



Navigator HD 2.0 Facial Recognition & VIP Greeting User Manual

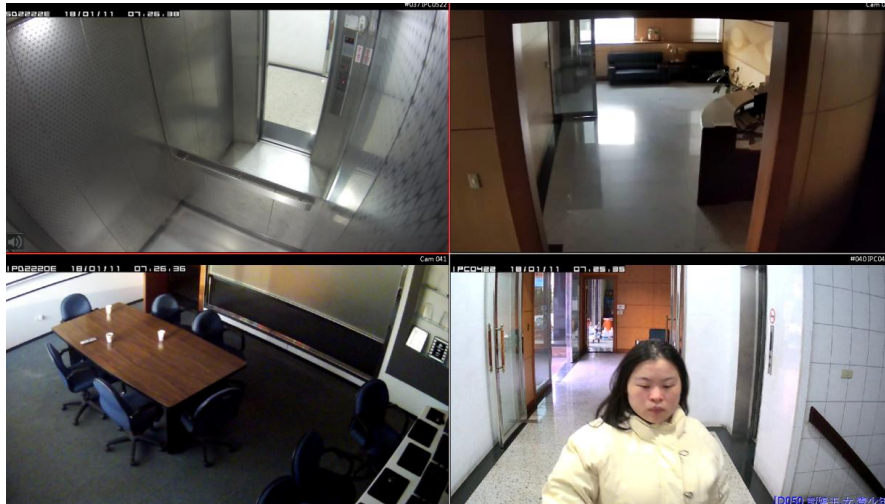
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1.0 Introduction

LILIN facial recognition system is based on LILIN NAV Enterprise and Corporate platform for access control and VIP greeting systems. Facial recognition system detects a face from a camera and compares it to photo face database of the denial list and VIP list for recognition. Based on the denial list and VIP list, it can trigger related alarm action output(s).

LILIN is the leading CCTV provider for video surveillance including number plate recognition, and facial recognition. LILIN world-class facial recognition accuracy, flexibility, and ease-of-use make Navigator software right choice for retail, access control, time and attendance, surveillance, denial list/VIP greeting management, and other applications.

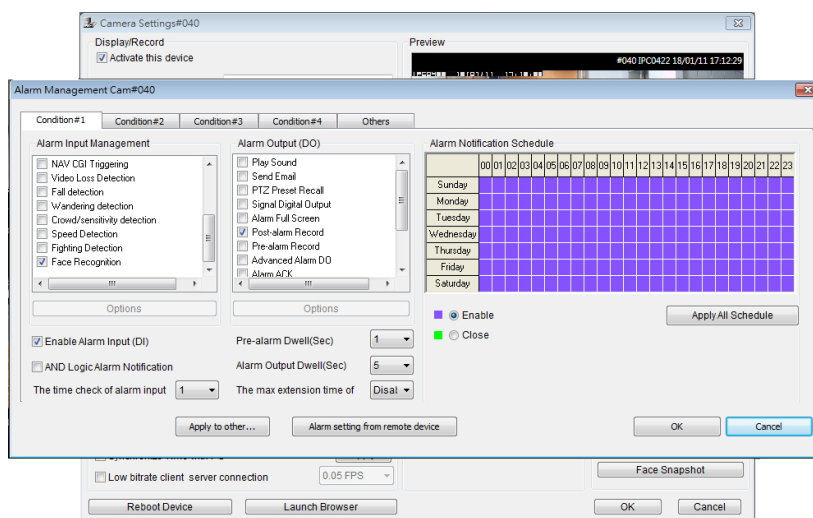
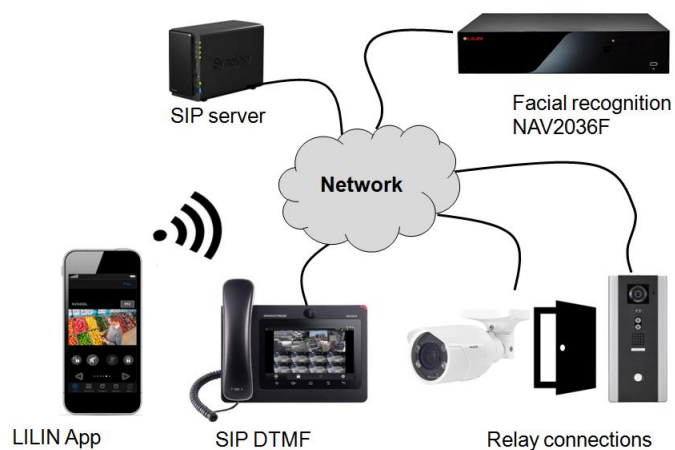
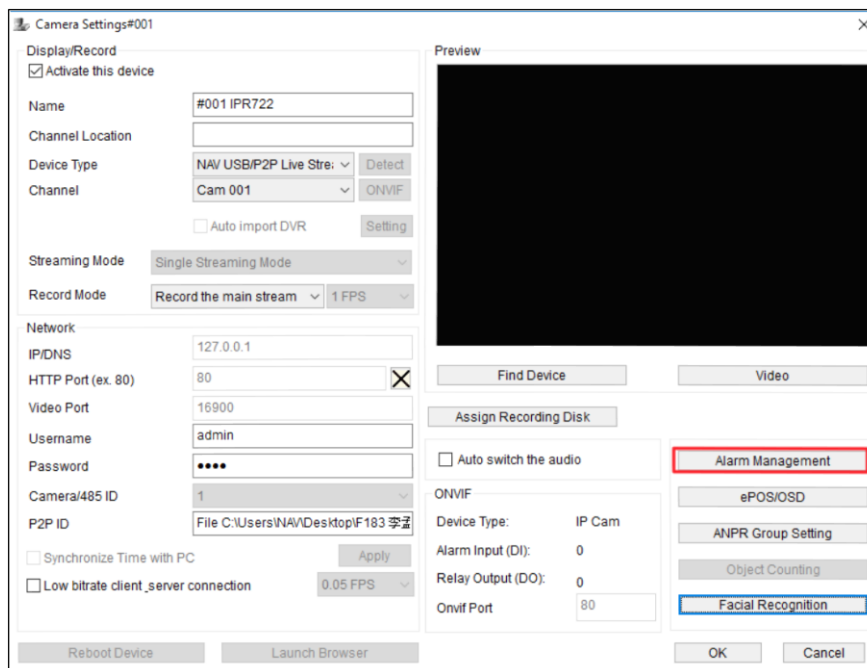


