

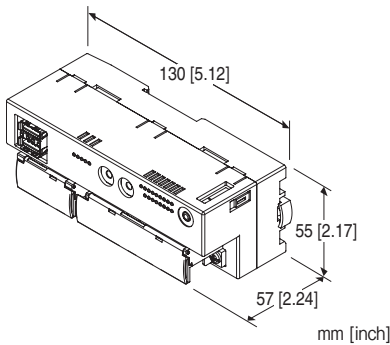
Remote I/O R7G4H Series

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 M-System's configurator software



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)

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 \pm 10 %, ripple 10 %p-p max.)

[1] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

RELATED PRODUCTS

- PC configurator software (model: R7CFG)

Downloadable at M-System's web site.

A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

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 mm² (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

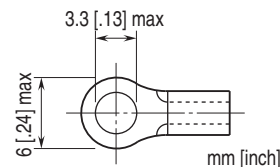
Output range: Selectable with the DIP SW on the top of the unit or configurable via R7CFG

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:)

MODEL: R7G4HML-6-YVF4

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

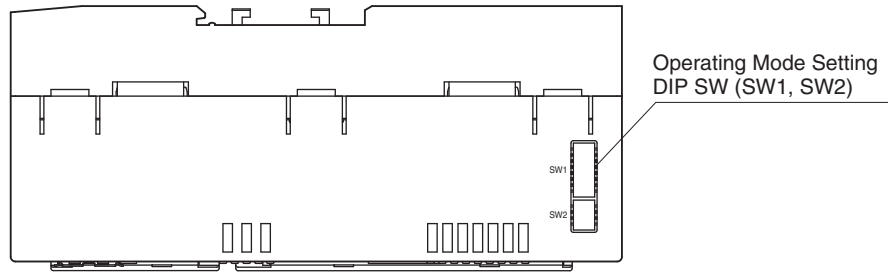
PARAMETER	SETTING RANGE	DEFAULT SETTING
Setting output at the loss of communication*2	Hold Clear	Hold

*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.

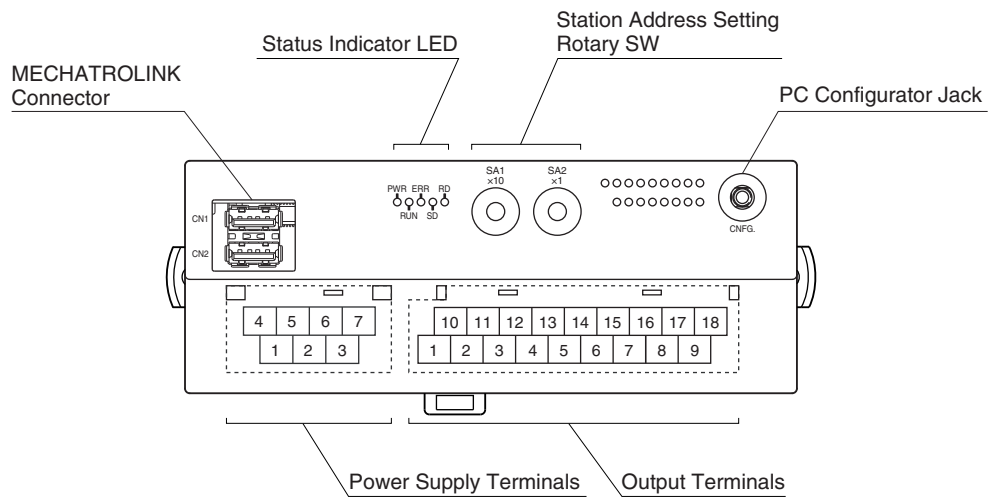
*2. Use the DIP switch to change the setting.

