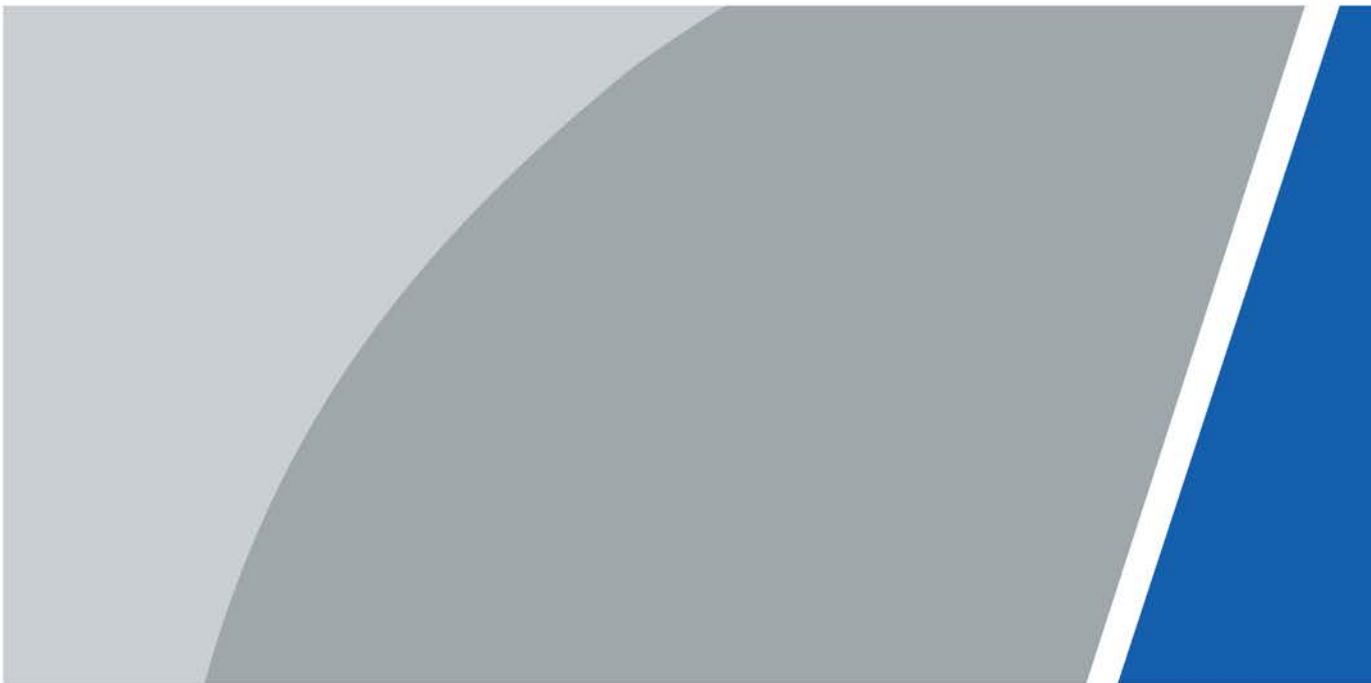# 2-Wire Hybrid Door Station

User's Manual

V1.0.0

Foreword

General

This manual introduces the structure, functions and networking of the 2-wire hybrid door station (hereinafter referred to as "the VTO"). Read carefully before using the device, and keep the manual safe for future reference.

Safety Instructions

The following signal words might appear in the manual.

Signal Words	Meaning
⚠ DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
⚠ CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
☲ TIPS	Provides methods to help you solve a problem or save time.
📖 NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.0	First Release.	August 2023

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.
- All designs and software are subject to change without prior written notice. Product updates

might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.

- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.
- Please visit our website, contact the supplier or customer service if any problems occur while using the device.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Operation Requirements

⚠

- Check whether the power supply is correct before use.
- Do not unplug the power cord on the side of the device while the adapter is powered on.
- Operate the device within the rated range of power input and output.
- Transport, use and store the device under allowed humidity and temperature conditions.
- If the device is powered off for longer than a month, it should be placed in its original package and sealed. Make sure to keep it away from moisture, and store it under allowed humidity and temperature conditions.
- Do not drop or splash liquid onto the device, and make sure that there is no object filled with liquid on the device to prevent liquid from flowing into it.
- Do not disassemble the device without professional instruction.

Installation Requirements

⚠ WARNING

- Do not connect the power adapter to the device while the adapter is powered on.
- Strictly comply with the local electric safety code and standards. Make sure the ambient voltage is stable and meets the power supply requirements of the device.
- Do not connect the device to two or more kinds of power supplies, to avoid damage to the device.
- Improper use of the battery might result in a fire or explosion.

⚠

- Personnel working at heights must take all necessary measures to ensure personal safety including wearing a helmet and safety belts.
- Do not place the device in a place exposed to sunlight or near heat sources.
- Keep the device away from dampness, dust, and soot.
- Install the device on a stable surface to prevent it from falling.
- Install the device in a well-ventilated place, and do not block its ventilation.
- Use an adapter or cabinet power supply provided by the manufacturer.
- Use the power cords that are recommended for the region and conform to the rated power specifications.
- The power supply must conform to the requirements of ES1 in IEC 62368-1 standard and be no higher than PS2. Please note that the power supply requirements are subject to the device label.
- The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.

Table of Contents

1 Product Overview

1.1 Introduction

The 2-wire hybrid VTO uses the metal front panel and supports featured nameplate. Using two wires for communication, the VTO supports video intercom with 2-wire hybrid VTH, and supports local lock and external 485 lock; it also supports call alarm and message notification on DMSS app.

📖

We recommend using the power supply provided with the device in the package. If you solely purchased the device without its power supply, then please make sure that the power supply you intend to use was certified by our company.

