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## BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact our sales office or representatives.

### ■ PACKAGE INCLUDES:

Power/network module .....(1)  
Protective cover.....(1)

### ■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

### ■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

### ■ EDS FILE

EDS files are downloadable at our web site:

## POINTS OF CAUTION

### ■ CONFORMITY WITH EU DIRECTIVES

- The equipment must be mounted inside a panel.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures\* to ensure the CE conformity.

\* For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.

### ■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:

DC Power supply: 24V DC rating

24V DC  $\pm$  10%, approx. 12W

(@ internal power max. current 1.6A)

Excitation supply (excitation for I/O module):

24V DC  $\pm$  10%, operational current 10A

(From power supply (excitation supply) connector, via connector for internal bus, supplied to each I/O module. Power output current consumption must be under operational current.)

### ■ GENERAL PRECAUTIONS

- Before you remove or mount the unit, turn off the power supply for safety.

### ■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

### ■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

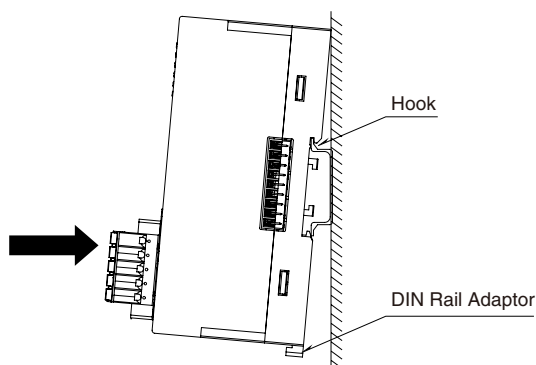
### ■ AND ....

- The unit is designed to function as soon as power is supplied, however for analog module, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

## INSTALLATION

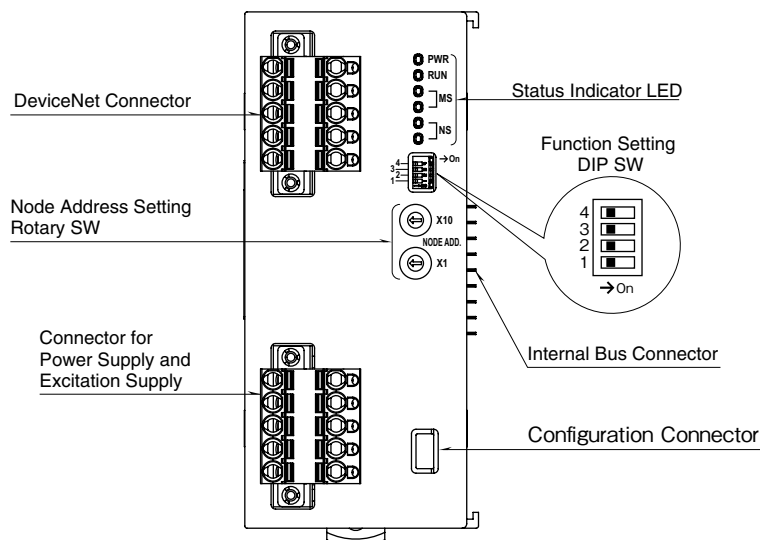
Internal power supply/communication is connected via each module's connector, therefore no backplane base is required, however, hot-swapping of modules is not possible.

### ■ HOW TO MOUNT THE MODULE ON DIN RAIL



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 flat-blade screwdriver and pull.

## COMPONENT IDENTIFICATION



### ■ STATUS INDICATOR LED

ID	STATE	COLOR	TO INDICATE
PWR	ON	Green	Power supplied
	OFF	—	No power supplied
RUN	ON	Green	Communication
	OFF	—	No communication
MS	ON	Green	Normal operation
	Blink	—	Standby (needs commissioning)
	ON	Red	Critical failure
	Blink	—	Minor failure
	OFF	—	No power supplied
NS	ON	Green	Connections are established
	Blink	—	Connections are not established
	ON	Red	Critical Link failure
	Blink	—	Minor Link failure
	OFF	—	No power supplied

### ■ FRONT SWITCHES

#### • Node Address

Node Address is selected from 0 to 63 in decimal. The upper switch determines the tens' place digit, while the lower switch does the ones' place digit of the address.

(Factory setting: 00)



Node Address Setting (x10)



Node Address Setting (x1)

### ■ OPERATING MODE

(\*) Factory setting

#### • BAUD RATE

Baud Rate is selected with the DIP switch.

BAUD RATE	SW1	
	1	2
125 kbps	OFF	OFF
250 kbps	ON	OFF
500 kbps	OFF	ON
Auto tracking	ON	ON

Note: When selecting 125 kbps, 250 kbps, and 500 kbps, setting baud rate at power ON is applied. When selecting auto tracking, determines baud rate by analyzing communication data from PLC at power ON (determines baud rate by following PLC's baud rate at power ON).

