Intelligent Face Recognition Terminal

VF205 User Manual

Document description

This document is mainly composed of the following parts.

Chapter 1~3：Overall product introduction, including product characteristics, appearance, parameters, interface leads and installation methods.

Chapter 4：Introduce several working modes of the device to facilitate users to fully understand the device certification process.

Chapter 5：Introduce the way to log in to the device background.

Chapter 6：Due to the relatively large number of background setting items, this chapter lists the setting methods of several common scenarios to facilitate users to quickly set the device after getting the device.

Chapter 7：Introduce the function and usage of face device configuration tool in detail.

Chapter 8：Introduce the configuration options and operation instructions of the background of face device in detail.

Chapter 9：Notes for device registration, installation and use.

Users can quickly master the using method of the device according to the guidelines.

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1.Preface

Thank you for using the VF205 face recognition device. Carefully reading this document can help you understand the functions and characteristics of this device, as well as quickly grasp the usage and installation methods of the device.

1.1.Product introduction

VF205 adopts the Linux operating system, with a storage capacity of 8GB and expandable 16GB/32GB storage. It has multiple communication methods such as RS485, Wiegand, WIFI and Ethernet. Face recognition adopts local verification method, and the face inventory is placed locally on the device. After successful verification, the person ID can be output. The output method can also use one of the above three methods.

This product features an 8-inch touch screen, voice broadcasting, reserved microphone, and excellent interactivity and usability.

The VF205 device can support protocol mode, and users can conduct secondary development based on the Communication Protocol provided by our company.

1.2.Product feature

✓ 8-inch high brightness LCD touch screen, live voice broadcast prompt, 200W pixel binocular camera.

✓ More than 97% of the full database has a recognition accuracy rate, and the recognition time is less than 0.3S/person.

✓ Recognition distance 0.3m-1.5m, maximum support for 50000 face databases, 50000 records.

✓ Personnel wearing masks, glasses, and hats can be effectively identified, supporting mask detection.

✓ Built in silent live detection, which can effectively block photo, video, and mask attacks.

✓ Supports TCP/IP, MQTT and HTTP protocols.

✓ External alarm input, door magnetic status input, and door switch input.

✓ RS485, Wiegand output face ID number.

- ✓ Built in high-precision clock chip and RTC battery, which can save time when powered off.

- ✓ Static electricity protection contact 8KV, air 12KV.

- ✓ The waterproof and dustproof level can reach IP66.

- ✓ Supports logo customization, protocol customization and OEM.

- ✓ Supports the installation of gate machine, 86 box, flat wall and column.

2.Product appearance

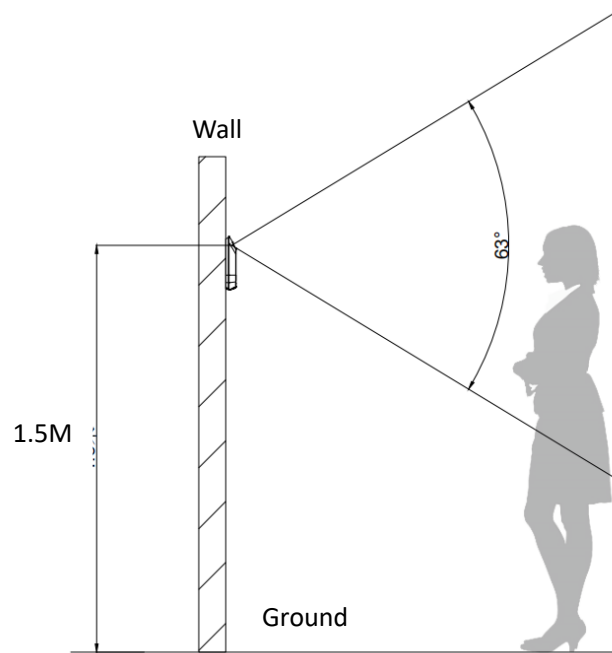## 2.1.Appearance drawing
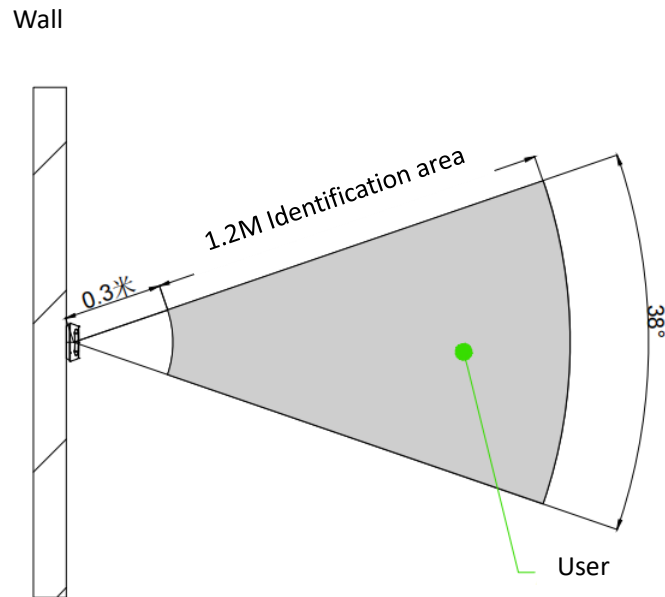
2.2.Dimension drawing
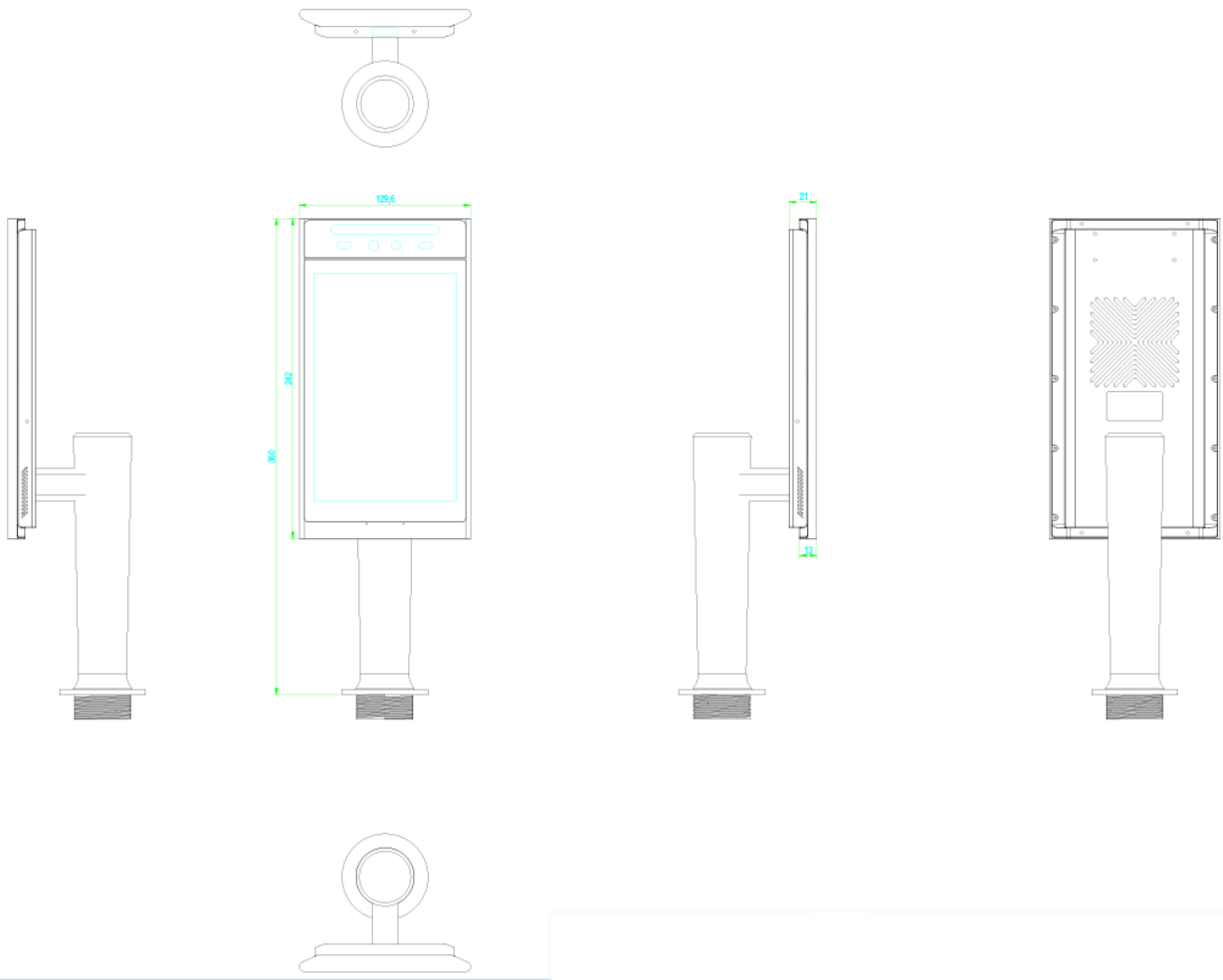
2.3.Appearance introduction
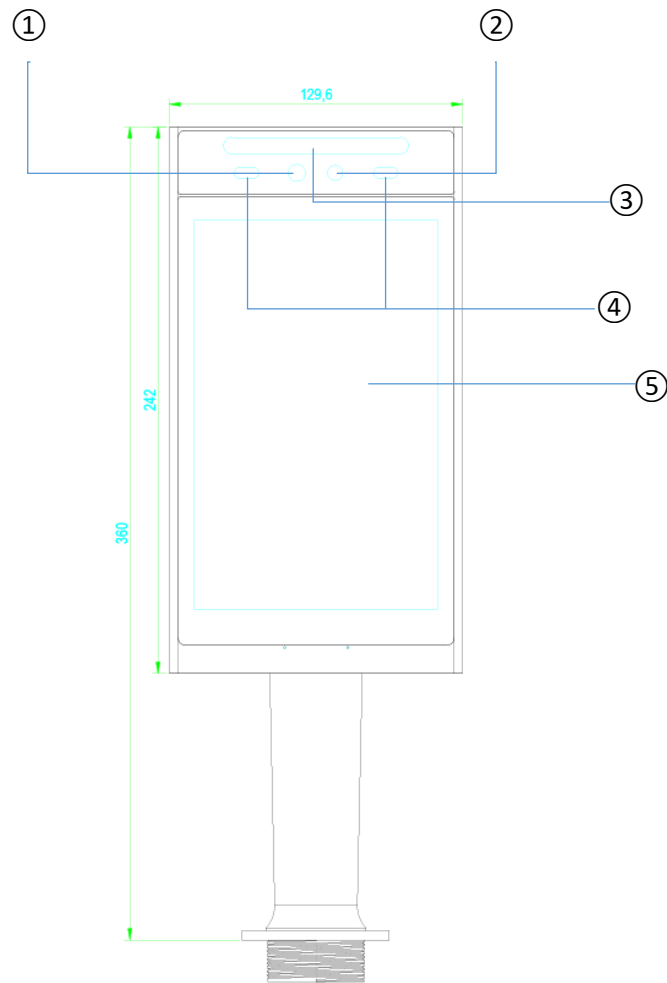
Serial number	Name
①	Infrared camera
②	RGB camera
③	White fill light
④	Infrared fill light
⑤	8-inch high brightness LCD touch screen

