Handling Instructions

CC-Link IE TSN Compatible Serial Transmission Slave Unit

T8TG□ / T8TGP□

(OPP7-□TG / OPP7-□TG-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

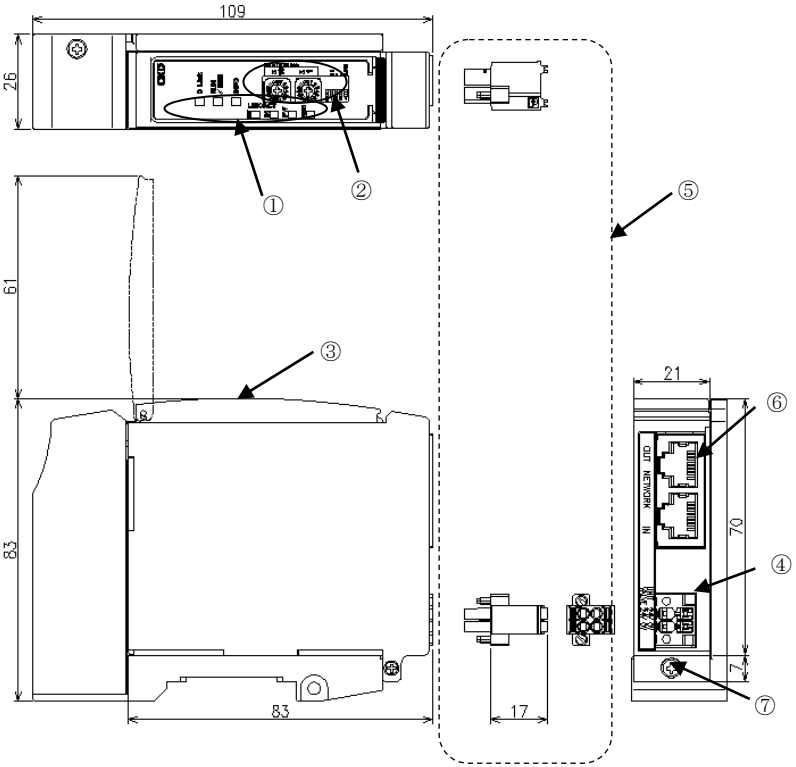
- System components such as valves and cylinders could malfunction if the hard switch setting of serial transmission slave unit is incorrect. Always check the settings before starting use.
- An electric shock may occur by touching the electrical wiring connection (bare live part). During wiring, keep the power off. Do not touch live parts with bare hands.
- Thoroughly read and understand the instruction manual for the network system to be used before using the serial transmission slave unit.
- This product is DC dedicated. Use the product within the specified power supply voltage.

1. Slave Unit specifications: Always operate the unit within its specifications.

Item	Specifications			
Manifold Model No.	-T8TG1	-T8TG2	-T8TGP1	-T8TGP2
Single unit model No.	OPP7-1TG	OPP7-2TG	OPP7-1TG-P	OPP7-2TG-P
Unit power supply voltage	21.6 VDC to 26.4 VDC (24VDC±10%)			
Unit power current consumption	140 mA or less (at 24.0 VDC with all points ON)			
Valve power voltage	22.8 VDC to 26.4 VDC (24 VDC+10%, -5%)			
Valve power current consumption	10 mA or less (all points OFF) 15 mA or less (under no load with all points ON)			
Output type	+COM (NPN)		-COM（PNP）	
Number of output points	16 points	32 points	16 points	32 points
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 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)			
Ambient atmosphere	No corrosive gas			
Communication protocol	CC-Link IE TSN			
Output insulation	Photo coupler insulation			
Leakage current	0.1 mA or less			
Residual voltage	0.5 V or less			
Fuse	Valve power: 24V, 3A/ Unit power: 24V, 1A (both fuses are non-replaceable)			
Operation indicator	LED (communication status, unit power and valve power status)			

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

2.Dimensional outline drawing



① LED indicators
D Link, RUN/ERR, INFO, LINK/ACT OUT, LINK/ACT IN, PW, , PW (V)
Indicate the status of the slave unit and network by LEDs.

② Switches
Set the IP address of the slave unit by rotary switches.
Set the operation at communication error and baud rate by slide switches.

③ Cover
Protects the LED indicators and setting switches.

④ Unit/valve power socket
Connects the unit/valve power plug.

⑤ Unit/valve power plug (supplied item)
Connects the unit/valve power cables (24 V).

