Remote I/O R7G4H Series

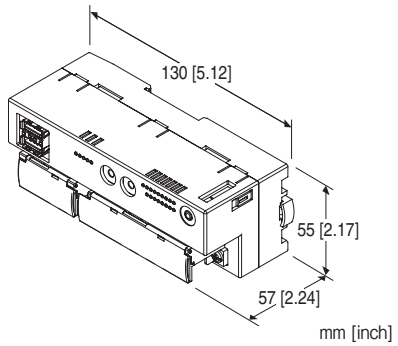
MECHATROLINK I/O MODULE

(high-speed DC voltage output, 4 points, isolated, screw terminal block, MECHATROLINK- I/- II use)

Functions & Features

• 4 points high-speed DC voltage output for MECHATROLINK - I/- II

• Easy parameter setting of individual channels with the configurator software



MECHATROLINK

MODEL: R7G4HML-6-YVF4-R[1]

ORDERING INFORMATION

• Code number: R7G4HML-6-YVF4-R[1]

Specify a code from below for [1].

(e.g. R7G4HML-6-YVF4-R/Q)

• Specify the specification for option code /Q

(e.g. /C01/SET)

TERMINAL BLOCK

6: Screw terminal block for power supply
Connector for MECHATROLINK-I/-II
Screw terminal block for I/O

I/O TYPE

YVF4: DC voltage output, high-speed, 4 points

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

[1] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-7775-A)

RELATED PRODUCTS

• PC Configurator cable (model: MCN-CON or COP-US)

• PC configurator software (model: R7CFG)

Downloadable at our web site.

GENERAL SPECIFICATIONS

Connection

MECHATROLINK: MECHATROLINK-I/-II connector

Power input, output: M3 separable screw terminal (torque 0.5 N·m)

Solderless terminal: Refer to the drawing at the end of the section.

Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,ltd

Applicable wire size: 0.25 to 1.65 mm^2 (AWG 22 to 16)

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (gray)

Isolation: Output 0 to output 1 to output 2 to output 3 to MECHATROLINK or FE to power

Zero adjustments: Configurable via R7CFG

Span adjustments: Configurable via R7CFG

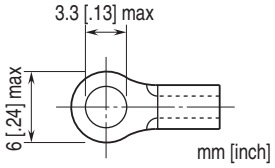
Output range: Selectable with the DIP SW on the top of the unit or configurable via R7CFG

Output at the loss of communication: With the side DIP SW

Output reset value: Configurable via R7CFG

Status indicator LEDs: PWR, RUN, ERR, SD, RD (Refer to the instruction manual)

■Recommended solderless terminal



MECHATROLINK COMMUNICATION

MECHATROLINK mode: Set with DIP switches

(MECHATROLINK-I or -II, data length; Factory setting:

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MECHATROLINK-II; data length (17 bytes)
(Refer to the instruction manual)
Station address: 60H - 7FH
(Function selected with Rotary SW. Factory setting: 61H).
(Refer to the instruction manual)

■ **MECHATROLINK-I**
Baud rate: 4 Mbps
Transmission distance: 50 m max.
Distance between stations: 30 cm min.
Transmission media: MECHATROLINK cable (Model JEPMC-W6003-x-E, Yaskawa Controls Co., Ltd.)
Max. number of slaves: 15
(The maximum number of slaves might change depending on the master unit. Refer to the manual of the master unit)
Transmission cycle: 2 msec. (fixed)
Data length: 17 bytes

■ **MECHATROLINK-II**
Baud rate: 10 Mbps
Transmission distance: 50 m max.
Distance between stations: 50 cm min.
Transmission media: MECHATROLINK cable (Model JEPMC-W6003-x-E, Yaskawa Controls Co., Ltd.)
Max. number of slaves: 30
(The maximum number of slaves might change depending on the master unit. Refer to the manual of the master unit)
Transmission cycle: 0.5 msec., 1 msec., 1.5 msec., 2 msec., 4 msec., 8 msec.
Data length: 17 bytes / 32 bytes selectable (Must choose identical data size for all stations on one network)

