

I/O Applications

This chapter discusses how you can set up and control the I/O devices connected to GV-System. I/O applications include these features:

- Configure I/O devices
- Move PTZ to a preset location on input trigger
- Support access control systems of Momentary and Maintained modes
- Arm and disarm I/O devices without interfering the monitoring
- Centrally manage I/O devices across the wide area by the Advanced I/O Panel

Setting Up I/O Devices

Devices necessary for I/O applications are: GV-Net, GV-Net card, GV-NET/IO card, GV-IO and GV-Relay. For details, see Chapter 2 in the *Installation Guide*.

To connect an I/O device to GV-System, you need to configure the settings. On the main screen, click the **Configure** button, point to **System Configure**, and then click the **I/O Device** tab. This window appears.

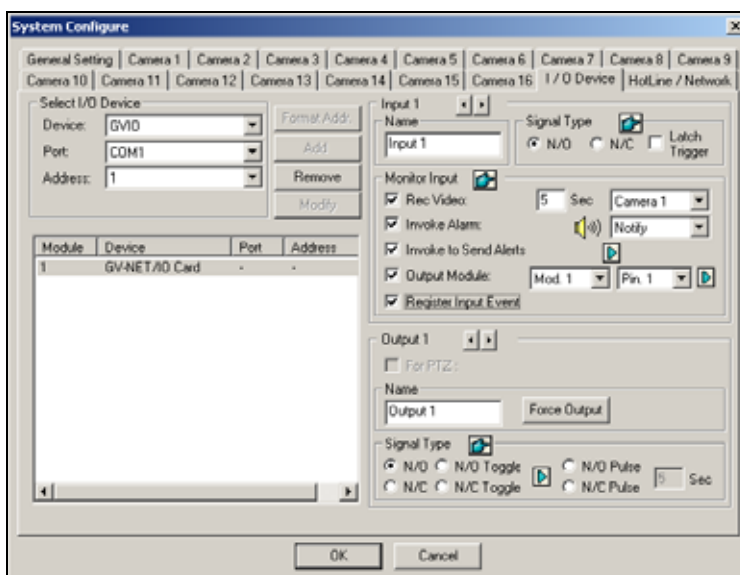


Figure 2-1 I/O Settings

[Select I/O Device] Adds an I/O device to the system:

1. Select the device from the **Device** drop-down list, for example, GV-IO Card.
2. Click the **Format Addr.** button to assign an address to the device. The Format Address dialog box appears.
3. Start your first device with **New Address** set to 1. Click the **Write** button to write the address to the device. Click **OK** to apply the setting.
4. Click the **Add** button. You should see the device listed in the display window.

Note: Repeat above steps to add more devices once at a time. Each device should have its own address; therefore, in step 3 you should assign a different address for the new device.

[Input X] Click the **Arrow** buttons to select an Input to set up. One GV-IO module provides up to 8 inputs.

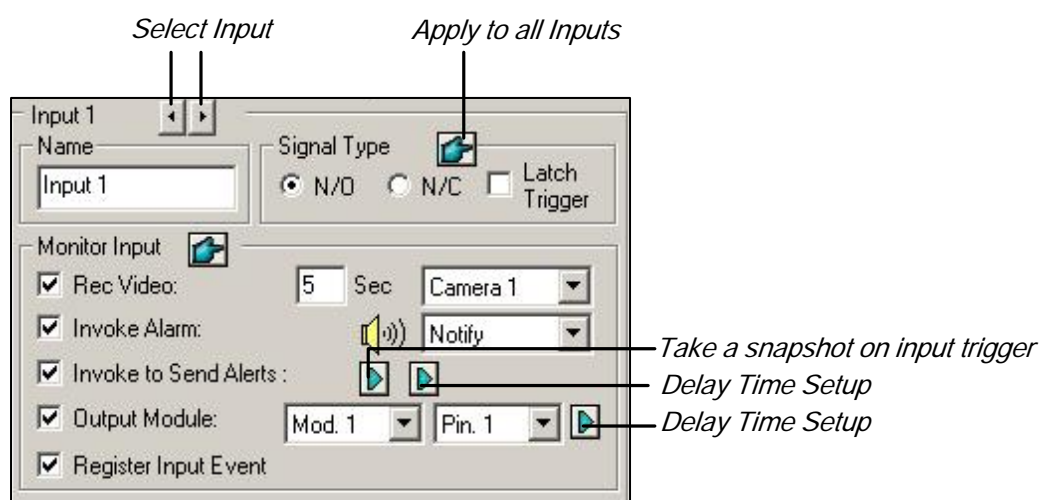


Figure 2-2

- **Name:** Specifies a name for each input device in the Name field. (Click the **Arrow** button to set up next input).
- **Signal Type:** Select signal type for your input device. You may use the **Finger** button to apply your selection to all input devices.

For details on Latch Trigger, see *Latch Trigger* later in this chapter.

[Monitor Input]

- **Rec Video:** Check this option to use the input (sensors or detectors) to trigger recording. You may select which camera to record in the Camera Select drop-down list and specify the recording duration.
- **Invoke Alarm:** Check this option to activate computer alarm when the input is triggered. You may select the alarm type in the drop-down menu.

- **Invoke to Send Alerts:** Check this option to send out an assigned alert (E-Mail/Hotline/SMS) when the input is triggered.
 - 1st Right Arrow button:** Appears when E-Mail is the assigned alert. Click to select the camera(s) to take a snapshot on input trigger. The snapshot will be sent out by E-Mail.
 - 2nd Right Arrow button:** Click to set the delay time to activate assigned alerts (E-Mail/Hotline/SMS).

 - **Output Module:** If the input is invoked, the system will automatically send a signal to an output pin.
 - Right Arrow button:** Click to set the delay time to activate the assigned output module.
- Note:** The delay functions in **Invoke to Send Alerts** and **Output Module** allow you time to deactivate prior alert and output settings. To deactivate these settings, you may stop monitoring or enable the assigned input module set at “**Deactivate notification when selected pin ON**” in I/O Application window (see Figure 2-8).
- **Register Input Event:** This option logs the alarm events into System Log. Each event is labeled with ID, time, device name (camera or I/O input), corresponding module of the device, and event for later retrieval. For details on *System Log*, see Chapter 1.

[Output X] Click the **Arrow** buttons to select an output. One GV-IO module provides up to 16 outputs.