1.2 Function

2-wire Communication

Supports 2-wire communication.

Video/Voice Call

Make video or voice call to VTHs.

Monitoring

Videos can be monitored by VTH or DMSS app users.

Auto IR Illumination

Supports auto IR illumination at night.

Unlock

Swipe the cards or use the password to open the door.

📖

Card and password function are available on select models.

Keypad with Braille

The device has the keypad with braille.

📖

Keypad with braille is available on select models.

2 Network Diagram

The network diagrams below display all the networking scenarios.

Different models of the devices have different requirements.

1. For H series VTH and F series VTO.

   When there are 6 devices (VTH+VTO) connected together, only a maximum of 2 devices can provide power output.

2. For G series VTH and S series VTO.

   - When there are no more than 4 VTHs, the maximum current output of all the 12 VDC power is 500 mA.
   - When there are more than 4 VTHs, the maximum current output of all the 12 VDC power is 300 mA.

   📖

   - The power supply of HDCVI camera cannot be grounded.
   - The product appearance is for reference only.

Wiring 1 VTO and 1 VTH

📖

- The two wires connected to the positive and negative terminals of OUT cannot be short-circuited.
- The line termination terminal and branch terminal are optional in this scenario.

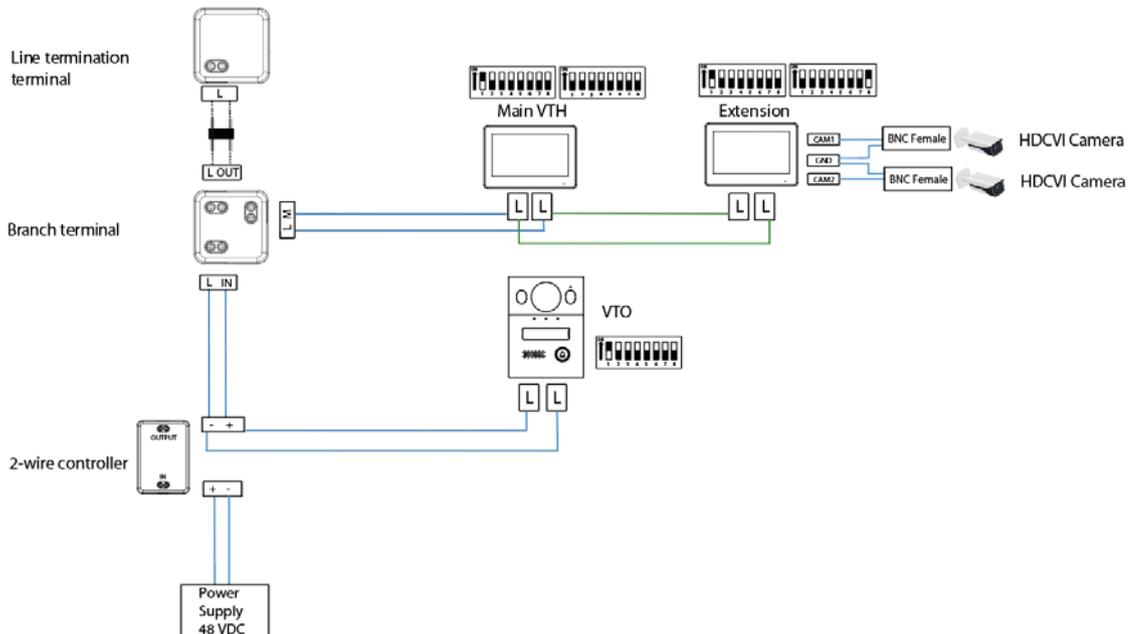Figure 2-1 Network diagram (without line termination terminal and branch terminal)

Figure 2-2 Network diagram (with line termination terminal and branch terminal)
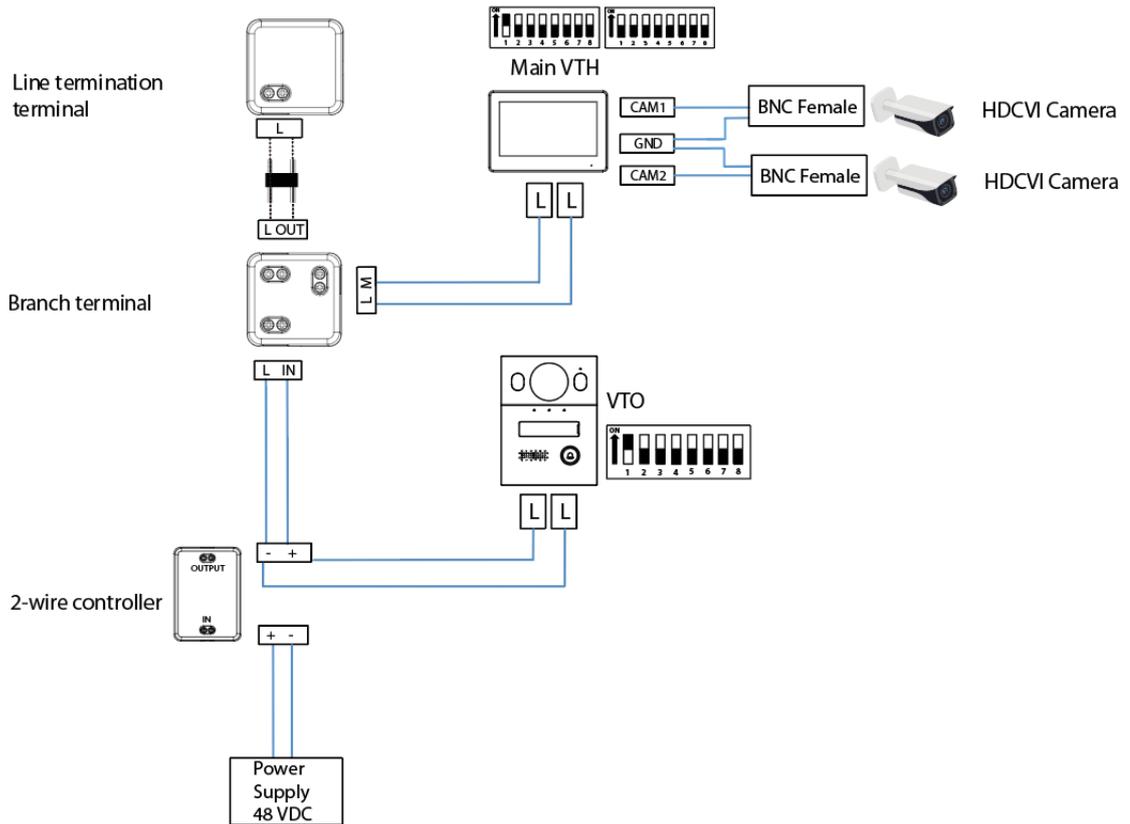
Wiring 1 VTO and 2 VTHs (Cascade Connection)

