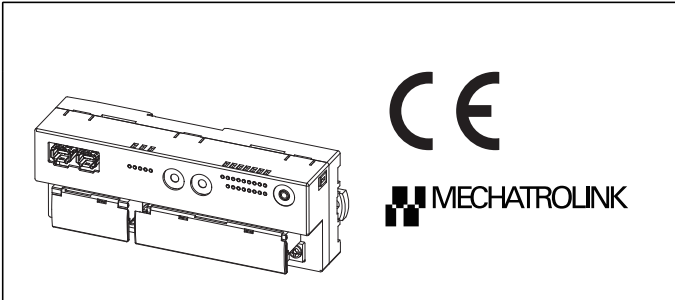


Remote I/O R7G4HML Series

MECHATROLINK I/O MODULE

(MECHATROLINK-III)



MODEL: R7G4HML3-6-[1]-R[2]

ORDERING INFORMATION

- Code number: R7G4HML3-6-[1]-R[2]
Specify a code from below for each [1] and [2].
(e.g. R7G4HML3-6-PA1A7-R/Q)
- Specify the specification for option code /Q
(e.g. /SET)

TERMINAL BLOCK: 6

Screw terminal block for power supply
Connector for MECHATROLINK- III
Screw terminal block for I/O

[1] I/O TYPE

- SV4:** DC voltage/current input (10 V/20 mA), 4 points
(under development)
- SVF4:** DC voltage /current input (10 V/20 mA),
high speed, 4 points
- TS4:** Thermocouple input, 4 points (under development)
- PA1SJ:** Encoder input (speed / position) 1 point (under development)
(RS-422 input)
- PA1A1:** Encoder input (speed / position) 1 point (under development)
(5 V open collector input)
- PA1A4:** Encoder input (speed / position) 1 point (under development)
(12 V open collector input)
- PA1A7:** Encoder input (speed / position) 1 point (under development)
(24 V open collector input)

POWER INPUT

DC power

R: 24 V DC
(Operational voltage range: $\pm 10\%$; ripple 10 %p-p max.)

[2] OPTIONS

Other Options

blank: none

/Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q

EX-FACTORY SETTING

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

FUNCTIONS & FEATURES

MECHATROLINK I/O module, R7G4HML3 interfaces discrete I/Os and PLC or PC via MECHATROLINK-III.
Removable terminal blocks make the module replaceable without disconnection of wiring

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.

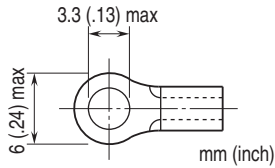
GENERAL SPECIFICATIONS

- **Common Specifications**
- Power input:** 24 V DC $\pm 10\%$; ripple 10 %p-p max.
- Insulation resistance:** $\geq 100\text{ M}\Omega$ with 500 V DC
- Dielectric strength:** 1500 V AC @1 minute
(between isolated circuits)
- Operating temperature:** -10 to +55°C (14 to 131°F)
- Operating humidity:** 30 to 90 %RH (non-condensing)
- Atmosphere:** No corrosive gas or heavy dust
- Mounting:** DIN rail (35 mm wide) or wall
- Connection**
- MECHATROLINK-III:** MECHATROLINK-III connector
- Power & I/O:** M3 separable screw terminals (torque 0.5 N·m)
- Screw terminal material:** Nickel-plated steel
- 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)
- Status indicator LEDs:** PWR, ERR, CON, LNK1, LNK2
(Refer to the instruction manual for details)
- **Current Consumption (at 24 V DC) & Weight**
- R7G4HML3-6-SV4: Approx. 100 mA, 220 g (0.46 lb)
- R7G4HML3-6-SVF4: Approx. 100 mA, 220 g (0.46 lb)
- R7G4HML3-6-TS4: Approx. 100 mA, 220 g (0.46 lb)



R7G4HML3-6-PA1x: Approx. 80 mA, 220 g (0.46 lb)

■ **Recommended solderless terminal**



MECHATROLINK-III COMMUNICATION

MECHATROLINK-III

Baud rate: 100 Mbps

Transmission distance: 6300 m max.

Distance between stations: 100 m max.

Transmission media: CAT5e STP

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 μsec., 250 μsec., 500 μsec., 1 - 64 msec. (with 1 msec. increments)

Communication cycle: 125 μsec. through 64 msec.

Applicable profile: Standard I/O profile (cyclic communication)

Acquiring ID profile (event-driven communication)

Data size: 16 bytes

Station address: 03H through EFH (set with rotary switches)

Cyclic communication: Available

Event-driven communication: Available

Slave monitoring: None

STANDARDS & APPROVALS

Refer to the manuals to comply with the standards.

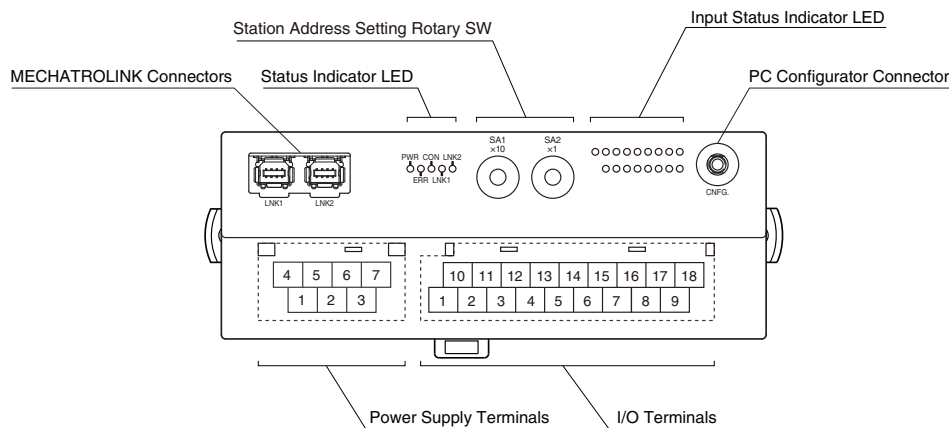
CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007/A1: 2011

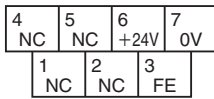
EMS EN 61000-6-2: 2005

EXTERNAL VIEW



CONNECTION DIAGRAMS

■ 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 RELATED COMMANDS

■ CYCLIC COMMUNICATION

Cyclic communication 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

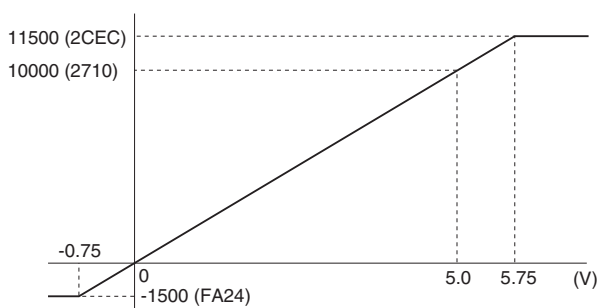
■ 0 – 100% DATA CONVERSION

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% respectively.

