KEYENCE

96M13455

* 9 6 M 1 3 4 5 5 - 2 *

# Dedicated Communication Unit
## RS-232C Output Type
# N-R2
# Instruction Manual

| | |
|---|---|
| ⚠ DANGER | **Failure to follow these instructions may lead to death or serious injury.** |
| ⚠ WARNING | **Failure to follow these instructions may lead to injury.** |
| ⚠ CAUTION | **Failure to follow these instructions may lead to product damage (product malfunction, etc.).** |
| Note | **Provides additional information on proper operation.** |
| TIPS | Indicates useful information or information that aids understanding of text descriptions. |

## For Safely Using the Product

### ■ General precautions

- At startup and during operation, be sure to check that the functions and performance of the N-R2 is operating properly.
- We recommend that you take substantial safety measures to avoid any damage in the event a problem occurs.
- If the N-R2 is modified or used in any way other than described in the specifications, its function and performance cannot be guaranteed.
- When the N-R2 is used in combination with other instruments, the function and performance may be effected by operating conditions and the surrounding environment.
- Do not use the N-R2 for the purpose of protecting the human body.
- The information contained in this manual is subject to change without notice.

### ■ Notice

When this product is used under the circumstances and operating environments described below, adhere to the limitations of the ratings, take adequate measures to ensure safety such as fail-safe installations and consult a KEYENCE sales representative.

- For use under circumstances or environments which are not described in the manual
- For use with nuclear power control, railway, aircraft, vehicles, incinerators, medical equipment, entertainment equipment, safety devices etc.
- For use in applications where death or serious property damage is possible and extensive safety precautions are required.

### ■ For properly using the product

| | |
|---|---|
| ⚠ CAUTION | **• Do not use the N-R2 in an environment subject to flammable, explosive, or corrosive gases.**<br>**• Be sure that all screws are tightened securely.**<br>**• Use crimp contacts of the specified size for wiring.**<br>**• The N-R2 uses a 24 VDC power supply. Using a power supply outside this range or an AC power supply may cause product failure.**<br>**• Do not disassemble or modify the N-R2. This may cause product failure.**<br>**• Locate the cables as far as possible from high-voltage lines and power lines. Otherwise, generated noise may cause product failure or malfunctions.**<br>**• The N-R2 is a precision instrument. If the unit is dropped or shock is applied, it may be damaged. Use caution when unpacking, carrying, and mounting.**<br>**• Be sure to observe all warnings, cautions, and precautions specified in the manual.** |

Do not install the N-R2 in the following locations:

- Locations subject to direct sunlight
- Locations where the surrounding air temperature is outside the range of 0 to +50°C or locations subject to condensation as the result of severe changes in temperature
- Locations where the ambient humidity is outside the range of 35 to 85%RH.
- Locations subject to corrosive or flammable gases
- Locations subject to dust, salts, iron dust, or oil smoke
- Locations subject to shock or vibration
- Locations subject to exposure of water, oil, or chemicals
- Locations where strong magnetic or electric fields are generated

## Foreign Regulations and Standards

### ■ UL certification

The N-R2 complies with the following UL/CSA standards and has obtained the UL/C-UL certification.

- Applicable standards UL508, UL60950-1
- UL File No. E207185, E167973
- UL category NRAQ/NRAQ7, NWGQ2/NWGQ8

Be sure to observe the following installation and environment conditions.

- Pollution degree 2
- Overvoltage category I

Caution - Do not connect directly to the branch circuit. This product must be supplied power by a suitable, approved isolated transformer or power supply not exceeding 200 VA max.

Attention - Ne raccordez pas l'unité directement au circuit de dérivation. Ce produit doit être alimenté par un transformateur adapté, isolé et approuvé ou une alimentation ne dépassant pas 200 VA.

### ■ FCC regulations

The N-R2 complies with the following FCC EMI regulations.

- FCC Part 15 Subpart B, Class B digital device
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1)This device may not cause harmful interface, and (2) this device must accept any interference received, including interference that may cause undesired operation.

  Note:
  This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
- FCC CAUTION
  Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### ■ Canada IC (Industry Canada) regulations

The N-R2 complies with the following IC EMI regulations.

- ICES-003, Class B digital apparatus

### ■ CE marking

The N-R2 complies with the following essential requirements of the EU Directive.

- EMC Directive

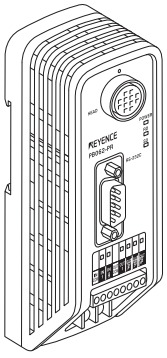
The following harmonized standards are applied to this product in order to confirm the compliance.

