Milesight

Wireless Smart Thermostat

WT401

User Guide

14 rue Edouard Petit
42000 St-Etienne

Tel : +33 477 92 03 56
Email : contact@rg2i.com

www.rg2i.com

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Chapter 1. Preface

Copyright Statement

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Milesight reserves the right to change this guide and the specifications without prior notice. The latest specifications and user documentation for all Milesight products are available on our official website http://www.milesight.com

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss. Milesight will not shoulder responsibility for any loss or damage resulting from not following the instructions of this operating guide.

CAUTION:

Injury or equipment damage may be caused if any of these cautions are neglected.

- Make sure this product meets the voltage and current requirements before installation.
- The device is intended only for indoor use.
- Do not pull the cable too hard, otherwise the product will be damaged.
- Please confirm that the fasteners are suitable for this product before installing on the wall.
- Do not leave any object inside the device during installation.
- The device is not intended to be used as a reference sensor, and Milesight will not should responsibility for any damage which may result from inaccurate readings.
- The device must not be disassembled or remodeled in any way.
- Do not place the device close to objects with naked flames.
- Do not place the device where the temperature is below/above the operating range.
- The device must never be subjected to shocks or impacts.
- To protect the security of the device, please change device password when first configuration. The default password is 123456.

Revision History

Release Date	Version	Revision Content
Oct. 20, 2025	V1.0	Initial version

Chapter 2. Product Introduction

Overview

WT401 is a LoRaWAN® wireless smart thermostat that supports various heating and cooling systems via BMS systems or Milesight HVAC controllers. WT401 offers multiple temperature modes and fan modes, enabling precise indoor climate control.

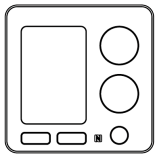
With a 2.7" e-ink screen and an embedded temperature and humidity sensor, WT401 continuously displays the room status while monitoring the ambient temperature and humidity. Compliant with Milesight LoRaWAN® gateways, users can control the room temperature via HVAC systems easily.

With battery powered (wireless) and various wired power supply options, WT401 can be widely used in building offices, hotels, stores, etc.

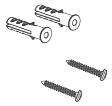
Features

- Supports most HVAC systems with HVAC controllers, including furnaces and air conditioners, heat pumps, boilers, PTAC, etc.
- Supports an intuitive 2.7-inch display, allowing for showing environment and control status of the room clearly
- Equipped with a PIR sensor to detect human presence to achieve energy-saving temperature control
- Equipped with 5 external buttons for friendly and easily control, and support button feature flexible switch
- Supports battery power for wire-free installation, and provide various power supply options
- Allows manual or automatic temperature adjustment with 8 kinds of working plans
- Equipped with NFC and Bluetooth for one touch configuration
- Function well with standard LoRaWAN® gateways and network servers
- Compatible with BACnet system via Milesight LoRaWAN® gateways
- Compatible with Milesight Development Platform
- Supports multicast for control in bulk
- Support Firmware Update Over the Air (FUOTA) feature
- Supports the child lock function and anti-theft installation for safety reasons
- Highly adaptable to different scenarios with walls or 60mm/86mm/118mm/120mm boxes

Packing List



1 × Wireless Smart Thermostat

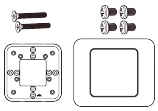


2 × Wall Mount Screw Kits

1 × Anti-theft Fixing Screw (M2*4)

1 × Quick Guide

1 × Warranty Card

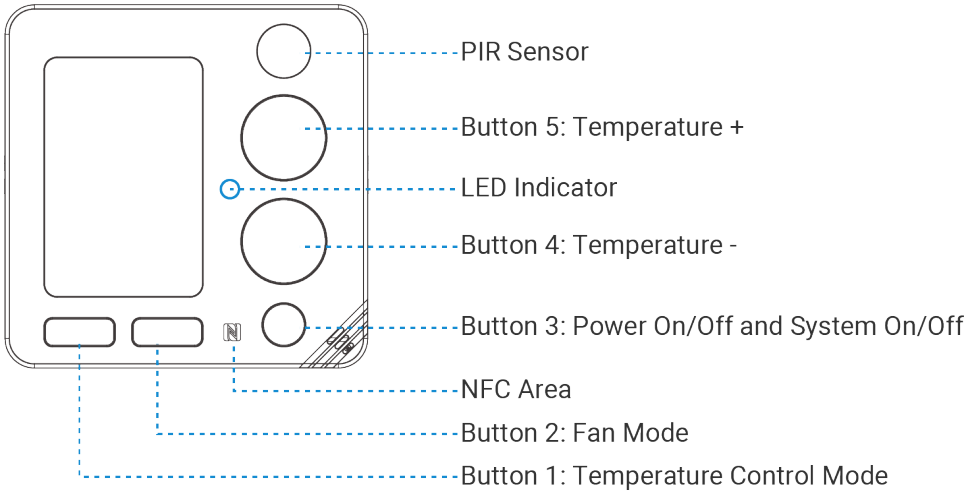


1 × Wall Plate Kit (Optional)

Note:
If any of the above items is missing or damaged, please contact your sales representative.

Hardware Overview

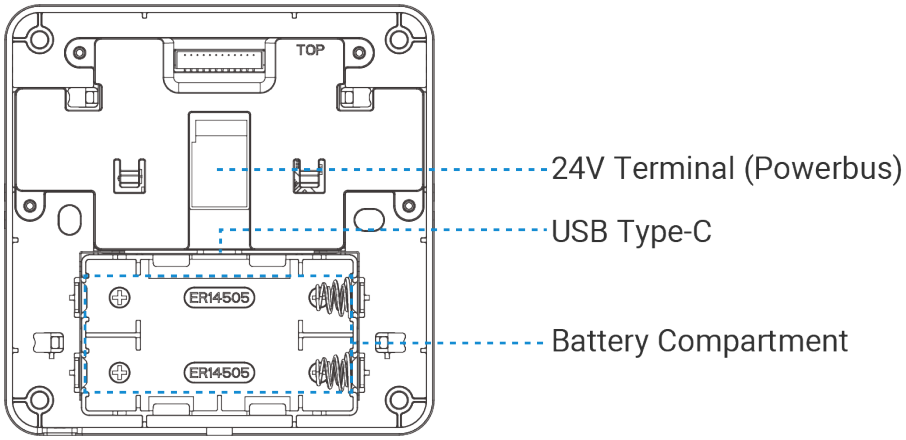
Front View



Part	Description
PIR Sensor	Achieve energy-saving settings by detecting human presence in the room.
LED Indicator	See LED Patterns.

Part	Description
NFC Area	Enables power on/off and wireless configuration via Milesight ToolBox App.
Button 1	Temperature control mode switch button. The button feature can be customized via Button Customization settings.
Button 2	Fan mode switch button. The button feature can be customized via Button Customization settings.
Button 3	Power on/off and system on/off button. The system on/off feature can be customized via Button Customization settings.
Button 4/5	Increase or decrease the target temperature. **Note:** When the target temperature mode is Dual Target Temperature, press the Temperature Control Mode button to switch the Button 4/5 for adjusting the auto-cooling target temperature.

Back View



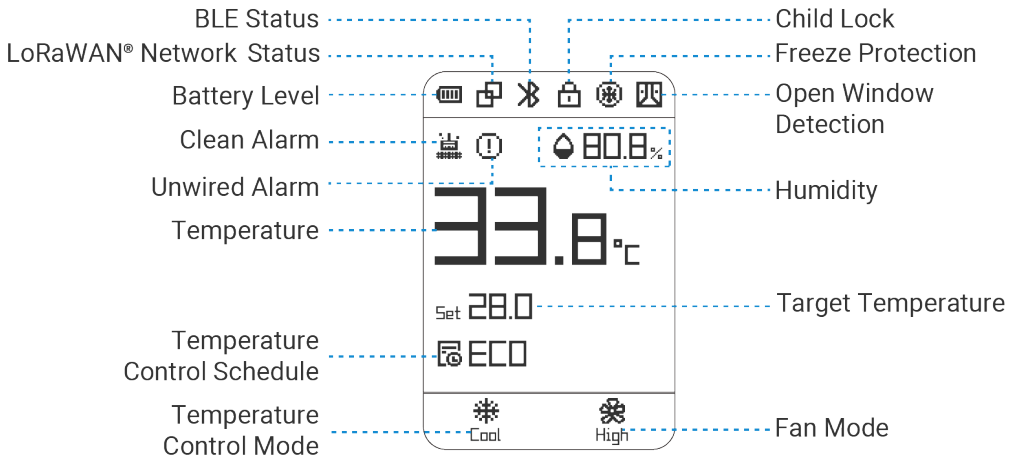
Part	Description
24V Terminal (Powerbus)	Provides DC/AC 24V power supply to this device, or enables communication with Milesight HVAC controller via Powerbus.
USB Type-C	Provides DC 5V power supply to this device, or serves as a console port.

Part	Description
Battery Compartment	Install batteries.

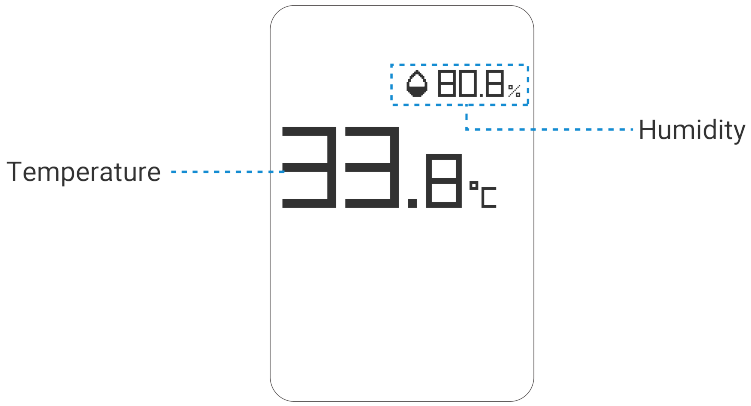
Screen Display

The device is equipped with an e-ink screen to monitor the environment and display the control status.

System On:



System Off:



Icon	Description
Battery Level	Display battery level only when the device is powered by batteries.
LoRaWAN® Network Status	Display network status when the communication mode includes LoRa.

Icon	Description
	: The device joins the network. : The device fails to join the network.
BLE Status *(Under Development)*	Display BLE pairing status with Milesight HVAC controller when the communication mode includes BLE.
Child Lock	All buttons locked: normal display Partial locked: display only when the locked button is pressed
Freeze Protection *(Under Development)*	Display when Freeze Protection is triggered.
Open Window Detection *(Under Development)*	Display when Open Window Alarm is triggered.
Clean Alarm *(Under Development)*	Display when the filter cleaning is required.
Unwired Alarm *(Under Development)*	Display when the connected Milesight HVAC controller is unwired.
Humidity	Display the ambient humidity.
Temperature	Display the ambient temperature.
Target Temperature	Display the target temperature. **Note:** If ambient temperature display is disabled, the original location will display the target temperature.
Temperature Control Schedule	Display current executed schedule name.

Icon	Description
Temperature Control Mode	Display current temperature control mode.
Fan Mode	Display current fan mode.

Tip:

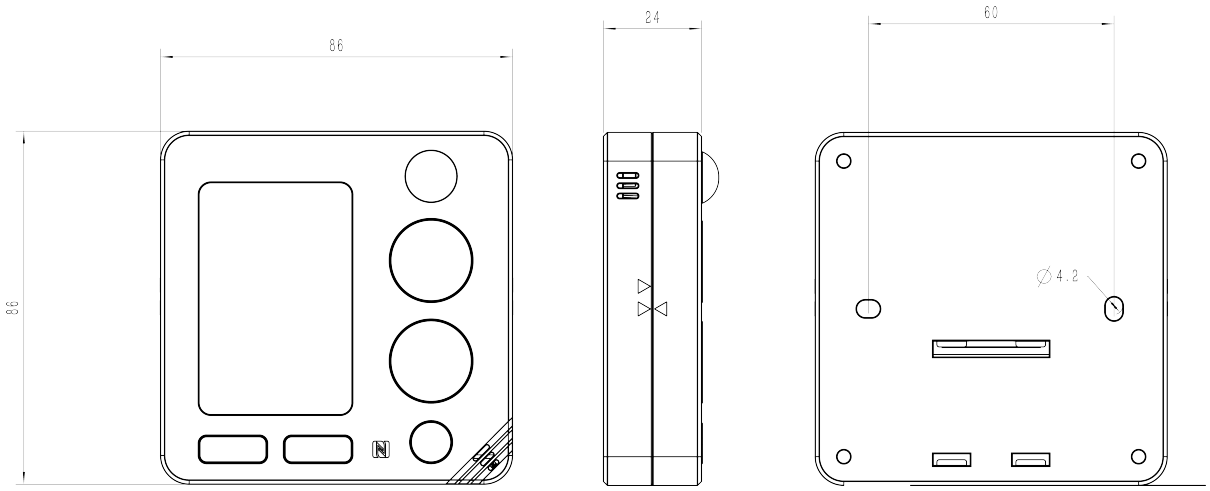
- The screen will do a full-screen refresh every 1 hour to remove ghosting.
- The screen content can be disabled via downlink commands.
- Over-temperature protection: When the device detects the environment temperature beyond the range of 0-40 °C for 6 consecutive times (the collect interval is 60s by default and can be changed by downlink command), the device will turn off the screen to protect it, and all buttons will be locked. During this time, the device can only be checked and configured via ToolBox or uplink/downlink messages. Over-temperature protection only uses internal sensors as its data source.

