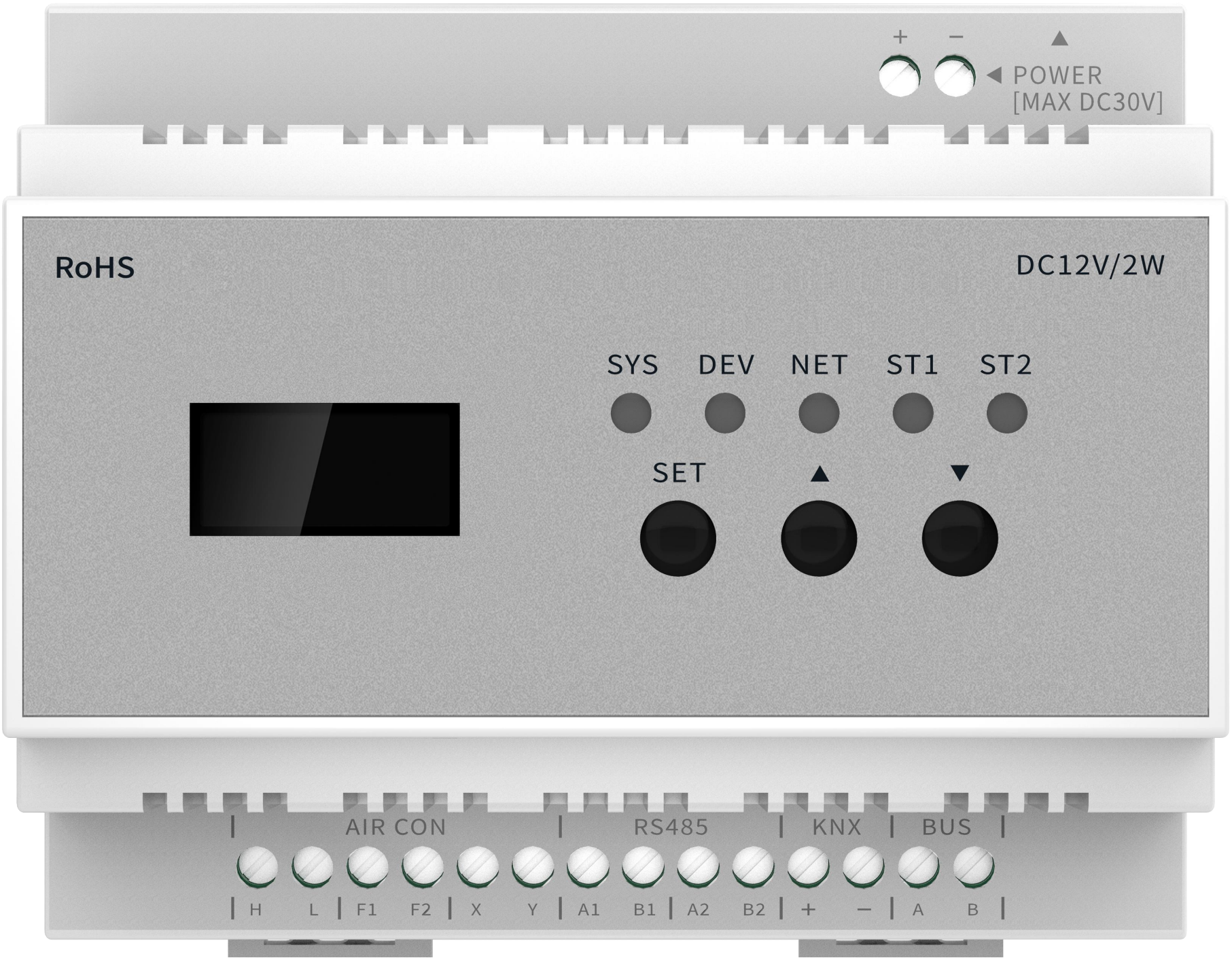




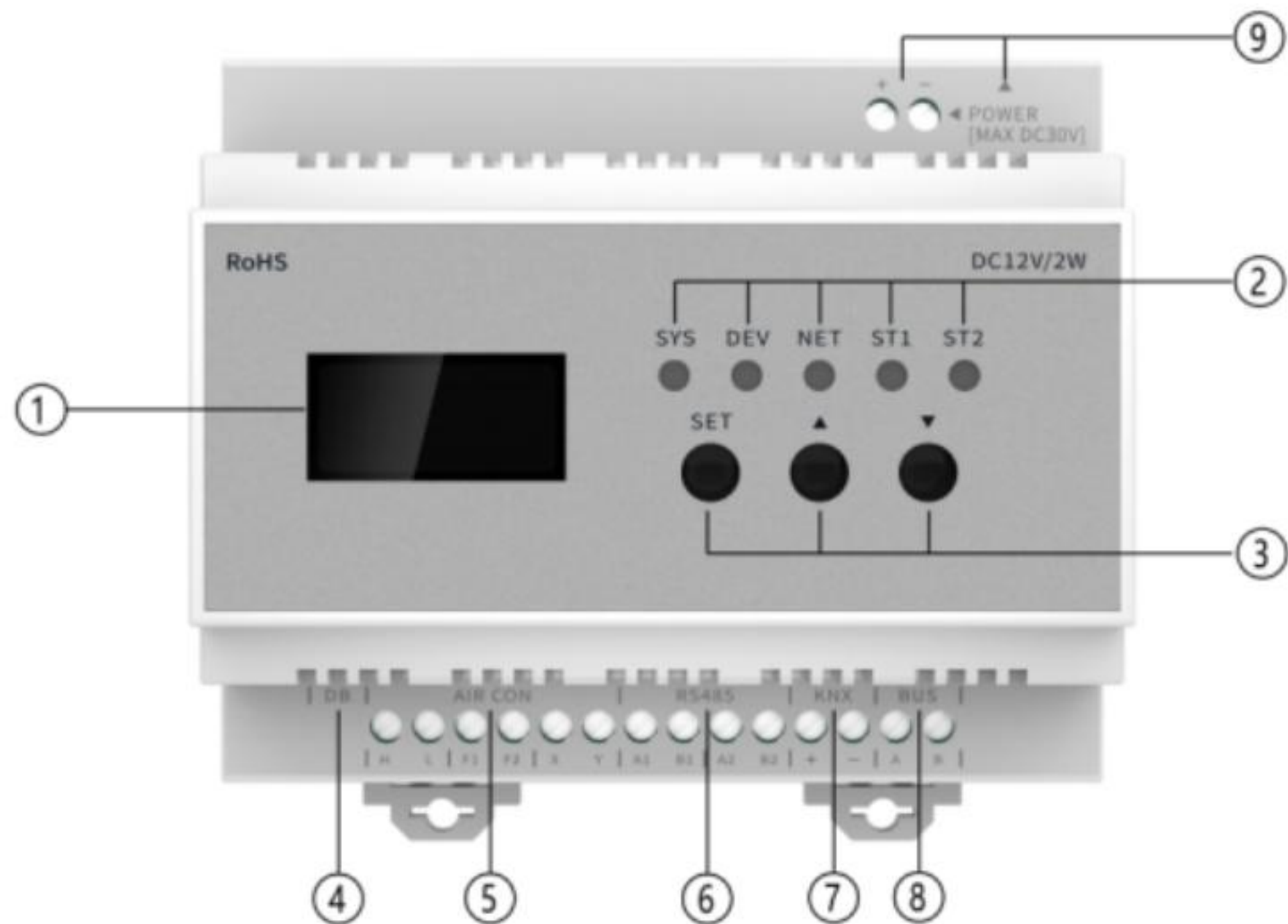
VRF Controller T1 Introduction

VRF Controller T1 Overview

VRF controller T1 is an HVAC controller based on Zigbee wireless protocol. It can integrate multi connected air conditioning systems/fresh air systems/underfloor heating systems into the Aqara smart home system. With Aqara devices equipped with gateway functions, it can control the on/off, temperature adjustment, mode switching, wind speed adjustment of multi connected air conditioning/fresh air/underfloor heating through a mobile app, and achieve scene linkage with other Aqara smart devices. The interface modes that the device can provide are RS485, KNX, or Zigbee. The air conditioner currently supports multi split air conditioning systems from brands such as Daikin, Hitachi, Toshiba, Mitsubishi Electric, Hisense, Haier, Panasonic, York, Mitsubishi Heavy Industries, Midea, LG, AUX, Bosch, Gree, Tianjia, Samsung, Zhigao, Trang, Carrier, and McQuay. Floor heating and fresh air support some brands.



VRF Controller T1 Overview



1) LCD screen: displays whether communication is normal, displays the brand and quantity of air conditioning being controlled, the quantity of fresh air searched, and the equipment parameters of this product.

2) LED indicator light: working status indicator light.

3) Button: It enables flipping of the displayed content on the LCD screen and setting of parameters, and can achieve different functions through key combinations.

4) DB interface: Debugging and downloading programs.

5) AIR CON terminal: According to the protocol, it is connected to air conditioners such as Daikin, Hitachi, Toshiba, Mitsubishi Electric, Hisense, Haier, Panasonic, York, Mitsubishi Heavy Industries, Midea, LG, AUX, Bosch, Gree, Tianjia, Samsung, Zhigao, Trane, Carrier, McQuay, etc. through different interfaces.

6) RS485 interface: an interface for interfacing with environmental control systems such as fresh air based on the 485 protocol.

7) KNX interface: a smart home and air conditioning system interface based on the KNX system.

8) BUS interface: a smart home and air conditioning system interface based on 485 communication. (Fresh air, underfloor heating)

9) POWER interface: power supply port, socket, and power supply terminal are all available.

