Smart Fan Coil Thermostat

WT30x

User Guide

Contents

Chapter 1. Introduction

Copyright Statement

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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.

Warning:

Serious injury or death may be caused if any of these warnings is neglected.

- The installation must be conducted by a qualified person and should strictly comply with the electrical regulations of the local region.
- Before installation or maintenance, make sure to keep the power off.
- Make sure all wires are connected, and unused cables must be insulated and secured.
- Please contact the after-sales service for equipment failure, do not try to repair it yourself.

CAUTION:

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

- Make sure this product is suitable for your system and meet the voltage and current requirements before installation.
- The device is intended only for indoor use.
- Please strictly follow the wiring diagram for wiring installation.
- 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.
- In order to protect the security of the device, please change device password when first configuration. The default password is 123456.

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

Revision History

Release Date	Version	Revision Content
June 16, 2025	V1.0	Initial version

Chapter 2. Product Introduction

Overview

WT303&WT304 is an advanced room thermostat specifically developed to oversee fan and valve operations in air conditioner applications where 2-pipe or 4-pipe fan coil unit (FCU) with 3-speed fan or ECM fan is adopted. It allows manual control by buttons, and automatic control through predefined logic, scheduled programming or remote management system. This ensures optimal comfort and energy efficiency in the controlled environment.

With 2.7" e-ink screen and embedded temperature and humidity sensor, the thermostat continuously displays the room status while monitoring the ambient temperature and humidity. It is compatible with standard LoRaWAN® gateway and Milesight Development Platform, enabling real-time monitoring of environmental status for effective remote management.

Features

- Applicable for 2-pipe and 4-pipe FCUs with 3-Speed fans or ECM fans
- Compatible with 2-wire On/Off relay, 3-wire On/Off relay or 0-10V valve control
- Supports an intuitive 2.7-inch display, allowing clear visibility of temperature/humidity and room status
- Equipped with an external NTC sensor signal input and a dry contact input for keycard/magnet switches
- Highly adapt to different scenarios with 60mm/86mm/118mm/120mm boxes
- Adjust the room temperature manually or automatically
- Optional data sources for environmental detection and accurate control: built-in temperature and humidity sensors, external NTC sensors, Milesight sensors, external sensor data from network servers
- Supports adding 8 plans and allow up to 16 schedules for each plan, ensuring various control needs and energy savings
- Supports open-window detection and freeze protection
- Supports the child lock function for safety reasons
- Function well with standard LoRaWAN® gateways and network servers
- Compatible with BACnet system via Milesight LoRaWAN® gateways
- Compatible with Milesight Development Platform
- Supports Milesight D2D protocol to enable ultra-low latency control without gateway
- Supports multicast for control in bulk
- Support Firmware Update Over the Air (FUOTA) feature

Chapter 3. Compatibility

Before purchase, it is suggested to use Compatibility Checker to select the suitable Milesight thermostat products.

Compatible Systems

WT30x supports both 2-pipe and 4-pipe fan coil units with AC 100-240V. Here are the compatibility of valves and fans:

Table 1. 2-pipe System

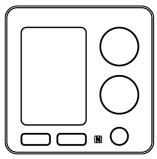
	3-Speed Fan (AC)	EC Fan (DC 0-10V)
2-wire ON/OFF valve	WT303	WT304
3-wire ON/OFF valve	WT303	WT304
0-10V Proportional Integral Valve	WT304	WT304

Table 2. 4-pipe System

	3-Speed Fan (AC)	EC Fan (DC 0-10V)
2-wire ON/OFF valve	WT303	WT304
3-wire ON/OFF valve	/	/
0-10V Proportional Integral Valve	WT304	/

Chapter 4. Hardware Introduction

Packing List



1 × Smart Fan Coil Thermostat

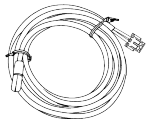
2 × Wall Mounting Screws (M4*25)

1 × 2-pin Signal Cable

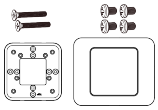
1 × Anti-theft Fixing Screw (M2*4)

1 × Quick Guide

1 × Warranty Card



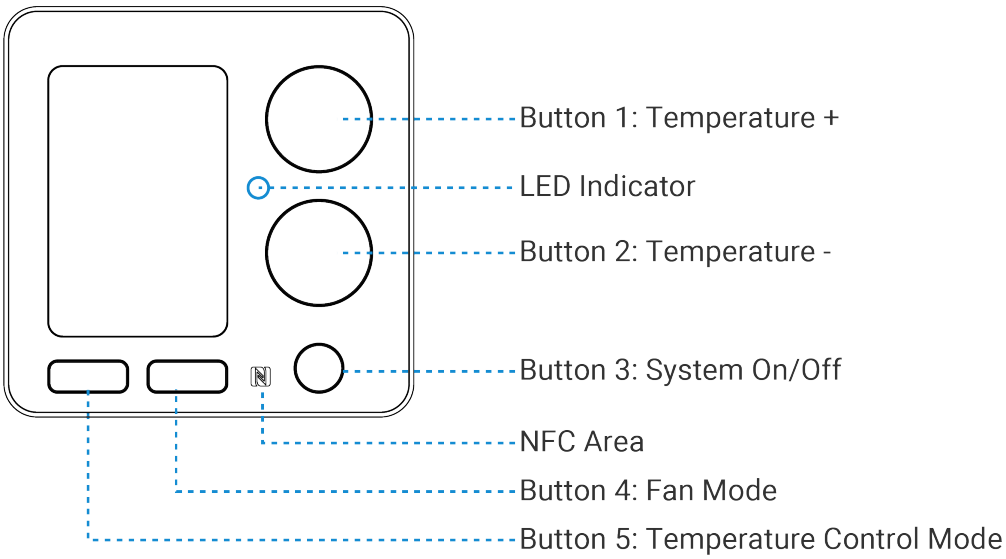
1 × NTC Temperature Sensor (Optional)

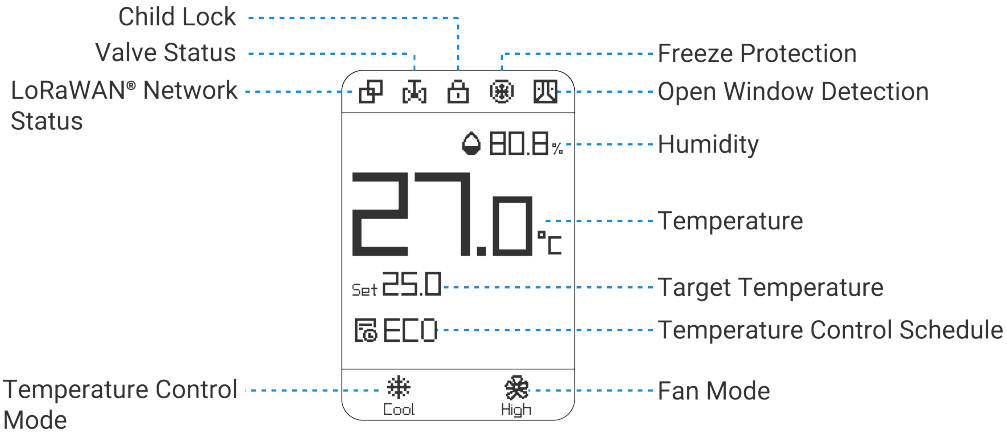


1 × Wall Plate Kit (Optional)

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

Hardware Overview

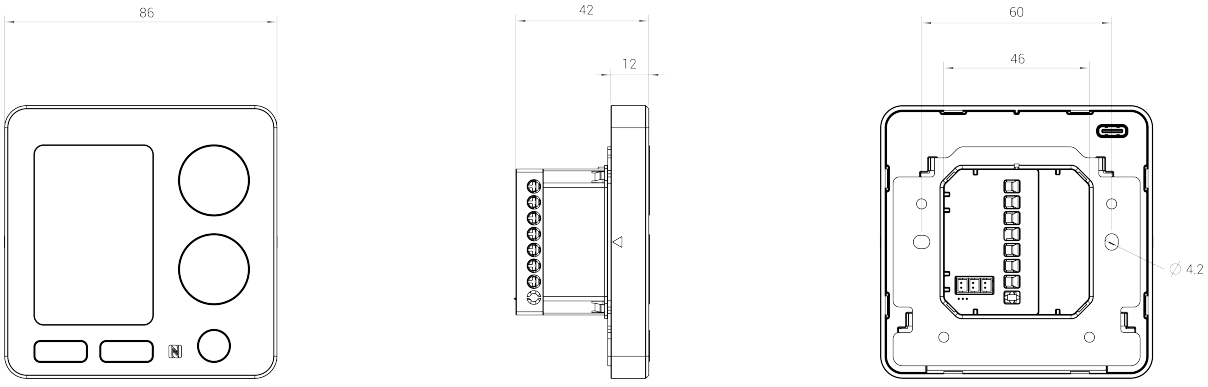




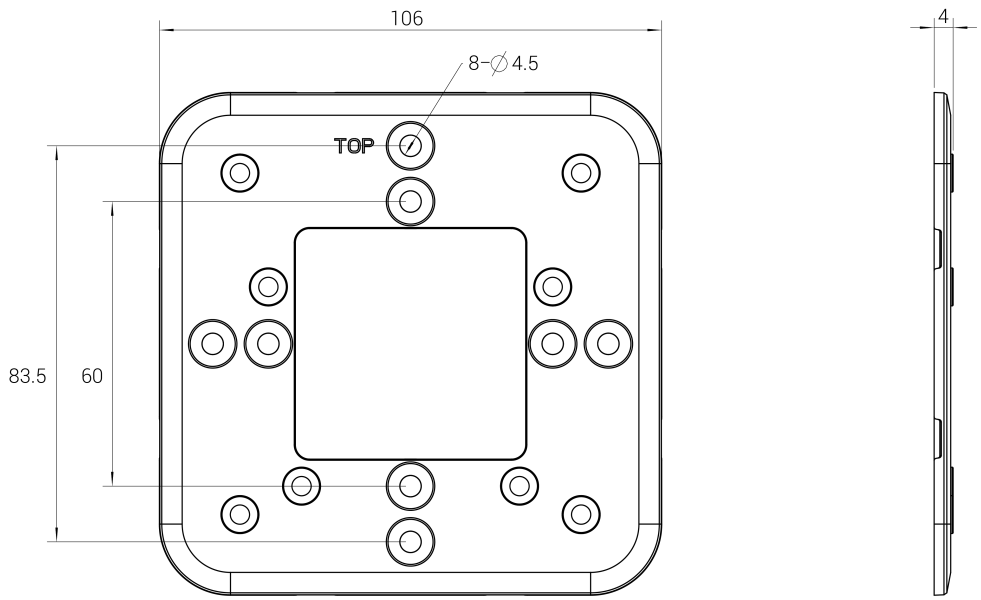
LED Patterns

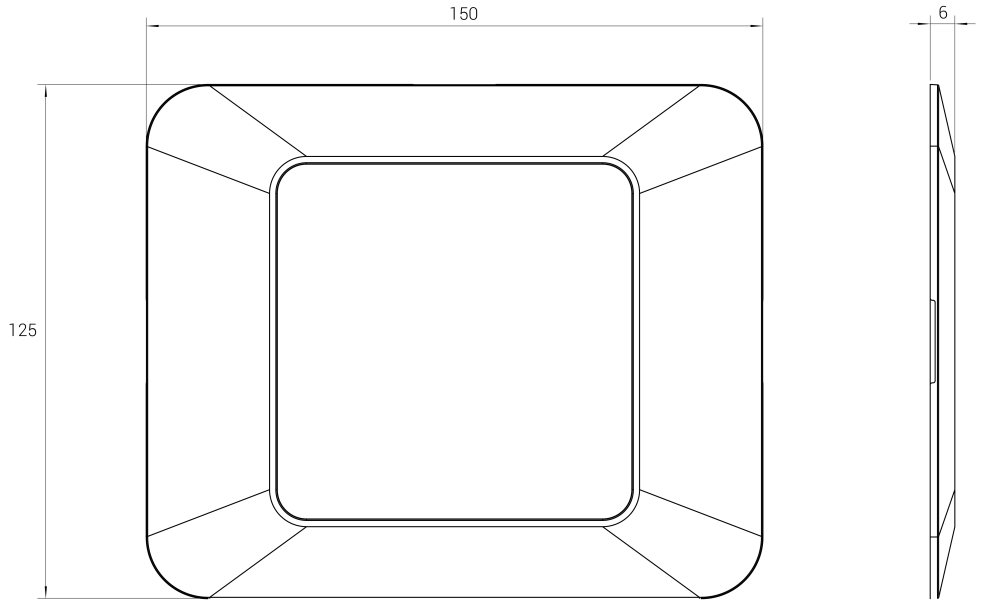
Function	Operation	LED Indicator
Reboot	Press and hold the button 3 and button 5 for more than 3s.	Slowly Blinks
Reset	Press and hold the button 3 and button 5 for more than 10s.	Quickly Blinks

Dimensions (mm)



Wall Plate


106
8-∅4.5
TOP
83.5
60
4


150
125
6

Chapter 5. Wiring Diagrams

This section describes the wirings of fan coil system and DI interface.

Note:
After wiring, it is necessary to select the correct system type or enable DI settings via ToolBox or downlink commands.

Fan Coil System Wirings

WT303

Figure 1. 2-pipe, 2-wire On/Off valve, 3 speed fan

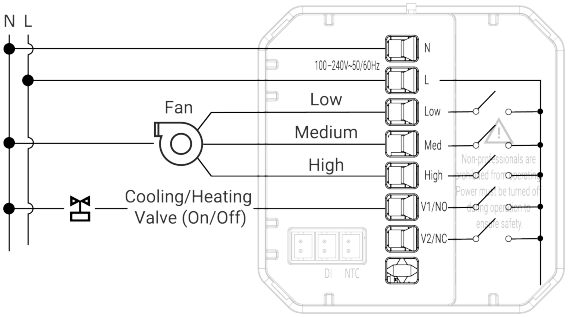


Figure 2. 2-pipe, 3-wire On/Off valve, 3 speed fan

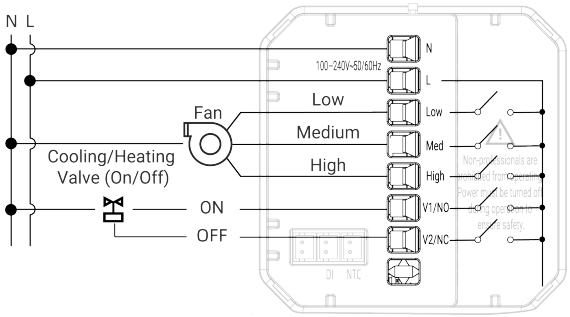
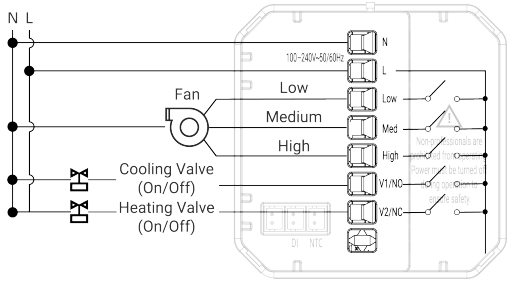