LED Patterns

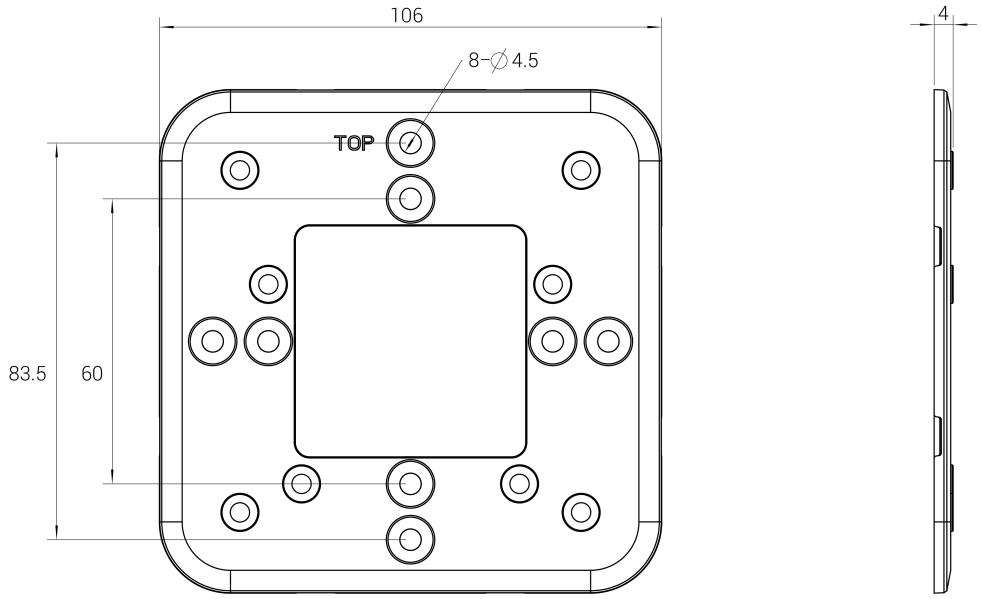
Function	Operation	LED Indicator
Power On	In an off state, press the button 3 once.	Off → On
Power Off	Press and hold the button 3 for more than 3s.	Off → Blinks
Reset to Factory Default	Press and hold the button 1 and 3 for more than 10s.	Quickly Blinks
Turn On Bluetooth for 1 minute	In an on state, press the button 4 and 5 together once.	Off → Blinks

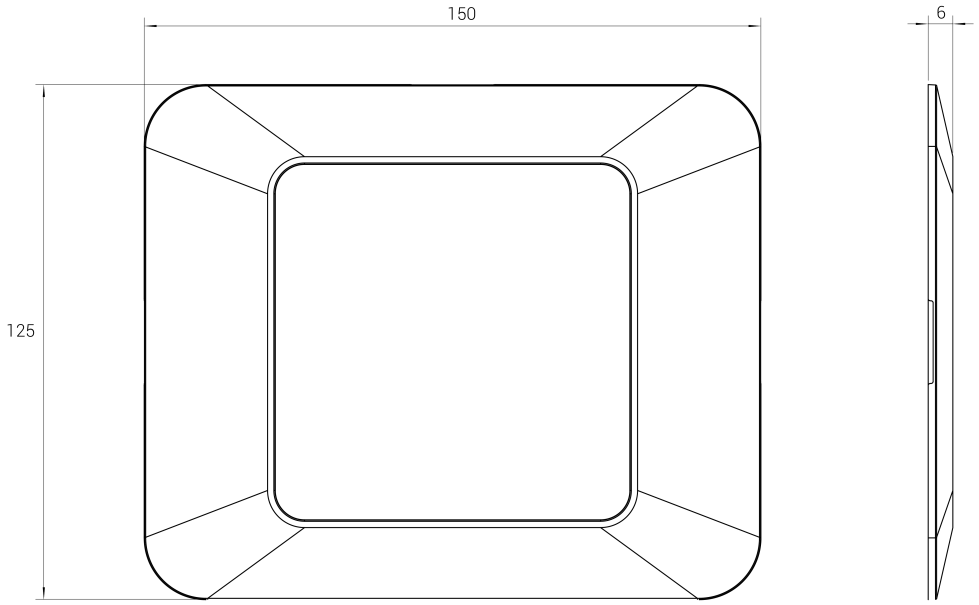
Dimensions (mm)

WT401:



Wall Plate:




150
6
125

Chapter 3. Power Supply

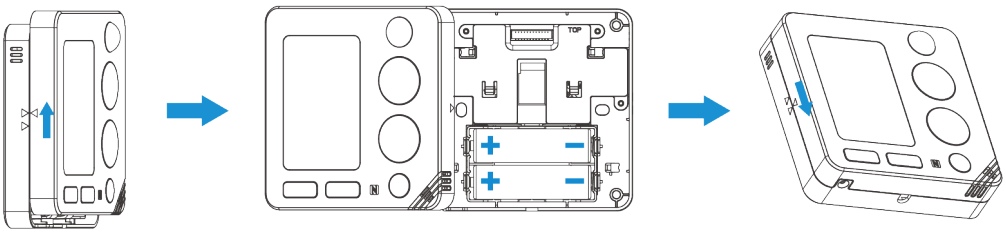
This chapter describes the power supply options of the device. These options cannot be used at the same time.

Powered by Batteries

The batteries are pre-installed in the device by default.

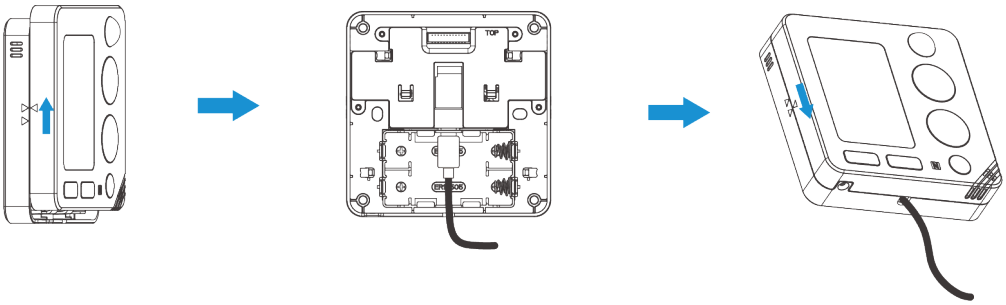
Note:

- The device can only be powered by the ER14505 Li-$SoCl_2$ batteries. The alkaline battery is not supported.
- Ensure the battery direction is not reversed.
- Ensure all replacing batteries are newest; otherwise, it may shorten battery life or cause inaccurate power calculations.
- The battery should be removed or replaced from the device if it is not used for an extended period.



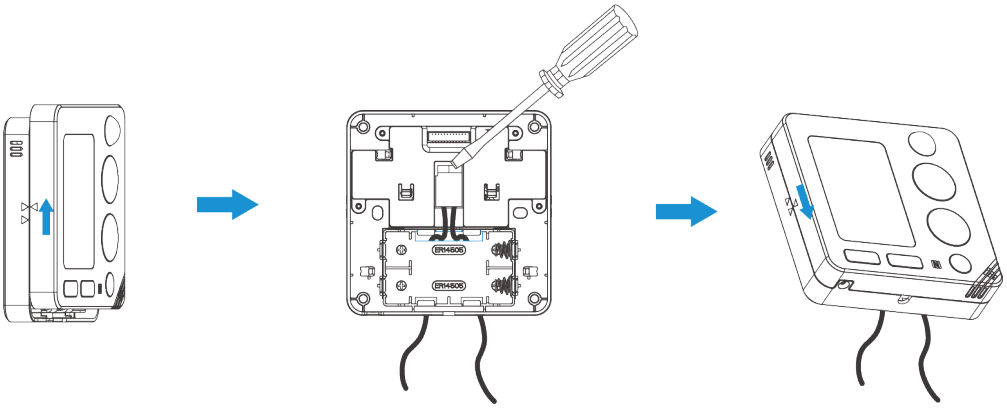
Powered by USB Type-C (5V)

1. Remove the front screen and internal batteries from the device.
2. Insert the USB power cable into the USB port.
3. Restore the screen to the device while passing the USB cable through the bottom opening of the device.



Powered by AC/DC 24V

1. Remove the front screen and internal batteries from the device.
2. Use your hand or a slotted screwdriver to press the power terminal block while inserting the power cables (no polarity required), then release the screwdriver or hand.
3. Gently pull the power cables to ensure they are securely fixed to the device.
4. Pass the power cables through the hole at the back of the device.
5. Restore the screen to the device.



Powered by Milesight HVAC Controller *(Under Development)*

The device can be powered by Milesight HVAC controllers (UC711, etc.) via PowerBus. For details, refer to the corresponding HVAC controller user guides.

Chapter 4. ToolBox Configuration Guide

Access the Device

This section describes how to access the status and configuration page of the device via NFC or Bluetooth. NFC and Bluetooth are both enabled by default.

Access the Device via NFC

1. Download and install “Milesight ToolBox” App from Google Play or Apple Store on an NFC-supported smartphone.
2. Enable NFC function on the smartphone.
3. Launch Milesight ToolBox, and select the default mode as NFC.
4. Attach the smart phone with NFC area to the device and click to read device information. Basic information, data, and settings of the device will be shown on the Milesight ToolBox App if it’s recognized successfully.
5. Adjust the settings on the App, then attach the smartphone with NFC area to the device and click **Write** to write the settings. After writing, reread the device to check if the configuration is written well.

Note:

- Ensure the location of smartphone NFC area and it’s recommended to take off phone case.
- If the smart phone fails to read/write configurations via NFC, keep the phone away and back to try again.
- The default device password is 123456. Please change a new password for security.

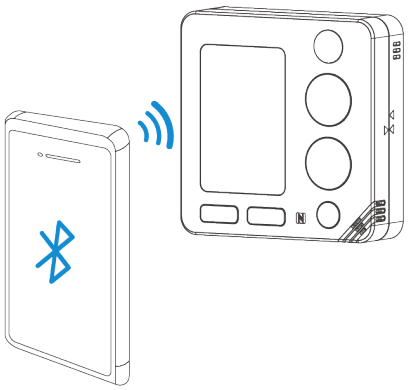
Access the Device via Bluetooth

1. Press button 3 once to turn on the device. The device can also be turned on by NFC.
2. Press buttons 4 and 5 together once to turn on the Bluetooth for one minute.

> **Note:**
> If the phone fails to connect to the device within one minute, Bluetooth will automatically turn off and must be reactivated by pressing the buttons again.

3. Download and install “Milesight ToolBox” App from Google Play or Apple Store on an Bluetooth-supported smartphone.
4. Enable Bluetooth and location functions on the smartphone.
5. Launch Milesight ToolBox, and select the default mode as Bluetooth.
6. Click to scan the devices around and select the target device to connect. The default Bluetooth name is `WT401 -XXXXXX` (5th to 11st characters of the device SN) and the default device password is 123456.
7. Once connected, the basic information, data, and settings of the device will be displayed in the Milesight ToolBox App if recognized successfully.
8. Adjust the settings on the App, then click **Write** to write the settings. After writing, reread the device to check if the configuration is written well.

> **Note:**
>
> - The Bluetooth connection will be terminated if there’s no data interaction within 3 minutes. Please connect again.
> - The device can connect to only one phone via Bluetooth. For example, if the device is connected to smart phone A via Bluetooth, the connection will be terminated after it is connected to smartphone B.
> - The default device password is 123456. Please change a new password for security.



Time Synchronization

This section describes how to sync the time of the device.

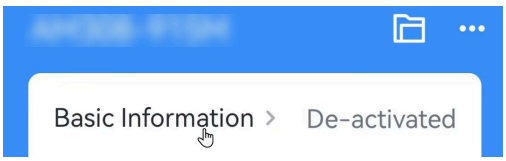
Note:
If device has ever been powered off, the time needs to be synced again.

Manually Sync

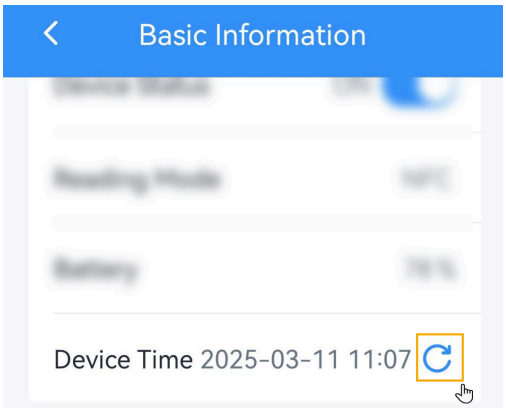
The device time can be synced via Milesight ToolBox App.

Steps:

1. Go to **Device > Basic Information** of Milesight ToolBox App.



2. Click the arrow to sync the time with time zone from the smart phone.



Auto Sync

The device time can be synced from the LoRaWAN® network server that supporting time synchronization feature. Example: Milesight gateway embedded NS.

