

EF-45N™

Next Generation Iris Recognition System

(Derivative Model : EF-45, UMX-10, UMX-20, UMX-G)

User Manual
(v0.1.1, July 1, 2016)



Intuitive face display positioning



Internal automatic motorized tilt cameras



LAN / RS485



Optional face image capture and face recognition

User graphics and screen shots in this guide may vary from actual
Some of the contents in this manual may differ from current operating library release

Introduction to the EF-45N™ Iris Recognition System

This new iris recognition system offers highly intuitive, hands-free iris biometrics imaging in a compact and elegantly designed identification and authentication terminal for use in a wide range of identity management applications.

The front facing nominal 5.0 inch LCD serves to display the user's face image for fast, easy and highly natural positioning for proper iris image capture. The subject merely puts his or her face in the center of the LCD, and then moves toward the system to size his or her head to the brackets in the display to be in proper range. Image capture is fast and automatic. While user instructions are very simple, almost all subjects will be able to interact with the system without any directions.



EF-45N™ Next Generation
Iris Recognition System

And the internal automatic tilt mechanism adjusts to the user's height or vertical position over a range of 50 cm (about 20 inches), making the EF-45N ideal for countertop, desktop, wall mount or kiosk installations.

The EF-45N is an embedded terminal, which means that all image processing and machine control is performed on the internal Linux-on-ARM mainboard. Typical connectivity to host systems is through TCP/IP (Ethernet). And iris biometric encoding and matching is typically performed on-board as well, so identification or authentication decisions are made locally for fast responsiveness. For access control, there are Wiegand connections for dedicated, local communications to door controllers or panels.

Other typical options include WiFi and a smart card reader.

For all specifications, please see Specification section.

For complete depiction of all EF-45N on-board screens, see "EF-45N LCD Control Screens and On-Board Demo Application" manual.

Key Features

- Iris user interface with intuitive LCD display face positioning, like smart phone “selfie”
- Contactless iris imaging at range of 35 to 45 cm stand-off
- Internal, automatic face and iris camera tilt mechanism with nominal height range of 50 cm
- Positioning guidance vocalizations selectable on / off and delay time. English standard, all other languages available with .wav file substitution
- Simultaneous dual iris recognition with typical capture speed of under 1 second
- On-board iris encoding and matching, with internal data base of up to 10,000 users in either 1:1 (authentication) or 1:N (identification) modes
- Optional Combined Face and Iris modes:
 - Face as primary modality, with face recognition rejects decisions automatically switch over to iris recognition
 - Supplemental face recognition in case of iris recognition failure-to-capture (FTC), so that face recognition follows iris recognition attempt
- Supports dual factor authentication with card or PIN
- Optimized imaging for difficult ambient lighting conditions
- Optimized image capture for most sunglasses, glasses, and facial veils
- Supports imaging of all iris colors
- Kensington lock slot standard
- Standard communications connectors and protocols for TCP/IP (Ethernet RJ-45), RS-484 and - 232, dual Wiegand I/O, TTL, and dry contact relay
- Connection cables with press-in connectors included in accessories kit
- External audio connector
- Tamper switch on rear panel
- Access control (AC) configuration includes wall mount plate
- Optional WiFi support (choice of compact or antenna type modules)
- Integrated Smart Card reader (choice of basic MiFare / DesFire card or HID multi-class reader)
- Meets CE mark, FCC, IEC 62471 eye safety, and RoHS standards. Iris recognition meets ISO 19794-6 2011 standard
- Design and production meet ISO 9001 2015 standard

Cautions

FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Accessories Kit

Includes:	ID Management Version	Access Control and Time & Attendance Versions
Power supply (IEC C13 female)	Yes	Yes
Power cord (IEC C14 male), power side connector type by country	Yes	Yes
Basic MiFare / DesFire card reader (internal)	No	Yes
Standard back cover	Yes	No
Wall mount bracket	No	Yes
ID I/O cables with push in connectors for device, and pig tails for external connections	Yes	No
Includes cables for RS 485, RS 232, TTL (2), dry contact relay		
AC I/O cables with push in connectors for device, and pig tails for external connections	No	Yes
Includes cables for Wiegand (2), RS 485, RS 232, TTL (2), dry contact relay		
diode	Yes	Yes

Mounting Instructions



Recommended mounting height and UI (left), Capture Volume of EF-45N (right)

The recommended mounting height for the EF-45N is 144cm (57 inches) from floor to the bottom of EF-45N. The mounting height can be adjusted to accommodate the height of the average user.

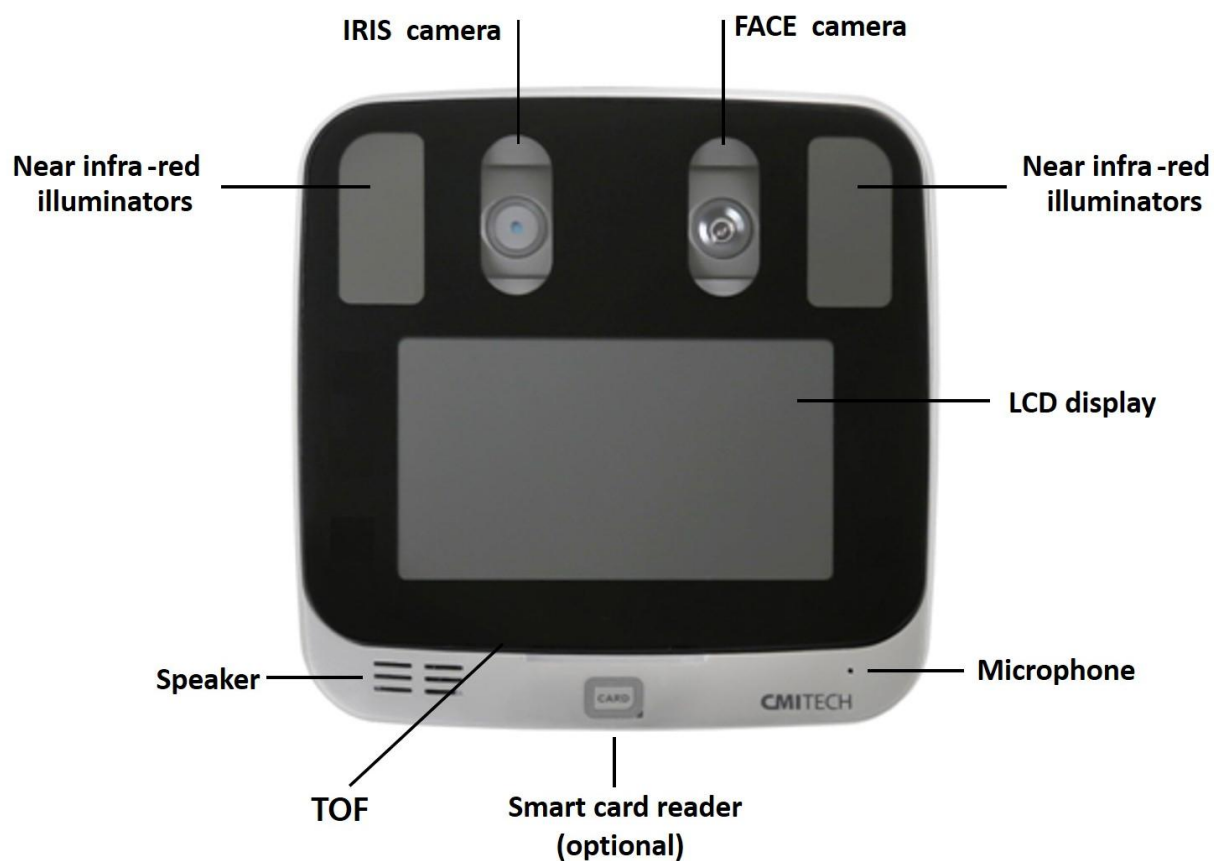
High ambient light and / or direct light into the EF-45N should be avoided. Sunlight, halogen lamps or other strong illumination may reduce the performance of the EF-45N and may result in increased failure-to-capture rates or failed authentication events.

The EF-45N was designed for indoor use only. This unit is not weatherproof and must not be exposed to water, ice, extreme temperatures or other adverse weather conditions. If it is required to use this unit in outdoor or extreme environments contact local sales or support@cmi-tech.com for more information.

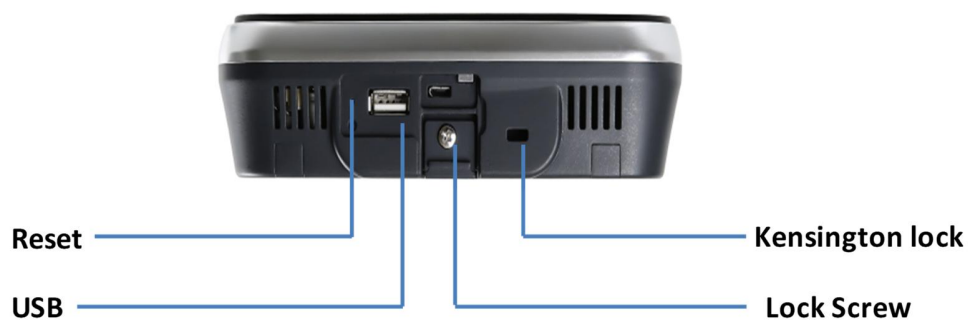
Note: Installation in extreme environments without proper protection may cause permanent damage and void warranty.

See System, Rear diagram for wall mounting instructions.

System, Front

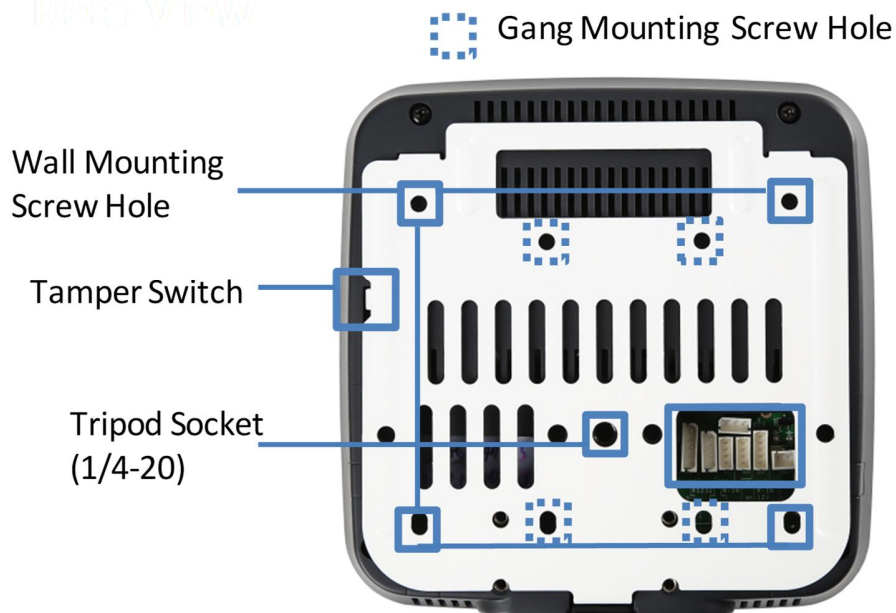


System, Bottom

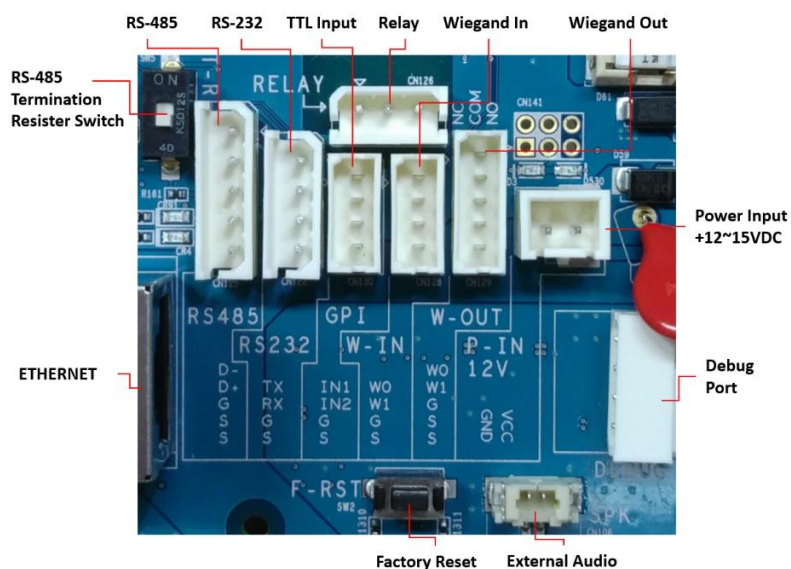


System, Rear

Rear View



System Rear Connections Block



User Interface for Iris Image Capture

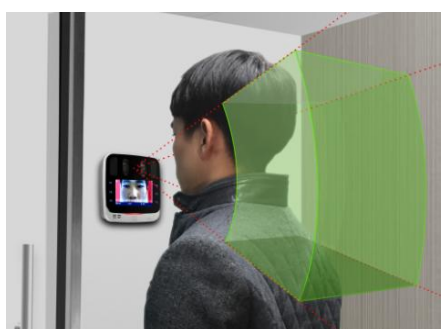
- Position yourself facing straight at the LCD display. When the device detects your movement within 1.0 meter parameter, it initiates the image capture sequence. A rectangular-shaped user guide box will appear on the screen. If it is BLUE, it means you are too far from the device. Move forward.



- Move towards the system to size your face to the LCD display. If the user guide box flashes GREEN, it means you are at an appropriate position. Stop and hold your position until the device captures image of your face and/or iris.



- If you are standing too close to the device, your face will not fit in the LCD display. When the user guide box flashes RED, it means the device cannot capture your image because you are too close. Move back until the box turns green.

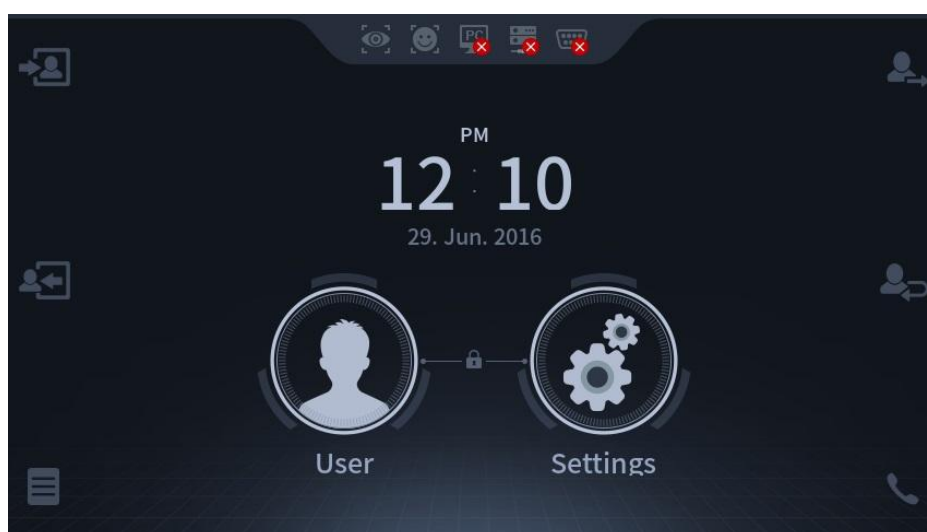


- EF-45N captures the image of your face and iris automatically.