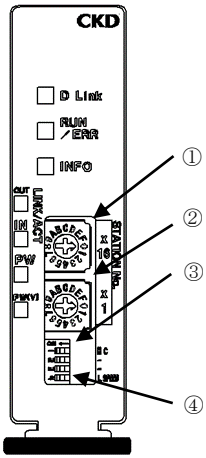
⑥ Network connector socket (RJ45 × 2 ports [IN, OUT]) (Network connector plug is not supplied.)
Transmits CC-Link IE TSN communication to the next slave or receives it from the previous slave unit.
Note: There is no difference in the function between input (IN) and output (OUT) ports which only named to distinguish each port.

⑦ Slave unit fixing screw (M2.5 tapping screw)
Secures the slave unit to the slave unit connecting block.

3. Switches and LED indicators

3.1 LED indicators

These LEDs indicate slave unit status and network status. Refer to the following table for the description of LED indicators.



LED	Indication
D Link	Indicates the data link communication status of CC-Link IE TSN with the LED (green) lighting. (Green on at normal communication)
RUN /ERR	RUN: Indicates the operating status of the product with the LED (green) lighting ERR: Indicates the error status of the product operation with the LED (red) lighting
INFO	Indicates the notification status from the slave unit with the LED (red) lighting (Lights off at normal communication)
LINK/ACT OUT(P1)	Indicates the status of the Ethernet port (OUT side) with the LED (green and yellow) lighting (light off, light on, rapid flashing)
LINK/ACT IN (P2)	Indicates the status of the Ethernet port (IN side) with the LED (green and yellow) lighting (light off, light on, rapid flashing)
PW	Green on when the unit power is on.
PW(V)	Green on when the valve power is on. (This indicator is disable when the unit power is off.)

3.2 Switch settings

Set the output status when a communication error occurs, the slave unit IP address, and baud rate.
The setting is read into memory at power-up.
Refer to the following table for the settings of each switch.

No.	Part name	Settings	Setting specification range
①	IP address setting switch (×16)	Sets the slave unit IP address. * The 1st to 3rd octets are automatically set to the same value as the master unit.	1 to 254
②	IP address setting switch (×1)		
③	Switch for output setting at communication error	Sets the output status when a communication error occurs. ON: Hold mode OFF: Clear mode	ON or OFF
④	Baud rate setting switch	Sets baud rate. ON: Communication speed 100 Mbps OFF: Communication speed 1 Gbps	ON or OFF

⚠ CAUTION

- Make sure to set the switches with the unit power off.
- The cover on the slave unit is hinged and can be flipped open and closed. Keep the cover closed except when setting the switches. Otherwise, foreign matter may enter the internal circuit from the cover and cause unexpected failure, or the cover itself may get damaged. Be careful not to allow any foreign matter to enter inside when setting the switches.
  Unexpected failure may result.
- The setting switch is very precise and may be damaged in case of rough handling. Also, never touch the internal circuit board when setting the switches.

4. Wiring

Function description and connection of the terminals are as following.

CAUTION

- An electric shock may occur by touching the electrical wiring connection (bare live part). During wiring, keep the power off. Do not touch live parts with bare 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 appropriate measures such as secure the wiring to the machine or device midway.
- To prevent noise problems, keep the following in mind when wiring:
  (1) If noise could have an effect, prepare power for each manifold solenoid valve and wire 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.
- Discharge static electricity that has built up on your body by touching a grounded metal object before handling the CC-Link IE TSN device. Static electricity may cause damage to the product.

4.1 Communication distance and wiring

Although the CC-Link IE TSN network uses a standard Ethernet cable and has flexible wiring methods, there are limits depending on the wiring material, devices, master, hub and such. Make sure to understand these specifications before wiring.
(For details, refer to the instruction manual of the master unit manufacturer and CLPA.).

4.2 Connecting and wiring to the unit/valve power socket

A valve power plug is supplied with this product and the unit and valve power supply cables are wired to this plug.
The plug is connected to the power socket on the slave unit.

Supplied power plug

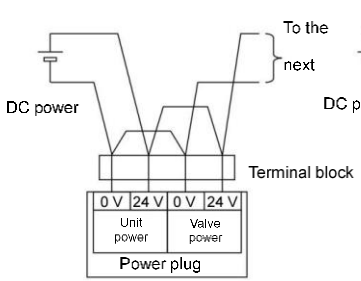
DFMC1,5/2-STF-3,5（1790292）	4-pin connector	by PHOENIX CONTACT

Recommended ferrules and crimping tool

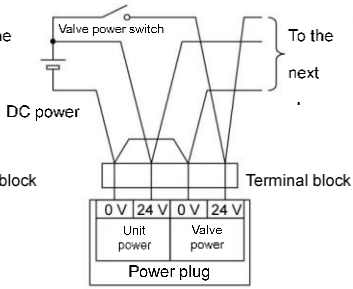
Ferrule (without sleeve): A0,5-10 to 1,5-10	by PHOENIX CONTACT
Ferrule (with sleeve): AI0,25-10 to 0,75-10	by PHOENIX CONTACT
Crimping tool (in common): CRIMPFOX6 (1212034)	by PHOENIX CONTACT

The following figures 1 to 3 are examples of the wiring for the power plug. Change the circuit configuration as needed.

