

## Remote I/O R7I4D Series

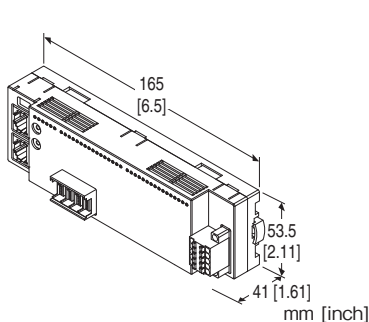
### EtherCAT I/O MODULE

(high-speed DC voltage output, 4 points, e-CON connector)

#### Functions & Features

- 4 points high-speed DC voltage output module for EtherCAT
- Easy parameter setting of individual channels with M-System's configurator software

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



**EtherCAT**®

### MODEL: R7I4DECT-1-YVF4-R[1]

#### ORDERING INFORMATION

- Code number: R7I4DECT-1-YVF4-R[1]  
Specify a code from below for [1].  
(e.g. R7I4DECT-1-YVF4-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

YVF4: DC voltage output, high-speed, 4 points

#### 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-YVF4)

#### 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

**Output:** e-CON connector

**Housing material:** Flame-resistant resin (gray)

**Isolation:** Output 0 to output 1 to output 2 to output 3 to EtherCAT or FE to power

**Zero adjustments:** Configurable via R7CFG

**Span adjustments:** Configurable via R7CFG

**Output range:** Configurable via R7CFG

**Output at the loss of communication:** Configurable via R7CFG

**Output reset value:** 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.)

#### OUTPUT SPECIFICATIONS

##### ■ Narrow Span voltage

**Output range:** -1 - +1 V DC, 0 - 1 V DC, -0.5 - +0.5 V DC

Load resistance: 100 kΩ min.

■ **Wide Span voltage**

Output range: -10 - +10 V DC, -5 - +5 V DC, 0 - 10 V DC, 0 - 5 V DC, 1 - 5 V DC

Load resistance: 100 kΩ min.

■ **Operational range**

Except -10 to +10 V DC: -15 to +115 % of output range

-10 to +10 V DC: Approx. -11.5 to +11.5 V DC

## INSTALLATION

**Current consumption**

•DC at 24 V DC: ≤ 70 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: 160 g (0.35 lb)

## PERFORMANCE

Conversion accuracy: ±0.1 %

Conversion rate: 200 μsec. per 4 channels

Data range: 0 - 10000 of the output range

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

Output delay time: ≤ 250 μsec. (0 - 90 %)

Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength: 1500 V AC @ 1 minute

(Output 0 to output 1 to output 2 to output 3 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
Output range	-10 to +10V DC -5 to +5V DC -1 to +1V DC 0 to 10V DC 0 to 5V DC 1 to 5V DC 0 to 1V DC -0.5 to +0.5V DC	-10 to +10V DC
Bias setting	-320.00 to +320.00 (%)	0.00 (%)
Gain setting	-3.2000 to +3.2000	1.0000
Zero scaling value	-32,000 to +32,000	0
Full scaling value	-32,000 to +32,000	10,000
Output reset value*1	-15.00 to +115.00 (%)	-15.00 (%)

■ **CHANNEL BATCH SETTING**

PARAMETER	SETTING RANGE	DEFAULT
Output at communication error	Output hold Output clear	Output hold

\*1. When output range is -10 to +10 V DC, approx. -115 V DC at approx. -7.5 to -15% and approx. +11.5 V DC at approx. 107.5 to 115% are outputted respectively.



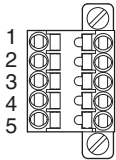
## ■ POWER SUPPLY

**Cable connector:** TFMC1,5 / 5-STF-3,5  
(Phoenix Contact) (included in the package)

**Applicable wire size:** 0.2 – 1.5 mm<sup>2</sup>; stripped length 10 mm

### Recommended solderless terminal

- AI0,25–10YE 0.25 mm<sup>2</sup> (Phoenix Contact)
- AI0,34–10TQ 0.34 mm<sup>2</sup> (Phoenix Contact)
- AI0,5–10WH 0.5 mm<sup>2</sup> (Phoenix Contact)
- AI0,75–10GY 0.75 mm<sup>2</sup> (Phoenix Contact)
- A1–10 1.0 mm<sup>2</sup> (Phoenix Contact)
- A1,5–10 1.5 mm<sup>2</sup> (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

