RADIONODE®

Optical Oxygen Sensor Transmitter
UA52-O2 User Manual

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About this Manual

This document contains instructions for usage and installation of the RADIONODE® UA52-O2. Product specifications and certain features herein may be subject to change without prior notice. Figures used in this manual are for explanatory purposes only, and may differ from your system depending on installation conditions. Software screenshots may change after software updates.

Intellectual Property Rights

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Notational Conventions

|	Failure to follow instructions marked with "Warning" may result in slight injury to the user.
	Failure to follow instructions marked with "Caution" may result in equipment damage or malfunction.
	Additional helpful information is marked with "Note".

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Introduction

UA52-O2 is a sensor that measures Oxygen concentration (O2) and Atmospheric pressure. Measurements are made by one of two methods:

- Connect the UA52-O2 sensor to your computer's USB port to use the Tapaculo® Lite program.

- Connect the UA52-O2 sensor to your smartphone via the USB gender to use the Tapaculo® Mobile app.
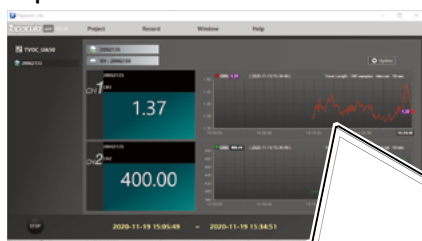
Tapaculo® Lite   **Tapaculo® Mobile**
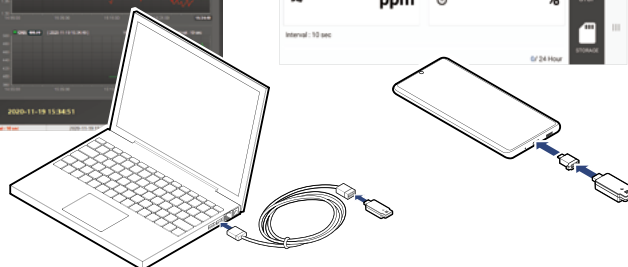
Once power is supplied through the USB port, the sensor will commence initialization. Initialization takes approximately 5 minutes to complete. Measurements may not be accurate until initialization is complete.

Radionode365, the cloud-based remote surveillance service provided RADIONODE, is available for UA52-O2 users with a RN17x WC series data transmitter. For information on how to install and use RN17x WC, see the information provided on the web page below:
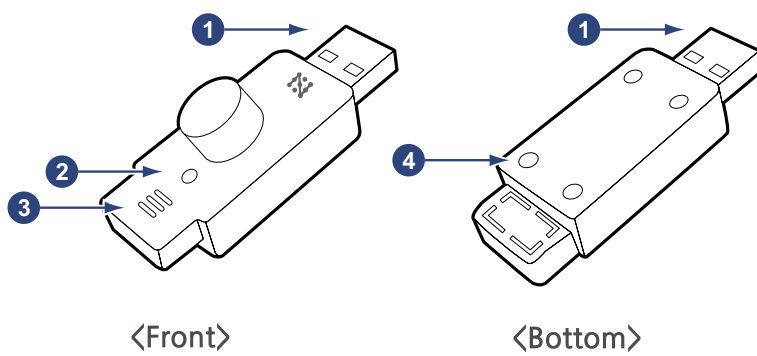
`https://help.radionode365.com/article-categories/RN17x-help`
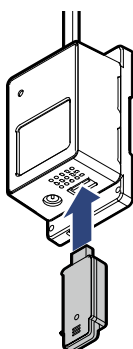
* Use in a non-condensing enviroment. Otherwise, distorted measurements are read.