•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



Analog output is converted in the reverse order of the input data. The output range 0 – 5V DC is expressed as 10000 at 5.0V (100%) and 0 at 0V (0%).

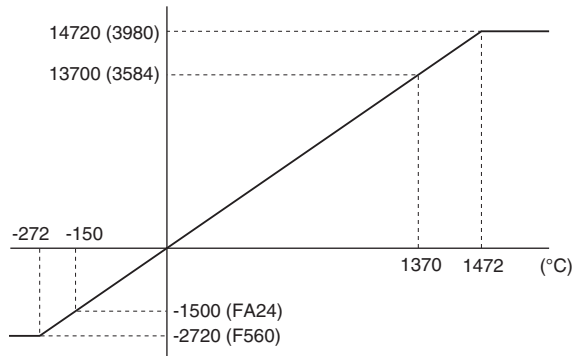


■ TEMPERATURE DATA CONVERSION

Temperature data (thermocouple and RTD) are represented in engineering unit value, °C or K, multiplied by 10 and expressed in 16 bits. °F data is represented in engineering unit value, without multiplication.

• Input Type K Thermocouple

Input Value	Converted Data, Decimal	Converted Data, Hex
≤ -272°C	-2720	F560
-150°C	-1500	FA24
1370°C	13700	3584
≥ 1472°C	14720	3980



■ ENCODER INPUT (SPEED CONVERSION DATA)

Encoder input data is converted into digital representations of 0 – 100% proportional to each scaled range.

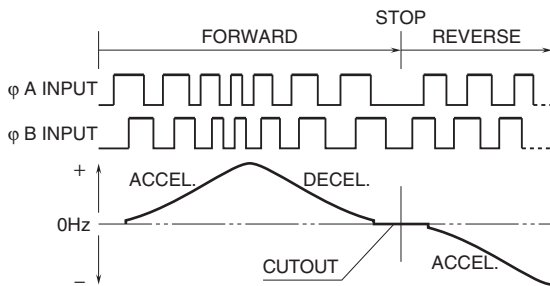
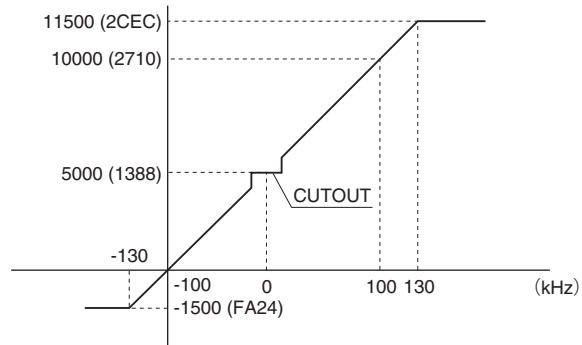
The converted % values are multiplied by 100 and expressed in 16 bits.

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% respectively.

• Input Range 0 – 100 kHz

Input Value	Input %	Converted Data, Decimal	Converted Data, Hex
-130kHz	-15%	-1500	FA24
-100kHz	0%	0	0
0kHz	50%	5000	1388
100kHz	100%	10000	2710
130kHz	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.

Response time of analog output module is time form 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-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)

T_{OUT} : Output module response time \leq Output internal processing delay time (T_d) (one minimum transmission cycle the unit can handle) + Conversion rate (T_e) + Output Delay time (T_f)

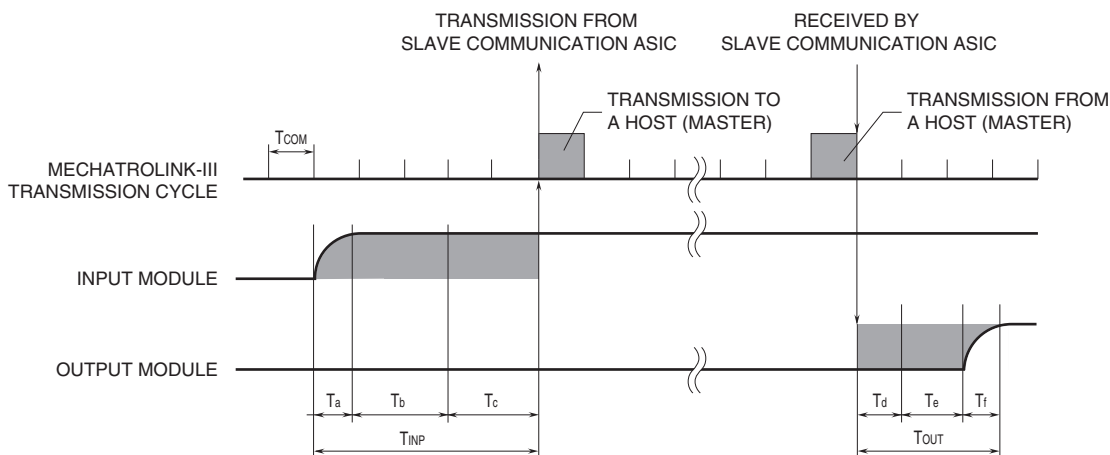
*1. R7G4HML3-6-SV4: Conversion rate $\times 2$

R7G4HML3-6-SVF4: Conversion rate \times Averaging

R7G4HML3-6-TS4 (Averaging): Conversion rate $\times 3$

E.g. 1: R7G4-HML3-6-SVF4 Averaging (1), transmission cycle of 0.5 msec.

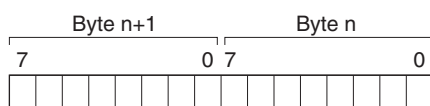
Input module response time (T_{INP}): Input Delay time (1 msec.) + Conversion rate (0.2 msec.) \times Averaging (1) + internal processing delay time (0.5 msec. $\times 2$) = 2.2 [msec.]



