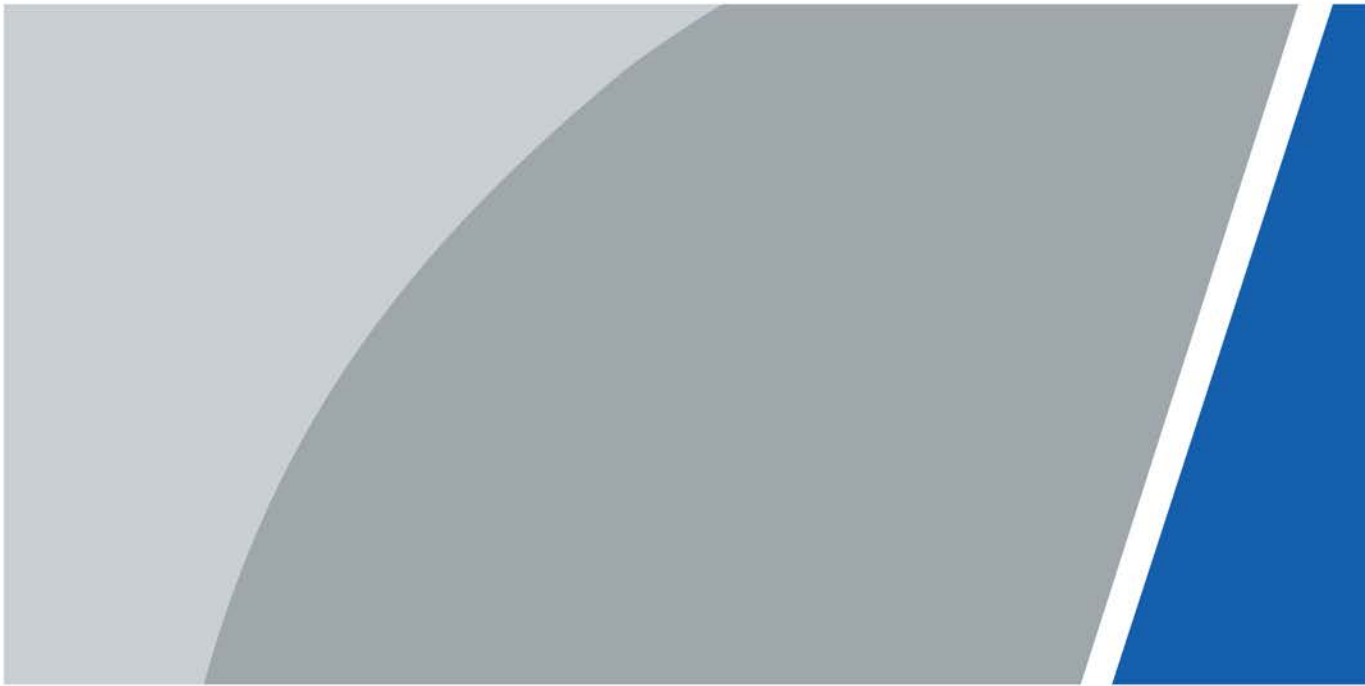# 2-Wire Hybrid Door Station

User's Manual

V1.0.3

Foreword

General

This manual introduces the installation, functions and operations 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
V1.0.3	Revised the network diagram.	March 2023
V1.0.2	Revised power supply demand.	February 2023
V1.0.1	Revised manual name.	November 2022
V1.0.0	First release.	October 2022

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

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- 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.
- 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 aluminum alloy front panel and supports featured nameplate. Using two lines for communication, the VTO supports the 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 and DMSS app users.

Auto IR Illumination

Supports auto IR illumination at night.

2 Network Diagram

See the network diagram below to see all the networking scenarios.

⚠

- When there are 6 devices (VTH+VTO) connected together, only a maximum of 2 devices can be connected to the power output port.
- The power supply of HDCVI camera cannot be grounded.
- The maximum power output allowed is 12 VDC/200 mA.

