CC-Link INTERFACE MODULE
(CC-Link Ver.1.10; for 32-point analog signals)

MODEL **R5-NC2**

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)
Terminating resistor (110 Ω, 0.5 W)..................................(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.

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.
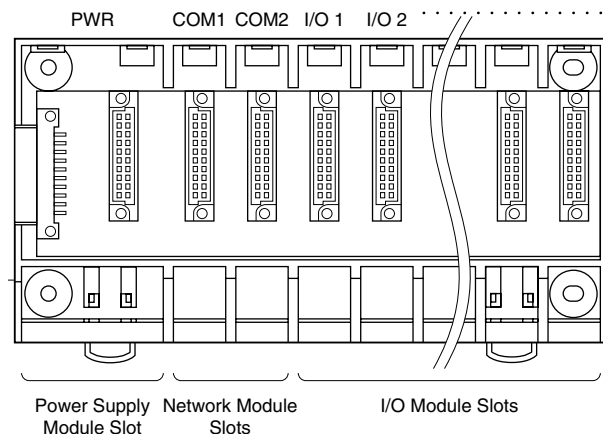
■ DATA ALLOCATION MODE

Data Allocation Mode 2 is used for the R5-NC2.
See "DATA DESCRIPTION".

■ STATION ADDRESS & BAUD RATE

See "COMPONENT IDENTIFICATION".

■ NETWORK SLOTS ON THE BASE

PWR   COM1 COM2 I/O 1   I/O 2

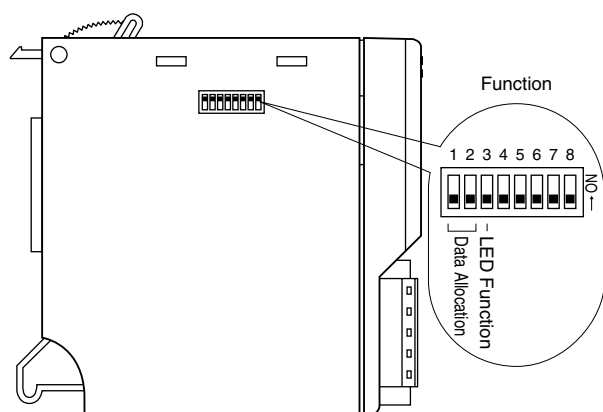Power Supply Module Slot   Network Module Slots   I/O Module Slots

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

Function

1 2 3 4 5 6 7 8

LED Function
Data Allocation

■ FRONT VIEW

RUN Indicator LED

ERR Indicator LED

Station Address Setting Rotary SW

Baud Rate Setting Rotary SW

Configuration Jack

Euto Type Connector Terminal

■ SIDE DIP SW

(*) Factory setting

• Data Allocation Mode: SW1, SW2

SW	DATA ALLOCATION MODE	
	2
1	OFF
2	OFF

• LED Function: SW3

SW3	LED FUNCTION	
	RUN	ERR
OFF (*)	Green when normal	Green when abnormal
ON	Red when receiving	Red when transmitting

Note: Be sure to set unused SW4 through 8 to OFF.
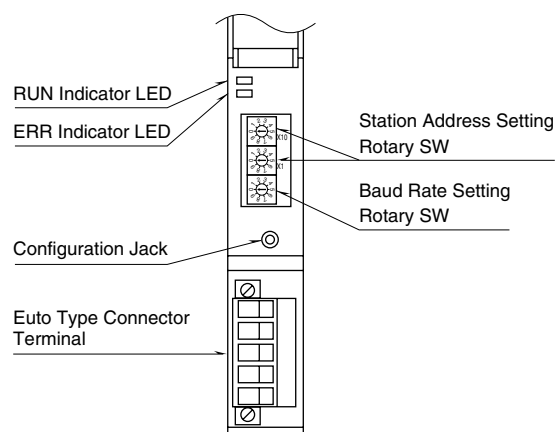
■ FRONT ROTARY SW

• Station Address: SA1, SA2

Station address is set in decimal.
(Setpoint adjustment: 01 – 64)

• Baud Rate

SW POSITION	BAUD RATE
0 (*)	156 kbps
1	625 kbps
2	2.5 Mbps
3	5 Mbps
4	10 Mbps
Other positions	Invalid; ERR LED ON