2.0 System Configuration



After a camera is configured, follow the steps below:

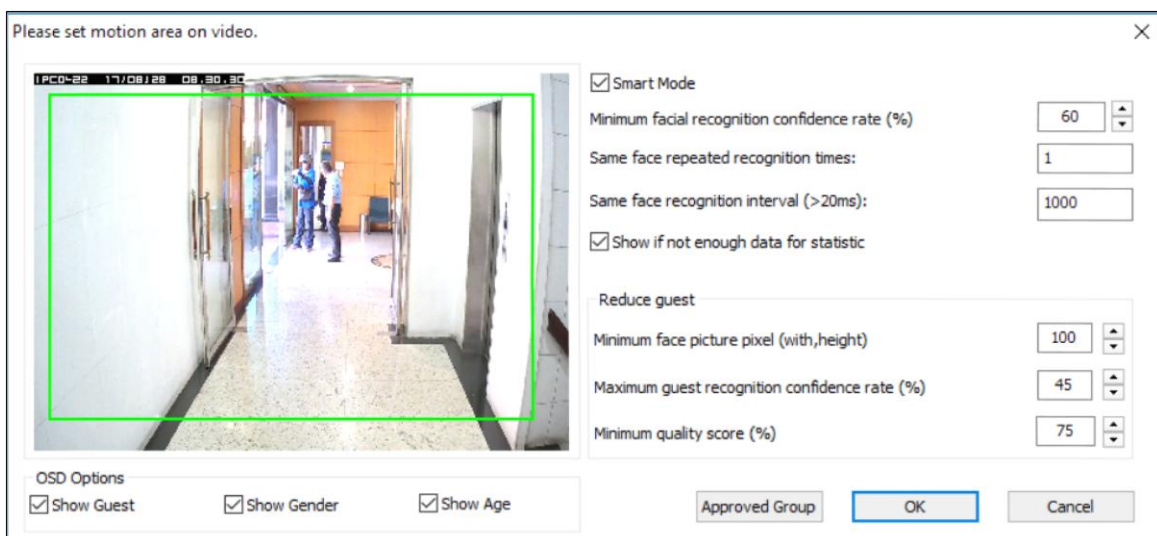
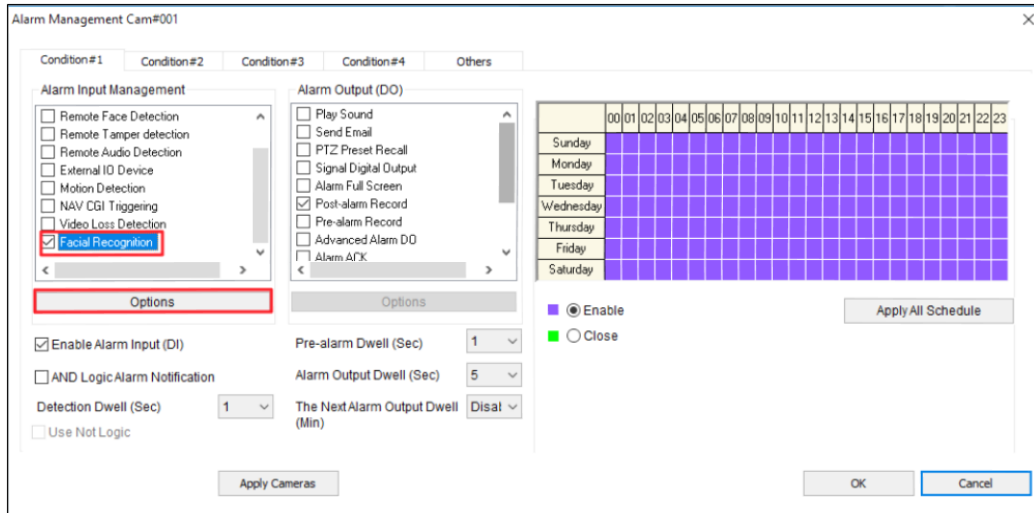
- Select Alarm Management
- Select facial recognition option from alarm input management
- Select alarm output, e.g., triggering DO of an IP camera.



