, the device will be restarted.



■ **If the IO-Link mode in-process flag and the IO-Link process data enabled flag do not turn ON**

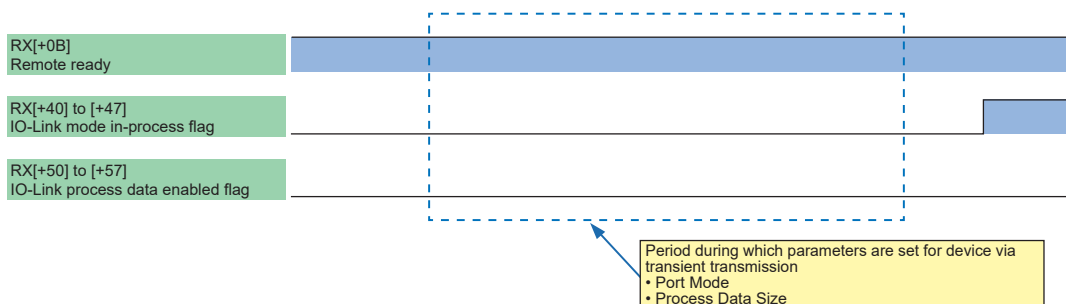
- If Port Mode is not set to IO-Link mode, check the set value and specification of Port Mode and the lighting state of the C/Q indicator.
- If the set value of Process Data Size is smaller than the value of the connected IO-Link device, the IO-Link mode in-process flag and the IO-Link process data enabled flag will not turn ON. Check the set value and specification of Process Data Size and the lighting state of the C/Q indicator.
- If the IO-Link device cannot start in IO-Link mode, check whether the IO-Link device is compatible with IO-Link mode.
- If the IO-Link device connected to the target IO-Link port is unconnected, check the connection status of the IO-Link device or check for any fault.



5.3 Checking Error Information

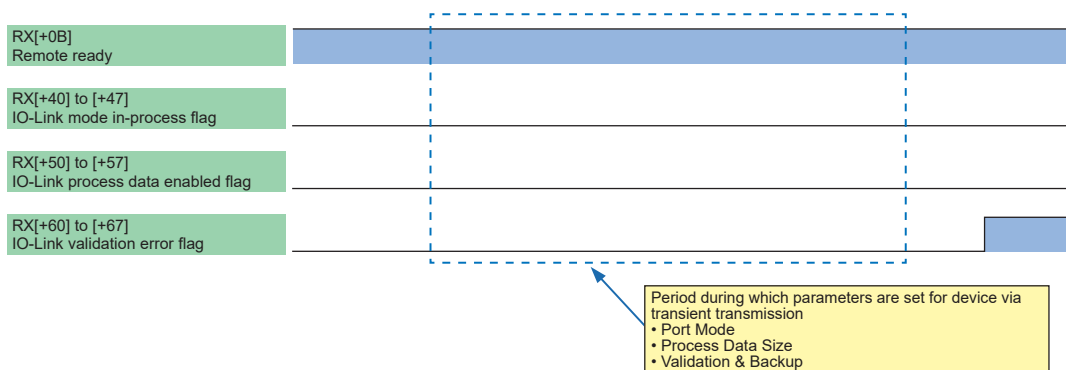
■ If the IO-Link process data enabled flag does not turn ON when the IO-Link mode in-process flag is ON

- The device could be faulty. Replace the device.



■ IO-Link validation error

- There is a possibility that the settings configured with the "Validation & Backup" dedicated instruction does not match the connected IO-Link device or a different IO-Link device is connected.
- Reset the Validation & Backup function and check the connected IO-Link device.



▼ Reference

- For details on how to check response errors with dedicated instructions, refer to the instruction manual of the PLC that you use.
- For error codes and warning codes, refer to “9.1 Error Codes and Solutions”.

