Remote I/O R7G4H Series

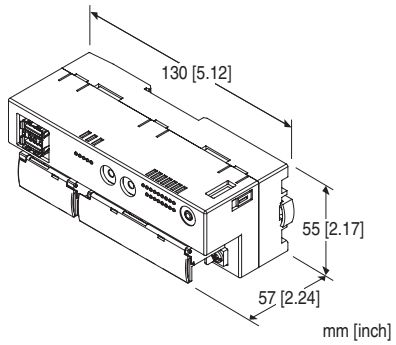
MECHATROLINK I/O MODULE

(high-speed DC voltage input, 8 points, non-isolated, screw terminal block, MECHATROLINK- I/- II use)

Functions & Features

• 8 points high-speed DC voltage input for MECHATROLINK-I/- II

• Easy parameter setting of individual channels with the configurator software



MECHATROLINK

MODEL: R7G4HML-6-SVF8N-R[1]

ORDERING INFORMATION

• Code number: R7G4HML-6-SVF8N-R[1]

Specify a code from below for [1].

(e.g. R7G4HML-6-SVF8N-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

SVF8N: DC voltage input, high-speed, 8 points (non-isolated)

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-C)

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, input: 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: Input to MECHATROLINK or FE to power

Zero adjustments: Configurable via R7CFG

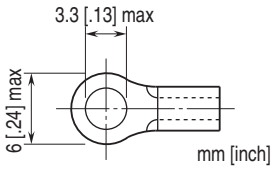
Span adjustments: Configurable via R7CFG

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

Number of times of averaging: 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: MECHATROLINK-II; data length (17 bytes)
(Refer to the instruction manual)

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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)

INPUT SPECIFICATIONS

Input resistance: ≥ 1 MΩ
Input range: -10 – +10 V DC, -5 – +5 V DC, 0 – 10 V DC, 0 – 5 V DC, 1 – 5 V DC

INSTALLATION

Current consumption
•**DC**: Approx 40 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: 2.5 msec. / 8 CH
Data range: 0 – 10000 of the input range
(Set the scaling value within the range of 0 - 255 when the module is used in MECHATROLINK-I or MECHATROLINK-II in the 17-byte mode)
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Input delay time: ≤ 20 msec. (0 - 90 %)
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute (input to 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
Input range	-10 – +10 V DC -5 – +5 V DC 0 – 10 V DC 0 – 5 V DC 1 – 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 *	255

* Set within the range of 0 – 255 for use in MECHATROLINK-I or MECHATROLINK-II in the 17-byte mode.

■ **SETTINGS FOR ALL CHANNELS**

PARAMETER	SETTING RANGE	DEFAULT SETTING
Averaging	1, 2, 4, 8, 16, 32, 64, 128	1

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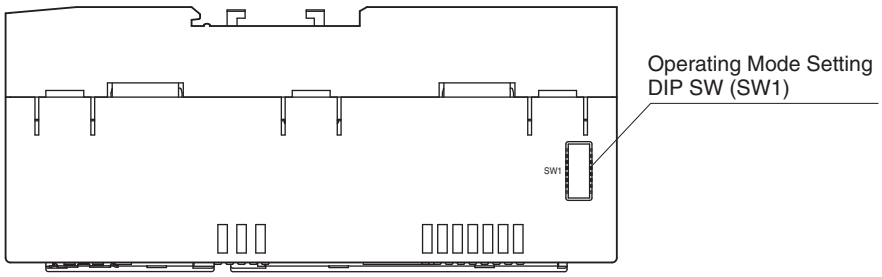
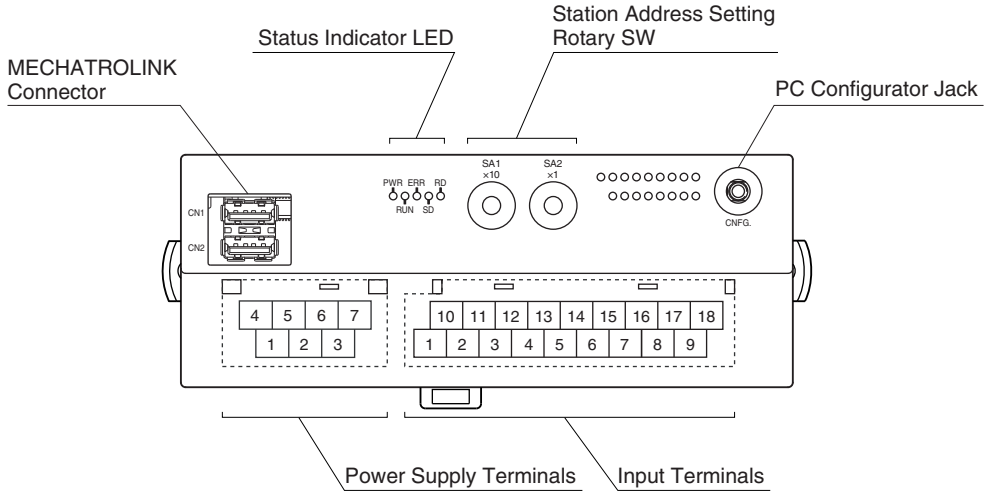
EXTERNAL VIEW

