

## Remote I/O R8 Series

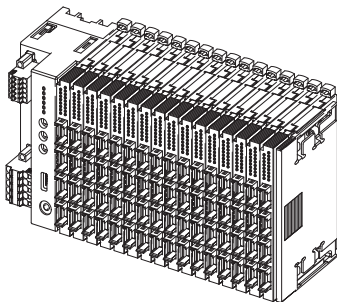
### R8 SERIES GENERAL SPECIFICATIONS

#### Functions & Features

- Remote I/O modules which interchange analog or digital I/O signals with the fieldbus
- Space-saving

#### Typical Applications

- Remote I/O for DCS and PLC
- Personal computer I/O



### ORDERING INFORMATION

- Power/Network module: R8-[1]-R  
Specify a code from below for [1].  
(e.g. R8-NM1-R)
- I/O module: R8-[1]  
Specify a code from below for [1].  
(e.g. R8-DA4A)

### POWER/NETWORK MODULE: R8-[1]-R

Refer to the specifications for the respective models.

### [1] MODULE TYPE

- ND1: DeviceNet
- NM1: Modbus
- NECT1: EtherCAT

### POWER INPUT

#### DC power

R: 24 V DC

(Operational voltage range:  $\pm 10\%$ ; ripple 10 %p-p max.)

### I/O MODULE: R8-[1]

Refer to the specifications for the respective models.

### [1] MODULE TYPE

#### • Analog Input

SS2: DC current input, (isolated), 2 points

SS4N: DC current input (built-in excitation, non-isolated), 4 points

SS4N: DC current input (non-isolated), 4 points

SV2: DC voltage input (isolated), 2 points

SV4N: DC voltage input (non-isolated), 4 points

TS2: Thermocouple input (isolated), 2 points

RS4N: RTD input (non-isolated), 4 points

#### • Analog Output

YS2: DC current output (isolated), 2 points

YV4N: DC voltage output (non-isolated), 4 points

#### • Pulse Input

PA4: Totalized pulse input, 4 points

#### • Discrete Input

DA4A: Discrete input, 4 points

DAM16A: Discrete input (NPN), 16 points

#### • Discrete Output

DC4A: Discrete output (NPN), 4 points

DC4A2: Discrete output (NPN), 4 points

DC4C: Photo MOSFET relay output, 4 points

DCM16A: Discrete output (NPN), 16 points

DCM16ALZ: Discrete output (NPN) with full interlock, 16 points

DCM16ALK: Discrete output (NPN) with full and individual interlock, 16 points

DCM16ALH: Discrete output (NPN) with full and partial interlock, 16 points

Since internal power supply source and internal communication bus are performed through the connector of each module, installation base is unnecessary.

### FUNCTIONS & FEATURES

The R8 Series Remote I/O is composed of power/network modules and I/O modules.

#### ■ I/O MODULE

Performs data conversion of field inputs; Data conversion of data received through the internal bus into outputs.

#### ■ POWER/NETWORK MODULE

The power/network module supplies the I/O modules with required internal electrical power source.

The power/network module changes the receiving data from internal bus into output signal and vice versa, acts as a gateway between transmission line and internal bus.

#### ■ DATA CONVERSION

Depends upon the type of module and ranges.

For analog input module, 0 to 100 % of the selected range is converted into 0 to 10000 (dec) or 0000 to 2710 (hex). -5 to 0 % is represented in 2's complements.

Analog output is represented with 16-bit binary data. 0 to 10000 (dec) or 0000 to 2710 (hex)

is converted into 0 to 100 % of the selected range.

-5 to 0 % is represented in 2's complements.



For RTD, thermocouple input module at factory setting, data is represented with 16-bit signed binary data of engineering unit value (°C) multiplied by 10. e.g. In case of measuring 27.5°C, value is 275.

Refer to each model manual for details.

## ■ SCALING & ZERO & SPAN ADJUSTMENTS

The PC Configurator Software (model: R8CFG) is available to scale 0 to 100 % data. It is available to configure in the range between -32000 and 32000. e.g. Configuring temperature range by Configurator Software enables to handle 100 to 200°C as value 0 to 10000.

