

USER MANUAL

Multibio 800 Facial Access Control Terminal

Version: 1.0

Date: July, 2015

About This Document

This document introduces the interfaces and menu function operations of the facial access control terminal product.

About This Manual

- This manual introduces the operation of user interfaces and menu functions.
- The pictures in this manual may not be exactly consistent with those of your product; the actual product's display shall prevail.

Contents

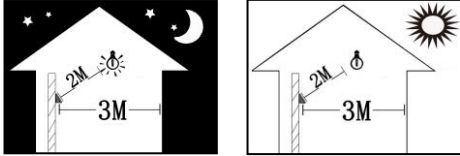
1 Use Instructions	1
1.1 Operating Environment of the Device	1
1.2 Method of Pressing Fingerprint	1
1.3 Standing Position, Facial Expression and Stance	2
1.4 Verification Modes	3
1.4.1 1:N Fingerprint Verification	3
1.4.2 1:1 Fingerprint Verification	4
1.4.3 Password Verification	4
1.4.4 1:N Face-based Attendance	5
1.4.5 1:1 Face-based Attendance	5
2 Main Menu	6
3 User Management	8
3.1 Adding User	8
3.1.1 Entering a User ID	8
3.1.2 Setting the User Role	9
3.1.3 Registering a Fingerprint	9
3.1.4 Registering a Face	9
3.1.5 Registering a Badge Number ★	10
3.1.6 Registering a Password	10
3.1.7 Registering a Photo	10
3.1.8 Setting the Access Control Rights	11
3.2 User Management	12
4 User Role	13
5 Comm. Settings	14
5.1 Ethernet Settings	14
5.2 Serial Comm. Settings	15
5.3 Connection Setting	15
5.4 Wiegand Setup	15
5.4.1 Setting of Card Format for the Device	16
5.4.2 Wiegand Input	16
5.4.3 Wiegand Output	18
5.4.4 Card Format Detect Automatically	19
6 System Settings	19
6.1 Time and Date	20
6.2 Attendance Parameters	21
6.3 Face Parameters	22
6.4 Fingerprint Parameters	23
6.4 Reset to Factory Settings	23
6.5 USB Upgrade	24
7 Personalize Settings	25

7.1 User Interface Settings	25
7.2 Voice Settings	26
7.3 Bells Settings	26
7.4 Punch States Settings	27
7.5 Shortcut Keys Settings	27
8 Data Mgt.	29
8.1 Deleting Data	29
8.2 Data Backup	29
8.3 Data Restoration	30
9 Access Control	31
9.1 Access Control Options Settings	31
9.2 Time Schedule Settings	32
9.3 Set Holiday for Access Group	33
9.4 Access Groups Settings	33
9.5 Combined Verification Settings	34
9.6 Anti-passback Settings★	35
9.7 Duress Options Settings	36
12 USB Manager★	37
12.1 USB Download	37
12.2 USB Upload	37
12.3 Download Options Settings	38
13 Attendance Search	39
14 Autotest	40
15 System Information	41
16 Appendices	42
Appendix 1 Image Uploading Rule	42
Appendix 2 Wiegand Introduction	43
Appendix 3 Statement on Human Rights and Privacy	44
Appendix 4 Environment-Friendly Use Description	45

1 Use Instructions

1.1 Operating Environment of the Device

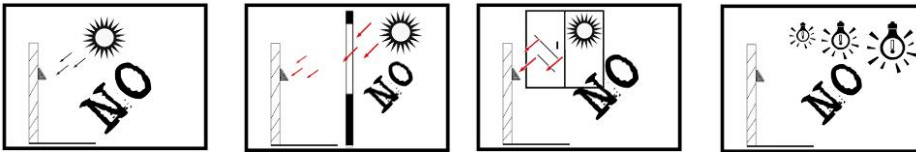
Recommended Installation Position



✓ **Recommended installation position (as shown in the left figure):**

Install the device in an indoor position which is three meters far from the window and door and two meters far from the lamp source, with illuminance of ambient light source being 0-800 LUX.

2) Several Installation Positions Affecting Application Effect



Direct sunlight (Outdoor)

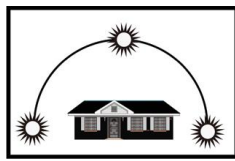
Direct sunlight through the window (Indoor)

Oblique sunlight through the window (Indoor)

Exposure to close range lamp light (Indoor)



10Lux



Larger than 1200 Lux



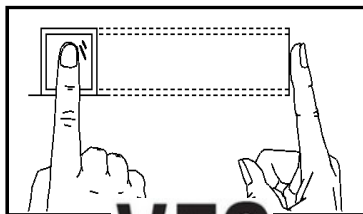
50-800Lux

Note: reference illuminance value of the ambient light source:

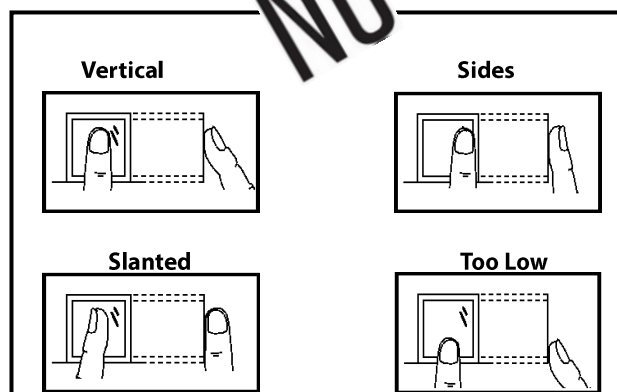
1.2 Method of Pressing Fingerprint

It is recommended to use the index finger, middle finger or ring finger; avoid using the thumb or little finger.

Press a figure flatly against the fingerprint collection window, with the fingerprint center right on the window center.



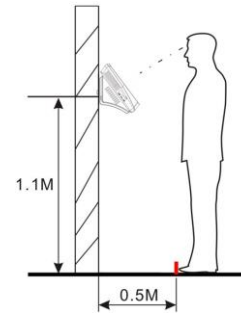
YES



1.3 Standing Position, Facial Expression and Stance

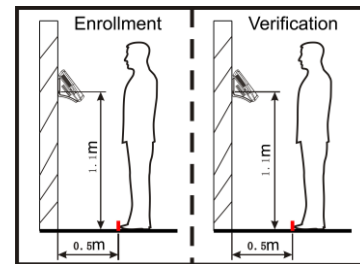
1. Recommended Standing Position

√ The distance between a person and the device is recommended to be 0.5 meters (applicable height range from 1.5–1.8 meters). The distance can be adjusted based on the effect of facial image captured by the device.

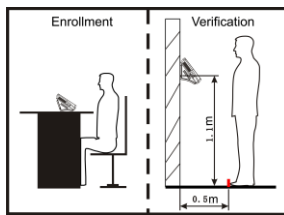


Recommended Application Position

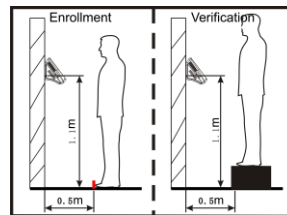
√ Recommended application method (as shown in the left figure): During enrollment and verification, the device installation position must be kept unchanged. If you really need to move the device, keep the installation height unchanged. Otherwise, the recognition effect of the equipment may be compromised.



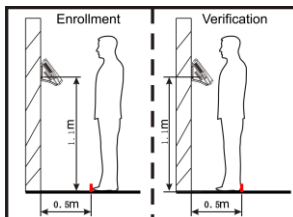
Several application methods affecting recognition effect



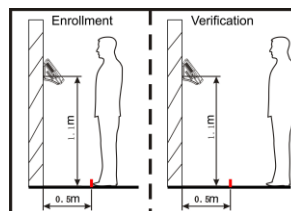
Too high



Too low

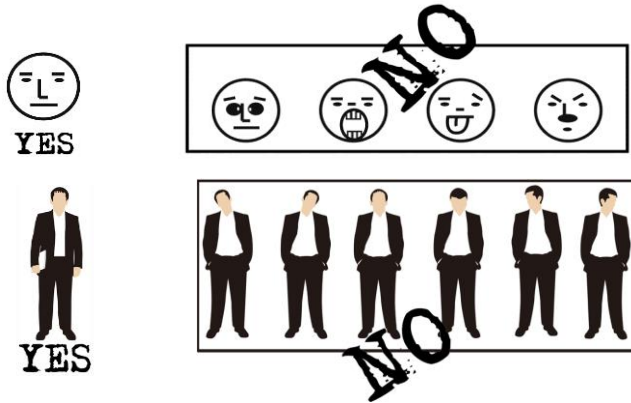


Too close



Too far

2. Facial Expression and Stance



Note: During enrollment and verification, keep the facial expression and stance natural.

3. Posture for Enrollment and Comparison

During enrollment, you need to move forward or backward to ensure that your eyes are within the green frame.

During comparison, ensure that the face is displayed in the center of the screen and is within the green frame.

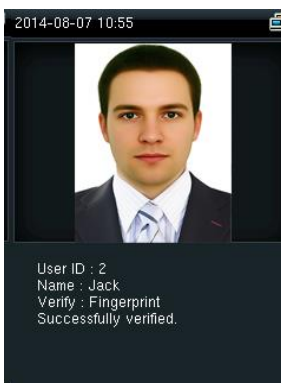


1.4 Verification Modes

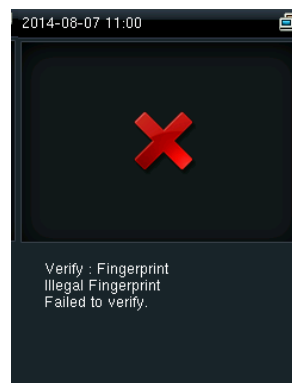
1.4.1 1:N Fingerprint Verification

Under this fingerprint verification method, a fingerprint collected by the sensor is verified with all fingerprints stored in the device.

Please use the correct way to press fingerprint onto the fingerprint sensor (for detailed instruction, please refer to [1.2 Method of Pressing Fingerprint](#)).



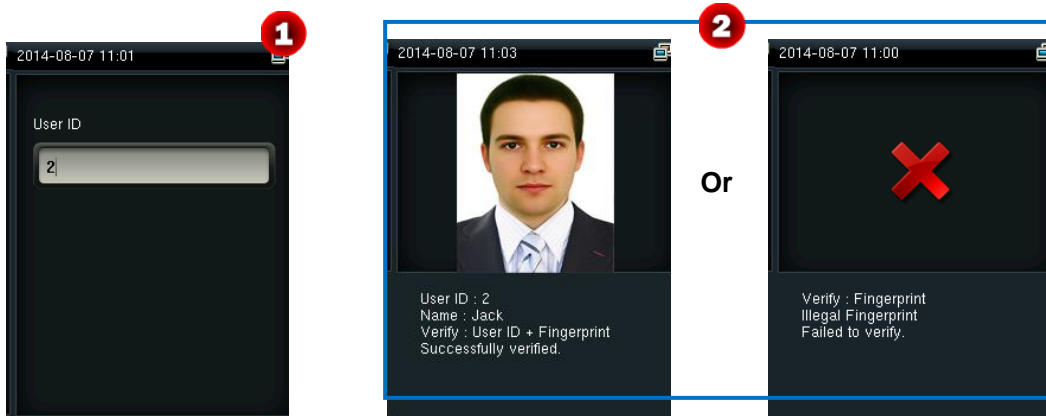
Verification Succeeds



Verification Fails

1.4.2 1:1 Fingerprint Verification

Under this fingerprint verification method, a fingerprint collected by the sensor is verified with the fingerprint corresponding to the entered user ID. Please use this method when difficulty is encountered in 1:N fingerprint verification.



Input the user ID and press [M/OK] "Fingerprint" and press [M/OK]. Press finger onto the sensor afterwards.

Verification succeeds

Verification fails

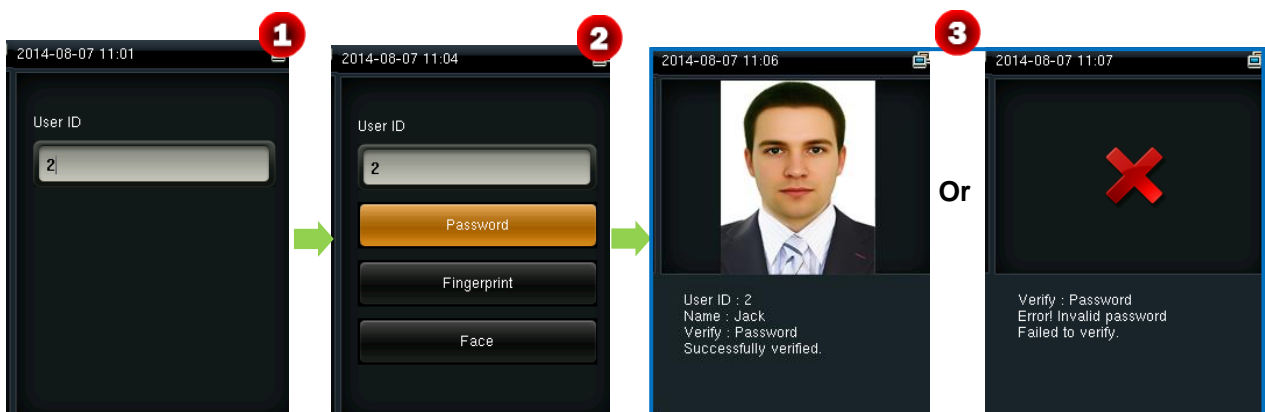


Remarks:

1. Input user ID in the initial interface and press [M/OK] button. If "Incorrect user ID" is displayed, this means the user ID does not exist.
2. When the device displays "please press your finger again" press your finger again onto the fingerprint sensor. If verification still fails after 2 attempts, it will exit to the initial interface.

