MODEL: R3-NC2

Remote I/O R3 Series

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

27.5 [1.08]
130 [5.12]
109 [4.29]
mm [inch]
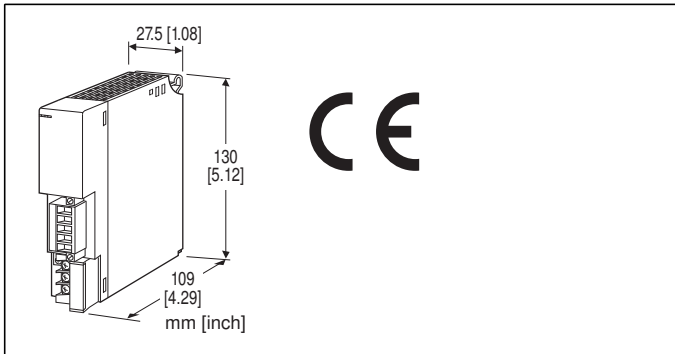
MODEL: R3-NC2-[1][2]

ORDERING INFORMATION
• Code number: R3-NC2-[1][2]
Specify a code from below for each of [1] and [2].
 (e.g. R3-NC2-R/CE/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) *
(CE not available)
L3: 200 – 240 V AC
(Operational voltage range 170 - 264 V, 47 - 66 Hz) *
(CE not available)
DC Power
R: 24 V DC
(Operational voltage range 24 V ±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 (multiple selections)
Standards & Approvals
blank: Without CE
/CE: CE marking
Other Options
blank: none
/Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)
COATING (For the detail, refer to our web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating
EX-FACTORY SETTING
/SET: Preset according to the Ordering Information Sheet
 (No. ESU-8355)

PACKAGE INCLUDES...
• Terminating resistor (110 Ω, 0.5 W)

GENERAL SPECIFICATIONS
Connection
 CC-Link: Euro type connector terminal
 (applicable wire size: 0.2 to 2.5 mm², 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: CC-Link to internal bus or internal power to power supply 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
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 (OFF with cable disconnection, blinking in setting error); Red ON at transmitting data (Function selected with DIP SW)
■ RUN CONTACT OUTPUT
RUN contact: Turns ON while the green RUN LED is ON (CC-Link in normal communication).
Rated load: 250 V AC @ 0.5 A (cos ø = 1)
30 V DC @ 0.5 A (resistive load)
(Less than 50 V AC to conform with EU Directive)
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 × 10⁷ cycles (300 cycles/min.)
When driving an inductive load, external contact protection and noise quenching recommended.

CC-Link COMMUNICATION

CC-Link: Conforms to Version 1.10

Station No. setting: Rotary switch; 1 – 64

Baud rate setting: Rotary switch
156kbps, 625kbps, 2.5Mbps, 5Mbps, 10Mbps

Station type: Remote device station

Required nodes: 8 (4 stations × 2)
(128 I/O points, 16 words) × 2
(This unit incorporates two ASICs, each requires 4 stations
(128 I/O points, 16 words), which are equivalent to two 4-
station remote devices.)

Transmission cable: Approved for CC-Link

INSTALLATION

Power consumption
•**AC**: Approx. 20 VA
•**DC**: Approx. 12 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: ≥ 100 MΩ with 500 V DC

