

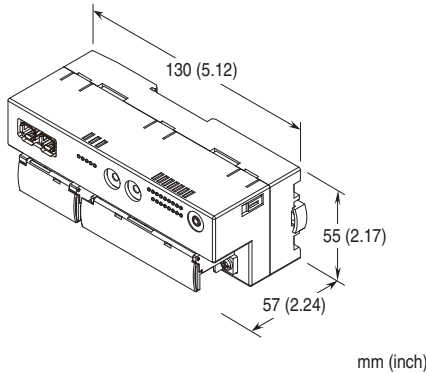
Remote I/O R7G4H Series

MECHATROLINK I/O MODULE

(DC voltage/current input, 4 points, isolated, screw terminal block, MECHATROLINK-III use)

Functions & Features

- 4 points each DC voltage/current input for MECHATROLINK-III
- Easy parameter setting of individual channels with M-System's configurator software



MODEL: R7G4HML3-6-SV4-R[1]

ORDERING INFORMATION

- Code number: R7G4HML3-6-SV4-R[1]
Specify a code from below for [1].
(e.g. R7G4HML3-6-SV4-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-III
- Screw terminal block for I/O

I/O TYPE

SV4: DC voltage/current input (10 V/20 mA), 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: Options other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

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

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-7772-SV4)

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-III: MECHATROLINK-III 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 mm² (AWG 22 to 16)

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (gray)

Isolation: Input 0 to input 1 to input 2 to input 3 to MECHATROLINK or FE to power

Zero adjustments: Configurable via R7CFG

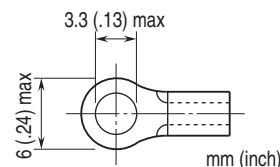
Span adjustments: Configurable via R7CFG

Input range: Configurable via R7CFG

Conversion rate: Configurable via R7CFG

Status indicator LEDs: PWR, ERR, CON, LNK1, LNK2
(Refer to the instruction manual for details)

Recommended solderless terminal



MECHATROLINK-III COMMUNICATION

Baud rate: 100 Mbps
Transmission distance: 6300 m max.
Distance between stations: 100 m max.
Transmission media: MECHATROLINK cable (Model JEPMC-W6013-x-E, Yaskawa Controls Co., Ltd.)
Connector: TYCO AMP Industrial mini I/O connector
Max. number of slaves: 62
 (The maximum number of slaves might change depending on the master unit. Refer to the manual of the master unit)
Transmission cycle: 125 μ sec., 250 μ sec., 500 μ sec., 1 - 64 msec. (with 1 msec. increments)
Communication cycle: 125 μ sec. through 64 msec.
Applicable profile: Standard I/O profile (cyclic communication)
 Event-driven communication acquiring ID profile (event-driven communication)
Transmission bytes: 16 bytes
Station address: 03H through EFH (set with rotary switches)
Cyclic communication: Available
Event-driven communication: Available
Slave monitoring: None

INPUT SPECIFICATIONS

■ **Current range**

- **Input resistance:** 70 Ω
- **Input range:** -20 - +20 mA DC, 0 - 20 mA DC, 4 - 20 mA DC

■ **Narrow span voltage**

- **Input resistance:** \geq 100 k Ω
- **Input range:** -1 - +1 V DC, 0 - 1 V DC, -0.5 - +0.5 V DC

■ **Wide span voltage**

- **Input resistance:** \geq 1 M Ω
- **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. 100 mA

Operating temperature: -10 to +55°C (14 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 rate / conversion accuracy:
 10 ms / \pm 0.8 %, 20 ms / \pm 0.4 %, 40 ms / \pm 0.2 %, 80 ms / \pm 0.1 %

Data range: 0 - 10000 of the input range
Temp. coefficient: \pm 0.015 %/°C (\pm 0.008 %/°F)
Input delay time: \leq 50 msec. (0 - 90 %)
Insulation resistance: \geq 100 M Ω with 500 V DC
Isolation: 1500 V AC @ 1 minute
 (input 0 to input 1 to input 2 to input 3 MECHATROLINK or FE to power)

STANDARDS & APPROVALS

EU conformity:
 EMC Directive
 EMI EN 61000-6-4
 EMS EN 61000-6-2
 RoHS Directive
 EN 50581

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.