3.0 Configure Detection Area & Facial Recognition

According to the installation site, you are able to define the recognition area. For defining the detection area, follow the steps below:

- Click Facial Recognition option.
- Click Options button.
- Use a mouse dragging on the video area for detecting area.



Other settings are described below:

- Minimum Facial recognition confidence rate (%): The minimum confidence rate required to have successful face recognition and trigger an enable alarm.
- Same face repeated recognition times: the number of times a face should be recognized for more accuracy.
- Same face recognition interval: The required interval time of a face recognition during consecutive identification.
- Minimum face picture pixel (X, Y) requirement: Minimum pixel size of face photo required to match from database.
- Maximum guest recognition confidence rate: maximum match ratio required for successful recognition
- Minimum quality score: minimum picture quality required to get recognition match from database.

Note: Reduce guest is to adjust level required to increase the face recognition match to data base.

3.1 OSD Display for Gender and Age

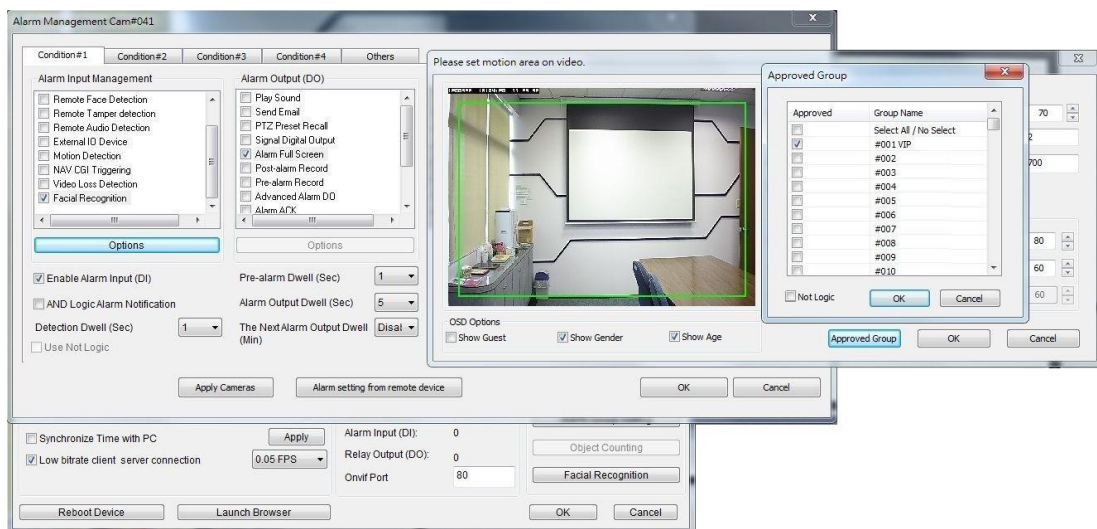
OSD display is described below :

- Show guest: if a face is not in the database, show the detected face as guest.
- Show gender: According to the hair, the detected gender of a face is displayed.
- Show age: According to the cheek, the detected age of a face is displayed.