Wiring 1 VTO and 1 VTH

📖

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

Figure 2-1 Network diagram (without line termination terminal and branch terminal)
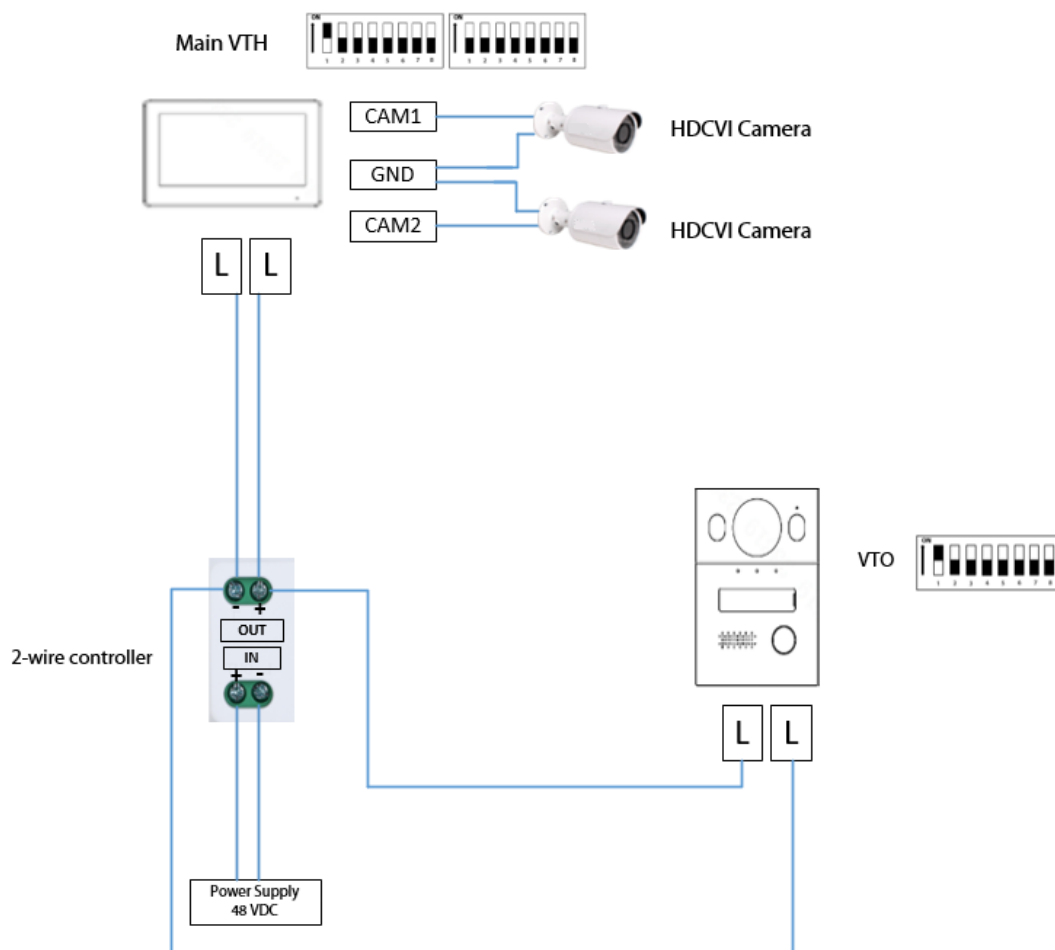
1 VTO + 1 VTH Scenario

