

ISS-R03 3-In-1 Access Control System

The ISS-R03 3-In-1 Access Control System has three major functions: Access Control, Time & Attendance, and Surveillance.

- **Contact-less Access Control:** The system utilizes the latest face detection and recognition technologies to authenticate users; Users can use this system without touching any sensor or carrying a personal ID card.
- **Time & Attendance:** The system uses very simple method to store time & attendance records. Most of the human resources applications can read and access these data easily.
- **Surveillance:** A traditional surveillance system records everything on tape or hard disk. Our system detects and stores only the facial images; it is the most efficient way to store and search surveillance data.
- **Other Features :**
 - The system can control two cameras at the same time. Each camera can be used with different function. For example, camera A can be used with surveillance function and camera B can be used with access control function.
 - The system supports a special function: train memory. This function analyzes all enrolled users' data and trains a special memory to improve accuracy of face recognition.
 - The system uses a patented image tracking/analyzing function to make sure that the recorded facial images are always clear.
 - The system automatically tracks the head motion and gives feedback to user. For example, the system detects the head size and view angle and then gives proper instructions to user such as “stand closer please” or “please look straight”.
 - The system also supports a hardware I/O control box. This I/O control box can access a maximum of 8 devices.
 - The system provides a CPU performance option to ensure that the system can run smoothly at different CPUs. For example, for a low performance CPU, the system can skip feedback drawings on preview window to prevent computer from locking up.

Description of Toolbar Buttons



Start : The system will start doing the face detection and recognition.



Stop : The system will stop doing the face detection and recognition.



Enroll Tool : The system will bring up the "Enroll Tool" dialog to create, modify or delete user data.



Train Memory : The system will analyze all enrolled users' data and then train a memory.



Select Camera : The system will bring up the "Select Camera" dialog for selecting camera.



Camera Settings : The system will bring up the "Camera Settings" dialog.



Camera Format : The system will bring up the "Camera Format" dialog.



System Settings : The system will bring up the "System Settings" dialog for setting system parameters.



Query Tool : The system will bring up the "Query Tool" dialog for searching and viewing all records.



Open Door : The system will force open the door.



Help : The system will bring up this help menu.



Exit : Exit the program.

System Easy Steps

Application Scenarios:

A. Surveillance: If you don't have I/O control for door-opening device, and you don't want to enroll users for time & attendance purpose, you can simply use this system as a surveillance system for recording facial images. You could also use this surveillance option in combination with Time & Attendance and/or Access Control functions.

- Turn on the "Select Camera" dialog and select the camera.
- Turn on the "System Settings" dialog and set the "Enable Surveillance Option" to Yes. You can disregard the Operation Mode for now.
- Press the "Start" button on the toolbar. When the system detects a human face near the camera, it will capture and record the facial image.
- Press the "Stop" button if you need to stop the process.
- Turn on the "Query Tool" dialog to check the surveillance records.

B. Time & Attendance: As long as you enroll at least one user, the Time & Attendance function will be activated. You could use this function in combination with Surveillance and/or Access Control functions.

- Turn on the "Select Camera" dialog and select the camera.
- Turn on the "Enroll Tool" dialog and do the user enrollment.
- Press the "Start" button on the toolbar. When the system detects a human face, it will capture the facial image and compare it to the user database. The facial image and recognition result will be stored in the system for time & attendance purpose.
- Press the "Stop" button if you need to stop the process.
- Turn on the "Query Tool" dialog to check the records.

C. Access Control: You need to hookup the I/O control for door-opening device in order to use this function. You also have two Operation Modes for this function: Open Door with Face Detection, and Open Door with Face Recognition. In order to do "Open Door with Face Recognition", you need to enroll at least one user – which also activate the Time & Attendance function. You could use this Access Control function in combination with Surveillance and/or Time & Attendance functions.

- Turn on the "Select Camera" dialog and select the camera.