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

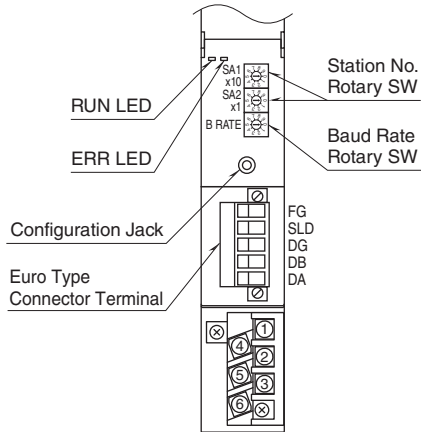## STANDARDS & APPROVALS

EU conformity:
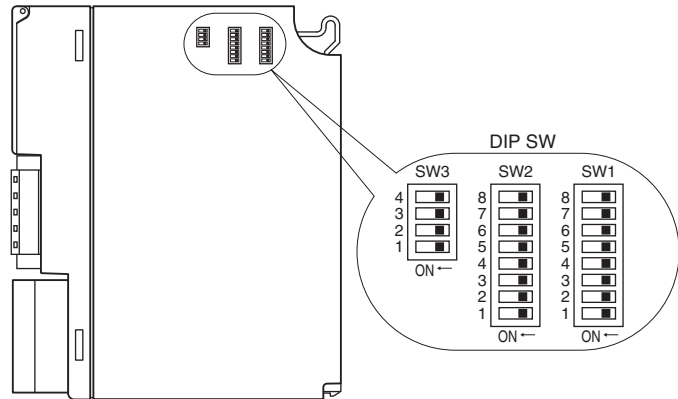EMC Directive
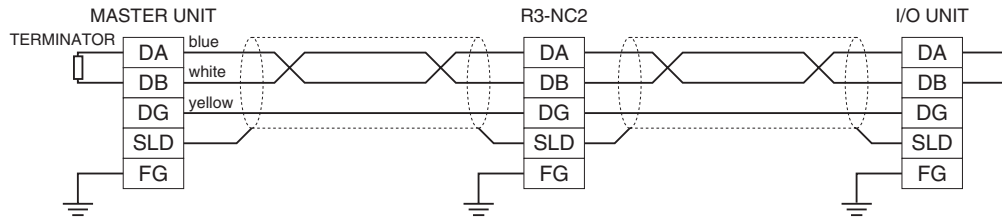 EMI EN 61000-6-4
  EMS EN 61000-6-2
RoHS Directive

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EXTERNAL VIEW

■ **FRONT VIEW**

RUN LED

ERR LED

Configuration Jack

Euro Type
Connector Terminal

SA1
x10
SA2
x1
B RATE

Station No.
Rotary SW

Baud Rate
Rotary SW

FG
SLD
DG
DB
DA

■ **SIDE VIEW**

DIP SW

SW3	SW2	SW1
4	8	8
3	7	7
2	6	6
1	5	5
ON ←	4	4
	3	3
	2	2
	1	1
	ON ←	ON ←

COMMUNICATION CABLE CONNECTIONS

MASTER UNIT

TERMINATOR

DA	blue
DB	white
DG	yellow
SLD	
FG	

R3-NC2

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

I/O UNIT

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

TRANSMISSION DATA DESCRIPTIONS

The DIP SW located at the side of the module specifies each I/O module's data allocation (occupied data area).
For example, when the data areas are assigned as shown below:

Module 1	4
Module 2	4
Module 3	4
Module 4	4
Module 5	4
Module 6	1
Module 7	1
Module 8	1

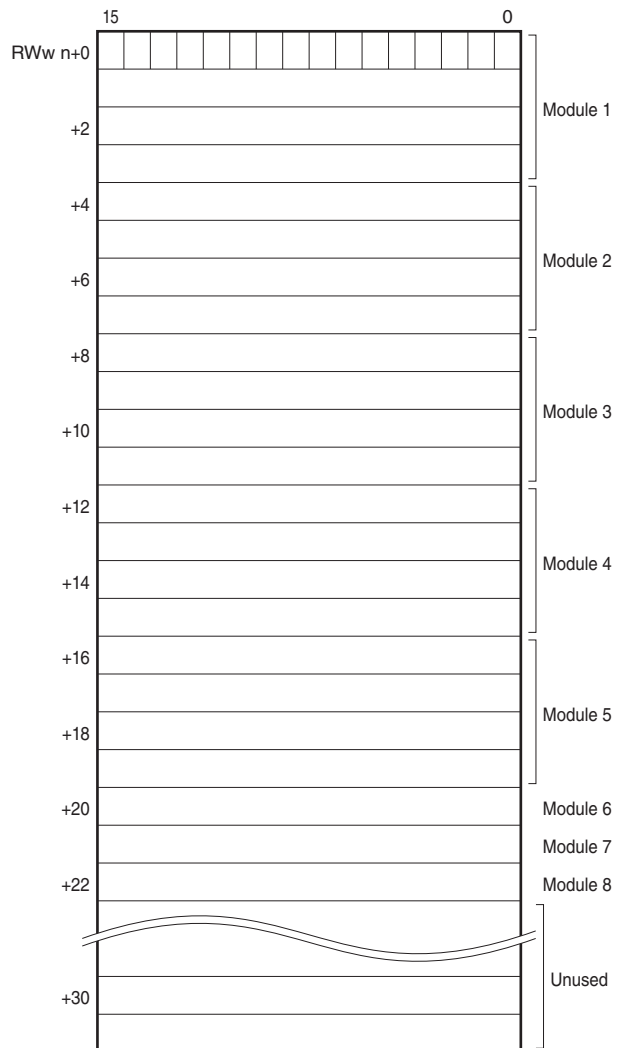Then the I/O data are assigned as in the figures below:

■ OUTPUT DATA
The figure below shows the allocation of the data sent from the network module to the master.
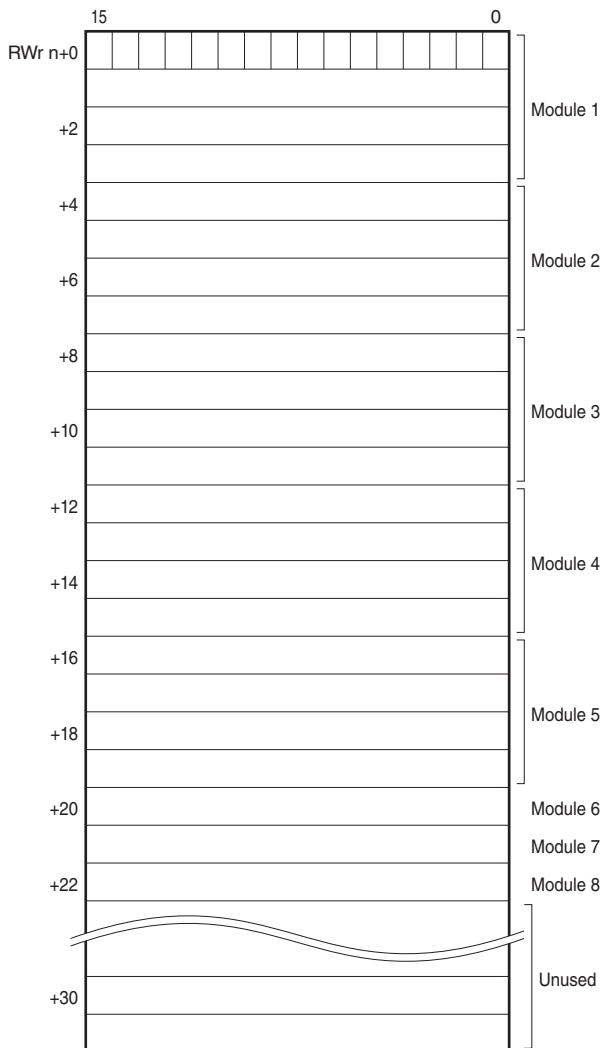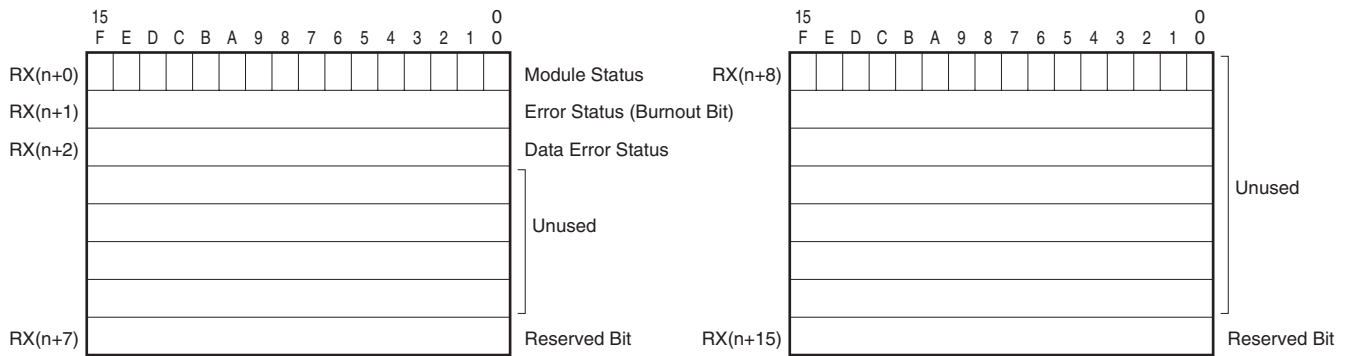
■ INPUT DATA
The figure below shows the allocation of the data sent from the master to the network module.

Thirty-two (32) data areas are available to this unit. Total data areas occupied by I/O modules must be within this limitation.

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• Module Status
  RX(n+0)0 through RX(n+0)F indicate 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
  RX(n+1)0 through RX(n+1)F indicate error status for each module as described below. The bit corresponding to such module turns to "1."

R3-TSx, R3-RSx, R3-US4:	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

• Data Error Status
  RX(n+2)0 through RX(n+2)F indicate overrange (R3-US4: out of -10% to +110%; the other types: out of -15% to +115%) status for each module. The bit corresponding to such module turns to "1."