I/O DATA DESCRIPTIONS

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

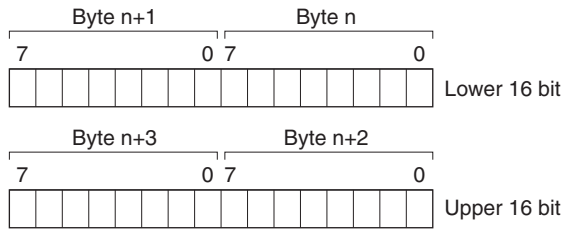
ANALOG I/O (R7G4HML3-6-SV4, SVF4, TS4)



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

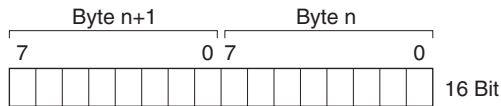


■ PULSE POSITION CONVERSION (R7G4HML3-6-PA1)



Position conversion data is represented in 16-bit binary. Negative value is represented in 2's complements.

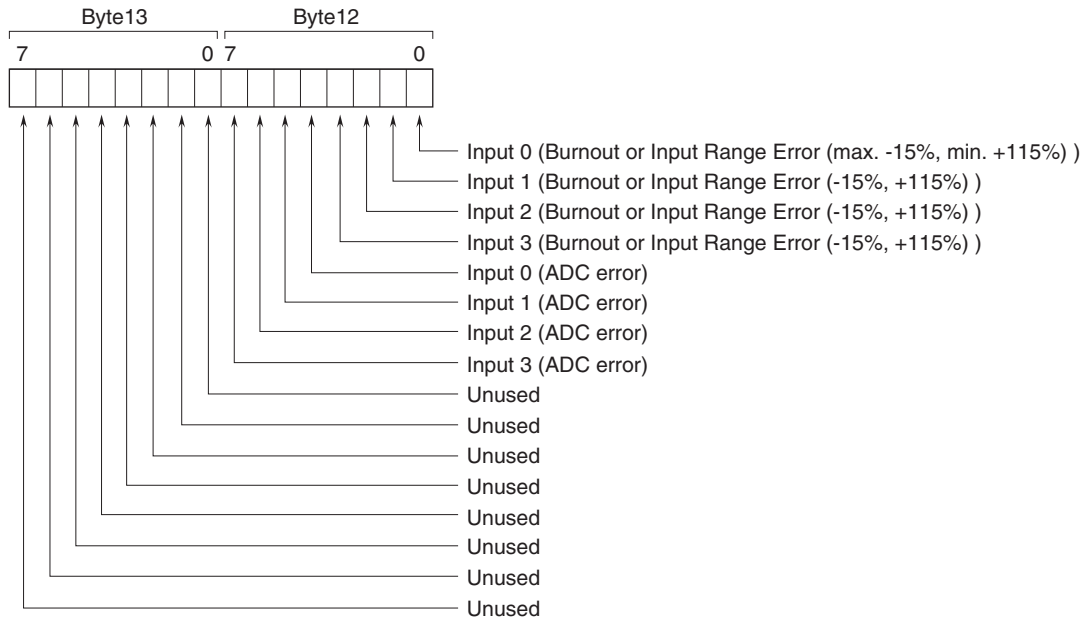
■ PULSE SPEED DATA (R7G4HML3-6-PA1)



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

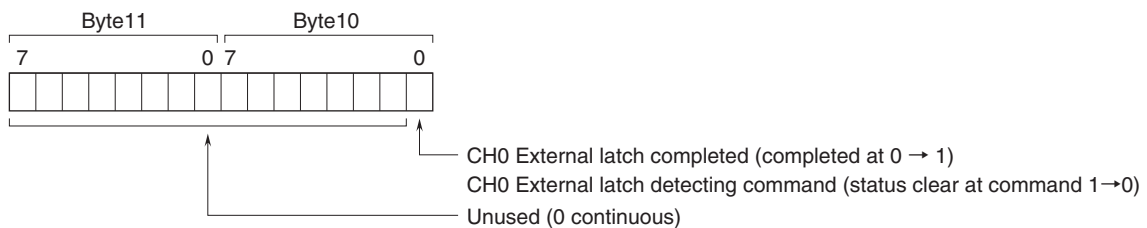
■ STATUS

For analog units (R7G4HML3-6-SV4, SVF4, TS4) every input status is displayed.



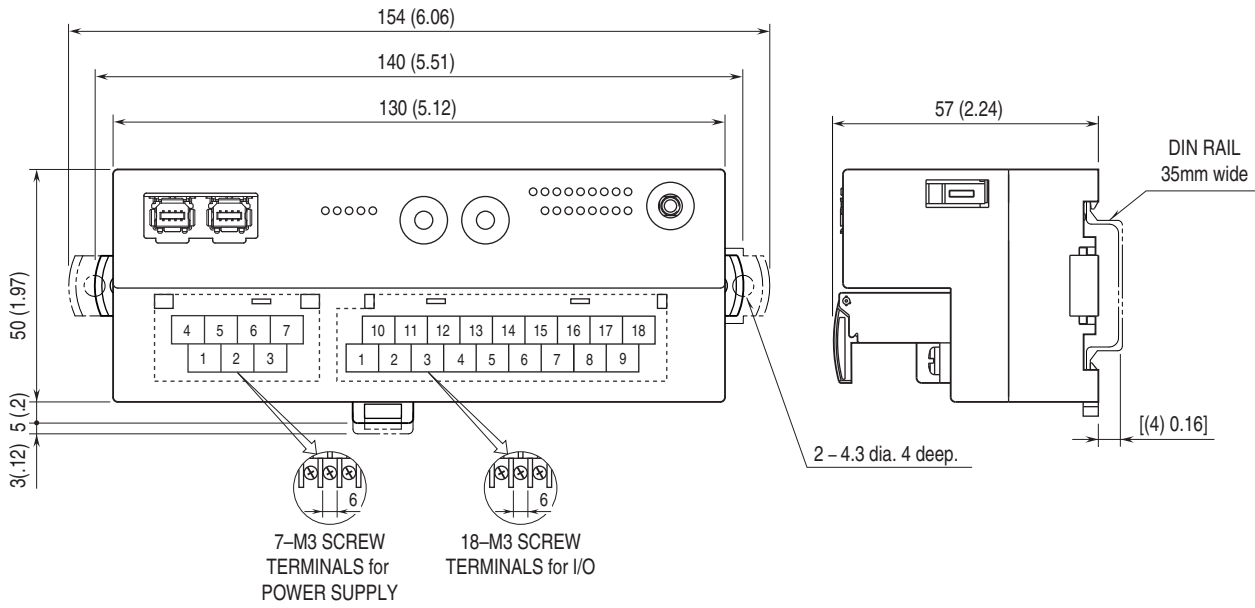
Burnout, Input Range Error
 0: Normal operating 1: Error
 ADC error (no response from ADC)
 0: Normal operating 1: Error

• Pulse Input Unit (R7G4HML3-6-PA1)

