CKD

SM-P00132-A/1

Instruction Manual

Block Manifold
MW4G Series

Serial Transmission Type
NW4G*-T7EB***
(W4G-OPP8-*EB-**)

[Compatible with CC-Link IEF Basic]

- Please read this instruction manual thoroughly before using the product.
- In particular, carefully read the contents related to safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

Safety precautions

When designing and manufacturing devices using CKD products, the manufacturer is obligated to ensure that the safety of the mechanism, pneumatic control circuit and/or fluid control circuit and the system that runs the electrical controls are secured.

It is important to select, use, handle and maintain CKD products appropriately to ensure their safe usage.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.

⚠ WARNING

1. This product is designed and manufactured as a general industrial machine part.
   It must be handled by an operator having sufficient knowledge and experience.

2. Use this product in accordance with specifications.
   This product must be used within its stated specifications.
   In addition, never modify or additionally machine this product.
   This product is intended for use in general industrial machinery, equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
   (Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid dangers in the event of problems.)
   (1) Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
   (2) Use for applications where life or assets could be significantly affected, and special safety measures are required.

3. Observe organization standards and regulations, etc., related to the safety of the device design and control, and such.
   ISO4414, JIS B 8370 (General rules for pneumatic systems)
   JFPS2008 (Principles for pneumatic cylinder selection and use)
   Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4. Do not handle, pipe, or remove devices before confirming safety.
   (1) Inspect and service the machine and devices after confirming safety of the entire system related to this product.
   (2) Note that there may be hot or charged sections even after operation is stopped.
   (3) When inspecting or servicing the device, turn OFF the energy source (air supply or fluid supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
   (4) When starting or restarting a machine or device that incorporates pneumatic components, make sure to secure system safety, such as pop-out prevention measures.

5. Observe the warnings and cautions on the following pages to prevent accidents.

Precautions are ranked as “DANGER”, “WARNING”, and “CAUTION” in this section.

DANGER In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.

WARNING A dangerous situation may occur if handling is mistaken, leading to fatal or serious injuries.

CAUTION A dangerous situation may occur if handling is mistaken, leading to minor injuries or property damage.

Note that some items indicated with “CAUTION” may lead to serious results depending on the conditions.
All items contain important information and must be observed.

Limited warranty and disclaimer

- Warranty period
  This warranty is valid for one (1) year after delivery to the customer’s designated site.

- Scope of warranty
  In case any defect clearly attributable to CKD is found during the warranty period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part and at no cost, according to its own judgment.

  Note that the following failures are excluded from the warranty scope:

  (1) Failures due to use outside the conditions and environments set forth in the catalog or these specifications.
  (2) Failures resulting from factors other than this product
  (3) Failures caused by improper use of the product.
  (4) Failures resulting from modifications or repairs made without CKD consent.
  (5) Failures caused by matters that could not be predicted with the technologies in practice when the product was delivered.
  (6) Failures resulting from natural disasters or accidents for which CKD is not liable.

  The warranty covers the actual delivered product, as a single unit, and does not cover any damages resulting from losses induced by malfunctions in the delivered product.

- Compatibility check
  The customer is responsible for confirming the compatibility of CKD products with the customer’s systems, machines and equipment.

WARNING

- If the product must be used under conditions that are different from the specified conditions or if the product is to be used for a special application, consult CKD before utilizing the product.
- Before performing maintenance, turn off the power, cut off the compressed air supply, and make sure there is no residual pressure.
- Before increasing or decreasing the number of stations (valves) on the manifold, turn off the power and release pressure.
- Before disassembling or assembling the manifold, read this manual carefully and with full understanding of its contents.
- Before performing electrical wiring, read this manual carefully and with full understanding of its contents.

CAUTION

- Regularly perform daily and periodic inspections to correctly maintain product performance.
- Confirm working voltage and polarity before wiring and turning on the power.
- Do not touch the electrical wiring connections (exposed live parts); as there is a risk of electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.
- Before using the serial transmission slave unit, read the manual for the applicable communication system carefully with full understanding of its content.
- System components such as valves and cylinders could malfunction if the IP address setting of serial transmission slave unit is incorrect. Always check the IP address setting before starting to use.
- This product does not meet the surge immunity requirements specified in EN61000-4-5 for CE marking. Please provide appropriate protective measures on the device side.
- The valve status light may flicker momentarily when the valve power of the slave unit turns on (i.e., when the power voltage starts to rise).
  This will not cause the valve itself to turn ON or OFF.

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1. PRODUCT

1.1 General outline of the system

1) NW4G*- T7EB***

The NW4G*-T7EB*** is a slave unit for NW4G which can establish connection to the EtherNet based CC-Link IE Field Basic (CC-Link IEF Basic) managed by CC-Link Partner Association (or CLPA). The NW4G*-T7EB*** slave unit has the following features:

(1) The slave unit is connected to the PLC with only an Ethernet cable (Category 5 or higher recommended), allowing a significant reduction of man-hours in wiring.

(2) Unit power and valve power are separated, ensuring easy maintenance work.

(3) IP address of the slave unit can be set by selecting the IP address setting with a HardWare switch.

(4) The slave unit is available in +COM or -COM output types and 16 or 32 output points, allowing for use in a wide variety of applications.

(5) The slave unit can connect to both W4G2 and W4G4 valves.

2) CC-Link IEF Basic

The Ethernet-based open network CC-Link IEF Basic is a high-speed and large-capacity network integrating distributed control, I/O control, safety control, and motion control.

CC-Link IEF Basic, which is a part of CC-Link IE Network, realizes easier network connection of Ethernet devices. Transparent communications are achieved by utilizing SLMP*1 that enables seamless connectivity within all levels of manufacturing. (*1: Seamless Message Protocol)

Note: Before using this slave unit, thoroughly read all relevant users' manuals.
This instruction manual mainly describes NW4G*-T7EB***.
For information on the master unit and other slave units to be connected to the system, read the manuals provided by their manufacturers.
For information on the manifold solenoid valves, read this instruction manual as well as the manuals provided with the solenoid valves to fully understand their functions and performance for their proper operation.

If you have any questions concerning the CC-Link IEF Basic system, refer to the following website run by CLPA (CC-Link Partner Association).

CLPA (CC-Link Partner Association)

https://www.cc-link.org/ja/

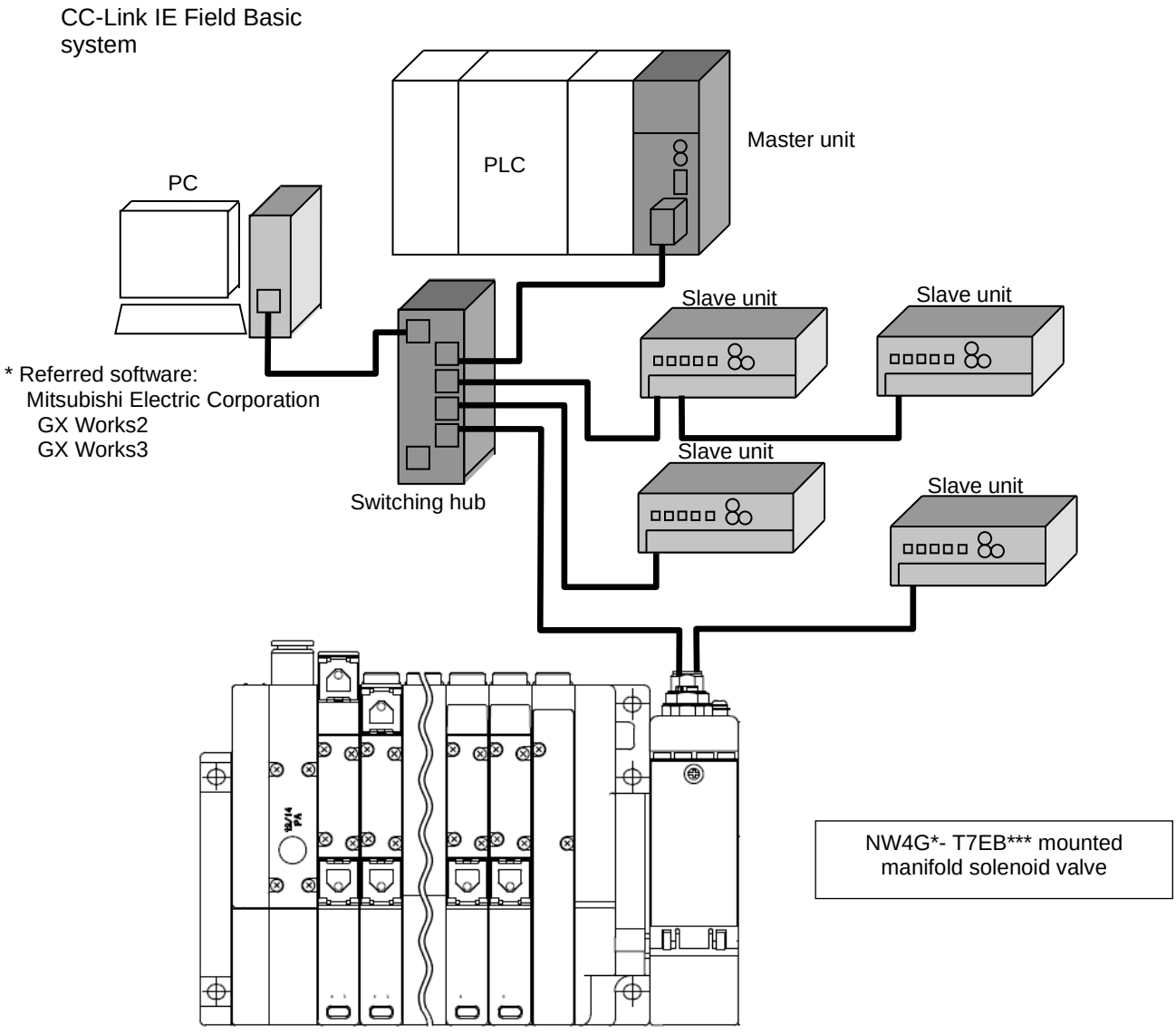
1.2 Network structure

This network mainly consists of a PLC, a master unit, a manifold solenoid valve with NW4G*-T7EB*** mounted, other slave units, and any other peripheral equipment.

1) Example of PLC and master unit combination

PLC Manufacturer	Compatible PLC	Master model
Mitsubishi Electric Corporation	MELSEC-Q series	Q03UDVCPU
Other CC-Link IEF Basic compatible master units		

2) Example of the basic network structure



1.3 Specifications

1) Transmission specifications

Item	Specifications
Communication protocol	CC-Link IE Field Basic compliant
Baud rate	100M/ 10Mbps (Auto Negotiation compatible)
Communication method	Full/Half duplex (Auto MDI//MDI-X compatible)
Transmission media	Ethernet cable (Category 5 or higher) Shielded twisted pair cable

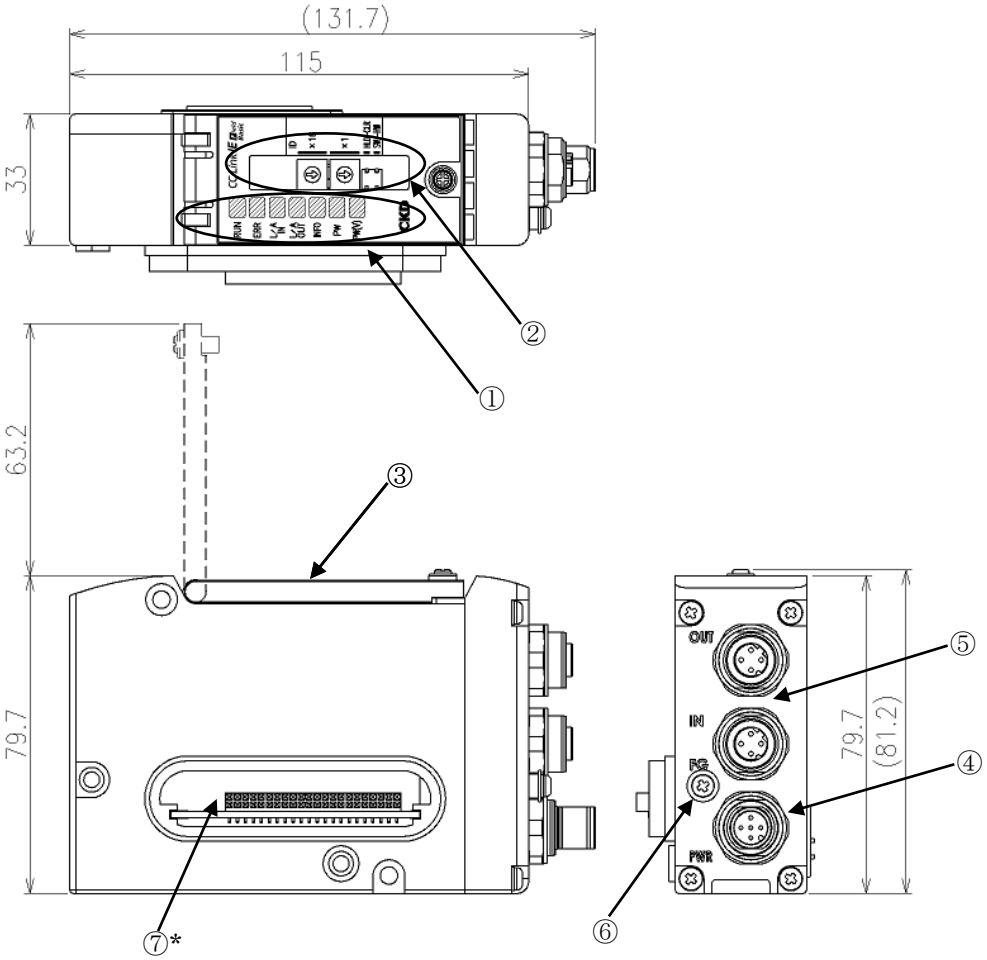
2) Specifications

Always operate this slave unit within its product specifications.