■ **TOP VIEW**



■ **FRONT VIEW**



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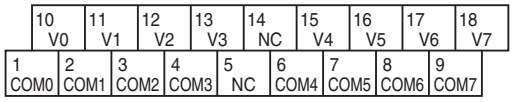
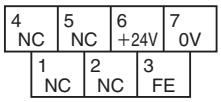
TERMINAL ASSIGNMENTS

■ INPUT TERMINAL ASSIGNMENT



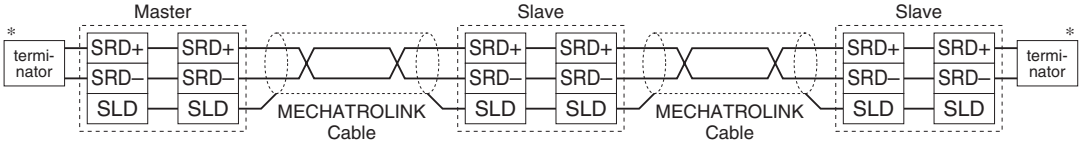
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	COM0	Common 0	10	V0	Voltage Input 0
2	COM1	Common 1	11	V1	Voltage Input 1
3	COM2	Common 2	12	V2	Voltage Input 2
4	COM3	Common 3	13	V3	Voltage Input 3
5	NC	No connection	14	NC	No connection
6	COM4	Common 4	15	V4	Voltage Input 4
7	COM5	Common 5	16	V5	Voltage Input 5
8	COM6	Common 6	17	V6	Voltage Input 6
9	COM7	Common 7	18	V7	Voltage Input 7

■ 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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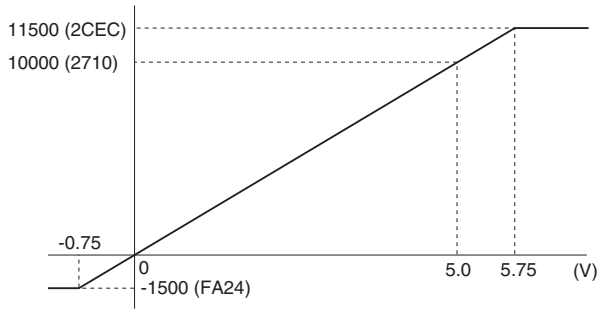
DATA CONVERSION

■ INPUT RANGE AND DATA CONVERSION (FACTORY DEFAULT SETTING)

Analog input data is converted into digital representations of 0 – 100% proportional to each scaled range.
The converted % values are multiplied by 100 and expressed in16 bits.
Overrange input is possible from -15 to +115% of the nominal range.
When the signal exceeds the limit, the data is fixed at -15% or +115%.

• Input Range 0 – 5V DC

Input Value	Input %	Converted Data, Decimal	Converted Data, Hex
≤ -0.75V	-15%	-1500	FA24
0V	0%	0	0
5V	100%	10000	2710
≥ 5.75V	115%	11500	2CEC



RESPONSE TIME

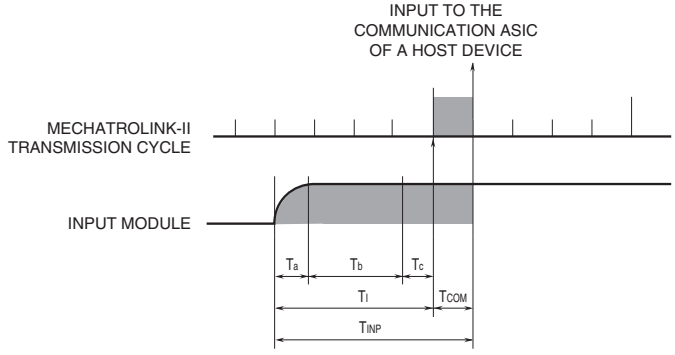
Response time of analog input module is time from when 0 to 100% stepwise signal change is applied to the analog module till when the communication ASIC of the module (slave) transmits 90 % of input signal.
T_{COM}: MECHATROLINK-II transmission cycle set at master
(depends on system and configuration)