Attention: The power supply specification is DC12V. If an incompatible power supply is used, it may cause damage to this product.

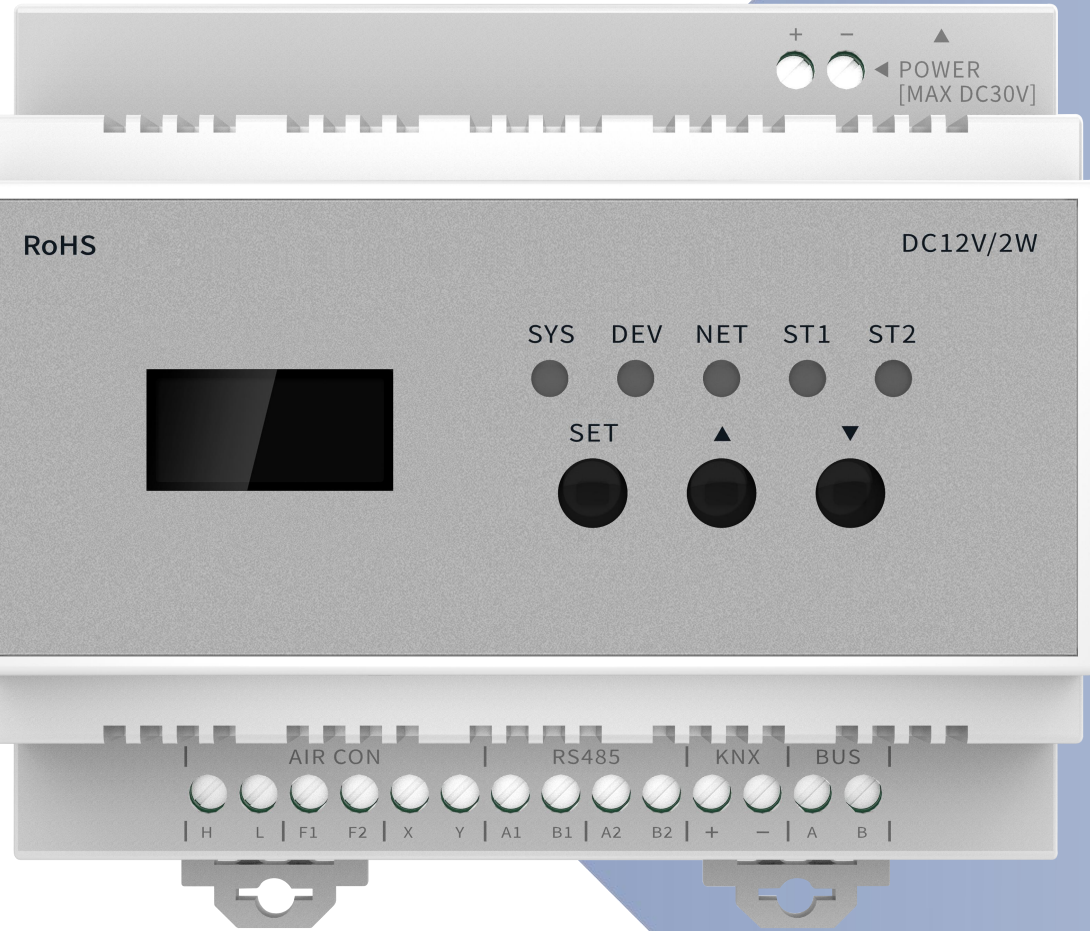
VRF Controller T1 Specification

Product Model	VRFKZQ02ES
Dimension	106*96*57mm
Color	White
Input power supply	DC 12V (MAX DC 30V)
Power consumption	≤2.0W
Working temperature	0-40℃
Working humidity	0~90% RH
Configuration upgrade	Device firmware: upgrade based on Bluetooth&WiFi+applet or official account, or Aqara Home APP;
	Module firmware: Zigbee upgrade
Smart device interface	ZigBee/BLE/WIFI/RS485 etc
Button	Three buttons (SET\▲\▼) , See button instructions for details
Indicator light	5 (SYS\DEV\NET\ST1\ST2) , See indicator instructions for details
Installation	Guide rails or placement (hidden, mostly on the ceiling)
What' s in the box	VRF Controller T1*1、 manual*1、 power adapter (DC12V) *1

VRF Controller T1 Overview

	VRF Controller T1
Use case scenario	central air-conditioning
Structure	One outdoor unit, multiple indoor units (fan coil units)
Feature	No matter how many indoor units are turned on, the outdoor unit needs to be turned on
Working principle	Central air conditioning relies on fan coil units to deliver cold and hot air indoors. Generally, the air does not circulate, and the air outlet and supply outlet of the central air conditioning are separated, resulting in more uniform temperature diffusion
Installation method	Plan the pipeline in advance, install the outdoor unit first, then connect the pipeline along the ceiling to each room, and finally hide the ceiling without any ceiling
Use	A central air conditioning system using a VRF device can control all indoor units within the entire air conditioning system, achieving one to many control of indoor units (switch, mode, air speed, temperature). The premise is that there needs to be interactive data on the communication bus between the internal and external units, and it is not possible to control the one-to-one air duct machine
Installation position	Connect the indoor unit (communication terminal between the indoor and outdoor units) or the outdoor unit. There are some models must be connected to the outdoor unit and placed indoors.
Control	Centralized control of central air conditioning and underfloor heating