* DO NOT use chemical cleaning agents

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Exteria

〈Front〉   〈Bottom〉

① USB 2.0   **②** LED   **③** Screw Hole

④ Screw for terminal **⑤** T/C input terminal

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Accessories

The UA52-O2 comes with the following accessories:
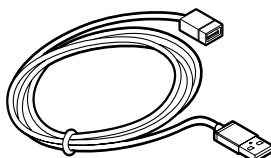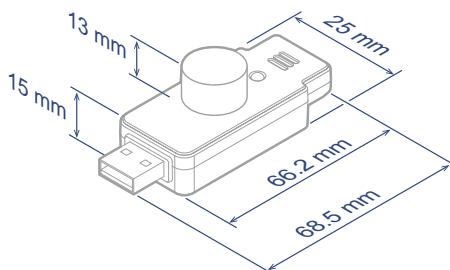

USB Extension Cable

Specifications

Model	UA52-O2-25
Sensor Channel Info.	• CH1: O2 • CH2: Barometric Pressure
Gas Sensor Type	Blue Optical sensor
Gas Sensor Filter	Metal Sintering filter
Body Material	PC(Polycarbonate)
Measurement Range	• Oxygen: 0~25 % • Barometric pressure : 500 ~ 1200 mBar
Measurement Unit (Selection using SW)	• Oxygen [%(Default), ppm, mBar] • Barometric pressure [mBar(Default), mmH2O]
Measurement Cycle	1 sec
Sensor Resolution	• O2: 0.1% • Barometric pressure: 1 mBar
Sensor Accuracy (Repeatability)	• Oxygen < 2% FS • Barometric pressure: ±5 mBar
Gas Response Time	T90 < 30 secs
Warming up Time	30 secs after power-on
Operating Condition	• Temperature: -30 ~ 60°C (-22 ~ 140°F) • Humidity: 0 ~ 99%RH
Lifetime	5 Years @ Clean Air
Power Consumption	5V (Max. 185mW)
Calibration Certificate	Bulk Calibration Certificate Calibration with 10.0% O2 calibration gas mixtures
Calibration Method	Offset adjustment
USB Port	USB 2.0 Type A Plug
Output Mode (Selection using SW)	Default mode: MODE1 • MODE1: [Oxygen(%), Baro (mBar)] • MODE2: [Oxygen(mBar), Baro (mBar)] • MODE3: [Oxygen(ppm), Baro (mmH2O)] • MODE4: [Oxygen(%), Baro (mBar)] • MODE5: [Oxygen(%), NONE]
Output Signal	USB digital, CDC Device (AT Command)
LED	Device Status Indicator • RED KEEP ON: USB Connection Failed • BLINK GREEN: Measuring
Software Support	• Tapaculo Lite 128CH recording software on PC Download: www.radionode365.com • Tapaculo Mobile 2CH recording software on Android devices Download: Google play store • Calibration Software Calibrator that compensates measuring error. Download: www.radionode365.com

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This chapter outlines how to use Tapaculo Lite. For more information on Tapaculo Lite, see the information provided on the web page below:

```
https://help.radionode365.com/article-categories/
tapaculo-lite
```

Installing Software

To view sensor measurements on your computer, download and install the following software package from the RADIONODE website at `www.radionode365.com`.

- Tapaculo Lite program (Windows or Mac version)
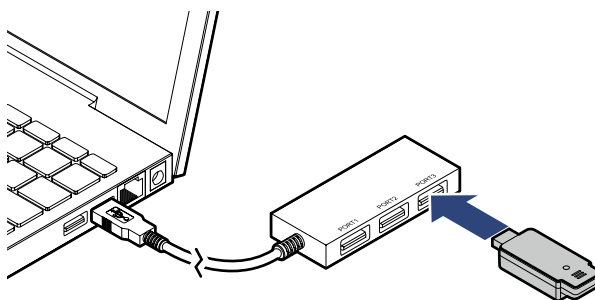
- USB drivers for Windows for UA products

Connecting Sensor to Tapaculo Lite

The sensor can be connected to Tapaculo Lite via one of the following methods:

- Insert the sensor into an available USB port on your computer.
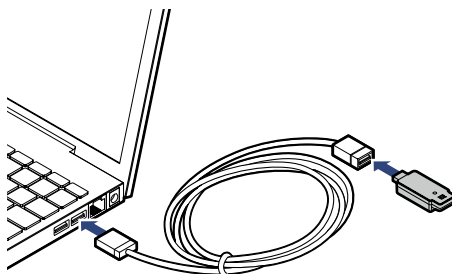
- Insert the sensor into an available port on the USB hub that is connected to your computer.
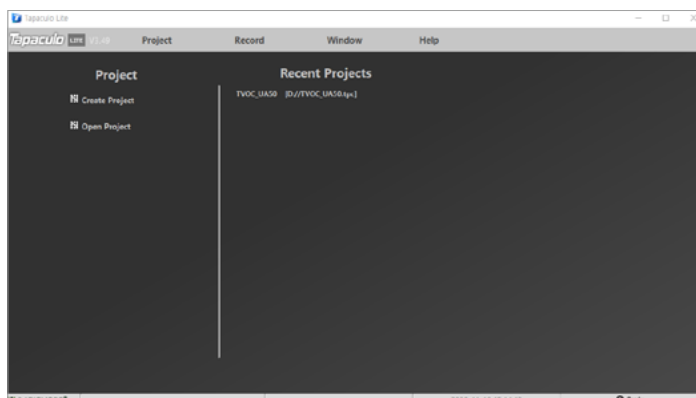
Starting Tapaculo Lite

A new project must be created first before combining Tapaculo Lite and the sensor. A project may include multiple sensors. Refer to the following procedure when using Tapaculo Lite:

> A project is a file that stores and manages sensor data.
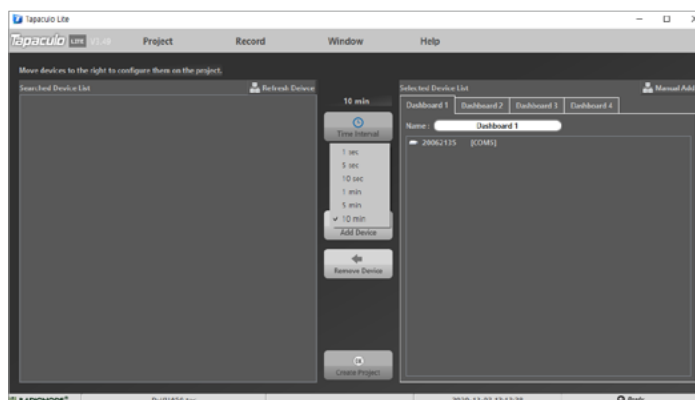
1. Click **Create Project** and enter a file name. The new file will contain sensor information.

2. Searched sensors appear in the left panel. Select a dashboard and sensor, then click **Add Device**. The sensor will be added to the dashboard.

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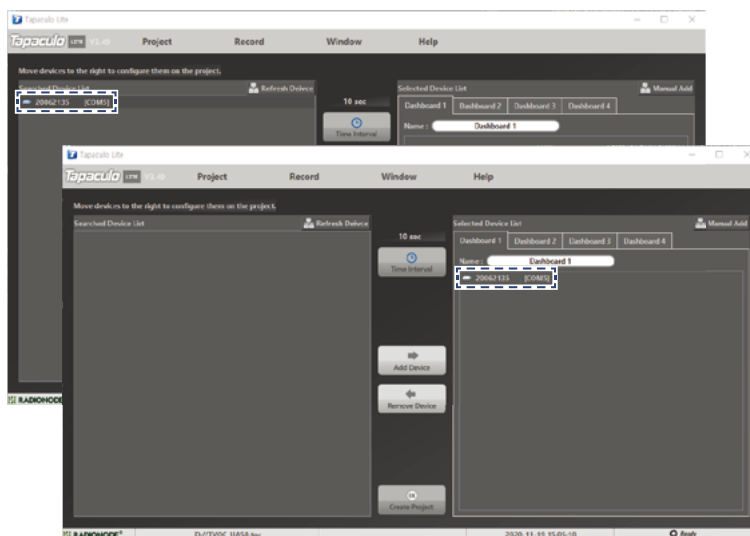
3. Click **Time Interval** and select the measurement interval.

