GeoVision inc
The Vision of Security

GV-AI FR

User's Manual



AIFRV121-UM-A

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Preface

Welcome to the *GV-AI FR User's Manual*. The instructions will guide you through the installation and use of the software.

This *Manual* is designed for the following GV-Software:

Software
GV-AI FR

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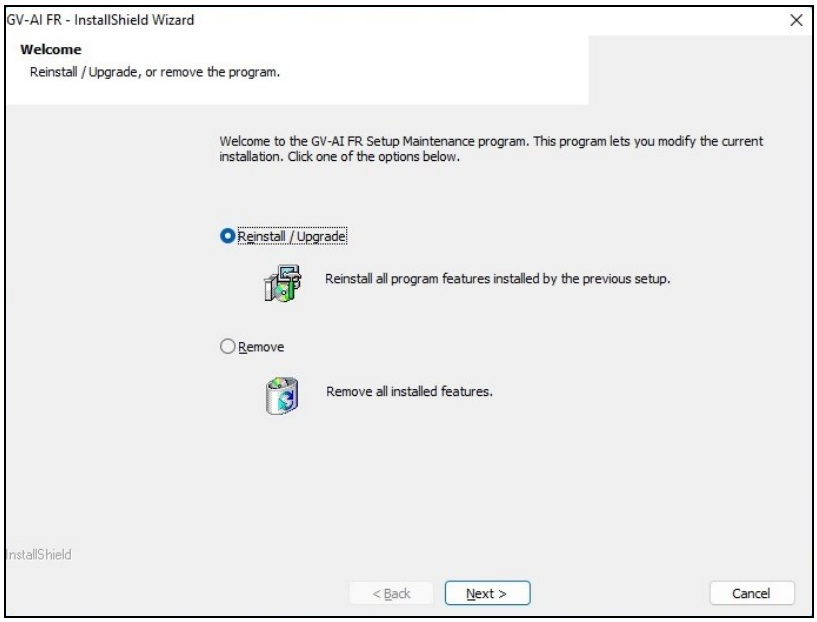
Note for Installing GV-IP Cameras

The following are some tips to consider when connecting to and installing GV-IP Cameras for face recognition:

- All cameras connected must be set to a resolution of 12 MP or lower.
- All cameras to be used for VA should not have Smart Streaming enabled as it may affect the VA's accuracy and results.
- Face Detection models are recommended as the ideal cameras to be connected to GV-AI FR for optimal face detection and recognition results.
- When connecting to 5 or more channels of IP cameras, it is recommended that they are installed at sites where the recognition targets are relatively stationary or moving directly toward the cameras for optimal recognition results.
- The feature of Liveness Detection works best when the recognition targets are relatively stationary and facing directly at the cameras in environments with stable lighting conditions.

Note for Upgrading GV-AI FR

To upgrade GV-AI FR, run the **Installer** (GV-AI FR setup.exe) included in the latest software downloads from our website. Select **Reinstall / Upgrade**.



Chapter 1 Introduction

GV-AI FR is a video analytic software designed to provide Face Recognition (FR) ability for up to 8 channels of IP cameras, and can be integrated into GV-VMS, a video management software, and/or GV-ASManager, via GV-Controllers, respectively for FR-triggered video recording and/or access management.



Note: For optimal recognition results, users are recommended to use GV-Face Detection (FD) Cameras.

Live Monitoring & Welcome

When a person enters the premises, a corresponding face recognition result, along with a predefined personalized image, can be displayed on the connected Welcome screen(s), playing advertisements, for greeting and/or commercial purposes.

Dashboard & Average Hourly FR Count

The **Dashboard** and **Hourly FR Count** features of GV-AI FR respectively display the distribution of age and gender of FR events within a day and an average hourly FR count for a selected day, week, month or year.

1.1 Key Features

- Support for up to 8 channels of IP cameras
- Realtime face recognition and tracking
- Average recognition speed of within 1 second per face when the recognition targets are moving toward the cameras
- Face Database managing up to 100,000 Face Profiles with 3 face images per profile
- Face profiling by age and gender
- Liveness detection for ensuring the persons recognized are not of inanimate objects, such as printed photos, during recognition
- Automatic compilation of statistical graphs for the number and distribution of age and gender of the faces recognized entering and exiting the premise
- Exportable daily / weekly / monthly / yearly average hourly face recognition count
- Query by face recognition events
- Integration of GV-VMS for video recording and management
- Integration of GV-ASManager for access management by pairing access data to Face Profiles
- Master and Slave feature for interconnecting multiple GV-AI FRs with a centralized Face Database
- Support for connecting to 3rd-party controllers for access management via GV-FWC within the LAN and/or GV-COM V3 + GV-WTR by physical connection

1.2 System Requirements

- For the minimum PC requirements for connecting and performing face recognition with up to 4 and 8 channels of IP cameras., see the datasheet.
- GV-AI FR is a paid software that requires a GV-Dongle License, which is available in increments of 1 channel, from 1 – 8 channels. For details, see the datasheet

1.3 Optional Accessories

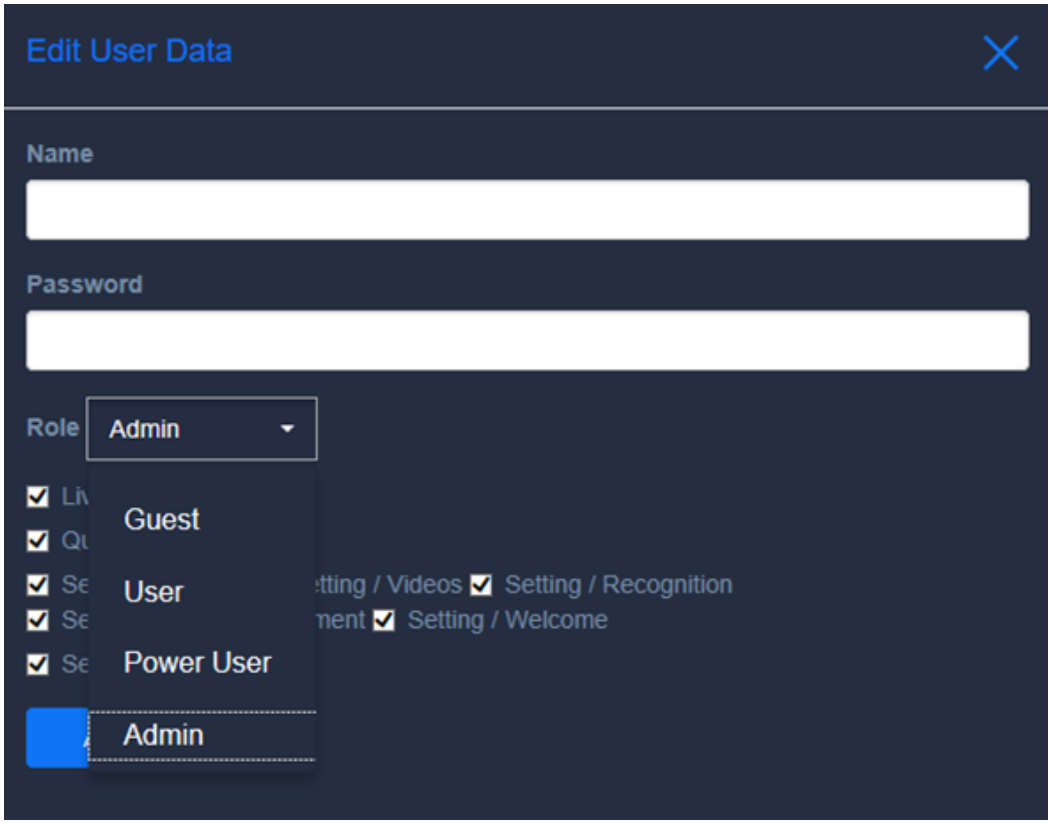
The following optional accessories are available for purchase to expand the capabilities and versatility of GV-AI FR. Contact your local dealer for details.

Optional Accessories	Details
GV-COM V3	By connecting to the USB port of a PC, GV-COM V3 is able to integrate 1 RS-485 port to your system.
GV-FWC	GV-FWC integrates GeoVision face-recognition-based cameras, software and readers into access control systems by sending access card data, paired to Face IDs, to controllers either through TCP/IP or Wiegand connection. See *6.2 Connecting 3rd-party Controllers*.
GV-IO Box (Ethernet) Series	GV-IO Box series (4E / 8E / 16E) provide 4 / 8 / 16 inputs and relay outputs and support Ethernet module, with 4E additionally supporting PoE connection. See *4.4.3 IO Box*.
GV-WTR	GV-WTR is a converter designed for converting Wiegand interface to RS-485 interface, and vice versa. It enables 3rd party readers to be connected to RS-485 GV-Controllers, as well as allowing GV-AI FR (software) and GV-CR1320 (RS-485 camera reader) to be connected to 3rd-party Wiegand controllers. See *6.2 Connecting 3rd-party Controllers*.

Chapter 2 Getting Started

2.1 Installation

1. Download GV-AI FR from the GeoVision's website and execute *GVFRServerInstaller.exe* to install.
2. To use an USB dongle, make sure the driver **GV-Series Card Driver / USB Devices Driver** is properly installed, from the GeoVision's website, and insert the dongle.
3. Upon first-time startup, users are required to set a new **Username** and **Password** for the administrator account after logging in with their default values of *admin*, *admin*.

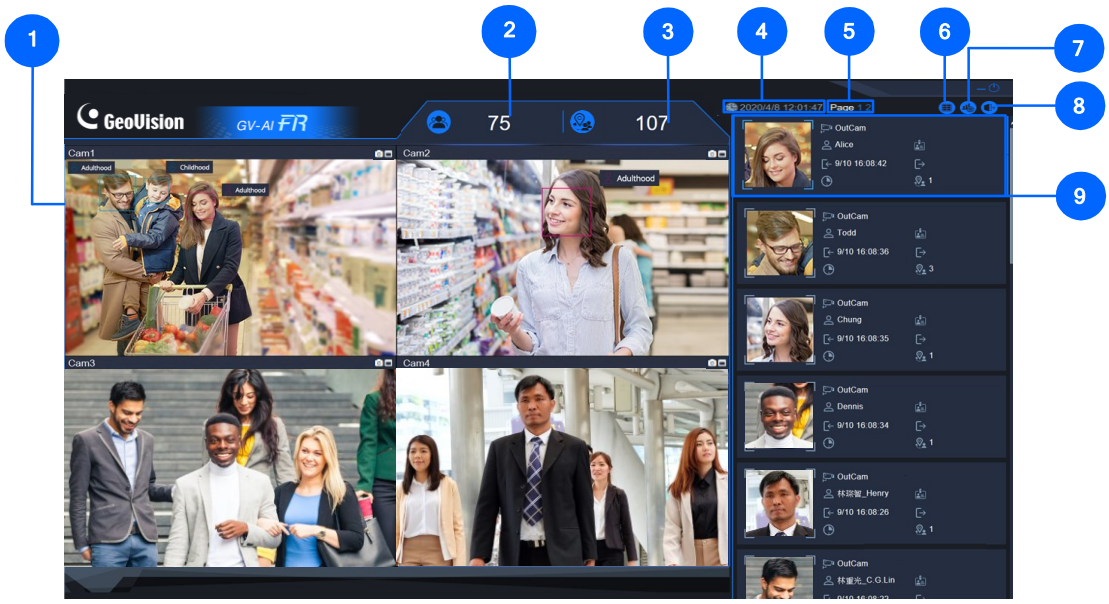


Note:

1. Upon first-time login, users are required to perform a one-time installation of the Windows OCX plugin in order to run the program
2. For different account settings and their privileges, see *4.2.5 Account & Authority*.

2.2 Main Screen

After logging into GV-AI FR, the following main screen appears.

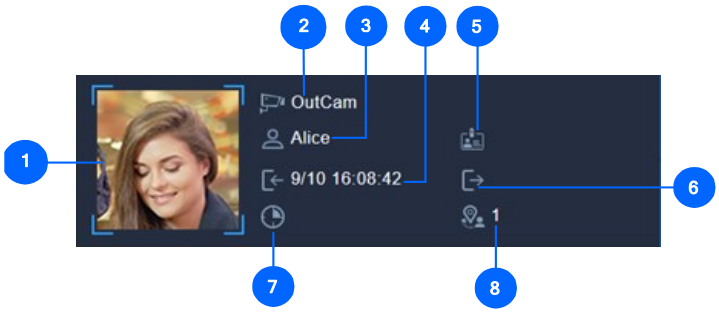


No.	Name	Description
1	Live View	Displays the live view of IP cameras connected.
2	Unique Face Count	Counts the number of unique face recognition events, the number of individuals recognized, within the day.
3	Total Face Count	Counts the total number of face recognition events within the day.
4	Time	Displays the current system date and time.
5	Page 1 / 2	Click **Page 1** or **2** to switch between the live views of camera channels 1 ~ 4 and camera channels 5 ~ 8.
6	FR List	Accesses the FR List, which simultaneously displays up to 60 realtime face recognition events. See *2.2.2 FR List*.
7	Dashboard	Accesses the following: ● Welcome — Previews the welcome screen to be displayed by the connected Welcome Monitor upon face recognition. For related settings, see *4.4.1 Welcome Settings*. ● Dashboard — Displays the face recognition events, by age and gender, within the day, see *4.1 Dashboard & Analysis*. ● Analysis — Displays the face recognition data in a given day, week, month or year, see *4.1 Dashboard & Analysis*.

		• General Settings — Accesses the settings of GV-AI FR, such as system, camera and face recognition, see *2.3 Basic Settings*. • Face Management — Manages the face recognition database of GV-AI FR, see *Chapter 3 Face Recognition*. • Notify Settings — Configures notification settings, see *4.4 Notify Settings*. • Event Query — Displays and searches for face recognition events and system logs in chronological order. See *3.3 Recognition Events*.
8	Logout	Logs out of the system.
9	Face Profile	Displays the latest faces recognized by the connected cameras, in chronological order. See *2.2.1 Face Profile*.

2.2.1 Face Profile

Next to the live view on the main screen, Face Profiles are displayed in chronological order, with the most recent face recognition events at the top.



No.	Name	Description
1	Face Snapshot	The face snapshot captured upon the face recognition event.
2	Camera Channel	The camera channel where the face recognition event occurred.
3	Face Profile	The face profile of the person recognized.
4	Entrance time	The time of the person recognized entering the vicinity, as determined by recognition events at cameras set as *Door(In)*. See *3.1 Configuring Recognition Settings*.
5	Face Group	The Face Group in which the Face Profile is categorized under, which is displayed as *Unknown* when unrecognizable.
6	Exit time	The time of the visitor exiting the vicinity, determined by the face recognition of cameras positioned at *Door(Out)*. See *3.1 Configuring Recognition Settings Cameras*.

7	Dwell time	The amount of time the person stayed in the vicinity (from Entrance time to Exit time).
8	Recognition Count	The number of times the person is recognized within a day.