Item		Specifications					
Manifold Model No.		-T7EB1	-T7EB2	-T7EBB7	-T7EBP1	-T7EBP2	-T7EBPB7
Slave unit		W4G-OPP8-1EB	W4G-OPP8-2EB	W4G-OPP8-7EB-B	W4G-OPP8-1EB-P	W4G-OPP8-2EB-P	W4G-OPP8-7EB-PB
Unit power supply voltage		21.6VDC to 26.4VDC (24VDC±10%)					
Unit power current consumption		130mA or less (at 24.0VDC with all points ON)					
Valve power supply voltage		22.8VDC to 26.4VDC (24VDC+10%, -5%)					
Valve power current consumption		10mA or less (with all points OFF) 15mA or less (with all points ON and without load)					
Output type		NPN output (+COM)			PNP output (-COM)		
Number of input/output points		(0 / 16)	(0 / 32)	(16 / 16)	(0 / 16)	(0 / 32)	(16 / 16)
Mode of IP address setting		Basic, HardWare, DHCP, SLMP					
Output setting in communication error		Hold (maintains output of all points)/ Clear (clears all outputs of points)/ SLMP set value (optional)					
Insulation resistance		30 MΩ or more with 500 VDC between external terminals and case					
Withstand voltage		500 VAC for 1 minute between external terminals and case					
Shock resistance		294.0m/s^2 in 3 directions, 3 times each					
Storage temperature		-20℃ to 70℃					
Storage humidity		30% to 85%RH (no dew condensation)					
Ambient temperature		-5℃ to 55℃					
Ambient humidity		30% to 85%RH (no dew condensation)					
Ambient atmosphere		No corrosive gas					
Communication protocol		CC-Link IE Field Basic					
Baud rate		100Mbps/ 10Mbps (correspondent to Auto Negotiation)					
Communication method		Full/Half duplex (correspondent to Auto MDI//MDI-X)					
Output isolation type		Photo coupler isolation					
Max. load current		40mA per output point					
Leakage current		0.1mA or less					
Residual voltage		0.5V or less					
Fuse rating		Valve power: 24V, 3A / Unit power 24V, 2A (both fuses are not replaceable)					
Status indicator		LED (communication status, unit power and valve power statuses*1)					
Number of occupied stations		1 station					
Degree of protection		IP65					
Vibration proof	Durability	10Hz to 150Hz to 10Hz, 1 octave/min, 15 sweeps each in X, Y, Z directions at half-amplitude of 0.75 mm or acceleration of 98.0 m/s^2, whichever is smaller					
	Malfunction	10Hz to 150Hz to 10Hz, 1 octave/min, 4 sweeps each in X, Y, Z directions at half-amplitude of 0.5 mm or acceleration of 68.6 m/s^2, whichever is smaller					

*1: Status can be monitored when unit power is supplied with specified voltage.

1.4 Parts of the Slave Unit



① Status monitoring lights
LEDs (RUN, ERR, L/A IN, L/A OUT, INFO, PW, PW(V)) indicate the slave unit status and network status.

② Switches
Slide switches and rotary switches to set the slave unit IP address, the mode of IP address setting, and the action taken on the output in the event of communication error.

③ Cover
Protects the status monitoring lights and the switches.

④ Power plug of the unit/valve (M12×1 port【PWR】 A-cord)
Connects socket for powering the unit/valve.

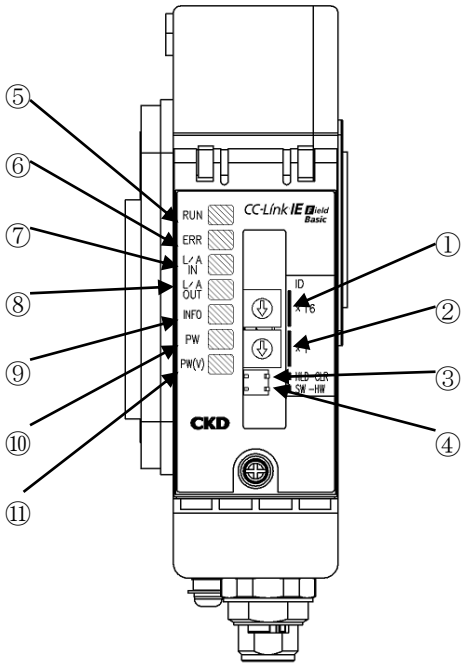
⑤ Network connector socket (M12×2 ports【IN, OUT】D-cord)
Transmits CC-Link IEF Basic communication to the next slave or receives it from the previous slave.
Note: There is no difference in the function between input(IN) and output (OUT) ports which only named to distinguish each.

⑥ FG Terminal
Connects to FG.

⑦ Input/output block connector
Connects to the input/output block. (*Only W4G-OPP8-7EB-*B is compatible.)

1.5 Switches and LED indicators

CAUTION: ● Discharge static electricity that has built up on your body before touching the slave unit. Otherwise, static electricity may damage this product.



No.	Name
①	Switch for IP address setting (x16)
②	Switch for IP address setting (x1)
③	Switch for the output setting in communication error
④	Switch for operating mode setting
⑤	RUN
⑥	ERR
⑦	L/A IN
⑧	L/A OUT
⑨	INFO
⑩	PW
⑪	PW(V)

1) Switches

IP address is read into memory at power-up.
Duplicate IP address cannot be assigned.

Mode of IP address setting	Switch settings				IP address setting	IP address Initial value	Output status in the event of communication error (③)
	①	②	③	④			
Basic	0	0	HLD or CLR	HW	Basic communication	192.168.3.250	HLD (ON: 1) CLR (OFF: 0)
HardWare	0 to F (01 to FEh)	0 to F	HLD or CLR	HW	192.168.3.1 to 254 Switch for IP address	192.168.3. Value for IP address	HLD (ON: 1) CLR (OFF: 0)
DHCP	F	F	HLD or CLR	HW	DHCP server	0.0.0.0	HLD (ON: 1) CLR (OFF: 0)
SLMP	-	-	-	SW	Basic communication and SLMP communication	192.168.3.250	Set Value by SLMP communication

Factory default

IP address setting mode	Switch settings				IP address	Output status in the event of communication error (③)
	①	②	③	④		
Basic	0	0	CLR	HW	192.168.3.250	CLR (OFF: 0)

2) LED Indicators

These LEDs indicate slave unit status and network status. See table below for their descriptions.

No.	Name	Function	Status	
⑤	RUN	Indicates CC-Link IEF Basic status	OFF	Initialized
			Green blinking	Waiting for receiving Basic communications
			Green on	Basic communication status
⑥	ERR	Indicates communication status	OFF	Normal Basic communication
			Red blinking	Master unit is in error or halt state
			Red flickering	Basic communication time out
			Red on	Duplicate IP address
⑦	L/A IN	Indicates CC-Link IEF Basic link status with [IN] port	OFF	No link
			Green blinking	Link established
			Green flickering	Link established, in communication
⑧	L/A OUT	Indicates CC-Link IEF Basic link status with [OUT] port	OFF	No link
			Green blinking	Link established
			Green flickering	Link established, in communication
⑨	INFO	Indicates slave unit operation status	OFF	Normal
			Red blinking	Maintenance notice *1
			Red double flash	Change notice of operating setting
			Red on	Backup error notice
⑩	PW	Indicates slave unit power status	OFF	Unit power OFF
			Green on	Unit power ON
⑪	PW(V)	Indicates valve power status	OFF	Valve power OFF
			Green on	Valve power ON

Note *1: By setting the maintenance information notice, INFO (LED) notices when maintenance is needed. “No notification” is the factory default. Refer to 2.3 maintenance information.

2. PRECAUTIONS

- Before turning the power ON or OFF, ensure the safety of the surroundings as the components in the system, including the valve (cylinder), may move unexpectedly.
- Refer to the user's manual provided for the master unit concerning the communication delay time. The transmission delay within the entire system depends on the scan time achieved by the PLC and on other devices included in the system.
- Refer to the valve specification for the response time as it varies by the model of solenoid valve.
- The time it takes for the solenoid valve to turn OFF delays by approximately 20 msecs since there is a surge absorbing circuit incorporated in the slave unit.
- Make sure the power cables and network cables are connected according to the specifications to avoid any incorrect wiring.
- Do not subject the power cables and network cables to tension and impact.
- Before turning on the power, make sure that all cables and connectors are connected firmly.
- Never attempt to disassemble, modify, and/or repair the slave unit. Doing so may result in failure or malfunction of the slave unit.
- Many precision devices are mounted inside the slave unit. Do not drop the slave unit nor apply vibration or impact to the unit.
- Do not connect or disconnect any connectors while the power is being supplied. Doing so may result in failure or malfunction.
- Mold and rust can develop on the product if it is exposed to high humidity during transportation. Include moisture absorbers and tightly seal the package.
- Install the Slave Unit at least 200mm away from high-voltage cables and power lines, or lay the high-voltage cables and power lines in metal tubing and ground it.

3. OPERATION

3.1 IP address setting

CAUTION:

- Discharge static electricity that has built up on your body before touching the slave unit.
  Otherwise, static electricity may damage this product.
- The slave unit will not identify the setting if the power is supplied.
  Make sure the power is turned off upon setting as they are read into the unit only at power-up.
- Keep the cover closed at all times except when setting the switches.
  Otherwise, foreign matter may enter into the internal circuit from the cover and cause unexpected failure, or the cover itself may get damaged.
  Be extremely careful not to allow any foreign matter to enter the slave unit when setting the switches.
- Make sure not to touch the internal circuit board when setting the switches as they are precisely built and can be damaged if mishandled.

Factory setting

	Mode of IP address setting	IP address
Factory setting	Basic	192.168.3.250

IP address setting

IP address setting	Description
Basic mode	Sets IP address using Basic communication.
HardWare mode	Sets IP address using setting switches.
DHCP mode	Sets IP address using DHCP server.
SLMP mode	Sets IP address using SLMP or Basic communication.

IP address setting

1) Basic mode

Change IP address by Basic communication, using PLC software (GX Works3 by Mitsubishi Electric Corp.). Initial value of IP address is: 192.168.3.250

Step ①

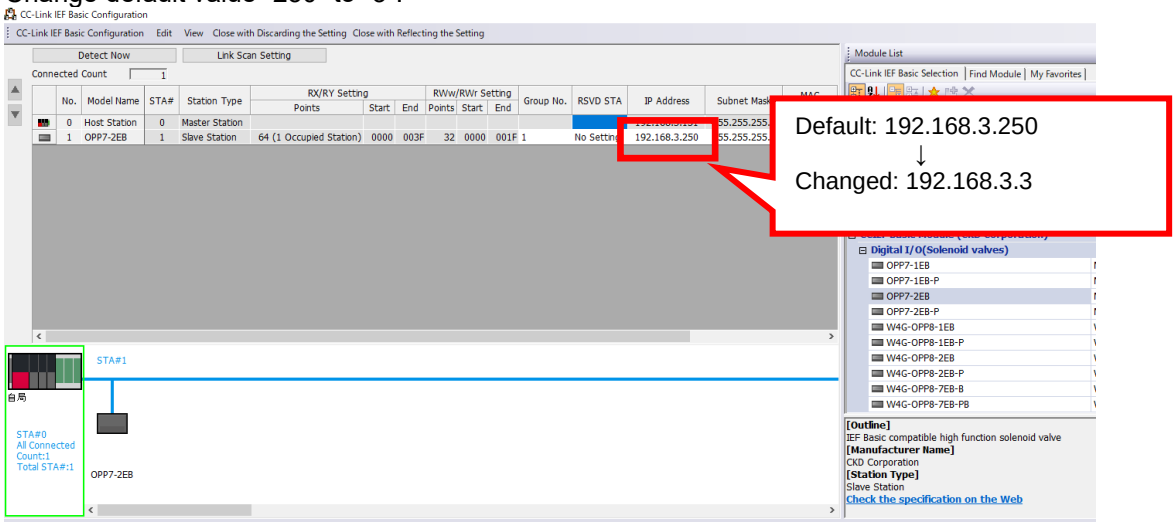
Set the HardWare switches.

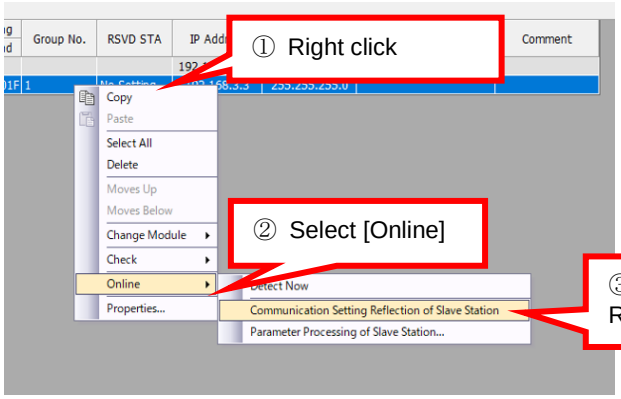
No.	Switch	Settings
①	Switch for IP address setting (x16)	Sets to “0”.
②	Switch for IP address setting (x1)	Sets to “0”.
③	Switch for the output setting in communication error	Specifies the action taken on the output in the event of communication error (such as communication line disconnection or timeout). “CLR”: clear the output of valve in the event of communication error “HLD”: hold the output of valve in the event of communication error
④	Switch for operating mode setting	Sets to “HW”.

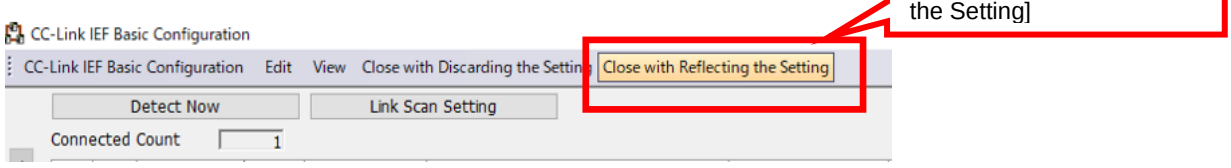
Step ②

Set IP address with Basic communication using GX Works3.

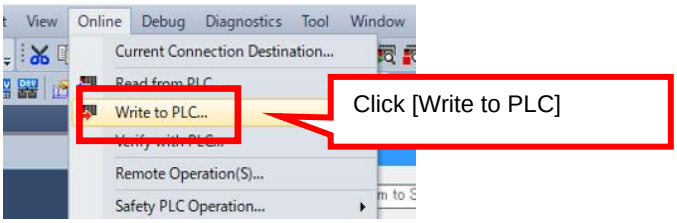
Change default value “250” to “3”.