OUTPUT SPECIFICATIONS

■ **Narrow Span voltage**
Output range: -1 – +1 V DC, 0 – 1 V DC, -0.5 – +0.5 V DC
Load resistance: 100 kΩ min.
■ **Wide Span voltage**
Output range: -10 – +10 V DC, -5 – +5 V DC, 0 – 10 V DC, 0 – 5 V DC, 1 – 5 V DC
Load resistance: 100 kΩ min.
■ **Operational range**
Except -10 to +10 V DC: -15 to +115 % of output range
-10 to +10 V DC: Approx. -11.5 to +11.5 V DC

INSTALLATION

Current consumption
•**DC**: Approx. 100 mA
Operating temperature: 0 to 55°C (32 to 131°F)
Storage temperature: -20 to +65°C (-4 to +149°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: Surface or DIN rail (35 mm rail)
Weight: 220 g (0.49 lb)

PERFORMANCE

Conversion accuracy: ±0.1 %
Conversion rate: 250 µsec. / 4 CH
Data range: 0 – 10000 of the output range
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Output delay time: ≤ 250 µsec. (0 - 90 %)
Insulation resistance: ≥ 100 MΩ with 500 V DC
Isolation: 1500 V AC @ 1 minute
(output 0 to output 1 to output 2 to output 3 MECHATROLINK or FE to power)

STANDARDS & APPROVALS

EU conformity:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
RoHS Directive

PC CONFIGURATOR

The following parameters can be set with using PC Configurator Software (model: R7CFG)
Refer to the users manual for the R7CFG for detailed operation of the software program.

■ **SETTINGS FOR INDIVIDUAL CHANNELS**

PARAMETER	SETTING RANGE	DEFAULT SETTING
Validating/ Invalidating	Valid Invalid	Valid
Output range	-10 – +10 V DC -5 – +5 V DC -1 – +1 V DC 0 – 10 V DC 0 – 5 V DC 1 – 5 V DC 0 – 1 V DC -0.5 – +0.5 V DC	-10 – +10 V DC
Bias	-320.00 – +320.00 (%)	0.00 (%)
Gain	-3.2000 – +3.2000	1.0000
Zero scale	-32 000 – +32 000	0
Full scale	-32 000 – +32 000	10 000
Output reset value*1	-15.00 – +115.00 (%)	-15.00 (%)

■ **SETTINGS FOR ALL CHANNELS**

PARAMETER	SETTING RANGE	DEFAULT SETTING
Setting output at the loss of communication*2	Hold Clear	Hold

*1. When output range is -10 – +10 V DC, approx.-11.5 V DC at approx.-7.5 – -15% and approx.+11.5 V DC at approx.107.5 – 115% are outputted respectively.
*2. Use the DIP switch to change the setting.

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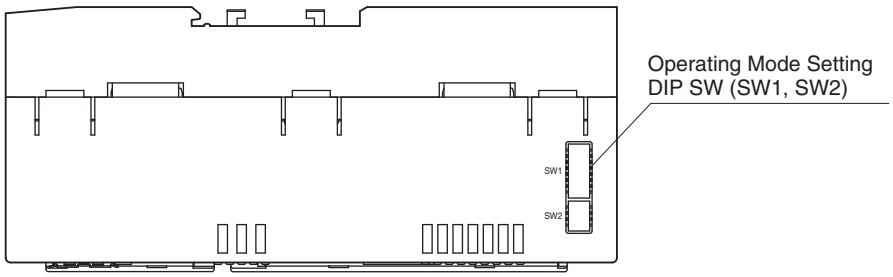
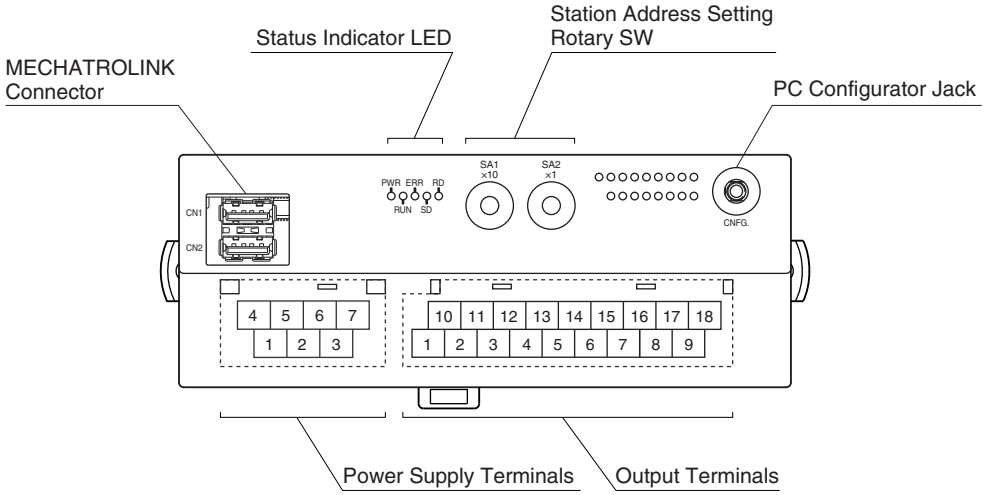
EXTERNAL VIEW

