

LoRAWAN Smart Thermostat

MA-LORT-0223



◆ Introduction

The smart thermostat integrates the latest wireless communication technology LoRaWAN, which provides capability for centralised control without modifying the existing building infrastructure. The device can regularly report the running status of the air conditioner and remotely control the switch, mode and temperature set point.

◆ Product advantage



Non-invasive / plug-and-play installation



Automatic time scheduling for individual thermostat



20-30% energy savings on FCUs by eliminating wastage

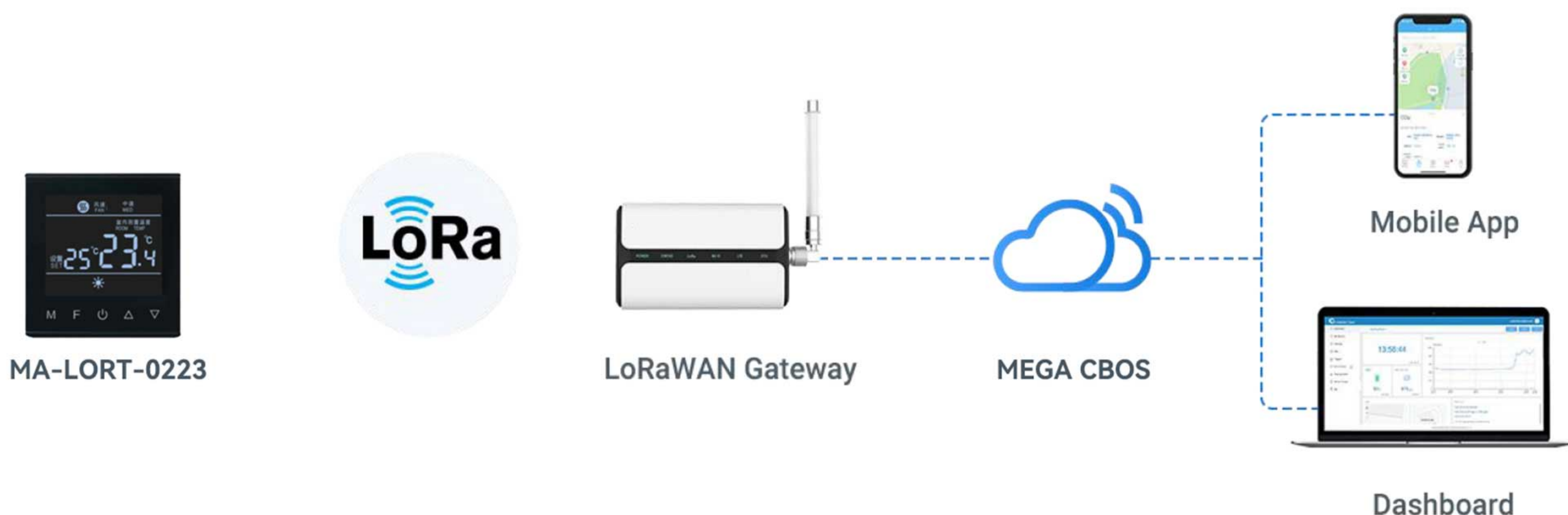


Centralized Control on all FCUs in a building/multiple buildings



Interact with wireless occupancy sensors for automatic on/off control

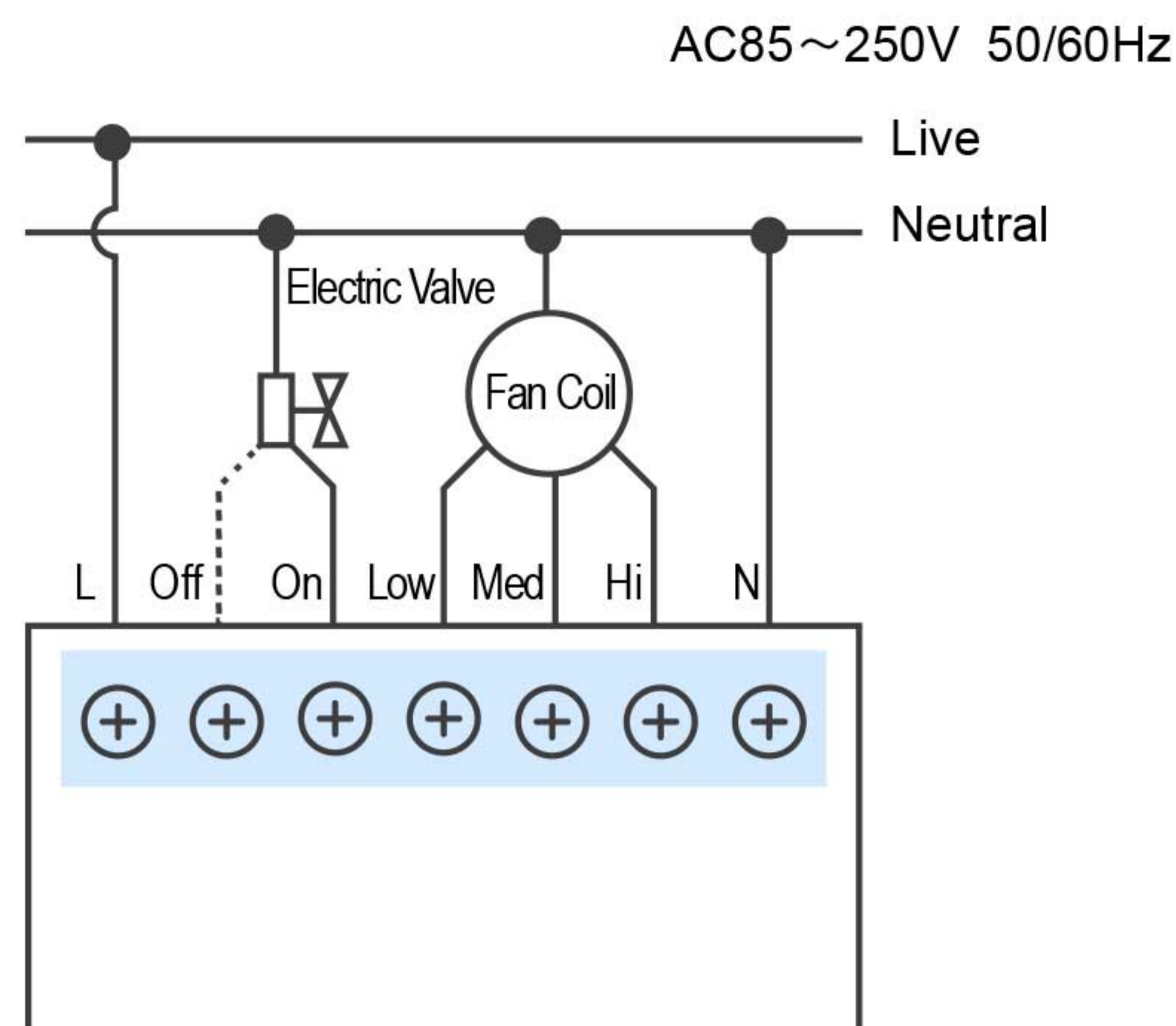
◆ Application Example



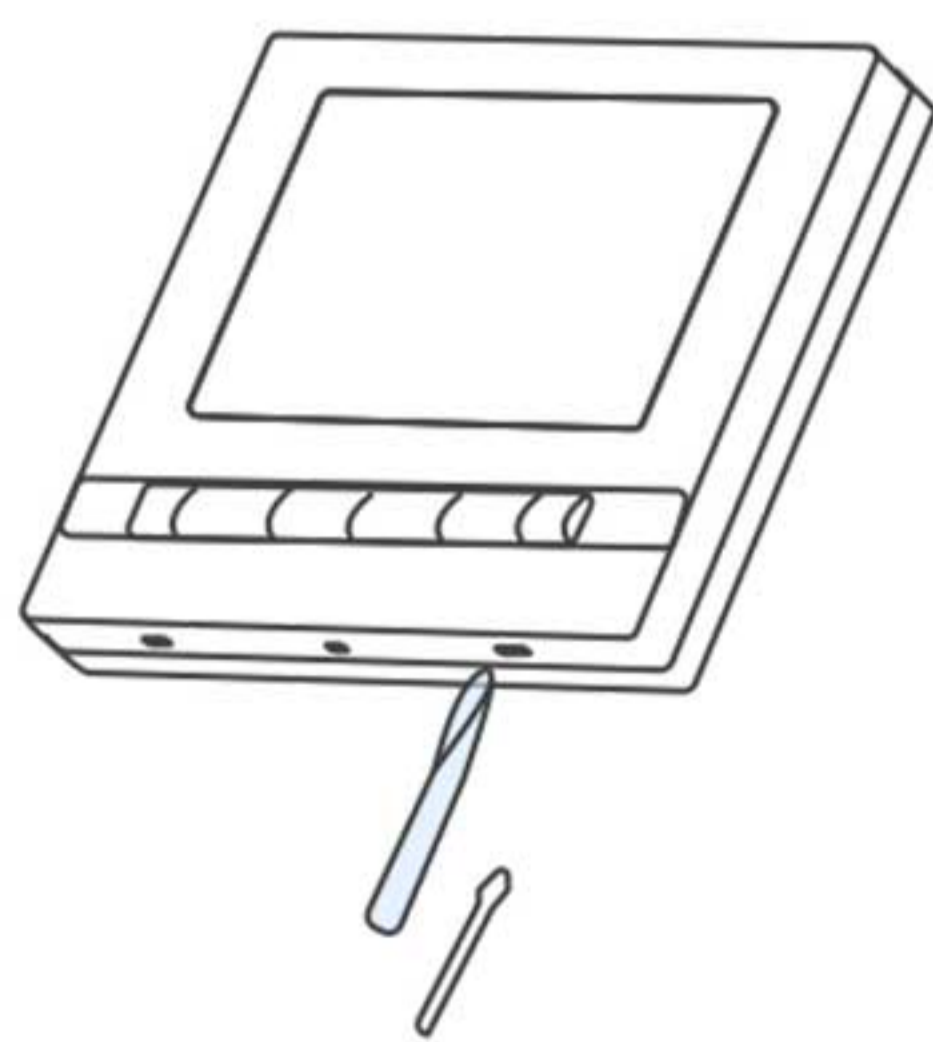
◆ Technical Specification

Communication Protocol	LoRaWAN AS923
Functional Specification	Equipment type: 7-wire 4-speed thermostat (applicable to 6 and 7-wire central air conditioners)
	Working mode: cooling, heating, ventilation, dehumidification (constant 5°C)
	Fan speed: 4 speeds (low speed, medium speed, high speed, automatic)
	Status reporting: switch, working mode, fan speed, current and setpoint temperature
	Remote control: switch, working mode, fan speed, setpoint temperature, button lock
	Set point range: 10°C~ 30°C
	Set point accuracy: ±1°C
Operating Voltage	AC220V±10% 50/60Hz
Rated Power	<1.5W
Dimensions	86*86*13mm