VRF Controller T1 Overview



- HVAC devices group control

Supports up to 64 air conditioners, 16 fresh air units, and 16 underfloor heating devices connected to the group control system

- Compatible with multiple brands

Compatible with many brands of central air conditioning; New air and underfloor heating support some brands

- Online OTA

The device firmware can be upgraded through the APP, or the corresponding brand of HVAC device can be selected for online upgrade through the WeChat mini program, with worry free installation and debugging

- Zigbee Automation

Rich Zigbee connectivity can be achieved through the Aqara platform

- HomeKit

Manage home central air conditioning and perform intelligent control on the Home app

- Voice Control

Support Siri

VRF Controller T1 Scene linkage



Smart adjustment: Living room
 Whole house smart linkage: VRF Controller T1+M2 Hub +Temperature and humidity sensor
 Implementation: When indoor temperature exceeds the set value of the temperature and humidity sensor, turn on the air conditioning/underfloor heating and set them to the preset mode; Automatically set to other preset modes when the temperature reaches the appropriate value;



Purifying air: living room, bedroom
 Whole house smart linkage: VRF air conditioning controller T1+M2 hub +air detection panel
 Implementation: When the air detection panel detects poor air quality at home, it opens the fresh air controller through VRF T1 to improve air quality by circulating air inside and outside



Mode pre enabled: Arrive home, leave home
 Whole house smart linkage: mobile phone location+M2 gateway+VRF controller T1
 Implementation: When reaching a radius of XX meters from home, the air conditioning and underfloor heating will be turned on in advance; After leaving home within a radius of XX meters, turn off the air conditioning and underfloor heating;



Multi mode scenarios: dining, watching movies, taking lunch breaks, reading books
 Whole house smart linkage: VRF controller T1+Cube T1 Pro+M2 hub
 Implementation: Wave the Cube to turn on the air conditioning to pre-set modes for dining, watching movies, taking a nap, reading, and other scenes, experiencing the most comfortable air conditioning and fresh air environment in different scenarios

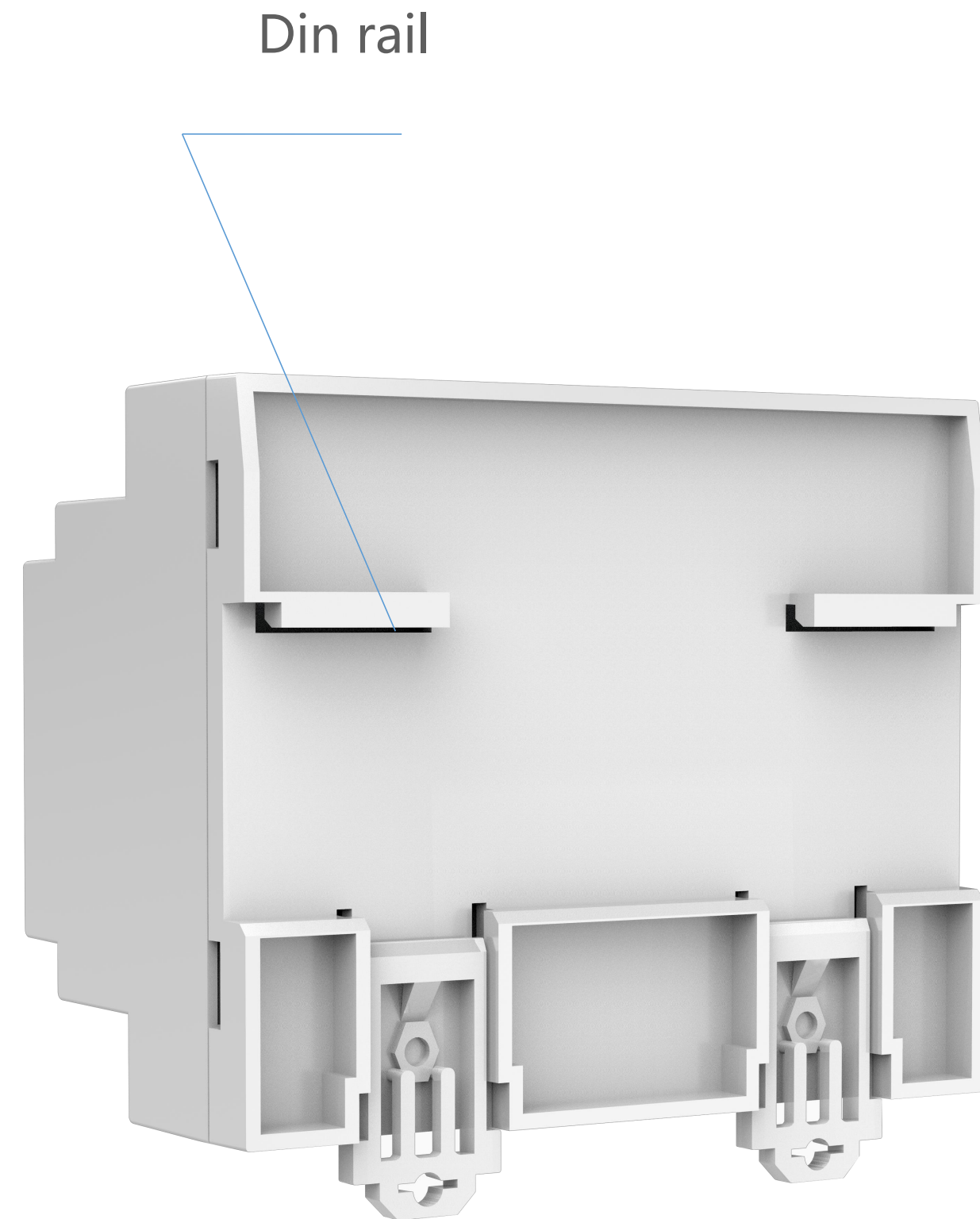
VRF Controller T1 Automation

Category	Type	Automation
IF	Air-conditioning	Turn on the designated indoor unit
		Turn off the designated indoor unit
		Designated indoor unit is on
		Designated indoor unit is off
	Fresh air	Turn on the designated Fresh air unit
		Turn off the designated Fresh air unit
		Designated Fresh air unit is on
		Designated Fresh air unit is off
	Floor heating	Turn on the designated floor heating unit
		Turn off the designated floor heating unit
		Designated floor heating unit is on
		Designated floor heating unit is off

