CKD

F2-453369-A 9

2022.9.30

Handling Instructions

CC-Link Ver.1.10 compatible
Serial transmission unit block
N4E0-T7G※

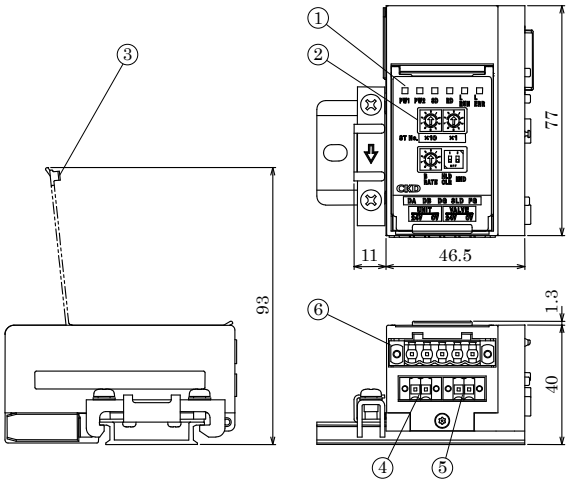
Thank you for purchasing CKD product.
Please review the precautions in this handling instructions thoroughly for safe operation of this equipment.
Dangers and malfunction can arise in the use of the product if it is used incorrectly.
Keep this instruction in a safe location so that it is easily referenced as necessary.
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.
- Be sure to turn off power source before performing wiring work on electrical connections (bare live parts). Never touch live parts with bare hand.
- Before using the serial transmission unit block, carefully read the operation manual (user's manual) of the communication system to be used to understand the operation of the system.
- This product operates only from DC supply. Observe the voltage specification.

1. Operate the serial transmission unit block according to the product specification.

Item		T7G1	T7G2
Power supply voltage (unit side)		DC21.6V～26.4V (DC24V ±10%)	
Current consumption (unit side)		65 mA max. (with all points ON)	90 mA max. (with all points ON)
Supply voltage (communication system)		DC22.8V～26.4V (DC24V +10%,－5%)	
Current consumption (communication system)		15 mA max. (with all points OFF)	
Power supply voltage (valve side)		0／16	0／32
Current consumption (valve side)		Across all external pins and casing 30MΩ or more w/500 VDC megger	
No. of inputs/outputs		Across all external pins and casing 500 VAC for 1 min.	
Insulation resistance		500 Vp-p pulse width 1μs	
Vibration resistance	Durability	10 -150-10 Hz 1 octave/min, peak amplitude 0.75 mm or 98.0 m/s², whichever smaller, 15 scans in each X, Y and Z direction	
	Malfunction	10 -150-10 Hz 1 octave/min, peak amplitude 0.5 mm or 68.6 m/s², whichever smaller, 4 scans in each X, Y and Z direction	
Mechanical shock proof		294.0 m/s², 3 times in each of 3 directions	
Ambient temperature		5～55℃	
Ambient humidity		30-85% RH (no dewing)	
Operating environment		No corrosive gas	
Compatible communication		DeviceNet	
Transmission rate		125 k/250 k/500 k bps (selectable from DIP switch)	
Type of output insulation		Photo coupler insulation	
Max. load current		40 mA/point	
Leakage current		0.1 mA max.	
Residual voltage		0.5 V max.	
Output circuit		NPN transistor open collector	
Fuse		1 A for 24 V unit supply; 2 A for 24 V valve supply; 1 A for 24 V communication power supply (non-replaceable)	
Operating indication		LED (unit power supply/valve power supply/communication status)	
No. of involved stations		1	

2. Dimensional outline drawing



① Monitor lamp：
LED that shows conditions of serial transmission unit block and network.

② Setting switch：
Used to set the address of serial transmission unit block, communication speed, and output status upon communication error.

③ Cover：
Protects monitor lamp and setting switch.

④ Unit power supply connector：
Connects power supply (24 V).

⑤ Valve power supply connector：
Connects valve power supply (24 V).

⑥ Communication connector：
Connects network communication cable.

3. Switch and LED display

3.1 Switch

Set the address of this serial transmission unit block, communication speed, and output upon occurrence of communication error.