Figure 3. 4-pipe, 2-wire On/Off valve, 3 speed fan



WT304

Figure 4. 2-pipe, 0-10V valve, 3 speed fan

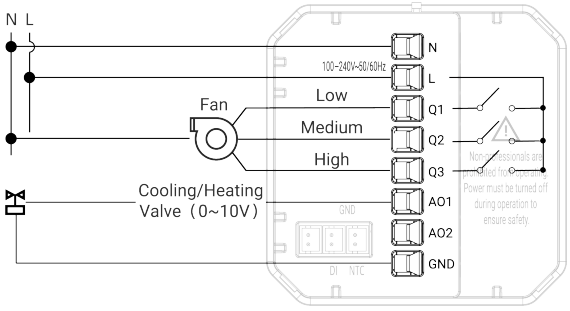


Figure 5. 4-pipe, 0-10V valve, 3 speed fan

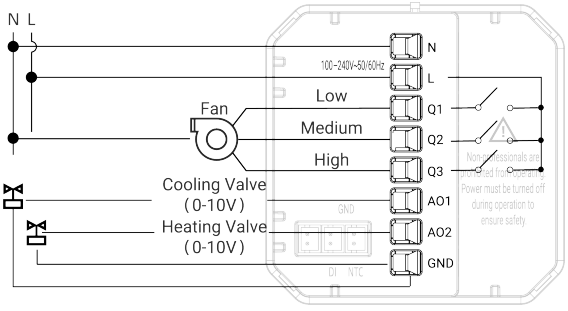


Figure 6. 2-pipe, 2-wire On/Off valve, EC fan

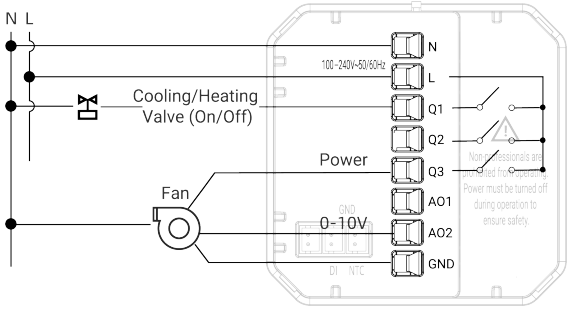


Figure 7. 4-pipe, 2-wire On/Off valve, EC fan

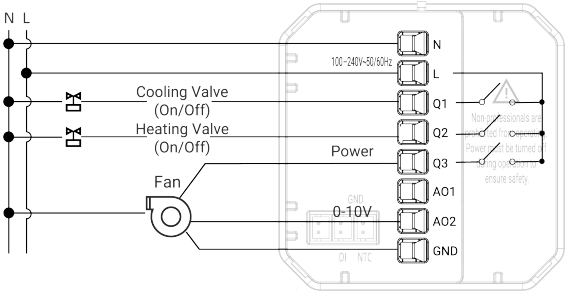


Figure 8. 2-pipe, 3-wire On/Off valve, EC fan

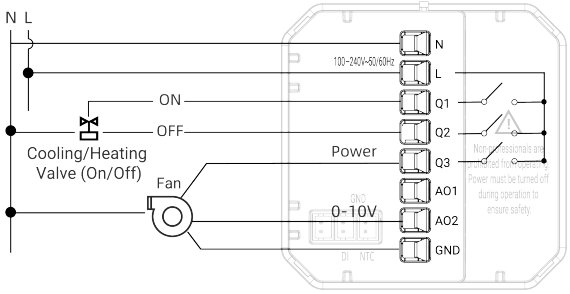
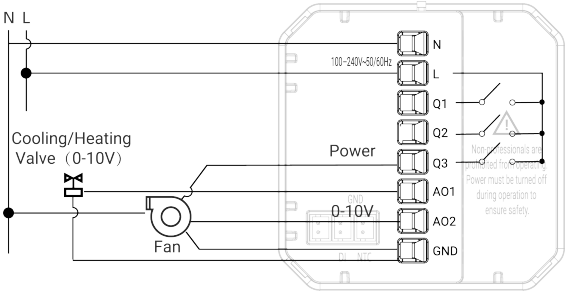
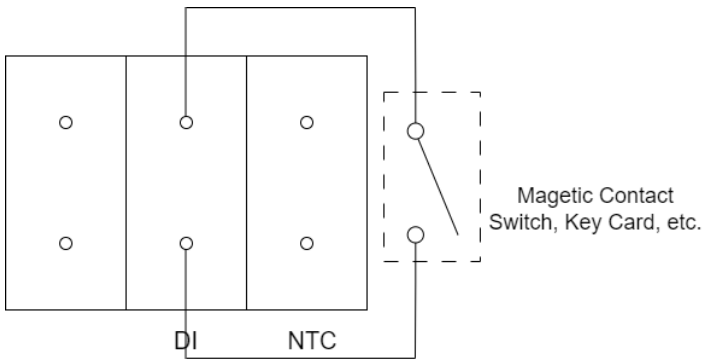


Figure 9. 2-pipe, 0-10V valve, EC fan



DI Wiring



Chapter 6. Installation

Important:

Before installation, make sure that the product is only used for fan coil systems with 100-240V and meets the maximum current requirements (resistive 4A, inductive 3A, capacitive not support).

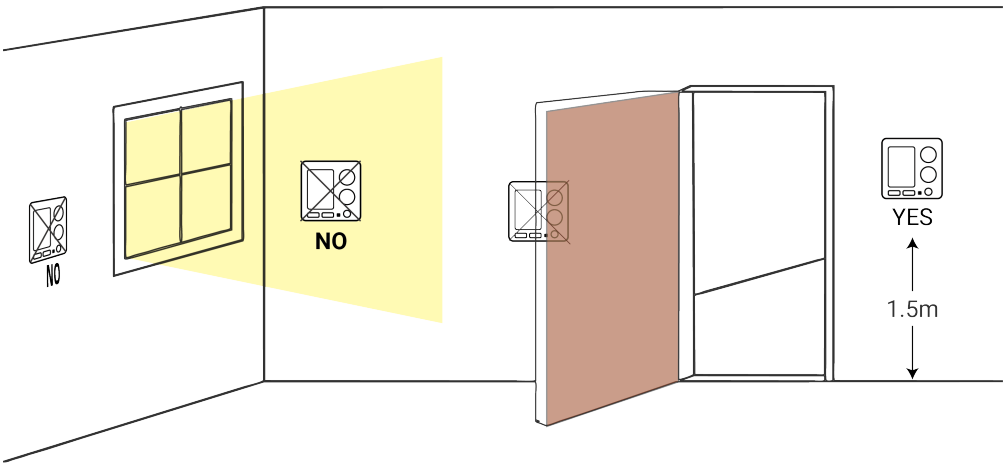
Installation Locations

It is necessary to select the installation locations for data source to collect the correct temperature and humidity data, and achieve the accurate control. The section will take internal data source as example to describe the best installation locations.

When using built-in sensors, it is suggested to install the thermostat about 5 ft. (1.5m) above the floor in an area with good air circulation at average temperature.

Note:

If installation in an appropriate location is not possible, please select other data sources. For more info, click Data Source Selection *(on page 49)*.



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.

Device Installation

Wall Screw Mounting

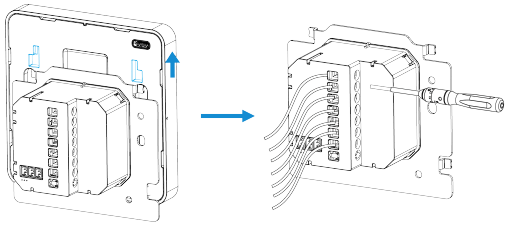
Applicable: Standard 86mm pattress box or European 60mm pattress box.

1. Switch off the power to your system.

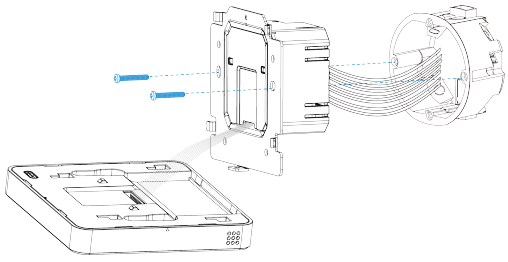
2. Remove the wire terminal from the device, then screw the wires to the wire terminals.

Note:

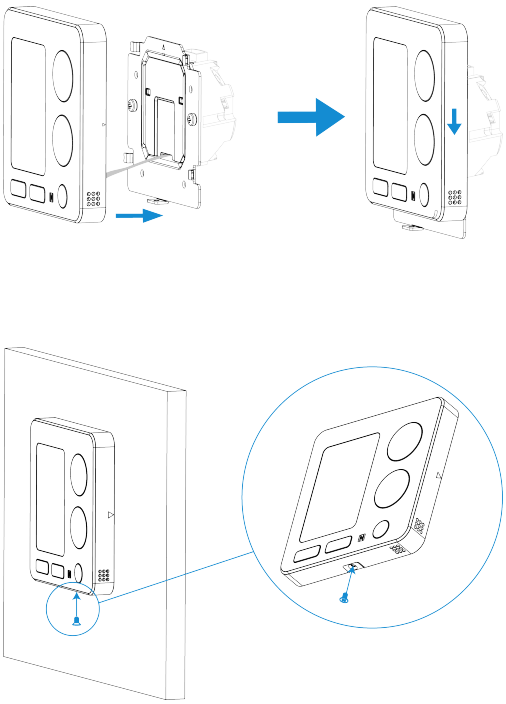
- If hard plastic wires are used, it must be bent to an appropriate angle in advance;
- Unused cables must be insulated and secured.



3. Fix the wire terminal to the pattress box via wall screws.



4. Fix the device to the wire terminal with the fixing screw.



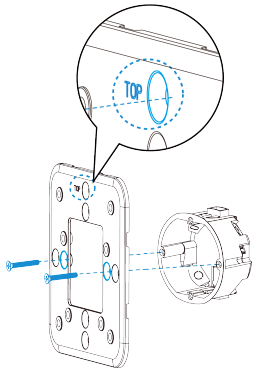
5. Switch the power back on. The screen will flash if the device is powered well.

Wall Plate Mounting (Optional)

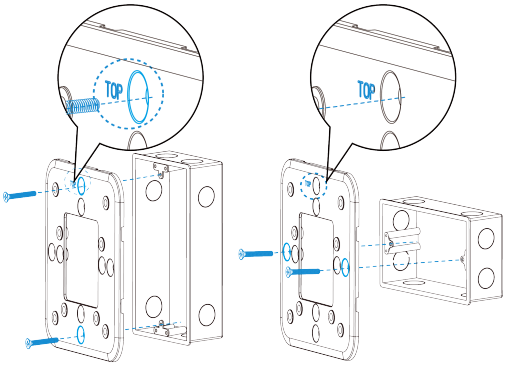
Applicable: Standard 86mm pattress box, European 60mm pattress box, 118/120mm pattress box.

1. Switch off the power to your system.

2. Fix the wall plate to the pattress box.



60mm Pattress Box

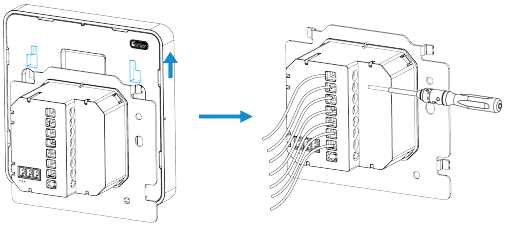


118/120 Pattress Box

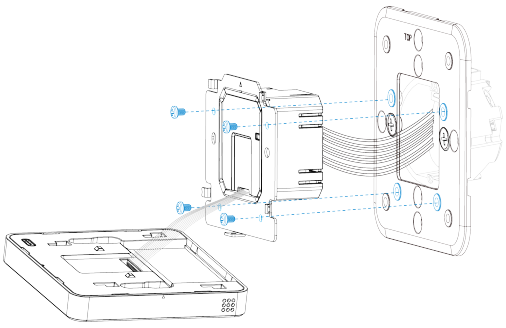
3. Remove the wire terminal from the device, then screw the wires to the wire terminals.

Note:

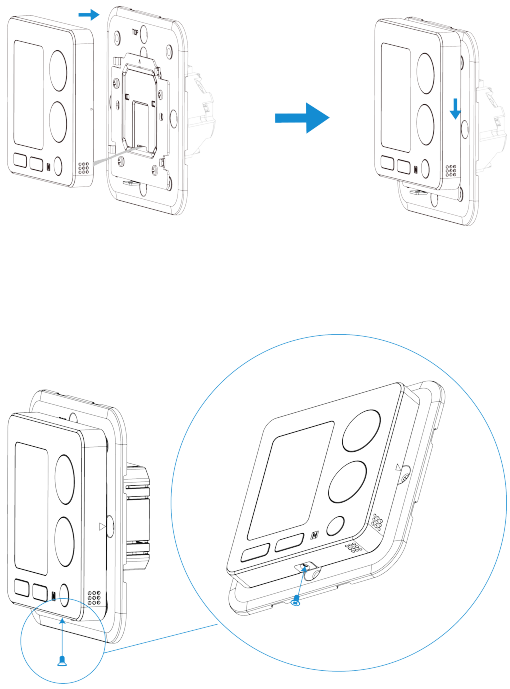
- If hard plastic wires are used, it must be bent to an appropriate angle in advance;
- Unused cables must be insulated and secured.



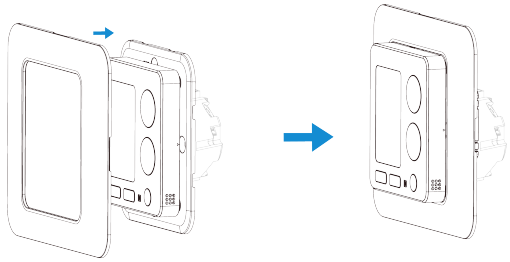
4. Fix the wire terminal to the wall plate via screws.



5. Fix the device to the wire terminal with the fixing screw.



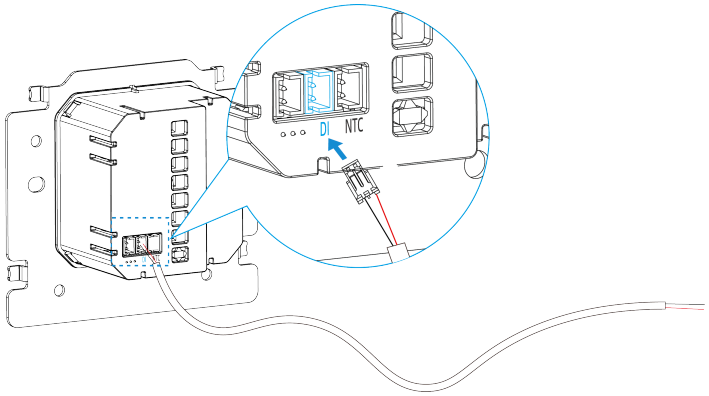
6. Fix the decorate plate to the device.



7. Switch the power back on. The screen will flash if the device is powered well.

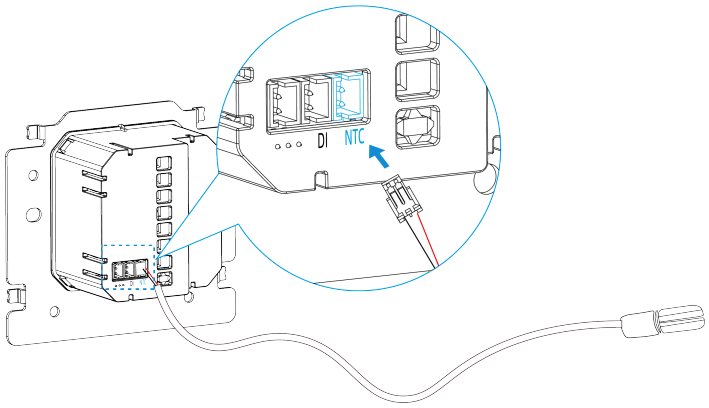
DI Installation (Optional)

The device supports connecting DI to key cards, magnetic switches, and other physical switches via the signal cable.



NTC Sensor Installation (Optional)

The device equips with a NTC input for optional NTC sensor connection. If you already have NTC sensors, please provide the spec of the sensors to Milesight to check the compatibilities.



Chapter 7. ToolBox Configuration Guide

Read/Write Operations

The device supports reading the data or writing the configuration via NFC locally.

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.

Network Settings

LoRaWAN® Settings

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.
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	It's fixed as Class C.
Confirmed Mode	If the device does not receive ACK packet from network server, it will re-send data once.
Join Type	OTAA and ABP mode are available. **Note:** it's necessary to select OTAA mode if connecting device to Milesight Development Platform.
Application Key	Appkey for OTAA mode, the default is 5572404C696E6B4C6F52613230313823. **Note:** please contact sales if you require random App Keys for bulks of devices before purchase.
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.