Note: Be sure to set unused SW1-3 and 1-4 to OFF.

### ■ POWER SUPPLY, EXCITATION SUPPLY CONNECTOR TERMINAL ASSIGNMENT

Unit side connector: MSTBV2,5/5-GF-5,08AU (Phoenix contact)

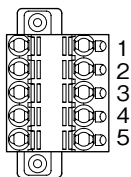
Cable side connector: TFKC2,5/5-STF-5,08AU (Phoenix contact)

Applicable wire size: 0.2 - 2.5mm<sup>2</sup>

Stripped length: 10mm

Recommended solderless terminal:

- AI0,25-10YE 0.25mm<sup>2</sup> (Phoenix contact)
- AI0,34-10TQ 0.34mm<sup>2</sup> (Phoenix contact)
- AI0,5-10WH 0.5mm<sup>2</sup> (Phoenix contact)
- AI0,75-10GY 0.75mm<sup>2</sup> (Phoenix contact)
- AI1-10RD 1.0mm<sup>2</sup> (Phoenix contact)
- AI1,5-10BK 1.5mm<sup>2</sup> (Phoenix contact)
- AI2,5-10BU 2.5mm<sup>2</sup> (Phoenix contact)



PIN No.	ID	FUNCTION
1	24V	Power supply 24V DC
2	0V	Power supply 0V DC
3	+	Excitation supply 24V DC
4	—	Excitation supply 0V DC
5	FE1	Grounding

### ■ NETWORK CONNECTOR ASSIGNMENT

Unit side connector: MSTBV2,5/5-GF-5,08AU (Phoenix contact)

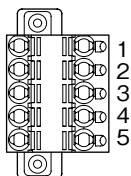
Cable side connector: TFKC2,5/5-STF-5,08AU M (Phoenix contact)

Applicable wire size: 0.2 - 2.5mm<sup>2</sup>

Stripped length: 10mm

Recommended solderless terminal:

- AI0,25-10YE 0.25mm<sup>2</sup> (Phoenix contact)
- AI0,34-10TQ 0.34mm<sup>2</sup> (Phoenix contact)
- AI0,5-10WH 0.5mm<sup>2</sup> (Phoenix contact)
- AI0,75-10GY 0.75mm<sup>2</sup> (Phoenix contact)
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- AI1,5-10BK 1.5mm<sup>2</sup> (Phoenix contact)
- AI2,5-10BU 2.5mm<sup>2</sup> (Phoenix contact)



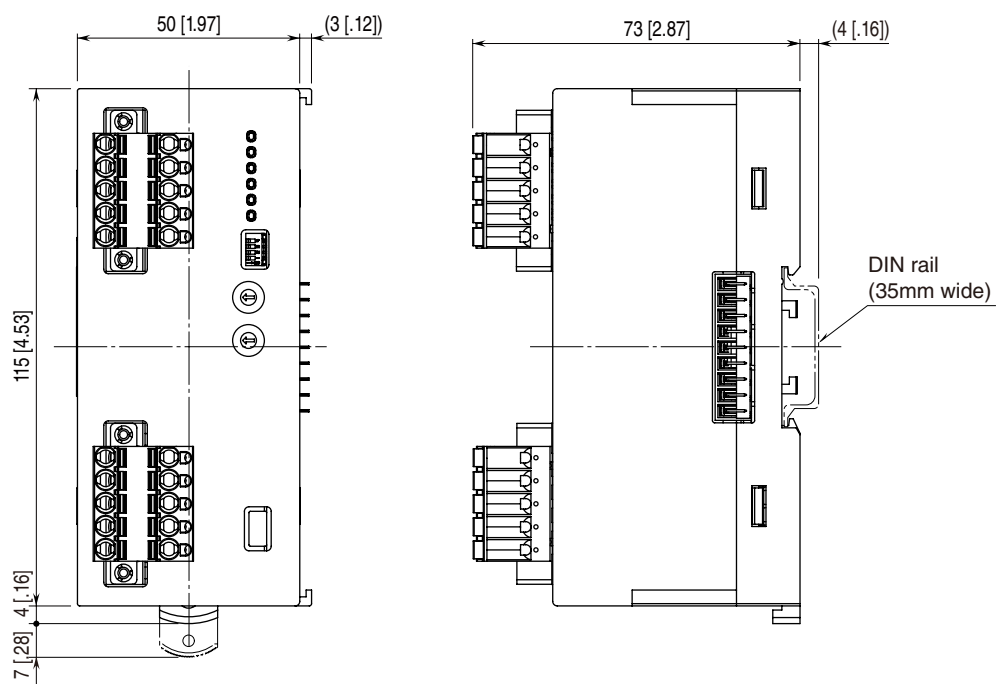
PIN No.	ID	FUNCTION
1	V-	POWER (-)
2	CAN_L	Signal Low
3	Drain	Shield
4	CAN_H	Signal High
5	V+	POWER (+)