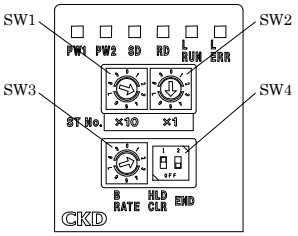
Symbol	Switch	Settings
SW1, SW2	ST No. ×10, ×1 (station No. setting)	Set the station number of the serial transmission unit block in the range of 1 to 64. Use SW1 for setting ten's place and SW2 for one's place.
SW3	B RATE (baud rate setting)	Set the transmission rate in the range 0 to 4, at which communication between the master station will take place.
SW4 No.1	HLD CLR (output mode setting)	Choose action to be taken upon occurrence of communication error: to hold output status (HLD) or clear it (CLR).
SW4 No.2	END (end station setting)	Turn this switch ON when the serial transmission unit block is located at the most distal end from the master station. ※ Turn this switch OFF when using high-performance CC-Link-specific cable, or when employing T junction wiring. (See 4.3.)

Note：Upon power up, the serial transmission unit block operates according to the default settings (station number and baud rate).

3.2 LED display

Displays the condition of the serial transmission unit block and network. Table below shows examples.

LED	State
PW1	Lit while unit power is on.
PW2	Lit while valve power is on.
SD	Lit while unit data is transmitted.
RD	Lit while unit data is received.
L RUN	Lit while valid data from master station is received.
	Turned off due to time over.
L ERR	Kept unlit during normal communication (L RUN is lit).
	Lit upon transmission error (CRC error).
	Lit if transmission rate setting or station number setting is invalid.
	"ERR" blinks when station number setting or transmission rate setting is changed.
	Turned off after specified time.



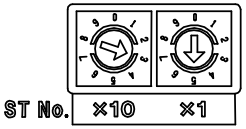
4. Switch setting

⚠CAUTION
- Be sure to turn off the unit power before attempting switch setting.
- The cover on serial transmission unit block can easily be opened/closed by a single operation. Keep the cover closed if switch setting is not required, to prevent intrusion of foreign matters which will cause malfunction of internal circuit or damage to the cover. Prevention of intrusion of foreign materials should be taken into account during switch setting operation also.
- Handle the setting switch as a precision device that may be easily damaged when subjected to excessive force. Never touch the internal circuit board during setting.

4.1 Setting station number

Set the station number of this product in the range 1 to 64.
Do not use duplicated number. (Set to 0 at the factory.)

×10 sets ten's place of the station number.
×1 sets one's place of the station number.



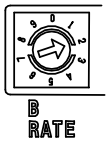
Example: Station No. is 35

4.2 Setting transmission rate

Set the baud rate at which data is transferred to/from the master station.

B RATE setting	Baud rate
0	156k bps
1	625k bps
2	2.5M bps
3	5M bps
4	10M bps

Factory setting: 156 bps.



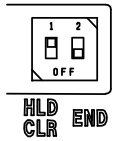
Example : B RATE 2 (2.5M bps)

⚠CAUTION
- The transmission rate must be common to all stations (master, local and remote). If a station on the network is set to different transmission rate, valid data link cannot be established.

4.3 Other settings

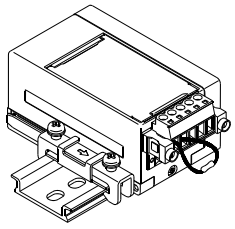
Set the type of data to be output upon occurrence of communication error.
If the product is located at the most distant end of the network in respect of the master, different setting is required.

No.	Settings	Switch state	
		ON	OFF
1	Output status upon occurrence of transmission error (discontinued, timeout)	Hold	Clear
2	Termination for end station (see description below)	As end station	As way station



Example: Hold (ON)
Way station (OFF)

※ Settings for end station
On the product, a 110Ω terminating resistance is internally provided across DA and DB.
By placing No.2 switch shown in the figure above in ON position, the product is set to function as the end station (no external resistor is required).
If the product is the end station and the communication cable requires a terminating resistance other than 110Ω (e.g. CC-Link-specific cable, FANC-SBH from Kuramo Denko); or if T junction connection is used (connecting method of the terminating resistance is different), set the end station setting switch No.2 to OFF. 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).