2.4.Schematic diagram of reading area

Wall

63°

1.5M

Ground

Profile

Wall

1.2M Identification area

0.3米

38°

User

Vertical view

2.5.Installation method

86 box installation

Step 1:Connect metal bracket and 86 box screws.	Step 2:Install the device to the 86 box, connect side by screws.	Step 3:Complete installation.

Column installation

Step1:Remove the upper cover plate of the column.	Step2:Remove the torch holder nut.	Step3:Fix the upper cover plate and torch holder.	Step4:Assemble the upper cover plate to the column.

Gate installation

Step1:The opening size of the gate panel is 34mm in diameter.	Step2:Remove the torch holder nut.	Step3:Fix the panel to the torch holder and connect the wire ends.	Step4: Assemble the panel to the gate and complete the installation.

Installation notes：

Avoid backlight, direct sunlight, direct sunlight through windows, oblique sunlight through windows, and close light.
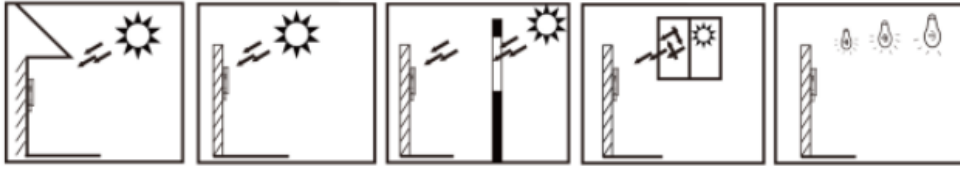
| Backlight | Direct sunlight | Direct sunlight through windows | Oblique sunlight through windows | Close light |

2.6.Device wiring

Port description

Screw terminal version

The face recognition device has six wiring terminals, and the wiring is defined according to the wire mark of the wiring terminal.
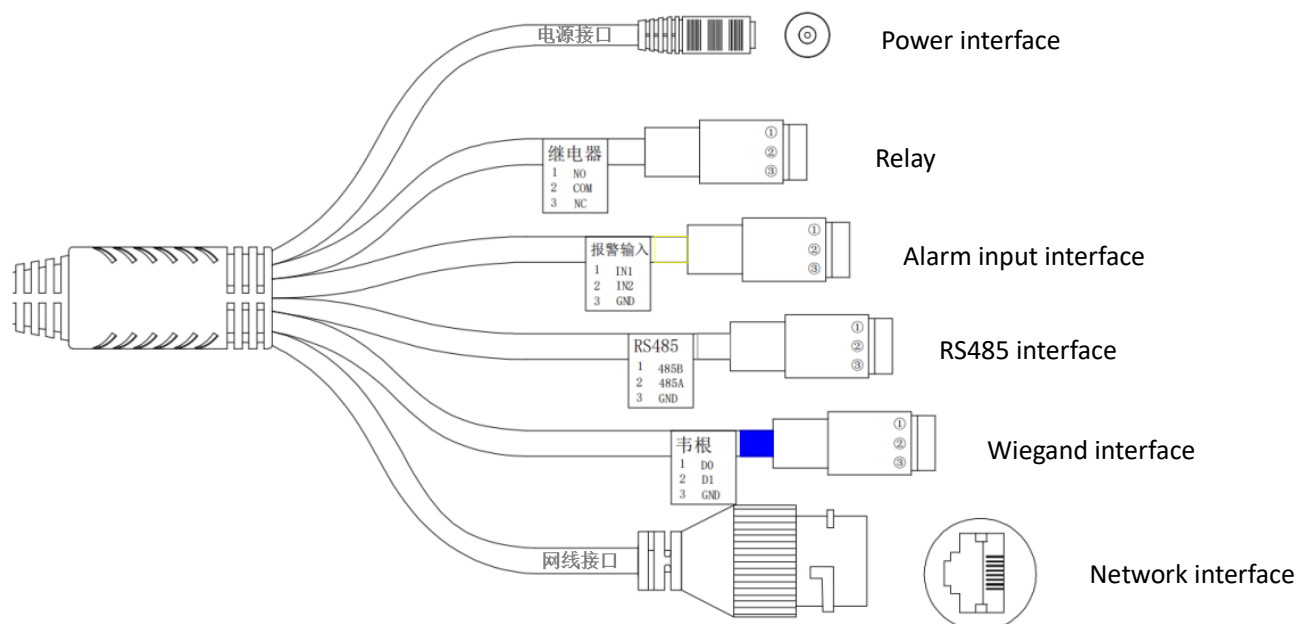
Port name	Pin number	Pin definition
Power interface	DC round head	12V power supply
Relay interface	1	NO：Normally open end of relay
	2	COM：Relay common terminal
	3	NC：Normally close end of relay

Alarm input interface	1	IN1：Alarm input 1
	2	IN2：Alarm input 2
	3	GND：Ground wire
RS485	1	485B：485B cable
	2	485A：485A cable
	3	GND：Ground wire
Wiegand	1	D0：Wiegand 0
	2	D1：Wiegand 1
	3	GND：Ground wire
Network interface	RJ45	Connect network cable

Bare wire version

PIN#	Color	Pin Definition	Pin Description
PIN1	Red	VCC	Power supply positive
PIN2	Black	GND	Power supply ground
PIN3	White	485B	485-B cable
PIN4	Blue	485A	485-A cable
PIN5	Brown	GND	Power supply ground
PIN6	Orange	D0	Wiegand 0
PIN7	Yellow	D1	Wiegand 1
PIN8	Green	IN1	Alarm input 1
PIN9	Purple	IN2	Alarm input 2
PIN10	Grey	NO	Normally open end of relay
PIN11	Pink	COM	Relay common terminal
PIN12	Cyan	NC	Normally close end of relay

Note：

Unused pins must be insulated!

If the device is damaged due to a short circuit due to lack of insulation treatment, the user shall bear the responsibility themselves!

