

Radionode LoRaWAN Smart Sensors for Environment

RN320, RN630 Series

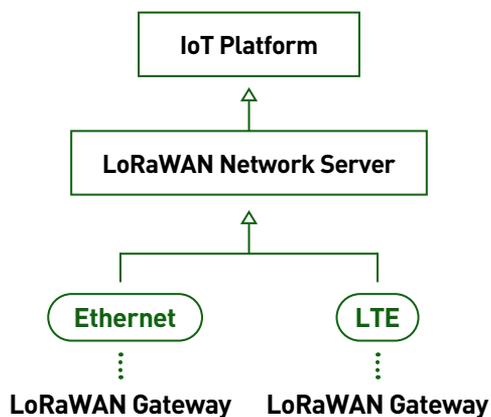


What is LoRaWAN?

LoRaWAN stands for Low Power Wide Area Network, a communication protocol developed by Semtech to transmit small amounts of data over long distances with low power consumption.

It is optimized for transmitting small data packets, making it ideal for IoT sensors. Over time, LoRaWAN has become an internationally recognized standard and is widely used in various countries. To implement a LoRaWAN network, several components are required, including sensor devices, gateways, network servers, LTE communication lines, and an IoT platform.

Radionode provides all the necessary technical solutions to help customers build sensor networks in industrial environments.



Key Features of LoraWAN

01 Long Range Communication

Capable of transmitting data over several kilometers in urban areas and up to 10–15 km in open environments. Covers wide areas without repeaters, significantly reducing installation costs.

02 Low Power Consumption

Ultra-low power design allows sensor devices to operate on batteries for several years. Reduces long-term maintenance costs by eliminating frequent battery replacements.

03 Cost-Effective

Lower deployment costs compared to cellular networks (LTE, 5G). Operates on license-free ISM (Industrial, Scientific, and Medical) bands, eliminating licensing fees. Enables large-scale IoT sensor deployment at a reduced network cost.

04 Wide Coverage & Scalability

A single gateway can support thousands of devices, ensuring excellent scalability. Can be deployed as either a public or private network.

05 Bi-Directional Communication

Supports both data transmission from sensors and remote control functionalities.

06 Security

Implements AES-128 encryption for secure communication. Provides separate encryption for the network layer and application layer.

07 Unlicensed Spectrum Usage

Uses region-specific ISM bands (e.g., EU 868MHz, US 915MHz, KR 920MHz). Unlike cellular networks, no usage fees are required.

08 Support for Various IoT Applications

Widely used in smart cities, smart agriculture, smart buildings, environmental monitoring, and industrial automation.

09 Roaming & Global Standardization

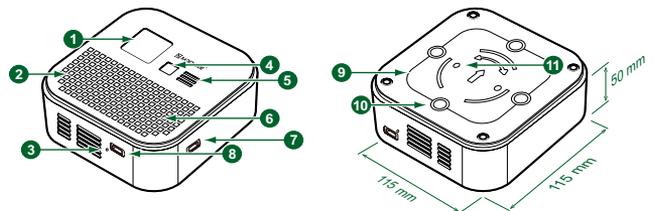
Standardized and supports global roaming through the LoRa Alliance. Ensures interoperability between various manufacturers and service providers. Thanks to these advantages, LoRaWAN is highly valued in industries requiring battery-powered sensor networks. Build an intelligent IoT ecosystem with Radionode, supporting LoRaWAN.

Smart Environmental Sensor via LoRaWAN with Easy Installation

RN320 Series

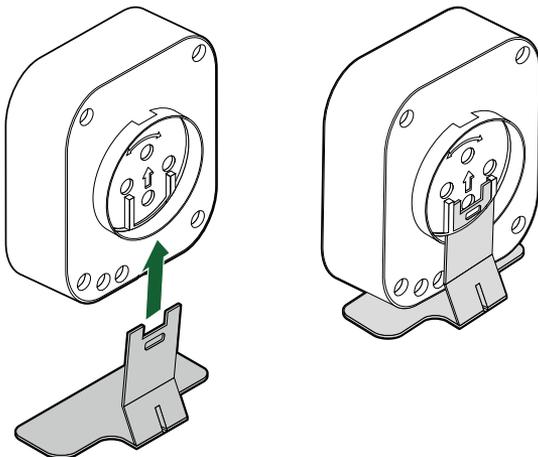


Exterior



- 1 E-Paper display
- 2 TEMP/RH Sensor
- 3 Reset Button
- 4 Setting Button
- 5 LED
- 6 Buzzer
- 7 SD-Card
- 8 USB-C Port
- 9 Magnet
- 10 Anti-slip Pad
- 11 Screw Hole

Tabletop Bracket (option)



Wallmount Bracket (magnet /screw)



RN320 Series Features

RN320 – A Powerful Environmental Monitoring Solution That Lasts Over 10 Years!