## ■ HOT INSERTION/REMOVAL OF I/O MODULES

Since internal power supply and internal bus are performed through the connector of each module, it cannot be replaced with the power on.

## ■ DIELECTRIC STRENGTH

As dielectric strength differs depending on each module, refer to each specification sheet.

## RELATED PRODUCTS

- PC configurator software (model: R8CFG)

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

### Power input:

- **R8-NM1-R, R8-NECT1-R, R8-ND1-R:**  
24 V DC  $\pm 10\%$ ; ripple 10 %p-p max.

### Power consumption

- **DC:** Approx. 12 W 24 V DC (@ output current 1.6 A)

### Internal power

- **DC:** 5 V DC
- **Operational current:** 1.6 A

### Excitation supply output

- **DC:** 24 V DC  $\pm 10\%$
- **Operational current:** 10 A

(Power output current consumption must be under 10 A)

**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:** DIN rail (35 mm wide)

### Connection

- **Power/network module**

• **Power, exc. supply:**

**Tension clamp style:** Front Twin Connection

**Applicable wire size:** 0.2 to 2.5 mm<sup>2</sup>, stripped length 10 mm

• **Modbus:**

**Tension clamp style:** Front Twin Connection

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

• **EtherCAT:** RJ-45 connector

• **DeviceNet:**

**Tension clamp style:** Front Twin Connection

**Communication cable:** Cable to meet the DeviceNet specification, Stripped length 10 mm

• **I/O module:**

### Connection

• **4 pin e-CON connector**

PWB connector XN2D-1474-S002 (Omron)

Cable connector XN2A-1470 (Omron)\*<sup>1</sup>

Applicable wire size: 0.08 mm<sup>2</sup> (AWG28) - 0.5 mm<sup>2</sup> (AWG20)  
(Outer sheath diameter: max. 1.5 dia)

• **20 pin MIL connector**

PWB connector XG4A-2034 (Omron), M-System's

Recommended socket XG5N-201 (Omron)\*<sup>1</sup>

Recommended contact XG5W-0231 (Omron)\*<sup>1</sup>

Applicable wire size: AWG22, number of conductor 17,  
diameter of conductor 0.16 mm

\*1. Not included in the package. Refer to the specifications of the product.

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

**Max. number of I/O modules:** 16 (module address: 0 to 31)

**Internal communication bus:** Transmission cycle approx.  
250  $\mu$ sec / Module address

## ■ WEIGHT

- R8-NM1: 160g (0.35 lb)
- R8-NECT1: 180g (0.40 lb)
- R8-ND1: 180g (0.40 lb)
- R8-DA4A: 60g (2.12 oz)
- R8-DAM16A: 65g (2.30 oz)
- R8-DC4A: 60g (2.12 oz)
- R8-DC4A2: 60g (2.12 oz)
- R8-DC4C: 60g (2.12 oz)
- R8-DCM16A: 65g (2.30 oz)
- R8-DCM16ALZ: 110g (0.24 lb)
- R8-DCM16ALK: 110g (0.24 lb)
- R8-DCM16ALH: 110g (0.24 lb)
- R8-PA4: 60g (2.12 oz)
- R8-RS4N: 60g (2.12 oz)
- R8-SS2: 60g (2.12 oz)
- R8-SS4N: 60g (2.12 oz)
- R8-SS4NJ: 60g (2.12 oz)
- R8-SV2: 60g (2.12 oz)
- R8-SV4N: 60g (2.12 oz)
- R8-TS2: 60g (2.12 oz)
- R8-YS2: 110g (0.24 lb)
- R8-YV4N: 60g (2.12 oz)
- Protective cover: 15g (0.53 oz)