Device wiring diagram

The electric plug-in lock mechanism in the figure is power-off unlocking and power on locking (two core wire lock head). If users use other types of electric plug-in locks, they should be connected according to the characteristics of the electric plug-in lock.
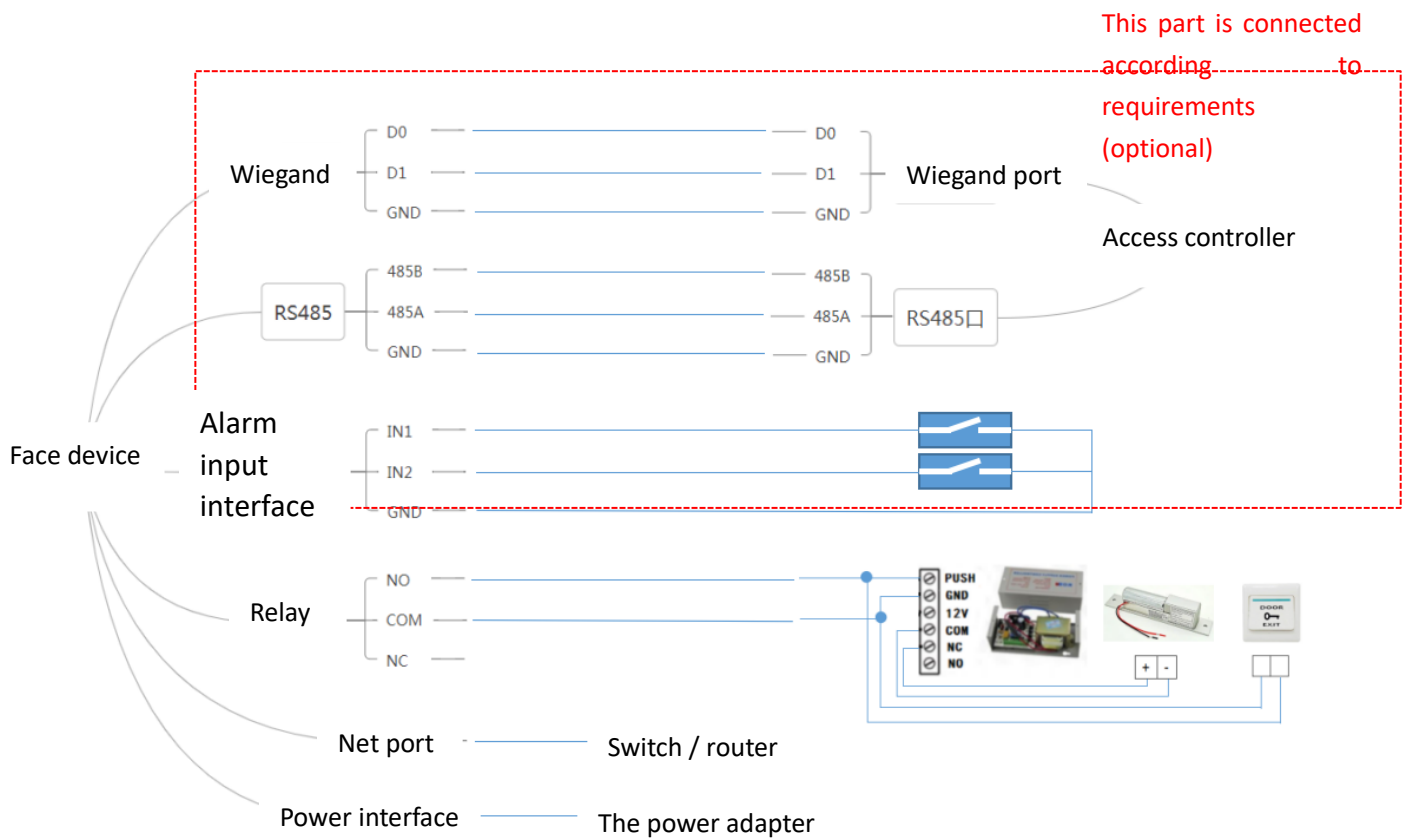
3.Technical parameters

Product parameters		
System parameters	OS：Linux	
	Storage capacity：8GB (16G&32G expandable)	
	Processor：ARM Cortex A7 MP2　1GHz	
Display screen	Size：8-inch LCD touch screen display	
	Resolution ratio：800*1280	
Communication mode	Wired：1 10/100M adaptive network port	
	Wireless：2.4G WiFi	
	1 RS485	
	1 Wiegand 26/Wiegand 34	
Physical interface	Relay：30V1A	
	2 Alarm signal input interface	
Power supply	Supply voltage：9～24V(DC)（12V power supply is recommended）	
	Max：11.3W	
Camera	RGB Camera	Field angle：D=65° H=59° V=38°
		Aperture：2.0
		Resolution ratio：1920*1080
		Focal length：4.35MM
	Infrared camera	Field angle D=68° H=60° V=40°
		Aperture 2.2
		Resolution ratio 1616*1232
		Focal length 2.35MM
Speaker	Built in one 4 Ω 2W speaker	
Material	Fireproof ABS + organic glass	
Working temperature	-20 ℃～55℃	

Working humidity	10%～90%（No condensation）
IP Grade	Electrostatic protection：Contact 8KV, air 12KV
	Dust and waterproof grade: IP66
Face recognition performance parameters	
Support mask detection	
1：N algorithm dynamic face detection (anti photo, video attack)	
Hardware infrared living detection (anti photo, video attack)	
50,000 face capacity	
Reading distance 0.3-1.5M	
Pass rate：≥97%（The capacity reaches 50,000 sheets）	
Error rate ≤0.01%（The capacity reaches 50,000 sheets）	
Reading time <0.3s	

4.Device working mode description

4.1.Transparent transmission mode

```
Face → Verify local face library
        ├─ YES → Authentication succeed → Transparent face ID
        └─ NO → Authentication failed
```
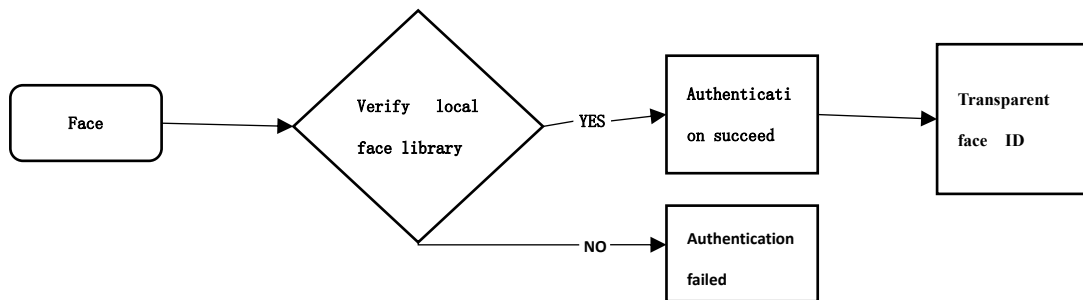
In transparent mode, face only compares with local facial databases, and there is no authentication process.

4.2.Protocol mode

```
Face → Verify local face library
        ├─ YES → Upload face ID in protocol format → Customer upper computer (supporting 485, TCP, HTTP, etc.) → Verify if passed
        │           ├─ YES → Authentication succeed
        │           └─ NO → Authentication failed
        └─ NO → Authentication failed
```
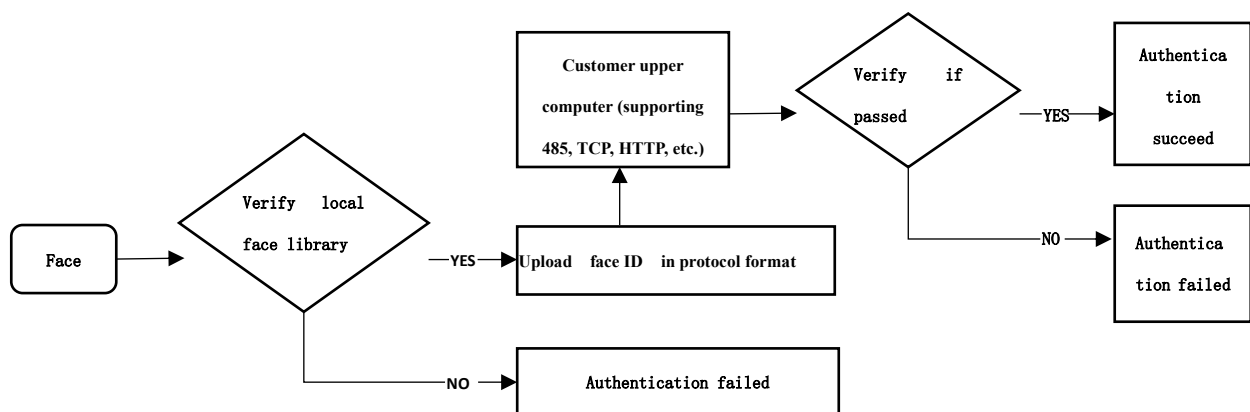
In protocol mode, the user needs to build an upper computer to receive data and return authentication results through 485 or TCP and HTTP protocols.

