

PM 2.5 Indoor Air Quality Monitor (Particle Air Quality Detector)

TM-280W

User's Manual



HB2TM280W001

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1. Introduction

The PM 2.5 Air Quality Monitor is designed with a laser particulate matter sensor for and a high-precision humidity/temperature sensor.

PM2.5 is:

A lot of pollutants existing in the air, where the dust-like particles floating in the air are called particulate matter (PM). Distinguishing particle size, the particles smaller than or equal to 2.5 microns, i.e. PM2.5 is commonly known as particulate matter in units of $\mu\text{g}/\text{m}^3$. With the diameter less than 1/28 of human hair thickness, the particles are so fine as to penetrate the alveoli, enter the blood vessels directly, and even circulate throughout the body via the blood. Therefore, the impact on the human body and ecology cannot be ignored.

The regulations for PM2.5 in Taiwan:

The Air Quality Act of Taiwan Environmental Protection Administration stipulates that the average value shall not exceed $35\mu\text{g}/\text{m}^3$ within 24 hours. The standard adopted by Taiwan is the same as the standard of the US, please refer to the US AQI if to view the AQI in Taiwan.

Lookup Table for AQI and PM2.5 Value

Air Quality Index (AQI)	Corresponding PM2.5 Concentration		Air Pollution Level for Health	Color Code
	CN standard	US standard		
0 - 50	0-35	0-12	Level 1 (Excellent)	Green
51 - 100	36-75	13-35	Level 2 (Good)	Yellow
101 - 150	76-115	36-55	Level 3 (Lightly Polluted)	Orange
151- 200	116-150	56-150	Level 4 (Moderately Polluted)	Red
201 - 300	151-250	151-250	Level 5 (Heavily Polluted)	Purple
301 - 500	251-500	251-500	Level 6 (Severely Polluted)	Maroon

AQI is :

The acronym of Air Quality Index, a new indicator for the ambient air quality, and used to describe the status of air quality.

2. Accessories

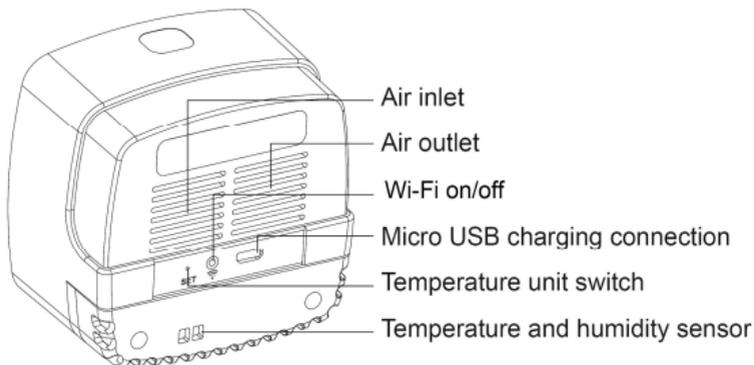
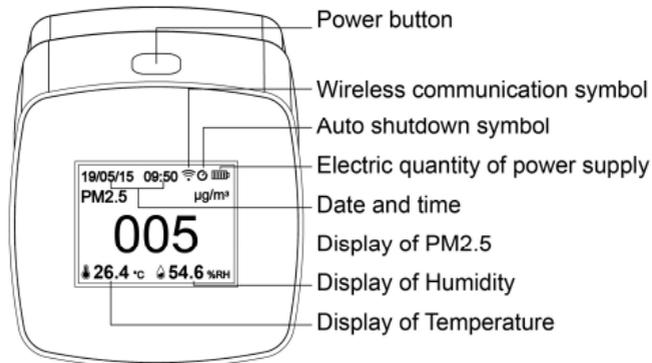
- 1 Instrument (Built-in 18650 Rechargeable Li-ion Battery)
- 1 USB AC to DC adaptor, 5V/1A
- 1 USB cable (for charging use)
- 1 User's Manual

3. Safety Precaution

	Caution! Please refer to this manual. Improper use may damage the meter and its components.
	Complies with European Directive.

