

Remote I/O R7I4D Series

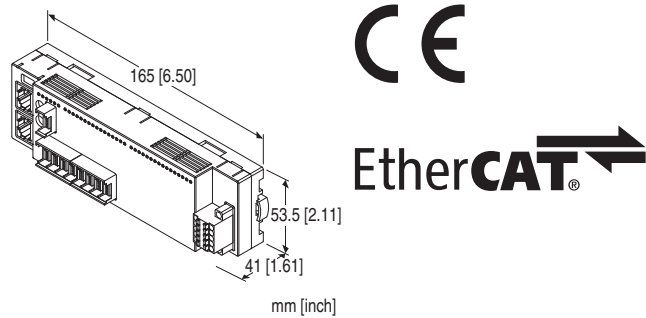
EtherCAT I/O MODULE

(high-speed totalized pulse input, 8 points, e-CON connector)

Functions and Features

- 8 points high-speed totalized pulse input module for EtherCAT

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.



MODEL: R7I4DECT-1-PA8A-R[1]

ORDERING INFORMATION

- Code number: R7I4DECT-1-PA8A-R[1]
- Specify a code from below for [1].
(e.g. R7I4DECT-1-PA8A-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

PA8A: Totalized pulse input, high-speed, 8 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 (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-PA8A)

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 & Sensor excitation: Separable screwless spring terminal

Input: e-CON connector

Housing material: Flame-resistant resin (gray)

Isolation: Input or sensor excitation to EtherCAT or FE to power

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

Pulse input status indicator LED: Green LED turns on with input ON

Reset input status indicator LED: Green LED turns on with input ON

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

Common: Positive common (NPN) per 8 points

Sensor excitation: 24 V DC \pm 10 %; ripple 5 %p-p max., \leq 5 A (including discrete input load charge); rated current 8 A

ON voltage / current: \geq 16 V DC (Input terminal to +24V) / \geq 7.2 mA

OFF voltage / current: \leq 6 V DC (Input terminal to +24V) / \leq

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2.5 mA

Input current: ≤ 11.2 mA per point at 24 V DC

Input resistance: Approx. 2 k Ω

Maximum input frequency: 10 kHz

Pulse input minimum pulse width: ≥ 20 μ sec. for both ON and OFF

Reset input minimum pulse width: ≥ 1 msec. for both ON and OFF

Accumulated pulse count: 0 - 4 294 967 295

Maximum accumulated pulse count: 1 - 4 294 967 295

Overflow reset value: 0 or 1

Count reset: Host PC/PLC or external reset

Preset pulse count: Can be set to a desired value from the host device or on PC configurator software.

INSTALLATION

Current consumption: Approx. 50 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

Insulation resistance: ≥ 100 M Ω with 500 V DC

Dielectric strength: 1500 V AC @ 1 minute
(input or sensor excitation 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.

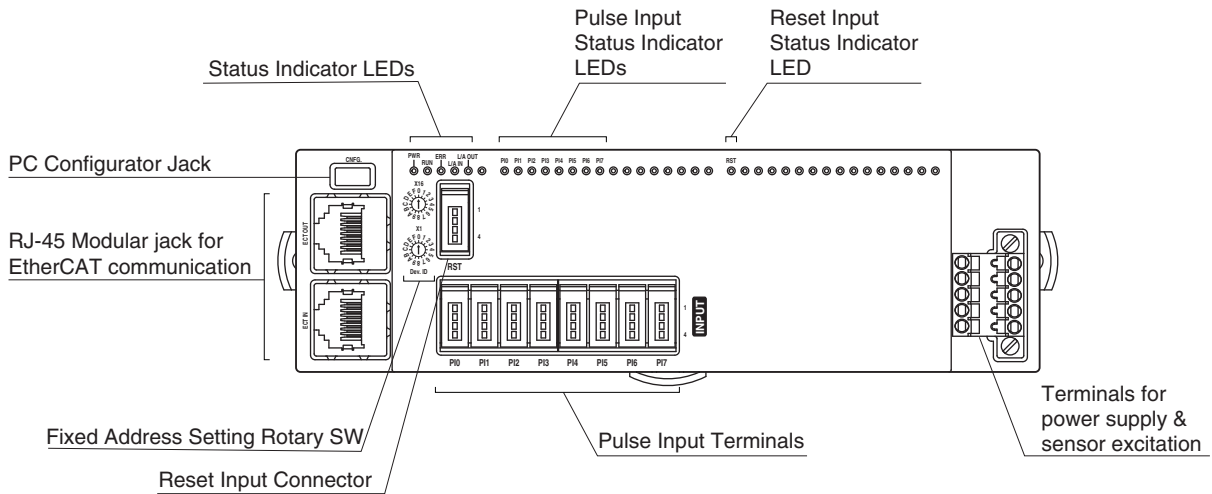
■ CHANNEL INDIVIDUAL SETTING

PARAMETER	SETTING RANGE	DEFAULT
Unused channels	Invalid (checked), Valid (unchecked)	Valid
Maximum accumulated pulse count	1 to 4294967295	4294967295
Overflow reset value	0 or 1	0
Preset pulse count	0 to max. accumulated pulse count	0

