CKD

SM-A31289-A/1

INSTRUCTION MANUAL

Serial Transmission Slave Unit
4GR Series T8G*
(OPP7-*G)

Compatible with CC-Link

- 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 a device using CKD products, the manufacturer is obligated to manufacture a safe product by confirming safety of the system comprising the following items:

- Device mechanism
- Pneumatic or water control circuit
- Electric control that controls the above

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
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 someone having sufficient knowledge and experience.

2. Use this product within its specifications.

This product cannot be used beyond its specifications. Additionally, the product must not be modified or machined.
This product is intended for use in general industrial devices and parts. Use beyond such conditions is not considered. Consult with CKD for details when using the product beyond the unique specification range, outdoors, or in the following conditions or environments. In any case, measures for safety shall be provided when the vavle malfunctions.

① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
② Use for applications where life or assets could be adversely affected, and special safety measures are required.

3. Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B 8370 (pneumatic system rules)
JFPS2008 (principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, 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 water supply), and turn off power to the facility. Release 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 that system safety, such as pop-out prevention measures, is secured.

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

■**The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.**

DANGER : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

WARNING : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

CAUTION : When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Precautions with regard to guarantee

● Guarantee period

The guarantee period of our product shall be one (1) year after it is delivered to the place specified by the customer.

● Guarantee coverage

If any failure for which CKD CORPORATION is recognized to be responsible occurs within the above warranty period, a substitute or necessary replacement parts shall be provided free of charge, or the product shall be repaired free of charge at the plant of CKD CORPORATION.

However, the guarantee excludes following cases:

① Defects resulting from operation under conditions beyond those stated in the catalogue or specifications.
② Failure resulting from malfunction of the equipment and/or machine manufactured by other companies.
③ Failure resulting from wrong use of the product.
④ Failure resulting from modification or repairing that CKD CORPORATION is not involved in.
⑤ Failure resulting from causes that could not be foreseen by the technology available at the time of delivery.
⑥ Failure resulting from disaster that CKD is not responsible of.

Guarantee stated here covers only the delivered products. Any other damage resulting from failure of the delivered products is not covered by this guarantee.

● Confirmation of product compatibility

Our customer shall be responsible of confirming compatibility of our product used in our customer's system, machinery or device.

⚠ WARNING

- If you have to use the product under conditions that are different from the specified conditions or if you intend to use the product for a special application, be sure to consult us about the product specifications before using 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 the daily and periodic inspections to correctly maintain product performance.
- Confirm working voltage and polarity before wiring and turning on the power.
- Do not touch electric wiring connections (exposed live parts); this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.
- This product does not meet the surge immunity requirements specified in EN61000-4-5 for CE marking. Please provide appropriate protective measures against lightning surges on the device side.
- The valve and cylinders, etc., could malfunction if the serial transmission slave station address setting is incorrectly set. Always check the address setting before starting use.
- This product is not resistant to the CE Marking surge immunity (EN61000-4-5). Always provide measures on the system side before starting use.
- The valve light may flicker momentarily when the valve power is turned ON (when the power starts). This will not cause the valve to turn ON and OFF.

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4GR Series T8G*(OPP7-*G)

Serial Transmission Slave Unit

Instruction Manual No. SM-A31289-A/1

Created date 2025.4.22

1. PRODUCT

1.1 General outline of the system

1) T8G*(OPP7-*G)

This solenoid valve system is equipped with a remote I/O station (T8G*(OPP7-*G)), the CC-Link open field network system. (This is specified by CC-Link Partner Association. : hereafter referred to as CLPA) The following features are provided.

(1) The Slave Unit is connected to PLC with only a network cable, allowing significant reduction in the number of man-hours associated with wiring.

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

(3) The Slave Unit is mounted by inserting it into a slot on the manifold block and secured with just one screw, allowing reduction in the number of man-hours associated with maintenance.

(4) The Slave Unit is available in +COM or -COM output type and 16 or 32 output points, allowing it to be used in a wide variety of applications.

(5) The slave station output states, if the communication error occurs, can be set using the switch (holding or all points OFF).

(6) The energized state of the valve power supply can be checked by using the master station through the communication. (Detection function, such as fuse blow-up)

2) CC-Link

The CC-Link is Open field network system for FA including remote I/O devices (Sensor and valve, etc.) and intelligent devices (high-speed counters, inverters, etc.), can be configured with reduced wire connections. Moreover, the user can create programs that control these devices installed away from the master station without being aware of the communication protocols.
The CC-Link system has following features :

(1) 10Mbps network, the fastest network in the industry, is applicable to a sensor and large capacity data communication requiring the high-speed response.

(2) Remote control handling the bit data and data communication handling word data (analog) can be performed at the same time. The communication is also stable at a high speed.

(3) “n : n” cyclic transmission can be performed between the controllers, ensuring easy distributed control.

Note: Before using this product, thoroughly read the User’s Manual.
This document mainly describes T8G*(OPP7-*G).
Also, read the User’s Manual for the master station and other slave stations to be connected to this system.
For this manifold solenoid valve, read this instruction manual, as well as manuals described above to fully understand the functions and performance in order to operate the manifold solenoid valve properly.

If the customer has any question the CC-Link, contact the following home page.

CC-Link Association

Home page address **http://www.cc-link.org**

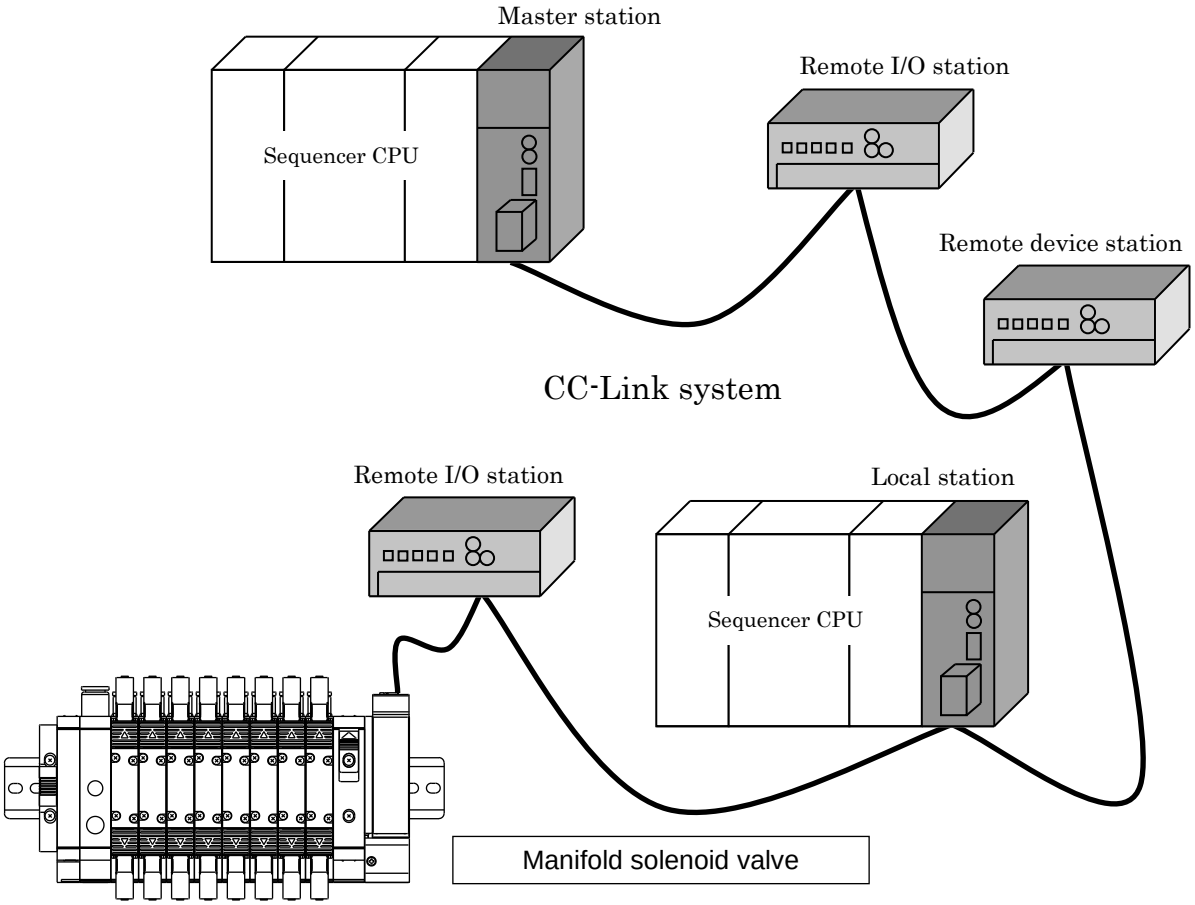
1.2 Network structure

This system chiefly consists of sequencer body, Master station Solenoid valve T8G*(OPP7-*G) and peripheral equipment.

