

Remote I/O R7I4D Series

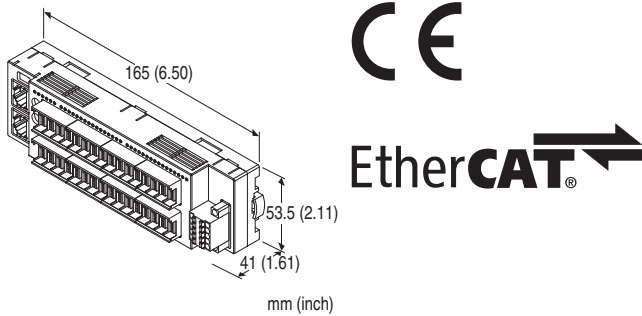
EtherCAT I/O MODULE

(NPN discrete input, 32 points, e-CON connector)

Functions & Features

- 32 points NPN discrete input module for EtherCAT

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



MODEL: R7I4DECT-1-DA32A-R[1]

ORDERING INFORMATION

- Code number: R7I4DECT-1-DA32A-R[1]
Specify a code from below for [1].
(e.g. R7I4DECT-1-DA32A-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

DA32A: NPN discrete input, 32 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-DA32)

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.)

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

Read rate: Selectable with R7CFG

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 32 points

Maximum inputs applicable at once: No limit (at 24V DC)

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 18 V DC (X0 through X1F to +24V) /
 \geq 2.0 mA

OFF voltage / current: \leq 9 V DC (X0 through X1F to +24V) /

≤ 1.0 mA

Input current: ≤ 3.0 mA per point at 24 V DC

Input resistance: Approx. 8.6 kΩ

ON delay: ≤ 0.5 msec.

OFF delay: ≤ 0.5 msec.

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: 180 g (0.40 lb)

PERFORMANCE

Insulation resistance: ≥ 100 MΩ 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

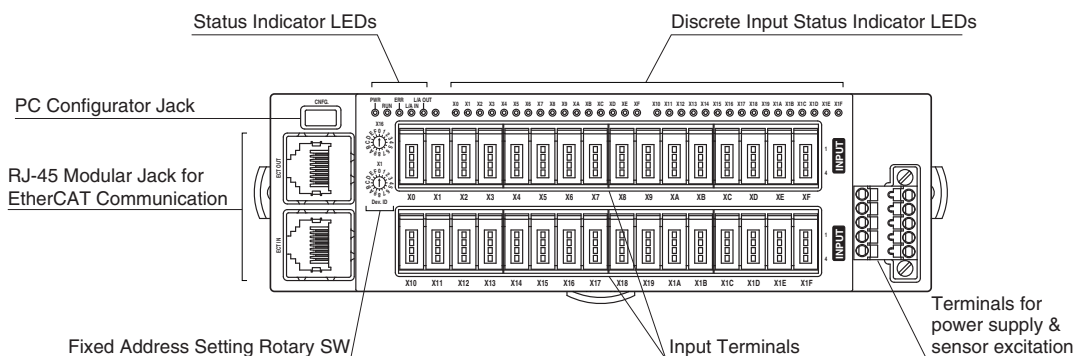
The following parameters can be set with using PC Configurator Software (model: R7CFG)

Refer to the users manual for the R7CFG for detailed operation of the software program.

■ CHANNEL BATCH SETTING

PARAMETER	SETTING RANGE	DEFAULT
Read cycle	1 msec., 5 msec., 10 msec., 20 msec., 50 msec., 70 msec., 100 msec., 200 msec.	10 msec.

