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# FT012TH Wireless Indoor 8-Channel Thermo-Hygrometer

## 1 Introduction

Thank you for your purchase of the FT012TH Wireless Indoor 8-Channel Thermo-Hygrometer with Display. The following user guide provides step by step instructions for installation, operation and troubleshooting.

### 1.1 Indoor Thermo-Hygrometer Sensor Set Up

1. Remove the battery door on the back of the display . 1. Insert two AAA (alkaline or lithium, avoid rechargeable) batteries in the back of the indoor sensor.

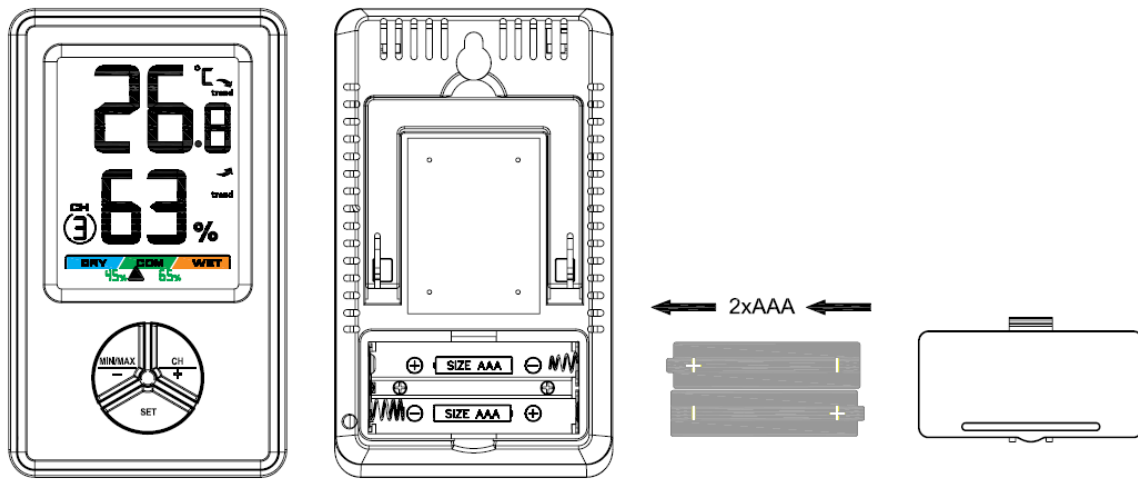



Figure 1

2. Insert two AAA batteries.  
After inserting the batteries, All of the LCD segments will light up for a few seconds to verify all segments are operating properly. and then  icon flash once per 60 seconds thereafter. Each time it flashes, the sensor is transmitting data.
3. Verify the correct channel number (CH) and temperature units of measure (°F vs. °C) are on the display, as shown in Figure 2.

