CKD

G108-3811-A 2023.09.08

Handing Precautions

CC-Link Ver1.10 Compatible Serial Transmission Device TVG series JA2* (OPP8-A2G / OPP8-A2G-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.

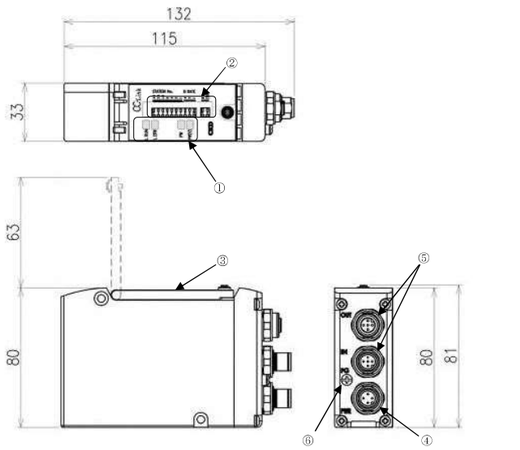
⚠ CAUTION

- 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.

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

Item	Specifications	
Model No	OPP8-A2G	OPP8-A2G-P
Unit power voltage	21.6 VDC to 26.4 VDC (24VDC±10%)	
Unit power current consumption	50 mA or less (24.0 VDC)	
Valve power voltage	22.8 VDC to 26.4 VDC (24 VDC+10%, -5%)	
Valve power current consumption	10 mA or less (with all points OFF) / 15 mA or less (with all points ON at no load)	
Output type	+COM(NPN)	-COM(PNP)
Number of output points	32 points	
Output setting when communication error occurs	Hold (all output points are hold) / Clear(all output points are OFF)	
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℃ to 70℃	
Storage humidity	30% to 85% RH (no dew condensation)	
Ambient temperature	-5℃ to 55℃	
Ambient humidity	30% to 85% RH (no dew condensation)	
Atmosphere	No corrosive gas	
Communication protocol	CC-Link Ver1.10 Compatible	
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: 24V, 3A/ Unit power: 24V, 2A (both fuses are non-replaceable)	
Operation indicator	LED (communication status, Unit power and valve power)	

2.Dimensional outline drawing



No.	Part name	Description
①	LED Indicators	Indicates the status of the remote station unit and network with L RUN, L ERR, PW, and PW(V).
②	Switches	Set the remote station unit station number, transfer rate, communication error output, and terminating resistor using DIP switches.
③	Cover	Protects the LED Indicators and the switches.
④	Unit/valve power plug (M12I 1 port [PWR] 4-pin,A-cord)	Connects the unit/valve power socket (24 V).
⑤	Network connector (M12I 2 ports [IN, OUT] 5-pin, A-cord)	Receives CC-Link communication from the previous remote station or transmits to the next remote station. [Note] There is no functional difference between the IN and OUT ports.
⑥	FG terminal	Connects FG (frame grounding) to the terminal.

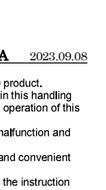
3. LED indicators and Switch settings

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
Station address and transfer rate setting is read into memory at power-up.
Duplicate station numbers cannot be set.

Station number	Switch number						
	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
to	to						
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【2.5Mbps】	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
H C (Output mode setting)	Set the output status in the event of communication error. (Such as communication line disconnection or timeout) OFF : Clear mode ON : Hold mode
END (End station setting)	Set the end station. OFF : When an intermediate station or internal terminating resistor is not used ON : 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.

3.3 LED indicators

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

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.)

⚠ CAUTION

- Set switches while the unit power is turned off.
- 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.
- The setting switch is very precise and may be damaged in case of rough handling. The internal circuit board can be easily damaged.

4. Wiring

Function description and connection of the terminal are as following.

⚠ CAUTION

- Check the working voltage and polarity before wiring and energizing.
- If power is supplied to more than one device (remote station) from one power supply, consider the voltage drop due to cables when selecting and wiring the cables.
- Since the device has no resistance to lightning surges, take measures against surges on the equipment side. For AC power model, use it in an installation category II environment.

4.1 Transmission rate and cable length

With CC-Link, cable length is limited by transmission rate, refer to the instruction manuals issued by the master unit manufacturer or CLPA (CC-Link Partner Association).

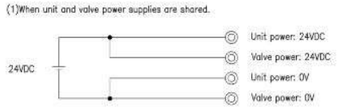
Multidrop connection (CC-Link Ver.1.10)

B RATE 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

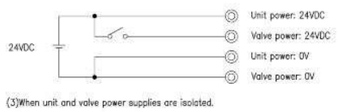
4.2 Connecting and wiring to the unit/valve power plug

In the product, the unit power supply and the valve power supply are separated.
Each power supply is connected by an M12 connector (socket). The following figures (1) to (3) are examples of the wiring for each power supply.
Note: Power connector is not supplied with the product. Separately purchase a power connector that satisfies the specifications.

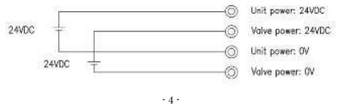
(1)When unit and valve power supplies are shared.