T_I: Delay of input module ≤ Delay of input circuit (Ta) + Conversion time[*1] (Tb) + Input internal processing delay time (Tc) (one transmission cycle)

T_{INP}: Response time of input module ≤ T_I + T_{COM}

*1. Conversion time x Averaging

E.g.: Averaging: 1, MECHATROLINK-II transmission cycle of 0.5 msec.
Delay of input module (T_I): Delay of input circuit (20 msec.) + Conversion time (2.5 msec.) x Averaging (1)
+ Input internal processing delay time (0.5 msec.) = 23 [msec.]
Response time of input module (T_{INP}): T_I (23 msec.) + T_{COM} (0.5 msec.) = 23.5 [msec.]



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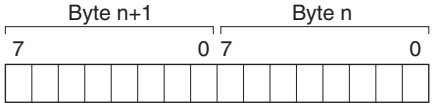
I/O DATA DESCRIPTIONS

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

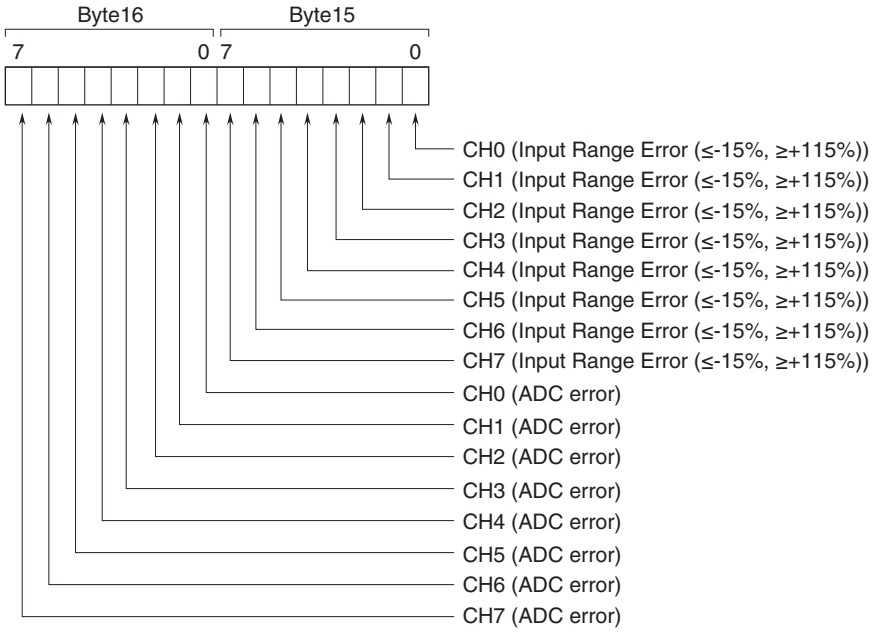
■ **ANALOG INPUT**



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

Note: 8-bit unsigned binary data for use in MECHATROLINK-I or MECHATROLINK-II in the 17-byte mode.

■ **STATUS**



Input Range Error
0: Normal, 1: Error
ADC error (no response from ADC)
0: Normal, 1: Error

Note: For use in MECHATROLINK-I or MECHATROLINK-II in the 17-byte mode, Input Range Error is set when 0 or 255 is input.