Figure 2-2 Network diagram (with line termination terminal and branch terminal)
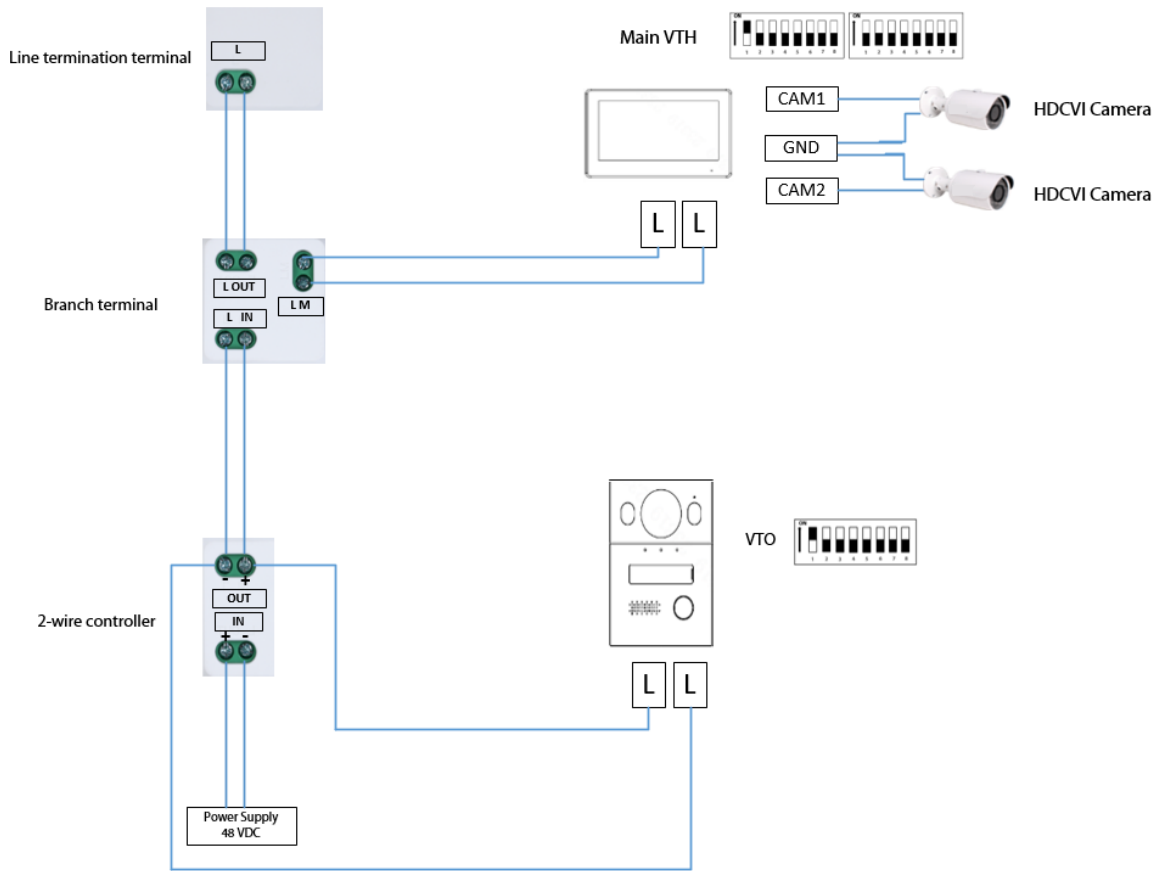
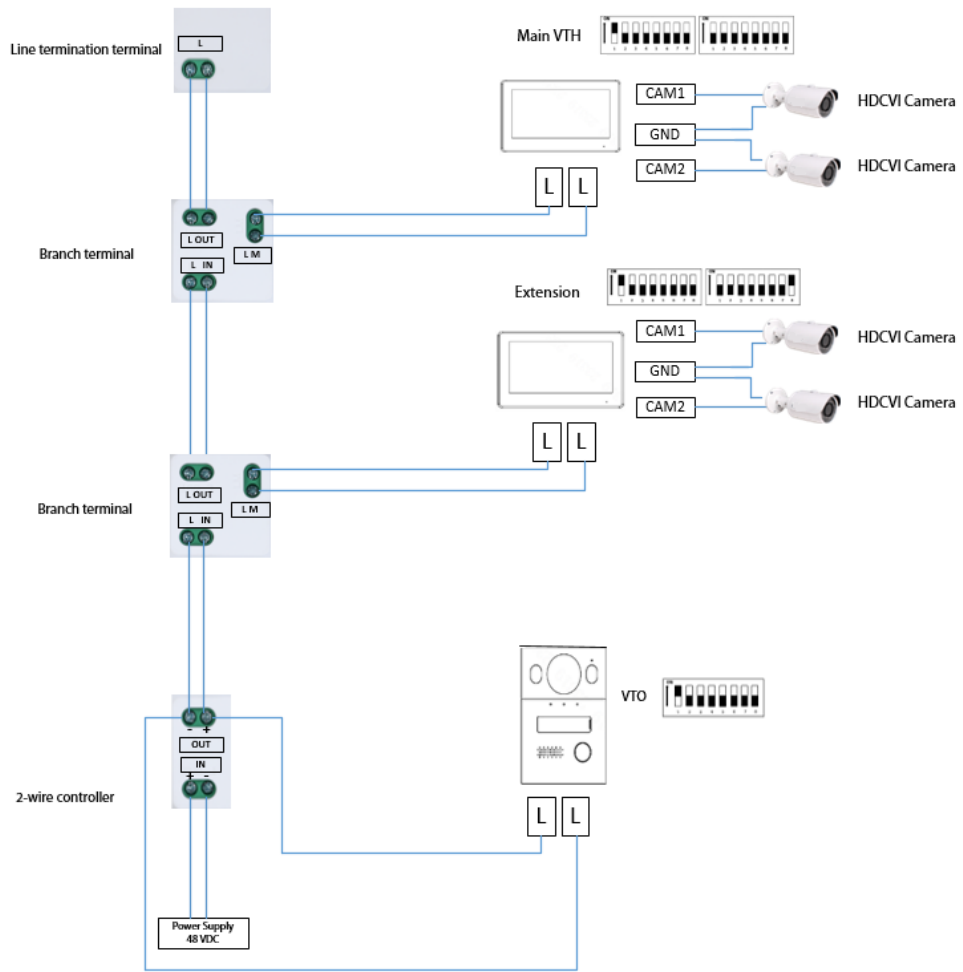**1 VTO + 1 VTH Scenario**

Wiring 1 VTO and 2 VTHs (Cascade Connection)