The protocol documents can be obtained on the official website.

4.3.Development mode

At present, the development mode is only used for card reading and writing operation, and other

functions are not supported temporarily.

4.4.Whitelist authentication mode
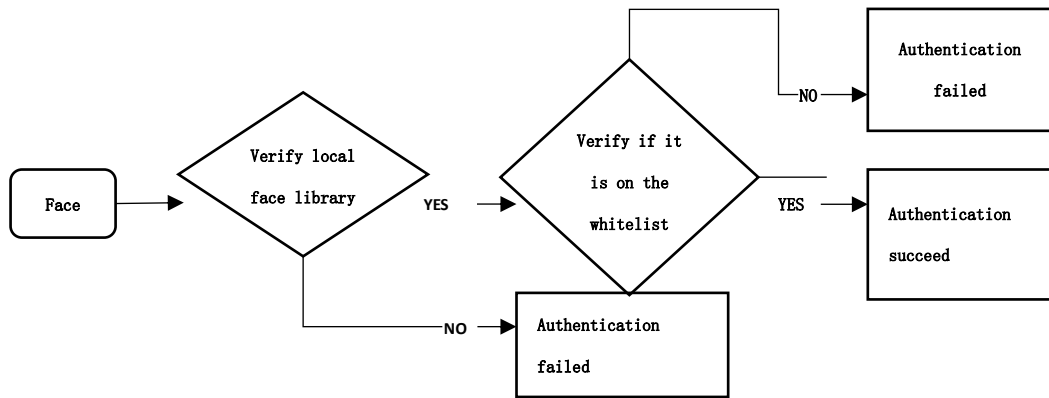
5.Login device background

5.1.Device networking configuration

Download the configuration tool 《 Face register offlinev1.2.3 》 on the official website（http://www.vguang.cn/vfxl）, and double-click to open the configuration tool.

Take the WiFi (only 2.4G WiFi) output mode as an example. Assume that the WiFi name is 123 and the WiFi password is 123. The generated configuration code is as follows.

Scan this configuration code for the camera on the face device (as shown in the following figure), and the screen of the face device will display a green font of "Network configuration successful" and broadcast a voice message of "Network configuration successful", indicating successful configuration. The device will automatically connect to the network, and when the connection is successful, the device will broadcast "Network connected".

Send a screenshot of the generated network configuration code to your phone and scan it for the camera.

5.2.**Login face device background**

After the face device is successfully connected to the network, the networking icon is displayed in the upper right corner of the screen, the device IP is displayed in the lower right corner, the system time is displayed in the upper left corner, and the device SN is displayed in the lower left corner.

Connect the computer and face device to the same network. Open the browser, enter http: / / device IP address: 8060 / in the address bar, and enter to enter the background management interface.

Assumed that the IP address obtained by the device is 10.102.106.124.

Enter the device address as follows and press enter.

Enter the background login interface. The login interface is as follows.

The default user name：admin

The default login password is: password (this password is the device password in face register offlinev1.2.3.)
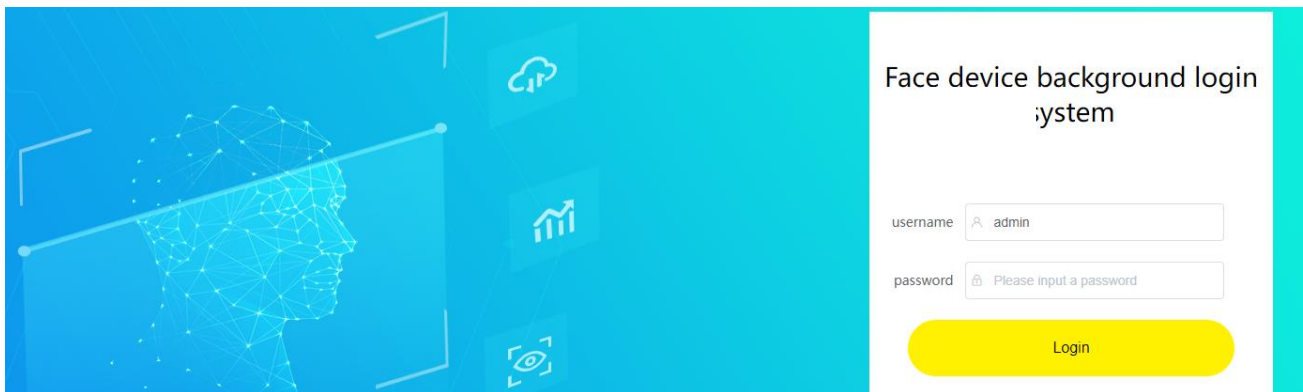
After successful login, the background prompts to set "device configuration password".

This configuration password is mainly used to set the working mode of the code scanner, as well as device upgrading, factory recovery and other operations. Click OK to enter the background system of the following device.

Face device background system

language   English ⌄   ☺ Administrator   ⏻ Quit

▣ Basic settings

A White list settings

⊘ Firmware information

● Personnel setting

☑ Pass record

Basic configuration	Automatically adjust screen brightness	⦿ close ○ open
Configuration related to access record		
Voice and output related configuration	Screen brightness	
Alarm related configuration		
Device anti removal setting	Auto off screen	○ close ⦿ open
Relevant settings of fill light	Auto off screen time	300 _____ s
Face related configuration		
Card swiping related configuration	Automatic Screensaver	○ close ⦿ open
Code scanning related configuration		
Channel related configuration	Automatic screen saver time	30 _____ s
Authentication mode	Show SN	○ Not show ⦿ Show
Network configuration		
MQTT related configuration	Show IP	○ Not show ⦿ Show
Camera calibration		
Set device time	Volume	
Disable / enable		
	Automatic update time	○ close ⦿ open

6.Face registration

Users can refer to the following scenarios for quick settings.

6.1.Scene 1

Scenario description

1，Can be used for device networking.

2，After registering the face, can pass freely.

Setup process

1，Refer to the instructions in Chapter 5 to log in to the device management background.

2，Select add personnel in personnel settings.
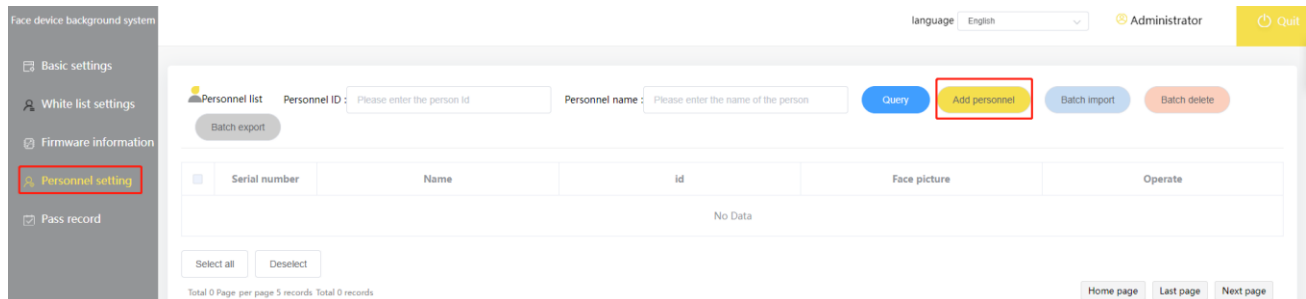
3，Fill in the person ID, such as 123, fill in the person name, such as "San Zhang", click the "+" sign, select the local photo, and click OK; or take photos and input directly.

26

4，The platform prompts that the entry is successful.

5，After successfully saving, can proceed with face authentication.

6.2.Scene 2

Scenario description

1，The face device unable to be connected to the network.

2，Only need to register face and use your face data to pass.

3，The premise is that the working mode of face device is "transparent transmission mode". The factory default of the device is "transparent transmission mode".

Setup process

Use the configuration tool "Face register offlinev1.2.3" to register personnel.

Open the configuration tool and select personnel configuration; Enter the person id; Fill in the name of the person; Click to generate configuration code; Scan the generated configuration code to the device, and the device screen prompts to use face for registration.During face registration, the face needs to be in the registration box. It is best to occupy all the registration boxes, and look at the registration box for 2-3 seconds, waiting for the device to complete registration.