Note: Gender and age detections are based on the hair and cheek, rough statistics of faces

3.2 Facial Recognition and Alarm Output

After face photos are added into facial recognition database, the face photos can be grouped into different lists. Based on the groups, you are able to trigger an alarm output for a grouped list. To set, select as per your requirement from Alarm Output -> Alarm Input Management -> Option -> Define motion area (optional) -> Approved Group -> Approved Group Name > OK



4.0 Set Alarm Output Settings for Applications

The alarm outputs for a detected face can be triggered for many applications.

- VIP greeting: Enable Alarm Full Screen with OSD display for the VIP guest.
- Access control: Enable Signal Digital Output can trigger DO of an IP camera for opening a door.

Alarm Input Management

- ☐ Remote Digital Input
- ☐ Remote IVS (Motion) Detection
- ☐ Remote Face Detection
- ☐ Remote Tamper detection
- ☐ Remote Audio Detection
- ☐ External IO Device
- ☐ Motion Detection
- ☐ NAV CGI Triggering
- ☐ Video Loss Detection

Options

Alarm Output (DO)

- ☐ Play Sound
- ☐ Send Email
- ☐ PTZ Preset Recall
- ☒ Signal Digital Output
- ☐ Alarm Full Screen
- ☒ Post-alarm Record
- ☐ Pre-alarm Record
- ☐ Advanced Alarm DO
- ☐ Alarm ACK

Options

Alarm Management Cam#040

Condition#1

Alarm Input Management

- ☐ Remote Alarm In
- ☐ Remote Motion/Tripwire Detection
- ☐ Remote Face Detection
- ☐ Remote Tamper detection
- ☐ Remote Audio Detection
- ☐ External IO Device
- ☐ Motion Detection
- ☐ NAV CGI Triggering
- ☐ Video Loss Detection

Options

Alarm Output (DO)

Notification Action Settings

Relay Camera: #040 #040 IPC0422

Relay Output: 1

Relay Interval: Always

OK Cancel

Alarm Notification Schedule

	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23

Apply All Schedule

☒ Enable Alarm Input (DI)

☐ AND Logic Alarm Notification

The time check of alarm input: 1

Alarm Output Dwell(Sec): 5

The max extension time of: Disal

Apply to other... Alarm setting from remote device OK Cancel

4.1 Schedule of Facial Recognition Triggering a Digital Output

For access control application, IP camera relay output can connect to an access control for opening a gate or a door. You can also apply the schedule for weekdays for automation. To set, select as per your requirement from Alarm Output -> Alarm Input Management -> Enable Alarm Notification Schedule Day/Time -> OK

Alarm Management Cam#040

Condition#1

Alarm Input Management

- ☐ NAV CGI Triggering
- ☐ Video Loss Detection
- ☐ Fall detection
- ☐ Wandering detection
- ☐ Crowd/sensitivity detection
- ☐ Speed Detection
- ☐ Fighting Detection
- ☒ Face Recognition

Options

Alarm Output (DO)

- ☐ Play Sound
- ☐ Send Email
- ☐ PTZ Preset Recall
- ☐ Signal Digital Output
- ☐ Alarm Full Screen
- ☒ Post-alarm Record
- ☐ Pre-alarm Record
- ☐ Advanced Alarm DO
- ☐ Alarm ACK

Options

Alarm Notification Schedule

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sunday																								
Monday																								
Tuesday																								
Wednesday																								
Thursday																								
Friday																								
Saturday																								

Apply All Schedule

☒ Enable Alarm Input (DI)