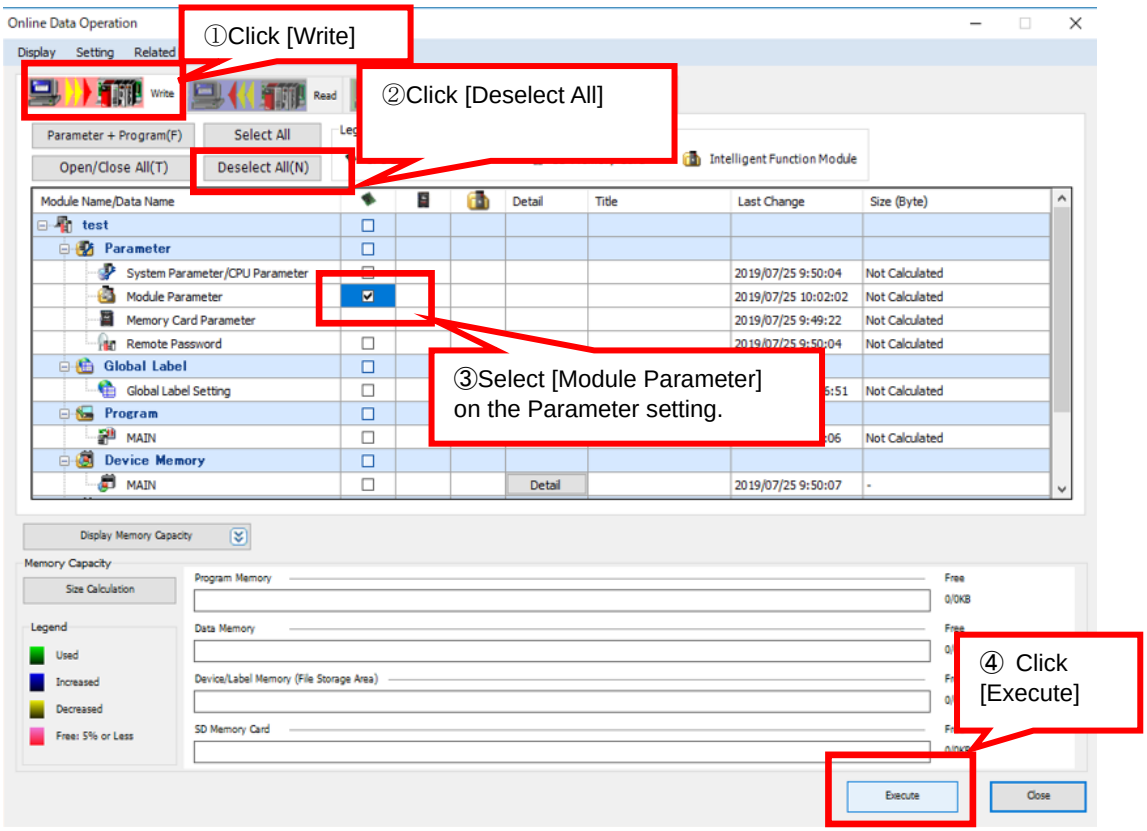




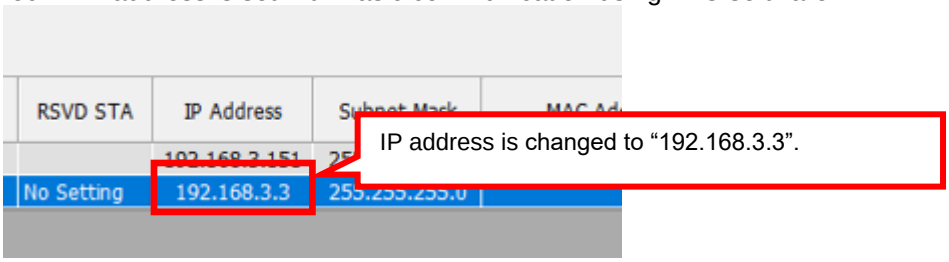


Write to PLC





Power off the PLC
Check if IP address is set with Basic communication using PLC software.



2) HardWare mode

Set IP address using the switches.
Set the fourth octet of 192.168.3.xxx for IP address.

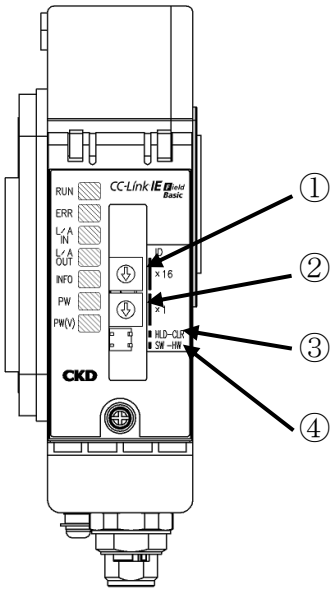
Step ①
Set the HardWare switches.

No.	Switch	Settings	Remarks
①	Switch for IP address setting (x16)	Sets between “0” to “F”	Setting range is 01 to FEh Set the 4th octet
②	Switch for IP address setting (x1)	Sets between “0” to “F”	
③	Switch for the output setting in communication error	Sets the action taken on the output in the event of communication error (such as communication line disconnection or timeout). “CLR”: clear the output of valve in the event of communication error “HLD”: hold the output of valve in the event of communication error	
④	Switch for operating mode setting	Sets to “HW”.	

Switch for IP address setting

x16: Upper digit (①)		
Set value (Hexadecimal)	⇔	Decimal
0	⇔	0
1	⇔	16
2	⇔	32
3	⇔	48
4	⇔	64
5	⇔	80
6	⇔	96
7	⇔	112
8	⇔	128
9	⇔	144
A	⇔	160
B	⇔	176
C	⇔	192
D	⇔	208
E	⇔	224
F	⇔	240

x1: Lower digit (②)		
Set value (Hexadecimal)	⇔	Decimal
0	⇔	0
1	⇔	1
2	⇔	2
3	⇔	3
4	⇔	4
5	⇔	5
6	⇔	6
7	⇔	7
8	⇔	8
9	⇔	9
A	⇔	10
B	⇔	11
C	⇔	12
D	⇔	13
E	⇔	14
F	⇔	15



[Example] To set the IP address to 71 (decimal)

Since 71=64+7, upper digit is set to 4 and lower digit is set to 7 [47 (hexadecimal)] according to the table above.

Step ②
Power on the unit and check if the communication establishes.

3) DHCP mode

Set IP address using DHCP server. Initial value of IP address is: 0.0.0.0.
IP address is assigned with DHCP server.

Step ①

Set the HardWare switches.

No.	Switch	Settings
①	Switch for IP address setting (x16)	Sets to “F”
②	Switch for IP address setting (x1)	Sets to “F”
③	Switch for the output setting in communication error	Sets the action taken on the output in the event of communication error (such as communication line disconnection or timeout). “CLR”: clear the output of valve in the event of communication error “HLD”: hold the output of valve in the event of communication error
④	Switch for operating mode setting	Sets to “HW”.

Step ②

Refer to the specifications of DHCP server.

4) SLMP mode

Change IP address by Basic communication or SLMP communication, using PLC software (GX Works3 by Mitsubishi Electric Corp.).

Initial value of IP address is: 192.168.3.250

Step ①

Set the HardWare switches.

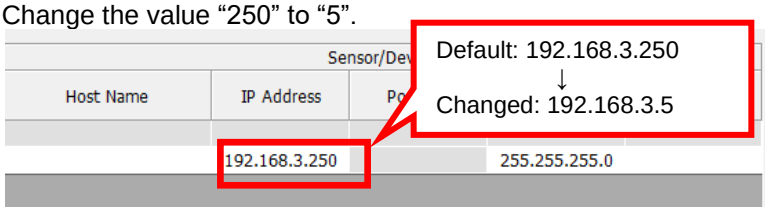
No.	Switch	Settings
①	Switch for IP address setting (x16)	Disable
②	Switch for IP address setting (x1)	Disable
③	Switch for the output setting in communication error	Disable Sets the output status in the event of communication error (such as communication line disconnection or timeout) with SLMP communication.
④	Switch for operating mode setting	Sets to “SW”.

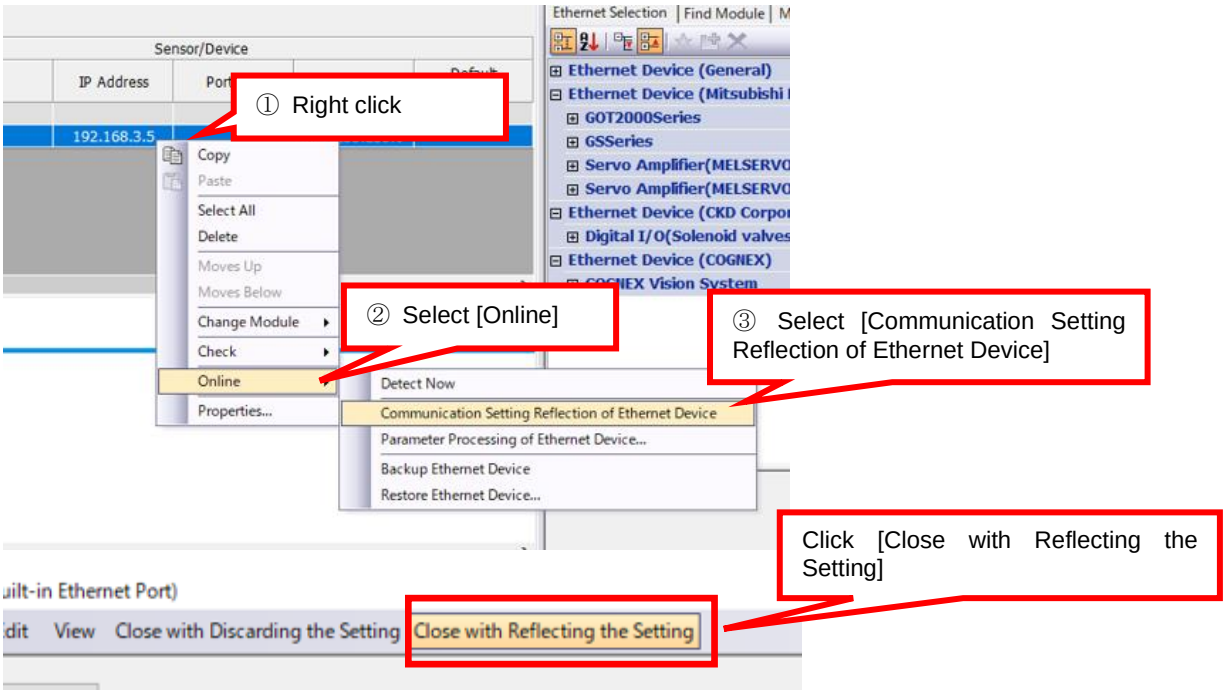
Note1*: Refer to page 27 for setting.

Step ②

Set IP address with SLMP communication using GX Works3.

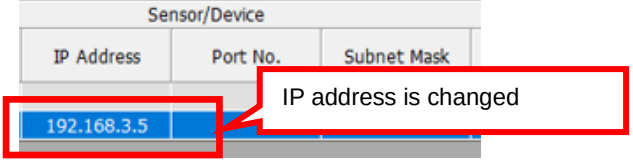
Change the value “250” to “5”.





Write to PLC. Refer to 1) Basic mode setting for writing.

Check if IP address is set by GX Works3.



3.2 Settings by CSP+ file

In order for the CC-Link IEF Basic slave unit to join the network, it is necessary to register the device to the network using the CPS+ (CC-Link Family System Profile Plus) file which describes the device's communication specification. Refer to the user's manual provided by the master unit manufacturer for registering the CSP+ file. Also, use the latest CSP+ file for proper network configuration.

1) How to register the device

Check the specifications (model name) of the device before registering, as both the device and CSP+ file need to be matched first.

Refer to the following table for the device specifications and CSP+ file.

Specifications and model names in the CSP+ file

Item	Specifications					
Manifold Model No.	-T7EB1	-T7EB2	-T7EBB7	-T7EBP1	-T7EBP2	-T7EBPB7
Slave unit	W4G-OPP8 -1EB	W4G-OPP8 -2EB	W4G-OPP8 -7EB-B	W4G-OPP8 -1EB-P	W4G-OPP8 -2EB-P	W4G-OPP8 -7EB-PB
Output type	+COM(NPN)			-COM (PNP)		
I/O point	16-point outputs	32-point outputs	16-point I/O	16-point outputs	32-point outputs	16-point I/O
Model names in the CSP+ file	W4G-OPP8 -1EB	W4G-OPP8 -2EB	W4G-OPP8 -7EB-B	W4G-OPP8 -1EB-P	W4G-OPP8 -2EB-P	W4G-OPP8 -7EB-PB

2) Function

Use Basic or SLMP communication (*1) for function setting and monitoring.

Note that the function varies depending on the mode of IP address setting.

No.	Item	Description	Mode of IP address setting			
			Basic	Hard Ware	DHCP	SLMP
1	Product information	Monitoring the product information of this unit.	Enable	Enable	Enable	Enable
2	Operational information	Monitoring IP address and communication status.	Enable	Enable	Enable	Enable
3	Maintenance information	Monitoring and setting of maintenance.	Enable	Enable	Enable	Enable
4	Output information	Monitoring and setting of output status.	Enable*2	Enable*2	Enable*2	Enable
5	Input information *3	Monitoring and setting of input status.	Enable	Enable	Enable	Enable

*1: Refer to 5.5 Notes/Remarks for operation.
*2: Set with slide switch for output status in the event of communication error.
*3: Only W4G-OPP8-7EB-*B is compatible.

2)-1 Product information

Following items are displayed.

No.	Item	Description
1	VenderName	Indicates vendor name.
2	VenderID	Indicates vendor ID.
3	ProductName	Indicates product name.
4	HWversion	Indicates HardWare version.
5	SWVersion	Indicates SoftWare version.
6	ItemCode	Indicates item code.
7	SlaveProtocolVersion	Indicates protocol version of this product.

2)-2 Operational information

Following items are displayed.