- Do not operate in environments with flammable gas or humid environments.
- Operating altitude: up to 2000M.
- Operating environment: Indoor use; Pollution degree 2.
- Clean with soft cloth when dirty, such as glasses cloth. Do not clean with chemicals and other solvents.
- For the qualified low-power radio-frequency devices, the company, shop, or user may not unauthorizably change the frequency, increase the power or change the characters and functions of original design without permission.
- The use of qualified low-power radio-frequency devices shall not either affect flight safety nor interfere with legitimate communications. If interference found, deactivate the devices immediately and improve until no interference occurs, then it can just be used.
- EMC: EN61326-1:CISPR 11:Group 1, Class B
- ◇ Class B – Equipment for use in all establishments other than domestic.
- ◇ Group 1 – RF energy generated is needed for internal functioning.

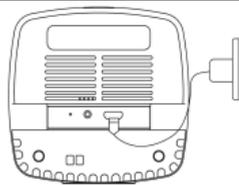
4. Instrument Description



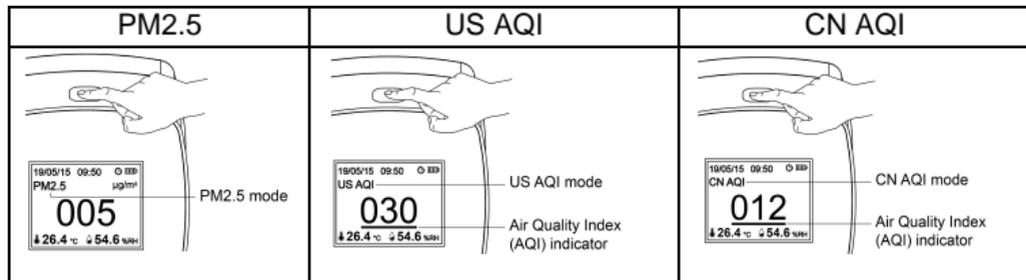
5. Operation**5.1 Turning on**

Press and hold the power button for more than two seconds to turn on;  flashing indicates the wireless router is on connecting, and  no more flashing indicates the connection completed.

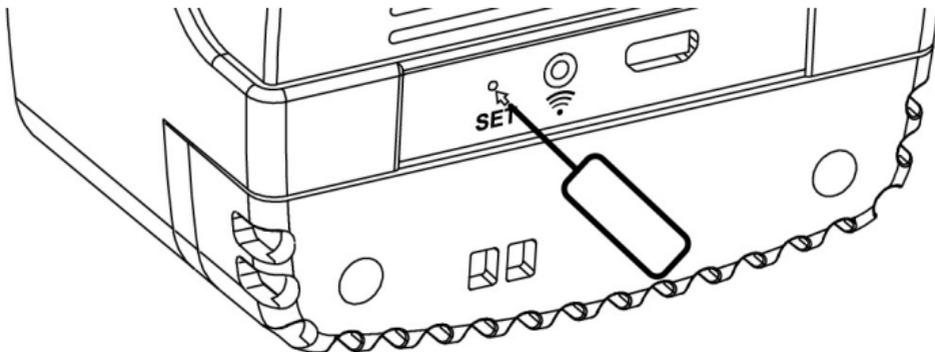
With a USB power cable plugging in, the auto turn-on function can be also enabled, while charging at the same time (the specification of charging transformer is 5V/1A).



Press the power button to sequentially select the display mode of PM2.5 → US AQI → CN AQI.

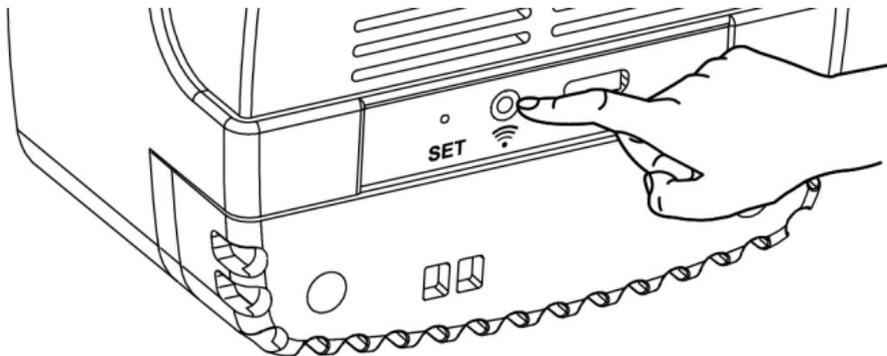


5.2 Switching the temperature unit



Poke the **SET** hole on the rear with a SIM card pin or paper clip for switching between °C and °F.

