

H-DO-G

Instruction Manual

IMS01K01-E2

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

This manual should be used in conjunction with **Hardware Quick Manual (IMS01V01-E□)**.

SYMBOLS

WARNING : This mark indicates precautions that must be taken if there is danger of electric shock, fire, etc., which could result in loss of life or injury.

CAUTION : This mark indicates that if these precautions and operating procedures are not taken, damage to the instrument may result.



: This mark indicates that all precautions should be taken for safe usage.



: This mark indicates important information on installation, handling and operating procedures.



: This mark indicates supplemental information on installation, handling and operating procedures.



: This mark indicates where additional information may be located.



WARNING

- To prevent injury to persons, damage to instrument and equipment, a suitable external protection device shall be required.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
 - If input/output or signal lines within the building are longer than 30 meters.
 - If input/output or signal lines leave the building, regardless the length.

- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action. The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage as a result of failure, protect the power line and the input/output lines from high currents with a suitable overcurrent protection device with adequate breaking capacity such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- When high alarm with hold action/re-hold action is used for Event function, alarm does not turn on while hold action is in operation. Take measures to prevent overheating which may occur if the control device fails.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

1. PRODUCT CHECK

H-DO-G module is the digital output module with output ratio function. H-DO-G module can be used by combining with H-PCP-J module (Power/CPU module).

The model code for the instrument you received is listed below.

H-DO-G-D
(1)(2)

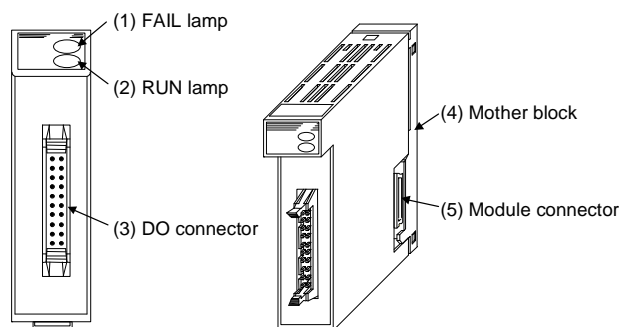
(1) Type

G: Output ratio type

(2) Output type

D: Open collector output, 16 points

2. PARTS DESCRIPTION



(1) FAIL lamp [Red]

OFF: During normal operation
ON: During abnormal operation

(2) RUN lamp [Green]

Flashing: During normal operation
ON: During abnormal operation

(3) DO connector

Connector for digital output

(4) Mother block

Module DIN rail mounting connector

(5) Module connector

Connector for power supply and bus connection

3. SPECIFICATIONS

■ Output

Output type: Open collector output
Number of outputs: 16 points
Number of common points:
Vcc: 2 points (8 points/common)
GND: 2 points (8 points/common)
Isolation method: Photocoupler isolation
Open collector output: Load voltage: 12 to 24 V DC
Maximum load current:
0.05 A/point, 0.4 A/common
Function: Output ratio, Output limiter

■ Self-diagnostic

Check item: RAM check, Watchdog timer
Operation at error occurrence in self-diagnosis:
FAIL lamp lights, Reset state

■ General specifications

Ambient temperature: 0 to 50 °C
for storage: -20 to +50 °C
Ambient humidity: 45 to 85 % RH (Non condensing)
for storage: 95 % RH or less
(Non condensing)
Usage atmosphere: There must be no corrosive gas and dust must not be excessive
Dimensions: 24 (W) × 96 (H) × 100 (D) mm
Weight: Approx. 140 g