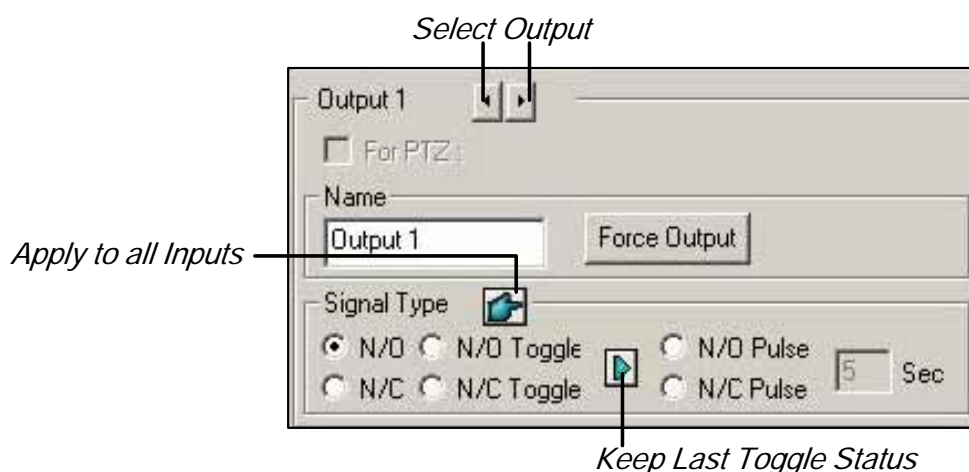


Figure 2-3

- **For PTZ:** This option opens the PTZ Control Panel, where to control movements of your PTZ camera.
- **Name:** Specifies a name for each output device in the Name field.
- **Force Output:** Click to test signal to the selected device.

- **Signal Type:** There are six signal types available: N/O (Normal Open), N/O Toggle, N/O Pulse, N/C (Normal Closed), N/C Toggle, and N/C Pulse. Choose the one that mostly suits the device you're using. The N/O Toggle or N/C Toggle signal type is the output high mode that turns to output low until the monitoring is stopped. You can also specify the pulse duration for pulse type signals.
- **Keep Last Toggle Status:** See *Keeping Last Toggle Status* later in this chapter.

Note: PTZ camera and I/O devices cannot be assigned to the same port at the same time.

Latch Trigger

Instead of constant output alarm in N/O and N/C, the Latch Trigger option provides a momentary alarm, and allows you to set the alarm duration.

Setting up Latch Trigger:

On the main screen, click the **Configure** button, point to **System Configure**, click the **I/O Device** tab, and then check **Latch Trigger**. See the red square in this dialog box.

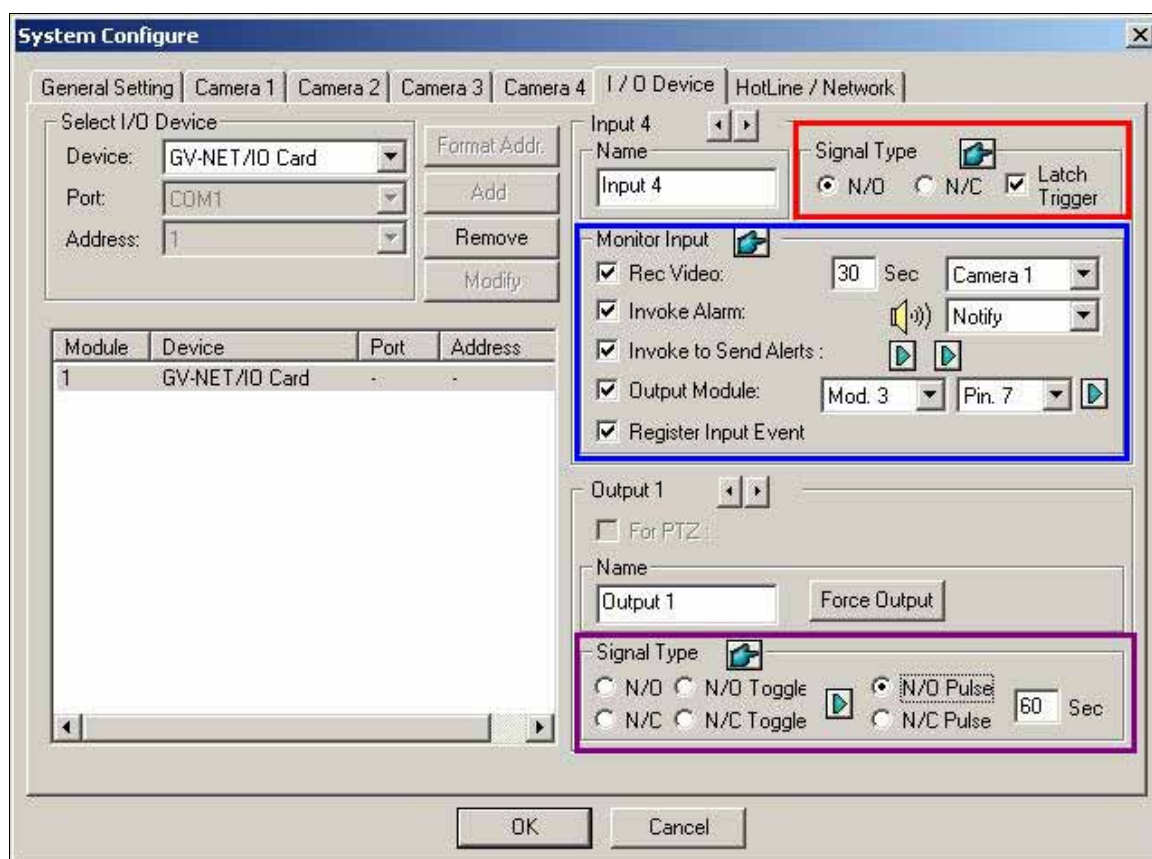


Figure 2-4

Application Example:

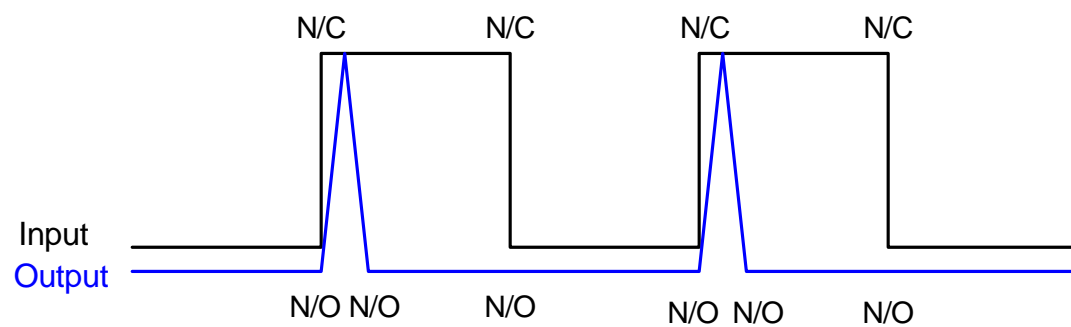
In the above scenario, Input 4 is set to N/O and Latch Trigger as well. When Input 4 is triggered:

- Camera 1 starts recording for 30 seconds and stops itself until the next input trigger (see the **Rec Video** option).
- Computer Alarm sounds once (see the **Invoke Alarm** option).
- The output (Module 3, Pin 7) is triggered simultaneously based on the Latch Trigger mode (see the illustrations below).