Steps:

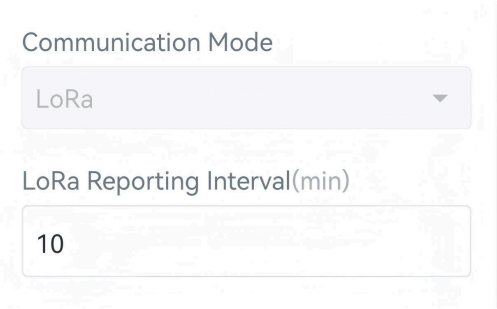
1. Ensure the communication mode includes LoRa.
2. Set the LoRaWAN® version of the device to V1.0.3.
3. Connect the device to the network server. After joining the network, the device will send a DeviceTimeReq MAC command to enquire the time from network server.

Note:

- This only supports to get the time but not time zone. The time zone can be configured by ToolBox App or downlink command.
- The device will send the DeviceTimeReq command every 5 days since the last sync. You can also send downlink command to ask the device for this operation.

Communication Settings

This section describes the communication settings for different applications.



Steps:

1. Go to **Setting > Network > Communication** page.

2. Select the Communication Mode.

Communication Mode	Description
LoRa	Communicates with LoRaWAN® gateways and network servers.

3. Configure the corresponding parameters based on the selected communication mode.

Parameter	Description
LoRa Reporting Interval	The interval to report data to the LoRaWAN® gateway. Range: 1-1440 mins, Default: 10 mins.

4. Click **Write** to save the settings.

LoRaWAN® Settings

This chapter describes how to configure the LoRaWAN® parameters for communication between the device and LoRaWAN® gateways.

Configure Join Type and Frequency

It is necessary to configure the join type and the frequency parameters to establish communication with LoRaWAN® gateways.

Steps:

1. Go to **Setting > Network > LoRaWAN** page.

2. Select the Join Type as OTAA or ABP mode as needed.

> **Note:**
> OTAA is required if you connect the device to Milesight Development Platform.

3. Configure the related Join Type parameters as needed. You can also use default values unless otherwise specified.

- If **OTAA** is selected, configure the **Application Key** and **Rejoin Mode** as needed.

Parameter	Description
Application Key	Appkey for OTAA mode, default value: "Device EUI" + "Device EUI". Example: 24e124123456789024e1241234567890

Parameter	Description
	Note: Please contact sales before purchase if you require random App Keys.
Rejoin Mode	Reporting interval≤35 mins: the device will send a specific number of LinkCheckReq MAC packets to the network server every reporting interval or every double reporting interval to validate connectivity; If there is no response, the device will re-join the network. Reporting interval > 35 mins: the device will send a specific number of LinkCheckReq MAC packets to the network server every reporting interval to validate connectivity; If there is no response, the device will re-join the network. When **Rejoin Mode** is enabled, enter a number in the **Set the number of detection signals sent** text box. The actual sending number is the configured number +1.

- If **ABP** is selected, configure Network Session Key, Application Session Key and Device Address as needed. You can also use default values unless otherwise specified.

Parameter	Description
Network Session Key	Nwkskey for ABP mode, the default is 5572404C696E6B4C6F52613230313823.
Application Session Key	Appskey for ABP mode, the default is 5572404C696E6B4C6F52613230313823.
Device Address	DevAddr for ABP mode, default is the 5th to 12th digits of SN.

4. Select the **Supported Frequency** the same as the LoRaWAN® gateway and configure the related parameters. You can also use default values unless otherwise specified.

- If the **Supported Frequency** is US915 or AU915, enter the channel index(es) separated by commas.

  Examples:

  1, 40: Enabling Channel 1 and Channel 40

  1-40: Enabling Channel 1 to Channel 40

  1-40, 60: Enabling Channel 1 to Channel 40 and Channel 60

  All: Enabling all channels

  Null: All channels are disabled

  > **Tip:**
  > Set the **Channel Index** to **8-15** when connecting to a Milesight LoRaWAN® gateway with default frequency settings.

- If the **Supported Frequency** is AS923, select a channel plan and enable the frequencies as needed.
- If the **Supported Frequency** is any option other than those listed above, enable the frequencies as needed.

Configure Other LoRaWAN® Parameters

Steps:

1. Go to **Setting > Network > LoRaWAN** page.

2. Configure the parameters as needed. You can also use default values unless otherwise specified.

Parameter	Description
Device EUI	Unique ID of the device which can be found on the device. **Note:** please contact sales for device EUI list if you have many units.

Parameter	Description
App EUI	The default App EUI (join EUI) is 24E124C0002A0001.
Application Port	The port used for sending and receiving data, the default port is 85.
LoRaWAN® Version	V1.0.2 and V1.0.3 are available.
Work Mode	Class A (default) or Class C is optional. **Class A:** This mode is applicable when the device is powered by batteries, which can save the power. **Class C:** This mode is applicable when the device is powered by an external power supply, enabling low-latency control.
Confirmed Mode	If the device does not receive ACK packet from network server, it will resend data once.
ADR Mode	Enable or disable network server to adjust Spreading Factor, Bandwidth an Tx Power to optimize data rates, airtime and energy consumption in the network.
Spreading Factor	If ADR mode is disabled, the device will send uplink data following this SF parameter. The higher the spreading factor, the longer the transmission distance, the slower the transmission speed and the more the consumption.
Tx Power	Tx power (transmit power) refers to the strength of the outgoing signal transmitted by the device. This is defined by LoRa alliance.
RX2 Data Rate	RX2 data rate to receive downlinks.
RX2 Frequency	RX2 frequency to receive downlinks. Unit: Hz
Multicast Group	Enable or disable the multicast groups to receive the multicast commands. This feature only works when the work mode is Class C. See Configure the Multicast Group for details.

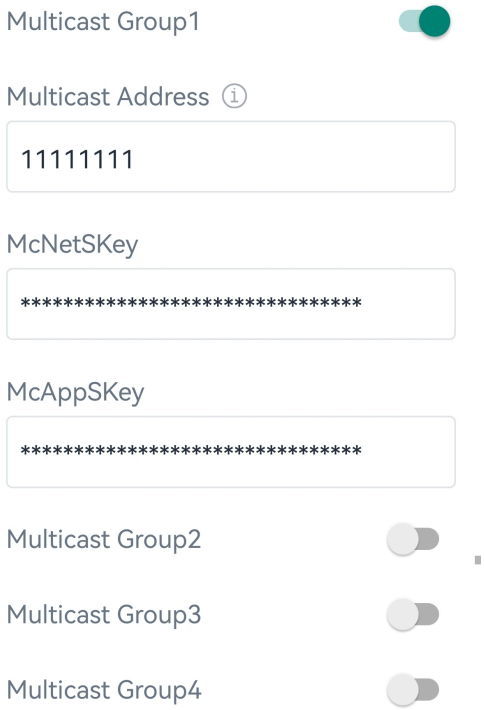
Configure the Multicast Group

The device supports setting up several multicast groups to receive multicast commands from the network server, then users can use this feature to control devices in bulk.

Note:
This feature only works when the work mode is Class C.

Steps:

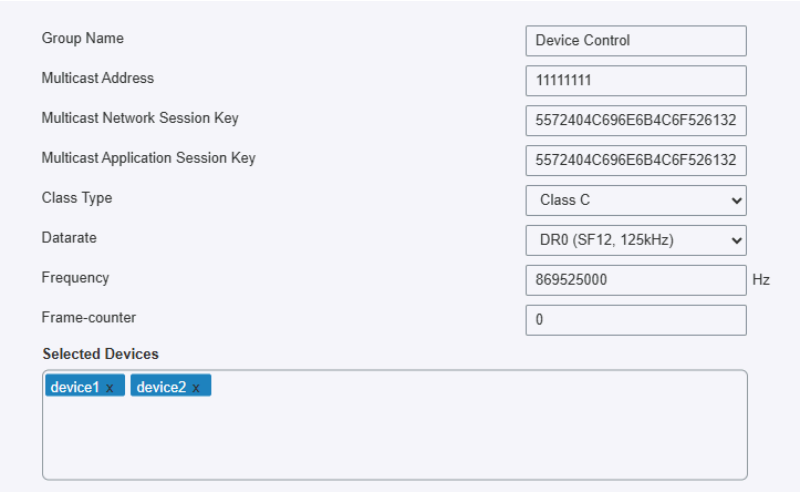
1. Enable **Multicast Group**, and set unique multicast address and keys to distinguish other groups. You can also keep these settings by default.



Parameter	Description
Multicast Address	Unique 8-digit address to distinguish different multicast groups.
Multicast McNetSkey	32-digit key. Default values: Multicast Group 1: 5572404C696E6B4C6F52613230313823 Multicast Group 2: 5572404C696E6B4C6F52613230313824 Multicast Group 3: 5572404C696E6B4C6F52613230313825
Multicast McAppSkey	

Parameter	Description
	Multicast Group 4: 5572404C696E6B4C6F52613230313826

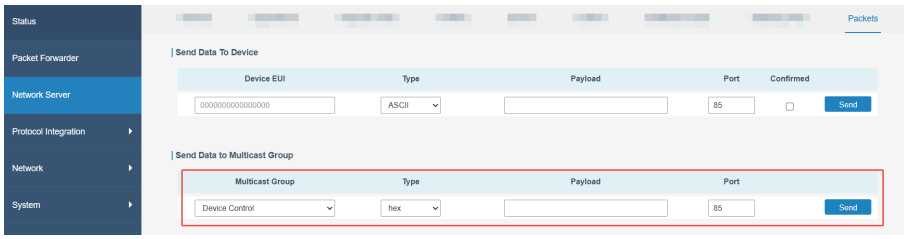
2. Add a multicast group on the LoRaWAN® network server. Take Milesight gateway as example, go to **Network Server > Multicast Groups** to add a multicast group and configure the group according to the device settings.



3. Go to **Network Server > Packets**, select the multicast group and fill in the downlink command, click **Send**. The network server will broadcast the command to devices that belong to this multicast group.

Note:

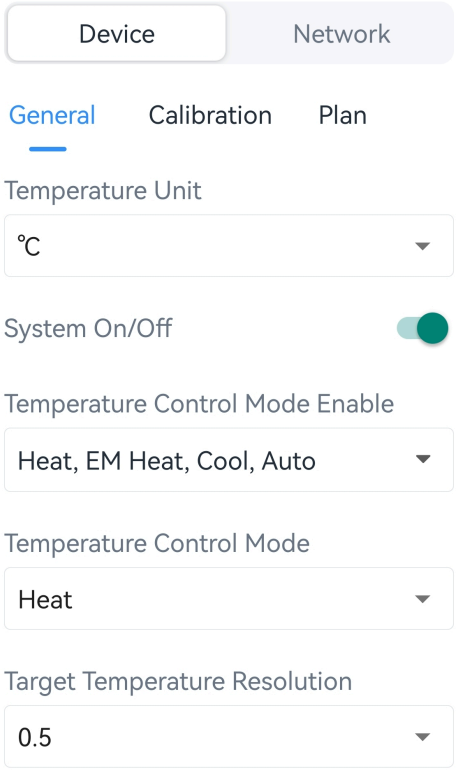
Ensure all devices' application ports are the same.



General Settings

This section describes the basic settings of the device.

Temperature Control Settings



Steps:

1. Go to **Setting > Device > General** page.

2. Select the temperature unit as °C or °F. This will affect the temperature display of the screen or the temperature configuration parameters.

3. Tap the **System On/Off** button to turn the system on or off. This can also be controlled by downlink command or the button.

4. Configure the temperature control mode.

Parameter	Description
Temperature Control Mode Enable	Select the control mode range and disable some certain control modes.
Temperature Control Mode	Select the temperature control mode from Auto, Heat, EM Heat and Cool. This can also be controlled via downlink command or the button.
Target Temperature Resolution	Select the resolution of the target temperature. Options:

Parameter	Description
	0.5: The screen displays the target temperature with one decimal place, and use temperature +/- buttons to adjust by 0.5°C each time. 1: The screen displays the target temperature as an integer, and use temperature +/- buttons to adjust by 1°C each time.

5. Configure the target temperature related parameters according to the temperature control mode.

If temperature control mode is not Auto:

Parameter	Description
Target Temperature	Set the target temperature for the device to control. The device will send the value out when it changes. Range: 5-35°C.
Target Temperature Regulation Range	Set the range to adjust the target temperature. Range: 5-35°C.