01 Install Once, Monitor for Over a Decade

The RN320 is an ultra-long-lasting environmental monitoring device with a battery life of over 10 years. It ensures stable air quality detection for extended periods without frequent recharging or battery replacements. 17,000mAh high-capacity battery support.



02 Optimized for Environmental Air Monitoring

Designed specifically for air quality monitoring, RN320 enables continuous environmental monitoring in various settings, including indoor spaces, outdoor areas, and industrial sites.



03 Intuitive 3-Color LED Status Indicator

Easily check the current air quality status at a glance with the 3-color LED indicator. The clear, visible LED allows quick detection and response even from a distance.

04 Crisp & Energy-Efficient E-Paper Display

The low-power, high-visibility E-Paper display ensures clear readability in both indoor and outdoor environments while minimizing energy consumption.



05 User-Friendly Button Operation & USB Configuration

The RN320 features simple button controls and USB configuration, making setup, adjustments, and maintenance effortless for anyone.

06 Built-in SD Card Storage – Perfect for Data Logging

With its integrated SD card storage, the RN320 enables long-term data recording and analysis. Effortlessly track air quality changes and access data whenever needed.

07 Flexible Installation Options – Easily Mount Anywhere

Wall Bracket Support – Securely mount the device on walls for stable installation
Strong Magnetic Mount – Effortlessly attach to any metal surface for quick setup

08 Where You Need RN320

Factories, laboratories, and construction sites – Ideal for critical air quality monitoring
Long-term monitoring environments – Perfect for areas requiring extended battery life
Workspaces needing data tracking & analysis – Great for environments that demand continuous data recording
Users looking for easy installation & intuitive monitoring

09 A Reliable Environmental Monitoring Solution That Lasts Over 10 Years with a Single Installation

Experience smarter air quality management with RN320 today!

RN320-BTH SPEC



I Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps	LED Status	User-defined Temperature Range GREEN : Normal ORANGE: Not in use RED : Exceed the Threshold
Battery	3.6V Li-SOCL2 X 2EA (17000mAh)	Buzzer	Min.80dB at 4.0KHz
Operating Condition	-20 ~ 60 °C / 5 ~ 95% (Non condensing)	Console	USB C type / Configuration Port
Channel Info.	CH1: Temperature (-40 ~ 80°C) CH2: Humidity(5 ~ 95%RH)	Display	E-ink display, 200x200 Pixel 1.54 Inch • Operating condition : 2~50°C (Display off is recommended below 0°C)
Weight	360g (with Battery)	Button	Menu Button, Reset Button
External Memory	Option (16GB microSD, only supports SLC and MLC options)	Accessory	<ul style="list-style-type: none"> • Wallmount Bracket (magnet /screw) (Included) • Desktop bracket for Table mount (Not Included)