After successful registration, can use face to pass.
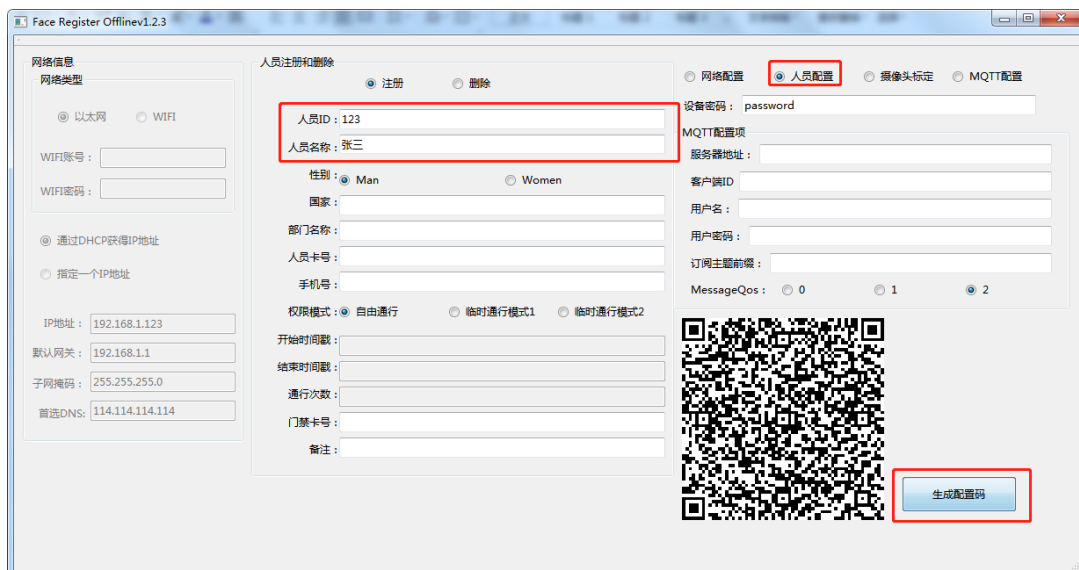
6.3.Scene 3

Scenario description

1，Can be used for device networking.

2，Face recognition in any mode.

Setup process

1， Refer to the instructions in Chapter 5 to log in to the device management background.

2， Select the white list setting.

3， Select "Add".

4， Enter the person ID.
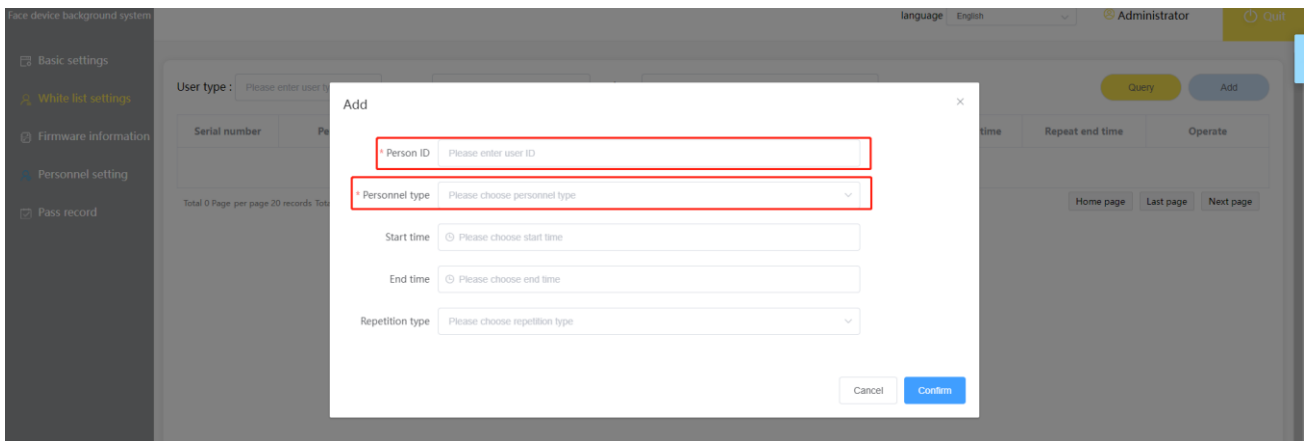
When the user type is face: fill in the ID of the person at the time of registration.

When the user type is QR Code: the ID is a user-defined card number, the user needs to generate a QR code picture according to the instructions for use of authorized pass code mechanism _v1.0. Users need to use this image to aim at the camera and scan the code when opening the door.

5， Select start time \ end time and specify the validity period of the white list.

6， Repeat type: no repeat.

7， Click OK.

7.Configuration tool instruction

7.1.Overview of configuration tool function

The configuration tool can realize the following functions.

1，Configure device network parameters.

2，Code scanning registration \ delete face, which can register \ delete personnel without networking or logging in the background.

3，Configure the MQTT parameters of the device.

7.2.Instruction

Network configuration

According to the purchased device model, choose to configure Ethernet or WiFi output mode, support DHCP, or configure fixed IP. Then, the tool generates the configuration code and scans the configuration code to the code scanning window of the face device.

Personnel configuration

This configuration is used to register \ delete faces locally.

After scanning the configuration code, the device will prompt for face registration. After successful registration \ deletion, there will be a voice prompt.

MQTT configuration

After filling in MQTT related information, click generate configuration code and scan the configuration code to the device reading window.

8.Background description

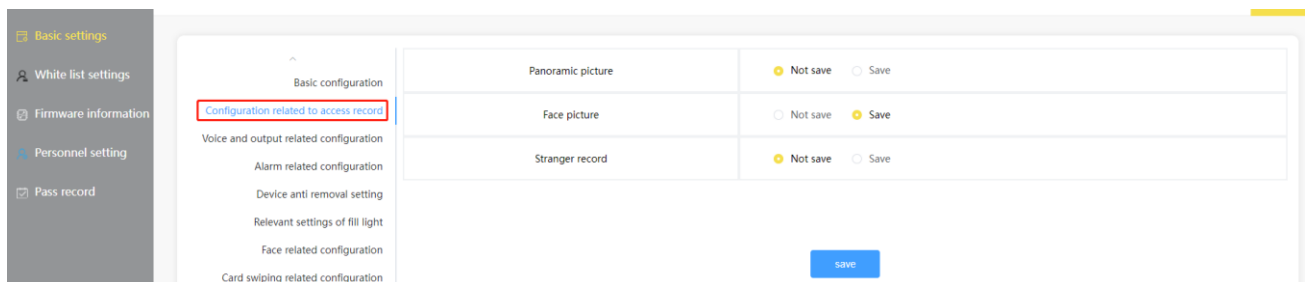## 8.1.Basic setting

Basic configuration
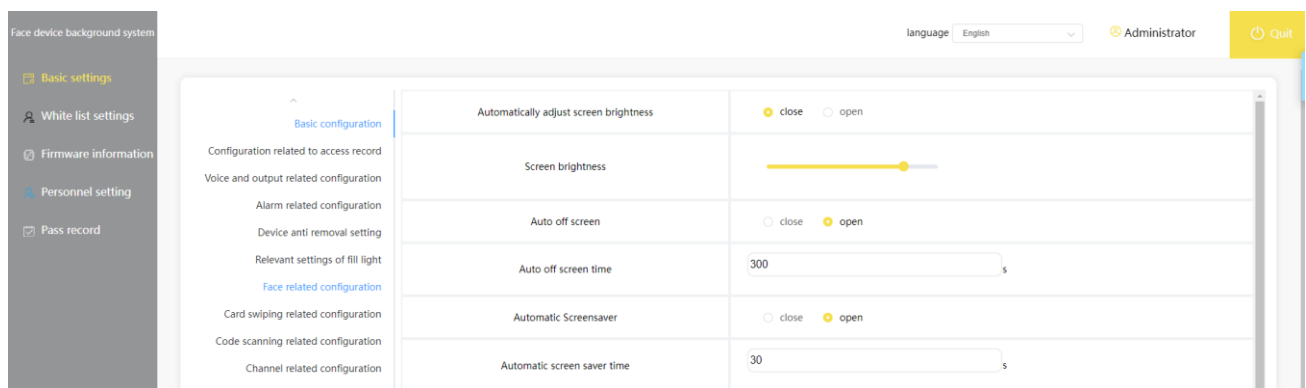
The description list of configuration items is as follows：