On-board Demonstration Application

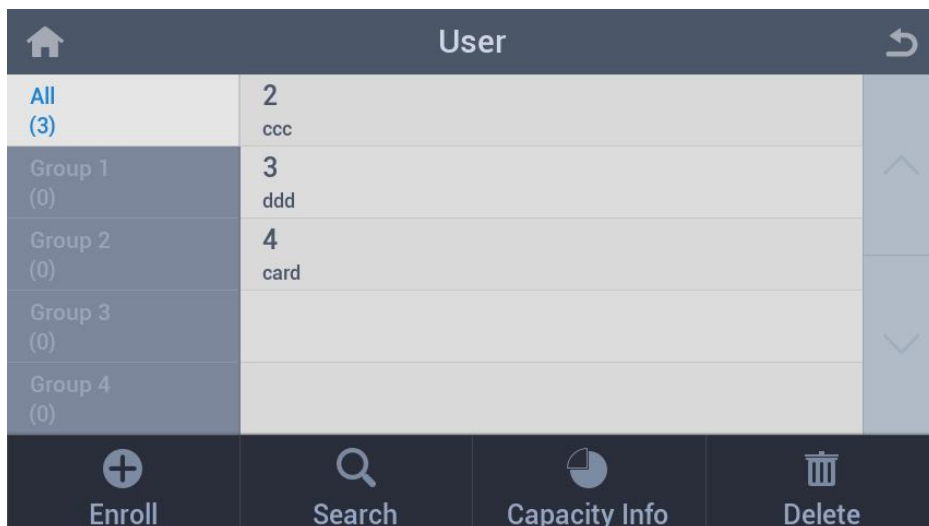
The on-board demonstration application shows the full capabilities of the EF-45N for image capture including subject positioning with the face display user interface, enrollment, and on-board matching (authentication).

The system boots up in this demo application. It is initiated by the video based motion detector that first finds the subject from about 1 meter distance, and then continues the natural iris image capture sequence for capture in recognition / authentication mode.



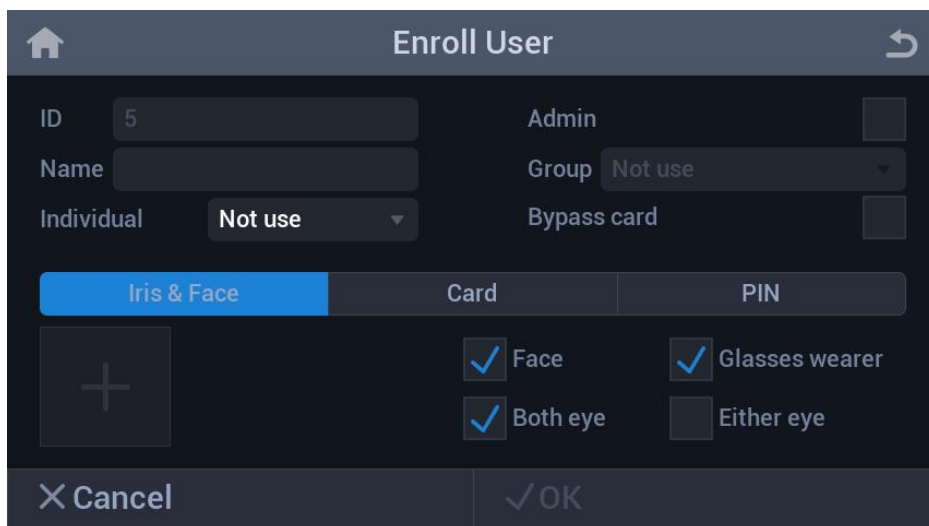
To switch to enrollment mode, press large User icon in center of main Launcher page. If the system is in image capture mode, press Home icon (🏠) on top left of active user interface display, which will stop Recognition mode and return system to Launcher page.

The following main User screen appears:



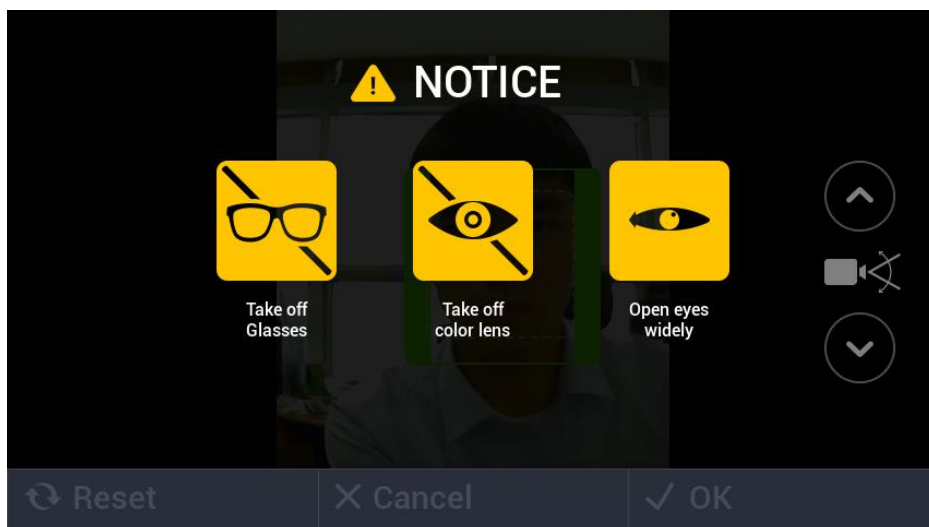
This user screen also allows simple database management. By tapping the **Delete** icon in the bottom right, one can easily delete information of enrolled users.

To enroll a new user, press the **Enroll** icon to bring up **Enroll User** screen.

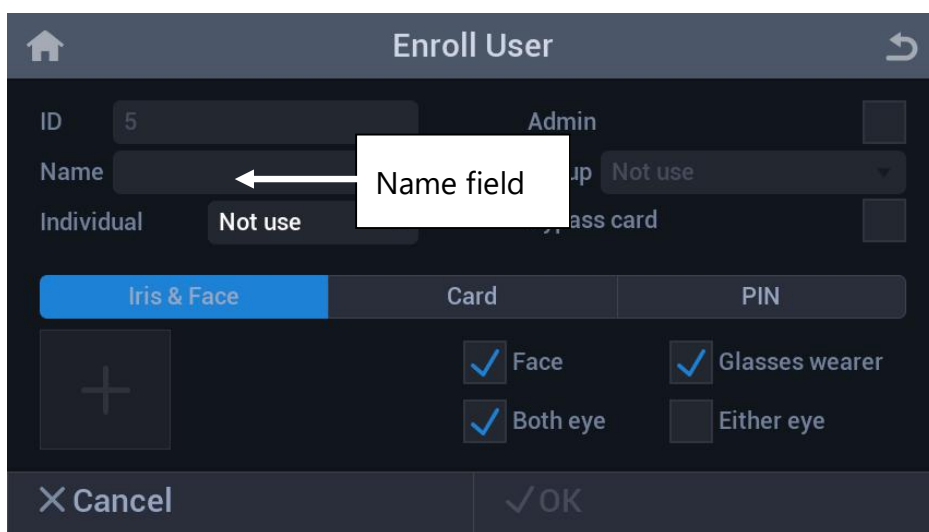


Press the plus(+) button in the bottom left to capture image of the new user.

An instruction screen will appear for 3 to 5 seconds, and then switch to the user interface.



After successfully capturing iris images, click on **✓OK** to accept images. The system then returns to Enroll User screen. Click on Name field to enter name of subject, then click on **✓OK** complete enrollment.



Press the Home icon (🏠) to return to the Launcher page to re-start Recognition and Authentication mode.

Summary of Specifications

Software and Platform Technical Specifications (Tentative)

Embedded CPU and OS	Freescall iMX6 Cortex A9 Quad Core ARM with Linux Yocto v1.8 OS
Iris on-board algorithm for encoding and matching	Optional
Face on-board algorithm for Combined Face and Iris encoding and matching	Optional
Web services configuration application (with embedded web server)	Yes, RESTful type SDK with C# and C++ versions for host side

Other Technical Specifications (Tentative)

Dimensions	166 x 166 x 43 mm(6.5 x 6.5 x 1.7 inches) without mounting wall plate
Weight	630 g without wall plate
On-board data size	Up to 10,000 iris template pairs, usable in either 1:1 (authentication) or 1:N (identification) modes Supports dual factor authentication
Iris image output	Meets new ISO 19794-6 2011 standard: MTF of minimum of 2 lp/mm @ $\geq 60\%$ contrast, and 160 pixels across 1.0 cm iris
Iris image pixel resolution	640 x 480 pixels, 8 bit depth. Supports multiple formats.
Iris encoding and matching algorithm	Delta ID (ISO 19794-6 compliant)
Operational iris imaging distance (stand-off range) and depth of field	35 to 45 cm range (10 cm depth of capture range) in both Enrollment and Recognition modes
Iris positioning indicators	Face positioning within box in LCD display for X – Y Face sizing to bracket (or box) within LCD display for distance (Z) positioning with simultaneous color bar display for correct distance positioning: Blue: too far away Green: OK Red: too close Supplemental voice distance feedback standard. Convertible to local language via .wav file substitution.

Other Technical Specifications (Tentative) (continued)

Auto tilt	Yes, internal: +25 deg to -20 deg tilt
Iris inter-pupillary distance covered	45 to 85 mm
Iris time of capture	Typically about 0.5 second from time subject's eyes are placed within proper capture volume
IR illumination for iris imaging	Dual LED: wavelengths of 850 nm nominal (about 50%); and 750 nm nominal (about 50%)
Iris maximum user positioning speed	125 mm per second (4.9 inches per sec.) in "Z" direction (distance from front of system)
Face image capture	Standard 24 bit color (for reference image)
Face recognition imaging	Optional on-board encoding and matching. Algorithm tbd.
Audio	24 bit, 1.8 W embedded speaker Line out connector for external speaker
Operating temperature range	0 to 45°C
Humidity	10 to 90% RH, non-condensing
Illuminator eye safety standard	IEC 62471
Network interface	10/100 Base-T Ethernet (RJ45 connector)
Other standard ports	USB host or slave (for service only)
Standard mounting	¼ - 20 UNC (camera tripod).
Physical Access Control (PACS) configuration: other communications ports	Terminal and wired connectors for: Wiegand in/out, RS-232, RS-485, 2X TTL inputs, USB host (internal), USB slave (for service), 1 dry contact relay
Physical Access Control configuration: internal ID card reader	Standard: ISO /IEC 14443 A/B (MiFare) contactless reader Optional: HID multi-class reader (model to be determined)
Physical Access Control configuration: wall mounting with tamper switch	Detachable wall mount plate for easy installation. Tamper switch standard in PACS configuration
Power supply	Input 110 to 240V AC Output 15V DC, 3.5A. Provided standard with system.

Contact Information

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Appendix 1

EF-45N LCD Control Screens and On-Board Demo Application



Main Launcher Page

- | | |
|---|---|
| ① Check Attendance (F1 Key) | ⑧ Notice Icon of Face mode is operating |
| ② Leave Work (F2 Key) | ⑨ Notice Icon of CMID manager is connected |
| ③ Supplement T&A (F3 Key) | ⑩ Notice Icon of IP network is connected |
| ④ Go Out (F4 Key) | ⑪ Notice Icon of Serial Communication is connected |
| ⑤ Return Button (same as F5 Key) | ⑫ Clock display |
| ⑥ Interphone Call Button (same as F6 Key) | ⑬ User Button for registration, search, modification and deletion |
| ⑦ Notice Icon of Iris mode is operating | ⑭ Settings Button for system configuration |

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4 Authentication

- 4.1 Auth.
 - 4.1.1 Combination Mode (Step 1)
- 4.2 T&A
- 4.3 T&A Mode

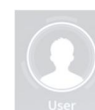
5 Mode

- 5.1 Operation
 - 5.1.1 Dual Authentication
 - 5.1.2 Match Timeout
 - 5.1.3 Card Mode

6 Log

- 6.1 Log Info

User



1 Enroll User

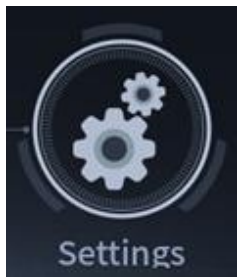
- 1.1 Name
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2 Search

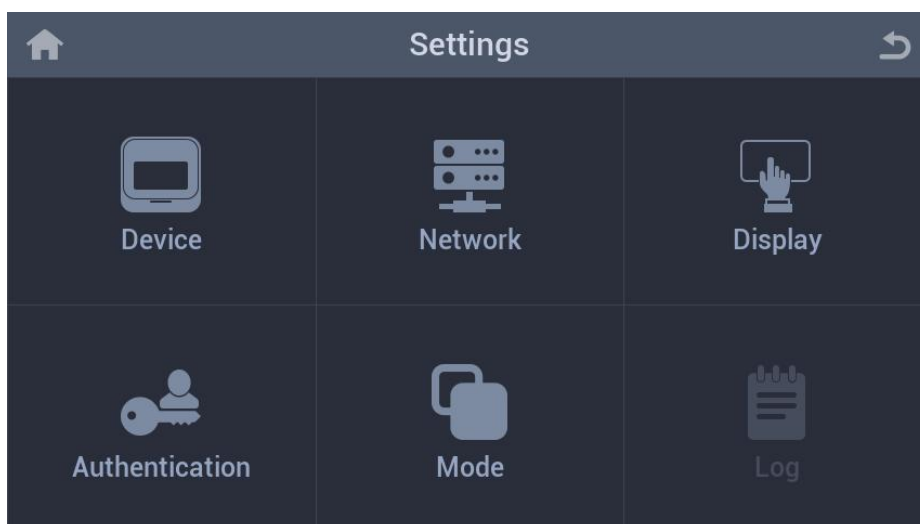
3 Capacity Info

4 Delete

Settings

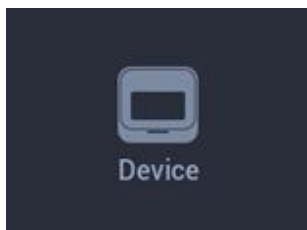


Tap the **Settings** icon in the home screen.



Device	Configuration for device operating
Network	Configuration for IP & serial communication
Display	Configuration for screen display
Authentication	Configuration for authentication method and T&A
Mode	Configuration for recognition operation
Log	Information of saved log and log search viewer (Note: In construction)

1 Device



Configure settings for device operation.