- Applicable standards (EMI) EN55011, Class A
  EN55032, Class B
- Applicable standards (EMS) EN61000-6-2
  EN61000-6-1

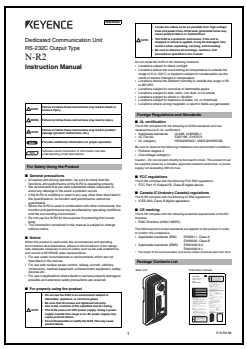
* The length of the communication and power cables should be less than 30 m.

## Package Contents List

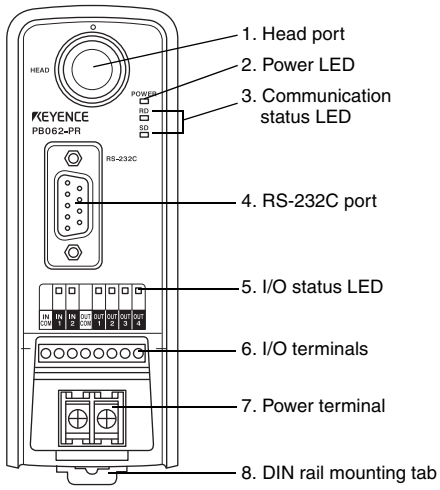
Main unit



Instruction manual

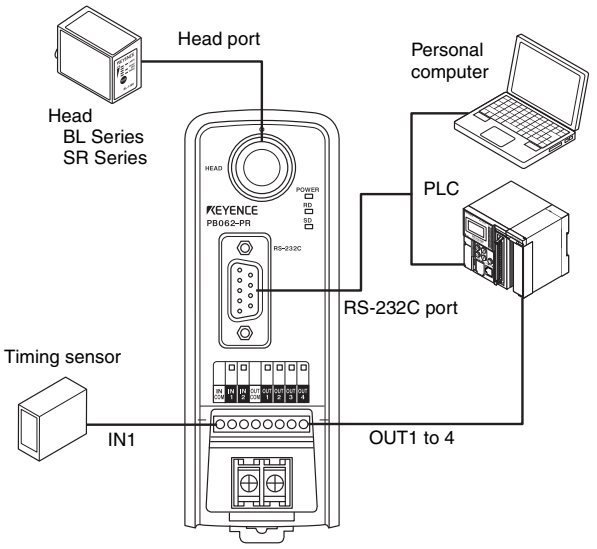


## Part Names and Functions




| Number | Name | Function |
|---|---|---|
| 1 | Head port | Used to connect the head. |
| 2 | Power LED | Lights when the power is ON. |
| 3 | Communication status LED | Monitors the status of communication with the head. |
| 4 | RS-232C port | Used to connect to the host (personal computer, PLC). |
| 5 | I/O status LED | Monitors the ON/OFF status of I/O terminals. |
| 6 | I/O terminals | Used to connect I/O signal lines of control units. |
| 7 | Power terminal | Terminal for 24 VDC power supply input. |
| 8 | DIN rail mounting tab | A tab for mounting the DIN rail. |

## System Configuration Figure

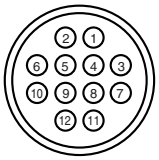



## Connection and Wiring Methods

### ■ Connecting the code reader

Connect the code reader to the head port of the N-R2.

Pin layout of the head port



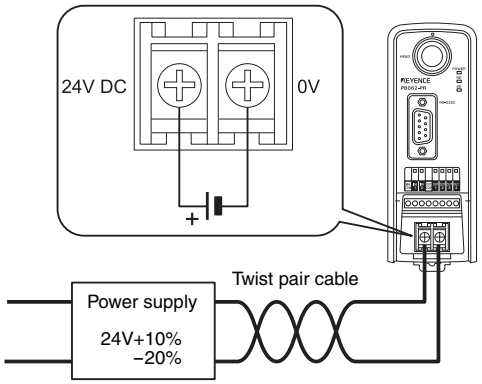
Round 12-pin jack

| Pin number | Name | Signal name | Signal direction |
|---|---|---|---|
| 1 | OUT1 | OUT1 input | Input |
| 2 | OUT2 | OUT2 input | Input |
| 3 | RXD | RS-232C Receive | Input |
| 4 | RTS | RS-232C Receivable | Output |
| 5 | OUT4 | OUT4 input | Input |
| 6 | IN2 | IN2 output | Output |
| 7 | TXD | RS-232C Transmit | Output |
| 8 | CTS | RS-232C Transmittable | Input |
| 9 | OUT3 | OUT3 input | Input |
| 10 | IN1 | IN1 output | Output |
| 11 | +5V | +5V power supply | Output |
| 12 | GND(SD) | Common GND | — |

| ⚠ CAUTION | **Install and remove connection cables with the power disconnected.** |
|---|---|