• RX(n+3) through RX(n+6) are unused.
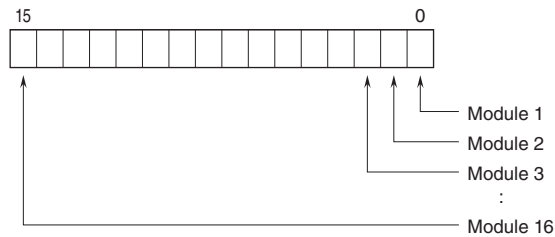 RX(n+8) through RX(n+14) are unused.

• RX(n+7)0 through RX(n+7)7 are reserved for future use. RX(n+7)B is assigned to Ready signal for ASIC 0, which is turned to "1" when the network module is in normal conditions. RX(n+7)8 through RX(n+7)A, RX(n+7)C through RX(n+7)F are not used.
  RX(n+15)0 through RX(n+15)7 are reserved for future use. RX(n+15)B is assigned to Ready signal for ASIC 1, which is turned to "1" when the network module is in normal conditions. RX(n+15)8 through RX(n+15)A, RX(n+15)C through RX(n+15)F are not used.

RX(n+0) 0, RX(n+1) 0, RX(n+2) 0	Module 1
RX(n+0) 1, RX(n+1) 1, RX(n+2) 1	Module 2
RX(n+0) 2, RX(n+1) 2, RX(n+2) 2	Module 3
:	:
RX(n+0) F, RX(n+1) F, RX(n+2) F	Module 16

MODULE STATUS, ERROR STATUS, DATA ERROR STATUS

Shows each module's availability and error status.

```
15                              0
┌─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┐
└─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┘
                         ↑ ↑ ↑
                         │ │ └── Module 1
                         │ └──── Module 2
                         └────── Module 3
                                 :
 └─────────────────────────────── Module 16
```

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.

```
15                              0
┌─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┐
└─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┘
```

■ TEMPERATURE DATA (16-bit data, models: R3-RS4, TS4, US4, etc.)

16-bit binary data.
With ℃ temperature unit, raw data is multiplied by 10. For example, 25.5℃ is converted into 255.
With ℉ temperature unit, the integer section of raw data is directly converted into the data.
For example, 135.4℉ is converted into 135.
Minus temperature is converted into negative values, represented in 2's complements.

```
15                              0
┌─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┐
└─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┘
```
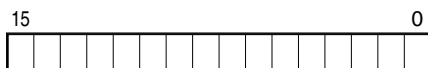
■ ANALOG DATA (16-bit data, models: R3-CT4A, CT4B, etc.)

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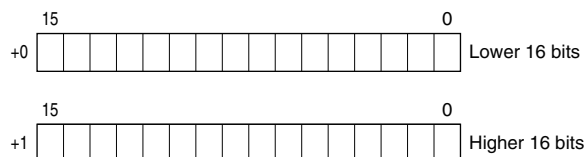 In case of CLSE-R5, integer obtained by multiplying unit value (A) by 1000.

```
15                              0
┌─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┐
└─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┘
```

■ 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.

```
     15                             0
+0  ┌─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┐  Lower 16 bits
    └─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┘

     15                             0
+1  ┌─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┬─┐  Higher 16 bits
    └─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┴─┘
```

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■ BCD DATA (32-bit data, models: R3-BA32A, BC32A, etc.)
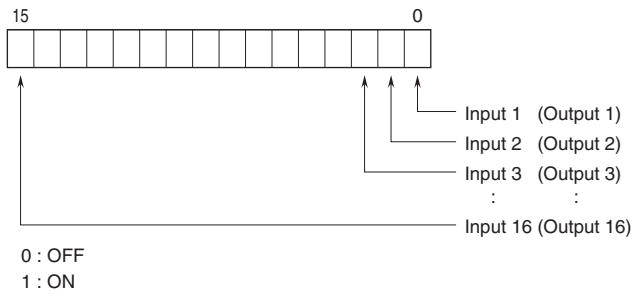
32-bit binary data is used for BCD.
Lower 16 bits are allocated from the lowest address to higher ones, higher 16 bits in turn.

```
      15                              0
+0   | | | | | | | | | | | | | | | | |   Lower 16 bits

      15                              0
+1   | | | | | | | | | | | | | | | | |   Higher 16 bits
```
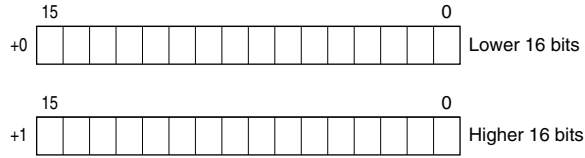
■ 16-POINT DISCRETE DATA (models: R3-DA16, DC16, etc.)

```
      15                              0
     | | | | | | | | | | | | | | | | |
                                  │ │ │
                                  │ │ └── Input 1   (Output 1)
                                  │ └──── Input 2   (Output 2)
                                  └────── Input 3   (Output 3)
                                   :        :
     └───────────────────────────────── Input 16 (Output 16)
```