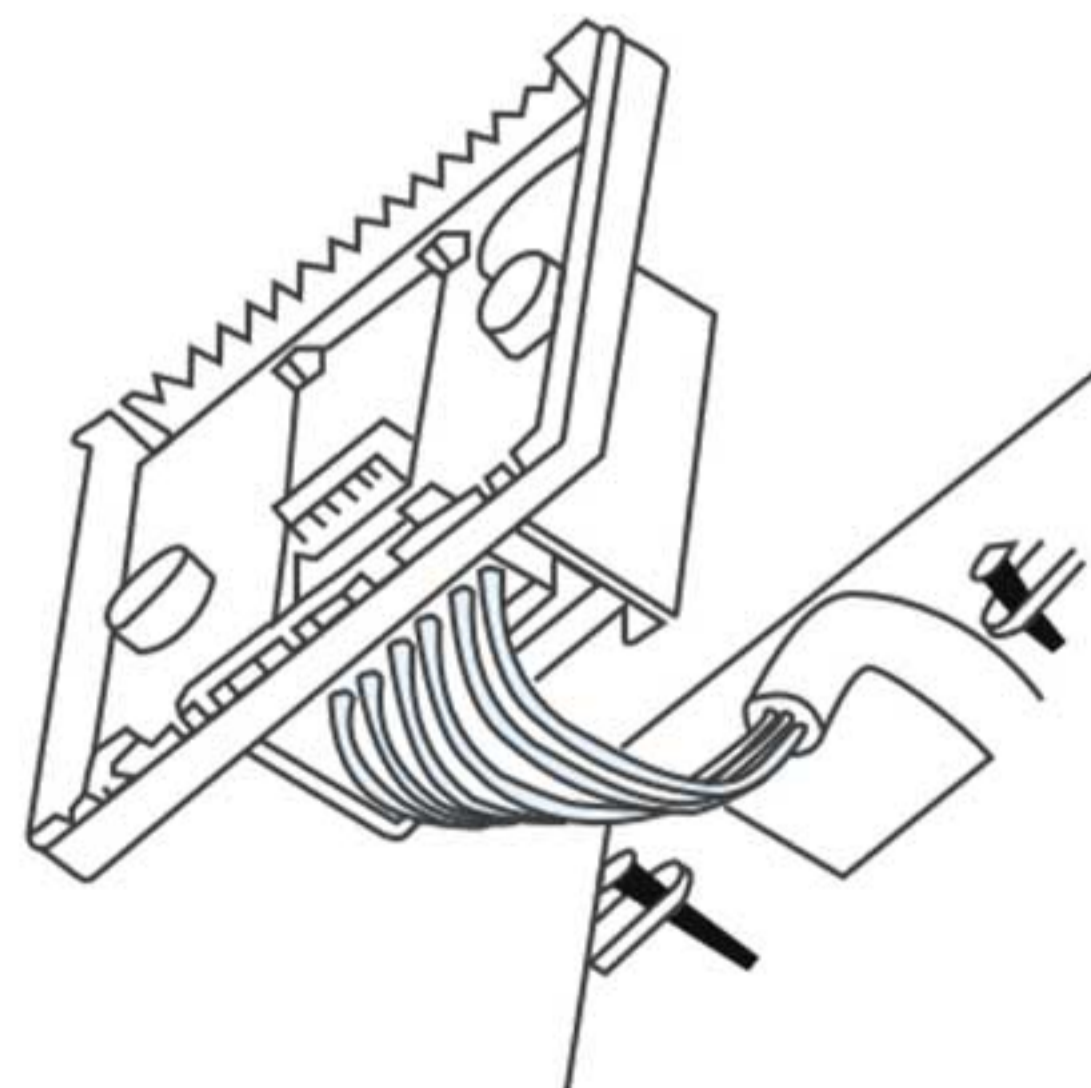
◆ Device Wiring Diagram



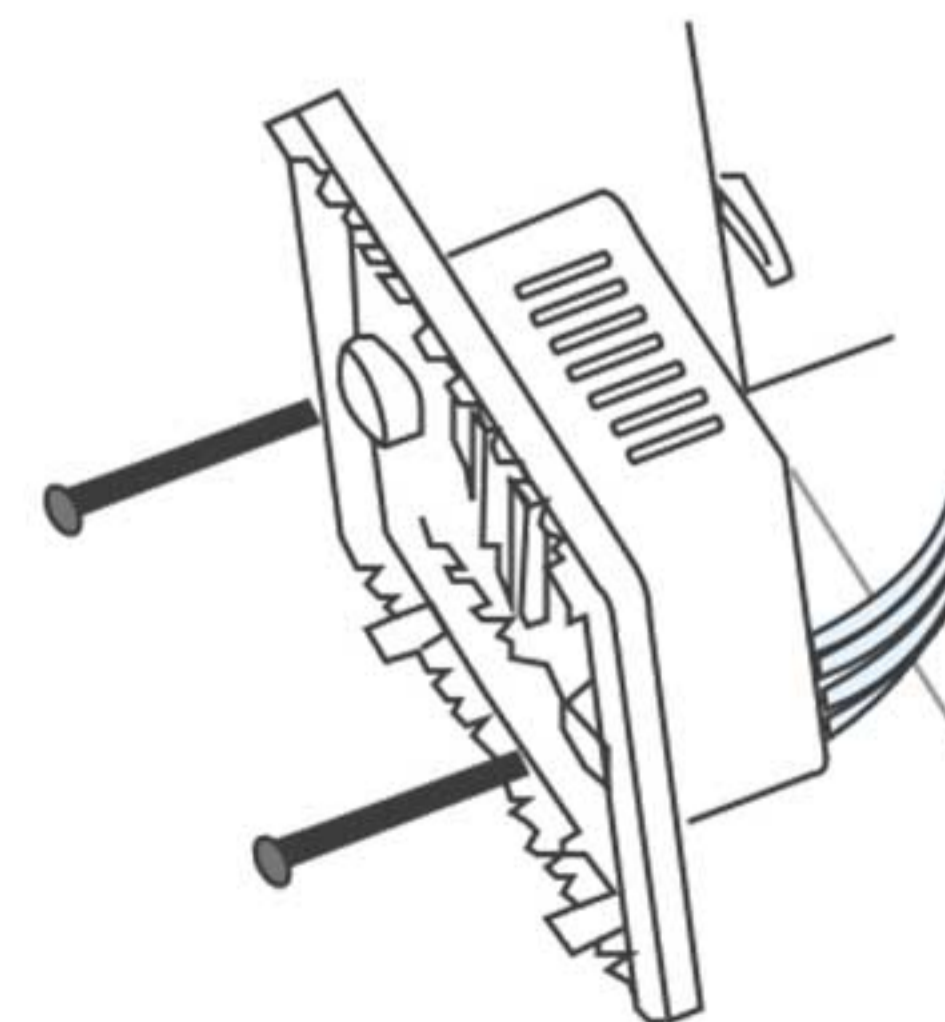
◆ Installation drawing



