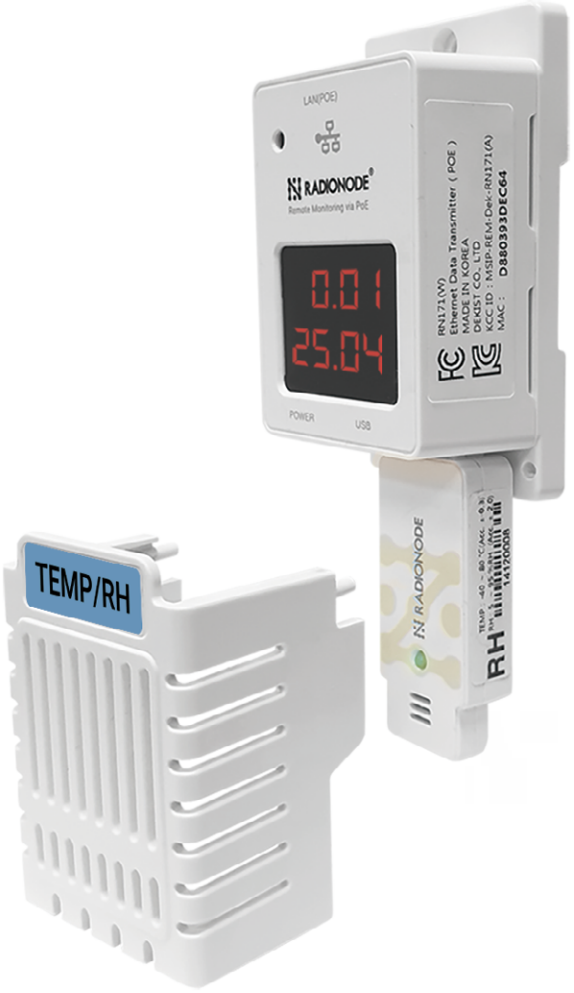
Easily, Setup your own Sensor Monitoring System

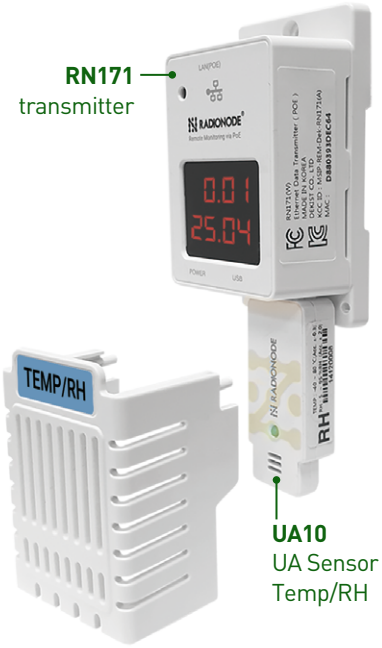
RN17X+UA Series



RADIONODE®

What are **RN17X** and **UA Sensors?**

The RN17X product line and the UA sensor series from Radionode are innovative hardware platforms designed to establish a Wireless Sensor Network (WSN) based on cutting-edge IoT technology. These products allow users to freely choose sensors and communication methods as needed, enabling flexible and efficient utilization in various industrial settings.



Key Features

Diverse Communication Options

The RN17X series offers various communication methods, including PoE, WiFi, RS485, and LoRaWAN, supporting an optimized network configuration tailored to the customer's environment.

Precise Measurements and Easy Sensor Replacement

UA sensors are designed with a USB type interface, making replacement simple and maximizing maintenance efficiency. Similar to printer cartridges, most gas and humidity sensors are consumables that need replacement every 1–2 years. The USB-type UA sensors simplify this routine process.

- **UA10 Series (Temperature Sensor)**

Offers T/K-type thermocouple temperature sensors, PT100 analog temperature sensors, and MEMS-based temperature and humidity sensors.
→ Accurately measures temperature and humidity, making it suitable for various environments.