Following illustrations can help you understand different output signals (see Purple Square in the above dialog box) working with the Latch Trigger option.

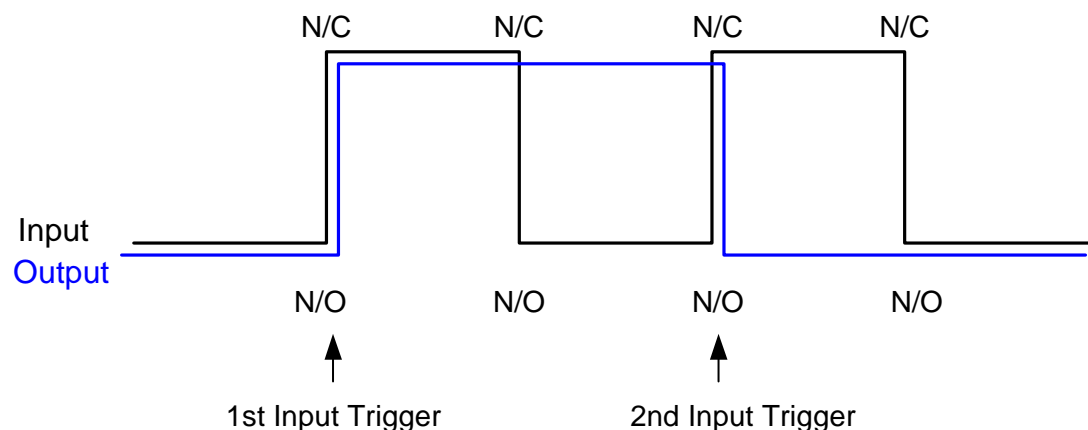
1. N/O (Normal Open) + Latch Trigger

Once the input triggers the output, the output will be triggered for a short moment and then turn off itself.



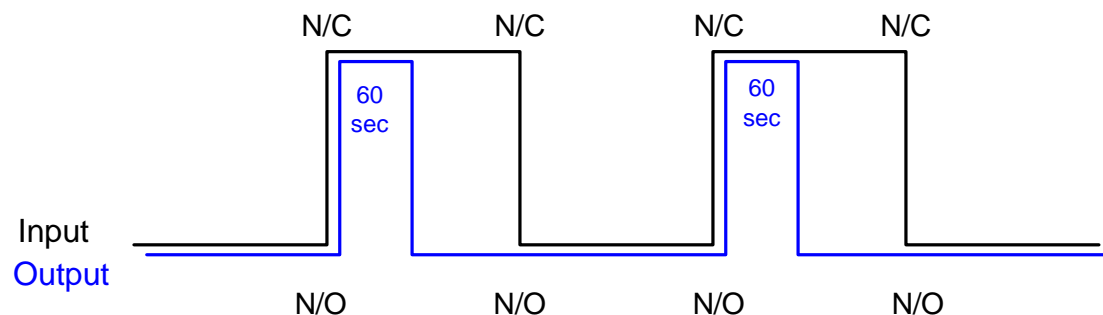
2. N/O Toggle + Latch Trigger

Once the input triggers the output, the output will keep triggering until a new input trigger.



3. N/O Pulse + Latch Trigger

Suppose you set the Pulse time to 60 second. Once the input triggers the output, the output will remain ON for 60 seconds before turning off itself.



Keeping Last Toggle Status

This feature can memorize the current output state when the monitoring is stopped or the system is restarted. For example, suppose the output is lights. When remaining on the premises, you stop monitoring but the triggered lights remain ON, not affected by the system state.

Setting up “Keep Last Toggle Status”:

In the System Configure dialog box (see Figure 2-3), select **N/O Toggle** or **N/C Toggle**, click the **Arrow** button beside to check **Keep Last Toggle Status**.

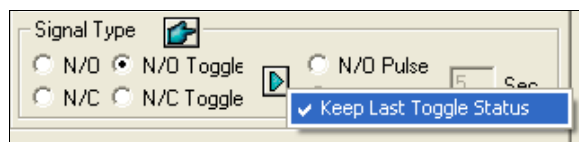


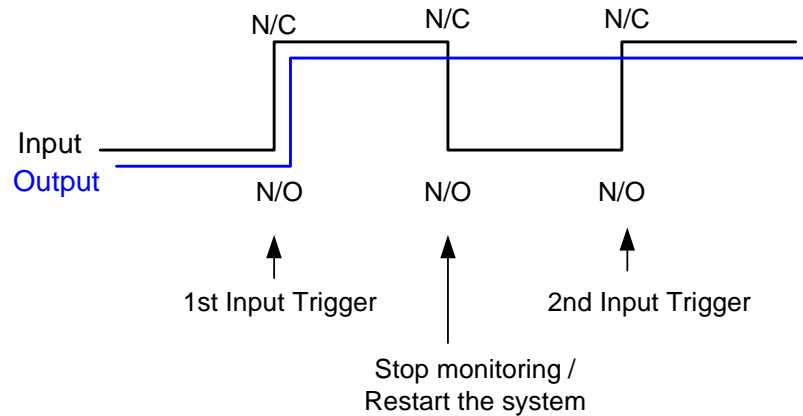
Figure 2-5

Application Example:

Following two illustrations help you understand how the input works with the output set to **Keep Last Toggle Status**.

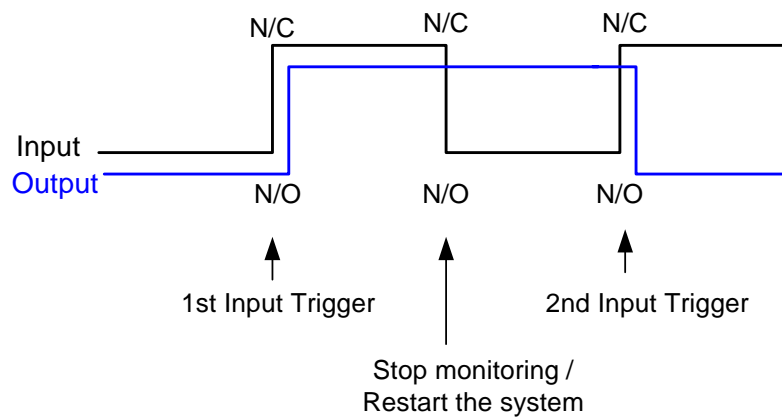
1. Input (N/C) + Output (N/O Toggle + Keep Last Toggle Status)

The triggered output remains ON even when you stop monitoring or restart the system.