## TERMINAL CONNECTIONS

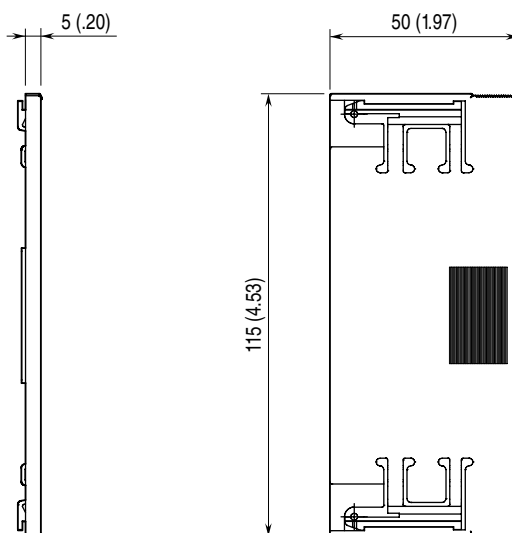
Connect the unit as in the diagram below.

### EXTERNAL DIMENSIONS unit: mm [inch]

#### • Unit



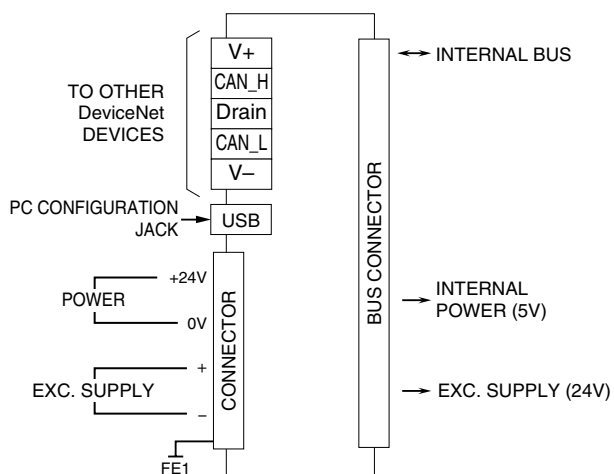
#### • PROTECTIVE COVER



## ■ CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE1 terminal to ground.

Caution: FE1 terminal is NOT a protective conductor terminal.



## WIRING INSTRUCTIONS

### ■ TENSION CLAMP TERMINAL

#### • POWER SUPPLY, EXCITATION SUPPLY CONNECTOR

Applicable wire size: 0.2 – 2.5 mm<sup>2</sup>

Stripped length: 10 mm

#### • NETWORK CONNECTOR

Communication cable: Approved for DeviceNet

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)

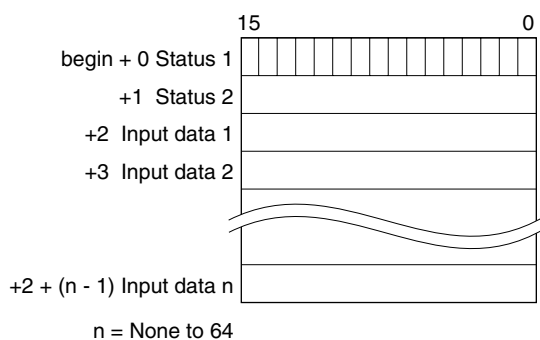
AI1-10RD 1.0 mm<sup>2</sup> (Phoenix Contact)

AI1,5-10BK 1.5 mm<sup>2</sup> (Phoenix Contact)

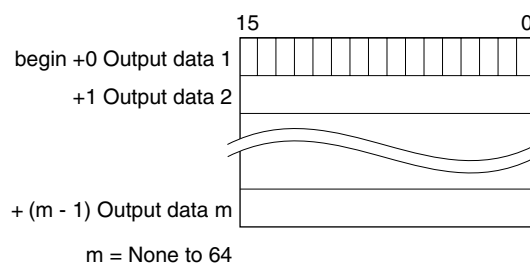
AI2,5-10BU 2.5 mm<sup>2</sup> (Phoenix Contact)

## DeviceNet I/O ASSIGNMENTS

### ■ IN AREA (R80ND2 to Master device)



### ■ OUT AREA (Master device to R80ND2)



R80ND2 automatically determines IN/OUT area size of DeviceNet when the power is turned on according to the configuration of the connected I/O module.

If the I/O module is an input type, input data is assigned in order from the 3rd word of IN area (R80ND2 to master device). If the I/O module is an output type, output data is assigned in order from the beginning of OUT area (master device to R80ND2).

Assign the addresses in ascending order of the module address setting.

Status data is assigned to the first two words of IN area regardless of the configuration of the I/O module.

Refer to the following table for the data size of each I/O module.