(MEMO)

6 Specification and Dimensions

6.1. Specifications 6-2

6.2. Dimensions 6-4

6.1. Specifications

6.1. Specifications

Product name		IO-Link Master Unit for CC-Link IE Field	
Model		SC-LG2-CEF-P	
Supply voltage		24VDC $\pm 10\%$, Ripple P-P 10% or less	
CC-Link IE Field specifications	Current consumption	200mA or less	
	Communication method	CC-Link IE Field	
	Remote station type	Intelligent device station	
	Network number setting	1 to 239 (decimal) [1 to EF (hex)] (0 and 240 or more: Error)	
	Cyclic transmission (Maximum number of link points per station)	RX/RX: Maximum 112 points (112 bits) / Maximum 112 points (112 bits) RWw/RWw: Maximum 132 points (132 words) / Maximum 132 points (132 words)	
	Transient transmission	For server function only, message size: 2 kilobytes (maximum)	
	Number of ports	1000BASE-T Ethernet port × 2	
	Station number setting	1 to 120 (decimal) (0 and 121 or more: Error)	
	Communication speed	1Gbps	
	Communication cable	Category 5e or higher Ethernet cables that satisfy the 1000BASE-T standard (Double shielded twisted pair cable or straight cable) (Note 1)	
	Transmission line type	Line type, star type (line/star mixed type also possible), and ring type	
	Maximum distance between stations	100m	
	Maximum number of stations that can be connected	121 (1 master station, 120 slave stations)	
	Maximum number of stages of cascade connection	20	
IO-Link specifications	Current consumption	150mA or less (excluding the current consumption of connected IO-Link devices)	
	Allowable passing current	3A or less (Note 2)	
	Communication method	IO-Link v1.0 / v1.1	
	Number of ports	e-CON compliant connector port for IO-Link × 8	
	Communication speed	COM1 (4.8kbps), COM2 (38.4kbps), COM3 (230.4kbps) Automatically set by IO-Link device	
	Current supplied to device (L+, L-)	Maximum 200mA per port (Note 2)	
	Digital I/O (C/Q)(Note 3)	IO-Link mode	Compliance with the IO-Link standard
		SIO mode	During input setting PNP input (Maximum inflowing current: 15mA)
			During output setting Push-pull output (Maximum drive capacity: 100mA)
	Digital input (DI)(Note 3)	PNP input (Maximum inflowing current: 15mA)	
	Communication cable	Unshielded	
	Maximum cable length	20m	
	IO-Link connector	e-CON compliant connector (4-pin type)(Note 4)	
Ambient temperature		-10 to +55°C (No condensation or icing) Storage: -20 to +70°C	
Ambient humidity		35% to 85% RH, Storage: 35% to 85% RH	
Withstand voltage		1,000VAC for one minute between all supply terminals and case	
Insulation resistance		20MΩ or higher, using 250VDC megohmmeter connected between all supply terminals and case	
Vibration resistance		10 to 150Hz with 0.75mm amplitude (10 to 58Hz) at acceleration of 49m/s ² (58 to 150Hz) in X, Y, and Z directions for two hours each	
Shock resistance		98m/s ² (approx. 10G) 3 times each in X, Y, and Z directions	

6.1. Specifications

Product name	IO-Link Master Unit for CC-Link IE Field
Model	SC-LG2-CEF-P
Grounding system	Power supply connector is equipped with a frame ground (FG) RJ45 connector shield: Directly connected to ground terminal Internal circuit: C coupling Casing: Floating type
Limit to the number of flash memory save operations	100,000 (Note 5)
Material	Case: Polycarbonate
Weight (main unit only)	Approx. 210g
Standards compliance	EMC Directive

