



# Cisco Video Analytics Apps Reference Guide

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# Contents

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<b>Introduction</b> .....	<b>1</b>
<b>Home Page Overview</b> .....	<b>5</b>
View Status .....	5
<b>Configuration Overview</b> .....	<b>8</b>
Channel Configuration.....	8
Analytics Behavior Selection .....	9
<b>Calibration Overview</b> .....	<b>11</b>
Person Calibration .....	21
Vehicle Calibration.....	26
Calibration Testing .....	32
<b>Rule Management Overview</b> .....	<b>35</b>
Getting Started: Create a Rule .....	36
Custom Response Fields.....	47
Copy Filters .....	54
Activate and Deactivate Rules .....	55
Delete Rules .....	56
Copy Rules.....	56
Show or Hide Rule Overlay .....	56
<b>Event and Object Types Overview</b> .....	<b>59</b>
Object Types .....	60
Event Types .....	61
Appears Events .....	62
Camera Tamper Events .....	63
Density Events.....	64
Crowd Threshold Events.....	65
Disappears Events.....	66
Dwell Time Threshold Events .....	68

## Contents

---

Dwell Time Data Events .....	69
Enters Events .....	70
Exits Events .....	71
Inside Events.....	72
Left Behind Events .....	73
Loiters Events.....	74
Occupancy Data Events.....	75
Occupancy Threshold Events.....	76
Taken Away Events .....	77
Video TripWire™ Events .....	79
<b>Performance Options.....</b>	<b>81</b>
Performance Options Descriptions.....	82
<b>Advanced Performance Options Overview.....</b>	<b>89</b>
Filter the Parameter List.....	90
Restore Default Parameter Values.....	91
Save Parameters.....	92
Test Parameter Changes .....	92
<b>Troubleshoot .....</b>	<b>93</b>
<b>Supported Browsers.....</b>	<b>96</b>
<b>Index .....</b>	<b>97</b>



# Introduction

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Cisco Video Analytics offers users innovative ways to perform video analysis. The software provides an intuitive interface and powerful tools to enable organizations to make the best use of their surveillance video. Analytics processing occurs on edge devices, providing a cost-effective method of deploying video analytics on the network. Cisco Video Analytics offers a four analytics packages

- **CiscoBaseAnalytics:** - Offers a base security package and base counting package; users may switch between the base security package and base counting packages.
- **CiscoAdvancedAnalytics:** - Offers an advanced security package and advanced counting package; users may switch between the advanced security package and advanced counting packages.
- **CiscoCrowdMonitoring:** - Offers a package to measure the crowd density levels.
- **CiscoFlowViolation:** - Offers a package to signal and event if the set flow is violated in the Area of Interest.

The following table shows the features that each Cisco Video Analytics app provides. You can enable up to five features at a time for the app that you are running.

**Cisco Video Analytics Apps Features**

Feature	Cisco Base Analytics Package		Cisco Advanced Analytics Package		Cisco Flow Violation Package	Cisco Crowd Monitoring Package
	Security	Counting	Security	Counting		
Object Classification	✓	✓	✓	✓		
Tripwire Event	✓	✓	✓	✓		
Multi-line Tripwire Event			✓	✓		
“Enters” Event			✓	✓		
“Exits” Event			✓	✓		
“Appears” Event (Full View)			✓			
“Appears” Event (AOI**)			✓			
“Disappears” Event (Full View)			✓			
“Disappears” Event (AOI)			✓			
“Inside of” Event			✓			
Loitering Event		✓	✓	✓		

Introduction

Leave Behind Event (Full View)			✓			
Leave Behind Event (AOI)			✓			
Configurable Leave Behind Time			✓			
Take Away Event (Full View)			✓			
Take Away Event (AOI)	✓		✓			
Camera Tamper Detection	✓		✓			
Object Size Filters	✓	✓	✓	✓		
Object Size Change Filters	✓	✓	✓	✓		
Saliency Filters	✓	✓	✓	✓		
Night Enhanced Snapshots	N/A	N/A	N/A	N/A		
Image Stabilization	✓	✓	✓	✓		
Multi-view	✓	✓	✓	✓		
Forensics Support	✓	✓	✓	✓		

Feature	Cisco Base Analytics Package		Cisco Advanced Analytics Package		Cisco Flow Violation Package	Cisco Crowd Monitoring Package
Object Tracking & Markup Data	✓	✓	✓	✓		
Enhanced People-only Object Classification	N/A	N/A	N/A	N/A		
People / Object Counting				✓		
Occupancy Monitoring				✓		
Dwell Time				✓		
Flow Violation					✓	
Object Density Level (AOI)						✓

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Crowd Estimation (AOI) (Medium Traffic)							✓
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## Accessing and Navigating to the Analytics Home Window

### Procedure

**Step 1** From the IP camera user interface, click the **Setup** link, click **Application Manager** to expand the menu, then click **App Setup**.

**Step 2** Click one of the following radio buttons to choose the app that you want to run.

The buttons that appear on your system depend on which apps you installed.

- **CiscoBaseAnalytics**
- **CiscoAdvancedAnalytics**
- **CiscoCrowdMonitoring**
- **CiscoFlowViolation**

**Step 3** (Optional) If you want the Video Analytics app to run automatically each time the IP camera reboots, in the Installed Application List area, check the **Start on Boot** check box that corresponds to this app.

If you do not check this check box, you must run the app manually each time the IP camera reboots.

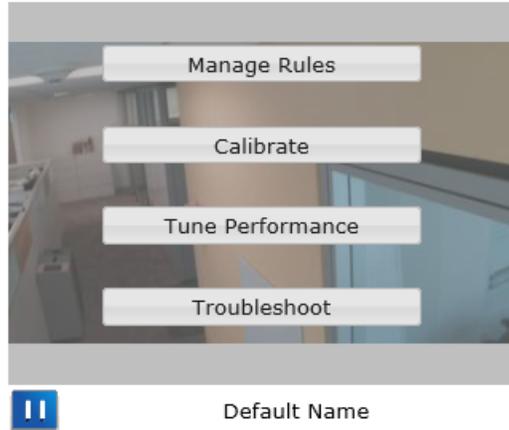
**Step 4** Click the **Run** button.

**Step 5** Click the **Configure** button.

The Web Console that comes up on clicking after "Configure" button allows you to view video channels, create video analytics rules, configure your device for analytics, and change parameters that control how events are detected.

On the Home page, you can hover over a channel snapshot to display the navigation options available for that channel.

- "Home Page Overview" on page 5
- "Configuration Overview" on page 8
- "Rule Management Overview" on page 35
- "Calibration Overview" on page 11
- "Performance Options" on page 81
- "Advanced Performance Options Overview" on page 89



# Home Page Overview

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The Home page provides a snapshot of every channel's camera view. The channel is identified by a name below the snapshot. By default, these snapshots provide live video of the camera's view. See "Play Video" on page 55 for details. To pause or play all the channel videos at once, click the **Pause All** or **Play All** link, respectively, in the upper right corner of the Home page.

If the camera is not in a known view or has a Bad Signal, a red box appears around the view. You can hover over the exclamation icon under the view to display the status message and the time the channel status changed.



See "View Status" on page 5 for information about the unknown view status.

You can hover your mouse over a channel snapshot to see the options available for that channel. See the following topics for details:

Button Name	For more information...	Basic functions..
Manage Rules	"Rule Management Overview" on page 35	Editing, creating, and deleting rules.
Tune Performance	"Performance Options" on page 81	Editing channel settings to modify video analytics.
Calibrate	"Calibration Overview" on page 11	Allows you to specify the size of average people or vehicles in the camera's field of view.
Force View	"Force a View" on page 7	If you are using User-controlled views, this allows you to force an unknown view to become a known view.

In the top-right corner of the Home page, you can select **Configuration** to open the Configuration page. On this page, you can access information about the Video Analytics Device and edit channel settings. See "Configuration Overview" on page 8.

## View Status

A Channel's view status is commonly referred to as "Known" or "Unknown." A channel in Known view is running properly. A channel in the Unknown view means the video analytics device does not recognize the view it is monitoring and will not detect any events. When the channel's view is in the Unknown state you must take action, either restore the device to a previous Known view or add the new view to the device. See "Force a View" on page 7.

Unknown views are represented by a red box around the camera snapshot in the Web Console. If you hover over the exclamation point icon below the snapshot, a message indicating that the channel is **Out of view** appears.



The type of view mode your channel is using determines what happens when the camera view changes significantly. The default view behavior is controlled by the device. In most cases the default view behavior should be appropriate, but you can modify this behavior using the Device Configuration page. The channel configuration area's **View Mode** drop-down menu displays the available view options.

The following view modes are available:

#### [Auto-force View Mode](#)

When the device first starts monitoring the channel, it looks for events in the current field of view. If the camera's field of view changes, the device automatically begins monitoring the new view. The device will continue to monitor the camera's field of view even if the view changes significantly. Camera Tamper events are only detected if they are caused by a Bad Signal (covered camera or major video signal issue).

If you are using Auto-force views, you may want to monitor the field of view periodically to be sure that the appropriate rules are activated for the current field of view.

#### [Auto-acquire View Mode](#)

When the device first starts monitoring the channel, it looks for events in the current field of view. If the camera's field of view changes, the device automatically begins monitoring the new view. There is a few seconds of downtime while the device begins monitoring the new view. But, as opposed to Auto-force view mode, a Camera Tamper event will be detected when the view changes (if a Camera Tamper rule exists on the channel). This may provide an advantage if you need to be notified of view changes, but you still want monitoring to continue regardless of the view.

#### [User-controlled View Mode](#)

When the device first starts monitoring the channel, it looks for events in the current field of view. If the field of view of the camera changes significantly, the device will no longer recognize the view. The channel will change to an unknown view status. Unknown views are represented by a red box around the camera snapshot in the Web Console.

The view behavior is controlled by the user because the system does not automatically force the camera to stay in a known view. You need to return the camera to a position that matches the recognized view or force the current view to continue monitoring. See "Force a View" on page 7.

If Camera Tamper rules are supported by your channel type, you can create them to notify you when the view changes significantly.

The channel stops generating responses when the view changes for two reasons. First, rules are created for a particular field of view of the camera. If the field of view changes, the rule

may no longer apply to the field of view. Second, a view change can sometimes be so severe that the device would be unable to detect events even if it was actively monitoring the video feed.

### **Force a View**

When a camera view is not known, you can force it to become a known view on the Home page. Hover your mouse over the channel view, and then click the **Force View** button.

This forces the device to monitor the current view of the camera. When you force a view, you are acknowledging that the camera view has changed and indicating that you still want to monitor the view of the camera. You can only force a view when a channel is in an unknown view and does not recognize the view of the camera. The **Force View** button only appears when you are in User-controlled View mode. If you are in any other view mode, the device should automatically begin monitoring the camera view when the view changes.

# Configuration Overview

The Device Status is always available at the top right of the application. Device status designations are:

OK—The device is running properly.

Warning—The device is running, but it may be experiencing issues.

Error—The device is not operating correctly. Events cannot be detected.

The screenshot shows the Cisco Analytics Management Console interface. At the top left is the Cisco logo. The main header reads "Cisco Analytics Management Console". On the right, there are links for "Configuration" and "Help", and the "App Status" is shown as "OK". Below the header, there is a breadcrumb "Home > Configuration". The main content area contains two configuration panels. The first panel, titled "Default Name", includes fields for "Channel ID" (0), "Video Resolution" (352x208), "License Type" (Cisco Security Plus), "Analytics" (On), and "View Mode" (User-controlled). A "Calibrate" button is located at the bottom right of this panel. To the right of the text fields is a small video snapshot of a hallway. The second panel, titled "Analytics Behavior Selection", has two radio button options: "Security Plus Package" (selected) and "Counting Plus Package". A "Save" button is at the bottom right of this panel.

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## Channel Configuration

On the Configuration page, a configuration section appears for every channel on the device. A channel snapshot provides a visual reminder of which channel is being monitored. The following information is also available:

Field	Description
Channel Name	A name assigned to the channel. It may be helpful to use a name that describes the camera's view or the analytic capabilities of the channel.
Channel ID	The unique channel identifier.
Video Resolution	The resolution currently being processed. For example, 320 x 240 would indicate a frame size of 320 pixels wide and 240 pixel high.
License Type	The type of video analytics the channel is licensed to perform.
Analytics	On/off. Specifies whether the channel is enabled to perform video analytics. If

Field	Description
	analytics capability is off, the <b>View Mode</b> field is unavailable. The channel will no longer be displayed on the Home page.
View Mode	The type of view mode your channel is using determines what happens when the camera view changes significantly. See View Status for details.