Figure 2-3 Network diagram

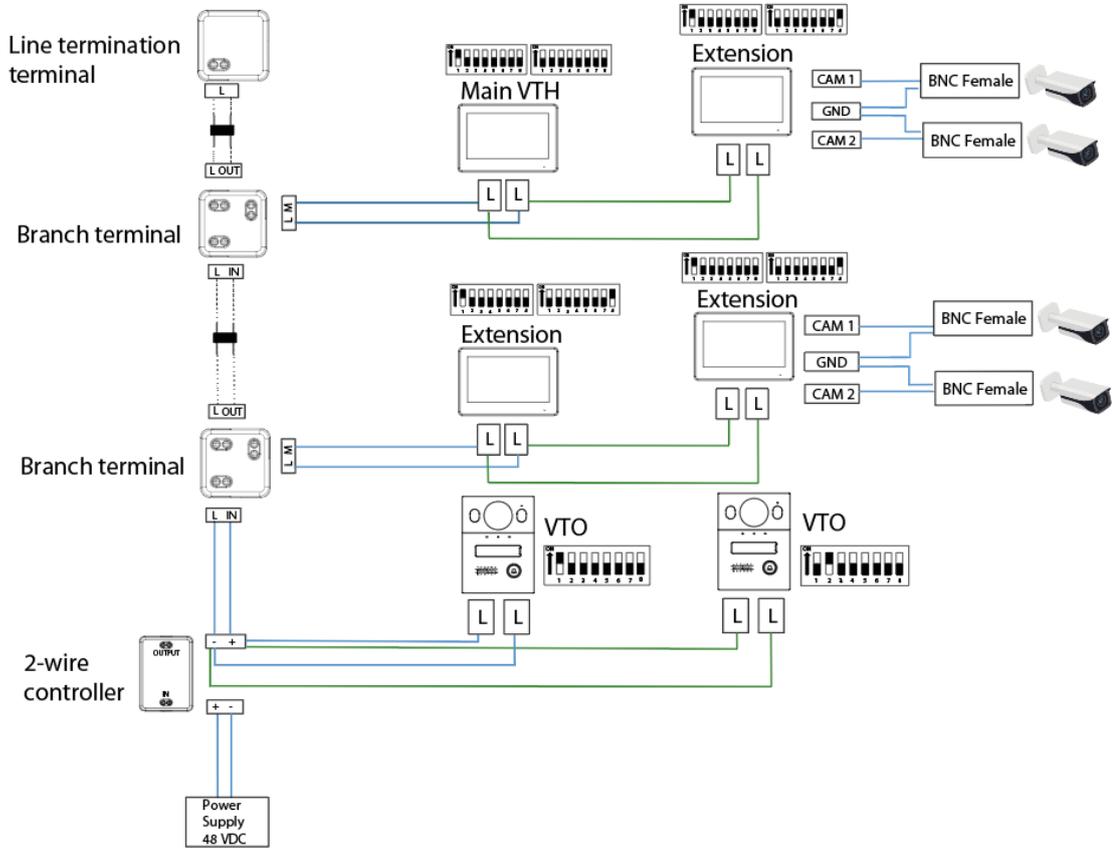# Wiring 1 VTO and 2 VTHs (Parallel Connection)