■ CHANNEL BATCH SETTING

PARAMETER	SETTING RANGE	DEFAULT
Edge direction for counting pulses	Falling edge (DI-ON) or Rising edge (DI-OFF)	Falling edge (DI-ON)
Edge direction for resetting pulse count by reset terminal	Falling edge (DI-ON) or Rising edge (DI-OFF)	Falling edge (DI-ON)
Pulse count reset by reset terminal	Enable or Disable	Disable
Pulse count reset / preset by master	Enable or Disable	Disable

EXTERNAL VIEW



TERMINAL ASSIGNMENTS

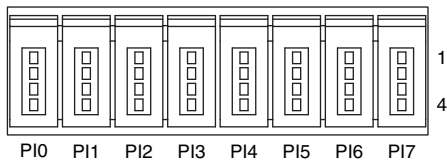
■ PULSE INPUT TERMINAL

• e-CON connector

Recommended cable connector: 37104-()-000FL (3M Company)

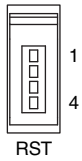
(The cable connector is not included in the package.)

Specify wire size instead of (); refer to the specifications of the product.)



PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
PI0	1	+24V 24V DC	PI4	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	PI0 Pulse Input 0		4	PI4 Pulse Input 4
PI1	1	+24V 24V DC	PI5	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	PI1 Pulse Input 1		4	PI5 Pulse Input 5
PI2	1	+24V 24V DC	PI6	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	PI2 Pulse Input 2		4	PI6 Pulse Input 6
PI3	1	+24V 24V DC	PI7	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	PI3 Pulse Input 3		4	PI7 Pulse Input 7

■ RESET INPUT TERMINAL



PIN NO.	ID	FUNCTION
RST	1	+24V 24V DC
	2	NC Unused
	3	GND 0V
	4	RST Reset Input

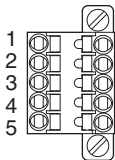
■ POWER SUPPLY, SENSOR EXCITATION

Cable connector: TFM1,5 / 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)



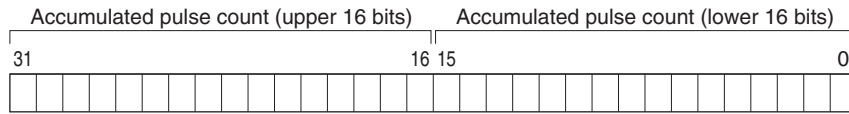
- | | |
|--------------|-------------------|
| 1. PWR+ | Power Supply |
| 2. PWR- | Power Supply |
| 3. FE | Functional earth |
| 4. SNSR.EXC+ | Sensor excitation |
| 5. SNSR.EXC- | Sensor excitation |

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.