1.4.3 Password Verification

Under this verification method, the entered password is verified with the password of the entered user ID.



Input the user ID and press [M/OK].

Choose "Password" and press [M/OK].

Verification Succeeds

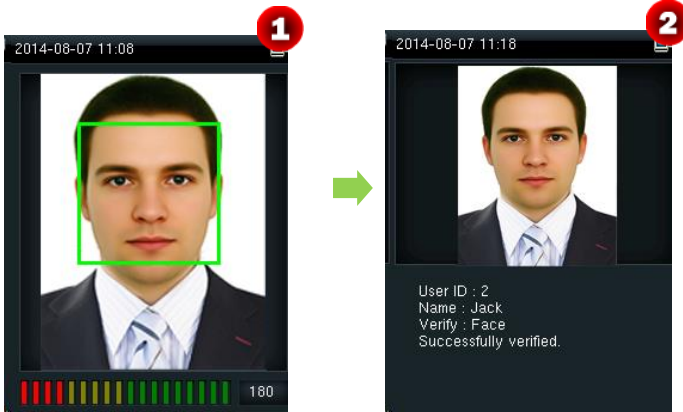
Verification Fails

 **Remarks:**

If "Incorrect password" is displayed, please enter the password again. If verification still fails after 2 attempts, it will exit to the initial interface.

1.4.4 1:N Face-based Attendance

Compare the facial image captured by the camera with all facial data in the device.

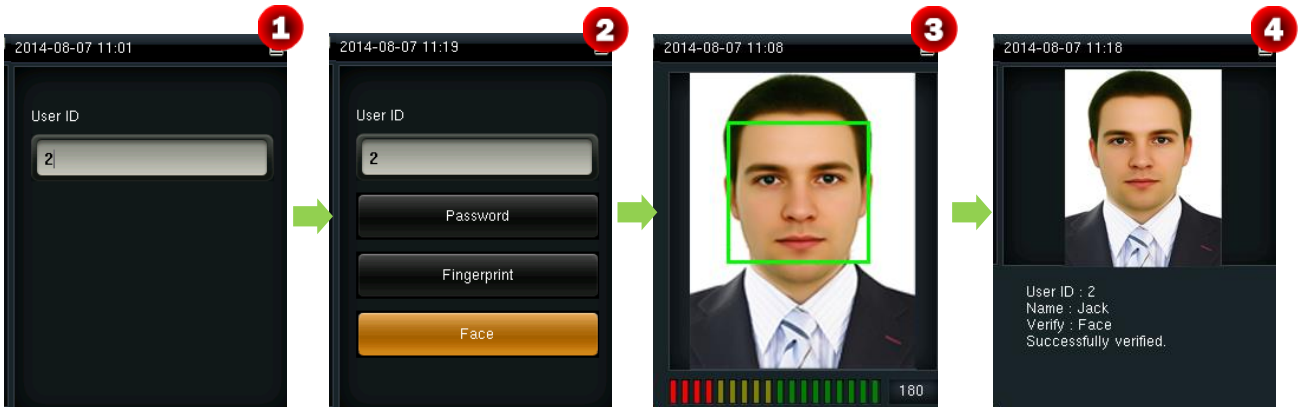


Conduct comparison in the correct way on the main interface.

Verification passed.

1.4.5 1:1 Face-based Attendance

Compare the captured facial image with the facial image associated with the entered user ID.



Enter the user ID into the main interface by using the keypad and then press [M/OK].

Select [Face] and then press [M/OK].

Compare the faces in the right way.

Verification passed.

2 Main Menu

When the device is in standby mode, press [M/OK] to open the Main Menu.



Functions of the main menu are described as follows:

- User Mgt.:** To add, browse and manage user information, including the user ID, permission, verification mode, fingerprint, face, password, user photo, and access control rights, and to add, edit and delete basic personnel information.
- User Role:** To set user roles for accessing into the menu and changing settings.
- Comm.:** To set the related parameters of the communication between the device and PC, including Ethernet parameters such as IP address, serial Comm, PC connection and Wiegand settings.
- System:** To set system-related parameters to meet user requirements to the maximum extent in terms of functions, display and others, including the system time, date, attendance parameters, face parameters, fingerprint parameters, factory settings restoration, and USB disk-based upgrade.
- Personalize:** This includes interface display, voice, bell, punch state key mode and shortcut key settings.
- Data Mgt.:** To manage data in the device, for example, to delete attendance records, all data, user roles, and user photos, clear publicity pictures, and back up and restore device data.
- Access Control:** To set the user access time period and the parameters of the control lock and related device.
- USB Manager:** To upload and download setting reports and download attendance reports. The user information and attendance data in the device can be imported into related software for processing, or the user information can be imported into other fingerprint devices through a USB disk.

Attendance Search: The attendance search and exception search functions enable employees to query records and exceptions that are saved in the device after successful attendance.

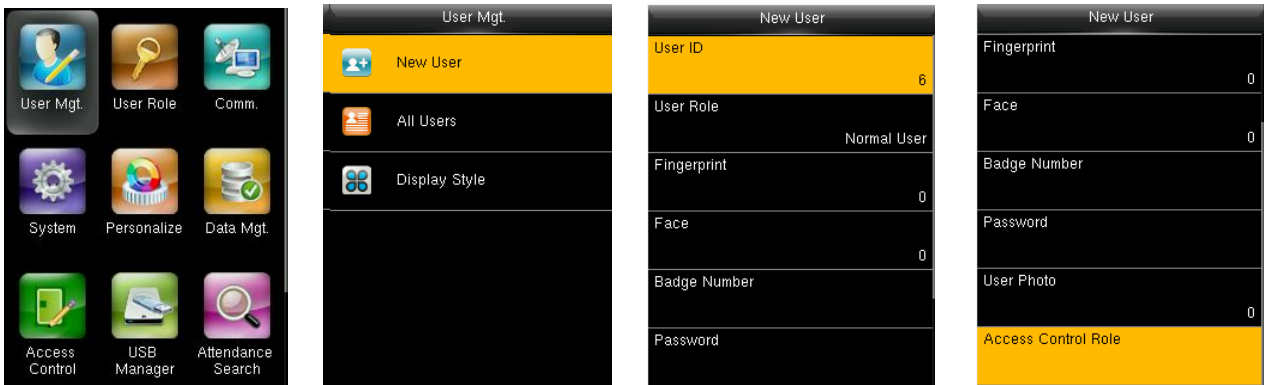
Autotest: To automatically test different module's functions, including the LCD, voice, keyboard, fingerprint sensor, camera* and clock RTC test.

System Info: To check device capacity, device and firmware information.

3 User Management

3.1 Adding User

The basic user information in the device includes the user ID, user role, verification mode, fingerprint, face, badge number, password, user photo, and access control rights. The access control rights include the belonged group, verification mode, whether the duress fingerprint is defined, and use time period. In the company's access control management, operations such as adding, deleting, query, and modifying need to be performed on the personnel information in the device.

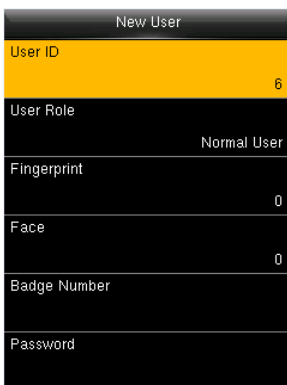


Press **M/OK** > **User Mgt.** > **New User** to access the interface of adding a user, in which you can enter a user ID, select a user role (normal user or super administrator), register a fingerprint, register a badge number, set a password, and set access control rights.

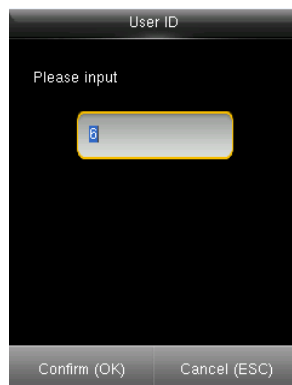
In the initial interface, press [M/OK] > User Mgt. > New User to enter New User setting interface. Settings include inputting User ID, Name, choosing User Role, registering Fingerprint and Badge Number, setting Password and setting Access Control Role.

3.1.1 Entering a User ID

The device automatically assigns user IDs for personnel, starting from 1 and so on. The user ID can also be entered manually.

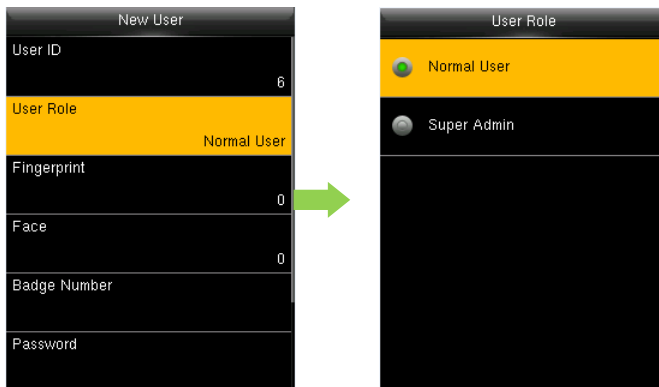


Select **User ID** and press **M/OK** for confirmation.



Press the number keys on the keypad to enter a user ID and press **M/OK** for confirmation.

3.1.2 Setting the User Role

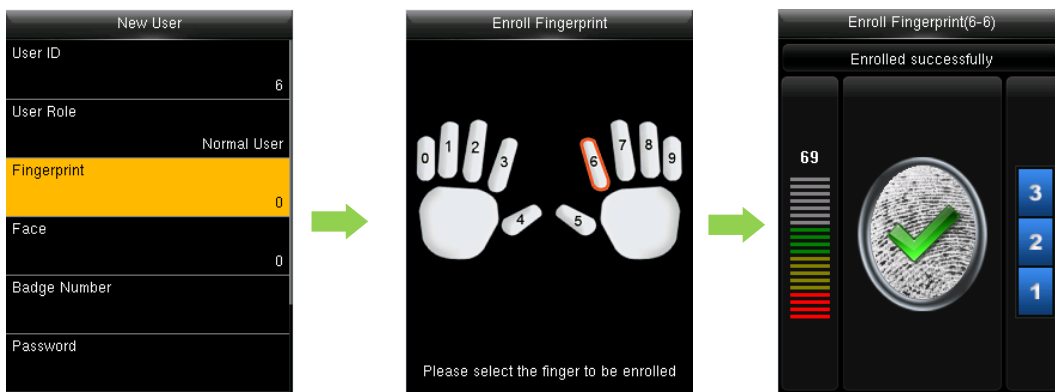


A super administrator can check in and out by using a fingerprint, face or password and enter the menu. A super administrator has the operation permissions over all menu items. A normal user can check in and out only by using a fingerprint, face or password.

Press ▼ to select **User Role** and then press **M/OK**.

Press ▲/▼ to select **Normal User** or **Super Admin**.

3.1.3 Registering a Fingerprint

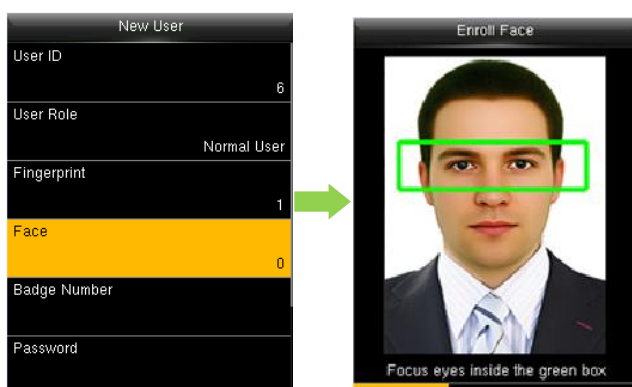


Press ▼ to select **Fingerprint** and press **M/OK** for confirmation.

Press the same finger in the right way for three continuous times until the registration succeeds.

For the method of pressing a fingerprint, see 1.2 "Method of Pressing Fingerprint." If registration fails, the device shows a prompt and returns to the fingerprint registration interface. Repeat the previous operation.

3.1.4 Registering a Face



i See 1.3 "Standing Position, Facial Expression and Stance". During face registration, when the green frame is in the middle, a user photo will be taken automatically and saved in the device.