☐ AND Logic Alarm Notification

The time check of alarm input: 1

Pre-alarm Dwell(Sec): 1

Alarm Output Dwell(Sec): 5

The max extension time of: Disal

Apply to other... Alarm setting from remote device OK Cancel

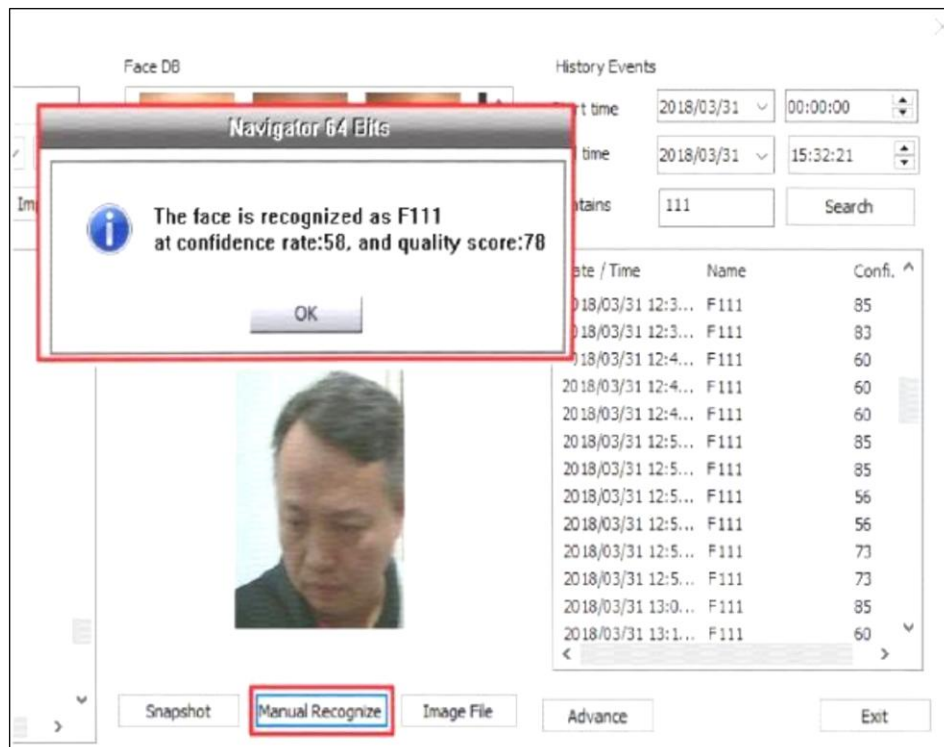
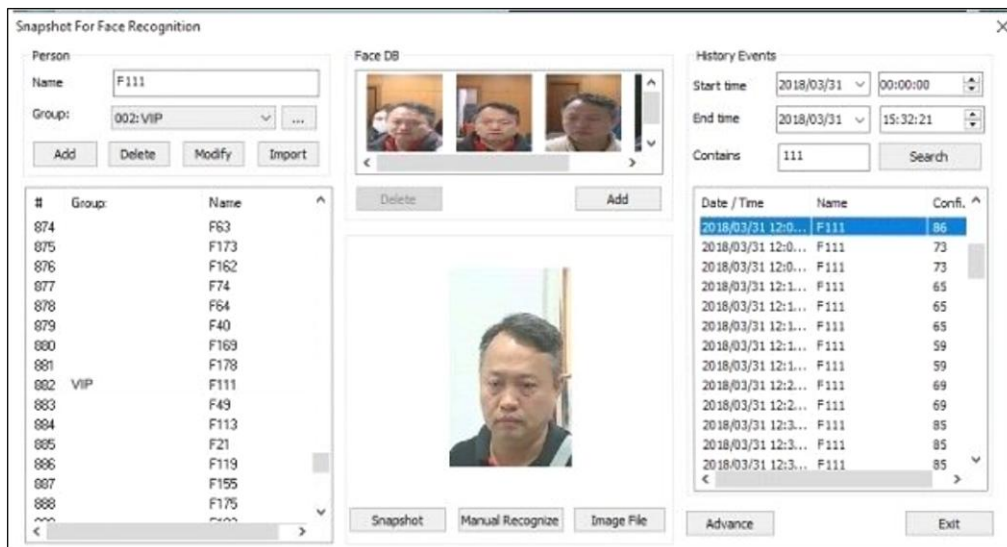
5.0 Add Faces Photo into Database

In camera property dialogue box, click Face Snapshot button. The snapshot of Facial Recognition dialogue box shows up for adding a face photo and entering personal information.

5.1 Add Photos Database for a Face

For adding face photos, follow the steps below:

- Enter the name.
- Click on “...” button for adding Group button.
- Select the group name.
- Click on the name list for deleting or modifying the person’s information.