1.1 Configuration

Device		
Configuration	User Positioning Interface	Box >
Bio	Motion wait time	2 >
Sound	Motion detect	☐
Date & Time	Debug	☐
Door		

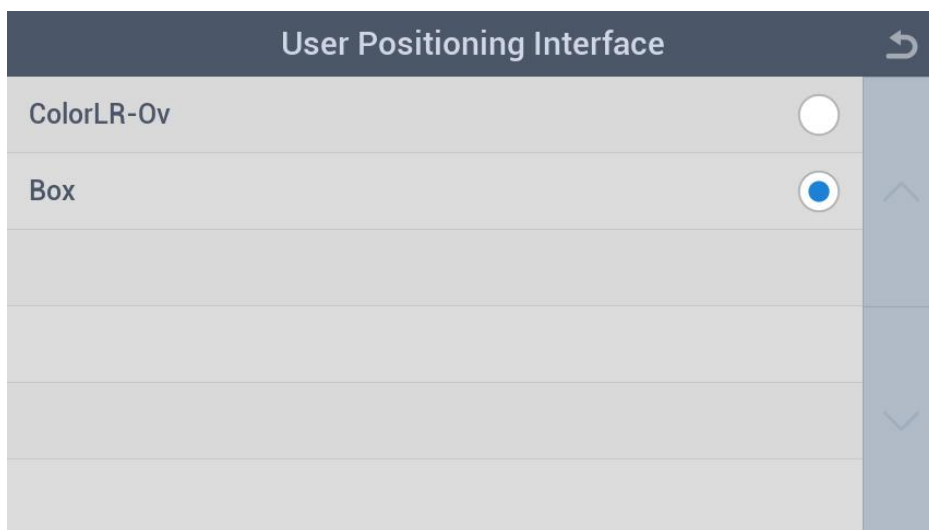
User Positioning Interface Select a guide display UI when enrollment and recognition

Motion wait time Set motion detection delay time from last recognition operating

Motion detect Select motion detection enable/disable for starting recognition

Debug Select Debug mode enable/disable (captures image stream for off-line analysis)

1.1.1 Configuration → User Positioning Interface

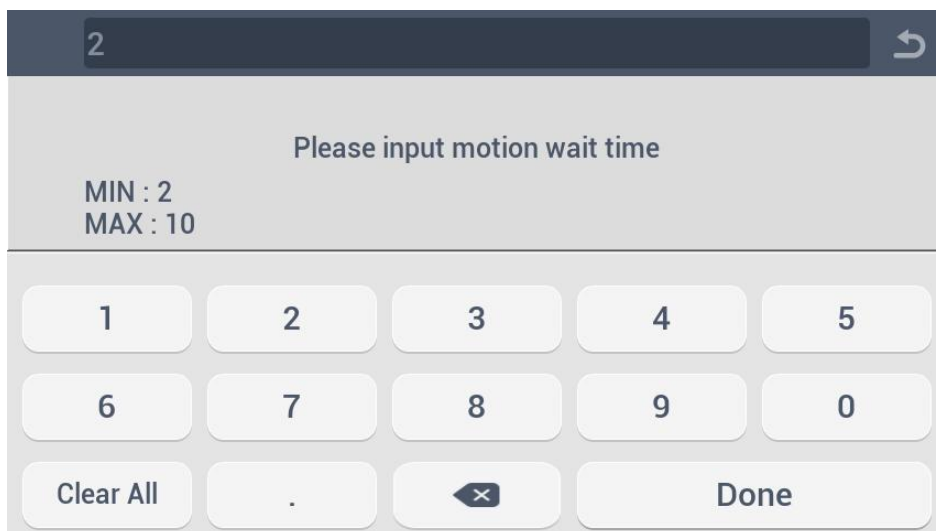


The screenshot shows a mobile application interface titled "User Positioning Interface". It features a list of two options: "ColorLR-Ov" and "Box". Each option has a radio button to its right. The "Box" option's radio button is selected, indicated by a blue dot. To the right of the list is a vertical scrollbar with up and down arrow icons.

ColorLR-Ov Select Color overlay type guide UI display

Box Select tracking box type guide UI display

1.1.2 Configuration → Motion Wait Time



The screenshot shows a mobile application interface for inputting motion wait time. At the top, a dark header bar contains the number "2" and a back arrow icon. Below the header, the text "Please input motion wait time" is displayed. Underneath, the minimum and maximum values are shown: "MIN : 2" and "MAX : 10". The main area contains a numeric keypad with buttons for digits 1 through 0. At the bottom, there are four buttons: "Clear All", a decimal point ".", a backspace icon (arrow pointing left with an 'x'), and "Done".

1.2 Bio



Security Level

Select a combination mode of Face and Iris

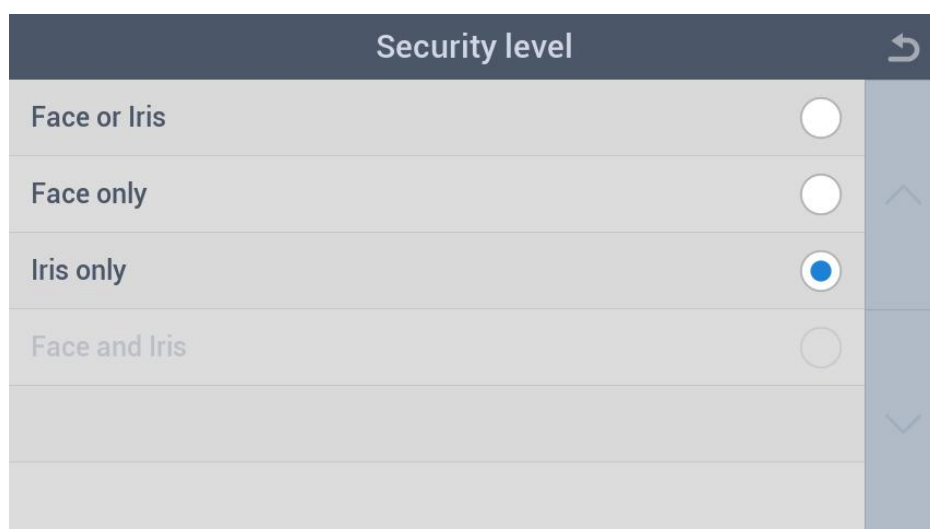
Iris

Additional configuration for Iris enrollment and recognition

Face

Additional configuration for Face enrollment and recognition (note: in construction)

1.2.1 Bio → Security Level (Must have face recognition option)



Face or Iris	Select 2 stage Face or Iris recognition mode (Face recognition first, and then automatic switch-over to Iris upon Face recognition non-match)
Face only	Select Face only recognition mode
Iris only	Select Iris only recognition mode
Face and Iris	Select 2 stage Face and Iris recognition mode (Face recognition first, and then automatic switch-over to Iris upon multiple matches) (note: in construction)

1.2.2 Bio → Iris



Iris	
Recognition sensitivity	50 >
Enroll sensitivity	50 >
Min distance	35 >
Max distance	45 >
Recognition either eye	☒
Enroll either eye	☒

Max distance	Set max distance for Iris recognition
Recognition either eye	Select enable/disable for either eye recognition mode
Enroll either eye	Select enable/disable for either eye enrollment mode

1.2.2.1 Bio → Iris → Max Distance

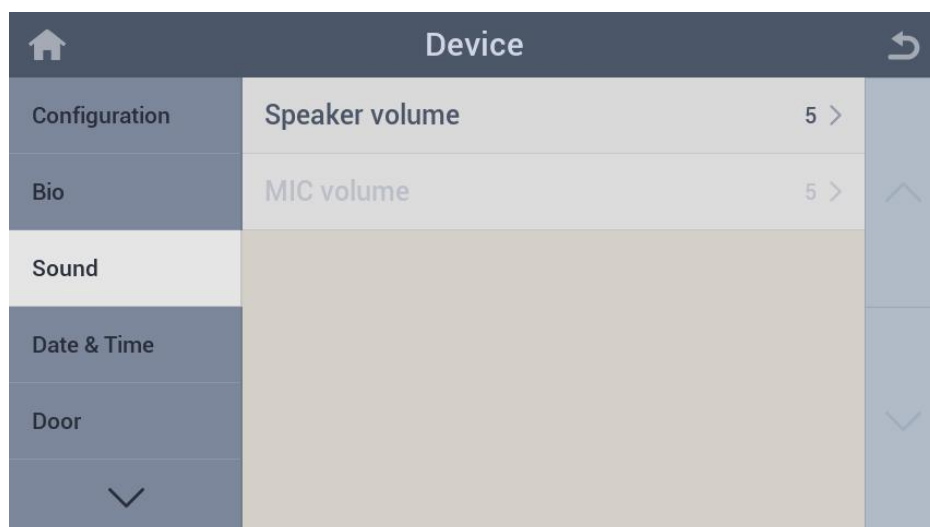
45

Please input maximum distance

MIN : 40
MAX : 49

1	2	3	4	5
6	7	8	9	0
Clear All	.	⌫	Done	

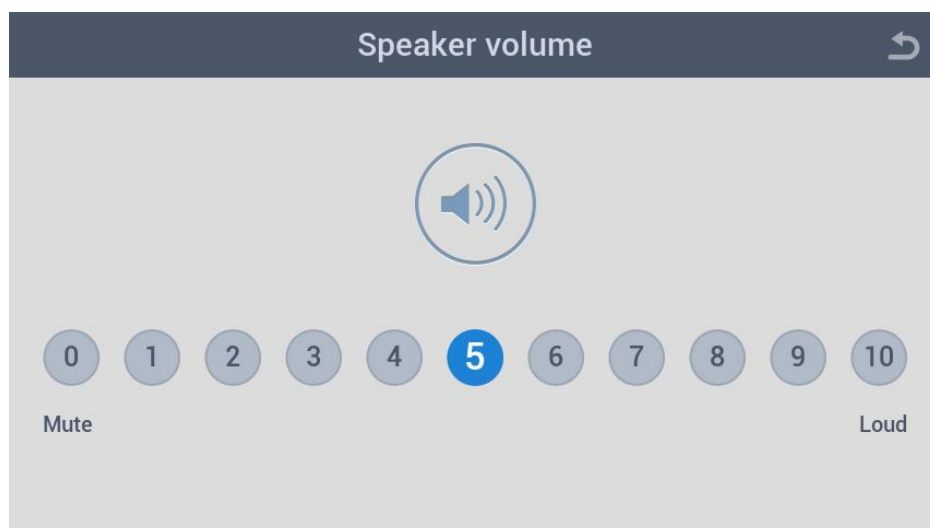
1.3 Sound



Speaker volume Set speaker volume for instruction sound and interphone voice

MIC volume Set microphone volume for interphone voice (note: in construction)

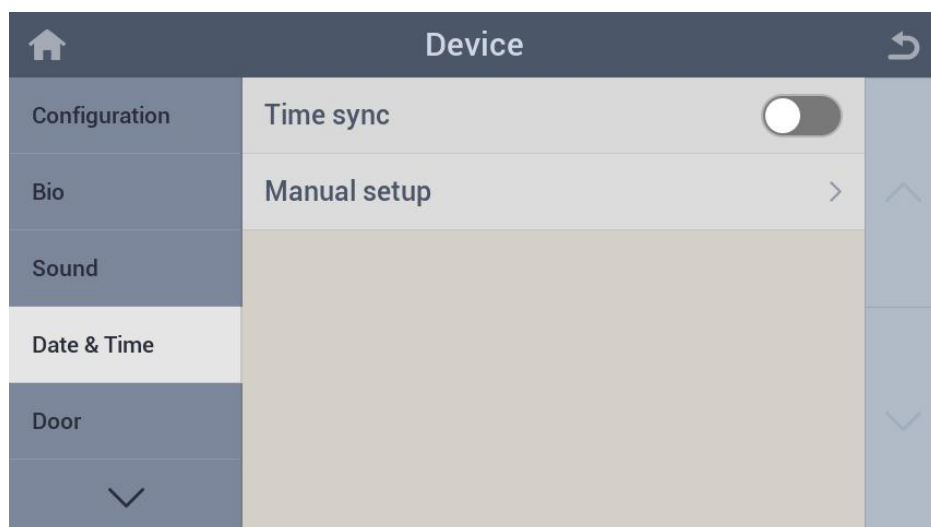
1.3.1 Sound → Speaker Volume



1.3.2 Sound → MIC Volume

Identical to settings for speaker volume

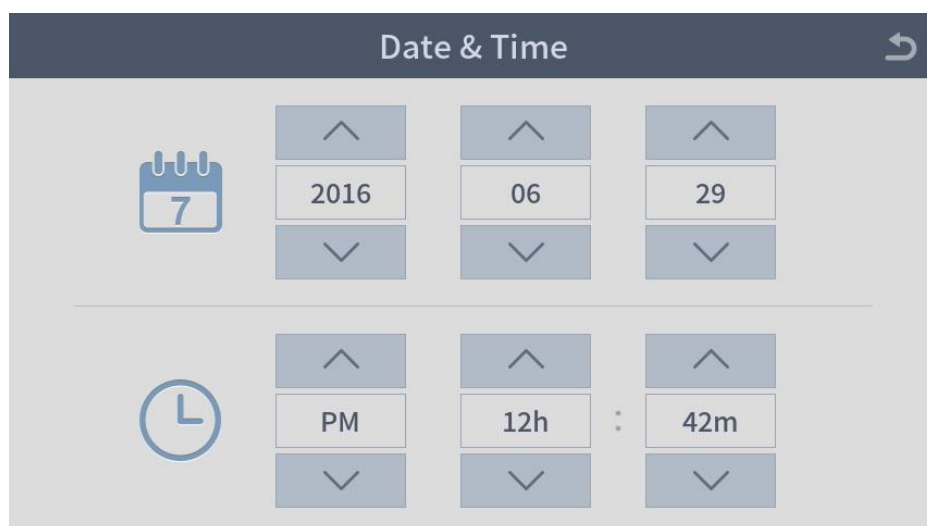
1.4 Date & Time



Time sync Select enable/disable for time sync with CMID manager

Manual setup Set date and time manually

1.4.1 Date & Time → Manual Setup



1.5 Door

Device			
Configuration	Relay	Not use >	^
Bio	Driven by	All Events >	
Sound	Duration(sec)	5 >	
Date & Time	RTE(Request To Exit)	Not use >	v
Door	RTE Type	N/O >	
	Door sensor	Not use >	

Relay Select a door open relay

Driven by Select an event mode for door open relay

Duration (sec) Set time duration for door open relay operation

RTE (Request to Exit) Select a door exit button (Note: in construction)

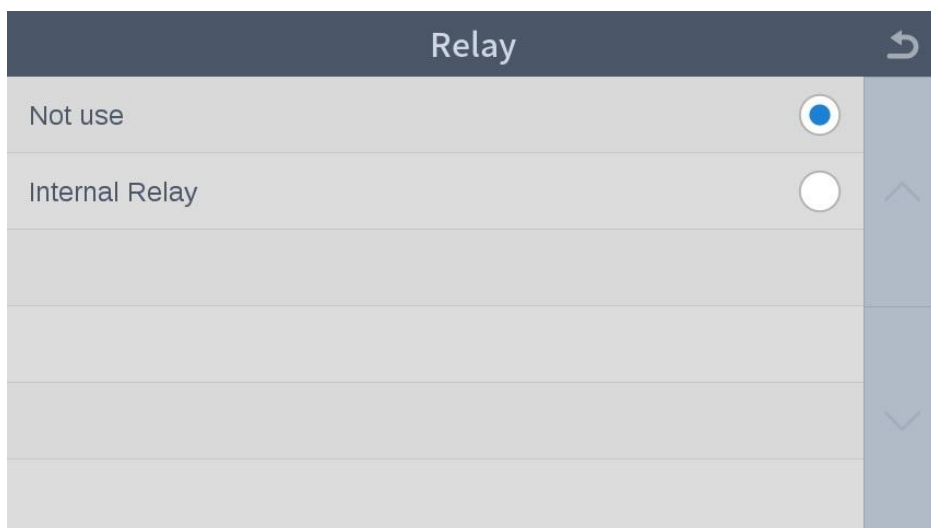
RTE Type Select a door exit button operating type (Note: in construction)