- Notes: 1) Use a cable recommended by CC-Link Partner Association.
- 2) Take care that the total consumption current of connected devices and the unit on the IO-Link side does not exceed the allowable passing current.
Power to devices (L+, L-), digital I/O (C/Q), and digital input (DI) are supplied from IO-Link (+V, -V) on the power supply connector.
- 3) Operation settings for digital I/O (C/Q) and digital input (DI) must be configured with CC-Link IE Field. If operation settings are not configured, they will not operate.
- 4) For the connectors for connecting devices to this product, purchase simple wire-press connector (e-CON) **CN-EP2** (5-piece set) or **CN-EP3** (5-piece set) or the following recommended product.
<Recommended simple wire-press connector (e-CON)>
Model 1473562-4 (e-CON) [manufactured by Tyco Electronics Japan G.K.]
- 5) This product saves settings in the built-in flash memory when the following operations are performed.
1. Changing the network number
 2. Executing some dedicated Instructions in Write mode (refer to “4.3.2 List of Instructions”)

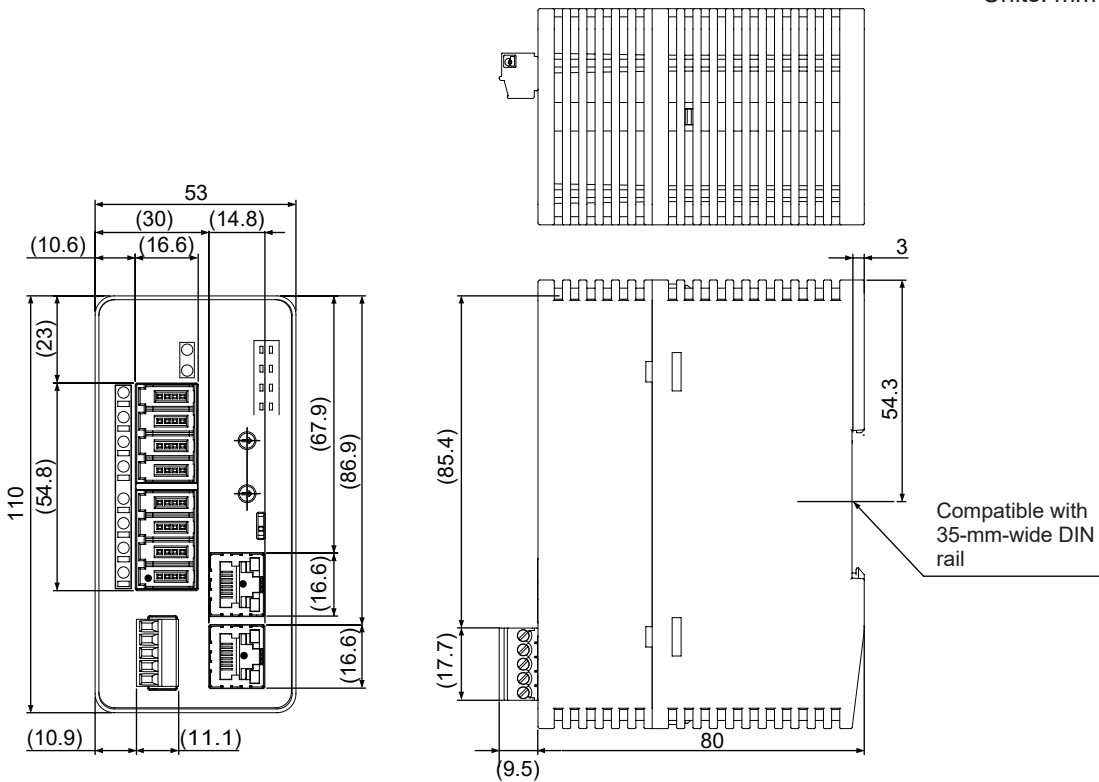
Reference

For details on how to configure operation settings for CC-Link IE Field, refer to “4.3 Dedicated Instructions”.

6.2. Dimensions

6.2. Dimensions

Units: mm



7 Warranty

7.1 Important Information about Order and Use of This Product	7-2
---	-----

7.1 Important Information about Order and Use of This Product

7.1 Important Information about Order and Use of This Product

The products and specifications listed in this manual are subject to change (including changes to specifications and discontinuation of manufacturing) without notice as occasioned by the improvements that we introduce into our products. Consequently, when you place orders for these products, we ask you to contact one of our customer service representatives and check that the details listed in the manual are commensurate with the most up-to-date information.