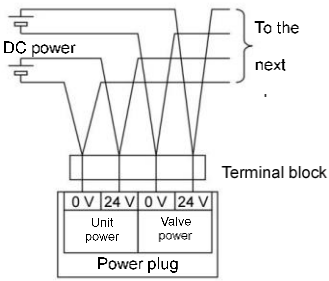
1. Common connection for unit power and valve power



2. Connection for turning on/off valve power



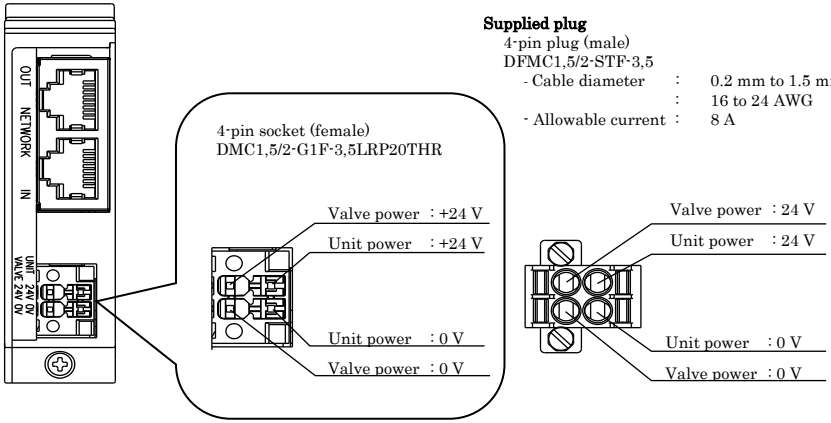
3. Separate connection for unit power and valve power



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

<Unit/Valve power cable>

(1) After confirming safety, power off the power supply connected to the slave unit.
(2) 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).



CAUTION

- Check the polarity of this product and the cable terminal before connecting.
- Calculate the current consumption before selecting the appropriate power cable.
- Consider the voltage drop due to cables when selecting and wiring the cables if power is supplied to more than one slave unit (remote device unit) from one power supply.
- 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 crossover wiring.

4.3 Connecting and wiring to the network connector socket (RJ45 connector)

Network plug is not supplied with the product. Separately purchase a network plug that satisfies the specifications. By wiring the network cable to a network plug, the plug can be connected to the network connector socket on the slave unit.

<Recommended cable with plug [Cat.5e]>

CCNC-IEF-24-S***□ Industrial Ethernet cable (double shielded) Manufactured by JMACS

***: Length, □: M = meter or C = centimeter

Follow the steps below to connect the network cable to the network plug.

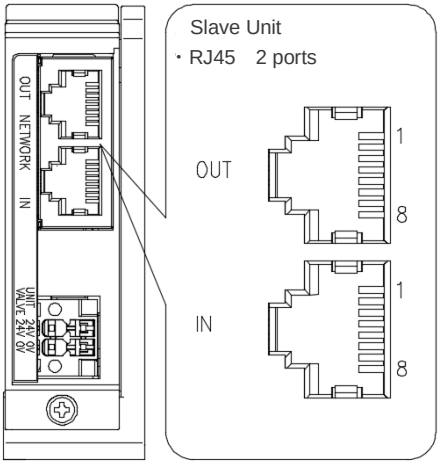
<Network cable>

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

(2) Refer to the figure below and connect the CC-Link IE TSN compliant cable to the RJ45 plug (CC-Link IE TSN compliant).

Note: There is no difference in the function between input (IN) and output (OUT) ports which only named to distinguish each port. (Except when the fast link up function is enabled)

Note: When the previous slave unit is OFF, network of this unit turns OFF.



Port	Pin	Signal	Function
IN / OUT	1	BI_DA+	Bi-directional data, plus
	2	BI_DA-	Bi-directional data, minus
	3	BI_DB+	Bi-directional data, plus
	4	BI_DC+	Bi-directional data, plus
	5	BI_DC-	Bi-directional data, minus
	6	BI_DB-	Bi-directional data, minus
	7	BI_DD+	Bi-directional data, plus
	8	BI_DD-	Bi-directional data, minus

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

5. Maintenance

5.1 Mounting the product (slave unit)

(1) Set the IP address and other switches of the product.