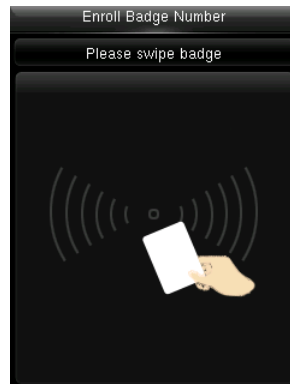
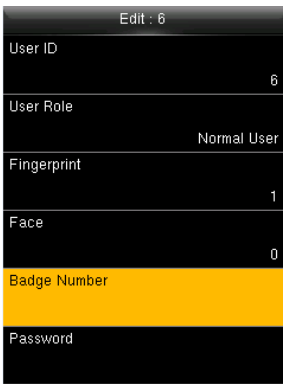
Press ▼ to select **Face** and press **M/OK** for

Follow the prompts on the device to place eyes in

confirmation.

the green frame until the registration succeeds.

3.1.5 Registering a Badge Number*

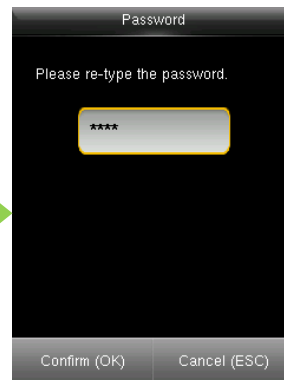
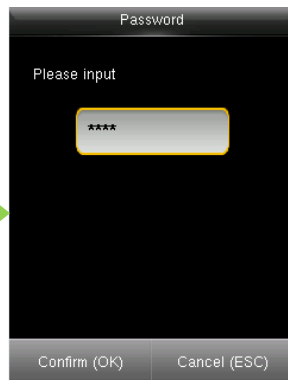
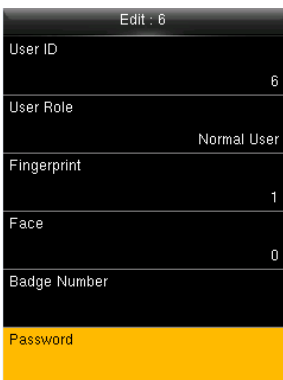


Press ▼ to select **Badge Number** and press **M/OK** for confirmation.

Swipe the badge slightly in the induction area until the device senses the badge.

The device saves and displays the read badge number on the screen.

3.1.6 Registering a Password



i
The equipment supports a 1-8 digit password.

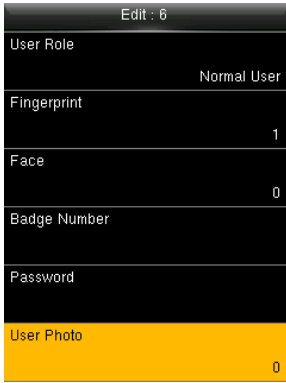
Press ▼ to select **Password** and press **M/OK** for confirmation.

Use the numeric keypad to enter a password and press **M/OK** for confirmation.

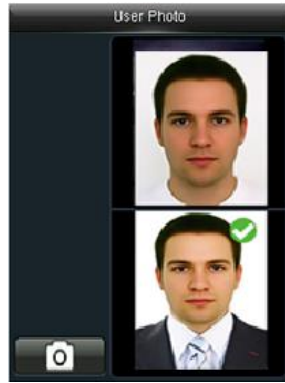
Re-enter the password for confirmation.

3.1.7 Registering a Photo

When a user registered with a portrait passes the verification, the registered user portrait is displayed besides information such as the user ID and name.



Press ▼ to select "User Photo" and press **M/OK** for confirmation.

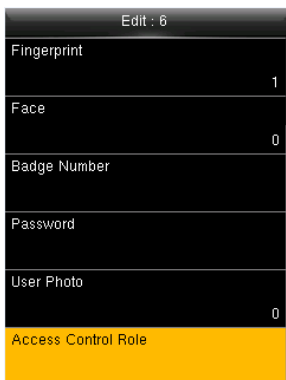


Stand in front of the screen naturally and press **M/OK** to take a photo.

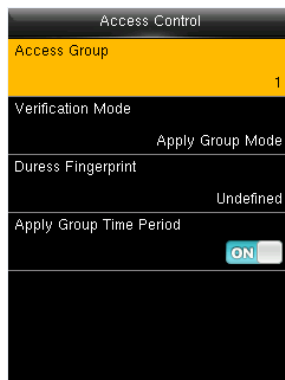
i When the photo taken during facial registration is used, photo taking is not required.

3.1.8 Setting the Access Control Rights

You can set which group a user belongs to, access verification mode, whether to register a duress fingerprint, and whether to use the group time period. By default, the unlocking permission is granted to newly enrolled users.



Press ▼ to select **Access Control Role** and then press **M/OK**.



Press ▲/▼ to select a different verification mode.

Access Group: Select the belonged group. By default, a newly enrolled user belong to group one.

Verification Mode: Select a user verification mode. A total of 22 user verification modes are supported, including group verification mode, face/fingerprint/password/badge, only fingerprint, only user ID, password, only badge, fingerprint/password, fingerprint/badge, password/badge, user ID&fingerprint, fingerprint&password, password&badge, fingerprint&password&badge, password&badge, user ID&fingerprint&password, fingerprint&badge&user ID, only face, face&fingerprint, face&password, face&badge, face&fingerprint&badge, and face&fingerprint&password.

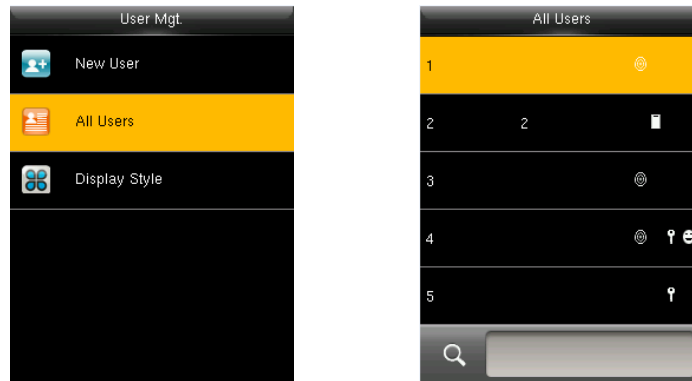
Duress Fingerprint: A fingerprint registered in the device is specially specified as a duress fingerprint. In any case, a duress alarm is generated when a fingerprint matches a duress fingerprint.

Apply Group Time Period: The default value is 1.

Note: For settings of the access control group and the time period, see 9 "Access Control!"

3.2 User Management

During daily company management, when a personnel change occurs, the personnel information needs to be updated on the device. Operations such as user adding, deleting, query and modifying can be performed.



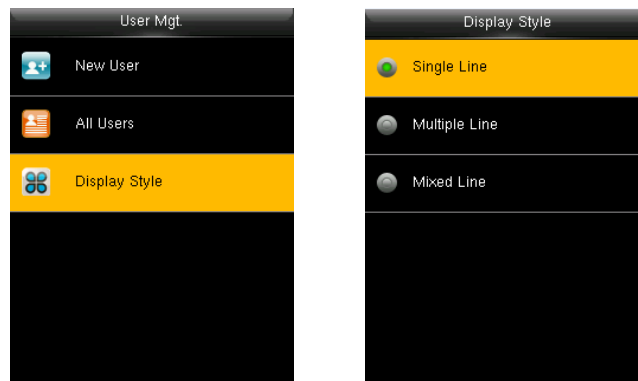
Querying a user: Enter a user ID to be queried in the user list. The device automatically locates the user with this user ID.

Modifying user information: Query to locate the person whose user information needs to be modified and press **M/OK** to modify the person information.

Deleting a user: You can select to delete a user, delete a fingerprint only, delete a face only, delete a password only, or delete a user photo only.

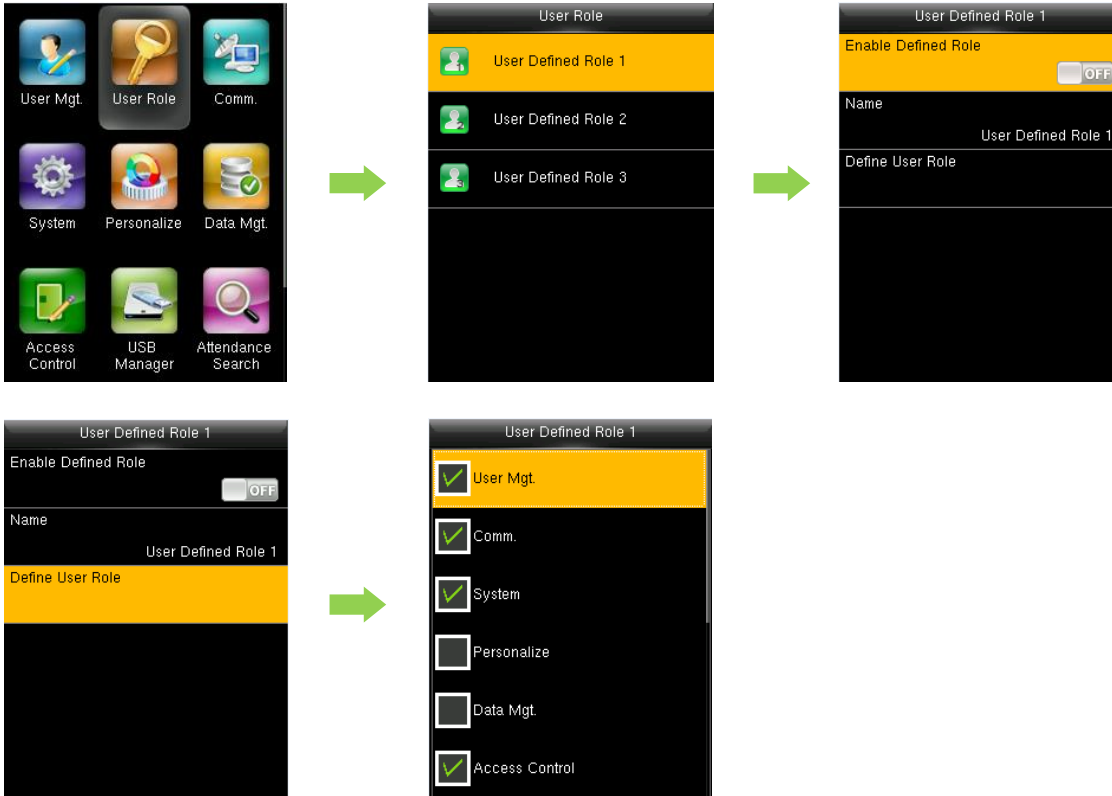
Display Style

Select the display style of the user list, including single line, multiple line and mixed line.



4 User Role

Set the permissions for a defined role to perform operations on the menu. Three roles can be created at most.



Access **User Role** from the main menu, enable a role and assign permissions. The name cannot be entered but can be uploaded with software or a default name can be used.

5 Comm. Settings

Set the parameters related to communication between the device and a PC over the Ethernet, including the IP address, gateway, subnet mask, baud rate, device ID, and connection password.



5.1 Ethernet Settings

Ethernet	
IP Address	192.168.1.132
Subnet Mask	255.255.255.0
Gateway	192.168.1.254
DNS	0.0.0.0
TCP COMM.Port	4370
DHCP	<input type="checkbox"/> OFF

IP Address: The default IP address is **192.168.1.201** and can be changed based on requirements.

Subnet Mask: The default subnet mask is **255.255.255.0** and can be changed based on requirements.

Gateway: The default gateway address is **0.0.0.0** and can be changed based on requirements.

DNS: The default DNS address is **0.0.0.0** and can be changed based on requirements.

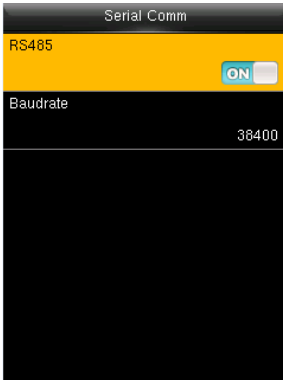
TCP COMM. Port: The default value is **4370** and can be changed based on requirements.

DHCP: This is the Dynamic Host Configuration Protocol, which uses the server to allocate dynamic IP addresses to network clients.

Displaying the network icon in the status bar: Set whether to display the network icon in the status bar of the main interface.

5.2 Serial Comm. Settings

When the device communicates with a PC in serial mode (RS485), check the following settings:



Baudrate: The rate of the communication with a PC has four options: 19200, 38400, 57600, and 115200. It is recommended to use 38400 for RS485 communication.

Note: When the 485 reader feature is enabled in access control management and the RS485 communication here is also enabled, a prompt will be displayed, indicating that the device needs to be restarted for the settings to take effect.

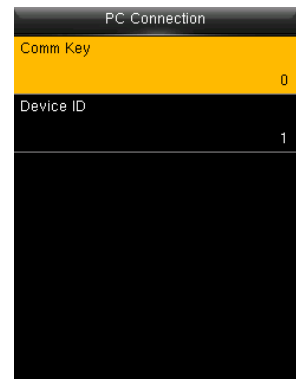
5.3 Connection Setting

To improve security of data, Comm Key for communication between the device and PC needs to be set.

If a Comm Key is set in the device, the correct connection password needs to be entered when the device is connected to the PC software, so that the device and software can communicate.