[To Expand/Collapse the Channel Details](#)

In order to more easily view many channels on one page, the channel list will be collapsed by default if there are more than 4 channels.)

- To **expand** a channel and view the channel details simply click the arrow next to the channel name, or anywhere on channel heading bar. Clicking the channel name link will open the channel in edit mode, see To Edit the Channel Configuration section for more details.
- To **collapse** a channel and hide the channel details simply click the arrow next to the channel name, or anywhere on channel heading bar. Clicking the channel name link will open the channel in edit mode, see To Edit the Channel Configuration section for more details.

[To Edit the Channel Configuration](#)

1. Click the channel name to edit the channel properties.
2. The following fields may be edited
  - **Channel name** - Modify the existing channel name by typing the new name in the text input field.
  - **Analytics** - Click the checkbox to turn on or off the analytics processing.
  - **View Mode** - If available, use the drop-down box to modify the view mode.

 With the OV Density license type, the **View Mode** field does not appear since Auto-force is the only available option.

3. Do one of the following
  - Click **Save** to save your changes and exit edit mode.
  - Click **Cancel** to exit edit mode without saving your changes.

## Analytics Behavior Selection

A security package and a counting package cannot run simultaneously on a single IP camera; only one package can be active at any time. However, you can change the analytics behavior (from security to counting, or from counting to security).

**Note**

When CiscoBaseAnalytics application is installed and running, you can change the analytics behavior between security base package and counting base package

When CiscoAdvancedAnalytics application is installed & running, you can change the analytics behavior between security plus package & counting plus package

# Calibration Overview

Before you create rules for a channel, you must calibrate that channel so that it understands the average size of a person and/or vehicle that appears in the camera's field of view.

Calibration requires people or vehicles placed in at least three different locations distributed over as wide an area as possible in the camera view. To perform this calibration using people or vehicles, you will use both the Take Snapshots tab and the Calibrate tab.

The screenshot displays the Cisco Analytics Management Console interface. At the top, the Cisco logo is on the left, and 'Cisco Analytics Management Console' is in the center. On the right, there are links for 'Configuration | Help' and 'App Status: OK'. Below the header, the navigation path is 'Home > Default Name > Calibration'. The main interface is split into two tabs: 'Take Snapshots' and 'Calibrate'. The 'Calibrate' tab is active. On the left, there's a 'View type' dropdown set to 'Indoor, anything'. Below it is a camera feed showing a person in a hallway with a red bounding box and a blue crosshair. To the right of the camera feed is a 'Calibrate Person' section with instructions and a grid of calibration samples. The instructions are: 1. Drag the box over a person in the snapshot. 2. Resize the box so that it's tightly-cropped around the person. 3. Drag the circle to the top-center of the person's head. 4. Drag the square to the bottom-center of the person. The first two steps are shown with a green checkmark, and the last two steps are shown with a red X. Below the main view are five small thumbnails of the camera feed, each with a red bounding box around a person. The 'Calibrate Person' section has a '(Overhead | Side view)' dropdown. At the bottom right, there are 'Cancel' and 'Save' buttons.

On the Take Snapshots tab, you collect one to five snapshots of the camera view that include images of people/vehicles in different locations.

You then use the Calibrate tab to draw red boxes around people/vehicles. For each box, you'll also identify the top and bottom of the person/vehicle. The way to designate the top and bottom for a person is different than that of a vehicle (see "Person Calibration" on page 21 or "Vehicle Calibration" on page 26.).

These boxes, combined with their top/bottom orientation, are called "calibration samples". You will create calibration samples in one or more snapshots that you created on the Take Snapshots tab.

Your calibration samples can be drawn exclusively from people, exclusively vehicles, or a mixture of both. This choice depends on what types of objects you will be monitoring.

 Calibration requires some preparation, and it frequently involves more than one person. For example, one person might be setting up the calibration in the software while a second person stands at (or drives a car to) different positions within the camera view.

### To Calibrate a View

1. Do one of the following:
  - On the Device Configuration page, click **Calibrate** in the channel's configuration, OR
  - On the Home page, hover with your mouse over a channel snapshot and then click **Calibrate**
2. Make sure that at the point at which you take a snapshot, the video shows at least one person or vehicle in full view. This may require you to "stage the scene" so that a person is standing or a vehicle is placed in a position useful for calibration.

 The more calibration samples you have, the better your system will perform. Calibration samples can be drawn from different people or from a single person standing in a different location in each snapshot. Remember that each snapshot can include more than one calibration sample, and you can have up to five snapshots.

3. Click the Take Snapshot icon  to capture a snapshot of the current video display.
4. Repeat Steps 2-3 to create additional snapshots. There is no fixed number of snapshots you should take; the important thing is that your set of snapshots includes at least three people/vehicles that you can use to create calibration samples. For examples, see "Calibration Tips" below.

 As you calibrate, you may find that you need to add or delete snapshots. You can always toggle back and forth between the Take Snapshots tab and the Calibrate tab.

5. Click to the Calibrate tab. The Calibrate tab is where you will create calibration samples within the snapshots you just took.
6. From the **View type** drop-down, select the option that best characterizes the scene and what you will be detecting in it.
  - **Indoor, anything** - Select this only in cases where people or vehicles would appear indoors (e.g., a parking garage or loading dock). Note that since vehicles don't typically appear in indoor settings, the **Indoor, people only** option is typically more useful than this option.
  - **Indoor, people only** - Select this option for building interiors where only people would appear in the camera view (e.g., within an office). This can also include objects that a person leaves behind (i.e., a "left-behind" event).

 For an Event Counting channel monitoring a retail environment from an overhead camera view, you can adjust the parameter 271 setting to improve your counting accuracy (see How to Improve Shopping Cart Classification).

- **Outdoor, anything** - Select this in exterior views where you may need to detect people or vehicles.
  - **Outdoor, vehicles only** - Select this for exterior views where you are only concerned with vehicular traffic (e.g., a major highway). Note that for this setting you can also detect unknown objects or objects left behind; you just won't detect people.
7. Select one of the small snapshots appearing at the bottom of the screen so it is displayed in the **Calibrate** area.
  8. Click the Add Person tool  or Add Vehicle tool  according to which type of object you are using. See "Person Calibration" on page 21 or "Vehicle Calibration" on page 26.
  9. Repeat Steps 7-8 to create at least three calibration samples. These calibration samples can be across as many snapshots as you have available (e.g., you could have one snapshot with three calibration samples and four more snapshots with one calibration sample each).

 To remove one of your calibration samples, click the Delete tool. 

10. Do one of the following:
  - Click **Cancel** to close the page without saving changes.
  - Click **Save**. The device will restart, during which time no events will be detected.

 Once you have saved your calibration, you can test its accuracy. See "Calibration Testing" on page 32.

### Calibration Tips

Follow the guidelines below when calibrating a view.

#### Snapshots Should Show Widely-Distributed Calibration Samples

When taking snapshots, arrange it so that the people or vehicles you will use as your calibration samples are distributed over as wide an area as possible within the scene. ***This is one of the most critical aspects of successful calibration.***

For instance, you might create one box around a person in the left foreground of the view, another box around a person in the center background, and a third box around a vehicle in

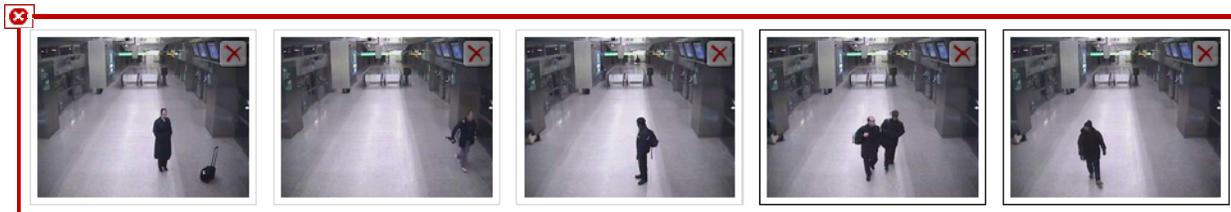
the center right of the view. If the objects are too close together, they will not provide the data needed for the device to infer the object size throughout the view.

**EFFECTIVE:**



People are distributed throughout the scene, from the foreground to the background. The first and third snapshots each show a single person in the foreground. The fourth and fifth snapshots show people farther away from the camera. The second snapshot shows multiple people, spread out between the foreground and the background.

**INEFFECTIVE:**



Having five snapshots is helpful, but in this case each snapshot only shows people in the foreground, which is ineffective.

**Take Enough Snapshots and Create Enough Calibration Samples**

Don't limit yourself to the minimum of one snapshot/three calibration samples. Take as many snapshots and calibration samples as possible. As mentioned in the previous tip, make sure your calibration samples are distributed as widely as possible across the scene.

**EFFECTIVE:**



Five snapshots (the maximum allowed) have been taken. These snapshots include a total of seven calibration samples, distributed widely within the scene.

**INEFFECTIVE:**



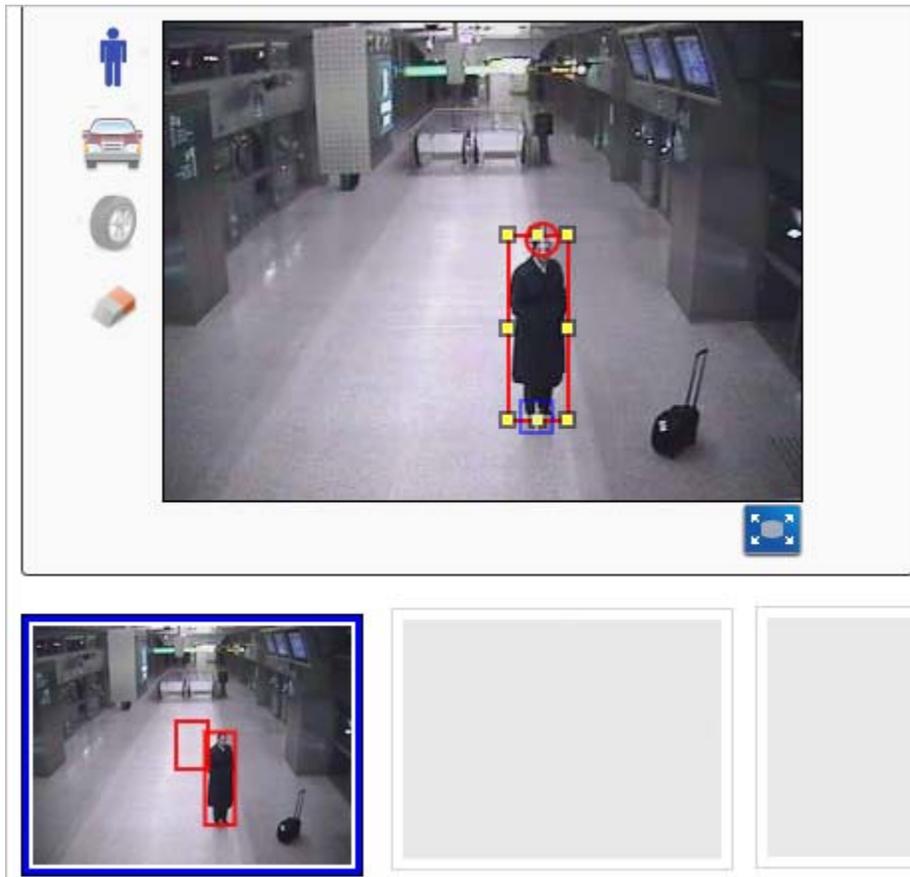
Only three snapshots have been taken. These snapshots include a total of three calibration samples (the bare minimum required to save the calibration).

[Remember that the Small Snapshots at the Bottom of the Screen Display All Calibration Samples](#)

When you tab to Calibrate and begin calibration samples, the red calibration box you are currently editing appears in the top, larger snapshot.

Bear in mind that any additional calibration boxes you have created will be in effect unless you remove them by clicking the Delete tool. 