We strive to improve the quality and reliability of our products, but malfunctions generally occur in electrical parts and devices with a certain probability. Durability of products differs according to the operating environment or operating conditions under which they are used.

Before using this product, always conduct testing using an actual machine under the actual operating conditions. Continuing to use the product with deteriorated performance could generate abnormal heat, smoke, or fire due to insulation deterioration. We request that safety design (such as redundant design, fire spread prevention design, and malfunction prevention design) and regular maintenance be implemented to prevent accidents resulting in injury or death, fire accidents, social damages, and other problems due to product failures or longevity.

1. WARRANTIES:

- (1) Subject to the exclusions stated in 2 (EXCLUSIONS) herein below, Panasonic Industrial Devices SUNX warrants the Products to be free of defects in material and workmanship for a period of one (1) year from the date of shipment under normal usage in environments commonly found in manufacturing industry.
- (2) Any Products found to be defective must be shipped to Panasonic Industrial Devices SUNX with all shipping costs paid by Purchaser or offered to Panasonic Industrial Devices SUNX for inspection and examination. Upon examination by Panasonic Industrial Devices SUNX, Panasonic Industrial Devices SUNX will, at its sole discretion, repair or replace at no charge, or refund the purchase price of, any Products found to be defective.

2. EXCLUSIONS:

- (1) This warranty does not apply to defects resulting from any cause:
 - (i) which was due to abuse, misuse, mishandling, improper installation, improper interfacing, or improper repair by Purchaser;
 - (ii) which was due to unauthorized modification by Purchaser, in part or in whole, whether in structure, performance or specification;
 - (iii) which was not discoverable by a person with the state-of-the-art scientific and technical knowledge at the time of manufacture;
 - (iv) which was due to an operation or use by Purchaser outside of the limits of operation or environment specified by Panasonic Industrial Devices SUNX;
 - (v) which was due to normal wear and tear;
 - (vi) which was due to Force Majeure; and
 - (vii) which was due to any use or application expressly discouraged by Panasonic Industrial Devices SUNX in 4 (CAUTIONS FOR SAFE USE) hereunder.
- (2) This warranty extends only to the first purchaser for application, and is not transferable to any person or entity which purchased from such purchaser for application.

3. DISCLAIMERS

- (1) Panasonic Industrial Devices SUNX's sole obligation and liability under this warranty is limited to the repair or replacement, or refund of the purchase price, of a defective Product, at Panasonic Industrial Devices SUNX's option.
- (2) THE REPAIR, REPLACEMENT, OR REFUND IS THE EXCLUSIVE REMEDY OF THE PURCHASER, AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF PROPRIETARY RIGHTS, ARE HEREBY EXPRESSLY DISCLAIMED. IN NO EVENT SHALL PANASONIC INDUSTRIAL

7.1 Important Information about Order and Use of This Product

DEVICES SUNX AND ITS AFFILIATED ENTITIES BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCTS, OR FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, GENERAL TERMS AND CONDITIONS 4 OR ANY DAMAGES RESULTING FROM LOSS OF USE, BUSINESS INTERRUPTION, LOSS OF INFORMATION, LOSS OR INACCURACY OF DATA, LOSS OF PROFITS, LOSS OF SAVINGS, THE COST OF PROCUREMENT OF SUBSTITUTED GOODS, SERVICES OR TECHNOLOGIES, OR FOR ANY MATTER ARISING OUT OF OR IN CONNECTION WITH THE USE OR INABILITY TO USE THE PRODUCTS.