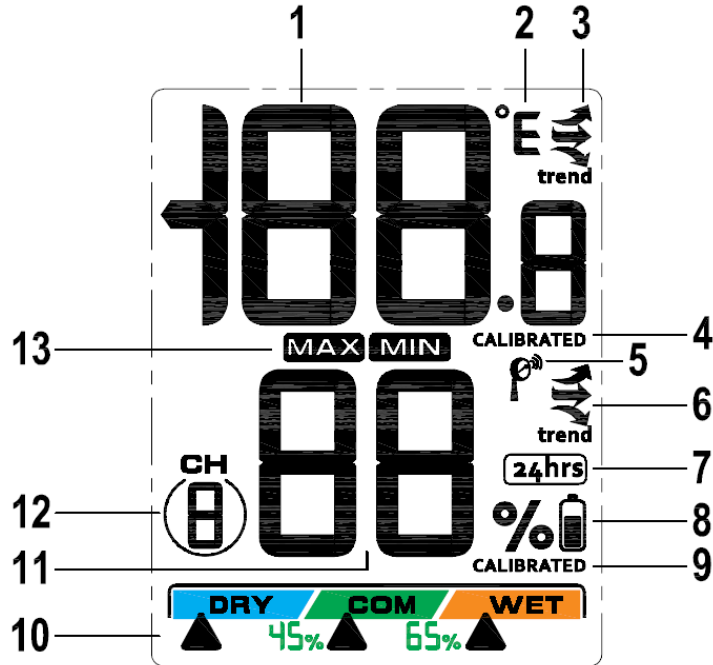


Figure 2

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|---|---|
| <ul style="list-style-type: none"> <li>1. Temperature</li> <li>2. Temperature units (°F or °C)</li> <li>3. Temperature, Rate of Change indicator</li> <li>4. Temperature Calibrated Icon (when the calibration is displayed )</li> <li>5. Emission Icon (flashes when updating)</li> <li>6. Humidity, Rate of Change indicator</li> <li>7. Min/Max Clears daily mode</li> </ul> | <ul style="list-style-type: none"> <li>8. Low power indicator</li> <li>9. Humidity Calibrated Icon (when the calibration is displayed )</li> <li>10. Humidity Comfort Colorful Icon</li> <li>11. Relative Humidity (%)</li> <li>12. Channel 1,2,3,4,5,6,7,8 indicator</li> <li>13. Min/Max Record mode</li> </ul> |
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- 4. Close the battery door. on the table or on the wall.

## 2 Display Features

### 2.1 Comfort Colorful Icon

The comfort icon is based on humidity ranges specified in Figure 3.

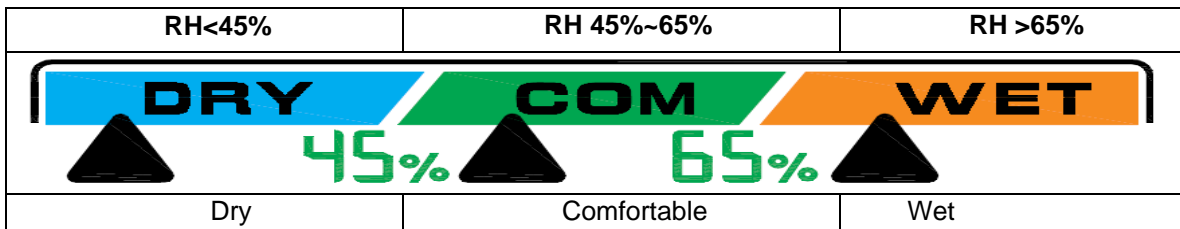


Figure 3


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## 2.2 Rate of Change Icon






The rate of change icon detects rapid changes in temperature and humidity. If the arrow points upward, the temperature is increasing at a rate of +2°C per 30 minutes (or greater), or humidity is increasing at a rate of +5% per 30 minutes (or greater). If the arrow points downward, the temperature is decreasing at a rate of -2°C per 30 minutes (or less), or humidity is decreasing at a rate of -5% per 30 minutes (or less).

## 3 Indoor Thermo-Hygrometer Sensor Operation

 **Note:** The indoor sensor has three buttons for easy operation: **MIN/MAX/-** button, **SET** button, and **CH/+** button.

### 3.1 Indoor Sensor Channel Setting

Press and hold the **CH/+** button 3 seconds to switch the display scroll mode . In scroll mode, press the **CH/+** button display between the 1 through 8 channel, Press and hold the **CH/+** button 3 seconds to exit channel setting, disappear  scroll mode.

 **Note:** **BEFORE** inserting the receiver batteries, To set each indoor sensor channel number **FIRST** (the default is Channel 1 , Outdoor sensor default is Channel 1) ,The FT012TH supports up to eight transmitters.


### 3.2 Min/Max Mode

The Min/Max mode displays the minimum and maximum temperature and humidity (since reset of the unit) for the indoor sensor.

1. **Display Maximum.** Press the **MIN/MAX** button once to display the maximum. The **MAX** icon will be displayed.
2. **Clear Maximum.** To reset the maximum values to the current values, *press and hold* the **MIN/MAX** button for 3 seconds.
3. **Display Minimum.** Press the **MIN/MAX** button again to display the minimum. The **MIN** icon will be displayed.
4. **Clear Minimum.** To reset the minimum values to the current values, *press and hold* the **MIN/MAX** button for 3 seconds.

