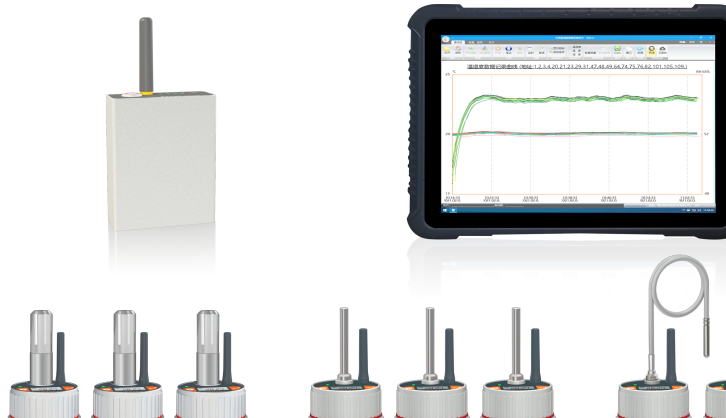


## PR750 Series High Precision Temperature & Humidity Recorder

——Intelligent solution for temperature and humidity measurement in high and low temperature environment



### Keywords:

- Temperature&humidity measurement
- Remote data monitoring
- Built-in storage and USB flash drive mode
- High and low temperature environment temperature and humidity measurement in large space

## I Overview

PR750 series high-precision temperature and humidity recorder (hereinafter referred to as "recorder") is suitable for temperature and humidity testing and calibration of large-space environment in the range of  $-30^{\circ}\text{C}\sim 60^{\circ}\text{C}$ . It integrates temperature and humidity measurement, display, storage and wireless communication. The appearance is small and portable, its use is very flexible. It can be combined with PC, PR2002 Wireless Repeaters and PR190A Data Server to form the various testing systems that are suitable for temperature and humidity measurement in different environment.

## II Features

### ■ Distributed Temperature and Humidity Measurement

A 2.4G wireless LAN is established through the PR190A data server, and one wireless LAN can accommodate up to 254 temperature and humidity recorders. When using, just place or hang the recorder in the corresponding position, and the recorder will automatically collect and store temperature and humidity data at preset time intervals.

### ■ Signal Blind Spots can be Eliminated

If the measurement space is large or there are many obstructions in the space to cause degraded communication quality, the signal strength of WLAN can be improved by adding some repeaters (PR2002 Wireless Repeaters), which can effectively solve the problem of wireless signal coverage in large space or irregular space.

### ■ Software and Hardware Design to Ensure the Reliability of Test Data

In the case of abnormal or missing data sent and received by the wireless network, the system will automatically query and supplement the missing data. Even if the recorder is offline during the entire recording process, the data can be supplemented in the U disk mode later, which can be used for Users provide complete raw data.

### ■ Excellent Full-scale Temperature and Humidity Accuracy

In order to meet the diverse calibration needs of users, different models of recorders use temperature and humidity measuring elements with different principles, which have excellent measurement accuracy in their full range, providing reliable guarantee for temperature and humidity traceability and calibration.

### ■ Low power Consumption Design

PR750A can work continuously for more than 85 hours under the setting of one minute sampling period, while PR751 series products can work continuously for more than 200 hours. The working time can be further increased by configuring longer sampling period.

### ■ Built in Storage and U Disk Mode

Built-in FLASH memory, can store more than 50 days of measurement data. And can charge or transfer data through Micro USB interface. After connecting to the PC, the recorder can be used as a U disk for data copying and editing, which is convenient for fast processing of test data when the local wireless network is abnormal.

### ■ Flexible and Easy to Operate

No other peripherals are needed to view the current temperature and humidity value,

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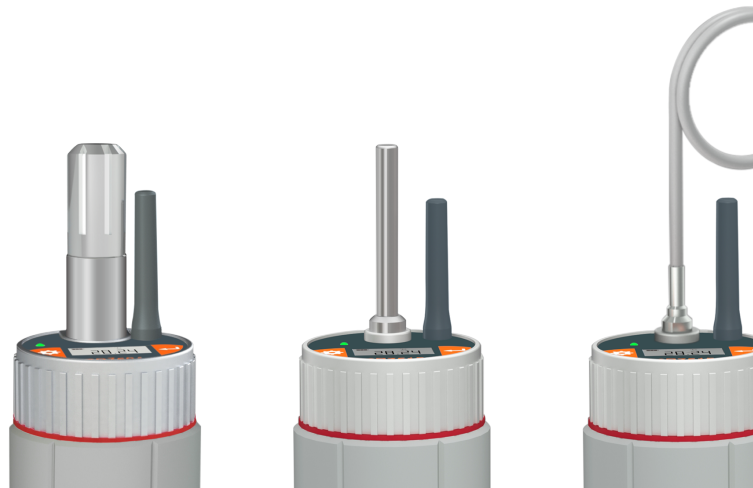
power, network number, address and other information, which is convenient for users to debug before networking. Furthermore, users can easily configure different environmental temperature and humidity calibration systems according to the actual needs.