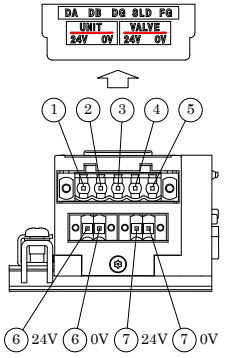
Example:
resistance connected across DA and DB

⚠CAUTION
- Do not attempt setting with power applied: settings may not be recognized. Be sure to turn off unit power before setting switch.
- Set the terminating resistance by referring to the master station user's manual. Wrong resistance or wrong connection will result in communication error.
- When connecting an external terminating resistance, be sure to turn off the end station setting.
- When connecting an external terminating resistance, insulate the lead of resistance to avoid short-circuiting or unintentional contact.

5. Wiring

The table below describes the function of terminals and their destinations.

	Terminal	Function	Application	Cable identification color
①	DA	Terminal for communication	Master or other slave communication lines "DA"	DA (Blue)
②	DB	Terminal for communication	Master or other slave communication lines "DB"	DB (White)
③	DG	Terminal for communication	Master or other slave communication lines "DG"	DG (Yellow)
④	SLD ※	Terminal for shielding	Master or other slave communication lines "SLD"	SLD (Bare)
⑤	FG ※	Terminal for GND	Perform at least class 3 earthing.	FG
⑥	Power source connector	Connect to unit power source	DC24V ±10%	0V
				24V
⑦	Power source connector	Connect to valve power source	DC24V +10%,−5%	0V
				24V



※ SLD and FG terminals are internally connected on serial transmission unit block.

⚠CAUTION
- Be sure to turn off power source before performing wiring work on electrical connections (bare live parts).
  Never touch live parts with bare hand.
- Provide means to protect power lines and communication lines so that they will not be exposed to excessive tension, vibration or shock. Longer line may exert force or shock generated by its own mass, on components and devices causing damage. If this is the case, mechanically support or secure the lines.

5.1 Transmission distance

With CC-Link, maximum transmission distance is limited by transmission rate:

5.1.1 Multidrop connection (Ver.1.10)

B RATE setting	Transmission rate	Cable distance between stations	Max. total cable length
0	156k bps	0.2 m or more	1200m
1	625k bps		900m
2	2.5M bps		400m
3	5M bps		160m
4	10M bps		100m

5.1.2 T junction connection

B RATE setting	Transmission rate	Max. trunk length	Max. branch length	Total branch length	Cable length between remote I/O stations, or remote device stations	Cable length between master and local stations, intelligent device station and upstream/downstream station
0	156k bps	500m	8m	200m	0.3 m or more	1 m or more ※1 2 m or more ※2
1	625k bps	100m		50m		

※1. For a system consisting of only remote I/O station or remote device station

※2. For a system including local station or intelligent device station

⚠CAUTION

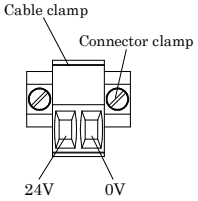
- The transmission distances described in 5.1 are feasible when the system is composed of units and cables of Ver.1.10. If a Ver.1.00 unit or Ver.1.00 cable is used in a "Ver.1.10" system, entire system wring/cable length must meet Ver.1.00 specification. For further information, refer to CC-Link user's manual available from Mitsubishi Electric Corporation.
- If your system is Ver.1.00, transmission/cable lengths shown in 5.1 are not applicable. Refer to CC-Link user's manual available from Mitsubishi Electric Corporation.
- In Ver.1.10 system, cables of different makes can be used. In Ver.1.00 system, all cables must be of the same type and brand.
- T junction connection imposes various limits on components such as cables and available number of units.
  Refer to CC-Link user's manual available from Mitsubishi Electric Corporation.