EXTERNAL VIEW

■ TOP VIEW



■ FRONT VIEW



TERMINAL ASSIGNMENTS

OUTPUT TERMINAL ASSIGNMENT

10	11	12	13	14	15	16	17	18
NC	VH0	NC	VH1	NC	VH2	NC	VH3	NC
1	2	3	4	5	6	7	8	9
NC	COM0	VL0	COM1	VL1	COM2	VL2	COM3	VL3

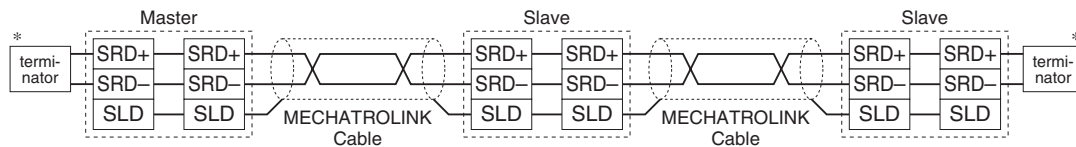
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	NC	No connection	10	NC	No connection
2	COM0	Common 0	11	VH0	Wide span vliolt. 0
3	VL0	Narrow span volt. 0	12	NC	No connection
4	COM1	Common 1	13	VH1	Wide span vliolt. 1
5	VL1	Narrow span volt. 1	14	NC	No connection
6	COM2	Common 2	15	VH2	Wide span vliolt. 2
7	VL2	Narrow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

POWER SUPPLY TERMINAL ASSIGNMENT

4	5	6	7
NC	NC	+24V	0V
1	2	3	
NC	NC	FE	

- 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.

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.

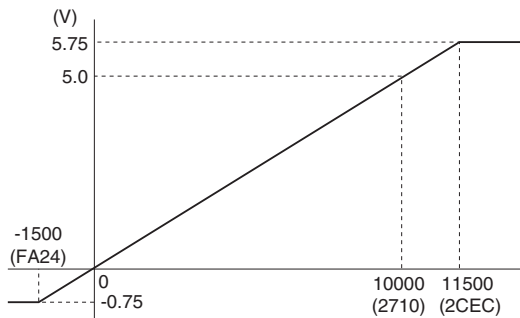
Overrange output is possible from -15 to +115% of the nominal range.

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)

• Output Range 0 – 5V DC

Digital Value, Decimal	Digital 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)

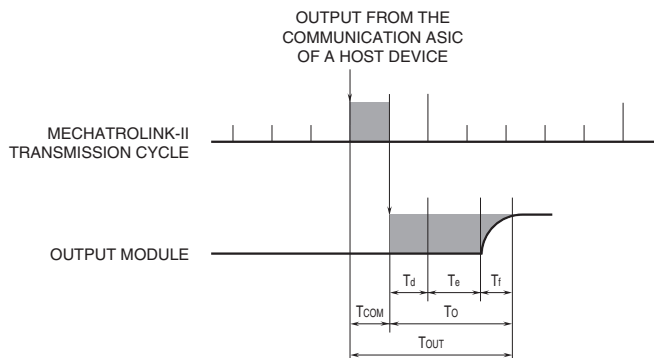
T_0 : Delay of output module ≤ Output internal processing delay time (T_d) (one minimum transmission cycle the unit can handle) + Conversion time (T_e) + Delay of output circuit (T_f)

T_{OUT} : Response time of output module ≤ $T_0 + T_{COM}$

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.]

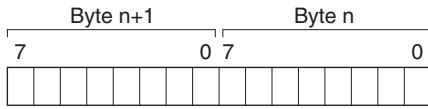
Response time of output module (T_{OUT}): T_0 (1.0 msec.) + T_{COM} (0.5 msec.) = 1.5 [msec.]



I/O DATA DESCRIPTIONS

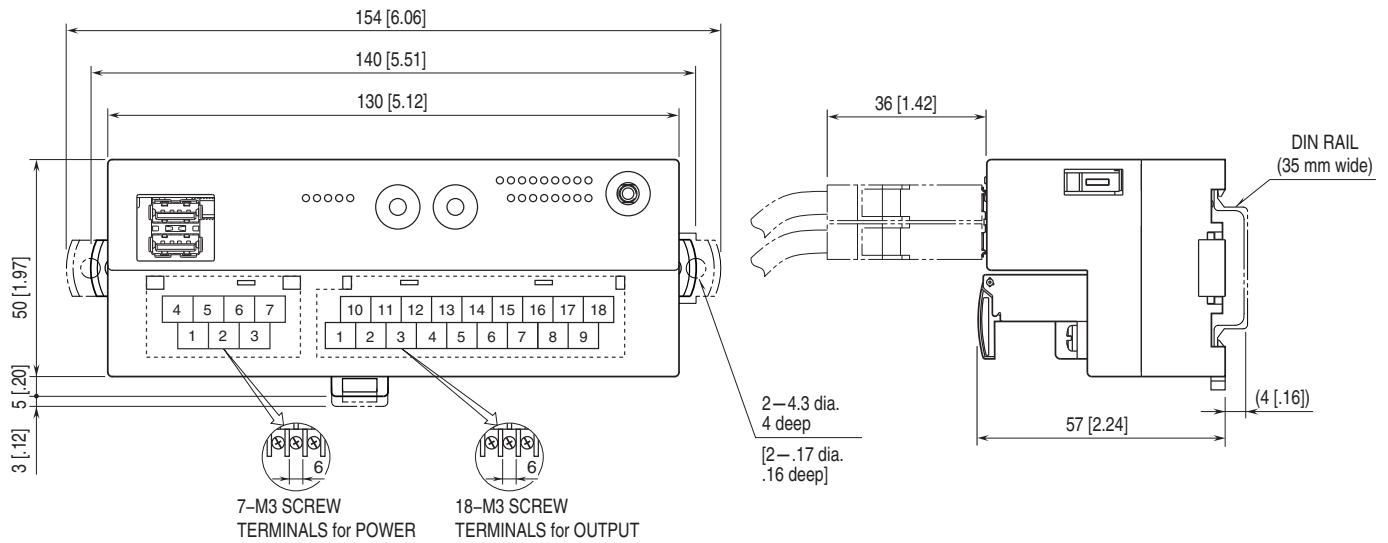
Scaling of analog output module is configurable with the configurator software (model: R7CFG). Refer to the software manual for details.