5.3 Turning on and turning off the wireless connection

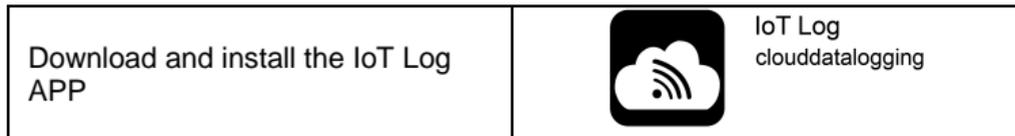
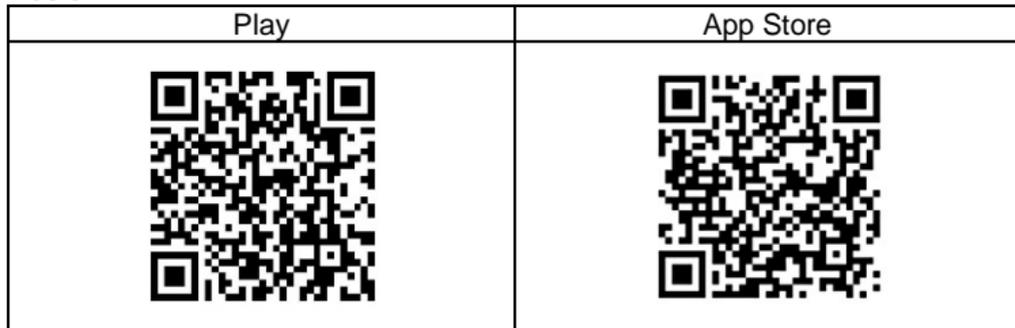


Press the  button to turn on or turn off the wireless function.

6. Steps for network pairing

6.1 APP application software installation

Search for IoT Log in the App Store or Play Store or scan the QR CODE as below.



Suitable for smartphones with the OS Android 4.0 / iOS 8.0 or higher

6.2 Register an Account

Open the IoT log app and click "Register"

IoT Log

IOT Live

Input your account name

Input your password

Remember me Forget Password?

Login

Register



Fill in the information. As done, click "✓" on the upper-right corner to complete the registration.

Register

Input your account name *

Input your password *

Re: Input your new password *

Input your e-mail *

Input your Mobile Number *

6.3 User login

Open the IoT Log APP, fill in the registered user name & password, and click "Login" to log into your personal account

 Input your account name 

 Input your password

Remember me [Forget Password?](#)

Login



If you forget the password, click "Forget Password" in the lower right corner to enter the "Reset Password" interface, and fill in the registered user name & email address. As done, click "✓" on the upper-right corner of the interface, the system will send an email to your registered mailbox for password modification.

 Input your account name 

 Input your password

Remember me [Forget Password?](#)

Login



6.4 Connection confirmation

Please follow the following steps for network pairing:

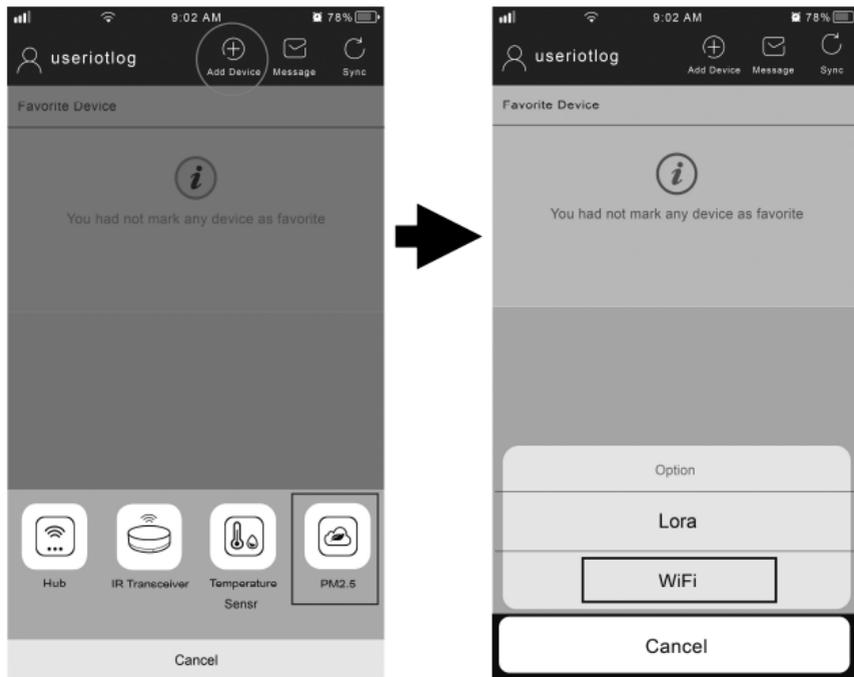
1. Make sure your mobile phone switched to Wi-Fi connection mode, and note the Wi-Fi name and the password of the configured network in the settings. **(This instrument supports 802.11n (2.4GHz) only.)**



2. Turn on the instrument, the symbol  on the upper-right corner flashes, while the instrument is waiting for Wi-Fi configuration.