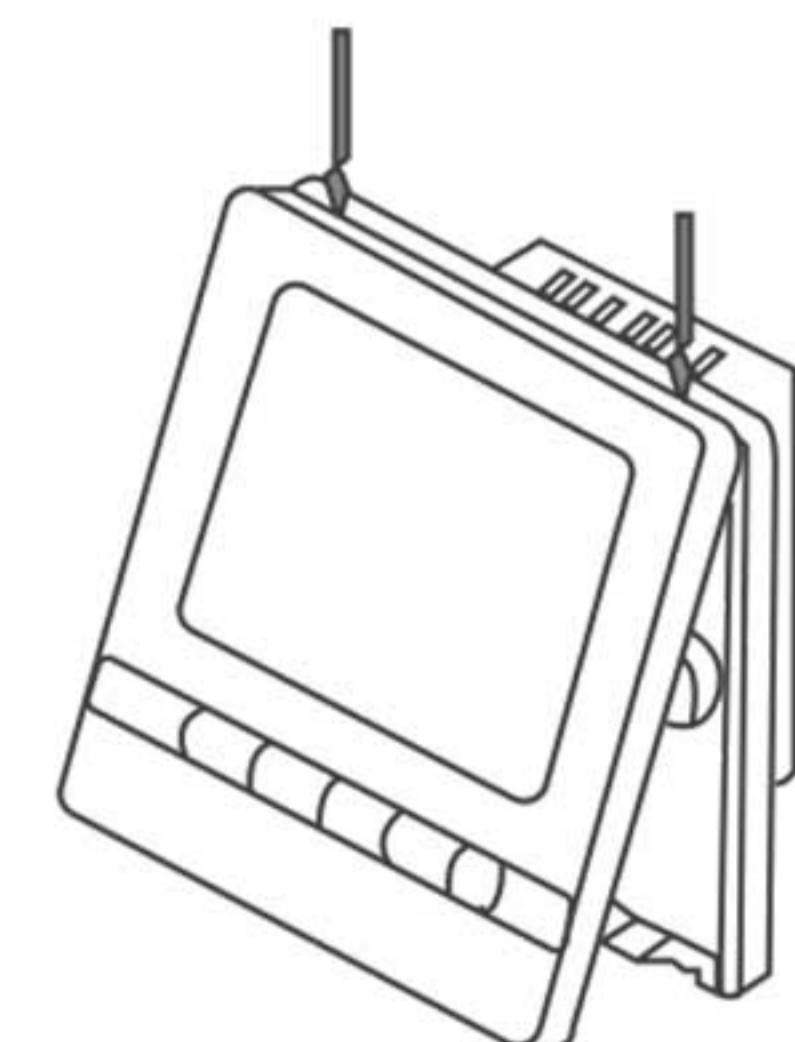
1. Use a flat screw driver to open the front cover of the thermostat.