■ **Excellent Software Features**

The recorder is equipped with professional temperature and humidity acquisition software. In addition to the regular display of various real-time data, curves and data storage and other basic functions, it also has visual layout configuration, real-time temperature and humidity cloud map display, data processing, and report output functions. The software can perform automated calibration of temperature and humidity parameters in constant temperature and humidity laboratories according to “JJF 2058-2023 Calibration Specification for Environmental Parameters in Constant Temperature and Humidity Laboratories”.

■ **Remote Monitoring can be Realized with PANRAN Smart Metrology**

All the original data in the whole test process will be sent to the cloud server through network in real time, The user can monitor the test data, test status and data quality in real time on the PANRAN smart metrology app, and can also view and output historical test data to establish a cloud data center, and provide users with long term data cloud storage, cloud computing and other services.



▲ PR750A, PR751A and PR752A are Shown from Left to Right

(PR751A and PR751B are same in appearance)(PR752A and PR752B are same in appearance)



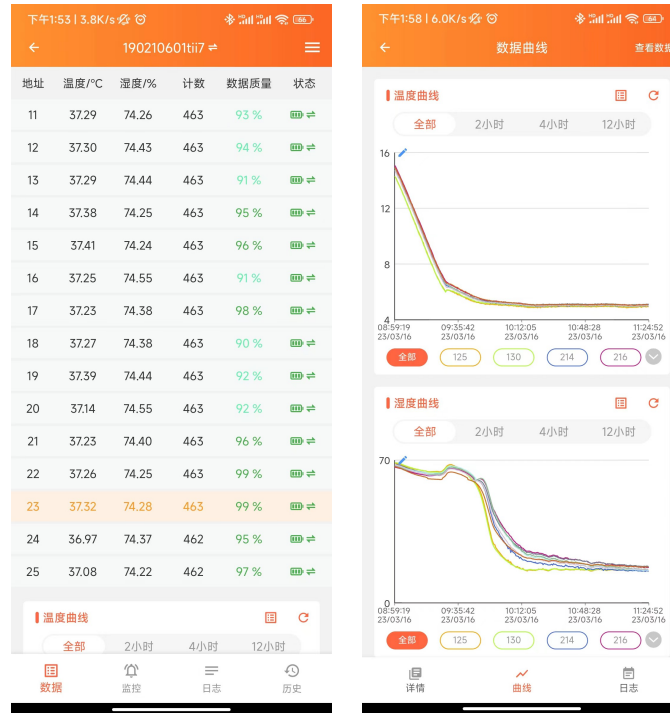
▲ Micro USB Connecting with PC or Dedicated Tablet



▲ PR750A Shown Partial Close-up



▲ Bottom Mechanical Switch Close-up



▲ Smart Metrology APP Interface

### III Technical Parameters

#### Basic Parameters

Model	PR750A	PR751A	PR751B	PR752A	PR752B
Name	High precision temperature and humidity recorder	High precision temperature recorder			
Sensor	Straight rod type $\phi 12 \times 38 \text{mm}$	Straight rod type $\phi 4 \times 38 \text{mm}$		Soft wire type $\phi 4 \times 300 \text{mm}$	
Dimensions	$\phi 38 \times 48 \text{mm}$ (75mm including sensor height)				
Weight	80g	78g		84g	
Battery Duration	85 hours (3.5days)	200 hours (8 days)			
Charging Time	1.5 hours	3 hours			
Battery Type	Rechargeable lithium batteries				
Battery Specifications	3.7V 650mAh	3.7V 1300mAh			
Data Storage Capacity	2MB (store 60K sets of data)	2MB 2MB (store 80K sets of data)			
Effective Communication Distance	Linear distance from transmitter $\geq 30 \text{m}$				
Wireless Communication	2.4G (using ZIGBEE protocol)				
Charging Interface	Standard Micro USB				
Calibration Cycle	1 year				

#### Measurement Parameters

Model	PR750A	PR751A	PR752A	PR751B	PR752B
Measurement Range	-30°C~60°C	-30°C~60°C			
	0%RH~100%RH				
Resolution	0.01°C 0.01%RH	0.01°C			
Temperature Accuracy [Note 1][Note 2]	$\pm 0.1^\circ\text{C}$ @ (5~30) °C $\pm 0.2^\circ\text{C}$ @ (-30~60) °C	$\pm 0.07^\circ\text{C}$ @ (5~30) °C $\pm 0.10^\circ\text{C}$ @ (-30~60) °C	$\pm 0.2^\circ\text{C}$		
Humidity Accuracy	$\pm 1.5\% \text{RH}$ @ (5~30) °C $\pm 3.0\% \text{RH}$ @ (-30~60) °C	/			

Note 1: For calibration of PR750/751 recorders, the entire recorder unit must be fully immersed in a constant-temperature environment.

