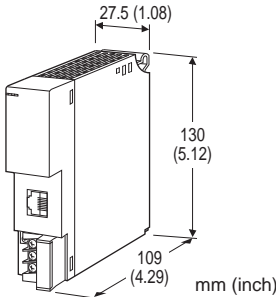


ETHERNET INTERFACE MODULE

(Modbus/TCP, use with TR30)

Functions & Features

· Ethernet interface module (Modbus/TCP) dedicated to TR30. Using combination with remote I/O R3 Series.



MODEL: TR3EX-R

ORDERING INFORMATION

Code number: TR3EX-R

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage 24 V \pm 10 %, ripple 10 %p-p max.) *

* Not selectable for use with independent power modules.
Not selectable for dual network.

RELATED PRODUCTS

- Remote I/O R3 series
- PC configurator software (model: R3CON)

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

Connection

Ethernet: RJ-45 Modular Jack

Internal bus or internal power: Via the Installation Base (model: R3-BSx)

Power input, RUN contact output: M3 screw terminal (torque 0.5 N·m)

Screw terminal: Nickel-plated steel

Isolation: Ethernet to internal bus or internal power to power supply to RUN contact output to FG

Input error data: Input value setting at input module error with side DIP SW

Main/Sub setting: Set with the side DIP switch

Slot assignment: Set with the side DIP switch

RUN indicator: Bi-color (green/red) LED; green in normal communications; red when receiving (Function selected with DIP SW)

ERR indicator: Bi-color (green/red) LED; the green ON/ blinks in communication errors; red when transmitting (Function selected with DIP SW)

■ RUN CONTACT OUTPUT

RUN contact: Turns ON while the green RUN LED is ON (Ethernet in normal communication).

Rated load: 250 V AC @ 0.5 A (cos ϕ = 1)

30 V DC @ 0.5 A (resistive load)

(Max. 50 V AC to conform with EU Directive)

Maximum switching voltage: 250 V AC or 30 V DC

Maximum switching power: 250 VA or 150 W

Minimum load: 1 V DC @ 1 mA

Mechanical life: 2×10^7 cycles (300 cycles/min.)

When driving an inductive load, external contact protection and noise quenching recommended.

ETHERNET COMMUNICATION

Communication Standard: IEEE 802.3u

Transmission: 10BASE-T, 100BASE-TX

Baud rate: 10/100 Mbps (Auto Negotiation function)

Protocol: Modbus/TCP

Data: RTU (Binary)

Max. number of socket connections: 2

Transmission media: 10BASE-T (STP, Category 5) 100BASE-TX (STP, Category 5e)

Max. length of fieldbus segment: 100 meters

Ethernet indicator LED: LINK, DPLX, LINK10, LINK100, COL

IP address: 192.168.0.1 (factory setting);

Selectable with PC Configurator Software (model: R3CON)

Port No.: 502

INSTALLATION

Power consumption

•DC: Approx. 12 W

Output current: 250 mA continuous at 20 V DC; 400 mA for 10 minutes

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: Installation Base (model: R3-BSx)

Weight: 200 g (0.44 lb)

PERFORMANCE

Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC

Dielectric strength: 1500 V AC @ 1 minute (Ethernet to internal bus or internal power to power input to RUN contact output to FG)

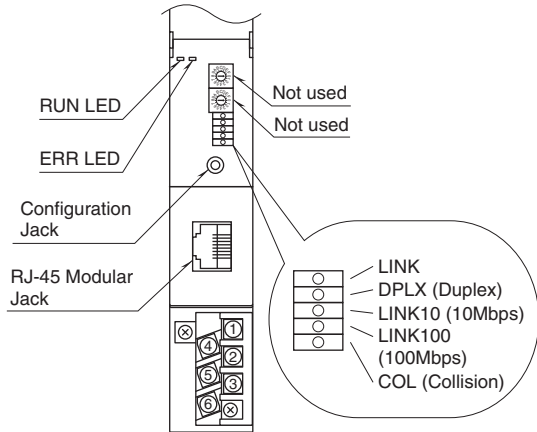
STANDARDS & APPROVALS

EU conformity:

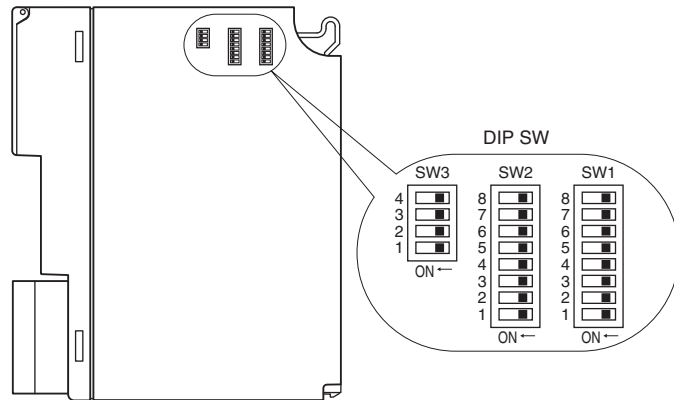
- EMC Directive
- EMI EN 61000-6-4
- EMS EN 61000-6-2
- RoHS Directive
- EN 50581

EXTERNAL VIEW

■ FRONT VIEW



■ SIDE VIEW



MODBUS I/O ASSIGNMENT

	ADDRESS	DATA TYPE	DATA
Coil (0X)	1 – 1024		Digital Output (discrete output)
Inputs (1X)	1 – 1024		Digital Input (discrete input)
	1025 – 1040		Module Status
	1041 – 1056		Error Status
	1057 – 1072		Data Error Status
Input Registers (3X)	1 – 256	I	Analog Input
	257 – 768	F	Analog Input
Holding Registers (4X)	1 – 256	I	Analog Output
	257 – 768	F	Analog Output

I: Integer, 0 – 10000 (0 – 100%)

F: Floating (32-bit data cannot be accessed using floating addresses.)

Note: DO NOT access addresses other than mentioned above. Such access may cause problems such as inadequate operation.

• Module Status indicates whether individual I/O module are mounted or not. The bit corresponding to the mounted slots turns to “1,” and the unmounted slots to “0.”

• Error Status indicates error status for each module as described below. The bit corresponding to such modules turns to “1.”

- R3-TSx, R3-RSx, R3-US4: Input burnout
- R3-DA16A: Power input in error or disconnected
- R3-YSx: Output current error (e.g. load unconnected)

• Data Error Status indicates overrange (R3-US4: out of -10% to +110%; the other types: out of -15% to +115%) status for each module. The bit corresponding to such modules turns to “1.”

TRANSMISSION DATA DESCRIPTIONS

The DIP SW located at the side of the module specifies each I/O module's data allocation (occupied data area).
For example, when the data areas are assigned as shown below:

Module 1	4
Module 2	4
Module 3	4
Module 4	1
Module 5	1
Module 6	1
Module 7	1

Then the I/O data are assigned as in the table below:

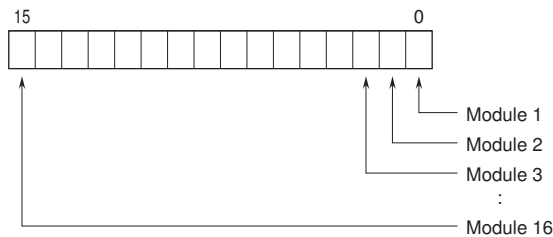
	ADDRESS	POSITION
Input Registers (3X)	1 – 4, 257 – 264	Slot 1
Holding Registers (4X)	5 – 8, 265 – 272	Slot 2
	9 – 12, 273 – 280	Slot 3
	13, 281 – 282	Slot 4
	14, 283 – 284	Slot 5
	15, 285 – 286	Slot 6
	16, 287 – 288	Slot 7