4. Click **OK Create Project** at the bottom of the menu. The Dashboard menu will open and display measurements of sensors registered in the project, and sensor indicators will blink.
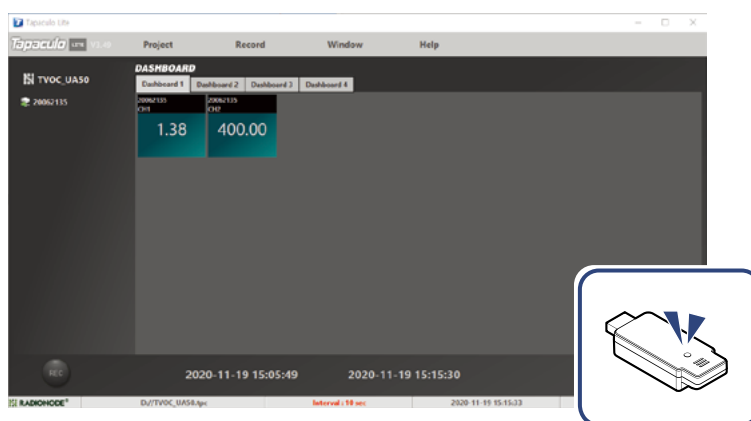
5. Click **REC** at the lower-left corner to start logging data. The **REC** button will change to **STOP**.
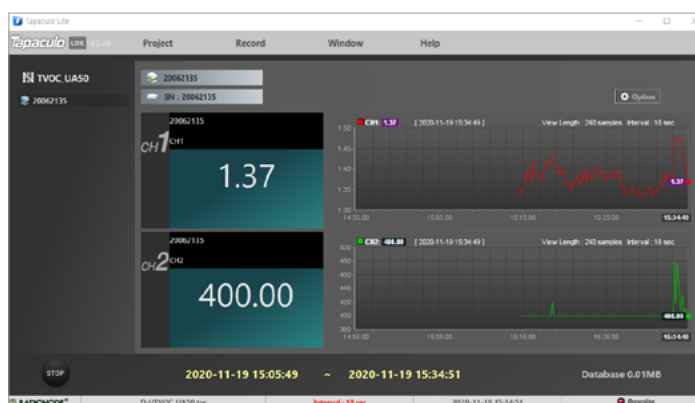
6. To exit the program, click **STOP**. You cannot exit the program until data logging is stopped.

Monitoring from your Smartphone

This chapter outlines how to use Tapaculo Mobile. For more information on Tapaculo Mobile, see the information provided on the web page below:

```
https://help.radionode365.com/article-categories/
tpm-manual
```

Installing Tapaculo Mobile

Search for "Tapaculo" on Google Play, or click the link below to install Tapaculo Mobile app on your Android smartphone.

```
https://play.google.com/store/apps/details?id=com.
dekist.mobile
```

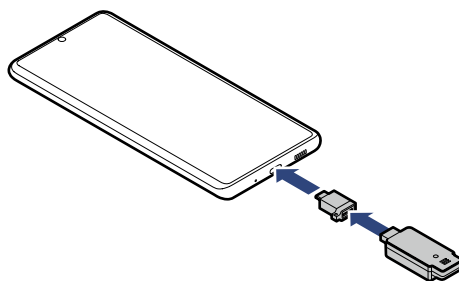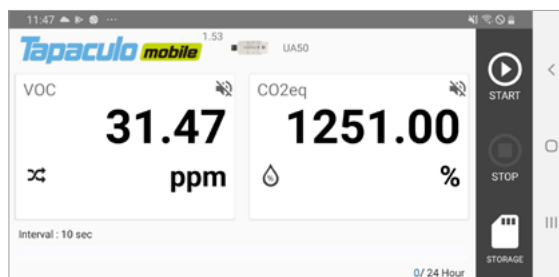> Tapaculo Mobile does not have an iOS version.