2. Input (N/C + Latch Trigger) + Output (N/O Toggle + Keep Last Toggle Status)

When "Latch Trigger" works with "Keep Last Toggle Status", the output only has a momentary trigger but also needs to remain ON even when you stop monitoring or restart the system. Therefore under the two conditions, the output turns off until a new input trigger.



I/O Control Panel

I/O control panel is used to control I/O devices that are added to the system. This control panel will not appear, unless at least one I/O device is connected to the system. To add and to configure a device, see *Setting Up I/O Devices* earlier in this chapter.

I/O Input Control Panel

After a device is added to the system, click the **I/O** button on the main screen to bring out the on-screen control panel for inputs and outputs (see Figure 2-6 and Figure 2-7). If only one I/O device is connected to the system, click the **I/O** button and select **Module 1** to bring up the control panel; if more than one I/O modules are connected to the system, clicking the **I/O** button will list all I/O modules connected to the system. Select one to bring out the control panel.

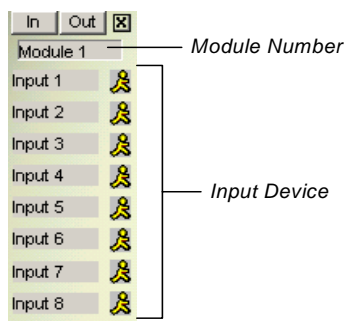


Figure 2-6 Input Control Panel

The input panel displays status of current input sensors. The “walking man” icon indicates the sensor is being triggered.

I/O Output Control Panel

Click the **Out** button to switch to the following output panel. Pressing an alarm icon will send an output signal to the corresponding relay.

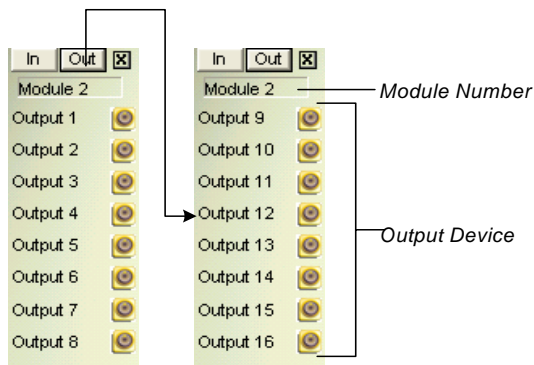


Figure 2-7 Output Control Panel

Moving PTZ Camera to a Preset Location upon Alarm Event

It is possible to direct a PTZ camera to a present location upon an alarm event. The setup determines how the PTZ camera moves to respond to an I/O-triggered event. Click the **Configure** button, and select **I/O Application Setting** from the menu to bring up the following dialog box.

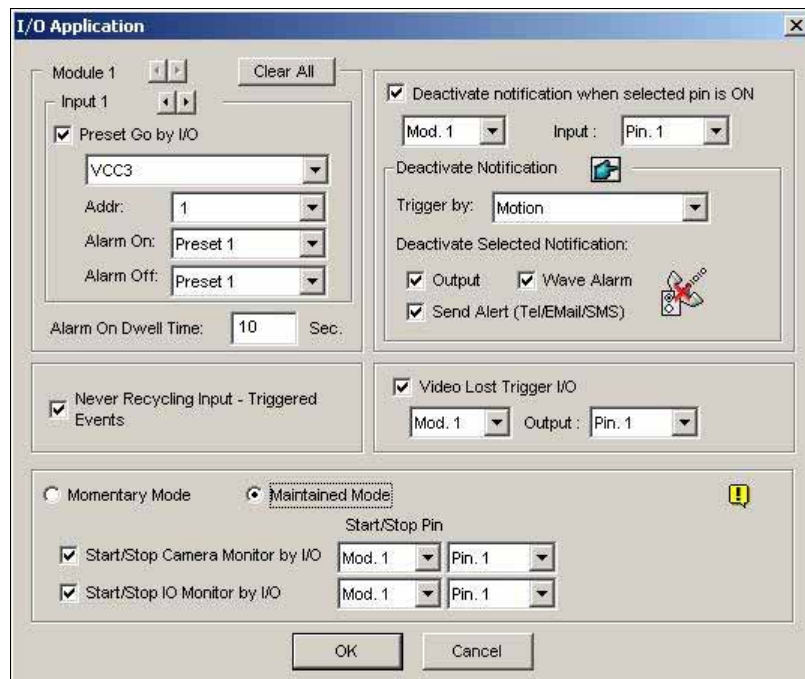


Figure 2-8 I/O Application

The options here allow you to specify how the PTZ camera, and the GV-System will respond to an I/O-triggered event. Click the **Arrow** buttons, and select a **module** and its **input** to set up.

- **Preset Go by I/O:** Enable the option and select your PTZ camera from the drop-down list.
- **Addr:** Specify the address of the PTZ camera.
- **Alarm On:** Turns the PTZ camera to a preset point when the input is triggered.
- **Alarm Off:** Returns the PTZ camera to a preset point when the triggered input is off.
- **Alarm On Dwell Time:** Specify the amount of time the PTZ camera stays at “Alarm On” preset point, before returning to the “Alarm Off” preset point.

[Never Recycling Input-Triggered Events] When the item is checked, the files of input-triggered events won’t be recycled by the system when disk space is full.

[Video Lost Trigger I/O] Activates the specified output module if any camera loses its video signal.

[Momentary Mode] Pushbutton switches that are normally open and stay closed only as long as the button is pressed. Momentary switches allow turn-on or turn-off from multiple locations. For example, certain premises have a designated entry/exit door. When the staff enters the entry door, the system starts monitoring. When the staff leaves from the exit door, the system stops monitoring.

[Maintained Mode] Push-on/push off button switches that stay open until thrown, and then stay closed until thrown again. Maintained switches are convenient for only one switch location. For example, in the business hour when the door is opened, the system stops monitoring; in the non-business hour when the door is closed, the system starts monitoring.

Deactivating Alarm and Alert Settings

The option lets you instantly deactivate all the prior alarm and alert settings (Output, Wave Alarm, Send Alerts), when an assigned input module is triggered. Open the I/O Application window (refer to Figure 2-8), and find the following section.

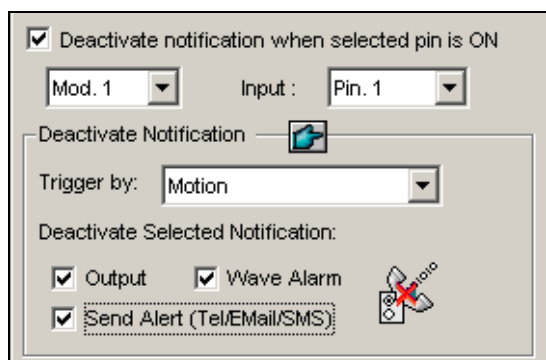


Figure 2-9

[Deactivate notification when selected pin is ON] When an assigned input module is activated, all designated alarms and alerts will be disabled. Assign an installed input module and a pin number for the application.