2.2.2 FR List

The FR List can display up to 60 realtime face recognition events simultaneously. To access, click **FR List** on the main screen of GV-AI FR (No. 6, *2.2 Main Screen*).



To pause the updating of the FR List, click the  button.

2.3 Basic Settings

This section will guide users through some of the basic settings of GV-AI FR, as listed below:

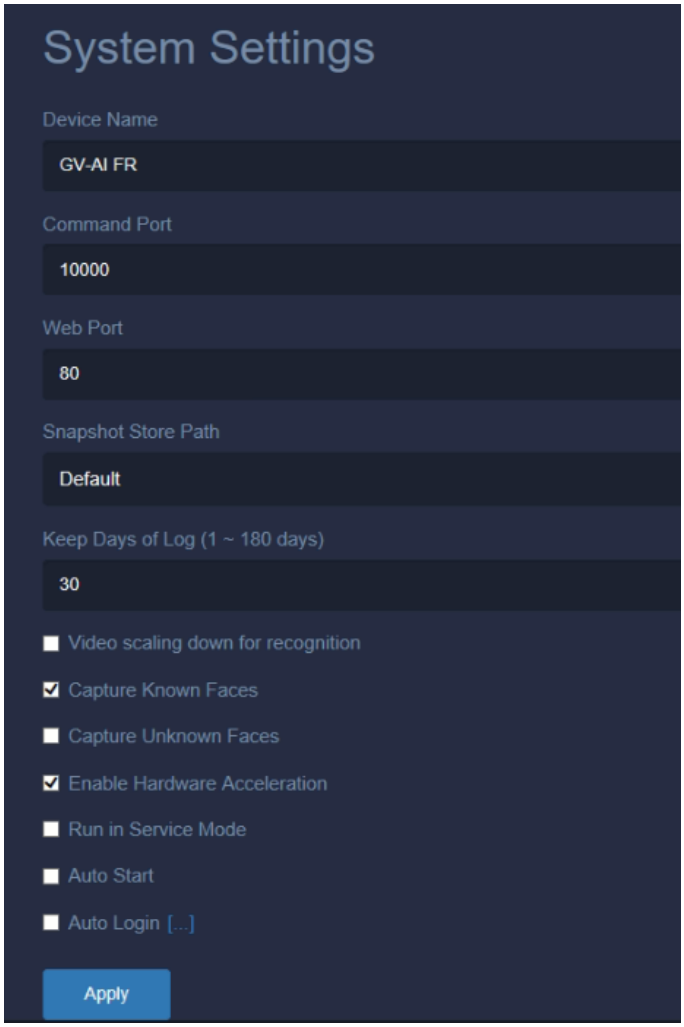
- General Settings: See *2.3.1 Configuring System Settings*.
- Camera Setup: See *2.3.2 Adding IP Cameras*.

For face recognition related settings, see *Chapter 3 Face Recognition*.

For other advanced settings, see *Chapter 4 Advanced Settings*.

2.3.1 Configuring System Settings

To configure the system settings of GV-AI FR, click **Dashboard** (No. 5, *2.2 Main Screen*) > **General Settings** > **System Settings**



- **Device Name:** Type a desired name for the GV-AI FR.
- **Command Port:** Modify the default port of *10000* if necessary.

- **Web Port:** Modify the default port of *80* if necessary.
- **Snapshot Storage Path:** Select the storage path to save the captured and encrypted face snapshots
- **Keep Days of Log (1 ~ 180 days):** Define the number of days face recognition event logs are kept for.
- **Video Scaling Down for Recognition:** Disabled by default, reduce the system loading by compressing the videos of 4 MP / 5 MP to 1 MP for face recognition.
- **Capture Known Faces:** Enabled by default, all faces captured upon face recognition are saved and displayed on GV-AI FR. Optionally deselect to disable.
- **Capture Unknown Faces:** Disabled by default, record and display unrecognizable faces.
- **Enable Hardware Acceleration:** Enabled by default, use GPU decoding to reduce the CPU loading of the PC.
- **GPU Decode:** Enable / disable GPU decoding.
- **Run in Service Mode:** Enable to continue running the program after logging out of Windows.
- **Auto Start:** Enable to automatically run GV-AI FR after the PC is started.
- **Auto Login […]:** Enable to automatically log in with the desired set of credentials, and display the main screen or one of the welcome screens upon starting of GV-AI FR. For the details of welcome screen and related settings, see *4.4.1 Welcome Settings*.

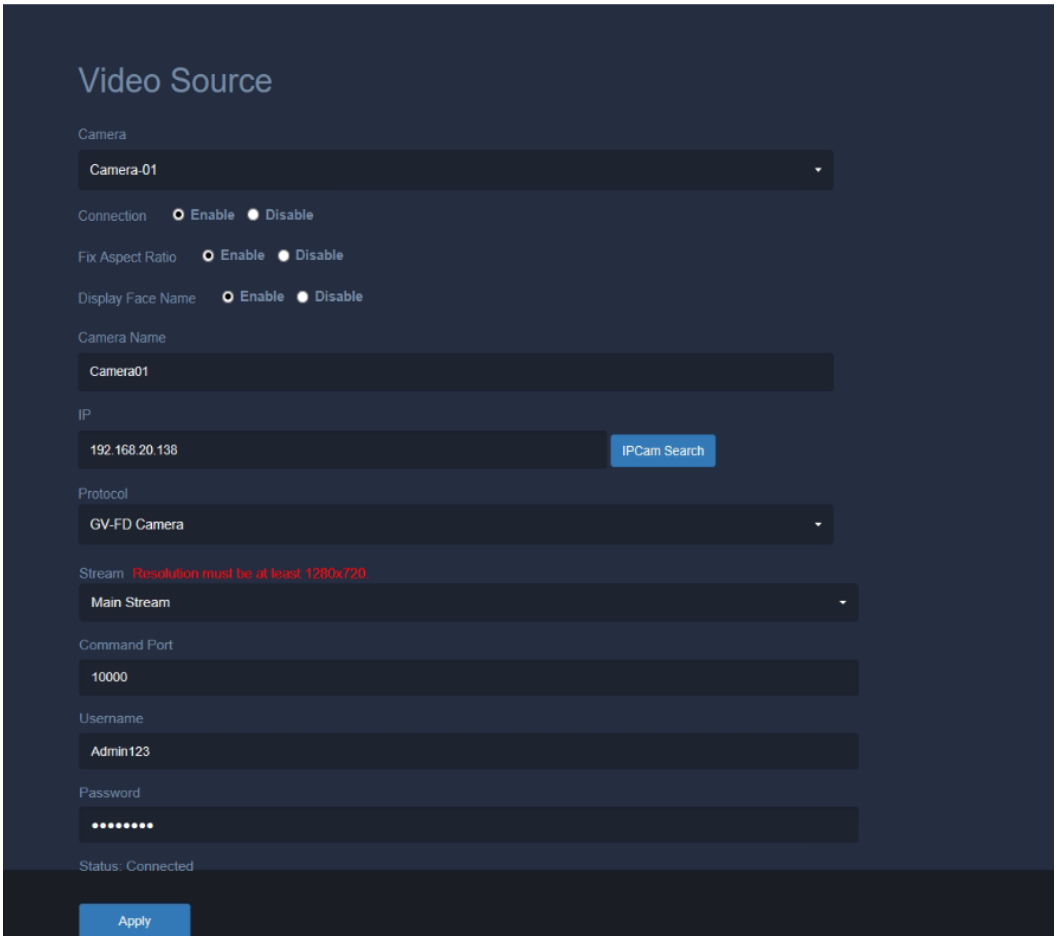
2.3.2 Adding IP Cameras

Note:

1. Make sure the IP cameras to be added are installed within the same LAN as GV-AI FR.
2. Any IP cameras to be added to GV-AI FR must first be set to a resolution of 12 MP or less.
3. Make sure all IP cameras to be used for Video Analytics does not have Smart Streaming enabled as it may affect the accuracy and results of the Video Analytics.

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1. From the main screen, click **Dashboard** (No. 5, *2.2 Main Screen*) > **General Settings** > **Video Source**.



2. Select one of the 8 channels for the IP camera to be connected under from the **Camera** dropdown list.
3. Enable **Connection** for the live view of the camera to be streamed to GV-AI FR.
4. Optionally enable **Fix Aspect Ratio** and **Display Face Name** to respectively keep the original aspect ratio of the video source and display the recognition results of the recognition targets on the live view.
5. Type a desired name for the camera channel under **Camera Name**.
6. Select one of the following as the **Camera Type/Protocol**:
   - **ONVIF**: For all GeoVision and/or 3rd-party IP devices via ONVIF protocol.
   - **RTSP(TCP)** / **RTSP(UDP)**: For all IP devices via RTSP(TCP) / RTSP(UDP).
   - **USB Webcam**: For webcam cameras connected via USB.
   - **GV-FD Camera**: For connecting to GV-Face Detection cameras only. For details on GV-Face Detection Cameras, see Face Detection models.

7. Type the **IP**, **Command Port** and login **Username** and **Password** of the camera to be added.
8. Optionally select **Main Stream** / **Sub Stream** from the **Stream** dropdown list.
9. Click **Apply**. After the camera is successfully connected, a Status of Connected is shown.



10. To add more cameras, select a different channel under the **Camera** dropdown list and repeat Step 3 – 8.

Chapter 3 Face Recognition

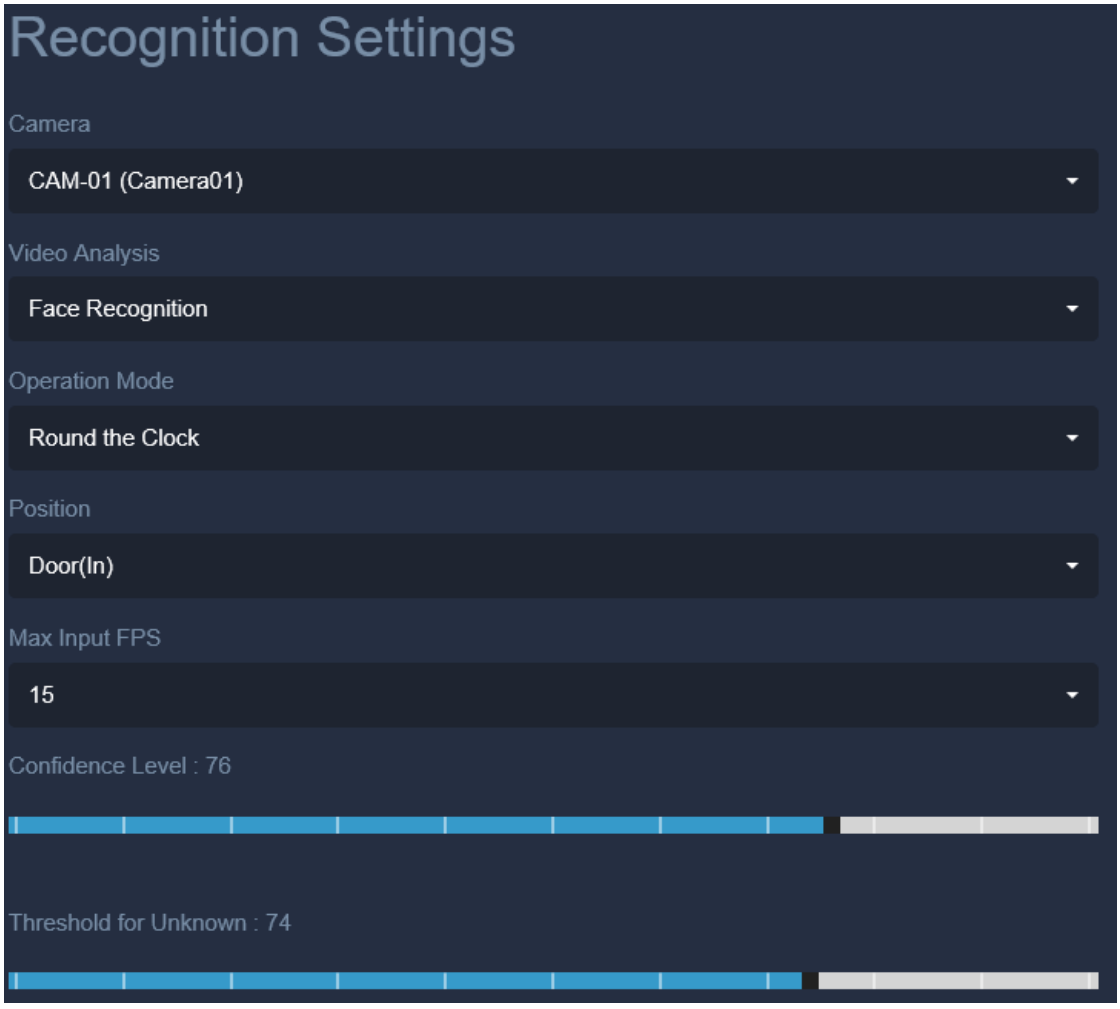
This chapter will guide users through all of the configurations related to face recognition, as listed below:

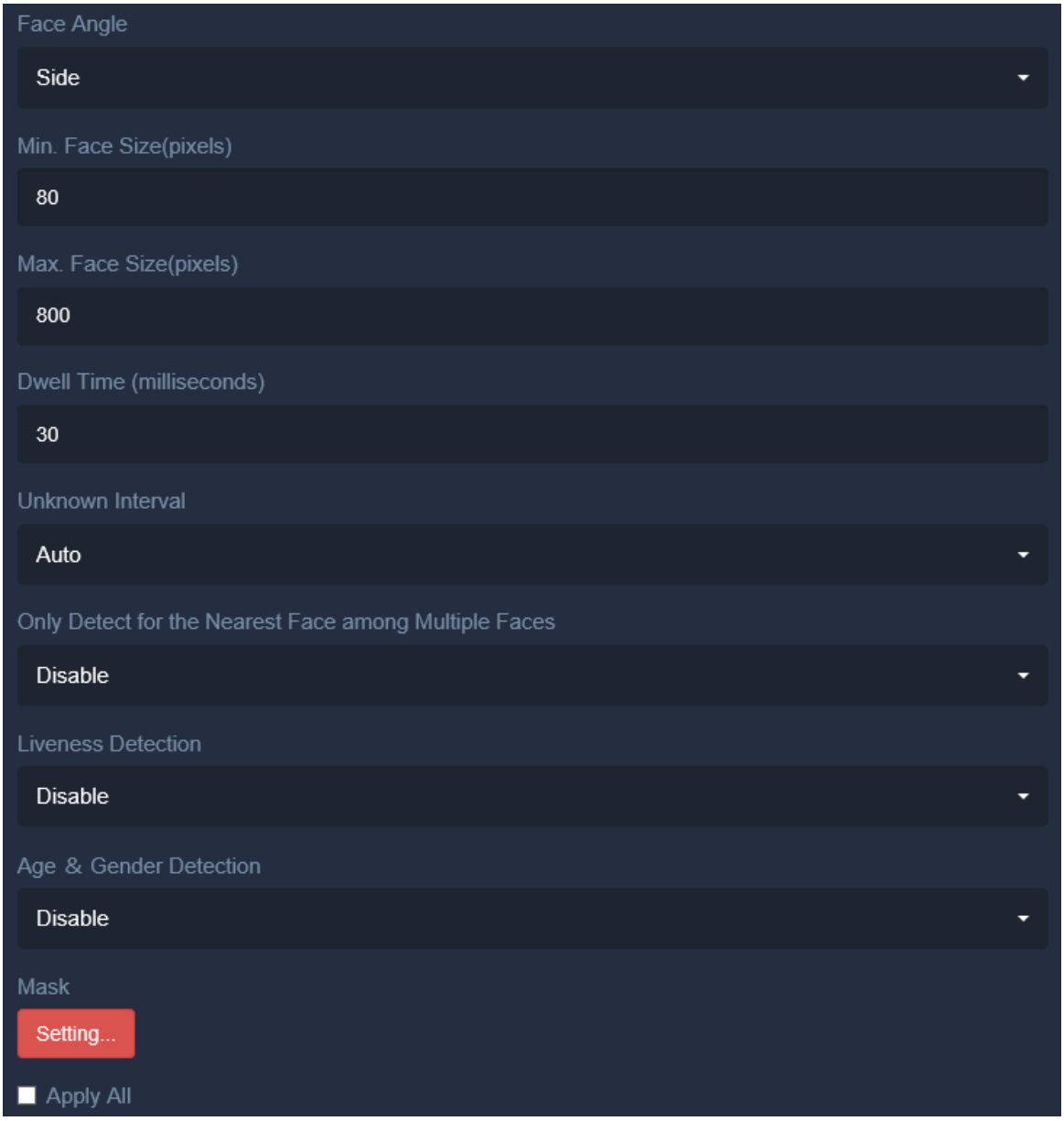
- **Enabling Face Recognition:** See *3.1 Configuring Recognition Settings*.
- **Enroll Faces:** See *3.2 Enrolling Face Data*.
- **Grouping Face Profiles:** See *3.3 Managing Face Groups*.