Note: Manual Recognize is to know the level of recognition.

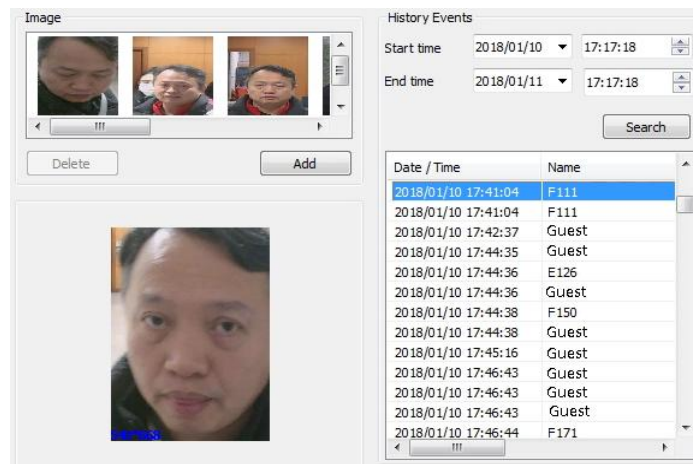
5.2 Adding Photos into Database

For adding a photo into the facial recognition database, you can click on Snapshot or click on Image File button. After a photo is loaded, you can click on Add button for adding into the facial recognition data base.

Note: The face of the photo needs to meet minimum pixel requirement.

5.3 Historical Recognized Data

The face photo recognized will be saved in the History Event list. Click on the name, the recognized photo can be displayed in the temporary area. Click Add button to add the photo to the database. If a face is not recognized, the face is added into guest list. You can add the photo into a database for elevating the recognition rate.

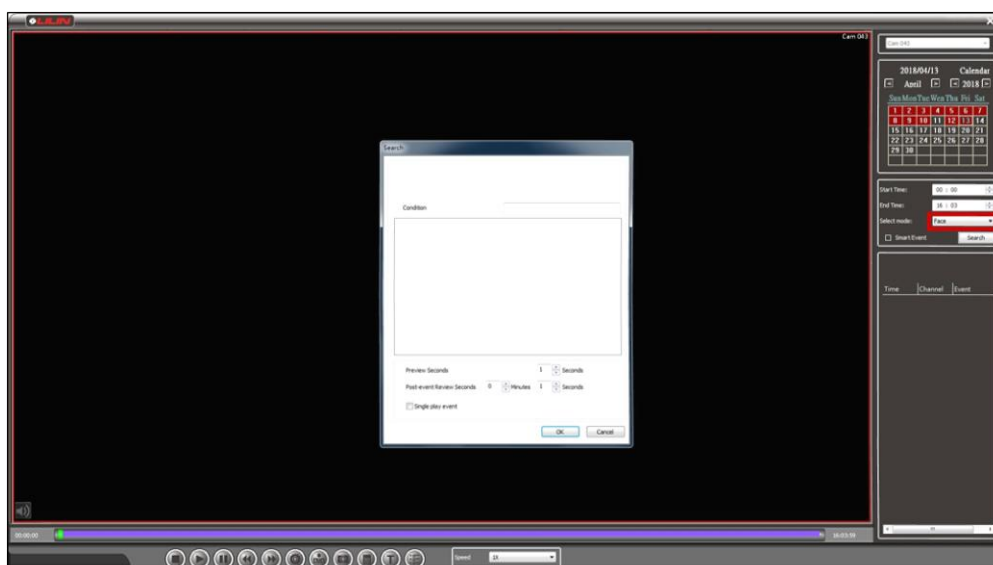


Note: It is highly recommended to have photos in different angles of a person.

6.0 Search the Name for the Video



Click on playback button and select Facial Recognition option. You are able to search the entire name list of recognition.



6.1 Playback

Click on the names after recognition for video playback.



7.0 Installations

For better recognition rate, follow the guidance for installation cameras.

- The environment of facial recognition cameras needs be at least 400Lux.
- The shutter speed of the camera should be 1/60 sec or 1/50 sec.
- Leveled camera installation facing a face at distance 3-5 meters.
- The pixel size of the photo should be 100 x 100 or higher.
- Do not use 4K cameras to slow down the recognition speed.

The following pictures are not good for facial recognition.