Door sensor Select a door sensor (Note: in construction)

Device			
Configuration	Door sensor type	N/O >	^
Bio	Held open period(sec)	30 >	
Sound	Lock time	Never >	
Date & Time	Unlock time	Never >	v
Door	Tamper	☐	

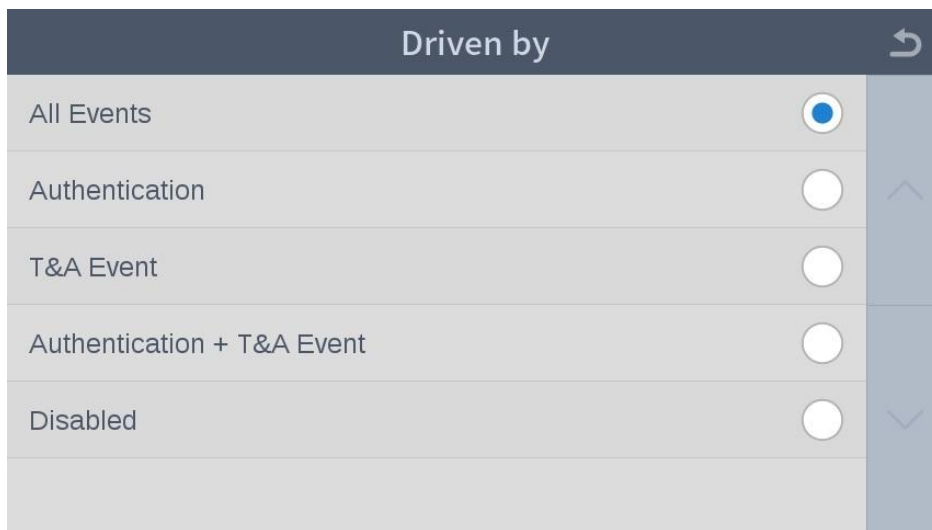
Door sensor type	Select door sensor operating type (note: in construction)
Held open period (sec)	Set time duration for door open operation (note: in construction)
Lock time	Set door lock time (note: in construction)
Unlock time	Set door unlock time (note: in construction)
Tamper	Select enable/disable for tamper (off the wall detection) operation

1.5.1 Door → Relay



Not use	Select not use
Internal Relay	Select internal relay

1.5.2 Door → Driven by



All Events Select door open for all events

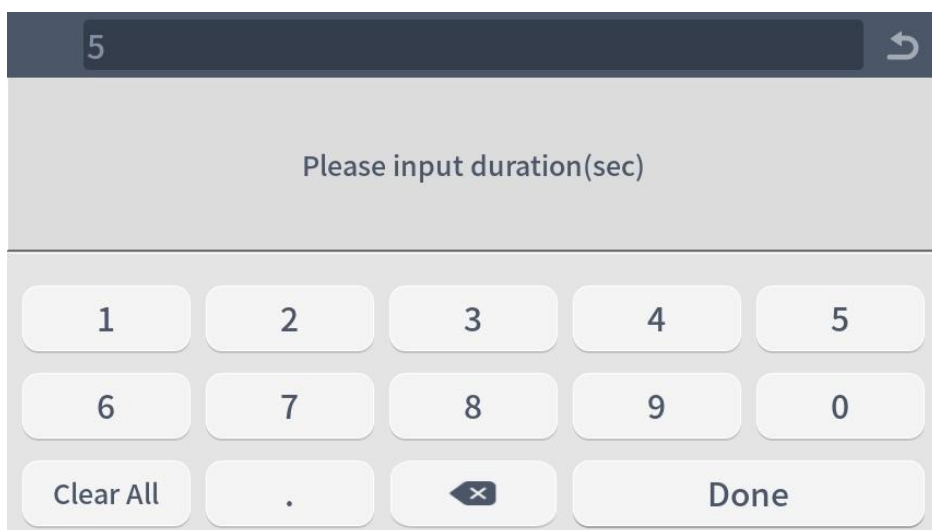
Authentication Select door open for authentication event

T&A Event Select door open for T&A event

Authentication + T&A Event Select door open for authentication plus T&A event

Disabled Select door open disable

1.5.3 Door → Duration (sec)



1.5.4 Door → Door Sensor

Door sensor		↶
Not use	☒	↑ ↓

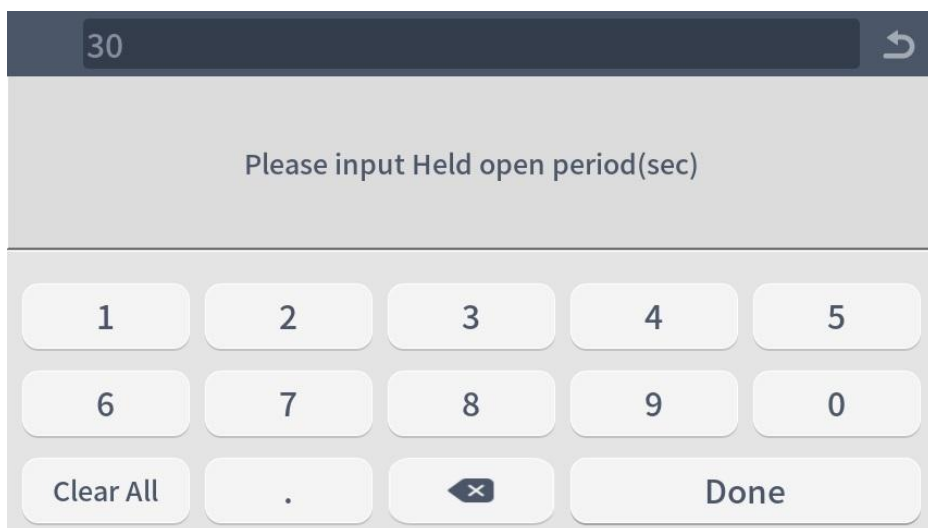
1.5.5 Door → Door Sensor Type

Door sensor type		↶
N/O	☒	↑ ↓
N/C	☐	

N/O Select door exit button sensor as Normal Open type

N/C Select door exit button sensor as Normal Close type

1.5.6 Door → Held Open Period (sec)



30

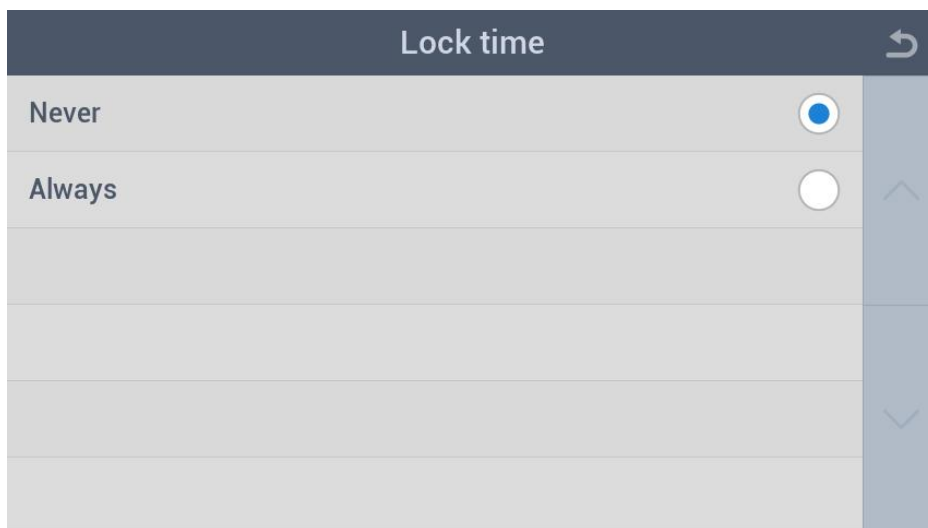
Please input Held open period(sec)

1 2 3 4 5

6 7 8 9 0

Clear All .  Done

1.5.7 Door → Lock Time



Lock time

Never ☒

Always ☐

^

↓

Never Select door lock time -- never

Always Select door lock time -- always

1.5.8 Door → Unlock Time

Unlock time		↶
Never	☒	↑
Always	☐	
		↓

Never Select door unlock time -- never

Always Select door unlock time -- always

1.6 Device Info

Device		
Model	UMX-10	
Device Info.	FW Version	umx-ota-upgrade-es_d20160707.bin
Interphone	Device ID	HC0706A000019
Memory Info.	Kernel version	1.1.7
Touchscreen Cal.	HW version	0x0201
MAC	00:25:ff:fe:47:9a	

Model Model name of this device

FW Version Version name of released firmware (F/W) file

Device ID Identification number of this device

Kernel version Revision number of kernel

HW version Revision number of hardware board

MAC MAC address of this device

Device		
Boot version	1.0.0	
Device Info.	Root version	1.1.9
Interphone	Recovery version	1.1.4
Memory Info.	Application version	1.1.11
Touchscreen Cal.	FPGA version	2.6.0

Boot version	Revision number of boot loader
Root version	Revision number of root file system
Recovery version	Revision number of recovery firmware
Application version	Revision number of Launcher application
FPGA version	Revision number of Camera FPGA firmware

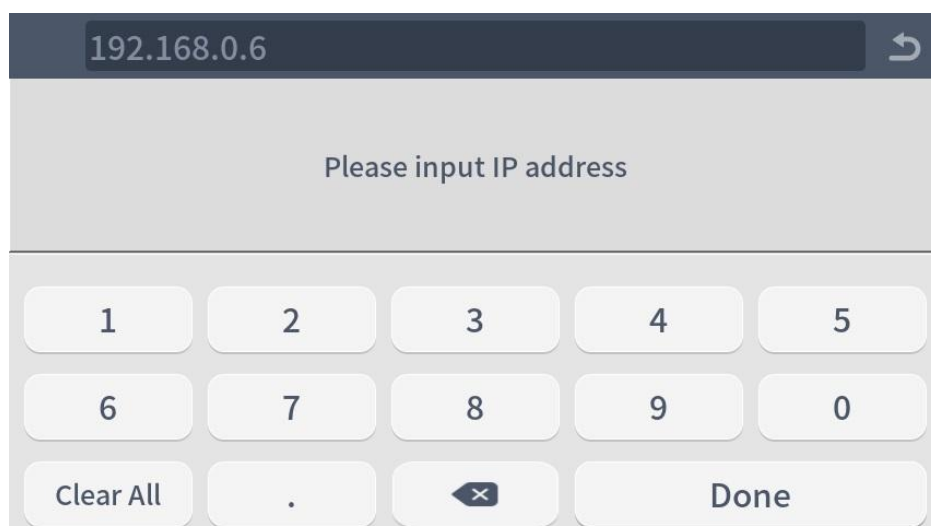
1.7 Interphone



Interphone Select enable/disable for interphone use (note: in construction)

IP Address IP address of PC which interphone program is installed (note: in construction)

1.7.1 Interphone → IP Address



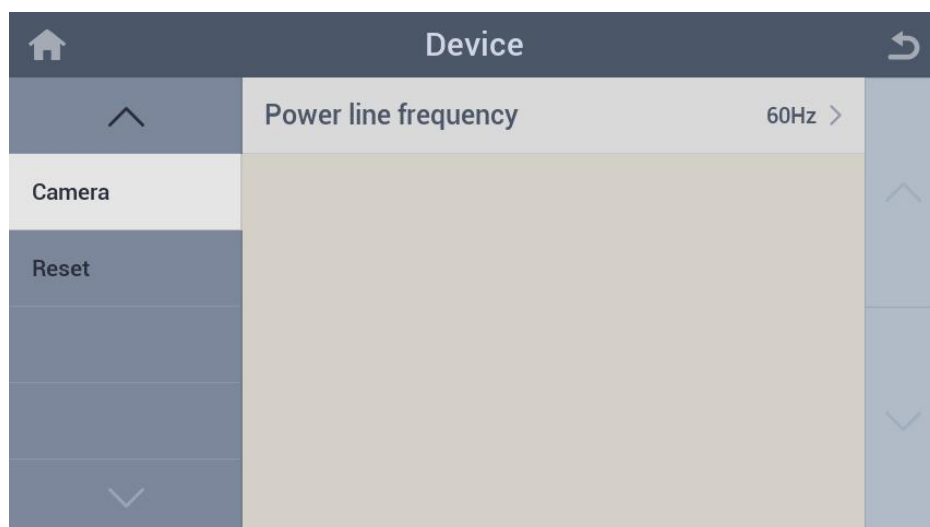
1.8 Memory Info



System Memory capacity of system area (note: in construction)

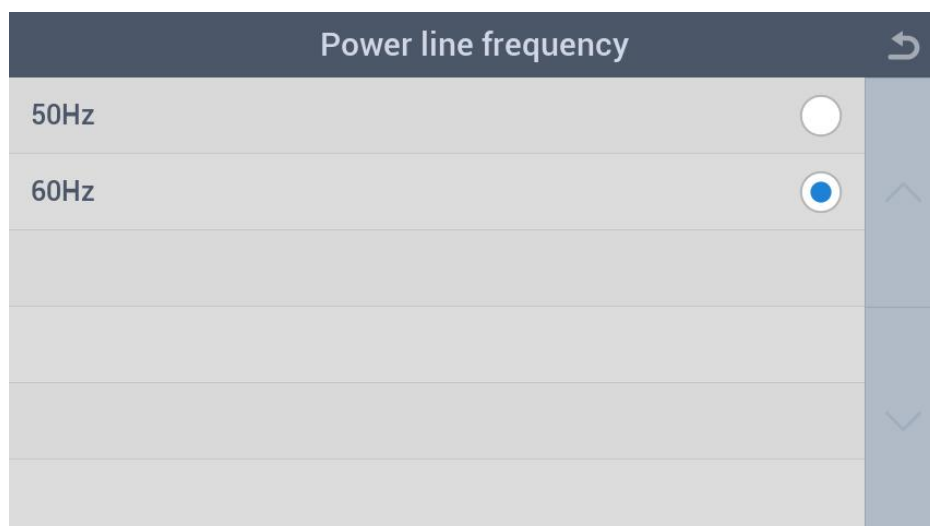
User data Memory capacity of user area (note: in construction)