### ■ Connecting the power supply

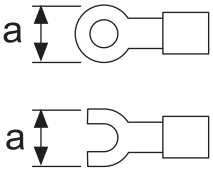
Connect the 24 VDC power supply to the power terminal of the N-R2.




| ⚠ CAUTION | **Using a power supply other than 24 VDC may cause product failure.** |
|---|---|

The dimensions of crimp contacts used for wiring should be as follows:

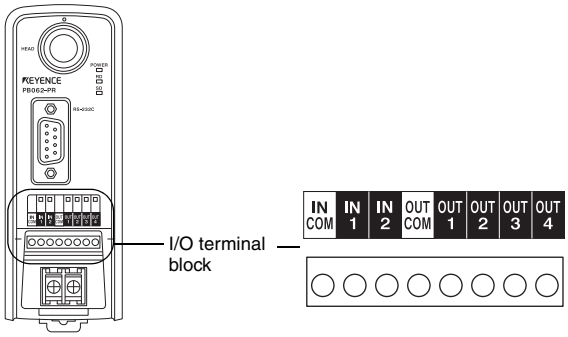
| Terminal | Dimensions |
|---|---|
| Round Terminal | a: 6 mm Max. |
| Y terminal | a: 6 mm Max. |




| Item | Description |
|---|---|
| Wire size | AWG14-22 |
| Tightening torque | 0.49 N·m (4.34 lbf·in) |
| Wire material | Copper |
| Wire type | Stranded wire |
| Electric wire temperature rating | +60°C max. |

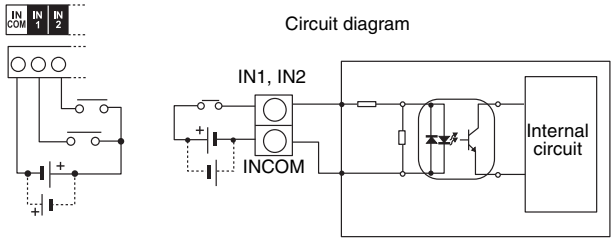
### ■ Layout and wiring of the I/O terminal block

- **Layout of the I/O terminal block**

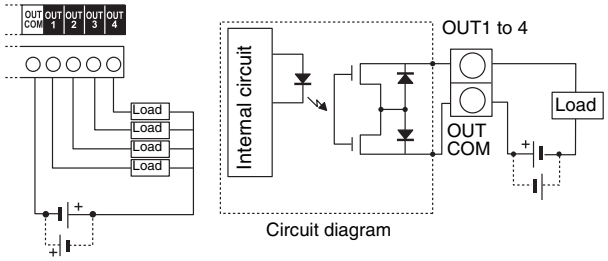



| Note | • **For connection, use stranded copper wire having a gage of AWG16 to 26 and temperature rating of 60°C or higher.**<br>• **The tightening torque is 0.19 N·m (1.7 lbf·in).** |
|---|---|

- **Wiring IN1 and IN2**



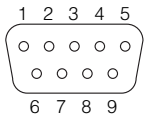
- **Wiring OUT1 to 4**



Circuit diagram

## ■ Wiring the RS-232C port

- **Pin layout of the RS-232C port**

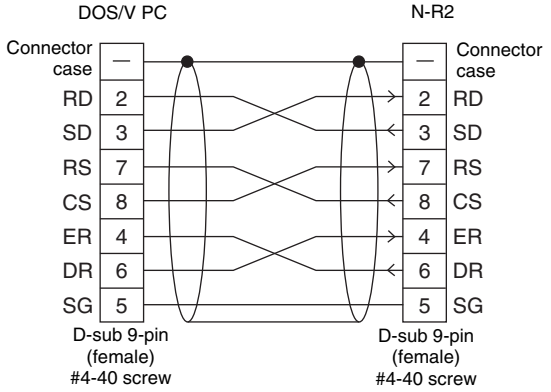


D-sub 9-pin (male)
DTE specification (terminal definition)
#4-40 screw (female)

| Pin number | Symbol | Description | Signal direction |
|---|---|---|---|
| 2 | RD (RXD) | Data reception | Input |
| 3 | SD (TXD) | Data transmission | Output |
| 4 | ER (DTR) | Connected to Pin 6 internally | Output |
| 5 | SG | Signal ground | |
| 6 | DR (DSR) | Connected to Pin 4 internally | Input |
| 7 | RS (RTS) | Transmission request (always ON) | Output |
| 8 | CS (CTS) | Transmission permitted | Input |

- **Wiring the RS-232C cable**

When connecting to the PC, wire as shown below.