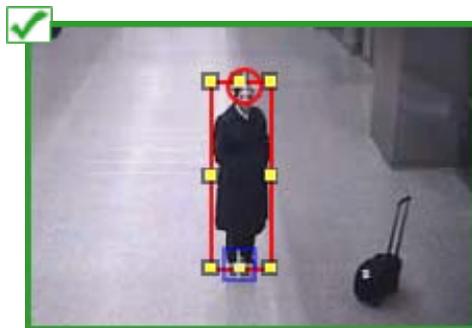
In the example below, the larger snapshot at the top displays a single calibration box, currently in edit mode. The smaller snapshot at the bottom displays two calibration boxes, the one currently being edited, plus an additional box that isn't visible in the larger snapshot. Both calibration boxes are factored into the calibration, but notice that the smaller calibration box isn't drawn around a person so it will skew the calibration data. Sometimes, such extraneous calibration boxes are inadvertently added during the calibration process. Delete all extraneous boxes.



### Resize Boxes

Boxes need to be resized. To resize, drag the yellow controls on the top, bottom, and sides of the box to modify the lengths of the box (i.e., the width or height).

### EFFECTIVE:



The red calibration box has been moved over a person and resized so that it's tightly cropped around them.

**INEFFECTIVE:**



The red calibration box has been moved over a person, but it has not been resized.

**Don't Make Boxes Too Big**

When resizing the box, the sides of the box should fit snugly around the main body of the person or vehicle. With people, this means that the box should only be as wide as the person's torso. If the person is extending their arms or legs, ignore the extended limbs and keep the borders tightly-cropped at shoulder width around the person.

**EFFECTIVE:**



The box is resized to the width of the person's torso. This means that one outstretched leg extends outside the box.

**INEFFECTIVE:**



The box is too wide, extending outward to encompass the outstretched legs.

**Objects Should Be Completely in the Screen**

The people or vehicles you use to create calibration samples must be completely within the camera view.

 You can create a calibration sample for an object that is partially obstructed *within* the camera view; the object just can't extend outside the displayed camera view. The important thing is that within the camera view you must be able to define the full dimensions of the object, as well as its top and bottom.

**EFFECTIVE:**



The person is in full view, so the calibration box can surround the entire person.

**INEFFECTIVE:**



The person is not in full view.

**Objects Should Be on the Same Ground Plane**

The people or vehicles you use to create calibration samples should be on the same "flat" ground plane. You can think of the ground plane as a level carpet within the camera's view. For example, do not use people standing on different elevations, floors, or stair steps.

**EFFECTIVE:**



Calibration samples are on the same ground plane (i.e., on the same road).

**INEFFECTIVE:**



Calibration samples are on different ground planes (i.e., one is on the road above, the other on the road below).

### Zoom In When Necessary

To place your calibration circles , squares , and/or tire arrows  as precisely as possible, it is useful to zoom into the screen. There are two ways to zoom in:

- Expand the entire screen by clicking the Expand button. 
- When you click and drag a calibration circle, square, or tire arrow, a small inset window appears with a zoomed-in view of that immediate area.



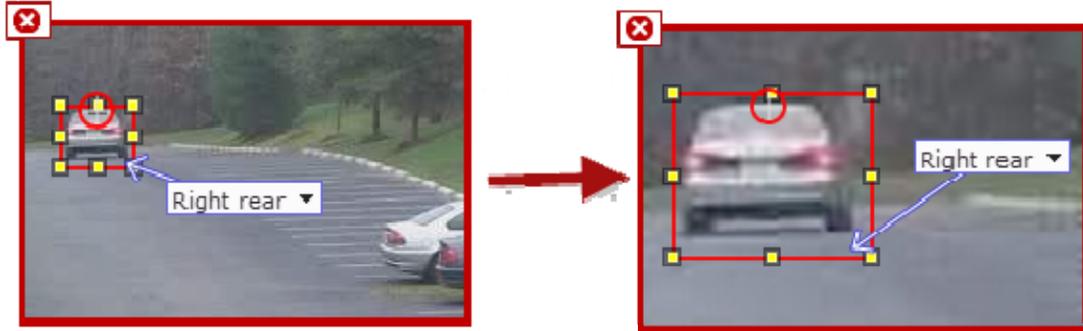
 The inset zoom-in window is not visible in Microsoft Internet Explorer® version 8 or earlier.

### EFFECTIVE:



In this example, the user starts by expanding the screen to the zoomed in view (displayed in the graphic on the left). The zoomed-in view shows sufficient detail, particularly the point at which the tire actually touches the pavement. The user adjusts the tire arrow while zoomed in and then returns to the normal view (displayed in the graphic on the right).

**INEFFECTIVE:**



In this example, the user starts by adjusting the tire arrow while in normal view (left). Because it's difficult to see the exact point where the right rear tire touches the pavement, when you zoom in (right) you see that the arrow head is not in the correct position, making the calibration less accurate.

 For additional guidelines specific to calibrating for people or vehicles, see "Person Calibration" on page 21 or "Vehicle Calibration" on page 26.

## Person Calibration

This topic describes how to use the Add Person tool to create a calibration sample around a person.

 To see how this fits in the overall calibration process, see "Calibration Overview" on page 11.

### To Use the Person Tool

1. Click the Add Person tool. 
2. Drag the red box over a person in the snapshot.
3. Resize the box so that it's tightly-cropped around the person.
4. Drag the red circle to the top center of the person's head. 
5. Drag the blue square to the bottom center of the person (i.e., at their feet). 
6. Repeat this process for all people, in all available snapshots.
7. Do one of the following:

- Click **Cancel** to close the page without saving changes.
- Click **Save**. The device will restart, during which time no events will be detected.

### People Calibration Tips

#### Use Appropriately-Sized People

Use the most common types of people that usually appear in the view.

Usually, this means choosing average-sized adults. If you were exclusively monitoring children, however, you would calibrate using children, not adults.

#### EFFECTIVE:



Adults are most common in this scene, so it is correct to calibrate using adults. The calibration box is sized correctly because it is drawn around an adult.

#### INEFFECTIVE:



The calibration box is too small because the box is drawn around a child.

#### People Should be Standing, Not Sitting

The people used in your calibration samples should be standing, not sitting.

 Note that just because your calibration samples include standing people, you will still be able to detect people sitting.

**EFFECTIVE:**



The person is standing.

**INEFFECTIVE:**

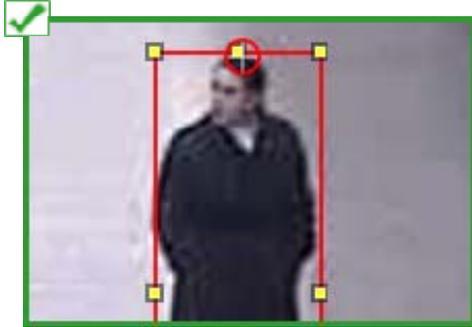


The person is sitting.

Place Red Circle at the Top Center of the Head

Carefully place the red circle so that its crosshairs are placed at the top and center of the head. 

**EFFECTIVE:**



The red circle is placed at the top and center of the head. Often, you'll need to look at the expanded (zoomed-in) camera view to see this level of detail.

**INEFFECTIVE:**



The red circle is placed over the face. The incorrect placement is particularly obvious when you zoom in.

**Place Blue Square at Base of the Feet**

Drag the crosshairs in the square directly between the person's feet. 

If the person's feet are not available, place the square at the bottom of the object (where the bulk of the person's body projects to the ground). If the camera is directly above the person, the two crosshairs may be in the same place (or very close to each other).

 Depending on the angle of the camera, there may be cases where the feet would appear above the head in the camera's view.

**EFFECTIVE:**



The blue square is placed at the person's feet.

Note that because this camera is mounted overhead, from this vantage point the square indicating the person's feet appears above the circle indicating his head.

**INEFFECTIVE:**

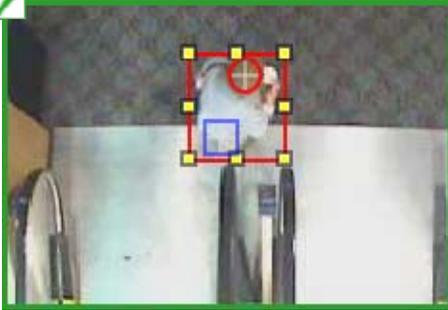


The blue square has not been moved to the person's feet, and the red circle has not been moved to his head.

**If Necessary, Estimate Locations of Head and Feet**

If the head or feet are occluded, move the circle or square to the approximate position of where you think the head or feet would be.

**EFFECTIVE:**



The person's feet are not visible because the camera is almost directly overhead. Therefore, the blue square is placed at the approximate location of where the feet should be.

**INEFFECTIVE:**



The red circle and blue square are simply placed in the center of the box. The red circle should be placed at the top center of the head and the blue square should be placed where the feet would likely be.

## Vehicle Calibration

This topic describes how to use the Add Vehicle tool to create a calibration sample around a vehicle.

 To see how this fits in the overall calibration process, see "Calibration Overview" on page 11.

### To Use the Vehicle Tool

1. Click the Add Vehicle tool. 
2. Drag the red calibration box over a vehicle in the snapshot.
3. Resize the box so that it's tightly-cropped around the vehicle.

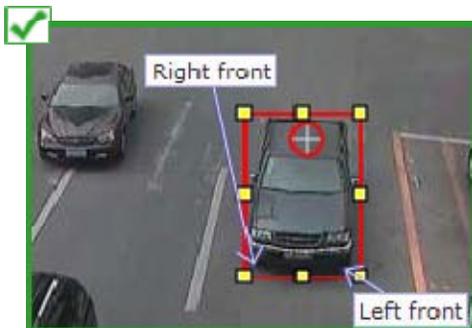
4. Drag the red circle to the top center of the vehicle's roof. 
5. Point the tire arrow to the place where the tire touches the pavement.  Select the correct tire label as appropriate (e.g., "Right front").
6. If there are additional tires visible in the snapshot, click the Tire tool  and place additional tire arrows for each visible tire. Remember to rename each tire arrow as appropriate.
7. Repeat this process in this and other snapshots until you have created at least three calibration samples. Depending on the scene, these might only include vehicles or could include a mix of vehicles and people.
8. Do one of the following:
  - Click **Cancel** to close the page without saving changes.
  - Click **Save**. Be aware that no events will be detected while the device restarts.

### Vehicle Calibration Tips

#### Use Medium-Sized Cars

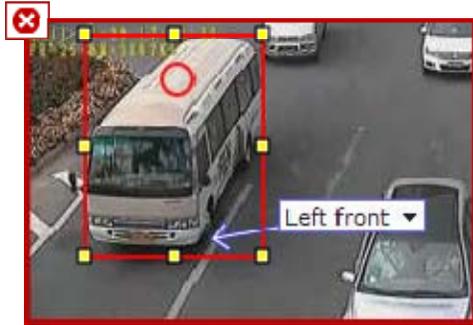
Use a medium (sedan)-sized car. Don't use a large vehicle (like an SUV or truck) or a small vehicle (like a bike or motorcycle). Note that you will still be able to *detect* large vehicles like SUVs and trucks; you just need to make sure that you *calibrate* using medium-sized cars.

#### EFFECTIVE:



The calibration sample is a medium-sized car.

**INEFFECTIVE:**

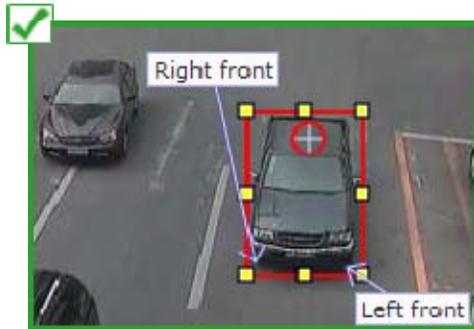


The calibration sample is too large (a bus).

Place Red Circle at the Center of the Car Roof

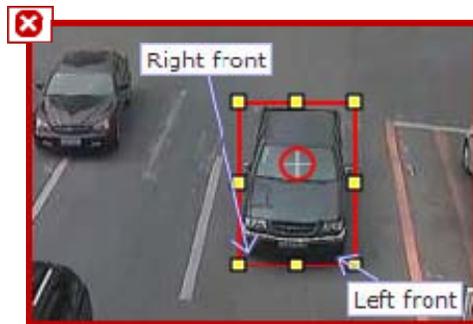
Carefully place the circle so that its crosshairs are at the top center of the car's roof.

**EFFECTIVE:**



The red circle crosshairs appear in the top center of the car's roof.

**INEFFECTIVE:**



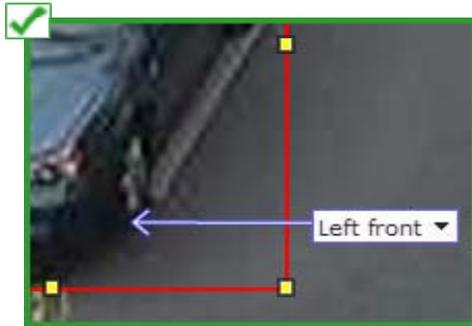
The red circle crosshairs are placed at a point other than the top center of the roof.