Figure 2-4 Network diagram
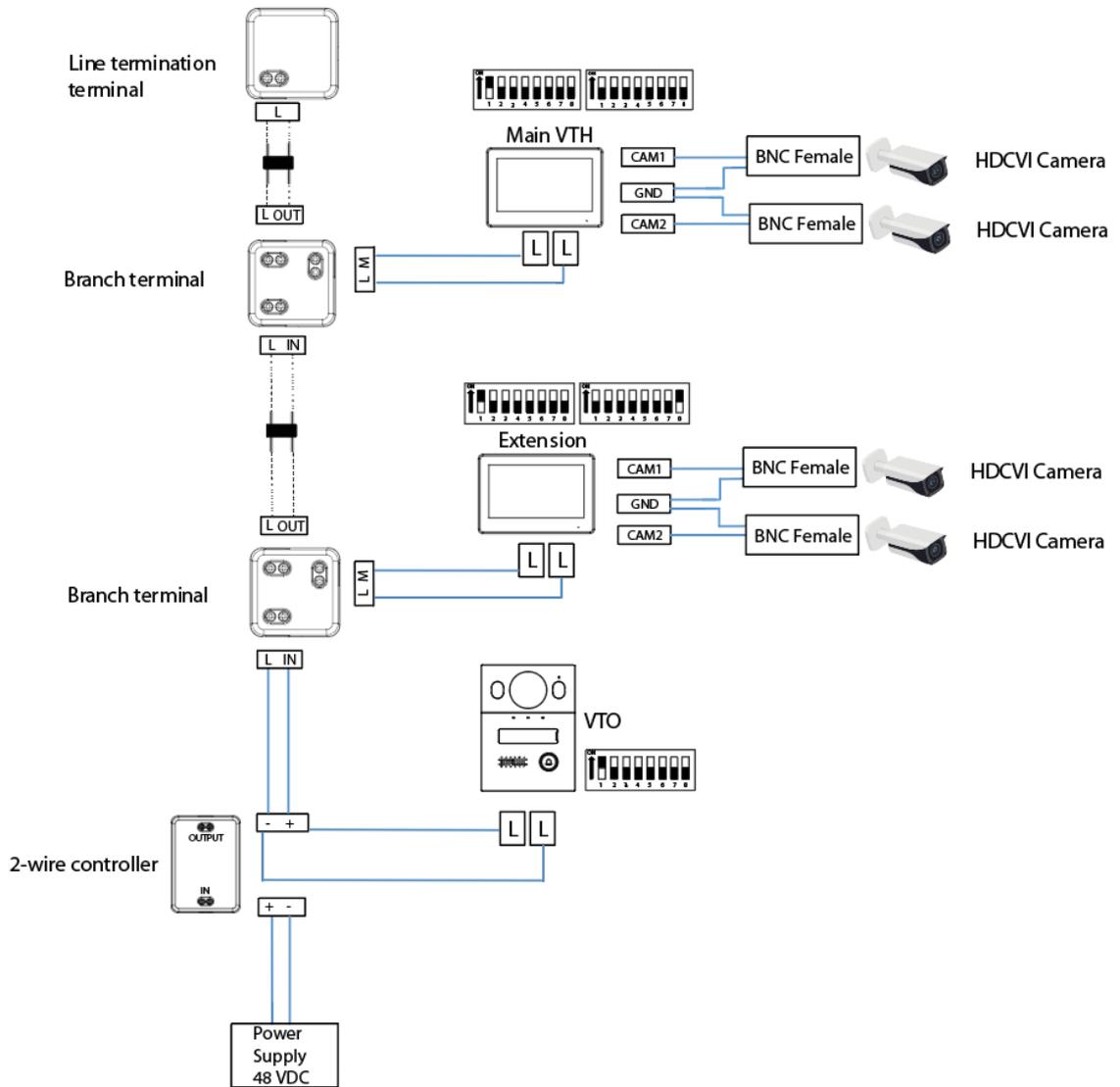
Wiring 2 VTOs and 4 VTHs

☷

The DIP number of each VTO cannot be the same. Otherwise, the connection might fail.

Figure 2-5 Network diagram

Wiring Distance Between the VTH and VTO

📖

● It is recommended that the distance between the line termination terminal and the 2-wire controller do not exceed 3 m.
● Max distance (A) refers to the distance between the VTH and the VTO.
● Max distance (B) refers to the distance between the 2-wire controller and the VTH.
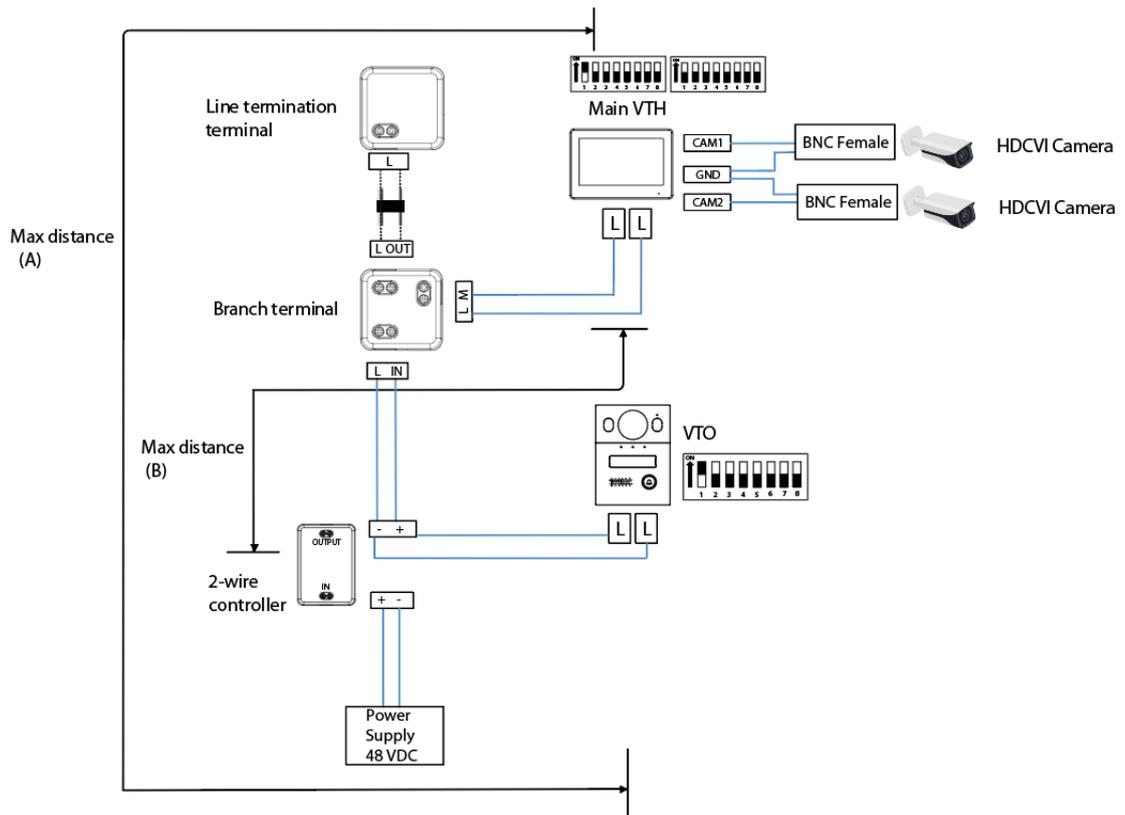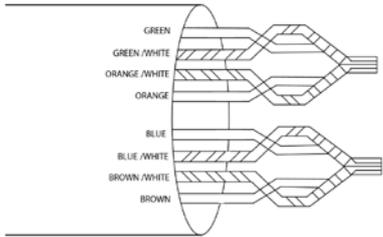
Figure 2-6 Max distance