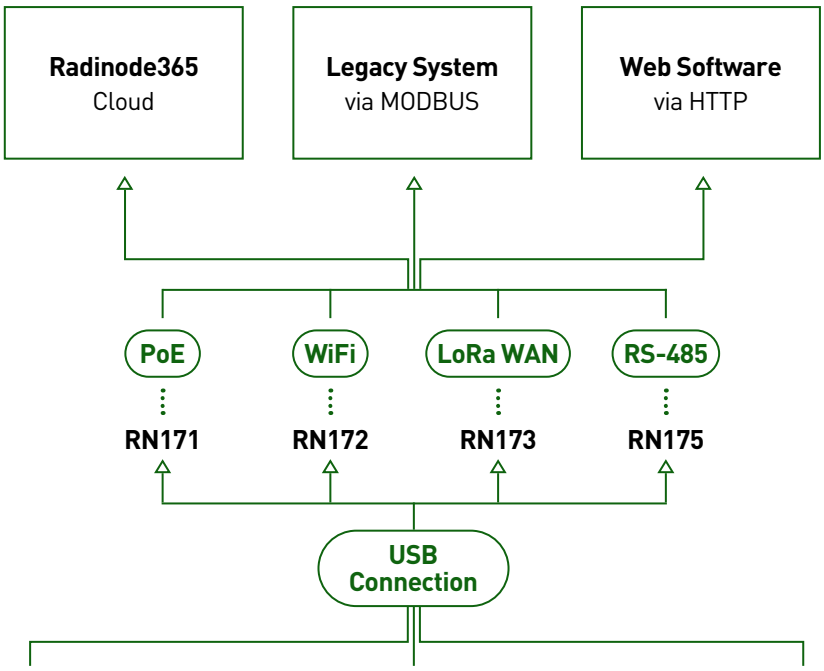
- **UA20 Series (Signal Converter)**

A system designed to monitor various industrial signals, providing functionality to convert and deliver data.
→ Precisely converts industrial signals (4-20mA / 0-1V / RS485) and delivers them as monitoring data.

- **UA5X Series (Gas Sensor)**

Accurately measures and monitors the concentration of gases in industrial environments, supporting up to 30 different gas substances for safe management.
→ Provides essential solutions for gas safety management in industrial sites.

Overview



UA1X Series
4 type Temp.
RH Sensors

- **UA10**
  MEMS
  Temp/RH Sensor
- **UA11**
  T/C T/K Type
  Temp Sensor
- **UA12**
  T/C 8 Type
  Temp Sensor
- **UA13**
  PT100
  Temp Sensor

UA20 Series
5 type Signal
Transmitters

- **UA20A**
  4-20mA Transmitter
- **UA20B**
  4-20mA Transmitter
  (12V Loop Power)
- **UA20C**
  0-1V Transmitter
- **UA20D**
  Pulse Counter
- **UA20E**
  RS-485 Converter

UA5X Series
30 type
Gas Sensors

- **UA52**
  Optical Gas Sensor
- **UA53**
  Electrochemical
  Film Gas Sensor
- **UA54**
  Electrochemical
  Cell Gas Sensor
- **UA58**
  Multi-gas Sensor
- **UA59**
  SUS Type Gas Sensor

RN17X Overview & Main Features

01 Support for a Wide Range of Sensors

- Offers up to 40 sensor options, allowing comprehensive management of all industrial data such as temperature, humidity, gas, and vibration.
- Flexible options to meet diverse requirements.

02 Reliability Without Data Loss

- The Sensor Data Recovery feature stores data in internal memory during communication interruptions and automatically transmits it later.
- Preventing data loss.

03 Ease of Maintenance

- USB-based Plug & Play design allows anyone to easily replace sensors, reducing maintenance costs.