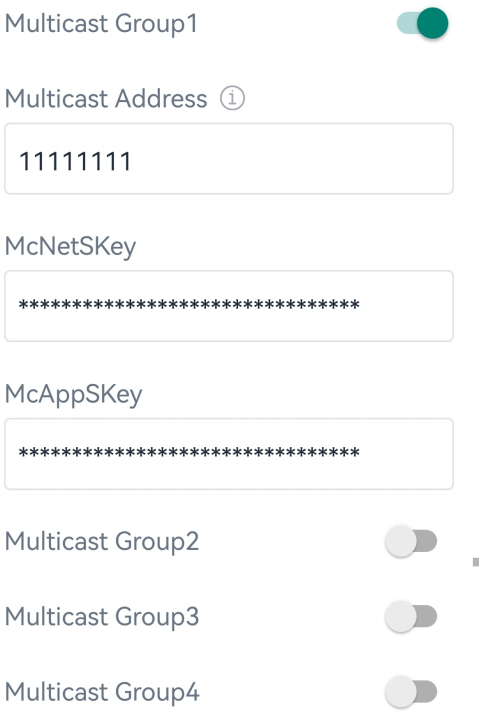
Parameter	Description
Rejoin Mode	Reporting interval≤35 mins: the device will send a specific number of Link-CheckReq MAC packets to the network server every reporting interval or every double reporting interval to validate connectivity; If there is no re-sponse, the device will re-join the network. 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. **Note:** 1. Only OTAA mode supports rejoin mode. 2. The actual sending number is **Set the number of packets sent** +1.
Supported Frequency	Enable or disable the frequency to send uplinks. If frequency is one of CN470/AU915/US915, enter the index of the channel to enable in the input box, making them 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: Indicate that all channels are disabled
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 consump-tion.

Parameter	Description
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 or send/receive D2D messages.
RX2 Frequency	RX2 frequency to receive downlinks or send/receive D2D messages. Unit: Hz
Multicast Group	Enable or disable the multicast groups to receive the multicast commands.

Multicast Setting

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.

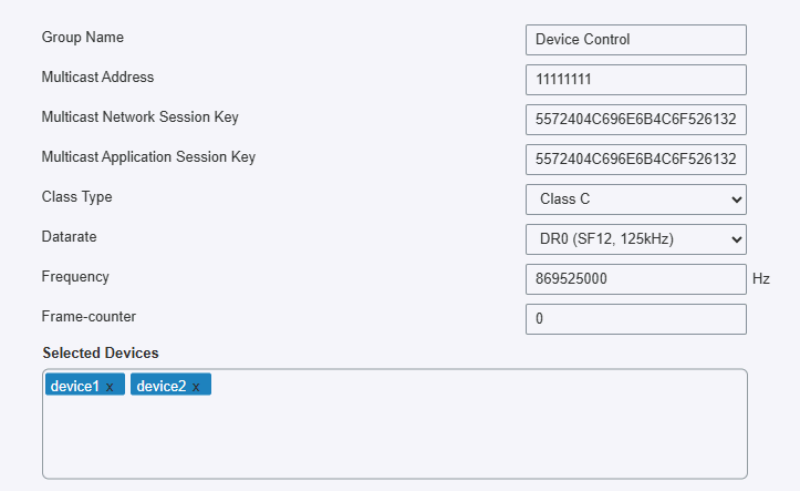
Step 1: Enable **Multicast Group**, and set unique multicast address and keys to distinguish other groups. You can also keep these settings by default.



Parameter	Description
Multicast Address	Unique 8-digit address to distinguish different multicast groups.

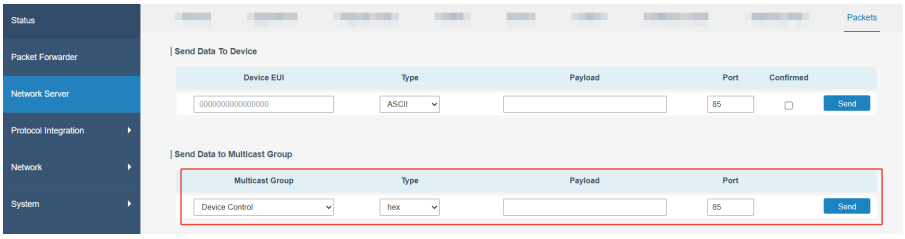
Parameter	Description
Multicast McNetSkey	32-digit key. Default values:
Multicast McAppSkey	Multicast Group 1: 5572404C696E6B4C6F52613230313823 Multicast Group 2: 5572404C696E6B4C6F52613230313824 Multicast Group 3: 5572404C696E6B4C6F52613230313825 Multicast Group 4: 5572404C696E6B4C6F52613230313826

Step 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.



Step 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.



Milesight D2D Settings

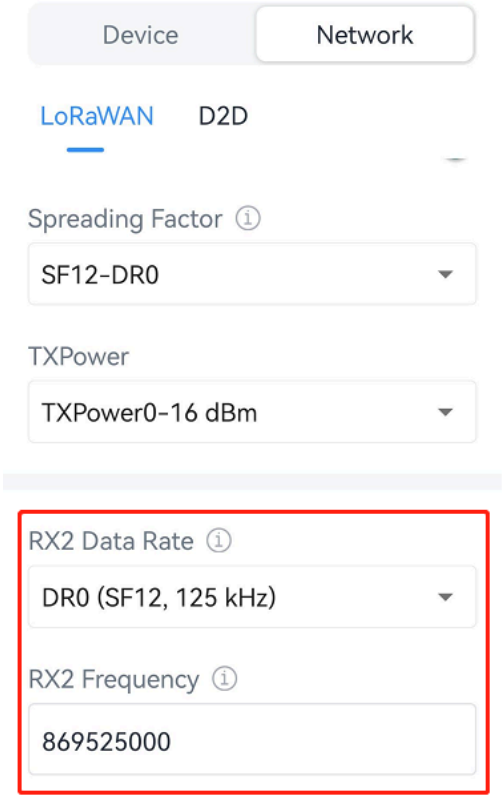
Milesight D2D protocol is developed by Milesight and used for setting up transmission among Milesight devices without gateway, which is able to reduce the latency and achieve the quick control.

D2D Data Receiving Settings

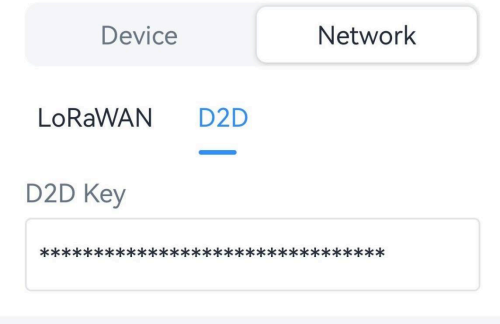
The device is able to receive temperature and humidity sensor data from Milesight sensors directly via Milesight D2D to display on the screen and achieve the accurate temperature control. Before using this feature, please ensure that you have one or more Milesight sensors **which support D2D Data Sending feature**.

Step 1: Send downlink command *(on page 70)* to switch the data source as D2D.

Step 2: Ensure the RX2 datarate and RX2 frequency are the same as the data sending devices.



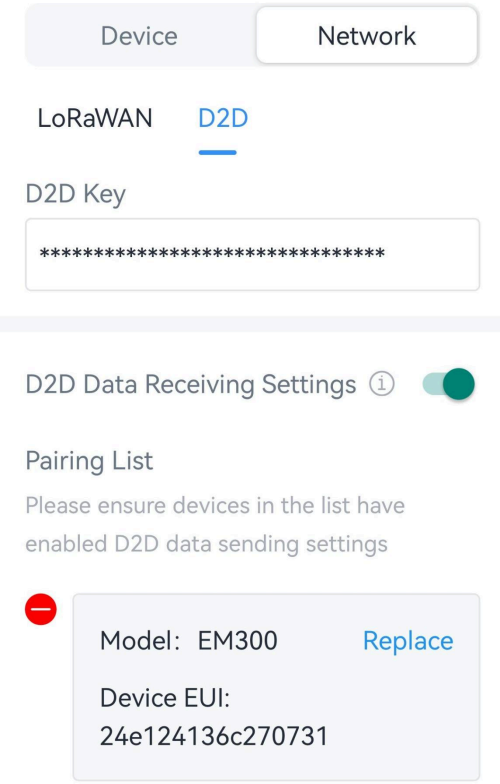
Step 3: Set the D2D key to be the same as the Milesight sensors. (Default D2D Key: 5572404C696E6B4C6F52613230313823)



Step 4: Enable **D2D Data Receiving Settings**, click Add, then attach the smartphone to NFC areas of Milesight sensors to add them to the device settings. If you require to replace the devices, click **Replace**, then attach the smartphone to anther sensor.

Tip:
One device supports to add 5 sensors at most. When multiple sensors are added, the device will use the average values of multiple sensors.

Step 5: Click **Write**, then attach the smartphone to device to save above settings.

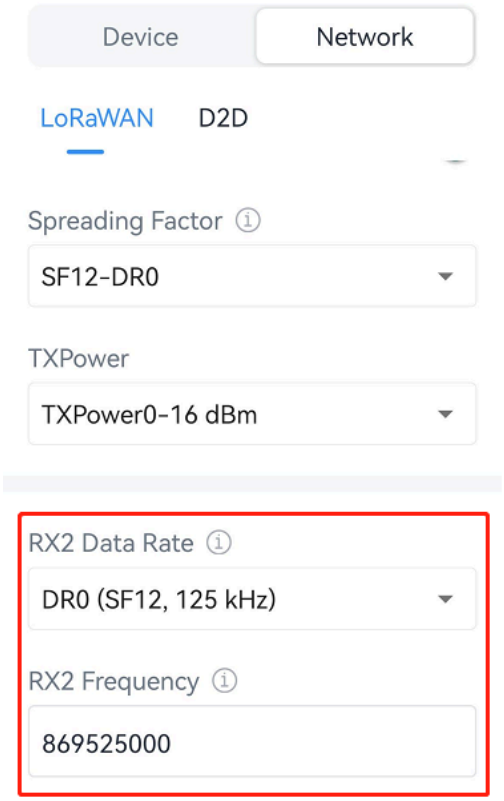


Milesight D2D Controller

The device is able to work as a D2D controller device to send commands to trigger D2D agent devices when system switches on/off or a specific schedule plan is switched.

Step 1: Configure the RX2 datarate and RX2 frequency.

> **Note:**
> It is suggested to change the default values if there are many LoRaWAN® devices around.

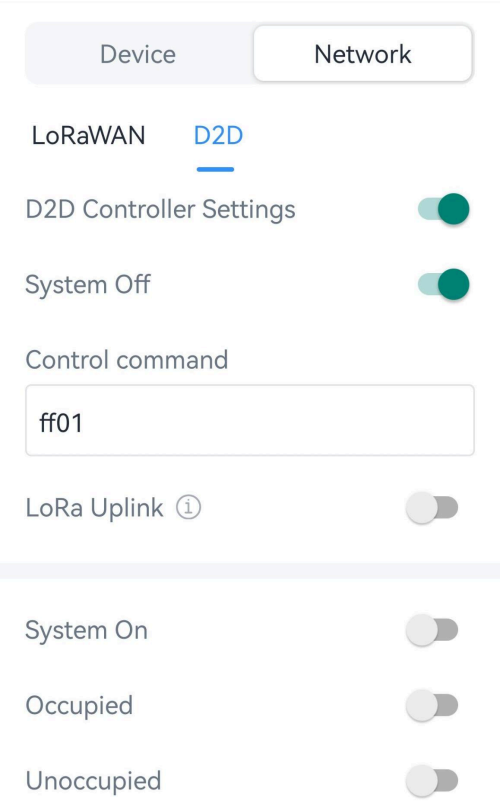


Step 2: Enable **D2D Controller Settings**, and define a unique D2D key to be the same as D2D agent devices. (Default D2D Key: 5572404C696E6B4C6F52613230313823)

Step 3: Enable one of statuses and configure 2-byte hexadecimal Milesight D2D command.

Note:
If **LoRa Uplink** is enabled, a LoRaWAN® uplink packet that contains corresponding alarm status will be sent to gateway after the Milesight D2D command packet. Otherwise, the packet will not send to LoRaWAN® gateway.

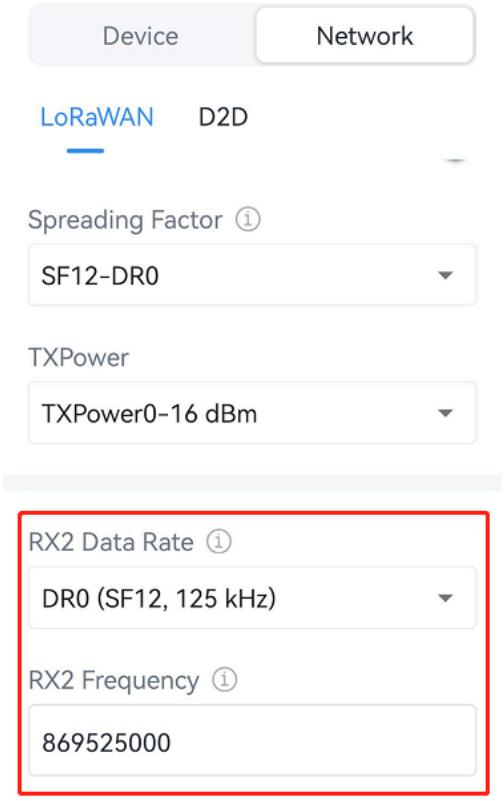
Example: When the system switches to off, the device will send command ff01 to D2D agent devices.



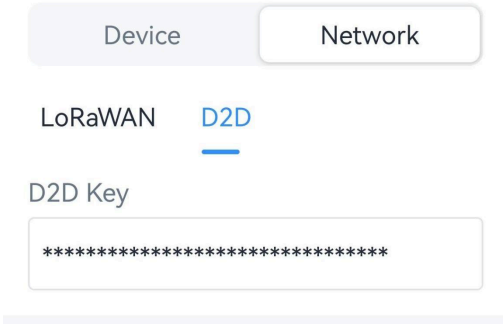
Milesight D2D Agent

The device is able to work as a Milesight D2D agent device to receive commands from Milesight D2D controller devices to trigger the system on/off or switch the schedule plans.

Step 1: Ensure the RX2 datarate and RX2 frequency are the same as the D2D controller devices.

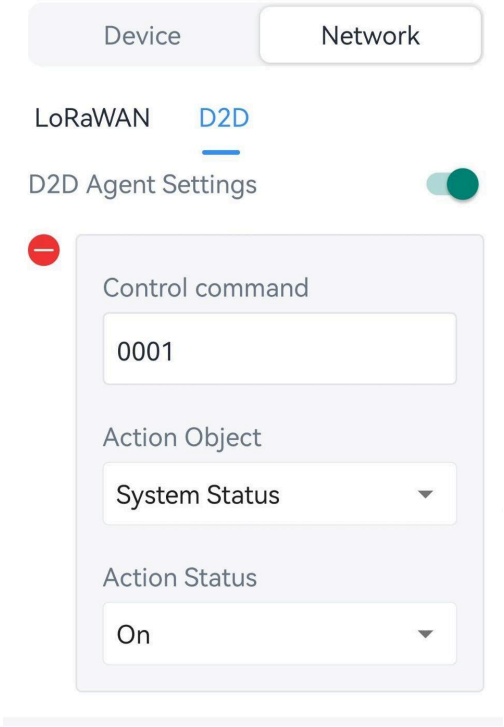


Step 2: Set the D2D key to be the same as the D2D controller devices. (Default D2D Key: 5572404C696E6B4C6F52613230313823)

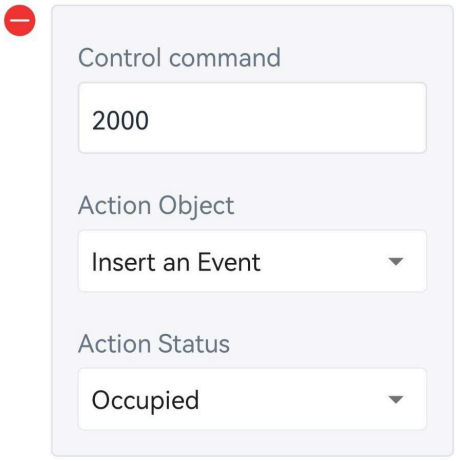


Step 3: Enable **D2D Agent Settings**, then add a rule to select the action object to trigger and configure a 2-byte hexadecimal Milesight D2D command. One device supports to add 8 rules at most.