1.9 Camera



Power line frequency Select power line frequency that supplying to device

1.9.1 Camera → Power Line Frequency



50Hz Select power line frequency to 50Hz

60Hz Select power line frequency to 60Hz

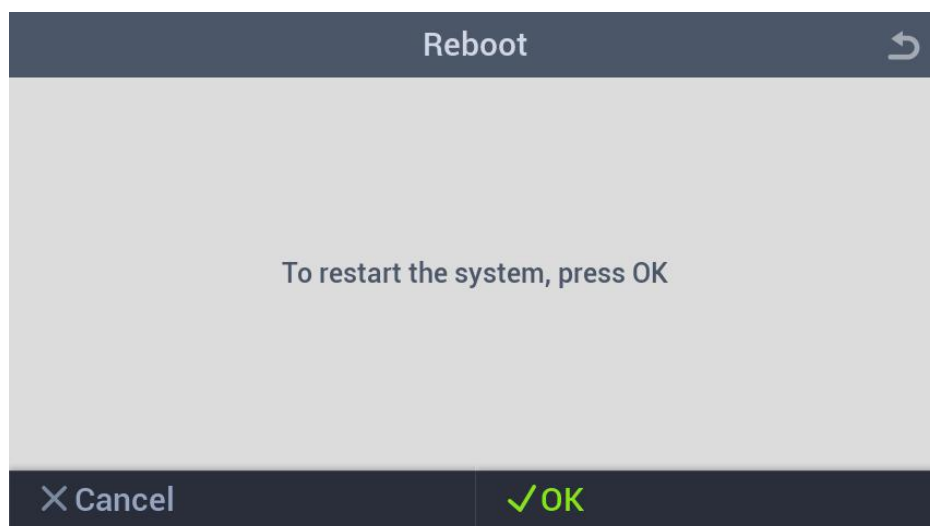
1.10 Reset



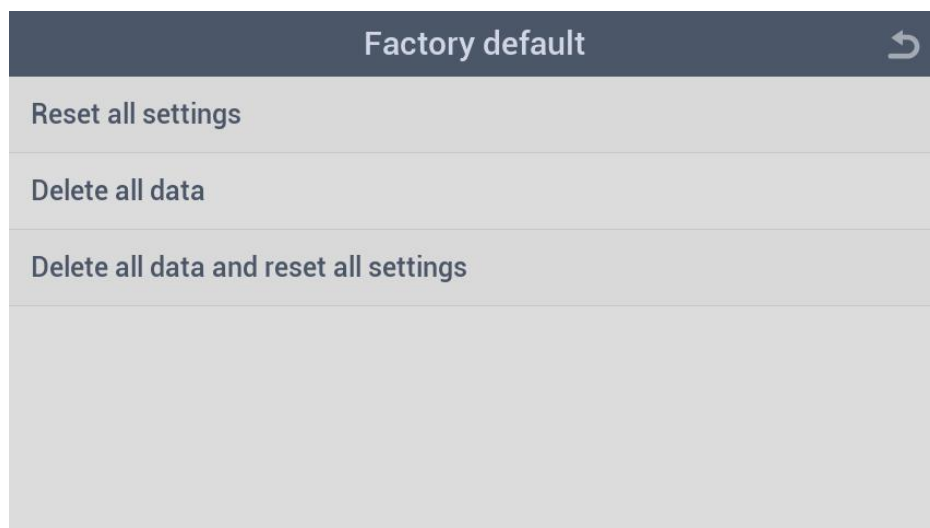
Reboot Reboot device

Factory Default Reset all configuration settings and/or delete all user data

1.10.1 Reset → Reboot



1.10.2 Reset → Factory Default

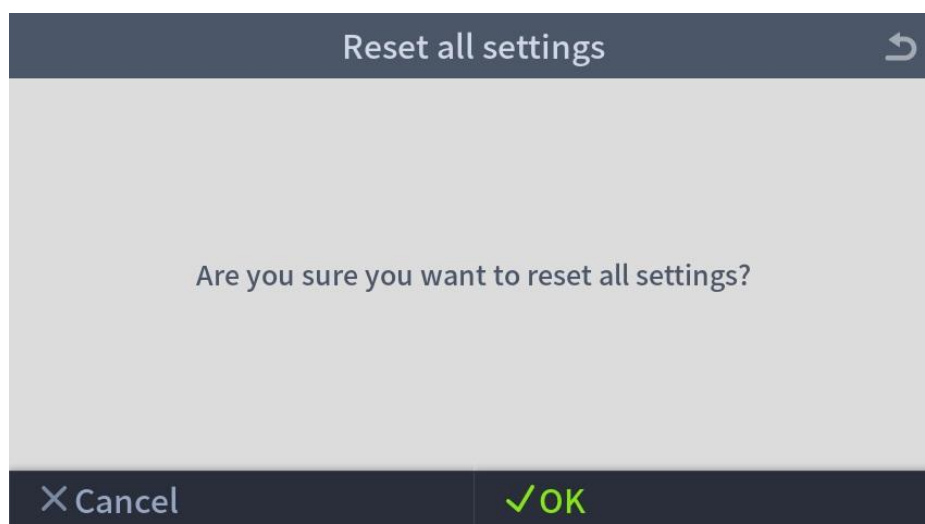


Reset all settings Reset all configuration settings

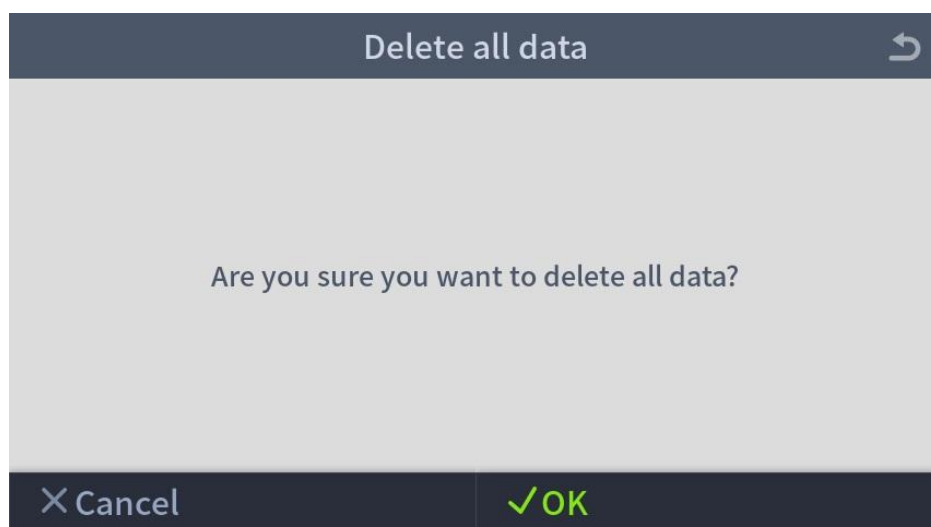
Delete all data Delete all user data

Delete all data and reset all configuration settings Reset all configuration settings and delete all user data

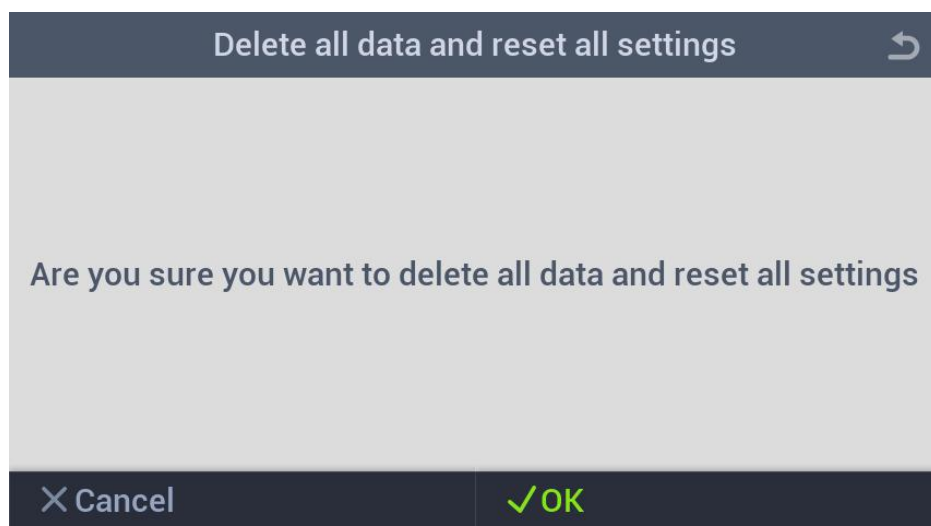
1.10.2.1 Reset → Factory Default → Reset All Settings



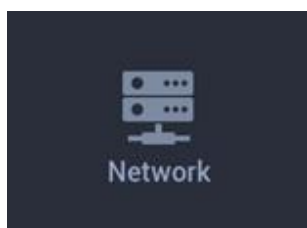
1.10.2.2 Reset → Factory Default → Delete All Data



1.10.2.3 Reset → Factory Default → Delete All Data and Reset All Settings



2 Network



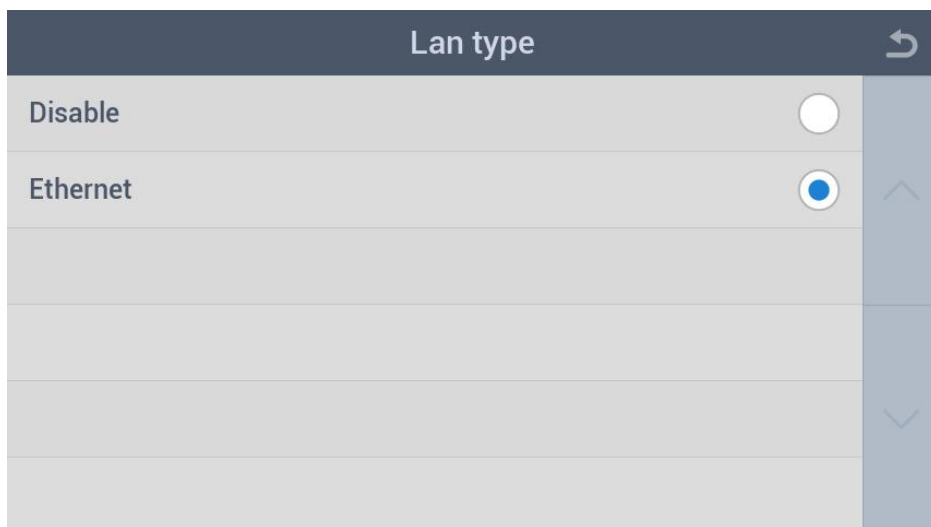
Configure settings for IP and serial communication.

2.1 TCP/IP

Network		
TCP/IP	Lan type	Ethernet >
Server	DHCP	☒ >
Serial	IP Address	192.168.0.7 >
USB Memory	Gateway	192.168.0.1 >
	Subnet	255.255.255.0 >

LAN type	Select a type of LAN
DHCP	Select enable/disable DHCP mode
IP Address	Set static IP address
Gateway	Set static gateway IP address
Subnet	Set static subnet mask

2.1.1 TCP/IP → LAN Type



Disable Disable LAN use

Ethernet Select Ethernet for LAN use

2.1.2 TCP/IP → IP Address



2.1.3 TCP/IP → Gateway

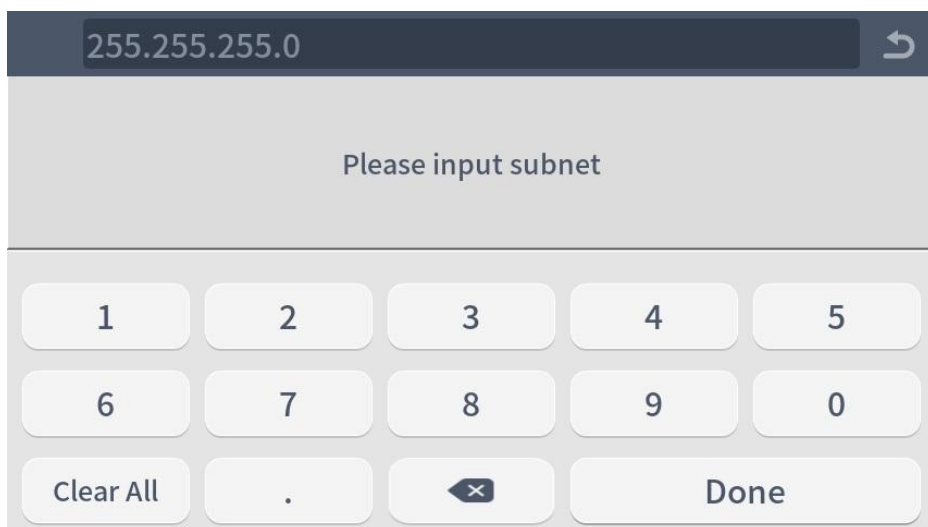


192.168.0.1 ↩

Please input gateway

1	2	3	4	5
6	7	8	9	0
Clear All	.	⬅✕	Done	

2.1.4 TCP/IP → Subnet

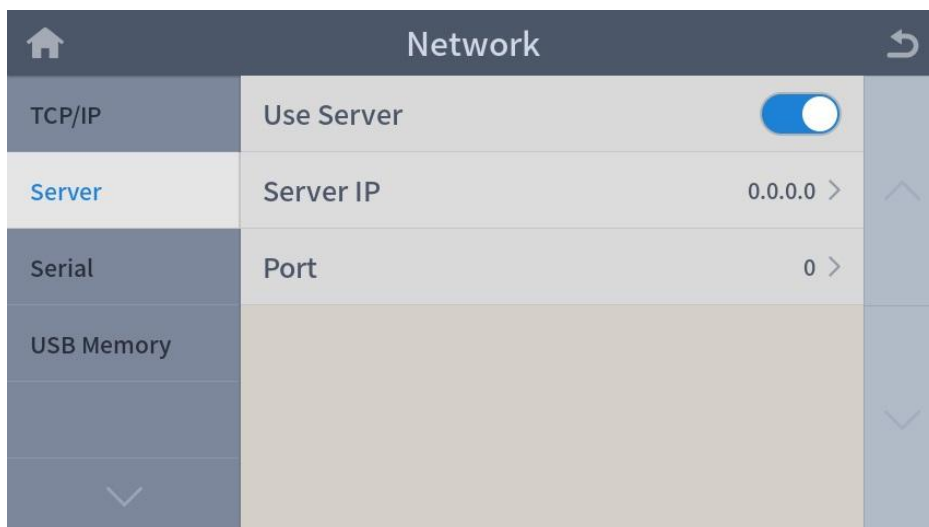


255.255.255.0 ↩

Please input subnet

1	2	3	4	5
6	7	8	9	0
Clear All	.	⬅✕	Done	

2.2 Server



(Currently settled server is CMID PC for time sync)

Use Server Select enable/disable for server use (Note: In construction)

Server IP Set IP address of server (Note: In construction)

Port (Note: To be eliminated)

2.2.1 Server → Server IP



2.3 Serial

Network			
TCP/IP	RS485-PC	Not use >	
Server	RS485-NET	Not use >	
Serial	RS232	Not use >	
USB Memory			

RS485-PC Select a baud rate for RS485 (note: in construction)

RS485-NET Select an operating mode for RS485 (note: in construction)

RS232 Select a baud rate for RS232 (note: in construction)

2.3.1 Serial → RS485-PC

RS485-PC		
Not use	☒	
9600	☐	
19200	☐	
38400	☐	
57600	☐	
115200	☐	

2.3.2 Serial → RS485-NET

RS485-NET		↶
Not use	☒	↑
NET-HOST	☐	
NET-SLAVE	☐	
		↓

- Not use** Disable RS485
- NET-HOST** Set RS485 operating mode as host
- NET-SLAVE** Set RS485 operating mode as slave