No.	Item	Description	Remarks
1	ChangeFlg	Notifies the operation change on next start-up.	Refer to 2-2-1
2	IPSettingMode	Indicates the mode of IP address setting. 「Basic」「HW」「DHCP」「SLMP」	-
3	IPSettingMode_f	Indicates setting mode of IP address on the next start up. 「Basic」「HW」「DHCP」「SLMP」	-
4	IPAddress	Indicates IP address at present.	-
5	IPAddress_f	Indicates IP address on the next start up.	-
6	SubNetmask	Indicates subnet mask.	-
7	CommParam	Indicates baud rate and communication method.	-
8	CommPort	Indicates communication port status.	-
9	CommFailureOutput	Indicates the setting made to specify which action to take on the output in the event of communication error.	-
10	CommFailureOutput_f	Indicates the setting made to specify which action to take on the output in the event of communication error on the next start up.	Refer to 2-2-2
11	CommFailureValue	Indicates the output status in the event of communication error.	Refer to 2-2-2
12	CommFailureValue_f	Indicates the output status in the event of communication error on the next start up.	-
13	ElectricityTime *1	Indicates energizing time.	-
14	OutputNumber	Indicates maximum output point.	-
15	InputNumber	Indicates maximum input point.	-
16	OutputType	Indicates output type.	-
17	OutputMonitor	Indicates the output of pneumatic valve.	-
18	InputMonitor *2	Indicates status of input from sensor.	-
19	MasterProtocolVersion	Indicates protocol version of master unit.	-

* 1: As initial status, energization time of factory delivery inspection may add.

* 2: Only W4G-OPP8-7EB-*B is compatible.

2-2-1 Change monitor on next start-up

Change monitor on next start-up

No.	Indication
1	Changed
2	Not changed

"Changed" is indicated when there is change with any of following items.

No.	Item	Remarks
1	Mode of IP address setting	Check the setting with Basic and SLMP communication.
2	IP address	
3	Switch for IP address setting Switch for operating mode setting Switch for the output setting in communication error	Check each switch.

Turning the power of slave unit from OFF to ON changes the setting of slave unit.
Slave unit operates with the changed setting at power on, and that may change valve output and other.
Confirm the safety of surroundings before powering on.

2-2-2 Output setting monitor and value setting monitor in the event of communication error.

IP address setting mode [Basic]

Switch for operating mode setting	Output point	Output setting monitor in the event of communication error	Value setting monitor in the event of communication error
HLD	16	0xFFFF	HLD (Status right before communication error occurs)
	32	0xFFFFFFFF	
CLR	16	0x0000	CLR (0x0000)
	32	0x00000000	CLR (0x00000000)

IP address setting mode [HW]

Switch for operating mode setting	Output point	Output setting monitor in the event of communication error	Value setting monitor in the event of communication error
HLD	16	0xFFFF	HLD (Status right before communication error occurs)
	32	0xFFFFFFFF	
CLR	16	0x0000	CLR (0x0000)
	32	0x00000000	CLR (0x00000000)

IP address setting mode [DHCP]

Switch for operating mode setting	Output point	Output setting monitor in the event of communication error	Value setting monitor in the event of communication error
HLD	16	0xFFFF	HLD (Status right before communication error occurs)
	32	0xFFFFFFFF	
CLR	16	0x0000	CLR (0x0000)
	32	0x00000000	CLR (0x00000000)

IP address setting mode [SLMP]

Switch for operating mode setting	Output point	Output setting monitor in the event of communication error	Value setting monitor in the event of communication error
HLD	16	CommFailureOutputModeSetting *1	CommFailureValueSetting *1
	32		
CLR	16		
	32		

*1: In IP address setting mode [SLMP], SLMP communication enables “CommFailureOutputModeSetting” and “CommFailureValueSetting” setting. Due to the initial value 0 for both “CommFailureOutputModeSetting” and “CommFailureValueSetting” (16 points: 0x0000 and 32 points: 0x00000000), Clear (16 points: 0x0000 and 32 points: 0x00000000, and clears all outputs of points) is applied when communication error occurs.

2-3 Maintenance information

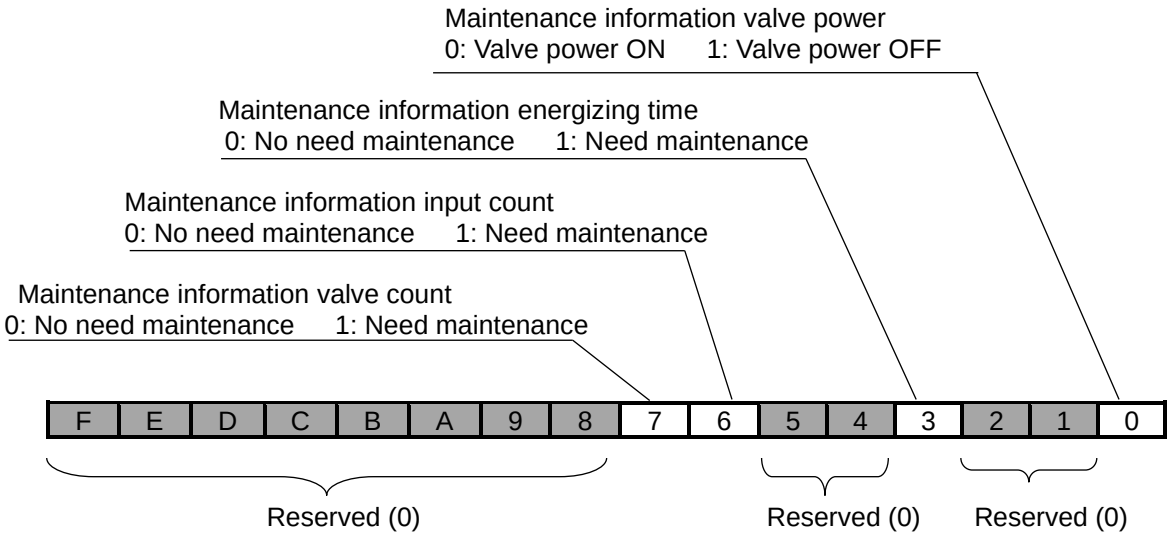
Following items can be set and monitored.
Use maintenance function after enabling [maintenance setting].

No.	Item	Description	Remarks
1	MaintenanceMon	Notifies maintenance information.	2-3-1
2	MaintenanceMon	Sets the maintenance items which to inform. (Initial value: 0x0000 (no maintenance information notice))	2-3-2
3	ElectricityTimeThreshold	Sets energizing time to the slave unit notifying maintenance information to.	-
4	OutputCountThreshold	Sets count of the valve notifying maintenance information to. Sets this threshold to use maintenance function. (maintenance function is disable due to the initial value 0)	-
5*	InputCountThreshold	Sets the count number of sensor input which notify maintenance information. Sets this threshold to use maintenance function. (maintenance function is disable due to the initial value 0)	-

2-3-1 Maintenance monitor information

Maintenance monitor is 2 bytes data.

Check the maintenance status of each device when maintenance monitor indicates “1: Need maintenance”.

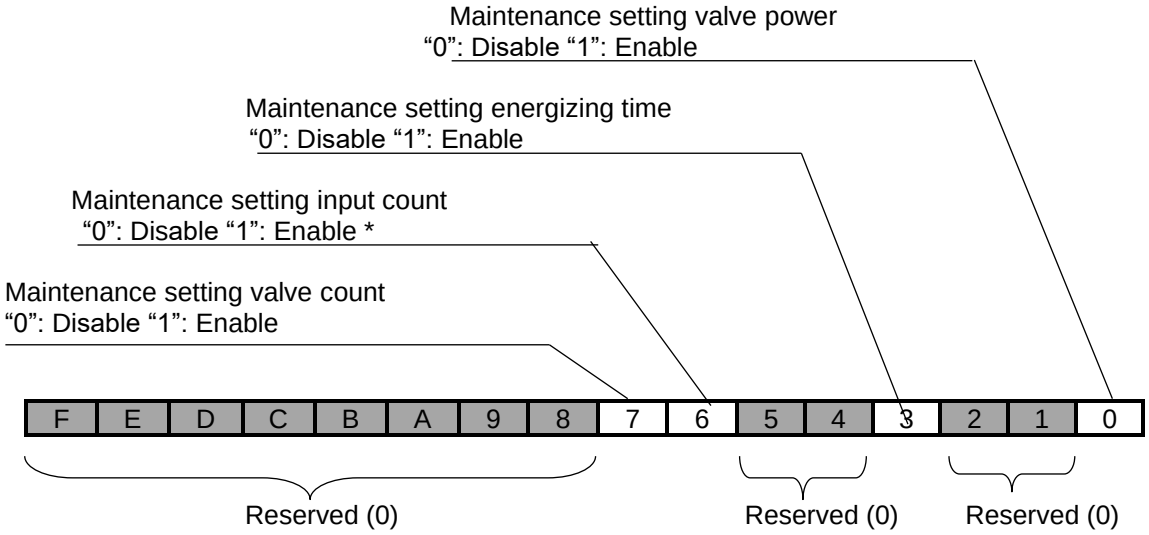


bit	Item	Description
0	Maintenance information valve power	0: Valve power ON 1: Valve power OFF Indicates valve power condition.
1	Reserved	0
2	Reserved	0
3	Maintenance information energizing time	0: No need maintenance (ElectricityTime < ElectricityTimeThreshold) 1: Need maintenance (ElectricityTime ≥ ElectricityTimeThreshold) Notifies maintenance information of energization time after comparing [ElectricityTime] and [ElectricityTimeThreshold].
4	Reserved	0
5	Reserved	0
6 *1	Maintenance information input count	0: No need maintenance ([InputCountThreshold] > InputCounter (minimum)) 1: Need maintenance (InputCountThreshold] ≤ InputCounter (minimum)) Notifies maintenance information of input count after comparing each input [InputCountThreshold] and [InputCounter]. Setting with each sensor input is needed to notify maintenance information. Change [InputCountSetting] to [maintenance setting - enable]. When plural input are set as [maintenance setting - enable], and if one or more sensor’s condition is as [InputCounter] ≤ [InputCountThreshold], then [InputCountMon] becomes 1.
7	Maintenance information valve count	0: No need maintenance ([OutputCountThreshold] > [OutputCounter (min.)]) 1: Need maintenance ([OutputCountThreshold] ≤ [OutputCounter (min.)]) Compare [[OutputCounter] and [OutputCountThreshold] of each valve, then alert valve count maintenance information. Setting with each valve is needed to notify maintenance information. Change [OutputCountSetting] to [maintenance setting - enable]. When plural valves are set as [maintenance setting - enable], and if one or more valve’s condition is as [OutputCounter] ≤ [OutputCountThreshold], then [OutputCountMon] becomes 1.
8-F	Reserved	0

*1: Only W4G-OPP8-7EB-*B is compatible.

2-3-2 Maintenance setting

Maintenance setting is 2 bytes data.
Use the function by changing bit of the maintenance item from “0”: Disable to “1”: Enable.



bit	Item	Description
0	Maintenance setting valve power	0: Disable 1: Enable Sets whether to monitor the load power supply status.
1	Reserved	0
2	Reserved	0
3	Maintenance setting energizing time	0: Disable 1: Enable Sets whether to monitor energizing time
4	Reserved	0
5	Reserved	0
6 *1	Maintenance setting input count	0: Disable 1: Enable Sets whether to monitor the sensor input count
7	Maintenance setting valve count	0: Disable 1: Enable Sets whether to monitor the valve input count
8-F	Reserved	0

*1: Only W4G-OPP8-7EB-*B is compatible.

[SM-P00132-A/1]

2-4 Output information (overall)

Following items can be set and monitored.

Either 16 points or 32 points output can be set altogether.
However, it enables each setting when the valve was set separately.

No.	Item	Description	Remarks
1	CyclicOutputMon	Indicates the data received by cyclic communication from the master unit.	-
2	CompulsionOutput	0: OFF 1: ON Sets the output value when the valve is output forcibly.	2-4-1
3	CompulsionOutputSetting	0: Cyclic output data - enable 1: Forced output data - enable Sets whether output the valve forcibly or not.	2-4-1
4 *1	CommFailureOutputModeSetting	0: Value data 1: Last data Either the value set with [CommFailureValueSetting] or the value right before is selectable.	2-4-2
5 *1	CommFailureValueSetting	0: OFF 1: ON Sets output value in the event of communication error. Sets “0: Value data” with [CommFailureOutputModeSetting to output the configured value.	2-4-2
6	OutputCountMon	0: No need maintenance 1: Need maintenance Monitors maintenance status of valve altogether by comparing [OutputCount] and [OutputCountThreshold] when [OutputCountSetting] is set [maintenance setting - enable].	2-4-3
7	OutputCountSetting	0: Maintenance setting - disable 1: Maintenance setting - enable Sets whether to monitor [OutputCounter]. When bit7 of maintenance setting is configured, maintenance notify is also sent to [MaintenanceMon].	2-4-3
8	LoadPowerMon	Power ON: when load power is ON. Power OFF: when load power is OFF. Monitors the load power (valve power) status.	-

*1 When SLMP is in the IP address setting mode, the setting [CommFailureOutput] reflects [CommFailureOutputModeSetting] of operational mode. In addition, [CommFailureValueSetting] reflects [CommFailureValueSettingMon].

2-4-1 Forced output setting

This function can be used when valve output needs to be changed temporary, or the equipment is installed.
Output the specified valve in arbitrary state, not with the valve state being sent by the master unit cyclically.
* The valve output set by this function is cleared in the event of communication error.
Reconfigure the setting as it is cleared when the unit is powered OFF.

No.	Item	Description
1	CompulsionOutput	Sets the output status of valve.
2	CompulsionOutputSetting	Sets the point to output arbitrarily.

Example)
Following tables show the case when the solenoid output S00 is set to OFF, the output S15 is set to ON, and the rest S01 to S14 are set to the value of cyclic data (for 16 output points).

CompulsionOutput:

MSB															LSB
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

0: OFF, 1: ON, -: Disvalue

CompulsionOutputSetting:

MSB															LSB
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

0: Cyclic output data - enable, 1: Forced (compulsion) output data -enable

Valve output (output data monitor):

MSB															LSB
1	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	0

0: OFF, 1: ON, “C“: Cyclic output data

Only for the bit with “1: CompulsionOutput - enable”, the solenoid output being set by the CompulsionOutput is executed. For the bit with “0: Cyclic output data - enable” setting, cyclic output data being sent from the master unit cyclically is executed.