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### Point the Tire Arrow to Where the Tire Touches the Pavement

Carefully place the arrow so that the arrow head is where the tire touches the pavement.

#### EFFECTIVE:



The tire arrow head is at the exact spot where the tire touches the pavement. Often, you'll need to look at the expanded (zoomed-in) camera view to see this level of detail.

#### INEFFECTIVE:



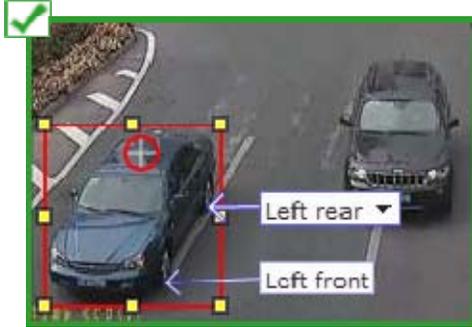
The tire arrow head is at the center of the wheel. The incorrect placement is particularly obvious when you zoom in.

### Add Tire Arrows for Each Visible Tire

Place tire arrows for each tire that is visible. The more calibration data, the better.

 If at least one tire is visible, place a tire arrow for each visible tire but do not estimate the location for any tires you cannot see. If no tires are visible, estimate the location of all four tires.

**EFFECTIVE:**



Two tires are visible for this vehicle, so two tire arrows have been placed.

**INEFFECTIVE:**

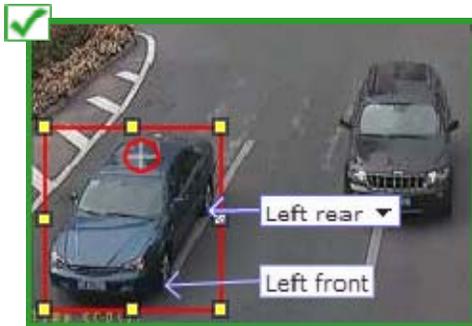


Only one tire arrow has been placed even though two tires are visible.

**Correctly Label Each Tire Arrow**

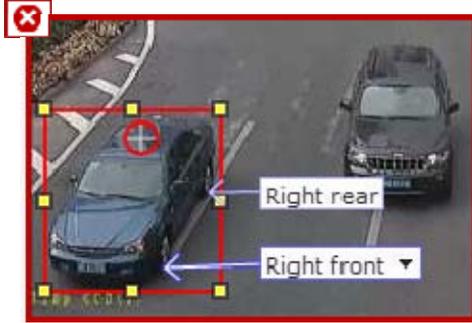
Correctly label each tire arrow (e.g., "Right front").

**EFFECTIVE:**



Tire arrows are correctly labeled (i.e., both are labeled "Left" since these wheels are on the car's left side).

**INEFFECTIVE:**

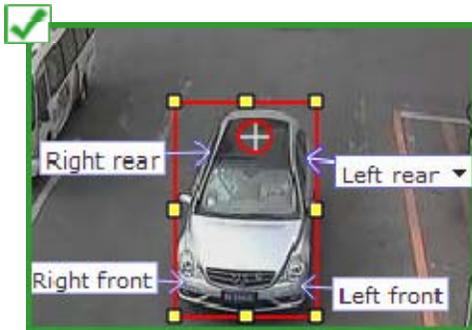


Tire arrows are incorrectly labeled.

**If Necessary, Estimate Tire Locations**

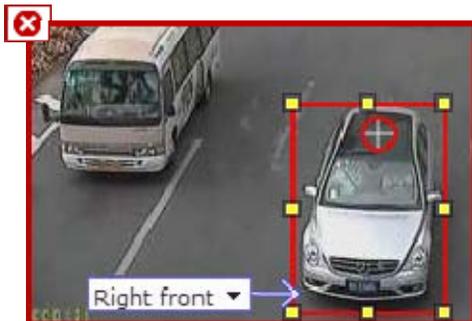
If no tires are visible (e.g., the camera is mounted directly above vehicles), point tire arrows to where you estimate the tires would be underneath the car. If no tires are visible, it is best to place all four tire arrows.

**EFFECTIVE:**



Four tire arrows are placed where the tires would likely appear under the car.

**INEFFECTIVE:**



Only one tire arrow is placed, and the arrow head is not underneath the car.

## Calibration Testing

After you have saved your calibration (see "Calibration Overview" on page 11), a link to the Test Calibration screen appears.

The Test Calibration screen allows you to see how effective your calibration is in identifying people or vehicles within the camera view.

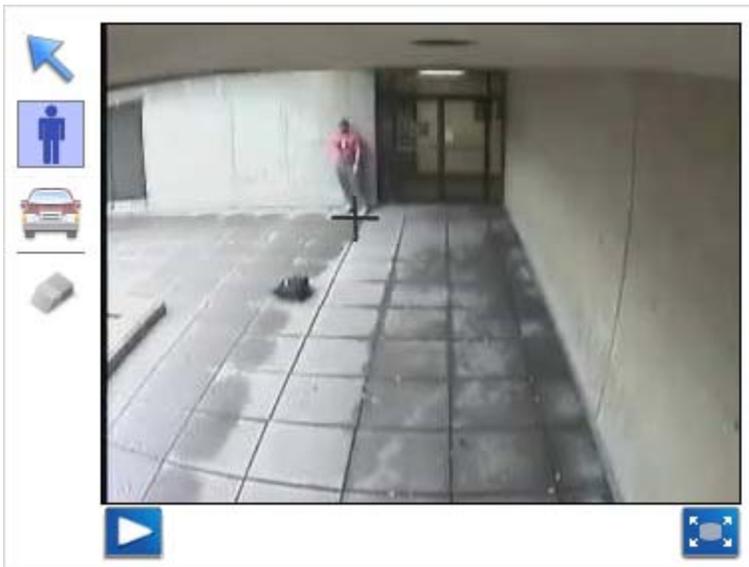
 You can perform calibration testing with multiple people or vehicles if you find it useful.

To test your calibration, a person or vehicle should be completely visible in the camera view. You may wish to use the Play or Pause buttons to capture the exact point at which a person or vehicle is visible.

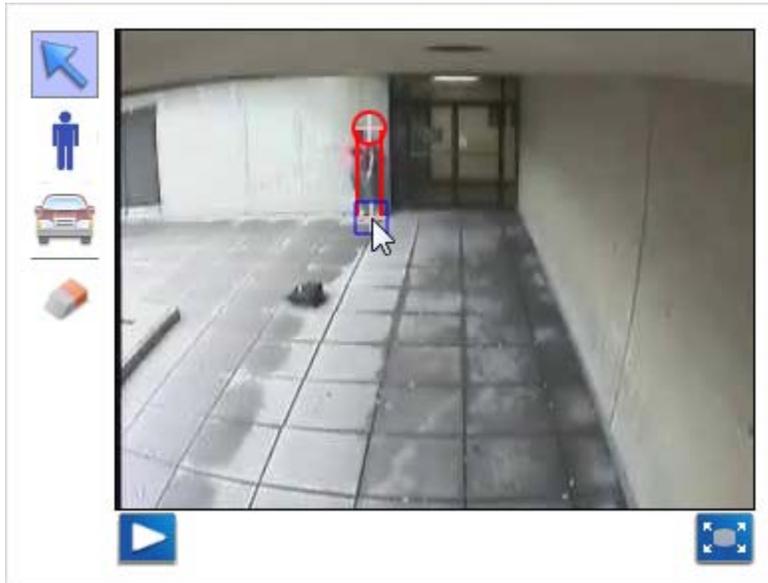
Once a person or vehicle is visible, click the appropriate Person  or Vehicle  icon. The next two sections describe how to complete the calibration test for people or vehicles, respectively.

### Calibration Testing for People

With the Person icon selected, move the center of the cross to the bottom-center of the person (i.e., between their feet). In the example below, a black cross is placed between the person's feet.



When you click your mouse, a red box will appear tightly-cropped around the person, a small red circle should be placed at the top-center of the person's head, and a small blue square should be placed at the bottom-center of the person's feet. If the system is properly calibrated, these elements will appear in the correct positions, indicating that the device would correctly detect people in that area of the view.

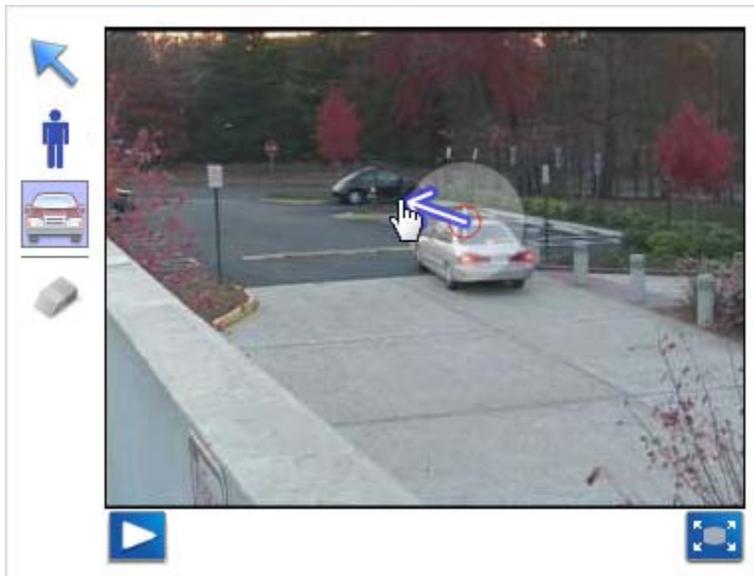


If the red box, small red circle, or small blue square do not appear in the correct positions, the calibration is inaccurate. If this occurs, return to the Calibrate screen and revise your person calibration. See "Person Calibration" on page 21.

#### Calibration Testing for Vehicles

With the Vehicle icon selected, move the center of the cross to the top-center of the vehicle's roof. A small red circle with a direction arrow coming out of it will appear.

Next, point and click your mouse so that the direction arrow indicates the vehicle's current path. To be more specific, the arrow should point to where the top-center of the roof will be as the vehicle continues along its current path.



 **IMPORTANT:** Place the direction arrow as precisely as possible.

When you click your mouse, a red box should appear around the vehicle, a small red circle should be placed at the top-center of the vehicle's roof, and arrows should appear pointing to all four tire locations. If the system is properly calibrated, these elements will appear in the correct positions, indicating that the device would correctly detect vehicles in that area of the view.



If the red box, small red circle, or tire arrows do not appear in the correct positions, first check that you've correctly placed the direction arrow. If the arrow is placed correctly and the test is still unsuccessful, the calibration is inaccurate. If this occurs, return to the Calibrate screen and revise your vehicle calibration. See "Vehicle Calibration" on page 26.

# Rule Management Overview

You can access the rule list by hovering your mouse over a channel snapshot in the Home page, and then selecting **Manage Rules**. On the Rule Management page you can edit existing rules, create new rules, and delete rules.



 You must calibrate the channel before you can begin creating rules for that channel. See "Calibration Overview" on page 11 for details.

## View Rules

The list of rules on the channel is displayed on the right side of the screen. In each row, you have options that only apply to that rule: activate/deactivate, edit, and delete.

## Create Rules

You can begin to create a new rule by selecting a rule category from the **Create new rule:** drop-down menu. See "Getting Started: Create a Rule" on page 36 for details about the rule creation process.

## Edit Rules

You can edit a rule by clicking the rule name link in the rule list. See "Getting Started: Create a Rule" on page 36 for details on how to edit a rule.

 You cannot edit Camera Tamper rules. Camera Tamper rules can only be added or deleted.

## Copy Rules

You can copy a rule by clicking the copy icon . See "Copy Rules" on page 56 for details.

## Delete Rules

You can permanently delete a rule using the delete icon . See "Delete Rules" on page 56 for details.

### Refresh rules list

You can update the list of rules by clicking the **Refresh rule list** link. The time of the last refresh is displayed above the rule list. This is the current time reported by the web browser at the time of the refresh, and it is formatted to match the local setting for the browser.

### Play Video

A video feed of the camera's view is displayed on the left side of the Rule Management page.

Click the play icon  to play a paused video feed.

Click the pause icon  to pause a playing video feed.

You may want to play or stop video when you are positioning objects in the field of view during rule or object filter creation. For example, you could stop the video when an object is in the proper position in the foreground to create a maximum size filter. Be aware that this button only controls how the camera view is shown in the Web Console, and it does not affect the actual operation of the camera.