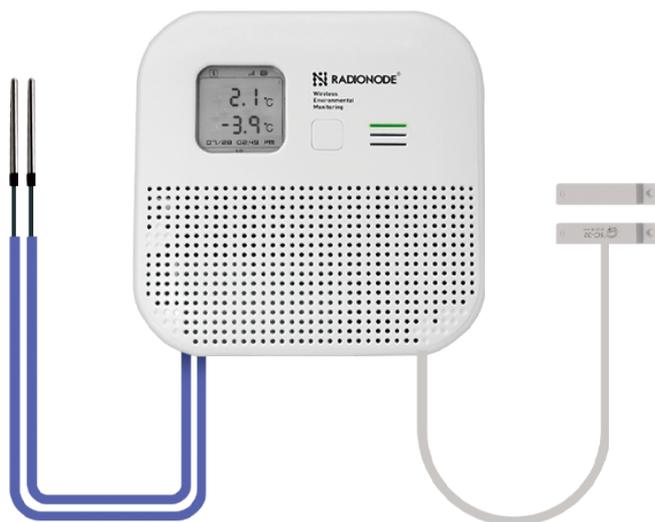
RN320-CDT SPEC



| Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps	LED Status	User-defined Temperature Range GREEN : Good ORANGE: Moderate RED : Bad
Battery	3.6V Li-SOCL2 X 2EA (17000mAh)	Buzzer	Min.80dB, at 4.0KHz, L 6.2 mm x Φ 12.8mm
Operating Condition	-20 ~ 60 °C / 5 ~ 95% (Non condensing)	Console	USB C type / Configuration Port
Channel Info.	CH1 : CO2 (400~15,000ppm) CH2 : Light (0~150,000lx) CH3 : Temperature (-40 ~ 80°C) CH4 : Humidity(5 ~ 95%RH)	Display	E-ink display, 200x200 Pixel 1.54 Inch <ul style="list-style-type: none"> • Operating condition : 2~50°C (Display off is recommended below 0°C)
Weight	360g (with Battery)	Button	Menu Button, Reset Button
External Memory	Option (16GB microSD, only supports SLC and MLC options)	Accessory	<ul style="list-style-type: none"> • Wallmount Bracket (magnet /screw) (Included) • Desktop bracket for Table mount (Not Included)

RN320-EX2 SPEC



Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps	LED Status	User-defined Temperature Range GREEN : Normal ORANGE: Not in use RED : Exceed the Threshold
Battery	3.6V Li-SOCL2 X 2EA (17000mAh)	Buzzer	Min.80dB, at 4.0KHz, L 6.2 mm x Φ 12.8mm
Operating Condition	-20 ~ 60 °C / 5 ~ 95% (Non condensing)	Console	USB C type
Channel Info.	CH1: Temperature (PT100/TC-K/TC-T) CH2: Temperature (PT100/TC-K/TC-T) CH3: DOOR SENSOR (Normal Close)	Display	E-ink display, 200x200 Pixel 1.54 Inch <ul style="list-style-type: none"> • Operating condition : 2~50°C (Display off is recommended below 0°C)
Weight	360g (with Battery)	Button	Menu Button, Reset Button
External Memory	Option (16GB microSD, only supports SLC and MLC options)	Accessory	<ul style="list-style-type: none"> • Wallmount Bracket (magnet /screw) (Included) • Magnetic Door Sensor (Not Included) • PT100, Thermocouple K, T Type (Not Included)

RN320-EX2 Accessory SPEC

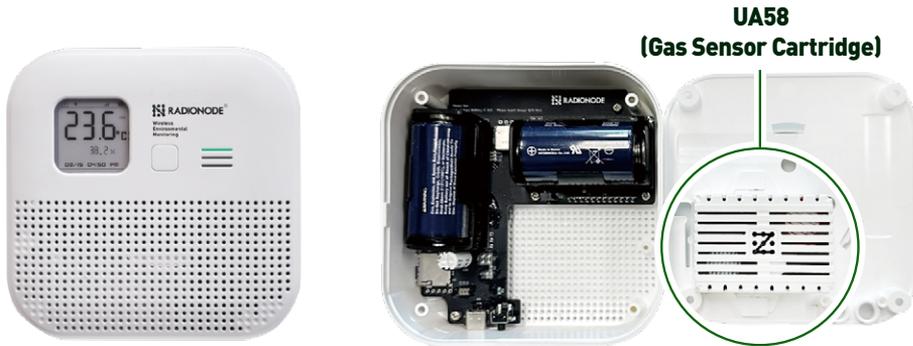


- PT100 Temp. Sensor
- Thermocouple Temp. Sensor
- NTC Temp. Sensor
- Magnet Door Contact

Spec.

Type	Model No.	Measurement Range	Cable Length	Sensor Probe Size
PT100 Temp. Sensor	PR-P1-3	-200 ~ 200 °C	3m	Diameter: 4.8 ø Length: 60.0mm
	PR-P1-15	-200 ~ 200 °C	15m	
K-type Thermocouple Temp. Sensor	PR-K1-3	-50 ~ 200 °C	3m	Diameter: 3.2 ø Length: 60.0mm
	PR-K1-15	-50 ~ 200 °C	15m	
T-type Thermocouple Temp. Sensor	PR-T1-3	-200 ~ 200 °C	3m	Diameter: 3.2 ø Length: 50.0mm
	PR-T1-15	-200 ~ 200 °C (±0.5 °C)	15m	
NTC Temp. Sensor	PR-N1-20	-20-50°C	20cm	Diameter: 6.4 ø Length: 60.0mm
	PR-N1-150	-20-50°C	150cm	Diameter: 6.4 ø Length: 60.0mm
Magnet Door Contact	AP-D1	at open : 99.0 at closed : 0.0	25cm	Case size (by case):62.5mm x 16.5mm x 16.5mm