Table 2-1 Wiring distance

RVV Cable	AWG	Max. Distance (A)	Max. Distance (B)	Max. Quantity of Terminals
2 × 0.5 mm²	20	180 m	100 m	6
2 × 1.5 mm²	15	180 m	100 m	6
RVVP Cable	AWG	Max. Distance (A)	Max. Distance (B)	Max. Quantity of Terminals
2 × 0.5 mm²	20	150 m	100 m	6
Network Cable	AWG	Max. Distance (A)	Max. Distance (B)	Max. Quantity of Terminals
Cat5e Single Pair	24	100 m	35 m	6

Cat5e Single Pair	24	100 m	50 m	4
Multi Pair Cable	24	200 m	100 m	6

| Telephone Wire	AWG	Max. Distance (A)	Max. Distance (B)	Max. Quantity of Terminals
Telephone Wire	24	20 m	20 m	2

Cable Insertion Loss

Insertion loss refers to the situation of sending a signal from one end of the cable and receiving the signal at the other end of the cable.

The calculation of cable insertion loss is as follows: Insertion Loss = 20 × Log (signal received/signal sent)

The cable insertion loss followed is collected from the laboratory environment, and is for reference only. The actual data might differ from that collected in the test environment.

Figure 2-7 Cable insertion loss
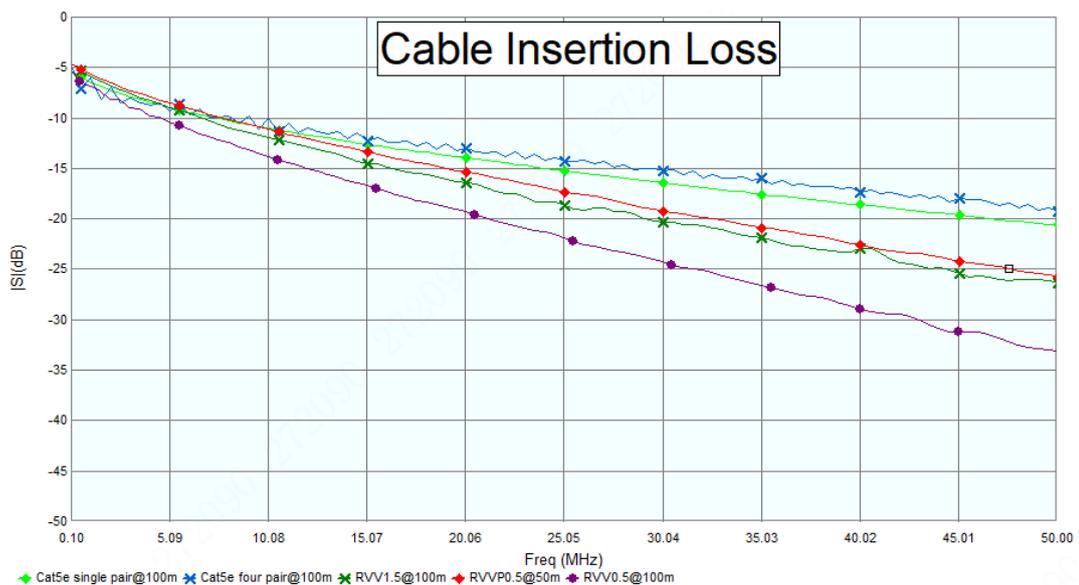
3 Installation

- Do not expose the VTO to condensation, high temperature, direct sunlight, stain, dust, and chemically corrosive substances.
- Installation should be done by professional teams. Do not dismantle or repair the VTO by yourself in case of device failure. Contact after-sales service if you need any help.
- Prepare cross screwdrivers and gloves yourself.
- The recommended installation height of the VTO should be no more than 2 m from the ground.

4 Structure

4.1 Front Panel

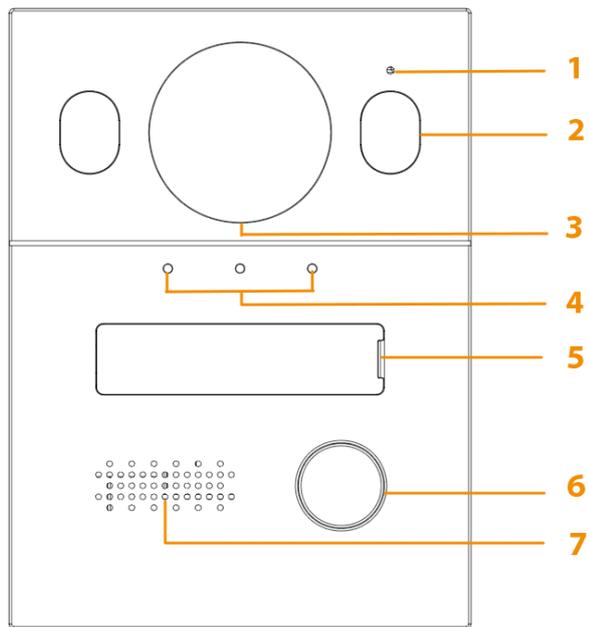F series model

Figure 4-1 Front panel

Table 4-1 Front panel description

No.	Description
1	MIC
2	Illuminator
3	Camera
4	Indicators ● The left indicator light indicates the call not answered. ● The middle indicator light indicates the call answered. ● The right indicator light indicates the door opens.
5	Nameplate 📖 The nameplate is in the accessory package.
6	Call button
7	Speaker