3.1 Configuring Recognition Settings

Note: To use face recognition, make sure there is at least one IP camera connected to GV-AI FR, see *2.3.2 Adding IP Cameras*.

1. To enable face recognition, click **Dashboard** (No. 5, *2.2 Main Screen*) on the main screen and select **General Settings** > **Recognition Settings**.





2. Select the camera channel in which to configure face recognition settings for from the **Camera** dropdown list.
3. Select *Face Recognition* under **Video Analysis** to enable face recognition.
4. Under **Operation** Mode, select **Round the Clock** or **Start/Stop by Trigger** to always perform face recognition or only recognize faces as controlled by event trigger(s), respectively.
5. Select a **Position** for the camera to be added from *Door(In)* and *Door(Out)*.
   - **Door(In):** Faces recognized from this camera are identified as persons entering the vicinity.
   - **Door(Out):** Faces recognized from this camera are identified as persons exiting the vicinity.

6. Optionally adjust the maximum frames per second under **Max Input FPS**.
7. Adjust the **Confidence** level, from 0 to 100. The higher the level, the more definitive and stricter the camera is toward distinguishing between similar faces upon face recognition.
8. Adjust the **Threshold for Unknown**. Recognition events below this value of confidence are recorded as unknown.
9. Select the **Face Angle** for the face recognition to perform under, as listed below:
   - **Front:** Faces are recognized for when they are facing the camera at a horizontal deviation of 0 ~ 15 degrees and a vertical deviation of 0 ~ 10 degrees.
   - **Side:** Faces are recognized for when they are facing the camera at a horizontal deviation of 0 ~ 25 degrees and a vertical deviation of 0 ~ 20 degrees
   - **Any Angle:** Faces are recognized for when they are facing the camera at a horizontal deviation of 0 ~ 45 degrees and a vertical deviation of 0 ~ 30 degrees.
10. Optionally modify the following settings:
    - **Min. Face Size(pixels)** and **Max. Faze Size(pixels):** Only the faces within this size range are recognized for.
    - **Unknown Interval:** The amount of time before face recognition can be performed again on recognition targets that have been identified as unknown.
    - **Only Detect for the Nearest Face among Multiple Faces:** Only the largest face detected are recognized for when there are two or more faces at a time.
    - **Liveness Detection:** Only record face recognition events as valid on targets detected as live and moving, in preventing the use of inanimate objects, such as printed photos, for face recognition.

Note:

1. With the optimized recognition engine for GV-AI FR V1.1 or later versions, it is no longer required to set the **Dwell Time** for face recognition.
2. In terms of anti-spoofing applications, liveness detection isn't applicable to all situations 100% of the time. For a higher level of security, the integration of GV-FWC and GV-ASManager for two-factor authentication, face recognition + access card, is strongly suggested.

- **Age & Gender Detection:** Detect for the estimated age range and gender of the faces recognized.
- **Mask:** Mask areas on which face recognition will not be performed.

11. Optionally select **Apply All** to apply the same recognition settings to all camera channels.
12. Click **Apply**. Face recognition is now enabled for the channel selected and will recognize Face Profiles as enrolled within Face Management.

Note: To enroll face images and create Face Profiles for face recognition, see *3.2 Enrolling Face Data*.

3.2 Face Enrollment

There are 3 ways to enroll face images into GV-AI FR, as listed below:

- **Manual Enrollment:** See *3.2.2 Creating Face Profiles*.
- **Enrolling Unknown Recognition Events:** See *3.3.1 Enrolling via Query*.

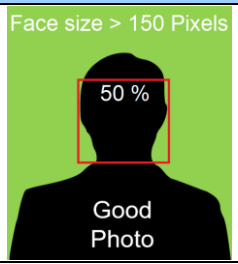
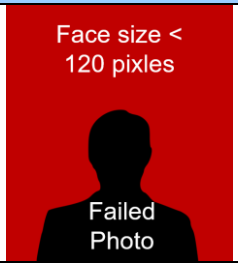
Regardless of the method of enrollment, the face images used must meet the criteria as specified in *3.2.1 Photo Requirements*.

3.2.1 Photo Requirements

All face images to be enrolled as the basis of face recognition must meet the following criteria:

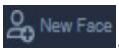
- Each photo must consist of only one face directly facing the camera.
- Do not use camera filters or wear a face mask.
- Make sure your hat, head covering, or hair does not block your eyebrows.
- Size of the face within the photo is greater than 150 pixels.
- Only JPEG format is supported.
- Make sure the face of the person does not occupy more than 50% of the image.

See examples below:

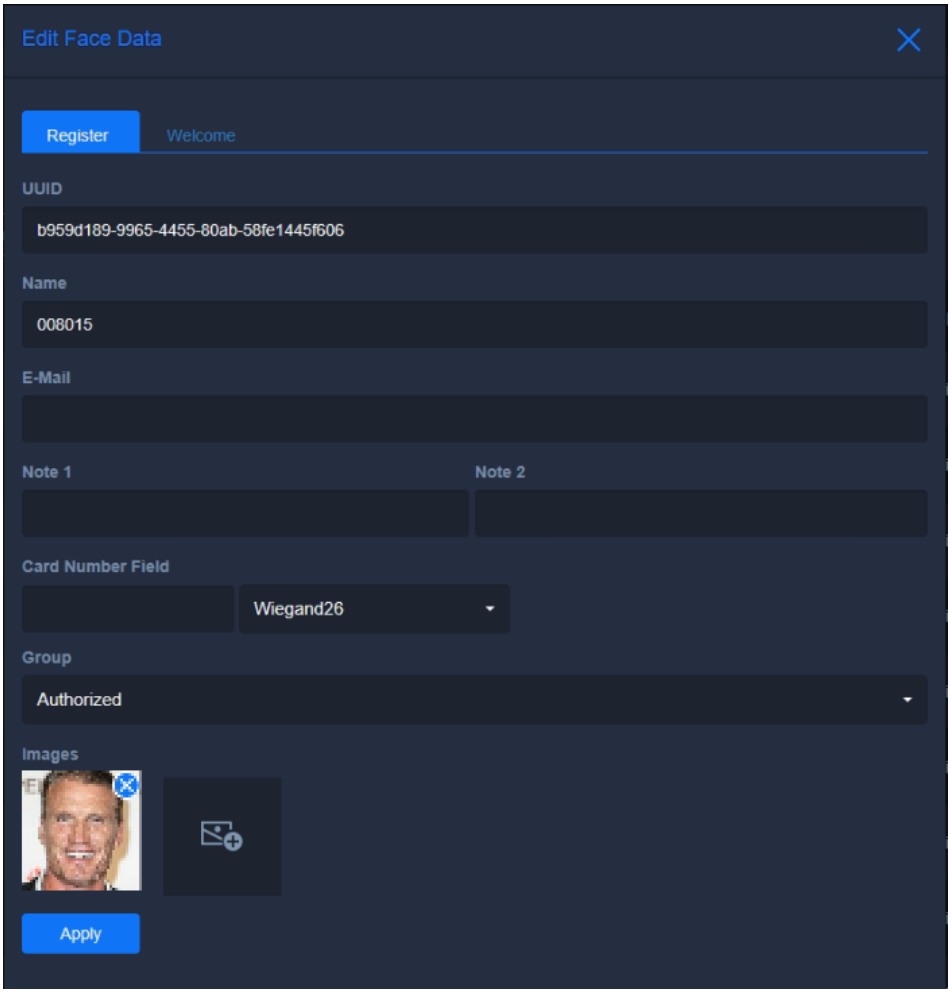
Ideal	Failed to enroll – 1	Failed to enroll – 2
		
The face occupies less than 50% of the image. The size of the person's face is greater than 150 pixels.	The face occupies more than 50% of the image.	The size of the person's face is less than 120 pixels.

3.2.2 Creating Face Profiles

To manually enroll face images and create Face Profiles on GV-AI FR, follow the steps below.

1. From the main screen, click **Dashboard** (No. 5, *2.2 Main Screen*), select **Face Management** > **Face Profiles** and click **New Face** 

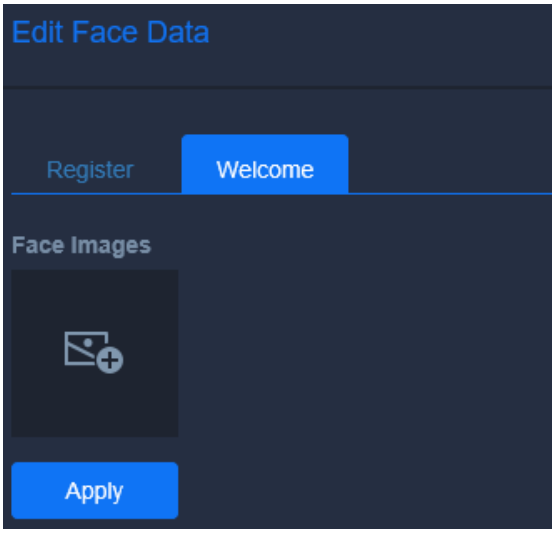
. This window appears.



2. Type a desired name for the Face Profile under **Name**.
3. Optionally type an e-mail account and notes for the Face Profile under **Note 1** and **Note 2**.
4. For integrating face recognition into access control systems, such as *GV-ASManager*, type a card number in the **Card Number Field** for the Face Profile to be paired with.
5. Select a **Group** for the Face Profile to be categorized under. To create and/or edit Face Groups, see *3.4 Editing Face Groups*.
6. Click the icon under **Images** to browse for and add face images for the Face Profile. Face images used must follow the criteria as specified in *3.2.1 Photo Requirements*.
7. Click **Apply**. The Face Profile is created.

Face Image

In the **Welcome** tab of **Edit Face Data**, optionally browse for a **Face Image**, which can be displayed on the Welcome screen upon recognizing of the Face Profile. For details on the Welcome screen settings, see *4.4.1 Welcome Settings*.



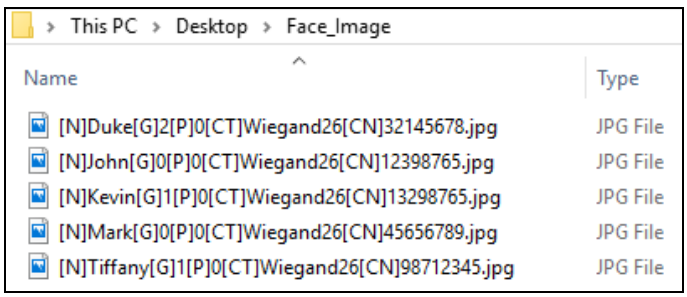
3.2.3 Batch Enrolling Faces

1. To enroll multiple face images, save all of the face images, which must follow the criteria as specified in *3.2.1 Photo Requirements*, to the same folder on your PC and rename them as exemplified below:

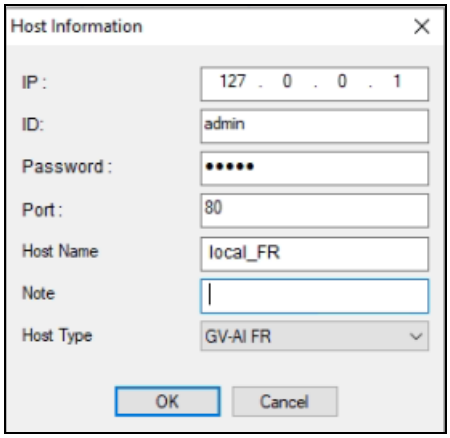
   [N]< Face Profile Name>[G]<Group No. – 1>[P]<Photo No. – 1>[CT]<Card Type>[CN]<Card Number>[ID1]<Note 1>[ID2]<Note 2>.jpg

   For example, [N]John[G]0[P]0[CT]Wiegand26[CN]12398765.jpg

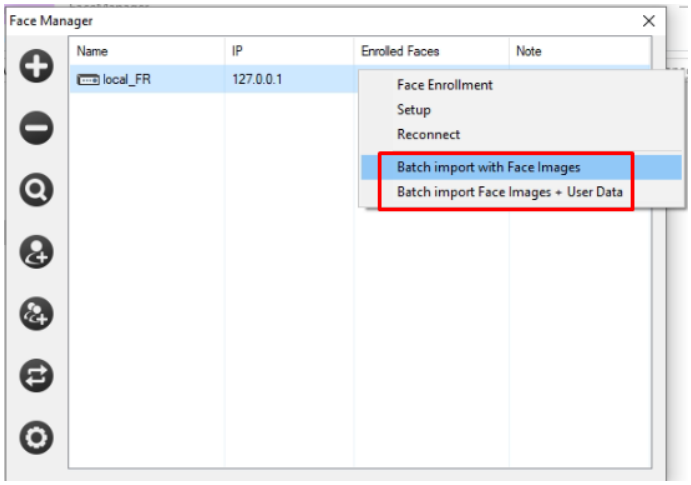
   The above image file will be added to Face Profile John, as its first photo, while being assigned an access card with Wiegand26 card type, a card number of 12398765, being categorized under Group 1, and with no data in its Note 1 and Note 2 fields.