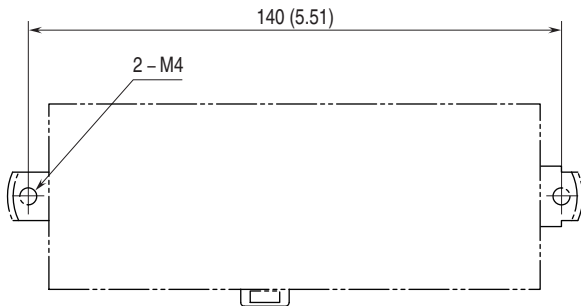


MODEL: R7G4HML3

DIMENSIONS unit: mm (inch)



MOUNTING REQUIREMENTS unit: mm (inch)



DC VOLTAGE/CURRENT INPUT MODULE

(4 points, isolated; screw terminal block)

MODEL: R7G4HML3-6-SV4

SPECIFICATIONS

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

Converted data range: 0 - 10000 of the input range

• **Input range**

Wide span voltage: -10 - +10 V DC, -5 - +5 V DC, 0 - 10 V DC, 0 - 5 V DC, 1 - 5 V DC

Narrow span voltage: -1 - +1 V DC, 0 - 1 V DC, -0.5 - +0.5 V DC

Current range: -20 - +20 mA DC, 0 - 20 mA DC, 4 - 20 mA DC

• **Input resistance**

Wide span voltage: $\geq 1 \text{ M}\Omega$

Narrow span voltage: $\geq 100 \text{ k}\Omega$

Current range: 70 Ω

Conversion rate / conversion accuracy:

10 msec./ $\pm 0.8 \%$, 20 msec./ $\pm 0.4 \%$, 40 msec./ $\pm 0.2 \%$,

80 msec./ $\pm 0.1 \%$

Input delay time: $\leq 50 \text{ msec.}$ (0 - 90 %)

Temperature coefficient: $\pm 0.015 \%/^{\circ}\text{C}$ ($\pm 0.008 \%/^{\circ}\text{F}$)

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	AVAILABLE RANGE	FACTORY 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	-32000 - +32000	0
Full scale	-32000 - +32000	10000

■ SETTINGS FOR ALL CHANNELS

PARAMETER	AVAILABLE RANGE	FACTORY 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. / $\pm 0.1 \%$

TERMINAL ASSIGNMENTS

10	11	12	13	14	15	16	17	18
VLO	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

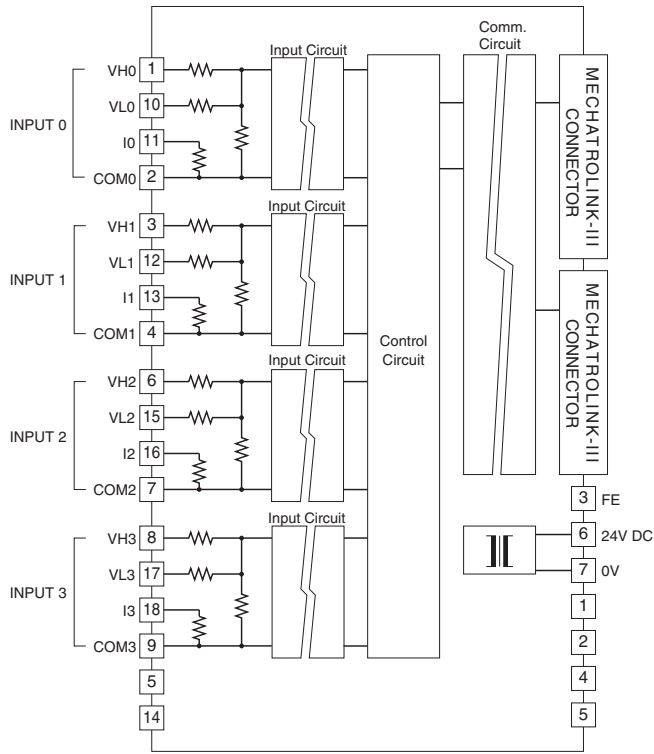
NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	VH0	Wide span volt. 0	10	VLO	Narrow span volt. 0
2	COM0	Common 0	11	I0	Current range 0
3	VH1	Wide span volt. 1	12	VL1	Narrow span volt. 1
4	COM1	Common 1	13	I1	Current range 1
5	NC	No connection	14	NC	No connection
6	VH2	Wide span volt. 2	15	VL2	Narrow span volt. 2
7	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



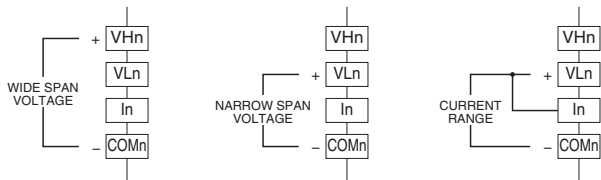
CIRCUIT DIAGRAM

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 \overline{VLn} and \overline{In} terminals are cross-wired at DC current input.

MODEL: R7G4HML3

HIGH-SPEED DC VOLTAGE/CURRENT INPUT MODULE

(4 points, isolated; screw terminal block)

MODEL: R7G4HML3-6-SVF4

SPECIFICATIONS

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

Converted data range: 0 - 10000 of the input range

• **Input range**

Wide span voltage: -10 - +10 V DC, -5 - +5 V DC, 0 - 10 V DC, 0 - 5 V DC, 1 - 5 V DC

Narrow span voltage: -1 - +1 V DC, 0 - 1 V DC, -0.5 - +0.5 V DC

Current range: -20 - +20 mA DC, 0 - 20 mA DC, 4 - 20 mA DC

• **Input resistance**

Wide span voltage: $\geq 1 \text{ M}\Omega$

Narrow span voltage: $\geq 100 \text{ k}\Omega$

Current range: 70Ω

Conversion rate: 200 μsec .