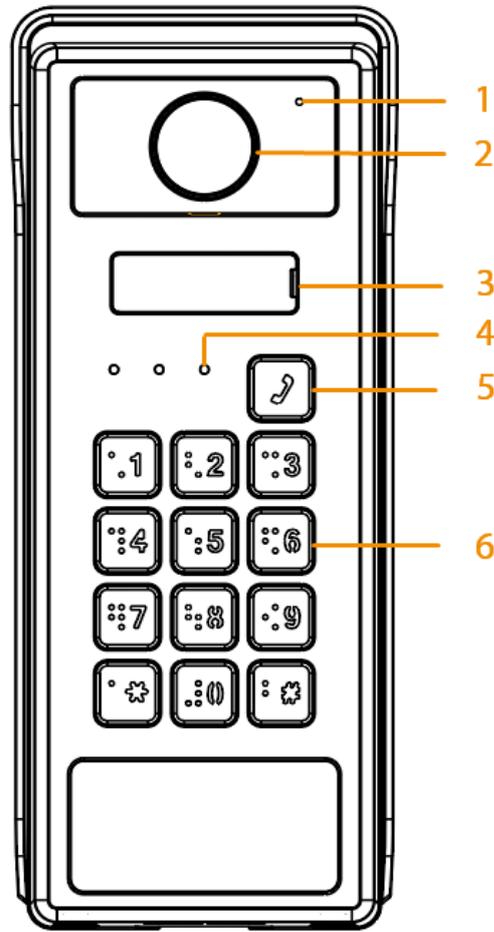## S series model

Figure 4-2 Front panel (S series model)

Table 4-2 Front panel description

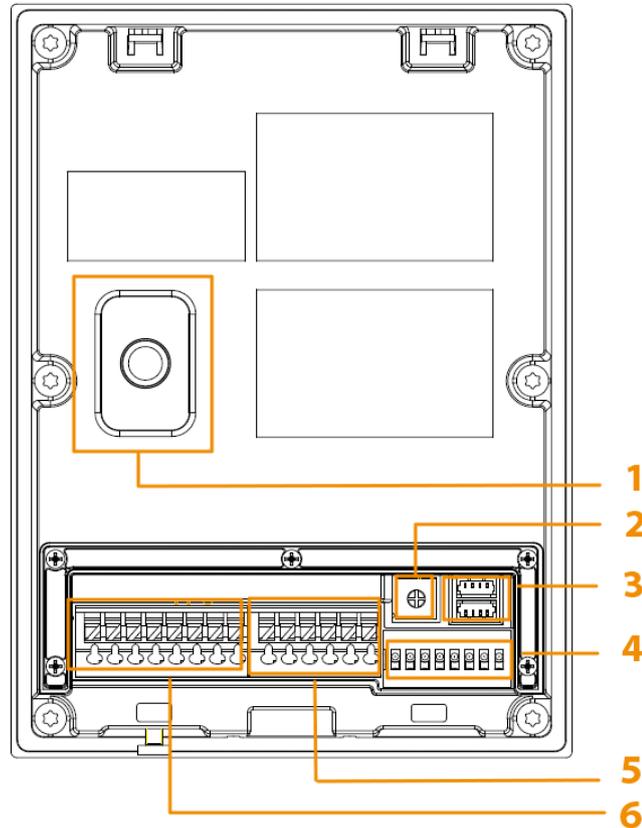| No.	Description
1	MIC
2	Camera
3	Nameplate 📖 The nameplate is in the accessory package.
4	Indicators ● The left indicator light indicates the call not answered. ● The middle indicator light indicates the call answered. ● The right indicator light indicates the door opens.
5	Call button
6	Keypad

4.2 Rear Panel

F series model

Figure 4-3 Rear panel

Table 4-3 Rear panel description

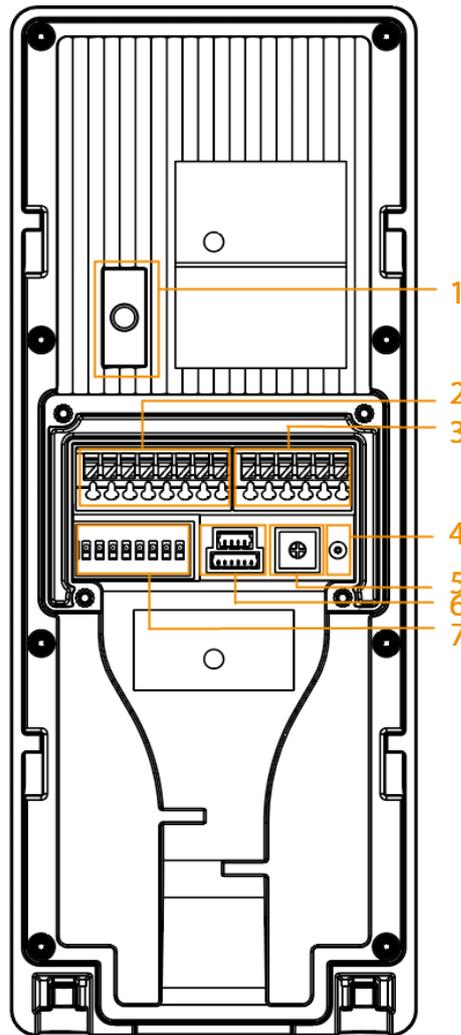| No.	Description
1	Tamper button.
2	Volume adjusting button. Use the screwdriver to adjust the volume of the talk. Rotate the button clockwise to turn down the volume.
3	The upper port is used to upgrade ISP. The lower port is used to upgrade MCU system.
4	DIP Switch.
5	Door lock port.
6	Power output, RS-485 port and alarm output.

