Wireless Outdoor Water pH Sensor with a Solar Panel

Wireless Sensor Network Based on LoRa Technology



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Introduction

R72608 is a device used for pH and temperature detection of water. It can detect and send data of pH and temperature by the wireless communication method which adopts SX1276 wireless communication module.

Features

- Overcharge, over-discharge, and overcurrent protection for rechargeable batteries
- Adopt SX1276 wireless communication module
- Solar panel charging function
- A rechargeable battery box (Rechargeable lithium batteries need to be purchased by users.)
- pH and water temperature detection
- Compatible with LoRaWANTM Class A
- Frequency hopping spread spectrum technology
- Applicable to the third-party platforms: Actility/ ThingPark/ TTN/ MyDevices/ Cayenne
- Low power consumption and long battery life

Note: Battery life is determined by the sensor reporting frequency and other variables, please refer to http://www.netvox.com.tw/electric/electric_calc.html. On this website, users can find the battery life of various models in different configurations.

Applications

- pH detection
- Water temperature detection

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Dimensions



▲ Main Body: 117mm x 89mm x 41mm



▲ pH Sensor

R72608

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▲ Cover: 220 mm (D) x 280 mm (H)

Solar panel: 290 mm x 150 mm x 25 mm

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Electrical Specifications

Power Supply	3* 3.7Vrechargeable lithium batteries in series
Operating Voltage Range	9.8V to 12.6V
Low Voltage Warning	10.5V
Operating Current	<100mA

Battery

Solar Panel Specification	5W / 18VDC
Lithium Battery Charging Current	About 300mA (charge with sufficient sunlight)
Lithium Battery Charging Time	About 4 days to fully charge
	Under the conditions: a. the battery capacity is 3200mAh; b. the battery is charged in sufficient sunlight.
	About 793 hours (typical value)
Operation Time after Fully Charged	Under the conditions: a. the battery capacity is 3200mAh; b. the data are reported every 30 minutes

pH Sensor

Operating Water Temperature Range	0 to 65°C
pH Value Range	0 to 14 pH
pH Value Resolution	0.01 pH
pH Value Accuracy	±0.3 pH
Usable Pressure Range	<0.2MPa
Temperature Compensation	Automatic Temperature Compensation (NTC)
Signal Output	RS-485
Installation	Immersion mounting, 3/4 NPT thread

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Cable Length	5m, other lengths can be customized
Power Consumption	0.2W@12V
pH Sensor IP Rating	IP68
pH Sensor Service Life	1 year

Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
Tx Power	US915 20dBm
	AS923 16dBm
	AU915 20dBm
	CN470 19.15dBm
	EU868 16dBm
	KR920 14dBm
	IN865 20dBm
Receive Sensitivity	-121dBm (FSK, Frequency deviation = 5kHz, Bit Rate = 1.2kbps)
	-136dBm (LoRa, Spreading Factor = 12, Bit Rate = 293bps)
Antenna Type	Built-in antenna
Communication Distance	10km (line of sight)
	Note: The actual transmission distance depends on the
	environment.
Data Transfer Rate	LoRa: 0.3kbps – 50kbps
	FSK: 1.2kbps – 300kbps
Modulation	LoRa / FSK
	Note: One modulation method is required.
Supportable LoRaWAN Band	EU863-870, US902-928, AU915-928, KR920-923, AS923-1,
	AS923-2, AS923-3, IN865-867, CN470-510
	Note: The frequency band is optional and needs to be configured before shipment.

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Physical Properties

Dimensions	Main body: 117 mm x 89 mm x 41 mm
	Cover: 220 mm (D) x 280 mm (H)
	Solar panel: 290 mm x 150 mm x 25 mm
Ambient Temperature Range	-20° C to $+55^{\circ}$ C
Ambient Humidity Range	< 90%RH (No condensation)
Storage Temperature Range	-40°C to +85°C