[Deactivate Notification]

- **Triggered by:** Select an alert condition from the drop-down list for the application. For example, if you choose Motion, all designated alarms and alerts upon motion detection will be deactivated when an assigned input module is activated.
- **Deactivate Selected Notification:** Select the alarms and alerts you want to be deactivated, such as Output, Wave Alarm and/or Send Alert, when the assigned input module is activated.

Detecting Input State

This feature is designed to monitor all inputs for a change of state whenever you start I/O monitoring. A change from the defined state (N/O to N/C or N/C to N/O) can activate an alarm condition, e.g. a warning light or buzzer.

1. On the main screen, click the **I/O** button, and then select **Detect Input Status**. This dialog box appears.

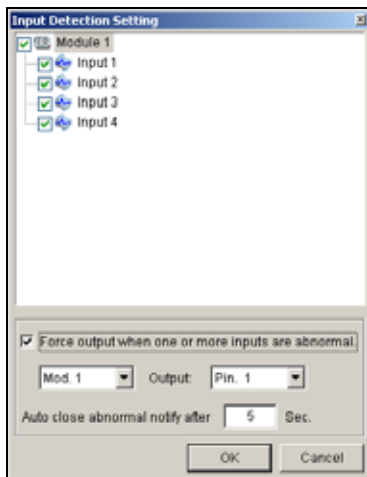


Figure 2-10

2. Check the Input(s) you want to monitor.
3. For any state change, you can trigger an alarm output by checking **Force Output when one or more inputs are abnormal**, and assigning the output module and pin number.
4. When the state change is detected, a warning message will pop up on the screen. In the **Auto close abnormal notify after x sec** field, you can define the duration of the message to close itself automatically.

After settings, you can manually detect all input states by selecting **Detect Input Status**. Or, you can just start I/O monitoring. When the system detects any change of input state, you may see this warning message:

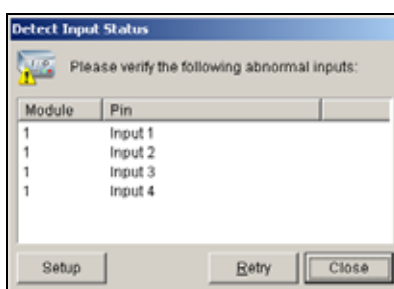


Figure 2-11

I/O Enable Setting

You can manually arm or disarm any I/O devices without interrupting the monitoring. For example, when an output alarm is triggered at the front door, you can turn off the specific output while the system keeps on recording and I/O monitoring.

Arming / Disarming I/O devices:

1. On the main screen, click the **I/O** button, and select **I/O Enable Setting**. This dialog box appears.

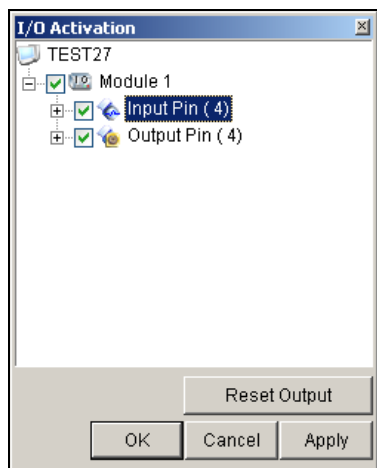


Figure 2-12

2. Check the Input/Output to arm or uncheck the Input/Output to disarm the device(s). Then click **Apply** to verify the changes.

Advanced I/O Panel

The Advanced I/O Panel provides a centrally managing solution for I/O devices installed across a wide area. It simplifies the process of configuring and managing many I/O devices. Its major features are:

- Trigger I/O devices without starting I/O monitoring
- Group I/O devices for cascade triggers
- Monitor different I/O cascade configurations at different times of the day
- Quickly access triggered I/O devices by a Quick Link window

The Advanced I/O Panel

To open the panel, click the **I/O** button on the main screen, and then select **Advanced I/O Panel**.

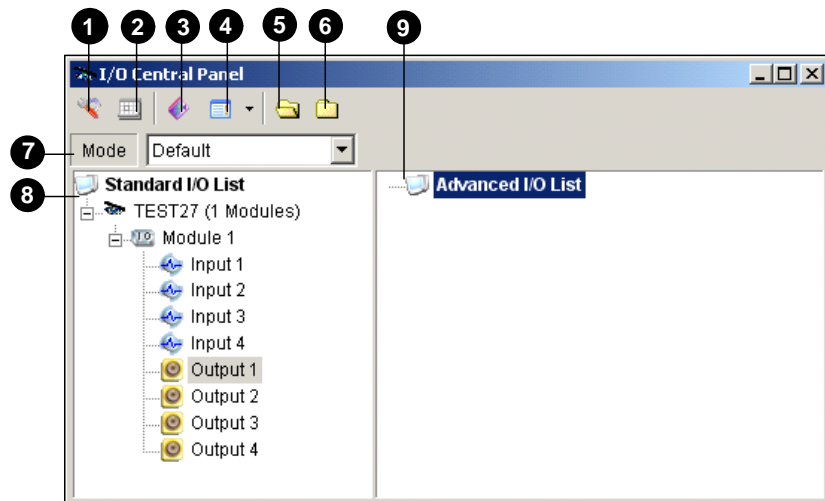


Figure 2-14

The controls on the Advanced I/O Panel:

No.	Name	Description
1	Configure	Accesses Panel and Schedule settings.
2	Mode Schedule	Starts/stops Mode Schedule.
3	Toggle Quick Link	Displays the Quick Link window for quick access to triggered I/O devices.
4	Advanced I/O List Style	Displays the Advanced I/O List in various styles: View/Edit, Icon and Detail.
5	Expand Tree Row	Expands tree branches.
6	Collapse Tree Row	Collapses tree branches.
7	Mode	Configures various cascade modes.
8	Standard I/O List	Displays connected I/O modules.
9	Advanced I/O List	Groups I/O devices in cascade mode.

Creating a Group for Cascade Triggers

You can group I/O devices by function or geography. Further, the group allows cascade triggers, meaning that the trigger actions of one trigger can activate another trigger.

For example, you might have a group called “Entrance” that contains all I/O devices installed at entrances. The “Entrance” group might contain other sub groups, each of which contains just the related I/O devices in various geographic locations:

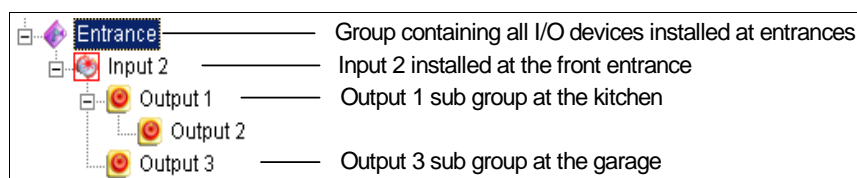


Figure 2-15

When Input 2 is triggered, it will trigger Output 1 and Output 3 sub groups, and Output 1 will trigger Output 2 in a cascade series.