## ■ DATA ALLOCATION



R8-DA4A: 1  
R8-DAM16A: 1  
R8-DC4A: 1  
R8-DC4A2: 1  
R8-DC4C: 1  
R8-DCM16A: 1  
R8-DCM16ALZ: 1  
R8-DCM16ALK: 1  
R8-DCM16ALH: 1  
R8-PA4: 2  
R8-RS4N: 2  
R8-SS2: 2  
R8-SS4N: 2  
R8-SS4NJ: 2  
R8-SV2: 2  
R8-SV4N: 2  
R8-TS2: 2  
R8-YS2: 2  
R8-YV4N: 2

#### ■ ADDRESSES IN USE

R8-DA4A: 1  
R8-DAM16A: 1  
R8-DC4A: 1  
R8-DC4A2: 1  
R8-DC4C: 1  
R8-DCM16A: 1  
R8-DCM16ALZ: 1  
R8-DCM16ALK: 1  
R8-DCM16ALH: 1  
R8-PA4: 4  
R8-RS4N: 2  
R8-SS2: 1  
R8-SS4N: 2  
R8-SS4NJ: 2  
R8-SV2: 1  
R8-SV4N: 2  
R8-TS2: 1  
R8-YS2: 1  
R8-YV4N: 2

#### STANDARDS & APPROVALS

##### CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007/A1: 2011

EMS EN 61000-6-2: 2005

#### CURRENT CONSUMPTION

The I/O modules operate by the DC voltage (5 V DC) supplied from the power/network module. Arrange these modules in order that the total current consumed by these modules be within the supply current capacity. If the current

consumption exceeds the limit, change the combination of the I/O modules or reduce the number of modules to be supplied from the power/network module. Even if total consumption current of the I/O modules is less than the supply current capacity, the total install number of the modules is max. 16.

#### ■ Max. current consumption

R8-DA4A: 80 mA  
R8-DAM16A: 100 mA  
R8-DC4A: 100 mA  
R8-DC4A2: 100 mA  
R8-DC4C: 120 mA  
R8-DCM16A: 110 mA  
R8-DCM16ALZ: 160 mA  
R8-DCM16ALK: 160 mA  
R8-DCM16ALH: 160 mA  
R8-PA4: 80 mA  
R8-RS4N: 100 mA  
R8-SS2: 100 mA  
R8-SS4N: 80 mA  
R8-SS4NJ: 80 mA  
R8-SV2: 100 mA  
R8-SV4N: 80 mA  
R8-TS2: 100 mA  
R8-YS2: 80 mA  
R8-YV4N: 160 mA

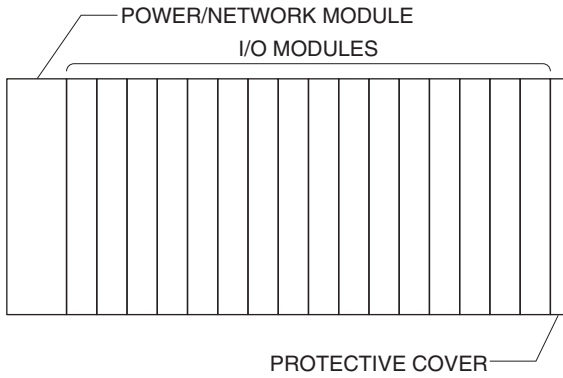
#### BASIC CONFIGURATION

The number of I/O modules that can be mounted changes depending on power/network module. Refer to the specifications of each power/network module for details. Although Module address position can be set arbitrary, avoid from address overlap.

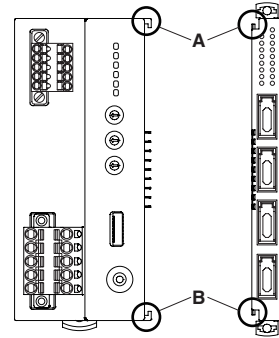
4-point analog I/O module takes two addresses per module. For example with the model R8-SV4N located at the module address 5, the inputs 1 and 2 are assigned to the address 5, and the inputs 3 and 4 are to the address 6. Do not assign another module to the address 6. All 4 inputs (input 1 through 4) can be used with Data Allocation 2, while only the inputs 1 and 3 can be used with Data Allocation 1. Totalize pulse input 4 points module have 4 addresses available per module. Set to allocation area 2.