PC CONFIGURATOR

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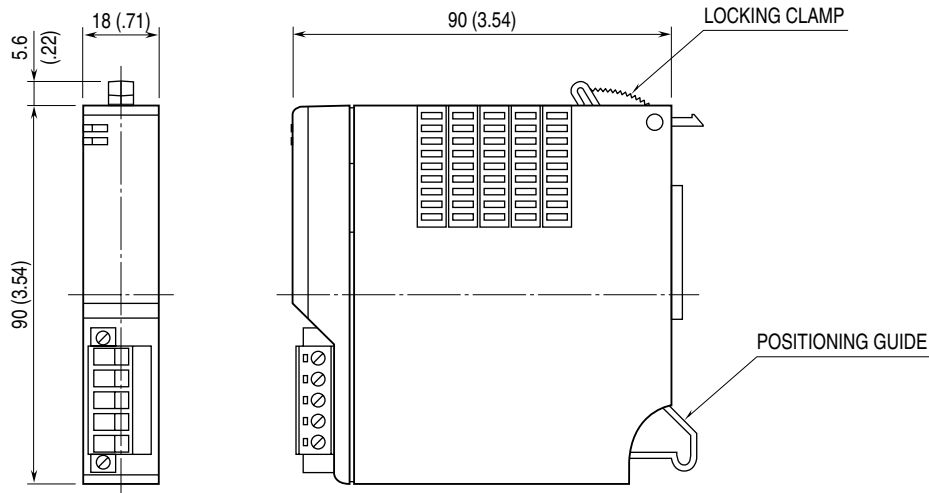Refer to the software manual of R5CON for detailed operation.

■ 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.

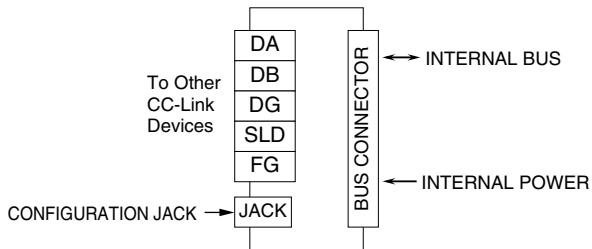## ■ EXTERNAL DIMENSIONS unit: mm (inch)

18 (.71)

5.6 (.22)

90 (3.54)

90 (3.54)

LOCKING CLAMP

POSITIONING GUIDE

■ CONNECTION DIAGRAM

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

Caution: FG terminal is NOT a protective conductor terminal.

To Other CC-Link Devices

| DA |
| DB |
| DG |
| SLD |
| FG |

BUS CONNECTOR → INTERNAL BUS

BUS CONNECTOR ← INTERNAL POWER

CONFIGURATION JACK → JACK

Note: The FG terminal is not connected with the FG of the power supply module (model: R5-PS).
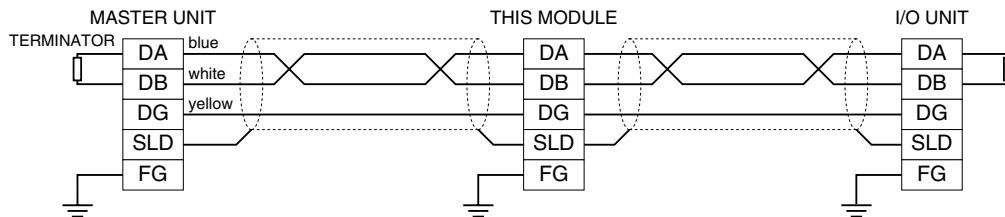
WIRING INSTRUCTIONS

■ EURO TYPE CONNECTOR TERMINAL (CC-Link)