2. Once all the face images are named properly and saved under the same folder, run **FaceManager.exe** from the GV-AI FR > FaceManager directory (C:\GV-AIFR\FaceManager).
3. Upon first-time execution, the user is required to set a login ID and Password for the Face Manager.
4. After logging in, click **Add Host** and type the **IP address**, **Port**, the login **ID** and **Password** and a desired **Host Name** for the GV-AI FR, and click **OK**.



5. Once the GV-AI FR is added to Face Manager, right-click on it and select **Batch import with Face Images** or **Batch import Face Images + User Data** to respectively batch enroll the face images *without* or *with* their paired access card data.



6. Select the folder and click **Select Folder**. All the face images saved within are imported into the GV-AI FR.

Note: For further details on the different functions of Face Manager, see *Face Manager User's Guide*.

3.3 Recognition Events

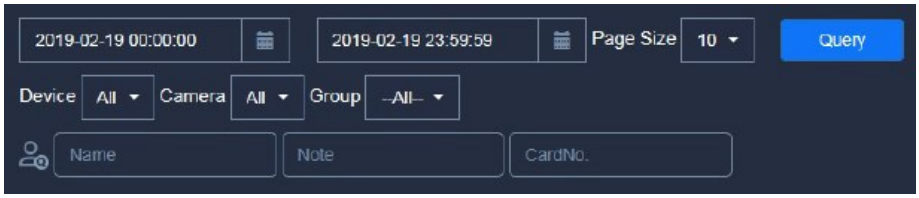
The **Event Query** stores all face recognition events and allows users to search for certain events during a specified time, as well as enroll the face snapshots of unknown recognition events into new or existing Face Profiles.

Note: For GV-AI FR to record and display recognition events, make sure there is at least one IP camera connected with the recognition function enabled, see *2.3.2 Adding IP Cameras* and *3.1 Configuring Recognition Settings*, respectively.

There are four types of event logs for face recognition events, which can be accessed by clicking **Dashboard** (No. 5, *2.2 Main Screen*) > **Event Query**:

- **Detail Log:** Records and displays the *Camera*, *Face Group*, *Name*, *Notes*, *Wiegand Card No.* and *Time* of all recognition events.
- **Invalid Detection Log:** Records and displays the *Camera*, *Type.* and *Time* of all abnormal recognition events.
- **Advanced Log:** Records and displays the *Gender*, *Age*, *Face Group*, *Name*, *Notes*, *Wiegand Card No.*, as well as the *Entering* and *Exit Time* of the Face Profiles recognized.
- **System Log:** Records and displays the system logs of the GV-AI FR.

When accessing **Detail** / **Invalid Detection** / **Advanced Log**, apply the desired search criteria and click **Query**.

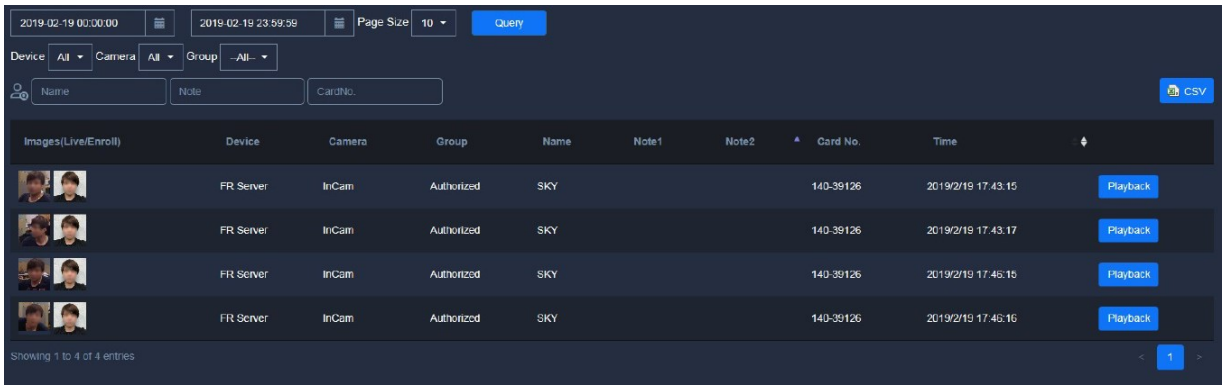


1. Select the start and end date/time of the events searched.
2. Optionally select the necessary **device**, **camera channel** and/or **face group** from the respective dropdown lists.
3. Not applicable to Invalid Detection Log, optionally type the necessary Face Profile name, note and/or access card number in the respective fields.
4. Only for **Detail Log**, choose to sort the search results by **Time** or **Name**.
5. Only for **System Log**, choose the **Category** of log to be searched for.

The search results are displayed based on the criteria set, with the data explained below.

- **Images (Live/Enrolled):** Displays the face snapshot captured upon the face recognition event, along with the face image already enrolled for the Face Profile recognized.
  - ⊙ For unknown recognition events, the face image shown next to the snapshot is of the Face Profile that the system determines to be most similar to the unknown face.
- **Group:** Displays the Face Group in which the recognized Face Profile belongs to. This field is displayed as *Unknown* if the face recorded is unrecognizable.
- **Gender:** Displays the gender of the face recognized as determined by GV-AI FR.
- **Age:** Displays the estimated age of the face recognized as determined by GV-AI FR.
- **Name:** Displays the name of the Face Profile recognized.
- **Note:** Displays the notes of the Face Profile recognized.
- **Card No:** Displays the Wiegand card number paired to the Face Profile recognized.

[Detail Log]



The following are data / options only available in **Detail** / **Invalid Detection Log**.

- **Camera:** Displays the camera channel where the face recognition event occurred.
- **Time:** Displays the time of the face recognition event.
- **Playback:** Only for Detail Log, click to play back recordings of the face recognition event.
- **Type:** Only for Invalid Detection Log, displays the type of invalid detection the event was identified as.

Note: For playing back recognition events, the camera channel where the event occurred must be connected to GV-VMS, with video recording enabled, see *Chapter 5 GV-VMS Integration*.

[Advanced Log] The following are data / options only available in **Advanced Log**.

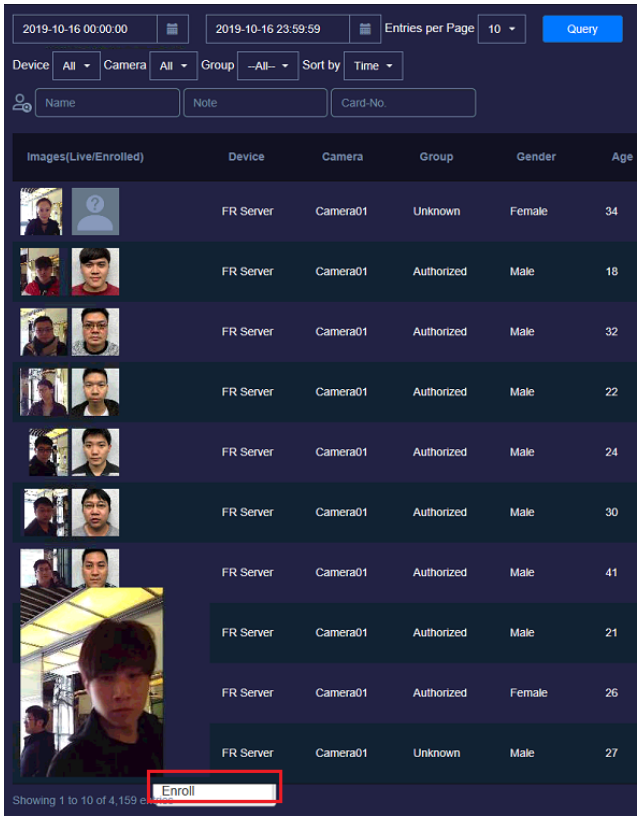
- **In** / **Out Time:** Displays the most recent entering and exiting times of the Face Profile recognized.
- **Stay Time:** Displays the amount of time the person recognized stayed within the vicinity.

Exporting Logs

On the Event Log pages, users can also export the event logs displayed as an *.csv* or *.html* file by clicking CSV or HTML. When exporting, all ongoing and finished export tasks are displayed on the **Exported Files** page, which can be accessed by clicking **Dashboard** (No. 5, *2.2 Main Screen*) > **Event Query** > **Exported Files**.

3.3.1 Enrolling via Query

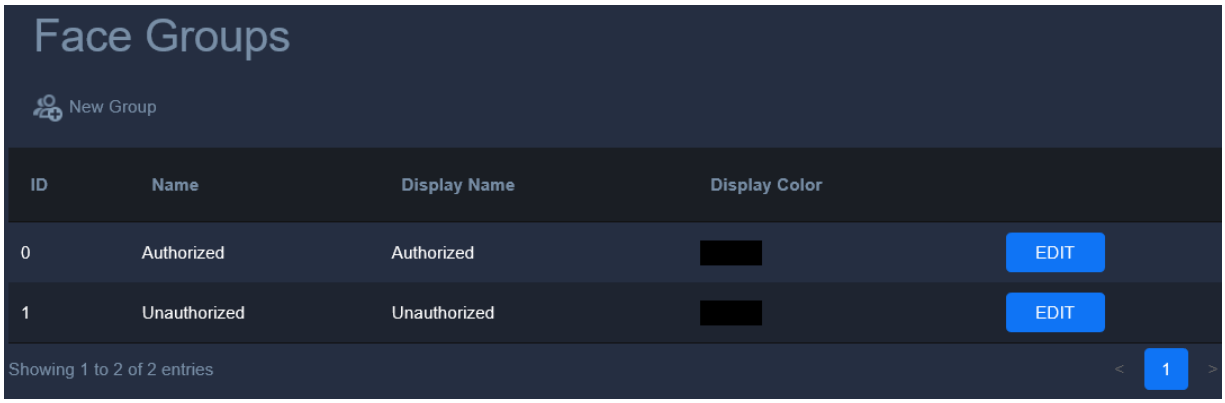
1. To enroll face snapshots of unknown recognition events, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Event Query** > **Detail Log** and follow Step 1 – 4 in *3.3 Recognition Events* and click **Query**.
2. Right-click on the snapshot of an unknown recognition event and click **Enroll**.



3. Follow Step 2 – 5 in *3.2.2 Creating Face Profiles*.
4. Click **Apply**. A new Face Profile is created.

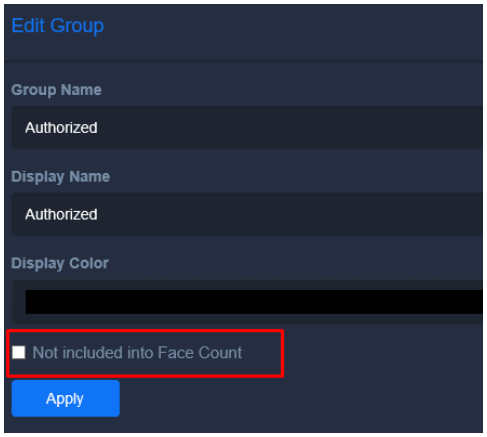
3.4 Face Groups

From the main screen, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Face Management** > **Face Groups**. The Face Groups page appears, which allows users to create new Face Groups and/or edit existing ones, for the Face Profiles to be categorized under.



- **New Group:** Click to create a new Face Group.
- **ID:** Displays the ID number of the Face Group.
- **Name:** Displays the name of the Face Group
- **Display Name:** Displays the name of the Face Profile as shown on the **Welcome** page, see *4.4.1 Welcome Settings*.
- **Display Color:** Highlights all Face Profiles within this Face Group with the color selected.
- **Edit:** Click edit to modify the Face Group.

When creating or editing a Face Group, optionally select **Not included into Face Count** to not include any face recognition events of that Face Group into the face/recognition counts of GV-AI FR.



Chapter 4 Advanced Functions

This chapter covers the advanced functions of GV-AI FR, which includes the following categories: **Dashboard & Analysis**, **General Settings**, **Notify Settings**, and **Event Query**.

List of Configurations

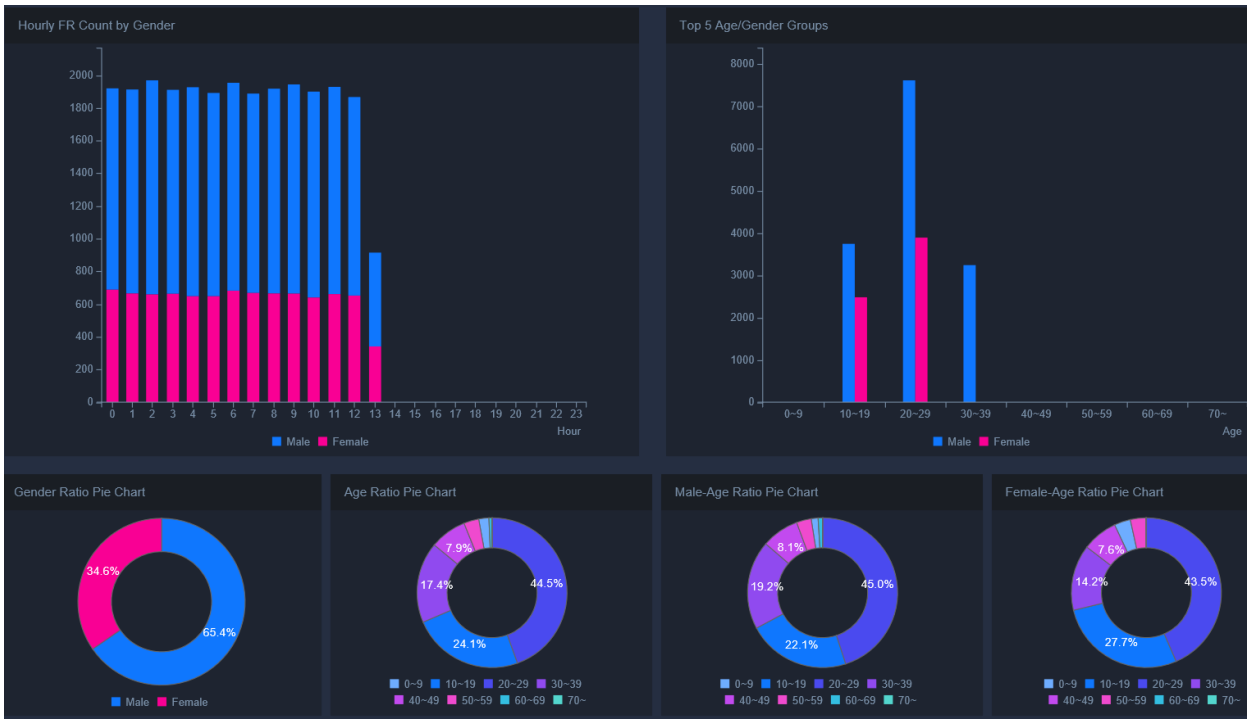
See the table below for the advanced functions of GV-AI FR.