4. MOUNTING



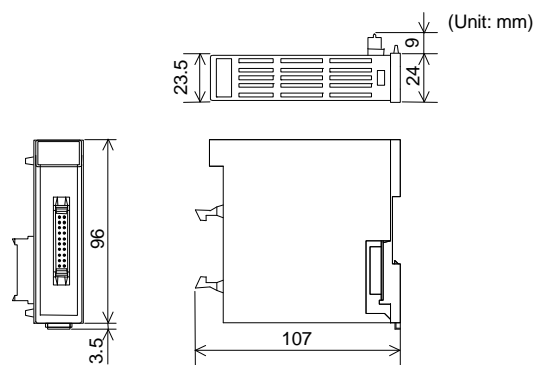
WARNING

To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

4.1 Mounting Cautions

- (1) This instrument is intended to be used under the following environmental conditions. **(IEC61010-1)**
[OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]
- (2) Use this instrument within the following environment conditions:
 - Allowable ambient temperature: 0 to 50 °C
 - Allowable ambient humidity: 45 to 85 % RH
(Absolute humidity: MAX. W. C 29 g/m³ dry air at 101.3 kPa)
 - Installation environment conditions: Indoor use,
Altitude up to 2000 m
- (3) Avoid the following when selecting the mounting location:
 - Rapid changes in ambient temperature which may cause condensation.
 - Corrosive or inflammable gases.
 - Direct vibration or shock to the mainframe.
 - Water, oil, chemicals, vapor or steam splashes.
 - Excessive dust, salt or iron particles.
 - Excessive induction noise, static electricity, magnetic fields or noise.
 - Direct air flow from an air conditioner.
 - Exposure to direct sunlight.
 - Excessive heat accumulation.
- (4) Mount this instrument in the panel considering the following conditions:
 - Provide adequate ventilation space so that heat does not build up.
 - Do not mount this instrument directly above equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
 - If the ambient temperature rises above 50 °C, cool this instrument with a forced air fan, cooler, etc. Cooled air should not blow directly on this instrument.
 - In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
High voltage equipment: Do not mount within the same panel.
Power lines: Separate at least 200 mm.
Rotating machinery: Separate as far as possible.
 - Ensure at least 50 mm space on top and bottom of the control unit for maintenance and environmental reasons.
- (5) In case this instrument is connected to a supply by means of a permanent connection a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.

4.2 Dimensions



Module mounting depth:

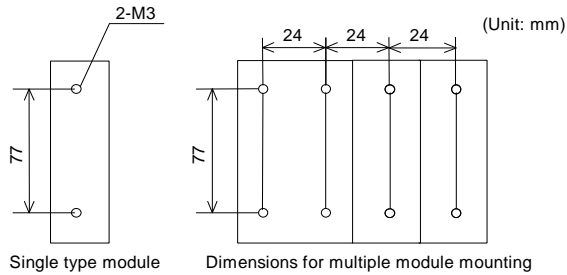
The mounting depth of each module is 115 mm from the mounting surface inside the panel to the front of the module with the module mounted on the DIN rail.

4.3 Mounting the Mother Block

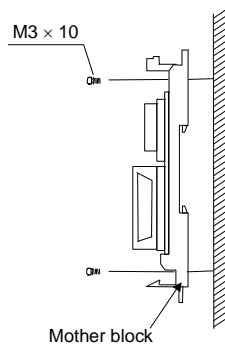
The mother block can be mounted to a panel or DIN rail.

■ Panel mounting directions

1. Refer to both the panel mounting dimensions below and the external dimensions in previous section when selecting the location.



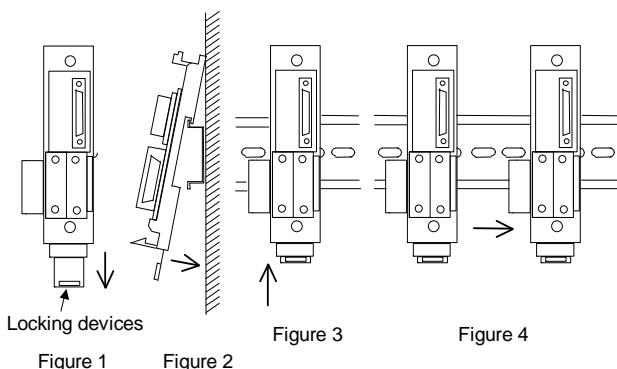
2. Remove the module from the mother block. For details of removing the module, see **4.5 Removing the Module Mainframe**.
3. Connect the mother blocks together before tightening the screws on the panel. (Customer must provide the set screws.)