	ADDRESS	POSITION
Coil (0X) Inputs (1X)	1 – 64	Slot 1
	65 – 128	Slot 2
	129 – 192	Slot 3
	193 – 208	Slot 4
	209 – 224	Slot 5
	225 – 240	Slot 6
	241 – 256	Slot 7

For Coil (0X) and Inputs (1X), addresses 16 times assigned data areas (Data Allocation Type) are allotted with the Data Allocation Type '1' and '4.' With '8' and '16,' 64 (4 × 16) are automatically assigned.

MODULE STATUS, ERROR STATUS, DATA ERROR STATUS

Shows each module's availability and error status.



I/O DATA DESCRIPTIONS

The data allocations for typical I/O modules are shown below.

Refer to the manual for each module for detailed data allocations.

■ ANALOG DATA (models: R3-SV4, YV4, DS4, YS4, US4, etc.)

16-bit binary data.

Basically, 0 to 100% of the selected I/O range is converted into 0 to 10000 (binary). Negative percentage is represented in 2's complements.



■ TEMPERATURE DATA (models: R3-RS4, TS4, US4, etc.)

16-bit binary data.

With °C temperature unit, raw data is multiplied by 10. For example, 25.5°C is converted into 255.

With °F temperature unit, the integer section of raw data is directly converted into the data.

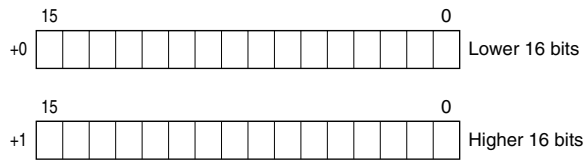
For example, 135.4°F is converted into 135.

Minus temperature is converted into negative values, represented in 2's complements.



■ ACCUMULATED COUNT DATA (32-bit data, models: R3-PA2, PA4A, WT1, WT4, etc.)

32-bit binary data is used for accumulated counts and encoder positions.
 Lower 16 bits are allocated from the lowest address to higher ones, higher 16 bits in turn.
 32-bit data cannot be accessed using floating addresses.

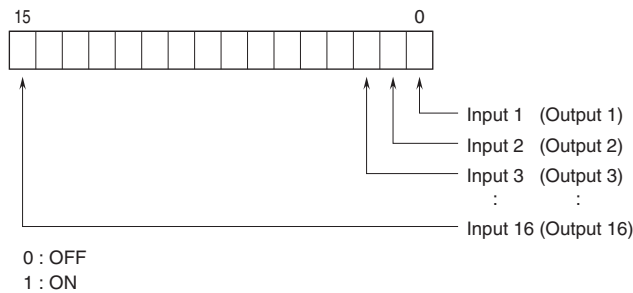


■ BCD DATA (32-bit data, models: R3-BA32A, BC32A, etc.)

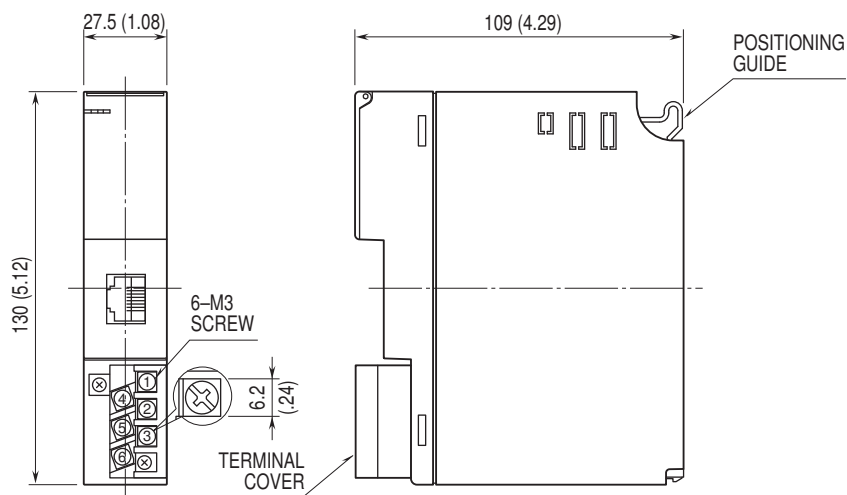
32-bit binary data is used for BCD.
 Lower 16 bits are allocated from the lowest address to higher ones, higher 16 bits in turn.
 32-bit data cannot be accessed using floating addresses.