EXTERNAL VIEW



TERMINAL ASSIGNMENTS

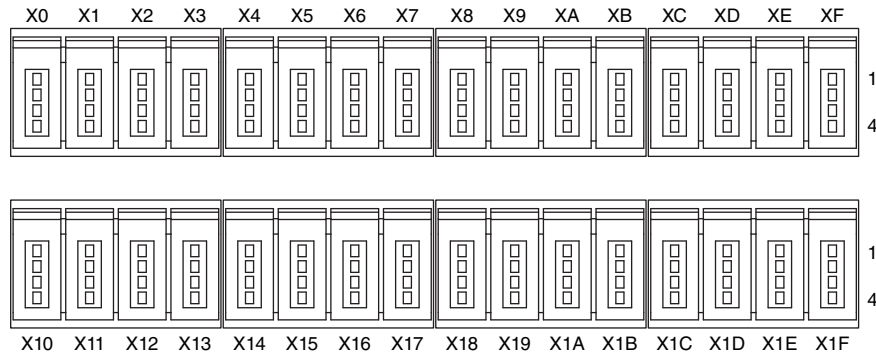
■ INPUT TERMINAL ASSIGNMENT

• 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	+24V 24V DC	X8	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X0 Input 0		4	X8 Input 8
X1	1	+24V 24V DC	X9	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X1 Input 1		4	X9 Input 9
X2	1	+24V 24V DC	XA	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X2 Input 2		4	XA Input 10
X3	1	+24V 24V DC	XB	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X3 Input 3		4	XB Input 11
X4	1	+24V 24V DC	XC	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X4 Input 4		4	XC Input 12
X5	1	+24V 24V DC	XD	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X5 Input 5		4	XD Input 13
X6	1	+24V 24V DC	XE	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X6 Input 6		4	XE Input 14
X7	1	+24V 24V DC	XF	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X7 Input 7		4	XF Input 15

PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
X10	1	+24V 24V DC	X18	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X10 Input 16		4	X18 Input 24
X11	1	+24V 24V DC	X19	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X11 Input 17		4	X19 Input 25
X12	1	+24V 24V DC	X1A	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X12 Input 18		4	X1A Input 26
X13	1	+24V 24V DC	X1B	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X13 Input 19		4	X1B Input 27
X14	1	+24V 24V DC	X1C	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X14 Input 20		4	X1C Input 28
X15	1	+24V 24V DC	X1D	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X15 Input 21		4	X1D Input 29
X16	1	+24V 24V DC	X1E	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X16 Input 22		4	X1E Input 30
X17	1	+24V 24V DC	X1F	1	+24V 24V DC
	2	NC Unused		2	NC Unused
	3	GND 0V		3	GND 0V
	4	X17 Input 23		4	X1F Input 31

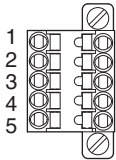
■ POWER SUPPLY, SENSOR EXCITATION

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. 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.

RESPONSE TIME

- Input module

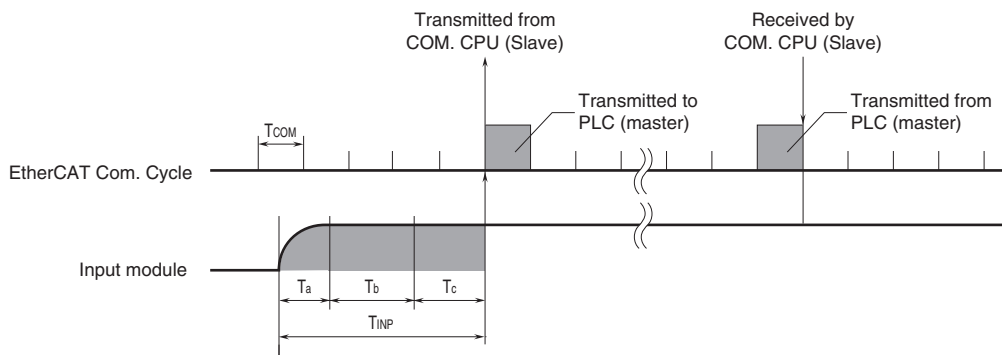
Response time is time from when a step (0 to 100%) input signal is applied to the input module (slave) until when output from its communication CPU reaches 90% of the final value.