Conversion accuracy: $\pm 0.1 \%$

Input delay time: $\leq 1 \text{ msec}$. (0 - 90 %)

Temperature coefficient: $\pm 0.015 \%/^{\circ}\text{C}$ ($\pm 0.008 \%/^{\circ}\text{F}$)

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	AVAILABLE RANGE	FACTORY 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	-32000 - +32000	0
Full scale	-32000 - +32000	10000

■ **SETTINGS FOR ALL CHANNELS**

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
Averaging	1, 2, 4, 8, 16, 32, 64, 128, 256	1

TERMINAL ASSIGNMENTS

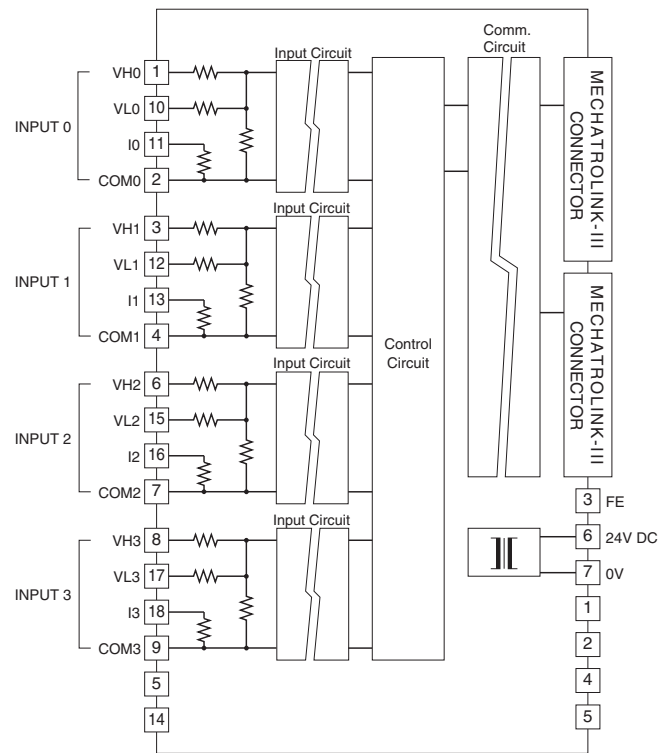
10	11	12	13	14	15	16	17	18
VL0	I0	VL1	I1	NC	VL2	I2	VL3	I3
1	2	3	4	5	6	7	8	9
VH0	COM0	VH1	COM1	NC	VH2	COM2	VH3	COM3

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

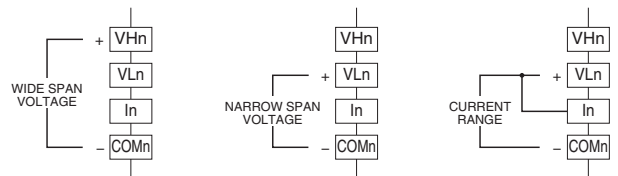
CIRCUIT DIAGRAM

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 VLn and In terminals are cross-wired at DC current input.



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E-mail : info@xintop.com
Website : www.xintop.com

THERMOCOUPLE INPUT MODULE

(4 points, isolated; screw terminal block)

MODEL: R7G4HML3-6-TS4

SPECIFICATIONS

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

Converted data range

Engineering unit value: (°C, K) × 10(integer);

No multiplication for °F

Scaling: Refere to the R7CFG operation manual for details.

Thermocouple: K, E, J, T, B, R, S, C, N, U, L, P, PR

Input resistance: ≥ 30 kΩ

Burnout sensing: ≤ 0.1 μA

Conversion accuracy: ±1°C (±1.8°F) (±2°C (±3.6°F) for B, R, S, C, PR)

Conversion rate: 240 msec.

Input delay time: ≤ 60 msec. (0 - 90 %)

Temperature coefficient: ±0.015 %/°C (±0.008 %/°F)

CJC error: ±1.0°C at 25°C ±10°C

(±1.8°F at 77°F ±18°F)

±1.5°C (±2.7°F) for R, S, PR

T/C	BURNOUT INDICATION (°C)		CONFORMANCE RANGE (°C)
	Downscale	Upscale	
K (CA)	-272	+1472	-150 to +1370
E (CRC)	-272	+1120	-170 to +1000
J (IC)	-260	+1300	-180 to +1200
T (CC)	-272	+ 500	-170 to + 400
B (RH)	24	1920	400 to 1760
R	-100	+1860	200 to 1760
S	-100	+1860	0 to 1760
C (WRe 5-26)	-52	+2416	0 to 2315
N	-272	+1400	-130 to +1300
U	-252	+ 700	-200 to +600
L	-252	+1000	-200 to +900
P (Platinel II)	-52	+1496	0 to 1395
(PR)	-52	+1860	0 to 1760

T/C	BURNOUT INDICATION (°F)		CONFORMANCE RANGE (°F)
	Downscale	Upscale	
K (CA)	-458	+2682	-238 to +2498
E (CRC)	-458	+2048	-274 to +1832
J (IC)	-436	+2372	-292 to +2192
T (CC)	-458	+932	-274 to +752
B (RH)	75	3488	752 to 3200
R	-148	+3380	392 to 3200
S	-148	+3380	32 to 3200
C (WRe 5-26)	-62	+4381	32 to 4199
N	-458	+2552	-202 to +2372
U	-422	+1292	-328 to +1112
L	-422	+1832	-328 to +1652
P (Platinel II)	-62	+2725	32 to 2543
(PR)	-62	+3380	32 to 3200

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	AVAILABLE RANGE	FACTORY SETTING
Validating/ Invalidating	Valid Invalid	Valid
Sensor type	K (CA) E (CRC) J (IC) T (CC) B (RH) R S C (WRe 5-26) N U L P (Platinel II) (PR)	K (CA)
Temperature unit	°C °F K	°C
Burnout	Up Down	Up
Bias adjustment	-320.00 - +320.00 (%)	0.00 (%)
Gain adjustment	-3.2000 - +3.2000	1.0000
Zero scale	-32000 - +32000	0
Full scale	-32000 - +32000	10000
Input 0 %	Depends on sensor type	0.00
Input 100 %	Depends on sensor type	0.00

■ SETTINGS FOR ALL CHANNELS

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
Averaging	Valid Invalid	Valid