5.2 Power wire

When connecting power cable to the product, follow the procedure described below:

① Before turning off power to the unit and valve to be connected, check all safety matters.
② Insert conductors of power cable to the corresponding hole on the connector.
See figure below to identify polarities.
③ Secure each conductor by turning the corresponding clamping screw on the connector.
(Recommended screw torque: 0.25N・m)
④ When unit power supply and valve power supply are independently used, insert connector to the correct location of the product and secure it with connector clamping screws.
(Recommended screw torque: 0.25N・m)

< Recommended connector >
Supplied: BL3.5/2F (Part No.: 160664)
Manufactured by WEIDMULLER



⚠CAUTION

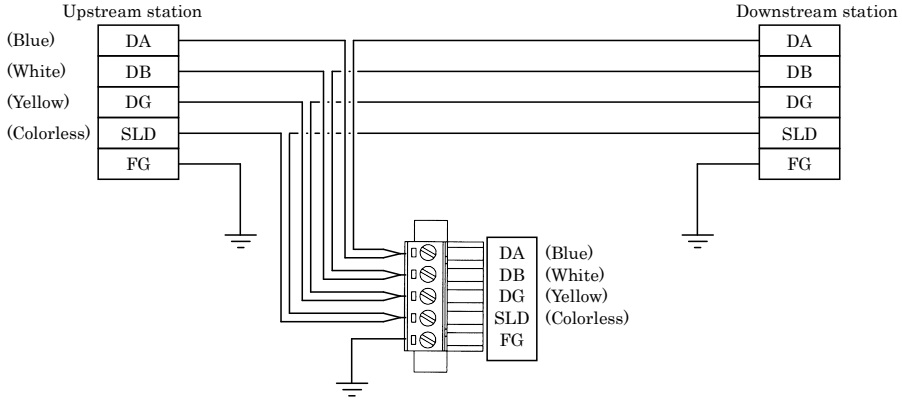
- Choose a cable that has enough capacity to carry amount of current to meet the calculated current consumption.
- When supplying power to I/O of two or more remote serial transmission unit blocks from a single power source, determine voltage drop on the cables before choosing cables.
- When the voltage will drop below the specified level, add cable(s) or power source.
- Before making connection, check polarity and rated voltage.

5.3 Communication line

When connecting CC-Link specific cable to the product, follow the procedure described below:

① Turn off power to the product.
② Insert conductors DA (blue), DB (white), DG (yellow), SLD (bare) of CC-Link cable into mated slots (DA, DB, DG and SLD) of supplied connector (BLZ5.08/5FAU). See the figure below.
③ Secure each conductor with the cable clamping screw on the connector.
Recommended torque 0.5N・m.
④ Verify that cable designation matches that on the product.
Fit the connector to the product and secure it with connector clamping screws.
Recommended torque 0.3N・m.

< Recommended connector >
Supplied: BLZ5.08/5FAU (connector w/clamping screws) Manufactured by WEIDMULLER



※ The figure above shows multidrop wiring diagram.
For T-junction connection diagram, refer to the master station user's manual.

⚠CAUTION

- Use the dedicated communication line compatible with CC-Link specification.
- Be sure to use signal cable that conforms to DeviceNet specification.
- Isolate communication line from power line and high-tension line.
- Before inserting cable conductor into connector, fully loosen the cable clamping screw so that the conductor can reach the back of the connector.
- When connector clamping screw is provided, tighten it after engaging the connector. Possible consequences: loosen connector may be disconnected causing malfunction.
  For connector without connector clamping screw, be sure to engage the connector claws.
- The bending radius of communication cable must be large to prevent the cable from excessive bending load.
- Before making any electrical connection, check polarity and rated voltage.
- To prevent noise related problem, use the following wiring procedure.
  ① When noises induce problem, prepare a power supply for each manifold solenoid valve, if possible, and prepare wiring separately.
  ② Use the shortest power supply lines as far as possible.
  ③ Isolate the wringing power supply lines for noise generating devices such as inverter and motor.
  ④ Do not run supply lines and communication lines in parallel with power lines.