If temperature control mode is Auto:

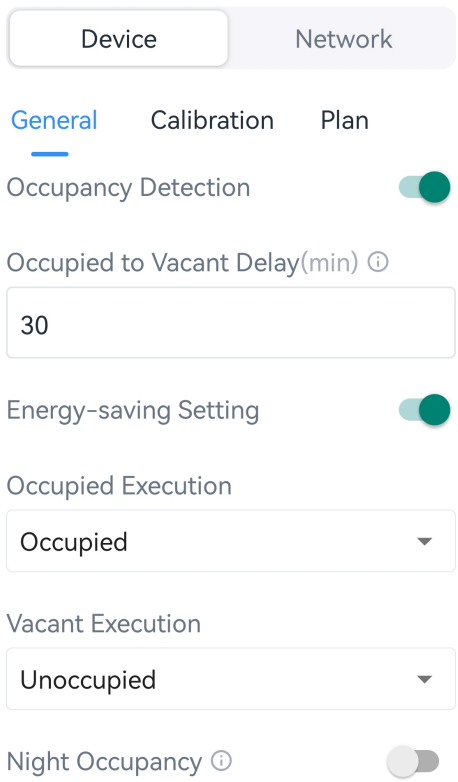
Parameter	Description
Target Temperature Mode	Select the target temperature configuration mode. Options: **Single Target Temperature**: Use the same target temperature for cooling and heating. **Dual Target Temperature**: Use separate target temperatures for cooling and heating.
Target Temperature Regulation Range	Set the range to adjust the target temperature. Range: 5-35°C.
Under single target temperature mode	
Target Temperature	Set the target temperature for the device to control. The device will send the value out when it changes. Range: 5-35°C.
Under dual target temperature mode	
Heating Target Temperature	Set the heating target temperature. Range: 5-35°C.

Parameter	Description
	Note: This value must be lower than cooling target temperature.
Cooling Target Temperature	Set the cooling target temperature. Range: 5-35°C.
Deadband	Set the minimum allowed difference between heating and cooling target temperatures.

6. Select the fan mode. This can also be controlled by downlink command or the button.

7. Click **Write** to save the settings.

Occupancy Detection and Energy Saving



Steps:

1. Go to **Setting > Device > General** page.

2. Enable **Occupancy Detection** feature and configure the related parameters.

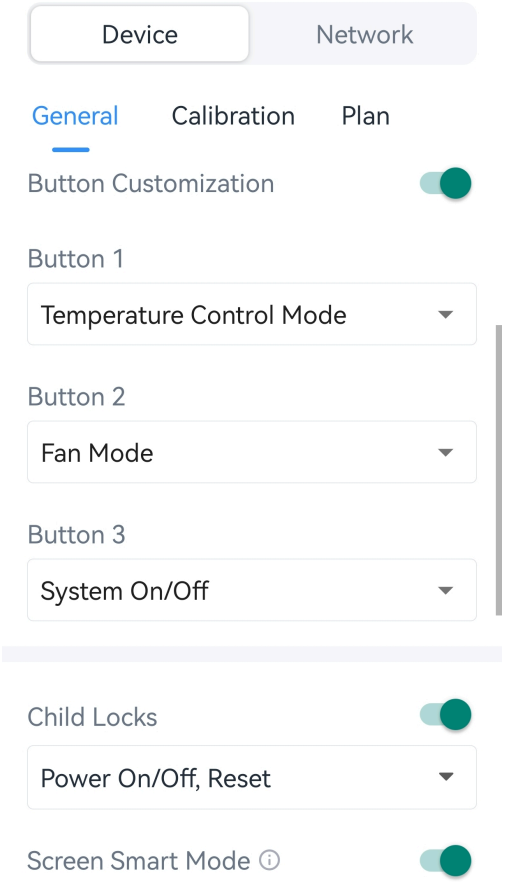
Parameter	Description
Occupancy Detection	If disabled, the occupancy(PIR) sensor will not work, and the device will neither display nor report the occupancy status.
Occupied to Vacant Delay	After entering the "Occupied" status, the device will switch to "Vacant" status only if no motion is detected during the delay time.

3. Enable the **Energy-saving Setting** as required and configure the related parameters.

Parameter	Description
Occupied Execution	Select the plan to execute when occupancy status changes to "Occupied".
Vacant Execution	Select the plan to execute when occupancy status changes to "Vacant". This plan must differ from occupied execution plan.
Night Occupancy	Once enabled, if an "Occupied" trigger is detected after the start time, the device will remain in "Occupied" status until the specified end time. **Start Time/End Time**: Set the time range for night occupancy. **Night Occupied Execution**: Select the plan to execute when an "Occupied" trigger is detected after the start time.

4. Click **Write** to save the settings.

Button and Screen Settings



1. Go to **Setting > Device > General** page.

2. Enable the **Button Customization** feature as needed and configure the related parameters.

Parameter	Description
Button Customization	Once enabled, the features of button 1-3 can be changed. This will not affect basic features.
Button 1	Select the feature for button 1: Temperature Control Mode (default), Fan Mode, Event 1 Report, °C or °F switch.
Button 2	Select the feature for button 2: Fan Mode (default), Temperature Control Mode, Event 2 Report, °C or °F switch.
Button 3	Select the feature for button 3: System On/Off (default), Event 3 Report, °C or °F switch.

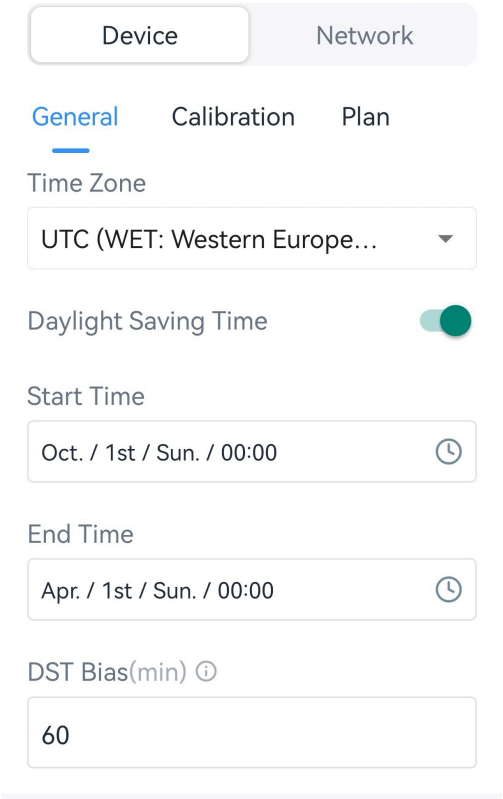
3. Enable the **Child Lock** feature and check the boxes to lock the button features as required.

> **Tip:**
> The device supports downlink commands to add 2-5 combination buttons for temporary unlock.

4. Enable or disable **Smart Display Mode** as needed. Once enabled, the screen will stop updating environment temperature or humidity if the newly collected value is close to the last value (temp. ≤ ±0.5°C or hum. ≤ ±3%) within 10 minutes. This helps conserve power and extend the screen lifespan.

5. Click **Write** to save the settings.

Time Settings



Steps:

1. Go to **Setting > Device > General** page.

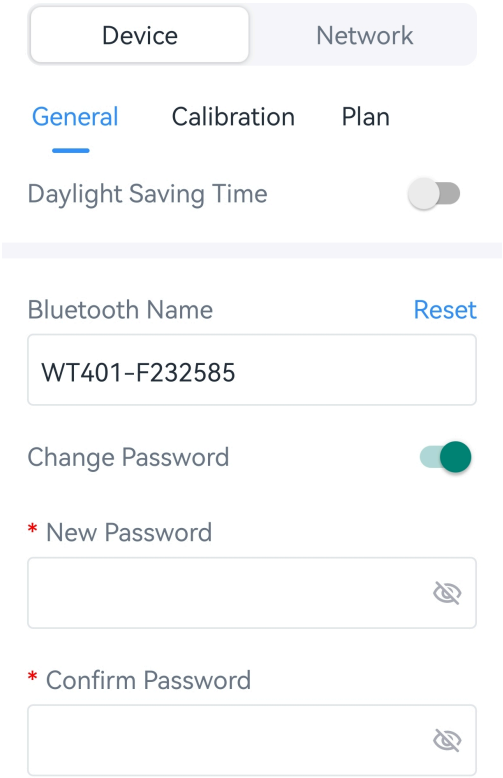
2. Select the appropriate UTC time zone. You can also go to **Device > Basic Information** to synchronize the device time with the time zone of your smartphone.

3. Enable the **Daylight Saving Time** and configure the related parameters.

Parameter	Description
Start Time	The start time of DST time range.
End Time	The end time of DST time range.
DST Bias	The DST time will be offset forward by this bias.

4. Click **Write** to save the settings.

Change Bluetooth Name and Device Password



Steps:

1. Go to **Setting > Device > General** page.

2. Change the device Bluetooth name for ToolBox App to connect as required. Length limitation: 13 bytes.

> **Note:**
> If the **Reset** button is clicked, the name will revert to the default: `WT401-XXXXXX` (5th to 11th of device SN).

3. Enable **Change Password** and configure the new password. The password must be 6 characters long. This device password is used for writing to the device via NFC or for connecting via Bluetooth.

4. Click **Write** to save the settings.

Calibration Setting

This section describes the steps to calibrate the sensor data.

> **Note:**
> This setting only applies when the data source is internal sensors.

Steps:

1. Go to **Setting > Device > Calibration** page.
2. Enable the desired calibration type, enter the calibration value, and then click **Write**.

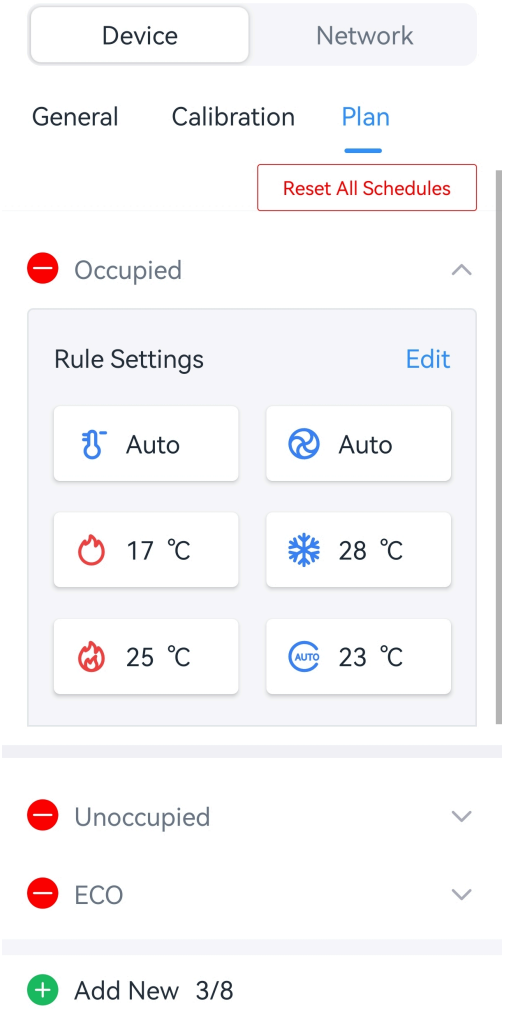
Temperature Calibration: set the calibration value. The device will apply the calibration value to the current temperature value and report the final value.

Humidity Calibration: set the calibration value. The device will apply the calibration value to the current humidity value and report the final value.

3. Click **Write** to save the settings.

Schedule Plan Settings

The device supports adding different kinds of schedule plans to achieve the automatic temperature control.



Steps:

1. Go to **Setting > Device > Plan** page.

2. The device includes three default plans. Click **Edit** to modify an existing plan or click **Add New** to create a new one. Each device supports up to 8 plans.

3. Configure the relevant parameters of the schedule plan.

Parameter	Description
Schedule Name	The schedule name can only include letters(a-z, A-Z), numbers, and spaces, with a maximum length of 10 characters.
Temperature Control Mode	Select the temperature control mode when executing this schedule plan.

Parameter	Description
Fan Mode	Select the fan mode when executing this schedule plan.
Heating Target Temperature	Set the target temperature when the temperature control mode is Heat.
EM-Heating Target Temperature	Set the target temperature when the temperature control mode is EM-Heat.
Cooling Target Temperature	Set the target temperature when the temperature control mode is Cool.
Under single target temperature mode	
Auto Target Temperature	Set the target temperature when the temperature control mode is Auto.
Under dual target temperature mode	
Auto-Heating Target Temperature	Set the heat target temperature when the temperature control mode is Auto.
Auto-Cooling Target Temperature	Set the cool target temperature when the temperature control mode is Auto.