Creating a Group:

1. Right-click on **Advanced I/O List**, and then select **Add A Group**. This dialog box appears.

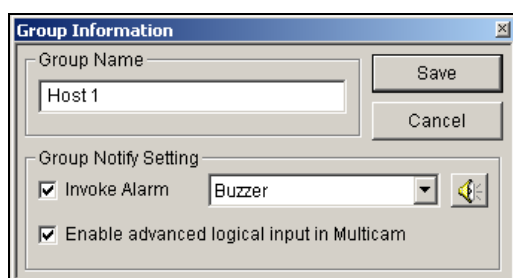


Figure 2-16

- **Group Name:** Names the group.
 - **Invoke Alarm:** Invokes the computer alarm on I/O trigger. Select a sound from the drop-down list.
 - **Enable advanced logical input in Multicam:** See *Setting Advanced Logical Input Status* later in this chapter.
2. Click **Save** to apply the settings, and return to the panel.
 3. To create a cascading hierarchy, drag the desired inputs/outputs from the left **Standard I/O List** to the group.

Note: In the cascading hierarchy, each input can only be used once while the same output can be used repeatedly.

Editing a Group:

To modify group settings, right-click a group, and select **View/Edit**. This dialog box appears.

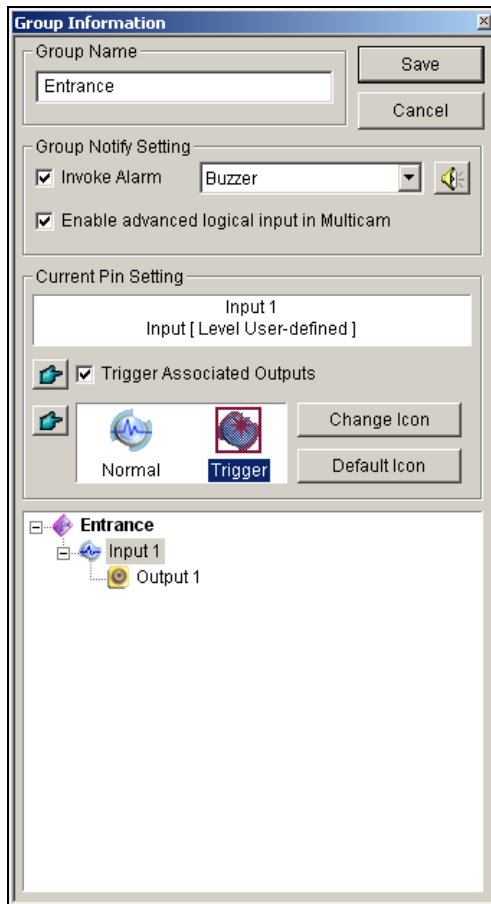


Figure 2-17

[Group Name] As described in *Figure 2-16*.

[Group Notify Setting] As described in *Figure 2-16*.

[Current Pin Setting] To enable this option, highlight an I/O device from the group list at the bottom.

- **Trigger Associated Outputs:** Triggers outputs in cascade mode. Click the **Finger** button to apply the change to all I/O devices at the same group.
- **Change Icon:** To enable this option, select one of two displayed icons: Normal or Trigger. Click the **Change Icon** button to change an icon. Click the **Finger** button to apply the change to all I/O devices at the same group.

Editing an I/O Device

In addition to editing groups, you can also edit the settings of individual I/O device. Right-click an I/O device, and select **Setting**. This dialog box appears.

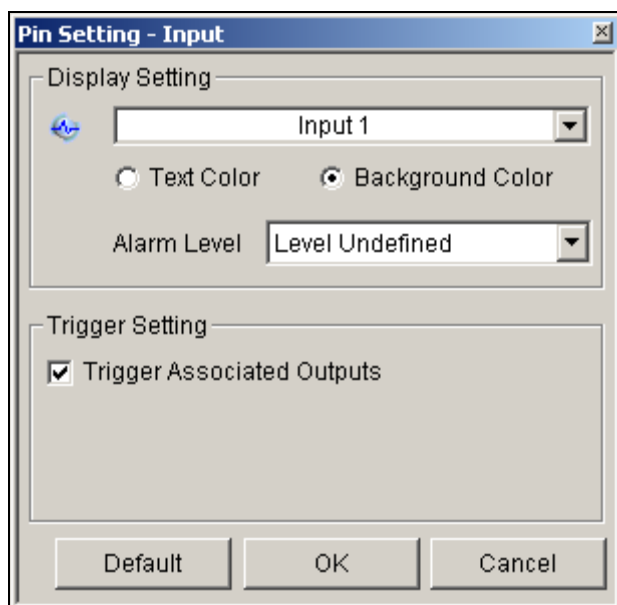


Figure 2-18

[Display Setting] You can define the nature of I/O devices by colors. Note that the setting only affects the **Detail** style of the Advanced I/O List (No. 4, Figure 2-14).

- **Alarm Level drop-down list:** Click the **Alarm Level** drop-down list, and select one of the six default colors: Fire, Smog, Vibration, Intruder, Motion and Emergency. For the Level Undefined option, select **Text Color** or **Background Color**, and then click the Input/Output drop-down list to change its color.

[Trigger Setting]

- **Trigger Associated Outputs:** Triggers outputs in cascade mode (see *Creating a Group for Cascade Triggers* above).

Configuring the Advanced I/O Panel

On the panel toolbar, click the **Configure** button, and select **Panel Setting**. This dialog box appears.

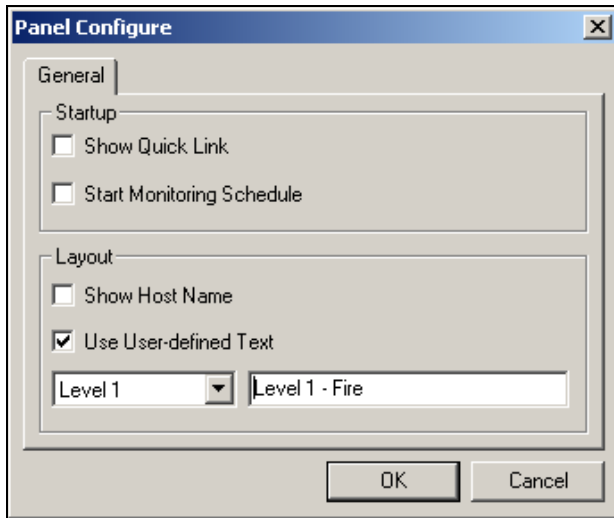


Figure 2-19

[Startup]

- **Show Quick Link:** Opens the Quick Link window at panel startup.
- **Start Schedule Monitoring:** Starts Mode Schedule at panel startup. For details, see *Setting up Mode Schedule* below.