To return to normal mode, press the **MIN/MAX** button again.

### 3.3 Clearing Min/Max Daily

The minimum and maximum can be set to clear daily (at midnight) or manually. Press and hold the **SET** button for 3 seconds to switch between  and Clears Manually.

When you manually clear the minimum and maximum, the Clears 24h function will clear every **0:00** hours from the time you clear it.

### 3.4 Temperature Units of Measure

The default temperature units of measure are degrees Celsius. To toggle between degrees Celsius and


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degrees Fahrenheit, press and hold the **MIN/MAX** button for 3 seconds in normal mode.

### 3.5 Backlight Operation

To temporarily turn on the back light for five seconds, press the **any** button on the indoor sensor.

## 4 Adjustment or Calibration

 **Note:** The measured humidity range is between 10 and 99%. Humidity cannot be accurately measured outside of this range. Thus, the humidity cannot be calibrated below 10% or above 99%.

The purpose of calibration is to fine tune or correct for any sensor error associated with the devices margin of error. The measurement can be adjusted from the console to calibrate to a known source.

Calibration is only useful if you have a known calibrated source you can compare it against, and is optional. This section discusses practices, procedures and sources for sensor calibration to reduce manufacturing and degradation errors. Do not compare your readings obtained from sources such as the internet, radio, television or newspapers. They are in a different location and typically update once per hour.

The purpose of your weather station is to measure conditions of your surroundings, which vary significantly from location to location.

### 4.1 Humidity Calibration

To enter the humidity calibration mode, press and hold the **SET and MIN/MAX** buttons at the same time for 3 seconds and the humidity value will begin flashing. Press the **CH/+** button to increase the humidity and the **MIN/MAX/-** button to decrease the humidity reading in 1% increments. To rapidly increase (or decrease) the humidity reading, press and hold the **CH/+** or **MIN/MAX/-** button.

To return the humidity to the actual or uncalibrated measurement, press the **SET** button. **CALIBRATED** will be displayed when the humidity calibrated measurement.


Once the displayed humidity equals the calibrated source, press and hold the **SET** button for three seconds, or wait 15 seconds for timeout, and the humidity value will stop flashing.

### 4.2 Temperature Calibration

To enter the temperature calibration mode, press and hold the **SET and CH/+** buttons for 3 seconds and the temperature value will begin flashing. Press the **CH/+** button to increase the temperature and the **MIN/MAX/-** button to decrease the temperature reading in 0.1° increments. To rapidly increase (or decrease) the temperature reading, press and hold the **CH/+** or **MIN/MAX/-** button.

To return the temperature to the actual or uncalibrated measurement, press the **SET** button. **CALIBRATED** will be displayed when the humidity calibrated measurement.

Once the displayed temperature equals the calibrated source, press and hold the **SET** button for three seconds, or wait 15 seconds for timeout, and the temperature value will stop flashing.

 **Discussion:** Temperature errors can occur when a sensor is placed too close to a heat source (such as a building structure, the ground or trees).

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To calibrate temperature, we recommend a mercury or red spirit (fluid) thermometer. Bi-metal (dial) and other digital thermometers are not a good source and have their own margin of error. Using a local weather station in your area is also a poor source due to changes in location, timing (airport weather stations are only updated once per hour) and possible calibration errors (many official weather stations are not properly installed and calibrated).

Place the sensor in a shaded, controlled environment next to the fluid thermometer, and allow the sensor to stabilize for 48 hours. Compare this temperature to the fluid thermometer and adjust the console to match the fluid thermometer.

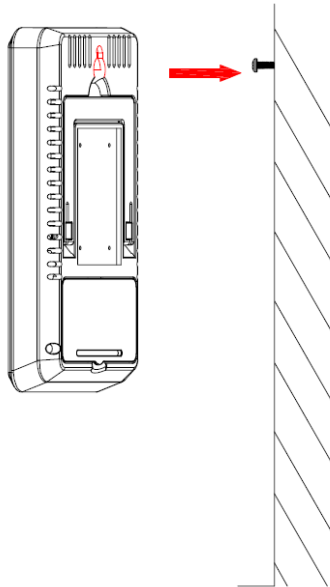
### 4.3 Sensor Operation Verification

Verify the indoor and outdoor humidity match closely with the console and sensor array in the same location (about 5 to 10' apart). The sensors should be within 10% (the accuracy is  $\pm 5\%$ ). Allow about 30 minutes for both sensors to stabilize.