1) Examples of PLC and master unit (master station) combination.

Manufacturer	Compatible PLC	Master unit model
MITSUBISHI ELECTRIC	QnA Series	AJ61QBT11
	Q2AS Series	A1SJ61QBT11
	Q Series	QJ61BT11
Others CC-Link Type of Master unit		

2) Fundamental structure of system



Master station……Station controlling remote I/O station, remote device stations, and local stations.
Remote I/O station……Remote station that handles ON/OFF data only.
Remote device station……Remote station that handles ON/OFF data and numerical data.
Local station ……Station that has its own CPU and can communicate with the master station and other local station.
Intelligent device station……Station informed by the transmission (including the local station).

1.3 Specifications

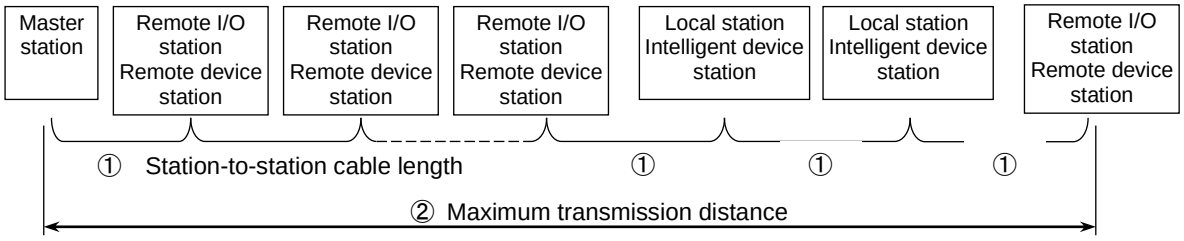
1) Transmission specifications

Item	Spaecifications
Communication protcol	CC-Link (Ver1.10) conformance
Communication speed (B RATE)	10M / 5M / 2.5M / 625k / 156k bps (selectable)
Max. transmission distance (overall cable length)	Depends on communication speed (See " 2) ")
Communication system	Polling system
Synchronization system	Frame synchronization system
Encoding system	NRZI
Transmission path format	Bus format (EIA RS485 conformance)
Transmission format	HDLC conformance
Error control system	CRC (X16 + X12 + X5 + 1)
Conection cable	Shielded twist pair cable (See 4.1 "Wiring".)

2) Communication speed and cable length

The following explains the selationships between the communication speed and the maximum transfer distance.

◆ Multi-dropped connection (CC-Link Ver.1.10 system)



B RATE	Communication speed	① Station-to-Station cable length	② Maximum transmission distance
4	10Mbps	0.2m or more	100m or less
3	5Mbps		160m or less
2	2.5Mbps		400m or less
1	625kbps		900m or less
0	156kbps		1200m or less

Since the transmission distance varies, depending on the communication speed and network cables used or the like, refer to the CC-Link User's Manual issued by MITSUBISHI ELECTRIC CO. LTD. or check it through the cable manufacturer, etc.

Since the number of stations (remote stations) connected differs, depending on the number of occupied stations and conditions of trancemission distance or the like, refer to the CC-Link User's Manual is sued by MITSUBISHI ELECTRIC CO, LTD. Check it through the cable manufacturer, etc.

CAUTION :

- Condition of transmission distance: All devices and CC-Link cable should be Ver.1.10 compatible products. If any of products is in Ver.1.00, follow the specification for Ver.1.00. Refer to the CC-Link User's Manual issued by MITSUBISHI ELECTRIC CO. LTD., etc.
- Network cables of different vendors can be used together if they are Ver.1.10 compatible. But, in case of Ver.1.00 network cable is used only single vendor.
- About T-brunch connections, there are various restrictions including the usable cable, the number of stations and etc.
  With reference to the instruction manuals (User's manual,etc.) of the master station, please wire it by all means after having confirmed contents.

3) T8G*(OPP7-*G) specificatioons

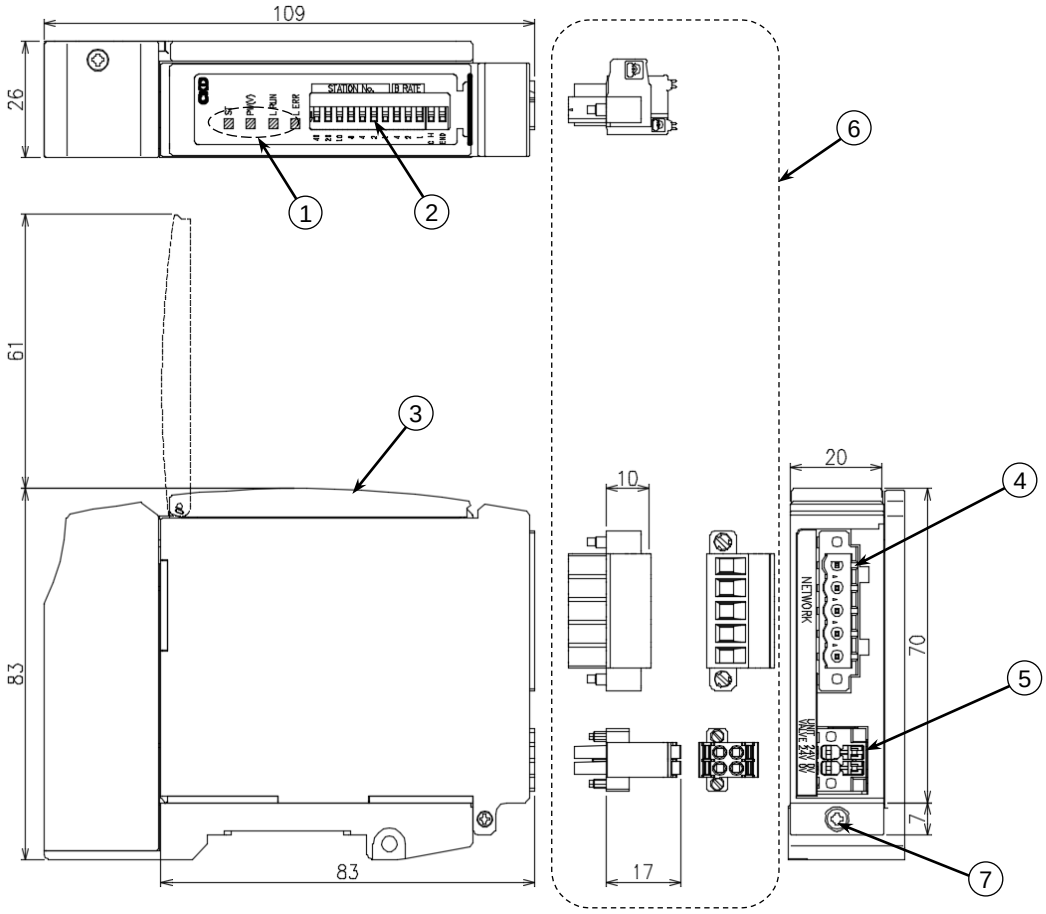
Always operate this product within its product specifications.