TERMINAL ASSIGNMENTS

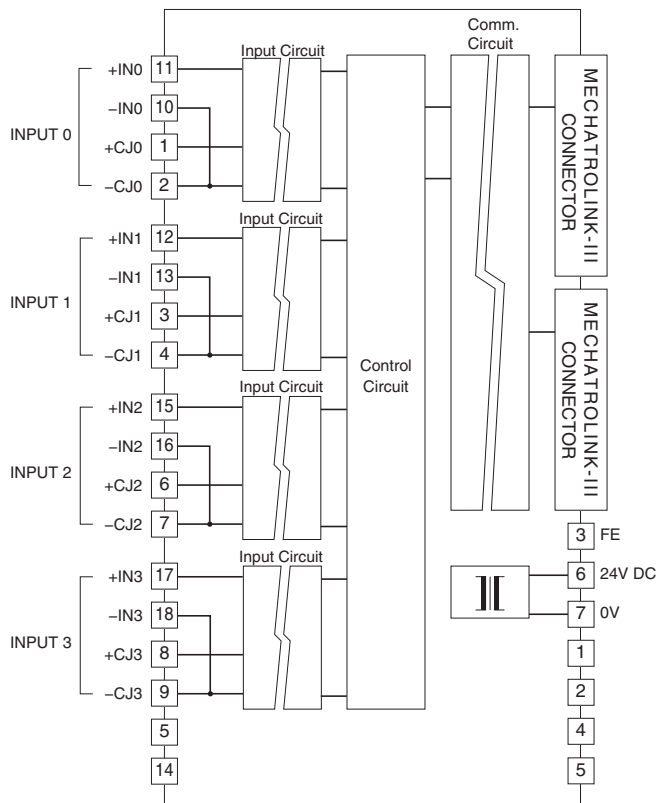
10	11	12	13	14	15	16	17	18
+IN0	-IN0	+IN1	-IN1	NC	+IN2	-IN2	+IN3	-IN3
1	2	3	4	5	6	7	8	9
+CJ0	-CJ0	+CJ1	-CJ1	NC	+CJ2	-CJ2	+CJ3	-CJ3

NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	+CJ0	CJC + 0	10	+IN0	T/C + 0
2	-CJ0	CJC - 0	11	-IN0	T/C - 0
3	+CJ1	CJC + 1	12	+IN1	T/C + 1
4	-CJ1	CJC - 1	13	-IN1	T/C - 1
5	NC	No connection	14	NC	No connection
6	+CJ2	CJC + 2	15	+IN2	T/C + 2
7	-CJ2	CJC - 2	16	-IN2	T/C - 2
8	+CJ3	CJC + 3	17	+IN3	T/C + 3
9	-CJ3	CJC - 3	18	-IN3	T/C - 3

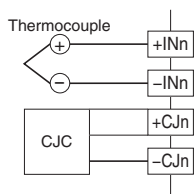
CIRCUIT DIAGRAM

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



ENCODER INPUT MODULE

(screw terminal block)

MODEL:

R7G4HML3-6-PA1J

R7G4HML3-6-PA1A1

R7G4HML3-6-PA1A4

R7G4HML3-6-PA1A7

SPECIFICATIONS

Isolation: Input or output or sensor excitation to MECHATROLINK or FE to power input

Counter type: Ring or linear

Speed conversion accuracy: $\pm 0.1\%$

Data range

Speed: 0 - 10000 of the input range

Position

Ring: 0 to 4 294 967 295

Linear: -2 100 000 000 to 2 100 000 000

Sensor Excitation* (External):

24 V DC $\pm 10\%$, ripple 5 %p-p max., 20 mA to 1 A

* Must be supplied since the input circuit also works with it.

When Latch or Reset turns on, its current is added.

Encoder excitation (External source; only for PA1Ax)

PA1A1: 5 V DC $\pm 5\%$, 1 A max.

PA1A4: 12 V DC $\pm 5\%$, 1 A max.

PA1A7: 24 V DC $\pm 5\%$, 1 A max.

Low-end cutout (speed): Programmable within 0.1 - 50 %

Encoder pulse input

Input: 1 point

Input pulse

•PA1J (RS-422)

Receiver: Conforms to RS-422

•PA1A1 (5 V open collector)

Sensing: Approx. 4 V DC @ 4.4 mA

ON/OFF level: $\geq 3\text{ k}\Omega / 3.3\text{ V}$ for OFF, $\leq 300\ \Omega / 1\text{ V}$ for ON

•PA1A4 (12 V open collector)

Sensing: Approx. 10 V DC @ 5.7 mA

ON/OFF level: $\geq 3\text{ k}\Omega / 6.5\text{ V}$ for OFF, $\leq 400\ \Omega / 1.8\text{ V}$ for ON

•PA1A7 (24 V open collector)

Sensing: Approx. 22 V DC @ 7.8 mA

ON/OFF level: $\geq 3\text{ k}\Omega / 11.5\text{ V}$ for OFF, $\leq 300\ \Omega / 2\text{ V}$ for ON

Pulse phase: A, B and Z

A and B phases are necessary to work.

Maximum input frequency

•PA1J (RS-422)

Position data: 4 MHz (quad multiplication)

Speed data: 100 kHz

•PA1Ax (Open collector)

Position data: 400 kHz (quad multiplication)

Speed data: 100 kHz

Minimum pulse width (ON and OFF)

•Phase A/B

•PA1J (RS-422)

Position data: $\geq 0.5\ \mu\text{sec}$.

Speed data: $\geq 5\ \mu\text{sec}$.

•PA1Ax (Open collector)

Position data: $\geq 5\ \mu\text{sec}$.

Speed data: $\geq 5\ \mu\text{sec}$.

•Phase Z $\geq 1\text{ msec}$

■ Reset input: Discrete input

Number of input: 1

Common: Positive common

Detecting voltage: Supplied sensor excitation voltage

Detecting current: 5.5 mA per channel (@24 V DC)

Detecting levels:

$\geq 15\text{ V DC}$ (between +24V1 and RST), $\geq 3.5\text{ mA}$ for ON

$\leq 5\text{ V DC}$ (between +24V1 and RST), $\leq 1\text{ mA}$ for OFF

Input resistance: Approx. 4.4 k Ω

ON delay time: $\leq 50\ \mu\text{sec}$.

OFF delay time: $\leq 500\ \mu\text{sec}$.

Pulse width: $\geq 50\text{ msec}$.

■ Latch input: discrete input

Number of input: 1

Common: Positive common

Detecting voltage: Supplied sensor excitation voltage

Detecting current: 5.5 mA per channel (@24 V DC)

Detecting levels:

$\geq 15\text{ V DC}$ (between +24 V1 and LCH), $\geq 3.5\text{ mA}$ for ON

$\leq 5\text{ V DC}$ (between +24 V1 and LCH), $\leq 1\text{ mA}$ for OFF

Input resistance: Approx. 4.4 k Ω

ON delay time: $\leq 10\ \mu\text{sec}$.

OFF delay time: $\leq 10\ \mu\text{sec}$.

■ Alarm Output: Open collector

Number of output: 2

Common: Negative common

Rated load voltage: 24 V DC $\pm 10\%$

Max. load current: 0.1 A per point

Voltage drop at ON: $\leq 1.2\text{ V}$

Leakage current at OFF: $\leq 1\text{ mA}$

ON delay: $\leq 50\ \mu\text{sec}$.

OFF delay: $\leq 500\ \mu\text{sec}$.

■ Command

Data type, Latch, Reset, Latch data clear, Reset data clear,

Preset and Alarm output

(For details refer to the instruction manual.)



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.