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 \leq Delay time of input circuit (T_a) + read cycle (T_b) + Input internal processing time (T_c)
(Communication cycle x 2)

ex.) When EtherCAT communication cycle: 1 msec.,

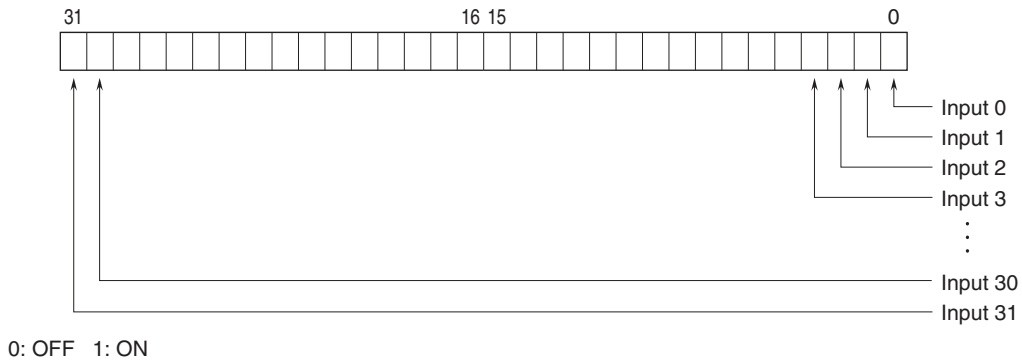
Input module response time (T_{INP}): Delay time of input circuit (0.5 msec.) + Read time (1 msec.) + Input internal processing time (1 msec. x 2) = 3.5 [msec.]



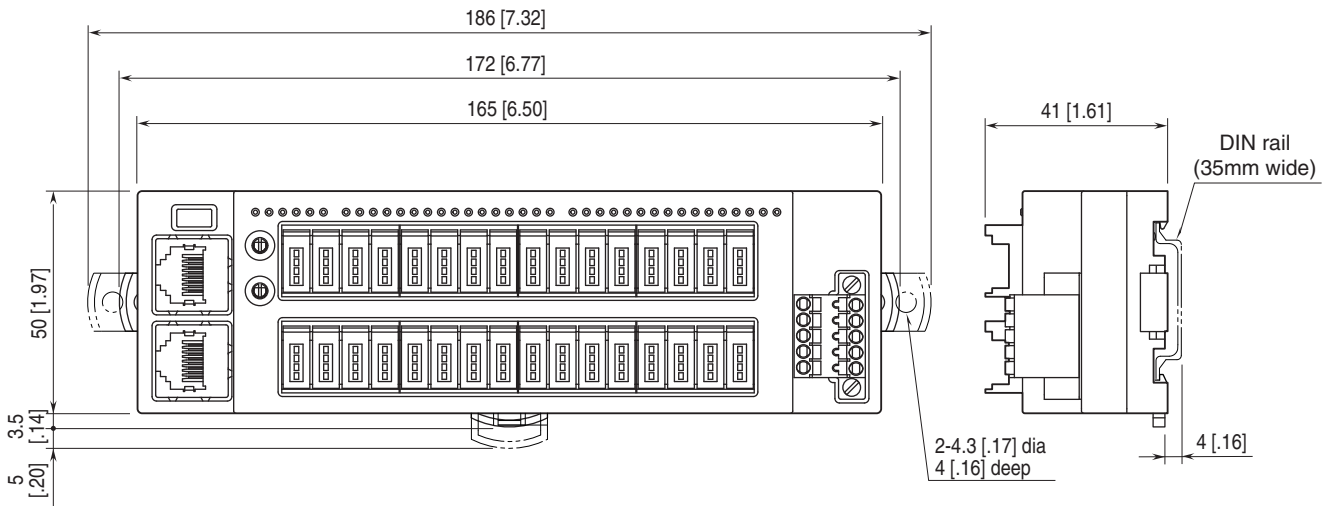
I/O DATA DESCRIPTIONS

■ DESCRETE INPUT MODEULE

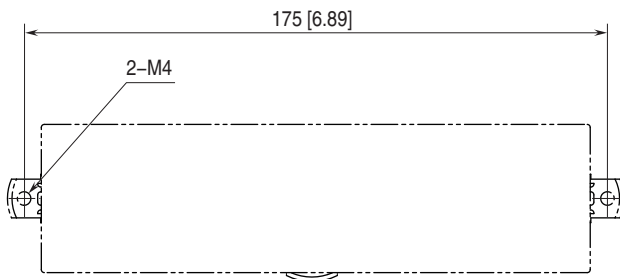
• Input Area Objects



EXTERNAL DIMENSIONS unit: mm [inch]