Example 1: When receiving a command 0001, the device will switch the system on.

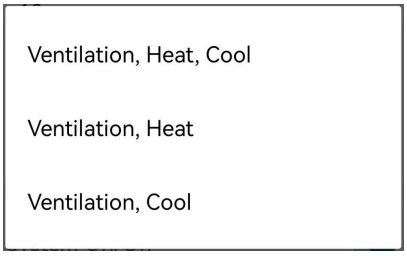


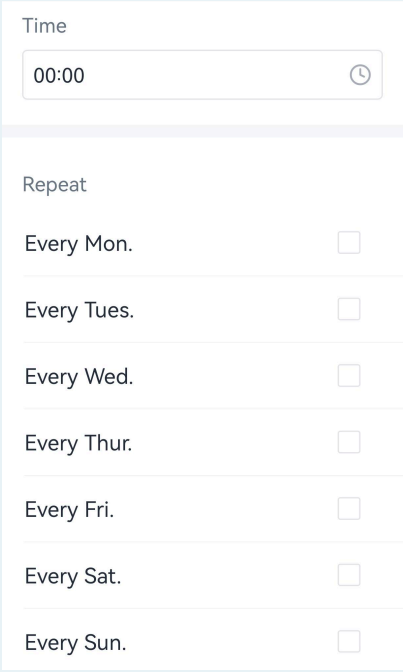
Example 2: When receiving a command 2000, the device will execute the Occupied schedule right away.

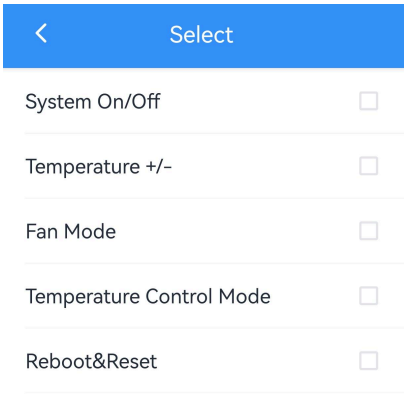


Device Settings

General Settings

Parameters	Description
Reporting Interval	The interval of reporting data to network server. Default: 10 min, Range: 1 - 1440 min
Temperature Unit	Set the unit of temperature displayed on the screen and the configuration page.
System On/Off	Turn on/off the fan coil system. This can also be switched by the button or downlink command.
Mode Enable	Select the control mode range for the button, ToolBox or downlink command to switches. 
Temperature Control Mode	Select the current control mode from the control mode range. This mode can also be switched by the button or downlink command.
Target Temperature Resolution	Select the resolution to adjust and display the target temperature. Options: 0.5, 1.
Target Temperature	Set the target temperature of heat or cool mode. This is not used in ventilation mode.
Target Temperature Tolerance	Set the allowed tolerance value between target temperature and current temperature.
Target Temperature Regulation Range	Set the range to adjust the target temperature, this must more than 1. Range: 5-35°C (41-95°F)
Target Humidity Range	Set the target humidity range.

Parameters	Description
Temp. Control and Dehumidify	When reaching the target temperature range but not reaching the target humidity range, the device will keep cooling or heating to dehumidify. **Temp. Tolerance for Dehumidification**: When reaching this tolerance over target temperature range, the device will stop heating or cooling even it is not reaching the target humidity range.
Fan Mode	Select from Auto, Low, Medium and High. This can also be switched by button or downlink commands.
Fan Delay	Enable to delay the close of fan after the system is off, or the temperature control stops under auto fan mode. **The Duration of Delay**: Set the duration of the fan's deferred closing. Range: 30-3600s.
Time Switch System	Enable to configure the time and weekday to turn on/off the fan coil system. The device supports to add at most 4 on time and 4 off time. **Tip:** If the repeat day is not selected, the time will only execute once. 

Parameters	Description
Smart Display	When the new collected value is close to the last value (temp. ≤ ±0.5°C or hum. ≤ ±3%) within 10 minutes, the screen will stop updating these values to save life and power.
Child Lock	Enable to lock the button features. After enabled, the device can only control these features via ToolBox or downlink commands. 
Time Zone	Select the UTC time zone. When you click **Sync** button of ToolBox App to sync time, the device will also sync the time zone from smart phone automatically.
Daylight Saving Time	Enable or disable Daylight Saving Time (DST). **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 faster according to this bias.
Change Password	Change the password for ToolBox App to write this device.

Calibration Settings

The device supports temperature and humidity numerical calibration.

Note:
The calibration settings will not work if the data source is LoRaWAN® network server or D2D devices.

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

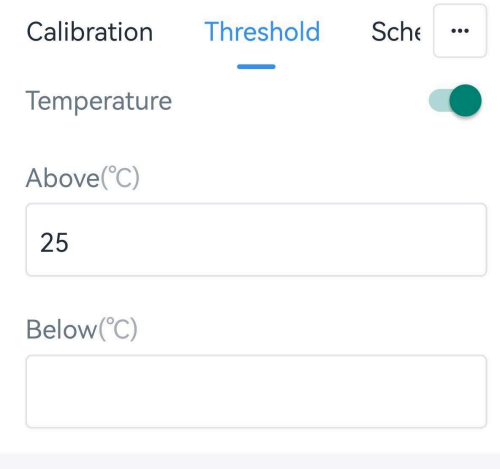
Humidity Calibration: set the calibration value, the device will add calibration value to the current humidity value and report the final value.

Threshold Settings

The device supports to send alarm packets when the environment temperature reaches the preset thresholds.

Temperature threshold

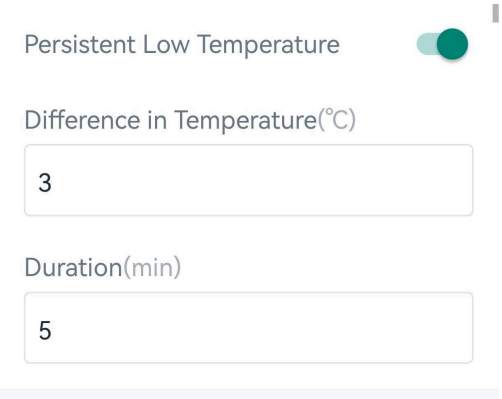
When current temperature is over or below the threshold value, the device will report a threshold alarm packet instantly. Only when the threshold is released and re-triggered, will the device report the alarm again.



Persistent low temperature threshold

When current temperature is lower than the *Tset - To*(target temperature - target temperature tolerance) for difference value and specific duration, the device will report a threshold alarm packet instantly. When the threshold is released, it will also report the alarm release packet.

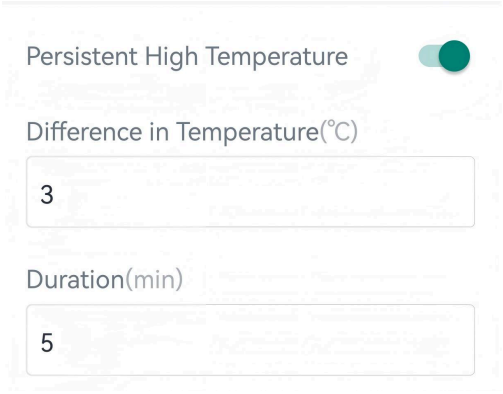
Example: Target temperature is 22°C, target temperature tolerance is 1°C, the device will send this alarm when the environment temperature is below 18°C for 5 minutes.



Persistent high temperature threshold

When current temperature is higher than the *Tset + To* (target temperature + target temperature tolerance) for difference value and specific duration, the device will report a threshold alarm packet instantly. When the threshold is released, it will also report the alarm release packet.

Example: Target temperature is 22°C, target temperature tolerance is 1°C, the device will send this alarm when the environment temperature is over 26°C for 5 minutes.



Schedule Settings

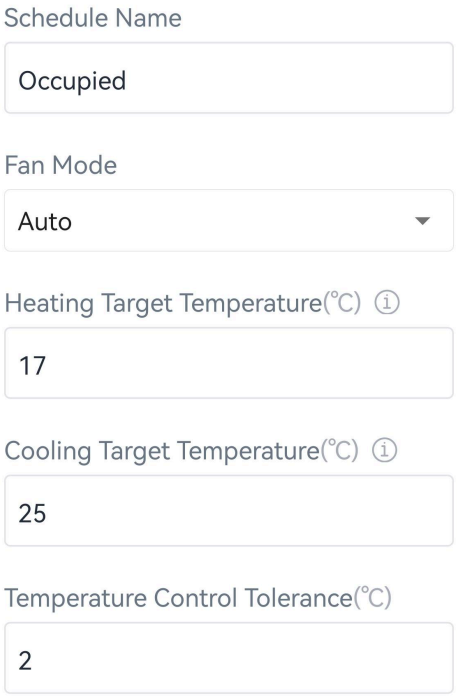
The device supports to add schedule plans to achieve the automatic temperature control for different time periods.

Step 1: Ensure the device time *(on page 53)* is correct.

Step 2: Select the required schedule plan and click **Edit** to configure the schedule name, temperature control mode, fan mode, target temperature and target temperature tolerance. You can also click **Add New Schedule** to add a new schedule. One device supports 8 kinds of schedule plans at most.

Tip:

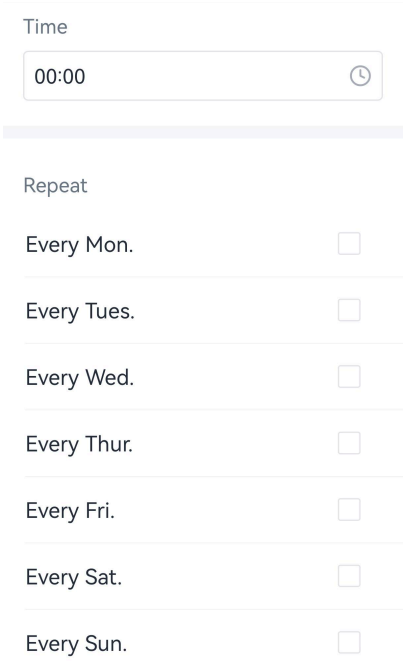
- The schedule name only allows these characters: a-z, A-Z, digits and spaces. The maximum length of the name is 10.
- If the temperatures are left blank, this schedule plan will only execute when the temperature control mode is Ventilation.



Step 3: Add the time period to execute the schedule plan. Every schedule plan supports 16 time periods at most.

Tip:

- If the repeat day is not selected, the time will only execute once.
- Every time period must be different.



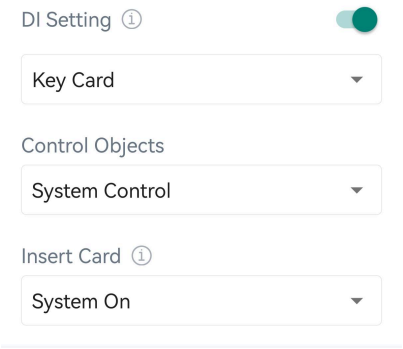
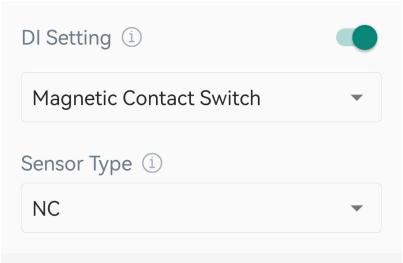
Step 4: Click **Write** to save above settings.

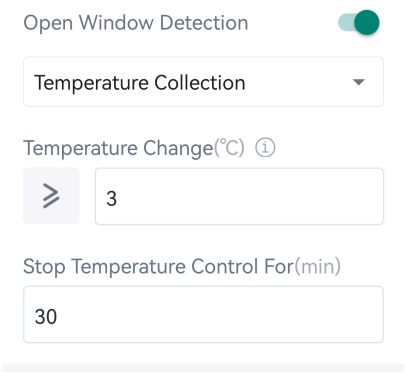
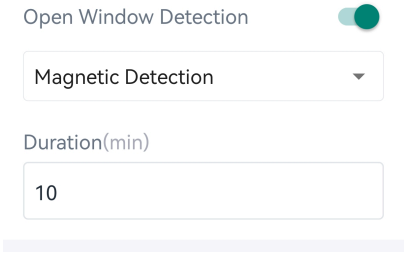
Installation Settings

It is necessary for the device to configure the features of every wire after wiring installation.

WT303

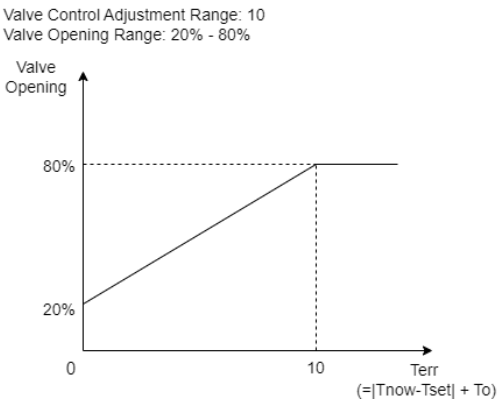
Parameter	Description
System Type	Select the fail coil system type according to the wiring *(on page 12)*.
DI Settings	Enable or disable the DI interface and select the type according to connected terminals. **Key Card**: Select the control action as system on/off control or schedule plan switches when inserting or removing the key card.

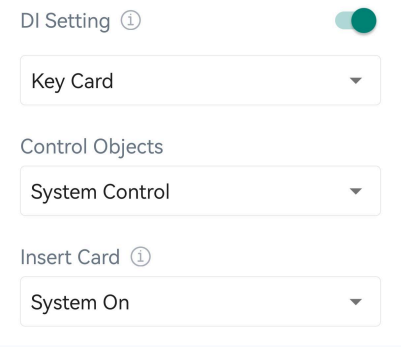
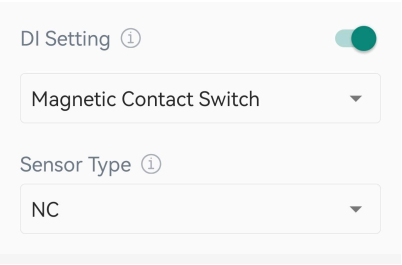
Parameter	Description
	 **Tip:** Insert card = DI and GND connected, remove card = DI and GND disconnected. **Magnetic Contact Switch**: select the sensor type as NC or NO.NO: DI and GND connected=door/window open NC: DI and GND connected=door/window open 
Open Window Detection	When the device detects the open window status, it will send the open window alarm and stop temperature control (valve and fan off). The open window status can be detected by two modes: **Temperature Collection**: When the temperature changes over the preset value, the device will judge as open window status to send alarm and stop temperature control. After the stop time, the device will release the open window status and start temperature control.

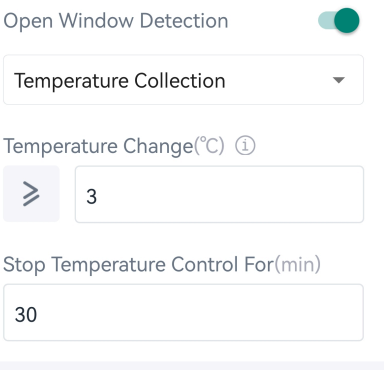
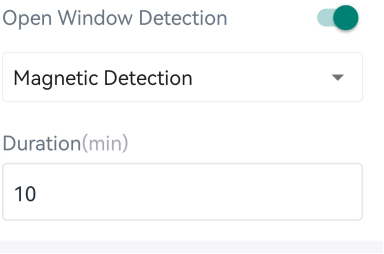
Parameter	Description
	 **Magnetic Detection**: This mode only works when the DI is enabled and work as Magnetic Contact Switch. When the magnetic contact switch detects window open and last for this duration, the device will judge as open window status to send alarm and stop temperature control. When the magnetic contact switch detects window close and last for this duration, the device will release the open window status and start temperature control. 
Freeze Protection	When current temperature is lower than the protection target temperature, the device will start heating until the temperature reaches to [protection target temperature + target temperature tolerance], then change back to the original status. If the system is off, this feature will turn on temporarily and only System On/Off button can work.