Angle of the face	Wearing a helmet	Mask blocking	Glasses too dark
			

7.1Face Photo Requirement

Gender and age detection requirements

- Face photo pixel requirement: 64 x 64 pixel or above
- Detectable face angle: up and down +/-30 degree, left and right +/-30 degree
- Environment minimum Lux: 400Lux~1000Lux
- Face detection condition: eyes, eyebrows, and nose cannot be blocked.

Facial recognition requirement

- Face photo pixel requirement: 100 x 100 pixel to 500 x 500 pixel
- Detectable face angle: up and down +/-15 degree, left and right +/-15 degree

- Recognition time: 1 second at 2000 photo db.
- Environment minimum Lux: 400Lux~1000Lux
- Face detection condition: eyes, eyebrows, and nose can not be blocked.
- Recognition distance: 0.5M~6M
- Shutter speed of the camera: 1/50 or 1/60 sec or higher
- Facial makeup might affect recognition rate.
- Avoid strong back light environment
- Increase camera brightness if the skin of a face is too dark or the camera faces strong back light.
- Do not use 2.2 mm and 2.8 mm lens due to distorted faces.

7.2 Confidence Rate and Pixel of a Photo

In general, the confidence rate of facial recognition might be affected by the pixel size of a photo. The following table describes examples of confidence rate and pixel size of a photo. However, the confidence rate could be also affected by poor lighting and bad video quality.

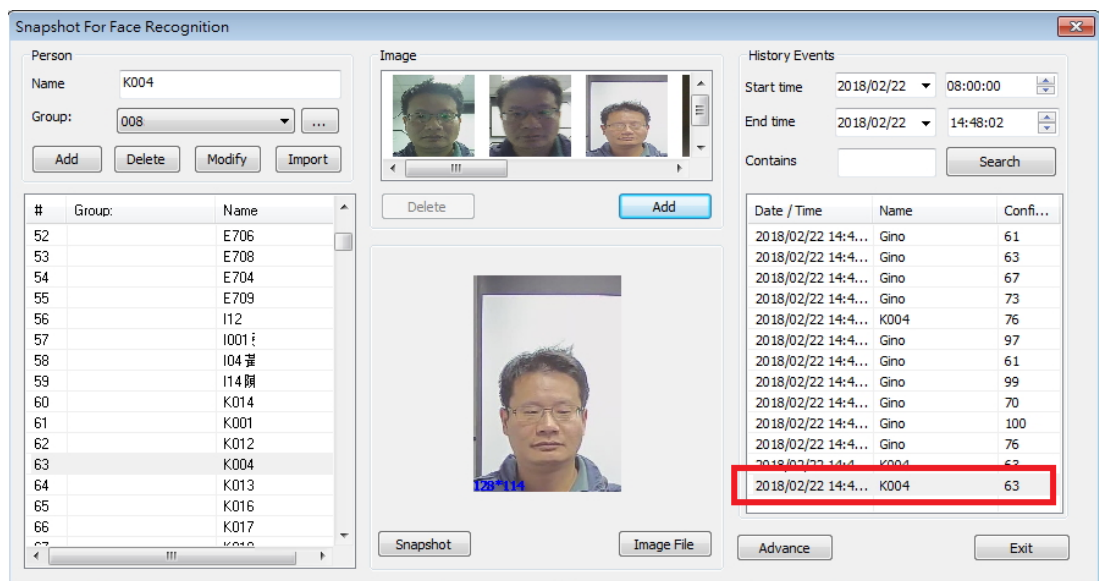
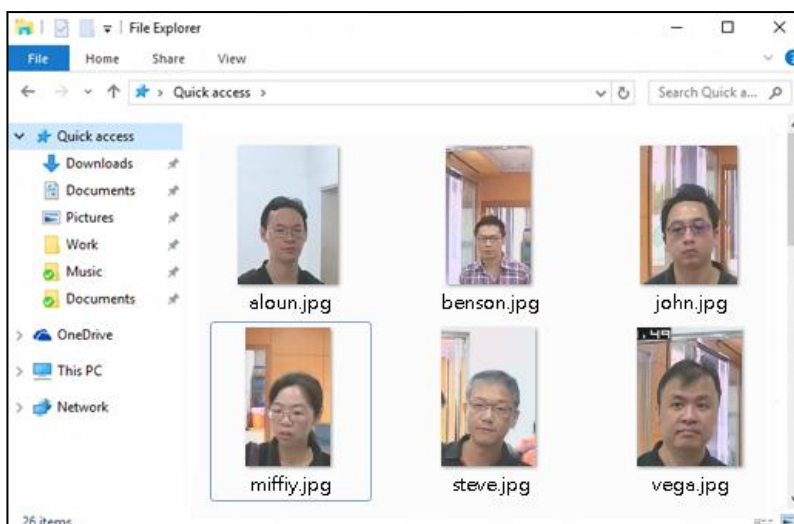