Note 2: PR752 recorders employ a probe immersion method in liquid bath calibration. Considering the impact of ambient temperature on the recorder mainframe, additional measurement errors may occur when operating in non-ambient conditions.

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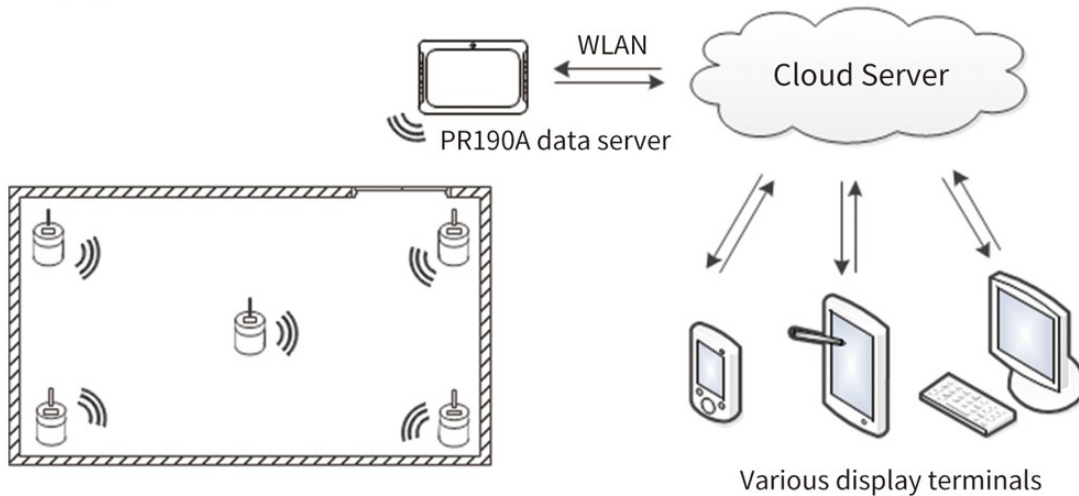
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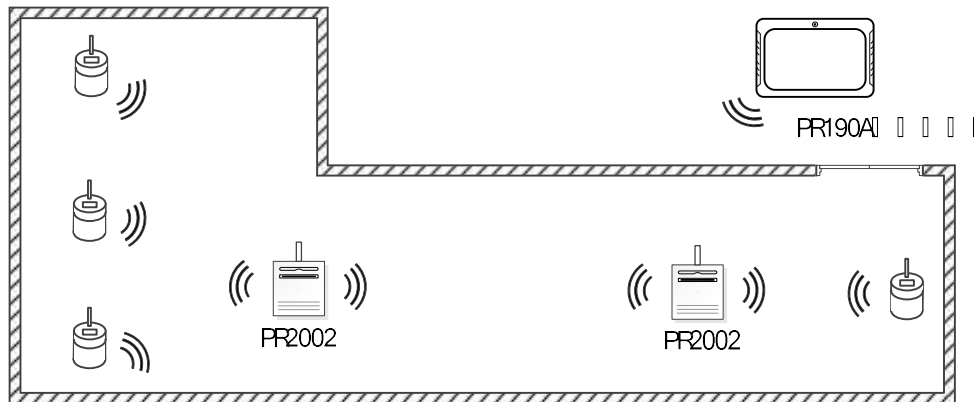
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## IV Application Examples

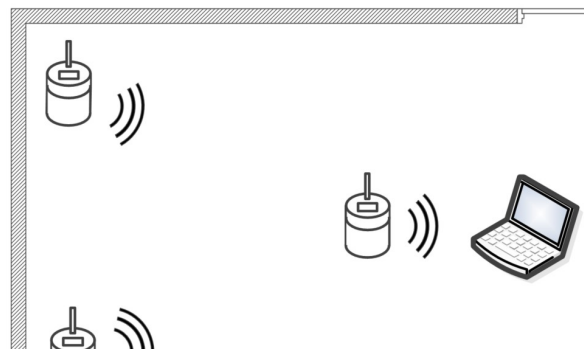
- Scenario 1: When utilizing the PR190A Data Server as the host unit, it provides full PC software functionality. With cloud server support, it enables real-time remote monitoring and data processing. The PR190A automatically establishes a 2.4G wireless LAN without peripherals, where temperature/humidity recorders sharing identical network IDs automatically join. By connecting to nearby WLAN or wired networks, the PR190A uploads environmental data from LAN-connected recorders to the cloud via the Internet. Authorized users can access real-time data and perform processing on mobile devices, tablets, or PCs.