[Layout]

- **Show Host Name:** Displays the host name of each I/O device on the Advanced I/O List.
- **Use User-defined Text:** Allows you to modify the text of Alarm Level (see Figure 2-18).

Setting Up Mode Schedule

The Mode Schedule allows you to monitor different I/O cascade configurations at different time. For example, you may want I/O cascade triggers one way during business hours and another way for non-business hours. Modes can be switched automatically at a scheduled time.

Creating a Mode:

1. Click the Mode drop-down list (No. 7, Figure 2-14), and select **More Edit**. This dialog box appears.

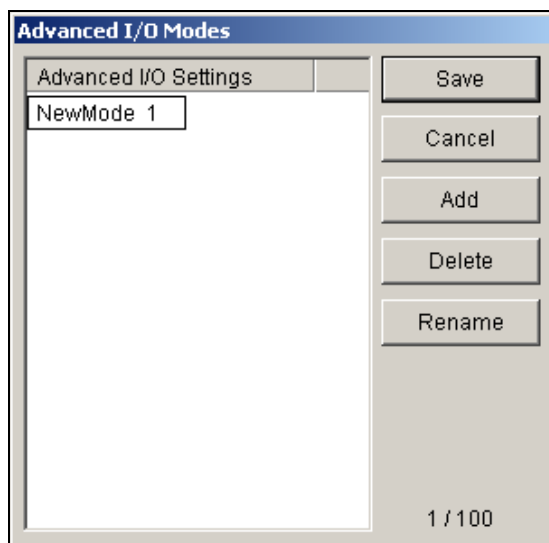


Figure 2-20

2. Click **Add**, and name the created mode. You can create up to 100 modes.
3. Click **Save** to return to the panel.
4. Select the created mode from the **Mode** drop-down list, and create the groups in the Advanced I/O List. For details, see *Creating a Group for Cascade Triggers*.

Creating a Mode Schedule:

Define the times and days you like the panel to switch modes.

1. On the panel toolbar, click the **Configure** button, and select **Schedule Setting**. This dialog box appears.

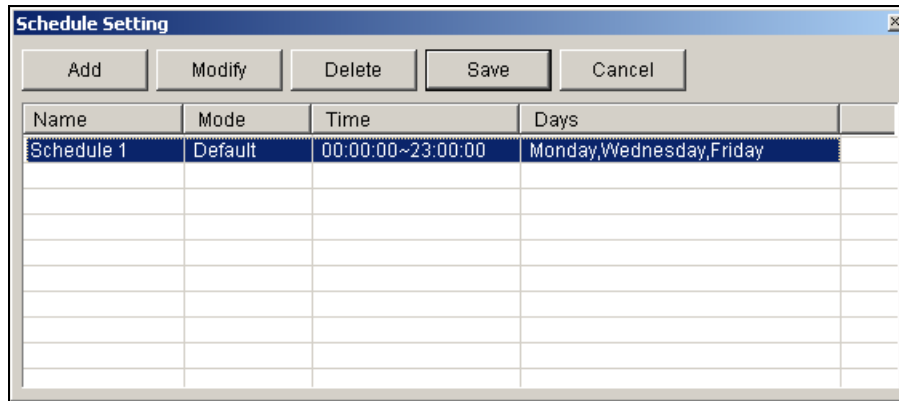


Figure 2-21

2. Click **Add** to create a schedule. This dialog box appears.

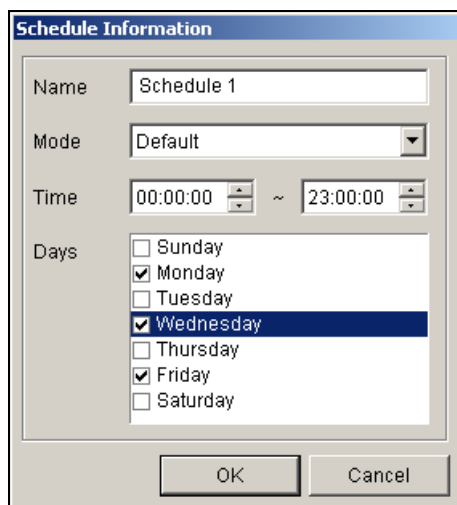


Figure 2-22

- **Name:** Type a name for the schedule.
 - **Mode:** Select a mode from the drop-down list.
 - **Time:** Define a time period you want the mode to run.
 - **Days:** Check the day(s) you want the mode to run.
3. Click **OK** to apply the settings, and click **Save** to return to the panel.
 4. To start the mode schedule, click the **Mode Schedule** button (No. 4, Figure 2-14), and then select **Mode Schedule Start**.

Quick Link

The Quick Link provides a quick access to triggered I/O devices. It is a separate window to display all group icons. The group icon flashes when any included I/O device is triggered. Clicking the flashing icon will bring you to the I/O location in the Advanced I/O List.

- To open the Quick Link window, click the **Toggle Quick Link** button. (No. 3, Figure 2-14).
- To set the Quick Link window at panel startup, see the **Show Quick Link** option in Figure 2-19.

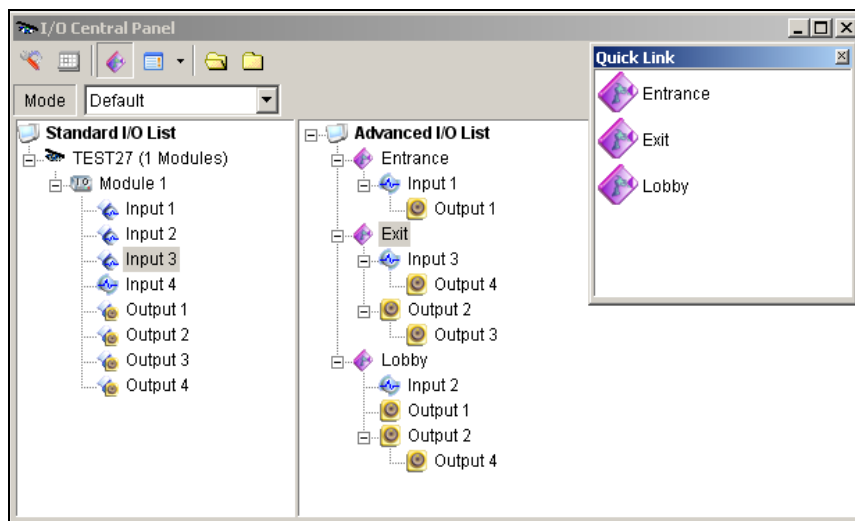


Figure 2-23

Forcing Output

To manually force an output, click one output, and select **Force Output**.