Comm Key: The default password is 0 (no password) and can be set to another value. After setting, this password must be entered for the communication between software and the device. Otherwise, the connection fails. **Comm Key** can be 1~6 digits.

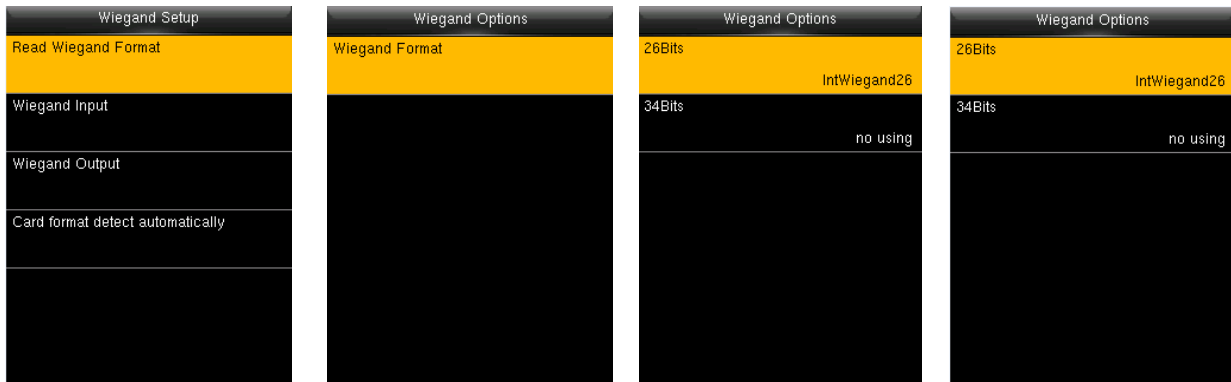
Device ID: The device ID ranges from 1 to 254. If the communication method is RS485, inputting this device ID in the software communication interface is required.



5.4 Wiegand Setup

Set the Wiegand communication formats of the internal card module and external Wiegand device.

5.4.1 Setting of Card Format for the Device



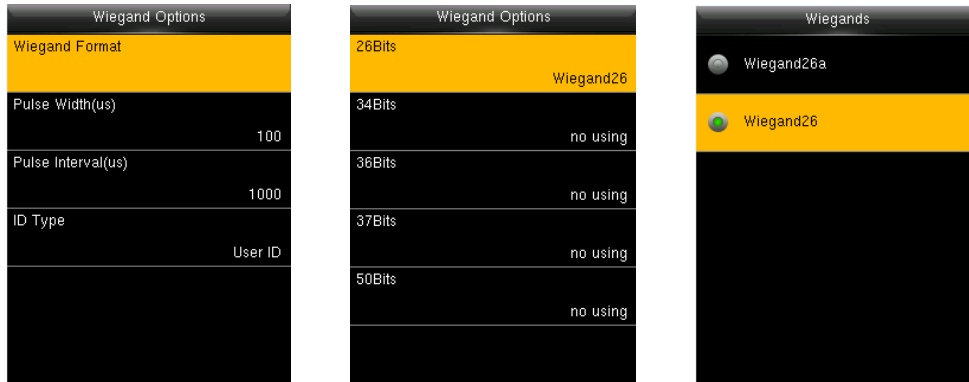
Set the Wiegand format matching the card module of the device. After a unified Wiegand format is used, correct card numbers can be read. The Wiegand format can be set to **IntWiegand26**, **IntWiegand26a**, **IntWiegand34**, or **IntWiegand34a** so that card numbers read by the device are in the preset format.

Wiegand Format	Description
IntWiegand26	<p>ECCCCCCCCCCCCCCCCCCCCCCCCCCCCO</p> <p>This is composed of 26 binary numbers, with bit 1 being the even parity check bit for bits 2-13 and bit 26 being the odd parity check bit for bits 14-25 and bits 2-15 being the card number.</p>
IntWiegand26a	<p>ESSSSSSSSCCCCCCCCCCCCCCCCCO</p> <p>This is composed of 26 binary numbers, with bit 1 being the even parity check bit for bits 2-13, bit 26 being the odd parity check bit for bits 14-25, bits 2-9 being the area code and bits 10-15 being the card number.</p>
IntWiegand34	<p>ECCCCCCCCCCCCCCCCCCCCCCCCCCCCO</p> <p>This is composed of 34 binary numbers, with bit 1 being the even parity check bit for bits 2-17 and bit 34 being the odd parity check bit for bits 18-33 and bits 2-15 being the card number.</p>
IntWiegand34a	<p>ESSSSSSSSCCCCCCCCCCCCCCCCCO</p> <p>This is composed of 34 binary numbers, with bit 1 being the even parity check bit for bits 2-17, bit 34 being the odd parity check bit for bits 18-33, bits 2-9 being the area code and bits 10-15 being the card number.</p>

Note: C stands for card number, E stands for even parity check, and O stands for odd parity check.
 Note: This item is available for ID card machine but not MF card machine.

5.4.2 Wiegand Input

Set the Wiegand format of an externally connected reader.



Wiegand Format: Users can choose among the following built-in Wiegand formats: **Wiegand 26, Wiegand 26a, Wiegand 34, Wiegand 34a, Wiegand 36, Wiegand 36a, Wiegand 37, Wiegand 37a and Wiegand 50**, in which no using means the format with this bit number is not used. The following table describes all formats.

Pulse Width (us): The width of pulse sent by Wiegand. The default value is 100 microseconds, which can be adjusted within the range of 20 to 100 microseconds.


Pulse Interval (us): The default value is 1000 microseconds, which can be adjusted within the range of 200 to 20000 microseconds.

ID Type: Input content included in Wiegand input signal. User ID or Badge Number can be chosen.

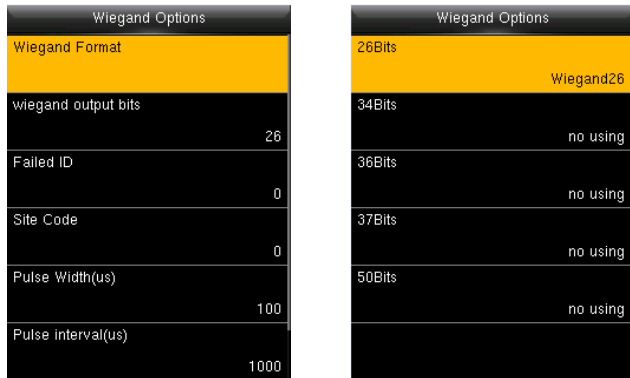
Definitions of Wiegand Formats:

Wiegand Format	Definition
Wiegand26	ECCCCCCCCCCCCCCCCCCCCCO Consists of 26 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 13 th bits, while the 26 th bit is the odd parity bit of the 14 th to 25 th bits. The 2 nd to 25 th bits are the card number.
Wiegand26a	ESSSSSSSSSSSSSSSSSSSSSSCO Consists of 26 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 13 th bits, while the 26 th bit is the odd parity bit of the 14 th to 25 th bits. The 2 nd to 9 th bits are the site code, while the 10 th to 25 th bits are the card number.
Wiegand34	ECCCCCCCCCCCCCCCCCCCCCCCCCO Consists of 34 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 17 th bits, while the 34 th bit is the odd parity bit of the 18 th to 33 rd bits. The 2 nd to 25 th bits are the card number.
Wiegand34a	ESSSSSSSSSSSSSSSSSSSSSSSSCO Consists of 34 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 17 th bits, while the 34 th bit is the odd parity bit of the 18 th to 33 rd bits. The 2 nd to 9 th bits are the site code, while the 10 th to 25 th bits are the card number.
Wiegand36	OFFFFFFFFFFFFFFFFFFCCCCCCCCCCCCMME Consists of 36 bits of binary code. The 1 st bit is the odd parity bit of the 2 nd to 18 th bits, while the 36 th bit is the even parity bit of the 19 th to 35 th bits. The 2 nd to 17 th bits are the device code, the 18 th to 33 rd bits are the card number, and the 34 th to 35 th bits are the manufacturer code.
Wiegand36a	EFFFFFFFFFFFFFFFFFFFFFFFFCCCCCCCCCCCCCO Consists of 36 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 18 th

Wiegand Format	Definition
	bits, while the 36 th bit is the odd parity bit of the 19 th to 35 th bits. The 2 nd to 19 th bits are the device code, and the 20 th to 35 th bits are the card number.
Wiegand37	OMMMMSSSSSSSSSSSSSCCCCCCCCCCCCCCCCCCE Consists of 37 bits of binary code. The 1 st bit is the odd parity bit of the 2 nd to 18 th bits, while the 37 th bit is the even parity bit of the 19 th to 36 th bits. The 2 nd to 4 th bits are the manufacturer code, the 5 th to 16 th bits are the site code, and the 21 st to 36 th bits are the card number.
Wiegand37a	EMMMFFFFFFFSSSSSSSCCCCCCCCCCCCCCO Consists of 37 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 18 th bits, while the 37 th bit is the odd parity bit of the 19 th to 35 th bits. The 2 nd to 4 th bits are the manufacturer code, 5 th to 14 th bits are the device code, 15 th to 20 th bits are the site code, and the 21 st to 36 th bits are the card number.
Wiegand50	ESSSSSSSSSSSSSSSCCCCCCCCCCCCCCCCCCCCCO Consists of 50 bits of binary code. The 1 st bit is the even parity bit of the 2 nd to 25 th bits, while the 50 th bit is the odd parity bit of the 26 th to 49 th bits. The 2 nd to 17 th bits are the site code, and 18 th to 49 th bits are the card number.

 **Note:** C denotes card number, E denotes even parity bit, O denotes odd parity bit, F denotes device code, M denotes manufacturer code, P denotes parity bit, and S denotes site code.

5.4.3 Wiegand Output



Wiegand Format: Users can select the standard Wiegand formats built in the system. See the definitions of all kinds of general Wiegand formats in 5.4.2 "Wiegand Input." Although multiple choices are supported, the actual format is determined by **Wiegand output bits**.

Wiegand output bits: the bit length of Wiegand data. After **Wiegand output bits** is set, the device will find the Wiegand format of this bit number in **Wiegand Format**.

For example, if **Wiegand26**, **Wiegand34a**, **Wiegand36**, **Wiegand37a** and **Wiegand50** are selected for **Wiegand Format**, but **Wiegand output bits** is set to **36**, the 36 bit Wiegand36 format will be adopted eventually.

Failed ID: It is defined as the output value of failed user verification. The output format depends on the **[Wiegand Format]** setting. The default value ranges from 0 to 65535.

Site Code: It is similar to device ID except that it can be set manually and repeatable with different devices.

The default value ranges from 0 to 256.

Pulse Width (μ s): The width of pulse sent by Wiegand. The default value is 100 microseconds, which can be adjusted within the range of 20 to 100 microseconds.

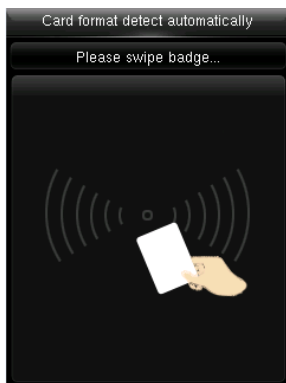
Pulse Interval (μ s): The default value is 1000 microseconds, which can be adjusted within the range of 200 to 20000 microseconds.

ID Type: Output content after successful verification. User ID or card number can be chosen.

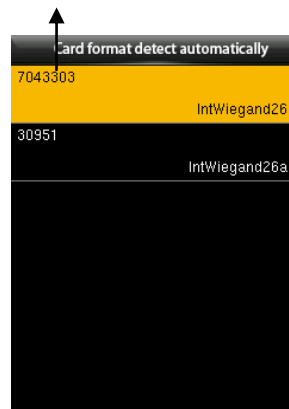
5.4.4 Card Format Detect Automatically

[Card Format Detect Automatically] aims at assisting user with quickly detecting the card type and its corresponding format. Various card formats are preset in the device. After card swiping, the system will detect it as different card numbers according to every format; user only requires to choose the item equivalent to the actual card number, and set the format as the Wiegand format for the device. This function is also applicable to card reading function and auxiliary Wiegand reader.

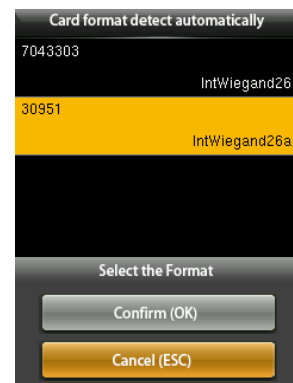
Card number obtained based on the
IntWiegand26 format parsing



After entering automatic detection, swipe the badge in the card swiping area (on the device or reader).



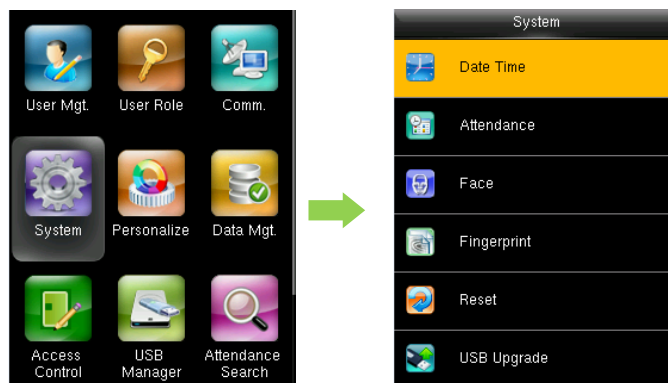
The Wiegand format and parsed card number are automatically detected.