RN320-KFG SPEC



Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps	LED Status	User-defined Temperature Range GREEN : Good ORANGE: Moderate RED : Bad
Battery	3.6V Li-SOCL2 X 2EA (17000mAh)	Buzzer	Min.80dB, at 4.0KHz
Operating Condition	-20~60 °C / 5~95% (Non condensing)	Console	USB C type
Channel Info.	CH1 : CO (0~1,000ppm) CH2 : O2 (0~25%) CH3 : H2S (0~100ppm) CH4 : CO2 (400~150,000ppm) CH5: Temperature (-20~50°C) CH6: Humidity (1~99%RH)	Display	E-ink display, 200x200 Pixel 1.54 Inch <ul style="list-style-type: none"> • Operating condition : 2~50°C (Display off is recommended below 0°C)
Weight	360g (with Battery)	Button	Menu Button, Reset Button
External Memory	Option (16GB microSD, only supports SLC and MLC options)	Accessory	<ul style="list-style-type: none"> • Wallmount Bracket (magnet /screw) (Included) • Magnetic Door Sensor (Not Included) • PT100, Thermocouple K, T Type (Not Included)

Gas Cartridge (Replaceable Gas Sensor)

Model No.	Measurement Range	Sensor Accuracy
UA58-KFG-S	CO: 0~1000ppm O2: 0~25% H2S: 0~100ppm CO2: 400~15,000ppm	CO: <3% of Measured value O2: <2% of Measured value H2S: <2% of Measured value CO2: ±50ppm+5 %

RN320-AQS SPEC



I Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps	LED Status	User-defined Temperature Range GREEN : Good ORANGE: Moderate RED : Bad
Battery	3.6V Li-SOCL2 X 2EA (17000mAh)	Buzzer	Min.80dB, at 4.0KHz
Operating Condition	-20 ~ 60 °C / 5 ~ 95% (Non condensing)	Console	USB C type / Configuration Port
Channel Info.	CH1 : TVOC (0 ~ 2,000 ug/m3) CH2 : HCHO (0 ~ 1,960 ug/m3) or C2H4 (0 ~ 1,000 ppm) CH3 : O3 (0~100ppm) CH4 : SO2 (0~50ppm) CH5 : NO2 (0~10ppm) CH6 : Temperature (-40 ~ 80°C) CH7 : Humidity(5 ~ 95%RH)	Display	E-ink display, 200x200 Pixel 1.54 Inch <ul style="list-style-type: none"> • Operating condition : 2~50°C (Display off is recommended below 0°C)
Weight	360g (with Battery)	Button	Menu Button, Reset Button
External Memory	Option (16GB microSD, only supports SLC and MLC options)	Accessory	<ul style="list-style-type: none"> • Wallmount Bracket (magnet /screw) (Included) • Desktop bracket for Table mount (Not Included)

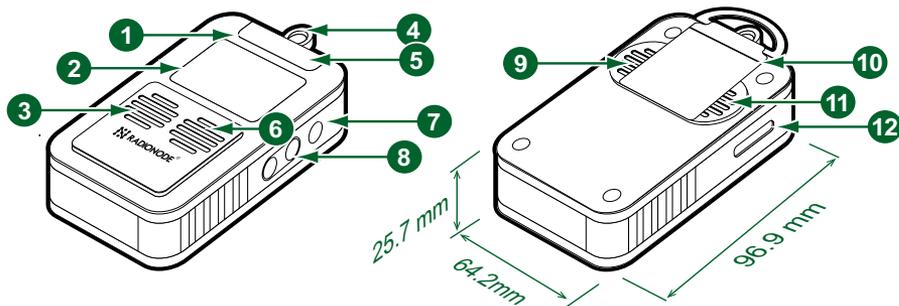
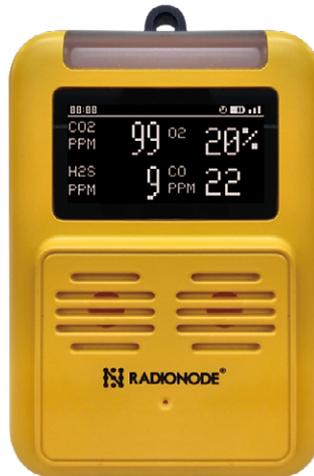
RN320-PMT SPEC



I Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps	LED Status	User-defined Temperature Range GREEN : Good ORANGE: Moderate RED : Bad
Battery	3.6V Li-SOCL2 X 2EA (17000mAh)	Buzzer	Min.80dB, at 4.0KHz, L 6.2 mm x Φ 12.8mm
Operating Condition	-20 ~ 60 °C / 5 ~ 95% (Non condensing)	Console	USB C type / Configuration Port
Channel Info.	CH1 : PM2.5 (0~1,000ug/m3) CH2 : PM10 (0~1,000ug/m3) CH3 : Light (0~150,000lx) CH4: HCHO (0~1,960ug/m3) CH5: CO2 (400 ~ 15,000ppm) CH6 : CO (0 ~ 1,000ppm) CH7 : Temperature (-40 ~ 80°C) CH8 : Humidity(5 ~ 95%RH)	Display	E-ink display, 200x200 Pixel 1.54 Inch <ul style="list-style-type: none"> • Operating condition : 2~50°C (Display off is recommended below 0°C)
Weight	360g (with Battery)	Button	Menu Button, Reset Button
External Memory	Option (16GB microSD, only supports SLC and MLC options)	Accessory	<ul style="list-style-type: none"> • Wallmount Bracket (magnet /screw) • Desktop bracket for Table mount

The World's Smallest Portable 4-Gas Detector With LoRaWAN RN630 Series



- | | | |
|-----------------------|--------------------------|---------------|
| ① Color LED Indicator | ⑤ High-intense Flash LED | ⑨ CO Sensor |
| ② OLED Display | ⑥ O2 Sensor | ⑩ Pocket Clip |
| ③ CO2 or LEL Sensor | ⑦ Power/Reset Button | ⑪ H2S Sensor |
| ④ Strap Hole | ⑧ Setup Button | ⑫ USB Port |

RN630 Series Features

RN630 – The Ultra-Lightweight Portable Gas Detector That Ensures Safety Anywhere, Anytime!

01 Your Safety, Right in the Palm of Your Hand

Weighing only 175g, the RN630 is designed for maximum portability, making it comfortable to carry all day long. Whether you're in a busy worksite or a fast-paced industrial environment, monitor safety effortlessly, anytime, anywhere.

02 Crystal-Clear OLED Display – Visibility in Any Environment

Not all worksites have ideal lighting. The high-resolution OLED display on the RN630 provides clear, sharp gas concentration readings, ensuring quick response even in bright sunlight or low-light conditions.

03 Intuitive Button Operation – Easy for Everyone

Forget complex controls! The simple button interface allows anyone to operate the RN630 with ease. From beginners to experienced professionals, start monitoring gas levels instantly with just a few clicks.

04 USB Configuration Support – Smarter Maintenance

Need to adjust settings? No problem! With USB connectivity, you can easily modify configurations and efficiently manage data for a hassle-free experience.

05 Pocket Clip & Strap Hole – Carry It Anywhere with Ease

Equipped with a built-in pocket clip and strap hole, the RN630 can be securely attached to workwear, belts, or bags, allowing for continuous monitoring while keeping your hands free.

06 Who Needs the RN630?

- Anyone looking for a highly portable gas detector
- Workers who need a clear display in low-light conditions
- Users who prefer simple button operation and smart maintenance features
- Professionals working in construction sites, factories, laboratories, confined spaces, and more

07 Flexible Installation Options – Easily Mount Anywhere

Wall Bracket Support – Securely mount the device on walls for stable installation
Strong Magnetic Mount – Effortlessly attach to any metal surface for quick setup

RN630 Series SPEC

Spec.

Network Protocol (Wireless)	<ul style="list-style-type: none"> • LoraWAN ® V1.0.3 ,OTAA/ABP ClassA • KR920/CN470/IN865/RU864 /EU868/US915/AU915/AS923 TX : 20dBm Sensitivity : -137 dBm @ 300 bps
Battery	3.6V Li-ion (2300mAh)
Display	OLED display, 160x80 Pixel 1.54 Inch
Operating Condition	-20 ~ 60 °C / 5 ~ 95% (Non condensing)
accuracy	CO: <3% of measured value O2: <2% of measured value H2S: < 2% of measured value CO2: ±50ppm+5% of measured value LEL (default Methane): ±3% • Temperature: ±0.2°C • Humidity: ±2.0%
Additional Feature	P2P mode support (Remote monitoring) Fall detection function SOS sending Zero Calibration function
Buzzer	4.1 kHz ± 500 H, 85db
Button	Menu Button, Reset Button
Weight	170g
Waterproof and Dustproof	IP65