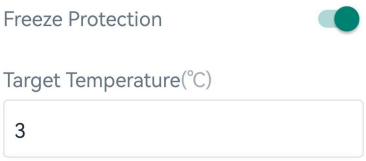
Parameter	Description
	Freeze Protection Target Temperature(℃) 3

WT304

Parameter	Description
System Type	Select the fail coil system type according to the wiring *(on page 12)*.
Valve Control Adjustment Range	These parameters can be used to adjust the change rate of 0-10V valve opening according to the difference between the current temperature and target temperature control stop point. Example: 
Valve Opening Range	
Valve Control Interval	The device will keep the valve opening percentage for this interval, and change after this interval.
Low/Medium/High Speed	When the fan type is ECM fan (0-10V), configure the voltage output percent of every speed.
DI Settings	Enable or disable the DI interface and select the type according to connected terminals.

Parameter	Description
	Key Card: Select the control action as system on/off control or schedule plan switches when inserting or removing the key card.  **Tip:** Insert card = DI and GND connected, remove card = DI and GND disconnected. **Magnetic Contact Switch**: select the sensor type as NC or NO.NO: DI and GND connected=door/window open NC: DI and GND connected=door/window open 
Open Win-dow Detection	When the device detects the open window status, it will send the open window alarm and stop temperature control (valve and fan off). The open window status can be detected by two modes: **Temperature Collection**: When the temperature changes over the preset value, the device will judge as open window status to send alarm and stop temperature control. After the

Parameter	Description
	stop time, the device will release the open window status and start temperature control.  **Magnetic Detection**: This mode only works when the DI is enabled and work as Magnetic Contact Switch. When the magnetic contact switch detects window open and last for this duration, the device will judge as open window status to send alarm and stop temperature control. When the magnetic contact switch detects window close and last for this duration, the device will release the open window status and start temperature control. 
Freeze Protection	When current temperature is lower than the protection target temperature, the device will start heating until the temperature reaches to [protection target temperature + target temperature tolerance], then change back to the original status. If the system is off, this feature will turn on temporarily and only System On/Off button can work.

Parameter	Description
	

Maintenance

Upgrade

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

Upgrade via NFC

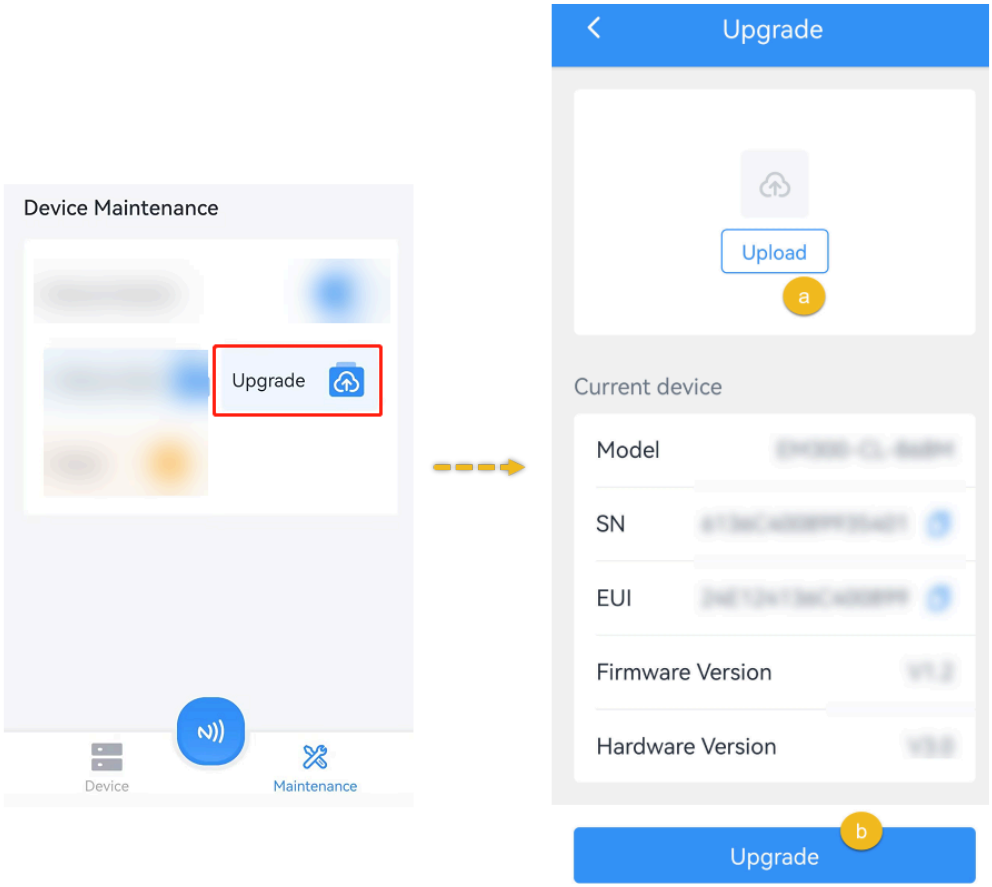
Step 1: Download firmware from Milesight official website to your smartphone.

Step 2: Launch ToolBox App, click **Upgrade** to upload the firmware file.

Step 3: Click **Upgrade** to upgrade the device.

Note:

- Operation on ToolBox is not supported during an upgrade.
- Only Android version ToolBox supports the upgrade feature.



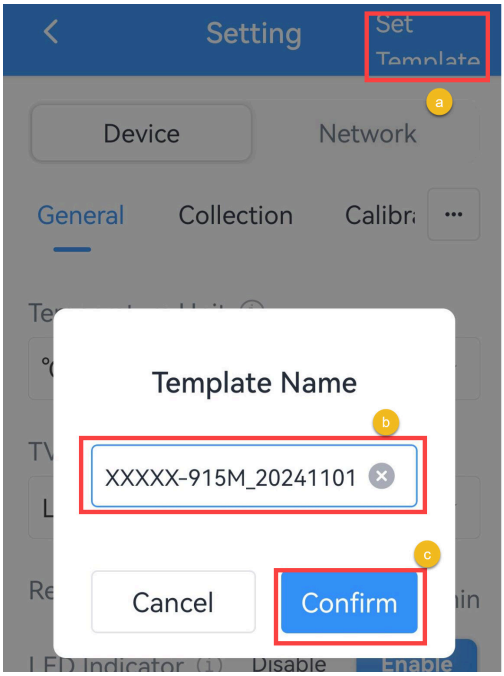
Backup and Restore

This device supports configuration backup for easy and quick device configuration in bulks. Backup and restore is allowed only for devices with the same model and frequency band.

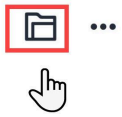
Backup and Restore

Step 1: Launch ToolBox App, attach the NFC area of smartphone to the device to read the configuration.

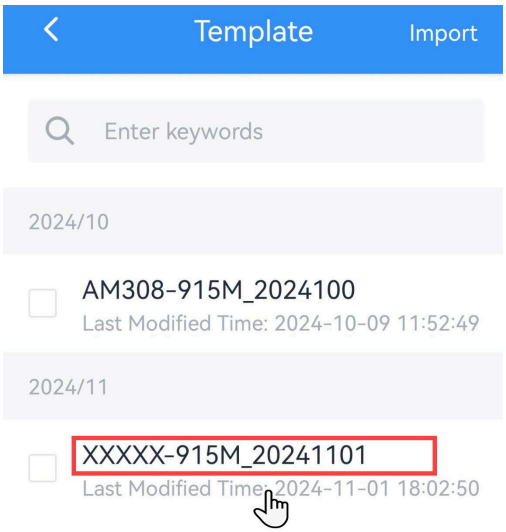
Step 2: Edit the configuration as required, click **Set Template** to save current configuration as a template to the ToolBox App.



Step 3: Go to **Device >Template** page.



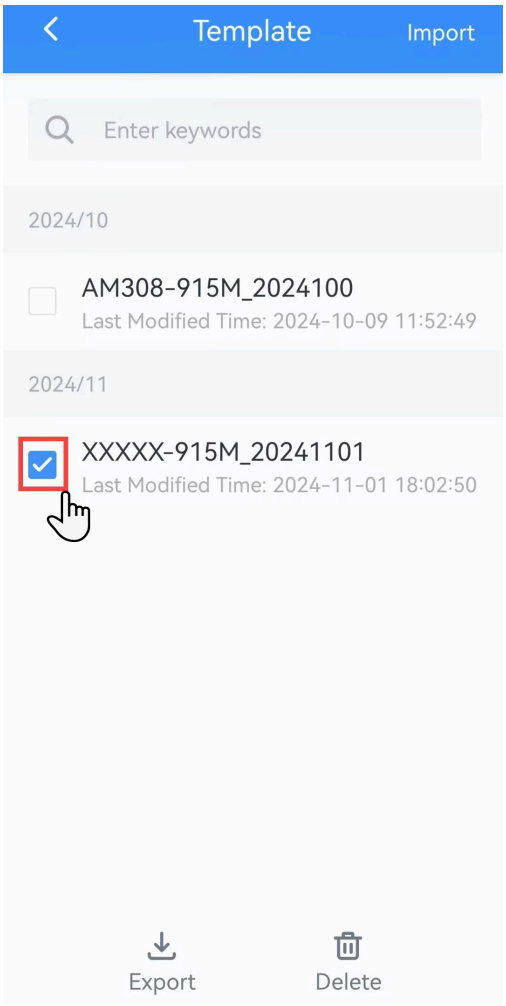
Step 4: Select and click the target template, click **Write** to import the configuration to target devices.



Export and Delete Template

Step 1: Check the box of the target template.

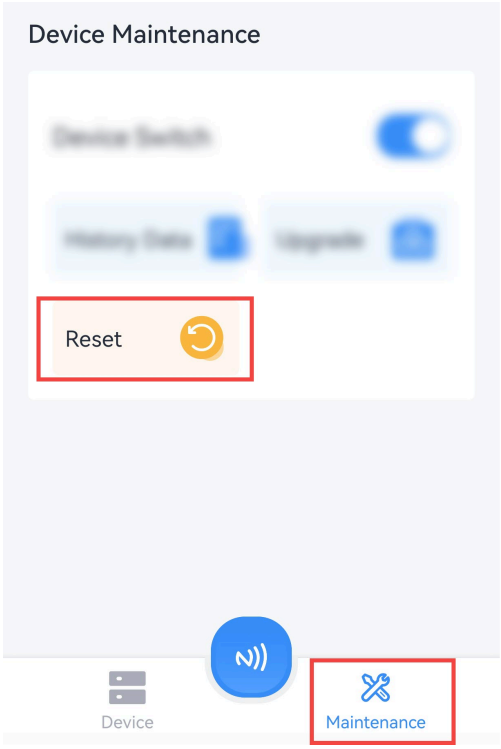
Step 2: Click **Export** to export this template as JSON format file and save it to the smartphone, click **Delete** to delete this template from your ToolBox App.



Reboot and Reset

Reboot: Click **Restart** and attach the smartphone to device to reboot the device.

Reset: Click **Reset** and attach the smartphone to device to reset the device.


Device Maintenance
Reset
Device
Maintenance

Chapter 8. Features Exploring

Data Source Selection

It is necessary for thermostat to know the environment temperature and humidity to display on the screen and achieve the accurate control. The thermostat provides 4 kinds of data sources for different application environments:

Source Mode	Description
Internal	The thermostat has already equipped the temperature and humidity sensors.
NTC	The thermostat provides a NTC input to connect to a NTC temperature sensor. When connecting a NTC sensor, the thermostat will use NTC sensor as temperature source and internal sensor as humidity data source.
LNS	The thermostat is able to receive the temperature and humidity data from LoRaWAN® network server.
D2D	The thermostat is able to receive the temperature and humidity data from Milesight sensors via Milesight D2D feature.

How to Select the Data Source

The thermostat internal sensors can suit for most of applications without extra sensor deployment. However, if one of the following scenarios occurs, you may choose to use other data sources:

- The accuracy of the internal sensors does not match the requirement;
- There are unavoidable temperature influences at target installation location of the thermostat;
- The target installation location of the thermostat is not representative.

If you decide not to use internal sensors, please select the data source mode depending on the sensors you have:

- NTC Sensor: select the NTC mode if your sensor can suit the requirement of thermostat NTC input.
- Milesght Sensor: If this model supports D2D Data Sending feature and is within the transmission distance with the thermostat, select D2D mode; if not, select LNS mode.
- Other type sensors: select LNS mode.

How to Configure the Data Source

The thermostat uses internal sensors by default and provides the downlink command *(on page 70)* to switch data sources. After switching, please refer to the following information:

- NTC: NTC Sensor Installation *(on page 19)*
- LNS: Send temperature/humidity downlink command *(on page 70)*
- D2D: D2D Data Receiving Settings via ToolBox *(on page 25)* or Downlink Command *(on page 79)*

Calibration

The thermostat supports numerical calibration for temperature and humidity data. The thermostat will use the calibration results to display on the screen and achieve temperature control.

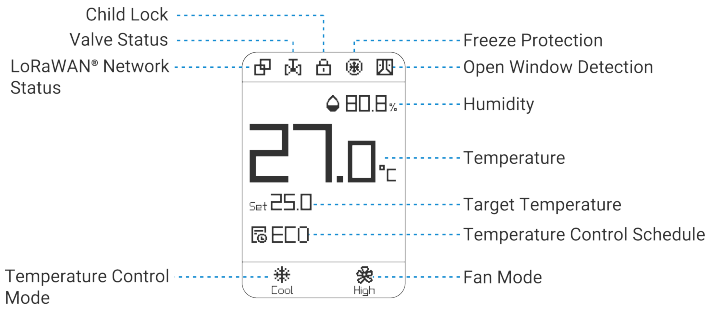
Note:
This only works when the data source is internal or NTC sensor.

Configuration Descriptions:

- ToolBox *(on page 33)*
- Downlink Command *(on page 71)*

Screen Display

WT30x equips an e-ink screen to monitor the environment and display the control status.



Icon	Description
Network Status	: The device joins the network. : The device fails to join the network.
Valve Status	Display when any valve opens.
Child Lock	All buttons locked: normal display Parts of buttons locked: display when the locked button is pressed
Freeze Protection	Display when freeze protection is triggered.
Open Window Detection	Display when detecting the open window status.
Humidity	Display the environment humidity. This display can be disabled by downlink command.
Temperature	Display the environment temperature. This display can be disabled by downlink command.
Target Temperature	Display the target temperature of heat or cool control mode. This display can be disabled by downlink command. **Note:** When the display of the environment temperature is disabled, the original location will display the target temperature.
Temperature Control Schedule	Display current executed schedule name. This display can be disabled by downlink command.
Temperature Control Mode	Display current temperature control mode setting.
Fan Mode	Display current fan mode setting.

Note:
When the system is off, the screen only displays environment temperature and humidity.

Smart Display

By default, the device will update the corresponding screen content in real-time when the values or statuses change. Besides, it will do a full-screen refresh every 1 hour in order to remove ghosting.

The device supports smart display feature to save and power and expand the screen life by reducing the screen update times. When the smart display is enabled, the screen will stop updating temperature or humidity if the new collected value is close to the last value (temp. ≤ ±0.5°C or hum. ≤ ±3%) within 10 minutes. And the device will do the full-screen refresh after updating the screen 30 times.