S series model

Figure 4-4 Rear panel

Table 4-4 Rear panel description

No.	Description
1	Tamper button. Within 5 minutes after the device is powered on, if you continuously press the tamper button for 5 times in 8 seconds, the device beeps and deletes the admin password.
2	Power output, RS-485 port and alarm output.
3	Door lock port.
4	Reset button. Press the button for 8 seconds, and the device beeps. The admin password, card information and opening password will be cleared.
5	Volume adjusting button. Use the screwdriver to adjust the volume of the talk. Rotate the button clockwise to turn down the volume.
6	The upper port is used to upgrade MCU system. The lower port is used to upgrade voice programs.
7	DIP switch.

5 Wiring

⚠️

The alarm input port is connected as dry contact.
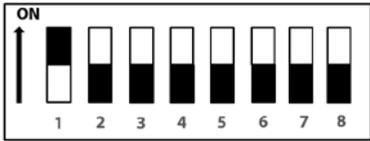
Figure 5-1 Wiring
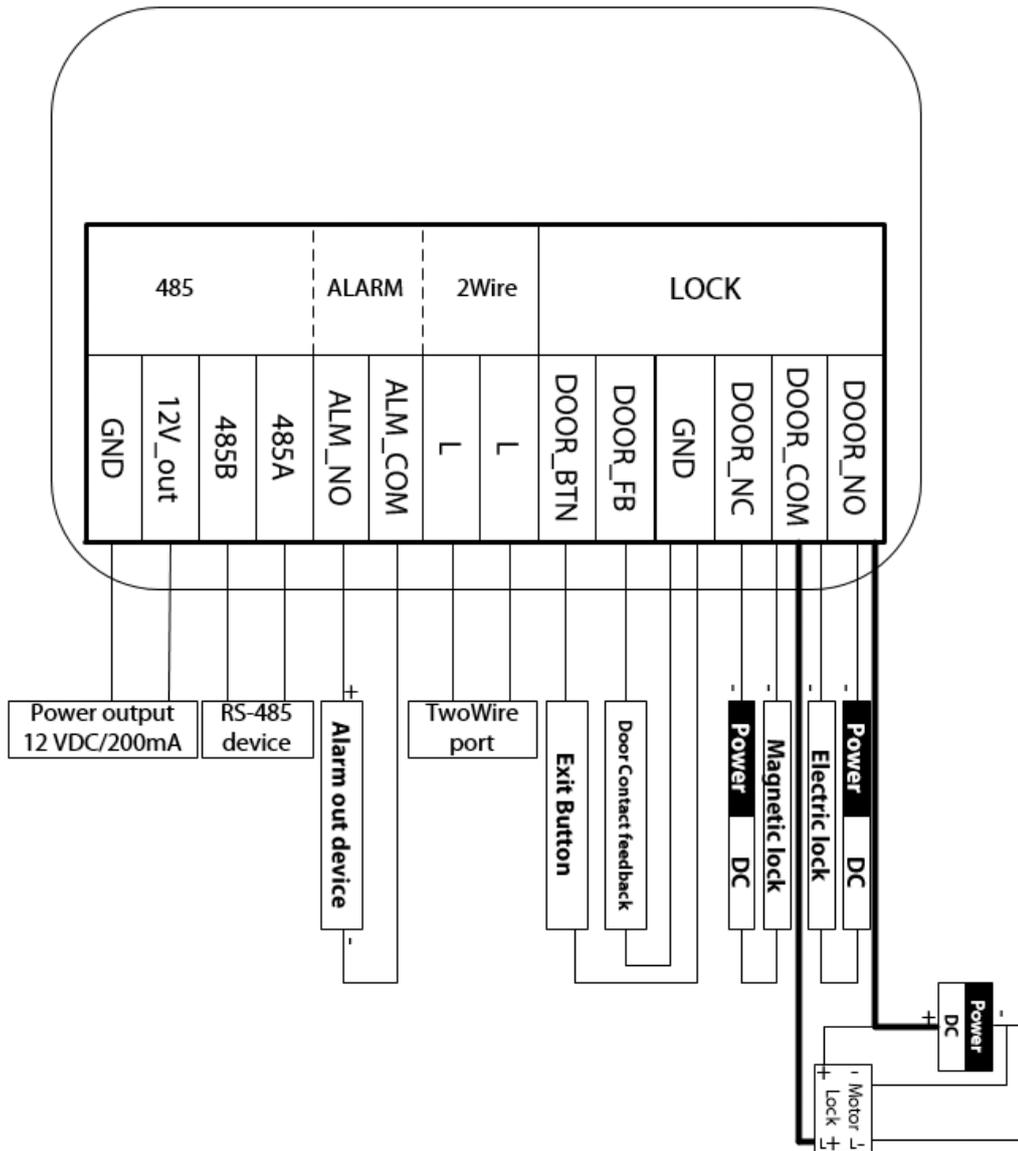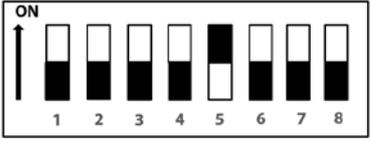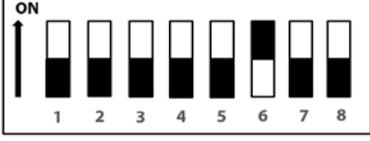
6 Basic DIP Configuration

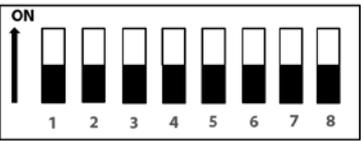Configure the DIP switches to achieve the function you would like to program, which includes:
● Configure the address of the VTO.
● Configure the connection mode.

