Handling Instructions

CC-Link Ver1.10 Compatible Serial Transmission Device

T8G* / T8GP*

(OPP7-*G / OPP7-*G-P)

Thank you for purchasing CKD product.
Please review the precautions in this handling instructions thoroughly for safe operation of this product.
Incorrect usage may result in malfunction and dangers.
Keep this Instruction in a safe and convenient place for future reference.
For further information, refer to the instruction manual and product catalog.

⚠ CAUTION

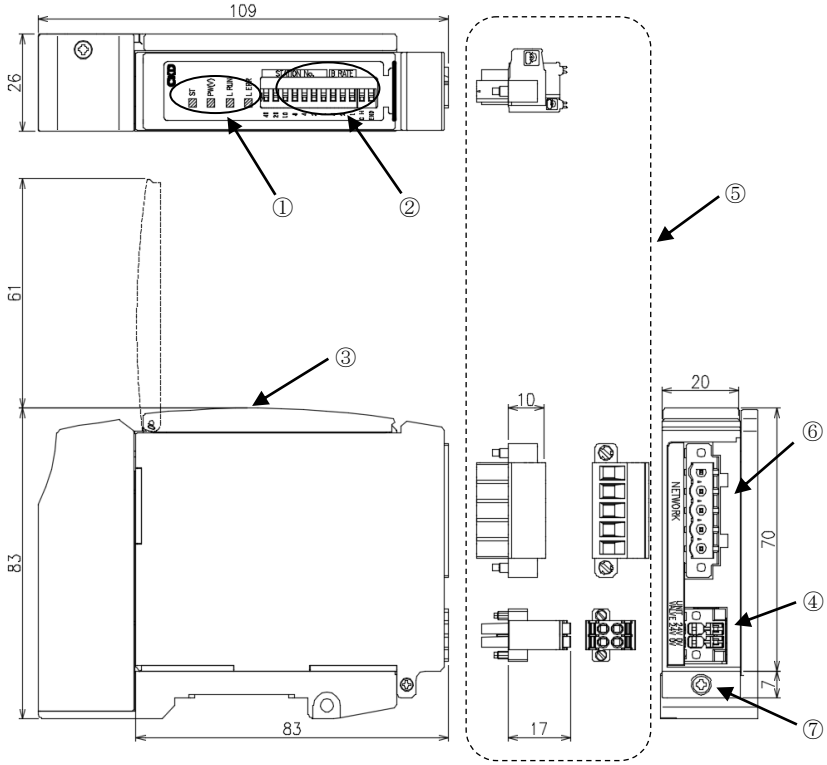
- Verify that the station number of the serial transmission unit block is correctly set.
  Operation with incorrect station number will result in malfunction of solenoid valve and cylinder.
- Do not touch the live part with bare hands or the electrical wiring (bare live part), as an electric shock may occur.
- Read the instruction manual of the communication system before using the product.
- This product is DC dedicated. Use the product within the specified power supply voltage.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

1. Device specifications: Always operate the device within its specifications.

Item	Specifications			
Model No	**T8G1**	**T8G2**	**T8GP1**	**T8GP2**
Single device model No.	OPP7-1G	OPP7-2G	OPP7-1G-P	OPP7-2G-P
Unit power voltage	21.6 VDC to 26.4 VDC (24 VDC±10%)			
Unit power current consumption	60 mA or less (with all points ON : 24.0 VDC)			
Valve power voltage	22.8 VDC to 26.4 VDC (24 VDC+10%, -5%)			
Valve power current consumption	15 mA or less (with all points OFF) 40 mA or less (with all points ON at no load)			
Output type	+COM(NPN)		-COM(PNP)	
Number of output points	16 points	32 points	16 points	32 points
Station number settings	With switches: 1 to 64			
Output setting when communication error occurs	Hold (all output points are hold) / Clear (all output points are clear)			
Insulation resistance	Between external terminals and the case: 30 MΩ or more with 500 VDC			
Withstand voltage	Between external terminals and the case: 500 VAC for one minute			
Shock resistance	294.0 m/s^2 for 3 times in 3 directions			
Storage ambient temperature	-20°C to 70°C			
Storage humidity	30% to 85% RH (no dew condensation)			
Ambient temperature	-5°C to 55°C			
Ambient humidity	30% to 85% RH (no dew condensation)			
Atmosphere	No corrosive gas			
Installation location	Indoor use			
Altitude	Up to 2000 m			
Pollution degree	2			
Communication protocol	CC-Link Ver1.10 Compatible (remote I/O type)			
Transfer rate (Baud rate)	10 M / 5 M / 2.5 M / 625 k / 156 k bps (selected by DIP switch)			
Output insulation	Photo coupler insulation			
Leakage current	0.1 mA or less			
Residual voltage	0.5 V or less			
Fuse	Valve power: 24 V, 3 A/ Unit power: 24 V, 2 A (both fuses are non-replaceable)			
Operation indicator	LED (communication status, Unit power and valve power) Note 1			

