Remote I/O R7I4D Series

EtherCAT I/O MODULE

(high-speed DC voltage input, DC current input, 4 points each, non-isolated, e-CON connector)

Functions & Features

• 4 points high-speed DC voltage input and 4 points DC current input module for EtherCAT

• Easy parameter setting of individual channels with M-System's configurator software

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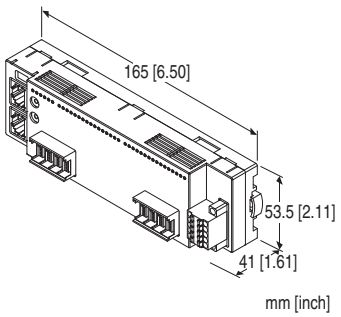


MODEL: R7I4DECT-1-SVSF8N-R[1]

ORDERING INFORMATION

• Code number: R7I4DECT-1-SVSF8N-R[1]

Specify a code from below for [1].
(e.g. R7I4DECT-1-SVSF8N-R/Q)

• Specify the specification for option code /Q
(e.g. /C01/SET)

TERMINAL BLOCK

1: Tension clamp terminal block for power supply
RJ-45 Modular jack for communication
e-CON connector for I/O

I/O TYPE

SVSF8N: DC voltage input & DC current input, high-speed, 4 points each (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 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-7779-SVSF8N)

RELATED PRODUCTS

• PC configurator software (model: R7CFG)

• ESI file

The configurator software and ESI files are downloadable at M-System's web site.

Use a commercially available Mini-B USB cable to connect the unit to a PC.

GENERAL SPECIFICATIONS

Connection

EtherCAT: RJ-45 Modular Jack

Power: Separable screwless spring terminal

Input: e-CON connector

Housing material: Flame-resistant resin (gray)

Isolation: Input to EtherCAT or FE to power

Zero adjustments: Configurable via R7CFG

Span adjustments: Configurable via R7CFG

Input range: Configurable via R7CFG

Number of times of averaging: Configurable via R7CFG

Status indicator LED: PWR, RUN, ERR, L/A IN, L/A OUT
(Refer to the instruction manual.)

EtherCAT COMMUNICATION

Standard: IEEE 802.3u

Transmission type: 100BASE-TX

Transmission speed: Full-duplex 100 Mbps

Transmission media: 100BASE-TX (STP cable; Category 5e)

Maximum internode length: 100 meters

Fixed address: Set with rotary switches
(The master must support MDP.)

INPUT SPECIFICATIONS

Input resistance: ≥ 1 MΩ (DC voltage input), 50 Ω (DC current input)

Input range

Xo to X3: -10 - +10 V DC, -5 - +5 V DC, 0 - 10 V DC, 0 - 5 V DC, 1 - 5 V DC

X4 to X7: 4 - 20 mA DC

INSTALLATION

Current consumption: Approx. 40 mA (rated current 8 A)
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: 170 g (0.37 lb)

PERFORMANCE

Conversion accuracy: ±0.1 %
Conversion rate: 2.5 msec. / 8 channels
Data range: 0 – 10000 of the input range
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Input delay time: ≤ 10 msec. (0 - 90 %)
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1500 V AC @ 1 minute
(input to EtherCAT 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.

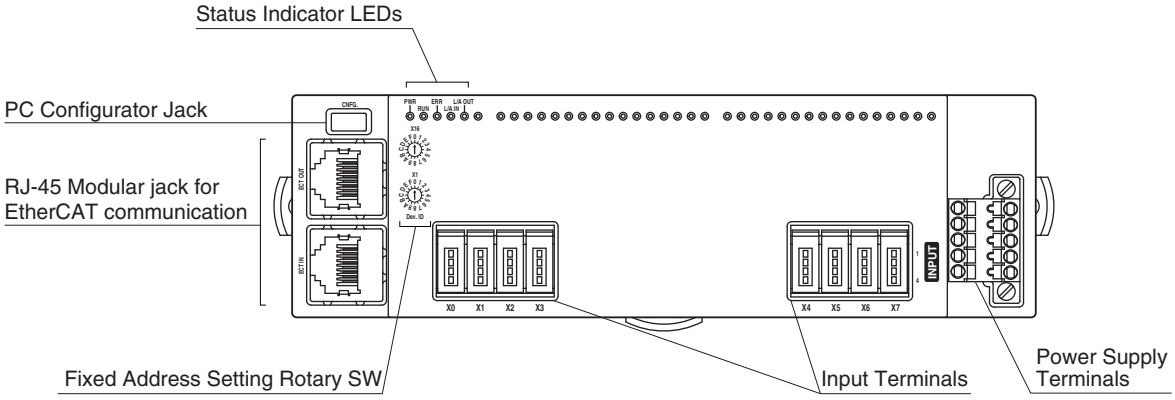
■ CHANNEL INDIVIDUAL SETTING

PARAMETER	SETTING RANGE	DEFAULT
Unused setting	CH enable, CH disable	CH enable
Input range (X0 to X3)	-10 to +10 V DC -5 to +5 V DC 0 to 10 V DC 0 to 5 V DC 1 to 5 V DC	-10 to +10 V DC
Input range (X4 to X7)	4 to 20 mA DC (fixed)	4 to 20 mA DC
Bias setting	-320.00 to +320.00 (%)	0.00 (%)
Gain setting	-3.2000 to +3.2000	1.0000
Zero scaling value	-32000 to +32000	0
Full scaling value	-32000 to +32000	10000