■ DATA TYPE

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
Data type	Position Speed	Position

■ POSITION DATA MODE

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
Reset value (linear counter)	Min. totaled value – Max. totaled value	0
Minimum totaled value (linear counter)	-2 100 000 000 to 2 099 999 999	-2 100 000 000
Maximum totaled value (linear counter)	-2 099 999 999 to 2 100 000 000	2 100 000 000
Count mode	Mode 0: x1 (phase A, B) Mode 1: x1 (phase A) Mode 2: x2 Mode 3: x4	Mode 3: x4
Data type	Linear counter Ring counter	Linear counter

■ SPEED DATA MODE

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
Frequency range	0 – 100 kHz 0 – 10 kHz 0 – 1 kHz 0 – 100 Hz 0 – 10 Hz 0 – 1 Hz 0 – 0.1 Hz	0 – 100 kHz
Drop out (low-end cutout)	0.10 – 25.00 (%)	0.10 (%)
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

■ ALARM

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
MECHATROLINK-III command	Valid Invalid	Invalid
Alarm Type	Not used Speed high Speed low Position high Position low	Not used
Setpoint A (position data)	Linear high setpoint: Min to [Max-1] Linear low setpoint: [Min+1] to Max	100 000 000
Setpoint B (position data)	Ring high setpoint: 0 to 4 294 967 294 Ring low setpoint: 1 to 4 294 967 295	100 000 000
Hysteresis (deadband) A (position data)	Linear: < [Max – Min] [Hi Setpoint – Hysteresis] > Min [Lo Setpoint + Hysteresis] < Max	1 000
Hysteresis (deadband) B (position data)	Ring: 0 to 4 294 967 295 [Hi Setpoint – Hysteresis] > 0 [Lo Setpoint + Hysteresis] < 4 294 967 295	1 000
Setpoint A (speed data)	-15.00 to 115.00 (%)	80.00 (%)
Setpoint B (speed data)		80.00 (%)
Hysteresis (deadband) A (speed data)	0.00 to 115.00 (%)	5.00 (%)
Hysteresis (deadband) B (speed data)		5.00 (%)
Alarm power on delay	0.0 to 60.0 sec.	5.0 sec.
Alarm on delay timer	0.0 to 60.0 sec.	0.1 sec.
Alarm on hold timer	0.0 to 60.0 sec.	0.1 sec.

■ LATCH AND RESET

PARAMETER	AVAILABLE RANGE	FACTORY SETTING
External latch	Valid Invalid command via MECHATROLINK-III	Valid
MECHATROLINK-III latch	Valid Invalid	Valid
MECHATROLINK-III latch data clear	Valid Invalid	Valid
External reset	Valid Invalid	Valid
MECHATROLINK-III reset	Valid Invalid	Valid
MECHATROLINK-III reset data clear	Valid Invalid	Valid
Z reset	Valid Invalid	Valid



TERMINAL ASSIGNMENTS

■R7G4HML3-6-PA1J (RS-422 INPUT)

10 SNSR EXC-	11 A-	12 B-	13 Z-	14 +24V1	15 GND	16 GND	17 GND	18 GND
1 SNSR EXC+	2 A+	3 B+	4 Z+	5 +24V1	6 LCH	7 RST	8 OCA	9 OCB

Pin. No.	ID	FUNCTION
1	SNSR EXC +	SENSOR EXCITATION +
2	A +	PHASE A +
3	B +	PHASE B +
4	Z +	PHASE Z +
5	+ 24V1	24V DC
6	LCH	LATCH INPUT
7	RST	RESET INPUT
8	OCA	OPEN COLLECTOR OUTPUT A
9	OCB	OPEN COLLECTOR OUTPUT B
10	SNSR EXC -	SENSOR EXCITATION -
11	A -	PHASE A -
12	B -	PHASE B -
13	Z -	PHASE Z -
14	+24V1	24V DC
15	GND	0V
16	GND	0V
17	GND	0V
18	GND	0V

■R7G4HML3-6-PA1Ax (OPEN COLLECTOR INPUT)

10 SNSR ENCDR-	11 ENCDR+	12 Z	13 V-	14 +24V1	15 GND	16 GND	17 GND	18 GND
1 SNSR EXC+	2 A	3 B	4 V+	5 +24V1	6 LCH	7 RST	8 OCA	9 OCB

Pin. No.	ID	FUNCTION
1	SNSR EXC +	SENSOR EXCITATION +
2	A	PHASE A
3	B	PHASE B
4	V +	ENCODER POWER OUTPUT +
5	+ 24V1	24V DC
6	LCH	LATCH INPUT
7	RST	RESET INPUT
8	OCA	OPEN COLLECTOR OUTPUT A
9	OCB	OPEN COLLECTOR OUTPUT B
10	SNSR/ ENCDR -	SENSOR EXCITATION - / ENCODER POWER INPUT -
11	ENCDR +	ENCODER POWER INPUT +
12	Z	PHASE Z
13	V -	ENCODER POWER OUTPUT -
14	+ 24V1	24V DC
15	GND	0V
16	GND	0V
17	GND	0V
18	GND	0V