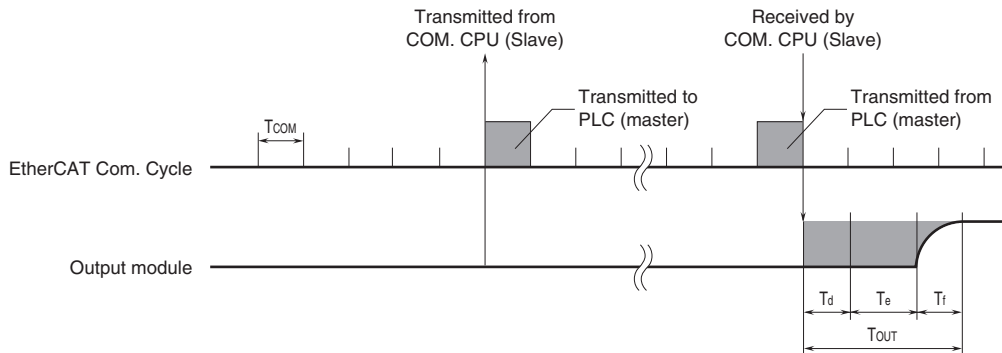
- Output module

Response time is time from when a step (0 to 100%) output signal is received by the communication CPU of the output module (slave) until when its output 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.)

$T_{OUT}$ : Output module response time  $\leq$  Delay time of output internal processing ( $T_d$ ) (communication cycle  $\times$  1) + conversion rate ( $T_e$ ) + Delay time of output circuit ( $T_f$ )

ex.) When EtherCAT communication cycle: 1 msec. and delay time of output: ON,  
Output module response time( $T_{OUT}$ ): Delay time of output internal processing (1 msec.) (communication cycle  $\times$  1) + 0.2 msec.  
+ Delay time of output circuit (0.25 msec.) = 1.45 [msec.]



## I/O DATA DESCRIPTIONS

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

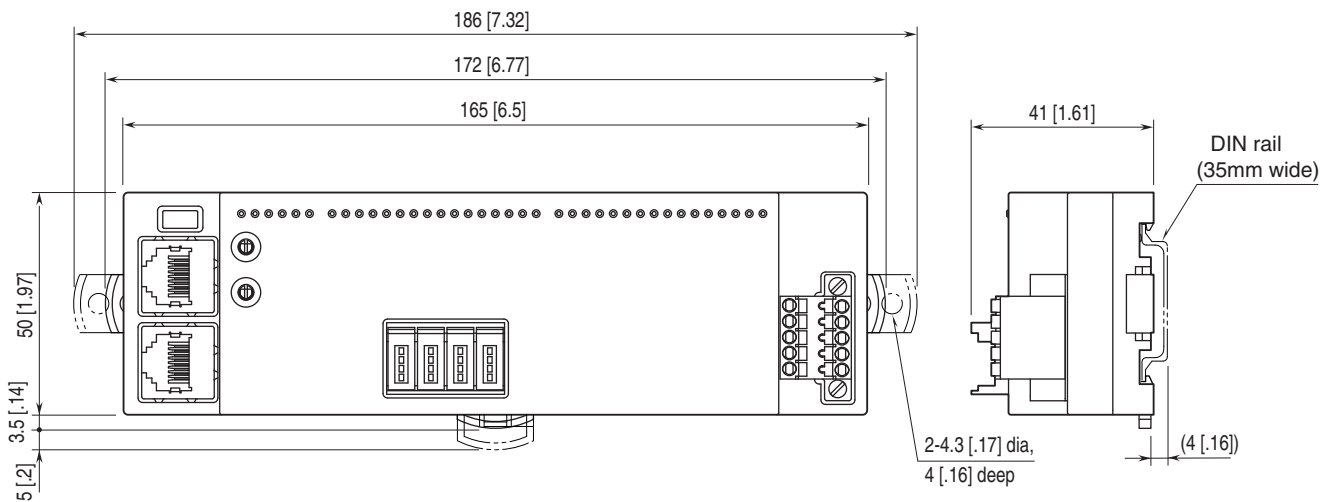
### ■ ANALOG OUTPUT MODULE

- Output Area Objects

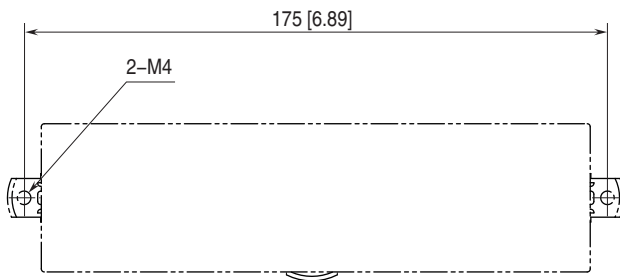


Data is represented in 16-bit binary.  
Negative value is represented in 2's complements.