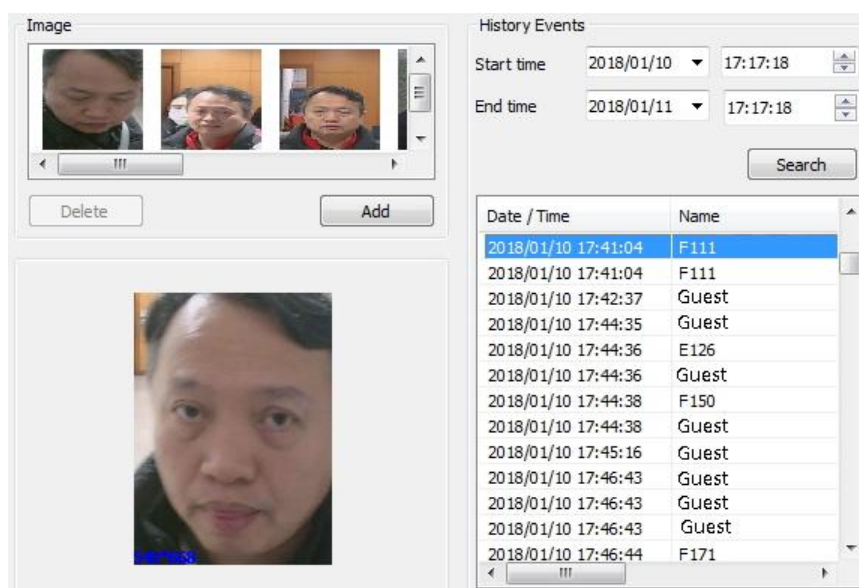
Photo resolution	128 x 114	320 x 310	430 x 430
Confidence	67%	86%	95%
			

7.3 Two Phases of Quick Face Photos Setup

For quick face database creation purpose, use Import feature for importing a batch of photos into face database after finishing cameras and NAV setup.



The face database has at least one face photo for a person. Utilizing the facial recognition feature, the camera keeps capture face photos for NAV to recognize. In History Event dialogue box, click Add button for adding the recognized photos for a person. For increasing the recognition rate, at least 5 photos of different angle of a person are highly recommended.



Datasheet

Items	Specification
Recognition speed	6~8 recognitions per second for a camera
Number of channels	4 cameras up to 15 recognitions / sec
Number of faces	Up to 4 faces per picture
Minimum face photo pixel requirement	80x80 pixel: 70% confidence rate, 300x300: 80% confidence rate, 450x450 pixel: 90% confidence rate
Detection distance	0.5 ~ 6m, face photo with 80x80 ~ 450x450 pixel
Video resolution supported	720P, 1080P
Maximum people detection allowed	600 people, 6000 photos database
Face training database	10 pictures for a person updatable from the guest list
Recognition rate	93.7% at 200 people database, recognition rate might drop and recognition rate might increase for big face database.
Recognition time	1 second at 2000 photo database
Detectable face angle	Up and down +/-15 degree, left and right +/-15 degree
Environment minimum Lux	400Lux ~ 1000Lux
Face photo db	Batch photos import
Face detected for alarm triggering	Full screen, OSD text, digital output triggering, buzzer, PTZ preset
Face lists	VIP list, unauthorized list, guest list
Guest list	Guest list allows added into face database (training)
Age and gender detection	Supported for SDK integration
Schedule	4 scheduling tables for alarm outputs and DO triggering
Camera supported	ONVIF IP camera and RTSP stream
System integration	SDK available
Video recording	16-ch Navigator 2.0 Corporate license
Hardware	
CPU	I7-7700 or higher
RAM	16GB DDR4-2400
OS	Windows 10 Embedded
SSD	PCIe 128GB SSD
HDDs	Up to 3 HDDs for recording
Applications	Access control, time and attendance, surveillance, denial list/VIP greeting management

Note: Do not use local motion detection if facial recognitions are activated for reducing CPU loading. Please use remote IP camera motion detection feature if necessary.