4.1 Dashboard & Analysis	
4.2 General Settings	4.2.1 System Settings 4.2.2 Video Source 4.2.3 Recognition Settings 4.2.4 GV-VMS Connection 4.2.5 Account & Authority 4.2.6 Master / Slave Sync
4.3 Face Management	
4.4 Notify Settings	4.4.1 Welcome Settings 4.4.2 Event Trigger 4.4.3 IO Box 4.4.4 Serial Port 4.4.5 GV-FWC / Controller 4.4.6 LINE Notify

4.1 Dashboard & Analysis

- **Dashboard**

The **Dashboard** page records and displays the total number of faces recognized along with the gender and age distribution, in statistical graphs, within a day.



- **Analysis — Hourly FR Count**

The **Hourly FR Count** page records and displays the average number of recognition events, by the hour, entering and exiting the premise in a day, week, month or year.



4.2 General Settings

This section covers all of the settings available under General Setting, including **System Settings**, **Video Source**, **Recognition Settings**, **GV-VMS Connection**, **Account & Authority** and **Master / Slave Sync**.

4.2.1 System Settings

The **System Settings** page configures the system settings of GV-AI FR, see *2.3.1 Configuring System Settings*.

4.2.2 Video Source

The **Video Source** page allows users to connect up to 8 IP cameras to the GV-AI FR for live video streaming, see *2.3.2 Adding IP Cameras*.

4.2.3 Recognition Settings

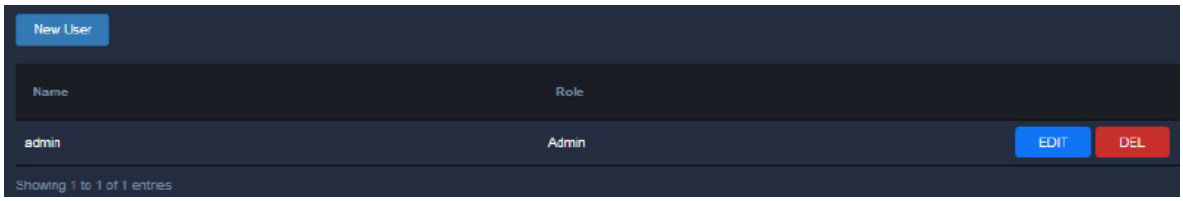
The **Recognition Settings** page enables and configures the face recognition parameters for each of the camera channels of GV-AI FR, see *3.1 Configuring Recognition Settings*.

4.2.4 GV-VMS Connection

GV-AI FR can be connected to GV-VMS V18.1 or later for remote streaming and video recording, see *Chapter 5 GV-VMS Integration*.

4.2.5 Account & Authority

The **Account & Authority** page allows users to create and edit user accounts, available in 4 levels, as well as enabling / disabling configuration rights for various accounts.



4.2.6 Master / Slave Sync

When there are two or more GV-AI FRs installed, users can set one of them as the **Master** for storing and recording all face recognition data to be used by **up to 10** other GV-AI FRs, or **Slaves**, to avoid the need of managing multiple databases simultaneously.

Note: By default, all GV-AI FR are set as **Standalone** and have their own, exclusive face database for face recognition.

To set up Master and Slave GV-AI FRs, follow the steps below:

1. On the GV-AI FR to be set as the Master, typically the one in which all the face data are stored, click **Dashboard** (No. 5, *2.2 Main Screen*) > **General Settings** > **Master/Slave Sync**.



2. Select **Master** as **Type** and set a desired **Username** and **Password**, which will be used by other Slave GV-AI FRs for connecting to the Master.
3. Optionally modify the default **Port** of **11112** if necessary and click **Apply**.
4. After the Master GV-AI FR is set, click **Dashboard** (No. 5, *2.2 Main Screen*) > **General Settings** > **Master/Slave Sync** on a separate GV-AI FR to set it as the Slave.
5. Select **Slave** as **Type** and type the **IP Address**, **Port**, **Username** and **Password** of the Master GV-AI FR.
6. Click **Apply** and restart the slave GV-AI FR for the changes to take effect.
7. To connect multiple Slave GV-AI FRs to the Master, repeat Step 4 – 6.

Once the Slave GV-AI FRs are successfully connected to the Master GV-AI FR, all face recognition events occurred on the Slaves will be based on and sent to the face database of the Master.

4.3 Face Management

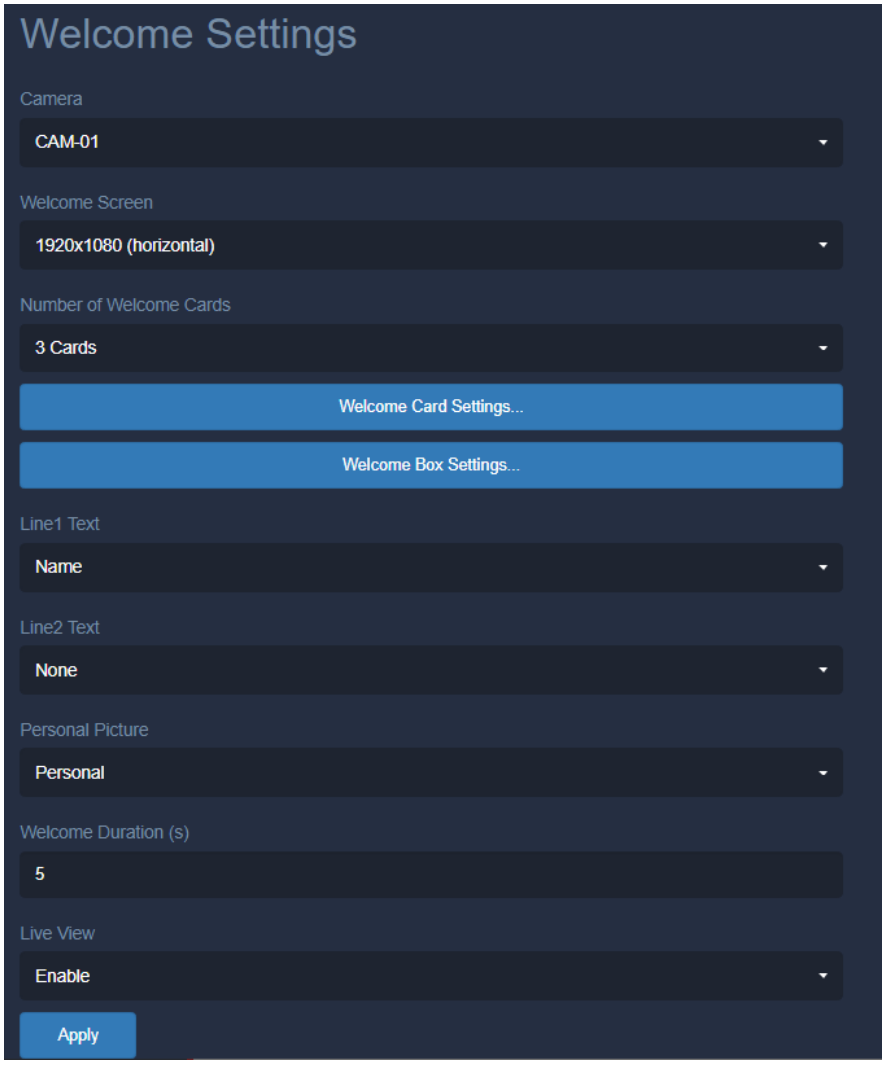
The Face Management pages, namely **Face Profiles** and **Face Groups**, allow users to manage the face database of GV-AI FR, see *3.2.2 Creating Face Profiles* and *3.4 Face Groups*.

4.4 Notify Settings

This section covers all the event notification functions of GV-AI FR, including **Welcome**, **Event Trigger**, **IO Box**, **Serial Port**, **GV-FWC / Controller**, **LINE Notify** and **SMTP Setting**.

4.4.1 Welcome Settings

The **Welcome Settings** page can configure to display a welcome screen and/or advertisement, either locally or at a remote monitor, for each of the camera channels upon face recognition. To access the Welcome Setting, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Notify Settings** > **Welcome**.



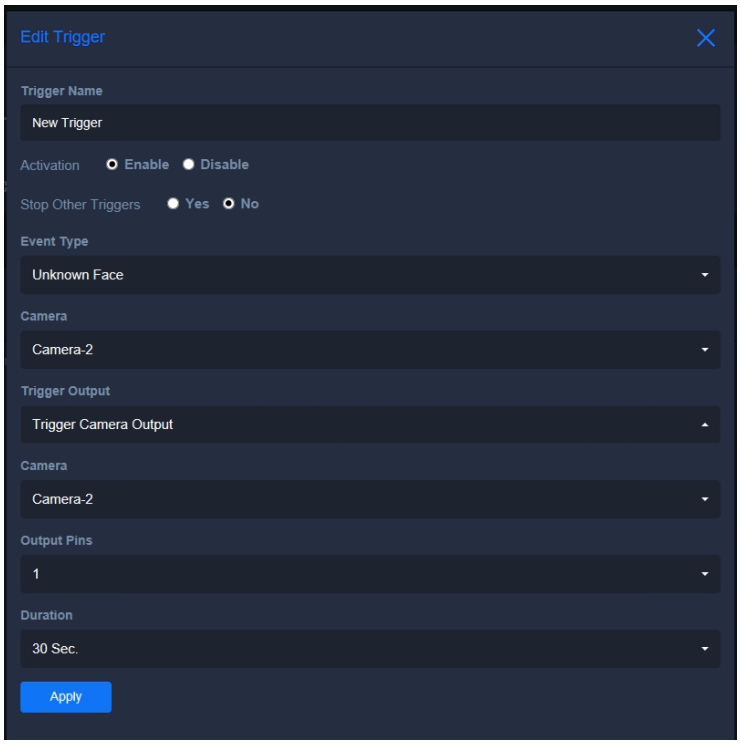
- **Camera:** Select the camera channel to configure the welcome screen for.
- **Welcome Screen:** Only for local display, select the desired image resolution for the welcome screen and/or configure to display an advertisement upon face recognition.
  - When displaying AD, users can replace the default advertisement videos with their own at *C:\\GV-AIFR\Apache\htdocs\welcomeboard\style4\ad* and *C:\\GV-AIFR\Apache\htdocs\welcomeboard\style5\ad*, respectively for **1920 x 1080 + AD (Horizontal)** and **1920 x 1080 + AD (Vertical)**.
- **Number of Welcome Cards:** Sets the maximum number of welcome messages, from 1 – 3, to be shown at a time.
- **Welcome Card Settings:** Select the type of message to display upon face recognition.

- **Welcome Box Settings:** Connects to and display the welcome screen remotely on GV-Welcome app, see *GV-Welcome App Installation Guide*.
- **Line 1** / **2 Text:** Select the info of the Face Profile recognized to be displayed on the welcome screen upon face recognition.
- **Personal Picture:** Select **Enroll** to display the enrolled face photo of the Face Profile recognized; select **Live** to display the live snapshot of the recognition target; or select **Personal** to display the Face Image of the Face Profile recognized, see *Face Image*, *3.2.2 Creating Face Profiles*.
- **Welcome Duration (s):** Sets the number of seconds the welcome card and message are displayed for upon face recognition.
- **Live View:** Only for local display, enable to display the live view at the bottom-right corner of the welcome screen.

4.4.2 Event Triggers

The **Trigger Settings** page allows users to set up various trigger actions upon certain face recognition and/or input trigger events. To access the Trigger Settings page, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Notify Settings** > **Event Triggers**.

1. To set up trigger actions, click **New Trigger**. This dialog box appears.



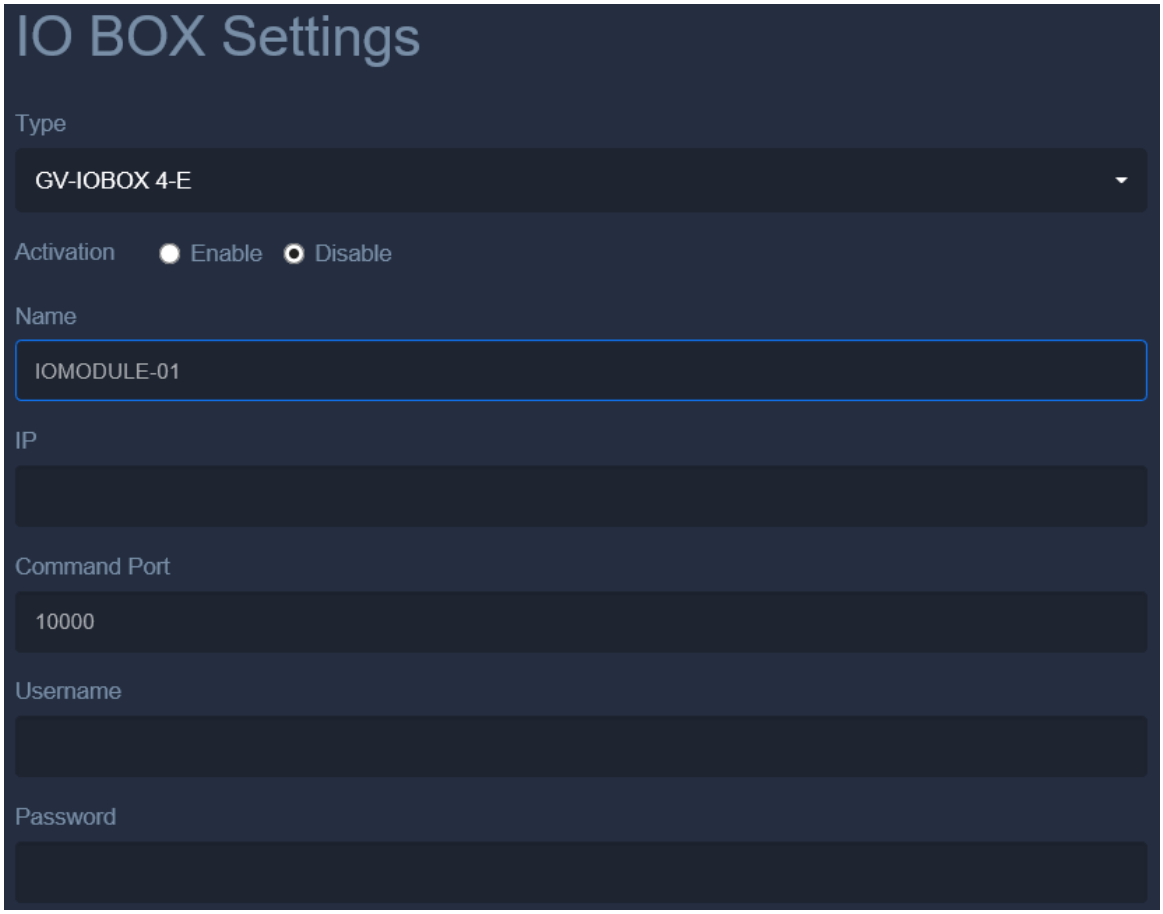
2. Type a desired name for the trigger action under **Trigger Name** and enable **Activation**.
3. Optionally enable **Stop Other Triggers** to have priority over and stop all other trigger events upon triggering.
4. Select the type of face recognition events the trigger action is triggered for under **Event Type**.
   - **Unknown Face:** Triggers action when unrecognizable faces are detected.
   - **Registered Face:** Triggers action when registered faces are recognized.
   - **Face in Group:** Triggers action when Face Profiles within a specific Face Group are recognized.
   - **Gender / Age in Range:** Triggers action when the specified gender and age range is detected for.
   - **Fake/Spoofed:** When Liveness Detection is enabled, triggers action upon recognition of inanimate face. See *3.1 Configuring Recognition Settings*.
   - **Input Trigger from IO:** Triggers action upon a specified input trigger.
   - **GV-FWC Controller Response:** This option is for triggering the LED and beeper of GV-CR1320 to indicate access status. For configuration details, see *Appendix*.
   - **System Event:** Triggers action when any of the following conditions occurs: Dongle removed, camera connected / disconnected, I/O Box connected / disconnected, GV-FWC/Controller connection failed and GV-FWC Controller Response (specially for GV-CR1320 use).
5. Select a desired type of trigger action under **Trigger Output**, from *IO-Box Output*, *Serial Port Output*, *LINE Notify*, *GV-FWC/Controller*, *GV-Face App, Trigger Camera Output* or *Send E-Mail.*
6. Click **Apply**.