4. CAUTIONS FOR SAFE USE

- (1) The applications shown in the catalogue are only suggestions, and it is Purchaser's sole responsibility to ascertain the fitness and suitability of the Products for any particular application, as well as to abide by Purchaser's applicable local laws and regulations, if any.
- (2) Never use the Products NOT rated or designated as "SAFETY SENSOR" in any application involving risk to life or property. When such a use is made by Purchaser, such Purchaser shall indemnify and hold harmless Panasonic Industrial Devices SUNX from any liability or damage whatsoever arising out of or in relation to such use.
- (3) In incorporating the Products to any equipment, facilities or systems, it is highly recommended to employ fail-safe designs, including but not limited to a redundant +++design, flame propagation prevention design, and malfunction prevention design so as not to cause any risk of bodily injury, fire accident, or social damage due to any failure of such equipment, facilities or systems.
- (4) The Products are each intended for use only in environments commonly found in manufacturing industry, and, unless expressly allowed in the catalogue, specification or otherwise, shall not be used in, or incorporated into, any equipment, facilities or systems, such as those:
 - (a) which are used for the protection of human life or body parts;
 - (b) which are used outdoors or in environments subject to any likelihood of chemical contamination or electromagnetic influence;
 - (c) which are likely to be used beyond the limits of operations or environments specified by Panasonic Industrial Devices SUNX in the catalogue or otherwise;
 - (d) which may cause risk to life or property, such as nuclear energy control equipment, transportation equipment (whether on rail or land, or in air or at sea), and medical equipment;
 - (e) which are operated continuously each day for 24 hours; and
 - (f) which otherwise require a high level of safety performance similar to that required in those equipment, facilities or systems as listed in (a) through (e) above.

5. EXPORT CONTROL LAWS

In some jurisdictions, the Products may be subject to local export laws and regulations. If any diversion or re-export is to be made, Purchaser is advised to abide by such local export laws and regulations, if any, at its own responsibility.

(MEMO)

8 Maintenance

- 8.1 Maintenance and Inspection 8-2
 - 8.1.1 Maintenance Precautions 8-2
 - 8.1.2 Main Inspection Items 8-2

8.1 Maintenance and Inspection

8.1 Maintenance and Inspection

8.1.1 Maintenance Precautions

- Before cleaning, always turn the power OFF.
- Never use thinner, benzene, or other organic solvents to wipe off dirt or dust.
- Use a clean, soft cloth to wipe off any dirt that adheres to IO-Link devices.

8.1.2 Main Inspection Items

Inspect the product regularly to maintain performance and enable optimum use. The main inspection items are as follows:

- Have any input and output terminals become loose or come off?
- Is the supplied power within the rated voltage range (24V DC +10% / -15%)?
- Is the ambient operating temperature within the specified range (-10 to +55°C)?
- Is the ambient operating humidity within the specified range (35% to 85% RH)?

9 Troubleshooting

- 9.1 Error Codes and Solutions 9-2
- 9.2 Indicators 9-4
- 9.3 Solutions to Problems 9-6

9.1 Error Codes and Solutions

Solutions to frequently encountered problems and errors are described below.

9.1 Error Codes and Solutions

Notifi- cation source	Type	Code	Description	Action method
SC-LG2-CEF-P	Error	HE301	Flash memory error	Restart the power supply. Even if the error cannot be reset by restarting the power supply, it is very likely that the device is faulty. In such a case, replace the device.
		HE302	RAM access error	
		HE303	Internal communication error	
		HE2FF	Port setting restoration error	Restart the power supply. If the power supply is restarted after a restoration failure error occurs, the data to be restored will be initialized and operation will be started in factory default mode. Even if the error cannot be reset by restarting the power supply, it is very likely that the device is faulty. In such a case, replace the device.
	Warning	H8301	Station/network number setting change notification	The station No./network No. setting switch was changed during normal mode operation. Restore the settings of the station No./network No. setting switch to its original settings.
		H8302	Mode setting switch change notification	The mode setting switch was changed during normal mode operation. Restore the settings of the mode setting switch to its original settings.
		H8201	Request data error	An unidentifiable error occurred when a dedicated instruction was executed. Check the parameters that were specified when the dedicated instruction was executed.
		H8202	Failure to use the function	A dedicated instruction was executed in unexecutable format. Check the specifications of the dedicated instruction.
		H8203	Attribute code error	A dedicated instruction was executed with an incorrect attribute code. Change to the correct attribute code.
		H8204	Port number error	A dedicated instruction was executed with a nonexistent port number. Change to the correct port number.
		H8205	Data length error	A dedicated instruction was executed with an incorrect data length. Change to the correct data length.
		H8206	Access code error	A dedicated instruction was executed with a nonexistent access code. Change to the correct access code.
		H8208	Parameter value error	A dedicated instruction was executed with an out-of-range parameter value. Change to the correct parameter value.
		H8209	Busy response	A dedicated instruction was received during a busy period and so it was discarded. Wait for a while and then try again.