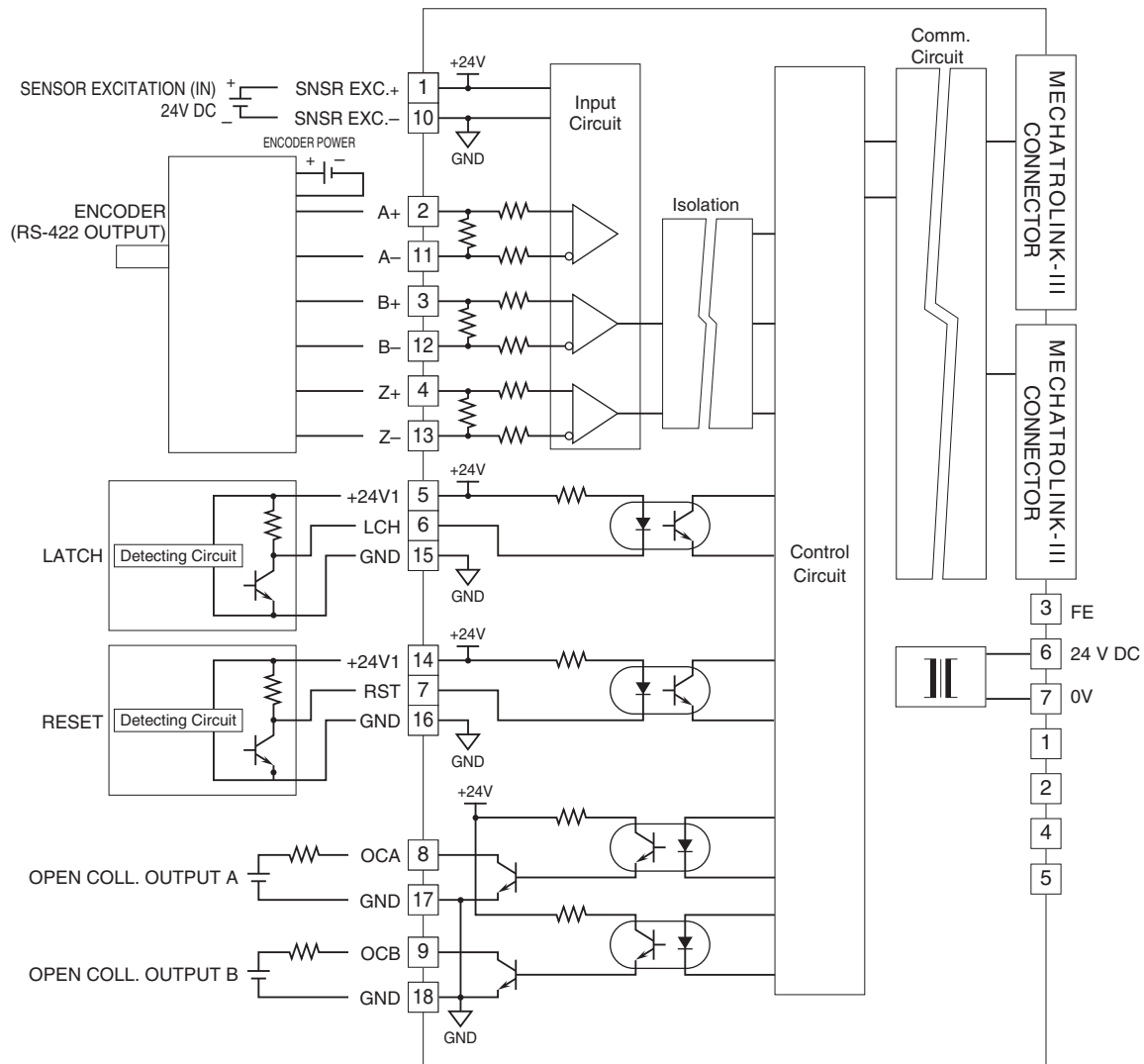


SCHEMATIC CIRCUITRY

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

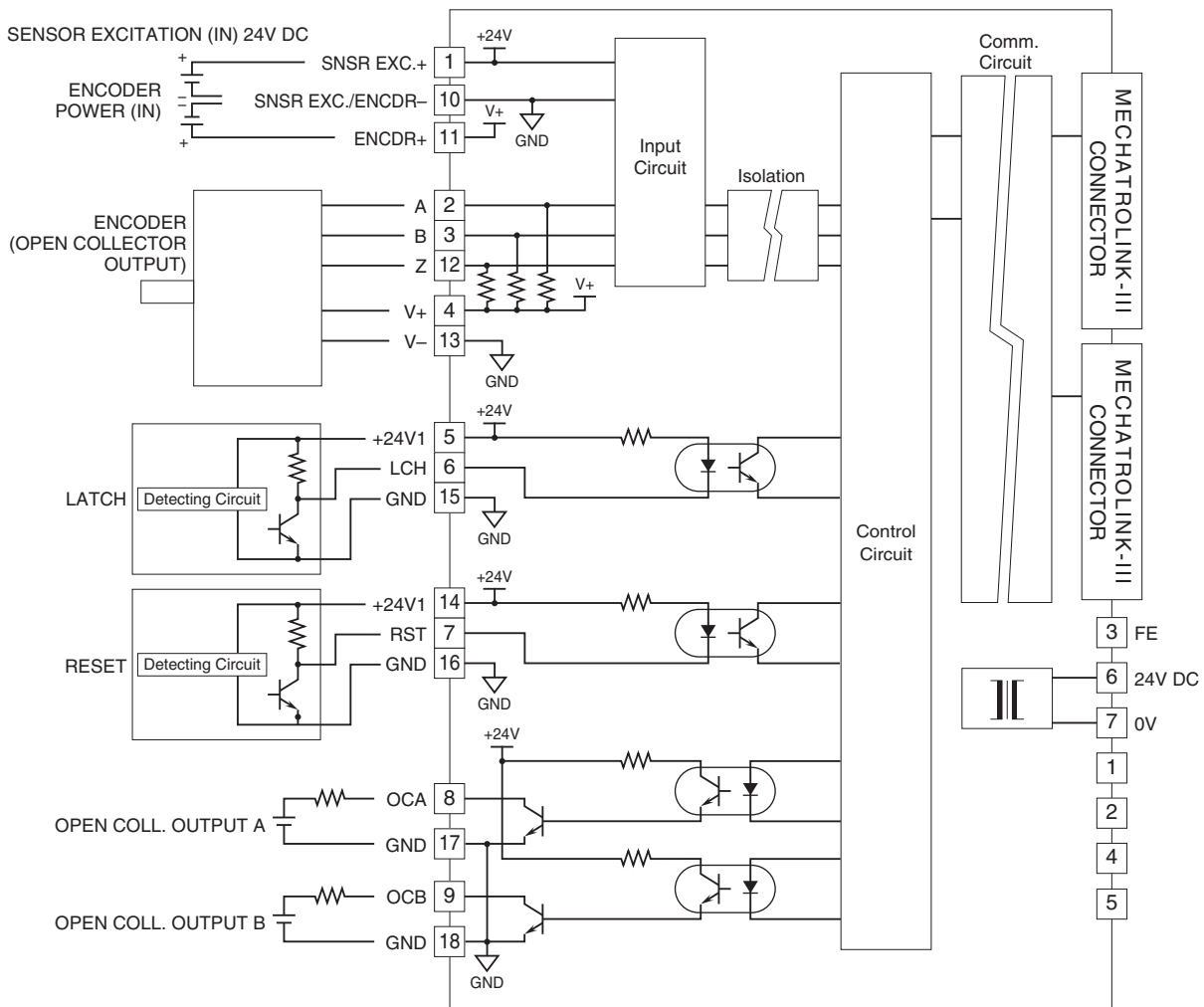
Caution: FE terminal is NOT a protective conductor terminal.

■ R7G4HML3-6-PA1J (RS-422 INPUT)



MODEL: R7G4HML3

■ R7G4HML3-6-PA1Ax (OPEN COLLECTOR INPUT)



Specifications are subject to change without notice.



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