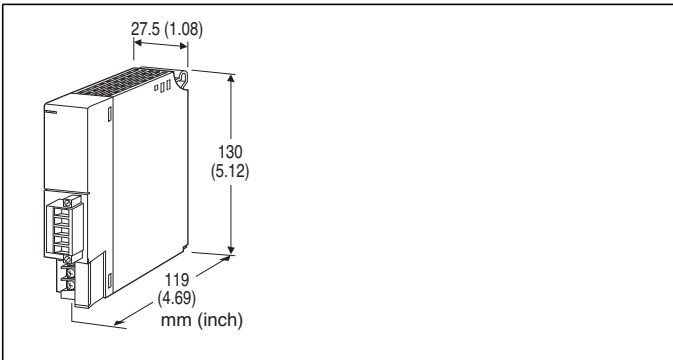


## Remote I/O R3 Series

### T-Link INTERFACE MODULE

(Fuji Electric T-Link use)



### MODEL: R3-NF1-[1][2]

### ORDERING INFORMATION

- Code number: R3-NF1-[1][2]
- Specify a code from below for each of [1] and [2].  
(e.g. R3-NF1-R/Q)
- Specify the specification for option code /Q  
(e.g. /C01/SET)

### [1] POWER INPUT

**N:** No power supply

#### AC Power

**K3:** 100 - 120 V AC

(Operational voltage range 85 - 132 V, 47 - 66 Hz) \*

**L3:** 200 - 240 V AC

(Operational voltage range 170 - 264 V, 47 - 66 Hz) \*

#### DC Power

**R:** 24 V DC

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

\* Not selectable for use with independent power modules or network modules with the internal power input options.

### [2] OPTIONS

**blank:** none

**/Q:** With options (specify the specification)

### SPECIFICATIONS OF OPTION: Q

**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-8429)

### GENERAL SPECIFICATIONS

#### Connection

**T-Link:** Euro type connector terminal (applicable wire size: 0.2 to 2.5 mm<sup>2</sup>, stripped length 7 mm)

**Internal bus:** Via the Installation Base  
(model: R3-BSx)

**Internal power:** Via the Installation Base (model: R3-BSx)

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

**Screw terminal:** Nickel-plated steel

**Isolation:** T-Link to internal bus or internal power to power input to RUN contact output to FG

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

**Dual communication setting:** Set with the side DIP switch

**Data allocation setting:** Set with the side DIP switch

**Status data setting:** WITHOUT / WITH (side DIP SW)

(Not available with firmware version earlier than 1.02)

**I/O points setting:** 4, 8, 16, 64 (front DIP SW)

**I/O type setting:** Input only, output only, input/output mixed (front DIP SW)

**RUN indicator:** Bi-color (green/red) LED; Green ON in normal communication; Red ON when receiving data (Function selected with DIP SW)

**ERR indicator:** Bi-color (green/red) LED;

Green ON or blinking at communication error (Blinking with setting errors); Red ON at transmitting data (Function selected with DIP SW)

#### ■ RUN CONTACT OUTPUT

**RUN contact:** Turns ON while the green RUN LED is ON (T-Link in normal communication).

**Rated load:** 250 V AC @ 0.5 A (cos  $\phi$  = 1)

30 V DC @ 0.5 A (resistive load)

**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:**  $2 \times 10^7$  cycles (rate 300 cycles/min.) When driving an inductive load, external contact protection and noise quenching recommended.