## EXTERNAL DIMENSIONS unit: mm [inch]



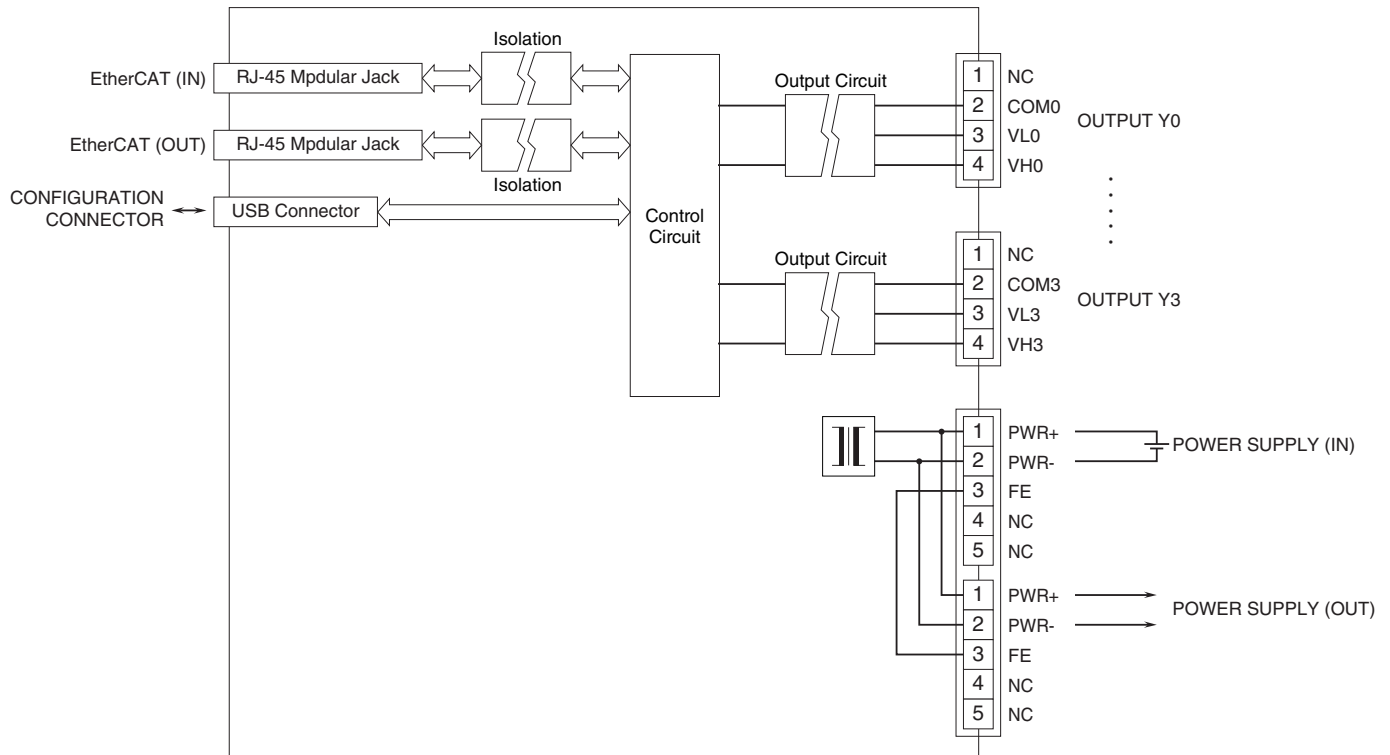
## MOUNTING REQUIREMENTS unit: mm [inch]



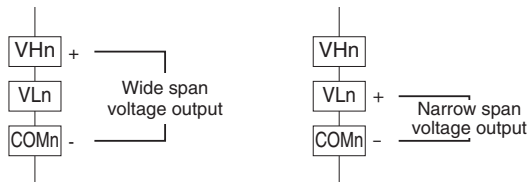
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

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

Caution: FE terminal is NOT a protective conductor terminal.



### ■ OUTPUT CONNECTION EXAMPLES



Specifications are subject to change without notice.