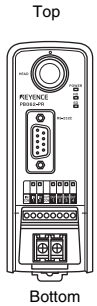

* It can be connected with Keyence's optional cable OP-27937 (2 m).

# Installing the N-R2

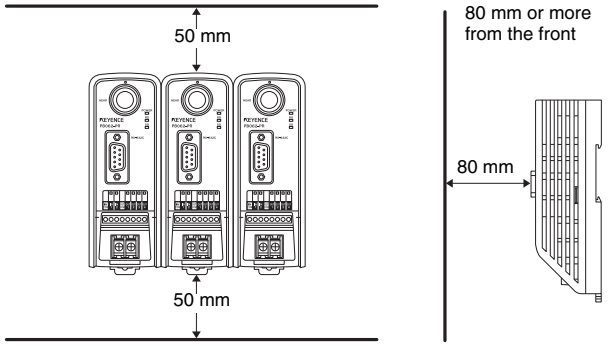
## ■ Surrounding space

- Install the N-R2 vertically.
  When the installation direction changes, provide adequate surrounding space so that heat does not build up.

- For ventilation, maintain a space of 50mm or more from the top and bottom of the N-R2. As long as the N-R2 is the only source of heat generation, the N-R2 can be installed without space on the right and left sides. Provide a space of 80 mm or more in front of the N-R2 to connect the BL head.




**50 mm or more on the top and bottom; no space is required on the right and left sides**




## ■ Installation precautions

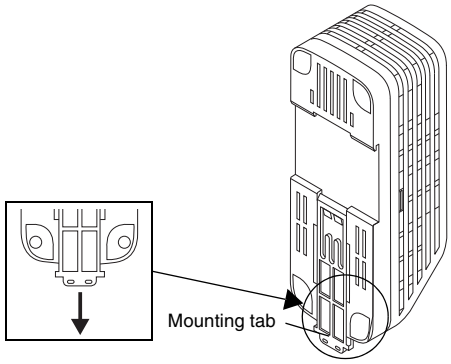
- When installing the N-R2, do not block the ventilation slots on the top and bottom of the unit. Otherwise, heat builds up inside the unit, causing product failure.
- If the temperature of the N-R2 will foreseeable exceed the upper limit of the operating temperature (50°C), take the appropriate measures such as performing forced air cooling or ensuring proper ventilation so that the temperature does not exceed the upper limit of the normal operating temperature (50°C).

## ■ Installing and removing the N-R2 to and from the DIN rail

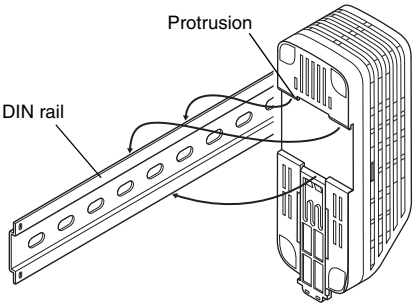
- **Installing the N-R2 to the DIN rail**

**1 Lower the mounting tab on the back of the N-R2.**

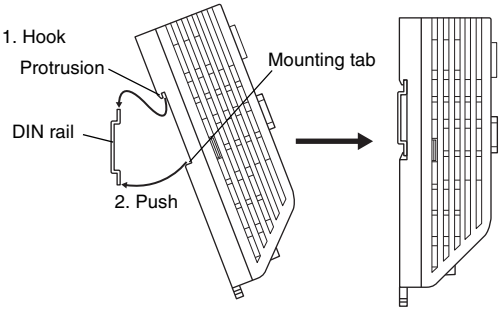
Check that the mounting tab is placed in the position shown in the following diagram.