3. Open the APP and press “Add Device” on the upper-right corner, and followed by PM2.5 → Wi-Fi



4. Fill in the Wi-Fi name & password which are set previously → press
“Set Wi-Fi with AP Mode”



1. Please hold down the Button*“Bee”
2. Please make sure that you have connected to Wi-Fi
3. Please select a wireless network and enter a password

WiFi NUMBER

Please fill in the password

Password

Set Wi-Fi with AP Mode

Search device in local network?

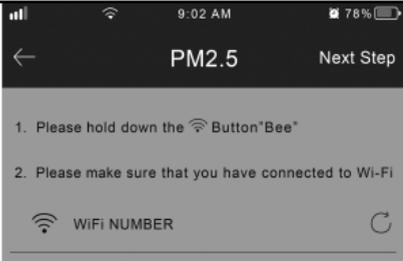
Submit

Note:

1. Auto-search for the Wi-Fi name to be configured. when SSID appears, please press the next to it, the system will auto-crawl the just connected Wi-Fi name. If SSID still displayed, please go back to the step on page P.13 and search for the Wi-Fi name to be configured.

2. Press “Set Wi-Fi with AP Mode” to configure.

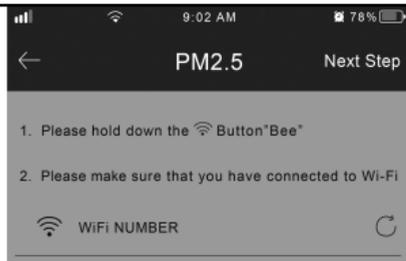
5. According to the configuration instructions, go to the phone setting screen, select the Wi-Fi with naming beginning as YS_→ then back to the APP for pairing

<p>1. Set Wi-Fi mode</p>	 <p>Set Wi-Fi</p> <ul style="list-style-type: none"> ❗ GO to your phone's settings and join your PM2.5 Detector's Wi-Fi network (Begin with "YS_").Return to the APP of IoT Log to continue setup. ✔ Connecting PM2.5 Detector to your phone Wi-Fi (This might take a few minutes) ✔ PM2.5 Detector is connected to your phone Wi-Fi "WiFi NUMBER" ✔ Go to your phone's settings and join your phone Wi-Fi "WiFi NUMBER" <p style="text-align: center;">Cancel</p>
--------------------------	---