Configuration Description:

- ToolBox *(on page 33)*
- Downlink Command *(on page 69)*

Over-temperature Protection

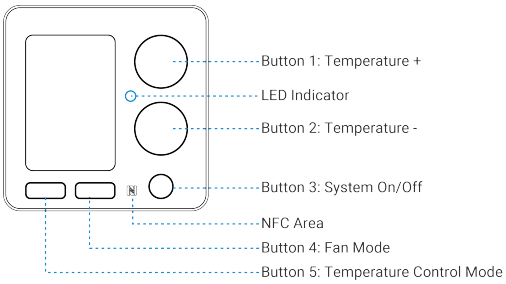
The operating temperature of the screen is 0°C to 40°C. When the device detects the environment temperature beyond the range of 0-40 °C for 6 consecutive times, the device will turn off the screen to protect it, and all buttons will be locked. During this time, the device can only be checked and configured by ToolBox or uplink/downlink messages.

Both the screen and buttons will return to normal work only when the device collects the temperature within the normal range for 6 consecutive times (The collect interval is 30s by default and can be changed by downlink command).

Note:
Over-temperature protection only uses internal sensors as data source even it is selected as other modes.

Buttons and Locks

WT30x equips 5 buttons to achieve simple controls.



Button	Function
1	Increase the target temperature
2	Decrease the target temperature
3	System on/off
4	Switch the fan mode parameter
5	Switch the temperature control mode parameter
3+5	Reboot: Press and hold the buttons together for more than 3s. Reset: Press and hold the buttons together for more than 10s.

Child Lock

The thermostat supports child lock feature to lock the features of the buttons to prevent accidental touch. When the button is locked, the corresponding feature can only be controlled by ToolBox or downlink commands.

Configuration Descriptions:

- ToolBox *(on page 33)*
- Downlink Command *(on page 65)*

Besides, the thermostat also provides the downlink command *(on page 65)* to configure 2-5 button combinations to release the button locks temporarily for professional debug. When this feature is configured, users can press the combination buttons to release the lock for a short time.

Time Settings

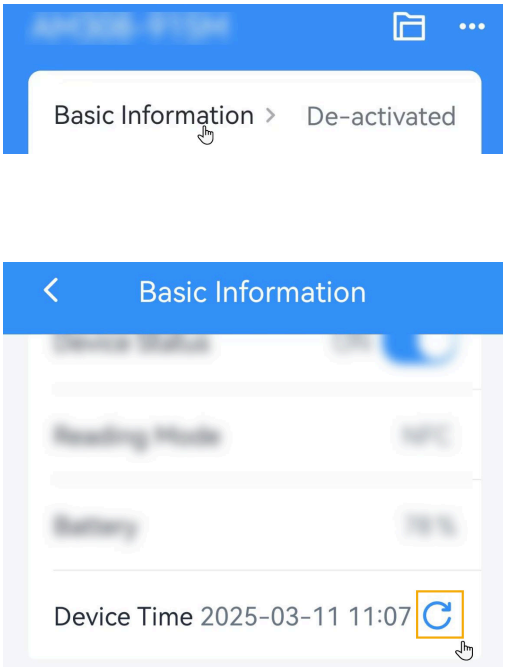
It is necessary for the thermostat to get the correct time and time zone for schedule plans and time switches control.

Time Synchronization

Please select one of below methods to sync the time and time zone of the device.

Sync via ToolBox App

After reading the device via Milesight ToolBox App, sync the device time with time zone from the smart phone.



Sync via LoRaWAN® Network Server

This requires to ensure the LoRaWAN® network server supports device time synchronization feature.

1. Set the LoRaWAN® version of the device to V1.0.3.
2. 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 *(on page 33)* or downlink command *(on page 68)*.
- By default, the device will send the DeviceTimeReq command every 5 days since the last sync. You can also send the downlink command *(on page 68)* to force the device to sync the time from LNS.

Daylight Saving Time

The thermostat is able to configure the daylight saving time (DST) setting for accurate time control.

Configuration Description:

- ToolBox *(on page 33)*
- Downlink Command *(on page 68)*

Temperature Control Mode

The thermostat supports 3 control modes:

Mode	Description
Heat	Adjust the heating valve to rise the temperature
Cool	Adjust the cooling valve to lower the temperature
Ventilation	Turn off the valves or output 0V

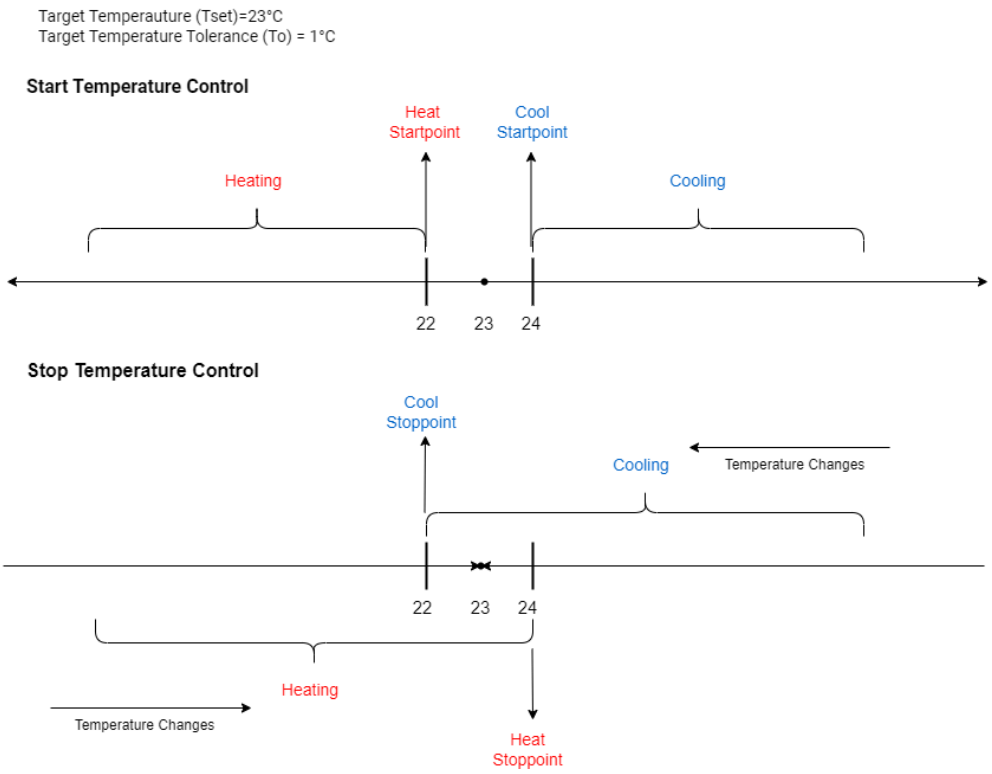
Heat or Cool Mode Control

The heating or cooling process is mainly decided by the target temperature and the tolerance.

Heat: start heating when *Tnow < Tset - To*, stop heating when *Tnow ≥ Tset + To*

Cool: start cooling when *Tnow > Tset + To*, stop heating when *Tnow ≤ Tset - To*

Example:



Configuration Description:

- Button Switch *(on page 52)* (when the child lock is disabled)
- ToolBox *(on page 31)*
- Downlink Command *(on page 74)*

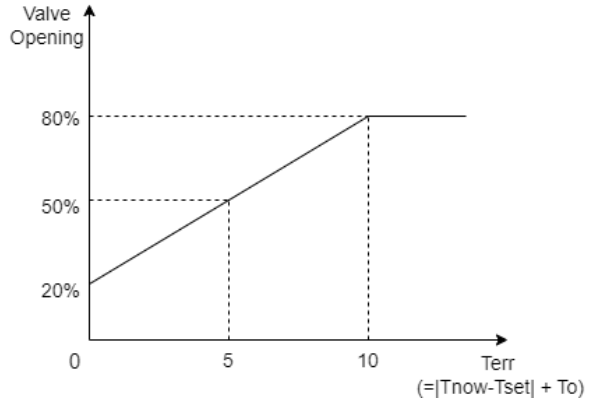
0-10V Valve Control (WT304 Only)

When the thermostat connects a 0-10V valve, it requires to configure the change rate of valve opening according to the difference between the current temperature and heat/cool stop point. Take below configuration example,

Heat: When current temperature (Tnow) = 19°C, Terr=5°C, the valve will output 50% of 0-10V; after 30s, it will check the Terr value again and change the valve opening the percentage until reaching the heat stop point.

Cool: When current temperature (Tnow) = 27°C, Terr=5°C, the valve will output 50% of 0-10V; after 30s, it will check the Terr value again and change the valve opening the percentage until reaching the cool stop point.

Valve Control Adjustment Range: 10
Valve Opening Range: 20% - 80%
Valve Control Interval: 30s
Target Temperauture (Tset)=23°C
Target Temperature Tolerance (To) = 1°C



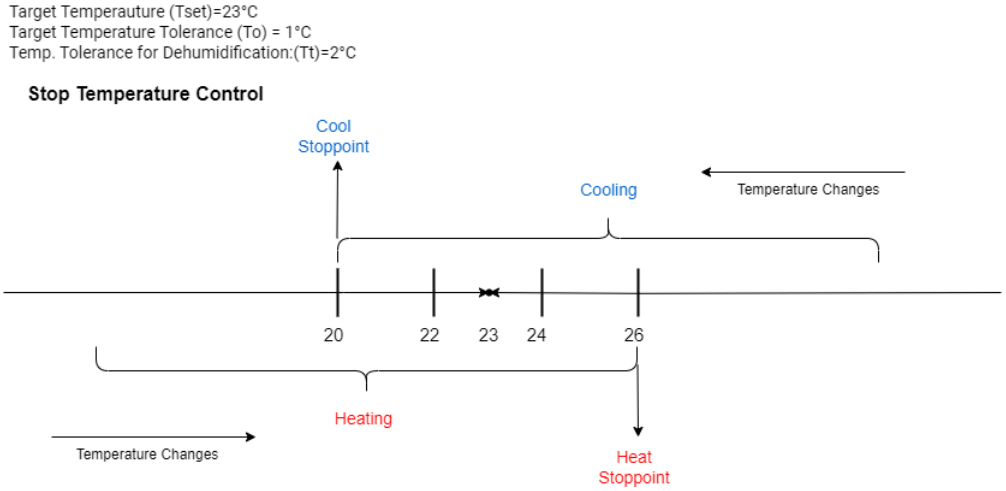
Configuration Descriptions:

- ToolBox *(on page 38)*
- Downlink Command *(on page 72)*

> **Tip:**
> When the thermostat stop controlling, the valve will output 0V to stop working. You can also send downlink command to change the valve status *(on page 73)* to output minimum opening range and change the fan status *(on page 76)* to Low.

Temperature Control and Dehumidify

When reaching the target temperature range but beyond the target humidity range, the thermostat will keep cooling or heating to dehumidify. This will extend the heating/cooling time and affect the temperature control stop points. Take below example:



Configuration Description:

- ToolBox *(on page 32)*
- Download Command *(on page 74)*

Fan Mode

The thermostat 4 fan modes:

Mode	Description
Low	AC 3-Speed Fan: Turn on the Low/Medium/High speed. ECM Fan: Adjust the voltage output of Low/Medium/High speed. This requires configuring the output percentage of the 3 speeds.
Medium	
High	
Auto	Adjust the fan speed according to the differences between current temperature and target temperature range.

Configuration Description:

- Button Switch *(on page 52)* (when the child lock is disabled)
- ToolBox *(on page 32)*
- Downlink Command *(on page 76)*

Auto Fan Mode

Under auto fan mode, the thermostat will switch the fan speed according to a threshold value ΔT.

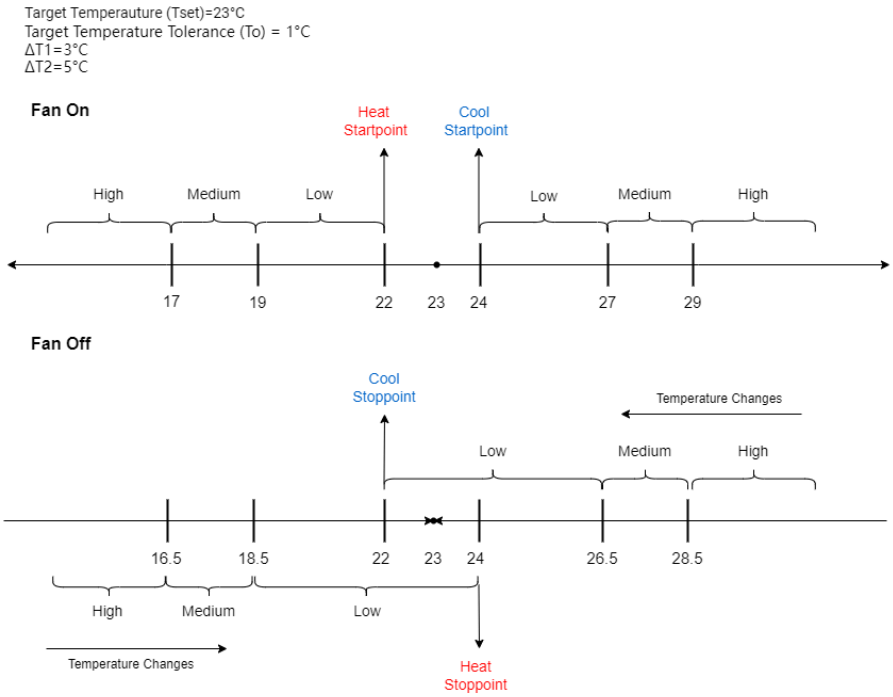
Heat: ΔT= *|Tnow - (Tset - To)|*

Cool: ΔT= *Tnow - (Tset + To)*

Fan Speed	Threshold
Low → Medium	≥ ΔT1
Medium → High	≥ ΔT2
High → Medium	< ΔT2-0.5
Medium → Low	< ΔT1-0.5

By default, ΔT1=3°C, ΔT2=5°C. Both values can be changed by downlink commands.

Example:



When the temperature reaches the heat or cool stop point, the fan will shut off. You can also send the downlink command to keep the fan mode as Low speed during standby status.

Fan Delay

When the system is switched off, or temperature reaches the heat or cool stop point under Auto fan mode, the thermostat support configuring the time to delay the close of fan.

Chapter 9. Communication Protocol

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 examples please find files on https://github.com/Milesight-IoT/SensorDecoders.

When sending downlink commands while enabling Confirmed mode, the device will send replies.

Table 3. 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.

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
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
Temperature	01	2	INT16/100, Unit: °C
Humidity	02	2	UINT16/10, Unit: %RH

Item	Command	Byte	Description
Target Temperature	03	2	INT16/100, Unit: °C
Data Source	04	1	00: Internal, 01: NTC, 02: LNS, 03: D2D Device
Temperature Control Mode and Status	05	1	Bit 7-4: Temperature Control Mode, 0=Ventilation, 1=Heat, 2=Cool Bit 3-1: Temperature Control Status, 0=Standby, 1=Heat, 2=Cool
Valve Opening Status	06	1	UINT8, Unit: %
Fan Mode and Status	07	1	Bit 7-4: Fan Status, 0=Off, 1=Low, 2=Medium, 3=High Bit 3-1: Fan Mode, 0=Auto, 1=Low, 2=Medium, 3=High
Temperature Control Schedule	08	1	Schedule ID Range: 00-07 (ff=Not executed)
System Status	67	1	00=Off, 01=On
Temperature Overrage Alarm	09	1	00=Collection error, 01=Under-range, 02=Over-range, 03=No data
Temperature Alarm	09	3	**Byte 1:** 10=Below dismiss, 11=Below (min. threshold) alarm 12=Above dismiss, 13=Above (max. threshold) alarm 14=Within dismiss, 15=Within alarm 16=Beyond dismiss, 17=Beyond alarm 20=Persistent low dismiss, 21=Persistent low alarm 22=Persistent high dismiss, 23=Persistent high alarm 30=Freeze protection dismiss, 31=Freeze protection alarm 32=Open window detection dismiss, 33=Open window detection alarm **Bit 2-3:** Temperature, INT16/100, Unit: °C

<table>
<tr><th>Item</th><th>Command</th><th>Byte</th><th>Description</th></tr>
<tr><td>Humidity Alarm</td><td>0a</td><td>1</td><td>00=Collection error, 01=Under-range, 02=Over-range, 03=No data</td></tr>
<tr><td>Target Temperature Invalid Alarm</td><td>0b</td><td>1</td><td>03</td></tr>
<tr><td>Relay Status</td><td>10</td><td>4</td><td>Byte 1: for every bit: 0=Disable, 1=Enable
<table><tr><th>Bit</th><th>Relay</th></tr><tr><td>0</td><td>Low/Q1</td></tr><tr><td>1</td><td>Mid/Q2</td></tr><tr><td>2</td><td>High/Q3</td></tr><tr><td>3</td><td>V1/NO</td></tr><tr><td>4</td><td>V2/NC</td></tr><tr><td>5-7</td><td>000</td></tr></table>Byte 2-4: 000000</td></tr>
</table>

Basic Information

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

Example:

df0100ee db6406f07159330024 da0101010100000000 d90000c801cf0002	
Command	**Value**
df	TSL Version: 0100=>V1.0
ee	Reset
db	SN: 6406f07159330024
da	Hardware version: 0101=V1.1 Software version: 0101=V1.1
d9	OEM ID: 0000
c8	01: Device is On

df0100ee db6406f07159330024 da0101010100000000 d90000c801cf0002	
Command	**Value**
cf00	02: Class C

Periodic Report

The device supports to report the periodic report packet when:

1. According to reporting interval (10 mins by default).
2. System status, target temperature, temperature control mode, fan mode or temperature control schedule ID changes.