4. Click **Confirm** to save the current schedule plan.

5. Repeat step 2 to 4 to configure additional plans, then click **Write** to save all settings.

6. Click ⊖ to delete a schedule plan if needed, or click **Reset All Schedules** to restore the default settings.

The schedule plan can be triggered by the following methods:

- Occupancy Detection
- Downlink Command
- Schedule from an HVAC controller

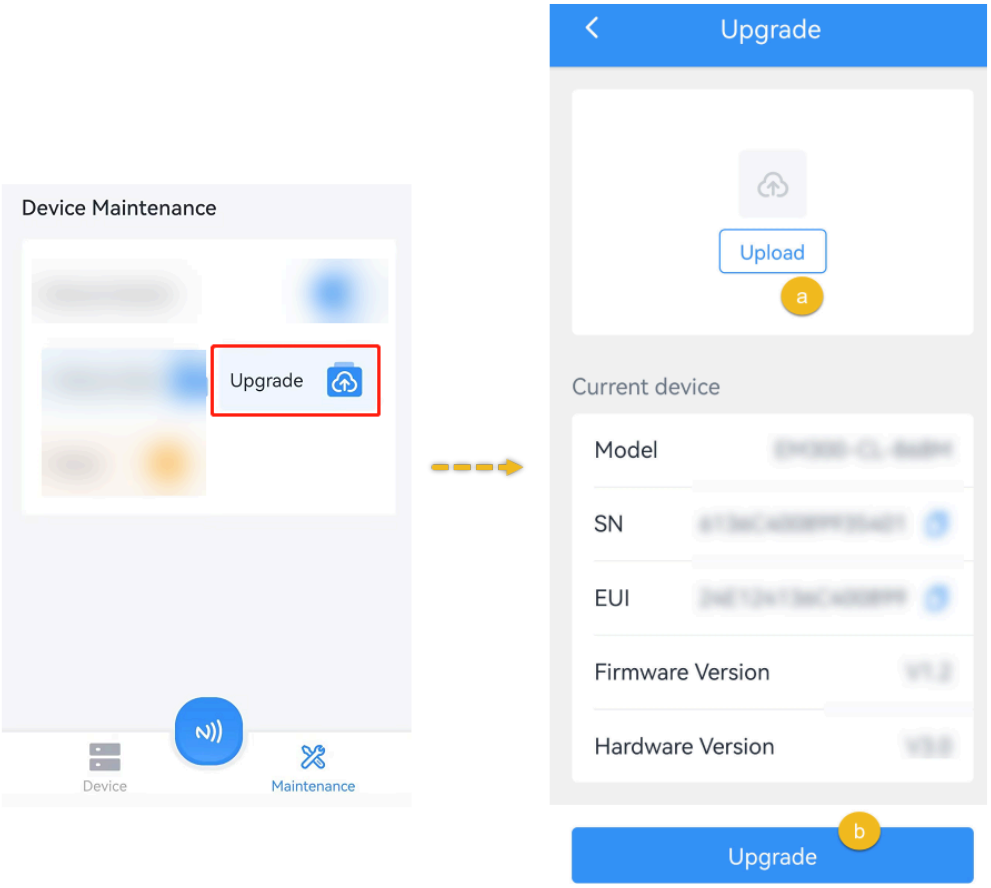
Maintenance

Upgrade

This chapter describes the steps to upgrade the device via ToolBox App.

1. Download firmware from Milesight official website to your smartphone.
2. Read the target device via ToolBox App, click **Upgrade** to upload the firmware file.
3. Click **Upgrade** to upgrade the device.

> **Note:**
> Operation on ToolBox is not supported during an upgrade.

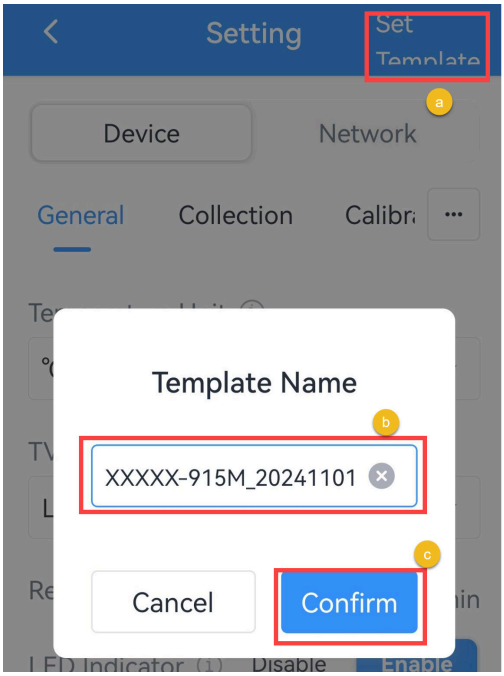


Backup and Restore

This section describes how to backup the configuration of a device and import to other devices.

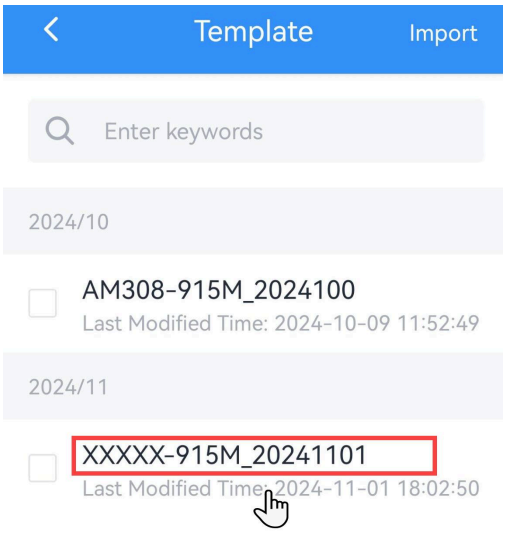
1. Read a device configuration via ToolBox App.

2. Edit the configuration as required, click **Set Template** to save current configuration as a template to the ToolBox App.

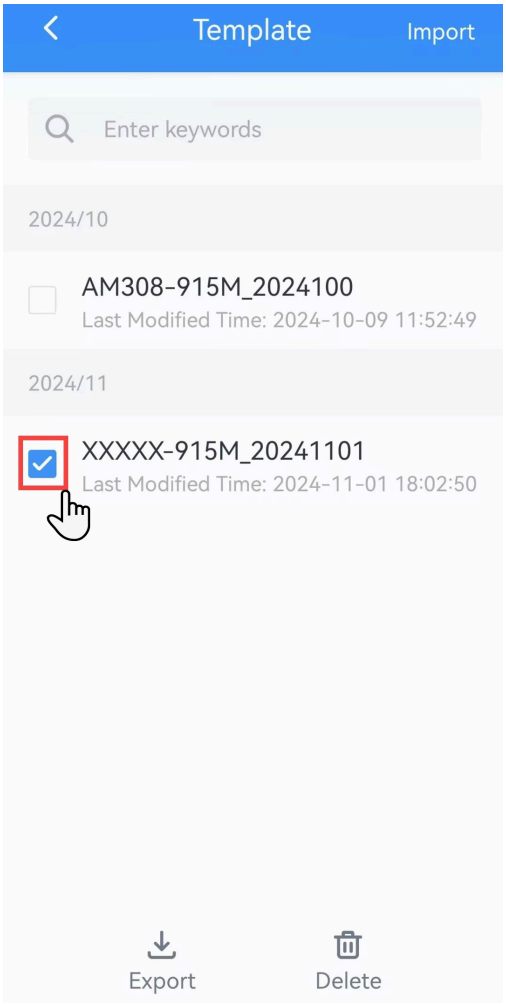


3. Go to **Device >Template** page of ToolBox App.

4. Select and click the target template, click **Write** to import the configuration to target devices.



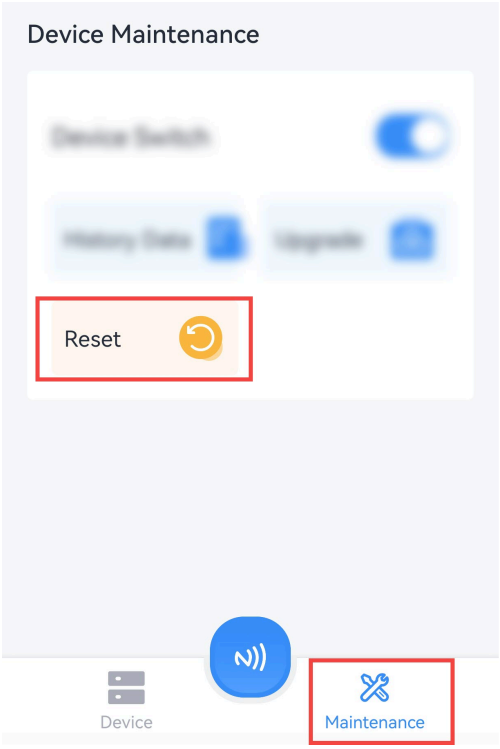
5 (Optional). Check the box of the target template, click **Export** to save this template as JSON format file to the smartphone, click **Delete** to delete this template from ToolBox App.



Reset to Factory Default

This section describes how to reset the device via Milesight ToolBox App.

1. Go to **Maintenance** page.
2. Click **Reset** button to reset the device.


Device Maintenance
Reset
Device
Maintenance

Chapter 5. Installation

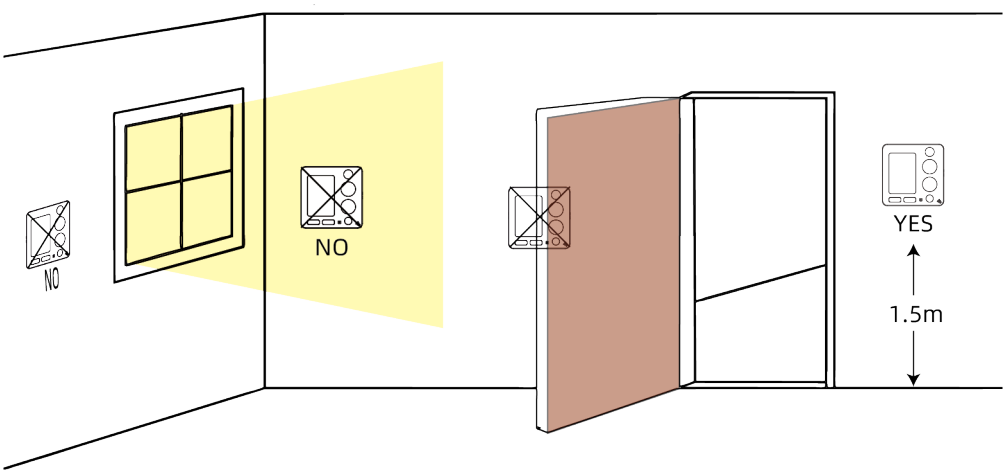
Installation Location

This section describes the recommended installation locations for the device to achieve accurate control.

Location for Temperature and Humidity

WT401 supports receiving ambient temperature and humidity data from either internal sensors or external servers/devices. When using internal sensors, it is important to choose appropriate installation locations to collect accurate environmental data and ensure precise control.

It is recommended to install the thermostat about 4-5 ft. (1.2-1.5m) above the floor, in an area with good air circulation at average temperature. If installation in an optimal location is not feasible, consider using external data sources.



Do not install the device where:

- Close to hot or cold sources like hot or cold air ducts;
- The place in direct sunlight;
- Dead spots or drafts (behind the doors and in corners);
- In areas that do not require conditioning;
- Close to concealed chimneys or pipes;
- Close to metal objects and large obstacles which affect the wireless transmission;
- The place with lots of electromagnetic interfaces;
- The place where strong vibration may happen or easy to be subjected to physical shock.

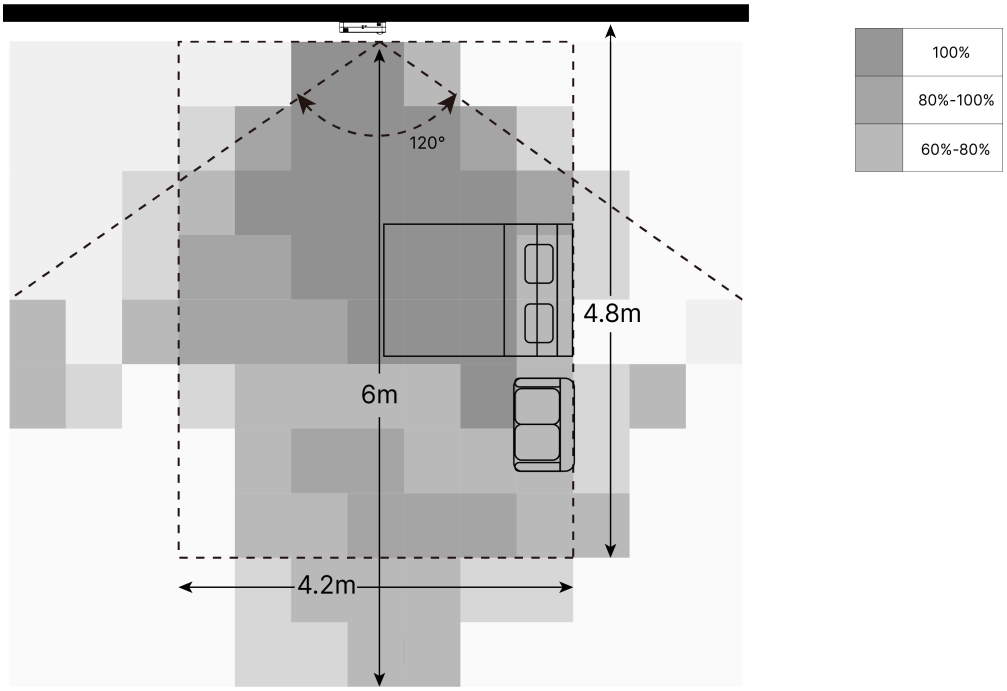
Location for Occupancy Detection

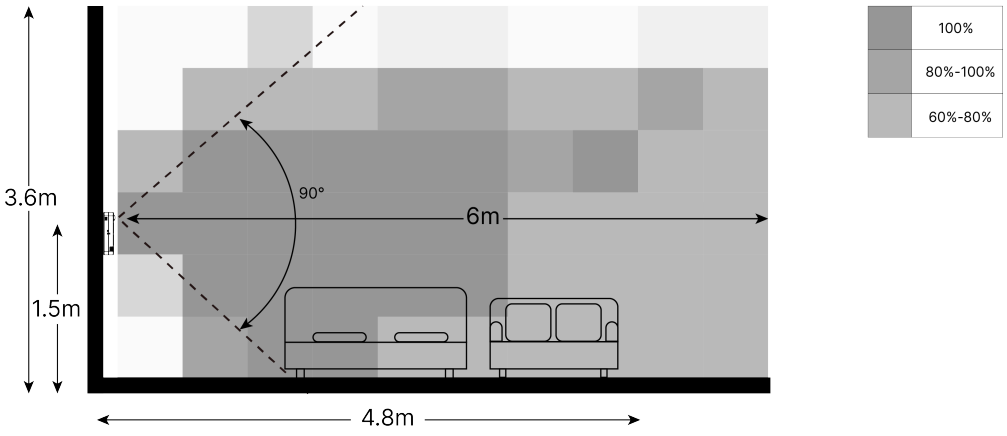
WT401 is equipped with a PIR occupancy sensor for human presence detection and supports Occupancy Detection to enable energy saving feature.