6.1 DIP Switch Introduction

On the Dip-switch, set the code corresponding to the function you want to program as shown in the table below.

Table 6-1 DIP Switch mapping relations and function

DIP Switch No.		Corresponding Function	Description
DIP 1		VTO Address 1	Address DIP configuration. Supports programing a maximum of 14 VTO addresses.
DIP 2		VTO Address 2	
DIP 3		VTO Address 4	
DIP 4		VTO Address 8	
DIP 5		Lock-release activation time: 2 Sec	Lock-release activation time
		Lock-release activation time: 4 Sec	
DIP 6		lock-release activation time: 6 Sec	

DIP Switch No.		Corresponding Function	Description
	ON 1 2 3 4 5 6 7 8	Lock-release activation time: 8 Sec	
DIP 7	ON 1 2 3 4 5 6 7 8	**ON**: NTSC Mainly used in the U.S., Canada and Japan.	Television signal coding system
	ON 1 2 3 4 5 6 7 8	**OFF**: PAL Mainly used in Germany, Britain, China and Spain.	
DIP 8	ON 1 2 3 4 5 6 7 8	**ON**: LED lighting of nameplate panel turned on.	LED lighting of nameplate panel
	ON 1 2 3 4 5 6 7 8	**OFF**: LED lighting of nameplate panel turned off.	

6.2 Configuring VTO Address

This section introduces how to configure the address of a VTO through the coding rules of DIP switches.
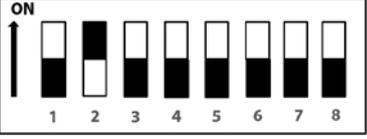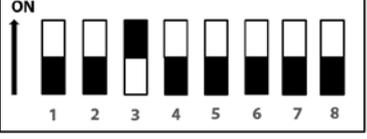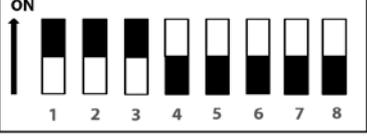
Procedure

Step 1 Find the mapping relation between the DIP switch number and the address number you plan to configure from the table.

It follows a calculation rule that combing only the numbers listed in the **Address No.** only to form a new address number.

Step 2 Manually move the actuator(s) corresponding to the DIP switch(s) to the status **ON**, so that the address of the VTO can be configured.

For example, if you want to set your VTO address as 4, you need to first find the mapping relation (DIP 3 equals to the address number of 4) in the table, and then manually move the actuator of the DIP 3 to the status **ON**. If you want to set your VTO address as 3, you need to do the calculation (1+2=3; which equals to the value of DIP1 and DIP 2 combined together in the mapping relation), and manually move both the actuator of DIP 1 and DIP 2 to the status **ON**.

Here is the list of commonly used VTO addresses (1-14) and their corresponding DIP switch number combinations.

Table 6-2 Common VTO Address (1-14) and DIP switch numbers
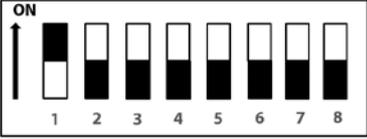
VTO Address	DIP Switch Combination	Coding Rule
1		DIP 1
2		DIP 2
3		DIP 2+ DIP 1
4		DIP 3
5		DIP 3 + DIP 1
6		DIP 2 + DIP 3
7		DIP 3 + DIP 2 + DIP 1
8		DIP 4
9		DIP 4 + DIP 1
10		DIP 4 + DIP 2

VTO Address	DIP Switch Combination	Coding Rule
11		DIP 4 + DIP 2+ DIP 1
12		DIP 4 + DIP 3
13		DIP 4 + DIP 3+ DIP 1
14		DIP 4 + DIP 3+ DIP 2

7 Software Functions

Only the S series door station supports the software functions.

- Press ***** to enter the setting mode. 3 indicators turn red.
- If the configurations succeed, the indicator light turns blue for 2 seconds and turns off.
- If the configurations fail, the indicator turns off and the device beeps.

📖

You can add up to 100 different opening passwords and 100 different cards. If you add more than 100 passwords or cards, the device beeps.

Configuring admin password

For first-time use, press ***0*admin password*** to configure the admin password.

📖

- The password must consist of 4 to 6 numbers.
- When the admin password is configured successfully, if you press ***0*admin password*** to configure a new password, the device beeps. The configuration is invalid.

Modifying admin password

Press ***0*original admin password*new admin password*** to modify the admin password. For example, the original password is 880088, and the new password is 008800. Press ***0*880088*008800***.

Adding the card

Press ***1*admin password***, swipe the card, and then press*****.

📖

If you have not configured the admin password, after pressing ***1**, the device beeps and exits the setting mode.

Deleting the card

Press ***2*admin password*** to clear the card information.

📖

If you have not configured the admin password, after pressing ***2**, the device beeps and exits the setting mode.

Adding the opening password

The password is used to open the door.

1. Press ***3*admin password*opening password*** to add a new opening password.
2. Press **#opening password#** to open the door.

$\square$

- The password must consist of 4 to 6 number.
- If you have not configured the admin password, after pressing ***3**, the device beeps and exits the setting mode.

Deleting the opening password

Press ***4*admin password*** to clear the opening password.

$\square$

If you have not configured the admin password, after pressing ***4**, the device beeps and exits the setting mode.