■ **TOP VIEW**



■ **FRONT VIEW**



TERMINAL ASSIGNMENTS

■OUTPUT TERMINAL ASSIGNMENT

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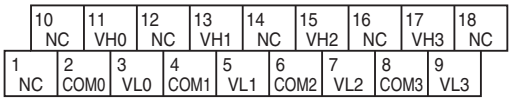
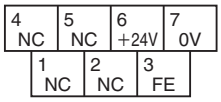


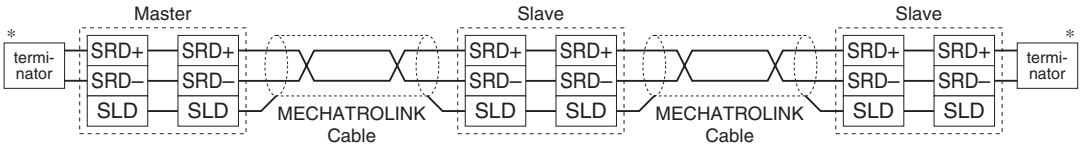
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	NC	No connection	10	NC	No connection
2	COM0	Common 0	11	VH0	Wide span vlolt. 0
3	VL0	Narrow span volt. 0	12	NC	No connection
4	COM1	Common 1	13	VH1	Wide span vlolt. 1
5	VL1	Narrow span volt. 1	14	NC	No connection
6	COM2	Common 2	15	VH2	Wide span vlolt. 2
7	VL2	Narrow span volt. 2	16	NC	No connection
8	COM3	Common 3	17	VH3	Wide span vlolt. 3
9	VL3	Narrow span volt. 3	18	NC	No connection

■ POWER SUPPLY TERMINAL ASSIGNMENT



1. NC –
2. NC –
3. FE Functional earth
4. NC –
5. NC –
6. +24V Power supply (24V DC)
7. 0V Power supply (0V)

■ MECHATROLINK CONNECTION



*Terminator
Be sure to connect the terminating resistors to the unit at both ends of transmission line.
Use the terminating resistor dedicated for MECHATROLINK: Model JEPMC-W6022, Yaskawa Controls Co., Ltd.
Certain types of Master units may have incorporated terminating resistors. Consult the instruction manual of the Master unit.

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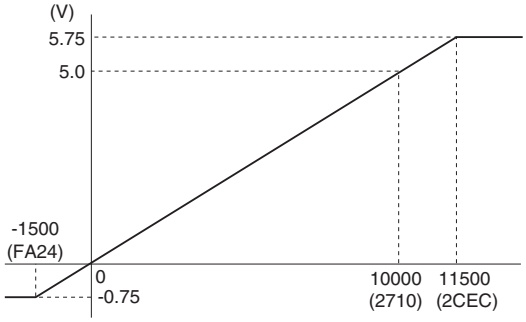
DATA CONVERSION

■ OUTPUT RANGE AND DATA CONVERSION (FACTORY DEFAULT SETTING)

Discrete output data is converted into analog representations of 0 – 100% proportional to each scaled range.
Overrange output is possible from -15 to +115% of the nominal range.
When the signal exceeds the limit, the data is fixed at -15% or +115%.
(approx. -11.5 V or 11.5 V when the output range is -10 - +10 V)