04 High Visibility and User Convenience

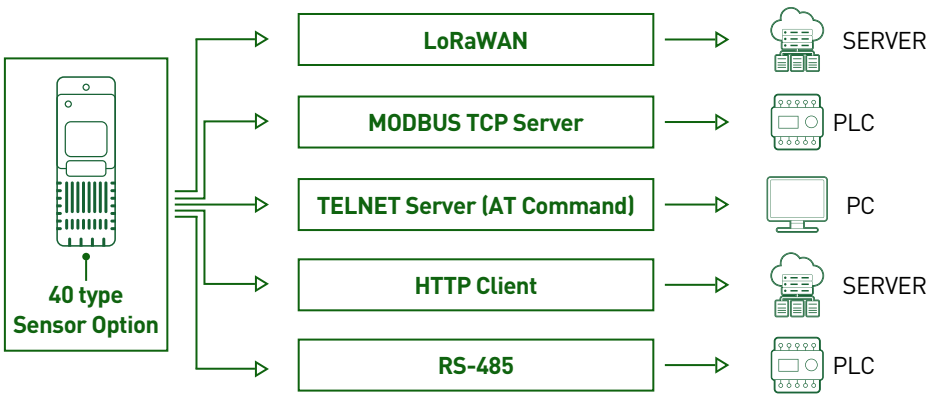
- High-brightness 4-Digit LED display provides excellent readability in industrial environments.
- Adjustable brightness to suit various settings.
- The built-in buzzer alerts in real time when thresholds are exceeded, ensuring quick on site response.

05 Simple Firmware Updates via USB

- Easy firmware updates via USB to keep the device up-to-date.

06 Extensive Network Compatibility

- Supports various communication protocols such as HTTP, MODBUS TCP, Telnet (AT Command), and LoRaWAN for flexible connectivity



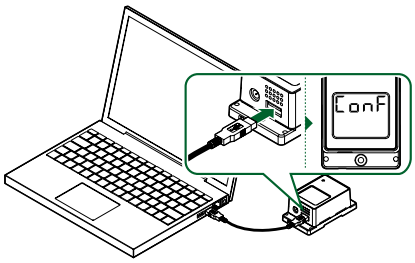
How to operate

How to Set Up

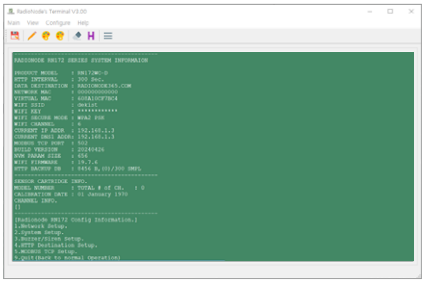
① Connect the USB to a PC and run the Radionode Term program. The Console menu will appear for configuration.

② Enter the IT infrastructure information where the sensor-measured data will be transmitted.

③ Set the data transmission interval.



<How to connect RN17X Series and PC>

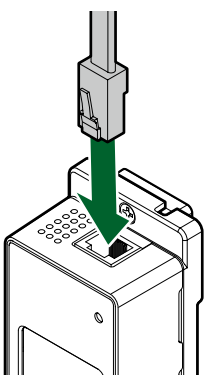


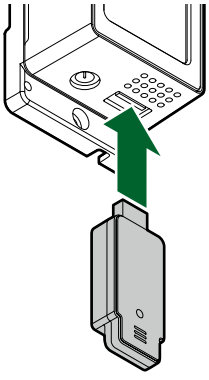
<Radionode Terminal Console>

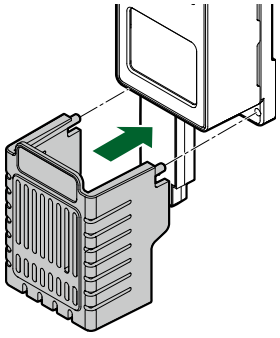
How to Install

① Connect the desired UA Sensor to the RN17X and complete the communication settings.

② Power the device. It will automatically connect and transmit data at the set intervals.