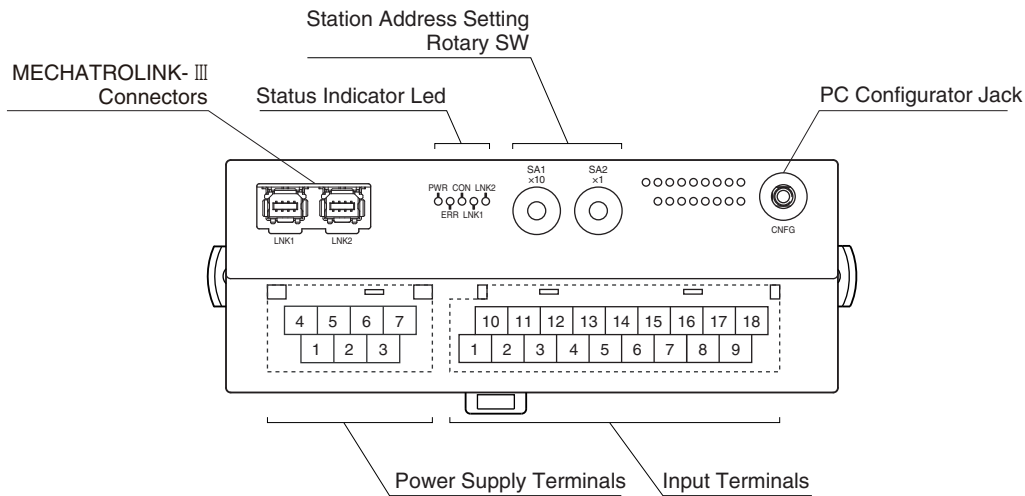
■ SETTINGS FOR INDIVIDUAL CHANNELS

PARAMETER	SETTING RANGE	DEFAULT SETTING
Validating/ Invalidating	Valid Invalid	Valid
Input range	-10 - +10 V DC -5 - +5 V DC -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 -20 - +20 mA DC 0 - 20 mA DC 4 - 20 mA DC	-10 - +10 V DC
Bias adjustment	-320.00 - +320.00 (%)	0.00 (%)
Gain adjustment	-3.2000 - +3.2000	1.0000
Zero scale	-32 000 - +32 000	0
Full scale	-32 000 - +32 000	10 000

■ SETTINGS FOR ALL CHANNELS

PARAMETER	SETTING RANGE	DEFAULT SETTING
Conversion rate/ accuracy	80 msec. / \pm 0.1 % 40 msec. / \pm 0.2 % 20 msec. / \pm 0.4 % 10 msec. / \pm 0.8 %	80 msec. / \pm 0.1 %

EXTERNAL VIEW



TERMINAL ASSIGNMENTS

■ INPUT TERMINAL ASSIGNMENT

10	11	12	13	14	15	16	17	18
VL0	I0	VL1	I1	NC	VL2	I2	VL3	I3
1	2	3	4	5	6	7	8	9
VH0	COM0	VH1	COM1	NC	VH2	COM2	VH3	COM3

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	VH0	Wide span volt. 0	10	VL0	Narrow span volt. 0
2	COM0	Common 0	11	I0	Current range 0
3	VH1	Wide span volt. 1	12	VL1	Narrow span volt. 1
4	COM1	Common 1	13	I1	Current range 1
5	NC	No connection	14	NC	No connection
6	VH2	Wide span volt. 2	15	VL2	Narrow span volt. 2
7	COM2	Common 2	16	I2	Current range 2
8	VH3	Wide span volt. 3	17	VL3	Narrow span volt. 3
9	COM3	Common 3	18	I3	Current range 3

■ 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 RELATED COMMANDS

Commands available with the unit are as follow.

PROFILE	COMMAND	CODE	FUNCTION
Common command	NOP	00H	No operation command
	ID_RD	03H	Read ID command
	CONFIG	04H	Setup device command
	ALM_RD	05H	Read alarm or warning command
	ALM_CLR	06H	Clear alarm or warning command
	CONNECT	0EH	Establish connection command
	DISCONNECT	0FH	Release connection command
Standard I/O profile	DATA_RWA	20H	Transmit I/O data

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.

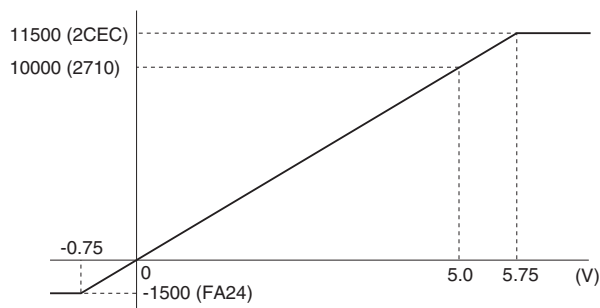
The converted % values are multiplied by 100 and expressed in 16 bits.