2.3.3 Serial → RS232

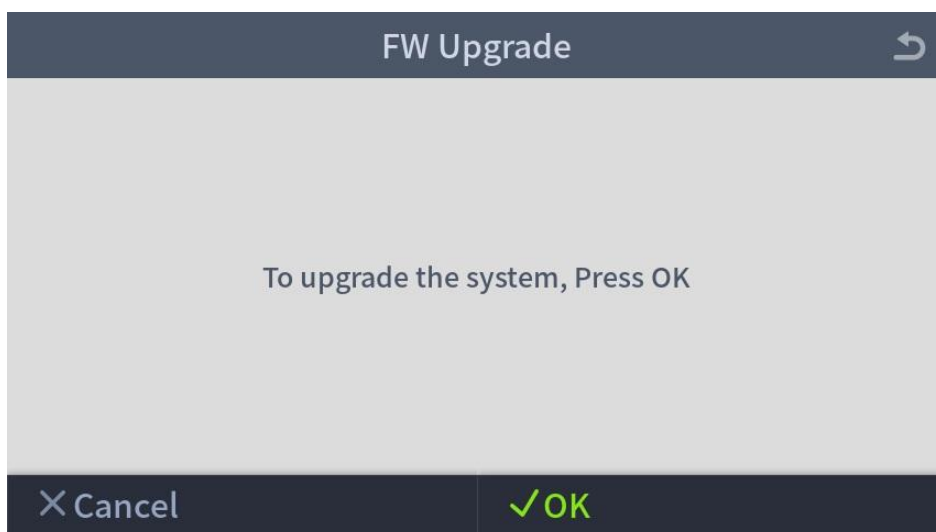
RS232		↶
Not use	☒	↑
		↓

2.4 USB Memory



- USB enable** Select enable/disable for USB memory use
- FW Upgrade** Go into firmware (F/W) upgrade from USB memory
- Import** Go into backup data (user & log data) restore from USB memory
- Export** Go into backup data (user & log data) save to USB memory

2.4.1 USB Memory → FW Upgrade

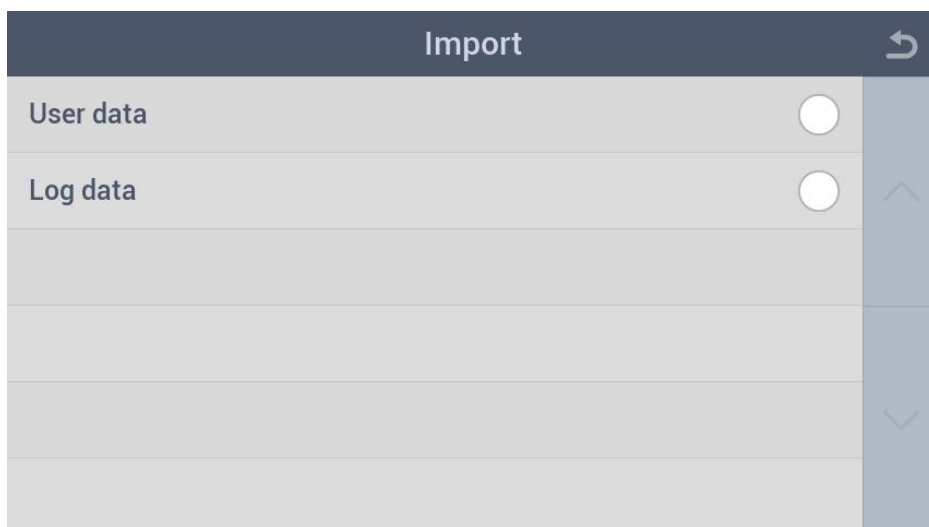


Upgrade F/W by tapping on ✓ OK button on the bottom right.



If the FW file (new firmware and operating library) does not exist in USB, message appears as shown above.

2.4.2 USB Memory → Import



User data Restore user enroll data from USB memory

Log data Restore log data from USB memory

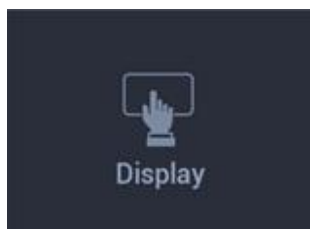
2.4.3 USB Memory → Export

Export		
User data	☐	
Log data	☐	
		

User data Backup user enroll data to USB memory

Log data Backup log data to USB memory

3 Display



Configure settings for screen display.

3.1 Voice Instructions



Voice Instruction

Select enable/disable for voice guide positioning / instructions

3.2 Central Timer



Central Timer

Select enable/disable for clock display on the center of Launcher application

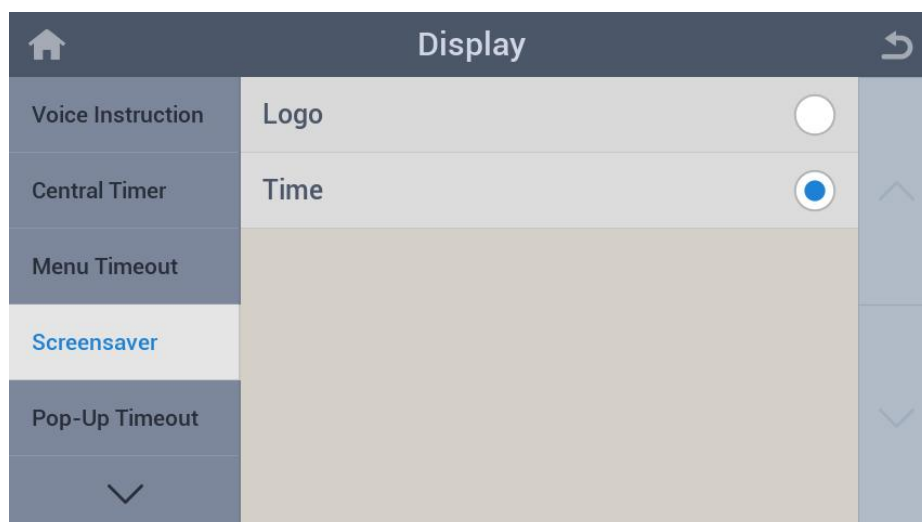
3.3 Menu Timeout



Menu Timeout

Set timeout for auto exit from menu display after leaving untouched

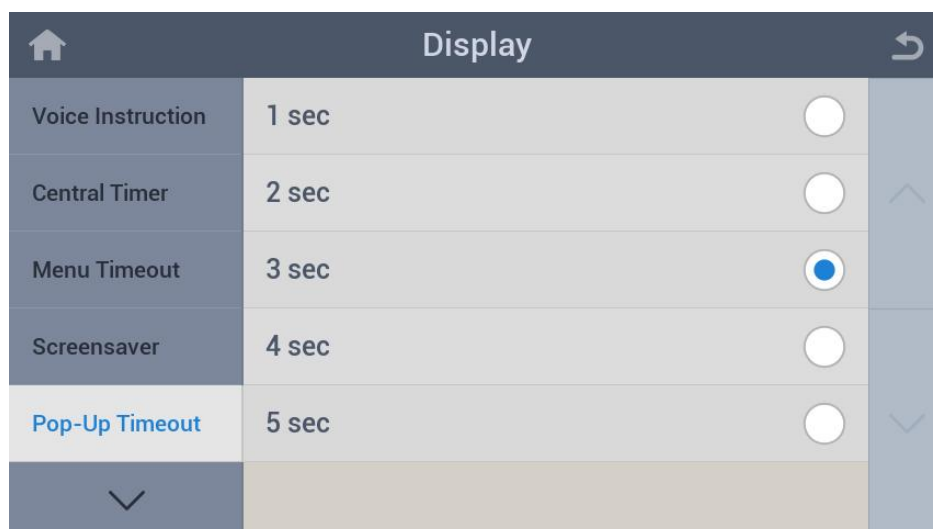
3.4 Screensaver



Logo Select logo display as screensaver

Time Select clock display as screensaver

3.5 Pop-Up Timeout



Pop-Up Timeout Set pop-up message window (recognition complete etc.) display duration

3.6 Backlight Timeout

	Display	
	Infinity	☒
Backlight Timeout	10 sec	☐
Date Display	20 sec	☐
Language	30 sec	☐
	40 sec	☐
	50 sec	☐

Pop-Up Timeout Set timeout for auto off of LCD backlight after leaving unused

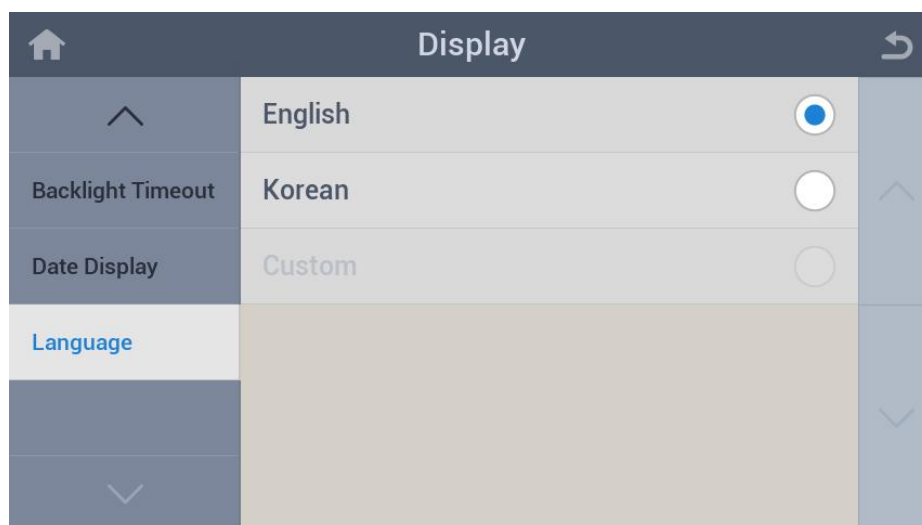
3.7 Date Display

	Display	
	YYYY/MM/DD	☐
Backlight Timeout	DD/MM/YYYY	☒
Date Display		
Language		
		
		

YYYY/MM/DD Select year/month/day display mode

DD/MM/YYYY Select day/month/year display mode

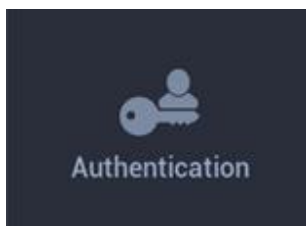
3.8 Language



Language

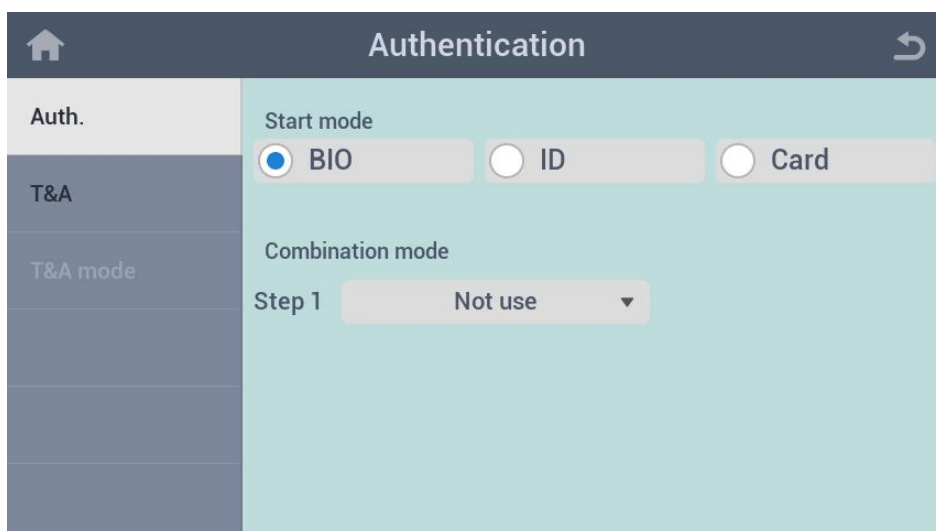
Select a language to use (Note: In construction)

4 Authentication



Configure settings for authentication method and T&A.

4.1 Auth.



Start mode Select a basic (first) recognition method

Combination mode Select a combination (additional) recognition method if necessary

4.1.1 Auth. → Combination Mode (Step 1)

Step 1		↩
Not use	☒	↑
Bio	☐	
ID	☐	
Card	☐	↓
PIN	☐	

Select a combination (additional) recognition method.

4.2 T&A

Authentication		↩
Auth.	Use T&A	☒
T&A	T&A > Recognition	☐
T&A mode	Recognition > T&A	☐

Use T&A Select enable/disable for T&A usage mode (note: in construction)

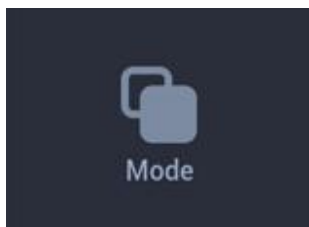
T&A > Recognition Select T&A mode (Attendance etc.) first, then recognition

Recognition > T&A After recognition, then input T&A mode (Attendance etc.)

4.3 T&A Mode

(Note: In construction)

5 Mode



Configure settings for recognition operation.

5.1 Operation

	Mode	
Operation	Face detection 	
Camera Event	Individual auth. 	
	Dual authentication Never >	
	Match timeout 5 sec >	
	Card mode Use CSN >	
		

Face detection	Select enable/disable for face image saving at recognition (note: to be eliminated)
Individual auth.	Select enable/disable for permission of individual authentication
Dual authentication	Select a dual authentication (simultaneous 2 persons) method (note: in construction)
Match timeout	Set a recognition trying timeout
Card mode	Select use or not for CSN in RFID card (note: in construction)

5.1.1 Operation → Dual Authentication

Dual authentication		↶
Never	☒	↑
Always	☐	
		↓

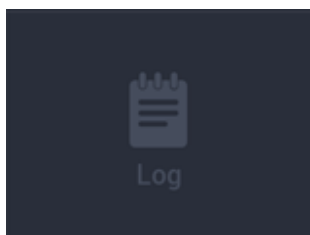
5.1.2 Operation → Match Timeout

Match timeout		↶
3 sec	☐	↑
5 sec	☒	
10 sec	☐	
20 sec	☐	↓
30 sec	☐	
60 sec	☐	

5.1.3 Operation → Card Mode

Card mode		↶
Not use	☐	↑
Use CSN	☒	
		↓

6 Log



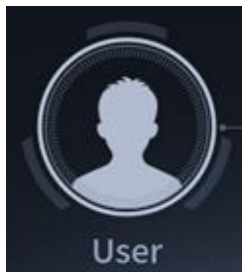
View information of saved log and log search viewer.

6.1 Log Info



(Note: In construction)

User



Tap the **User** icon in Home screen.

User			
All (3)	2	ccc	
Group 1 (0)	3	ddd	^
Group 2 (0)	4	card	
Group 3 (0)			
Group 4 (0)			v
+ Enroll Q Search 📊 Capacity Info 🗑️ Delete			

Displays the registered user lists in All and Group 1, 2, 3, 4

Enroll button	Switch to enroll process
Search button	Switch to search process
Capacity Info button	Show the used memory percentage
Delete button	Switch to delete process

1 Enroll User



Tap the **Enroll** button to enroll a new user.

The screenshot shows the 'Enroll User' form with the following fields and callouts:

- 1: ID field (value: 4)
- 2: Name field
- 3: Individual dropdown menu (value: Not use)
- 4: Admin checkbox
- 5: Group dropdown menu (value: Not use)
- 6: Bypass Card checkbox

Below the fields are three tabs: 'Iris & Face' (selected), 'Card', and 'Pin'. Under 'Iris & Face' is a plus icon for image capture. To the right are checkboxes for 'Face' (checked), 'Both eye' (checked), 'Glasses wearer', and 'Either eye'. At the bottom are 'Cancel' and 'Save' buttons.