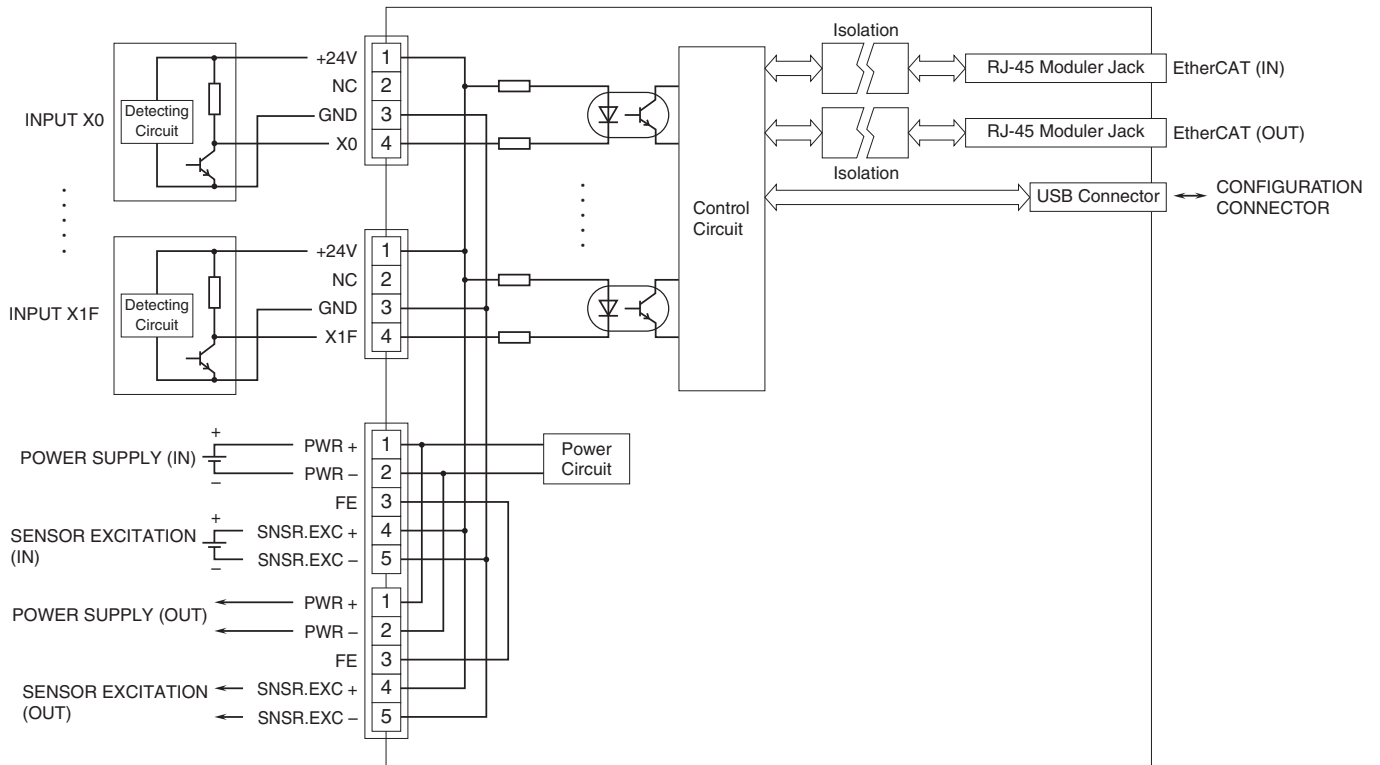
MOUNTING REQUIREMENTS unit: mm [inch]



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.