Suitable Detection Area

WT401 provides optimal occupancy detection performance within an area of approximately 20 m² (4.2*4.8m² with 3.6m height). Since active zones typically account for 40% to 50% of the total room area, the device is suitable for spaces of around 40-50 m² with standard layouts. It also performs well in smaller rooms.

Reference: occupancy detection success rate in different areas within the detection range.





Suitable Installation Location

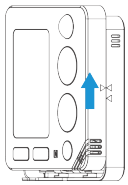
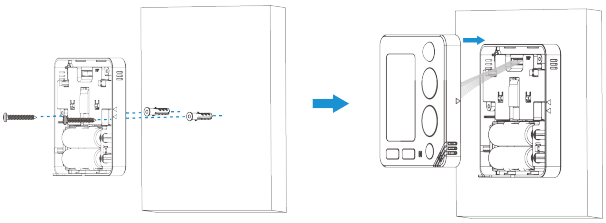
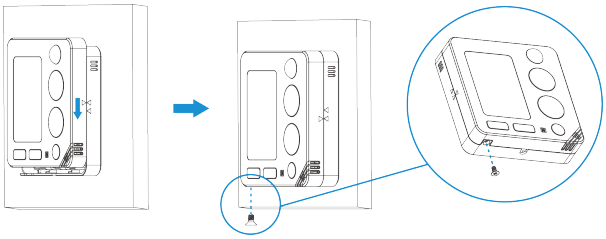
To ensure accurate detection, it is recommended that the device be positioned towards the primary activity areas of occupants within the room, such as the bed or working desk in a hotel room. Do not install the device where:

- Close to hot or cold sources like hot or cold air ducts;
- The detection area contains moving objects such as waving trees or fans;
- The view is blocked by curtains or barriers;
- Facing a transparent surface (such as glass) within 6m.

Device Installation

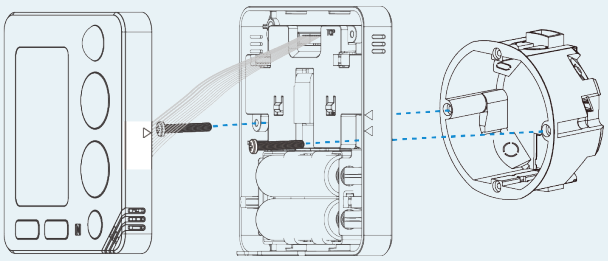
WT401 supports both wall screw mounting or wall plate mounting. Please select the appropriate method based on your needs.

Wall Screw Mounting

1. Remove front screen from the device. 2. Install the power cable or batteries to the device.	
2. Fix the wall plugs to the wall. 3. Secure the device to the wall using wall screws.	
4. Restore the front screen to the device. 5. Secure the bottom of the device using the anti-theft fixing screw.	

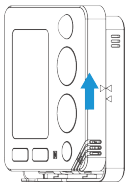
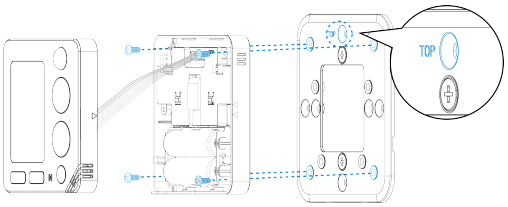
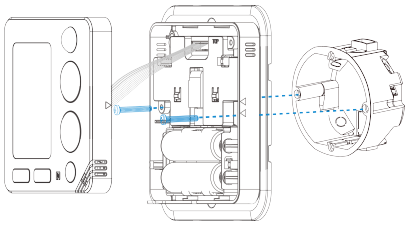
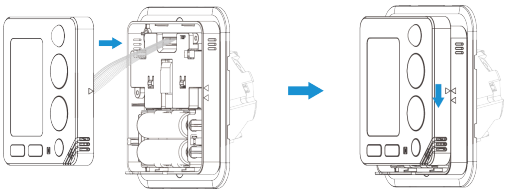
Tip:

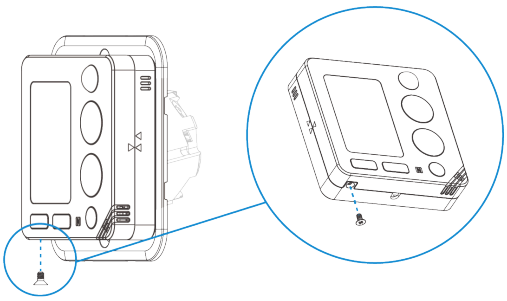
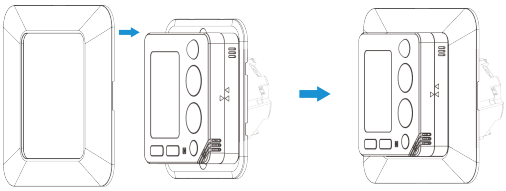
The device can be mounted to either an 86mm pattress box or a European 60mm using box mounting screws.



Wall Plate Mounting (60/86mm Box Optional)

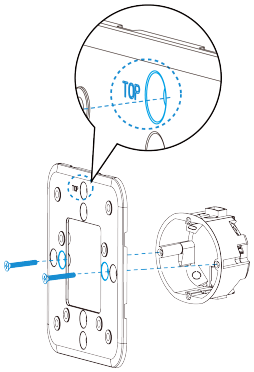
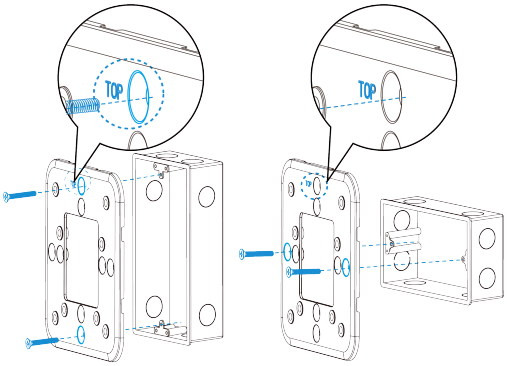
Applicable: Standard 86mm pattress box, European 60mm pattress box.

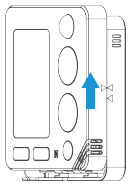
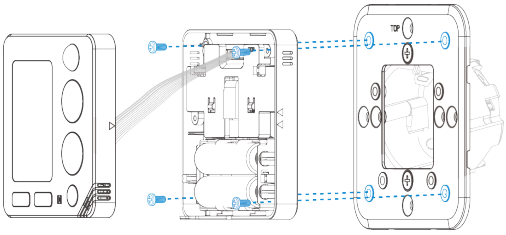
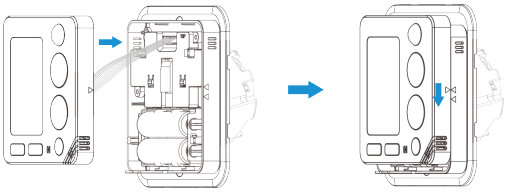
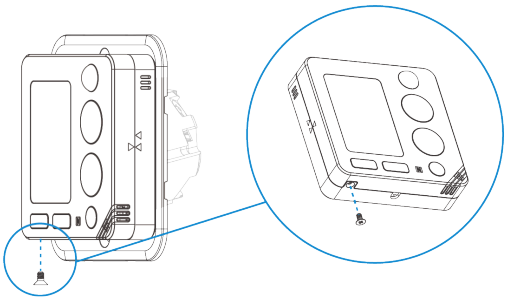
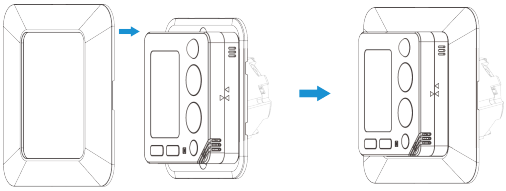
1. Remove front screen from the device. 2. Install the power cable to the device.	
3. Secure the device to the wall plate using screws.	
4. Attach the wall plate and device assembly to the pattress box.	
5. Restore the front screen to the device.	

6. Secure the bottom of the device using the anti-theft fixing screw.	
7. Attach the decorative plate to the device.	

Wall Plate Mounting (60/86/118/120mm Box Optional)

Applicable: Standard 86mm pattress box, European 60mm pattress box, 118/120mm pattress box.

1. Secure the wall plate to the pattress box using screws.	 60mm Pattress Box  118/120 Pattress Box

2. Remove front screen from the device. 3. Install the power cable to the device.	
4. Secure the device to the wall plate using screws.	
5. Restore the front screen to the device.	
6. Secure the bottom of the device using the anti-theft fixing screw.	
7. Attach the decorative plate to the device.	

Chapter 6. Uplink and Downlink

Overview

All messages are based on following format (HEX), the Parameter/Data field should follow **little-endian**:

Command ID	Parameter/Data	...
N Bytes	0-N Byte	...

For decoder and encoder examples please find files on https://github.com/Milesight-IoT/SensorDecoders.

When sending downlink commands while enabling Confirmed mode, the device will send replies as below format:

Table 1. Reply Format:

Command (1B)	Result & Length (1B)	Command ID (1-N Byte)	...
ef	Bit 7-4: result code, 0=success, 5=parameter error, 7=execute error, 10=association error Bit 3-0: command length	Same as downlink command	...

Uplink Data

This chapter describes the reported data of the device.

Basic Information

The device will report a basic information packet whenever joining the network.

Item	Command	Byte	Description
Device Status	c8	1	00: Off, 01: On
TSL Version	df	2	Example: 01 02 = V1.2
Device Request	ee	0	Send after reset

Item	Command	Byte	Description
Device Version	da	8	Hardware version (2B) + Software version (2B) + 00000000
OEM ID	d9	2	4 digits
Device Type	cf00	1	00: Class A, 01: Class B, 02: Class C, 03: Class C to B
Serial Number	db	8	16 digits

Example:

df0100 ee db6409f23258520003 da0102010100000000 d90000 c801 cf0000	
Command	**Value**
df	TSL Version: 0100=>V1.0
ee	Reset
db	SN: 6409f23258520003
da	Hardware version: 0102=V1.2 Software version: 0101=V1.1
d9	OEM ID: 0000
c8	01: Device is On
cf00	00: Class A

Periodic Report

Item	Command	Byte	Description
Battery Level	00	1	UINT8, Unit: % **Note:** This only report when the device is powered by batteries.

Item	Command	Byte	Description
Temperature	01	2	INT16/100, Unit: °C
Humidity	02	2	UINT16/10, Unit: %RH
Occupancy Status	08	1	00=Vacant, 01=Occupied, 02=Night Occupied **Note:** This only report when Occupancy Detection is enabled.

Example:

1. Periodic report: report according to reporting interval.

006401860a02ef010801	
Command	**Value**
00	Battery: 64=>100%
01	Temperature: 86 0a => 0a 86=2694/100=26.94°C
02	Humidity: ef 01 => 01 ef=495/100=49.5 %RH
08	Occupancy status: 01=Occupied

Configuration Report

Item	Command	Byte	Description
Temperature Control Mode	03	1	00=Heat, 01=EM Heat, 02=Cool, 03=Auto
Fan Mode	04	1	00=Auto, 01=Circulate, 03=Low, 04=Middle, 05=High
Execution Plan	05	1	Plan ID, Range: 00-0f (ff=Not executed)
Target Temperature (Single Target Mode)	06	2	INT16/100, Unit: °C
Heat Target Temperature (Dual Target Mode)	06	2	INT16/100, Unit: °C

Item	Command	Byte	Description
Cool Target Temperature (Dual Target Mode)	07	2	INT16/100, Unit: °C
System Status	67	1	00=Off, 01=On

Example:

1. Configuration change report: report when system status, target temperature, temperature control mode, fan mode or temperature control schedule ID changes.

67010303062e09040005ff	
Command	**Value**
67	01=System On
03	Temperature Control Mode: 03=Auto
06	Target Temperature: 2e 09 => 09 2e =2350/100=23.5°C
04	Fan Mode: 00=Auto
05	Execution Plan: ff=Not executed

Alarm Report

The device supports to various types of alarm reports.