Figure 2-3 Network diagram

1 VTO + 2 VTH Scenario
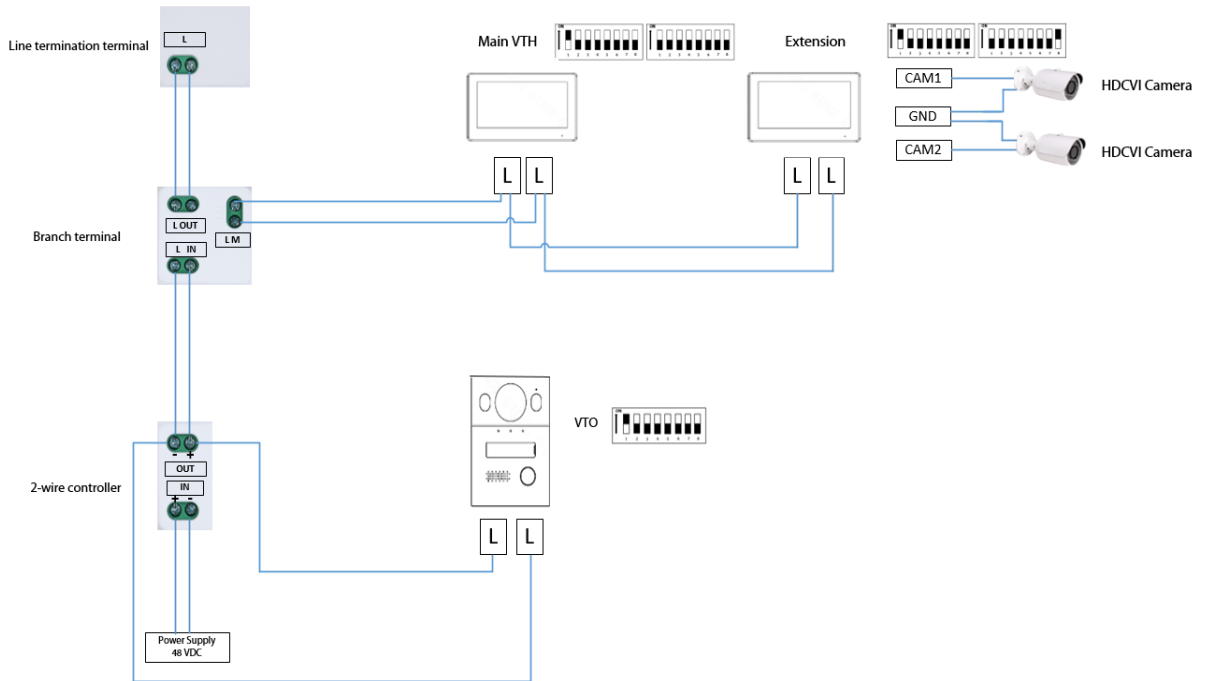
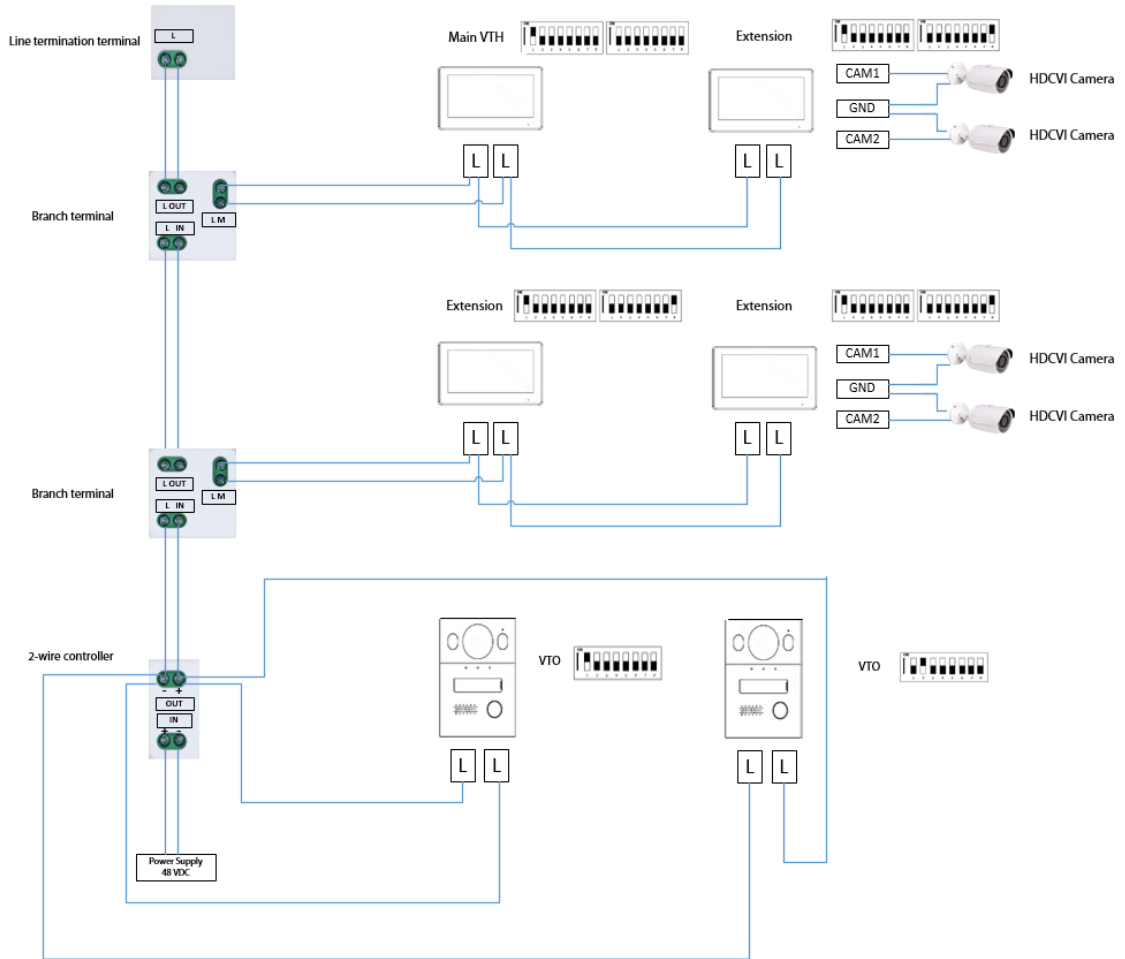# Wiring 1 VTO and 2 VTHs (Parallel Connection)

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 VTH and VTO

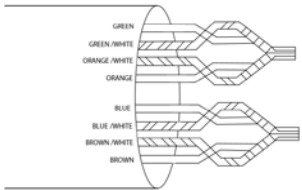It is recommended that the distance between the line termination terminal and the 2-wire controller does not exceed 3 m.