Note:

1. For triggers to function, make sure the corresponding trigger output(s) are properly set, see *4.4.3 IO Box*, *4.4.4 Serial Port*, *4.4.5 GV-FWC / Controller, 4.4.6 LINE Notify* and *4.4.7 SMTP Setting* (for sending e-mail).
2. To trigger push notifications through GV-Face mobile app, see *GV-Face Installation Guide*.

4.4.3 IO Box

The **IO Box Settings** page can configure for and connect the GV-AI FR to a GV-IO Box via network.



- **Type:** Select the type of GV-IO Box the GV-AI FR is connecting to.
- **Activation:** Enables / disable the GV-IO Box to be connected.
- **Name:** Type a desired name for the GV-IO Box to be connected.
- **IP Address:** Type the IP address of the GV-IO Box.
- **Command Port:** Modify the default port value of *10000* if needed.
- **Username** & **Password:** Type the login Username and Password of the GV-IO Box to be connected.

Click **Apply**.

4.4.4 Serial Port

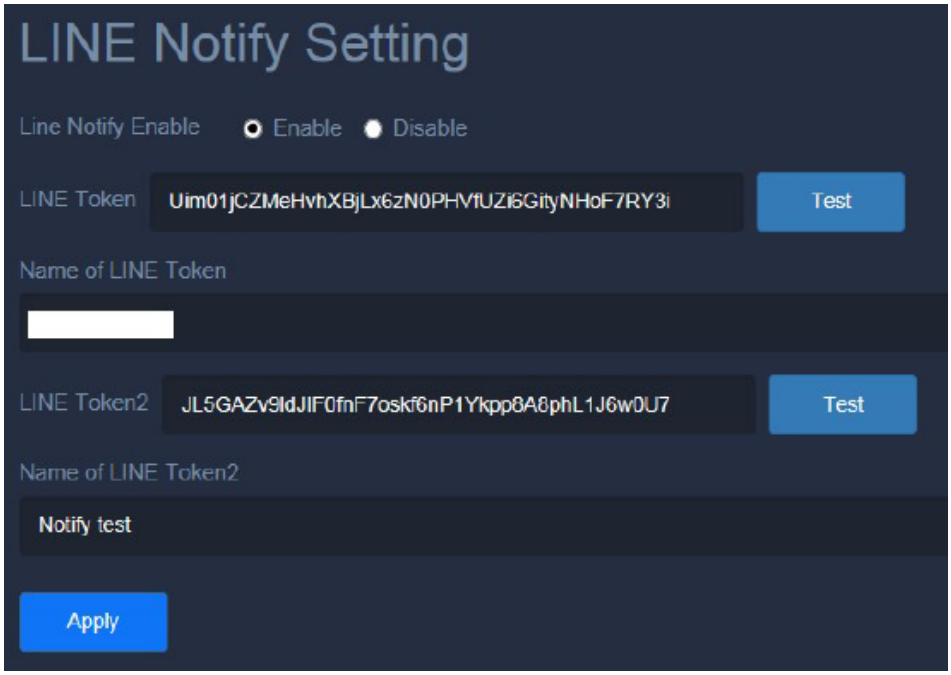
The **Serial Port** settings page is used for physically connecting GV-AI FR to 3rd-party controllers in order to send the access data paired to the face(s) recognized upon face recognition events. For details, see *6.2.2 Connecting 3rd-party Controllers via Serial Port*.

4.4.5 GV-FWC / Controller

The **GV-FWC / Controller Settings** page allows GV-AI FR to connect to and send access data to GV-AS Controller or GV-FWC via LAN. For details, see *Chapter 6 Access Control Management*.

4.4.6 LINE Notify

GV-AI FR can be configured to connect to up to 2 LINE IDs for sending LINE notifications upon face recognition and/or input trigger events. To access the **LINE Notify Settings** page, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Notify Settings** > **LINE Notify**.



1. **Enable** Line Notify.
2. Access and log into the desired LINE ID on the LINE notify website.
3. After logging in, click the name of the LINE ID and select **My page**.
4. Under Generate access token (For developers), click **Generate token**.

5. Type a message of up to 20 characters to be displayed before every LINE notification, select a LINE chat group to send the notifications to and click **Generate token**.
6. Once the access token is generated, copy and paste it into the **LINE Token** field on the LINE Notify Setting of GV-AI FR.
7. Optionally click **Test** to make sure the connection is properly established.

Click **Apply**.

4.4.7 SMTP Setting

GV-AI FR can be configured to send e-mail notifications upon various triggered events.



- **Activation:** Enables / disable the SMTP server.
- **Host:** Type the SMTP server address.
- **Server Port:** Type the SMTP server port.
- **Username:** Type your SMTP username.
- **Password:** Type your SMTP password.
- **SSL Type:** Select SSL or TLS if the SMPT server required the authentication for connection.
- **Send Mail to:** Type an e-mail address for sending.

Click **Apply**.

Chapter 5 GV-VMS Integration

This chapter will guide users through all of the configurations related to the integration of GV-VMS, as listed below:

- **Connect GV-AI FR to GV-VMS:** See *5.1 Connecting to GV-VMS*.
- **Record Camera Streams of GV-AI FR by GV-VMS:** See *5.2 Video Recording by GV-VMS*.
- **Playback Face Recognition Events:** See *5.3 Playing back Recognition Events on GV-AI FR*.

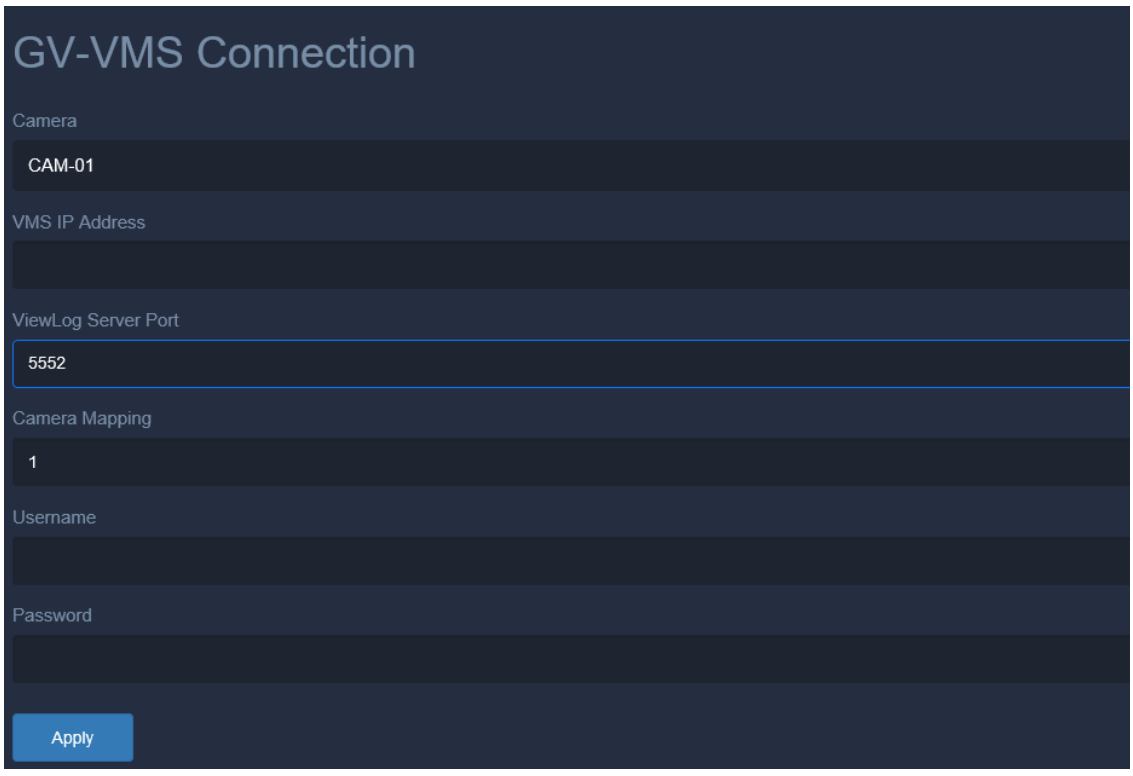
Note: The GV-VMS to be connected must be on a separate PC and within the same LAN as GV-AI FR.

5.1 Connecting to GV-VMS

To connect GV-AI FR to GV-VMS, follow the steps below:

Configuring GV-AI FR

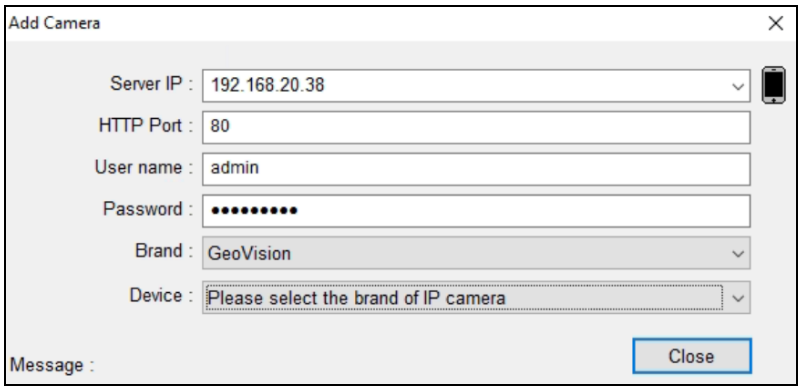
1. On the GV-AI FR, click **Dashboard** (No. 5, *2.2 Main Screen*) > **General Settings** and select **GV-VMS Connection**. This page appears.



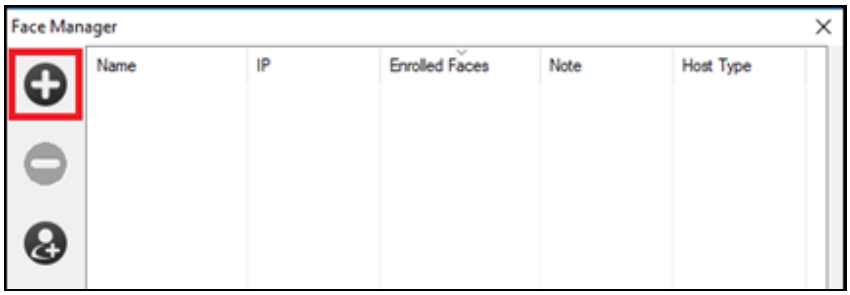
2. Under **Camera**, select the desired camera channel of the GV-AI FR to be connected to GV-VMS.
3. Under **VMS IP Address**, type the IP address of the GV-VMS.
4. Under **ViewLog Server Port**, optionally modify the default port value of *5552*, to match the Control Center Server Log port of GV-VMS.
5. Under **Camera Mapping**, type the camera channel of GV-VMS to which the camera will be connecting to.
6. Type the login **Username** and **Password** of the GV-VMS to be connected to.
7. Click **Apply**.
8. Repeat Step 2 – 7 to connect multiple camera channels of the GV-AI FR to GV-VMS.

Configuring GV-VMS

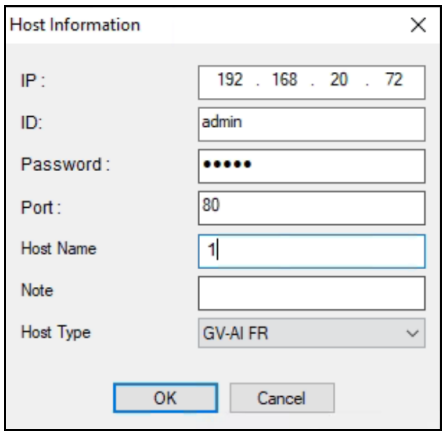
9. In **IP Device Setup** of the GV-VMS (**Home** > **Toolbar** > **Configure** > **Camera Install**), click **Add Camera**. This dialog box appears.