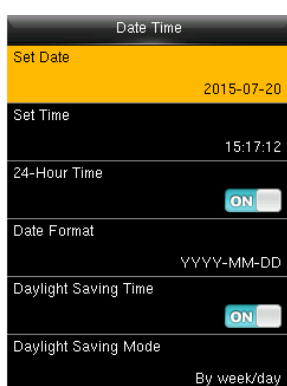
Select the number consistent with the actual card number, and the corresponding format is the Wiegand format which should be selected for reading this type of card.

6 System Settings

Set system-related parameters to meet user requirements to the maximum extent in terms of functions, display and others, including the time and date, attendance parameters, and fingerprint parameters.



6.1 Time and Date



Set Date and Set Time: Set the date and time for the device.

24-Hour Time: Set the time display mode on the main interface. When it is set to **ON**, the time is displayed in 24-hour system; when it is set to **OFF**, the time is displayed in 12-hour system.

Date Format: Set the format of dates displayed on all interfaces of the device.

Daylight Saving Time:

The daylight saving time, or DST, is a system which artificially stipulates local time for energy saving. The unified time used during the implementation of this system is called daylight saving time. In summertime when the daybreak is early, the time is usually set one hour ahead artificially so that people sleep and get up early, which reduces lighting consumption and makes full use of sunlight resource to save lighting power. When autumn comes, the time is set back. The countries adopting the daylight saving time have different specific provisions.

In order to meet requirements for daylight saving time, the device is specially customized with a feature which sets the time one hour ahead at XX:XX on day XX in month XX and sets the time back at XX:XX on day XX in month XX.

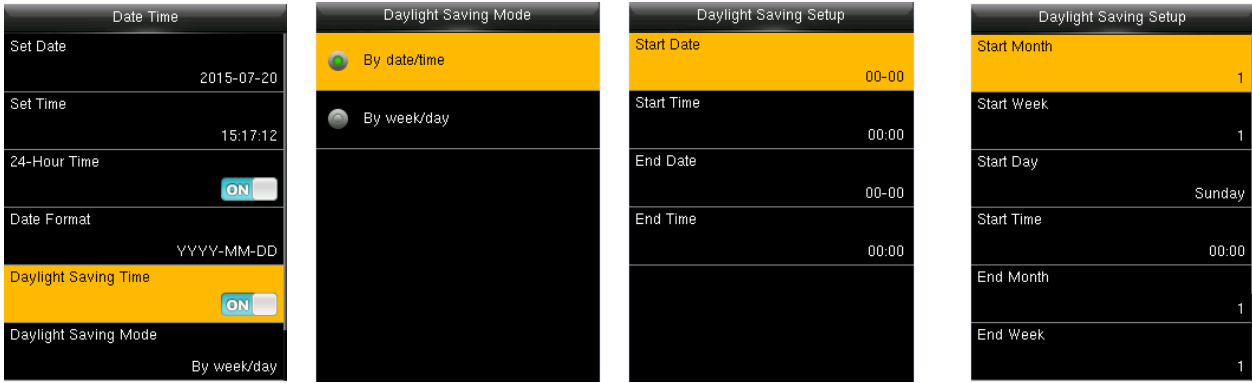
Operation instructions:

Set **Daylight Saving Time** to **ON**.

2) Enter the start time and end time of DST.

For example, the device is set to start DST at 08:00 on April 1 and the time is set one hour ahead; the device resumes normal time at 08:00 on October 1.

3) Press **OK** to save the setting. Press **ESC** to quit without saving.



Enable DST Conversion mode of DST Time setting in date mode Time setting in week mode

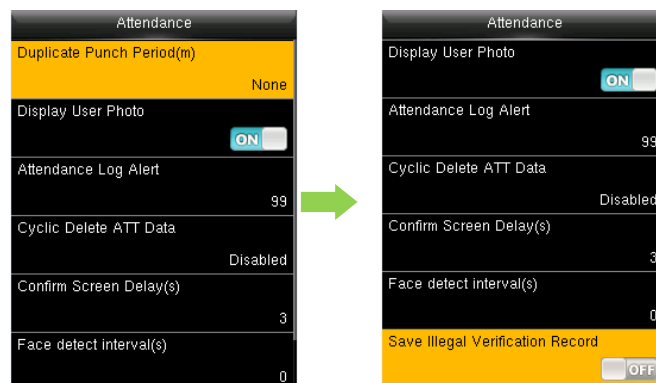
Daylight Saving Mode: The date mode (month-day-hour) (default) or week mode (month-week-hour) can be selected.

Daylight Saving Setup: Set the start time and end time of DST.

The date mode and week mode are described as follows:

1. If the DST start month is set to be later than the DST end month, the DST end month is in the next year of the DST start month. For example: The DST starts at 4:00, 2012-9-1, and ends at 4:00, 2013-4-1.
2. In week mode, assume that the DST start day is set to the sixth Sunday in September, and the current year is 2012, but the calendar shows that September of 2013 has five not six weeks. In this case, the system starts DST at corresponding time on the last Sunday of this month.
3. Assume that the DST start day is set to Monday of the first week of September, and the current year is 2012, but the calendar shows that the first week of September does not have Monday. In this case, the system automatically locates the first Monday of this month.

6.2 Attendance Parameters



Duplicate Punch Period (m): Within a set time period (unit: minutes), the duplicated attendance logs will not be reserved (value ranges from 1 to 999999 minutes).

Display User Photo: indicates whether to display a user photo when the user passes attendance check.

Attendance Log Alert: When the remaining storage is smaller than the set value, the device will automatically alert users to the remaining storage information. It can be disabled or set to a value ranged from 1 to 9999.

Cyclic Delete ATT Data: The number of attendance logs allowed to be deleted in one time when the maximum storage is attained. It can be disabled or set to a value ranged from 1 to 999.

Face Detect Interval: Set the interval time between comparisons for the same face.

Save Illegal Verification Record: To set if failed verifications, such as those caused by access in invalid Time Schedules or illegal Combined Verification, will be saved when the advanced access control function is turned on.

6.3 Face Parameters

Face	
1:1 Match Threshold	75
1:N Match Threshold	82
Exposure	300
Quality	80

1:1 Match Threshold: the similarity with the face template registered in the device in 1:1 verification mode. When the similarity is larger than this value, matching succeeds. Otherwise, matching fails. The valid value is in the range of 70-120. The higher the threshold is set, the lower the misjudgment is, leading to higher rejection rate, and vice versa.

1:1:N Match Threshold: the similarity with the face template registered in the device in 1:N comparison mode. When the similarity is larger than this value, matching succeeds. Otherwise, matching fails. The valid value is in the range of 80-120. The higher the threshold is set, the lower the misjudgment is, leading to

higher rejection rate, and vice versa.

Recommended match thresholds:

Rejection rate	Misjudgment rate	Matching threshold	
		1:N	1:1
High	Low	85	80
Medium	Medium	82	75
Low	High	80	70

Exposure: to set the camera exposure value, 300 by default.

Quality: the quality threshold for facial image acquisition. When the quality of an image is larger than this value, the device receives this facial image and starts algorithm processing. Otherwise, the device filters this facial image. The default value is 80 (within 50-150).



Note: Improper adjustments of **Exposure** and **Quality** seriously affect the device service effect. If you need to adjust the parameters, please follow the instructions of our after-sales service personnel for operations.

6.4 Fingerprint Parameters

1:1 Match Threshold: Under 1:1 Verification Method, only when the similarity between the verifying fingerprint and the user's registered fingerprint is greater than this value can the verification succeed.

1:N Match Threshold: Under 1:N Verification Method, only when the similarity between the verifying fingerprint and all registered fingerprints is greater than this value can the verification succeed.

Recommended Match Threshold:

FRR	FAR	Match Threshold	
		1: N	1:1
High	Low	45	25
Medium	Medium	35	15
Low	High	25	10

Fingerprint	
1:1 Match Threshold	15
1:N Match Threshold	35
FP Sensor Sensitivity	Low
1:1 Retry Times	3
Fingerprint Image	Always show

FP Sensor Sensitivity: To set the sensibility of fingerprint collection. It is recommended to use the default level "**Medium**". When the environment is dry, resulting in slow fingerprint detection, you can set the level to "**High**" to raise the sensibility; when the environment is humid, making it hard to identify the fingerprint, you can set the level to "**Low**".

1:1 Retry Times: In 1:1 Verification or Password Verification, users might forget the registered fingerprint or password, or press the finger improperly. To reduce the process of re-entering user ID, retry is allowed; the number of retry can be within 1~9.

Fingerprint Image: To set whether to display the fingerprint image on the screen in registration or verification. Four choices are available: Show for enroll, Show for match, Always show, None.

6.4 Reset to Factory Settings

Reset data such as communication settings and system settings to factory settings.



Remarks: When resetting to factory settings, the user date and Attendance logs will not be affected.

6.5 USB Upgrade

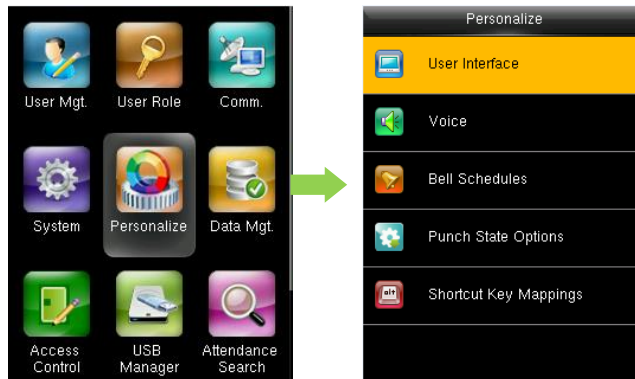
This option enables the device firmware to be upgraded with the upgrade file in a USB disk.



If upgrade file is needed, please contact out technical support. Firmware upgrade is not recommenced under normal circumstances.

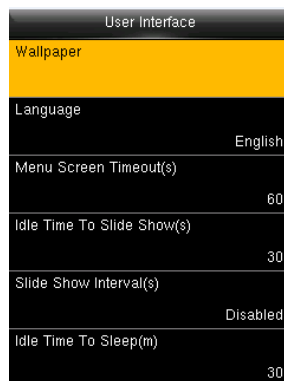
The upgrade with a USB disk is possible only for machines supporting the USB flash disk feature.

7 Personalize Settings



7.1 User Interface Settings

Users are able to customize the display style of the main interface based on their personal preference.



Wallpaper: Select the wallpaper of main screen as required, you can find wallpapers of various styles in the device.

Language: Select the language of device as required.

Menu Screen Timeout (s): When there is no operation in the menu interface and the time exceeds the set value, the device will automatically exit to the initial interface. You can disable it or set the value to 60~99999 seconds.

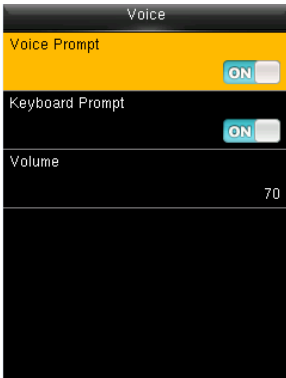
Idle Time To Slide Show (s): When there is no operation in the initial interface and the time exceeds the set value, a slide show will be shown. It can be disabled (set to "**None**") or set to 3~999 seconds.

Slide Show Interval (s): This refers to the interval between displaying different slide show pictures. It can be disabled or set to 3~999 s.

Idle Time To Sleep (m): When there is no operation in the device and the set Sleep Time is attained, the device will enter standby mode. Press any key or finger to cancel standby mode. You can disable this function, or set the value to 1~999 minutes. If this function is turned to [**Disabled**], the device will not enter standby mode.

Main Screen Style: Choosing the position and ways of the clock and status key.

7.2 Voice Settings



Voice Prompt: Select whether to enable voice prompts during operating, press [M/OK] to enable it.

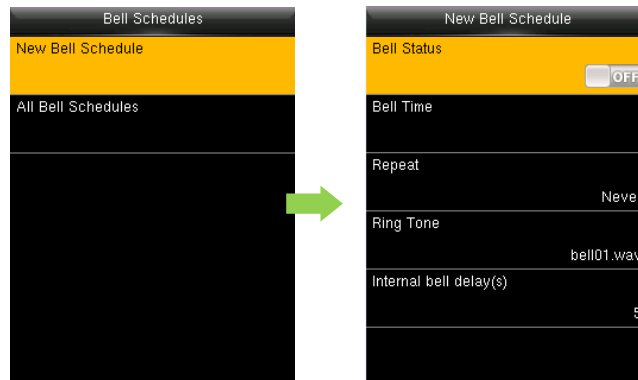
Keyboard Prompt: Select whether to enable keyboard voice while pressing keyboard, press [M/OK] to enable it.