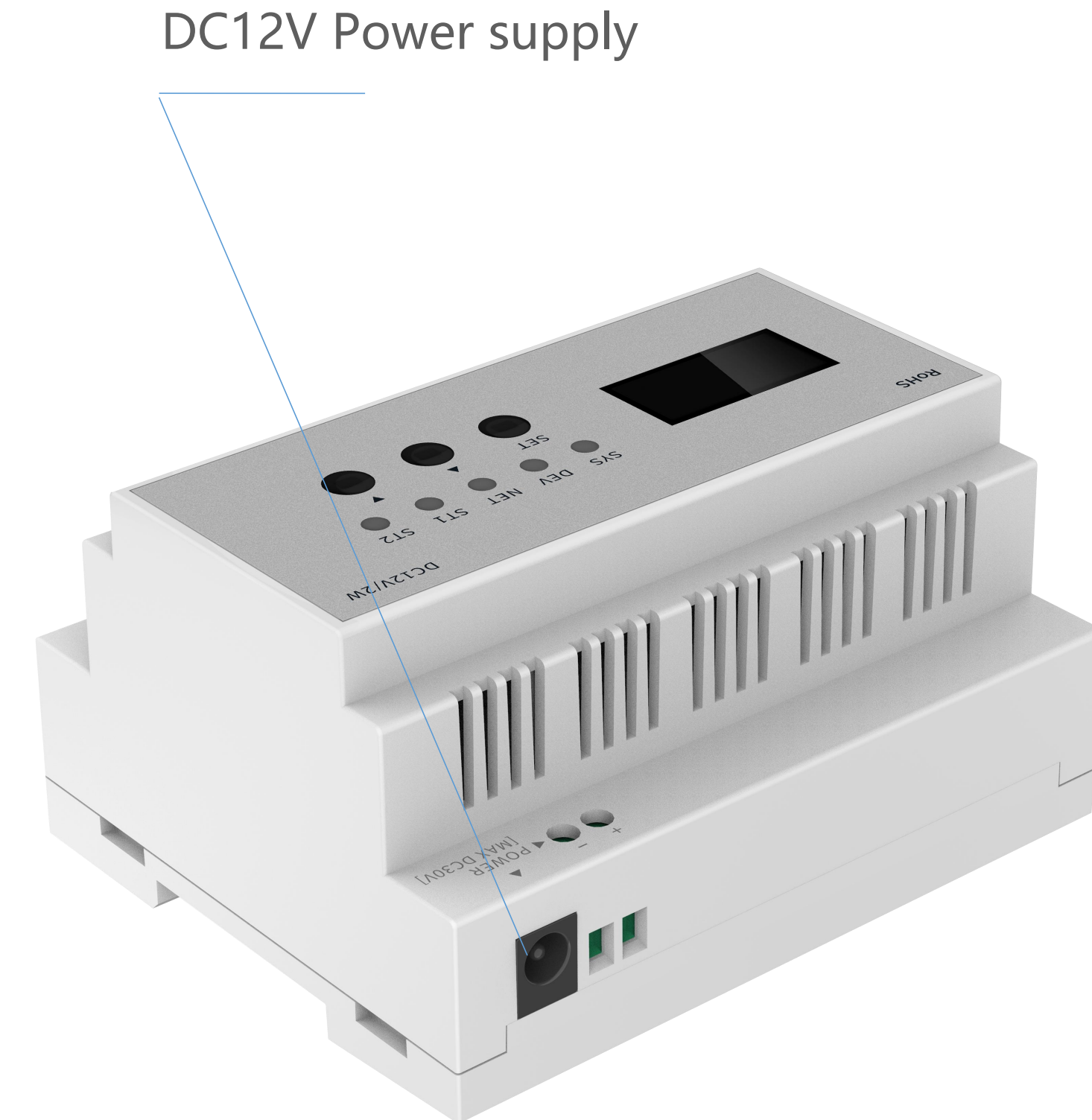
Category	Type	Automation
Then	Air-conditioning	Turn on the designated indoor unit
		Turn off the designated indoor unit
		Turn on all indoor unit
		Turn off all indoor unit
		Turn on the designated indoor unit to the specified state
		Raise the indoor unit temperature to X degrees
		Lower the indoor unit temperature to X degrees
	Fresh air	Turn on the designated Fresh air unit
		Turn off the designated Fresh air unit
		Turn on all Fresh air unit
		Turn off all Fresh air unit
		Turn on the designated Fresh air unit to the specified state
	Floor heating	Turn on the designated floor heating unit
		Turn off the designated floor heating unit
		Turn on all floor heating unit
		Turn off all floor heating unit
		Turn on the designated floor heating unit to the specified state
		Raise the designated floor heating unit temperature to X degrees
		Lower the designated floor heating unit temperature to X degrees



VRF Controller T1 Installation



This product needs to be installed indoors and can be installed in smart home control boxes or ceiling inspection ports.
The back supports Din rail installation and can also be fixed with Din rail.