Item	Command	Byte	Description
Temperature Alarm	0b	1	00=Collection error, 01=Under-range, 02=Over-range, 03=No data
Humidity Alarm	0c	1	00=Collection error, 01=Under-range, 02=Over-range, 03=No data
Button Event Report	0d	1	00=Button 1, 02=Button 2, 03=Button 3
Battery Alarm	0f	1	00=Normal, 01=Low battery voltage

Example:

1. Battery alarm

0f01	
Command	**Value**
0f	01=Low battery voltage

2. Button 1 event report

0d00	
Command	**Value**
0d	00=Button 1

Downlink Command

This device supports downlink commands for configuration and control. The downlink application port is 85 by default.

Communication Settings

Item	Byte	Command	Parameter
Collect Interval	1+3	60	Byte 1: 00 Byte 2-3: Interval time, range: 1-3600, unit: s
Report Interval	1+4	61	Byte 1-2: 0001 Byte 3-4: Interval time, range: 1-440, unit: minute

Example:

1. Set the report interval as 10 minutes.

6100010a00	
Command	**Parameter**
61	0a 00=>00 0a=10 minutes

Basic Settings

Item	Byte	Command	Parameter
Enquiry Periodic Report	1	b9	-
Reboot	1	be	-
Rejoin the Network	1	b6	-
Temperature Unit	1+1	63	00=°C, 01=°F
Bluetooth	1+1	85	00=Disable, 01=Enable (default)
Reset Bluetooth Name	1	54	-

Examples:

1. Reboot the device.

be

Time Settings

<table>
<tr><th>Item</th><th>Byte</th><th>Command</th><th>Parameter</th></tr>
<tr><td>UTC Time Zone</td><td>1+2</td><td>c7</td><td>INT16/60</td></tr>
<tr><td>Daylight Saving Time</td><td>1+10</td><td>c6</td><td>Byte 1: 00=Disable, 01=Enable

Byte 2: DST bias, unit: min, range: 1-120

Byte 3-6: Start time, Month (1B)+Week&Day (1B) + Minute Time (2B)

Byte 7-10: End time, Month (1B)+Week&Day (1B) + Minute Time (2B)

Week&Day:
<table>
<tr><th>Bit7-4</th><th>Bit3-0</th></tr>
<tr><td>Week number, range: 1-5</td><td>Weekday, range: 1-7</td></tr>
</table></td></tr>
</table>

Item	Byte	Command	Parameter
Sync time from LNS	1	b8	-

Examples:

1. Set the time zone as UTC-4.

c710ff	
Command	**Parameter**
c7	10 ff => ff 10 = -240/60=-4

2. Set DST time: start time is last Sunday 1:00 of March, end time is last Sunday 1:00 of October, and bias is 1h (60 minutes).

c6013c03573c000a573c00	
Command	**Parameter**
c6	01=Enable DST bias: 3c=>60 mins Start time: 03=>March, 57=>last (5) Sunday(7), 3c 00 =>00 3c=60 minutes =1:00 End time: 0a=>10=October, 57=>last (5) Sunday(7), 3c 00 =>00 3c=60 minutes =1:00

Data Source Settings

Item	Byte	Command	Parameter
Data Source	1+1	7d	00=Internal (Default), 01=External
Data Timeout*	1+1	7e	UINT8, unit: minute, range: 1-60, default: 10
External Temperature	1+2	86	INT16/100, Unit: °C, Range: -20 ~ 60
External Humidity	1+2	87	UINT16/10, Unit: %RH, Range: 0-100

*Data Timeout: When the device does not receive external values for the timeout, the device will use the data from internal sensors.

Examples:

1. Switch to receive the data from LNS.

7d01	
Command	**Parameter**
7d	01=External

2. Send temperature and humidity value from LNS.

860208 87d901	
Command	**Parameter**
86	02 08 => 08 02 =2050/100=20.50°C
87	d9 01 => 01 d9 =473/10=47.3 %RH

Calibration Settings

Note:
This setting only takes effect when the data source is internal sensors.

Item	Byte	Command	Parameter
Temperature Calibration	1+3	76	Byte 1: 00=Disable, 01=Enable Byte 2-3: Calibration Value, INT16/100, Unit: °C, Range: -80 ~ 80
Humidity Calibration	1+3	77	Byte 1: 00=Disable, 01=Enable Byte 2-3: Calibration Value, INT16/10, Unit: %RH, Range: -100 ~ 100

Example:

1. Enable temperature calibration and set calibration value as -0.3°C.

7601e2ff	
Command	**Parameter**
76	01=Enable, e2 ff=>ff e2=-30/100=-0.3 °C

Temperature Control Settings

Item	Byte	Command	Parameter
System On/Off	1+1	67	00=Off, 01=On
Temperature Control Mode Enable	1+1	64	For every bit: 0=Disable, 1=Enable Bit: Mode 0: Auto 1: Cool 2: EM Heat 3: Heat
Temperature Control Mode	2+1	6800	00=Heat, 01=EM Heat, 02=Cool, 03=Auto
Target Temperature Mode	1+1	65	00=Single Target Temperature, 01=Dual Target Temperature
Target Temperature Resolution	1+1	66	00=0.5, 01=1
Target Temperature	1+3	69	Byte 1: 00=Heat, 01=EM Heat, 02=Cool, 03=Auto, 04=Auto-Heat, 05=Auto-Cool Byte 2-3: target temperature, INT16/100, Unit: °C, Range: 5~35
Deadband	1+2	6a	INT16/100, Unit: °C, Range: 1-30
Target Temperature Regulation Range	1+5	6b	Byte 1: 00=Heat, 01=EM Heat, 02=Cool, 03=Auto

<table>
<tr><th>Item</th><th>Byte</th><th>Command</th><th>Parameter</th></tr>
<tr><td></td><td></td><td></td><td>Byte 2-3: Min. Range, INT16/100, Unit: °C, Range: 5~35

Byte 4-5: Max. Range, INT16/100, Unit: °C, Range: 5~35</td></tr>
<tr><td>Fan Mode Enable</td><td>1+1</td><td>88</td><td>For every bit: 0=Disable, 1=Enable
<table>
<tr><th>Bit</th><th>Mode</th></tr>
<tr><td>0</td><td>Auto</td></tr>
<tr><td>1</td><td>Circulate</td></tr>
<tr><td>2</td><td>0</td></tr>
<tr><td>3</td><td>Low</td></tr>
<tr><td>4</td><td>Medium</td></tr>
<tr><td>5</td><td>High</td></tr>
</table></td></tr>
<tr><td>Fan Mode</td><td>1+1</td><td>74</td><td>00=Auto, 01=Circulate, 03=Low, 04=Middle, 05=High</td></tr>
</table>

Examples:

1. Switch the system on.

6701	
Command	**Parameter**
67	01=On

2. Set the temperature control mode as Cool.

680002	
Command	**Parameter**
6800	02=Cool

3. Set target temperature of cool mode to 24°C.

69026009	
Command	**Parameter**
69	02=Cool, 60 09=>09 60=2400/100=24°C

Occupancy Detection Settings

Item	Byte	Command	Parameter
Occupancy Detection	2+1	8201	00=Disable, 01=Enable
Occupied to Vacant Delay	2+2	8202	UINT16, Unit: minute, Range: 1 ~ 360, Default: 30
Energy-saving Setting	2+1	8301	00=Disable, 01=Enable
Occupied/Vacant Execution	2+2	8302	Byte 1: Occupied Execution Plan ID, Range: 00-0f, ff=None Byte 2: Unoccupied Execution Plan ID, Range: 00-0f, ff=None
Night Occupancy	2+1	8401	00=Disable, 01=Enable
Night Occupied Time	2+4	8404	Byte 1-2: Start Time, Unit: minute, Range: 0-1439 Byte 3-4: End Time, Unit: minute, Range: 0-1439
Night Occupied Execution	2+1	8405	Plan ID, Range: 00-0f, ff=None

Examples:

1. Enable occupancy detection and set the delay time.

82010182020a00	
Command	**Parameter**
8201	01=Enable
8202	0a 00=>00 0a=10 minutes

2. Enable night occupancy and configure the related parameters.

840101844605e001840502	
Command	**Parameter**
8401	01=Enable
8404	Start time: 46 05 => 05 46=1350 minutes =22:30 End time: e0 01 => 01 e0 =480 minutes =8: 00
8405	02=Schedule plan 3

Button Settings

Item	Byte	Command	Parameter
Button Customization	2+1	7100	00=Disable, 01=Enable
Button 1	2+1	7101	01=Temperature Control Mode (default), 02=Fan Mode, 06=Event 1 Report, 07=°C or °F switch
Button 2	2+1	7102	01=Temperature Control Mode, 02=Fan Mode (default), 06=Event 2 Report, 07=°C or °F switch
Button 3	2+1	7103	00=System On/Off (default), 06=Event 3 Report, 07=°C or °F switch
Child Lock	1+3	72	Byte 1: 00=Disable, 01=Enable Byte 2-3: for every bit: 0=Disable, 1=Enable

Bit	Button
0	Temperature +
1	Temperature -
2	System On/Off
3	Fan Mode
4	Temperature Control Mode
5	Reset
6	Power On/Off

<table>
<tr><th>Item</th><th>Byte</th><th>Command</th><th>Parameter</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Bit</th><th>Button</th></tr>
<tr><td>7-10</td><td>0</td></tr>
<tr><td>11</td><td>Button 1 Evemt Report</td></tr>
<tr><td>12</td><td>Button 2 Event Report</td></tr>
<tr><td>13</td><td>Button 3 Event Report</td></tr>
<tr><td>14</td><td>°C or °F switch</td></tr>
<tr><td>15</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Temporary Unlock</td><td>1+2</td><td>81</td><td>Byte 1: 00=Disable, 01=Enable

Byte 2-3: Unlock time, Unit: s, Range: 1-3600, Default: 30</td></tr>
<tr><td>Temporary Un-lock Button</td><td>1+1</td><td>80</td><td>Combination buttons for unlock, at least 2 buttons should be enabled

for every bit: 0=Disable, 1=Enable,
<table>
<tr><th>Bit</th><th>Button</th></tr>
<tr><td>0</td><td>Button 1</td></tr>
<tr><td>1</td><td>Button 2</td></tr>
<tr><td>2</td><td>Button 3</td></tr>
<tr><td>3</td><td>Button 4</td></tr>
<tr><td>4</td><td>Button 5</td></tr>
<tr><td>7-5</td><td>000</td></tr>
</table>
</td></tr>
</table>

Examples:

1. Enable button customization feature and switch button 2 feature to °C or °F switch.

710001710207	
Command	**Parameter**
7100	01=Enable
7102	07=°C or °F switch

2. Lock reset feature of the button.

72012000	
Command	**Parameter**
72	01=Enable, 20 00=>00 20 = 00100000 => Bit 5= 1(reset)

3. Allow to press the button 1 and button 2 together to unlock for 300s (5 minutes).

800381012c01	
Command	**Parameter**
80	03=>00000011=Button 1 and 2 enable
81	01=Enable, 2c 01=>01 2c=300s

Screen Settings

<table>
<tr><th>Item</th><th>Byte</th><th>Com-mand</th><th>Parameter</th></tr>
<tr><td>Screen Display</td><td>1+1</td><td>75</td><td>00=Disable all, ff=Enable all
For every bit: 0=Disable, 1=Enable
<table>
<tr><th>Bit</th><th>Content</th></tr>
<tr><td>0</td><td>Temperature Control Schedule</td></tr>
<tr><td>1</td><td>Temperature</td></tr>
<tr><td>2</td><td>Humidity</td></tr>
<tr><td>3</td><td>Target Temperature</td></tr>
</table></td></tr>
</table>

Item	Byte	Com-mand	Parameter	
			Bit	Content
			7-4	0000
Smart Display	1+1	62	00=Disable, 01=Enable	

Examples:

1. Disable the screen display.

7500	
Command	Parameter
66	00=Disable all

2. Only disable the display of target temperature.

7507	
Command	Parameter
75	07=>0000 0111 = Target temperature disable

Schedule Plan Settings

Item	Byte	Command	Parameter
Schedule Plan	3+1	7b+Schedule ID (1B, 00-07) + 00	00=Disable, 01=Enable
Schedule Name (First 6B)	3+6	7b+Schedule ID (1B, 00-07) + 01	ASCii to Hex strings (6B)
Schedule Name (Last 4B)	3+4	7b+Schedule ID (1B, 00-07) + 02	ASCii to Hex strings (4B)
Schedule Content 1	3+7	7b+Schedule ID (1B, 00-07) + 03	Byte 1: Temperature control mode, 00=Heat, 01=EM Heat, 02=Cool, 03=Auto

Item	Byte	Command	Parameter
			Byte 2-3: Heating Target Temperature, INT16/100, Unit: °C, Range: 5 ~ 35 Byte 4-5: EM-Heating Target Temperature, INT16/100, Unit: °C, Range: 5 ~ 35 Byte 6-7: Cooling Target Temperature, INT16/100, Unit: °C, Range: 5 ~ 35
Schedule Content 2	3+7	7b+Schedule ID (1B, 00-07) + 04	Byte 1: Fan mode, 00=Auto, 01=Circulate, 03=Low, 04=Medium, 05=High Byte 2-3: Auto Target Temperature, INT16/100, Unit: °C, Range: 5 ~ 35 Byte 4-5: Auto-Heating Target Temperature, INT16/100, Unit: °C, Range: 5 ~ 35 Byte 6-7: Auto-Cooling Target Temperature, INT16/100, Unit: °C, Range: 5 ~ 35
Execute Schedule Plan	1+1	5c	Schedule ID, Range: 00-07
Delete/Reset Schedule Plan	1+1	5f	Schedule ID, Range: 00-07, ff=Reset

Examples:

1. Add a schedule plan 4 and enable it.

7b0300 01	
Command	**Parameter**
03=schedule4	01=Enable

2. Set the name of schedule plan 1 as `Occupied`.

7b00014f6363757069 7b000265640000	
Command	**Parameter**
7b0001	4f 63 63 75 70 69 => Occupi
7b0002	65 64 00 00 => ed

3. Set schedule plan 4 content.

7b030303a406c409f00a 7b030400fc080807540b	
Command	**Parameter**
7b0303	Temperature Control Mode: 03=Auto Heat Target Temperature: a4 06=>06 a4=1700/100=17°C EM Heat Target Temperature: c4 09=>09 c4=2500/100=25°C Cool Target Temperature: f0 0a=>0a f0=2800/100=28°C
7b0304	Fan Mode: 00=Auto Auto Target Temperature: fc 08=>08 fc=2300/100=23°C Auto-Heat Target Temperature: 08 07=>07 08=1800/100=18°C Auto-Cool Target Temperature: 54 0b=>0b 54=2900/100=29°C

4. Execute schedule plan 3 immediately.

5c02	
Command	**Parameter**
5c	02=schedule3

Chapter 7. BACnet Object List

When the device is integrated to BACnet system via Milesight gateway or Milesight default decoder and encoder, please refer to below list to read and write BACnet objects.