Figure 2-6 Max distance
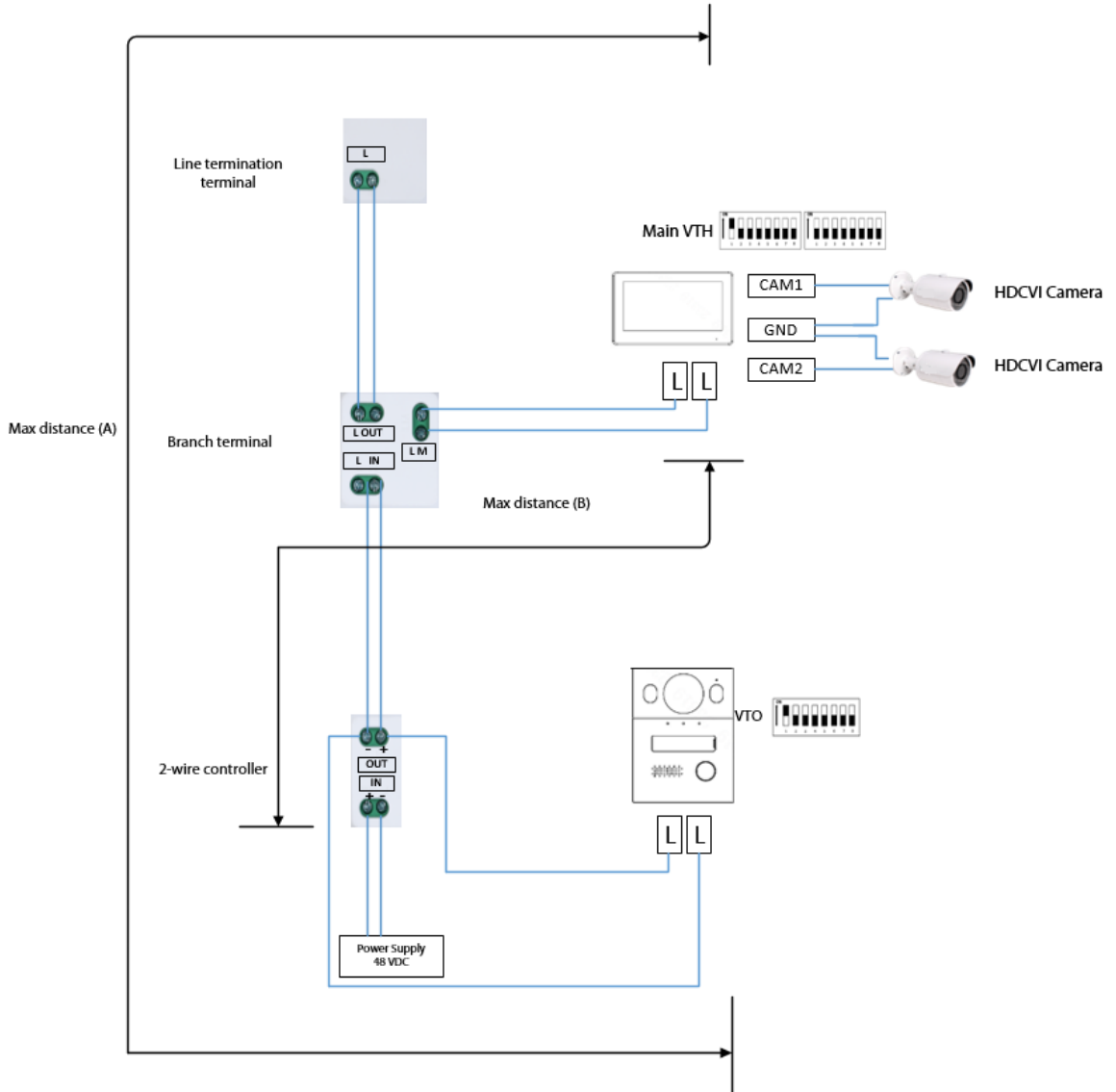
Table 2-1 Wiring distance

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
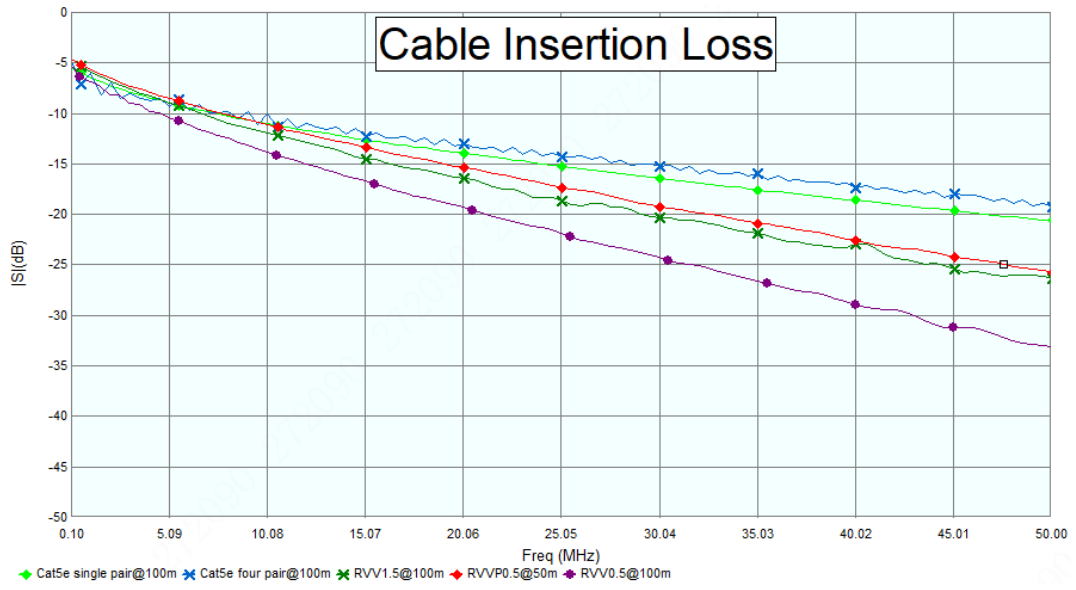
3 Installation