**2 Install the N-R2 to the DIN rail as shown in the following diagram.**

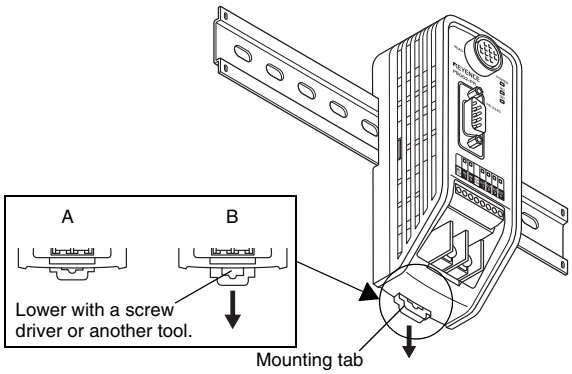



Installing the N-R2 to the DIN rail



- **Removing the N-R2 from the DIN rail**

**1 Lower the mounting tab as shown in B in the following diagram, and then remove the N-R2.**




**2 After the N-R2 is removed, return the mounting tab to the state shown in A.**

## Specifications

### ■ General specifications

| Model | | N-R2 |
|---|---|---|
| Power supply for the code reader | | 5 VDC ± 5% (650 mA) |
| Display | | 9 LEDs (power supply status, data transmission/ reception status, I/O terminal status) |
| Environment resistance | Operating surrounding air temperature | 0 to 50°C |
| | Storage ambient temperature | -20 to 60°C |
| | Operating ambient humidity | 35 to 85%RH (no condensation) |
| | Operating atmosphere | No dust or corrosive gases present |
| | Vibration resistance | 10 to 55 Hz, complex amplitude 1.5 mm, 2 hours in each of X, Y, and Z directions |
| Rating | Power voltage | 24 VDC (+10%, -20%) |
| | Consumption current | 380 mA or less |
| Mass | | Approx. 135 g |

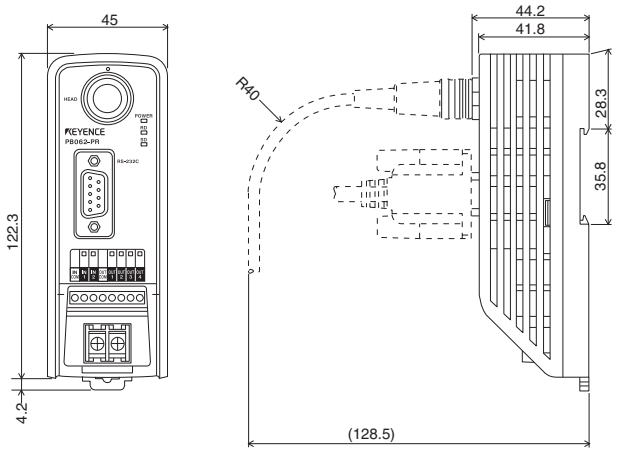
### ■ I/O specifications

| | | | |
|---|---|---|---|
| Terminal block | Input | Number of pins | 2 (IN1 and IN2) |
| | | Input format | Bidirectional voltage input |
| | | Input maximum rating | 26.4 VDC |
| | | Minimum ON voltage | 15 VDC |
| | | Maximum OFF current | 1 mA |
| | Output | Number of pins | 4 (OUT1 to 4) |
| | | Output format | Photo MOS relay output |
| | | Output rating load | 30 VDC, 100 mA |
| | | OFF time leak current | 0.1 mA or less |
| | | ON time residual voltage | 1 V or less |

### ■ Communication specifications

| | | |
|---|---|---|
| Head interface | Connector | 1 (12-pin round connector) |
| | Communication standards | RS-232C compliant |
| | Communication rate | 4800, 9600, 19200, 31250, 38400, 57600, 115200 bit/s |
| | Data bit length | 7/8 bits |
| | Parity check | None/even/odd |
| | Stop bit length | 1/2 bits |
| | Flow control | Hardware/software/none selectable |
| Host interface | Connector | 1 (D-sub 9-pin connector) |
| | Communication standards | RS-232C compliant |
| | Total extended length | 15 m or less (including the head cable) |

### ■ Dimensions diagram

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(1) KEYENCE warrants the Products to be free of defects in materials and workmanship for a period of one (1) year from the date of shipment. If any models or samples were shown to Buyer, such models or samples were used merely to illustrate the general type and quality of the Products and not to represent that the Products would necessarily conform to said models or samples. Any Products found to be defective must be shipped to KEYENCE with all shipping costs paid by Buyer or offered to KEYENCE for inspection and examination. Upon examination by KEYENCE, KEYENCE, at its sole option, will refund the purchase price of, or repair or replace at no charge any Products found to be defective. This warranty does not apply to any defects resulting from any action of Buyer, including but not limited to improper installation, improper interfacing, improper repair, unauthorized modification, misapplication and mishandling, such as exposure to excessive current, heat, coldness, moisture, vibration or outdoors air. Components which wear are not warranted.

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