2-4-2 Setting in the event of communication error (when IP address mode is SLMP)

When SLMP is in the IP address setting mode, it enables valve output with arbitrary setting in the event of communication error. The unset port holds the last output value.

No.	Item	Description
1	CommFailureOutputModeSetting	Sets the point to output arbitrarily in the event of communication error.
2	CommFailureValueSetting	Sets the value in the event of communication error.

Example)

Following tables show the case when the solenoid output S00 is set to OFF, the output S15 is to ON, and the rest S01 to S14 are held to the last value (for 16 output points) at the communication error.

CommFailureOutputModeSetting:

MSB															LSB
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0

0: Value data, 1: Last data

CommFailureValueSetting:

MSB															LSB
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

0: OFF, 1: ON, -: Disvalue

Valve output in the event of communication error:

MSB															LSB
1	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	“C“	0

0: OFF, 1: ON, “C”: Cyclic output data (Last data)

2-4-3 Maintenance (output count)

No.	Item	Description
1	OutputCountMon	0: No need maintenance 1: Need maintenance Each valve can be checked altogether whether they are in due time for maintenance, by changing [OutputCountSetting] to [maintenance setting - enable]. Note that [OutputCountMon] becomes “0: No need maintenance”, when [OutputCountSetting] is OFF.
2	OutputCountSetting	0: Maintenance setting - disable 1: Maintenance setting - enable Sets each valve whether to monitor maintenance. When the condition of valve with [maintenance setting - enable] is [Need maintenance], it is also applied to the maintenance monitor (maintenance information bit7: valve input maintenance information- INFO LED)).

Example) For 16 output points

Notify the maintenance when the output of any solenoid valve among 00 to 07 exceeds 0x0000FFFF with the ON count. The ON count of valve S0 and S8 were over 0x0000FFFF.

OutputCountSetting

MSB															LSB
0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

0: Stop maintenance monitor, 1: Execute maintenance monitor

OutputCountThreshold --- 0x0000FFFF

Maintenance threshold of input count [OutputCountThreshold] is in common for all the valves.

OutputCountMon

MSB															LSB
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1

0: No need maintenance, 1: Need maintenance

When the valve count of S0 and S7 is 0x0000FFFF or more.

2-5 Output information (each valve)

Following items can be set and monitored.

Each valve can be set. If the setting is operated for each valve, the setting is applied as a whole.
Output count can be checked for each valve.

No.	Item	Description
1	CyclicOutputMon	Indicates the data received with cyclic communication from the master unit.
2	CompulsionOutput	0: OFF 1: ON Sets the output value when the valve is output forcibly.
3	CompulsionOutputSetting	0: Cyclic output data - enable 1: Forced (compulsion) output data - enable Sets whether to output this valve forcibly.
4	CommFailureOutputModeSetting *	0: Value data 1: Last data When SLMP is in the IP address setting mode, set valve output in the event of communication error. The value set with [CommFailureValueSetting] or the value immediately before that (Last data) are selectable.
5	CommFailureValueSetting *	0: OFF 1: ON When SLMP is in the IP address setting mode, set output value of this valve in the event of communication error. Sets “0: Value data” with [CommFailureOutputModeSetting] to output the configured value.
6	OutputCountMon	0: No need maintenance 1: Need maintenance Becomes “Need maintenance” when it is set as [OutputCountSetting] and [OutputCounter] is equal to or greater than [OutputCountThreshold].
7	OutputCountSetting	0: Maintenance setting - disable 1: Maintenance setting - enable Sets whether monitor [OutputCounter] of the valve. When bit7 of maintenance setting is configured, it also reflects to [MaintenanceMon].
8	OutputCounter	Indicates the number this valve output.

* When SLMP is in the IP address setting mode, the setting [CommFailureOutput] reflects [CommFailureOutputModeSetting] of operational mode.
In addition, [CommFailureValueSetting] reflects [CommFailureValueSettingMon].

2-6 Input information (overall)

* Only W4G-OPP8-7EB-*B is compatible.

Following items can be set and monitored.

All the sensor input can be set together

If each sensor was set separately, each setting become enable.

No.	Item	Description	Remarks
1	Inputdata	Indicates the sensor data entered from input block.	
2	CompulsionIntput	0: OFF 1: ON Sets the input value when the sensor is input forcibly.	2-6-1
3	CompulsionInputSetting	0: Input data - enable 1: Forced input data - enable Sets whether to input this sensor forcibly.	2-6-1
4	InputONReplySetting	0: ON response function - disable 1: ON response function - enable Sets whether to use [InputONReplySetting] when input changes from OFF to ON.	2-6-2
5	InputONReplyTimeSetting	1msec, 2msec, 10msec, 20msec, 100msec, 200msec Sets input ON response time (InputONReplyTime). Sets the time starting from the slave unit sensor input till remote input. (Communication timing of cyclic communication will be added separately.)	2-6-2
6	InputOFFReplySetting	0: Input OFF response function - disable 1: Input OFF response function - enable Sets whether to use [InputOFFReplySetting] when input changes from ON to OFF.	2-6-2
7	InputOFFReplyTimeSetting	1msec, 2msec, 10msec, 20msec, 100msec, 200msec Sets input OFF response time (InputOFFReplyTime). Sets the time starting from the slave unit sensor input till remote input. (Communication timing of cyclic communication will be added separately.)	2-6-2
8	InputCountMon	0: No need maintenance 1: Need maintenance Becomes “Need maintenance” when it is set as [InputCountSetting] then [InputCounter] is equal to or greater than [InputCountThreshold].	2-6-3
9	InputCountSetting	0: Maintenance setting - disable 1: Maintenance setting – enable Sets whether to monitor the sensor input count([InputCounter]) When bit6 of maintenance setting is configured, it also notifies to [MaintenanceMon].	2-6-3

2-6-1 Forced input setting

This function can be used when sensor input needs to be changed temporary, such as the time of equipment installation.

Input specified sensor input arbitrarily, instead of the input value from the input block.

The sensor input set with this function is deactivated when communication error occurs.

[Note] Reconfigure the setting as it is cleared when the unit is powered OFF.

No.	Item	Description
1	CompulsionIntput	Sets input status from sensor.
2	CompulsionInputSetting	Sets the point to input arbitrarily.

Example)

Turn OFF the input block 1 to 0 and turn ON the block 4 to 2 then input the actual sensor input for the rest.

CompulsionIntput:

MSB															LSB
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

0: OFF, 1: ON, -: Disvalue

CompulsionInputSetting

MSB															LSB
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

0: Sensor input data - enable, 1: Forced input data - enable

IntputMonitor

MSB															LSB
1	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	“S”	0

0: OFF, 1: ON, S: Sensor input data

Only the bit with forced input setting [1: forced input data - enable] accepts sensor input set with the forced input data. On the other hand, the bit with setting [0: sensor input data - enable] receives input data from the sensor of input unit.

2-6-2 Input response time setting

To reduce the network burden by such as input chattering, input respond time can be set.

No.	Item	Description
1	InputONReplySetting	0: ON response function - disable 1: ON response function - enable Sets altogether whether disable or enable the setting of input response ON time
2	InputONReplyTimeSetting	1msec, 2msec, 10msec, 20msec, 100msec, 200msec Sets input ON response time (InputONReplyTime). Input ON response time (InputONReplyTime) is in common for all the input points.
3	InputOFFReplySetting	0: Input OFF response function - disable 1: Input OFF response function - enable Sets altogether whether disable or enable the setting of input response OFF time
4	InputOFFReplyTimeSetting	1msec, 2msec, 10msec, 20msec, 100msec, 200msec Sets input OFF response time (InputOFFReplyTime). Input OFF response time (InputONReplyTime) is in common for all the input points.

For input response function, sets then uses ON/OFF response setting (1) & (3) and ON/OFF response time setting (2) & (4).

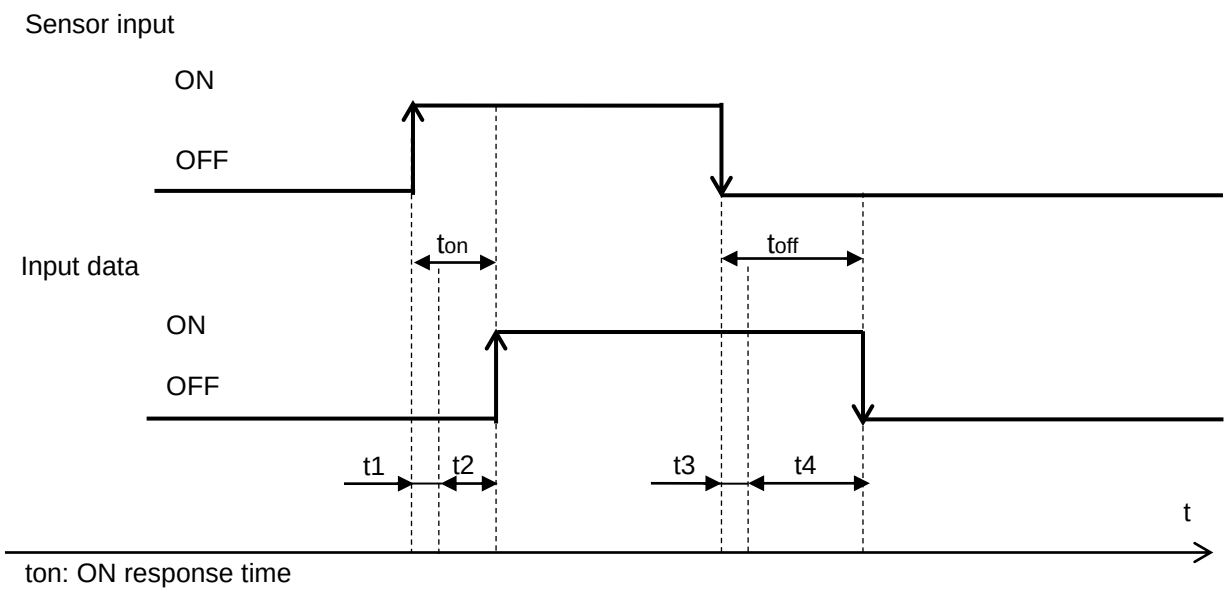
- Input ON/OFF response setting enables or disables setting for each input ports.
- Input ON/OFF response time setting is in common for all the input ports.

According to the input block specification, below mentioned delay time may occur.

No.	Item		Maximum delay time [ms]
1	InputONReplyTime	OFF→ON	15
2		ON→OFF	18

Example 1)

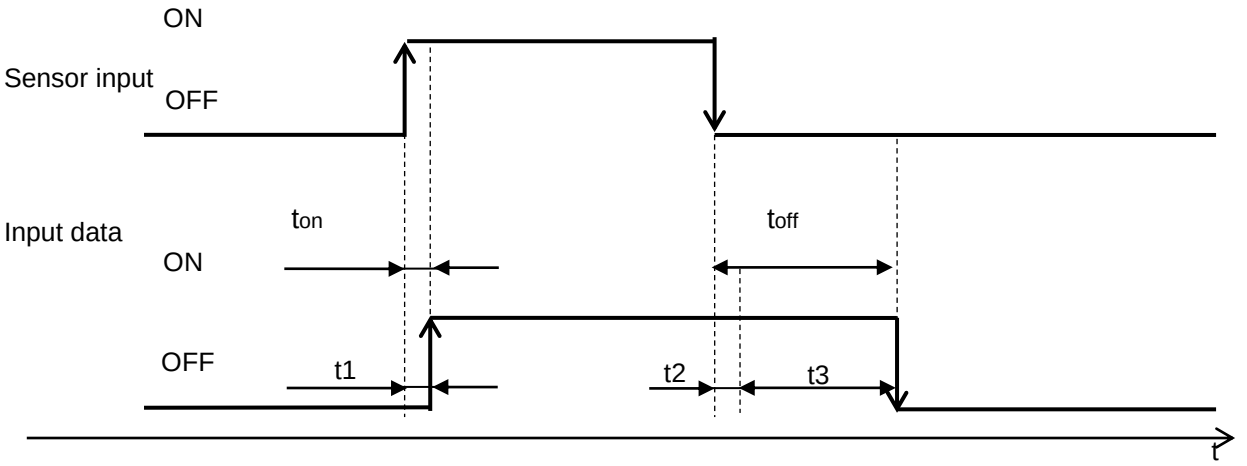
Below is when input ON response setting is [1: input ON response function - enable] and input OFF response setting is [1: input OFF response function - enable].



ton: ON response time
toff: OFF response time
t1: Input block delay time (ON response) + delay time by CC-Link IEF Basic cyclic communication.
t2: Delay time with input ON response time setting
t3: Input block delay time (OFF response) + delay time by CC-Link IEF Basic cyclic communication..
t4: Delay time with input OFF response time setting

Example 2)

Below is when input ON response setting is [1: input ON response function - enable] and input OFF response setting is [1: input OFF response function - enable].



ton: ON response time
toff: OFF response time
t1: Input block delay time (ON response) + delay time by CC-Link IEF Basic cyclic communication.
t2: Input block delay time (OFF response) + delay time by CC-Link IEF Basic cyclic communication.
t3: Delay time with input OFF response time setting

2-6-3 Maintenance (Input ON count)

No.	Item	Description
1	InputCountMon	0: No need maintenance 1: Need maintenance Each sensor can be checked altogether whether they are in due time for maintenance, by changing [InputCountSetting] to [maintenance setting - enable]. Note that [InputCountMon] becomes “0: No need maintenance”, when [InputCountSetting] is OFF.
2	InputCountSetting	0: Maintenance setting - disable 1: Maintenance setting – enable Sets each sensor whether to monitor maintenance. If the condition of sensor with [maintenance setting - enable] is [Need maintenance], it is also applied to the maintenance monitor (maintenance information bit 6: sensor input maintenance information- INFO LED).

Example) For 16 output points

When any of sensor input 1-0, 1-1, 1-2, 1-3, 2-0, 2-1, 2-2, and 2-3 have sensor input on count more than 0x0000ffff times, maintenance is notified. The input ON count of sensor 1-0 and 2-3 became over 0x0000FFFF.

InputCountSetting

MSB															LSB
0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

0: Stop maintenance monitor, 1: Execute maintenance monitor

[InputCountThreshold]: 0x0000FFFF
Maintenance threshold of input count [InputCountThreshold] is in common for all the sensor input.