- Scenario 2: When deploying the PR190A Data Server as the host unit, wireless range extenders (1 or more) can be added to monitor temperature/humidity in large space/irregular spaces. These extenders automatically identify and join the local wireless LAN matching their Network ID, featuring enhanced transmit power and antenna gain to significantly expand network coverage and optimize signal quality. In this configuration, the PR190A can be positioned outside the measured space, enabling real-time data access for operators.



- Scenario 3: When using a PC host co-located with temperature/humidity recorders in the measured space, the PC connects to a PR6001 Transmitter via USB. The transmitter establishes a wireless LAN, and recorders sharing its Network ID auto-join the network. These devices automatically transmit temperature/humidity data to the PC software at configured sampling intervals. This configuration is suitable for spaces under 400 m<sup>2</sup>.



## V System-Complementary Products & Technical Profiles

No.	System-complementary product names	Remarks
1	PR190A Data Server	Features cloud-enabled capability, serving as a direct alternative to pc hosts
2	PR2002 Wireless Repeater	Extends coverage of local wireless LAN
3	PR6001 Wireless Transmitter	When connected to a pc, the device can take control of the local wireless LAN as the host unit

- PR190A Data Server

PR190A data server is a key component to realize the data interaction between PANRAN instruments are available in South Africa from Intercal (Pty) Ltd

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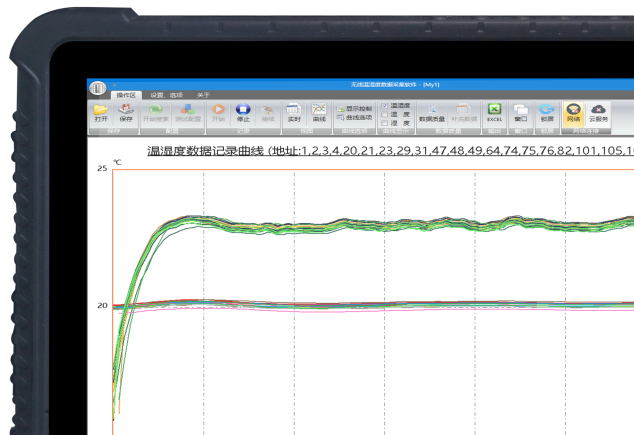
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recorders and cloud server, It can automatically set up a LAN without any peripherals and replace the general PC. It can also upload real-time temperature and humidity data to the cloud server through WLAN or wired network for remote data monitoring and data processing.

Model	PR190A Data Server
Memory	4GB
FLASH Memory	128GB
Display	10.1" 1280*800 IPS/10 capacitive touch screen (glove touch can be supported)
Wireless	GPS, Bluetooth, WLAN, ZigBee
Battery	7.4V/5000mAH/Removable battery
I/O Interface	TF card holder of memory cardx1, USB 3.0x1, Micro USB2.0x1, Earphone/Microphone jackx1, DC power interfacex1, Mini HDMI interface x1, Pogo Pin interface(12pin) x1, RS232 serial portx1, RJ45x1
Power Supply Adapter	Input: AC 100~240VAC, 50/60HZ, Output: DC 19V, 2.1A
Dimension	278X186X26mm (L×W×T)
Weight	1.28kg with external AC adapters
Working/Storage Temperature	Working temperature: -10~60°C Storage temperature: -30°C~70°C/Humidity : 95 %RH no-condensation



■ PR2002 Wireless Repeater

PR2002 wireless repeater is used to extend the communication distance of 2.4G wireless