Note 1: Status can be monitored when the unit power is supplied with the voltage within the specified range.

2. Dimensional outline drawing



① Status monitoring lights
These lights indicate Remote station Unit status and network status.
② Switches
These switches are used for setting the Remote station Unit address (STATION No.), communication speed (Baud RATE), terminal resistor, and an output of the Remote station Unit when the communication error occurs (Output mode).
③ Cover
This clear cover protects the status monitoring lights and the switches.
④ Unit/Valve power socket
This is the socket for connecting the Unit/Valve power plug.
⑤ 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).
⑥ Network connector socket
This is the connector socket for connecting the network connector plug
⑦ Mounting screw (M2.5 tapping screw)
This screw is used to secure the Remote station Unit to the connecting block.

3. LED indicators and Switch settings

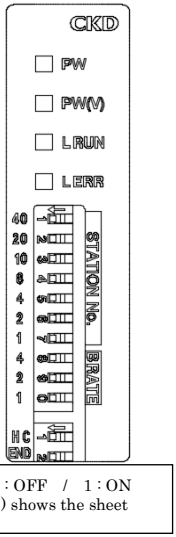
3.1 Station number/ transfer rate (Baud rate) setting

Set the station number of this remote station unit.

Station number Setting range: 1 to 64

Baud rate Setting range: 0 to 4

Switches	STATION No. [Station number] 40 20 10 8 4 2 1	B RATE[Transfer rate] 4 2 1
Settings	The switch Station number is weighted according to BCD code.	The switch Transfer rate is weighted according to BCD code.



0 : OFF / 1 : ON
( ) shows the sheet

Station address and transfer rate setting is read into memory at power-up.

Duplicate station numbers cannot be set.

Station number	Switch numbe						
	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

Transfer rate (Baud rate)	Switch number		
	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

Example) To set the station number to 50

50＝40･(1)＋20･(0)＋10･(1)＋8･(0)＋4･(0)＋2･(0)＋1･(0)

From the above formula, switch Nos. 1 and 3 are turned on, and the other switches (Nos. 2, 4 to 7) are turned off.

To set the transfer rate to 5Mbps

Switch Nos. 9 and 0 are turned ON, and other switches (No. 8) are turned OFF.

3.2 Setting other switches

Set the output data when a communication error occurs and the terminal station when it is connected to the position farthest from the master unit.

Switches	Settings
C H (Output mode setting)	Set the output status in the event of communication error. (Such as communication line disconnection or timeout) OFF(0) : Clear mode ON(1) : Hold mode
END (End station setting)	Set the end station. OFF(0) : When an intermediate station or internal terminating resistor is not used ON(1) : When using the built-in terminating resistor at the end station (Using 110Ω cable)

* Setting end station

This product has a built-in 110 Ω terminating resistor between the DA and DB communication lines.

By setting the END switch to ON, the end station can be set without connecting a terminating resistor to the connector of this product.

Then, connect the terminating resistance supplied with the master station (or commercially available resistance) to the connector of the product in accordance with the connecting condition (specification).

⚠CAUTION

- Set switches while the unit power is turned off.
- The cover of serial transmission device can be opened and closed with one touch.
  Keep the cover of serial transmission device closed except when setting the switches. The cover may get damaged or foreign matters may enter inside and cause unexpected failure.
- Switches are precisely built and can be damaged if mishandled. Make sure not to touch the internal circuit board when setting the switches.

3.2 LED indicators

These LEDs indicate the status of the product and network. Refer to the following table for the description.

LED	Indication
PW	Unit power is ON (Red on at normal condition).
PW(V)	Valve power is ON (Red on at normal condition). Note: This indicator is disable when the unit power is OFF.
L RUN	Red on when refreshed data of CC-Link is received normally. (Off when it is data read timeout.)
L ERR	Red on when received data of CC-Link is erroneous. (Off when communication is normal.)