Note:
The reference parameters points the objects to be written together, otherwise the parameters will be failed to change. When users write multiple reference parameters via Milesight gateway, ensure these values are sent within 60s.

Uplinks

Item	LoRa Object	BACnet Type	Access Mode	Description
Device Status	device_status	Multistate Value	R	1: Off, 2: On
TSL Version	tsl_version	character-String Value	R	
Device Version	version.hardware_version	character-String Value	R	
	version.firmware_version	character-String Value	R	
OEM ID	oem_id	character-String Value	R	
Device Type	lorawan_class	Multistate Value	R	1: Class A, 2: Class B, 3: Class C, 4: Class C to B
Serial Number	product_sn	character-String Value	R	

Item	LoRa Object	BACnet Type	Access Mode	Description
Battery Level	battery	Analog Input	R	Unit: % (98)
Temperature	temperature	Analog Value	R	Unit: °C (62)
Humidity	humidity	Analog Value	R	Unit: %RH (29)
Target Temperature	target_temperature_1	Analog Input	R	Unit: °C (62)
Heat Target Temperature	target_temperature_1	Analog Input	R	Unit: °C (62)
Cool Target Temperature	target_temperature_2	Analog Input	R	Unit: °C (62)
Temperature Control Mode	temperature_control_mode	Multistate Value	RW	1: Heat, 2: EM Heat, 3: Cool, 4: Auto
Fan Mode	fan_mode	Multistate Value	RW	1: Auto, 2: Circulate, 4: Low, 5: Medium, 6: High
Executed Plan	execution_plan	Multistate Value	R	ID Range: 1-16 (255=Not executed)
Occupancy Status	pir_status	Multistate Value	R	1: Vacant, 2: Occupied, 3: Night Occupied
System Status	system_status	Multistate Value	RW	1: Off, 2: On
Temperature Alarm	temperature_alarm	Multistate Value	R	1: Collection error, 2: Under-range, 3: Over-range, 4: No data
Humidity Alarm	humidity_alarm	Multistate Value	R	1: Collection error, 2: Under-range, 3: Over-range, 4: No data

Item	LoRa Object	BACnet Type	Access Mode	Description
Button Event Alarm	button_event	Multistate Value	R	1: button 1, 2: button 2, 3: button 3
Battery Alarm	battery_event	Multistate Value	R	1: normal, 2: low voltage

Communication Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Collecting Interval	collection_interval.unit	Multi-state Value	RW	1: Second	These objects should be written together
	collection_interval.seconds_of_time	Analog Value	RW	Range: 1-3600, Unit: s (73)	
Reporting Interval	reporting_interval.unit	Multi-state Value	RW	2: Minute	These objects should be written together
	reporting_interval.mode	Multi-state Value	RW	2: LoRa	
	reporting_interval.minutes_of_time	Analog Value	RW	Range: 1-1440, Unit: min (72)	

Basic Settings

Item	LoRa Object	BACnet Type	Access Mode	Description
Enquiry Periodic Report	query_device_status	Binary Output	W	1: Yes
Reboot	reboot	Binary Output	W	1: Yes
Rejoin the Network	reconnect	Binary Output	W	1: Yes
Temperature Unit	temperature_unit	Multistate Value	RW	1: °C, 2: °F

Item	LoRa Object	BACnet Type	Access Mode	Description
Bluetooth	ble_enable	Binary Value	RW	0: Disable, 1: Enable
Reset Bluetooth Name	reset_ble_name	Binary Output	W	1: Yes

Time Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
UTC Time Zone	time_zone	Analog Value	RW	Unit: min (72)	
Daylight Saving Time	daylight_saving_time.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	daylight_saving_time.offset	Analog Value	RW	Unit: min (72), Range: 1-60	
	daylight_saving_time.start_month			Range: 1-12	
	daylight_saving_time.start_week_num			Range: 1-5	
	daylight_saving_time.start_week_day			Range: 1-7	
	daylight_saving_time.start_hour_min			Unit: min (72), Range: 0-1439	
	daylight_saving_time.end_month			Range: 1-12	
	daylight_saving_time.end_week_num			Range: 1-5	
	daylight_saving_time.end_week_day			Range: 1-7	
	daylight_saving_time.end_hour_min			Unit: min (72), Range: 0-1439	

Item	LoRa Object	BAC-net Type	Access Mode	Description	Reference
Sync time from LNS	synchronize_time	Binary Output	W	1: Yes	

Temperature Control Settings

Item	LoRa Object	BAC-net Type	Access Mode	Description	Reference
System Status	system_status	Multi-state Value	RW	1: Off, 2: On	
Tempera-ture Control Mode Enable	temperature_control_-mode_support.heat	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	temperature_control_-mode_support.em_heat				
	temperature_control_-mode_support.cool				
	temperature_control_-mode_support.auto				
Temperature Control Mode	temperature_control_mode	Multi-state Value	RW	1: Heat, 2: EM Heat, 3: Cool, 4: Auto	
Target Tempera-ture Resolution	target_temperature_resolution	Multi-state Value	RW	1: 0.5, 2: 1	
Target Tem-perature Mode	target_temperature_mode	Multi-state Value	RW	1: Single, 2: Dual	
Heat Target Temperature	target_temperature_-settings.em_heat	Analog Value	RW	Unit: °C (62), Range: 5-35	
EM Heat Target Temperature	target_temperature_-settings.em_heat				

Item	LoRa Object	BAC-net Type	Access Mode	Description	Reference
Cool Target Temperature	target_temperature_settings.cool				
Auto Target Temperature	target_tempera-ture_settings.auto				
Auto-Heat Tar-get Temperature	target_temperature_-settings.auto_heat				
Auto-Cool Tar-get Temperature	target_temperature_-settings.auto_cool				
Deadband	dead_band	Analog Value	RW	Unit: °C (62), Range: 1-30	
Heat Target Tempera-ture Regula-tion Range	target_tempera-ture_range.heat.min	Analog Value	RW	Unit: °C (62), Range: 5~35 **Note:** Max. Range-Min. Range≥1	Both ob-jects should be written together
	target_tempera-ture_range.heat.max	Analog Value	RW		
EM Heat Tar-get Temper-ature Regu-lation Range	target_temperature_-range.em_heat.min	Analog Value	RW		Both ob-jects should be written together
	target_temperature_-range.em_heat.max	Analog Value	RW		
Cool Target Tempera-ture Regula-tion Range	target_tempera-ture_range.cool.min	Analog Value	RW		Both ob-jects should be written together
	target_tempera-ture_range.cool.max	Analog Value	RW		
Auto Target Tempera-ture Regula-tion Range	target_tempera-ture_range.auto.min	Analog Value	RW		Both ob-jects should be written together
	target_tempera-ture_range.auto.max	Analog Value	RW		

Item	LoRa Object	BAC-net Type	Access Mode	Description	Reference
Fan Mode Enable	fan_support_mode.auto	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	fan_support_mode.circulate				
	fan_support_mode.low				
	fan_support_mode.medium				
	fan_support_mode.high				
Fan Mode	fan_mode	Multi-state Value	RW	1: Auto, 2: Circulate, 4: Low, 5: Medium, 6: High	

Data Source Settings

Item	LoRa Object	BACnet Type	Access Mode	Description
Data Source	data_sync_to_peer	Binary Value	RW	0: Internal, 1: External
Data Timeout	data_sync_timeout	Analog Value	RW	Range: 1-60, Unit: min (72)
External Temperature	external_temperature	Analog Output	W	Unit: °C (62)
External Humidity	external_humidity	Analog Output	W	Unit: %RH (29)

Calibration Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Temperature Calibration	temperature_calibration_settings.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
	temperature_calibration_-settings.calibration_value	Analog Value	RW	Unit: °C (62), Range: -80 ~ 80	

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Humidity Calibration	humidity_calibration_settings.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
	humidity_calibration_settings.calibration_value	Analog Value	RW	Unit: %RH, Range: -100 ~ 100	

Occupancy Detection Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Occupancy Detection	pir_config.enable	Binary Value	RW	0: Disable, 1: Enable	
Occupied to Vacant Delay	pir_config.release_time	Analog Value	RW	Range: 1-360, Unit: min (72)	
Energy-saving Setting	pir_config.eco_mode.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
Occupied Execution	pir_config.eco_mode.occupied_plan	Multistate Value	RW	Plan ID, range: 1-16	
Vacant Execution	pir_config.eco_mode.vacant_plan				
Night Occupancy	pir_config.night_mode.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
Night Occupied Time	pir_config.night_mode.start_time	Analog Value	RW	Range: 0-1439, Unit: min (72)	
	pir_config.night_mode.end_time				
Night Occupied Execution	pir_config.night_mode.occupied_plan	Multistate Value	RW	Plan ID, range: 1-16	

Screen Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Screen Display	screen_display_settings.ambient_temperature	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	screen_display_settings.target_temperature				
	screen_object_settings.target_temperature_enable				
	screen_display_settings.plan_name				
Smart Display	intelligent_display_enable	Binary Value	RW	0: Disable, 1: Enable	

Button Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Button Customization	button_custom_function.enable	Binary Value	RW	0: Disable, 1: Enable	
Button 1	button_custom_function.button_1	Multistate Value	RW	2: Temperature Control Mode, 3: Fan Mode, 7: Event Report, 8: °C or °F switch	
Button 2	button_custom_function.button_2	Multistate Value	RW		
Button 3	button_custom_function.button_3	Multistate Value	RW	1: System On/Off, 7: Button Report, 8: °C or °F switch	
Child Lock	child_lock_settings.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be
	child_lock_settings.temperature_up				
	child_lock_settings.temperature_down				

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
	child_lock_settings.system_on_off				written together
	child_lock_settings.fan_mode				
	child_lock_settings.temperature_control_mode				
	child_lock_settings.reboot_reset				
	child_lock_settings.power_on_off				
	child_lock_settings.button_report_1				
	child_lock_settings.button_report_2				
	child_lock_settings.button_report_3				
	child_lock_settings.temperature_unit_switch				
Temporary Unlock	temporary_unlock_settings.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	temporary_unlock_settings.timeout				
Temporary Unlock Button	unlock_combination_-button_settings.button_1	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	unlock_combination_-button_settings.button_2				
	unlock_combination_-button_settings.button_3				
	unlock_combination_-button_settings.button_4				
	unlock_combination_-button_settings.button_5				

Schedule Settings

Item	LoRa Object	BACnet Type	Access Mode	Description
Execute Schedule	insert_plan	Multistate Value	W	Schedule plan ID, Range: 1-8
Delete Schedule	remove_plan.plan_1	Binary Output	W	1: Delete/Reset
	remove_plan.plan_2			
	remove_plan.plan_3			
	remove_plan.plan_4			
	remove_plan.plan_5			
	remove_plan.plan_6			
	remove_plan.plan_7			
	remove_plan.plan_8			
	remove_plan.reset			

Chapter 8. Services

Milesight provides customers with timely and comprehensive technical support services. End-users can contact your local dealer to obtain technical support. Distributors and resellers can contact directly with Milesight for technical support.

Technical Support Mailbox: iot.support@milesight.com

Online Support Portal: https://support.milesight-iot.com

Resource Download Center: https://www.milesight.com/iot/resources/download-center/

MILESIGHT CHINA

TEL: +86-592-5085280

FAX: +86-592-5023065

Add: Building C09, Software Park Phase III, Xiamen 361024, Fujian, China