### Show and Hide Rule Overlay

**Rule overlay** displays Video TripWire or Area of Interest markup for rules created on the channel. See "Show or Hide Rule Overlay" on page 56 for details.

## Getting Started: Create a Rule

Rules tell the device which events to look for in the view of a camera. You can begin to create rules from the Rule Management page. Open this page by selecting the **Manage Rules** button that appears when you hover your mouse over a channel snapshot in the Home page.

This topic provides a general overview of how to create an event. If you already know the type of event you want to create, see "Event and Object Types Overview" on page 59 and select the option for that specific event type for detailed instructions.

 Available Event Types, and all options displayed within each event type, are determined by the channel's license type. All options described below may not be available for your channel.

### To Create or Edit a Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select a type of rule:
    - Video TripWire™: See "Draw a Video TripWire™" on page 38 to learn how to draw the Video TripWire(s).

- Camera Tamper: The Camera Tamper rule is automatically created and added to the rule list when you select this option. See "Camera Tamper Events" on page 63 for details.
- Area Rules. Draw an area of interest or apply the rule to the whole view. See "Draw an Area" on page 41.
- To edit an existing rule: Click the rule name link on the Rule Management page. Based on the type of rule, do one of the following:
  - Video TripWire: See "Draw a Video TripWire™" on page 38 to learn how to edit the Video TripWire(s).
  - Area Rules: Edit the area using the instructions in "Draw an Area" on page 41.

 **Camera Tamper rules cannot be edited. They can only be added or deleted.**

2. Enter a rule name.
3. Select one or more object types. See "Object Types" on page 60.
4. If you created an **Area** type of rule, select the event(s) that you want to apply to the rule and complete any extra rule specifications that appear when you select the event type. See "Event and Object Types Overview" on page 59.
5. If desired, enter details about the rule or other descriptive text in the **Alert text** field (not available for counting rules).
6. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
7. Create a schedule. See "Schedules Overview" on page 45.
8. If desired, add filters. See "Filters Overview" on page 48.
9. Do one of the following:
  - Click **Save**. All rules are activated by default. If you do not want the rule to detect events at this time, see "Activate and Deactivate Rules" on page 55 for instructions on how to deactivate the rule.
  - Click **Cancel** to abandon changes and return to the Rule Management page.
9. Test the rule. See "Test Rules" on page 54.

The options available on the Edit Rule page may make it easier to create a rule:

- Expand the camera view to draw your area of interest or Video TripWire(s) on a larger image. This allows you to see the scene in more detail. See "Expand Snapshot" on page 55.
- You can see whether other rules have been drawn on this channel using the **Rule overlay** option. See "Show or Hide Rule Overlay" on page 56 for details.

- When drawing the area of interest, it may be helpful to have objects in the field of view. You can play and stop the video when positioning objects in the view. See "Play Video" on page 55.

### Draw a Video TripWire™

A Video TripWire is a line drawn within the camera's field of view in the Edit Rule page. An object triggers a response by crossing the line. See "Video TripWire™ Events" on page 79 for details.

#### To Draw Video TripWires

Select the Video TripWire Drawing tool.



For a single segment Video TripWire:

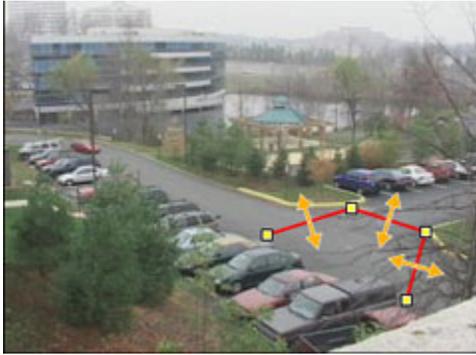
Left-click your mouse on the camera's snapshot where you want to start the Video TripWire. Drag the mouse to where you want the Video TripWire to end, and then right-click the mouse or double-click the left mouse button.



For a multiple segment Video TripWire:

Left-click your mouse on the camera's snapshot where you want to start the Video TripWire. Drag the mouse to where you want to add an additional point, and then left-click the mouse again. Continue clicking to add additional points.

To end the Video TripWire on the last point shown, right-click the mouse or double-click the left mouse button.



If you have the option of creating Multi-line Video TripWires, click the Video TripWire Drawing tool again and left-click on a different location to create a second Video TripWire using the instructions above. See "Video TripWire™ Events" on page 79 for advice on when to use Multiple Video TripWires vs. a single Video TripWire.



Once you have ended the second Video TripWire, the letters A and B appear next to the Video TripWires. These letters identify the Video TripWires so that you can determine the order in which objects must cross the Video TripWires in the **Detect when** section.

When you are finished drawing Video TripWires, determine their direction using the instructions below.

#### To Change a Video TripWire Direction

Click the Select tool, and then click on the Video TripWire you want to modify.



Click the Video TripWire Direction tool to change which direction objects must cross the Video TripWire in order to trigger the rule.

There are three directional options. Click the tool repeatedly to display the different choices. As the direction changes, you will see that the arrows appear differently on the Video TripWire.

Both directions: 

Single direction option: 

Other single direction option: 

Keep in mind that the direction of the arrow is relative to the position of the Video TripWire.

#### To Edit a Video TripWire

Click the Select tool, and then select a point on the Video TripWire.



Drag a point with the mouse button pressed, and then release the mouse when you have the point in the new position.



#### To Delete a Video TripWire

Click the Select tool, and then click on the Video TripWire you want to delete.



Click the Delete tool to permanently remove the Video TripWire.



#### Video TripWire Tips and Tricks

- Single segment Video TripWires are appropriate when you need to draw a straight Video TripWire.
- You should usually draw the Video TripWire on a horizontal surface, such as the ground or the floor.
- It is not advisable to cross Video TripWire segments over one another in the same rule. Crossed segments will produce confusing alert snapshots.

- If you are drawing a vertical Video TripWire, start the line at the bottom of the camera's field of view. This makes it easier to specify the direction that an object must cross the Video TripWire in order to trigger a response.
- You can use a Multi-segment Video TripWire instead of creating multiple single segment Video TripWire rules. A Multi-segment Video TripWire may be appropriate for areas, such as a perimeter fence or shoreline, that do not appear to be straight in a camera's field of view. In the example below, a Multi-segment Video TripWire is being used to monitor a shoreline. An object that crosses any of the Video TripWire's segments is detected.
- Ensure that the endpoints of the Video TripWire are placed accurately. If the Video TripWire extends further than it needs to, it may lead to unwanted event detection (e.g., a Video TripWire extending into the area of a busy street in the background will pick up that traffic). Conversely, if the Video TripWire is not long enough, it may miss some events that you intend to detect.
- Make sure the Video TripWire is not placed at a point of marked contrast in the background (e.g., between two sections of different-colored carpeting).
- Remember that the Video TripWire may be bi-directional or unidirectional. Changing this may improve results.
- Do not extend the Video TripWire to the very edge of the view. Always leave a buffer of a few pixels between the end of a Video TripWire and the edge of the view.
- When creating rules, it is best to keep them as simple as possible. Often, it is better to use a less-precise event specification with less configuration elements rather than an event specification that attempts to be all-inclusive but entails many configuration elements.
- See "Video TripWire™ Events" on page 79 for information on when to use Multiple Video TripWires vs. a single Video TripWire.
- If the Video TripWire is at a doorway, pay careful attention that it is placed at the appropriate position along the ground of the doorway. In other words, the Video TripWire should intersect with the object's base, or footprint.
- Expand the camera view to draw your area of interest on a larger image. This allows you to see the scene in more details. See "Expand Snapshot" on page 55.
- You can see where other rules have been drawn on this channel using the **Rule overlay** option. See "Show or Hide Rule Overlay" on page 56 for details.
- When drawing Video TripWires, it may be helpful to have objects in the field of view. You can play and stop the video when positioning objects in the view. See "Play Video" on page 55.

### Draw an Area

You can draw an area of interest using the snapshot and drawing tools on the left side the Edit Rule page. The area of interest indicates where you want the system to monitor for

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events. See "Area of Interest" on page 44 for more information. The area can be a portion of the view, or it can encompass the entire camera view.

Rules configured to detect events in the whole view are useful for general event detection. Keep in mind that because the device is monitoring the entire scene, choosing this event type can lead to unwanted event detection. If there is an area of the view where activity you do not want to detect is prone to occur, it is recommended you instead create area of interest event with an area of interest that excludes the area of unwanted activity. Not all event types allow you to monitor the full view.

### To Monitor the Full View

You can monitor the entire view by clicking the Full View tool. When full view is selected, the icon has a checkmark and a blue overlay covers the entire view.



Events are detected anywhere in the field of view shown in the camera snapshot.

### To Monitor Only an Area of Interest

If you are currently monitoring the full view, click the Full View tool to deactivate detection on the entire view. The checkmark should disappear from the icon.



Click the Area Drawing tool.



Left-click on the snapshot where you want to begin the area. Drag the mouse to extend the side of the area.



Left-click again to add additional points to the area. You must create at least three sides for the area. To close the area of interest, right-click the mouse or double-click the left mouse button. The area will close automatically from the last point shown to the starting point you created. A blue overlay covers the area of interest.



If you need to edit the location of a point, use the instructions below.

### To Edit an Area of Interest

Click the Select tool.



The Select tool allows you to reshape the area of interest by clicking and dragging the points (yellow controls) along the edges of the shape.

### To Delete the Area

If you want to delete the area of interest, click the Delete tool. The area no longer appears on the snapshot, and it cannot be recovered.



Use these tips when drawing an area:

- Expand the camera view to draw your area of interest on a larger image. This allows you to see the scene in more detail. See "Expand Snapshot" on page 55.
- You can see whether other rules have been drawn on this channel using the **Rule overlay** option. See "Show or Hide Rule Overlay" on page 56 for details.
- Although you can create a maximum of 28 points on an area, you usually only need a smaller number of point. When creating rules, it is best to keep them as simple as possible.
- Pay attention to where you have placed the edges of the area of interest. Leaving a buffer of a few pixels between the edge of the view and the edge of the area of interest can help avoid false detections and missed events. Also, avoid placing the edge of the area of interest along the point of transition between two areas of different color.
- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. Refer to "Area of Interest" on page 44 for more information.

- When drawing the area of interest, it may be helpful to have objects in the field of view. You can play and stop the video when positioning objects in the view. See "Play Video" on page 55.

### Area of Interest

An area of interest is a square, a rectangle, or another multi-sided shape drawn within the camera's field of view that specifies where the system should monitor for events. For example, an airport's security team can create an area of interest so that a response is triggered when a person walks into an area that is too close to a restricted part of the runway. For information on what events can use areas of interest, see "Event and Object Types Overview" on page 59.

For some types of channels, you can specify whether an area of interest is ground plane or image plane. The area of interest type is specified when the rule is created. The way the device detects events depends on which area of interest type you specify when you create the rule.

To specify ground plane or image plane, click the Options tool in the Edit Rule page's

drawing toolbar.  In the **Options** dialog, select **Ground plane** or **Image plane**. Click **OK**.

### Ground Plane Areas of Interest

Ground plane areas of interest are usually drawn on horizontal surfaces within the camera's field of view, such as the floor, the ground, a walkway, or a road. Ground plane areas of interest are the most commonly used type of area of interest.

Ground plane areas of interest are best used when it is necessary to trigger a response when the "bottom" of the object is within the area. The bottom of the object is where the object is touching the ground and is referred to as its footprint. If the object is a person, the footprint of the object is the person's feet. If the object is a vehicle, the footprint of the object is at its base.

A ground plane area of interest can be thought of as a carpet within the camera's field of view that objects can walk on. The system is aware of where the ground is when you use a ground plane area of interest.

For example, if you create a rule telling the system to generate a response when a person enters a ground plane area of interest, the system will not generate a response when the person approaches or walks past the area of interest, but it will generate a response when a person walks into the area of interest, because it can determine where the person's feet are.

### Image Plane Areas of Interest

Image plane areas of interest are usually drawn on vertical surfaces within the camera's field of view, such as on a wall, doorway, or window. Image plane areas of interest are best used when it is necessary to trigger a response when any part of the object involved in the event overlaps with the area, regardless of whether the footprint of the object is within the

area. In other words, in most cases, the entire object does not have to be within the area in order for the system to generate a response.

An image plane area of interest can be thought of as a pane of glass within the camera's field of view. Responses are triggered when objects walk behind the pane of glass. The system does not know where the ground is when you use an image plane area of interest. Rather, it is looking for movement within the area of interest you specify.