9.1 Error Codes and Solutions

Notification source	Type	Code	Description	Action method
IO-Link devices	Warning	H8011	Nonexistent index	An ISDU instruction was executed with an index that does not exist in the device. Check the service data (SD) specifications of the device.
		H8012	Nonexistent subindex	An ISDU instruction was executed with a sub-index that does not exist in the device. Check the service data (SD) specifications of the device.
		H8023	Access denied	An ISDU instruction was executed while device access lock was being applied or an ISDU instruction was executed using a different method in Read Only or Write Only mode. Check the service data (SD) specifications of the device.
		H8030	Out-of-range parameter value	An ISDU instruction was executed with an out-of-range parameter value. Check the service data (SD) specifications of the device.
		H8031	Parameter value above the upper limit value	
		H8032	Parameter value below the lower limit value	An ISDU instruction was executed with an out-of-range parameter length. Check the service data (SD) specifications of the device.
		H8033	Too long parameter length	
CC-Link IE Field Master station	Warning	H8034	Too short parameter length	
		HD0A0	Transient data transmission response wait timeout error	Refer to the instruction manual of the PLC that you use.
		HD0A1	Transient data transmission completion wait timeout error	
		HD0A2	Transient data transmission processing wait timeout error	
		HD0A3	Transient data transmission error	

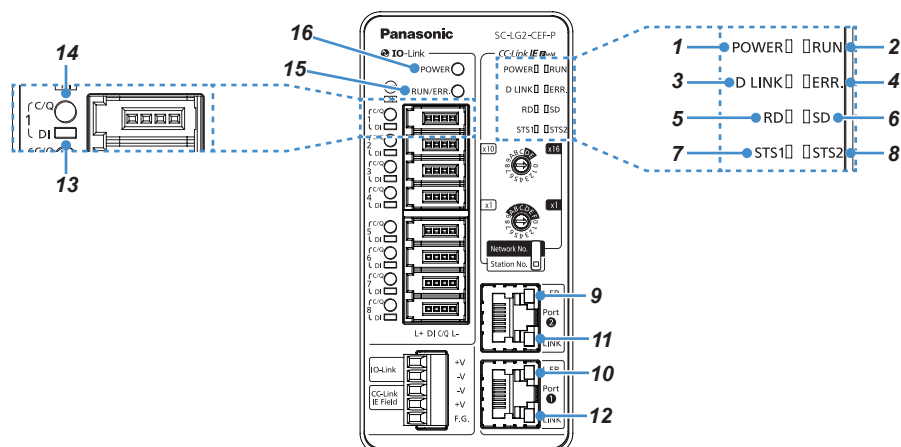
▼ Reference

- There are also warning codes issued by IO-Link devices that are not in the list of error and warning codes. For details, refer to the specifications of IO-Link.
- There are also warning codes issued by CC-Link IE Field master stations that are not in the list of error and warning codes. For details, refer to the instruction manual of the PLC that you use.

9.2 Indicators

9.2 Indicators

You can check the indicators on this product to identify the cause of a problem and take appropriate action.