InputCountMon

MSB															LSB
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1

0: No need maintenance 1: Need maintenance.

When the valve ON count of S0 and S7 are 0x0000FFFF or more.

2-7 Input information (each sensor)

Each sensor input can be set and if such setting is operated, it is applied as a whole. Input ON count can be checked for each valve.

No.	Item	Description
1	InputMonitor	Indicates each sensor data entered by input block.
2	CompulsionIntput	0: OFF 1: ON Sets the input value of each sensor when the input is set forcibly.
3	CompulsionInputSetting	0: Input data - enable 1: Forced input data - enable Sets each sensor whether to input sensor data forcibly.
4	InputONReplySetting	0: ON response function - disable 1: ON response function - enable Sets whether to use [InputONReplySetting] for each sensor input when input changes from OFF to ON.
5	InputOFFReplySetting	0: Input OFF response function - disable 1: Input OFF response function - enable Sets whether to use [InputOFFReplySetting] for each sensor input when input changes from ON to OFF.
6	InputCountMon	0: No need maintenance 1: Need maintenance Becomes “Need maintenance” when it is set as [InputCountSetting] then [InputCounter] is equal to or greater than [InputCountThreshold]
.7	InputCountSetting	0: Stop maintenance monitor 1: Execute maintenance monitor Sets whether to monitor [InputCounter]. When bit6 of maintenance setting is configured, it also reflects to [MaintenanceMon]
.8	InputCounter	Indicates the number of this sensor input turned from OFF to ON. When [InputONReplySetting] is set, and the time the sensor turned ON was shorter than [InputONReplySetting] time, sensor counts [InputCounter]. Input count does not count even if the sensor input is changed from OFF to ON by the forced input.

3.3 Correspondence between the slave unit output No. and PLC address No.

1) PLC addresses correspondence tables

Tables below explain the correspondence using PLC Manufactured by Mitsubishi Electric as a representative example. Additionally, this indicates the case that serial transmission type slave unit is set “station No.1”.

NW4G*-T7EB*1 (16 output points)

PLC allocated memory address	RY *0-*F															
	RY*0	RY*1	RY*2	RY*3	RY*4	RY*5	RY*6	RY*7	RY*8	RY*9	RY*A	RY*B	RY*C	RY*D	RY*E	RY*F
Serial Transmission(S-Trans) Type Slave unit Output No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Solenoid output No.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15

RY data 1st word

NW4G*-T7EB*2 (32 output points)

PLC allocated memory address	RY *0-*F																RY *0-*F															
	RY *0	RY *1	RY *2	RY *3	RY *4	RY *5	RY *6	RY *7	RY *8	RY *9	RY *A	RY *B	RY *C	RY *D	RY *E	RY *F	RY *0	RY *1	RY *2	RY *3	RY *4	RY *5	RY *6	RY *7	RY *8	RY *9	RY *A	RY *B	RY *C	RY *D	RY *E	RY *F
S-Trans Type Slave unit Output No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Solenoid output No.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

RY data 1st word　　RY data 2nd word

NW4G*-T7EB*B7 (16 output points), with 8 points solenoids, 4 input blocks, and 2 output blocks.

	PLC allocated memory address RY *0-*F																RX *0-*F															
	RY *0	RY *1	RY *2	RY *3	RY *4	RY *5	RY *6	RY *7	RY *8	RY *9	RY *A	RY *B	RY *C	RY *D	RY *E	RY *F	RX *0	RX *1	RX *2	RX *3	RX *4	RX *5	RX *6	RX *7	RX *8	RX *9	RX *A	RX *B	RX *C	RX *D	RX *E	RX *F
S-Trans Type Slave unit Output No.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15																
Solenoid output No.	S1	S2	S3	S4	S5	S6	S7	S8																								
Output block No.									1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3																
S-Trans Type Slave unit Input No.																	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Input block No.																	1-0	1-1	1-2	1-3	2-0	2-1	2-2	2-3	3-0	3-1	3-2	3-3	4-0	4-1	4-2	4-3

RY data 1st word　　RY data 2nd word

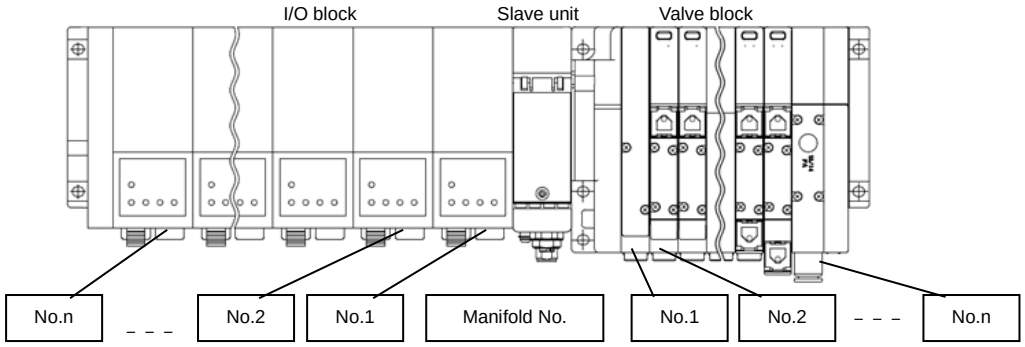
* Connect the input block first then output block to the slave unit.
* Set 1 and 2 with rotary switches of output block from the side of slave unit.

NW4G*-T7EB*B7 (16 output points), with 12 points solenoids, 4 input blocks, and 1 output block.

	PLC allocated memory address RY *0-*F																RX *0-*F															
	RY *0	RY *1	RY *2	RY *3	RY *4	RY *5	RY *6	RY *7	RY *8	RY *9	RY *A	RY *B	RY *C	RY *D	RY *E	RY *F	RX *0	RX *1	RX *2	RX *3	RX *4	RX *5	RX *6	RX *7	RX *8	RX *9	RX *A	RX *B	RX *C	RX *D	RX *E	RX *F
S-Trans Type Slave unit Output No.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15																
Solenoid output No.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12																				
Output block No.													2-0	2-1	2-2	2-3																
S-Trans Type Slave unit Input No.																	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Input block No.																	1-0	1-1	1-2	1-3	2-0	2-0	2-2	2-3	3-0	3-1	3-2	3-3	4-0	4-1	4-2	4-3

RY data 1st word　　RY data 2nd word

* Connect the input block first then output block to the slave unit.
* Set 2 with rotary switches of output block.



2) Examples of Valve No. assignments corresponding to the slave unit T7EB* solenoid output No.
The valve No. 1a, 1b, 2a, 2b, … indicate the station numbers such as station No.1, station No.2, and so on; while the alphabets 'a' and 'b' mean, respectively, the solenoid on the a-side and the solenoid on the b-side of the "double-solenoid type" valve. Also, "V" stands for "vacant".

Appearance and maximum station number depends on solenoid model.

[Standard wiring]

· When all valves mounted on the manifold are single solenoids:

Solenoid output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a	17a	18a	19a	20a	21a	22a	23a	24a	25a	26a	27a	28a	29a	30a	31a	32a

·When all valves mounted on the manifold are double solenoids:

Solenoid output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	16b

·When both single and double solenoids valves are mounted on the manifold (an example is shown above)

Solenoid output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No.	1a	2a	3a	3b	4a	4b	5a	6a	7a	7b	8a	9a	10a	10b	11a	11b	12a	13a	14a	14b	15a	15b	16a									

[Double wiring]

· When all valves mounted on the manifold are single solenoids:

Solenoid output No	.s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No.	1a	(V)	2a	(V)	3a	(V)	4a	(V)	5a	(V)	6a	(V)	7a	(V)	8a	(V)	9a	(V)	10a	(V)	11a	(V)	12a	(V)	13a	(V)	14a	(V)	15a	(V)	16a	(V)

·When all valves mounted on the manifold are double solenoids:

Solenoid output No	.s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	16b

·When both single and double solenoids valves are mounted on the manifold (an example is shown above)

Solenoid output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	s22	s23	s24	s25	s26	s27	s28	s29	s30	s31	s32
Valve No.	1a	(V)	2a	(V)	3a	3b	4a	4b	5a	(V)	6a	(V)	7a	7b	8a	(V)	9a	(V)	10a	(V)	11a	11b	12a	12b	13a	(V)	14a	(V)	15a	15b	16a	(V)

3.4 Programming

This slave unit is treated as a unit device from a master unit with 16 output points: T7EB*1, 32 output points: T7EB*2, and 16 output points: T7EB*B7.

There are 2 types of I/O data: RY data transmitted from a master to a slave unit (remote output) and RX data transmitted from a slave unit to a master unit (remote input).

Refer to the manual provided by the PLC manufacturer when creating a program.
Execute the programing by referring to the following table for I/O mapping.

Mapping for output data

Output point		Output data	bit															
			RY*0	RY*1	RY*2	RY*3	RY*4	RY*5	RY*6	RY*7	RY*8	RY*9	RY*A	RY*B	RY*C	RY*D	RY*E	RY*F
32	16	**1st word**	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	-	**2nd word**	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Mapping for input data

Input point	Input data	bit															
		RX*0	RX*1	RX*2	RX*3	RX*4	RX*5	RX*6	RX*7	RX*8	RX*9	RX*A	RX*B	RX*C	RX*D	RX*E	RX*F
16	**1st word**	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15

4. INSTALLATION

The network cables and power cables must be connected to the NW4G*-T7EB*** to function.
Incorrect connection causes not only malfunctions but in some cases, critical transmission damage to this slave unit as well as other related devices.

Before use, read this instruction manual and the user's manuals of the PLC and other devices for correct connections.

CAUTION:

- Discharge static electricity that has built up on your body by touching a grounded metal object before handling the CC-Link IEF Basic device. Otherwise, static electricity may damage this product.
- Do not touch the electrical wiring connections (exposed live parts); as there is a risk of electric shock.
  During wiring, keep the power off.
  Also, do not touch these live parts with wet hands.
- Do not subject the power cables and network cables to tension and impact. Long cables can exert unexpected momentum and impact due to its weight, and this can consequently damage the connectors and devices.
  Take preventative measures such as securing the cables part way along its length to reduce inertia.
- To prevent noise problems, keep the following in mind when wiring:
  1) If noise is likely to have an influence, make efforts to provide a separate power supply for each manifold solenoid valve and wire them independently.
  2) Do not make the power and FG cables needlessly long, but wire them with the shortest possible lengths.
  3) Do not share power with noise generating devices such as inverters and motors.
  4) Do not lay the power cables, network cables, and other power lines parallel to each other.
- Make sure the power cables and network cables are connected correctly within the specifications to avoid any incorrect wiring.
  Incorrect wiring can cause the slave unit to malfunction or to be damaged.
- Make sure that all cables and connectors are connected firmly before turning the power on.

4.1 Connecting and wiring to the network connector socket

While the standard Ethernet cable can be used with CC-Link IEF Basic, and the wiring methods are flexible, there are limits depending on the wiring material, devices, master, hub and etc. Always understand these specifications thoroughly before wiring. (For further information, refer to the instruction manuals provided by the master unit manufacturer and CLPA (CC-Link Partner Association)).

Network connector plug is not included in this product. Purchase a network connector plug separately that meets the specifications.
Network cable can be wired by connecting it to the network connector plug then the plug to the network connector socket on the slave unit.

<Recommended M12 cable with RJ45 connector [Category 5e]>

XS5W-T421-□MC-K (M12 straight)	Manufactured by Omron
09 45 700 50□□ (M12 straight)	Manufactured by HARTING

* □ differs depending on the cable specifications.

<Recommended assembly type connector>

21 03 281 1405 (M12 assembly type connector) Manufactured by HARTING
09 45 151 1100 (RJ45 assembly type connector) Manufactured by HARTING

<Recommended cable [Category.5e]>

09 45 600 01□□ (industrial Ethernet cable) Manufactured by HARTING

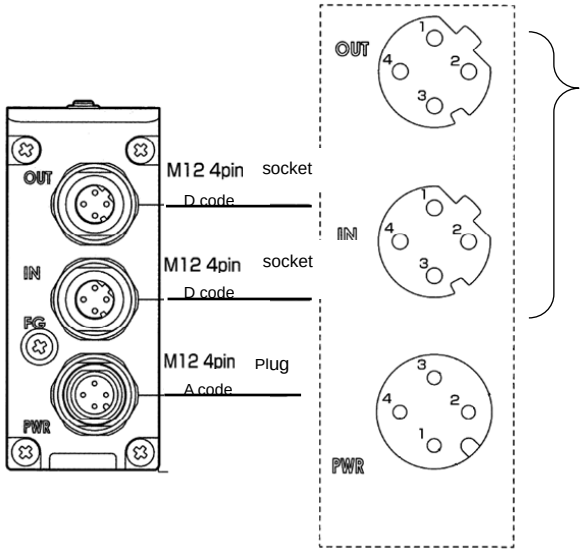
* □ differs depending on the cable specifications.

Connecting the network cable

Connect the network cable to the network connector plug according to the following instructions.

(1) After confirming safety, stop network communication and turn off all peripheral equipment.

(2) Connect the CC-Link IEF Basic compliant cable to M12 connector referring to the following figure.



Network connector socket

Note: There is no difference in the function between input (IN) and output (OUT) ports, which were named only to distinguish each.
Note: When the previous slave unit turns OFF, network of this unit turns OFF.

Port	Pin No.	Signal	Function
IN / OUT	1	TD+	Transmission data, plus
	2	TD-	Transmission data, minus
	3	RD+	Reception data, plus
	4	RD-	Reception data, minus

CAUTION:

- For the network, use a dedicated cable that complies with CC-Link IEF Basic specifications.
- Make sure that the network cable have a sufficient bending radius, and do not bend it forcibly.
- Separate the network cable from the power cable and high-voltage wire.

4.2 Connecting and wiring to the Unit/Valve power plug

Power socket is not included in this product. Purchase a power socket separately that meets the specifications.
Power cable can be wired by connecting it to the power socket then the socket to the power plug on the slave unit.

<Unit power>

Power to operate the slave unit.
Prepare a 21.6 VDC to 26.4 VDC power with the least noise.

<Valve power>

Power to operate the solenoid valve which is a load on the system.
Prepare a 22.8 VDC to 26.4 VDC power with the least noise.