■ CHANNEL BATCH SETTING

PARAMETER	SETTING RANGE	DEFAULT
No. of moving average	1, 2, 4, 8, 16, 32, 64, 128	1

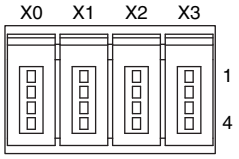
EXTERNAL VIEW

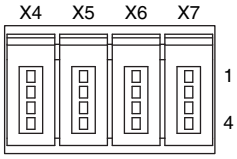


TERMINAL ASSIGNMENTS

■ INPUT TERMINAL ASSIGNMENT

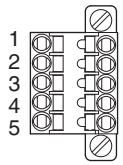
• e-CON connector
Recommended cable connector: 37104-( )-000FL (3M Company)
(The cable connector is not included in the package.
Specify wire size instead of ( ); refer to the specifications of the product.)





PIN No.		ID	FUNCTION	PIN No.		ID	FUNCTION
X0	1	NC	Unused	X4	1	NC	Unused
	2	COM	Common		2	COM	Common
	3	NC	Unused		3	NC	Unused
	4	VH0	Voltage Input 0		4	I0	Current Input 0
X1	1	NC	Unused	X5	1	NC	Unused
	2	COM	Common		2	COM	Common
	3	NC	Unused		3	NC	Unused
	4	VH1	Voltage Input 1		4	I1	Current Input 1
X2	1	NC	Unused	X6	1	NC	Unused
	2	COM	Common		2	COM	Common
	3	NC	Unused		3	NC	Unused
	4	VH2	Voltage Input 2		4	I2	Current Input 2
X3	1	NC	Unused	X7	1	NC	Unused
	2	COM	Common		2	COM	Common
	3	NC	Unused		3	NC	Unused
	4	VH3	Voltage Input 3		4	I3	Current Input 3

■ **POWER SUPPLY**
Cable connector: TFMC1,5 / 5–STF–3,5
(Phoenix Contact) (included in the package)
Applicable wire size: 0.2 – 1.5 mm²; stripped length 10 mm
Recommended solderless terminal
• AI0,25–10YE 0.25 mm² (Phoenix Contact)
• AI0,34–10TQ 0.34 mm² (Phoenix Contact)
• AI0,5–10WH 0.5 mm² (Phoenix Contact)
• AI0,75–10GY 0.75 mm² (Phoenix Contact)
• A1–10 1.0 mm² (Phoenix Contact)
• A1,5–10 1.5 mm² (Phoenix Contact)



1. PWR+ Power Supply
2. PWR– Power Supply
3. FE Functional earth
4. NC Unused
5. NC Unused

Note: The numbers marked on the connector have no relationship to the pin number of the unit.
Wire according to the instruction manual of the unit.

RESPONSE TIME

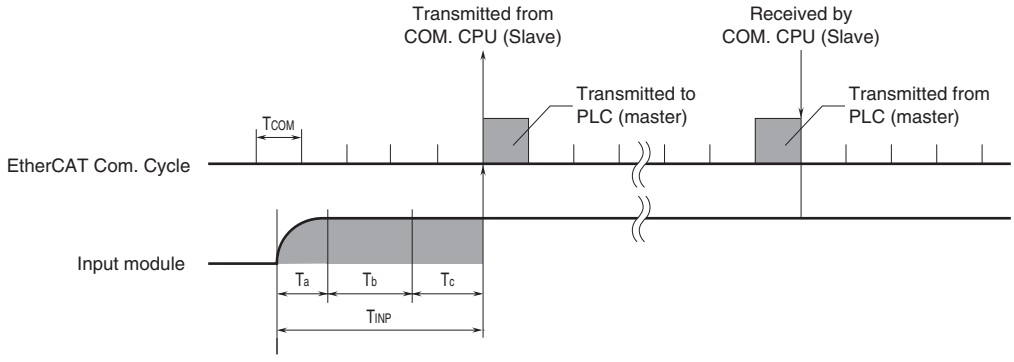
• Input module
Response time is time from when a step (0 to 100%) input signal is applied to the input module (slave) until when output from its communication CPU reaches 90% of the final value.