- 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

Figure 4-1 Front panel
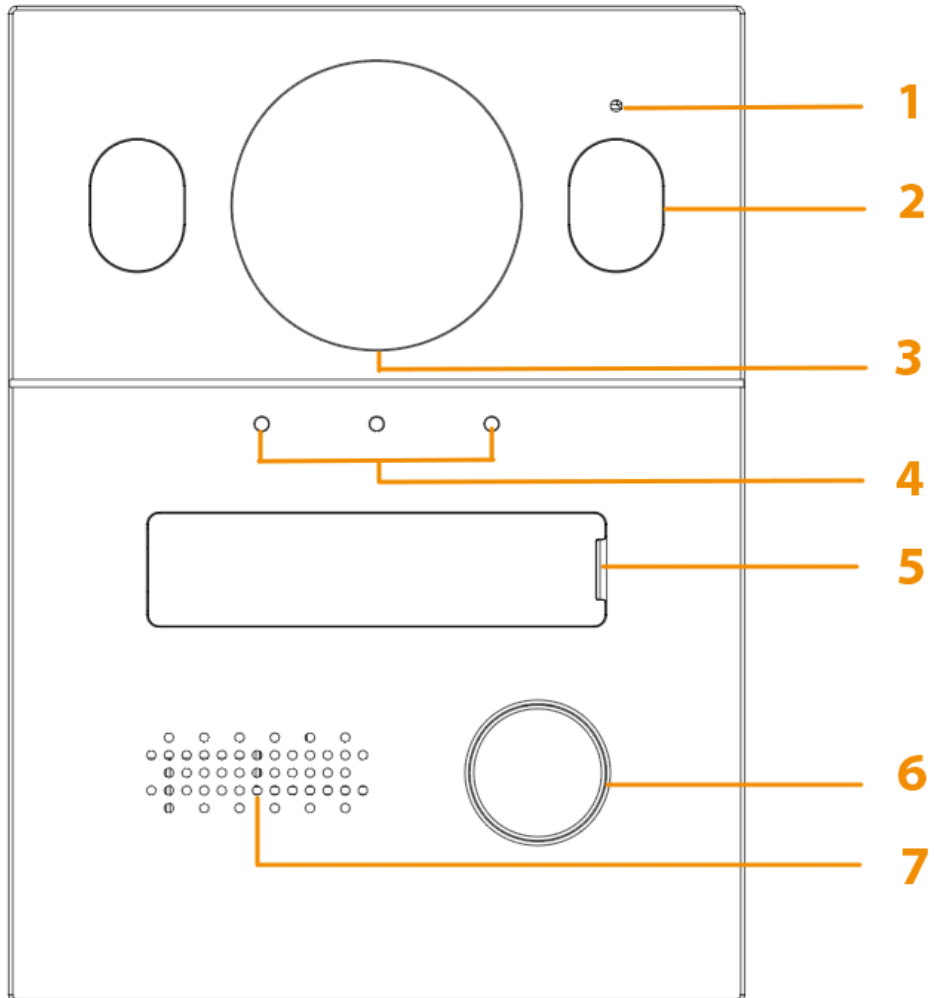
Table 4-1 Front panel description

No.	Description
1	MIC.
2	Illuminator.
3	Camera.
4	Indicators.
5	Nameplate.
6	Call button.
7	Speaker.