4. Wiring

Function description and connection of the terminal are as following.

⚠CAUTION

- There is a risk of electric shock if the electric wiring connections (exposed live sections) are touched.always turn the power OFF before starting wiring work.Do not touch the live sections with wet hands.
- Do not apply tension or shocks to the power cable or network cable.
  If the wiring is long, the cable weight or shocks may cause an unexpected force and result in damage to the connector or device.
  Take appropriate measures; for example, secure the wiring to the machine or device midway.
- When wiring, be careful of the following points to prevent problems caused by noise.
  ① If noise could have an effect, prepare power for each manifold solenoid valve and wire independently.
  ② Wire the power cable as short as possible.
  ③ Wire the power cables for the product separately from the power cables for noise-generating devices such as inverter motors.
  ④ Wire the power cable and network cable away from other power lines as much as possible.
- Before handling an CC-Link device, touch a grounded metal part to discharge static electricity from your body.Static electricity may cause damage to the product.
- When conformity to UL is required, the unit must be used with a power supply which classified as “LIM (Limited Energy Circuit) or UL 1310 Class 2” which is insulated from MAINS by double or reinforced insulation.
- When conformity to UL is required, separate power supplies should unit and valve.

4.1 Transmission rate and cable length

With CC-Link, cable length is limited by transmission rate, Cable type,Device, Wiring method (Multidrop /T branch)refer to the instruction manuals issued by the master unit manufacturer or CLPA (CC-Link Partner Association).

Multidrop connection (CC-Link Ver.1.10)

B RATE [Communication speed]	Cable distance between stations	Max. total cable length
0【156k bps】	0.2m or more	1200m
1【625k bps】		900m
2【2.5M bps】		400m
3【5M bps】		160m
4【10M bps】		100m

4.2 Connecting and wiring to the unit/valve power socket

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 device unit.

Power plug included：

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

Recommended ferrules and crimping plier:

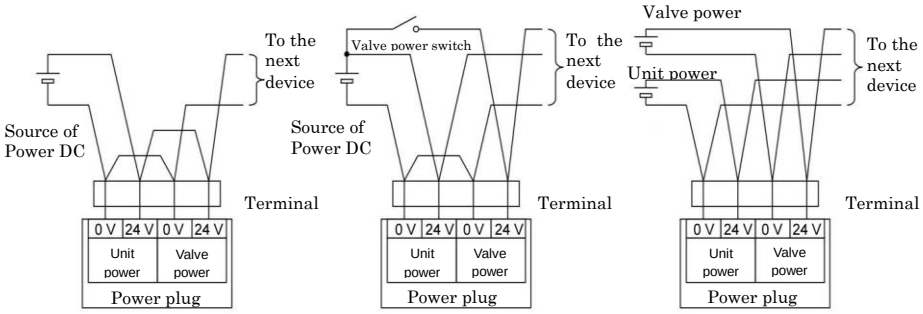
Ferrule (without sleeve)：A0.5 to 1,5-10 Phoenix Contact

Ferrule (with sleeve)：AI0.25 to 0.75-10 Phoenix Contact

Crimpling plier (common)：CRIMPFOX6（1212034） Phoenix Contact

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

1. Common connection for unit power and valve power
2. Connection for turning on/off valve power
3. Separate connection for unit power and valve power



Follow the steps below to connect the unit/valve power cables to the power plug.

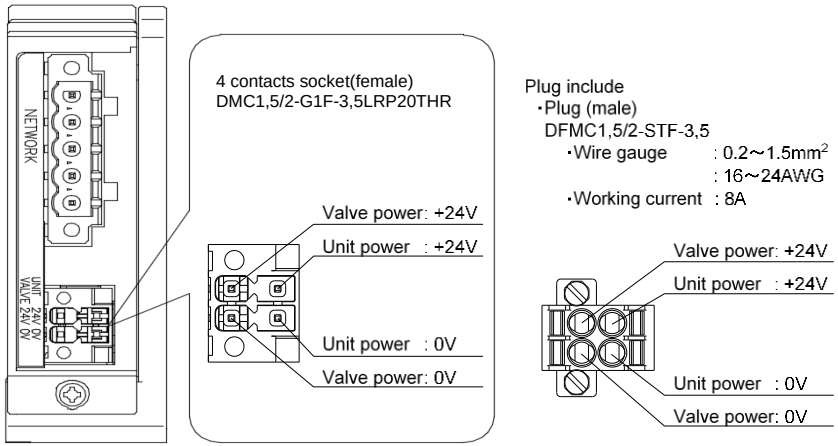
＜Unit/Valve power cable＞

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

② Stripping length of wire coating is 10mm.Attach a terminal such as a ferrule to the power cable when needed.