How to Manage

If using UA5X gas sensor cartridges, replace them regularly to maintain high precision and accuracy

RN17X SPEC
Network Transmitter

RN171 Transmitter via PoE

Product name	RN171 plus
Model name	RN171WC
Ethernet	100 Mbps
Network Protocol (Wired)	HTTP MODBUS TCP TELNET(ATcmd)
Network Port	TCP: 23, UDP: 50000, Modbus:502, HTTP:80
USB	2.0, Sensor Port, Configuration Port
Power Supply	DC 6 V or PoE 48 V (IEEE 802.3af/802.3at)
Power consumption	1.9 W
Size	H90 × W50.4 × D40.5 mm (with sensor protective cover, total length is 141.9 mm)

RN172 Transmitter via WiFi

Product name	RN172 plus
Model name	RN172WCD
WiFi	IEEE 802.11 b/g/n WPA,WPA2 2.4GHz
Network Protocol (Wireless)	HTTP MODBUS TCP TELNET(ATcmd)
Network Port	TCP: 23, UDP: 50000, Modbus:502, HTTP:80
USB	2.0, Sensor Port, Configuration Port
Power Supply	DC 6~24V
Power consumption	1.4 W
Size	H90 × W50.4 × D40.5 mm (with sensor protective cover, total length is 141.9 mm)

RN173 Transmitter via LoRaWAN

Product name	RN173 plus
Model name	RN173
Network Protocol (Wireless)	LoRaWAN ® V1.0.3 ,OTAA/ABP ClassA CN470/IN865/RU864/EU868/US915/AU915/ KR920/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps
USB	2.0, Sensor Port, Configuration Port
Power Supply	DC 6 ~ 24V
Power consumption	1.9 W
Size	H90 × W50.4 × D40.5 mm (with sensor protective cover, total length is 141.9 mm)

(Upcoming Product)

RN175 Transmitter via RS-485

Product name	RN175 plus
Model name	RN175
RS485	Modbus RTU
Network Protocol (Wired)	R485 Specifications Baud Rate: 9600bps(default) Data Bits: 8 Stop Bit: 1 Parity: None
USB	2.0, Sensor Port, Configuration Port
Power Supply	DC 6 ~ 24V
Power consumption	1.9 W
Size	H90 × W50.4 × D40.5 mm (with sensor protective cover, total length is 141.9 mm)

(Upcoming Product)

UA Sensor Overview & Main Features

01 Various Sensor Options

- Provides sensor options capable of collecting diverse data such as temperature, humidity, gas, and pressure.

02 Advanced Signal Processing

- Delivers precise and reliable data using advanced signal processing technology.

03 USB Communication Support

- Enables easy and convenient data transmission and management through a USB interface.

04 Dedicated Calibrator Software Support

- Offers professional software for sensor calibration and management to maintain accuracy.

05 Temperature Compensation Algorithm

- Ensures accurate data even in varying environmental conditions by applying a temperature compensation algorithm.

06 Machine Learning Technology

- Utilizes machine learning-based data analysis for enhanced precision and predictive capability.

07 Compact Design

- Features a compact size, making it easy to install and operate in space-constrained environments.

08 AT Command Support

- Allows efficient control of communication and settings with sensors through AT commands.

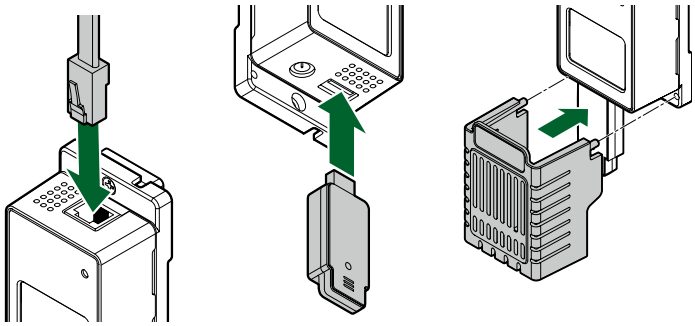
09 Versatile Applications

- Suitable for various fields such as industrial environment monitoring, air quality management, smart farming, and research and development.