<Recommended M12 loose power cable >

XS2F-D421-□8□-□ straight type Manufactured by Omron

* □ differs depending on the cable specifications.

<Recommended power socket and power cable>

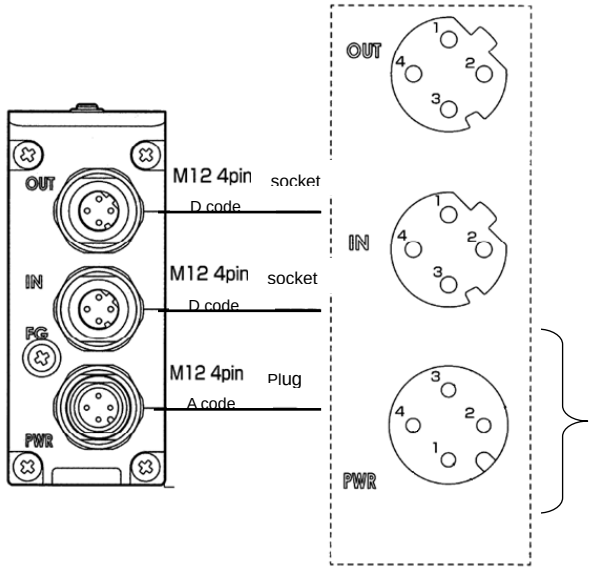
21 03 212 2305 (M12 assembly type connector) Manufactured by HARTING
Cable size: AWG22 to 18, outside diameter of compatible cable : 6 to 8 dia.

1) Connecting the power cable

Connect the Unit/Valve power cables to the power socket according to the following instructions.

(1) After confirming safety, power off the power supply connected to the slave unit.

(2) Connect the power cable's 24V power line to the power plug's 24V terminal and the 0V power line to the 0V terminal referring to the following figure.



Port	Pin No.	Function
PWR	1	Unit power 24V
	2	Valve power 24V
	3	Unit power 0V
	4	Valve power 0V

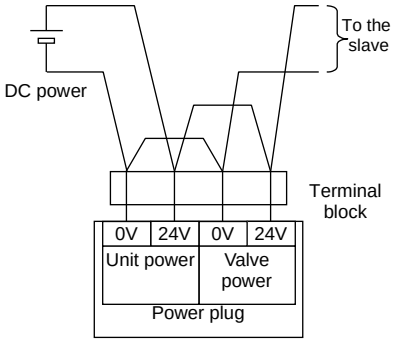
CAUTION:

- Carefully check the polarities and rated voltage before making any connections.
- Calculate the current consumption before selecting the appropriate power cable.
- Keep in mind that a voltage drop may occur from powering multiple slave units from one power supply when selecting and wiring the cables.
- Secure the specified power supply voltage by taking countermeasures, such as wiring the power cables in multiple systems or installing other power supplies if a voltage drop cannot be avoided.
- Wire the power cables at the terminal block placed in front of the power plug, when daisy chain.

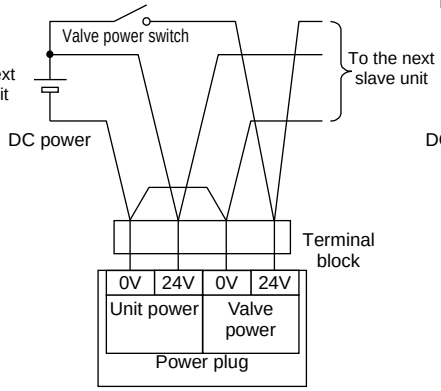
2) Wiring the power cable

Followings are examples 1 to 3 for wiring to the power plug.
Configure any other circuit as needed.

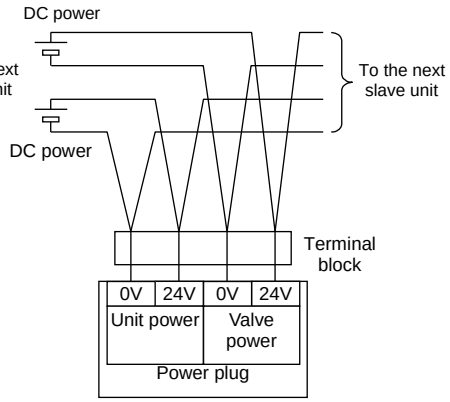
1. Common connection for unit power and valve power



2. Wiring to turn on/off valve power



3. Separate connection for unit power and valve power



5. MAINTENANCE

5.1 Removing the product (slave unit)

(1) After confirming safety, stop network communication and turn off all the peripheral devices as needed.

(2) After confirming safety, turn off unit power and valve power as needed.
(Note that following stations next to the unit stop communication.)

(3) Remove the network connector plugs and the power socket.

(4) Remove the slave unit's mounting screws.

(5) Remove the slave unit by holding laterally.

5.2 Mounting the product (slave unit)

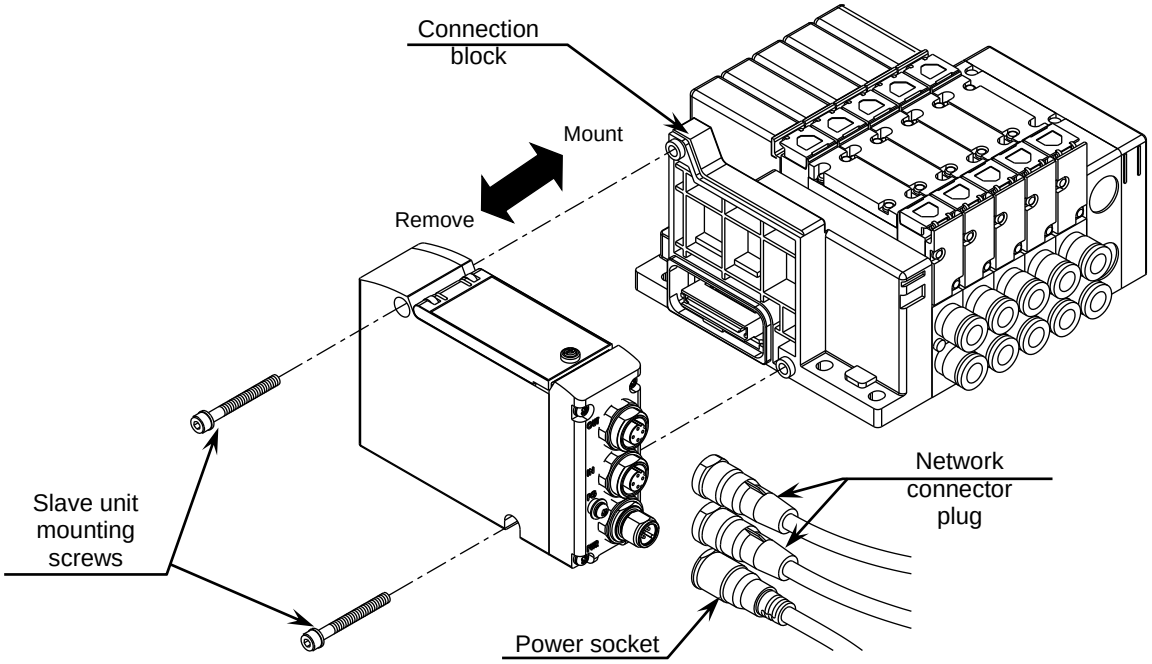
(1) Set the station No. of the unit.

(2) Hold the unit and insert it slowly by matching connectors of connection block and slave unit's side surface.

(3) Make sure that the slave unit and the connection block are connected and firmly tighten together with the mounting screws.
(Proper tightening torque: 1.2 N·m)

(4) Make sure that the power (for both unit and valve) is turned off, and after confirming safety, attach the network connector plugs and the power socket.
Installing the connectors while the power is turned on may cause the components in the system to operate unexpectedly.
Ensure the safety of the surroundings before starting.
Network connector plug: reference tightening torque 0.6 N·m
(Torque depends on the network connector plug. Contact the plug manufacturer for proper torque.)
Power socket: reference tightening torque 0.45 N·m
(Torque depends on the connector socket. Contact the socket manufacturer for proper torque.)

(5) After confirming safety, turn on each power supply.

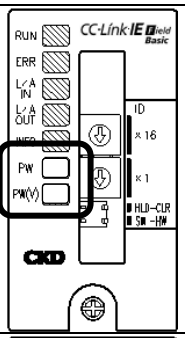
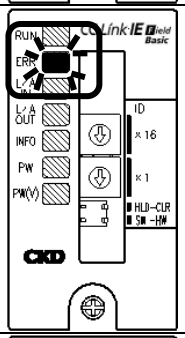
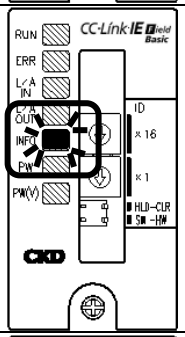
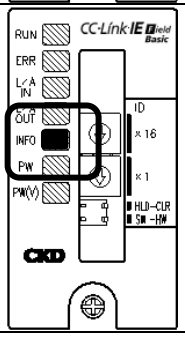


CAUTION:

- Before turning the power ON or OFF, ensure the safety of the surroundings as the components in the system, including the valve (cylinder), may move unexpectedly.
- Check the output setting in communication error and node address when power on the unit.
- Do not touch the electrical wiring connections (exposed live parts), as there is a risk of electric shock.
- Many precision devices are mounted inside the slave unit. Do not drop the slave unit nor apply vibration or impact to the unit.
- Do not connect or disconnect any connectors while the power is being supplied. Doing so may result in failure or malfunction.
- When the network connector (OUT) is unused, make sure to cover with water-resistant cap.
  <Recommended water-resistant cap>
  21 01 000 0003 (M12 Cap) Manufactured by HARTING

5.3 Troubleshooting

Troubleshooting needs to be conducted on the entire system and not just on a single unit.
Depending on the communication status, the system may move unexpectedly. Therefore, be sure to exercise ample caution and ensure safety when conducting maintenance.

No.	Problem		Check items
1		PW LED does not light up, PW(V) LED does not light up	Check if the power cables are connected and not broken. Check if the supplied power voltage is within the specified range.
2		ERR LED flashing	Check if PLC is turned on. Check if the switch of PLC is in RUN position. Check if both network cable and connector are connected safely (not broken or damaged). Check if the network cable is compatible with CC-Link IEF Basic. Check if the transmission distance is compatible with CC-Link IEF Basic. Check if neither noise generating devices nor high voltage wires are in surroundings of the communication line.
3		INFO LED flashing	Check the state of maintenance by maintenance monitor. Check if the setting is changed by HardWare switch or Basic/SLMP communication.
4		INFO LED light up	System error. (Replace the slave unit.)

5.4 Maintenance of components

This section describes the daily maintenance of devices; such as methods of cleaning, inspection, and replacing the slave unit.

1) Cleaning

Clean the device periodically in the following manner to ensure its optimum state.

(1) For daily cleaning, wipe the device with a dry, soft cloth.

(2) If dirt remains even after wiping with a dry cloth, use a damp cloth with 2% diluted detergent that has been firmly wrung out.

(3) Rubber, vinyl, and tape products may stain the slave unit if they are left on for long periods of time. Remove such items during regular cleaning.

2) Inspection

Always perform periodic inspections to ensure that everything is in an optimum state.
Periodic inspections should be carried out at least once every 6 to 12 months.
However, for a slave unit used in environments subject to high temperatures, humidity and/or excessive dust, inspections should be carried out more frequently.

■ Inspection items

Periodically inspect the following items to ensure that they do not deviate from the criteria.
If the items deviate from the criteria, improve the ambient environment to fall within the criteria or adjust the slave unit itself.

Inspection items	Inspection details	Criteria	Inspection method
Environment	Are the ambient and in-panel temperatures suitable?	Refer to the specifications of the slave unit.	Thermometer
	Are the ambient and in-panel humidity suitable?	Refer to the specifications of the slave unit.	Hygrometer
	Is there any accumulated dust?	There should be no dust.	Visual check
Condition of installation	Is the slave unit securely mounted?	There should be no looseness.	Hexagonal wrench
	Is the network cable connector fully inserted?	There should be no looseness.	Visual check
	Are there any damages to the connection cables?	There should be no external abnormalities.	Visual check

3) Replacing the slave unit

Each unit (master and slave) is a device configuring a network.
If any unit fails, immediately perform recovery work to prevent the entire network from being affected.
To restore network function as soon as possible, it is recommended to keep spare units on hand for the replacement.

■ Inspection items

When replacing the unit after a periodic inspection has detected a problem, check if the new unit does not have any errors.

