DeviceNet INTERFACE MODULE
(for 32-point analog signals)

MODEL **R5-ND2**

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:

Network interface module ....(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 the instrument panel of a metal enclosure.
• 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.

■ HOT INSERTION/REMOVAL OF MODULES

• It is possible to replace the module with the power is supplied. Be sure to replace it when the module is not communicating with a host, as it is possible to affect the system. However, replacing multiple modules at once may greatly change line voltage levels. We recommend that you replace them one by one.

■ GENERAL PRECAUTIONS

• Do not set the DIP switch on the side panel while the power is supplied. The DIP switch is selectable for maintenance without the power.

■ 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, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

INSTALLATION

Use the Installation Base (model: R5-BS).

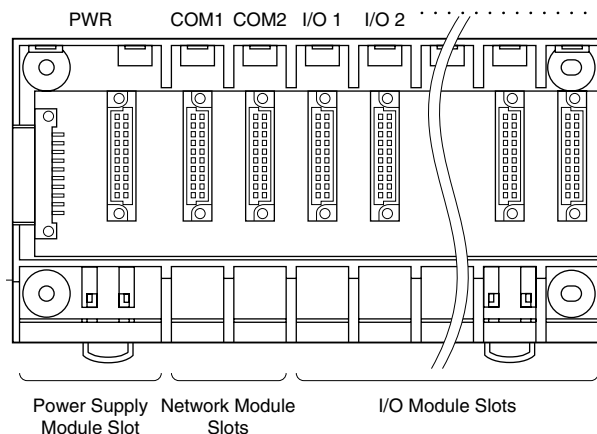Before mounting the Network Interface Module onto the Base, be sure to configure the module as explained below.

■ DATA ALLOCATION MODE

Data Allocation Mode 2 is used for the R5-ND2.
See "DATA DESCRIPTION".

■ NODE ADDRESS & BAUD RATE

See "COMPONENT IDENTIFICATION".

■ NETWORK SLOTS ON THE BASE

The Network Interface Modules must be mounted on the COM1 on the Base.
The COM2 is used only when the dual redundant communication is selected. If the I/O modules are selected for the dual communication, the Network Module can be mounted either on the COM1 or COM2.
The bases for single communication mode (model: R5-BS05, R5-BS09) does not have COM2.

COMPONENT IDENTIFICATION

■ **SIDE VIEW**

■ **FRONT VIEW**
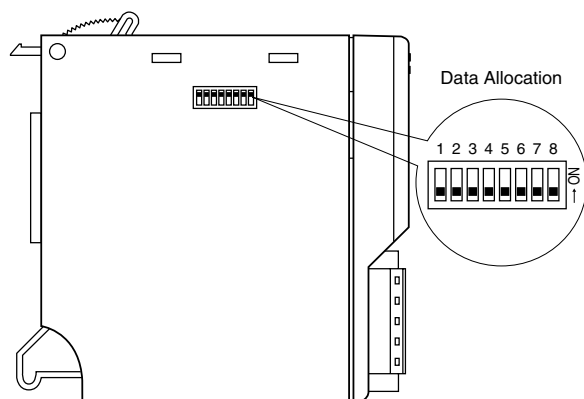
■ **SIDE DIP SW**

(*) Factory default setting

• **Data Allocation Mode: SW1-1, 1-2**

SW	DATA ALLOCATION MODE
	2
1	OFF
2	OFF

Note: Be sure to set unused SW1-3 through 1-8 to OFF.

■ **FRONT DIP**

• **Node Address: SW2-1 through SW2-6**

Node Address is defined in a 6-digit binary code. SW2-1 to SW2-6 (NA0 to NA5) correspond to the least to the most significant digits as in the table below.
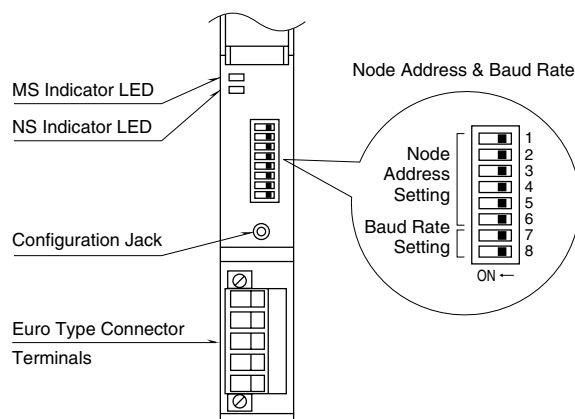
1 (NA0)	2 (NA1)	3 (NA2)	4 (NA3)	5 (NA4)	6 (NA5)
2^0	2^1	2^2	2^3	2^4	2^5

Each combination of the SW2-1 through SW2-6 positions corresponds to the addresses as in the table below.