	Name	Function
1	POWER (Green)	Indicates the power supply status of CC-Link IE Field Lit: Power ON Unlit: Power OFF
2	RUN (Green)	Indicates the operating status of CC-Link IE Field Lit: While CC-Link IE Field is operating normally Unlit: When a CC-Link IE Field error occurs
3	D LINK (Green)	Indicates the data link status of CC-Link IE Field Lit: During data link operation (when cyclic transmission is executed) Flashing: During data link operation (when cyclic transmission is stopped) Unlit: When data link is not operated (during disconnection)
4	ERR. (Red)	Indicates the error status of CC-Link IE Field Lit: When a CC-Link IE Field communication error occurs Flashing: When the setting of the station No./network No. setting switch or mode setting switch is changed after the power supply is turned ON (If a station number is changed after the power supply is turned ON, the change will not be reflected.) Unlit: While CC-Link IE Field is operating normally
5	CC-Link IE Field operation indicator	RD (Green)
6		SD (Green)
7		STS1 (Green)
8		STS2 (Red)
		Indicates the data reception status of CC-Link IE Field communication Lit: While CC-Link IE Field data is being received Unlit: When no CC-Link IE Field data is received
		Indicates the data transmission status of CC-Link IE Field communication Lit: While CC-Link IE Field data is being sent Unlit: While no CC-Link IE Field data is sent
		The behavior is switched by the mode set with the mode setting switch. ● Normal mode Lit: While the system is operating normally Unlit: When a system error occurs ● Network No. setting mode Lit: When network No. setting is completed Flashing: When the system is started in network No. setting mode (when preparation for network No. setting is completed)
		The behavior is switched by the mode set with the mode setting switch. ● Normal mode Lit: When a system error occurs Unlit: While the system is operating normally ● Network No. setting mode Lit: When an out-of-range network number is set Unlit: When network No. setting mode is running normally

9.2 Indicators

	Name		Function
9	Port 2 L ER indicator (Yellow)		Lit: When abnormal data is received during CC-Link IE Field communication
10	Port 1 L ER indicator (Yellow)		Unlit: When normal data is received during CC-Link IE Field communication
11	Port 2 LINK indicator (Green)		Lit: During link-up
12	Port 1 LINK indicator (Green)		Unlit: During link-down
13	DI indicator (x 8) (Orange)		Indicates the status of digital input (DI). Lit: When HI level is detected Unlit: When LO level is detected
14	C/Q indicator (x8)(Green/Red/Orange)		Indicates the status of IO-Link port. The behavior is switched according to C/Q settings. <ul style="list-style-type: none"> • IO-Link mode <ul style="list-style-type: none"> Lit in green: While IO-Link communication is in progress Flashing in green: When no IO-Link device is connected Lit in red: When there is a port error Flashing in red: When there is an IO-Link communication error • SIO mode <ul style="list-style-type: none"> • Digital input setting <ul style="list-style-type: none"> Lit in orange: When HI level is detected Unlit: When LO level is detected Lit in red: When there is a port error • Digital output setting <ul style="list-style-type: none"> Lit in orange: When HI level is output Unlit: When LO level is output Lit in red: When there is a port error
15	IO-Link operation indicator	RUN/ERR. (Green/Red)	Indicates the operating status of IO-Link. Lit in green: While IO-Link is running normally Lit in red: When an IO-Link error occurs
16		POWER (Green/Red)	Indicates the power supply status of IO-Link. Lit in green: When IO-Link power supply voltage is normal Lit in red: When IO-Link power supply voltage drops below the warning level (18V or lower) Unlit: When IO-Link power supply is OFF (11V or lower)