I/O DATA DESCRIPTIONS

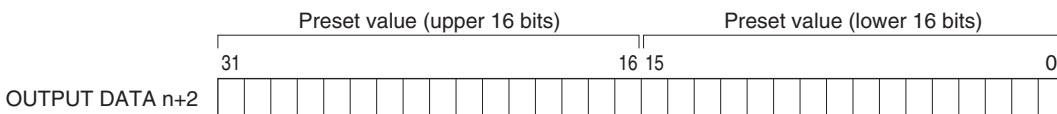
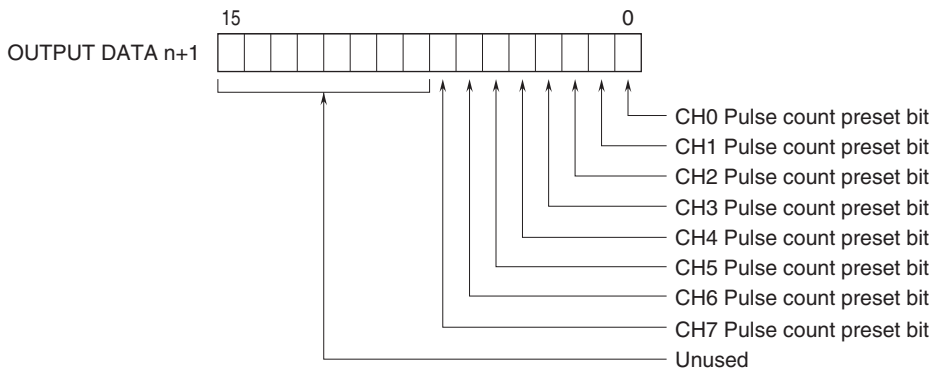
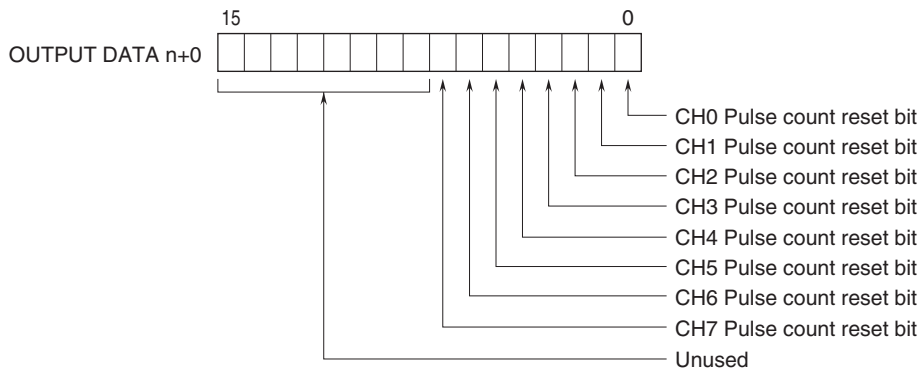
■ TOTALIZED PULSE INPUT MODULE

• Input Area Objects



32-bit binary data
When the channel is invalid, the pulse count is fixed to 0.

• Output Area Objects



■ PULSE COUNT RESET

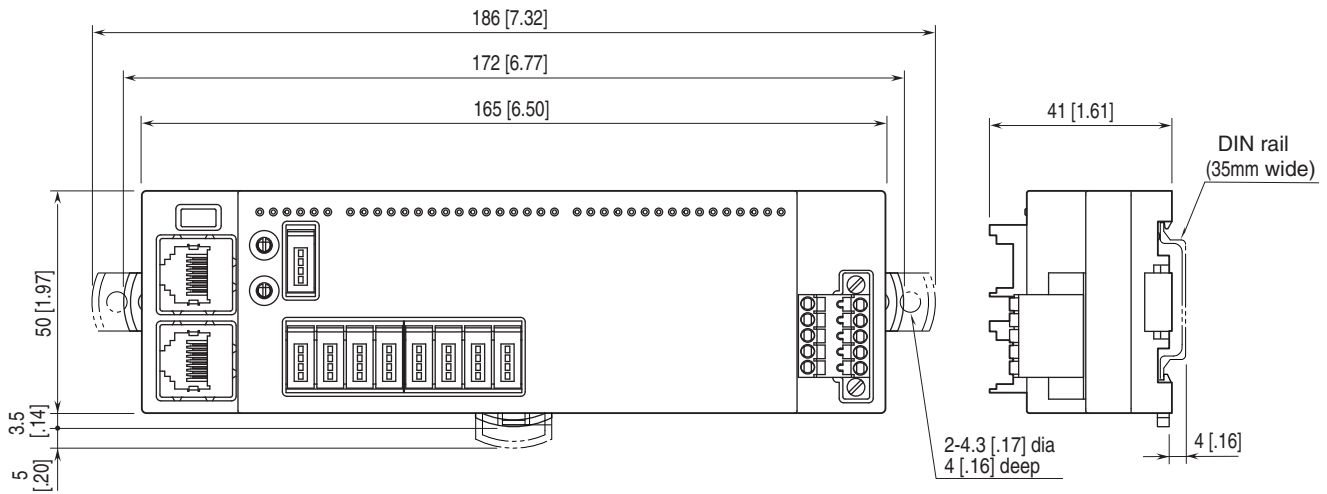
In n+0 word of the output data from host PC/PLC, the bits to reset the totalized values of the respective channels are allocated. By changing the bits from 0 to 1, the totalized values of the respective channels are reset. Confirm that the totalized values are reset, and return the bits to 0. Note that the next reset will not work if the reset bits remain at 1.