Item		Specification			
Model number		T8G1(OPP7-1G)	T8G2(OPP7-2G)	T8GP1(OPP7-1G-P)	T8GP2(OPP7-2G-P)
Unit power supply voltage		21.6VDC to 26.4VDC (DC24V ±10%)			
Unit power current consumption		60mA or less (@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 (@24.0VDC with all points OFF) 15mA or less (@24.0VDC with all points ON)			
Output type (polarity)		NPN (+common output)		PNP (-common output)	
Number of output points		16 points	32 points	16 points	32 points
Station number setting		By switches (staion number between 1 and 64)			
Output setting at the communication error occurs		Hold (All outputs are maintained.) / Clear (All outputs are turned off.)			
Insulation resistance		30MΩ or more at 500VDC between external terminals and body.			
Withstand voltage		500VAC applied between external terminals and body for 1 minute.			
Noise resistance		500Vp-p Pulse width 1μm/s			
Shock resistance		294.0m/S^2 for 3 times in each direction of X, Y, Z			
Storage temperature		-20 to 70°C			
Sotrage humidity		30 to 85%RH (no dew condensation)			
Ambient temperature		-5 to 55°C			
Ambient humidity		30 to 85%RH (no dew condensation)			
Ambient atmosphere		No corrosive gas			
Communications object		CC-Link Ver.1.10 (remote I/O station)			
Communications speed (BRATE)		10M / 5M / 2.5M / 625k / 156k bps (set by dip switches)			
Output insulation type		Photo coupler insulation			
Max, load current		40mA / output			
Leakage current		0.1mA or less			
Residual voltage		0.5V or less			
Fuse rating		Valve power : 24V, 3A Unit power : 24V , 2A (Both fuses not replaceable)			
Display		LED (communication status*1, unit and valve power supply status*2)			
Occupation station		1 station			
Degree of protection		IP20			
Vibration proof	Durability	10Hz to 150Hz to 10Hz, 1 octave / min.15 sweeps each in X, Y, Z directions with 0.75mm half-amplitude or 98.0m/ S^2, whichever smaller.			
	Malfunction	10Hz to 150Hz to 10Hz, 1 octave / min. 4 sweeps each in X, Y, Z directions with 0.75mm half-amplitude or 68.6m/s^{2}whichever smaller.			

*1. This product does not have SD, the RD lamp.

*2. Status can be monitored when Unit power is supplied with specified voltage.

1.4 Parts of Slave Unit



① Status monitoring lights

These lights indicate Slave Unit status and network status.

② Switches

These switches are used for setting the Slave Unit address (STATION No.), communication speed (Baud RATE), terminal resistor, and an output of the Slave Unit when the communication error occurs (Output mode).

③ Cover

This clear cover protects the status monitoring lights and the switches.

④ Network connector socket

This is the connector socket for connecting the network connector plug

⑤ Unit/Valve power socket

This is the socket for connecting the Unit/Valve power plug.

⑥ Unit / Valve power plug and network connector plug (included)

・Unit / Valve power plug : This is the plug for connecting the Unit/Valve power cables (24V).

・Network connector plug : This is the plug for connecting the network cable (CC-Link dedicated cable).

⑦ Mounting screw (M2.5 tapping screw)

This screw is used to secure the Slave Unit to the connecting block.

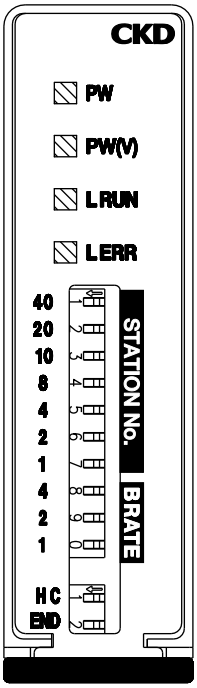
1.5 Switches and LED indicators

CAUTION :

- Discharge static electricity that has built up on your body before touching the Slave Unit. Otherwise, static electricity can cause dameges to the Slave Unit.

1) Switches

These switches are used to set the Slave Unit address (STATION No.), communication speed (B RATE), terminal resistor, and an output of the Slave Unit when the communication error occurs (Output mode).



Name of switch	Content of Setting
STATION No. 40 20 10 8 4 2 1	Set station number of slave unit in the range of 64 from 1. [switches are BCD-weighted]
B RATE [Communication speed] 4 2 1	Set communication speed in the range of 4 from 0. [switches are BCD-weighted]
[Output mode] H C	When communication abnormality occurred, output date selects hold (H) or clear (C).
[Terminal resistor] *1 END	When is terminal station, END is ON.

*1. Turn this switch “OFF” when the high-performance cable exclusively for CC-Link is used, and connect a terminal resistor externally. (See 3.1 “Switch setting”.)

Turning on the power will load the assigned STATION No., B RATE, and Output mode (Duplicate STATION No. cannot be assigned).

2) LED indicators

LED displays this product and network state. Refer to a lower list.

Name of LED	Content of indication
PW	At the time of unit power ON, red lighting.
PW(V)	At the time of valve power ON, red lighting. (Status can be monitored when Unit power is supplied with specified voltage.)
L RUN	At the time of red lighting, refresh date of CC-Link come by the normal reception.
	At the time of timeout error, lights out. (It turns on by receiving normal data.)
L ERR	When is receiving abnormal data of CC-Link, red lighting.
	When is operating normally, lights out. (L RUN turns on)
	When is transmission error (CRC error), red lighting.
	When is a different station number setting or communication speed setting, red lighting.
	When station number setting or communication speed setting changes during movement, red fashes. (L RUN turns on, and this product works under conditions of station number setting and communication setting at the time of Unit power ON)
	When is a timeover, lights out. (L RUN lights out, too.)

This product does not have SD, the RD lamp.

2. CAUTION

- The product is rated for DC24V CLASS2 only and shall only be used at its specified power supply voltage.
- Before turning on or off the power, take a good look around and make sure it is safe to do so 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 transmission 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.
- Solenoid valve response time varies by model. Refer to the valve specification for the delay in response time.
- The time it takes for the solenoid valve to turn off is delayed by approximately 20ms since there is a surge absorbing circuit incorporated in the Slave Unit.
- Make sure the power cables and network cable are connected according to the specifications to avoid any incorrect wiring.
- Do not subject the power cables and network cable 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 Slave Unit.
- Do not connect or disconnect any connectors while the power is 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 Switches setting

CAUTION :

- Setting the Slave Unit address to an improper value can cause a solenoid valve, a cylinder, or such to malfunction. Before using the Slave Unit, make sure the address is set correctly before use.
- Make sure the power is turned off when setting the switches.
- The cover on the Slave Unit can be easily opened by flipping it up with a finger. 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.
- Switches are precisely built and can be damaged if mishandled. Make sure not to touch the internal circuit board when setting the switches.

1) Switches setteing of station number and communication speed

Switch name	STATION No. 40 20 10 8 4 2 1	B RATE (communication speed) 4 2 1
Setting range	1 to 64	0 to 4

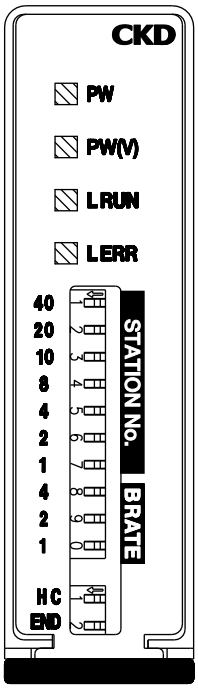
Turning on the power will load the assigned STATION No., and B RATE.
(Duplicate STATION No. cannot be assigned).

Switches are BCD-weighted.
Examples of the Station No., and B RATE are indicated in the following table.

STATION No.	Switch No.						
	1(40)	2(20)	3(10)	4(8)	5(4)	6(2)	7(1)
1	0	0	0	0	0	0	1
2	0	0	0	0	0	1	0
3	0	0	0	0	0	1	1
	≀						
62	1	1	0	0	0	1	0
63	1	1	0	0	0	1	1
64	1	1	0	0	1	0	0

B RATE	Switch No.		
	8(4)	9(2)	0(1)
0 (156k bps)	0	0	0
1 (625k bps)	0	0	1
2 (2.5M bps)	0	1	0
3 (5M bps)	0	1	1
4 (10M bps)	1	0	0

0: OFF
1: ON
Value ( ) is indicated on the sheet.



Example) To set the Station No. to “50”(Decimal number)
50＝40･(1)＋20･(0)＋10･(1)＋8･(0)＋4･(0)＋2･(0)＋1･(0)
According to the above formula, turn on switches 1, and 3, and turn off other switches (2, 4, 5, 6, and 7).

Example) To set the Transfer rate “5Mbps”
According to the above formula, turn on switches 9, and 0, and turn off other switches (8).

CAUTION :

- Set the same communication speed in all the stations in the CC-Link system. Data link cannot be performed with a slave station where the different communication speed from the master station is set.

2) Switches setting of others

Using this switch, specify whether to hold or clear the output when an error occurs and whether this slave station is the end station (Station furthermost form the master station) or not.

Switch name	Content of indication
H C [Ouput mode setting]	Specifies whether to hold or clear the output when an error (bus line error, time over, etc) occurs. OFF(0) : Clear mode ON(1) : Hold mode
END [Terminal station setting]	Setting terminal station. OFF(0) : Slave station is the intermediate station. ON(1) : Slave station is the end station and using Ver.1.10-compatible CC-Link dedicated cable or CC-Link dedicated cable (Ver.1.00-compatible) .