- Turn on the "Enroll Tool" dialog and do the user enrollment if you want to "Open Door with Face Recognition".
- In the same "System Settings" dialog, set the "Operation Mode" to either "Open Door with Face Recognition" or "Open Door with Face Detection".
- In the same "System Settings" dialog, set the I/O control.
- Press the "Start" button on the toolbar. The system will open the door if either a face is detected or recognized according to your Operation Mode setting. The facial image and recognition result will be stored in the system.
- Press the "Stop" button if you need to stop the process.
- Turn on the "Query Tool" dialog to check the records.

Enroll Tool Easy Steps

A. New User

- Press the "New User" button.
- Enter the "User ID" and "User Name".
- Select the Indoor or Outdoor camera and then press the "Capture" button. The system will start capturing the user's facial image. While the system is capturing the facial image, the user in front of the camera needs to move his/her head slightly left-to-right top-to-down, in order to let the camera see and capture various views of the user.
- Press the "Stop" button to stop capturing.
- Move the mouse cursor over the unqualified face image and click the left mouse button. The system will mark this facial image to be deleted. Click the left mouse button again to cancel the deleting. Note that there are a few examples on the dialog box that show you what unqualified facial images are looked like.
- If all of face images are not good enough, you can press the "Delete All" button to delete all of them.
- If you get more than 10 good facial images, press the "Save User" button to save the user's profile in the system.
- Enable the "Show Eyes Position" option to display red dots on detected eyes location of each facial image. If the red dots do not coincide with the true location of eyes, this facial image is considered "unqualified" for recognition purpose, and it should be deleted from the database.

B. Modify User

- On the user list, click on the user you want to modify, the system will display the user's data including the facial images on the dialog.
- You may update the user's data, delete the unqualified face images or capture more facial images.
- Press the "Save User" button to save the user's profile in the system.

C. Delete User

- On the user list, click on the user you want to delete.
- Press the "Delete User" button to delete this user.

Query Tool Easy Steps

- In the search condition, select the year, month and date.
- In the "Log Source" field, select camera from dropdown list.
- In the "Log Type" field, select either "Not Identified" or "Identified".
- Press the "Search" button to start the search.
- The system will display the search results in the result list.
- Click on an entry in the result list, the system will display the details on the right side.
- The "Not Identified" log only displays the camera captured facial image. While the "Identified" log displays both the camera captured facial image and the matched facial image from the database.

System Settings --- Indoor / Outdoor Settings

The system can control two cameras at the same time. These two cameras are named "Indoor Camera" and "Outdoor Camera" in the system. The two cameras have their own set of parameters in order to function independently. Each camera can be used with different functions. For example, indoor camera can be used with surveillance function and outdoor camera can be used with access control function.

- **Operation Mode:** There are two options, "Open Door with Face Detection" and "Open Door with Face Recognition". Both of these modes will do the face recognition to identify the user. The only difference is the condition for opening the door through the I/O control.
- **Enable Surveillance Option:** Enable or disable the surveillance function. If enable this option, the system will capture and store facial images regardless. (see System Easy Steps for details)
- **Face Recognition Threshold:** There are five levels in this field.
- **Min. / Max. Detectable Face Size:** Set the face size range for face detection. Face size falls outside of this range will not be used for face detection.
- **Min. / Max. Recognition Face Size:** Set the face size range for face recognition. Face size falls outside of this range will not be used for face recognition.
- **Allowed Head Motion Range:** Set the allowed head motion range. For example, if "15" is selected, that means the system will allow a facial image to have up to +/-15 degrees rotation on horizontal axis. Any view angle exceeds that range will be discarded.
- **Detection Triggered by Motion:** This option tells the system to skip face detection if motion is not detected beyond certain threshold. Enable this option can decrease the computer load, especially the CPU load.
- **Motion Trigger Threshold for Detection:** Set the motion trigger threshold for face detection. The system will skip face detection if motion is not detected beyond this threshold.
- **Enable Face Tracking Option:** Enable or disable the face tracking option. If enable this option, the system will start tracking the detected human face and continually store the face recognition results in a temporary memory for analysis. This option can help to decrease storage space and to increase recognition accuracy.
- **Min. / Max. Motion Threshold for Face Tracking:** Set the motion threshold range for face tracking.