2. Click YS_8285XXXX
(This is the network
configured code at the
instrument)



3. Return to the APP for viewing, the three steps in the following figure will be completed at the moment

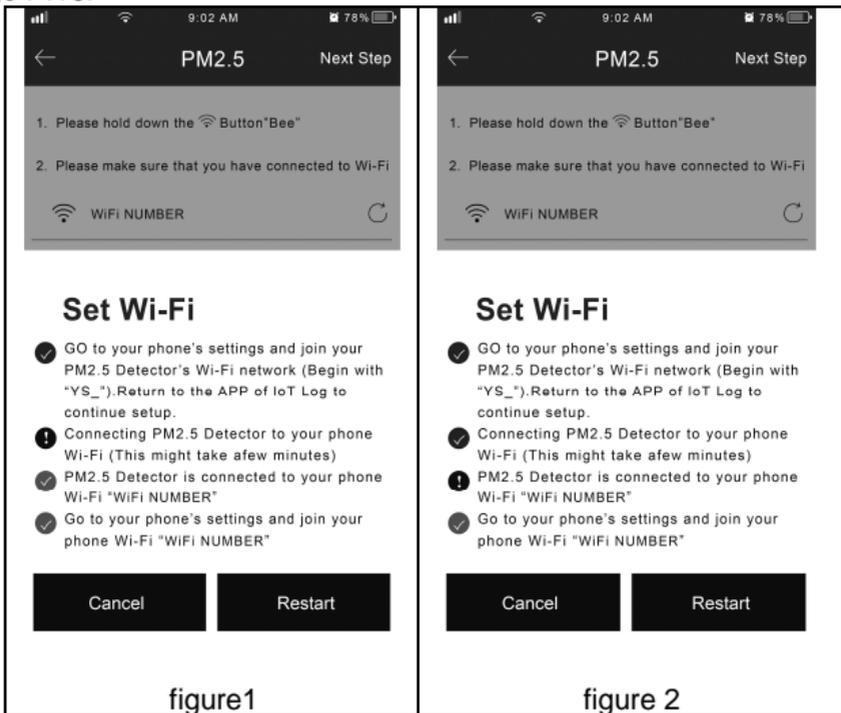


Set Wi-Fi

- ✓ GO to your phone's settings and join your PM2.5 Detector's Wi-Fi network (Begin with "YS_"). Return to the APP of IoT Log to continue setup.
- ✓ Connecting PM2.5 Detector to your phone Wi-Fi (This might take a few minutes)
- ✓ PM2.5 Detector is connected to your phone Wi-Fi "Wi-Fi NUMBER"
- ! Go to your phone's settings and join your phone Wi-Fi "Wi-Fi NUMBER"

Cancel

If the configuration fails, the following figure 1 or figure 2 will appear. Press "Restart" to re-configure or press "Cancel" and return to the steps from page P.16.

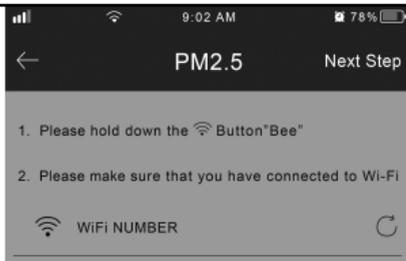


6. Please go to the Wi-Fi settings of the mobile phone

1. Reconnect to the Wi-Fi name that being paired.



2. Return to the APP, then this screen appears, that indicates the network pairing is successful. Press "Done".

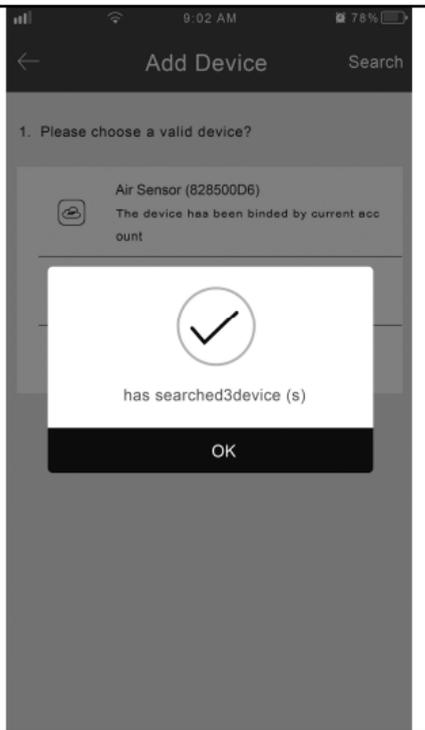


Set Wi-Fi

- ✓ GO to your phone's settings and join your PM2.5 Detector's Wi-Fi network (Begin with "YS_"). Return to the APP of IoT Log to continue setup.
- ✓ Connecting PM2.5 Detector to your phone Wi-Fi (This might take a few minutes)
- ✓ PM2.5 Detector is connected to your phone Wi-Fi "Wi-Fi NUMBER"
- ✓ Go to your phone's settings and join your phone Wi-Fi "Wi-Fi NUMBER"

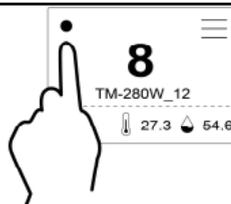
Done

3. This screen indicates that the instrument is available for pairing.



6.5 Operation settings

- The green light indicates the device is connected.
- The gray light indicates the device is disconnected, please check the device.



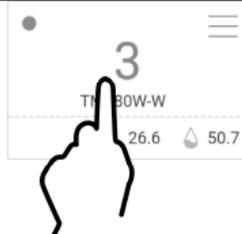
- Click "Sync" on the top right, update the status of all devices immediately.