Note: End-resister setting

This product built in end-resister between thecommunication connector DA, DB.
Turn the terminal SW END, this product setting is end-station. Without using end-station.
Terminal station setting in using CC-Link exclusive high-performance cable :
When the high-performance cable, exclusively for CC-Link (FANC SBH, etc. by KURAMO DENKO) is used for a communication cable, be sure to turn the terminal station setting END "OFF", and connect a commercially available resistor or end resistor at cached to mast unit between the communication connectors DA, DB of this slave station.
For the resistor lead part, insulation is always required.

CAUTION :

- Set collect with end-resister, referring user's manual of master unit. Wrong resister, or wiring lead to transmission-err.
- If a terminal resistor is connected externally (on a terminal block), be sure to set this switch to OFF.
- When connecting end-resister outside the unit, make insulate to percent (short) touching electric wires each other.

3.2 Correspondence of the Slave Unit output No. and PLC address No.

1) Correspondence table showing the correspondence between the channels in PLC internal memory and the output points.

Tables below explain the correspondence using PLC manufactured by MITSUBISHI ELECTRIC as a representative example. For this explanation, the Station No. of the Slave Unit is set to "1".

◆ T8G1、T8GP1

Occupied channel in the PLCinternal memory	160H															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Slave Unit output No.	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Solenoid Output No.	**s1**	**s2**	**s3**	**s4**	**s5**	**s6**	**s7**	**s8**	**s9**	**s10**	**s11**	**s12**	**s13**	**s14**	**s15**	**s16**

◆ T8G2、T8GP2

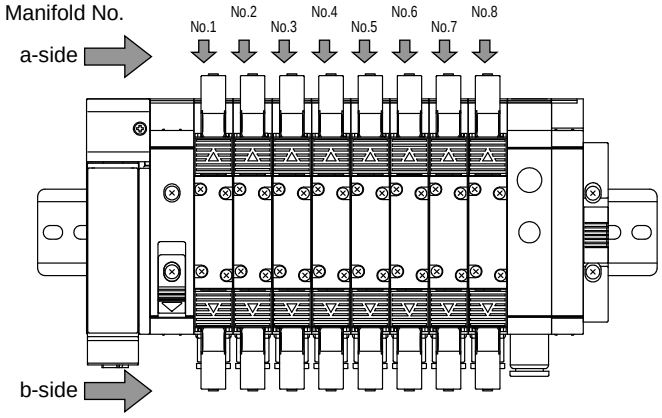
Occupied channel in the PLCinternal memory	160H																161H													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Slave Unit output No.	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
Solenoid Output No.	**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**

2) Example of Valve No. assignments corresponding to Slave Unit Solenoid Output No

The numbers in valve No. 1a, 2a, 2b… indicate the station No.1 station No.2 and so on, while the alphabets (a) and (b) mean, respectively the solenoid on the side (a) and the solenoid on the side (b).

The numbers in the valve solenoid 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.

<T8G1、T8GP1>



Note: The figure above is an example of mounting 8 stations of double-solenoid type valves on the manifold. There is no solenoid on the b-side for single-solenoid types. Depending on the valve model selected by the customer, the appearance and the maximum number of stations will differ.

Standard wiring

● When all valves mounted on the manifold are single-solenoid types:

Solenoid Output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
Valve solenoid No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a

● When all valves mounted on the manifold are double-solenoid types:

Solenoid Output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
Valve solenoid No.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b

● When both single- and double-solenoid type valves are mounted on the manifold (one such example is shown below):

Solenoid Output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
Valve solenoid No.	1a	2a	3a	3b	4a	4b	5a	6a	7a	7b	8a					

Double wiring

● When all valves mounted on the manifold are single-solenoid types:

Solenoid Output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
Valve solenoid No.	1a	B	2a	B	3a	B	4a	B	5a	B	6a	B	7a	B	8a	B

Note: "B" indicates a blank station.

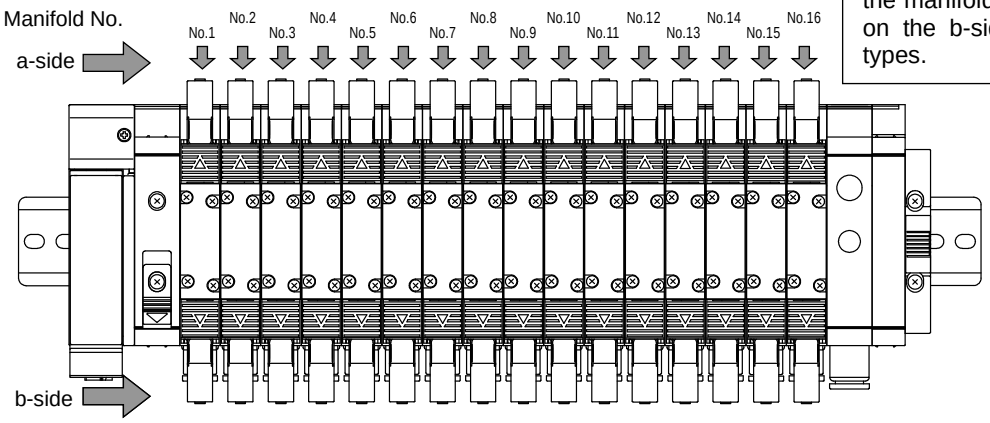
● When all valves mounted on the manifold are double-solenoid types:

Solenoid Output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
Valve solenoid No.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b

● When both single- and double-solenoid type valves are mounted on the manifold (one such example is shown below):

Solenoid Output No.	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16
Valve solenoid No.	1a	B	2a	B	3a	3b	4a	4b	5a	B	6a	B	7a	7b	8a	B

<T8G2、T8GP2>



Note: The figure above is an example of mounting 16 stations of double-solenoid type valves on the manifold. There is no solenoid on the b-side for single-solenoid types.

Standard wiring

● When all valves mounted on the manifold are single-solenoid types:

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 solenoid 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-solenoid types:

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 solenoid 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-solenoid type valves are mounted on the manifold (one such example is shown below):

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 solenoid 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-solenoid types:

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 solenoid No.	1a	B	2a	B	3a	B	4a	B	5a	B	6a	B	7a	B	8a	B	9a	B	10a	B	11a	B	12a	B	13a	B	14a	B	15a	B	16a	B

Note: “B” indicates a blank station.

● When all valves mounted on the manifold are double-solenoid types:

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 solenoid 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-solenoid type valves are mounted on the manifold (one such example is shown below):

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 solenoid No.	1a	B	2a	B	3a	3b	4a	4b	5a	B	6a	B	7a	7b	8a	B	9a	B	10a	10b	11a	11b	12a	B	13a	B	14a	14b	15a	15b	16a	B

3.3 Programing

This slave station unit is seen as a 16-point output unit…T8G*1, 32-points output unit …T8G*2, constituting a remote I/O station. (The unit monopolizes the position of a single station.)
Refer to the manual provided by the PLC manufacturer when creating a program.
This slave station provides the special functions, setting of the output status if an error occurs and setting of the end station. However, both settings do not relate to the program.
Additionally, this slave station also has a function that informs the fuse blow-up status of the valve power supply to the master station. By checking relevant bit of the following register (this bit No. may vary depending on the station No.), the fuse blow-up or ON/OFF status of the valve power supply can be understood.

<table>
<tr><th>Link special registers</th><th>Name</th><th>Contents</th></tr>
<tr><td>SW0088 (688H)

SW0089 (689H)

SW008A (68AH)

SW008B (68BH)</td><td>Fuse blown status of other station</td><td>Whether a fuse blown error has occurred is stored.

0 : Normal (Correct)
1 : Error (Fuse blow-up occurs)

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>～</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>～</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>～</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>～</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>～</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
1 to 64 in the table shows station No.</td></tr>
</table>

Note: When the master station is QJ61BT11N model.