NODE ADDRESS	SW2-6 (NA5)	SW2-5 (NA4)	SW2-4 (NA3)	SW2-3 (NA2)	SW2-2 (NA1)	SW2-1 (NA0)
0 (*)	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
:	:	:	:	:	:	:
60	1	1	1	1	0	0
61	1	1	1	1	0	1
62	1	1	1	1	1	0
63	1	1	1	1	1	1

0 = OFF, 1 = ON

• **Baud Rate: SW2-7, 2-8 (DR0, DR1)**

BAUD RATE	7 (DR0)	8 (DR1)
125 kbps	OFF (*)	OFF (*)
250 kbps	ON	OFF
500 kbps	OFF	ON
N/A	ON	ON

■ **INDICATORS**

The following table defines the LED states of the MS and NS indicators.

ID	STATE	TO INDICATE
MS	Green	Operating in a normal condition
	Blinking Green	Standby (needs commissioning)
	Red	Critical failure
	Blinking Red	Minor failure
	OFF	No power supplied
NS	Green	Link on-line and connections in the established state
	Blinking Green	Link on-line but no connections in the established state
	Red	Critical link failure
	Blinking Red	Minor link failure
	OFF	No power supplied

PC CONFIGURATOR

With configurator software, settings shown below are available.
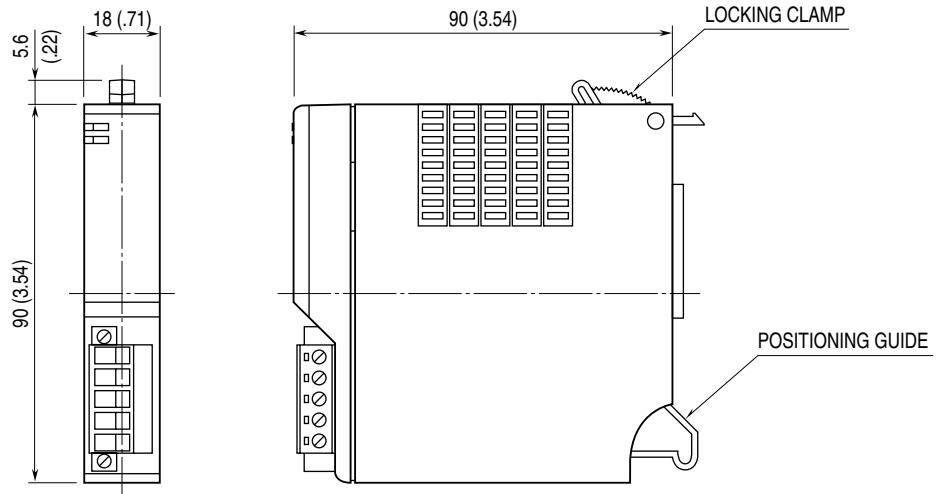Refer to the software manual of R5CON for detailed operation.

■ **NETWORK MODULE SETTING**

PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
Communication Timeout	0.0 – 3276.7 (sec.)	3.0 (sec.)

TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

■ EXTERNAL DIMENSIONS unit: mm (inch)

18 (.71)   5.6 (.22)   90 (3.54)   90 (3.54)

LOCKING CLAMP

POSITIONING GUIDE

■ CONNECTION DIAGRAM

To Other DeviceNet Devices

| V+ |
| CAN_H |
| Drain |
| CAN_L |
| V– |

CONFIGURATION JACK → JACK

BUS CONNECTOR

← → INTERNAL BUS

← INTERNAL POWER
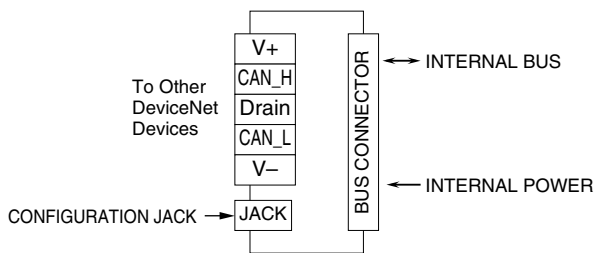
WIRING INSTRUCTIONS

■ EURO TYPE CONNECTOR TERMINAL (DeviceNet)

Applicable wire size: 0.2 to 2.5 mm^2 (AWG24 to 12)
Stripped length: 7 mm

DATA DESCRIPTION

The Data Allocation Mode 2 is used for the R5-ND2. In this mode, two (2) words are assigned for one I/O module regardless of whether the second word area is required or not. For example, discrete I/O modules require only one (1) word, but two (2) words are automatically assigned to these modules.