6. Maintenance

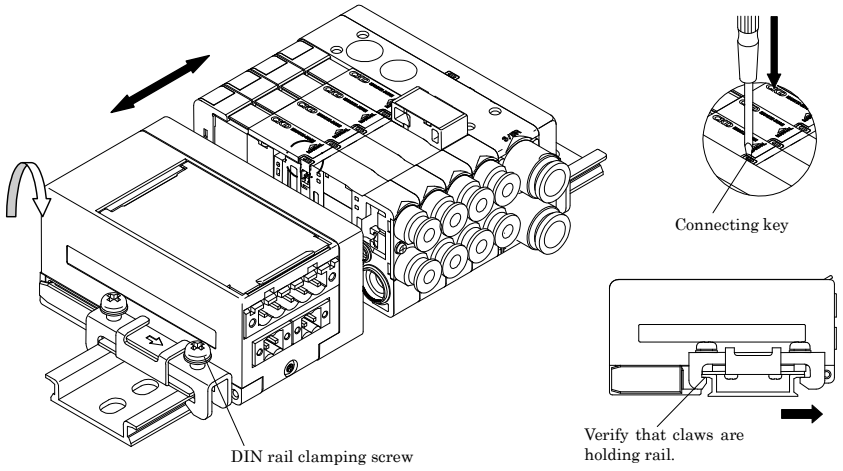
6.1 Removing serial transmission unit block

① Verify that loss of power will not cause danger and then turn off power to the unit and valve.
② Shut down the pressure supply and bleed residual pressure.
③ Loosen DIN rail fixing screws. Using a needle-nosed tool, press and hold the connecting key spanning the serial transmission unit block and adjacent blocks.
④ While pressing and holding the connecting key, slide the serial transmission unit block along the DIN rail in the direction so that block link port and connector are isolated.
⑤ Turn up the block toward the piping port and remove the serial transmission unit block.
Verify that the power is turned off and then disconnect the power supply connector and communication connector.

6.2 Installing the product

① Set the address, communication speed and the status of output upon occurrence of communication error of the serial transmission unit block.
② Verify that power is turned off. Install the power supply connector and communication connector to the serial transmission unit block. and secure them.
③ Slide the serial transmission unit block along the DIN rail in the direction so that adjacent blocks are linked without leaving gap between them. Verify that the wiring connector is pinch-free.
Verify that the connecting key returns back to the groove on the block upper surface.
④ Slide the retainer toward piping port until the claws catch the DIN rail and tighten the clamping screws. (Recommended screw torque: 1.4 N·m.)
⑤ Verify that application of power and pressure will not cause danger and then turn on power and pressure source.

⚠CAUTION
- Before turning on unit power source, check the address of the serial transmission unit block, communication speed and output settings upon occurrence of communication error.
- Never touch electrical wiring connections (exposed live parts). Electrical shock may occur.



7. CAUTION

- The comply with EC Directives, the power supply used as a unit power supply and valve power supply must be AC/DC power supply adapter (for example , switching power supply) that suits EMC standard.
- For lag time, refer to the master station user's manual. System transmission lag depends on PLC scanning time and devices connected to the network.
- Response time lag of solenoid valve varies from one to another and should be checked by referring to the particular solenoid specification.
- Solenoid valve lags behind in OFF operation, approx. 20 ms, due to the fact that the surge absorption circuit is installed on the serial transmission unit block.
- Install and connect power lines and signal lines to the applicable specification.
- Provide means to protect power lines and communication lines so that they will not be exposed to excessive tension, vibration or shock.
- Before turning on power, make sure that connection cables and connectors are installed and positively engaged.
- Do not attempt to disassemble, modify or repair the product. Unauthorized alteration will cause trouble or malfunction.
- Handle the unit as a precision device which may be easily damaged when subjected to excessive shock or vibration, e.g. due to falling.
- Do not engage/disengage connector with power applied. Possible consequences: trouble or malfunction.
- Should any questions arise regarding the product, contact below or your local business office.

CKD Corporation

Head Office & Factory

2-250 Ouji Komaki, Aichi 485-8551, Japan

Phone +81-(0)568-77-1111 FAX +81-(0)568-77-1123

Overseas Sales Administration Department

2-250 Ouji Komaki, Aichi 485-8551, Japan

Phone +81-(0)568-74-1338 FAX +81-(0)568-77-3461

For dealer information refer to our catalog or visit our website.

http://www.ckd.co.jp/