I/O TYPE	DATA SIZE	
	IN AREA	OUT AREA
Analog input	No. of input x 1 word	0 word
Analog output	0 word	No. of output x 1 word
Discrete input	1 word	0 word
Discrete output	0 word	1 word

## ■ DeviceNet DATA EXAMPLE

As an example, the data size of DeviceNet data for the following I/O module configuration are described.

### • I/O module configuration example

Network module + nine I/O modules

MODULE ADDRESS	MODEL	MODULE TYPE	I/O TYPE	DeviceNet DATA SIZE (word)	
				IN	OUT
–	R80ND2	Power/network module	–	2	0
0	R80UST4	Universal input module (4 points)	Analog input	4	0
1	R80DCT4D	Discrete output module (4 points)	Discrete output	0	1
2	R80DCT8A	Discrete output module (8 points)	Discrete output	0	1
3	R80DCT16A2	Discrete output module (16 points)	Discrete output	0	1
4	R80FST4NJ	DC voltage/current input module (4 points)	Analog input	4	0
5	R80DAT8A	Discrete input module (8 points)	Discrete input	1	0
6	R80DAT16A2	Discrete input module (16 points)	Discrete input	1	0
7	R80YST4N	DC current output module (4 points)	Analog output	0	4



### • DeviceNet Data

IN AREA (R80ND2 to master device)

Begin + 0	Status 1
+1	Status 2
+2	R80UST4 (ch1)
+3	R80UST4 (ch2)
+4	R80UST4 (ch3)
+5	R80UST4 (ch4)
+6	R80FST4NJ (ch1)
+7	R80FST4NJ (ch2)
+8	R80FST4NJ (ch3)
+9	R80FST4NJ (ch4)
+10	R80DAT8A (ch1 to 8)
+11	R80DAT16A2 (ch1 to 16)

IN size = 30-word (60-byte)

OUT AREA (Master device to R80ND2)

Begin + 0	R80DCT4D (ch1 to 4)
+1	R80DCT8A (ch1 to 18)
+2	R80DCT16A2 (ch1 to 16)
+3	R80YST4N (ch1)
+4	R80YST4N (ch2)
+5	R80YST4N (ch3)
+6	R80YST4N (ch4)

OUT size = 7-word (14-byte)

## ■ EDS FILE

EDS files are downloadable at our web site.

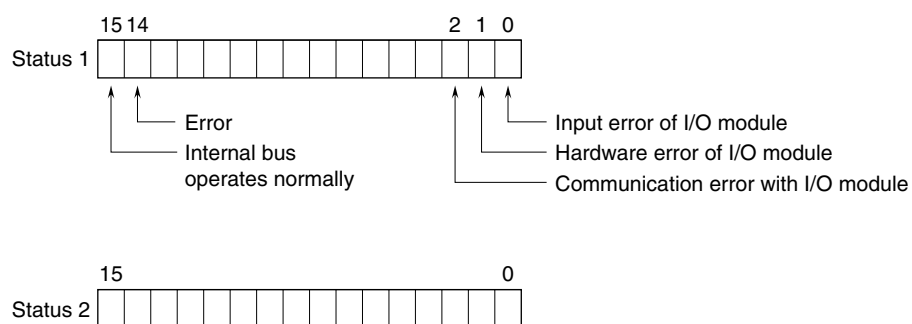
R80ND2 automatically determines IN/OUT area size of DeviceNet when the power is turned on according to the configuration of the connected I/O module.

Only the largest data size is registered on the EDS files. When registering to the master device, set the data size according to the configuration of I/O modules.



## STATUS

### ■ STATUS



Status 1	bit15	Internal bus operates normally 1: Normal 0: Error
	bit14	Error 1: One of bit0 to 2 turns to 1 0: All af bit0 to 2 is 0
	bit3 to 13	0
	bit2	Communication error with I/O module 1: Some I/O modules cannot communicate 0: Communication with all I/O modules is normal
	bit1	Hardware error of I/O modules 1: Some I/O modules are in hardware error. 0: Hardware of all I/O modules are normal
	bit0	Input error of I/O modules 1: Some I/O modules are out of input range, or in burnout 0: Input of all I/O modules are normal
Status 2 (reserved)	bit0 to 15	0

## I/O DATA DESCRIPTIONS

### ■ OPERATION IN CASE OF A COMMUNICATION ERROR WITH I/O MODULES

When the communication between the network module and the I/O modules is lost due to an error in an input module, the last process values are held until the communication is re-established.

### ■ ANALOG DATA (16-bit data, models: R80UST4, R80FST4NJ, R80YST4N, 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.



### ■ ANALOG DATA (16-bit data, models: R80UST4, 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.



### ■ DISCRETE DATA (models: R80DAT16A2, R80DCT16A2, R80DCT4D, etc.)