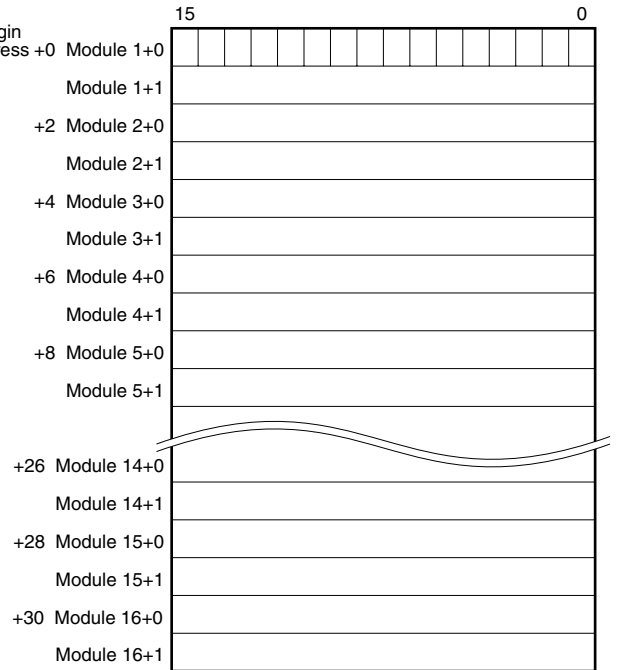## ■ DATA ALLOCATION MODE 2

• Output Data

The figure below shows the allocation of the data sent from the network module to the master.
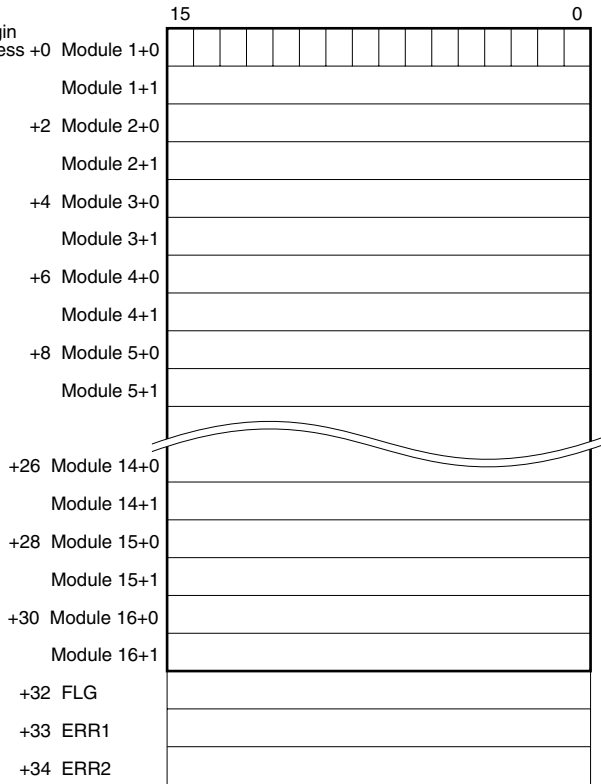
• Input Data

The figure below shows the allocation of the data sent from the master to the network module.

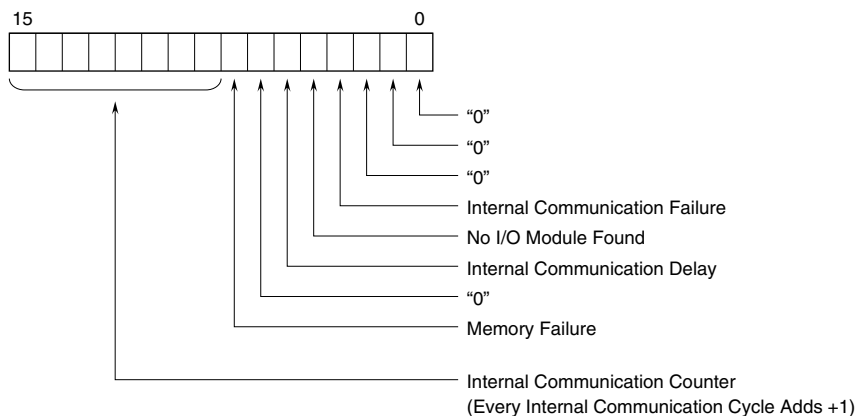The area enclosed with a bold line is assigned for I/O data.