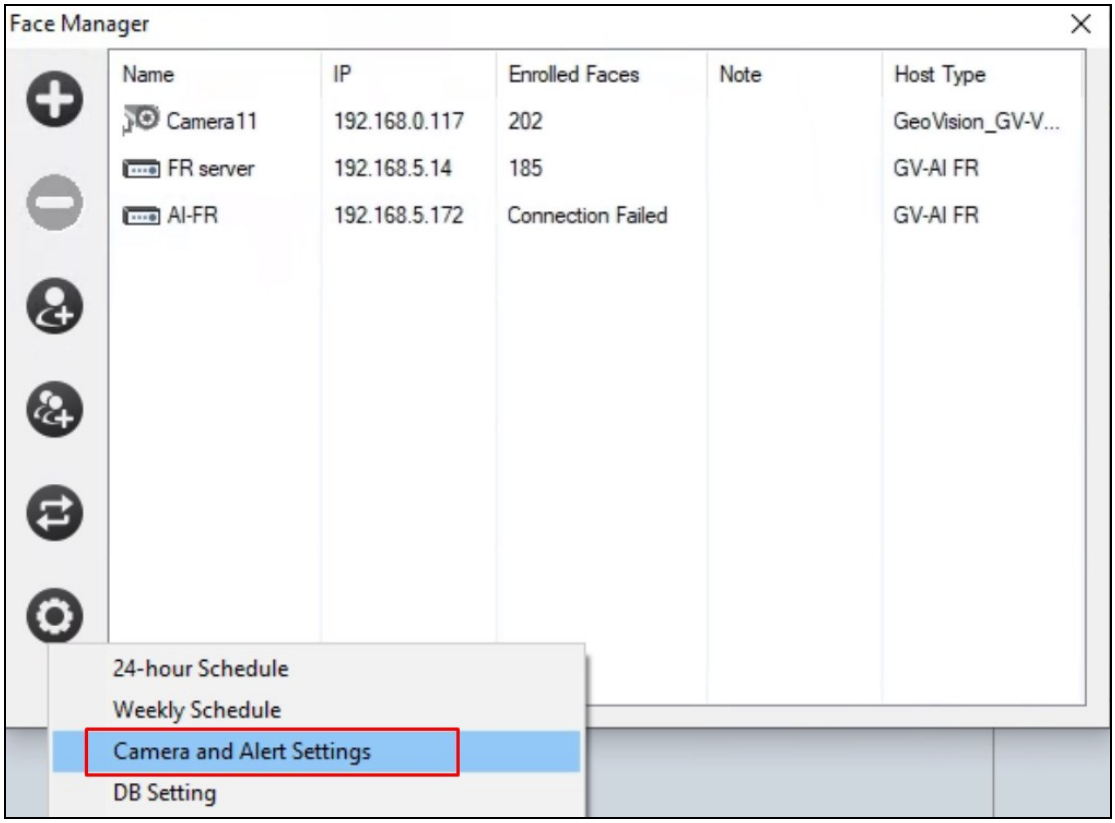
10. Type the IP Address, Port, Username and Password of the IP camera corresponding to the channel of GV-AI FR selected in Step 2 and select its brand and model from the respective **Brand** and **Device** dropdown lists.
11. Repeat Step 10 to add multiple cameras of the GV-AI FR to GV-VMS.
12. Once the desired IP camera(s) of the GV-AI FR are added to GV-VMS, assign them to the same camera channel(s) as defined by Step 5 and close **IP Device Setup**.
13. In **Face Manager** of the GV-VMS (**Home** > **Toolbar** > **Configure** > **Face Manager**), click **Add GV-AI FR**.



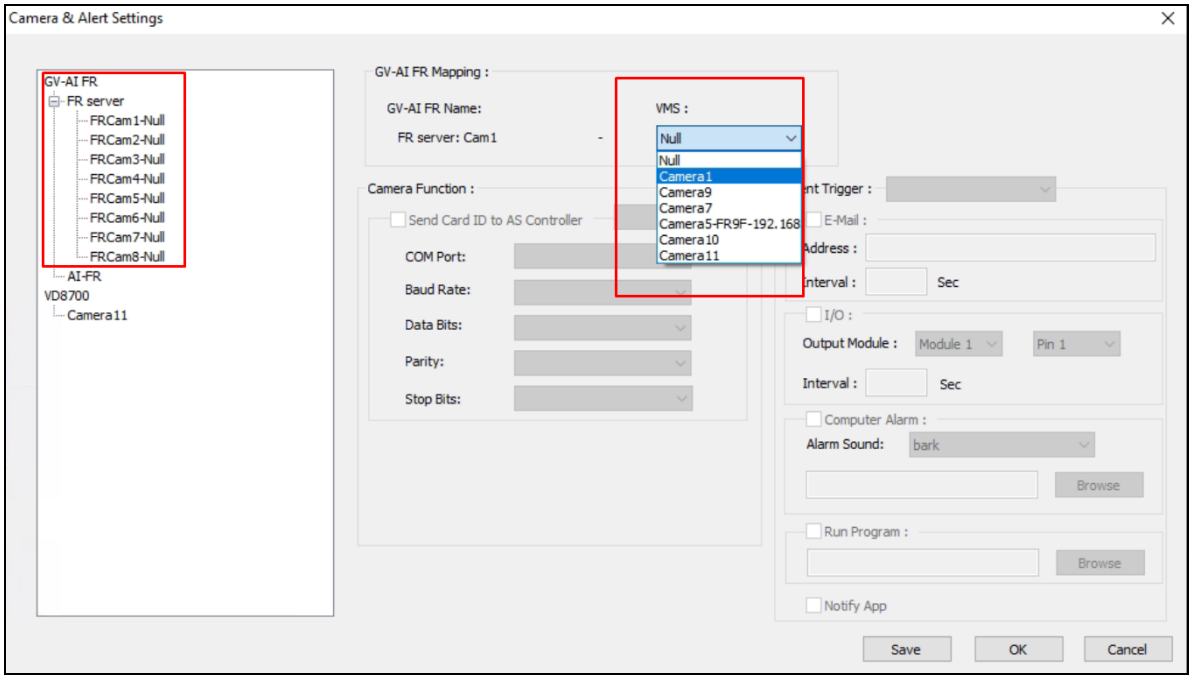
14. Type the IP Address, Port, Username (ID) and Password of the GV-AI FR, type a desired Host Name, select GV-AI FR as the **Host Type** and click **OK**.



15. After adding the GV-AI FR in Face Manager, select it, click **Configure** and select **Camera and Alert Settings**.



16. On the left of the window, select the camera channel of GV-AI FR selected in Step 2. Then under **GV-AI FR Mapping**, select the channel of GV-VMS in which the same IP camera is assigned to in Step 12 from the **VMS** dropdown list.



17. Repeat Step 16 to map multiple cameras of the GV-AI FR to the corresponding channels on the GV-VMS.

Once successfully configured, the camera channel(s) of the GV-AI FR mapped can be streamed to and recorded by the GV-VMS. For details, see *5.2 Video Recording by GV-VMS*.

5.2 Video Recording by GV-VMS

After the IP cameras of GV-AI FR are added to GV-VMS, users can start recording their video streams on the GV-VMS by starting monitoring.

To start monitoring, click **Home** > **Toolbar** > **Monitor** and select the camera channels the IP cameras of the GV-AI FR are assigned to in Step 12, *5.1 Connecting to GV-VMS*.

Note: After starting monitoring, the camera channels will be recorded upon motion detection by default. To change the recording settings of GV-VMS, see *Recording Settings*, Chapter 1, *GV-VMS User's Manual*.

5.3 Playing back Recognition Events on GV-AI FR

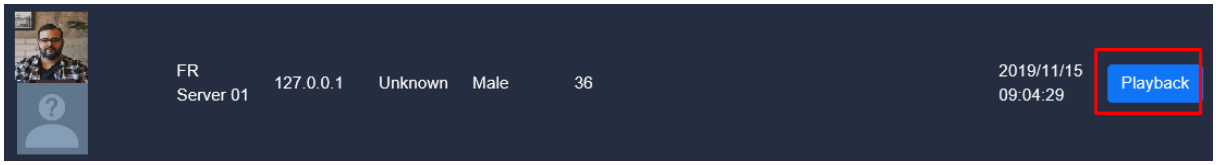
Prior to playing back face recognition events on GV-AI FR, make sure the Remote ViewLog Server of the GV-VMS used for recording is enabled.

Enabling Remote ViewLog Server

On the GV-VMS, click **Home** > **Toolbar** > **Network** > **Control Center Server** and select **Remote ViewLog Service** to enable.

Face Recognition Event Playback

On the GV-AI FR, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Event Query** > **Detail Log**, set a search criterion to search for the desired face recognition events and click **Playback** next to an event to play back its recording.



For details on face recognition events and the event log of GV-AI FR, see *3.3 Recognition Events*.

Chapter 6 Access Control Management

This chapter will guide users through all of the configurations related to connecting GV-AI FR to GV-AS Controllers and 3rd-party controllers, for access management by GV-ASManager or 3rd-party access control systems, respectively.

- **Connect GV-AI FR to GV-AS Controller:**

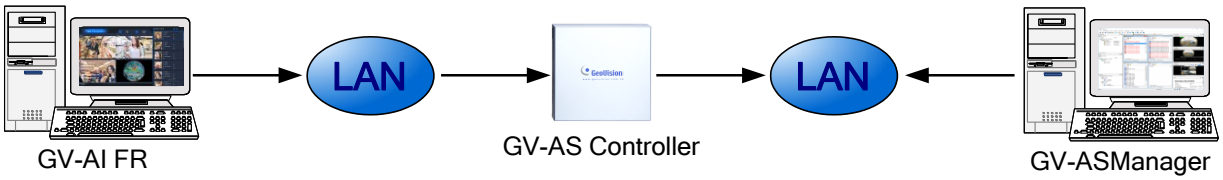
  For connecting to GV-AS Controllers and the necessary configurations on the GV-ASManager, see *6.1 Connecting GV-AS Controller*.

- **Connect GV-AI FR to 3rd-party Controller:**

  For connecting to 3rd-party controllers, see *6.2 Connecting 3rd-party Controllers*.

6.1 Connecting GV-AS Controller

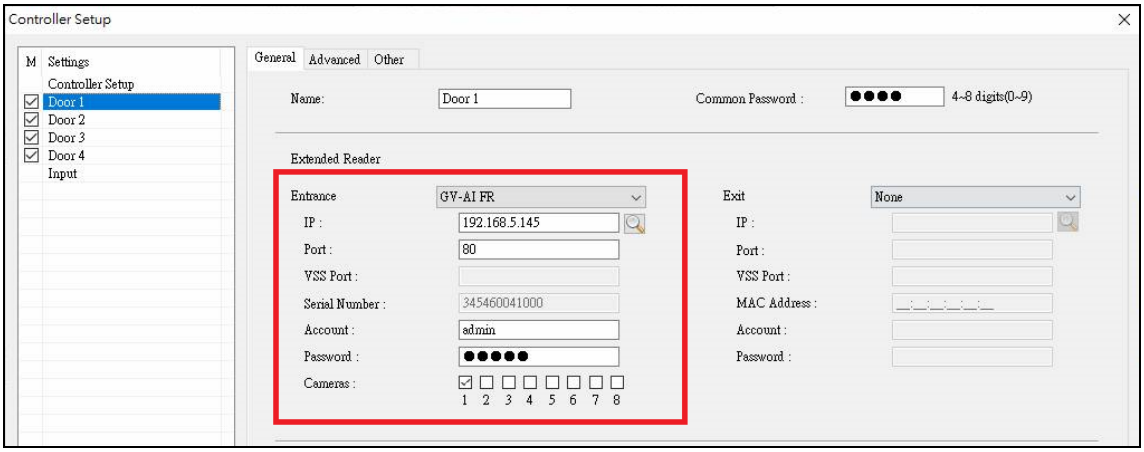
By connecting to and sending access card data to GV-AS Controller(s) via LAN, the face recognition feature of GV-AI FR can be easily integrated into GV-ASManager for a face-recognition-based access management.



Note: The following procedures are only applied to GV-AI FR V1.2.0 or later.

To set up **GV-ASManager** to connect to GV-AI FR:

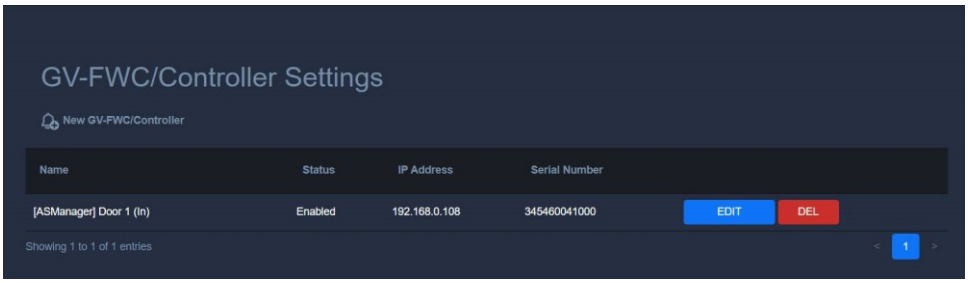
1. In **Device List** (**Setup** > **Devices**), double-click the GV-AS Controller that GV-AI FR is to be connected to and select a desired **Door**. This window appears.



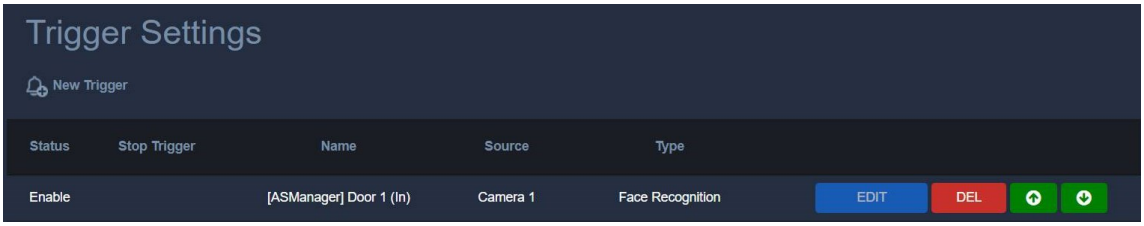
2. Under **Extended Reader**, select **GV-AI FR** from **Entrance** and/or **Exit** drop-down lists, according to the access scenario.
3. Type the **IP**, login **Account** and **Password** of the GV-AI FR. Optionally modify the default **Port** of *80* if necessary.
4. For **Camera**, select the camera(s) of the GV-AI FR used in the access scenario.
5. Click **OK**. The GV-AI FR is connected to the selected GV-AS Controller and GV-ASManager is also connected to GV-AI FR.

To verify the connection in **GV-AI FR**:

6. On the GV-FWC / Controller Setting page (**Dashboard** > **Notify Settings** > **GV-FWC / Controller**), you should find an entry, for example, *[ASManager] Door 1 (In)*, written back from GV-ASManager to indicate which controller IP and which door is connected to.



7. On the Event Trigger page (**Event Trigger** > **Notify Settings**), you should also find an entry of face recognition. No matter which FR events, recognized or unknown faces, all will trigger GV-AI FR to send the access data to GV-ASManager.



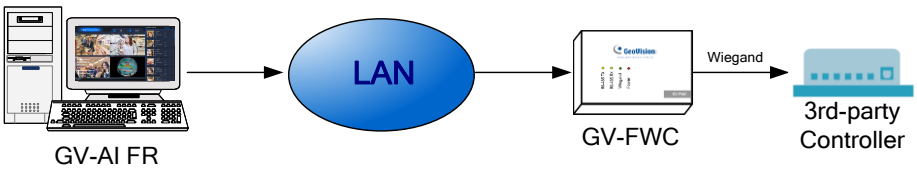
Note: To create face data using the GV-ASManager access management software and transfer it back to GV-AI FR, see *14.3 Managing Face Recognition Access Data* in *GV-ASManager User's Manual*.

IMPORTANT: For GV-AI FR, all of its camera channels, to which separate Doors may be connected to, share the same face database, therefore whenever a User is uploaded to or removed from any of its channels, the same changes will be made to all of its other channels simultaneously. **To prevent confusion, you must upload or remove face data using a designed door.** *See 14.3 Managing Face Recognition Access Data* in *GV-ASManager User's Manual*.

6.2 Connecting 3rd-party Controllers

There are two methods of connecting GV-AI FR to 3rd-party controllers, as illustrated below:

- **Via GV-FWC within the LAN:**



For connecting GV-AI FR to 3rd-party controllers through GV-FWC within the LAN, see *6.2.1 Connecting 3rd-party Controllers via GV-FWC*.