Verify the indoor and outdoor temperature match closely with the console and sensor array in the same location (about 1.5m to 3m apart). The sensors should be within  $2^{\circ}\text{C}$  (the accuracy is  $\pm 1^{\circ}\text{C}$ ). Allow about 30 minutes for both sensors to stabilize.

### 4.4 Indoor Sensor Installation

**Indoor use only.** It is recommended you mount the Indoor sensor on a north facing wall, in a shaded area. Direct sunlight and radiant heat sources will result in inaccurate temperature readings. Use a screw or nail (not included) to affix the indoor sensor to the wall, as shown in Figure 4.



**Figure 4**

Or put it on the table, Place the console at least three feet away from computers, TVs and wireless phones. Avoid transmitting through solid metal barriers. as shown in Figure 4

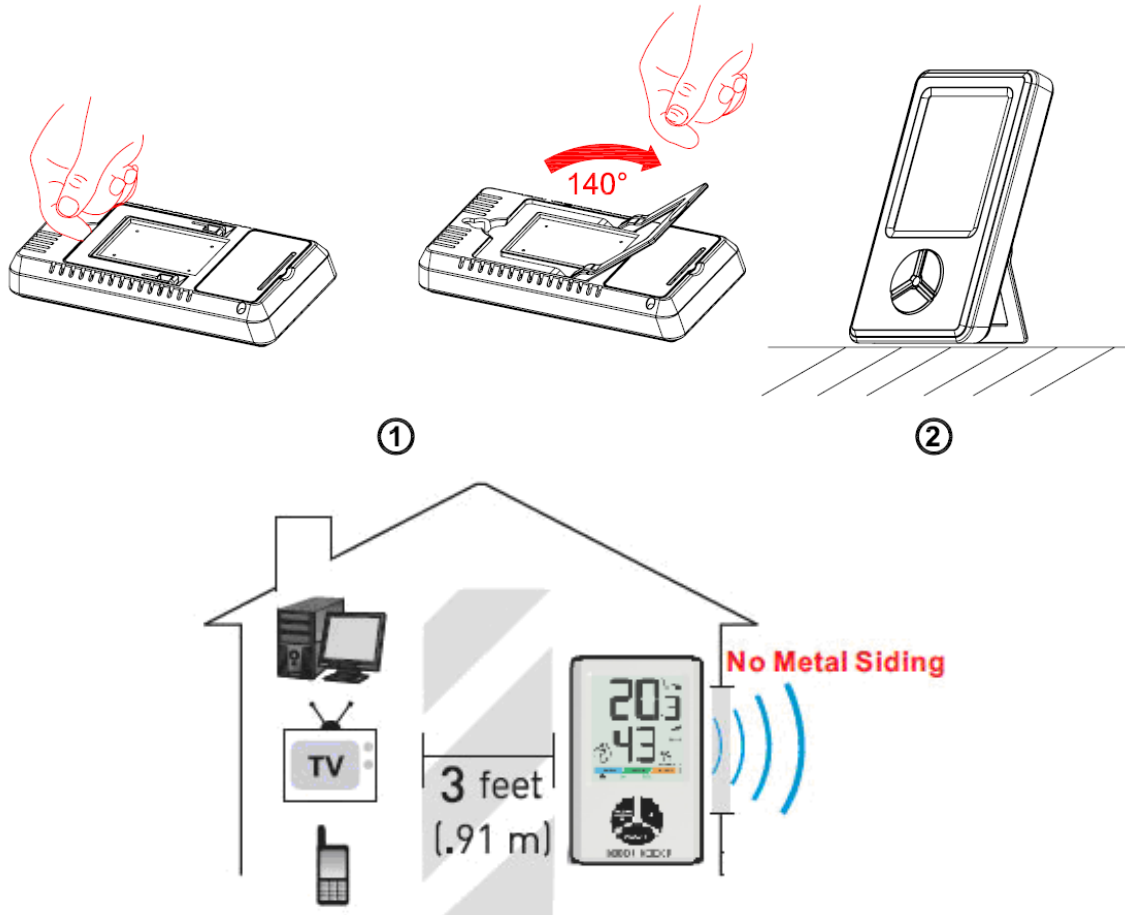


Figure 7

## 4.5 Best Practices for Wireless Communication

Wireless communication is susceptible to interference, distance, walls and metal barriers. We recommend the following best practices for trouble free wireless communication.

1. **Electro-Magnetic Interference (EMI).** Keep the console several feet away from computer monitors and TVs.
2. **Radio Frequency Interference (RFI).** If you have other 433.9MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.
3. **Line of Sight Rating.** This device is rated at 100 meter line of sight (no interference, barriers or walls) but typically you will get 30 meter maximum under most real-world installations, which include passing through barriers or walls.
4. **Metal Barriers.** Radio frequency will not pass through metal barriers such as aluminum siding. If you have metal siding, align the remote and console through a window to get a clear line of sight.

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## 4 5.6 Glossary of Terms

Term	Definition
Accuracy	Accuracy is defined as the ability of a measurement to match the actual value of the quantity being measured.
Hygrometer	A hygrometer is a device that measures relative humidity. Relative humidity is a term used to describe the amount or percentage of water vapor that exists in air.
Range	Range is defined as the amount or extent a value can be measured.

## 5 Specifications

### 5.1 Wireless Specifications

- Line of sight wireless transmission (in open air): 100 meters, 30 meters under most conditions.