01040b02540203a4060400 05100600070008ff6701	
Command	**Value**
01	Temperature: 04 0b => 0b 04=2820/100=28.2°C
02	Humidity: 54 02 => 02 54 = 596/10=59.6%RH
03	Target temperature:a4 06 => 06 a4= 1700/100=17 °C
04	00=Internal sensors
05	Temperature Control Mode: 1=Heat Temperature Control Status: 0=Standby
06	00=0%=Valve Off
07	Fan Mode: 1=Heat Fan Status: 0=Off
08	ff=Schedule Not Executed
67	01=System On

Alarm Report

The device supports to various types of alarm or alarm dismiss report packets. Examples:

1. Temperature threshold alarm

09136d0a	
Command	**Value**
09	13=Above (max. threshold) alarm 6d 0a => 0a 6d= 2669/100=26.69 °C

2. Freeze protection alarm

0931be00	
Command	**Value**
09	31=Freeze protection alarm be 00=>00 be=190/100=1.9°C

3. Open window detection alarm

0933a406	
Command	**Value**
09	33= Open window detection alarm a4 06=>06 a4=1700/100=17°C

4. Target temperature invalid alarm: report this alarm packet when the temperature control mode is switched to Ventilation.

0b03

Relay Status Report

After sending downlink command to enable Relay Change Report feature, the device will send a relay status report when any relay status changes.

1002000000	
Command	**Value**
10	02=>0000 0010 =Mid/Q2 enable, others disable

Downlink Command

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

Basic Settings

<table>
<tr><th>Item</th><th>Byte</th><th>Command</th><th>Parameter</th></tr>
<tr><td>Collecting Interval</td><td>1+3</td><td>60</td><td>Byte 1: 00=Second, 01=Minute
Byte 2-3: Interval time, range: 10-64800s or 1-1440 mins</td></tr>
<tr><td>Reporting Interval</td><td>1+3</td><td>62</td><td>Byte 1: 00=Second, 01=Minute
Byte 2-3: Interval time, range: 10-64800s or 1-1440 mins</td></tr>
<tr><td>Enquiry Peri-odic Report</td><td>1</td><td>b9</td><td>-</td></tr>
<tr><td>Relay Change Report</td><td>1+1</td><td>90</td><td>00=Disable, 1=Enable</td></tr>
<tr><td>Reboot</td><td>1</td><td>be</td><td>-</td></tr>
<tr><td>Rejoin the Network</td><td>1</td><td>b6</td><td>-</td></tr>
<tr><td>Temperature Unit</td><td>1+1</td><td>63</td><td>00=°C, 01=°F</td></tr>
<tr><td>Child Lock</td><td>1+2</td><td>75</td><td>Byte 1: 00=Disable, 01=Enable
Byte 2: for every bit: 0=Disable, 1=Enable
<table><tr><th>Bit</th><th>Button</th></tr><tr><td>0</td><td>Button 3: System On/Off</td></tr><tr><td>1</td><td>Button 1&2: Temperature +/-</td></tr><tr><td>2</td><td>Button 4: Fan Mode</td></tr><tr><td>3</td><td>Button 5: Temperature Control Mode</td></tr><tr><td>4</td><td>Reset and Reboot</td></tr><tr><td>7-5</td><td>000</td></tr></table></td></tr>
</table>

<table>
<tr><th>Item</th><th>Byte</th><th>Command</th><th>Parameter</th></tr>
<tr><td>Temporary Lock Release</td><td>1+4</td><td>8d</td><td>Byte 1: 00=Disable, 01=Enable
Byte 2: Combination buttons for release, 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 3: System On/Off</td></tr>
<tr><td>1</td><td>Button 1: Temperature +</td></tr>
<tr><td>2</td><td>Button 2: Temperature -</td></tr>
<tr><td>3</td><td>Button 4: Fan Mode</td></tr>
<tr><td>4</td><td>Button 5: Temperature Control Mode</td></tr>
<tr><td>7-5</td><td>000</td></tr>
</table>
Byte 3-4: Release time, UINT16, Unit: s, Range: 1-3600</td></tr>
</table>

Examples:

1. Set the reporting interval as 20 minutes.

62011400	
Command	**Parameter**
62	01=Minute, 14 00=>00 14=20

2. Reboot the device.

be

3. Lock the system on/off and reset/reboot features of buttons.

750111	
Command	**Parameter**
75	01=Enable 11=>0001 0001 =Enable reset/reboot and system on/off lock

4. Allow to press the button 3 and button 5 together to release the lock for 30 minutes.

8d01110807	
Command	**Parameter**
8d	01=Enable 11=>0001 0001 =Enable the lock release by button 3 and 5 08 07 => 07 08=1800s=30 minutes

System On/Off Settings

Item	Byte	Command	Parameter
System On/Off	1+1	67	00=Off, 01=On
Time Switch System	2+1	8c00	00=Disable, 01=Enable
Time Switch System-On Time	3+4	8c01+Time ID (0-3)	Byte 1: 00=Disable, 01=Enable Byte 2-3: Time, Unit: mins, Range: 0-1439 Byte 4: Repeat weekday, per bit 0=Disable, 1=Enable
Time Switch System-Off Time	3+4	8c02+Time ID (0-3)	

Bit	7	6	...	1	0
	0	Sat.	...	Mon.	Sun.

Examples:

1. Switch the fan coil system on.

6701	
Command	**Parameter**
67	01=On

2. Enable the time switch system and configure a time to switch on the system at 8:00 AM on weekdays.

8c0001 8c010001e0013e	
Command	**Parameter**
8c00	01=Enable time switch system
8c0100	01=Enable this on time e0 01=> 01 e0= 480 minutes =8:00 3e => 0011 1110 = Mon. to Fri. enable

Time Settings

Item	Byte	Command	Parameter
UTC Time Zone	1+2	c7	INT16/60
Daylight Saving Time	1+10	c6	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 Week&Day: **Bit7-4**: Week number, range: 1-5 **Bit3-0**: Weekday, range: 1-7
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) Sun-day(7), 3c 00 =>00 3c=60 minutes =1:00 End time: 0a=>10=October, 57=>last (5) Sun-day(7), 3c 00 =>00 3c=60 minutes =1:00

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+2</td><td>66</td><td>Byte 1: 00=Disable all, 01=Enable
Byte 2: for every bit: 0=Disable, 1=Enable
<table>
<tr><th>Bit</th><th>Content</th></tr>
<tr><td>0</td><td>Temperature</td></tr>
<tr><td>1</td><td>Humidity</td></tr>
<tr><td>2</td><td>Target Temperature</td></tr>
<tr><td>3</td><td>Temperature Control Schedule</td></tr>
<tr><td>7-4</td><td>0000</td></tr>
</table></td></tr>
<tr><td>Smart Display</td><td>1+1</td><td>65</td><td>00=Disable, 01=Enable</td></tr>
</table>

Examples:

1. Disable the screen display.

660000	
Command	**Parameter**
66	00=Disable all

2. Only disable the display of temperature control schedule.

660107	
Command	**Parameter**
66	01=Enable screen display 07=>0000 0111 = Temperature control schedule disable

Data Source Settings

Item	Byte	Command	Parameter
Internal	2	8500	-
NTC	2	8501	-
LNS	2+2	8502	Byte 1: Timeout, Unit: minute, Range: 1-60 Byte 2: Offline setting*, 00=Keep current status, 01=Valve off & Ventilation, 02=Switch to internal sensors
D2D	2+2	8503	
Send Temperature	1+2	5b	INT16/100, Unit: °C, Range: -20 ~ 60
Send Humidity	1+2	5c	UINT16/10, Unit: %RH, Range: 0-100

*When the device does not receive *valid temperature* values for timeout, the device will execute this setting.

Examples:

1. Switch to receive the data from LNS, when the device does not receive the temperature values for 60 minutes, switch to internal sensors.

85023c02	
Command	**Parameter**
8502	3c=60 minutes, 02=Internal sensors

2. Send temperature value from LNS.

5b0208	
Command	**Parameter**
5b	02 08 => 08 02 =2050/100=20.50°C

Calibration Settings

Item	Byte	Command	Parameter
Temperature Calibration	1+3	79	Byte 1: 00=Disable, 01=Enable Byte 2-3: Calibration Value, INT16/100, Unit: °C, Range: -80 ~ 80
Humidity Calibration	1+3	7a	Byte 1: 00=Disable, 01=Enable Byte 2-3: Calibration Value, INT16/10, Unit: %RH, Range: -100 ~ 100

Example:

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

7901e2ff	
Command	**Parameter**
79	01=Enable, e2 ff=>ff e2=-30/100=-0.3 °C

Threshold Settings

Item	Byte	Command	Parameter
Temperature Threshold	1+6	76	Byte 1: 00=Disable, 01=Enable Byte 2: 00=Disable, 01=Below, 02=Above, 03=Within, 04=Beyond Byte 3-4: Min. Threshold, INT16/100, Unit: °C, Range: -20 ~ 60 Byte 5-6: Max. Threshold, INT16/100, Unit: °C, Range: -20 ~ 60
Persistent High Threshold	1+4	77	Byte 1: 00=Disable, 01=Enable Byte 2-3: Difference value, INT16/100, Unit: °C, Range: 1 ~ 10 Byte 4: Duration, UINT8, Unit: minute, Range: 0 ~ 60
Persistent Low Threshold	1+4	78	Byte 1: 00=Disable, 01=Enable

Item	Byte	Command	Parameter
			Byte 2-3: Difference value, INT16/100, Unit: °C, Range: 1 ~ 10 Byte 4: Duration, UINT8, Unit: minute, Range: 0 ~ 60

Examples:

1. Enable threshold alarm and set the below threshold value as 10°C.

760101e8030000	
Command	**Parameter**
76	01=Enable, 01=Below Min. Threshold: e8 03=>03 e8=1000/100=10°C

2. Enable persistent high temperature threshold difference as 1°C and duration is 10 minutes.

770164000a	
Command	**Parameter**
77	01=Enable 64 00=>00 64=100/100=1°C 0a=>10 minutes

Installation Settings

Item	Byte	Command	Parameter
System Type	1+1	7c	WT303: 00=4-pipe, 2-wire valve, 3-speed fan 01=2-pipe, 2-wire valve, 3-speed fan 02=2-pipe, 3-wire valve, 3-speed fan WT304: 00=4-pipe, 0-10V valve, 3-speed fan 01=2-pipe, 0-10V valve, 3-speed fan

Item	Byte	Command	Parameter
			02=2-pipe, 0-10V valve, ECM fan 03=4-pipe, 2-wire valve, ECM fan 04=2-pipe, 2-wire valve, ECM fan 05=2-pipe, 3-wire valve, ECM fan
Valve Control Adjustment Range (WT304)	2+2	7d00	INT16/100, Unit: °C, Range: 1-15
Valve Opening Range (WT304)	2+2	7d01	Min. Range (1B) + Max. Range (1B), UINT8, Unit: %, Range: 0-100
Valve Control Interval (WT304)	2+1	7d02	UINT8, Unit: s, Range: 1-60
Valve Status(under Standby control status, WT304)	1+1	8f	00=Min. Valve Opening Range, 01=Stop (0%)
ECM Fan-Low speed (WT304)	2+1	7e00	INT8, Unit: %, Range: 1-100
ECM Fan-Medium speed (WT304)		7e01	
ECM Fan-High speed (WT304)		7e02	
DI Setting	1+1	80	00=Disable, 01=Enable
Key Card-System Control	3+1	810000	00=Insert Card-System Off, 01=Insert Card-System On
Key Card-Insert an Event	3+2	810001	Insert Card Schedule ID (1B) + Remove Card Schedule ID (1B), Range: 0-7
Magnetic Contact Switch-Sensor Type	2+1	8101	00=NC, 01=NO
Open Window Detection	1+1	82	00=Disable, 01=Enable

Item	Byte	Command	Parameter
Open Window Detection-Temperature Collection	2+3	8300	Byte 1-2:Temperature change value, INT16/100, Unit: °C, Range: 1 ~ 10 Byte 3: Stop temperature control time, UINT8, Unit: minute, Range: 1-60
Open Window Detection-Magnetic Detection	2+1	8301	Duration, UINT8, Unit: minute, Range: 1-60
Open Window Status Release	1+1	5d	00=Release, 01=Trigger
Freeze Protection	1+2	84	Byte 1: 00=Disable, 01=Enable Byte 2-3: Target temperature, INT16/100, Unit: °C, Range: 1-5

Examples:

1. Set valve adjustment range as 10°C and the valve opening range as 20-100%.

7d00e803 7d011464	
Command	**Parameter**
7d00	e8 03=> 03 e8 =1000/100=10°C
7d01	14=>20%, 64=>100%

2. Enable the freeze protection and set the target temperature as 5°C.

8401f401	
Command	**Parameter**
84	01=Enable, f4 01=>01 f4=500/100=5°C

Temperature Control Mode Settings

Item	Byte	Command	Parameter
Mode Enable	1+1	64	07=Ventilation, Heat, Cool 03=Ventilation, Heat 05=Ventilation, Cool

Item	Byte	Command	Parameter
Temperature Control Mode	1+1	68	00=Ventilation, 01=Heat, 02=Cool
Target Temperature Resolution	1+1	69	00=0.5, 01=1
Target Temperature Tolerance	1+2	6a	INT16/100, Unit: °C, Range: 0.1~5
Heat Target Temperature	1+2	6b	INT16/100, Unit: °C, Range: Depend on regulation range
Cool Target Temperature	1+2	6c	
Heat Target Temperature Regulation Range	1+4	6d	Min. Range (2B) + Max. Range (2B), INT16/100, Unit: °C, Range: 5~35
Cool Target Temperature Regulation Range	1+4	6e	**Note:** Max. Range-Min. Range≥1
Temp. Control and Dehumidify	1+3	6f	Byte 1: 00=Disable, 01=Enable Byte 2-3: Tolerance, INT16/100, Unit: °C, Range: 0.1~5
Target Humidity Range	1+4	70	Min. Range (2B) + Max. Range (2B), UINT16/10, Unit: %RH, Range: 0-100

Examples:

1. Set the temperature control mode as Cool.

6802	
Command	**Parameter**
68	02=Cool

2. Set cool target temperature to 24°C.

6c6009	
Command	**Parameter**
6c	60 09=>09 60=2400/100=24°C

Fan Mode Settings

Item	Byte	Command	Parameter
Fan Mode	1+1	72	00=Auto, 01=Low, 02=Medium, 03=High
Fan Delay	1+3	74	Byte 1: 00=Disable, 01=Enable Byte 2-3: Duration, UINT16, Unit: s, Range: 30-3600
Auto Fan Status (under Standby control status)	1+1	8e	00=Low speed, 01=Off
Auto Fan Mode Threshold	1+4	73	ΔT1 (2B) + ΔT2 (2B), INT16/100, Unit: °C, Range: 1~15