- **Via Serial Port Physical Connection:**



For physically connecting GV-AI FR to 3rd-party controllers through its serial port, see *6.2.2 Connecting 3rd-party Controllers via Serial Port*.

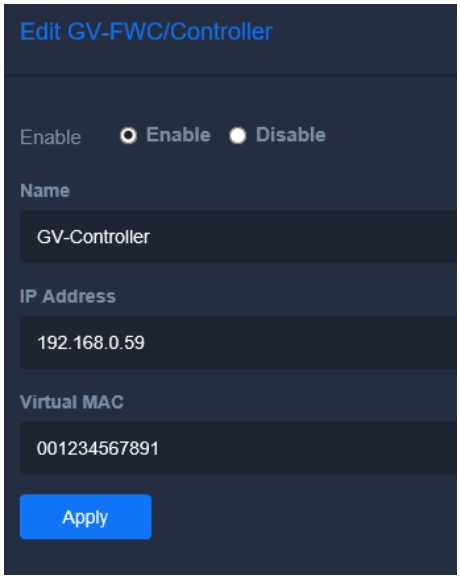
6.2.1 Connecting 3rd-party Controllers via GV-FWC

Note: The GV-FWC, used for connecting to 3rd-party controllers, must be connected to the same LAN as GV-AI FR.

IMPORTANT: Face images of recognition events cannot be sent to 3rd-party controllers from the GV-FWC for they are connected via Wiegand.

1. Click **Dashboard** (No. 5, *2.2 Main Screen*) > **Notify Settings** > **GV-FWC / Controller** to access the **GV-FWC / Controller Settings** page.

2. Click **New GV-FWC**. This dialog box appears.



3. Select **Enable** and type a desired **Name** for the GV-FWC to which the GV-AI FR is connecting to.
4. Type the **IP Address** of the GV-FWC.
5. Type a 12-digit long **Virtual MAC** to be recognized as a virtual reader for connecting to the GV-FWC.
6. Click **Apply**.
7. After successfully adding the GV-FWC, select **Event Triggers** under **Notify Settings** in the left menu to configure for sending face recognition events to the GV-FWC, see *4.4.2 Event Triggers*.

For connecting the GV-FWC and sending Wiegand access data to 3rd-party controllers upon face recognition, see *GV-FWC Installation Guide*.

6.2.2 Connecting 3rd-party Controllers via Serial Port

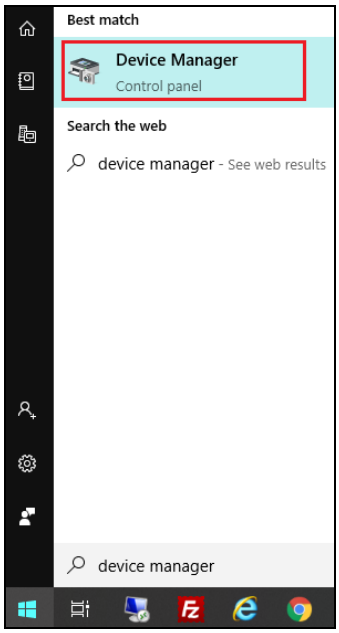
Note: For connecting to 3rd-party controllers via LAN, see *6.2.1 Connecting 3rd-party Controllers via GV-FWC*.

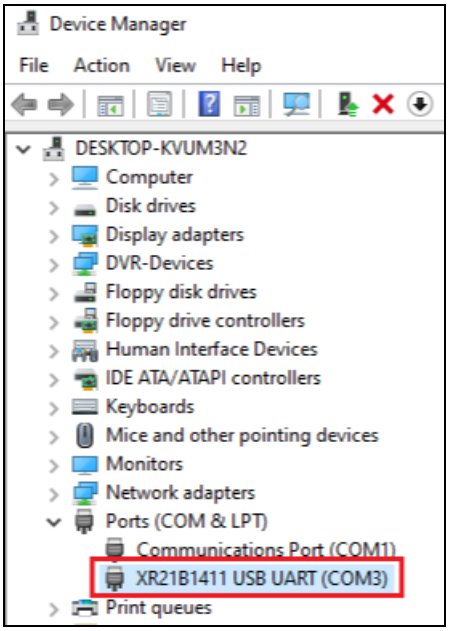
IMPORTANT: Face images of recognition events cannot be sent to the controller when connected through the serial port.

1. Connect the GV-AI FR to a 3rd-party controller via GV-COM V3 and GV-WTR, as illustrated below.

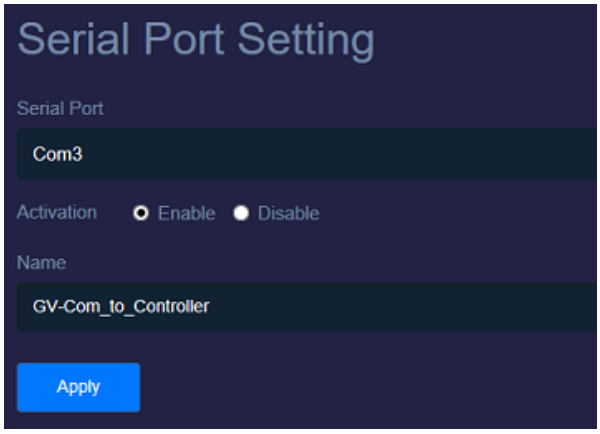


2. From the Windows **Start** menu of the GV-AI FR PC, type **Device Manager** and click on the application of the same name to run. Then click and expand **Ports (COM & LPT)** to display the COM number with the GV-COM V3 serial number, as shown below.





3. On GV-AI FR, click **Dashboard** (No. 5, *2.2 Main Screen*) > **Notify Setting** > **Serial Port** to access the **Serial Port Setting** page.



4. Select the corresponding COM number, as displayed by Step 2, from the **Serial Port** dropdown list and select **Enable** next to **Activation**.
5. Type a desired **Name** for the serial port and click **Apply**.

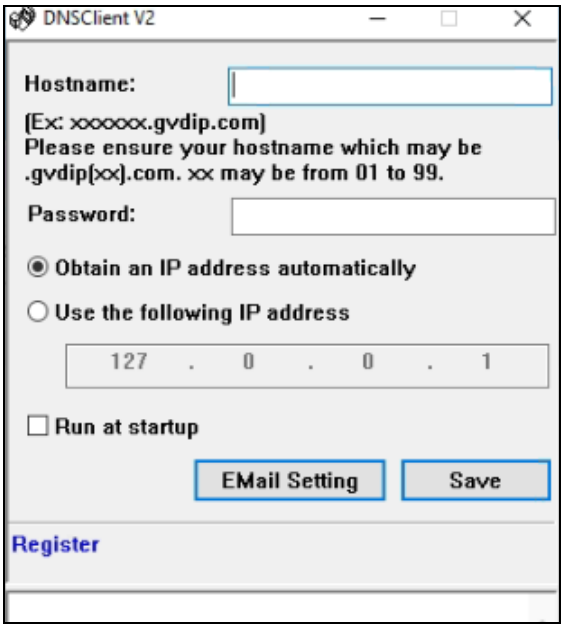
Once properly configured, any access data paired to the Face Profiles of GV-AI FR will be sent to the 3rd-party controller upon face recognition.

Chapter 7 Useful Utilities

7.1 GV-DDNS V2 Client

GV-AI FR comes with **GV-DDNS V2 Client**, which provides GeoVision's Dynamic DNS Service for users to register for a domain name that always point to GV-AI FR when it uses a dynamic IP address.

To access GV-DDNS V2 Client, go to the DDNS folder within the GV-AI FR directory (*C:\GV-AIFR\DDNS*) and double-click **DNSClientV2.exe**. This dialog box appears.

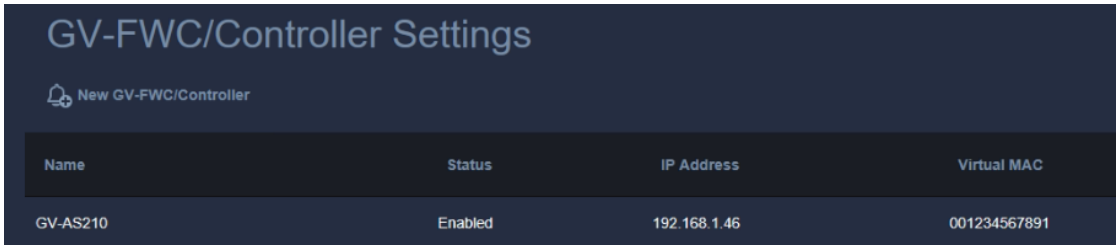


For details on registering for and configuring GV-DDNS, see *GV-DDNS V2 Installation Guide*.

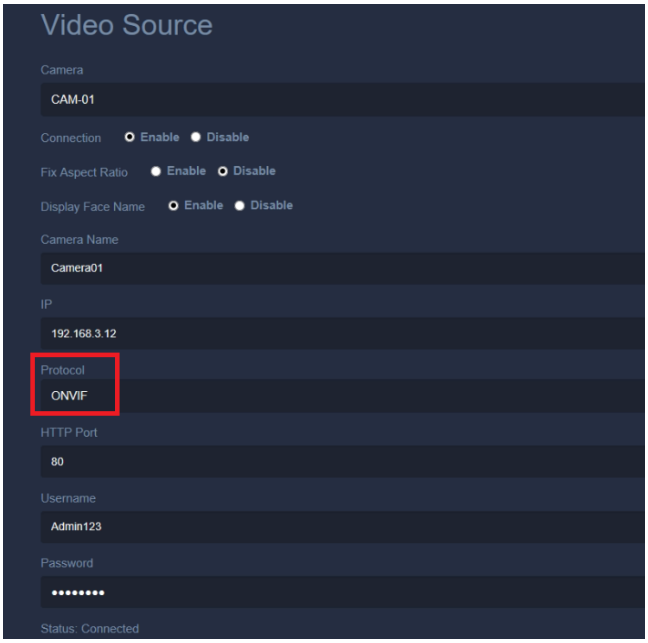
Appendix for GV-CR1320

To trigger the LED and beeper on GV-CR1320 (V1.07 or later) upon face recognition events, to indicate the access status, follow the steps below:

1. Make sure the connection between GV-AI FR, GV-AS Controller and GV-ASManager is well established. For how to connect GV-AI FR to GV-AS Controller, see *6.1 Connecting GV-AS Controller*. The following is an illustration of a GV-AS210 controller connected on GV-AI FR.



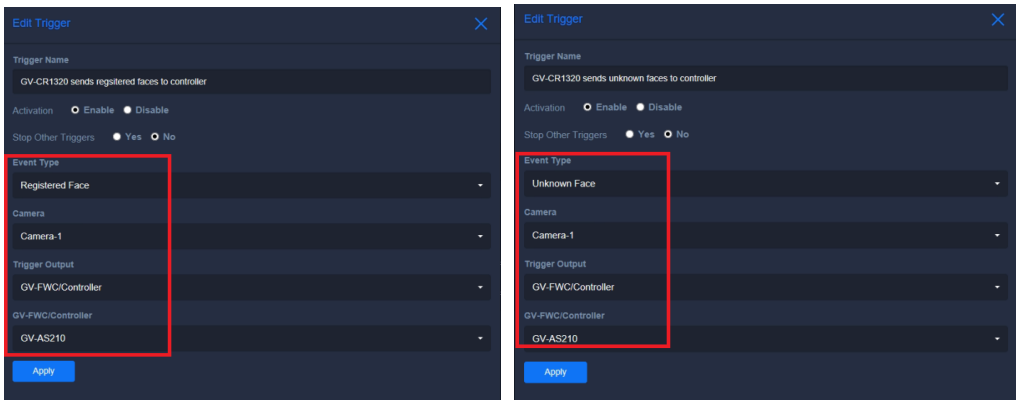
2. Connect GV-CR1320, as a camera, to GV-AI FR.
   - Select **General Settings** > **Video Source**, type the connection information of the GV-CR1320 and select **ONVIF** under protocol.



3. Send the recognition events of GV-CR1320 to GV-AS Controller.

   A. Select **Event Trigger** > **New Trigger**, select the **Camera** of the GV-CR1320, select **GV-FWC/Controller** under Trigger Output, and select the corresponding controller under GV-FWC/Controller.

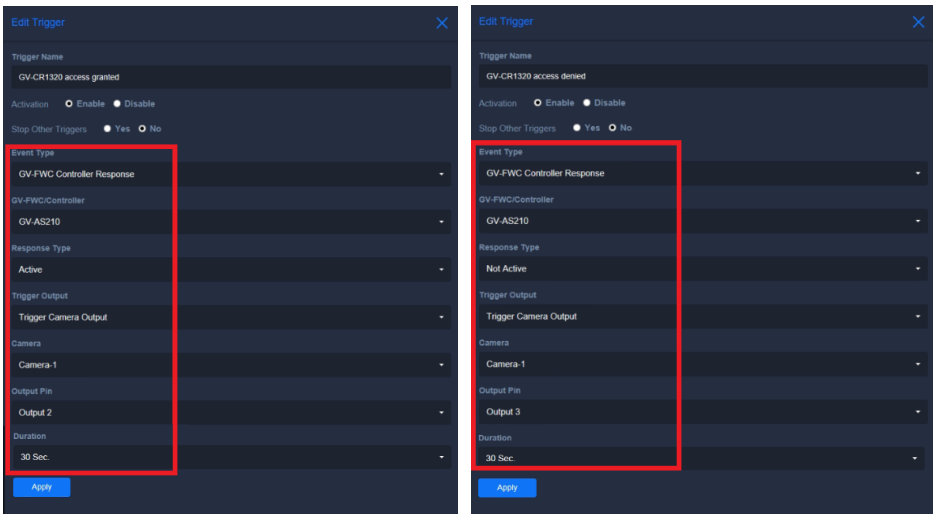
   B. Create two event trigger conditions. One is to send recognized events; the other is to send unrecognized events.



4. GV-AS Controller triggers the LED and beeper on GV-CR1320.

   A. To have trigger action on recognized events, select **Event Trigger** > **New Trigger**, select **GV-FWC/Controller Response** under Event Type, the corresponding controller under GV-FWC/Controller, **Active** under Response Type, **Trigger Camera Output** under Trigger Output, the **Camera** of the GV-CR1320, **Output 2** under Output Pin, and the desired trigger **Duration**.

   B. To have trigger action on unrecognized event, select **Event Trigger** > **New Trigger**, select **GV-FWC/Controller Response** under Event Type, the corresponding controller under GV-FWC/Controller, **Not Active** under Response Type, **Trigger Camera Output** under Trigger Output, the **Camera** of the GV-CR1320, **Output 3** under Output Pin, and the desired trigger **Duration**.



5. The following is an illustration of four event trigger conditions set based on step 3 - 4. When the GV-CR1320 detects faces, its LED and beep will response accordingly.