For example, if you created a rule specifying that the system should alert you when a person enters an image plane area of interest that you have drawn around a doorway, the system would generate a response when at least half of the person entered the area. In this case, the word "enter" does not necessarily refer to entering the doorway. It refers to a specific percentage of the object entering the area you have drawn.

### Schedules Overview

Each rule has a schedule that you assign in the **Schedule** area on the **Edit Rule** page. By default, rules are scheduled to **Run all the time**. This means the rule will run for 24 hours a day, 7 days a week. If you select any other schedule, a graphical view of the schedule appears in the schedule area.

The following options may also be available:

Use this schedule...	If you want the system to monitor for new events during this period of time...
<b>Every Day (8:00 AM-6:00 PM)</b>	Every day during normal business hours
<b>Every Night (6:00 PM-8:00 AM)</b>	Every day after normal business hours
<b>Monday-Friday Night (6:00 PM-8:00 AM)</b>	During the workweek after normal business hours
<b>Monday-Friday Day (8:00 AM-6:00 PM)</b>	During the workweek during normal business hours
<b>Monday-Friday (All Times)</b>	24 hours per day during the workweek
<b>Weekend (All Times)</b>	24 hours per day on weekends only

In addition, you can create a custom schedule by selecting **Custom** or modifying an existing schedule.

 **If you edit a schedule from the drop-down menu, it becomes the "custom" schedule. The default options always remain unmodified in the Schedule menu.**

#### To Create a New Custom Schedule

1. Select **Custom** from the **Schedule** drop-down menu.

If you have not set a custom schedule previously, a blank graphic of the schedule appears. If there is an existing custom schedule, a graphical view of it appears.

2. Click **Edit**.

A table appears to allow you to enter time blocks in the schedule.

3. In the first **Start** time block, enter the day of the week the rule should start running on.
4. Enter the time on the start day the rule should begin running.
5. In the first **End** time block, enter the day of the week the rule should stop running on.
6. Enter the time on the end day the rule should stop running.

Start		End	
Monday	9:00 AM	Sunday	5:00 PM

In the example above, the rule would start monitoring at 9:00 AM on Monday and monitor continuously until 5:00 PM the following Sunday.

7. Do one of the following:
  - If you want to add an additional time block, click **add row** and return to step 3.
  - If you want to delete a time block, click the delete icon in that time block.  Then, if you want to add an additional time block, click **add row** and return to step 3.
  - If you are finished creating time blocks, click **done** to return to the graphical view of the schedule or **Save** to save the entire rule with the new schedule.

### To Edit an Existing Schedule

When you edit any existing custom schedule or schedule template, it becomes the custom schedule.

1. Select the schedule you want to customize from the **Schedule** drop-down menu.  
A graphical view of the schedule appears.
2. Click **Edit**.
3. Do one or more of the following:
  - Modify the start day and time and end day and time for any time blocks you want to change.
  - If you want to add an additional time block, click **add row**. Enter the start date and time and end date and time for the new time block.
  - If you want to delete a time block, click the delete icon in that time block.  Then, if you want to add an additional time block, click **add row** and return to step 3.

4. When you are finished creating time blocks, click **Done** to return to the graphical view of the schedule or **Save** to save the entire rule with the new schedule.

#### To Copy a Schedule from Another Rule

You can copy a schedule from an existing rule. This may be particularly useful if you have created a complex, custom schedule.

1. From the **Schedule** drop-down menu, select **Copy Schedule from Rule**.
2. Select the channel containing the rule from which you want to copy the schedule.
3. Select the rule.

Rules are only included on the list if they have a value other than the default value of **Run all the time**.

4. Click **OK**.

The schedule is applied to the rule. The schedule has the same name as the original schedule. For example, if the schedule is named **Custom**, it would continue to appear as **Custom** after it is copied.

You can modify the schedule after copying it, or you can save it without modification. Changing the copied schedule does not modify the original schedule and vice versa.



Be sure you enter times in the correct format. You must specify the hour, minutes, and AM or PM designation. For example, you could enter 10:00 PM or 10:00 AM. If your version of the application allows for 24 hours time, you would enter time in a format such as 22:00 for 10 PM.

## Custom Response Fields

Custom response fields can only be used with integrated systems that are designed to support this functionality.

When you click **Custom Fields** in the Edit Rule page, the **Custom Response Fields** dialog opens. This dialog allows you to create responses that will occur when an event is detected because of the rule. You can create up to eight custom responses per rule.

#### To Create a Custom Response

1. In the **Custom Response Field** screens, enter a key in the **Key** column.
2. Enter the value for the key in the **Value** column.
3. If you want to add additional responses, click **add row**.
4. Repeat steps 1-3 until you have entered all the responses.
5. When you are finished entering keys and values, click **OK** to close the dialog.

#### To Delete a Custom Response

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1. Select the delete icon next to the key/value row you wish to delete. 
2. When you are done modifying responses, click **OK** to close the dialog.

 The system will not let you enter blank or duplicate keys.

## Filters Overview

This section describes how to use object filters, which reduce false alarms by giving the device a more realistic understanding of the characteristics of the objects within the camera's field of view. Objects are people or things that either act or are acted upon during an event.

Object filtering "filters out" objects that have certain characteristics. Object filtering eliminates common causes of false alarms like shadows, waves, foliage, vehicle headlights, and emergency lights. Object filters are not required, but they are recommended if you are encountering a high number of false alarms.

You can create and edit filters in the Edit Rule page. There is a filters area available to add, delete, and copy filters. Select an object type in the table below for information on creating or editing that type of filter. See "Copy Filters" on page 54 for information on how to replicate a filter set from another rule.

The following table lists the object filters:

Filter	Definition
"Minimum and Maximum Size Filters" on page 50*	Eliminates objects that are larger than the size you specify.
"Minimum and Maximum Size Filters" on page 50*	Eliminates objects that are smaller than the size you specify.
"Object Size Change Filter" on page 48*	Eliminates objects that change in size too rapidly to be objects of interest.
"Irregular Shape or Motion Filter" on page 50	Eliminates objects that do not have a consistent shape or direction of motion (e.g., trees moving in the wind).

\* The filters related to size are most useful for low tilt angle cameras with long focal lengths in which object sizes vary greatly depending on their distance from the camera (i.e., objects closer to the camera appear much larger than objects of the same size in the distance).

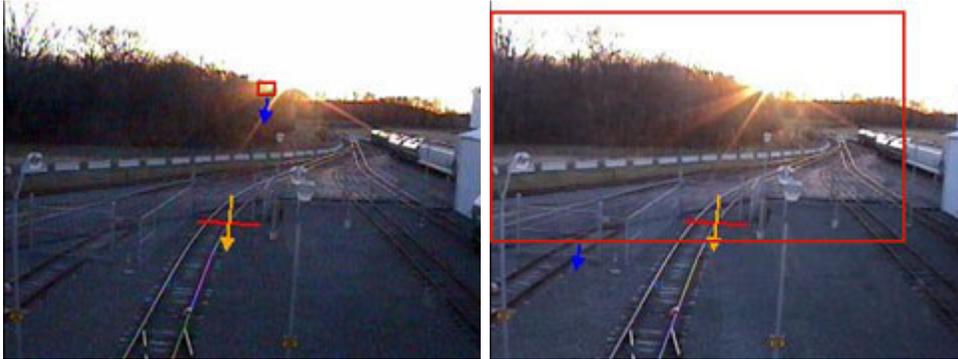
## Object Size Change Filter

Object size change filters may not be supported by every channel.

The object size change filter enables the system to ignore objects that increase or decrease in size between frames of video too quickly to be objects of interest. (In video, a frame is one still picture in a series of pictures that, when displayed in succession, depicts motion.) The object size filter is most often used in outdoor environments in which shadows and other lighting conditions trigger false alarms.

The filters related to size are most useful for low tilt angle cameras with long focal lengths in which object sizes vary greatly depending on their distance from the camera (i.e., objects closer to the camera appear much larger than objects of the same size in the distance).

In the following alert snapshots, a Video TripWire™ event has been triggered by light glare through foliage. This is an example of where an object size change filter would be helpful.



#### How to Draw Object Size Change Filters

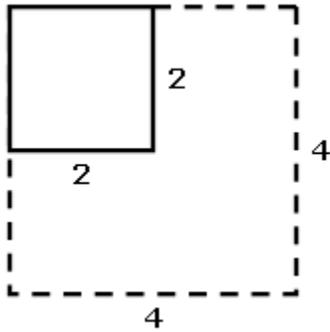
1. Do one of the following on the filters area of the Edit Rule page:
  - To edit an existing filter: Locate the **Size change filter** in the filters list.
  - To create a new filter: Select **Size Change** from the **Create new filter** drop-down menu.

A **Size change filter** appears in the filters list.

2. In the **Change ratio limit** field, enter a new value.

The device ignores any object that increases or decreases in size more than the amount specified in the ratio field. The ratio is a multiplier of 100%, with 100% representing an object size that does not change between frames. Multiply 100 by the **Change ratio limit** value to determine the largest possible change in size between frames.

Be aware that, when an object increases in size by the ratio, its overall size (or area) increases more than the ratio. For example, if an object increases 2 times in length and width from one frame to the next, its area does not increase 2 times. Instead, it increases 4 times in its overall size, as the figure below shows.



Divide 100 by the **Change ratio limit** value to determine the maximum possible decrease in size between frames. For example, if you specify a **Change ratio limit** of **2**, the device will ignore objects that increase in size by 200% or more between frames, and they will ignore objects that decrease in size by 50% or more between frames. The highest available **Change ratio limit** value is 100. The lowest available **Change ratio limit** value is 1.5.

### Irregular Shape or Motion Filter

Irregular shape and motion filters may not be supported by every channel.

The irregular shape or motion filter enables the system to ignore objects that change shape and move in different directions between frames of video too quickly to be real objects. (In video, a frame is one still picture in a series of pictures that, when displayed in succession, depicts motion.) The Irregular shape or motion filter is most often used in outdoor environments in which waves, tree foliage or flags moving in the wind, or erratic lighting conditions trigger false alarms.

If you are using a Video TripWire™ to detect events on a shoreline, you can try combining an irregular shape and motion filter with a Multi-line Video TripWire to reduce false alarms. See "Video TripWire™ Events" on page 79 for more information.

**⚠ Be aware that using an irregular shape or motion filter may cause some real events to not be detected by the system. For instance, if a boat was moving through an area of water where there were lots of choppy waves, the boat may not be identified as an object until it has moved away from the waves.**

#### How to Create Irregular Shape or Motion Filters

From the filters area on the Edit Rule page, select **Irregular Shape or Motion** from the **Create new filter** drop-down menu. An **Irregular Shape or Motion filter** appears in the filters list.

### Minimum and Maximum Size Filters

Minimum and maximum size filters may not be supported by every channel.

Minimum size filters eliminate objects that are smaller than the size you specify. Maximum size filters eliminate objects that are larger than the size you specify. These filters allow you

to reduce false alarms caused by objects that are not a typical size for real objects of interest.

Defining minimum and maximum object size filters requires some preparation, and it frequently involves more than one person to accomplish. This is because some representative objects need to be in front of the camera while the user sets up the filters. Representative objects are people, vehicles, or other things that are the same type and size as the kinds of objects the system will be monitoring a video feed for.

Depending on the kinds of events a device is detecting, one of the following may need to take place while you are defining an object filter:

- A person may have to walk or stand within the camera's field of view
- A vehicle may have to drive or park within the camera's field of view
- You may have to place another object, such as a package or bag, within the camera's field of view

It may be convenient to play video while representative objects are moving into position, and then stop the video when objects are in a position where you can draw filters around them. See "Play Video" on page 55. It may also be helpful to expand the camera's view to see the scene in more details. See "Expand Snapshot" on page 55. You can hover your mouse over an existing filter to show the filter boxes on the camera view.

If you continue to receive too many false alarms or if the system starts missing "real" events after you have defined the filters, you may need to adjust the filters to achieve better results. You can also try defining a change in object size filter as described in "Object Size Change Filter" on page 48.

The filters related to size are most useful for low tilt angle cameras with long focal lengths in which object sizes vary greatly depending on their distance from the camera (i.e., objects closer to the camera appear much larger than objects of the same size in the distance).

### How to Draw a Maximum Size Filter

1. Do one of the following in the filters area on the Edit Rule page:
  - To edit an existing filter: Click the underlined **Maximum Size filter** name.
  - To create a new filter: Select **Maximum Size** from the **Create new filter** drop-down menu.