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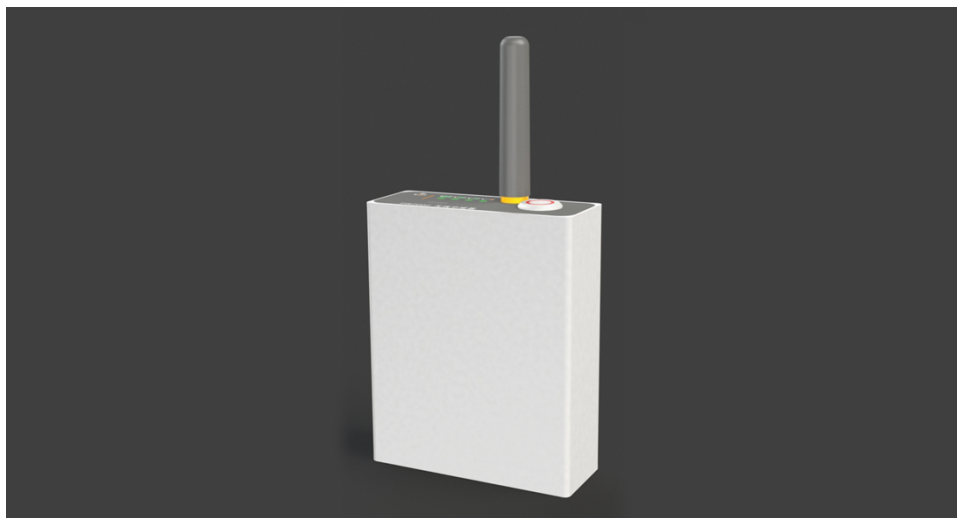
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network based on zigbee communication protocol. With built-in 6500mAh large-capacity lithium battery, the repeater can work continuously for about 7 days. PR2002 wireless repeater will automatically connect the network with the same network number, the recorder in the network will automatically connect to the repeater according to the strength of the signal.

The effective communication distance of the PR2002 wireless repeater is much longer than the transmission distance of the low-power transmission module built in the recorder. Under open conditions, the ultimate communication distance between the two PR2002 wireless repeaters can reach 500m.

Model	PR2002 wireless repeater
Radio Transmitting Power	23dBm
Maximum Transmission Rate	250kbps
The Battery Specification	3.7V 6800mAH
The Charging Interface	Micro USB
External Dimensions (excluding Antenna)	71×27×88mm (L×W×H)
Weight	220g
Working/Storage Temperature	-10~60°C, 10~90%RH non-condensing



■ PR6001 Wireless Transmitter

PR6001 wireless transmitter is used to establish wireless network based on zigbee communication protocol. With the standard USB2.0 interface, it can be used after connecting to USB interface of PC.

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## VI Comprehensive Technical Overview of Zigbee Technology

Zigbee is a low-speed, short-range wireless networking protocol. Technically, it is a bidirectional low-data-rate wireless technology operating in the 2.4GHz band. Key features include: Low speed & Low power consumption, Cost-effectiveness & High node capacity, Support for multiple topologies, Low complexity with high reliability and security, As an emerging short-range wireless communication technology for sensor and control applications.

Compared to traditional networking technologies, Zigbee wireless communication demonstrates superior efficiency and operational convenience. As a short-range, cost-effective, low-power wireless technology, its core specifications for network formation, security, and application software are derived from the IEEE 802.15.4 wireless standard. This technology is optimized for low-bandwidth applications and enables seamless deployment across fixed and portable mobile devices. Features are as follows:

### ■ Ultra-low Power Consumption

In low-power standby mode, two AA dry cells can sustain a node for 6~24+ months – a defining advantage of Zigbee. Comparatively, Bluetooth lasts weeks while WiFi operates only hours.

### ■ Optimized Low Data Rate

Zigbee operates at 20-250 kbps, delivering raw throughput of: 250 kbps @ 2.4GHz, 40 kbps @ 915 MHz, 20 kbps @ 868 MHz, This meets low-bandwidth operational requirements for sensor networks.

### ■ Short Range

The transmission range is generally between 10 and 100 m, but it can be increased to 1 to 3 km by boosting the transmission power. This refers to the distance between adjacent nodes. If routing and relay communication between nodes are used, the transmission distance can be extended even further.

### ■ Low Latency

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ZigBee has a relatively fast response time—typically, it takes only 15 ms to switch from sleep to active mode, and just 30 ms for a node to connect and join the network, which further conserves energy. In comparison, Bluetooth requires 3~10s, and WiFi needs about 3s.

■ High Network Capacity

Zigbee supports star, tree, and mesh topologies where a coordinator manages up to 254 child nodes. This hierarchical structure enables multi-layer scaling, forming networks of 65,000+ nodes through parent-coordinator cascading.

■ High Security

Zigbee implements three-tier security mechanism, including secure configuration, the use of an Access Control List (ACL) to prevent unauthorized data access, and symmetric encryption using the Advanced Encryption Standard (AES 128), allowing for flexible definition of security attributes.