■ PULSE COUNT PRESET

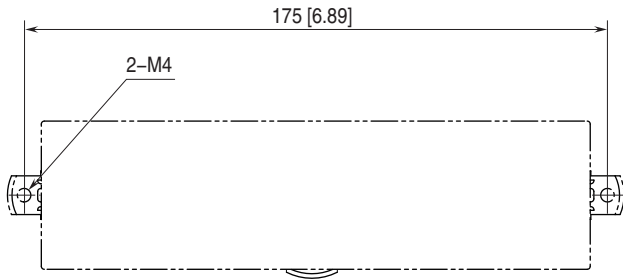
Write the desired preset values in n+2 word and n+3 word of the output data from host PC/PLC. The bits to preset the totalized values of the respective channels are allocated in n+1 word. By changing the bits from 0 to 1, the preset values are reflected to the totalized values of the respective channels. Confirm that the totalized values are preset, and return the bits to 0. Note that the next preset will not work if the preset bits remain at 1.

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EXTERNAL DIMENSIONS unit: mm [inch]



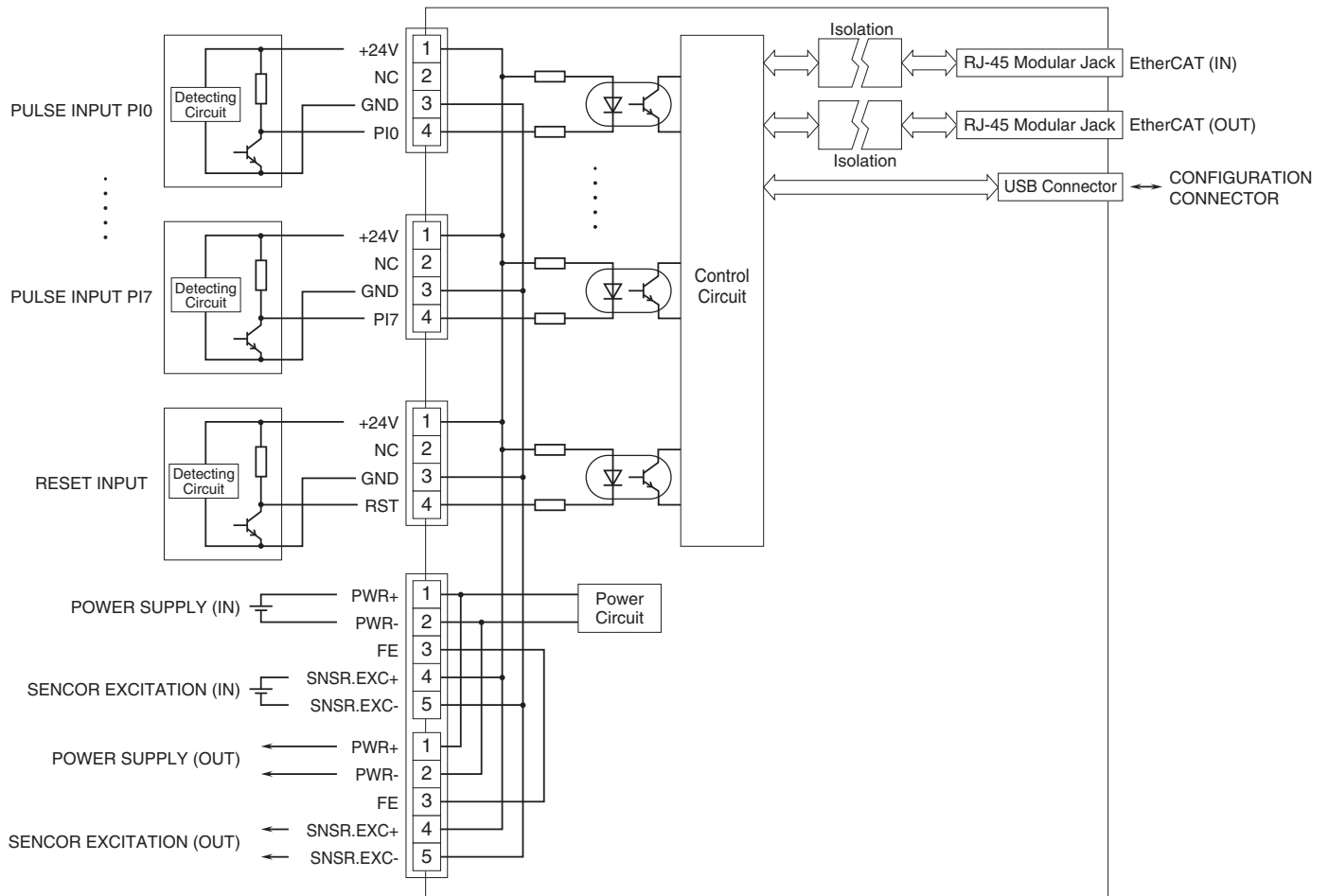
MOUNTING REQUIREMENTS unit: mm [inch]



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.