9.3 Solutions to Problems

9.3 Solutions to Problems

Indicator	State	Description	Corrective action
CC-Link IE Field Operation indicator	POWER (Green)	Unlit	Power supply voltage anomaly detection The power supply voltage is below the specification range. Check whether electric power (24V) is supplied to the CC-Link IE Field power supply unit of this product. For the power supply specifications of this product, refer to “6.1. Specifications”.
	STS2 indicator (Red)	Network number setting error	<ul style="list-style-type: none"> For network No. setting mode An out-of-range network number was set. Valid range of network numbers: 1 to 239 Restart the power supply and start setting a network number again from the beginning. For details on how to set network numbers, refer to “■Setting a network number” in “3.3.2 Setting Up the SC-LG2-CEF-P”.
		System error	<ul style="list-style-type: none"> For normal mode An unresettable error occurred. Restart the power supply as described in “5.3 Checking Error Information”.
	D LINK indicator (Green)	Flash-ing	<p>CC-Link IE Field network communication settings could be incorrect. Check the following settings.</p> <p><Station number setting> Check whether the station number assigned by the master station matches the station number setting in this product.</p> <p><Network number setting> Check whether the network number setting in this product matches the network number of the master station.</p> <p><Other settings></p> <ul style="list-style-type: none"> Register this product on the master station as an intelligent device station. Check whether the network state of the master station or this product is set to “Link stop”. <p>* For details on how to set station and network numbers, refer to “3.3.2 Setting Up the SC-LG2-CEF-P”.</p>
		Unlit	<p>This product is not connected to the CC-Link IE Field network.</p> <p>Check whether the CC-Link IE Field network cable is broken or not connected properly.</p>
	ERR. (Red)	Lit	<p>A fault related to network transmission lines could have occurred. Check the following items.</p> <ul style="list-style-type: none"> Check whether the Ethernet cable is broken or not connected properly. Check whether the Ethernet cable is a cable recommended by the CC-Link Partner Association. Check whether the cable length between stations is no more than 100 m. Check whether the remote stations or network devices (such as switching hubs) connected to this product are turned ON. If the loopback function has been set up at the master station, check whether ring connection is used. Check for any noise environment around this product and the Ethernet cable.
		Flash-ing	<p>Changes were made to the settings of the station No./network No. setting switch or mode setting switch during operation. Changes to the switch settings have not yet been reflected. If the switch is restored to its original settings, the indicator will stop flashing.</p> <p>To apply the changes to the switch, turn the power off and then on.</p>

9.3 Solutions to Problems

Indicator		State	Description	Corrective action
IO-Link operation indicator	POWER (Green/Red)	Lit in red Unlit	Power supply voltage anomaly detection	The power supply voltage is below the specification range. Check whether electric power (24V) is supplied to this product. For the power supply specifications of this product, refer to "6.1. Specifications" .
	RUN/ERR. (Green/Red)	Lit in red	IO-Link Short-circuit detected in all IO-Link ports	Short circuits occur in all IO-Link ports. Check the connection state of each IO-Link port.
	C/Q indicator (Green/Red/Orange)	Flash-ing in red	Validation & Backup error or Process Data Size error	<ul style="list-style-type: none"> • Validation & Backup error There is a possibility that the settings configured with the "Validation & Backup" dedicated instruction do not match the connected IO-Link device or a different IO-Link device is connected. Reset the Validation & Backup function and check the connected IO-Link device. • Process Data Size error The process data length of the connected IO-Link device is greater than the process data length specified in the "Process Data Size" dedicated instruction. Set a process data length that is equal to or greater than the process data length of the connected IO-Link device. For details on how to specify the dedicated instruction, refer to "4.3 Dedicated Instructions".
		Lit in red	IO-Link port error	An error has occurred in the IO-Link port. Take action according to "5.3 Checking Error Information" .
		Flash-ing in green	IO-Link unconnected	An attempt is being made to run IO-Link mode with no IO-Link device connected. Check the connection status of IO-Link devices.

<Important>

If the product still does not operate normally after you check the above, consult our technical support center.

(MEMO)

Revision history	Revision date	Revision item
First edition	February 2019	—
2nd edition	August 2022	Revised “ 5.1 Network Configuration Setup Method (GX Works3 Setup) <Network configuration settings> ”

(MEMO)

(MEMO)

Panasonic Industry Co., Ltd.
Panasonic Industrial Devices SUNX Co., Ltd.
<https://panasonic.net/id/pidsx/global>

Please visit our website for inquiries and about our sales network.

Panasonic Industrial Devices SUNX Co., Ltd. 2022
August, 2022

WUME-SCLG2CEFP-2