This product comes standard with a DC12V power adapter by default

VRF Controller T1 Indicator Light



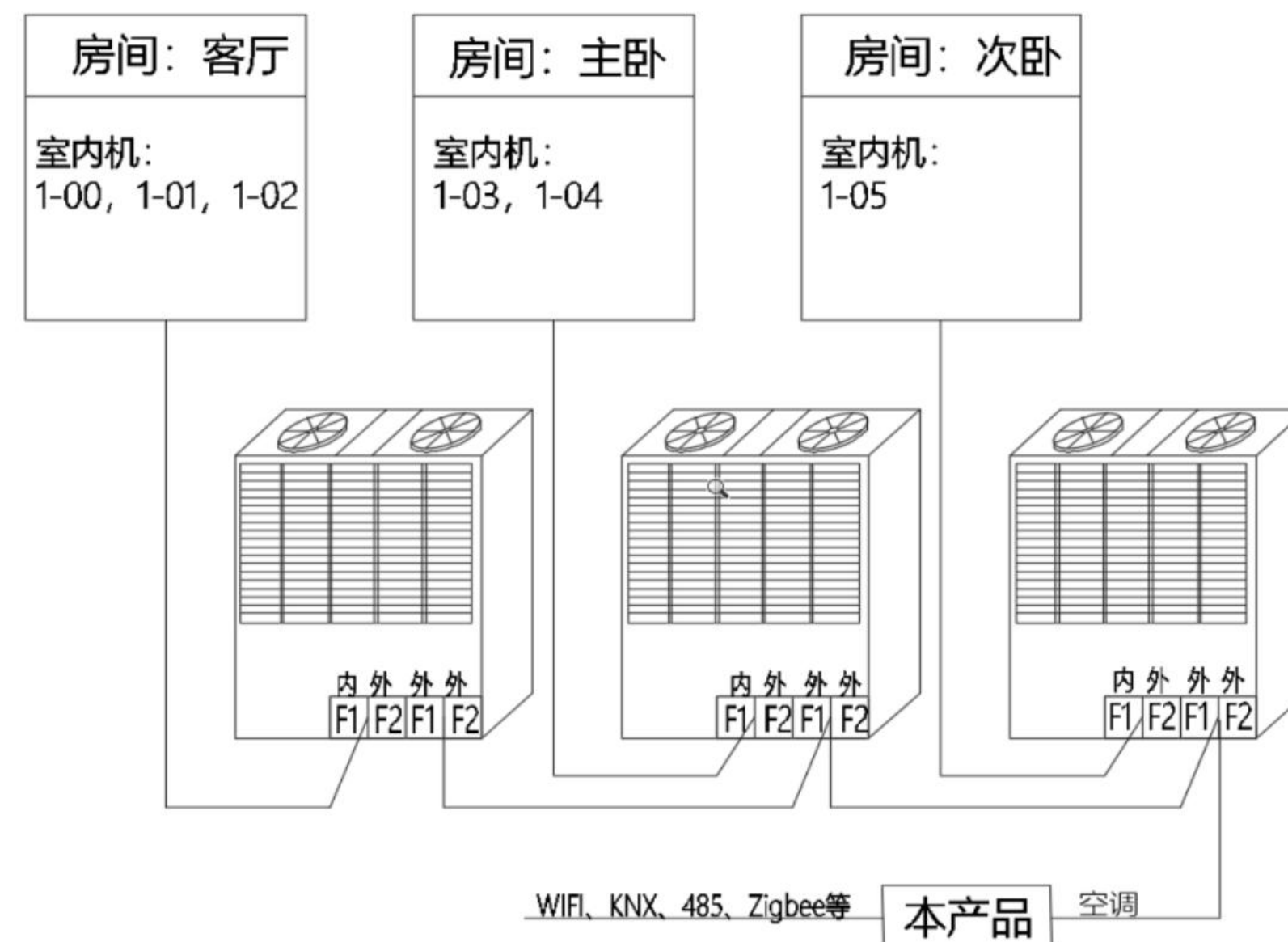
VRF Controller T1 Indicator Light

Name	Device	Indicator Light	Description
SYS	VRF Device	Yellow light on for 2s	Power on within 2 seconds
		Green light flashes slowly	VRF normal
		Yellow light stays on	VRF abnormal
		Green light stays on	VRF initializing
DEV	Device end	Green light stays on	Search for air conditioning
		Green light flashes	VRF has found air conditioning, fresh air, and panel device. The green light flashes slowly when running normally, and the green light flashes quickly when the equipment has data
		Red light stays on	VRF has found air conditioning, fresh air, and panel equipment. When there is a fault code on the air conditioning bus or no data on the bus
NET	Smart end (ZigBee)	Red light stays on	Smart end module (ZigBee) malfunction (prolonged lack of communication or module failure)
		Yellow light stays on	Smart end module (ZigBee) detached
		Green light stays on	Binding successfully
		Green light flashes	Searching for network
		Light off	Not connected or configured
ST1	BLE end	Light off	Mobile Bluetooth not connected
		Green light stays on	Mobile Bluetooth connected
ST2	Wi-fi end	Light off	Wi-Fi not connected
		Green light stays on	Wi-Fi connected

VRF Controller T1 Wiring Methods and Precautions

Wiring Methods:

- The communication line between the indoor and outdoor units of the air conditioner is the responsibility of the air conditioner construction party, and does not require consideration from the weak current integration party.
- This product is connected to the outdoor or indoor unit of the air conditioning system through a 2-core shielded twisted pair cable, and then communicates with all indoor units in the air conditioning system to implement monitoring. The shielded twisted pair cable from the outdoor unit of the air conditioner to this product requires a wire diameter of 0.75mm^2 or more and a total length of no more than 1000 meters. It can be reserved by the air conditioner construction party or added later. The communication between this product and the weak current integration system is also achieved using twisted pair or Ethernet cables. The parameter requirements and construction details of this communication cable should be determined based on the location between the gateway and the weak current integration system.



Taking Daikin Central Air Conditioning as an Example

continuous connection

VRF Controller T1 Wiring Methods and Precautions

Precautions for wiring operations, pay attention when performing wiring operations:

1. The control methods of different protocols have different input terminals and wiring terminals.
2. It is recommended to use the device's built-in power supply or a DC12V power adapter produced by a reputable manufacturer.
3. Attention! If the wiring is incorrect, it may cause damage to this product.
4. During wiring operations, user must cut off the power supply to the gateway and air conditioner, otherwise it may cause malfunctions and cause damage to this product.
5. Please be careful to avoid wiring between signal cables and parallel to power lines, as this may result in erroneous actions due to signal interference. If it is not possible to avoid parallel wiring, please maintain a distance of at least 15cm between the communication lines related to this product and the communication lines between the air conditioning system, and at least 30cm from other wiring. Alternatively, connect the cable to an iron protective tube and ground one end of the protective tube. The chassis must be grounded in type D.
6. If the power cord is mistakenly connected to the signal terminal, it may cause the product components to burn out. If this situation occurs, please contact the manufacturer and it is strictly prohibited to disassemble and repair without authorization.

Precautions:

1. Confirm that the air conditioning system is powered on: Check if all indoor and outdoor units connected to centralized control are powered on.
2. Confirm that the air conditioning system has been successfully debugged and operated by the air conditioning manufacturer without any alarms or abnormalities.
3. After supplying power to this product (DC12V), initialization and searching for air conditioning will begin, which will take approximately 2-5 minutes. When the LCD screen quickly displays the specific brand, the number of indoor units will be displayed after 2-5 minutes of searching for air conditioning. At this time, the SYS green light flashes slowly, the DEV indicator light flashes slowly green (no data) or flashes rapidly (with data). When no air conditioner is found, the LCD screen will display the number of local air conditioners as 0, and the DEV indicator light will remain green

VRF Controller Hardware Configuration Preparation

1. Hardware configuration preparation

- 1) Confirm that the air conditioning system is powered on: Check if all indoor and outdoor units connected to centralized control are powered on.
- 2) Confirm that the air conditioning system has been successfully debugged and operated by the air conditioning manufacturer without any alarms or abnormalities.
- 3) Confirm the address of the indoor unit and the corresponding outdoor unit of the air conditioner and record the wiring method (please scan the QR code behind to follow the WeChat official account of "Firmware upgrade of the air conditioner gateway" for relevant information).
- 4) Connect the wires according to the "Product Port Selection and Communication Matching" on the rear or query the wiring rules through the official account of "Firmware Upgrade of Air Conditioning Gateway".
- 5) Power on the device, press the Aqara gateway network button three times, press and hold the SET button for more than 5 seconds, the device buzzer will beep, enter the network configuration state, and automatically configure the network successfully. (Requires Aqara devices that support Zigbee 3.0 gateway functionality) or use the Aqara Home App to configure Zigbee network.



VRF Controller T1 Hardware Configuration Preparation

2. Update of equipment air conditioning/fresh air/underfloor heating model database

When using VRF for the first time, the default air conditioning brand supported by the factory firmware is Daikin. To ensure that the firmware is up-to-date, please update the corresponding database through the Aqara Home app after receiving the product. The specific steps are as follows:

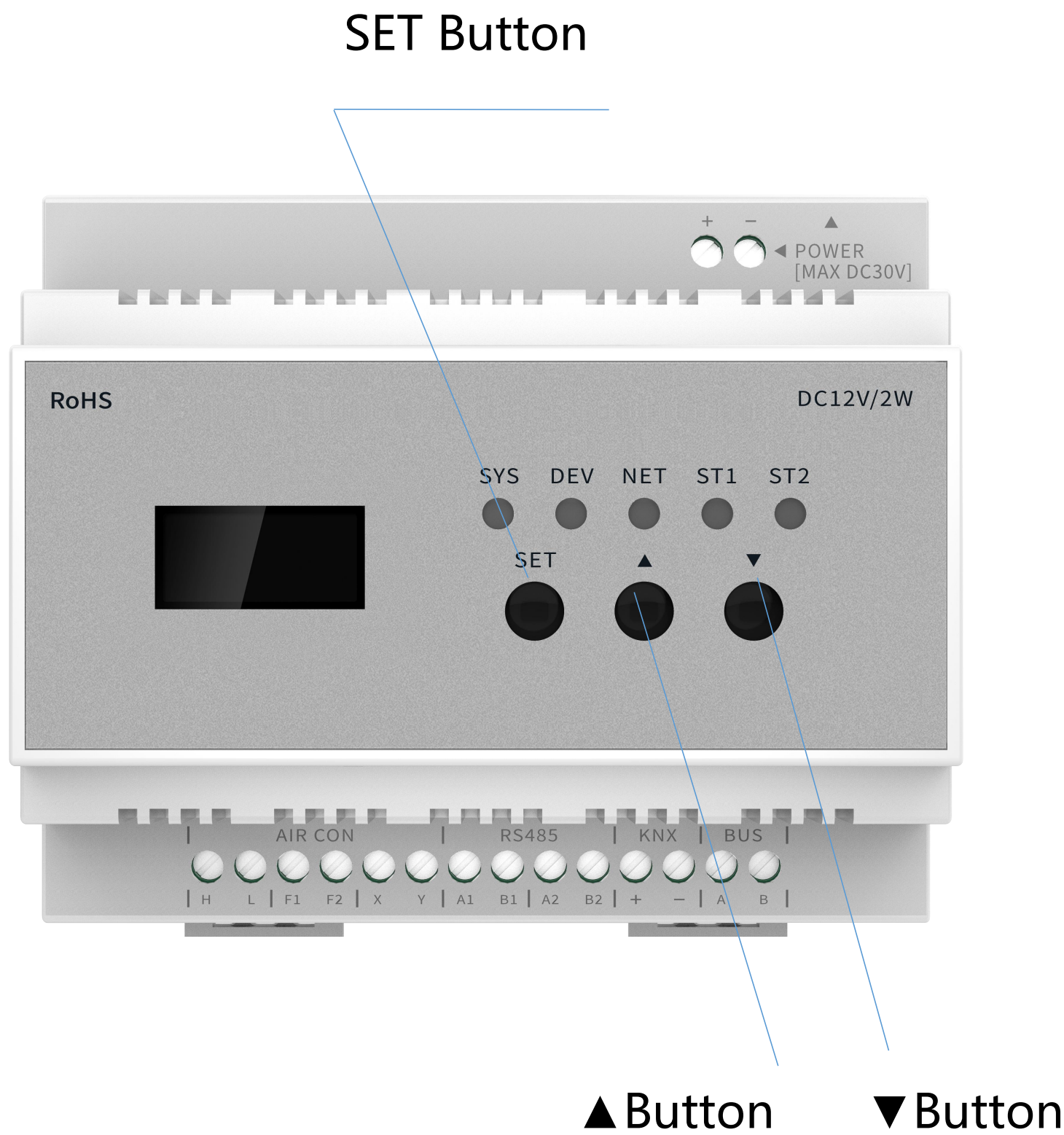


- 1) Go to the device homepage, click on "... " in the upper right corner, enter the device settings page, click on "More Settings", select "Connect Wi Fi" for Wi Fi configuration;
- 2) Once the settings are complete, return to "More Settings" and select "Update Database" to update the equipment model database for air conditioning/fresh air/underfloor heating;
- 3) After selecting the corresponding air conditioning, fresh air, and underfloor heating brands, click "Update";
- 4) After clicking on the update button, the device will automatically restart, and the LCD screen will display "Upgrade in progress". The upgrade process will take approximately 5 minutes;
- 5) After the VRF upgrade is successful, the LCD screen displays as Upgrade Successfully;
- 6) After the VRF upgrade is successful, it will automatically restart and then you can officially connect the devices you need to control.

VRF Controller T1 Buttons & Buzzer Description

1) Button Description

Button: It enables flipping of the displayed content on the LCD screen and setting of parameters, and can achieve different functions through key combinations.



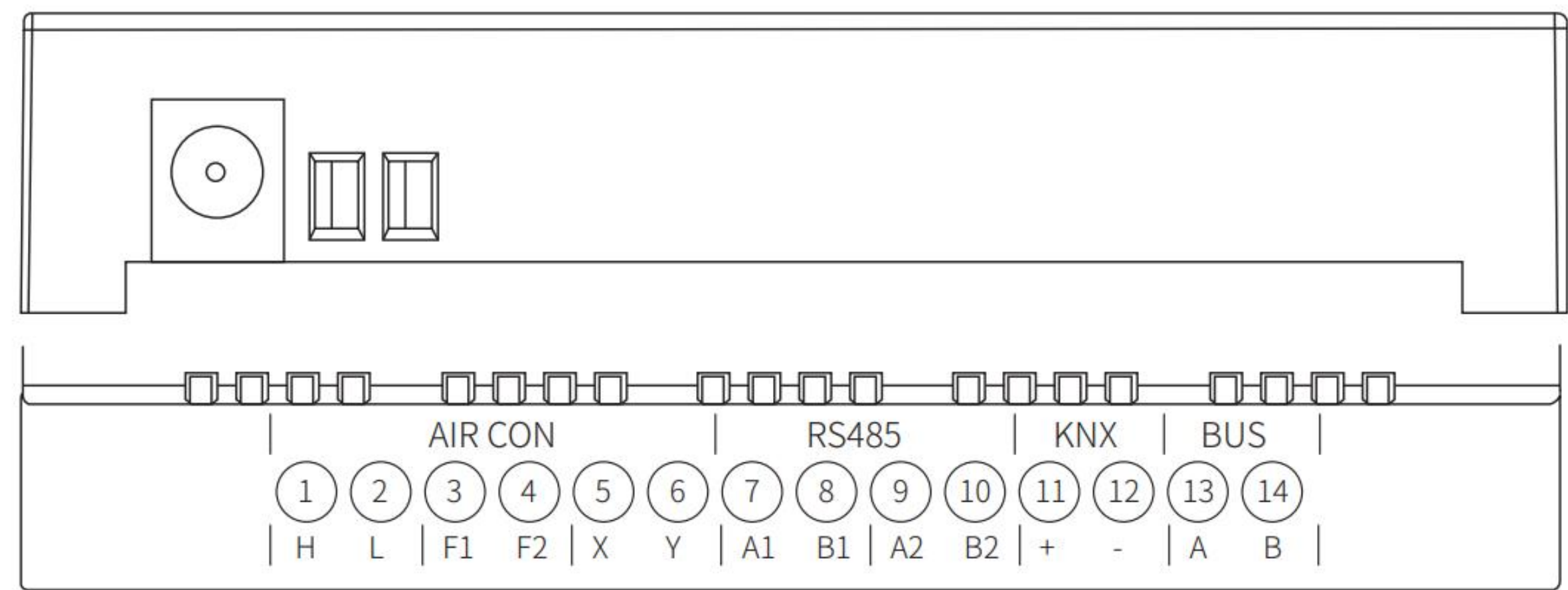
Button type	State	Description
SET Button	After powering on	Press and hold for 5 seconds to reset the network or enable binding, and the buzzer will beep for 4 seconds; During the power on window period (long press set reset at this time), the factory settings can be restored
	After binding	Single click, Aqara hub sends a "normal link confirmed" or beep prompt sound
▲Button (UP Button)	After finding the air conditioner	Short press to page up
▼Button (DOWN Button)	After finding the air conditioner	Short press to page down
SET+ ▲Button	After finding the air conditioner	Press and hold for 5 seconds to turn on all air conditioning.
SET+ ▼Button	After finding the air conditioner	Press and hold for 5 seconds to turn off all air conditioning.

2) Buzzer Description

Status	Action	Description
When configuring/resetting the network	Press and hold the SET button for 5 seconds to enter networking or reset the network	Buzzer - beep for 3 seconds.
APP - When searching for devices	When connecting to Homekit, click on "Identify Accessories" on the app	Buzzer - beep briefly 3 times.

VRF Controller T1 Port Selection and Communication Matching

1. The hardware port structure is illustrated in the following figure



2. Please use this product according to the air conditioning brand and follow the table below for on-site wiring and equipment wiring.