T_{COM}: EtherCAT communication cycle set by the host device (master)
(The cycle is determined in accordance with the system configuration and settings.)

T_{INP}: Input module response time ≤ Delay time of input circuit (Ta) + Conversion speed[*1] (Tb) + Input internal processing time (Tc) (Communication cycle x 2)

*1. Conversion speed x No. of moving averages (1 to 128)

ex.) When No. of moving averages: 1 and EtherCAT communication cycle: 1 msec.,
Input module response time (T_{INP}): Delay time of input circuit (10 msec.) + Conversion speed (2.5 msec.) x No. of moving averages (1) + Input internal processing time (1 msec. x 2) = 14.5 [msec.]

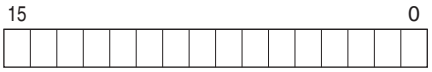


I/O DATA DESCRIPTIONS

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

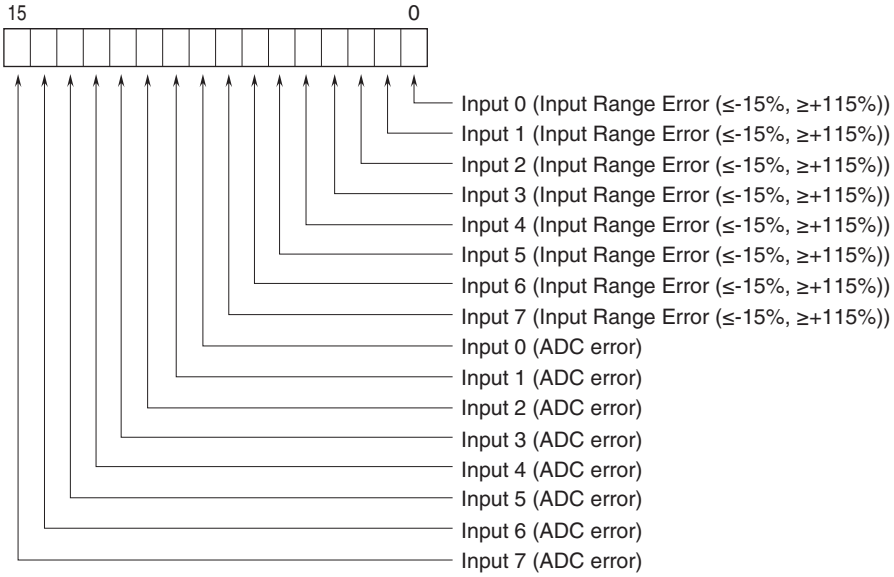
■ **ANALOG INPUT MODULE**

• Input Area Objects



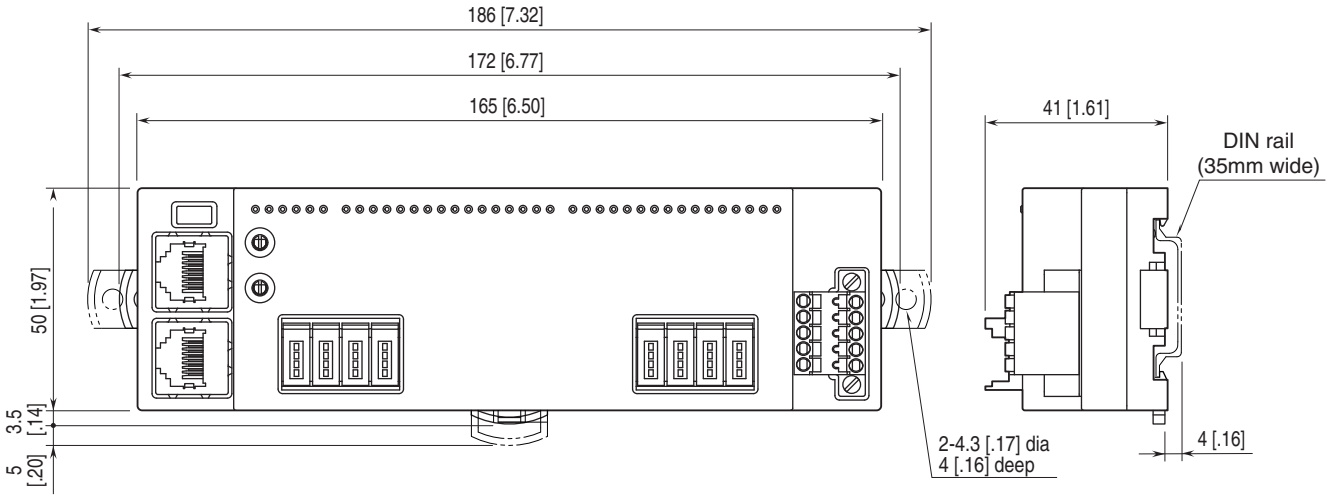
16 bit binary data
Negative values are represented by 2's complements.