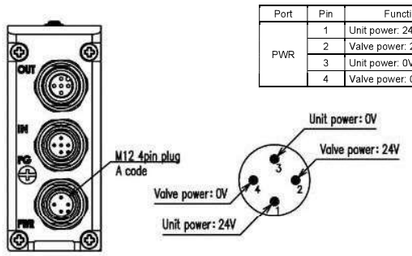
(2)When only the valve power is turned ON/OFF.



(3)When unit and valve power supplies are isolated.



Follow the steps below to connect the power cables to the power plug.
(1) After confirming safety, stop network communication and power off all peripheral equipment.
(2) Refer to the figure below and wire to the M12 connector.



Port	Pin	Function
PWR	1	Unit power: 24V
	2	Valve power: 24V
	3	Unit power: 0V
	4	Valve power: 0V

Recommended M12 connector (socket): loose wire type power cable
XS2F-D421-□8□-□ Straight type Mfd by Omron Corporation
Note: □ differs depending on the cable specifications.

Recommended assembly type M12 connector and power cable
21 03 212 2305 M12 Assembly type connector Mfd by HARTING
Cable size : AWG22 to 18, outside diameter of compatible cable : 6 to 8 dia.

⚠ CAUTION

- Check the polarity of the device and the cable terminal before connecting.
- Select the power cable by calculating the current consumption.

4.3 Connecting and wiring to the network connector socket (M12 connector)

Network plug is not supplied with the product. Separately purchase a network plug that satisfies the specifications.
Wiring the network cable to the network plug enables the plug to connect to the network connector socket on the device.

Recommended CC-Link Ver.1.10
FANC-110SBH series Mfd by Kuramo Electric

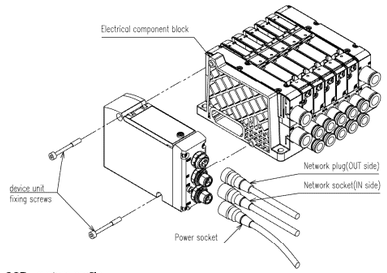
Recommended M12 assembly type connector: A code 5Pin
21 03 272 1501 M12 assembly type connector (male) Mfd by HARTING
21 03 272 2501 M12 assembly type connector (female) Mfd by HARTING

5.2 Removing the product (device)

(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.
(3) Remove the device fixing screws and pull out the device slowly from the electrical component block.

⚠ CAUTION

- Do not remove the device by pulling cable or connector that may cause disconnection or damage.
- 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 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.

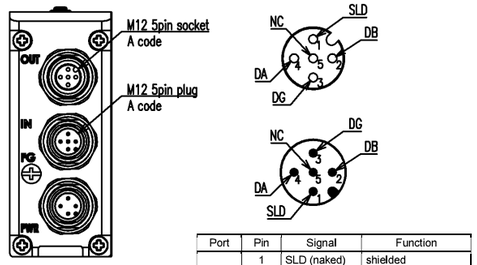
6.1 Registering the device

As both the device and CSP+ profile need to be matched, check the specifications (model name) of the device to be used.
Refer to the following table for the device specifications and CSP+ profile and set accordingly.

Specifications and the model's name in the CSP+ profile

Item	Specifications	
Model No.	OPP8-A2G	OPP8-A2G-P
Product Name	OPP8-2G	OPP8-2G-P
Output type	+COM(NPN)	-COM(PNP)
Number of output points	32 points	
CSP+ profile name	0x0104_ OPP8-2G_2.10_en	0x0104_ OPP8-2G-P_2.10_en

Follow the steps below to connect the network cable to the network connector.
(1) After confirming safety, stop network communication and turn off all peripheral equipment.
(2) Refer to the figure below and connect the CC-LINK compliant cable to M12 connector.



Port	Pin	Signal	Function
IN/ OUT	1	SLD (naked)	shielded
	2	DB (white)	Differential signal B
	3	DG (yellow)	Ground signal
	4	DA (blue)	Differential signal A
	5	NC	Not used

⚠ 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.
- Separate the network cable from power lines and high-voltage lines.

5. Maintenance

5.1 Mounting the product (device)

(1) Conduct the switch settings of the product.
(2) Assemble the product to the Electrical component block and screw it with the device fixing screws.
(3) Turn off the power (for unit/valve) and connect the network connector 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.
(4) After confirming safety, turn on each power supply.

6.2 I/O mapping

There are two types of I/O data: RY (remote output) data sent from the master unit to the remote station (this product) and RX (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 RY mapping
(There is no remote input for the product).

RY mapping

Number of I/O points		Bit														
	RY	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-point output	4 bytes	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

Note: With the standard wiring of the double solenoid valve, the a-side solenoid close to the 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 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 this product, please contact the following or the nearest sales office.

CKD Corporation

Head Office and Plant
250, Ouji 2-chome, Komaki, Aichi, 485-8551, Japan
Phone: +81-(0)568-77-1111 /Fax: +81-(0)568-75-1123
Overseas Sales Administration Department
250, Ouji 2-chome, Komaki, Aichi, 485-8551, Japan
Phone: +81-(0)568-74-1338 /Fax: +81-(0)568-77-3461
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