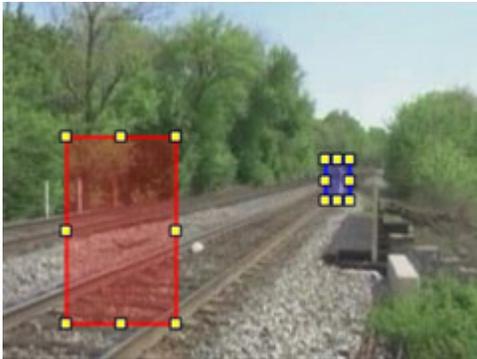
The snapshot area becomes the only editable area of the page. On the camera snapshot, you need to position the blue and red boxes to indicate the maximum size of objects in the foreground and background.

2. Resize the blue background box based on a representative object that is farther from the camera.

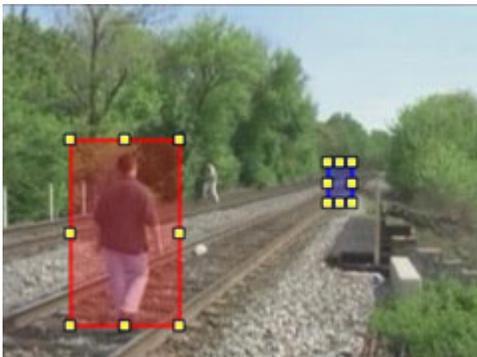
Any object that is not fully contained within the box you draw will be ignored by the system. The entire object (i.e., the top, bottom, and sides of the object) must be visible in order for this setting to be accurate.

Use the controls on the corner of the box to change the shape (i.e., the length or height) of the box. As you change the shape of the blue box, the red box's shape changes as well. Use the controls on the corners of the box to change the scale of the box while maintaining its proportions. The red box must be larger than the blue box, and it must be lower in the view than the blue box.

In the figure below, the representative object being used is a person. Notice that the box is drawn slightly larger and wider than the person, to account for larger people.



3. Resize the red foreground box based on a representative object that is closer to the camera.



4. Do one of the following:
  - Click **Save** to save the filter. The **Maximum Size filter** appears in the filter list.
  - Click **Cancel** to return to the last saved filter. If this is the first time you are creating a maximum size filter for this rule, the boxes will return to default positions.

#### How to Draw a Minimum Size Filter

1. Do one of the following on the filters area of the Edit rule page:
  - To edit an existing filter: Click the underlined **Minimum Size Filter** name.

- To create a new filter: Select **Minimum Size** from the **Create new filter** drop-down menu.

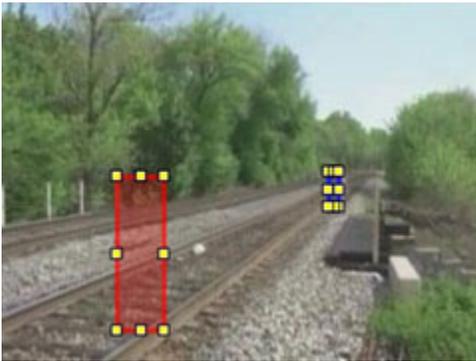
The snapshot area becomes the only editable area of the page. On the camera snapshot, you need to position the blue and red boxes to indicate the minimum size of objects in the foreground and background.

2. Resize the blue background box based on a representative object that is farther from the camera.

Any object that is fully contained within the box you draw will be ignored by the system. The entire object (i.e., the top, bottom, and sides of the object) must be visible in order for this setting to be accurate.

Use the controls on the corners of the box to change the shape (i.e., the length or width) of the box. As you change the shape of the blue box, the red box's shape changes as well. Use the controls on the corners of the box to change the scale of the box while maintaining its proportions. The red box must be larger than the blue box, and it must be lower in the view than the blue box.

In the figure below, the representative object being used is a person. Notice that the box is drawn slightly shorter and narrower than the person, to account for smaller people.



3. Resize the red foreground box based on a representative object that is closer to the camera.



4. Do one of the following:

- Click **Save** to save the filter. The **Minimum size filter** appears in the filter list.
- Click **Cancel** to return to the last saved filter. If this is the first time you are creating a minimum size filter for this rule, the filter will return to a default position.

## Copy Filters

Instead of recreating filters, you can copy the filter set from an existing rule.

 **Be aware that if you copy filters into a rule, they will replace the entire existing filter set on the rule. For instance, if you only have a Size change filter on a rule and you copy in the filter set from a rule that has only a Minimum size filter, the Size change filter is removed and only the Minimum size filter will apply to the rule. You can add additional rules after a rule set has been copied.**

1. From the **Create new filter** menu, select **Copy from another rule**.
2. From the **Copy Filters From Rule** dialog, select the rule that contains the filters you want to copy.

Only rules with existing filters appear in the rule list.

3. Click **OK**.

The new filters appear in the filter's area. You can change copied filters, or you can save them without modification. Changing the copied filters does not modify the original filters and vice versa.

## Delete Filters

You can delete object filters from the filters area on the Edit Rule page. Existing filters appear in a list below the camera's field of view. Click the Delete icon next to an individual filter to permanently remove the filter.



Deleted filters cannot be recovered.

## Test Rules

Once you have created a rule, you need to test the rule to ensure that you have set up the rule properly and responses are being generated.

Use these general guidelines to test each rule:

- Check the responses for each rule to make sure it is being triggered correctly.
- Check the rule at the time of day it was designed for. For instance, if your rule should be detecting events during the daytime and nighttime, verify that rules can be triggered during these times of day.

- After system has been left idle for 24 hours, verify that there are no false alarms being generated.

## Play Video

Wherever you see the Play/Stop buttons below a camera view, you can play live video from the camera's field of view. You can also click the Stop button to freeze the view at the current frame of video.

Play button



Stop button



You may want to play or stop video when you are positioning objects in the field of view during rule or object filter creation. For example, you could stop the video when an object is in the proper position in the foreground to create a maximum size filter. Be aware that this button only controls how the camera view is shown in the Web Console, and it does not modify the actual operation of the camera.

## Expand Snapshot

You can show an expanded snapshot of the camera's view in the Edit Rule page. When you click the expand icon, the view expands to fill the browser window while maintaining the original aspect ratio. This allows you to observe the scene in greater detail, and it may make it easier to more precisely draw an area of interest and Video TripWires™ in the field of view. For your convenience, the same drawing tools are available in the normal and expanded view.



Expand the view

Once you are in the expanded view, you can return to the normal snapshot size by clicking the minimize icon. You must return the snapshot to the normal size in order to save the rule.



Minimize the view

## Activate and Deactivate Rules

You can activate and deactivate rules from the Rule Management page. Before each rule name in the rules list, there is a checkbox that allows you to control whether the rule is active.

Active rule: If the rule is currently schedule to run, the system is actively monitoring the video feed for the event defined in the rule. A response is generated when the event occurs. All new rules are active by default.

Inactive rule: The system is not monitoring the video feed for the event defined in the rule.

You may want to deactivate a rule if you do not currently need it to run, but you do not want to have to recreate it in the future. If you want to permanently delete a rule, see "Delete Rules" on page 56.

**Note** : Each device supports a maximum of five active or inactive rules configured at a time.

## Delete Rules

You can delete rules from the Rule Management page. A delete icon  appears next to every rule in the rule list.

When you click the delete icon, a **Delete Rule?** confirmation dialog appears. Click **Yes** to delete the rule. You can also click **No** to preserve rule.

 **Be aware that deleting a rule permanently removes it from the system. There is no way to recover delete rules. If you prefer to deactivate rules, see "Activate and Deactivate Rules" on page 55.**

## Copy Rules

If the rule you are creating shares many of the elements of an existing rule, it may be easier to create the rule based on an existing rule. You can copy rules from the Rule Management page.

A copy icon  appears next to the rule in the rule list. When you click the copy icon, the Edit Rule page opens automatically for a new rule. With the exception of the rule name that now begins with **Copy of**, the rule is identical to the original rule.

After making any modifications to the new rule, click **Save** to preserve your changes. Changes to the new rule do not modify the original rule. Also, since only one Camera Tamper rule can appear per channel, you cannot copy a Camera Tamper rule.

The copy icon is not available if the maximum number of rules has already been created for the device.

## Show or Hide Rule Overlay

Rule overlay displays where rule elements (Video TripWires™ and/or areas of interest) appear on the channel's field of view. This allows you to place rule elements relative to one another. For example, you can be sure that you have full coverage of an area by comparing the overlap of areas of interest created for that channel.

The **Rule overlay** option is available under the channel snapshot in the Rule Management page. It is also available on the Edit Rule page when you create or edit a rule. When the

**Rule overlay** checkbox is selected, all the rule elements created for that channel for rules that are active appear on the camera view.

The following snapshot shows one Video TripWire and two rules involving an area of interest:



If you hover your mouse over a particular rule in the rule list on the right side of the Rule Management page with **Rule overlay** on, that rule's elements appear highlighted on the camera view regardless of if the rule is active. Any other rule's elements are shown, but they are not highlighted. The following snapshot shows a camera view when the mouse is hovering over a rule with an area of interest:



If the **Rule overlay** checkbox is not selected, you can still view an individual rule's elements by hovering your mouse over the rule in the rule list. Other rule's elements are not shown.

Here is an example of how the snapshot would appear when **Rule overlay** is off and you hover over an area of interest rule:



**⚠ Camera Tamper rules and rules that apply to the full view do not display any elements on the camera view.**

# Event and Object Types Overview

The object and event options available in the Edit Rule page are determined by the type of channel and the category of event you decide to create on the Rule Management page.

When you set up certain types of events, you specify one or more objects for the event. An object either performs an action or is acted upon to trigger a response. See "Object Types" on page 60 for more details.

Object Type	Description
Person	The object has some characteristics of a human being.
Vehicle	The object is a mechanism designed to carry people or other cargo (e.g., a car, boat, or plane).
Anything	For most event types, these are all types of objects, including people, vehicles, and objects that do not fit into either category. For Left Behind and Taken Away events, these are passive objects that do not appear to move on their own. For instance, a box that a person has left behind.

An event is an activity of interest that takes place within the field of view of a camera. The following event types may be available:

Event Type	Description	See Also
Appears	An object appears in an area of interest without previously appearing within the camera's field of view or an area of interest.	"Appears Events" on page 62
Disappears	An object is no longer visible within the camera's field of view or an area of interest.	"Disappears Events" on page 66
Taken Away	An object in the camera's view or an area of interest is moved.	"Taken Away Events" on page 77
Left Behind	An object is placed in the camera's view or an area of interest for a user-specified period of time.	"Left Behind Events" on page 73
Enters	An object enters the perimeter of an area of interest from any direction within the camera's field of view.	"Enters Events" on page 70
Exits	An object exits the perimeter of an area of interest in any direction.	"Exits Events" on page 71
Loiters	An object remains within an area of interest for a user-specified period of time.	"Loiters Events" on page 74
Inside	An object appears in an area of interest or enters the perimeter of an area of interest.	"Inside Events" on page 72
Dwell Time Data	The device records the amount of time each object spends in an area of interest.	"Dwell Time Data Events" on page 69
Dwell Time Threshold	The device determines that one or more objects have exceeded a time threshold for loitering in an area of interest.	"Dwell Time Threshold Events" on page 68
Occupancy Data	The device tracks the number of objects in an area of interest.	"Occupancy Data Events" on page 75

Event Type	Description	See Also
Occupancy Threshold	The device determines that a user-specified number of objects have occupied an area of interest for a user-specified period of time.	"Occupancy Threshold Events" on page 76
Density	A crowd of objects of low, medium, or high density exists in an area of interest within the camera's field of view for a user-specified period of time.	"Density Events" on page 64
Crowd Threshold	The device determines that a user-specified number of people in a crowd have occupied an area of interest for a user-specified period of time.	"Crowd Threshold Events" on page 65

A Camera Tamper event is any event that significantly changes the camera's field of view. These events are only created from the Rule Management page. See "Camera Tamper Events" on page 63 for details.

When you indicate that you wish to create a Video TripWire™ rule on the Rule Management page, you only need to specify the object type. The event type is assumed to be a Video TripWire. See "Video TripWire™ Events" on page 79 for details.

 Depending on the type of rule and the events already added to the rule, you may be able to select more than one event type per rule.

## Object Types

Some events require that you specify an object. An object either performs an action or is acted upon to trigger a response. An example of an object that performs an action is a person that enters a restricted area. An example of an object that is acted upon is a suspicious bag that is left on the ground.