4. INSTALLATION

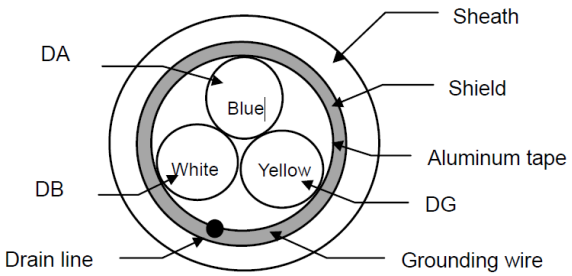
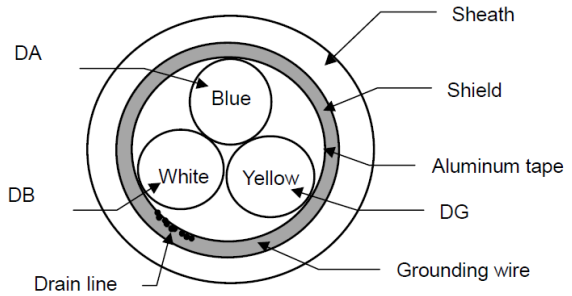
It is requied to connect signal circuit with power line to make this model T8G*(OPP7-*G) function. Erroneous connection causes not only malfunction but in some case, vital transmission damage to this station including other related devices. Read and understand the content of each User's manual for Sequencer and CC-Link system, product of MITSUBISHI ELECTRIC CO. LTD., as well as reading this manual to accomplish correct wiring.

CAUTION :

- Before handling the CC-Link device, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.
- Contact with electric wiring connections (bare live parts) involves a risk of electric shock. Always disconnect power before wiring. Never touch live parts with wet hands.
- Pay special attention so that any tensile force or impact is not applied to the power cable and communication cable. Additionally, if the wiring distance is long, unexpected force due to own weight or shock may be applied, causing the unit to break. Therefore, to prevent such troubles take appropriate measures, such as securing of the wires and cables to the machine.
- To prevent problems caused by noise, keep the following in mind when wiring.
  - ① If noise is likely to have an influence, provide a power supply for each manifold solenoid valve when possible and wire them independently.
  - ② Do not use power cables that are longer than necessary and wire them in the shortest distance possible.
  - ③ Do not share power with noise generating devices such as an inverter motor.
  - ④ Do not lay the power cables, network cable, and other power lines in parallel.
  - ⑤ The shielding of the network cable must be connected to the equipotential bonding as close as possible to the slave unit.
  - ⑥ Refer to CC-Link Cable Wiring Manual when wiring.
- Make sure the power cables and network cable are connected according to the specifications to avoid any incorrect wiring. Incorrect wiring can cause the Slave Unit to malfunction or to be damaged.
- Before turning on the power, make sure that all cables and connectors are connected firmly.

4.1 Specifications of network cable (Shielded twisted cable)

The table below illustrates the communication line recommended for use in the CC-Link system. The quality of data transfer in the CC-Link system is guaranteed only if you use the recommended cable. Note the name and specifications of the recommended cable in the table below.

Item			Specifications
Name			FANC－110SBH Series
Vendors			Kuramo electric co.,LTD.
Cable type			Shielded twisted cable
Finish outer diameter			8.0mm or less
Conductor size			20AWG
Sectional area of conductor			0.5mm^2
Drain line			20 lines/0.18 mm or 24 lines/0.18 mm Insert separately or in a bundle between the ground cable bundle and aluminum tape.
Electric characteristics	Conductor resistance(20°C)		37.8Ω/km
	Insulation resistance		10000MΩ km or more
	Withstand voltage		DC500V 1minute
	Electrostatic capacity(1kHz)		60 nF/km or less
	Characteristic impedance	1MHz	110±15Ω
		5MHz	110±6Ω
	Attenuation amount(20°C)	1MHz	1.6 dB/100m or less
		5MHz	3.5 dB/100m or less
Cross section			 
Approx. weight			70 kg/km

Note: CC-Link special cable other than that described in the above table can be used. However, the transfer distance may vary depending on the type cable. To use such cable, refer to the User's Manual for CC-Link or contact cable manufacturer.

4.2 Connecting and wiring to the network connector plug

Network connector plug is included in the package with this product. Network is wired by connecting the network cable to the network connector plug, and then connecting the network connector plug to the network connector socket on the Slave Unit.

Network connector plug included:

MSTB 2,5/5-SFT-5,08 ABGY AU (1882832)

with a screw for connector fixation : Phonenix Contact

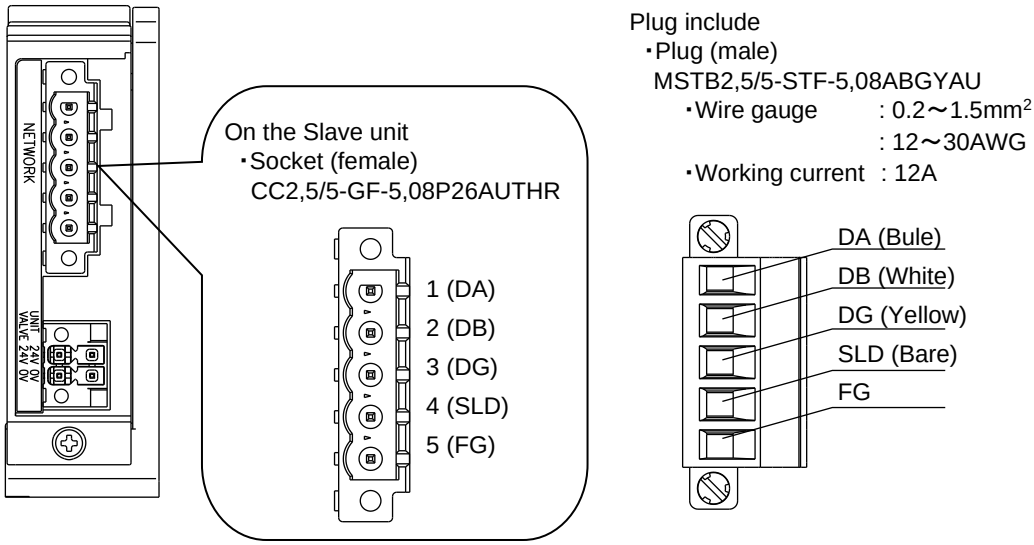
1) Wiring of network cable

Connect the network cables 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 cable to network connector plug according to the illustrations below.

③ After connecting the network connector plug to the network connector socket on the Slave Unit, fix the connector fixing screw of the plug. (Reference clamping torque (0.4N, m)).



Pin No.	Signal ( ): Color of isolator	Connection
1	DA (Blue)	Connect this terminal to the master or other slave communication line ”DA”
2	DB (White)	Connect this terminal to the master or other slave communication line ”DB”
3	DG (Yellow)	Connect this terminal to the master or other slave communication line ”DG”
4	SLD (Bare) *1	Connect this terminal to the master or other slave communication line ”SLD”
5	FG *1	Class 3 or higher grounding should be provided.

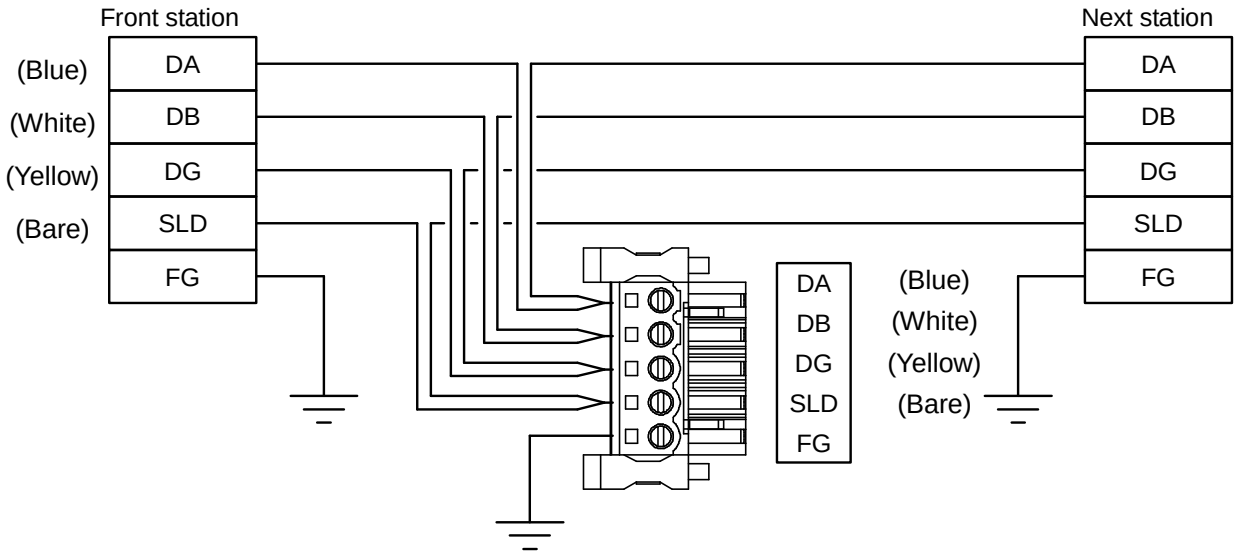
*1. SLD and FG terminals are connected inside the Slave Unit.