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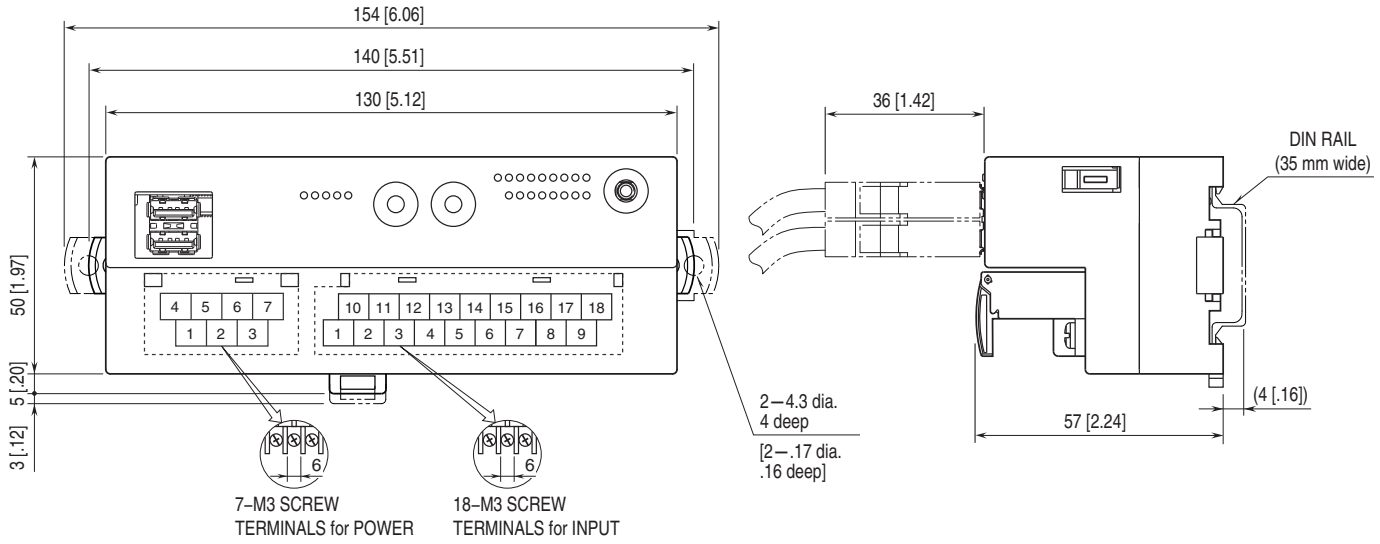
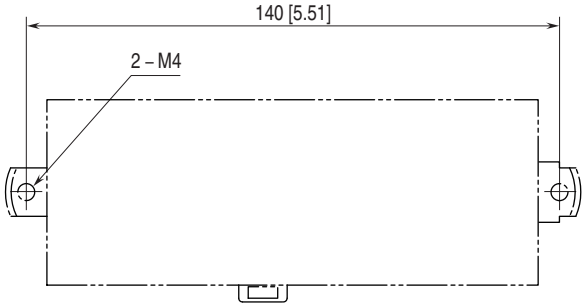
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



MOUNTING REQUIREMENTS unit: mm [inch]



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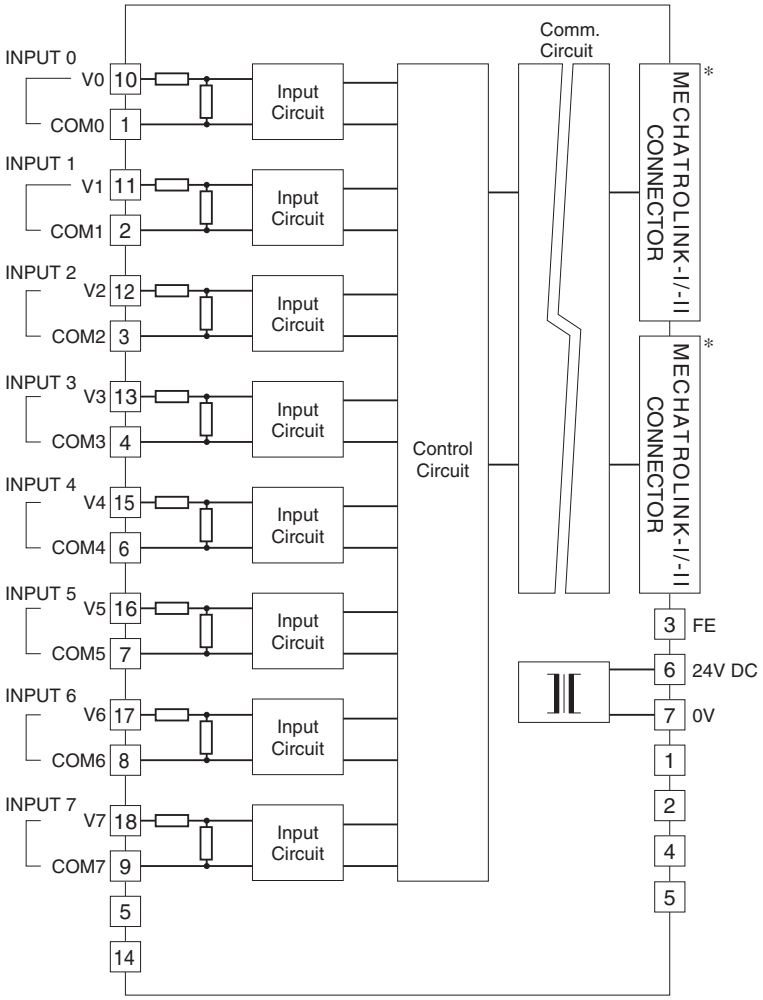
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

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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