■ **STATUS (Input Area Object)**

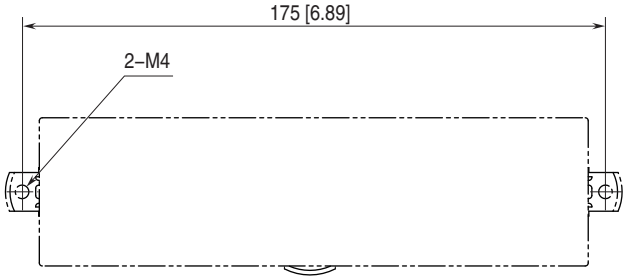


Input Range Error
0 : Normal 1 : Error
ADC error (no response from ADC)
0 : Normal 1 : Error

EXTERNAL DIMENSIONS unit: mm [inch]

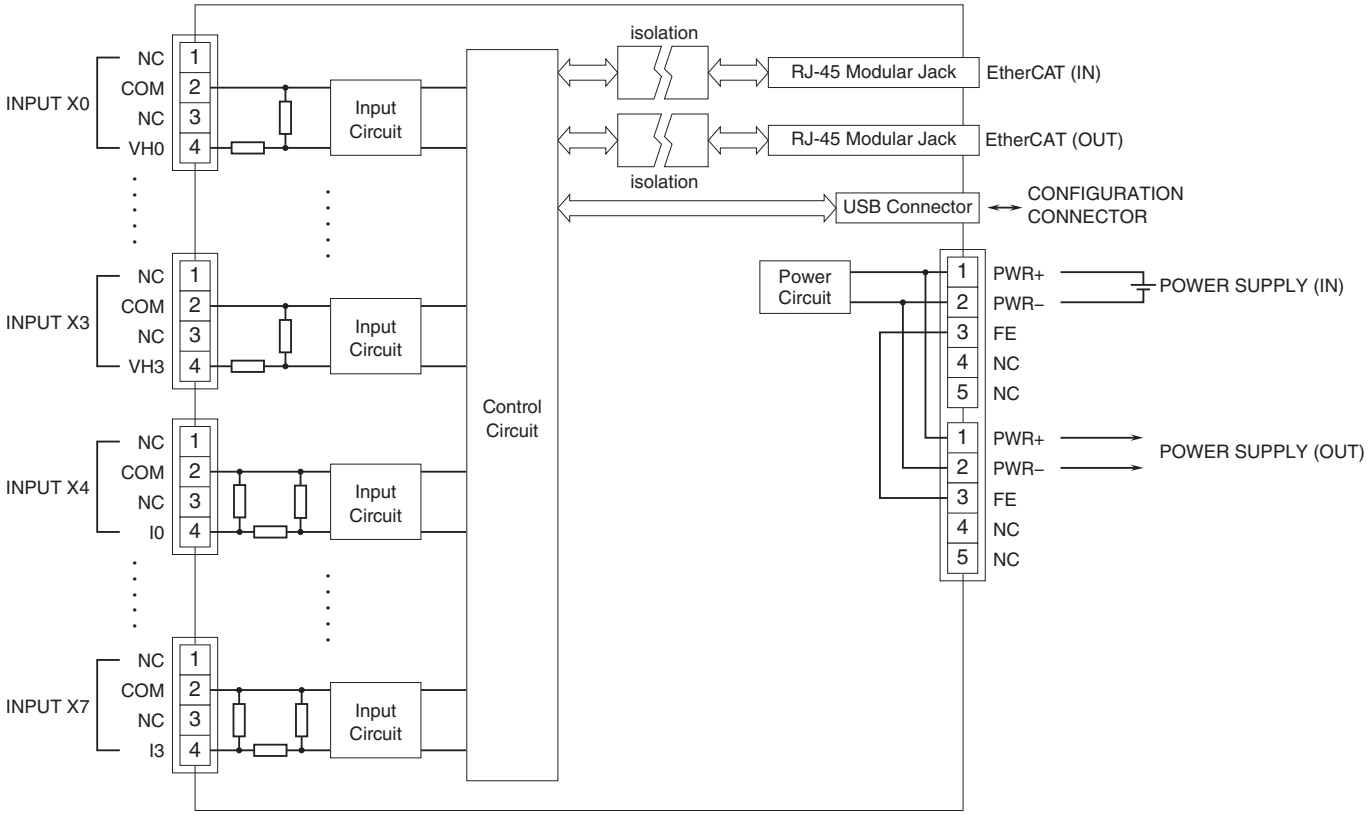


MOUNTING REQUIREMENTS unit: mm [inch]



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.



⚠ Specifications are subject to change without notice.