Protective cover included for power/network modules.





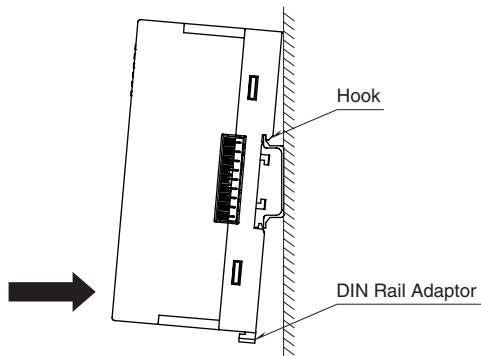
• I/O Module



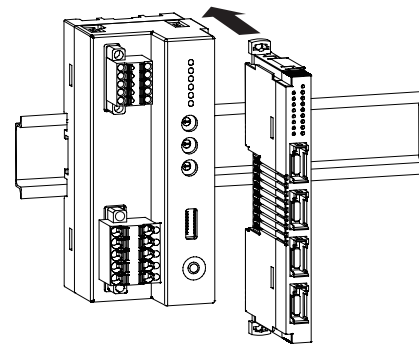
Confirm that the locking clamps of the I/O module are set. Insert the module in parallel to the next one while aligning the grooves of both modules (A & B in the above figure). Maintain it perpendicularly to the rail.

■ HOW TO MOUNT THE MODULE ON DIN RAIL

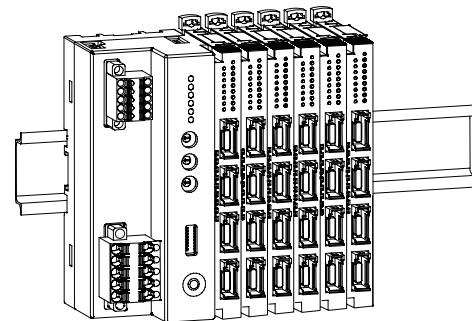
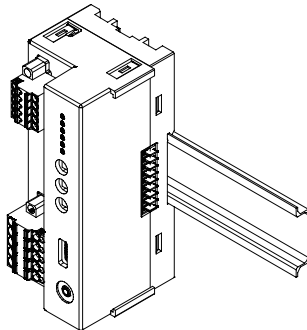
• Power/Network Module



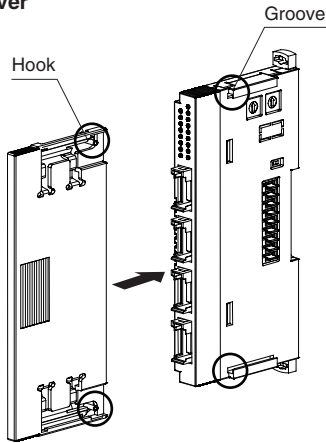
Position the upper hook at the rear on the DIN rail and push in the lower. When removing the module, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



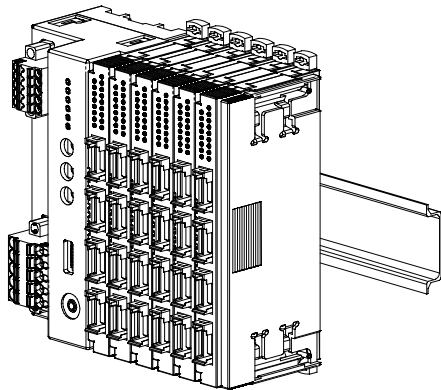
More I/O modules can be added in the same manner.



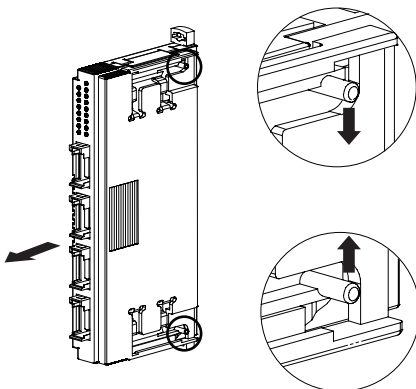
## • Protective Cover



The protective cover is to be attached over the connected I/O module at the right end.  
Align the hooks on the cover with the grooves of the module and slide it straight until the hooks are latched.