Configuration item	Default value	Instruction
Auto adjust screen brightness	Close	Turn on / off the device to automatically adjust the screen brightness
Screen brightness	80	Set screen brightness value
Auto off screen	Open	A period of standby, the screen will off
Auto off screen time	300s	Screen standby time
Auto screen saver	Open	After a certain standby time, enter the screensaver screen
Auto screen saver time	30s	Screensaver standby time
Display SN	Display	Whether SN number is displayed in the lower right corner of the screen
Display IP	Display	Whether the device IP address is displayed in the lower right corner of the screen
Display logo	No display	Upper left corner of face interface/Logo image in the

|		middle of the screensaver
Upload logo image		Select an image and set the logo image (png format 100x70 pixels)
Screen saver image		Select an image and set the screensaver image (jpg format 1280x800 pixels)
Volume	60	Adjust volume
Auto update time	Open	Networking automatically updates device time
Auto set time zone	Open	Networking automatically sets the device time zone
Device name	\	Name the device

Pass record configuration

The description list of configuration items is as follows：

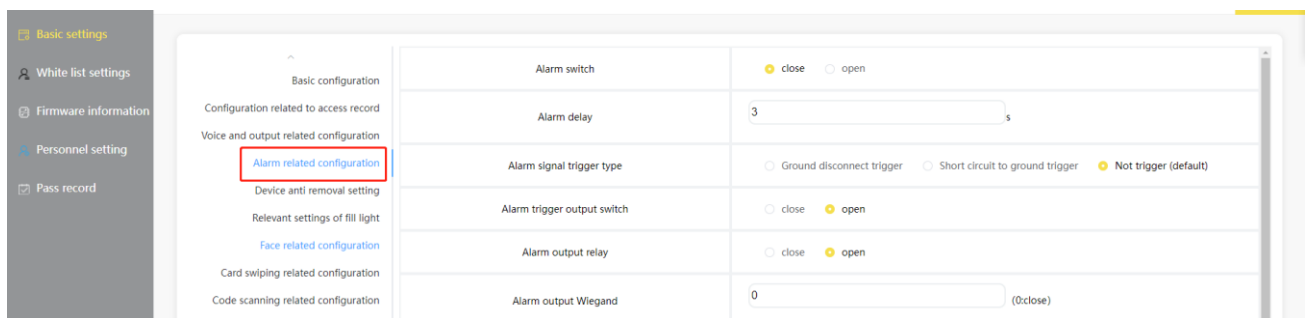| Configuration item	Default value	Instruction
Panoramic picture	Not save	Set whether to save the panoramic picture when face recognition
Face picture	Save	Only save the face photos when face recognition, and the priority is higher than the panoramic picture
Stranger record	Not save	Set whether to save stranger's face recognition record

Voice and output related configuration

The description list of configuration items is as follows：
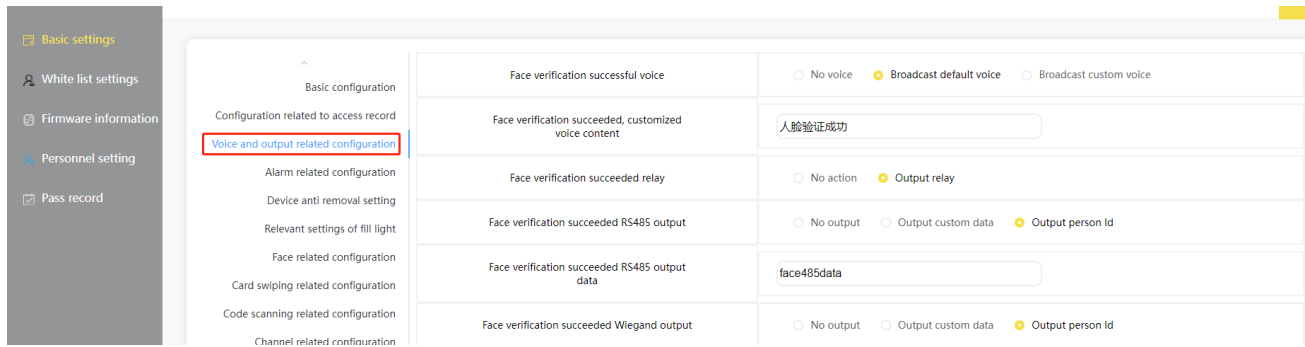
Configuration item	Default value	Instruction
Face verification successful voice	Broadcast default voice	Set the voice feedback action when the face recognition device successfully recognizes the face.
		Broadcast custom voice:does not take effect in protocol mode and development mode.
Face verification succeeded, customized voice content	" Face recognition succeeded"	Set custom voice content
Face verification succeeded relay	Output relay	Set the action of the output relay when face recognition is successful.
Face verification succeeded RS485 output	Output personnel ID	Set the 485 port to output data content when face recognition is successful.
Face verification succeeded RS485 output data	face485data	It takes effect when "output custom data" is selected in the previous item.
Face verification succeeded Wiegand output	Output personnel ID	Set that when face recognition is successful, Wiegand port outputs data content. The personnel ID must meet the specifications of Wiegand 26 or Wiegand 34.
Face verification succeeded Wiegand output data	1234567890	It takes effect when "output custom data" is selected in the previous item.
Face verification failed voice	Broadcast default	Set the voice feedback action when the face

|	voice	recognition device fails to recognize the face.
		Broadcast custom voice: does not take effect in protocol mode and development mode.
Face verification failed, custom voice content	" Face authentication failed"	Set custom voice content

Alarm related configuration

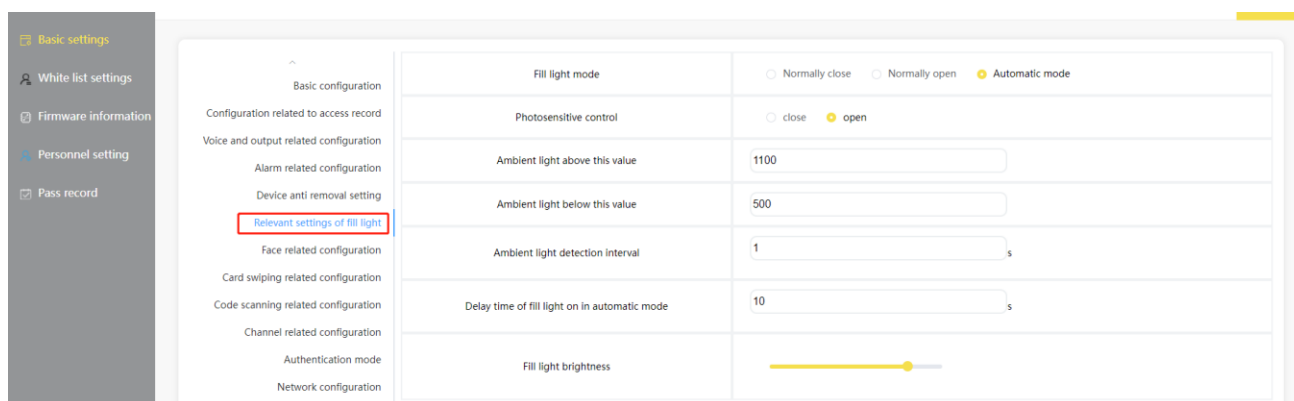

The description list of configuration items is as follows

Configuration item	Default value	Instruction
Alarm service switch	Close	Set to turn on / off face device alarm signal trigger function.
Alarm delay	3s	The alarm trigger signal needs to last for 3 seconds to trigger the alarm voice.
Alarm signal trigger type	Not trigger	Set alarm trigger mode.
Alarm trigger output switch	Open	Set the feedback action of the device after the alarm signal is triggered.
Alarm output relay	Open	Act immediately when the alarm signal is triggered.
Alarm Wiegand output	Close	Output Wiegand data immediately when the alarm signal is triggered.
485 output	Close	Output 485 data immediately when the alarm signal is triggered.
Broadcast voice	Default voice	Voice broadcast when the alarm signal is triggered.

