

LMHT-1ZBS Ambient Light, Humidity and Temperature Sensor

Introduction

LMHT-1ZBS is a ZigBee Ambient Light, Humidity and Temperature Sensor. It monitors your home environment and transmits measured Illuminance (lux), humidity and temperature to the coordinator in the ZigBee network.

The sensor utilizes ZigBee technology for wireless signal transmission. ZigBee is a wireless communication protocol that is reliable, has low power consumption and high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and coordinated for data exchange and signal transmission.

The sensor serves as an end device in the ZigBee network. It can be included in the ZigBee network to transmit signal upon activation, but cannot permit any other ZigBee device to join the network through the sensor.

Parts Identification

1. Light Sensor / LED Indicator

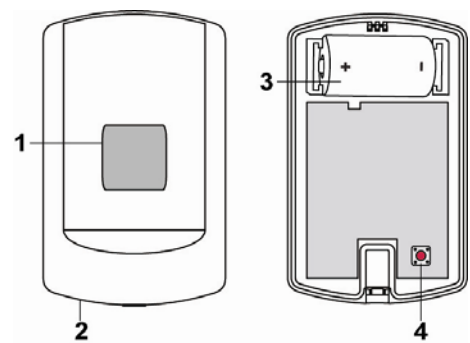
- **Flashes once:** Factory Reset
- **Flashes twice:** After the sensor has successfully joined a ZigBee network.
- **Flashes 3 times:** Battery inserted.
- **Flashes 5 times:** Low battery detected when inserting battery.
- **Flashes once every 20 minutes:** The sensor has lost connection to its current ZigBee network.

2. Temperature Sensor

3. Battery Compartment

4. Function Button

- Press once to send a signal to the coordinator.
- Press and hold for 10 seconds to reset the device.



Features

● **Lighting, Humidity and Temperature Monitoring**

- The sensor measures illuminance, humidity and temperature to transmit measured data to ZigBee network coordinator regularly.
Illuminance reading is transmitted every 30 minutes.
Humidity and temperature reading is transmitted every 10 minutes.
The sensor will also transmit signal automatically when:
 - The temperature changes by +/- 2°C.
 - Humidity changes +/- 10%.
 - When the current illuminance changes by +/- 10%.
- You can also press the Function Button once to transmit current reading manually.

● **Battery and Low Battery Detection**

- The sensor uses one CR123A 3V Lithium battery as its power source.
- The sensor features Low Battery Detection function. When the battery voltage is low, the sensor will transmit Low Battery signal to the coordinator in ZigBee network
- When changing battery, after removing the old batteries, press the Function Button twice to fully discharge before inserting new battery.
- If low battery voltage is detected upon inserting new battery, the LED indicator will flash 5 times.

● **Supervision**

The sensor will transmit a supervision signal along with the reading signal to report its condition regularly. The factory default interval is 30 minutes, which can be adjusted according to setting.

ZigBee Network Setup

● **ZigBee Device Guideline**

ZigBee is a wireless communication protocol that is reliable and has low power consumption and high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and coordinated for data exchange and signal transmission.

Due to the fundamental structure of ZigBee network, ZigBee device will actively seek and join network after powering on. Since performing a task in connecting network may consume some power, it is required to follow the instructions to avoid draining battery of a ZigBee device

- Ensure your ZigBee network router or coordinator is powered on before inserting battery into the ZigBee device.
- Ensure the ZigBee network router or coordinator is powered on and within range while a ZigBee device is in use.
- Do not remove a ZigBee device from the ZigBee network router or coordinator without removing the battery from a ZigBee device.

● **Joining the ZigBee Network**

As a ZigBee device, the sensor needs to join a ZigBee network to transmit signal. Please follow the steps below to join the sensor into the ZigBee network.

1. Detach the Top Cover and Base assembly and insert battery.
2. Press and hold the function button for 10 seconds as the sensor resets (LED flashes once) and starts searching for existing ZigBee network. Please make sure the permit-to-join feature on the router or coordinator of your ZigBee network is enabled.
3. If the sensor successfully joins a ZigBee network, the LED Indicator will flash twice to confirm.
4. After joining the ZigBee network, the sensor will be registered in the network automatically. Please check your ZigBee coordinator, system control panel or CIE (Control and Indicating Equipment) to confirm if joining and registration is successful.
5. After joining the ZigBee network, if the sensor loses connection with current ZigBee network, the LED will flash every 20 minutes to indicate. Please check your ZigBee network condition and sensor signal range to correct the situation.

● **Removing Device from ZigBee Network (Factory Reset)**

To remove the Power Switch from current ZigBee network, the sensor must be put to Factory Reset to complete device removal. Factory Reset function will clear the device of its stored setting information and prompt the sensor to search for new ZigBee network.

Before removing device, make sure the sensor is within current ZigBee network signal range

1. Press and hold the function button for 10 seconds, then release the button to reset sensor.
2. Upon reset, the sensor will clear current ZigBee network setting and transmit signal to ZigBee coordinator to remove itself from current ZigBee network. It will then actively search for available ZigBee network again and join the network automatically.