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.

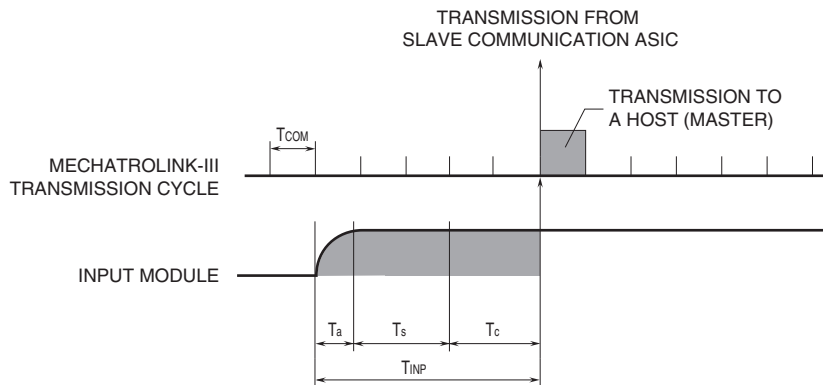
T_{COM} : MECHATROLINK-III transmission cycle set at master
(depends on system and configuration)

T_{INP} : Input module response time \leq Input Delay time (T_a) + Conversion rate^{*1} (T_b) + input internal processing delay time (T_c)
(two transmission cycle)

*1. Conversion rate \times 2

E.g.: Conversion rate: 10 msec., transmission cycle of 0.5 msec.

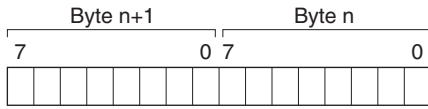
Input module response time (T_{INP}): Input Delay time (50 msec.) + Conversion rate (10 msec.) \times 2 + internal processing delay time (0.5 msec. \times 2) = 71 [msec.]



I/O DATA DESCRIPTIONS

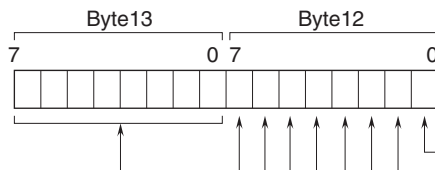
Scaling of analog input module is configurable with the configurator software (model: R7CFG). Refer to the software manual for details.