### T-Link SPECIFICATIONS

**Node address:** Rotary switch; 00 - 99

**Configuration:** Multi-drop

**Communication:** Half-duplex

**Baud rate:** 500 kbps

**Transmission media/distance:**

KPEV-SB, 0.75 mm<sup>2</sup>  $\times$  1 pair, 700 m

T-KPEV-SB, 1.25 mm<sup>2</sup>  $\times$  1 pair, 1000 m

## INSTALLATION

### Power consumption

- AC: Approx. 25 VA
- DC: Approx. 14 W

**Current consumption (no power supply):** 130 mA

**Output current (power supply):** 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)

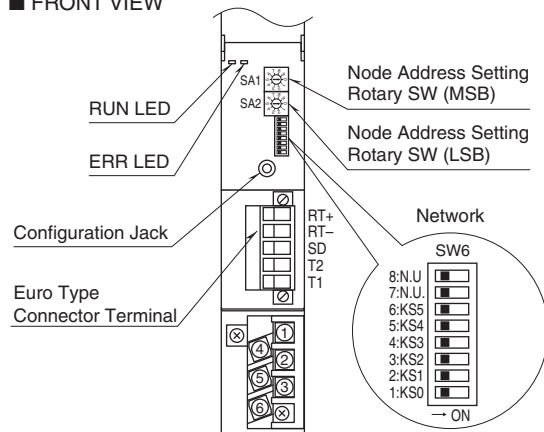
## PERFORMANCE

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

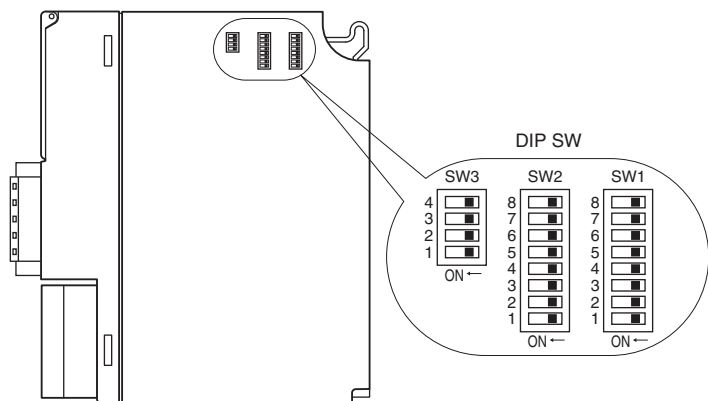
**Dielectric strength:** 1500 V AC @ 1 minute (T-Link to internal bus or internal power to power input to RUN contact output to FG)

## EXTERNAL VIEW

### FRONT VIEW



### SIDE VIEW



## TRANSMISSION DATA DESCRIPTIONS

The DIP switches on the front of the module specify each I/O module's I/O points and I/O type. The DIP switches on the side of the module specify status data. The allocation area, which is set in order from the slot No. 1, is assigned to the I/O data. I/O module's data exceeding the configured area is unable. With input status data ON, the last 2 words of the input data area are used as status data. The status data setting is available for firmware version 1.02 or later. For other versions SW3-3 setting is ignored and the device works as if SW3-3 is off. When I/O data and the status area are duplicated, status data takes priority.

For example, when the total number of I/O points is of 16, 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 figures below:

### ■ WITHOUT STATUS DATA (SW3-3: OFF)

#### • INPUT-ONLY or OUTPUT-ONLY DATA

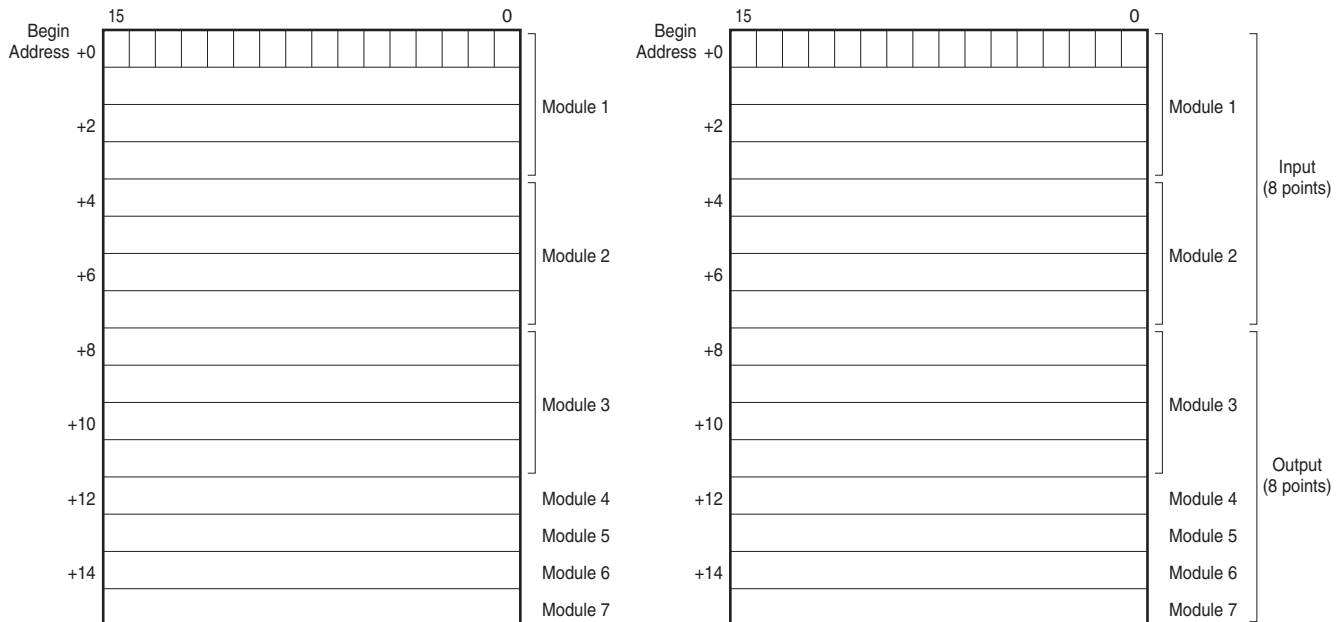
Data areas specified with the side DIP switches are assigned to each module from Module 1 through Module 7 in turn.

If the total number of I/O points is of 4 or 8, non-existing data are not sent/received.

#### • I/O MIXED DATA

Half of the words specified with the KS0 through KS3 are assigned to the inputs, the other half to the outputs.

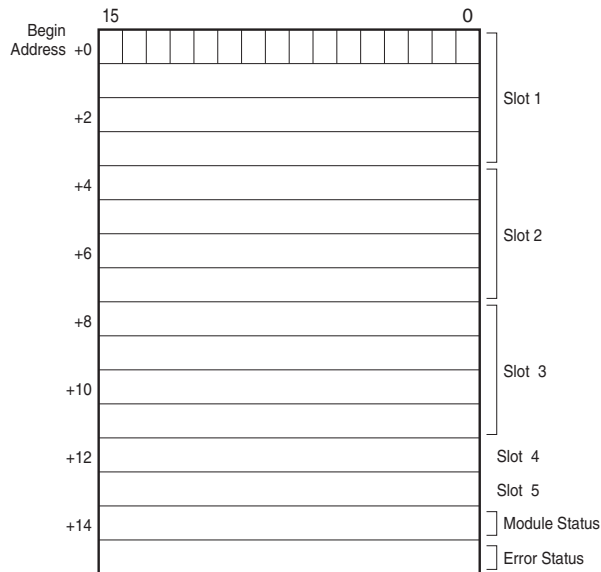
Module 1 is always assigned to the input. Insert the input modules to the slots 1 and 2, and the output modules to the slots 3 through 7.



■ **WITH STATUS DATA (SW3-3: ON)**

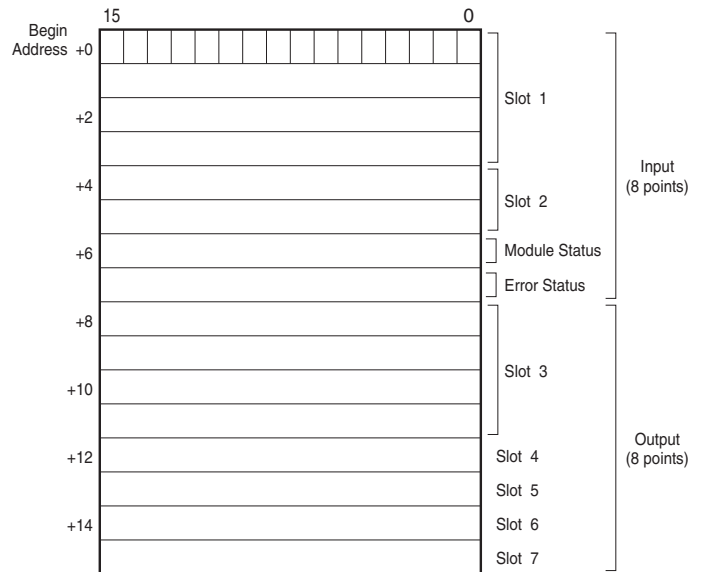
• **I/O type: Input**

Status data is assigned to the last 2 words.  
Data of the slots 6 and 7 is unable.