Note ①: If the port polarity is marked as "none ×", the wiring between the device wiring port and the air conditioning wiring port can be done freely; If the port polarity displays "Yes ✓", the wiring between the device wiring port and the air conditioning wiring port must be wired according to the order marked below the device port in the instruction manual and the corresponding order of the ports below the air conditioning port. For example, Midea has the polarity label "Yes" on the gateway wiring port. It is necessary to connect the air conditioner X wiring port to the device X wiring port, and connect the air conditioner Y wiring port to the device Y wiring port.

Note ②: When using Mitsubishi Electric's multi outdoor unit system, connect the centralized control line to TB7 "M1, M2" and plug the jumper cap of the outdoor unit PCB centralized control switch CN41 into CN40.

※ **Note 3:** Usually A1 and B1 are connected to fresh air equipment, A2 and B2 are connected to ground heating equipment, and relevant support brands can be found on the official account.

VRF Controller T1 Port Selection and Communication Matching



Brand	VRF side wiring port	AC side wiring port	Polarity of wiring port*①	Must connect an external device?	Is it a centralized control address?	Brand	VRF side wiring port	AC side wiring port	Polarity of wiring port*①	Must connect an external device?	Is it a centralized control address?
Daikin Multi External Unit	F1, F2	F1, F2 (External -Internal)	×	√	√	Midea, Bosch, Carrier	X, Y	X, Y	√	√	×
Daikin - Single External Unit	F1, F2	F1, F2 (Internal-External)	×	×	√		X, Y	P, Q	√	×	×
Mitsubishi Electric - Multi External Unit * ②	F1, F2	M1, M2 (TB7)	×	√	×	Midea - Cool Style	X, Y	A, B (External)	√	√	×
Mitsubishi Electric - Single External Unit	F1, F2	M1, M2 (TB3)	×	×	×	Oaks	X, Y	A, B	√	×	×
Mitsubishi Electric - Power Multi Lingyao	F1, F2	M1, M2 (External Unit) M1, M2(Cable distribution cabinets)	×	×	×	Samsung	X, Y	F1, F2	×	×	×
Hitachi	F1, F2	1, 2	×	×	×	LG	X, Y	A, B(CEN)	√	×	×
Toshiba	F1, F2	U1, U2	×	×	√	McVeil	X, Y	Apc, Bpc	√	√	×
Panasonic	F1, F2	U1, U2	×	×	×	Tianjia	X, Y	A3, B3	√	×	×
Hisense	F1, F2	1, 2	×	×	×	chigo	X, Y	P, Q	√	×	×
Haier	F1, F2	P, Q	×	×	×	Trang	X, Y	A, B	√	√	×
York - Qingdao	F1, F2	1, 2	×	×	×	York household water machine	X, Y	A, B	√	√	×
York - Guangzhou	X, Y	A2, B2	√	√	×		X, Y	A2, B2	√	√	×
GREE	H, L	G1, G2	√	√	×	McQuay household water machine	X, Y	Apc, Bpc	√	√	×
	H, L	D1, D2	√	×	×		X, Y	A, B	√	√	×
TCL	H, L	F1, F2	√	×	×	Carrier household water machine	X, Y	A, B	√	√	×
Mitsubishi Heavy Industries	X, Y	A1, B1	×	×	×	Trang household water machine	X, Y	CN29(A, B)	√	√	×
	X, Y	A2, B2	×	×	×						

continuous connection

VRF Controller T1 Device usage steps

- 1.When the VRF is connected to the DC12V power supply, the device ID QR code of this VRF will first be displayed. Based on this code, remote firmware upgrades or product information viewing can be performed on this VRF, as shown in Figure ①
- 2.After the QR code disappears, the LCD screen displays: "At this time, long press SET for 5 seconds to reset", as shown in Figure ②. If no reset operation is required, wait for automatic skipping; If a reset is required, press and hold the "SET" button for about 5 seconds when it displays "SET can be reset for 5 seconds", and the LCD screen will display "reset successful" to complete the reset.
- 3.At this point, the information page will be displayed:
 The first page displays the air conditioning brand, supported protocols, normal operation/errors of the device, and the number of air conditioners found in the search (when the number of air conditioners is 0, it is in the search for air conditioners and needs to wait for about 5 minutes before refreshing the interface to display the number of air conditioners found in the search),
 At this point, pressing "▼" will switch to the next page, with the first line displaying the local IP and the second line displaying the firmware version number.
 At this point, pressing '▼' will switch to the next information page, displaying the presence or absence of remote functions, as well as brand information for fresh air and underfloor heating,
 At this point, pressing '▼' will switch to the next information page, displaying local and module fault information,
 At this point, pressing "▼" will switch to the next information page, displaying WIFI, RSSI, Bluetooth, and Bluetooth address. Each information page can be switched freely through "▲" and "▼". As shown in Figure ③:



Figure ①

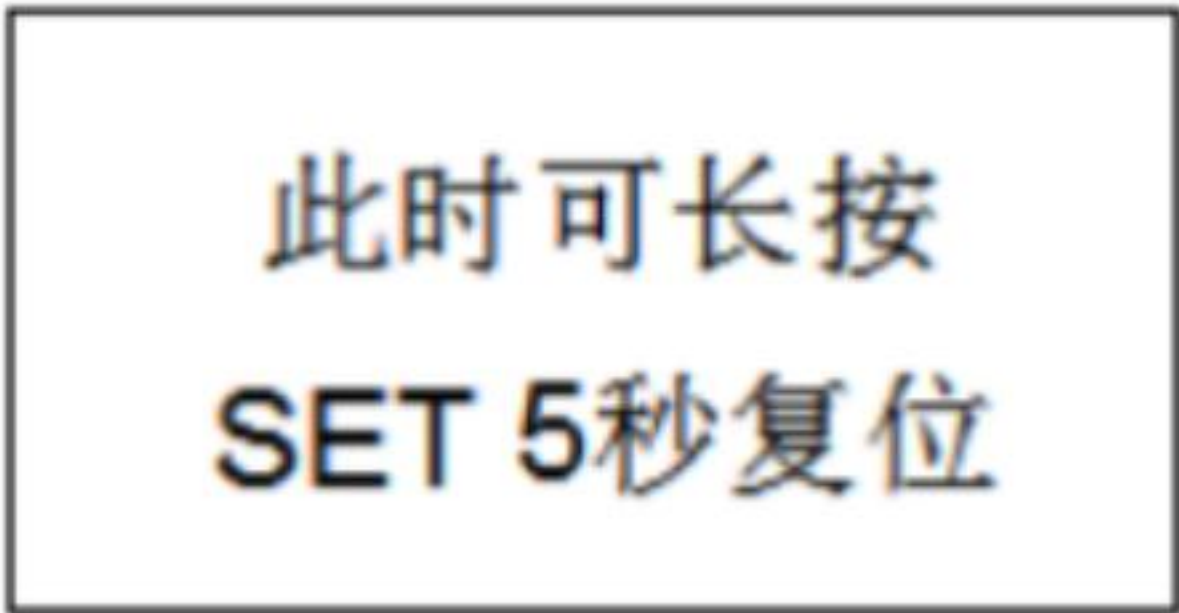


Figure ②



Figure ③

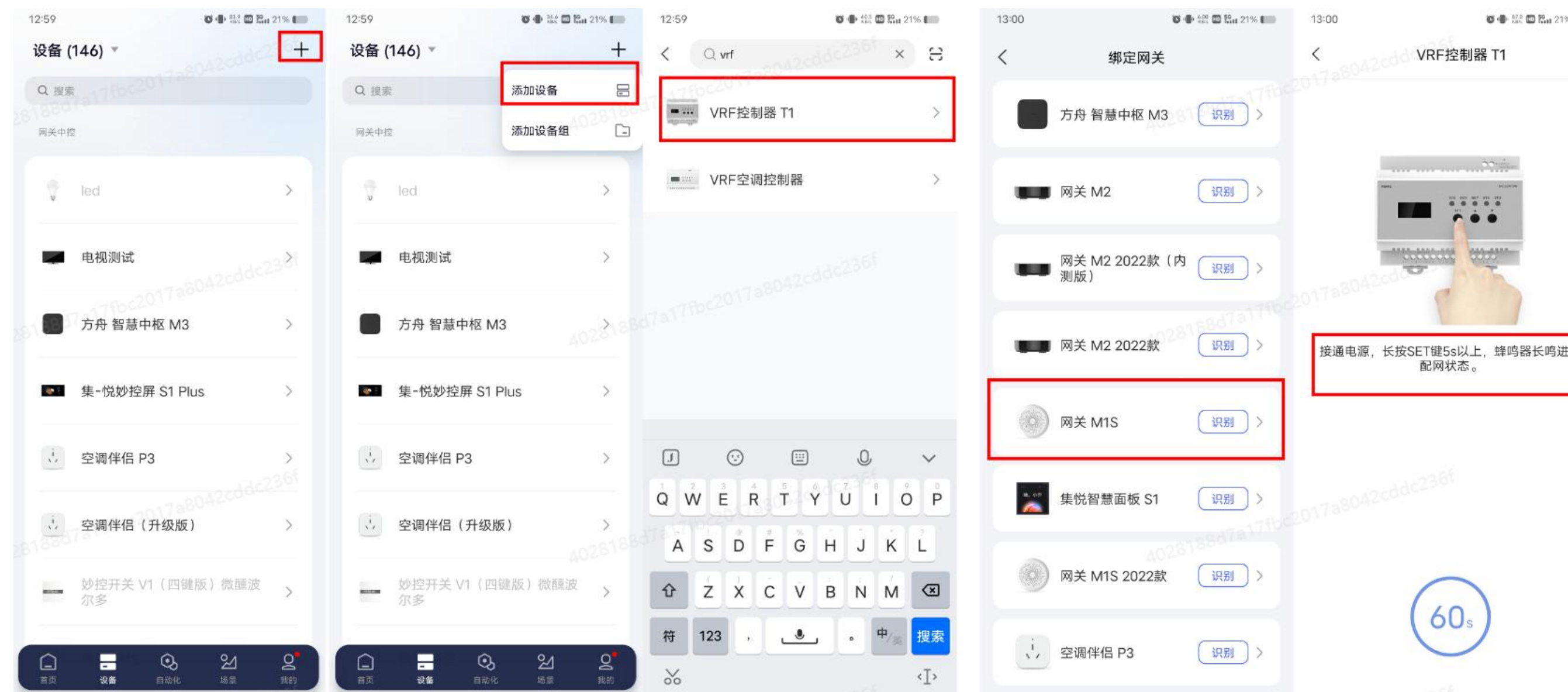
VRF Controller T1 Device Binding

Aqara Home APP:

Please download the Aqara Home App and ensure that the supported gateways have been added to the Aqara Home App. Click on the "+" icon in the upper right corner of the homepage to enter the "Add Device" page. Search for "VRF Controller T1" and follow the prompts on the app until the connection is successful.

Quick way of binding:

Quickly press the gateway reset button three times. After hearing the gateway report "Please add accessory" or "Please add child device", press and hold the SET button for more than 5 seconds. After hearing the buzzer beep, release it and wait for the binding successfully.



VRF Controller T1 How to Rename Indoor Unit

1. Select VRF T1 in Aqara home app
2. Select the type of device (AC, floor heating, fresh air) in this case, the AC unit you would like to change name for.
3. Click the “...” sign on top right.
4. Change the indoor unit name



VRF Controller T1 How to use Bluetooth mini program debugging for indoor units?

Debugging method

1. Complete the wiring of VRF controller T1, according to the wiring guidelines of the official account and power up the equipment
2. Turn on the Bluetooth function on your phone and then search for the mini program "Gateway Bluetooth Configuration" (网关蓝牙配网).
3. After entering the "Gateway Bluetooth Configuration" page of the mini program, click on the device list at the top of the "Gateway" and find the corresponding VRF controller T1 connection

After the device is successfully connected, you can debug the air conditioning function control through the "Air Conditioning" column to see if it is normal. If you need to upgrade other brand firmware, you can also find the "Air Conditioning Brand Settings" option in the "Gateway" column to upgrade



VRF Controller T1 FAQ

Q1: What's the VRF Air Conditioning Controller?

A: The VRF Air Conditioning Controller is based on the Zigbee wireless protocol. It can connect the multi-connected air conditioning system to the Lumi smart home system. Paired with the hub device, it can, through the app, realize on-off control, temperature adjustment, mode switch, and fan speed adjustment. It can also realize the scene interaction when it is paired with other Lumi smart devices.

Q2: What platforms does the VRF Air Conditioning Controller support?

A: The VRF Air Conditioning Controller can be controlled by the Aqara home app.

Q3: How to wire the VRF Air Conditioning Controller?

A: First, you need to supply power for the VRF Air Conditioning Controller, and the power supply area is located at the "POWER" logo of the product; the AIR CON area on the VRF Air Conditioning Controller is connected with the communication port of the indoor unit or outdoor unit. For more details, please refer to the wiring instructions in the product manual.

Q4: What should the AIR CONG wiring port of the VRF Air Conditioning Controller wire? The indoor unit or outdoor unit?

A: According to the actual installation environment, most AC brands can connect to the wiring port of the indoor unit, but some AC brands need to connect to that of the outdoor unit.

Q5: Why does the control function sometimes work abnormally?

A1: 1. The air conditioning unit is in the alarming or abnormal status, which causes the control to be ineffective. Please try again after eliminating the fault of the air conditioning unit; 2. The outdoor unit does not power on or temporarily power off; 3. The automatic mode or automatic air volume is set on the wire controller side. They should be adjusted to non-automatic status in time.

A2: This problem is caused by the mismatch between the address of the indoor unit and the address of the control command issued by the app. The address of the indoor unit needs to be modified. The modification method depends on the different AC brands.

Q6: How many indoor units and outdoor units do the VRF Air Conditioning Controller support?

A: Supports up to 64 air conditioners, 16 fresh air units, and 16 underfloor heating devices connected to the group control system.

Q7: After the installation is completed, the VRF air conditioning controller searches for the indoor unit and has found it, but the Mijia app still displays "Network failure".

A: It is recommended that you can restart up the VRF air conditioning controller; if the network still fails, please contact the official after-sales service.

Q8: How to reset? Please refer to below video.

<https://yunpan.aqara.com/link/AAC4495B95AC6D43A49F691D639C62B804>

Q9: How to update firmware? Please refer to below video.

<https://yunpan.aqara.com/link/AAF82DB54877184305B5E4EF0585F3D016>

Q10: How to do first time installation configuration? Please refer to below video.

<https://yunpan.aqara.com/link/AAB9765578880841CA8E6C618E9C0F6A59>

THANK YOU