CAUTION :

- For the network cable, use a dedicated cable that complies with CC-Link specifications.
- Make sure the network cable has sufficient bending radius, and do not bend it forcibly.
- Separate the network cable from the power cable and high-voltage cables.
- When inserting a cable into the connector, the cable may intrude into not the connector tightening side but the rear side; it is, therefore, necessary to keep the cable fixing screw satisfactorily loose.
- For the connector provided with a connector fixing screw, be sure to firmly tighten the connector fixing screw when inserting the connector. If it is only inserted, the connector will come off, thereby causing malfunctions. When no connector fixing screw is provided, ensure that the connector claw is engaged securely.

2) Wiring of network cable

This figure is wiring of multi-drop connection About, T-branch connection, refer with users manual attached with master unit.



4.3 Connecting and wiring to the power plug

Unit/Valve power plug is included in the package with this product. Power is wired by connecting the Unit power cable and the Valve power cable to the power plug, and then connecting the power plug to the power socket on the Slave Unit.

Unit power:
Of the power supply necessary to operate the Slave Unit, 21.6VDC to 26.4VDC, use one with the least noise.

Valve power:
Of the power supply necessary to operate the Valve (load), 22.8VDC to 26.4VDC, use one with the least noise.

Power plug included:

DFMC1,5/2-STF-3,5 (1790292)	4 contacts	Mfd by Phoenix Contact

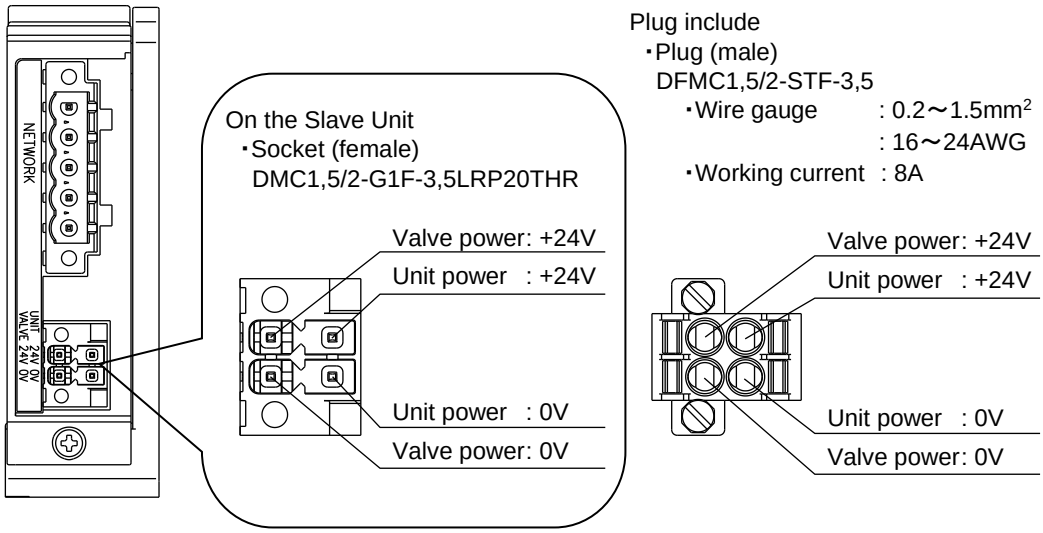
Recommended ferrules and crimping plier:

Ferrule (without sleeve): A0.5 to 1,5-10	Mfd by Phoenix Contact
Ferrule (with sleeve): AI0.25 to 0.75-10	Mfd by Phoenix Contact
Crimpling plier (common): CRIMPFOX6 (1212034)	Mfd by Phoenix Contact

1) Wiring of power cable

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

① After confirming safety, turn off the power to be connected to the Slave Unit.
② Attach a terminal such as a ferrule to the power cable as necessary.
③ Connect the power cable's 24V power line to the power plug's 24V terminal and the 0V power line to the 0V terminal according to the illustrations below.
④ After connecting the power plug to power socket on the Slave Unit, fix the connector fixing screw of the plug. (Reference clamping torque (0.25N・m)).



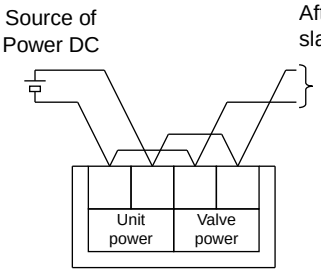
CAUTION :

- Always check the polarities and rated voltage carefully before making any connections.
- Calculate the current consumption before selecting an appropriate power cable.
- If power is to be supplied to more than one slave unit from one power supply, voltage drop due to cables should be considered when selecting and wiring the cables.
- If voltage drop cannot be avoided, take measures to secure the specified power supply voltage such as wiring the power cables in multiple systems or installing other power supplies.
- If branch wiring (double wiring or double lugging) of the power lines is necessary, install a terminal block just before the power plug, and wire at the terminal block.

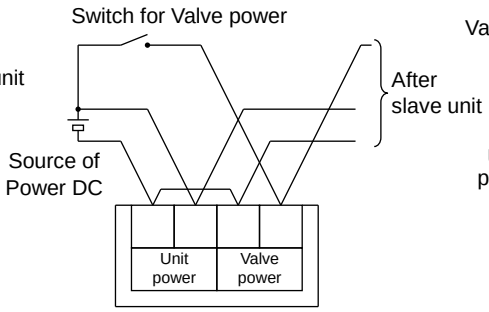
2) Wiring of power cable

The illustrations below are examples of power supply to two or more slave units from power source(s) at a single location. You may try other variations as required

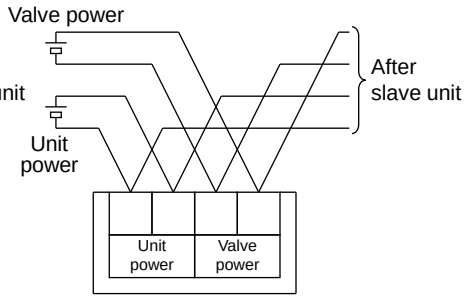
1. Common connection of
   Unit power and Valve power



2. Wiring to enable
   Valve power to be turned On ・ Off.



3. Seperate connection
   Unit power with Valve power



5. MAINTENANCE

5.1 Removing the Slave Unit

① After confirming safety, stop network communication and turn off all peripheral equipment as necessary.

② After confirming safety, turn off Unit power and Valve power as necessary.
(If the Slave Unit is the last slave and its power is turned off, the power supply to terminating resistance will stop and communication throughout the whole system may become unstable or even stop.)

③ Remove the Slave Unit mounting screw. Since this mounting screw is a fall-prevention type, stop loosening it as soon as it detaches from the Slave Unit connecting block.

④ Hold the Slave Unit and slowly pull it out in the direction of the plugs.

⑤ Remove the network connector plug and the power plug.