③ Refer to the figure below and wire the cables to the correct terminals on the power plug (24 V to 24 V, 0 V to 0 V).

④ Connect the power plug to the power socket and secure the plug flange with the appropriate tightening torque (0.2 N·m).



⚠ CAUTION

- Check the polarity of the device and the cable terminal before connecting.
- Select the power cable by calculating the current consumption.
- Consider the voltage drop due to cables when selecting and wiring the cables if power is supplied to more than one device from one power supply.
- Take measures to secure the specified power supply voltage if voltage drop cannot be avoided. For example, wire the power cables in multiple systems or install other power supplies to secure the specified power supply voltage.
- Install a terminal block if multi-drop wiring of the power cables is needed. Install the terminal block so that it comes before the power plug.

4.3 Connecting and wiring to the network connector socket

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 Remote station Unit.

Network connector plug included:

MSTB 2,5/5-SFT-5,08 ABGY AU (1882832) with a screw for connector fixation Phoenix Contact

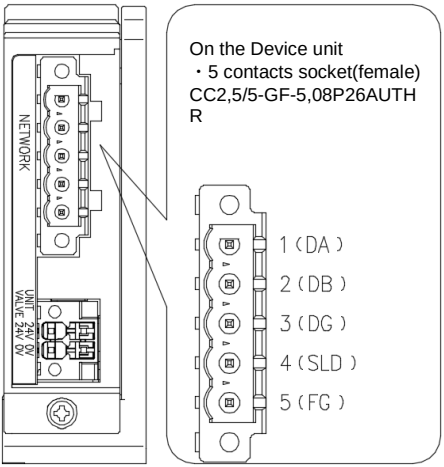
Connect the network cables to the network connector plug according to the following instructions.

＜Network cable＞

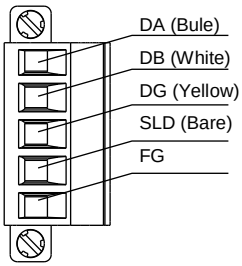
(1) After confirming safety, stop network communication and turn off all peripheral equipment.

(2) Stripping length of wire coating is 10mm. Attach a terminal such as a ferrule to the power cable when needed.

(3) Connect the CC-Link cable to network connector plug according to the illustrations below.



Plug include
・5 contacts socket(male)
MSTB2,5/5-STF-5,08ABGYAU
・Wire gauge :0.2~2.5mm²
:12~30 AWG
・Working current :12A



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

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

⚠CAUTION

- Use a dedicated network cable that complies with CC-Link specifications.
- Provide sufficient bending radius for the network cable and do not bend it forcibly.

5. Maintenance

5.1 Mounting the product (device)

① Set the STATION No. , Communications speed, Operation when communication error occurs,terminal resistor of the Remote station Unit.

② Turn off the power (for unit/valve) and connect the network plug and power socket. The system may start operating suddenly if they are connected while the power is turned on. Be careful of the surroundings and secure safety before performing work.

③ Hold this product and slowly insert it into the Device station connection block from the front along the side wall.

④ Make sure the Device Unit and the connecting block are connected and tighten the Device Unit mounting

screw firmly. (Adequate tightening torque: 0.5N·m)

⑤ After confirming safety, turn on each power supply.

5.2 Removing the Remote station 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 Remote station Unit is the last remote station 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.)