Device anti removal setting
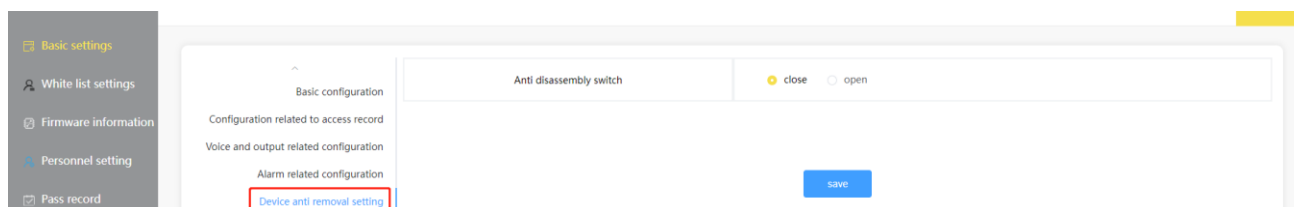
It is closed by default. When it is turned on, the device will give an alarm when it is removed or powered on without installation. （VF205 device is not supported temporarily）
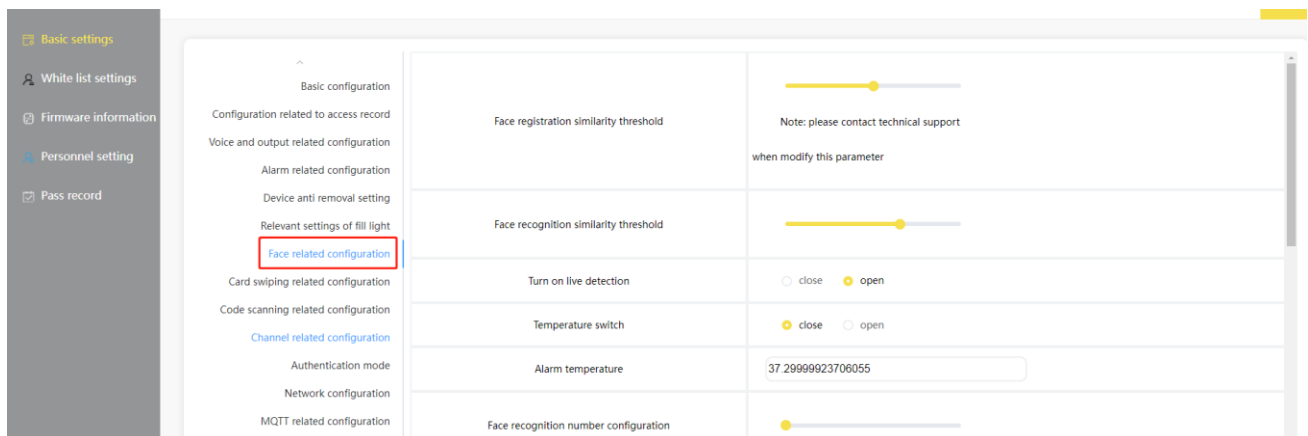
Fill light setting

The description list of configuration items is as follows：

Configuration item	Default value	Instruction
Fill light mode	Automatic mode	Set the working mode of the fill light. In the automatic mode, the fill light will be turned on or off automatically according to the needs of face recognition.
Photosensitive control	Open	This item will not take effect temporarily.
Ambient light above this value	1100	Effective in automatic mode: turn off the fill light when the ambient light is higher than this value.

Ambient light below this value	500	Effective in automatic mode: turn on the fill light when the ambient light is lower than this value.
Ambient light detection interval	1	Device detects the ambient light intensity every second.
Delay time of fill light on in automatic mode	10	Delay time of fill light on in automatic mode.
Fill light brightness	80	Set the fill light brightness.

Note: the high and low values of ambient light are recommended to remain the default. If the environment is limited and must be adjusted, the high value shall be at least 600 greater than the low value. Otherwise, the backlight of the device will be abnormal.
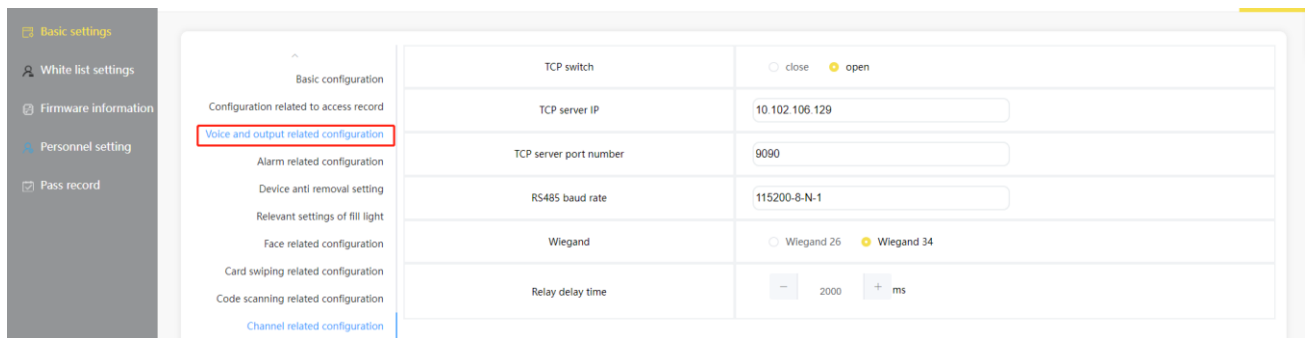
Face related configuration

The description list of configuration items is as follows：

Configuration item	Default value	Instruction
Face registration similarity threshold	50	Set the face detection standard during registration. It is recommended to keep the default value. The larger the value, the stricter the detection.
Face recognition similarity threshold	54	Set the face detection standard during face recognition. It is recommended to keep the default value. The larger

		the value, the stricter the detection.
Turn on live detection	Open	Set whether to turn on the live detection function.
Alarm temperature	37.299	Set temperature alarm threshold.
Face recognition number configuration	1	Only one person can be identified at the same time.
Face recognition	Open	Set whether to turn on the face recognition function.
Infrared image	Close	Set whether to turn on the infrared image. It is recommended to turn it off.
Live detection threshold	10	Set the live detection standard . It is recommended to keep the default value. The larger the value, the stricter the detection.
Mask detection	Close	Check whether the person is wearing a mask.
Mask recognition	Open	When face recognition personnel wear masks, open this item to help them recognize successfully.
Mask threshold	53	Set the detection standard for recognizing the face of people wearing masks. It is recommended to keep the default value. The larger the value, the stricter the detection.
Recognition distance	150cm	Set the maximum face recognition distance.
Repeat broadcast interval	5s	Set repeated broadcast interval.
Time interval of repeated recognition	1.5s	Set the face recognition interval.
Recognition timeout	1s	Set face recognition timeout.
Repeat identification switch	Open	Set whether to turn on the detection of face repetition recognition function.
Stranger voice	"Hello stranger"	Broadcast when recognizing unregistered face.
Voice mode	No voice	Set the voice to broadcast when face verification is

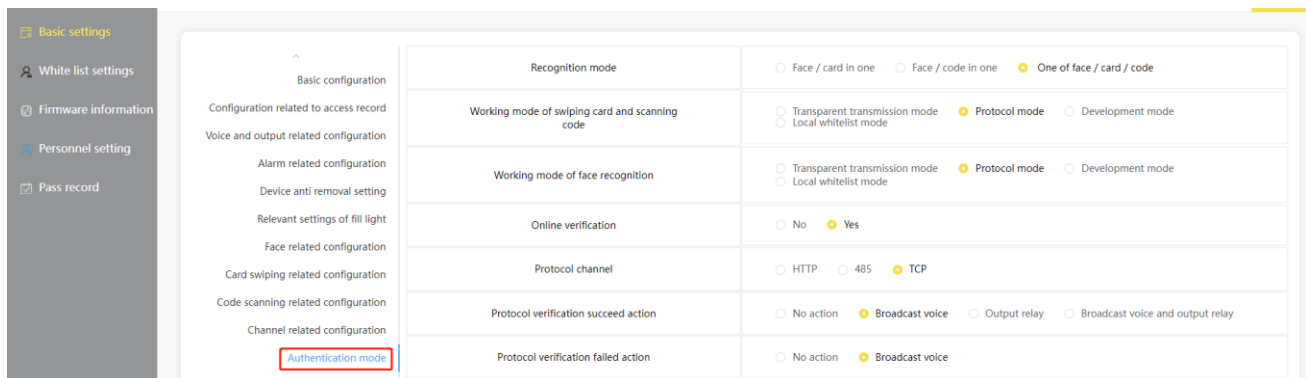|		
		successful.
Greeting	No voice	Select the greeting type when the previous option is broadcast greeting.