Installation

● **Mounting the Sensor**

The sensor can be mounted using two methods: Self-adhesive or Screw mounting.

Self adhesive mounting

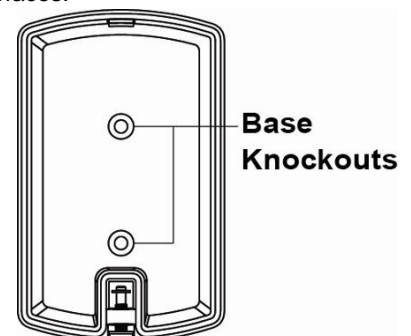
1. Clean the surface with a suitable degreaser.
2. Remove the protective covering from one side of double-sided adhesive pad and firmly apply to the back of the device.
3. Remove the other covering and firmly place/press the device in the desired location.

Do not use the Self-adhesive mounting method on poorly painted and/or rough surfaces.

Screw Mounting

The base of the sensor has two screw knockouts, where the plastic is thinner for mounting purposes. To mount the sensor:

1. Detach the Top Cover and Base assembly by loosening the Cover-Fixing Screw using a Philips screwdriver.
2. Break through the knockouts on the base.
3. Use the holes as a template to drill two holes and insert the wall plugs.
4. Screw the base into the wall plugs.
5. Replace the top cover over the base by hooking the base onto the fixing hook and pushing the cover towards the base.
6. Secure and screw the top cover back on to its base using a Philips screwdriver.



● **Using the Sensor with ZigBee Router**

IMPORTANT NOTE

If the sensor installation location is away from your system control panel and requires ZigBee routers to improve

signal strength. **DO NOT** use a ZigBee Router without backup battery. A ZigBee router without battery will be powered down during AC power failure and the sensor connected to the router will lose connection with ZigBee network. You should plan your sensor installation location using only ZigBee router with backup battery.

Appendix

(The Appendix information is for developers only.)

- **Light Sensor Cluster ID**

Device ID: Room Sensor 0x0302	
Endpoint: 0x01	
Server Side	Client Side
Mandatory	
Basic (0x0000)	Basic (0x0000)
Identify(0x0003)	Identify(0x0003)
Illuminance Measurement (0x0400)	
Optional	
Power Configuration(0x0001)	None
Temperature Measurement(0x0402)	
Relative Humidity Measurement(0x0405)	

- **Attribute of Basic Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 –0xff	Read only	0x01	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 –0xff	Read only	0x00	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 –0xff	Read only	0	O
0x0004	<i>ManufacturerName</i>	Character String	0 – 32 bytes	Read only	Climax Technology	O
0x0005	<i>ModelIdentifier</i>	Character String	0 – 32 bytes	Read only	(Model Version)	O
0x0006	<i>DateCode</i>	Character String	0 – 16 bytes	Read only		O
0x0007	<i>PowerSource</i>	8-bit	0x00 –0xff	Read only		M
0x0010	<i>LocationDescription</i>	Character String	0 – 32 bytes	Read / Write		O
0x0011	<i>PhysicalEnvironment</i>	8-bit	0x00 –0xff	Read / Write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00 –0x01	Read / Write	0x01	M

- **Attribute of Identify Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>IdentifyTime</i>	Unsigned 16-bit integer	0x00 –0xffff	Read / Write	0x0000	M

- **Attribute of Power Configuration Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0035	<i>BatteryAlarmMask</i>	8-bit bitmap	0000 000x	Read / Write	0000 0000	O

- **Attribute of Illuminance Measurement Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
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0x0000	<i>MeasuredValue</i>	Signed 16-bit Integer	MinMeasuredValue to MaxMeasuredValue	Read only	0x00	M
0x0001	<i>MinMeasuredValue</i>	Signed 16-bit Integer	0x0002 – 0xffffd	Read only	-	M
0x0002	<i>MaxMeasuredValue</i>	Signed 16-bit Integer	0x0001 – 0xffffe	Read only	-	M

• **Attribute of Temperature Measurement Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	MeasuredValue	Signed 16-bit Integer	MinMeasuredValue to MaxMeasuredValue	Read only	0x00	M
0x0001	MinMeasuredValue	Signed 16-bit Integer	0x954d – 0x7ffe	Read only	-1000 (-10°C)	M
0x0002	MaxMeasuredValue	Signed 16-bit Integer	0x954e – 0x7fff	Read only	5000 (50°C)	M
0x0003	Tolerance	Unsigned 16-bit Integer	0x0000 – 0x0800	Read only	100 (1°C)	O

• **Attribute of Relative Humidity Measurement Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	MeasuredValue	Unsigned 16-bit Integer	MinMeasuredValue to MaxMeasuredValue	Read only		M
0x0001	MinMeasuredValue	Unsigned 16-bit Integer	0x0000 – 0x270f	Read only	0 (0%)	M
0x0002	MaxMeasuredValue	Unsigned 16-bit Integer	0x0001 – 0x2710	Read only	10000 (100%)	M
0x0003	Tolerance	Unsigned 16-bit Integer	0x0000 – 0x0800	Read only	200 (2%)	O

Federal Communication Commission Interference 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 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.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example – use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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.