0 : OFF
1 : ON

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS   unit: mm [inch]

27.5 [1.08]   109 [4.29]   POSITIONING GUIDE

130 [5.12]

6–M3 SCREW

6.2 [.24]

TERMINAL COVER

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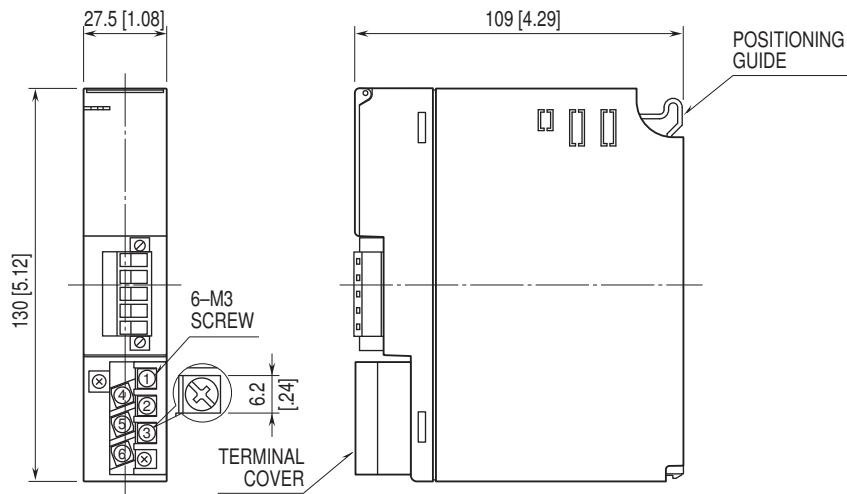
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

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

Caution: FG terminal is NOT a protective conductor terminal.

*Not provided with 'No Power Supply' type module.
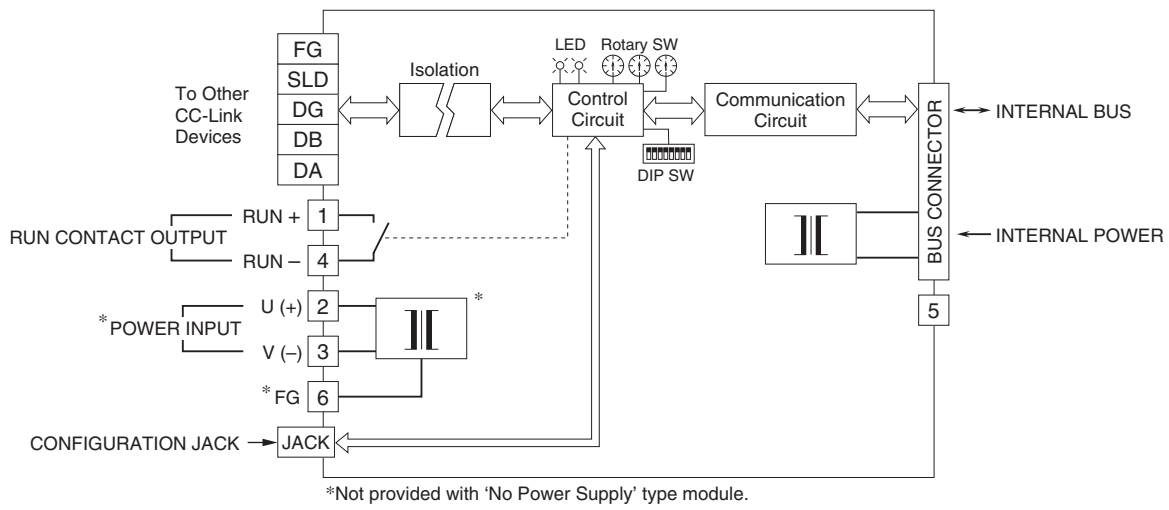
⚠ Specifications are subject to change without notice.

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