Channel related configuration

The description list of configuration items is as follows：

Configuration item	Default value	Instruction
TCP switch	Close	Set whether to open the TCP transmission channel
TCP Server IP	\	Set TCP server IP
TCP Server port number	\	Set TCP server port number
RS485 Baud rate	115200-8-N-1	Set 485 channel parameters
Wiegand	Wiegand 34	Set Wiegand port protocol
Relay delay time	2000ms	Set the relay action holding time when the authentication is successful

Authentication mode

The description list of configuration items is as follows：

Configuration item	Default value	Instruction
Recognition mode	One of face / card / code	The other two items are not supported temporarily.
Working mode of face recognition	Transparent transmission mode	Working mode (for face recognition 1: Transparent transmission mode 2: Protocol mode 3: Development mode 4: Local white list mode) Note: when it is the development mode, the face recognition working mode will also change to the development mode at the same time.
Online verification	No	Valid when code scanning / card swiping or face is in white list mode "Yes": offline priority "no": offline only
Protocol channel		Protocol channel (1: HTTP 2: 485 3: TCP) Note: when it is in the development mode, the channel in the configuration development mode does not support HTTP. If HTTP is configured, TCP will be used by default.
Protocol verification		Successful protocol verification action (the

succeed action		corresponding bit is 1 valid, Bit1: broadcast voice Bit2: output relay)
Protocol verification failed action		Protocol verification failure action (Bit1: broadcast voice bit2)
HTTP protocol callback address		HTTP protocol callback address
HTTP request timeout		HTTP request timeout ms

Network configuration

The description list of configuration items is as follows：

Configuration item	Default value	Instruction
Device password	Fill in the device password by default	Device password set when logging in the system for the first time
Network type	The configuration tool shall prevail	Set networking mode
Wi-Fi name	\	WiFi name to be configured when setting WiFi mode
Wi-Fi password	\	WiFi password to be configured when

		setting WiFi mode
DHCP mode selection	DHCP	IP mode selection dynamic / static
ip address	\	Configure when selecting custom network configuration
Gateway	\	Configure when selecting custom network configuration
Subnet mask	\	Configure when selecting custom network configuration
DNS server	\	Configure when selecting custom network configuration

MQTT configuration

The description list of configuration items is as follows：

Configuration item	Default value	Instruction
Server address	0.0.0.0	Set mqtt server address
Client ID	123456788	Set client ID
User name	admin	Set user name
User password	password	Set user password
Topic prefix	\	Set topic prefix
Qos	Qos2	Set Qos type

Camera calibration

This item is a device debugging item. Users are not allowed to use this function.

Set device time

Set the face device system time.

Disable/enable

Disable /enable the device.

Password modification

Modify the background login password and the device configuration password.

Device restart

Restart the face device.

8.2.White list setting

When selecting the whitelist working mode for scanning codes or face recognition, the personnel ID set through the whitelist can pass through normally.

Click add

Select the person Id, user type, start time and end time of the white list and the type of repetition.

When the user type is selected as two-dimensional code, the two-dimensional code needs to be generated according to the instruction for authorized access code mechanism.

When the user type is face, the user ID is the person Id set when registering face.

When the user type is card, the user ID is the card number.

8.3.Firmware information

This part is mainly used to upgrade the device or restore the device to the factory.

Firmware update
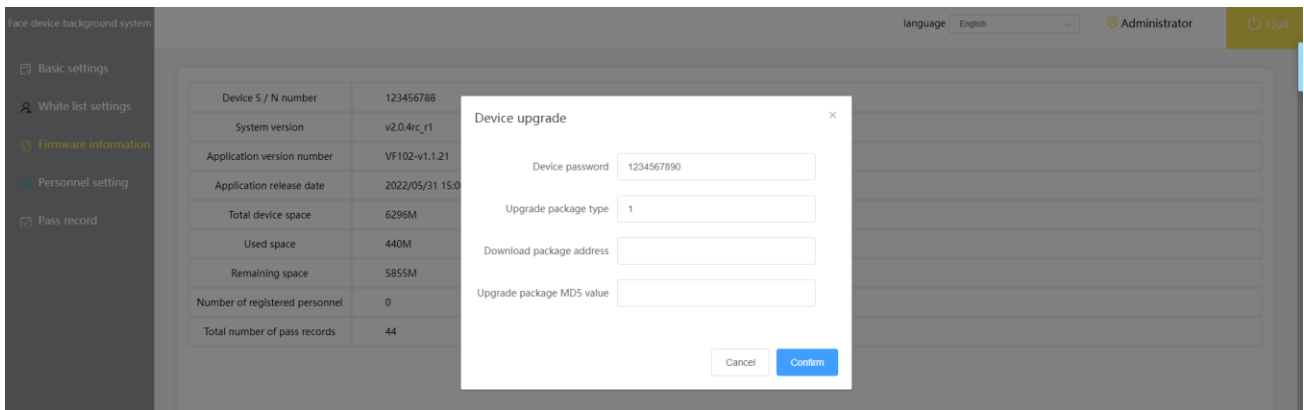
Contact the manufacturer to obtain the upgrade address and MD5 value.

Reset device
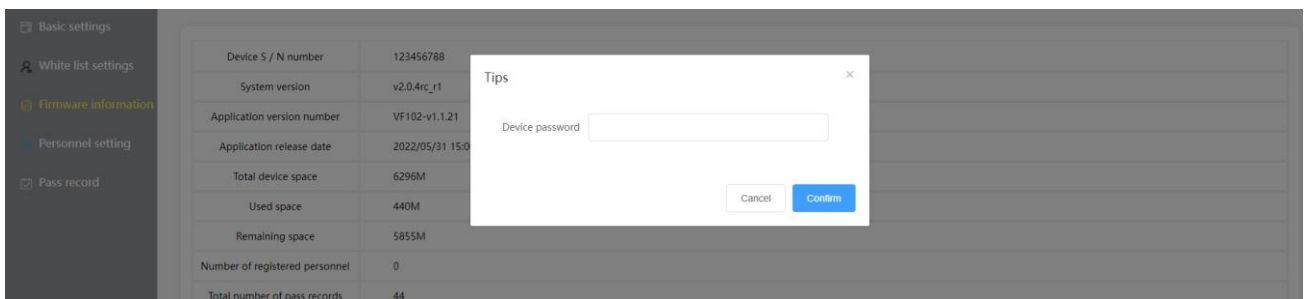
After entering the device password, click "OK".

The device will return to the factory state.

8.4.Personnel setting

Add personnel

Local import

After filling in the personnel ID and name, (Department and gender are not required), click local import, and then click the plus sign in the right border to import face photos.

Photo import

After filling in the personnel ID and name, (Department and gender are not required), click photo import, and the device will enter the photo mode. If the employee uses his face, the device will be registered successfully.

Batch import

Download the form template and import the form after completing the form.

8.5.Pass record

This item is used to query and delete pass records and export pass record tables.
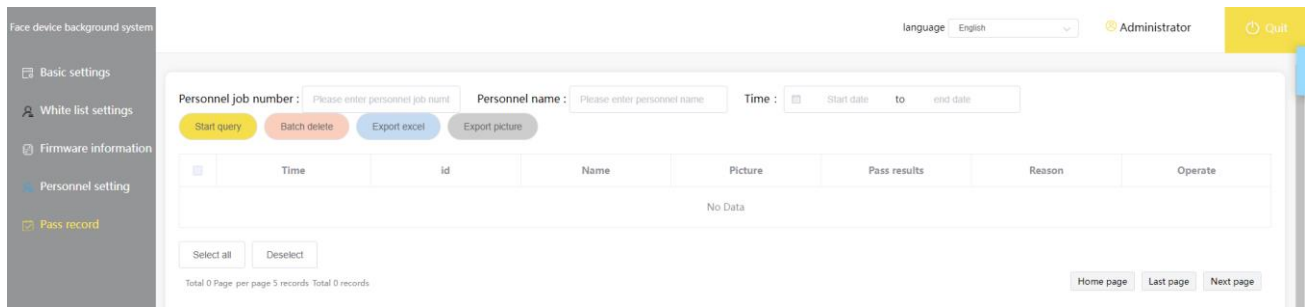
9.Notes

Face registration photo requirements

Face pixels: minimum 80, maximum 512

Image size: 50 ~ 300K

Image height and width: 512 ~ 800 wide, 640 ~ 1024 high

Image format: JPG

Background requirements: life photos, no beauty filters, no heavy makeup, no sunglasses, scarves, masks, etc.

Face registration requirements

During face registration, the face needs to be in the registration box. It is best to occupy all the registration boxes, and look at the registration box for 2-3 seconds, waiting for the device to complete registration.

Wiring requirements：

For unused pins, insulation treatment must be applied!

If the device is short circuited or damaged due to lack of insulation treatment, the user shall bear the responsibility on their own!

Installation environment requirements

It is necessary to avoid backlight, direct sunlight, direct sunlight through windows, oblique sunlight through windows, and close illumination of lights. The above environment will affect the effect of face recognition.
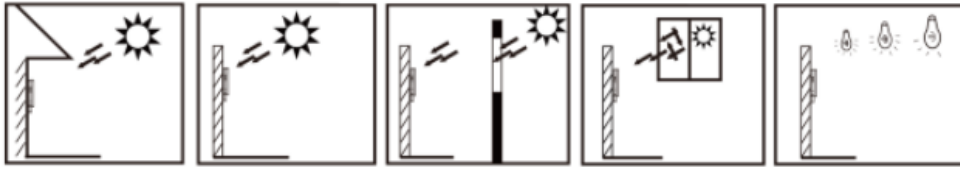
Backlight	Direct sunlight	Direct sunlight through windows	Oblique sunlight through windows	Close illumination of lights