Volume: Set the volume of device. Press ► key to increase the volume, press ◀ key to decrease the volume.

7.3 Bells Settings

Many companies choose to use bell to signify on-duty and off-duty time. When reaching the scheduled time for bell, the device will play the selected ringtone automatically until the ringing duration is passed.

1. Adding a bell schedule



Bell Status: [ON] is to enable the bell, while [OFF] is to disable it.

Bell Time: The bell rings automatically when reaching the specified time.

Repeat: To set whether to repeat the bell.

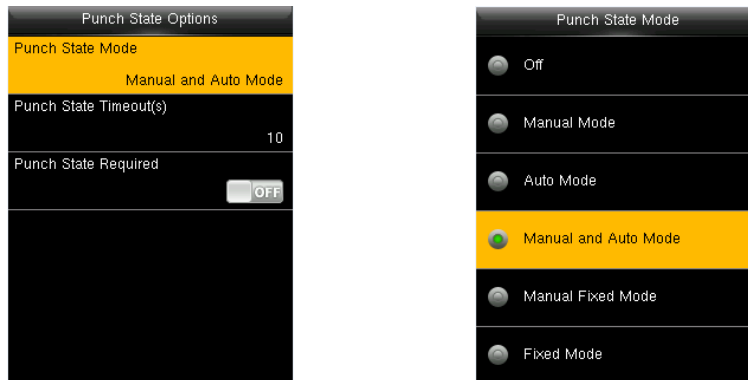
Ring Tone: Ringtone played for bell.

Interval bell delay (s): To set the ringing length. The value ranges from 1 to 999 seconds.

2. Editing and deleting a bell schedule

The edit operation is similar to the operation of adding a bell schedule. To delete a bell schedule, select the bell schedule to be deleted and then conduct deletion.

7.4 Punch States Settings



Punch State Mode: To choose the **Punch State Mode**, which includes the following modes:

- 1. Off:** To disable the punch state key function. The punch state key set under **Shortcut Key Mappings** menu will become invalid.
- 2. Manual Mode:** To switch the punch state key manually, and the punch state key will disappear after **Punch State Timeout**.
- 3. Auto Mode:** After this mode is chosen, set the switching time of punch state key in **Shortcut Key Mappings**; when the switching time is reached, the set punch state key will be switched automatically.
- 4. Manual and Auto Mode:** Under this mode, the main interface will display the auto-switching punch state key, meanwhile supports manually switching punch state key. After timeout, the manually switching punch state key will become auto-switching punch state key.
- 5. Manual Fixed Mode:** After punch state key is manually switched, the punch state key will remain unchanged until being manually switched next time.
- 6. Fixed Mode:** Only the fixed punch state key will be shown and it cannot be switched.

Punch State Timeout (s): The timeout time of the display of punch state. The value ranges from 5~999 seconds.

Punch State Required: Whether it is necessary to choose attendance state in verification.

7.5 Shortcut Keys Settings

Shortcut keys can be defined as punch state keys or menu function key. When the device is on the main interface, pressing the set shortcut key will display the attendance state or enter the menu operation interface.

Shortcut Key Mappings	
Up Key	Check-In
Down Key	Check-Out
ESC Key	Undefined
M/OK Key	Undefined

Select the shortcut key to be defined and press **M/OK**.

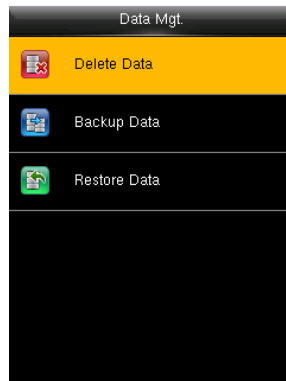
Up Key	
Punch State Value	0
Function	Punch State Options
Name	Check-In
Set Switch Time	

Set the state.

i When the state key is selected, automatic switching can be set. Automatic switching refers to that the device automatically switches the punch state when a preset time point is reached.

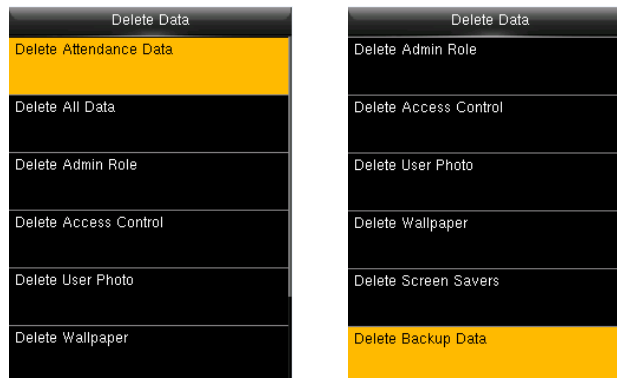
2. When the state key is selected, the device does not enable the state key if the prohibition mode is enabled in state key mode setting.

8 Data Mgt.



8.1 Deleting Data

To manage data in the device, which includes delete attendance data, delete all data, delete admin role and delete screen savers etc.



Delete Attendance Data: To delete all attendance data in the device.

Delete All Data: To delete all user information, fingerprints and attendance logs etc.

Delete Admin Role: To make all Administrators become Normal Users.

Delete Access Control: To delete all access data.

Delete User Photo: To delete all user photos in the device.

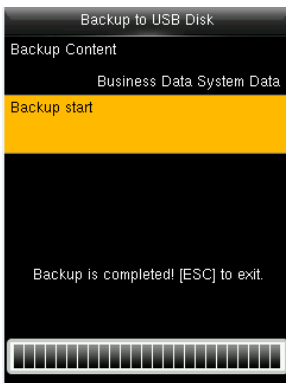
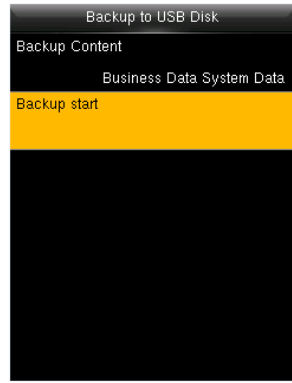
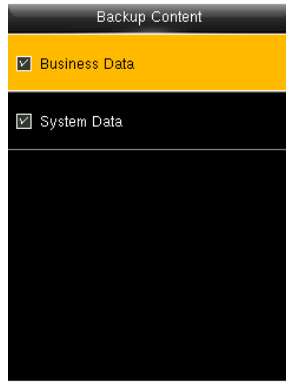
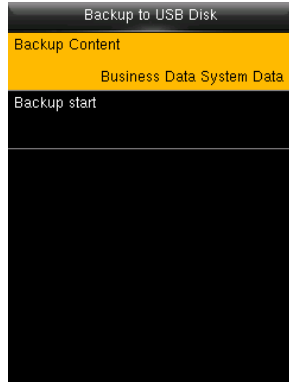
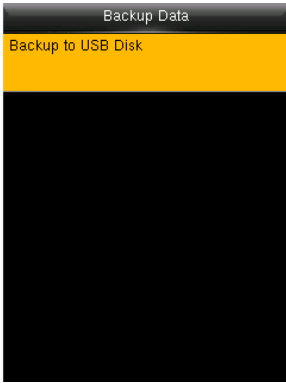
Delete Wallpaper: To delete all wallpapers in the device.

Delete Screen Savers: To delete all screen savers in the device. (For details of uploading screen savers, please refer to [Appendix 1 Image Uploading Rule](#))

Delete Backup Data: To delete all backup data.

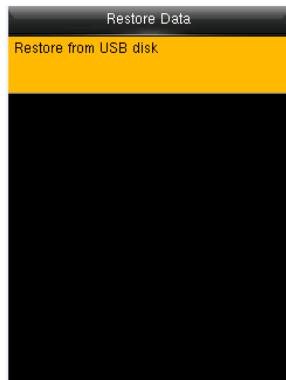
8.2 Data Backup

To backup the business data, or configuration data to the U disk.

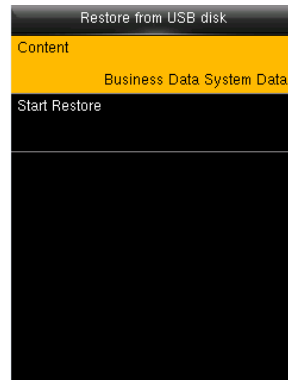


8.3 Data Restoration

To restore the data in the U disk to the device.



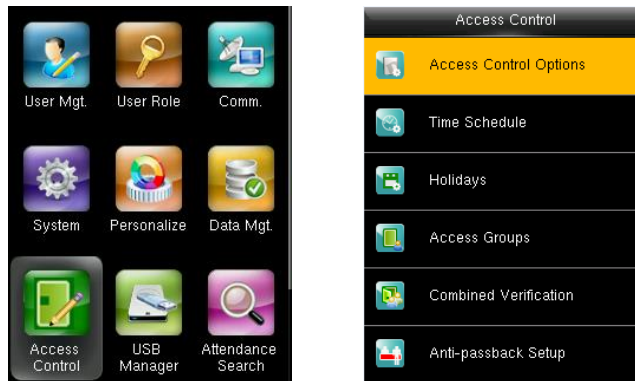
Select the restoration mode.



Select the content to be restored and then start restoration.

9 Access Control

Access Control is used to set the user access time period and the parameters of the control lock and related device.



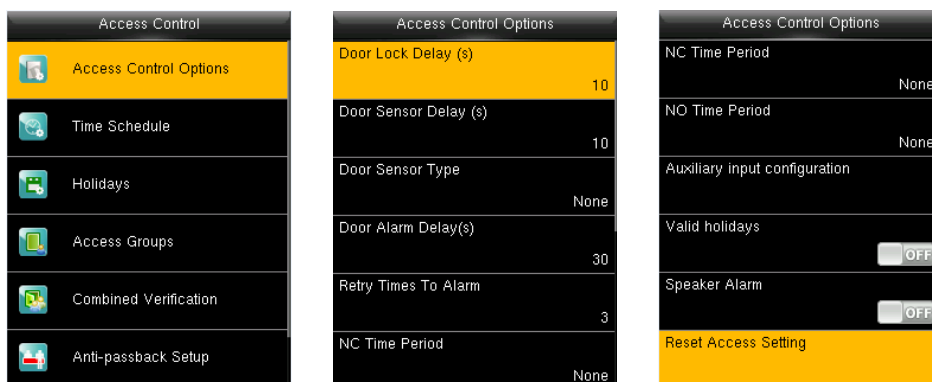
To gain access, the registered user must meet the following conditions:

1. User's access time falls within either user's personal time zone or group time zone.
2. User's group must be in the access combo (when there are other groups in the same access combo, verification of members of those groups are also required to unlock the door).

In default settings, new users are allocated into the first group with the default group time zone and access combo as "1", and set in unlocking state.

9.1 Access Control Options Settings

Set the parameters of device control lock and related device.



Door Lock Delay (s): The period of time of unlocking (from door opening to closing automatically) after the electronic lock receives an open signal sent from the device (value ranges from 0 to 10 seconds).

Door Sensor Delay (s): When the door is opened, the door sensor will be checked after a time period; if the state of the door sensor is inconsistent with that of the door sensor mode, alarm will be triggered. The time period is the **Door Sensor Delay** (value ranges from 0 to 255 seconds).

Door Sensor Type: It includes **No**, **Normally Open** and **Normally Closed**. **No** means door sensor is not in use;

Normally Open means the door is opened when electricity is on; **Normally Closed** means the door is closed when electricity is on.

Door Alarm Delay (s): When the state of the door sensor is inconsistent with that of the door sensor type, alarm will be triggered after a time period; this time period is the **Door Alarm Delay** (the value ranges from 1 to 999 seconds).

Retry Times To Alarm: When the number of failed verification reaches the set value (value ranges from 0 to 9 times), the alarm will be triggered. If the set value is 0, the alarm will not be triggered after failed verification.

NC Time Period: To set time period for Normally Closed mode, so that no one can gain access during this period.

NO Time Period: To set time period for Normally Open, so that the door is always unlocked during this period.


Auxiliary Input Configuration: To set the **Aux output/lock open time** and **Aux Output type** for the device with auxiliary connector. **Aux Output type** includes **None**, **trigger door open**, **trigger Alarm**, and **trigger Door open and Alarm**.

Verify Mode by RS485: To turn on RS485 reader function; it is the verification method used by the device when it is the master/slave device.

Valid holidays: To set if **NC Time Period** or **NO Time Period** settings are valid in set holiday time period. Choose **[ON]** to enable the set **NC** or **NO** time period in holiday.

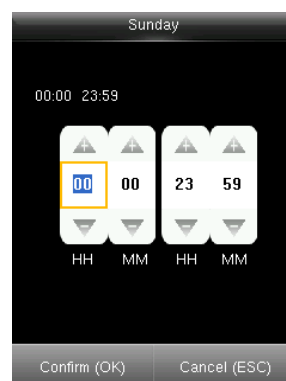
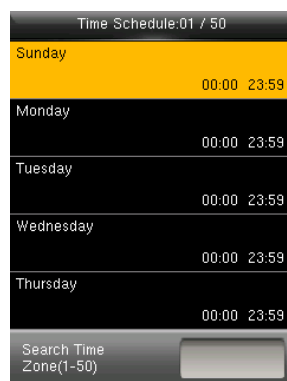
Speaker Alarm: When the **[Speaker Alarm]** is enabled, the speaker will raise an alarm when the device is being dismantled.