• Ouputput Range 0 – 5V DC

Digital Value, Decimal	Degital Value, HEX	Output Value, Engineering Unit	Output value, %
-1500	FA24	≤ -0.75V	-15%
0	0	0V	0%
10000	2710	5V	100%
11500	2CEC	≥ 5.75V	115%



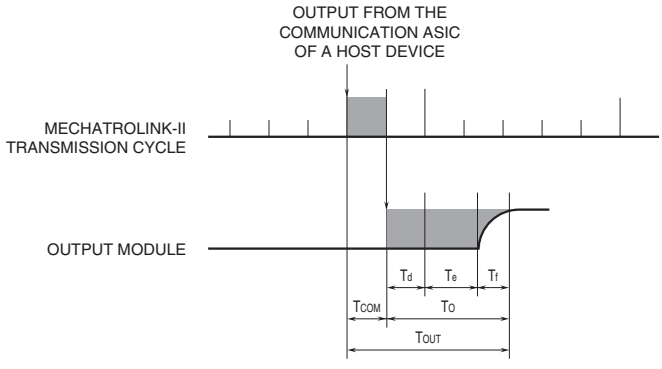
RESPONSE TIME

Response time of analog output module is time from when 0 to 100% stepwise signal change is received by the communication ASIC of the module (slave) till when the analog output signal reaches 90 %.
T_{COM}: MECHATROLINK-II transmission cycle set at master
(depends on system and configuration)

T_O: Delay of output module ≤ Output internal processing delay time (Td) (one minimum transmission cycle the unit can handle) + Conversion time (Te) + Delay of output circuit (Tf)

T_{OUT}: Response time of output module ≤ T_O + T_{COM}

E.g.: MECHATROLINK-II transmission cycle of 0.5 msec.
Delay of output module (T_0): Internal processing delay time (0.5 msec.) + Conversion time (0.25 msec.) + Delay of output circuit (0.25 msec.) = 1.0 [msec.]
Response time of output module (T_{OUT}): T0 (1.0 msec.) + T_{COM} (0.5 msec.) = 1.5 [msec]



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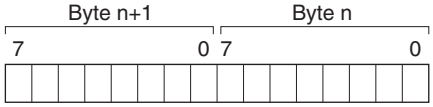
I/O DATA DESCRIPTIONS

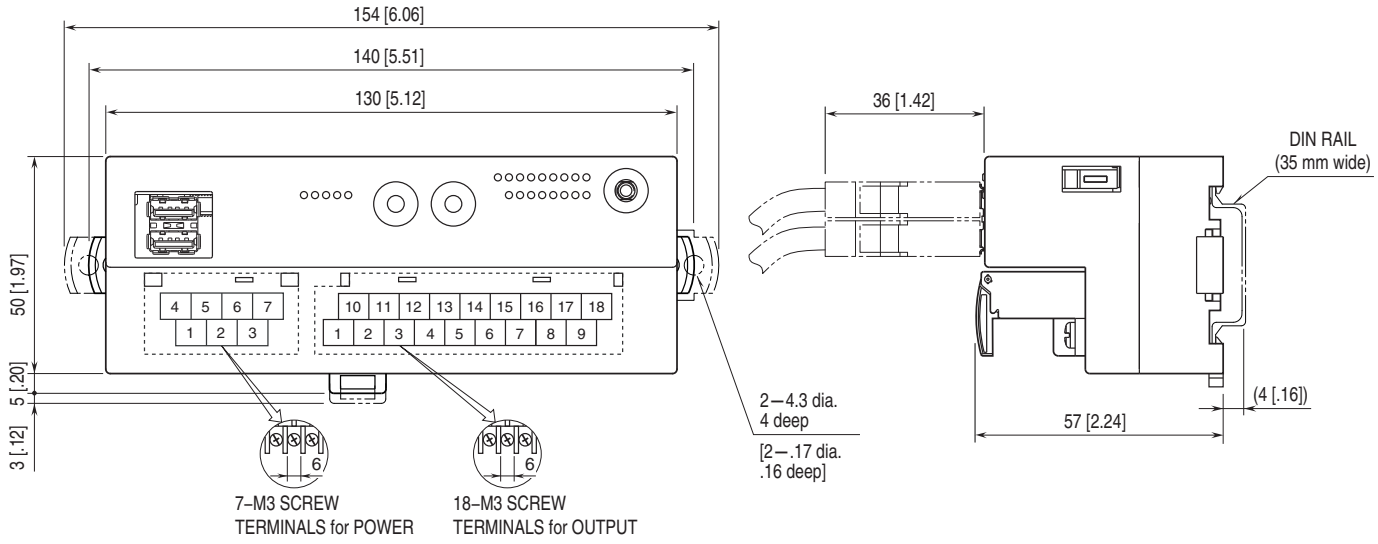
Scaling of analog output module is configurable with the configurator software (model: R7CFG). Refer to the software manual for details.