**Recommended
tightening torque:
0.3 N·m (3 kgf·cm)**

■ DIN rail mounting directions

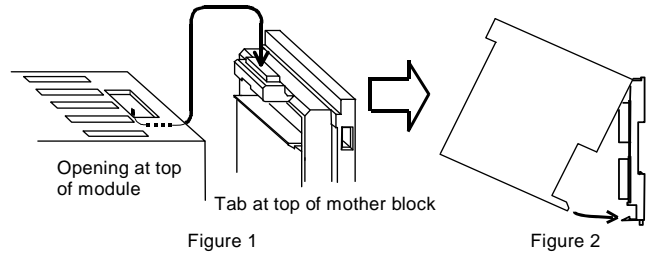
1. Remove the module mainframe from the mother block. For details of removing the module mainframe, see **4.5 Removing the Module Mainframe**.
2. Pull down both locking devices at the bottom of the mother block. (Figure 1)
3. Attach the top bracket of the mother block to the DIN rail and push the lower section into place on the DIN rail. (Figure 2)
4. Slide the locking devices up to secure the mother block to the DIN rail. (Figure 3)
5. Slide connectors together to complete mother block installation. (Figure 4)



When the mother block is mounted on panel, 50 mm or more space is required at the top and bottom of the mother block to attach the module mainframe.

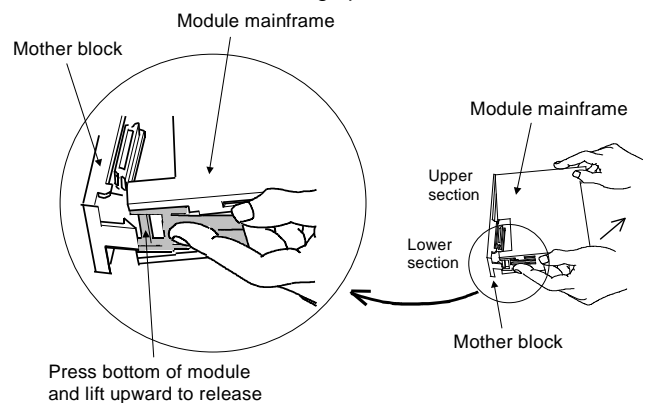
4.4 Mounting the Module Mainframe

1. Place the module mainframe opening on top of the mother block tab. (Figure 1)
2. Snap the lower part of module mainframe on to the mother block. (Figure 2)
A snapping sound will be heard when module mainframe is securely connected to mother block.



4.5 Removing the Module Mainframe

To separate the module mainframe from the mother block, press the bottom on the module, lifting upward, to release connection.



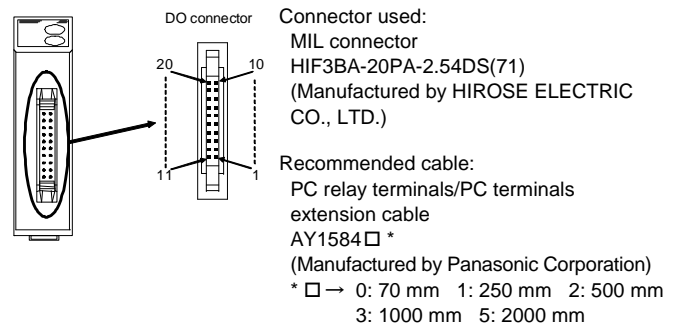
5. CONNECTION



WARNING

To prevent electric shock or instrument failure, turn off the power before connecting or disconnecting the instrument and peripheral equipment.