Reset Access Setting: To reset parameters of door lock delay, door sensor delay, door sensor type, door alarm delay, retry times to alarm, NC time period, NO time period, auxiliary input configuration, normally open / close for holidays, speaker alarm, anti-passback direction, device status, duress function, alarm on 1:1 match, alarm on 1: N match, alarm on password and alarm delay. However, the content of the Access Data Deletion in **[Data Mgt.]** will not be affected.

 **Remarks:** After setting **NC Time Period**, please lock the door well, otherwise alarm might be triggered during **NC Time Period**.

9.2 Time Schedule Settings

Each user is allowed to set a maximum of three time periods, which are in OR relationship. The time is valid as long as the time during verification meets one of the periods. The format of each time interval in a time period is HH:MM-HH:MM, that is, with the accuracy of minute in 24-hour system.





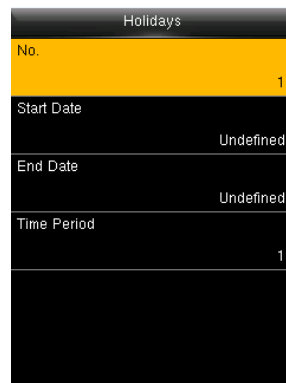
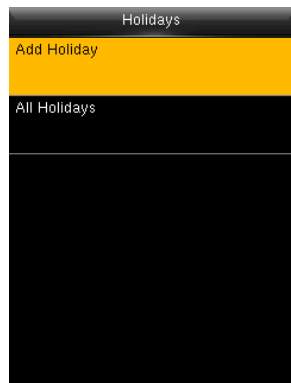
When the end time is earlier than the start time (for example, 23:57-23:56), this means closing all day long. When the end time is later than the start time (for example, 00:00-23:59), this means that this interval is valid.

Valid Time Schedule: 00:00 ~ 23:59 (Whole-day valid) or when the end time is greater than the start time.

Note: By default, the number one time period of the system means opening all day long (that is, unlocking for newly enrolled users).

The concept of holiday and festival is introduced into access control. On holidays or festivals, special access control time may be required, but changing everyone's access control time is very tedious. Therefore, the access control time on holidays and festivals, which applies to all staff, can be set.

If the access control time on holidays and festivals is set, the opening period of time on holidays and festivals subjects to the time period set here.



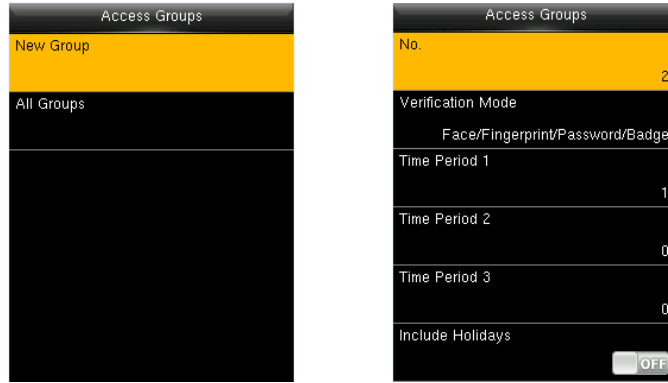
9.4 Access Groups Settings

Grouping is to manage users in groups.

Group users' default time zone is set to be the group time zone, while users can set their personal time zone. When the group verification mode overlaps the user verification mode, the user verification modes prevails. Each group can set 3 time zones at most, as long as one of them is valid, the group can be verified successfully. By default, the newly enrolled user belongs to Access Group 1, and can also be allocated to other access group.

Operation instructions:

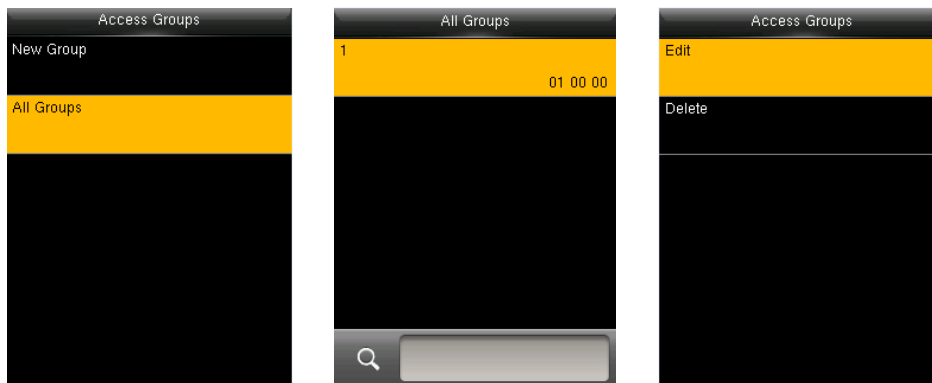
- Adding a group time period



A total of 21 verification modes are supported: face/fingerprint/password/badge, only fingerprint, only user ID, password, only badge, fingerprint/password, fingerprint/badge, password/badge, user ID&fingerprint, fingerprint&password, password&badge, fingerprint&password&badge, password&badge, user ID&fingerprint&password, fingerprint&badge&user ID, only face, face&fingerprint, face&password, face&badge, face&fingerprint&badge, and face&fingerprint&password.

Period of time on holidays and festivals: 1. When the holiday or festival is set to be valid, the personnel in the group can open the door only when group time period overlaps holiday and festival time period.
2. When the holiday or festival is set to be invalid, the access control time of the personnel in this group is not affected by holidays or festivals.

- Editing and deleting a group time period



During editing, the number is not allowed to be modified, and other operations are similar to those of adding an access control group. Press **ESC** to quit.

To delete a group time period, select the access control group to be deleted and delete it.

9.5 Combined Verification Settings

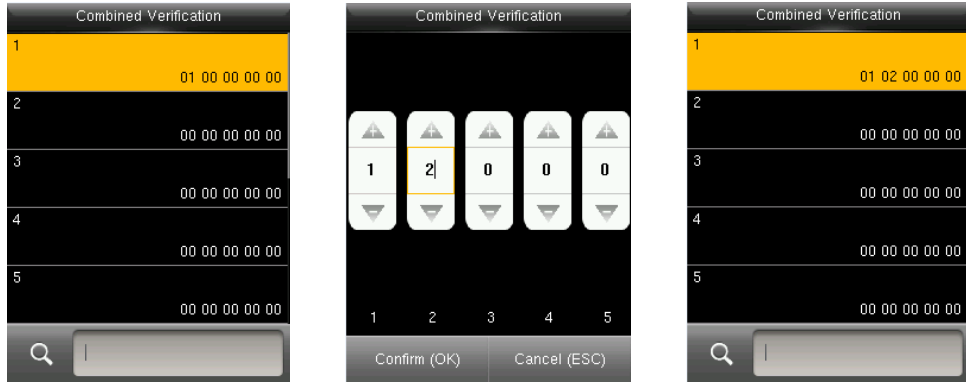
Combine two or more members to achieve multi-verification and improve security.

In a Combined Verification, the range of user number is: $0 \leq N \leq 5$; the users can all belong to a single group, or belong to 5 different groups at most.

Operation instructions:

Adding a unlocking combination

For example, the following figures show how to add a combination which can be unlocked only when both group 1 and 2 succeed in verification:



2) Editing and deleting a unlocking combination

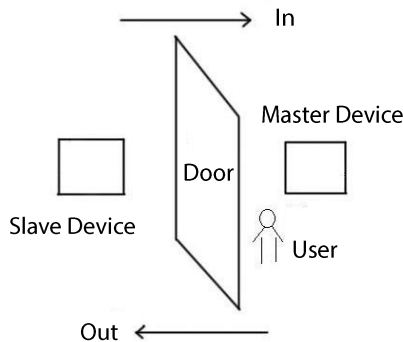
For editing, directly enter to modify the combined group, similar to the operation of adding a unlocking combination.

To delete a Combined Verification, set all access group numbers to 0.

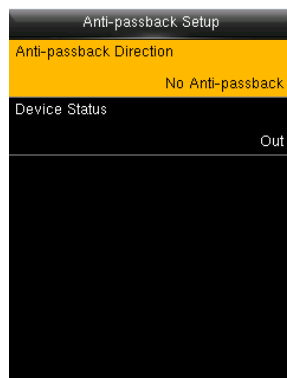
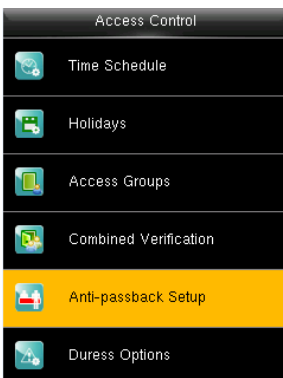
9.6 Anti-Passback Settings*

To avoid some persons following users to enter the door without verification, resulting in security problem, users can enable anti-passback function. The check-in record must match with check- out record so as to open the door.

This function requires two devices to work together: one is installed inside the door (master device), the other one is installed outside the door (slave device). The two devices communicate via Wiegand signal. The Wiegand format and Output type (User ID / Badge Number) adopted by the master device and slave device must be consistent.



Operation instructions



Press ▼ to select **Anti-Passback Setup**. Press **OK** to enter the **Anti-Passback Setup** interface.

● **Anti-Passback Direction**

No Anti-Passback: Anti-Passback function is disabled, which means passing verification of either master device or slave device can unlock the door. Attendance state is not reserved.

Out Anti-Passback: After a user checks out, only if the last record is a check-in record can the user check out again; otherwise, the alarm will be triggered. However, the user can check in freely.

In Anti-Passback: After a user checks in, only if the last record is a check-out record can the user check in again; otherwise, the alarm will be triggered. However, the user can check out freely.

In/Out Anti-Passback: After a user checks in/out, only if the last record is a check-out record can the user check in again, or a check-in record can the user check out again; otherwise, the alarm will be triggered.

Null and Save: Anti-Passback function is disabled, but attendance state is reserved.

● **Device Status**

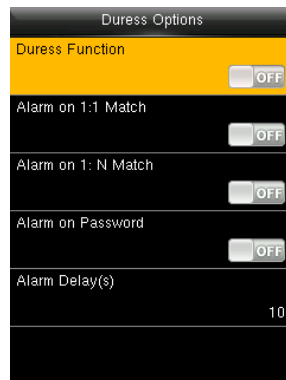
None: To disable the Anti-Passback function.

Out: All records on the device are check-out records.

In: All records on the device are check-in records

9.7 Duress Options Settings

When users come across duress, select duress alarm mode, the device will then open the door as usual and send the alarm signal to the backstage alarm.



Duress Function: In **[ON]** state, press "Duress Key" and then press any registered fingerprint or ID Number (within 10 seconds), duress alarm will be triggered after successful verification. In **[OFF]** state, pressing "Duress Key" will not trigger the alarm.

Alarm on 1:1 Match: In **[ON]** state, when a user uses 1:1 Verification Method to verify any registered fingerprint, alarm will be triggered. In **[OFF]** state, no alarm signal will be triggered.

Alarm on 1: N Match: In **[ON]** state, when a user uses 1:N Verification Method to verify any registered fingerprint, alarm will be triggered. In **[OFF]** state, no alarm signal will be triggered.

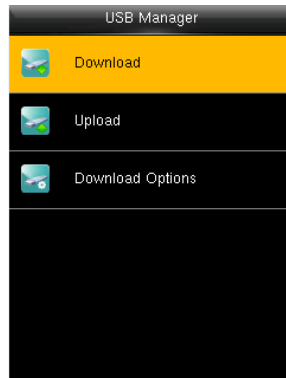
Alarm on Password: In **[ON]** state, when a user uses password verification method, alarm will be triggered. In **[OFF]** state, no alarm signal will be triggered.

Alarm Delay (s): When duress alarm is triggered, the device will send out alarm signal after 10 seconds (default); the alarm delay time can be changed (value ranges from 0 to 999 seconds).

12 USB Manager*

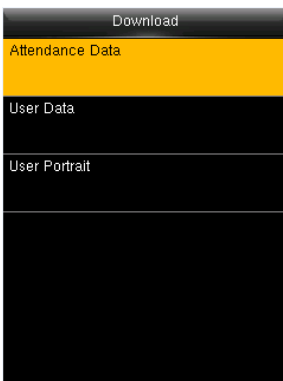
The user information, fingerprint template and attendance data in the device can be imported into related software for processing, or the user information and fingerprints can be imported into other fingerprint devices through a USB disk.

Before uploading/downloading data from/to the USB disk, insert the USB disk into the USB slot first.



Select **USB Manager** in the main menu.

12.1 USB Download

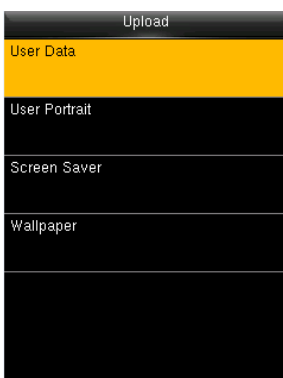


Attendance Data: To download attendance data in specified time period into USB disk.