How to
Use UA Sensor

Use Case 1

Use the sensor as a cartridge with the Radionode RN17X product

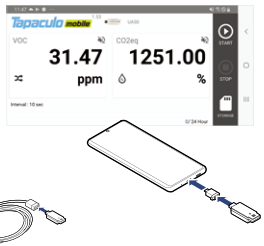


Use Case 2

Connect it independently to a PC or other devices (Linux, Android).
For Windows, dedicated recording software is provided.

Tapaculo® Lite

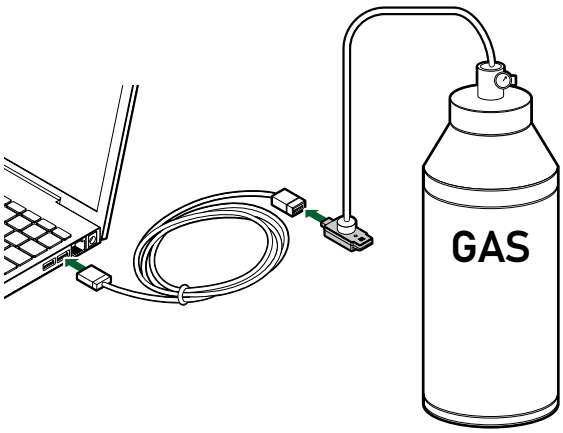
Tapaculo® Mobile



Using the Precision Calibration Software for UA Sensors

① Connect the sensor to a PC and calibrate it using the dedicated software and calibration gas (Zero / Span).

② Perform zero calibration in an environment with clean air.



UA1X SPEC
Temperature Sensor

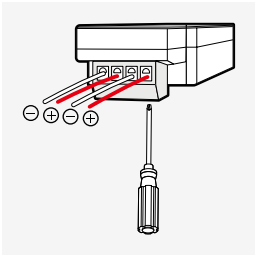
UA10 High Accurate Temp/RH

Temperature m. range	-40 ~ 80 °C (±0.2%)
Humidity m. range	5 – 95% RH (±2.0 RH)
Absolute humidity m. range	0 ~ 256 g/m³
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 13 mm
Operating conditions	-40 ~ 80 °C, 5 ~ 95% RH (non condensable)

• The UA10H features as internal MEMS-type temperature and humidity sensor for high-accuracy measurements.

UA11 T,K Type Thermocouple

TC-T Type m. range	-100 ~ 300 °C (±0.8°C)
TC-K Type m. range	0 ~ 1000 °C (±0.8 °C)
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	-40 ~ 80°C, 5 ~ 95% RH (non condensable)



① Turn over UA11, connect external sensor cable from left to right
② Loose bolt on connector for connecting external sensor cable
③ Red is +, White is - that connect as a picture

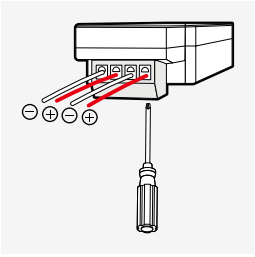
- UA11 supports maximum 2 external thermocouple sensors.
- The UA11 supports 2-wire thermocouple temperature sensor.
- The UA11 can measure up to 2CH simultaneously.
- Use the same type of thermocouple sensor in one device.