■ 16-POINT DISCRETE DATA (models: R3-DA16, DC16, etc.)



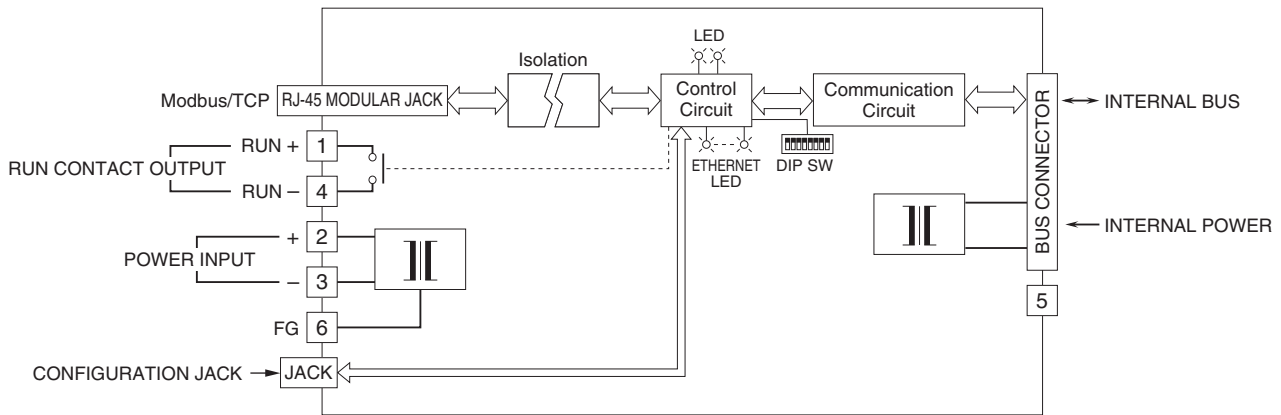
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

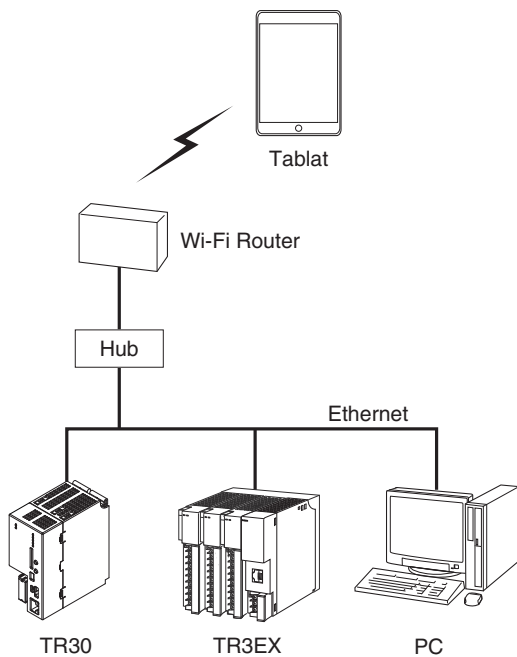
Note: In order to improve EMC performance, bond the FG terminal to ground.

Caution: FG terminal is NOT a protective conductor terminal.



SYSTEM CONFIGURATION EXAMPLES

■ VIA LOCAL NETWORK (LAN)



Specifications are subject to change without notice.