• **I/O type: Input/Output Mixed**

Status data is assigned to the last 2 words of the input area.  
Data on the words 3 and 4 of the slot 2 is unable.



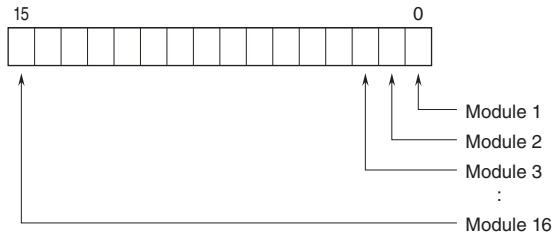
• **I/O type: Output**

Status data cannot be assigned because there is no input data.  
For output only, operate without status area.

- Module Status indicates whether individual I/O modules are mounted or not. The bit corresponding to the mounted slot turns to "1," and the unmounted slot to "0."
- Error Status indicates error status for each module as described below. The bit corresponding to such module turns to "1."
  - R3-TSx, R3-RSx, R3-US4 (T/C, RTD input): Input burnout
  - R3-DA16A: Power input in error or disconnected
  - R3-YSx: Output current error (e.g. load unconnected)
  - R3-PC16A: External power supply in error or disconnected
  - Every module which input is less than -15% or more than +115%
  - R3-US4 (voltage input): out of -10% to +110% input.

## MODULE STATUS, 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 (16-bit 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).  
-15 to 0 % is a negative range represented in 2's complement.  
In case of R3-US4, -10 to 0% is a negative range represented in 2's complement.



### ■ TEMPERATURE DATA (16-bit 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.



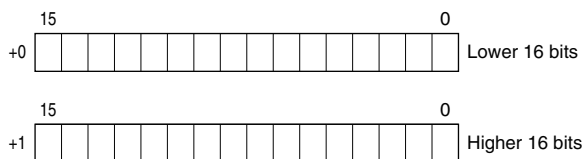
### ■ ANALOG DATA (16-bit data, models: R3-CT4A, CT4B, etc.)

16-bit binary data.  
Integer obtained by multiplying unit value (A) by 100.  
In case of CLSE-R5, integer obtained by multiplying unit value (A) by 1000.



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

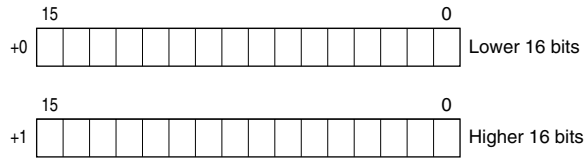
32-bit binary data is used for accumulated counts and encoder positions.  
Lower 16 bits are allocated from the lowest address to higher ones, higher 16 bits in turn.



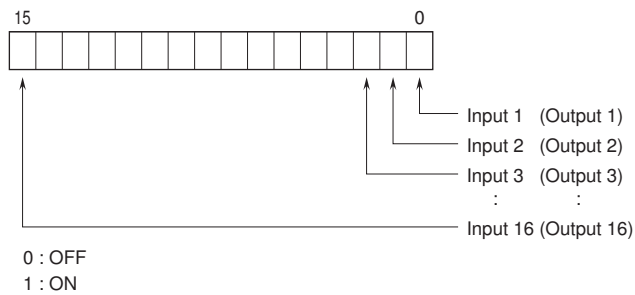
## ■ BCD DATA (32-bit data, models: R3-BA32A, BC32A, etc.)

32-bit binary data is used for BCD.