Enroll User Page

- ① ID: Created a user ID number automatically or input manually
- ② Name: Input user name manually
- ③ Individual: Set user individual authentication mode if necessary
- ④ Admin: Can make a user administrator or not
- ⑤ Group: Can make a user belong to a group
- ⑥ Bypass Card: Can register a user who holding bypass card (highest priority card)

1.1 Name

Please input user name

q w e r t y u i o p
a s d f g h j k l
↑ z x c v b n m ✕
ABC ,?123 Space . Done

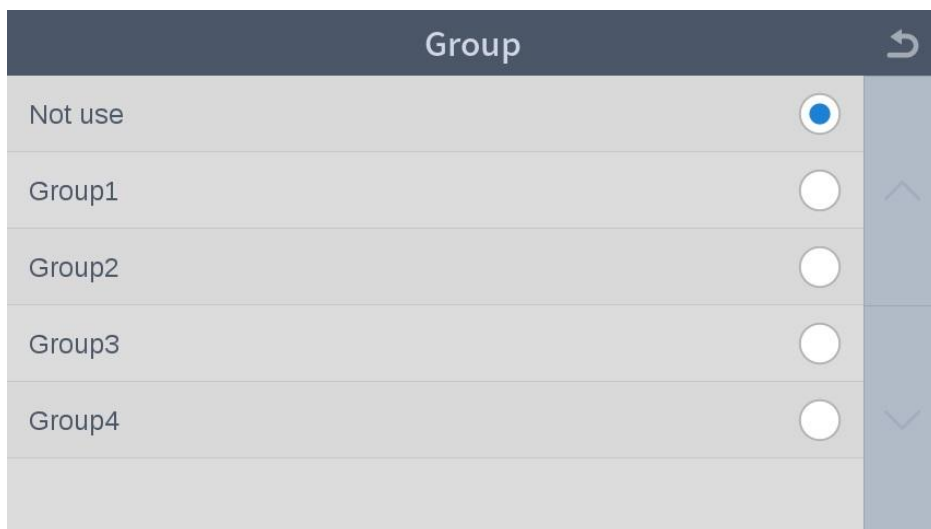
1.2 Individual

Individual mode

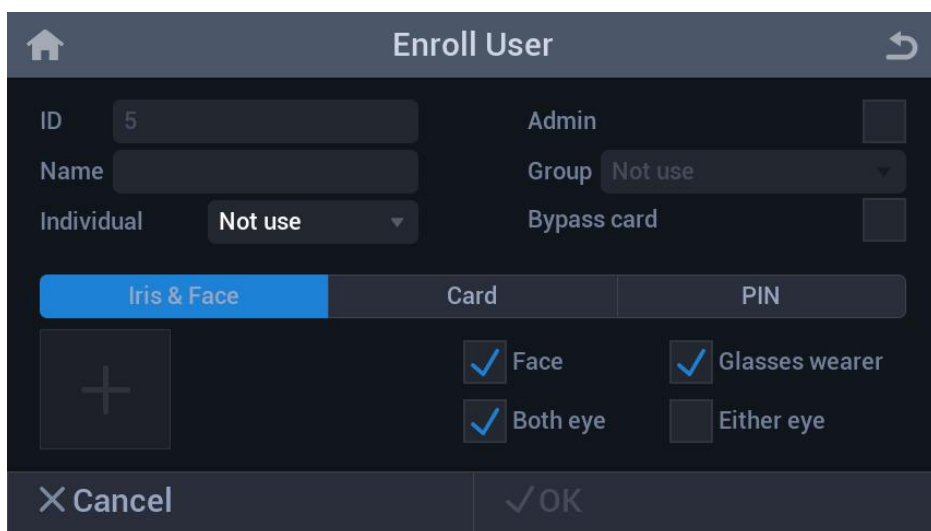
Not use	☒
Bio only	☐
Bio and ID	☐
Bio and Card	☐
Bio and PIN	☐
ID only	☐

Select an individual authentication mode.

1.3 Group



1.4 Iris & Face Process



Iris & Face tab

Selection changes tab to blue color

Bio select check boxes are shown

Face

Select box for face image capture

Glasses wearer

Select box for face taking off glasses additionally if necessary

Both eye	Select box for "both eye" Iris mode
Either eye	Select box for "either eye" Iris mode
Start(+) button	Switch to enroll process

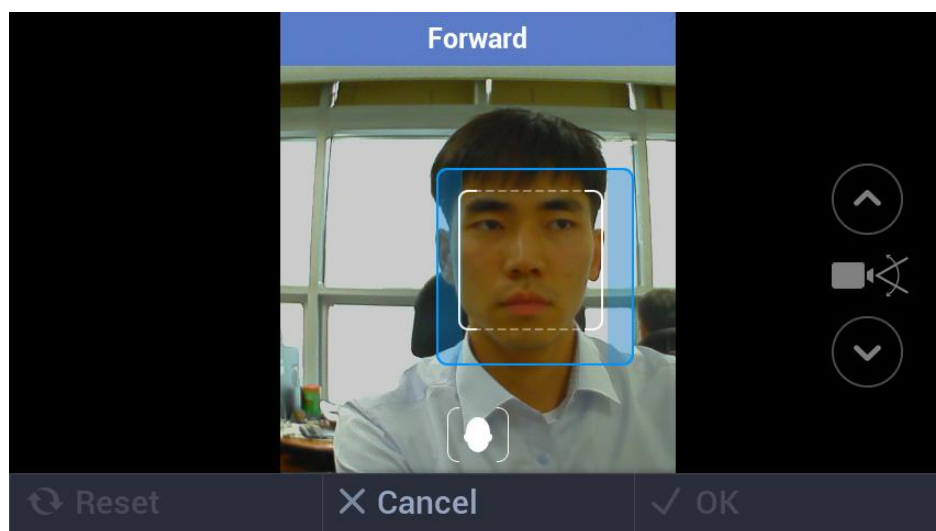
1.4.1 Iris & Face Process → Face Capture



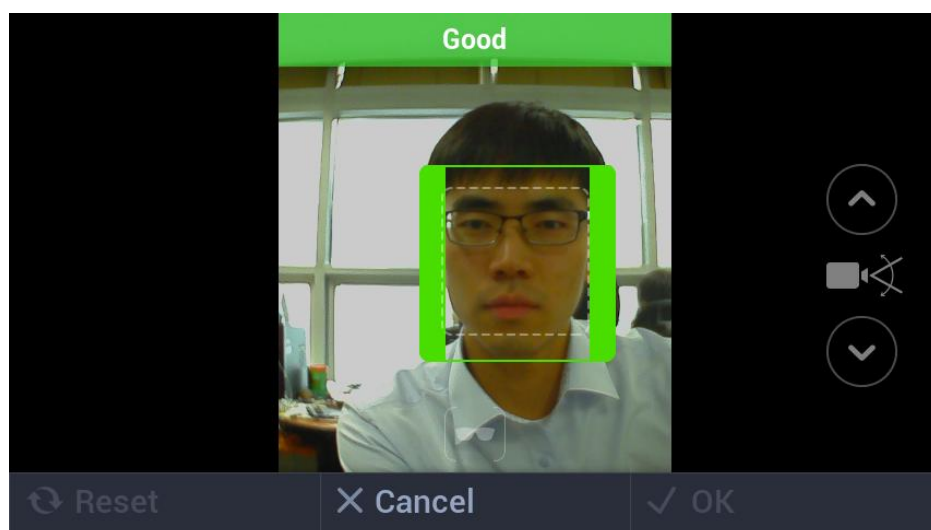
※ **Note: Only operational if "Combined Face and Iris" mode is active**

Color Overlay	BLUE means too far GREEN means OK RED means too close.
Up/Down Arrow	Can tilt camera manually if necessary (note: to be eliminated)
Switch to Iris Capture stage after good face image acquisition	

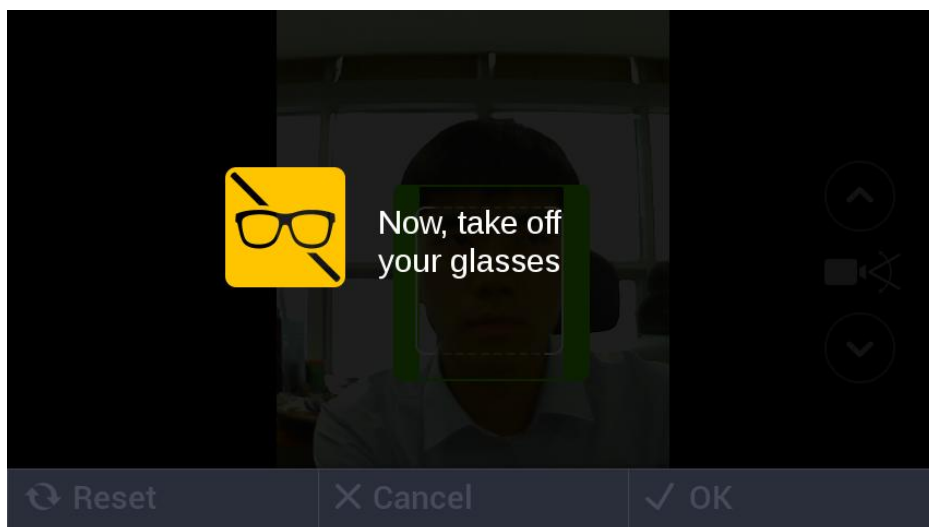
1.4.1.1 Iris & Face Process → Face Capture → Tracking Guide Box UI



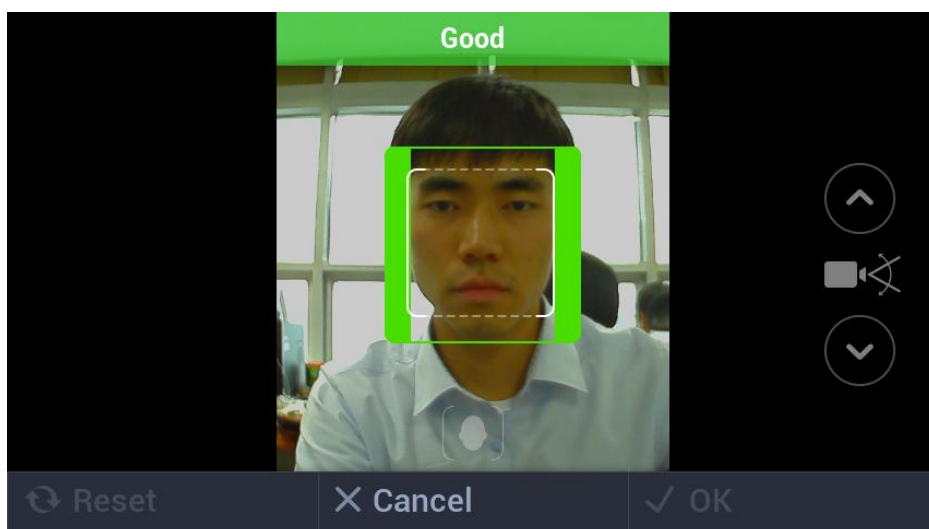
Positioning box appears in order to guide subject.



Capture normal face images.

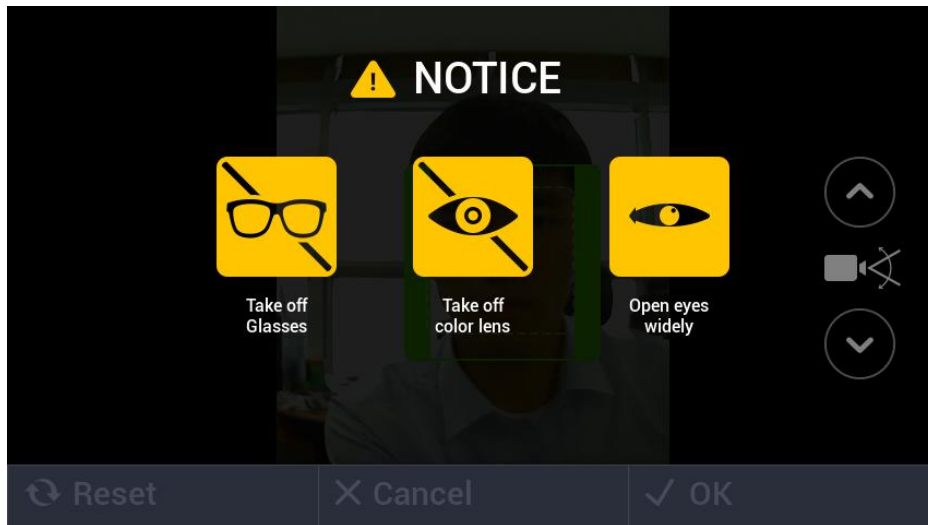


In case of selection of Glasses wearer check box, will be active for about 3 to 5 seconds.



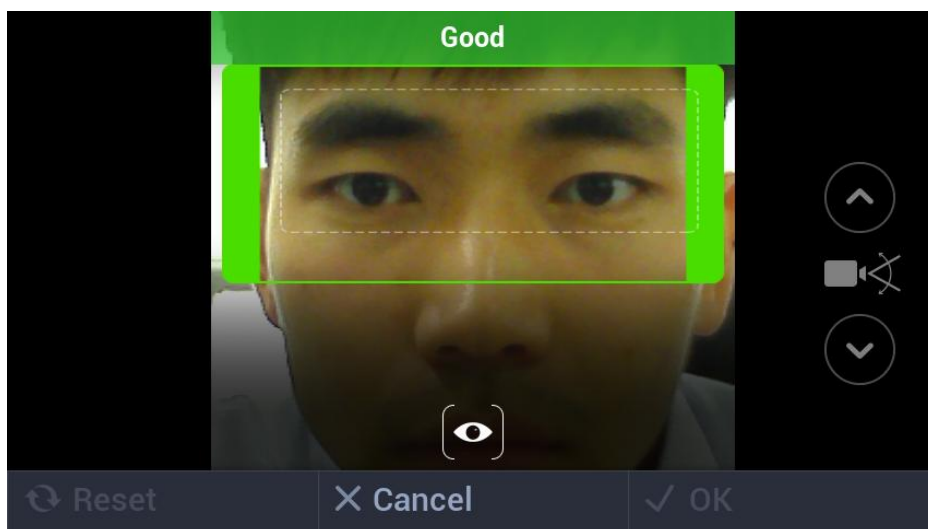
Capture additional face images taken off glasses.