5.2 Mounting the Slave Unit

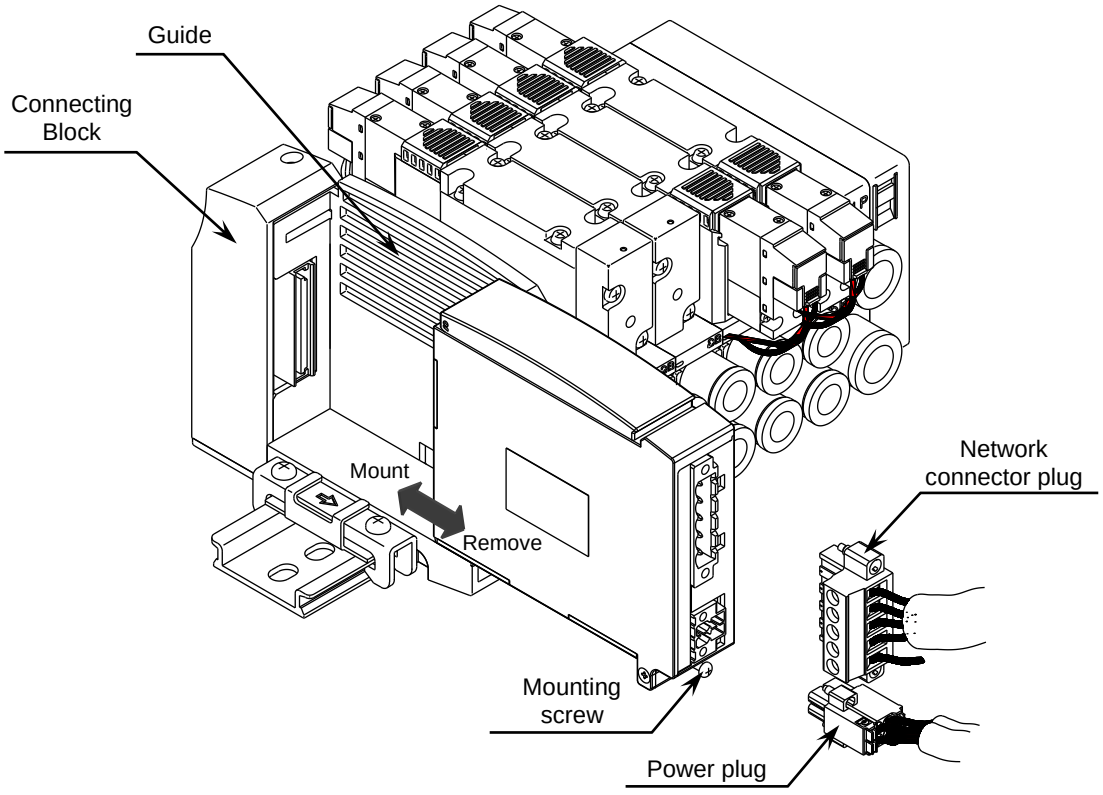
① Set the STATION No. of the Slave Unit.

② Make sure the power (for both Unit and Valve) is turned off, and after confirming safety, attach the network connector plug and the power plug. Attaching the plugs while the power is turned on may cause the components in the system to move suddenly.
(Network connector plug reference tightening torque: 0.4N·m; contact the plug manufacturer for appropriate torque)
(Power plug adequate tightening torque: 0.25N·m)

③ Holding the Slave Unit, insert it into the Slave Unit connecting block slowly from the front along the guide.

④ Make sure the Slave Unit and the connecting block are connected and tighten the Slave Unit mounting screw firmly. (Adequate tightening torque: 0.5N·m)

⑤ After confirming safety, turn on the Unit power and Valve power.

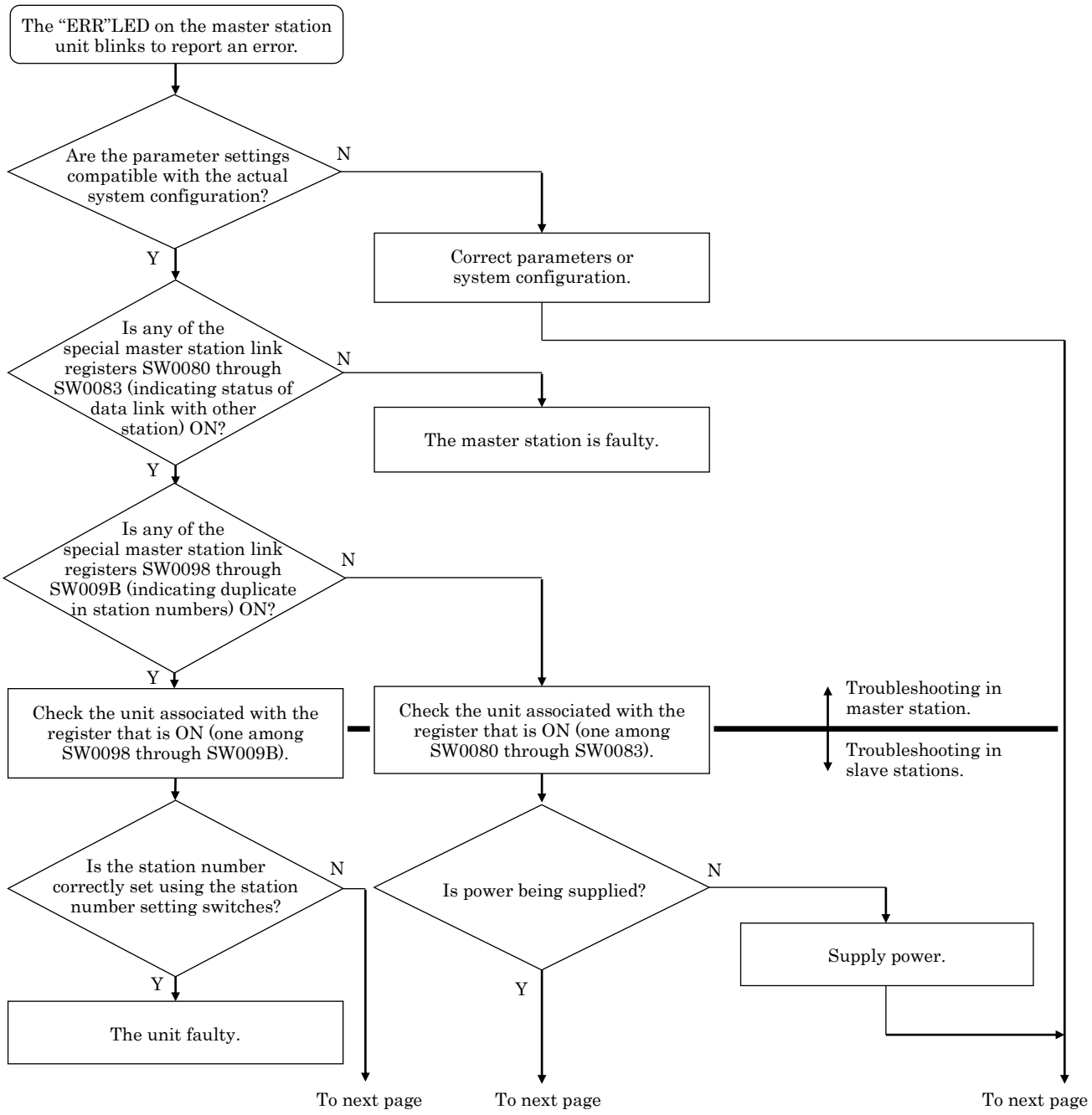


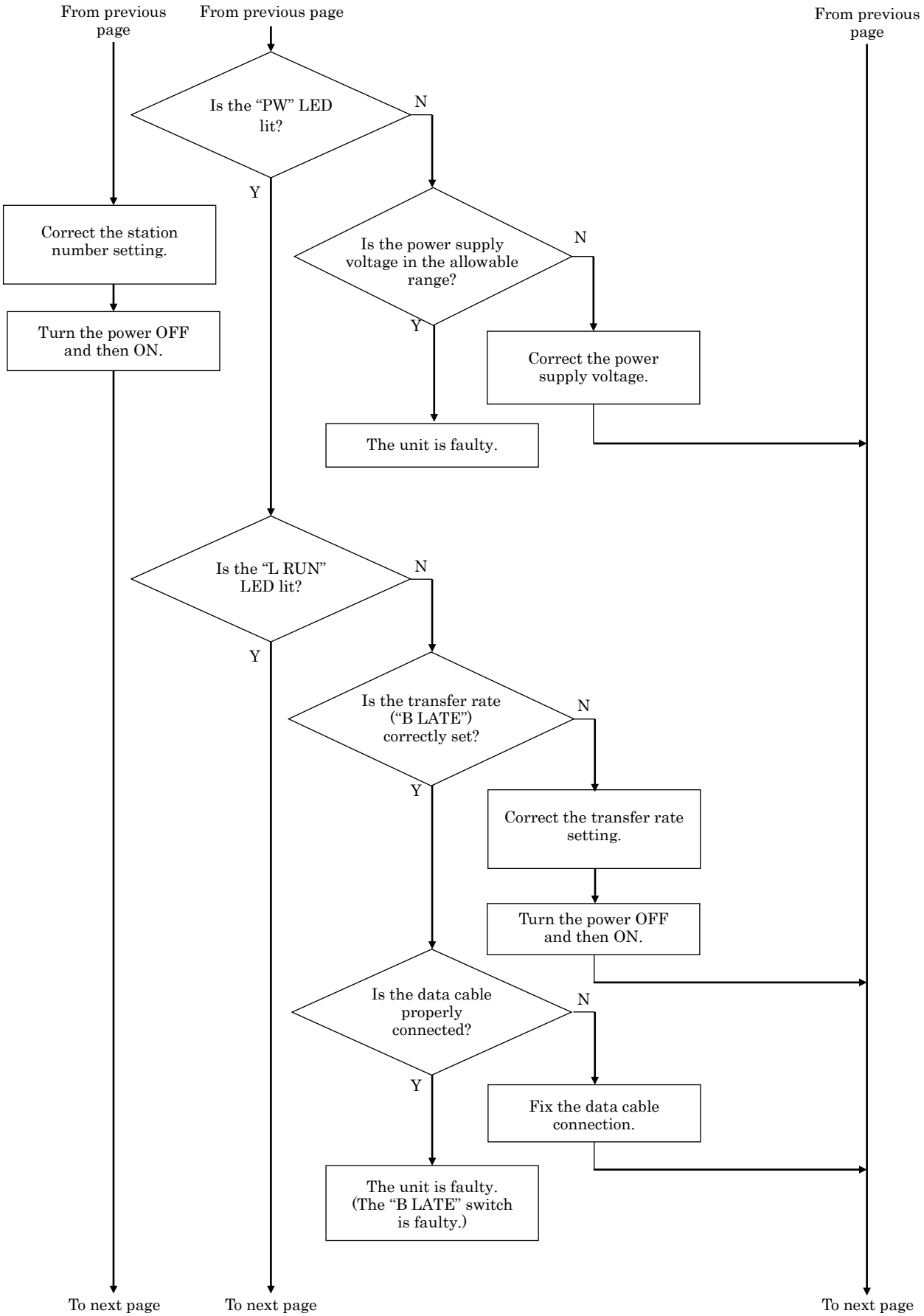
CAUTION :