Sensor Type	External Sensor	Line length
K Type Thermocouple (TC-K) -50 ~ 200°C	PR-K1-3	3m
	PR-K1-15	15m
T Type Thermocouple (TC-T) -200 ~ 200°C	PR-T1-3	3m
	PR-T1-15	15m

UA1X SPEC
Temperature Sensor

UA12 T,K,N,E,S,B,R,J Type ThermoCouple

TC-T Type m. range	-100 ~ 300 °C (±0.8°C)
TC-K Type m. range	0 ~ 1000 °C (±0.8 °C)
TC-N Type m. range	-150°C ~ 1300°C
TC-E Type m. range	-200°C ~ 1000°C
TC-S Type m. range	250°C ~ 1664°C
TC-B Type m. range	1000°C ~ 1800°C
TC-R Type m. range	250°C ~ 1664°C
TC-J Type m. range	-150°C ~1200°C
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	-40 ~ 80°C, 5 ~ 95% RH (non condensable)

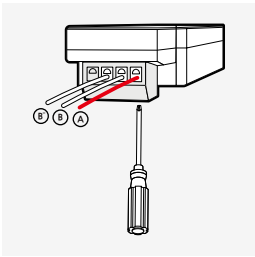


① Turn over UA12, connect external sensor cable from left to right
② Loose bolt on connector for connecting external sensor cable
③ Red is +, White is - that connect as a picture

- UA12 supports up to 2 external thermocouple sensors (K, T, J, N, E, S, B, R types).
- The UA12 supports 2-wire thermocouple temperature sensor.

UA13 PT100

PT100 m.range	-200 ~ 300 °C (±0.625°C)
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	-20 ~ 80°C, 5 ~ 95% RH (non condensable)



① Turn over UA13, connect external sensor cable from left to right
② Loose bolt on connector for connecting external sensor cable
③ Red is +, White is - that connect as a picture

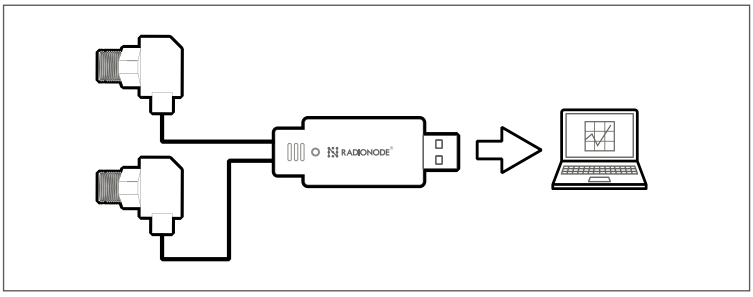
- The UA13 supports 2-wire PT100 temperature sensor.
- The UA13 can measure up to 1CH

Sensor Type	External Sensor	Line length
PT100 -200 ~ 200°C	PR-P1-13	3m
	PR-P1-15	15m

UA2X SPEC
Signal Converter

UA20A, UA20C 4-20mA / 0-1V transmitter

UA20A/C Input signal	A model : 4-20mA or 0-20mA C model : 0 ~ 1000mV
channel info.	• Channel # : 2 • Accuracy: ± 0.08% F.S. • Resolution : 0.01mA • Sample Rate : 300ms/Channel
Sensing Interval	Min: 100ms
Scale Range Setup	Software Setting -99999.99 ~ 99999.99
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	-40 ~ 80°C, 5 ~ 95% R.H (non condensable)



2 Channel 0-1000mV Analog to Digital Available to connect ANY 0-1V output Sensors Output measurement values to USB

UA20B 4-20mA transmitter+12V DC Output

Input 4-20mA(1CH)	• Channel # : 1 • Accuracy: ± 0.08% F.S. • Resolution : 0.01mA • Sample Rate : 300ms/Channel
Sensing Interval	Min: 100ms
Scale Range Setup	Software Setting -99999.99 ~ 99999.99
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	-40~80°C, 5~95% R.H (non condensable)