Starting Tapaculo Mobile

Refer to the following when using Tapaculo Mobile:

1. Connect the sensor to your smartphone using the USB gender.

2. Tapaculo Mobile will open. Tap **START** to start logging data.

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3. Swipe right to change sensor settings.
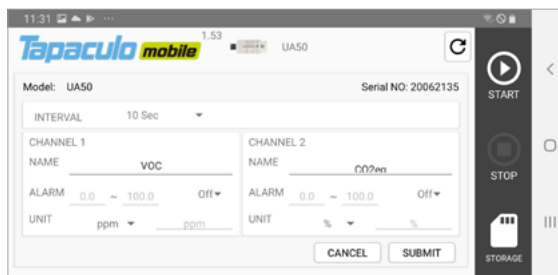
4. Swipe left to view the measurement chart.
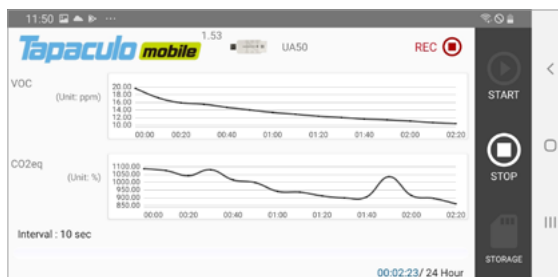
5. Tap **STORAGE** to share your measurement history with others.

Measurement history is saved as a CSV file.

Date measured/tVOC measurement/carbon dioxide equivalent (or absolute humidity) measurement

	A	B	C
1	time	VOC(ppm)	CO2eq(%)
2	2020-11-19 11:48	19.69	1087
3	2020-11-19 11:48	17.21	1075
4	2020-11-19 11:48	15.88	1042
5	2020-11-19 11:48	15.51	1081
6	2020-11-19 11:48	14.71	1015

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Zero Calibration

Changes in dust concentration, temperature, or other environment factors may affect sensor performance. If the sensor has not been used for more than two weeks, run zero calibration to maintain optimal performance.

Ensure the ambient air is clean and free of hazardous gases before starting calibration. Zero calibration begins once power is supplied to the sensor. Connect PC to the sensor and wait at least 30 minutes.
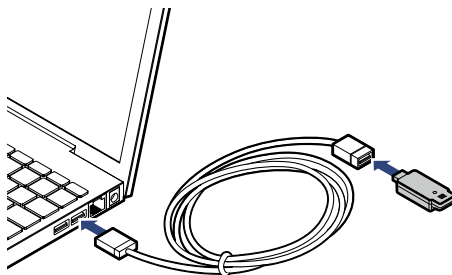
Connecting UA to a PC

The sensor can be connected to PC via one of the following methods:

• Insert the sensor into an available USB port on your computer.

• Insert the sensor into an available port on the USB hub that is connected to your computer.
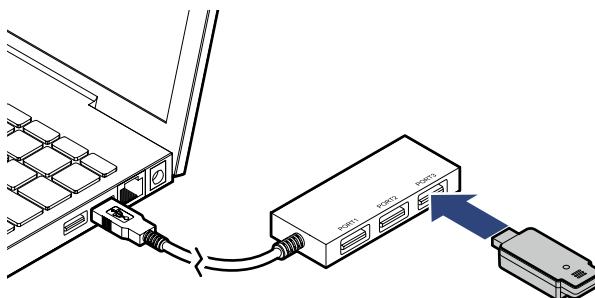
Setting UA Calibrator Software

In Order to perform calibration on your computer, download and install the following software from the Radionode homepage

(https://www.radionode365.com).

• Calibration software

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Adjusting the offset

- If there is an error in the O2 (oxygen) value, you can use the full range offset to change the value.

- To adjust the offset, it must be left in clean air (non-polluted, ventilated) for at least 30 minutes.

- A typical O2 (oxygen) value in an uncontaminated place is 20.9%, so set the offset value to a range of 20.9% or more. Assuming the current UA O2 (oxygen) value is 19% in an uncontaminated place, enter +1.9% in the full range offset value and save it, then the value will be corrected and displayed as 20.9%.
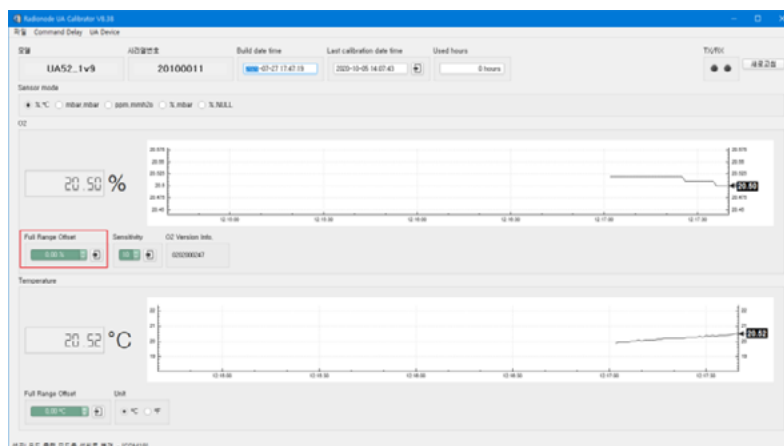
⚠️ Oxygen concentration may vary depending on the region.