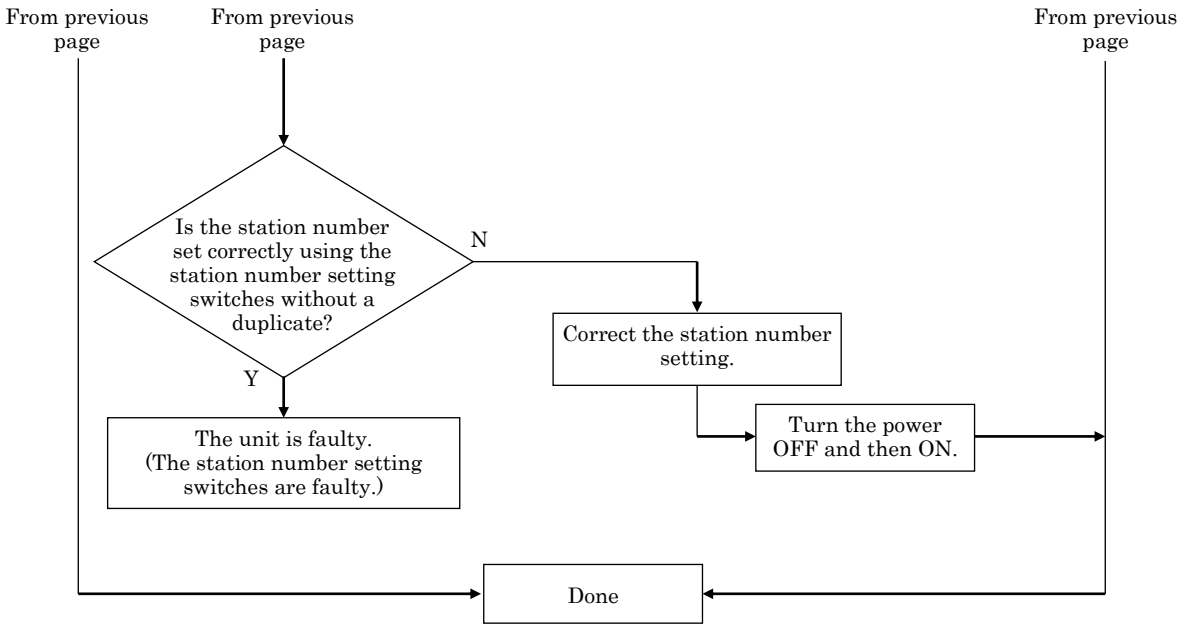
- Before turning on or off the power, take a good look around and make sure it is safe to do so as the components in the system, including the Valve (cylinder), may move unexpectedly.
- Before turning on the Unit power, check the Slave Unit address.
- Touching the electrical wiring connection part (bare live part) may cause an electric shock.
- Slave Unit is a delicate device. Do not drop the Slave Unit or apply vibration or impact to the Slave Unit.
- Do not connect or disconnect any connectors while the power is supplied. Doing so may result in failure or malfunction.

5.3 Troubleshooting

Troubleshooting should address the entire system rather than a particular slave station. This slave station has its LED indicators similar to those provided on a Mitsubishi remote I/O station. Looking at these indicators and the indicators on the master station, you can determine the cause and take corrective action. During such troubleshooting operations, refer to Chapter 13 “Troubleshooting” of the Mitsubishi User’s Manual (CC-Link system master/ local units). Moreover, PW(V) LED is a peculiar LED disply to this product. If only this LED is off, check the voltage of the power supply to the valve power.




From previous page
From previous page
From previous page
Is the "PW" LED lit?
N
Y
Correct the station number setting.
Is the power supply voltage in the allowable range?
N
Y
Turn the power OFF and then ON.
Correct the power supply voltage.
The unit is faulty.
Is the "L RUN" LED lit?
N
Y
Is the transfer rate ("B LATE") correctly set?
N
Y
Correct the transfer rate setting.
Turn the power OFF and then ON.
Is the data cable properly connected?
N
Y
Fix the data cable connection.
The unit is faulty. (The "B LATE" switch is faulty.)
To next page
To next page
To next page


From previous page
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From previous page
Is the station number set correctly using the station number setting switches without a duplicate?
N
Y
Correct the station number setting.
Turn the power OFF and then ON.
The unit is faulty. (The station number setting switches are faulty.)
Done

5.4 Maintenance of components

This section describes everyday maintenance of components, particularly the methods of cleaning, inspecting, and replacing the Slave Unit.

1) CLEANING

Regularly clean the physical components of the network as follows to ensure that the network is kept in the best condition possible.

① For daily cleaning, use a soft, dry cloth to wipe over the components.
② If dirt remains even after wiping with a soft, dry cloth, wipe with a cloth wrung out in a sufficiently diluted detergent (2%)
③ Slave Unit will become stained if items such as rubber or vinyl products and tape are left on the Slave Unit for long periods. Remove such items during regular cleaning.

2) INSPECTING

Always perform periodic inspections to ensure that the network is kept in the best possible condition. Periodic inspections should be carried out at least once every 6 to 12 months; however, for Slave Unit used in environments subject to high temperature and humidity or excessive dust, periodic inspections should be carried out more frequently.

■ Points of Inspection

Periodically inspect the following items to ensure that they do not deviate from the criteria.
If the items deviate from the criteria, adjust the environment so the criteria are met or adjust the Slave Unit itself.

Inspection item	Inspection details	Criteria	Inspection method
Environment	Are the ambient and in-panel temperatures appropriate?	Refer to the specifications of Slave Unit	Thermometer
	Is the ambient and in panel humidity appropriate?	Refer to the specifications of Slave Unit	Hygrometer
	Is there any dust accumulation?	No dust	Visual inspection
Installation	Is the Slave Unit securely mounted?	No looseness	Phillips screwdriver
	Is the network connector plug inserted properly?	No looseness	Flat blade screwdriver
	Are there any loose external wiring screw?	No looseness	Flat blade screwdriver
	Are there any damages to the connection cables?	No visible damage	Visual inspection

3) REPLACING

The network consists of a master unit and one or several slave units. Malfunctioning of any unit can affect the entire network, so such unit must be replaced immediately. To restore network functions as quickly as possible, it is recommended that spare units be kept on hand at all times to replace the malfunctioning unit.

■ Precaution

When replacing a unit after periodic inspection has revealed a problem, check that the new unit does not have errors after replacement.

■ Setting the new Slave Unit after replacement

After replacing the Slave Unit, make necessary changes to the switches and other settings so that they are the same as before the Slave Unit was replaced.