4.2 Rear Panel

Figure 4-2 Real panel
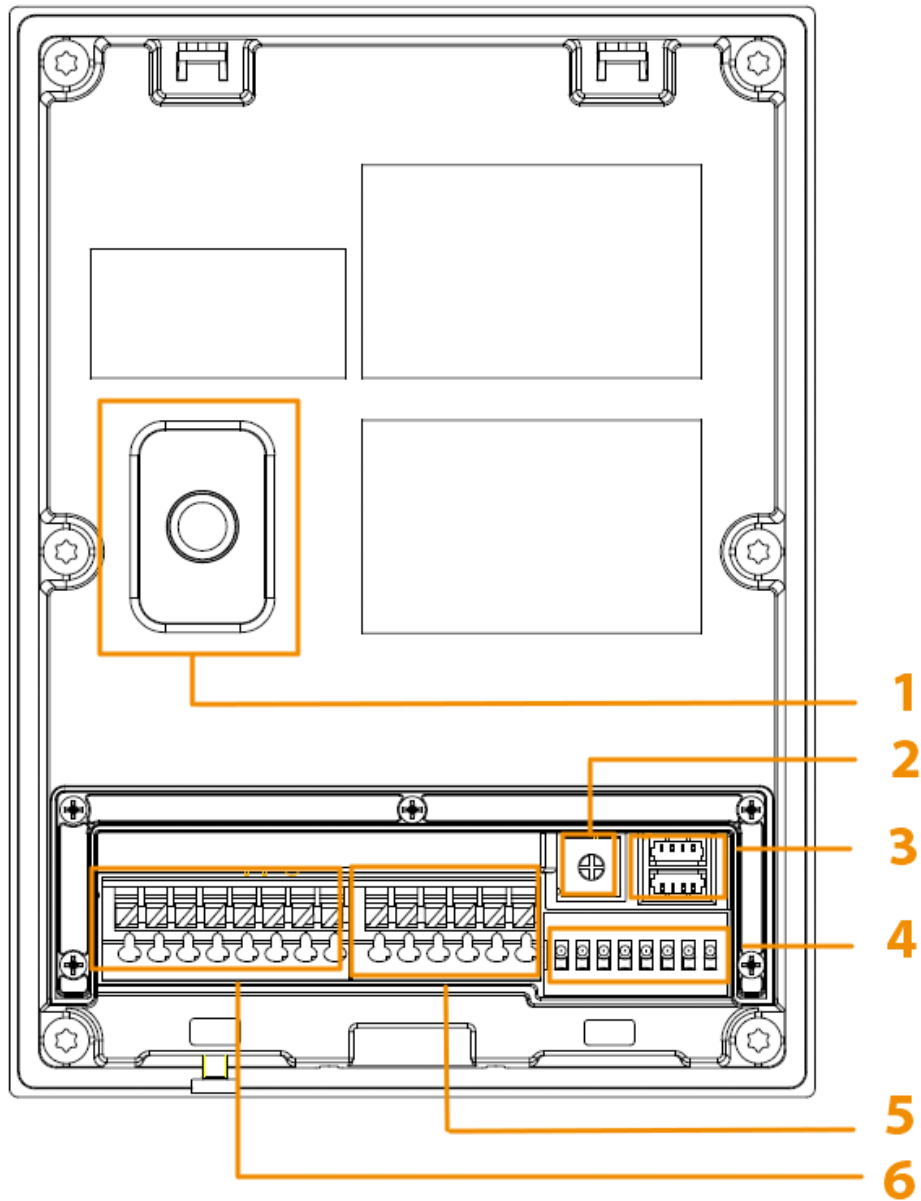
Table 4-2 Rear panel description

No.	Description
1	Anti-tampering switch.
2	Volume adjusting button. Rotate the button clockwise to turn down the volume.
3	Port for upgrading image ISP and MCU system.
4	DIP Switch.
5	Door lock port.
6	Power output, RS-485 port and alarm output.

5 Wiring

⚠

The alarm input port is connected with dry contact.

Figure 5-1 Wiring
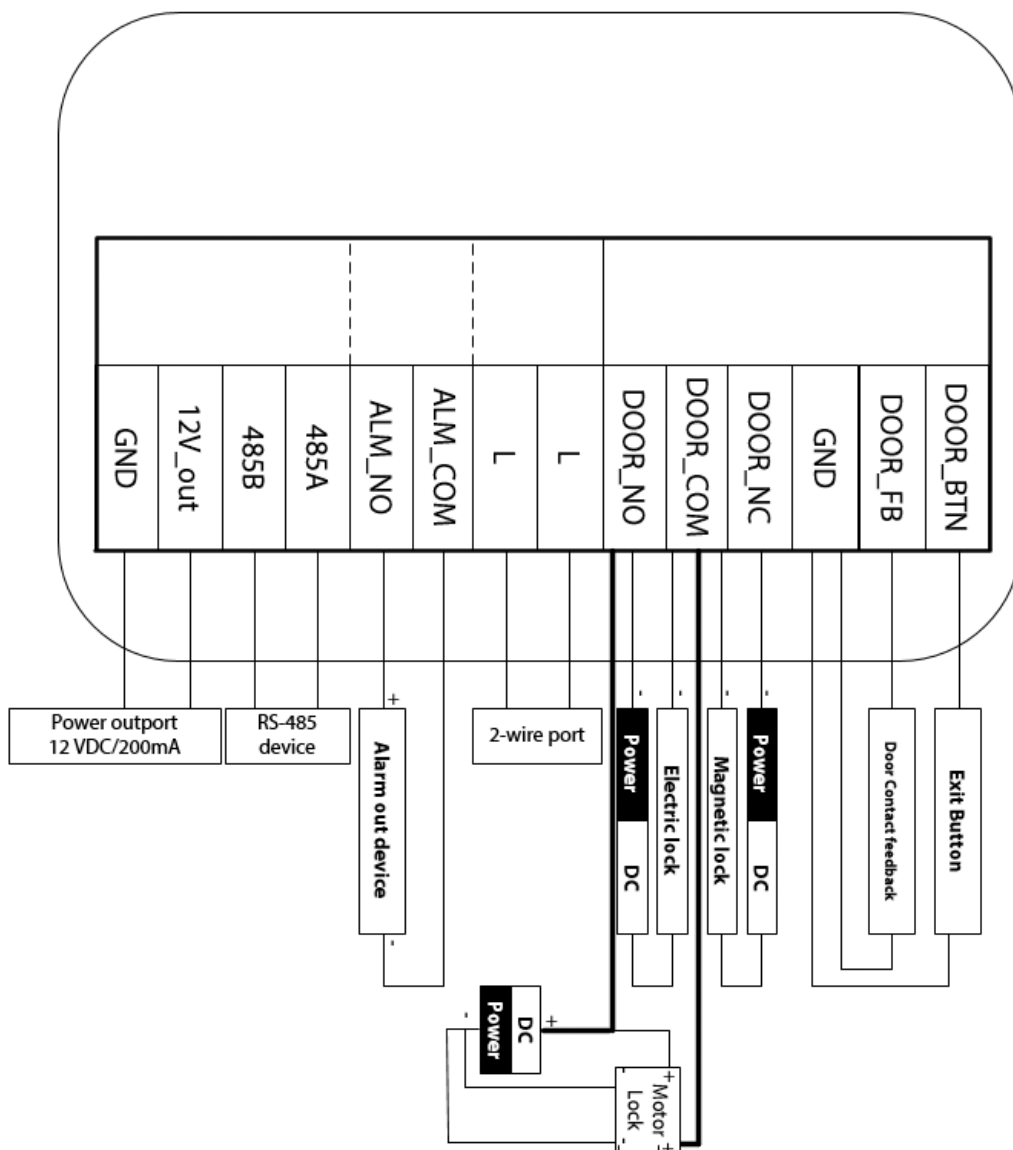
6 Basic DIP Configuration