- Frequency: 433.9 MHz(+/-250K)
- Update Rate: 60 seconds

### 5.2 Measurement Specifications

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Indoor Temperature	0 to 60 °C	± 1 °C	0.1 °C
Indoor Humidity	10 to 99%	± 5% (only guaranteed between 20 to 90%)	1 %

### 5.3 Power Consumption

- Indoor sensor : 2 x AAA 1.5V Alkaline or Lithium batteries (not included)
- Battery life: Minimum 12 months for indoor thermometer-hygrometer sensor , Backlight often light may reduce the battery life.

## 6 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

## 7 Troubleshooting Guide

<b>Problem</b>	<b>Solution</b>
Wireless remote (thermo-hygrometer) not reporting in to console.	<p>If any of the sensor communication is lost, The maximum line of sight communication range is 100 meters and 30 meters under most conditions. Move the sensor assembly closer to the display console.</p> <p>If the sensor assembly is too close (less than 5'), move the sensor assembly away from the display console.</p> <p>Make sure the remote sensor LCD display is working and the transmitter light is flashing once per 48 seconds.</p> <p>Install a fresh set of batteries in the remote thermo-hygrometer. For cold weather environments, install lithium batteries.</p> <p>Make sure the remote sensors are not transmitting through solid metal (acts as an RF shield), or earth barrier (down a hill).</p> <p>Move the remote sensors around electrical noise generating devices, such as computers, TVs and other wireless transmitters if used indoor.</p> <p>Move the remote sensor to a higher location. Move the remote sensor to a closer location.</p>
Temperature sensor reads too high in the day time.	Make sure the thermo-hygrometer is mounted in a shaded area on the north facing wall.
Indoor and Outdoor Temperature do not agree	Allow up to one hour for the sensors to stabilize due to signal filtering. The two temperature sensors should agree within 2 °C (the sensor accuracy is $\pm 1$ °C).
Indoor and Outdoor Humidity do not agree	Allow up to one hour for the sensors to stabilize due to signal filtering. The two humidity sensors should agree within 10 % (the sensor accuracy is $\pm 5$ %).



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<b>Problem</b>	<b>Solution</b>
Display contrast is weak	Replace console batteries with a fresh set of batteries.