User Data: To download all user information and fingerprints from the device into USB disk.

User Portrait: To download all user photos from the device into a USB disk.

12.2 USB Upload



User Data: To upload all the user information and fingerprints from USB disk into the device.

User Portrait: Upload a .JPG picture file named the user ID in a USB disk to the device, and the user portrait in the USB disk will be displayed on the device for preview. During uploading, you can choose **Upload selected picture** or **Upload all pictures**. After uploading, the portrait is displayed when the device is verifying an employee's fingerprint.

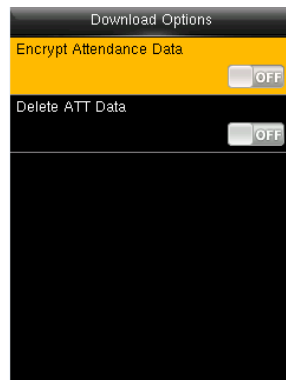
Screen Saver: To upload all screen savers from USB disk into the device. You can

choose **[Upload selected picture]** or **[Upload all pictures]**. The images will be displayed on the device's main interface after upload

Wallpaper: To upload all wallpapers from USB disk into the device. You can choose **[Upload selected picture]** or **[Upload all pictures]**. The images will be displayed on the screen after upload

12.3 Download Options Settings

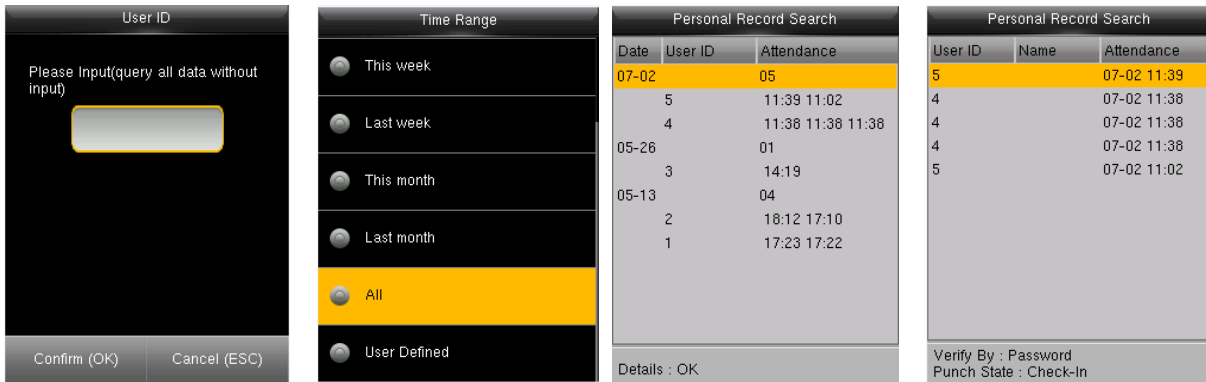
To encrypt attendance data in the USB disk or delete attendance data.



13 Attendance Search

After an employee successfully checks in and out, the record will be saved in the device. The attendance search allows employees to query employee attendance records.

Searching Attendance Record



Enter the user ID of an employee whose attendance records need to be queried. If no user ID is entered, the attendance records of all employees are queried.

Select the time period for query.

Press ▼ to select a attendance record and press **M/OK**.

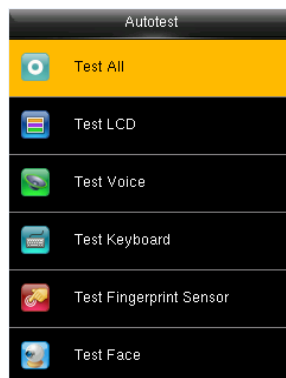
Record details

User ID: user ID of an employee whose attendance records need to be queried. If no user ID is entered, the attendance records of all employees are queried. After a user ID is entered, attendance records of the employee with the user ID are queried.

Time Range: Select the time period for query, including user defined, yesterday, this week, last week, this month, last month and all time periods.

14 Autotest

To automatically test whether all modules in the device function properly, which include the LCD, voice, keyboard, fingerprint sensor and RTC (Real-Time Clock).



Test All: To test LCD, voice, keyboard, fingerprint sensor and RTC. During the test, press **[M/OK]** to continue to the next test, while press **[ESC]** to exit the test.

Test LCD: To test the display effect of LCD screen by displaying full color, pure white, and pure black to check whether the screen displays colors properly. During the test, press **[M/OK]** to continue to the next test, while press **[ESC]** to exit the test.

Test Voice: The device automatically tests whether the voice files stored in the device are complete and the voice quality is good. During the test, press **[M/OK]** to continue to the next test, while press **[ESC]** to exit the test.

Test Keyboard: To test all keys to see if every key functions properly. Press any key in the **Keyboard** testing interface; if the pressed key is consistent with the key sign shown on the screen, then the key functions properly. Press **[M/OK]** or **[ESC]** to exit the test.

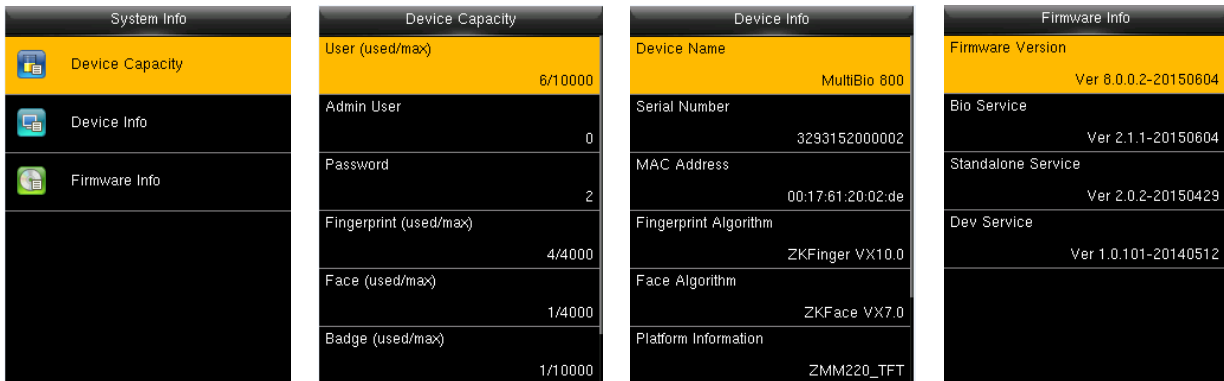
Test Fingerprint Sensor: To test the fingerprint sensor by pressing fingerprint to check if the collected fingerprint image is clear. When pressing fingerprint on the sensor, the image will be displayed on the screen. Press **[M/OK]** or **[ESC]** to exit the test.

Test Face: The device automatically tests whether the camera is in proper operation and checks whether the captured images are clear and usable. Press **ESC** to quit this test.

Test Clock RTC: To test the Real-Time Clock. The device tests whether the clock works properly and accurately by checking the stopwatch. Press **[M/OK]** to start counting time, and press it again to stop counting, to see if the stopwatch counts time accurately. Press **[ESC]** to exit the test.

15 System Information

Check data capacity, device and firmware information.



Select "System Information" in the main menu.

Data capacity information

Device information

Firmware information

Device Capacity: To display the number of registered users, administrators, passwords, fingerprints, badges, attendance logs and so on.


Device Info: To display the device name, serial number, MAC address, fingerprint algorithm, platform information, manufacturer and manufacturer date.

Firmware Info: To display the firmware version, Bio service, push service, standalone service and Dev service.

16 Appendices

Appendix 1 Image Uploading Rule

- **User photo:** It is required to create a file named as "**photo**" er the USB disk file, and put user photos into the file. The capacity is 8000 images, with each of them not exceeding 15k. The image name is x.jpg (x is the actual user ID, max. 9 digits). The photo format must be JPG.
- **Advertising image:** It is required to create a file named as "**advertise**" under the USB disk file, and put advertising images into the file. The capacity is 20 images with each of them not exceeding 30k. Image name and format are not restricted.
- **Wallpaper:** It is required to create a file named as "**wallpaper**" under the USB disk file, and put wallpapers into the file. The capacity is 20 images with each of them not exceeding 30k. Image name and format are not restricted.

 **Note:** When each user photo and attendance photo does not exceed 10k, the device can save a total number of 10000 user and attendance photos.

Appendix 2 Wiegand Introduction

Wiegand26 Protocol is a standard protocol on access control developed by the Access Control Standard Subcommittee affiliated to the Security Industry Association (SIA). It is a protocol used for contactless IC card reader port and output.

The protocol defines the port between the card reader and controller which are widely used in access control, security and other related industries. This has standardized the work of card reader designers and controller manufacturers. The access control devices produced by our company also apply this protocol.

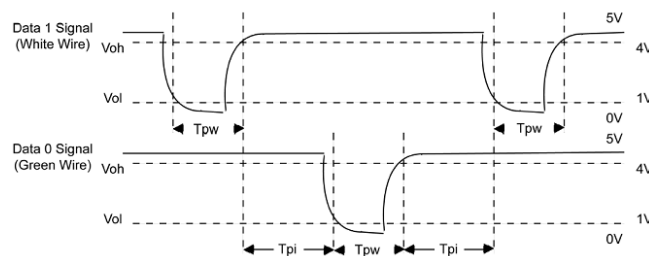
Digital Signal

Figure 1 shows the sequence diagram of the card reader sending digital signal in bits to the access controller. The Wiegand in this diagram follows the SIA access control standard protocol, which targets at 26-bit Wiegand card reader (with a pulse time within $20 \mu s$ to $100 \mu s$ and pulse hopping time within $200 \mu s$ and $20 ms$). Data1 and Data0 signals are high level (greater than V_{oh}) until the card reader is ready to send a data stream. The card reader send out asynchronous low level pulse (less than v_{ol}), transmitting data stream via Data1 or Data0 wire to access control box (as the sawtooth wave in figure 1). Data1 and Data0 pulses do not overlap or synchronize. Figure 1 shows the maximum and minimum pulse width (successive pulses) and pulse hopping time (the time between two pulses) allowed by the F series fingerprint access control terminals.

Table1: Pulse Time

Sign	Definition	Card Reader Typical Value
Tpw	Pulse Width	100 μs
Tpi	Pulse Interval	1 ms

Figure1: Sequence Diagram



Appendix 3 Statement on Human Rights and Privacy

Dear Customers:

Thank you for choosing the hybrid biometric products designed and manufactured by us. As a world-renowned provider of biometric technologies and services, we pay much attention to the compliance with the laws related to human rights and privacy in every country while constantly performing research and development.

We hereby make the following statements:

1. All of our fingerprint recognition devices for civil use only collect the characteristic points of fingerprints instead of the fingerprint images, and therefore no privacy issues are involved.
2. The characteristic points of fingerprints collected by our products cannot be used to restore the original fingerprint images, and therefore no privacy issues are involved.
3. We, as the equipment provider, shall not be held legally accountable, directly or indirectly, for any consequences arising due to the use of our products.
4. For any dispute involving the human rights or privacy when using our products, please contact your employer directly.

Our fingerprint products for police use, or development tools support the collection of the original fingerprint images. As for whether such a type of fingerprint collection constitutes an infringement of your privacy, please contact the government or the final equipment provider. We, as the original equipment manufacturer, shall not be held legally accountable for any infringement arising thereof.

The law of the People's Republic of China has the following regulations regarding the personal freedom:

1. Unlawful arrest, detention or search of citizens of the People's Republic of China is prohibited; infringement of individual privacy is prohibited.
2. The personal dignity of citizens of the People's Republic of China is inviolable.
3. The home of citizens of the People's Republic of China is inviolable.
4. The freedom and privacy of correspondence of citizens of the People's Republic of China are protected by law.

At last we stress once again that biometrics, as an advanced recognition technology, will be applied in a lot of sectors including e-commerce, banking, insurance and legal affairs. Every year people around the globe suffer from great loss due to the insecurity of passwords. The biometric products actually provide adequate protection for your identity under a high security environment.

Appendix 4 Environment-Friendly Use Description



- The Environment Friendly Use Period (EFUP) marked on this product refers to the safety period of time in which the product is used under the conditions specified in the product instructions without leakage of noxious and harmful substances.
- The EFUP of this product does not cover the consumable parts that need to be replaced on a regular basis such as batteries and so on. The EFUP of batteries is 5 years.

Names and Concentration of Toxic and Hazardous Substances or Elements

Parts Name	Toxic and Hazardous Substances or Elements					
	Pb	Hg	Cd	Cr6+	PBB	PBDE
Chip resistor	×	○	○	○	○	○
Chip capacitor	×	○	○	○	○	○
Chip inductor	×	○	○	○	○	○
Chip diode	×	○	○	○	○	○
ESD components	×	○	○	○	○	○
Buzzer	×	○	○	○	○	○
Adapter	×	○	○	○	○	○
Screws	○	○	○	×	○	○

○: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

×: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006.

Note: 80% of the parts in this product are manufactured with non-hazardous environment-friendly materials. The hazardous substances or elements contained cannot be replaced with environment-friendly materials at present due to technical or economical constraints.