■ ANALOG OUTPUT

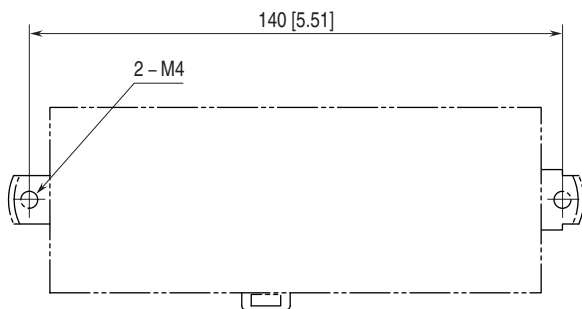


Data is represented in 16-bit binary. Negative value is represented in 2's complements.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



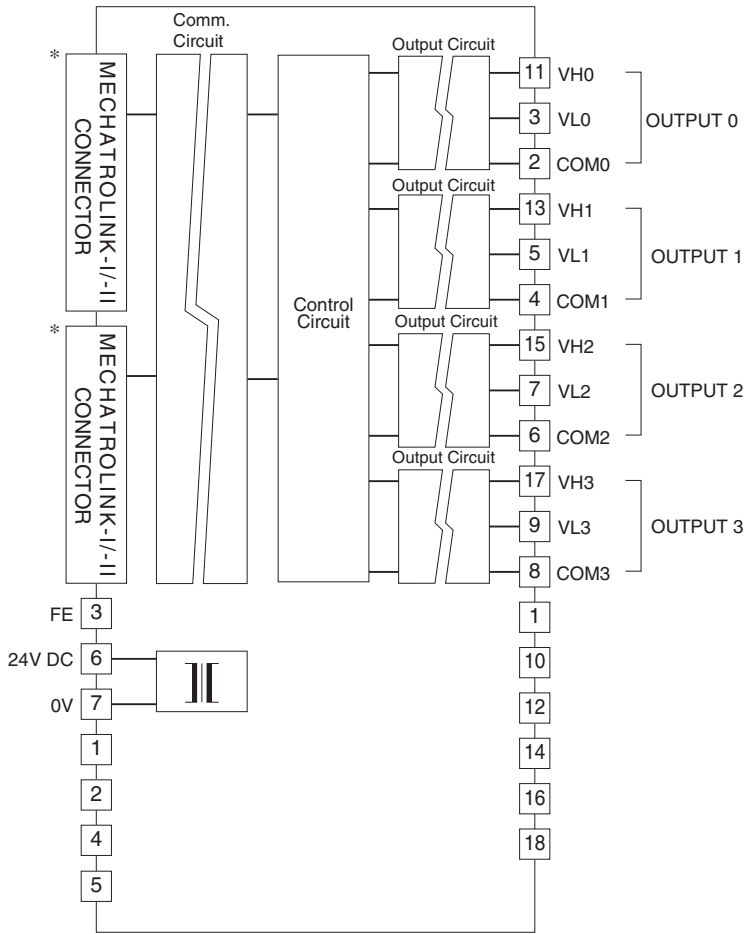
MOUNTING REQUIREMENTS unit: mm [inch]



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.