- In the Standard I/O List, you can force the output individually.
- In the Advanced I/O List, considering cascade triggers, you can only manually force the output at the top level, e.g. Figure 2-24. Other outputs at sub levels cannot be forced manually, e.g. Figure 2-25.

However, if the output is not in a cascading hierarchy, you can definitely force it manually, e.g. Figure 2-26.

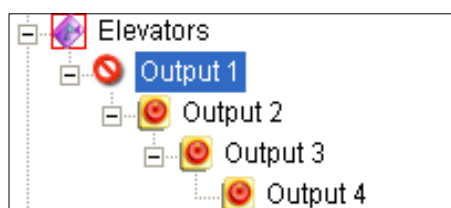


Figure 2-24

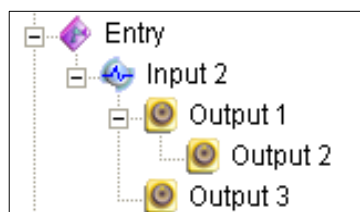


Figure 2-25

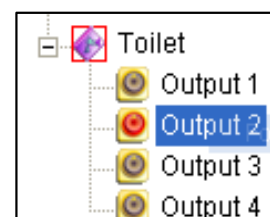


Figure 2-26

Editing Background Image

With the Background Image feature, you can import a floor plan to lay out the locations of triggered I/O devices. This feature works in the **Icon** style of the Advanced I/O List.

1. To switch to the Icon style, click the **Advanced I/O List Style** button (No. 4, Figure 2-14) and then select **Icon**.
2. Select a group in the Advanced I/O List. The I/O icons of this group will be displayed.
3. Right-click on the right screen, and select **Background Image** to import a graphic file.
4. Right-click on the right screen, and uncheck **Auto Arrange**. Now you can freely drag the I/O icons to the desired locations on the imported map.
5. To add images to another group, repeat the steps 2 to 4.

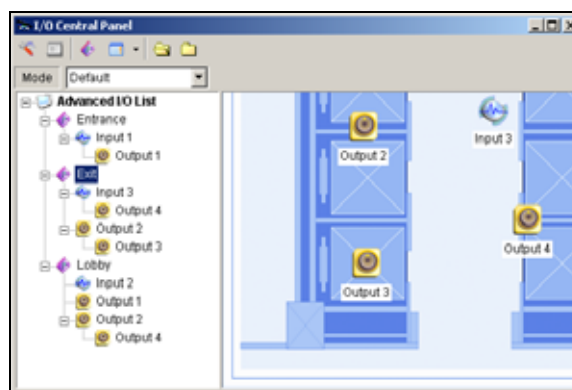


Figure 2-27

Note: Highlighting **Advanced I/O List** in the Advanced I/O List, you can import another image.

System-Wide Triggers

The System-Wide feature gives privileges to remote applications, such as Center V2 and VSM, to force the outputs in the Main System for cascade triggers.

For this example, the System-Wide feature is enabled in Output 1. When the VSM operator manually forces Output 1, Output 2, 3 and 4 will be triggered in a cascade series. If the System-Wide feature is disabled, the operator can only force Output 1 without cascade triggers.

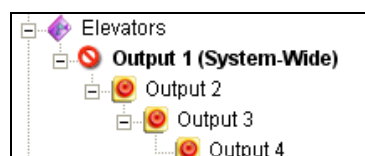


Figure 2-28

To enable this feature, right-click an output at the top level, and then select **System-Wide Output**.

The “Advanced Logical Input Status in Mutlicam” Option

If you already set a specific input to trigger a specific output in the Main System, you can decide whether to apply the simple input-trigger-output setting in the Advanced I/O Panel.

For example, you have set a simple access system in the Main System: Input 2 (card reader) triggers Output 3 (the door opens).

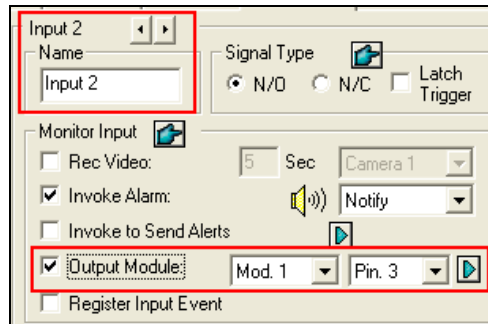


Figure 2-29

But to tighten security, you may set a group “Garage” in the Advanced I/O Panel. Both Input 1 (power switch) and Input 2 (card reader) should be activated together to trigger Output 1 (light), Output 2 (alarm) and Output 3 (the door opens) in a cascade series. Simply activating Input 2 (card reader) shouldn’t cause any output triggers in the cascading hierarchy.

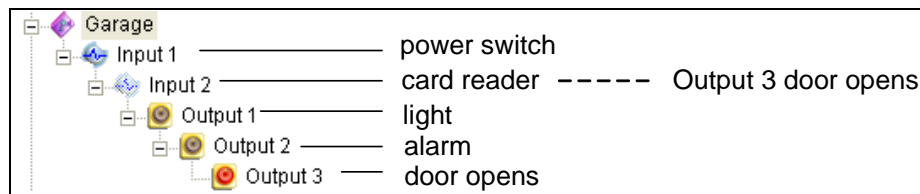


Figure 2-30

So now you have the options:

- At default, the simple input-trigger-output setting is applied at the Advance I/O Panel when **I/O monitoring** is activated. For this example, Input 2 will trigger Output 3.
- To only apply the cascade triggers set in the Advanced I/O Panel and ignore the simple input-trigger-output setting, enable **Use adv. Logical input result as input status** from the I/O icon on the main screen and **Enable advanced logical input in Multicam** from a certain group (see Figure2- 16) together.
- To switch to the simple input-trigger-output setting, just disable **Enable advanced logical input in Multicam**.

Managing a Group of I/O Devices

With groups of I/O devices set up on the I/O Advanced Panel, you can enable or disable these I/O devices by groups.

Enabling a Group

On the I/O Advanced Panel, right-click a desired group and select **Start Monitoring**. All input devices of this group are now enabled. When inputs are triggered, outputs will be activated in cascade mode.

Disabling a Group

On the I/O Advanced Panel, right-click a desired group and select **Stop Monitoring**. All input devices of this group are now disabled. No cascade triggers will occur.

Pausing the Triggered Inputs

This feature is designed for a group of outputs set to be Toggle mode. When inputs activate outputs in cascade triggers, right-click this group and select **Pause Monitoring**. The inputs of the group will be reset, but the outputs keep on alarming.

Note: With the **System-Wide Output** option (see *System-Wide Triggers* above) activated, you cannot use these three options to manage a group of I/O devices.