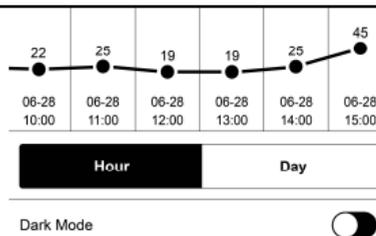
Sync



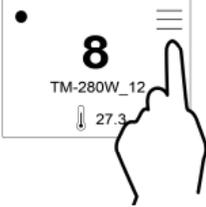
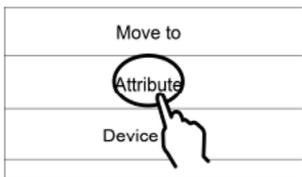
- Click to view historical tendency chart



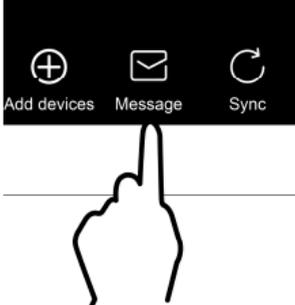
- Click "Hour": to view the average PM2.5 data per hour, up to 30 hours.
- Click "Day": to view the average PM2.5 data per day, up to 30 days.
- Clicks "Dark Mode": to enable auto shut down at 10 p.m.



6.6 Alarm setting

<ul style="list-style-type: none"> ● Click "☰" 	<ul style="list-style-type: none"> ● Click "Attribute" 	<ul style="list-style-type: none"> ● Click to set alarm range ● Click "Save" to set 												
		<table border="1"> <tr> <td>PM2.5 threshold (µg/m³)</td> <td>0</td> <td>-</td> <td>100</td> </tr> <tr> <td>Temperature threshold</td> <td>-20 °C</td> <td>~</td> <td>50 °C</td> </tr> <tr> <td>Humidity threshold</td> <td>10 %</td> <td>-</td> <td>99 %</td> </tr> </table>	PM2.5 threshold (µg/m ³)	0	-	100	Temperature threshold	-20 °C	~	50 °C	Humidity threshold	10 %	-	99 %
PM2.5 threshold (µg/m ³)	0	-	100											
Temperature threshold	-20 °C	~	50 °C											
Humidity threshold	10 %	-	99 %											

6.7 Alert Notification

<ul style="list-style-type: none"> ● When the test value is above or below the set alarm range, a message will be sent to the APP automatically. View it by clicking "Message" in the upper right corner. ● For viewing the details, click "☰" on the menu bar on the right. ● Click "Device Log" to view 	
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7. General Specifications

- Battery: rechargeable lithium battery of 3.7V 18650 2600mAh (using primary cell made in Japanese/Korean lithium battery), with the value 1A/5V for charging and using.
- Battery life: approximately 8 hours for continuous use (set as one sending per hour)
- Auto power off: Automatically shut down after 60 minutes in case of no external power input.
- Long-term use mode: Auto shut down will be disabled when connecting to an external power input. (the symbol  disappears).
- Operation temperature and humidity: 5 to 40°C; < 80%RH (no condensation)
- Storage temperature and humidity: -5 to 40°C, < 70%RH (no condensation)
- Dimension: 84x81x55 mm (LxWxH)
- Weight: approximately 217g (battery included)

8. Electrical specifications

Particulate matter (PM 2.5)	0-500 μ g/m ³	
Reaction time	<10 seconds	
Accuracy	\pm 5 μ g (<=50 μ g/m ³) \pm 10% reading(>50 μ g/m ³)	
Temperature	-20~50°C (-4~122°F)	
Reaction time	5 seconds (at least)	
Accuracy	\pm 2°C (3.6°F) No external power supply	
Humidity	1 - 99% RH	
Resolution	PM 2.5→1	Temperature and Humidity→0.1
Reaction time	8 seconds (at least)	
Accuracy	\pm 5%RH: (20~80%RH @25°C) \pm 7%RH: other @25°C	
WIFI wireless module (built-in antenna)	Protocol	802.11 b/g/n (802.11n up to 150 Mbps) A-MPDU and A-MSDU aggregation and 0.4 μ s guard interval support
	Frequency range	2.4 GHz ~ 2.5 GHz

9. Maintenance

1. Read the instruction manual in detail and check if any operational error.
2. For the low battery indication:  indicates the battery full;  indicates the battery low, please charge it timely.

10. Cleaning

Wipe it with a soft and dry cloth for cleaning, where the wet cloth, solution or water etc. is not allowed.

11. Product Disposal



Note: This symbol indicates that the meter and its accessories must be separated and processed properly.



**TENMARS ELECTRONICS CO., LTD
6F, 586, RUI GUANG ROAD, NEIHU,
TAIPEI 114, TAIWAN.**

**E-mail: service@tenmars.com
<http://www.tenmars.com>**