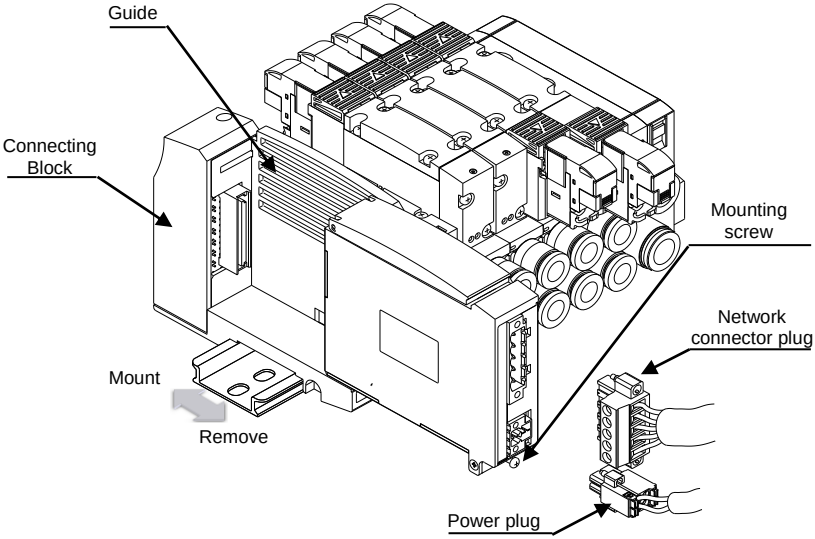
③ Remove the Remote station Unit mounting screw. Since this mounting screw is a fall-prevention type, stop loosening it as soon as it detaches from the Remote station Unit connecting block.

⚠ CAUTION

- Do not remove the device by pulling cable or connector that may cause disconnection or damage.
- Do not pull out the Device unit by pulling the cable or connector.
  This may cause cable disconnectionodeamage.
- An electric shock may occur by touching the electrical wiring connection (bare live part).

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

⑤ Remove the network connector plug and the power plug.



6. Settings by CSP+ system profile

In order for the CC-Link device to join the network, it is necessary to register the device to the network using the CSP+ profile which describes the device's communication specification.

Refer to the instruction manual issued by the master unit manufacturer for registering the CSP+ profile.

Use the latest CSP+ profile for proper network configuration.

CSP profile name（for OPP7-*G-*）：CKD_OPP7_G.xml

(The above CSP+ file contains data for four models.)

6.1 Registering the device

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

Specifications and the model name in the CSP file

Item	Specifications			
Model No.	T8G1	T8G2	T8GP1	T8GP2
Single device model No.	OPP7-1G	OPP7-2G	OPP7-1G-P	OPP7-2G-P
Output type	+COM（NPN）		－COM（PNP）	
Number of output points	16 points	32 points	16 points	32 points
Model name in the CSP+ file	OPP7-1G	OPP7-2G	OPP7-1G-P	OPP7-2G-P

6.2 I/O mapping

There are two types of I/O data: output (remote output) data sent from the master unit to the remote station (this product) and input (remote input) data sent from the remote station to the master unit.
The product is an output device that receives remote output data from the master unit and output to the valve.Refer to the following table for I/O mapping(There is no remote input for the product).

I/O data mapping

Number of output points		master	master unit **of address (160_H :** Station number **1)**															
			Y*0	**Y*1**	**Y*2**	**Y*3**	**Y*4**	**Y*5**	**Y*6**	**Y*7**	**Y*8**	**Y*9**	**Y*A**	**Y*B**	**Y*C**	**Y*D**	**Y*E**	**Y*F**
32 points	16 points	**1 word【0*】**	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	—	**2 word【1*】**	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Note: With the standard wiring of the double solenoid valve, the a-side solenoid close to the product is assigned input data 00, and the b-side solenoid is assigned output data 01 in order.

PRECAUTIONS

- To correspond with the requirements of the relevant EC Directive, use AC/DC adapter (e.g., switching power supplies) complying with EMC standards for the unit and valve power supplies.
- The system or solenoid valve (cylinder) may operate suddenly when powering on and off.
  Be careful of the surroundings and secure safety before performing work.
- For the delay time, refer to the instruction manual of the master unit.
  Transmission delay as a system varies depending on the PLC scan time and other devices connected to the same network.
- For the Response time of the solenoid valve, check the solenoid valve specifications.
- Solenoid valve OFF time is delayed by approximately 20 msec due to the surge absorbing circuit integrated in the device.
- Wire the power cable and network cable properly within its specifications to avoid any incorrect wiring.
- Do not apply tension or impact to the power cable or network cable.
- Make sure that cables and connectors are securely connected before turning on the power.
- Do not disassemble, modify, or repair the product as that may cause failure or malfunction.
- Do not drop or apply excessive vibrations or shocks to the product as the part inside are made precisely.
- Do not attach or detach the connector while the power is ON as that may cause a failure or malfunction.
- Mold and rust may develop on the product if it is exposed to high humidity during transportation. Include moisture absorbers and tightly seal the package.

For inquiries regarding the product, please contact the following or the nearest sales office.

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