Each module takes two-word areas for input and output respectively, regardless of whether the module type is input or output. If a module for Data Allocation Mode 1 is used, all the bits for Module n+1 data turn to "0" (unused).

Each module can handle either input or output data. Input and output cannot be mixed in one module.

Input data from the master device is transferred to the module's output data area. The master device can read from the output data area the data it has set.

• Status Flag

FLG: Communication status data. When the module is unmounted, the module type is not correct, or when communication errors occur frequently, the corresponding bit turns to "1."

- "0"
- "0"
- "0"
- Internal Communication Failure
- No I/O Module Found
- Internal Communication Delay
- "0"
- Memory Failure
- Internal Communication Counter
  (Every Internal Communication Cycle Adds +1)

ERR1, ERR2: Analog input modules check high/low limits and ADC. When there is an error in one or more channels, the bit corresponding to the channels turns to "1." The bit corresponding to unmounted channels turns to "1." DC current output modules check output wire breakdown to alert as an error. The bit corresponding to the channels turns to "1."

Among the two bits assigned for each module, the least significant bit is used for channel 1 of a two-channel analog module or for a discrete module.
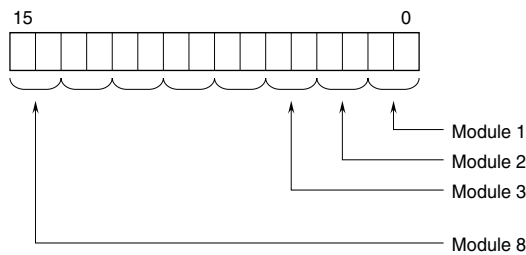

■ I/O CAPACITY

A maximum of 16 I/O modules can be mounted per node.

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.

■ 16-BIT ANALOG DATA (models: R5-SV, YV, DS, YS, RS, TS, etc.)

0 to 100% of the selected I/O range is converted into 0 to 10000 (binary).
With °C or Kelvin 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.
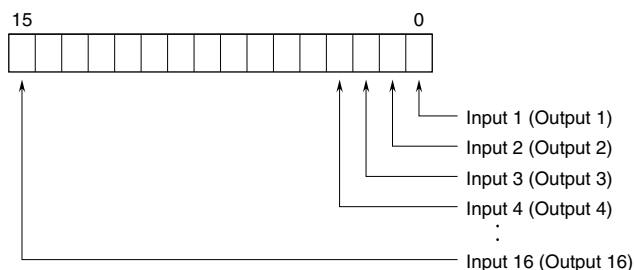Negative values are represented in 2's complements.
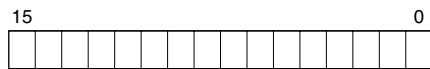
■ 4-POINT DISCRETE DATA (models: R5-DA4, DC4, etc.)
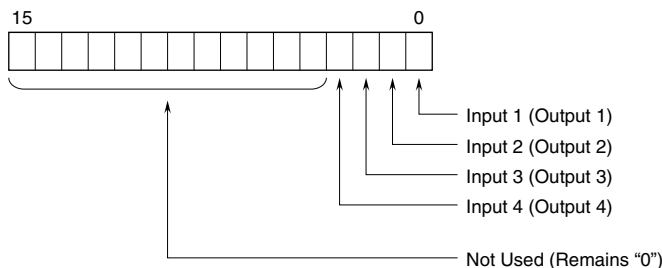
0 : OFF
1 : ON

■ 16-POINT DISCRETE DATA (models: R5-DA16, DC16, etc.)

0 : OFF
1 : ON

EDS

$ DeviceNet Electronic Data Sheet
$ Author:H. Iijima

[File]	DescText	= "This is for R5_ND2";
	CreateDate	= 05-09-2003;
	CreateTime	= 15:49:41;
	ModDate	= 05-29-2003;
	ModTime	= 15:50:24;
	Revision	= 0.1;

[Device]	VendCode	= 184;
	VendName	= "M*System Co.,Ltd.";
	ProdType	= 0;
	ProdTypeStr	= "Generic Device";
	ProdCode	= 23;
	MajRev	= 1;
	MinRev	= 1;
	ProdName	= "R5_ND2";
	Catalog	= "N/A";

[IO_Info]	Default	= 0x0001;
	PollInfo	= 0x0001,1,1;
	Input1	= 70,0,0x0001,
		"Input data",6,
		"20 04 24 65 30 03","";
	Output1	= 64,0,0x0001,
		"Output data",6,
		"20 04 24 64 30 03","";

[ParamClass]

[Params]

[EnumPar]

[Groups]