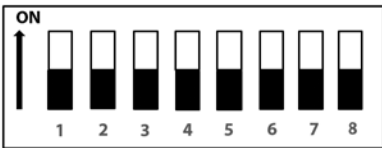Configure the DIP switches to achieve the function you would like to program, which includes:
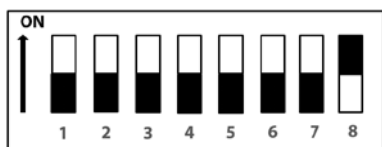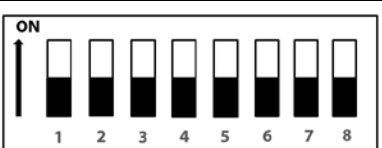- Configure the address of the VTO.
- Configure the connection mode.
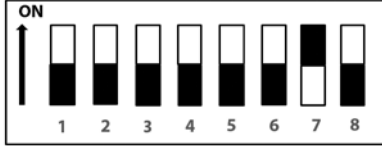
6.1 DIP Switch Introduction

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
		Lock-release activation time: 8 Sec	
DIP 7		**ON:** NTSC 📖 Mainly used in the U.S., Canada and Japan.	Television signal coding system
	*	**OFF**: PAL 📖 Mainly used in Germany, Britain, China and Spain.	
DIP 8		**ON:** LED lighting of nameplate panel turned on.	LED lighting of nameplate panel
	*	**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.

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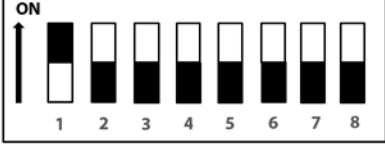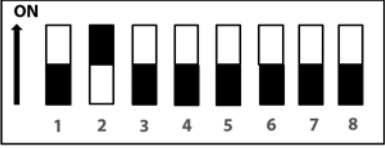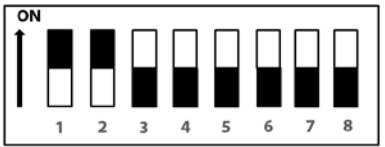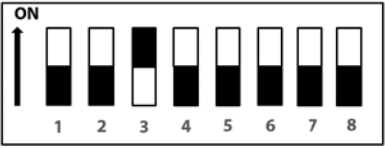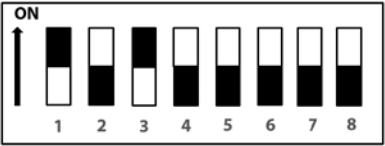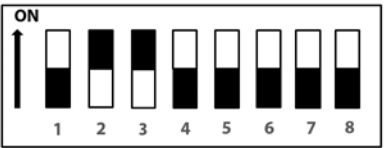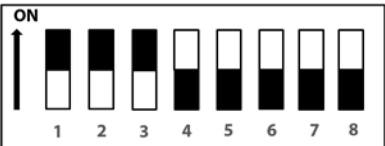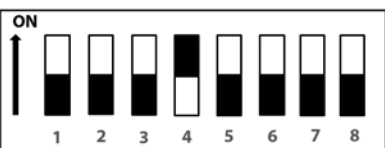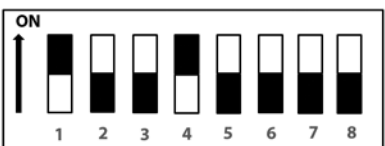
Step 2   Manually move the actuator(s) corresponding to the DIP switch(s) to the status **ON**, so that the address of the VTO can be configured.

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 the 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

VTO Address	DIP Switch Combination	Coding Rule
10		DIP 4 + DIP 2
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