	Condition	LED color	LED Status
LED	Sensor Measuring	GREEN	Blinking
	Charging	RED	Steady On
	Fully Charged	GREEN	Steady On
	RF	BLUE	Blinking
Alarm Criteria (Warning Light and Buzzer)	CO: ≥50 ppm O2: ≤18-23.5% H2S: ≥ 5 ppm CO2: ≥ 5000 ppm LEL: ≥ 10% • Hazardous Situation : WHITE		
Port	USB C type / Recharging / Configuration Port		
LEL (Lower Explosive Limit) Detectable Gases	Hydrogen Butane Isobutane Isobutylene Isopropanol Ethane Propane Propylene	MEK Acetone Ethylene Heptane Octane Styrene Toluene Xylene	
Accessory	Calibration Certificate USB Cable		

Channel Info.

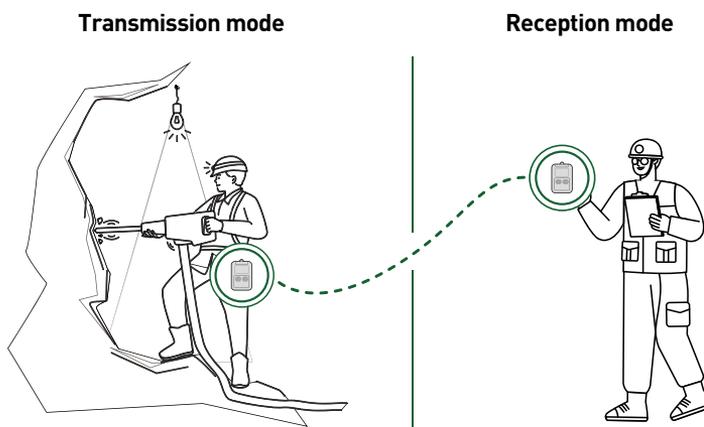
	RN630-KFG	RN630-AFG
Channel Info.	CH1 : CO2 (400~15,000ppm) CH2 : O2 (0~25%) CH3 : CO (0~1,000ppm) CH4 : H2S (0~100ppm) CH5: Temperature (-40 ~ 80°C) CH6 : Humidity (5 ~ 95%RH) CH7 : SOS CH8 : ManDown	CH1 : LEL (0~100%) CH2 : O2 (0~25%) CH3 : CO (400~1,000ppm) CH4 : H2S (0~100ppm) CH5: Temperature (-40 ~ 80°C) CH6 : Humidity (5 ~ 95%RH) CH7 : SOS CH8 : ManDown

RN630 Series

Additional features

P2P Mode Support

Enable real-time remote monitoring with P2P mode. Users can check sensor-measured data remotely on their devices, allowing for quick responses to hazardous situations.



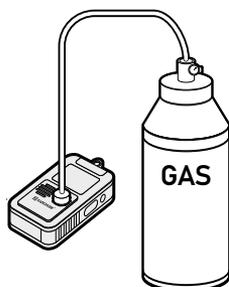
SOS Function / Worker Down Detection

Ensure safety with SOS alerts and fall detection. The SOS function plays a crucial role in protecting lives, especially for those working in hazardous environments. In the event of a fall or worker collapse, an instant alert is triggered, minimizing response time in critical situations.

Calibration Mode

Maintain sensor accuracy with Zero Calibration.

- ① Connect to a PC and use Radionode's dedicated calibration software with calibration gas for precise sensor calibration (Zero / Span).
- ② Perform Zero Calibration in clean air to ensure measurement accuracy.



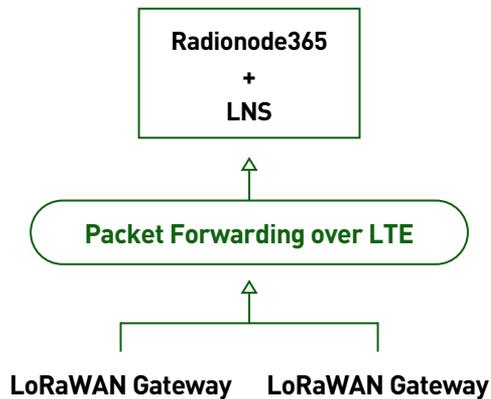
Lorawan System Integration

There are two main ways to set up a LoRaWAN network:

Using the Radionode365 Service

With Radionode365, a professional IoT platform, all necessary systems are provided in one integrated solution. Simply register the unique LoRaWAN ID of your Radionode device, and everything will function seamlessly.