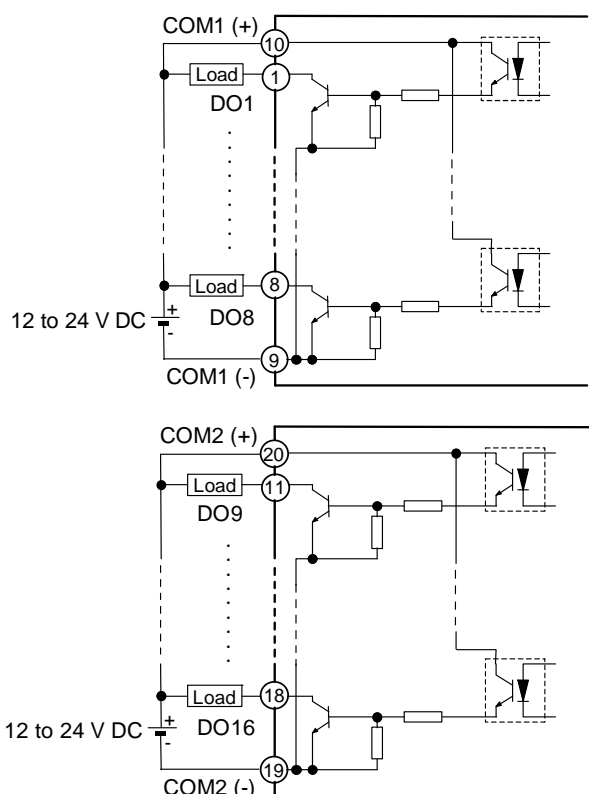
■ DO connector connection



Connector pin number and signal details

Pin No.	Description	Pin No.	Description
1	DO1	11	DO9
2	DO2	12	DO10
3	DO3	13	DO11
4	DO4	14	DO12
5	DO5	15	DO13
6	DO6	16	DO14
7	DO7	17	DO15
8	DO8	18	DO16
9	GND (COM1) -	19	GND (COM2) -
10	VCC (COM1) +	20	VCC (COM2) +

Open collector output wiring example:



In using the open collector output, an external power supply of 24 V DC is required. Note that if this power supply is not connected, there will be no output from the module.



DO1 to DO16 can be assigned as slave channel of H-TIO module (master channel).



For the channel assignment, see the **H-PCP-J Instruction Manual (IMS01J02-E□)**.



When replacing the module with a new one, always use the module with the same model code. In addition, when replacing the module with a new one of the different module type, please contact RKC sales office or the agent as it becomes necessary to initialize the module, etc.

Problem	Probable cause	Solution
RUN lamp does not flash	Power line defect	Replace mother block
	Power supply section defect	Replace H-PCP-J module
	CPU section breakdown	Replace module
RUN lamp stays lit	Module different from system specifications inserted	Replace with module matching specifications
FAIL lamp lit up	CPU section breakdown	Replace module
Specific output not operating (RUN lamp flashing)	External operating device defect	Inspect external operating device
	Output section mis-wiring, cut line	Inspect wiring, replace as necessary
	Terminal screw loose	Tighten more
	Output circuit, CPU breakdown	Replace module
	Bus line defect	Replace mother block
No outputs operate	Load power not supplied	Supply power
	Load power supply voltage outside rating	Change to voltage within rating
	Main CPU section breakdown	Replace H-PCP-J module
	Bus line defect	Replace mother block
Error from certain module on	Head mother block defect in error module	Replace mother block
	Module connections disconnected	Check connections

6. TROUBLESHOOTING

This section lists some basic causes and solutions to be taken when any problem would arise in this instrument. If you can not solve a problem, please contact RKC sales office or the agent, on confirming the type name and specifications of the product.



WARNING

- To prevent electric shock or instrument failure, always turn off the system power before replacing the instrument.
- To prevent electrical shock or instrument failure, always turn off the power before mounting or removing the instrument.
- To prevent electrical shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.
- To prevent electrical shock or instrument failure, do not touch the inside of the instrument.
- All wiring must be performed by authorized personnel with electrical experience in this type of work.

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