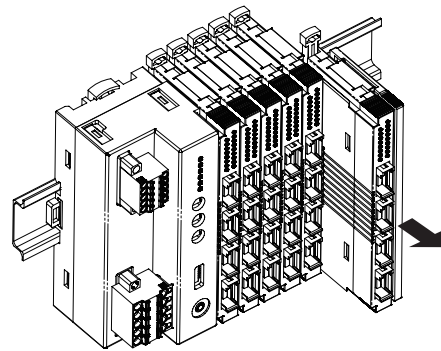
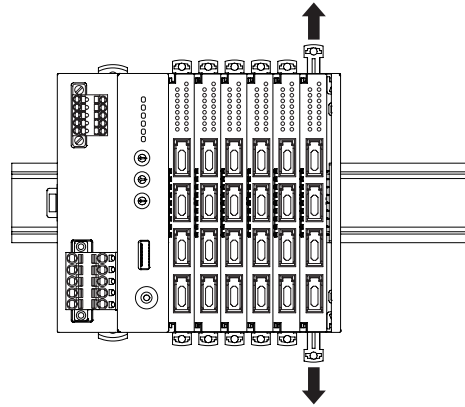


When removing the cover, pull it out while squeezing the hooks inward.

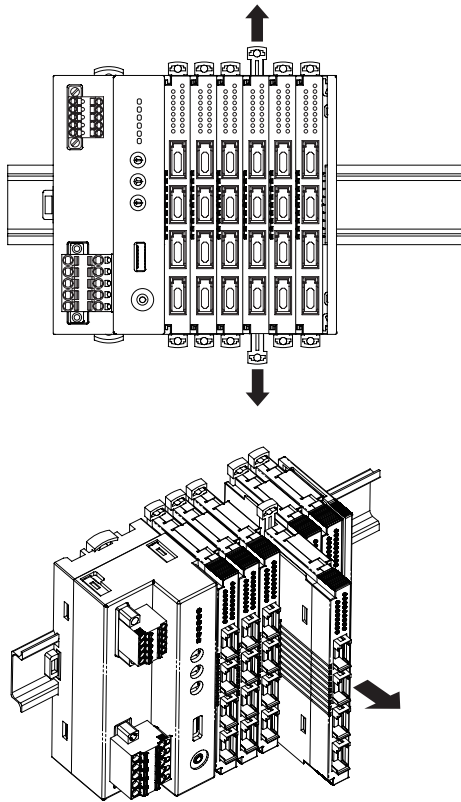


## ■ HOW TO UNMOUNT MODULES

Release the locking clamps and pull out straight the module.