The "sensitivity" item means responsiveness. Its value is set to the default value (10).

A lower sensitivity value makes the sensor more responsive. Higher sensitivity values reduce the sensor's responsiveness.

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Customer Service Information

Manufacturer Contact Information

DEKIST Co., Ltd. provides repair service and replacement parts for RADIONODE products. To request customer service, contact us via one of the following methods.

- Tel: +(82) 1566-4359
- Fax: (+82) 31-8039-4400
- E-mail: master@dekist.com

Warranty

Repairs are provided free of charge for product failure under normal operating conditions within one year of the product installation date.

Limit of Liability

Warranty repairs are not provided in the event of:

- Failure caused by unapproved installation methods;
- Failure caused by user negligence;
- Failure caused after alteration, disassembly, or repair of the product by a person unauthorized by DEKIST;
- Failure caused by corrosion, falling, submersion, or other improper storage methods;
- Failure caused by natural disaster or other unforeseen circumstances, such as storms, floods, earthquakes, lightning, or abnormal voltage;
- Service requested for actions that the user can take, such as replacing consumables;
- Alteration of the software through decompilation or the like

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Certifications

FCC Class A Digital Device

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

⚠️ Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

KC

This equipment has passed conformity testing for use in work environments, and is likely to cause interference when used in a household environment.

Order List

UA Sensor

Type	Order No.	External Sensor
Temperature, Humidity	UA10	
High Temperature	UA11-K	PR-K1-3, PR-K1-15
Normal Temperature	UA11-T	PR-T1-3, PR-T1-15
Cryogenic Temperature	UA13	PR-P1-3, PR-P1-15
4-20mA Transmitter	UA20-A	
4-20mA Transmitter	UA20-B	
0-1V Transmitter	UA20-C	
tVOC, CO2eq, Absolute Humidity	UA50	
Oxygen, Atmospheric pressure, Temperature	UA52-O2-25 UA52-O2-25-F	
Carbon dioxide, Temperature	UA52-CO2-20	
Carbon monoxide, Temperature	UA53-CO-1000	
Sulfur dioxide, Temperature	UA53-SO2-50	
Nitrogen dioxide, Temperature	UA53-NO2-50	
Ammonia, Temperature	UA54-NH3-100 UA54-NH3-1000	
Hydrogen sulfide, Temperature	UA54-H2S-50	
Hydrogen chloride, Temperature	UA54-HCL-20	
Ethylene oxide, Temperature	UA54-EO-10	
Ethylene, Temperature	UA54-C2H4-10 UA54-C2H4-100	
Carbon dioxide, Temperature	UA59-CO2-20-U UA59-CO2-100-U UA59-CO2-100-C	
Hydrogen, Temperature	UA54-H2-4	
Oxygen, Temperature	UA54-O2-21	
Carbon monoxide, Oxygen, Hydrogen sulfide, Carbon dioxide	UA58	

Accessories

Temperature Sensor

Type	Order No.	Cable Length
K Type Thermocouple (TC-K)	PR-K1-3	3 m
-50 ~ 200℃	PR-K1-15	15 m
T Type Thermocouple (TC-T)	PR-T1-3	3 m
-200 ~ 200℃	PR-T1-15	15 m
PT100	PR-P1-3	3 m
-200 ~ 200℃	PR-P1-15	15 m

Sensor Data Transmitter

Type	Order No.	Remark
LAN	RN171WC	Support PoE
WiFi	RN172WC	Support WiFi ENT

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