Applicable wire size: 0.2 to 2.5 mm² (AWG24 to 12)
Stripped length: 7 mm

COMMUNICATION CABLE CONNECTIONS

MASTER UNIT   THIS MODULE   I/O UNIT

TERMINATOR

DA	blue
DB	white
DG	yellow
SLD	
FG	

| DA |
| DB |
| DG |
| SLD |
| FG |

| DA |
| DB |
| DG |
| SLD |
| FG |

DATA DESCRIPTIONS

The Data Allocation Mode 2 is used for the R5-NC2. 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.
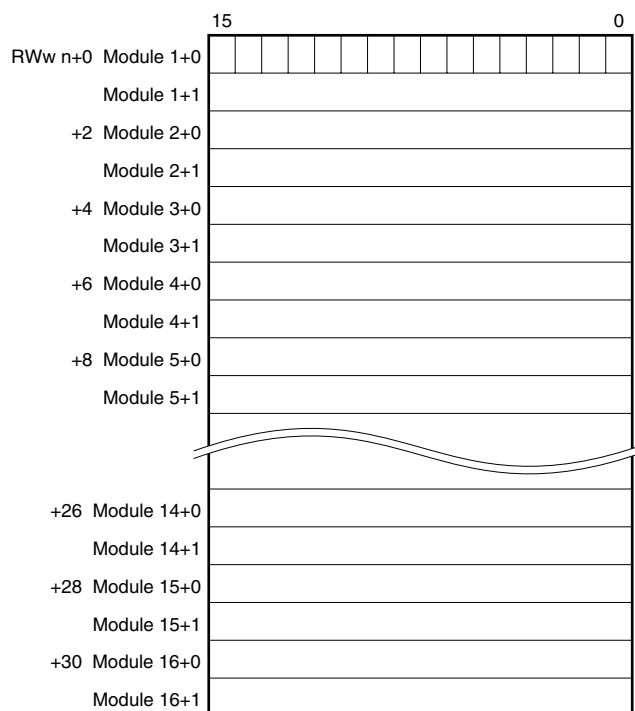
■ DATA ALLOCATION MODE 2

• Output Data

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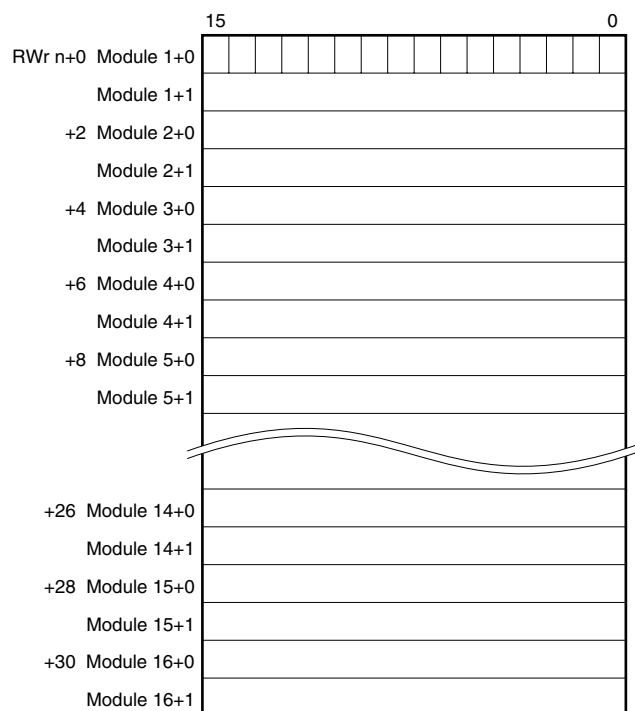
• Input Data

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

RWr n+0 Module 1+0	15 ... 0
Module 1+1	
+2 Module 2+0	
Module 2+1	
+4 Module 3+0	
Module 3+1	
+6 Module 4+0	
Module 4+1	
+8 Module 5+0	
Module 5+1	
+26 Module 14+0	
Module 14+1	
+28 Module 15+0	
Module 15+1	
+30 Module 16+0	
Module 16+1	

RWw n+0 Module 1+0	15 ... 0
Module 1+1	
+2 Module 2+0	
Module 2+1	
+4 Module 3+0	
Module 3+1	
+6 Module 4+0	
Module 4+1	
+8 Module 5+0	
Module 5+1	
+26 Module 14+0	
Module 14+1	
+28 Module 15+0	
Module 15+1	
+30 Module 16+0	
Module 16+1	

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.

• RX(n+0)0 through RX(n+0)F, RX(n+8)0 through RX(n+8)F

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."

RX(n+0) 0	Module 1	I/O 1
RX(n+0) 1	Module 1	I/O 2
RX(n+0) 2	Module 2	I/O 1
RX(n+0) 3	Module 2	I/O 2
:	:	:
:	:	:
RX(n+0) E	Module 8	I/O 1
RX(n+0) F	Module 8	I/O 2
RX(n+8) 0	Module 9	I/O 1
RX(n+8) 1	Module 9	I/O 2
RX(n+8) 2	Module 10	I/O 1
RX(n+8) 3	Module 10	I/O 2
:	:	:
:	:	:
RX(n+8) E	Module 16	I/O 1
RX(n+8) F	Module 16	I/O 2

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.