ANALOG INPUT



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

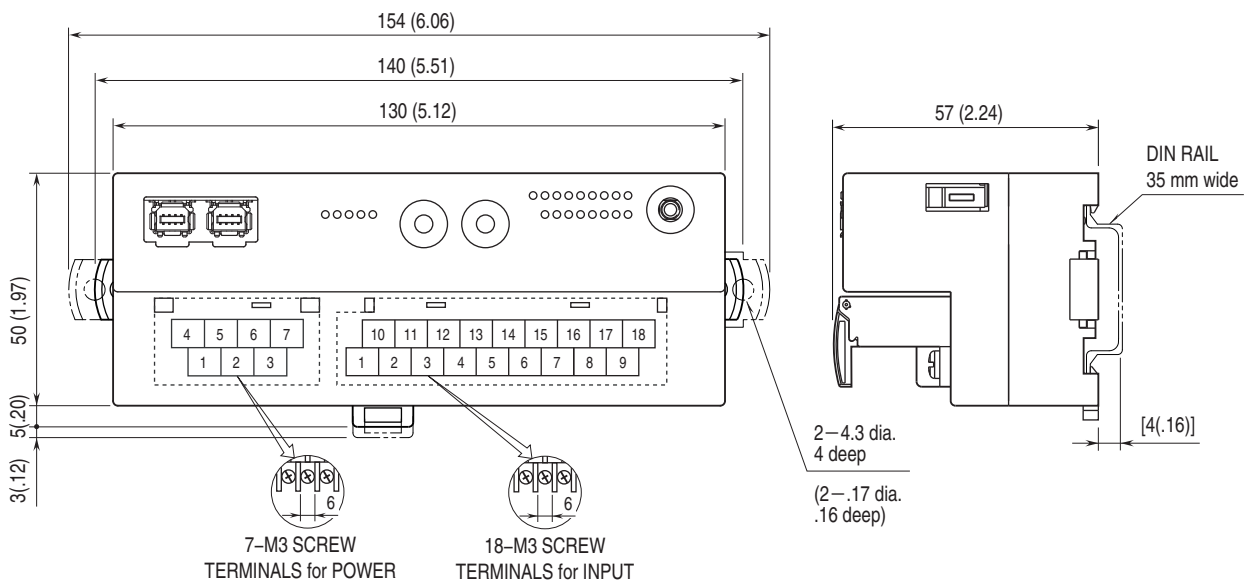
STATUS



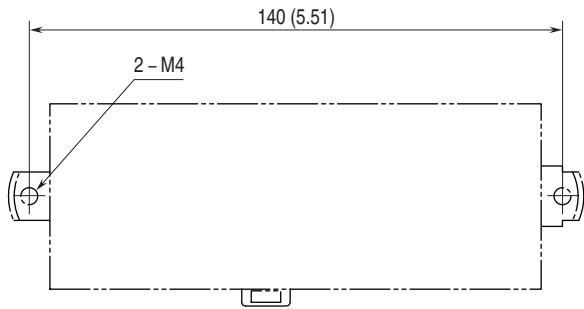
- CH0: Input range error (-15% or less, 115% or more)
- CH1: Input range error (-15% or less, 115% or more)
- CH2: Input range error (-15% or less, 115% or more)
- CH3: Input range error (-15% or less, 115% or more)
- CH0: ADC error
- CH1: ADC error
- CH2: ADC error
- CH3: ADC error
- Not used (fixed to 0)

Input range error
 0: normal, 1: error
 ADC error (no response from ADC)
 0: normal, 1: error

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



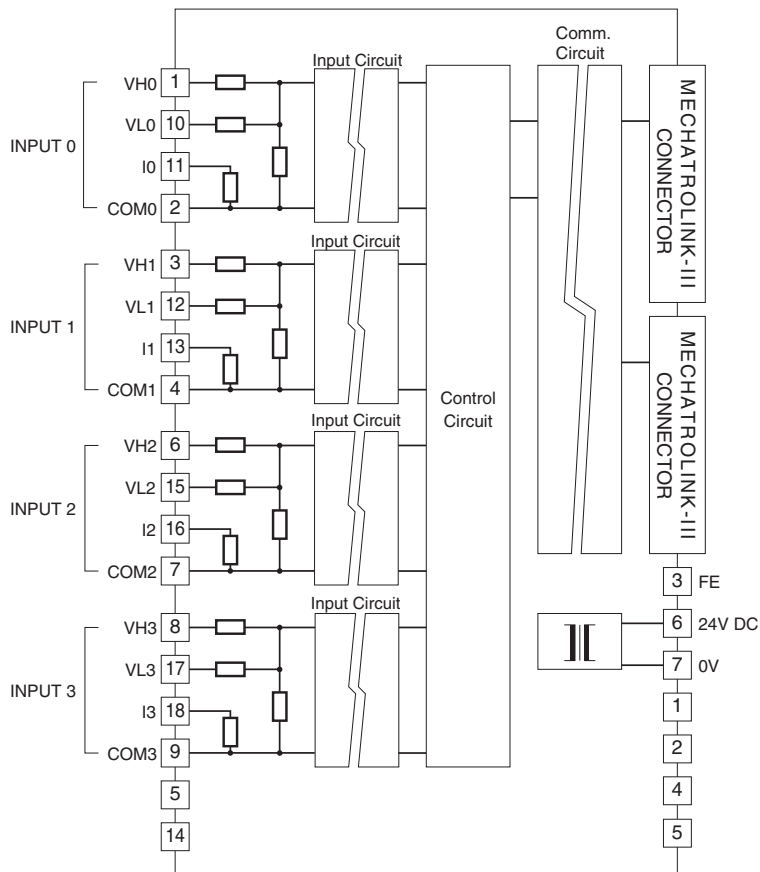
MOUNTING REQUIREMENTS unit: mm (inch)



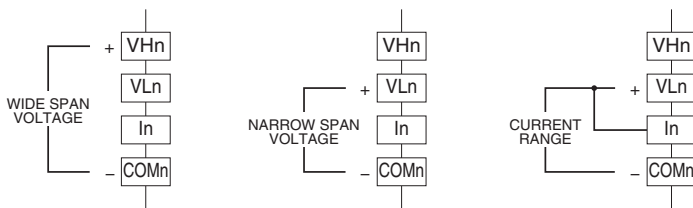
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

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

Caution: FE terminal is NOT a protective conductor terminal.



INPUT CONNECTION EXAMPLES



Note: Be sure V_{Ln} and I_n terminals are cross-wired at DC current input.



Specifications are subject to change without notice.