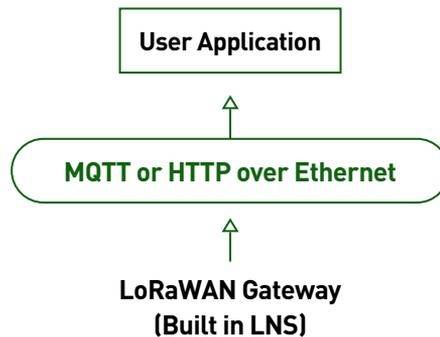
The Radionode365 web service includes a built-in LoRaWAN Network Server (LNS), eliminating the need for additional setup or management



Developing Your Own Software

If you prefer to develop your own application to manage data, you can utilize the LNS function embedded within the gateway.

Incoming sensor data can be converted via LNS and transmitted to a specific server using HTTP or MQTT protocols. However, if multiple gateways are required, expert assistance may be necessary to ensure proper system configuration and operation.



Radionode Lorawan Gateway



I Radionode Gateway LRK **LTE** **PoE**

Computing	MT7628, DDR2 RAM 128 MB	Power consumption	12 W (typical)
Wi-Fi feature	Frequency: 2.4 GHz (802.11b/g/n) RX Sensitivity: -95 dBm (Min) TX Power: 20 dBm (Max) Operation channels: 2.4 GHz: 1-13	LAW	RJ45 (10/100 M)
LoRa feature	SX1302 Mini PCIe card 8 Channels RX Sensitivity: -139 dBm (Min) TX Power: 27 dBm (Max) Frequency: EU433/CN470/EU868/ US915/AS923/AU915/IN865/KR920	Console	Type-C USB
Cellular	Supports Quectel EG95-E/EG95-NA (IoT/M2M -optimized LTE Cat 4 Module) EG95-E for EMEA Region - LTE FDD: B1/B3/B7/B8/B20/B28A - WCDMA: B1/B8 - GSM/EDGE: B3/B8 EG95-NA for North America Region - LTE FDD: B2/B4/B5/B12/B13 - WCDMA: B2/B4/B5 Optional supports other PCIe LTE module for Global Region	Antenna	LoRa: RP-SMA female connector LTE: Internal antenna Wi-Fi: Internal antenna
Power supply	DC 12 V - 1 A PoE (IEEE 802.3 af), 36-57 VDC	LEDs	POWER LED Breathing LED (Top side) ETH LED (On ETH connector) LoRa LED WLAN LED LTE LED (functional only in RAK7268CV2)
Accessory	Wall bracket Adapter Antenna	Ingress protection	IP30
Optional accessories	Radionode SIM U Plan (Available for activation, cancellation, payment, and billing inquiries within Radionode365 service)	Enclosure material	Plastic
		Weight	0.3 kg
		Dimensions	166 x 127.5 x 36 mm
		Operating temperature	-10 to 55 °C
		Installation method	Wall mounting

Radionode Lorawan Gateway



I Radionode Gateway LMT **Ethernet**

Computing	Cortex A7 processor with 32 KB L1 Instruction Cache and 32 KB L1 Data Cache Volatile Memory: 512 MB SDRAM / Non-Volatile Memory: 512 MB NAND flash memory / 568 MHz	Antenna	LORA: RP-SMA female connector
		LEDs	POWER, STATUS, LORA
LoRa feature	SX1303 baseband processor with SX1250 Tx/Rx front-end	Safety	IEC/UL/cUL 60950-1, IEC/UL/cUL 62368-1
		Enclosure material	PC-ABS (polycarbonate-ABS)
LAN	Ethernet 10/100 BaseT	Weight	1.5 kg(3.3 lbs)
		Dimensions	165 (6.5) x 135 (5.3) x 36 (1.4) mm (in) (See diagram)
Power supply	5 VDC, 2.5A	Operating temperature	0° C to +70° C
Power consumption	12 W (typical)	Installation method	Desk mount or wall mount
Accessory	Wall bracket Adapter Antenna		