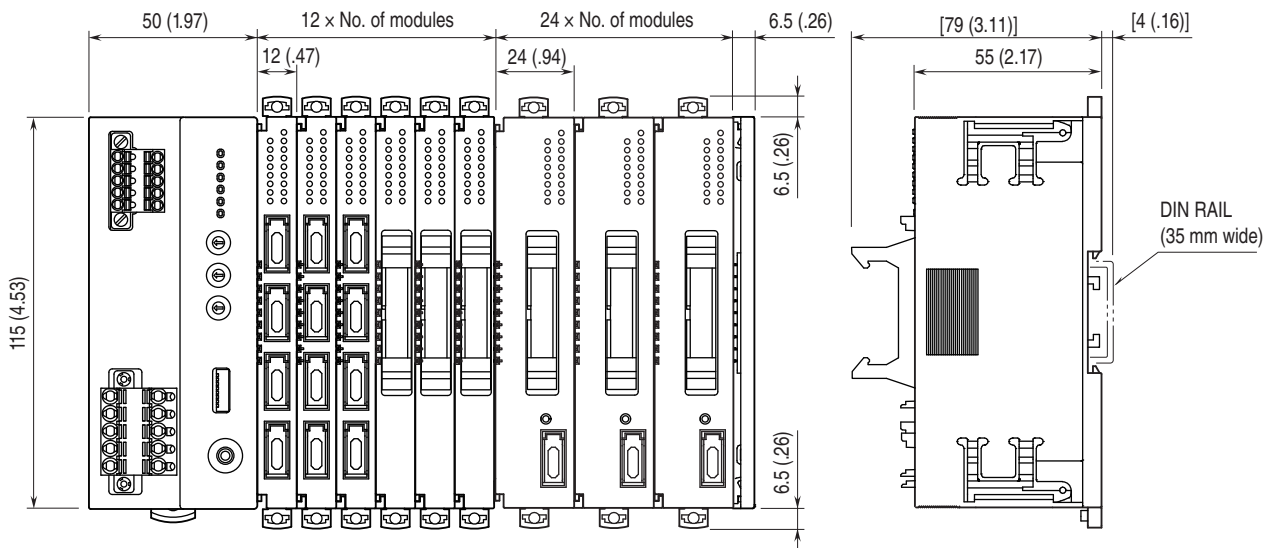
• Removing an intermediate module



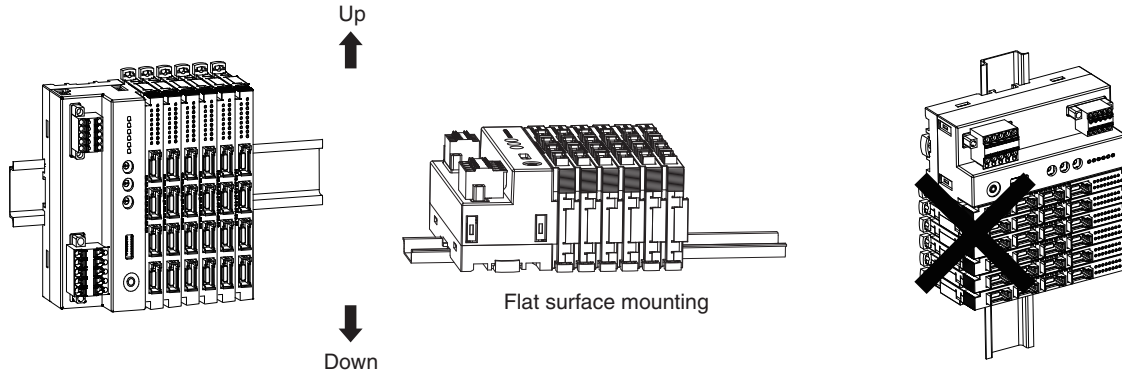
**Caution !**

- 1) Be careful not to hurt your hand by pointed edges of the internal communication bus connector.
- 2) I/O modules cannot hold tightly on the DIN rail by themselves without power/network module.  
Secure them to the position if necessary by using DIN rail end plates.

## MOUNTING REQUIREMENTS

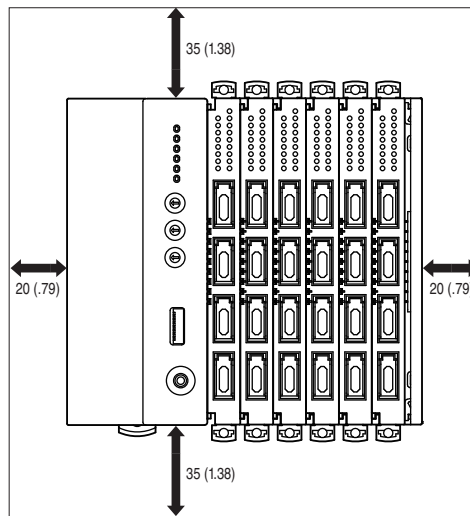


■ MOUNTING DIRECTION



■ MOUNTING TO PANEL: mm (inch)

Leave enough space between the unit and the mounting panel.



Specifications are subject to change without notice.