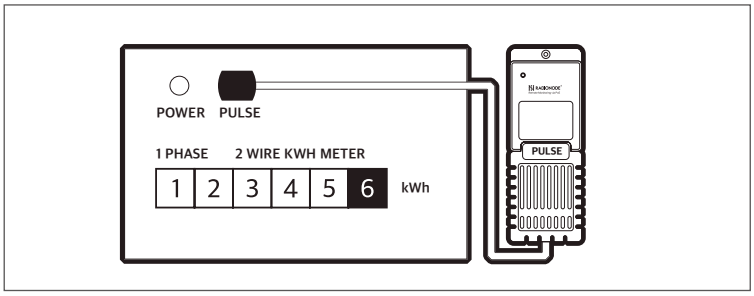
1 Channel 4-20mA(0-20mA) Analog to Digital Available to connect ANY 4-20mA output Sensors Output measurement values to USB

UA2X SPEC
Signal Converter

Optical Pulse Sensor (Included)

UA20D Pulse Signal transmitter

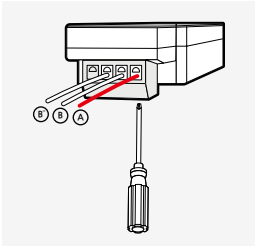
External Sensor	Included, Optical Pulse Sensor
LED	Device Status Indicator GREEN BLINK : Measuring Sensor
Measurement Range	Count : 0 ~ 99,999,999 (Wrap Around)
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	Temp : -20 ~ 50°C (-40 ~ 122°F) Humidity: 5 ~ 95% R.H



① Turn over UA20D, connect external sensor cable from left to right

② Loose bolt on connector for connecting external sensor cable

③ Brown is 1pin +, Green is - , White is 3pin + that connect as a picture



x

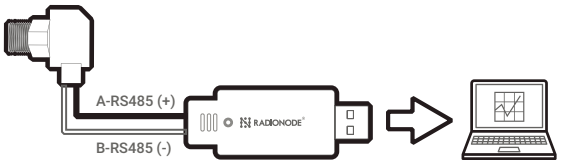
1pin : VDD(brown)

2pin : DATA(green)

3pin : GND(white)

UA20E RS485 transmitter

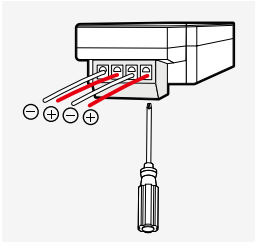
Channel Info.	CH1 to CH6 to read from Holding Register of RS485 device
RS485	MODBUS® RTU Protocol
Transmission Mode	Half Duplex (2wire)
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	Temp : -20 ~ 50°C (-40 ~ 122°F) Humidity: 5 ~ 95% R.H



① Turn over UA20E, connect external sensor cable from left to right

② Loose bolt on connector for connecting external RS485 cable

③ RS485-A is 1pin +, RS485-B is 3pin + that connect as a picture



1pin : A-RS485 (+)

2pin :

3pin : B-RS485 (-)

4pin :

UA54 Series SPEC
Gas Sensor

UA54 Series

channel info.	CH1 : GAS CH2 : Temperature CH3 : Humidity
Gas Sensor Type	Electrochemical Cell
Gas Sensor Filter	Metal Sintering filter
Measurement Cycle	1 sec
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	Temp: -20 ~ 50°C (-40 ~ 122°F) Humidity: 5~95% R.H

Model	Measurement Range	Sensor Accuracy
UA54-C2H4-3	0 ~ 3 ppm	<2% of Measured value
UA54-C2H4-5	0 ~ 5 ppm	<2% of Measured value
UA54-C2H4-10	0 ~ 10 ppm	<2% of Measured value
UA54-C2H4-100	0 ~ 100 ppm	<2% of Measured value
UA54-Cl2	0 ~ 10 ppm	<2% of Measured value
UA54-EO-10	0 ~ 10 ppm	<2% of Measured value
UA54-H2-4	0 ~ 4%LEL	<2% of Measured value
UA54-H2S-50	0 ~ 50 ppm	<2% of Measured value
UA54-HCL-20	0 ~ 20 ppm	<2% of Measured value
UA54-NH3-100	0 ~ 100 ppm	<3% of Measured value
UA54-NH3-1000	0 ~ 1000 ppm	<3% of Measured value
UA54-NO-50	0 ~ 50 ppm	±2% of Measured value
UA54-NO-1000	0 ~ 1000 ppm	±2% of Measured value
UA54-O2-21	0 ~ 25%	<2% of Measured value
UA54-VOC-2000	0 ~ 2000 ppm	<2% of Measured value