■ **ANALOG OUTPUT**

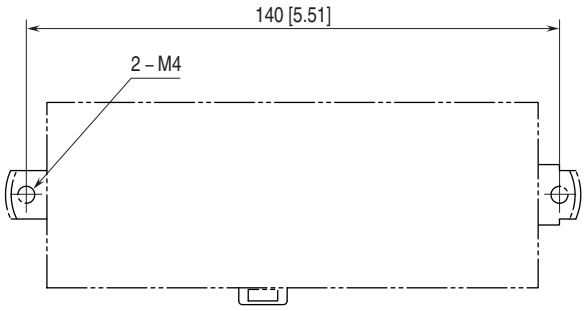


Data is represented in 16-bit binary. Negative value is represented in 2's complements.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



MOUNTING REQUIREMENTS unit: mm [inch]



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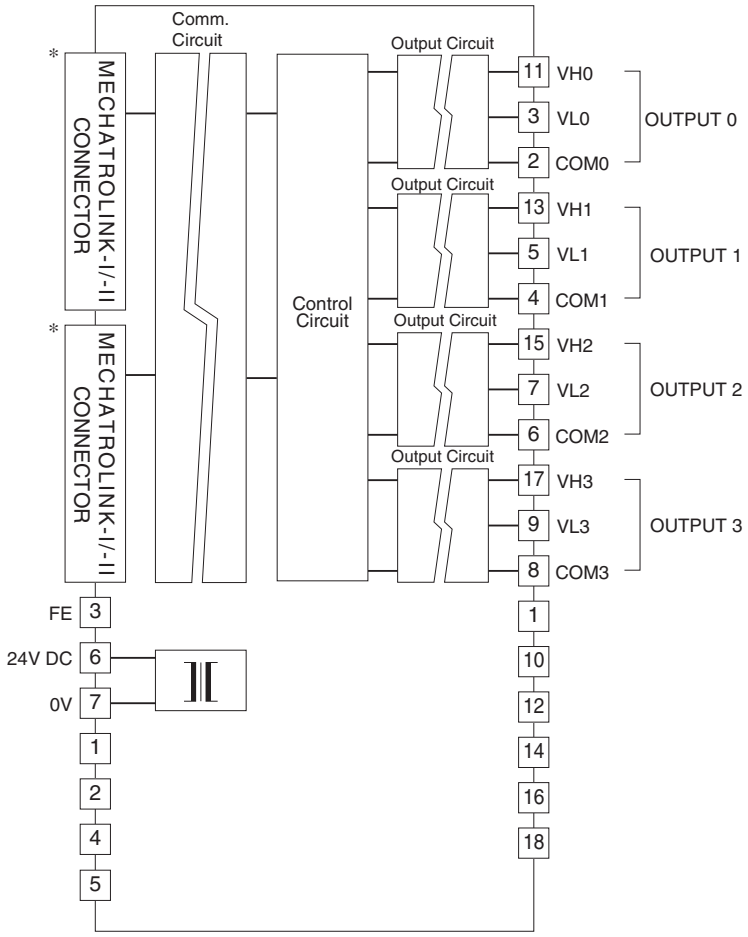
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE terminal to ground.

Caution: FE terminal is NOT a protective conductor terminal.



* MECHATROLINK connectors are internally connected.
The network cable can be connected to either one.

⚠ Specifications are subject to change without notice.

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