- **Motion Trigger Threshold for Turning Light On:** The system will turn on light (via I/O control) to improve lighting condition if detected motion exceeds this threshold.
- **Time for Keeping Light On:** Set the time length for keeping the light on. After the light-on period, the light will be turned off to conserve energy.

System Settings --- General and Hardware Settings

The system can work with one I/O control box which has 8 I/O ports and can control at most 8 devices. There are three default devices can be used in the system: door, indoor light, and outdoor light.

- **Time for Keeping Door Open:** Set the time length for keeping door open. When it times up, the door closes again.
- **Announce User Name:** Tells the system to announce user's name (such as "Hello David") after a user is identified.
- **Door Control I/O Port:** Set the I/O port for electronic door lock.
- **Indoor Light Control I/O Port:** Set the I/O port for indoor light.
- **Outdoor Light Control I/O Port:** Set the I/O port for outdoor light.
- **Computer Performance:** Set the computer performance level. To make the whole system running smoothly and efficiently, the program can adapt different user interface to conserve CPU power, so that a slow CPU will not appear as lockup.

FAQ --- How to check video device

We suggest the following steps to check your video device:

1. Our program uses Microsoft's "WDM" standard to connect to the video devices (e.g. webcams, capture cards, etc.). Therefore the first thing to check is whether your video device supports Microsoft's WDM. To check this, please use the "vidcap.exe" program (Which is usually included in our install CD; the program is a Microsoft freely available video test program and can be downloaded on many websites. Just Google it!)
2. If you couldn't bring up video in the vidcap program, that means you should check if your video device supports WDM. (There are something else you could check in next step.) If the video does come up, please make sure you could select 320x240 as resolution, and select RGB24 as format. If your device does not support these two options, then this device is not compatible with our program.
3. If your video device supports other functions such as TV tuner, our program as well as vidcap program could fail to connect to the device. The solution is to run the application that come with your video device to check if there are any "modes" (e.g. TV mode, video capture mode, etc.) or "options" you should set properly. Then run vidcap or our application again.
4. If your device does not show up in device list in our program or vidcap program, it is also likely that you have not installed your device's driver/application properly.

FAQ --- How to improve face recognition

Why computer makes errors on face recognition?

1. Human are good at recognizing familiar faces (of friends or same race) but it gets worse at recognizing unfamiliar faces. Despite occasional mistakes, computer on average performs better at recognizing faces given the ambient lighting is ideal.
2. Computerized face recognition gives a good balance between security and conveniences. Just like any security measure, face recognition could fail. Backup methods should always be considered.
3. Computer creates models for recognition based on enrolled facial images; It is not hard to understand that the recognition performance is strongly related to the enrollment process.
4. At current state-of-the-art, face recognition is affected by ambient lighting and image quality.

Precautions on face recognition:

1. Need sufficient ambient lighting - make sure no shadow or highlight on face.
2. Hair or hat should not touch eyebrows or cast shadow on face.
3. Push up eyeglasses a bit so that eyeglass frame does not block the view of pupils. Sunglasses should be removed before attempting recognition.

What can I do to improve face recognition?

1. Make sure each enrolled user has at least registered 10 facial images. On the enroll dialog window, there are details regarding how to remove unqualified images. For example, user should remove any captured image that does not show eyes location correctly.
2. Try to adjust the recognition threshold that fits your need. Heighten the threshold makes the recognition process longer but more secure; lower the threshold makes the processing faster but with more false identification. But with the facial records, correcting errors is easy and foolproof. Unlike other biometric methods, face recognition always leaves an identifiable trail for human intervene.