2. Connect the wires according to the wiring diagram, make sure they are tightly connected.



3. Use the screws provided to mount the thermostat on the wall.



4. Hook the top part of the front cover on to the back plate and push the bottom part in to secure the fixture on the wall.

◆ 1. Uplink messages

There are two types of uplink message frames: power-on frame and heartbeat frame.

1.1 Power-on frame

First message sent after the device is powered on, restarted, or reset.

Byte	Fied	Description
0	0xNN	Device type(0xCA)
1	0xNN	Message type(0x01)
2	0xNN	SDK version
3	0xNN	Software and hardware version
4	0xNN	Region: '00' AS923; '02' CN470
5	0xNN	Join (OTAA/ABP): '00' ABP; '01' OTAA
6	0xNN	Communication mode: '01' CLASS-A; '02' CLASS-C
7	0xNN	DR: '01' DR1(SF11/125KHz); '00' DR0(SF12/125KHz)
8	0xNN	Heartbeat rate High (Unit: minutes)
9	0xNN	Heartbeat rate Low (Unit: minutes)

1.2 Heartbeat frame

Byte	Fied	Description
0	0xNN	Device type(0xCA)
1	0xNN	Message type(0x02)
2	0xNN	Device status: '00' normal; 'EE' Communication error
3	0xNN	Situation classification: default '00' null
4	0xNN	On-off state: '01' ON; '00' OFF
5	0xNN	Mode: '01' Cool; '02' Heat; '04' Dry; '08' Fan
6	0xNN	Wind speed: '01' High; '02' Med; '04' Low; '08' Auto
7	0xNN	Current temperature: HEX to DEC
8	0xNN	Setpoint: HEX to DEC
9	0xNN	Thermostat time(hour): BCD format
10	0xNN	Thermostat time(minutes): BCD format

◆ 2. Downlink Commands

2.1 Downlink commands format

Channel	Operation Code	Type	Value (not available during read)
0xNN	0xNN	0xNN	
FA	'04' Write/ 05' Read	0x01: Heartbeat rate	Unit: minutes Range: 1~255
FA	'04' Write/ 05' Read	0x02: Situational model	00: Null 01: Cool-Auto-19C° 02: Heat-Auto-24C° 03: Fan-Med-Null 04: Dry-Auto-Null
FA	'04' Write/ 05' Read	0x03: On/Off & Lock	00: Off + Unlock 01: Off + Lock 02: On + Unlock
FA	'04' Write	0x05 Mode	01: Cool 02: Heat 04: Dry 08: Fan
FA	'04' Write	0x06 Wind speed	Reference format: Mode + Wind Speed ('01' High; '02' Med; '04' Low; '08' Auto) e.g.: 0104 Cool-Low 0202 Heat-Med Note: not available for dry mode and fan mode
FA	'04' Write	0x07 Setpoint	Reference format: Mode + Temperature (range: 5~30C°) e.g.: 0110 Cool mode setpoint 16C° 0219 Heat mode setpoint 25C° 0319 Cool & Heat setpoint both 25C° Note: not available for dry mode and fan mode
FA	'04' Write	0x10 Time synchronization	Year Month Day Min Sec Week
FA	'04' Write/ 05' Read	0x0F Timing Switch	0xNNNN : HI Timing mode selection; LO Timing plan selection Timing mode: '00' Off '01' Weak mode (time point) '02' Strong mode (Querying and controlling time ranges) Timing plan selection: '01' plan1(0x17 SEL) '02' plan2(0x18 SEL) '03' plan3(0x19 SEL)
FA	'04' Write/ 05' Read	0x11 Scene 1	Default 010813 Cool Auto 19C°

◆ Feedback

After receiving the platform downlink commands, the device gives feedback to the received

Channel	Operation Code	Type	Value/Return code	Status
0xNN	0xNN	0xNN	0xNN	0xNN
FB	Same as command	Same as command	Same as command	0xAA success