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

(3) Hold the slave unit and mount it along the guide of the slave unit connecting block slowly from the near side in the direction of the arrow.

(4) Check that the product and the connecting block are connected properly and tighten the slave unit fixing screw firmly with appropriate torque (0.5 N·m).

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

5.2 Removing the product (slave unit)

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

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

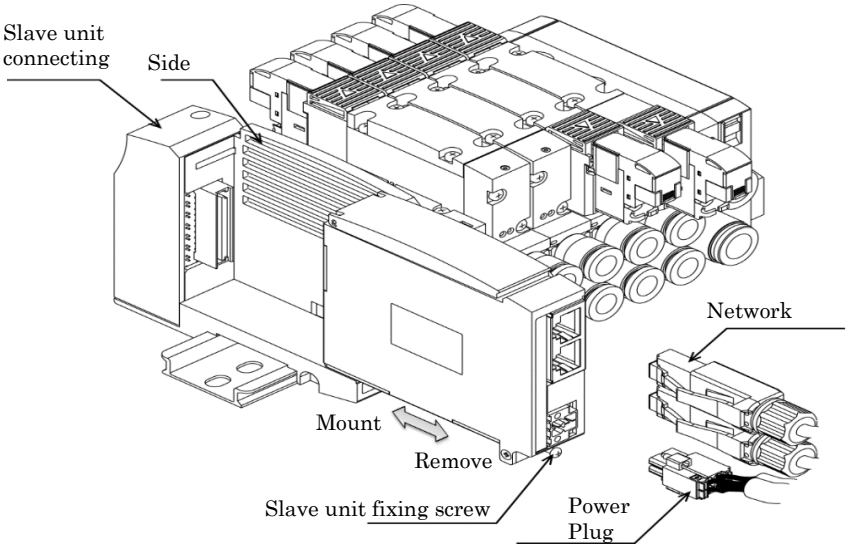
(3) Loosen the slave unit fixing screw. Since it is a fall prevention screw, stop loosening when it detaches from the slave unit connecting block.

(4) Hold and pull out the product slowly to the near side in the direction of the arrow.

(5) Remove the network plug and the power plug.

⚠ CAUTION

- Do not remove the slave unit by pulling cable or connector that may cause cable disconnection or damage.
- Fully loosen the plug fixing screw before removing the plug.
  After inserting the plug, tighten the plug fixing screw securely.
- An electric shock may occur by touching the electrical wiring connection (bare live part).



6. Settings by CSP+ system profile

In order for the CC-Link IE TSN slave unit to join the network, it is necessary to register the device to the network using the CPS+ file which describes the communication specification of the device.

Refer to the instruction manual of the master unit manufacturer for registering the CSP+ file.

Also, use the latest CSP+ file for proper network configuration.

6.1 Registering the device

Check the specifications (model name) of the device before registering, as both the device and CSP+ file need to be matched. 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.	T8TG1	T8TG2	T8TGP1	T8TGP2
Single unit model No.	OPP7-1TG	OPP7-2TG	OPP7-1TG-P	OPP7-2TG-P
Output type	+COM (NPN)		-COM（PNP）	
Number of output points	16-point output	32-point output	16-point output	32-point output
CSP+ file name	0x0104_OPP7 -1TG_1.0_en	0x0104_OPP7 -2TG_1.0_en	0x0104_OPP7 -1TG-P_1.0_en	0x0104_OPP7 -2TG-P_1.0_en

6.2 Output data mapping

There are two types of I/O data: RY (remote output) data sent from the master unit to the slave unit (in case of this product; T8TG□1 for 16-point output, T8TG□2 for 32-point output) and RX (remote input) data sent from the slave unit to the master unit.

This product is an output device that receives remote output data from the master unit and output to the valve.

(There is no remote input).

Output data mapping

I/O points		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 points	16 points	1 word	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	-	2 words	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

* With the standard wiring of the double solenoid valve, the a-side solenoid close to this product is assigned RY data 00, and the b-side solenoid is assigned RY 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 valve and slave unit 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 for the master unit.
- Transmission delay as a system varies depending on the PLC scan time and other devices connected to the same network.
- Check the solenoid valve specifications since the response delay of the valve varies depending on the model.
- The solenoid valve OFF time is delayed by approximately 20 msec due to the surge absorbing circuit integrated in the slave unit.
- 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.
- Check 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 this product, please contact the following or the nearest sales office.

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