UA53 Series SPEC
Gas Sensor

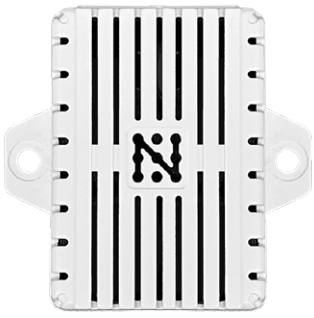
UA53 Series

channel info.	CH1 : GAS CH2 : Temperature CH3 : Humidity
Gas Sensor Type	Electrochemical Cell
Gas Sensor Filter	Metal Sintering filter
Measurement Cycle	1 sec
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	Temp: -20 ~ 50°C (-40 ~ 122°F) Humidity: 5~95% R.H

Model	Measurement Range	Sensor Accuracy
UA53-CO-1000	0 ~ 1000 ppm	<2% of Measured value
UA53-H2S-50	0 ~ 50 ppm	<2% of Measured value
UA53-NO2-10	0 ~ 10 ppm	<2% of Measured value
UA53-O3-10	0 ~ 100 ppm	<2% of Measured value
UA53-SO2-50	0 ~ 50 ppm	<2% of Measured value

UA58 Series SPEC
GAS Sensor

OUTPUT:USB



OUTPUT:RS485

UA58 Series

Network Protocol	USB, RS485 (MODBUS RTU, Half Duplex, 2-wire) • X represents the output type, and you can choose the appropriate model based on your required output option: - USB Output: U - RS485 Output: R - Serial Output: S
Gas Sensor Type	Electrochemical Cell, NDIR
Gas Sensor Filter	Metal Sintering filter
Measurement Cycle	1 sec
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	Temp: -20 ~ 50°C (-4 ~ 122°F) Humidity: 5 ~ 95% R.H

Model info.

Model	Measurement Range		Sensor Accuracy
UA58-CO2-x	0 ~ 1000 ppm		±50ppm+5 %of Measured value
UA58-DFG-x	CO	0~1000ppm	<3% of Measured value
	HCHO	0~2000ug/m3	<1% of Measured value
	C6H6	0~50ppm	<2% of Measured value
UA58-KFG-x	CO	0~1000ppm	<3% of Measured value
	O2	0~25%	<2% of Measured value
	H2S	0~100ppm	<2% of Measured value
	CO2	400~15000ppm	±50ppm+5 %
UA58-LEL-x	0-100 %LEL		0.1%LEL
UA58-Methane-x	0 ~ 2000 ppm		<: ±6% of Measured value

UA59 Series SPEC
GAS Sensor

UA59 Series

Network Protocol	USB, 4 -20mA • X represents the output type, and you can choose the appropriate model based on your required output option: - USB Output: U - RS485 Output: R
channel info.	Model Information
Gas Sensor Type	Thermal Conductivity Cell
Gas Sensor Filter	Metal Sintering filter
Measurement Cycle	1 sec, 300ms/Channel(4-20mA)
USB Port	USB 2.0 Type A Plug
Power consumption	5 V, max 50 mW
Size	68.5 × 25 × 15 mm
Operating conditions	Temp: -20~50°C (-4~122°F) Humidity: 5~95% R.H

Model info.

Model	Measurement Range	Sensor Accuracy
UA59-CO2-x	1~100% (1 - 100 ppm)	< 5% of Measured value
	1~25% (1 - 25 ppm)	
UA59-O2-x	0 ~ 21 %	
UA59-H2S-x	0 ~ 50 ppm	