1.4.2 Iris & Face Process → Iris Capture



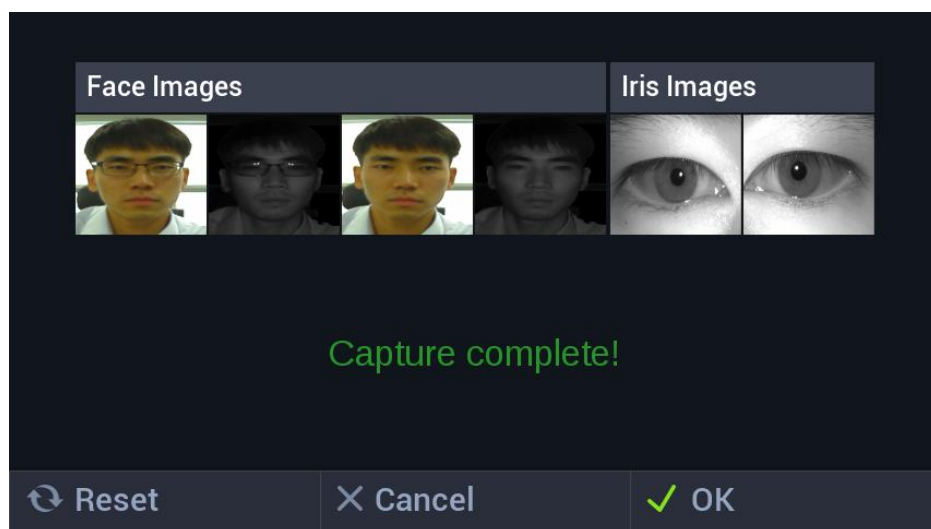
In case of Tracking Guide Box UI mode, display will be active for about 3 to 5 seconds.

1.4.2.1 Iris & Face Process → Iris Capture → Tracking Guide Box UI



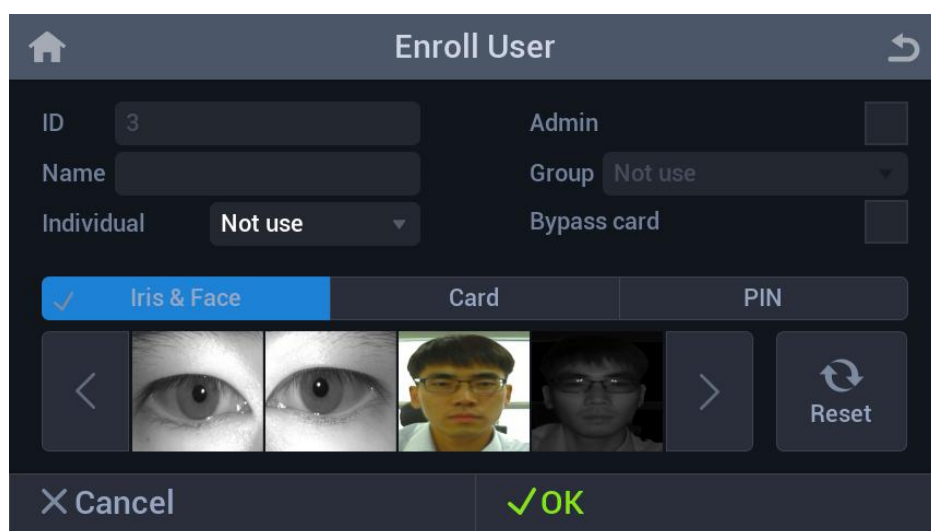
Capture iris images.

1.4.3 Iris & Face Process → Save Data / Complete Enrollment



Reset	Return to face capture stage
Cancel	Return to Enroll User screen
OK	Move to next screen to complete enrollment

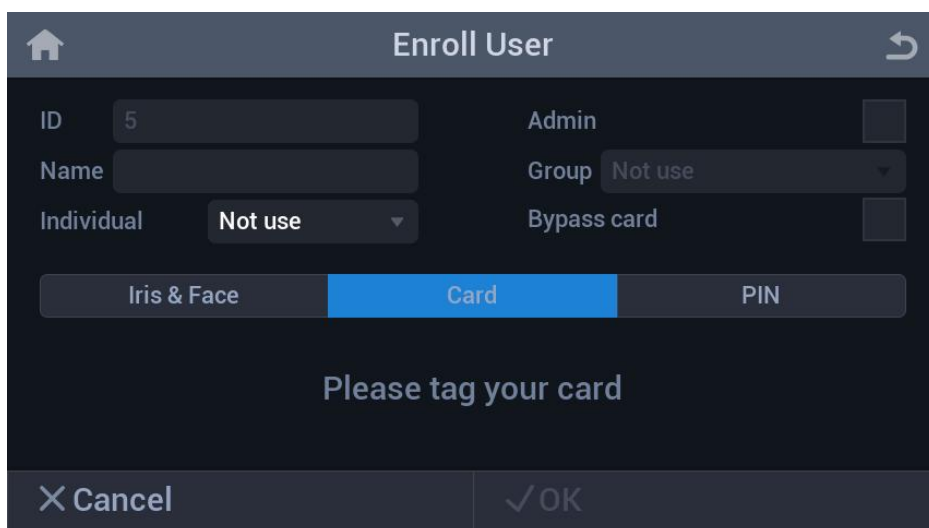
1.4.4 Iris & Face Process → Complete Enrollment



Cancel	Return to User Main screen
---------------	----------------------------

OK Save user data to complete biometrics Enrollment, then return to User Main screen

1.5 Card

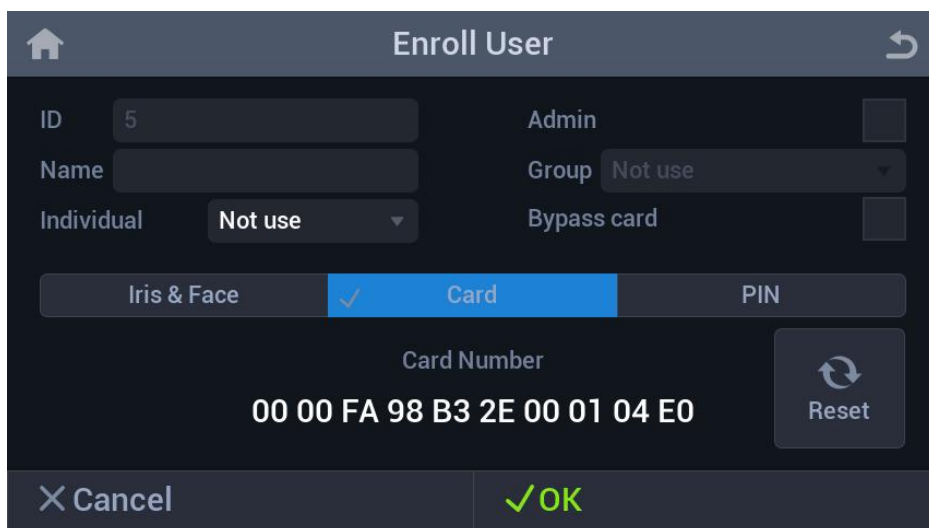


The screenshot shows the 'Enroll User' screen. At the top, there is a home icon and a back arrow. The title is 'Enroll User'. Below the title, there are input fields for 'ID' (containing '5'), 'Name', 'Individual' (a dropdown menu showing 'Not use'), 'Admin' (a checkbox), 'Group' (a dropdown menu showing 'Not use'), and 'Bypass card' (a checkbox). Below these fields are three tabs: 'Iris & Face', 'Card' (which is highlighted in blue), and 'PIN'. Below the tabs, the text 'Please tag your card' is displayed. At the bottom, there are two buttons: 'X Cancel' and '✓ OK'.

Card tab Selection changes tab to blue color

If "Please tag your card" message appears, touch front-bottom part of device with user card.

1.5.1 Card → Save Data



The screenshot shows the 'Enroll User' screen with the 'Card' tab selected. The 'Card Number' is displayed as '00 00 FA 98 B3 2E 00 01 04 E0'. There is a 'Reset' button with a circular arrow icon. The 'OK' button now shows a green checkmark.

Card number is shown on tagging a card

Reset	Clear card number and "Please tag your card" message is shown
Cancel	Return to User Main screen
OK	Save user data and return to User Main screen

1.6 Pin

PIN tab	Selection changes tab to blue color
Start (+) button	Switch to input screen

1.6.1 Pin → Input

1.6.2 Pin → Save Data

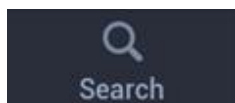
Pin number is shown as "*" character.

Reset Clear pin number and (+) button is shown

Cancel Return to User Main screen

OK Save user data to complete PIN enrollment / return to User Main screen

2 Search



Tap the **Search** icon to browse list of enrolled users.

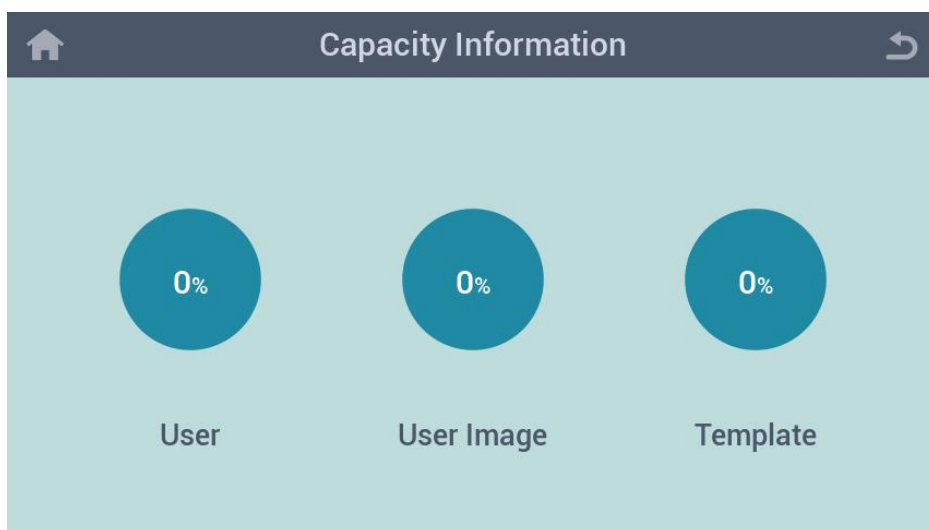


(Note: In construction)

3 Capacity Info

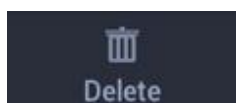


Tap the **Capacity Info** icon to check storage space.

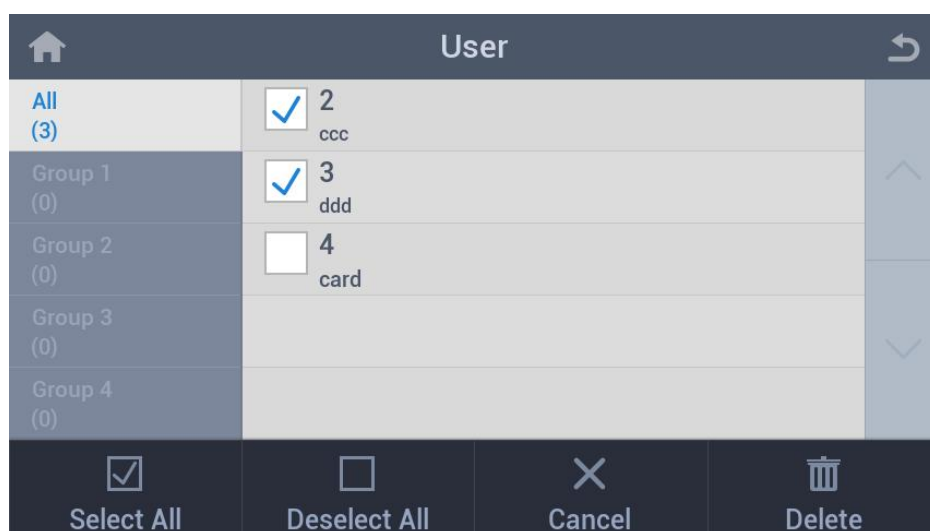


(Note: In construction)

4 Delete



Delete information of enrolled user.



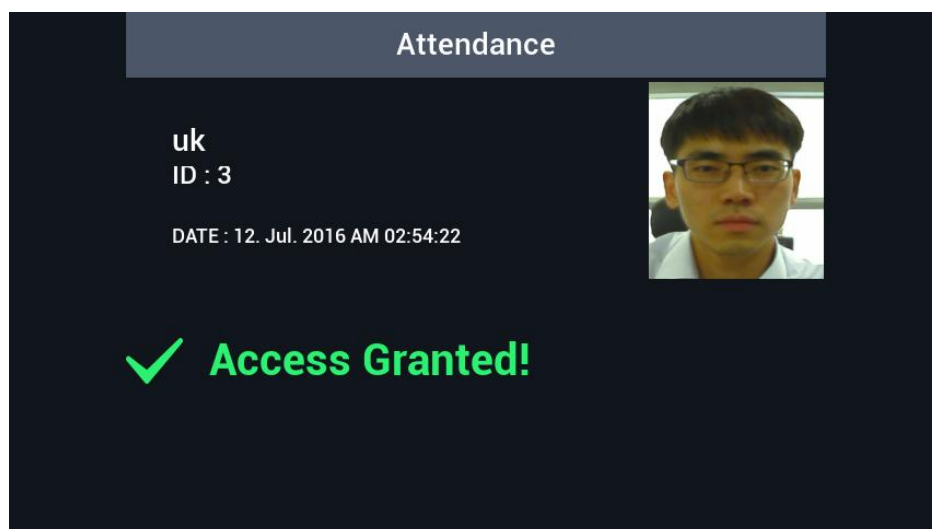
Select All	Select all users
Deselect All	Deselect all users
Cancel	Return to User Main screen
Delete	Delete selected user(s)

Recognition Process

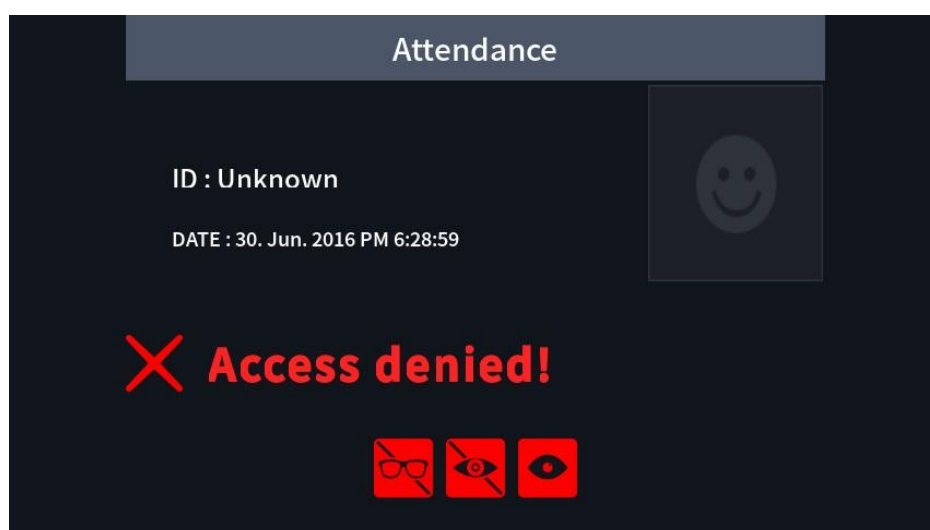
1.1 Recognition Process

Recognition process is identical to the enrollment process.

1.2 Recognition / Authentication Success



1.3 Recognition / Authentication Failure



When access is denied, warning icons can appear on the screen.

- . Glasses: Device detects occlusion by glasses.
- . Color Lens: Device detects colored lenses.
- . Small Eye: Device cannot fully detect iris due to eyelid.