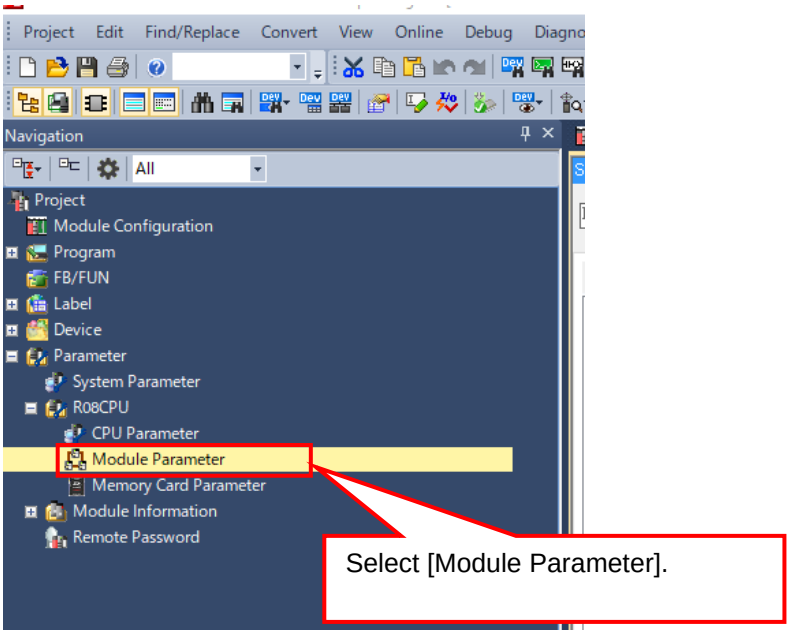
■ Setting the replaced slave unit

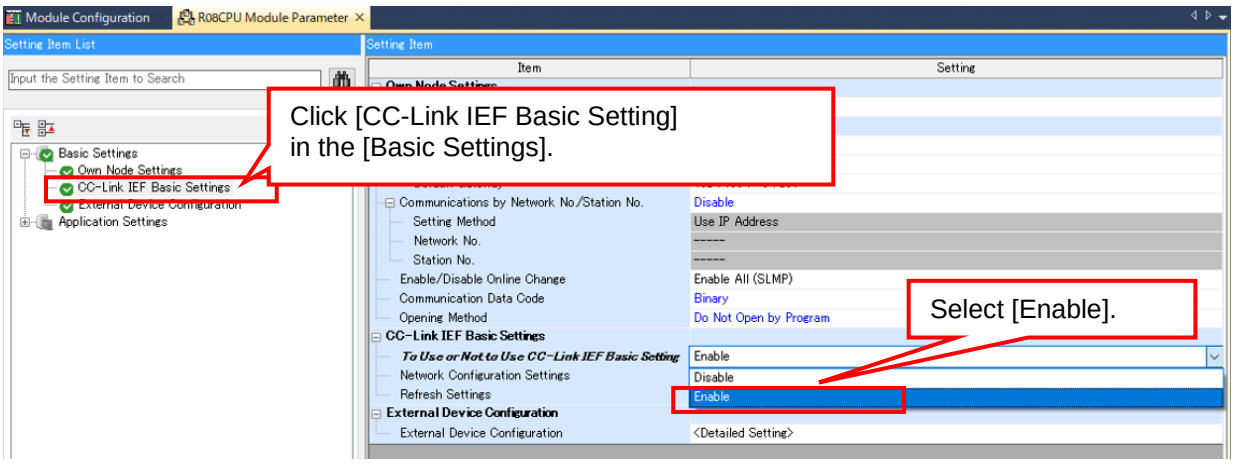
After replacing the slave unit, make necessary changes to the switches and other settings so that they are the same as before the replacement.

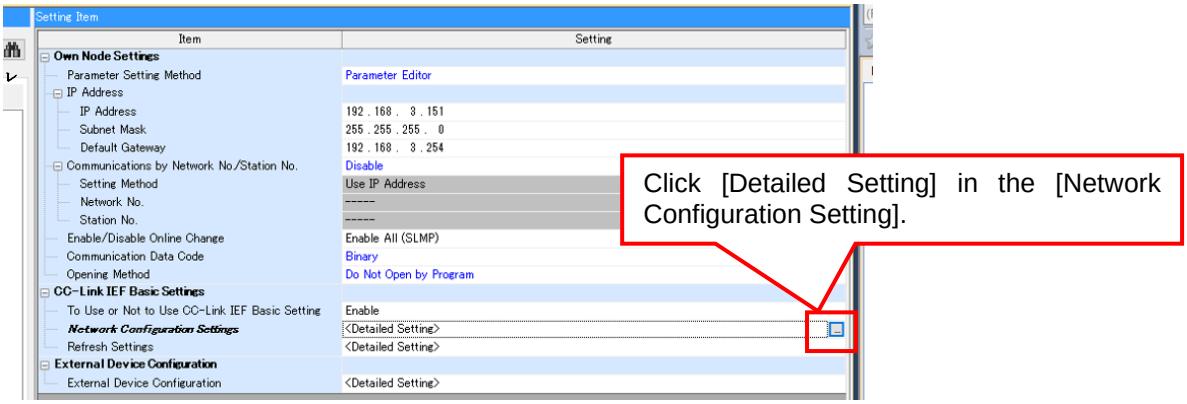
5.5 Notes/Remarks

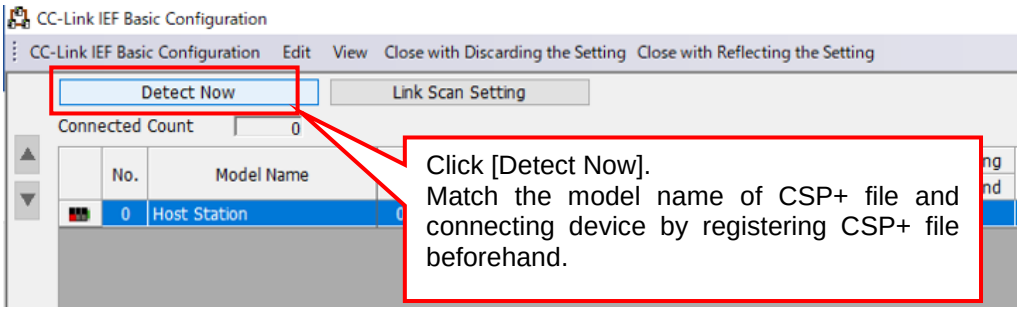
This section describes the examples of monitoring and setting items defined by CSP+ file.

Setting and monitoring examples of the item which is defined by CSP+ file via Basic and SLMP communication, by using other manufacture's software (referenced software: Mitsubishi Electric Corporation's GX Works3)

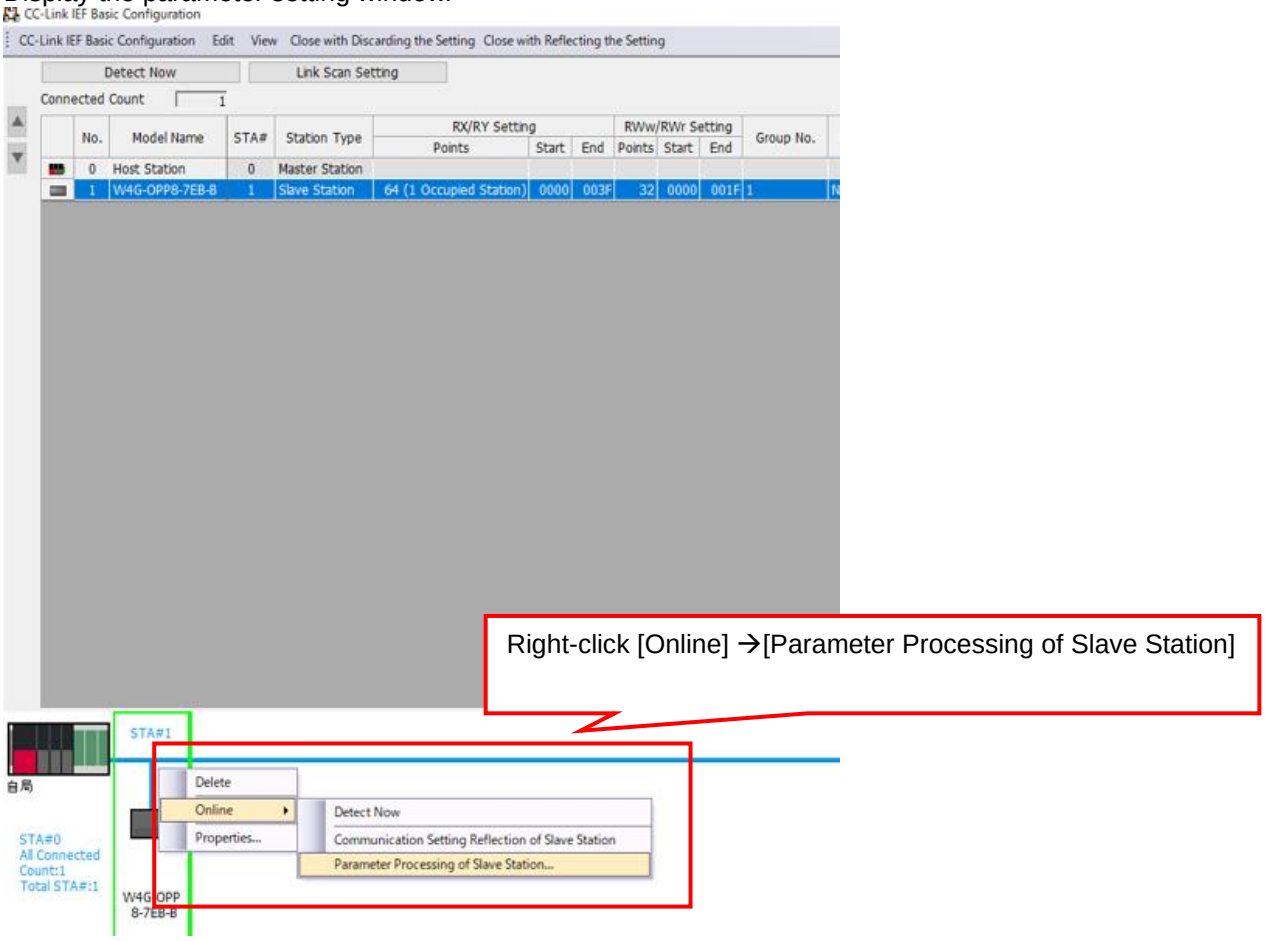






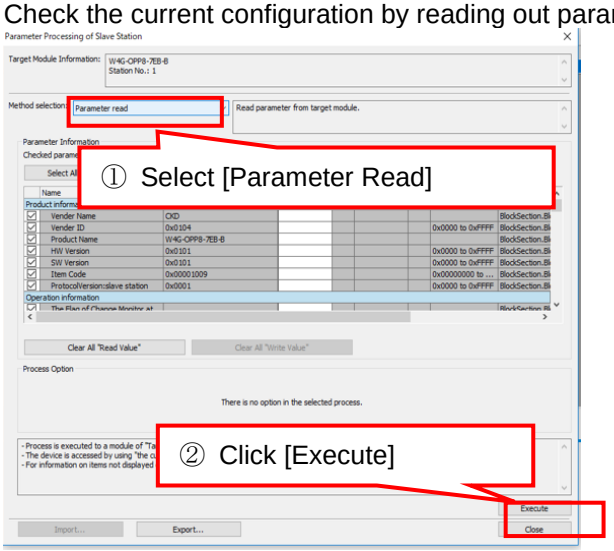


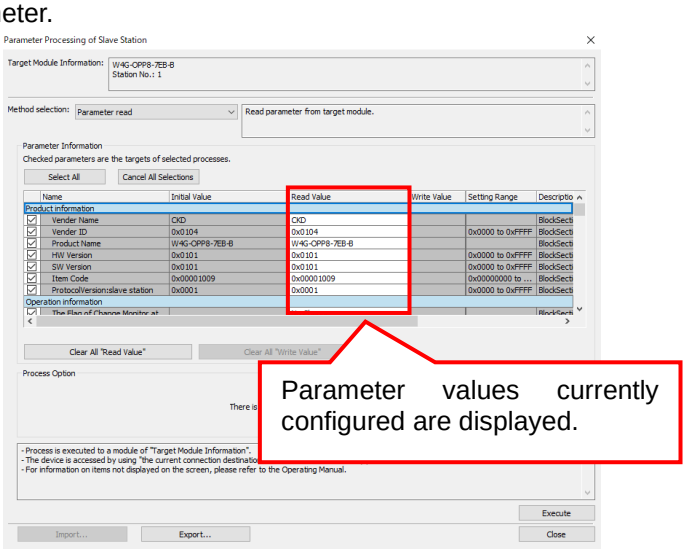
Display the parameter setting window.



How to read parameters

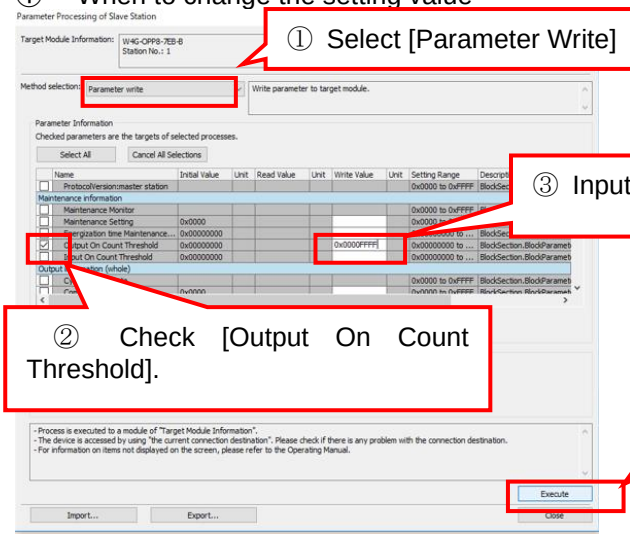
Check the current configuration by reading out parameter.



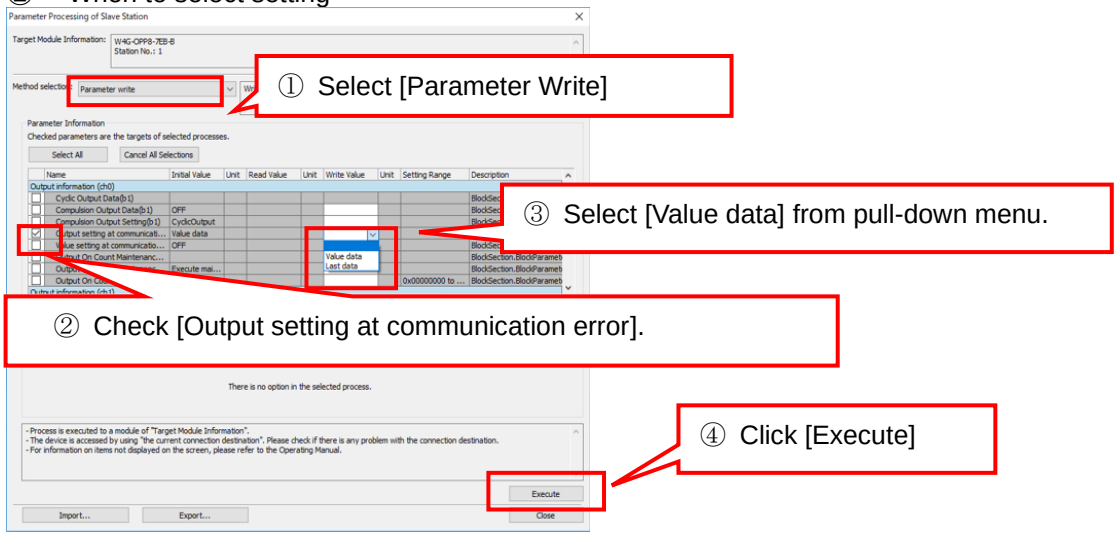


How to write parameters

① When to change the setting value



② When to select setting



Check if the parameter has changed by the [Parameter Read].