• RX(n+1)0 through RX(n+1)F

RX(n+1)0 through RX(n+1)7 are reserved for future use. RX(n+1)8 through RX(n+1)A and RX(n+1)C through RX(n+1)F are not used, while RX(n+1)B is assigned to Ready signal, which is turned to "1" when the network module is in normal conditions.

• RX(n+9)0 through RX(n+9)F

RX(n+9)0 through RX(n+9)7 are reserved for future use. RX(n+9)8 through RX(n+9)A and RX(n+9)C through RX(n+9)F are not used, while RX(n+9)B is assigned to Ready signal, which is turned to "1" when the network module is in normal conditions.

■ I/O CAPACITY

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

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).
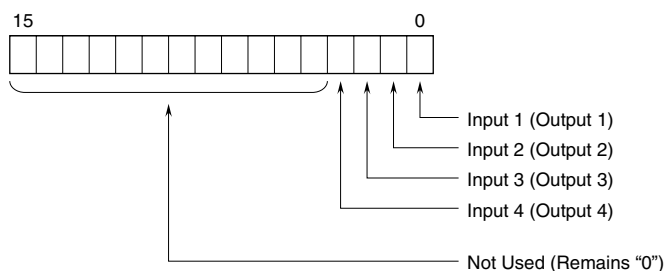With °C or Kelvin temperature unit, raw data is multiplied by 10. For example, 25.5°C is converted into 255.
With °F temperature unit, the integer section of raw data is directly converted into the data. For example, 135.4°F is converted into 135.
Negative values are represented in 2's complements.

■ 4-POINT DISCRETE DATA (models: R5-DA4, DC4, etc.)

Input 1 (Output 1)
Input 2 (Output 2)
Input 3 (Output 3)
Input 4 (Output 4)

Not Used (Remains "0")

0 : OFF
1 : ON

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

Input 1 (Output 1)
Input 2 (Output 2)
Input 3 (Output 3)
Input 4 (Output 4)
:
Input 16 (Output 16)
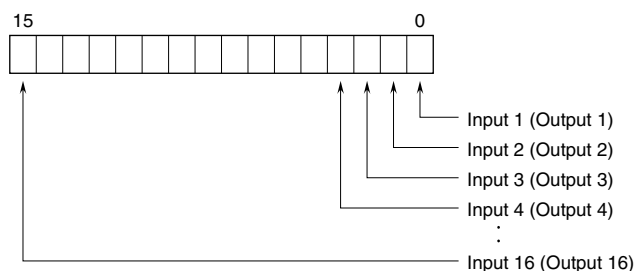
0 : OFF
1 : ON

PARAMETERS SETTING BY PLC PROGRAM

The ladder diagram below shows a program example assuming that the master station's first I/O number is X/Y20 to 3F. For detailed information, refer to users manuals for the PLC CPU and the Master Unit.

Ladder instruction	Comment
X0020 (NC) — X002F (NO) —[PLS M0]	
M0 —[SET M1]	
M1 —[MOV ____ D0]	Number of connected *1 modules
—[MOV ____ D1]	Number of retries
—[MOV ____ D2]	Number of automatic return modules
—[T0 H0002 H0001 D0 K3]	
—[MOV ____ D3]	Operation specification when the CPU is down
—[T0 H0002 H0006 D3 K1]	

Only when required:

Ladder instruction	Comment
M1 —[MOV ____ D4]	
—[MOV ____ D5]	
—[MOV ____ D6]	Reserved station specification
—[MOV ____ D7]	
—[MOV ____ D8]	
—[MOV ____ D9]	
—[MOV ____ D10]	Invalid station specification
—[MOV ____ D11]	
—[T0 H0002 H0010 D4 K8]	

Ladder instruction	Comment
M1 —[MOV ____ D13] *2	
⋮	Station information (set for the number of connected modules.)
—[MOV ____ D __]	
—[T0 H0002 H0020 D13 K __]	
—[RST M1]	

*1. Two (2) remote devices for four stations each must be assigned for one R5-NC2 to the host PLC.

*2. One R5-NC2 takes two consecutive remove device stations occupying four stations each. Set these fields for two stations.
[MOV 14mm D13]
[MOV 14nn   D14]
mm = R5-NC2 station address, nn = R5-NC2 station address + 4