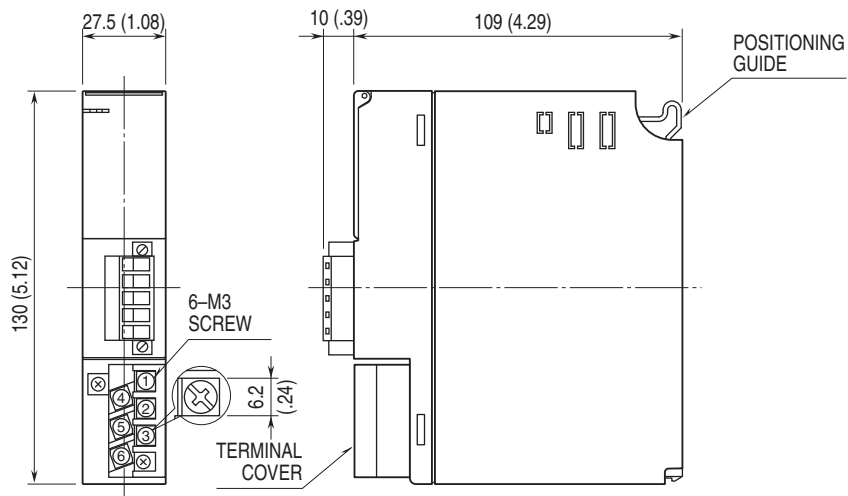
Lower 16 bits are allocated from the lowest address to higher ones, higher 16 bits in turn.



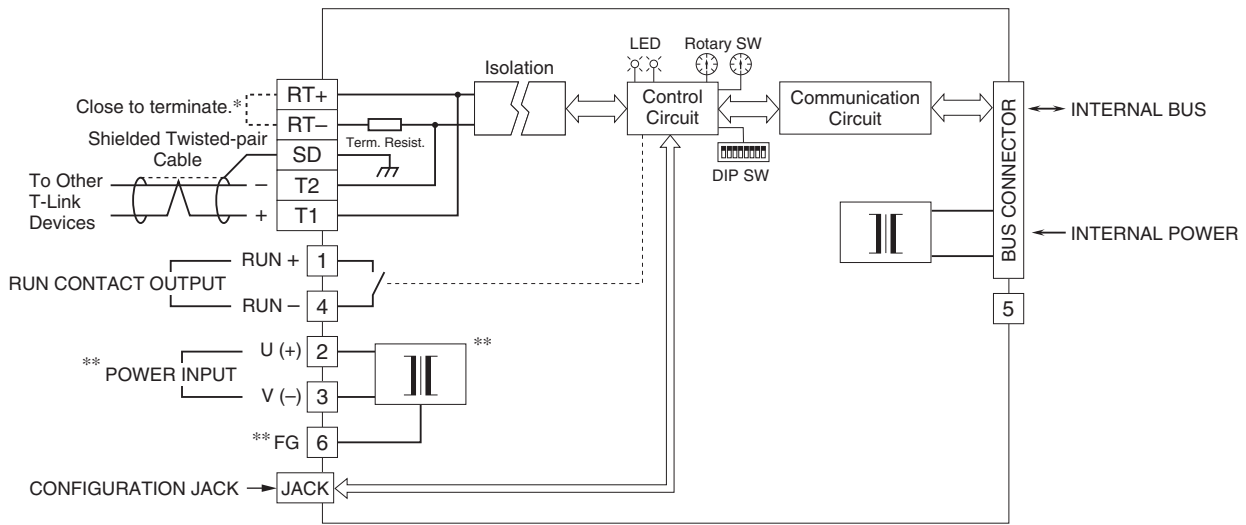
## ■ 16-POINT DISCRETE DATA (models: R3-DA16, DC16, etc.)



## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\* When the module is at an end of the transmission line via twisted-pair cable (= when there is no cross wiring), close across the RT+ and RT- terminals with the jumper included in the product package. Remove the jumper for all other locations.  
 \*\*Not provided with 'No Power Supply' type module.  
 Caution: FG terminal is NOT a protective conductor terminal.



Specifications are subject to change without notice.