Examples:

1. Set fan mode as Auto.

7200	
Command	**Parameter**
72	00=Auto

2. Enable fan delay and set the duration as 10 minutes.

74015802	
Command	**Parameter**
74	01=Enable, 58 02=>02 58=600s=10 minutes

Schedule Settings

Item	Byte	Command	Parameter
Schedule En-able/Disable	3+1	7b+Schedule ID (1B, 0-7) + 00	00=Disable, 01=Enable
Schedule Name (First 6B)	3+6	7b+Schedule ID (1B, 0-7) + 01	ASCii to Hex strings (6B)
Schedule Name (Last 4B)	3+4	7b+Schedule ID (1B, 0-7) + 02	ASCii to Hex strings (4B)

<table>
<tr><th>Item</th><th>Byte</th><th>Command</th><th>Parameter</th></tr>
<tr><td>Schedule Content</td><td>3+7</td><td>7b+Schedule ID (1B, 0-7) + 03</td><td>Byte 1: Fan mode, 00=Auto, 01=Low, 02=Medium, 03=High
Byte 2-3: Heating Target Temperature, Unit: °C, Range: 5 ~ 35
Byte 4-5: Cooling Target Temperature, Unit: °C, Range: 5 ~ 35
Byte 6-7: Target Temperature Tolerance, Unit: °C, Range: 0.1 ~ 5
<table><tr><th>Bit15-1</th><th>Bit0</th></tr><tr><td>Temperature Value</td><td>0=Disable
1=Enable</td></tr></table></td></tr>
<tr><td>Schedule Time</td><td>4+4</td><td>7b+Schedule ID (1B, 0-7) + 04 + Time ID (1B, 0-15)</td><td>Byte 1: 00=Disable, 01=Enable
Byte 2-3: Time, UINT16, Unit: minute, Range: 0-1439
Byte 4: Repeat weekday, per bit 0=Disable, 1=Enable
<table><tr><th>Bit</th><th>7</th><th>6</th><th>...</th><th>1</th><th>0</th></tr><tr><td></td><td>0</td><td>Sat.</td><td>...</td><td>Mon.</td><td>Sun.</td></tr></table></td></tr>
<tr><td>Execute Schedule</td><td>1+1</td><td>5e</td><td>Schedule ID, Range: 0-7</td></tr>
<tr><td>Delete Schedule</td><td>1+1</td><td>5f</td><td>Schedule ID, Range: 0-7</td></tr>
</table>

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 3 content: fan mode is Low, cool target temperature is 23°C, heat target temperature tolerance is 15°C, target temperature tolerance is 2°C.

7b020301b90bf9119101	
Command	**Parameter**
7b0203 02=Schedule 3	01=Low Heat: b9 0b> 0b b9= *1011 1011 100*1, 1=enable, 10111011 100=>1500/100=15°C Cool: f9 11=> 11 f9= *1 0001 1111 100*1, 1=enable, 100011111100=>2300/100=23°C Tolerance: 91 01=>01 91 = *1 1001 000*1, 1=enable, 11001000=>200/100=2°C

4. Add times for schedule plan 3: Enable 6:30 AM on weekdays (Mon. To Fri.), 8:00 AM on weekend.

7b0204000186013e 7b02040101e00141	
Command	**Parameter**
7b020400	01=Enable 86 01=>01 86=390 minutes=6:30 3e =>0011 1110=weekdays enable
7b020401	01=Enable e0 01=>01 e0=480 minutes=8:00 41 =>0100 0001=weekend enable

5. Execute schedule plan 3 immediately.

5e02	
Command	**Parameter**
5e	02=schedule3

D2D Settings

Item	Byte	Command	Parameter
D2D Data Receiving Feature	1+1	86	00=Disable, 01=Enable
Pairing Device	3+1	87+Device ID (1B, 0-4)+00	00=Disable, 01=Enable
Pairing Device EUI	3+8	87+Device ID (1B, 0-4)+01	Device EUI (8B)
Pairing Device Name (First 8B)	3+8	87+Device ID (1B, 0-4)+02	ASCii to Hex strings (8B)
Pairing Device Name (Last 8B)	3+8	87+Device ID (1B, 0-4)+03	ASCii to Hex strings (8B)
D2D Controller Feature	1+1	88	00=Disable, 01=Enable
D2D Controller-Schedule	2+7	89 + Schedule ID (1B, 0-7)	Byte 1: 00=Disable, 01=Enable Byte 2-3: Control command Byte 4: 00=Disable LoRa Uplink, 01=Enable LoRa Uplink Byte 5-7: 000000
D2D Controller-System Off	2+7	8910	
D2D Controller-System On	2+7	8911	
D2D Agent Feature	1+1	8a	00=Disable, 01=Enable
D2D Agent Rule	2+4	8b+ Rule ID (1B, 0-7)	Byte 1: 00=Disable, 01=Enable Byte 2-3: Control command Byte 4: Action object 00~07=Schedule ID

Item	Byte	Command	Parameter
			10=System Off, 11=System On

Examples:

1. Add and enable a pairing device EUI and the name is device1.

87000001 87000124e124136c270731 8700026465766963653100	
Command	**Parameter**
870000	01=Enable
870001	24e124136c270731
870002	64 65 76 69 63 65 31 00 => device1

2. Enable D2D Controller: When the system switches to off, send command ff01 to D2D agent devices.

89100101ff00000000	
Command	**Parameter**
8910	01=Enable 01 ff=> ff 01=Command 00=Disable LoRa Uplink

3. Enable D2D Agent Rule 1: When receiving a command 0001, switch the system on.

8b0101010011	
Command	**Parameter**
8b01	01=Enable 01 00=>00 01=Command 11=System on

Chapter 10. 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	
Temperature	temperature	Analog Value	RW	Unit: °C (62)
Humidity	humidity	Analog Value	RW	Unit: %RH (29)
Target Tem-perature	target_temperature	Analog Input	R	Unit: °C (62)
Data Source	temperature_data_source	Multistate Value	R	1: Internal, 2: NTC, 3: LNS, 4: D2D

Item	LoRa Object	BACnet Type	Access Mode	Description
Temperature Control Status	temperature_control_status	Multistate Value	R	1: Standby, 2: Heat, 3: Cool
Temperature Control Mode	temperature_control_mode	Multistate Value	RW	1: Ventilation, 2: Heat, 3: Cool
Valve Opening Status	valve_status	Analog Input	R	UINT8, Unit: %
Fan Status	fan_status	Multistate Value	R	1: Off, 2: Low, 3: Medium, 4: High
Fan Mode	fan_mode	Multistate Value	RW	1: Auto, 2: Low, 3: Medium, 4: High
Temperature Control Schedule	plan_id	Multistate Value	R	ID Range: 1-8 (255=Not executed)
System Status	system_status	Multistate Value	RW	1: Off, 2: On
Temperature Alarm	temperature_alarm.type	Multistate Value	R	1: Collection error, 2: Under-range, 3: Over-range, 4: No data 17: Below dismiss, 18: Below (min. threshold) alarm 19: Above dismiss, 20: Above (max. threshold) alarm 21: Within dismiss, 22: Within alarm 23: Beyond dismiss, 24: Beyond alarm

Item	LoRa Object	BACnet Type	Access Mode	Description
				33: Persistent low dismiss, 34: Persistent low alarm 35: Persistent high dismiss, 36: Persistent high alarm 49: Freeze protection dismiss, 50: Freeze protection alarm 51: Open window detection dismiss, 52: Open window detection alarm
	temperature_alarm.temperature	Analog Input	R	Unit: °C (62)
Humidity Alarm	humidity_alarm	Multistate Value	R	1: Collection error, 2: Under-range, 3: Over-range, 4: No data
Target Temperature Alarm	target_temperature_alarm	Multistate Value	R	3
Relay Status	relay_status.gl_status	Binary Input	R	Low/Q1, 0: Disable, 1: Enable
	relay_status.gm_status			Mid/Q2, 0: Disable, 1: Enable
	relay_status.gh_status			High/Q3, 0: Disable, 1: Enable
	relay_status.valve_1_status			V1/NO, 0: Disable, 1: Enable
	relay_status.valve_2_status			V2/NC, 0: Disable, 1: Enable

Basic Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Collecting Interval	collection_interval.unit	Multi-state Value	RW	1: Second, 2: Minute	
	collection_interval.seconds_of_time	Analog Value	RW	Range: 10-64800, Unit: s (73)	collection_interval.unit
	collection_interval.minutes_of_time	Analog Value	RW	Range: 1-1440, Unit: min (72)	collection_interval.unit
Reporting Interval	reporting_interval.unit	Multi-state Value	RW	1: Second, 2: Minute	
	reporting_interval.seconds_of_time	Analog Value	RW	Range: 10-64800, Unit: s (73)	reporting_interval.unit
	reporting_interval.minutes_of_time	Analog Value	RW	Range: 1-1440, Unit: min (72)	
Enquiry Periodic Report	query_device_status	Binary Output	W	1: Yes	
Relay Change Report	relay_changes_report_enable	Binary Value	RW	0: Disable, 1: Enable	
Reboot	reboot	Binary Output	W	1: Yes	
Rejoin the Network	reconnect	Binary Output	W	1: Yes	

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Temperature Unit	temperature_unit	Multi-state Value	RW	1: °C, 2: °F	
System On/Off	system_status	Multi-state Value	RW	1: Off, 2: On	
Child Lock	child_lock_settings.system_button	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	child_lock_settings.temperature_button				
	child_lock_settings.fan_button				
	child_lock_settings.temperature_control_button				
	child_lock_settings.reboot_reset_button				
Temporary Lock Release	temporary_unlock_settings.system_button	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	temporary_unlock_settings.temperature_up_button				
	temporary_unlock_settings.temperature_down_button				
	temporary_unlock_settings.fan_button				
	temporary_unlock_settings.temperature_control_mode_button				
	temporary_unlock_settings.duration			Release Time, Unit: s (73), Range: 1-3600	

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	
Sync time from LNS	synchronize_time	Binary Output	W	1: Yes	

Screen Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Screen Display	screen_object_settings.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	screen_object_settings.environment_temperature_enable				
	screen_object_settings.environment_humidity_enable				
	screen_object_settings.target_temperature_enable				
	screen_object_settings.schedule_name_enable				
Smart Display	intelligent_display_enable	Binary Value	RW	0: Disable, 1: Enable	

Calibration Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Temperature Calibration	temperature_calibration_config.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
	temperature_calibration_config.calibration_value	Analog Value	RW	Unit: °C (62), Range: -80 ~ 80	
Humidity Calibration	humidity_calibration_config.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
	humidity_calibration_config.calibration_value	Analog Value	RW	Unit: %RH, Range: -100 ~ 100	

Threshold Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Temperature Threshold	temperature_alarm_settings.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	temperature_alarm_settings.threshold_condition	Multi-state Value	RW	1: Disable, 2: Below, 3: Above, 4: Within, 5: Beyond	
	temperature_alarm_settings.threshold_min	Analog Value	RW	Unit: °C (62), Range: -20 ~ 60	
	temperature_alarm_settings.threshold_max	Analog Value	RW	Unit: °C (62), Range: -20 ~ 60	
Persistent High Threshold	high_temperature_alarm_settings.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be written together
	high_temperature_alarm_settings.delta_temperature	Analog Value	RW	Unit: °C (62) Range: 1 ~ 10	
	high_temperature_alarm_settings.duration	Analog Value	RW	Unit: minute (72), Range: 0 ~ 60	
Persistent Low Threshold	low_temperature_alarm_settings.enable	Binary Value	RW	0: Disable, 1: Enable	These objects should be

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
	low_temperature_alarm_settings.delta_temperature	Analog Value	RW	Unit: °C (62) Range: 1 ~ 10	written together
	low_temperature_alarm_settings.duration	Analog Value	RW	Unit: minute (72), Range: 0 ~ 60	

Installation Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Valve Status(under Standby control status, WT304)	valve_opening_negative_valve_mode	Multistate Value	RW	1: Min. Valve Opening Range, 2: Stop	
DI Setting	di_settings.enable	Binary Value	RW	0: Disable, 1: Enable	
Open Window Detection	window_opening_detection_settings.enable	Binary Value	RW	0: Disable, 1: Enable	
Open Window Status Release	opening_window_alarm	Multistate Value	RW	1: Release, 2: Trigger	
Freeze Protection	freeze_protection_settings.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be
	freeze_protection_settings.target_temperature	Analog Value	RW	Unit: °C, Range: 1 ~ 5	

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
					written together

Temperature Control Mode Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Mode Enable	support_mode	Multi-state Value	RW	4: Ventilation, Heat, Cool 6: Ventilation, Heat 8: Ventilation, Cool	
Temperature Control Mode	temperature_control_mode	Multi-state Value	RW	1: Ventilation, 2: Heat, 3: Cool	
Target Temperature Resolution	target_temperature_resolution	Multi-state Value	RW	1: 0.5, 2: 1	
Target Temperature Tolerance	target_temperature_tolerance	Analog Value	RW	Range: 0.1~5, Unit: °C (62)	
Heat Target Temperature	heating_target_temperature	Analog Value	RW	Unit: °C (62), Range: Depend on regulation range	
Cool Target Temperature	cooling_target_temperature	Analog Value	RW		
Heat Target Temperature Regulation Range	heating_target_temperature_range.min	Analog Value	RW	Unit: °C (62), Range: 5~35 **Note:** Max. Range-	Both objects should be written together
	heating_target_temperature_range.max	Analog Value	RW		

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Cool Target Temperature Regulation Range	cooling_target_temperature_range.min	Analog Value	RW	Min. Range≥1	Both objects should be written together
	cooling_target_temperature_range.max	Analog Value	RW		
Temp. Control and Dehumidify	dehumidify_config.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
	dehumidify_config.temperature_tolerance	Analog Value	RW	Unit: °C (62), Range: 0.1~5	
Target Humidity Range	target_humidity_range.min	Analog Value	RW	Unit: %r.h (29), Range: 0-100	Both objects should be written together
	target_humidity_range.max	Analog Value	RW		

Fan Mode Settings

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Fan Mode	fan_mode	Multistate Value	RW	1: Auto, 2: Low, 3: Medium, 4: High	
Fan Delay	fan_delay_config.enable	Binary Value	RW	0: Disable, 1: Enable	Both objects should be written together
	fan_delay_config.delay_time	Analog Value	RW	Unit: s (73), Range: 30-3600	
Auto Fan Status (under	temperature_control_with_standby_fan_mode	Multistate Value	RW	1: Low speed, 2: Off	

Item	LoRa Object	BACnet Type	Access Mode	Description	Reference
Standby control status)					
Auto Fan Mode Threshold	fan_speed_config.delta_1	Analog Value	RW	Unit: °C, Range: 1~15	Both objects should be written together
	fan_speed_config.delta_2	Analog Value	RW		

Schedule Settings

Item	LoRa Object	BACnet Type	Access Mode	Description
Execute Schedule	insert_plan_id	Multistate Value	W	Schedule ID, Range: 1-8
Delete Schedule	clear_plan.plan_1	Binary Output	W	1: Delete
	clear_plan.plan_2			
	clear_plan.plan_3			
	clear_plan.plan_4			
	clear_plan.plan_5			
	clear_plan.plan_6			
	clear_plan.plan_7			
	clear_plan.plan_8			
	clear_plan.plan_all			

D2D Settings

Item	LoRa Object	BACnet Type	Access Mode	Description
D2D Data Receiving Feature	d2d_pairing_enable	Binary Value	RW	0: Disable, 1: Enable

Item	LoRa Object	BACnet Type	Access Mode	Description
D2D Controller Feature	d2d_master_enable	Binary Value	RW	0: Disable, 1: Enable
D2D Agent Feature	d2d_slave_enable	Binary Value	RW	0: Disable, 1: Enable