To understand what is going on in front of a camera, the device categorizes the objects and determines whether the activity that is going on violates the rules that have been created. The device observes each object and does its best to identify the object based on its characteristics.

When you set up certain types of events, you specify one or more objects for the event.

 **Density channels do not support the classification of objects.**

Object Type	Meaning
Person	The object has some characteristics of a human being.
Vehicle	The object is a mechanism designed to carry people or other cargo (e.g., a car, boat, or plane).
Anything	For most event types, these are all types of objects, including people, vehicles, and objects that do not fit into either category. For Left Behind and Taken Away events, these are passive objects that do not appear to move on their own. For instance, a box that a person has left behind.

The following tips may help you use object classification more effectively:

- Defining object filters can improve object categorization. See "Filters Overview" on page 48 for more information.
- The device detects events involving any of the object types you specify in the same rule. For instance, if you selected to search for people and vehicles, the detection of a person or vehicle would trigger a response.
- In some cases, you may want to specify several object types (even if you are only looking for one object type) so that you can ensure that you do not miss any events due to misclassification.

## Event Types

In the Rule Management page, you select the event category from the **Create new rule** drop-down menu. The types of events the system can detect depend on the channel type and the channel configuration.

Event Category	Description
Video TripWire™	<p>A Video TripWire is a line drawn within the camera's field of view. An object triggers a response by crossing the line.</p> <p>You may also have the option to create Multi-line Video TripWires. Multi-line Video TripWires are two lines drawn within the camera's field of view. An object triggers a response by crossing both lines within a user-specified period of time.</p> <p>See "Video TripWire™ Events" on page 79.</p>
Area Events	<p>An area event occurs within a user-defined portion of the camera's field of view called an area of interest. See "Area of Interest" on page 44 for details. You may also have the option of applying the rule to the entire camera view for some event types.</p> <p>See the following for more information:</p> <ul style="list-style-type: none"> <li>• "Enters Events" on page 70</li> <li>• "Exits Events" on page 71</li> <li>• "Inside Events" on page 72</li> <li>• "Appears Events" on page 62</li> <li>• "Disappears Events" on page 66</li> <li>• "Density Events" on page 64</li> <li>• "Taken Away Events" on page 77</li> </ul>

Event Category	Description
	<ul style="list-style-type: none"> <li>• "Left Behind Events" on page 73</li> <li>• "Loiters Events" on page 74</li> <li>• "Dwell Time Data Events" on page 69</li> <li>• "Dwell Time Threshold Events" on page 68</li> <li>• "Occupancy Threshold Events" on page 76</li> <li>• "Occupancy Data Events" on page 75</li> </ul>
Camera Tamper	An event that significantly changes the camera's field of view. See "Camera Tamper Events" on page 63.

## Appears Events

These events may not be supported by every channel.

Appears in area events occur when an object appears in an area of interest without previously appearing within the camera's field of view. An example of such an event is a person entering a doorway around which an area of interest is drawn. Because the first time the object was detected was when the person entered the doorway, a response is triggered. Objects can also "appear" in areas of interest drawn around windows, trees, and other scenery within the camera's field of view, as well as architectural features, such as the corner of a building.

If the area you select is the entire field of view, the event occurs when an object appears anywhere in the camera view. An object "appears" the first time it moves into the camera's field of view. Appears events are generally set up in areas where there is very little activity expected, and a response needs to be generated whenever an object is detected within or moves into the field of view. For example, you can create an Appears in full view event to trigger a response when a person enters a room where there is usually no one present.

### How to Create or Edit an Appears Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Do one of the following:
  - Create an area of interest. See "Draw an Area" on page 41.
  - Select full view to apply the rule to the entire camera view. 

3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. Select **Appears** as the event type.
6. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
8. Create a schedule. See "Schedules Overview" on page 45.
9. If desired, create filters (may not be available on all channels). See "Filters Overview" on page 48.
10. Do one of the following:
  - Click **Save**.
  - Click **Cancel** to abandon changes and return to the Rule Management page.

## Camera Tamper Events

These events may not be supported by every channel.

Camera Tamper events are triggered differently and cause the channel to respond differently depending on what View behavior you are using. See "View Status" on page 5 for details.

If you are using Auto-acquire or User-controlled view behavior, a Camera Tamper event is any scene change event in a known view that significantly changes the camera's field of view, such as the camera being panned away from a known view, a camera being turned off or unplugged, or the lights being turned on or off. A known view is a live camera feed that matches a stored view. A stored view is a camera field of view that has been designated in the system for monitoring by a device.

If you are using Auto-force views, a Camera Tamper event is only triggered when a Bad Signal channel status occurs. For example, a Camera Tamper event may occur when the camera is covered or there is another severe problem with the video signal.

The channel's response to a Camera Tamper event also differs based on how your system handles views. A Camera Tamper event can cause some channels to stop monitoring a camera. See "View Status" on page 5.

 **Channels that can detect Camera Tamper events can only detect them when the channel is in a known view. For example, if the lights are turned off while the channel's status is unknown, no Camera Tamper responses will be triggered for that event.**

 **You can only create one Camera Tamper rule per channel.**

### [How to Create a Camera Tamper Rule](#)

From the **Create new rule** drop-down menu on the Rule Management page, select **Camera Tamper**. The rule appears automatically in the rule list.

## Density Events

These events may not be supported by every channel.

The system analyzes the view with respect to how many people appear in an area of interest, and then categorizes the scene as having a low, medium, or high density level of people.

Density is a qualitative approach to detecting abnormal crowding of people in an identified area. This solution has broad applications across multiple industries, such as railway safety and security, commercial retail, and gaming intelligence. While most applications require spotting times of high traffic volume and crowding, Density is designed to also enable detection rules for a range of density levels to possibly spot abnormal lulls in crowds.

With Density, you can define rules for crowd density changes for defined periods of time (e.g., alert when density is HIGH for more than 20 seconds) to only alert for a persistent problem and not the normal ebb and flow of traffic. You need to adjust the density levels to optimize the solution for your specific usage scenario.

**⚠ Auto-force view behavior is used with density events. See "View Status" on page 5 for details on this type of view behavior.**

**⚠ When estimating density, the system assumes that you are looking down over the area at an angle between 20 to 70 degrees from horizontal. If your camera is set up at a different angle, contact your system integrator.**

Since determining what constitutes a crowd of high density versus a crowd of low density may vary from application to application, the settings for Density detection are adjustable. The following snapshots provide an example of how the system might categorize a scene's Density as low, medium, or high.



### [How to Create or Edit a Density Rule](#)

1. Do one of the following:

- To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.
  3. Enter a rule name.
  4. Select **Density**.
  5. Select a density level.

You can select a single level or use a combination of two levels. Do not combine all three levels in one rule.
  6. Select the amount of time in minutes and/or seconds the density level must be maintained.

This duration determines how long the density must remain at the specified level before triggering an event. By default, this value is set to 30 seconds. You can use any value between 1 second and 30 minutes.
  7. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
  8. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
  9. Create a schedule. See "Schedules Overview" on page 45.
  10. Do one of the following:
    - Click **Save**.
    - Click **Cancel** to abandon changes and return to the Rule Management page.

## Crowd Threshold Events

These events may not be supported by every channel.

Crowd Threshold events occur when a certain user-defined criteria are met by a crowd of people gathered in an area of interest. For example, the system can estimate that a certain number of people are in a crowd, and alerts you as soon as that number is reached. Optionally, you could also determine how long the crowd should be gathered before triggering the alert.

Crowd Threshold rules can be set up to detect a wide variety of different activities, depending on where you place the area of interest and how you define the event. For example, you might create a rule to detect when a security post is unmanned. Alternatively, you could create a rule to detect a crowd of a certain volume gathering by a store display for a given amount of time.

### How to Create or Edit a Crowd Threshold Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.
3. Enter a rule name.
4. Select **Crowd contains**.
5. From the first drop-down list, select the option that describes how the number of people (which you determine in step 7) relates to the event occurrence.

Select one of the following options:

- **at least**
  - **exactly**
  - **no more than**
7. Enter the number of people that must occupy the area.
  8. Specify whether the event could happen **at any time** or **for** a specific duration.
  9. If you selected **for** in the previous steps, enter a duration for the event.

The default duration is **0 minutes** and **10 seconds**.
  10. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
  11. Create a schedule. See "Schedules Overview" on page 45.
  12. Do one of the following:
    - Click **Save**.
    - Click **Cancel** to abandon changes and return to the Rule Management page.

## Disappears Events

These events may not be supported by every channel.

Disappears from area of interest events occur when an object disappears from the camera's field of view, having last been detected within an area of interest. In other words, the last time the system detected the object within the camera's field of view, it was present in the area of interest. For example, a Disappears from area of interest event could be created to

detect a person exiting a restricted doorway within part of a camera's field of view. Because the last time the object was detected was before the person exited the doorway, a response is triggered. Objects can also disappear from areas of interest drawn around trees and other scenery within the camera's field of view, and architectural features, such as the corner of a building or a window.

If the area you select is the entire field of view, an event occurs when an object disappears from anywhere in the camera's field of view. An object "disappears" when it is no longer visible within the camera's field of view. For example, you can create a Disappears event to trigger a response whenever a person leaves a room that he or she is not supposed to leave.

### How to Create or Edit a Disappears Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Do one of the following:
  - Create an area of interest. See "Draw an Area" on page 41.
  - Select full view to apply the rule to the entire camera view. 
3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. Select **Disappears** as the event type.
6. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
8. Create a schedule. See "Schedules Overview" on page 45.
9. If desired, create filters (may not be available on all channels). See "Filters Overview" on page 48.
10. Do one of the following:
  - Click **Save**.
  - Click **Cancel** to abandon changes and return to the Rule Management page.

## Dwell Time Threshold Events

These events may not be supported by every channel.

Dwell Time Threshold events occur when one or more objects remain within an area of interest for a user-specified period of time. A different dwell time can be specified for each event.

Dwell Time Threshold events are similar to Loiters in area of interest events, but Loiters in area of interest events can only apply to one object at a time.

Most often, Dwell Time Threshold rules are set up to detect a group of people staying in an area for a certain amount of time. This can include both security applications, such as a gang of people congregating in a secure area, and retail applications, such as a long queue of people waiting for an extended period of time. In Dwell Time Threshold rules, the device is monitoring the dwell time of particular objects. If a particular object leaves the area of interest, the dwell time for that object ends.

Dwell Time Thresholds do not result in event responses (such as alerts), but Dwell Time Threshold data could be stored and retrieved later. For example, it could be stored and retrieved from a database for reporting purposes.

### How to Create or Edit a Dwell Time Threshold Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.
3. Enter a rule name.
4. Select **Dwells** as the event type.
5. Select the option that begins with **Output event when...**
6. Enter the number of people that must dwell in the area of interest for a response to be triggered.
7. Enter the duration of time the number of people must remain in the area of interest for a response to be triggered.

The default value is 0 minutes and 10 seconds. It can be set to any value greater than 0 seconds and less than 60 minutes.

8. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
9. Create a schedule. See "Schedules Overview" on page 45.

10. Do one of the following:

- Click **Save**.
- Click **Cancel** to abandon changes and return to the Rule Management page.

## Dwell Time Data Events

These events may not be supported by every channel.

Dwell time refers to the amount of time one or more objects remain in an area of interest. By default, the time ends when the objects exit the perimeter of the area of interest or disappear from within the area of interest (like a person leaving the view from a door in the area of interest). In Dwell Time Data rules, the device is monitoring the dwell time of particular objects. If a particular object leaves the area of interest, the dwell time for that object ends.

When a Dwell Time Data event occurs, the system records the dwell times for objects in the area of interest.

Dwell Time Data collection can be applied in a variety settings. For example, an area of interest might include a ticket queue to record to average wait time.

Dwell Time Data does not result in event responses (such as alerts), but Dwell Time Data could be stored and retrieved later. For example, it could be stored and retrieved from a database for reporting purposes. These reports may be customized according to factors such as the time range and dwell time duration.

### How to Create or Edit a Dwell Time Data Rule

1. Do one of the following:

- To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
- To edit an existing rule: Select the underlined rule name in the Rule Management page.

2. Create an area of interest. See "Draw an Area" on page 41.

3. Enter a rule name.

4. Select **Dwells** as the event type.

5. Select **Output dwell data**.

6. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.

7. Create a schedule. See "Schedules Overview" on page 45.

8. Do one of the following:

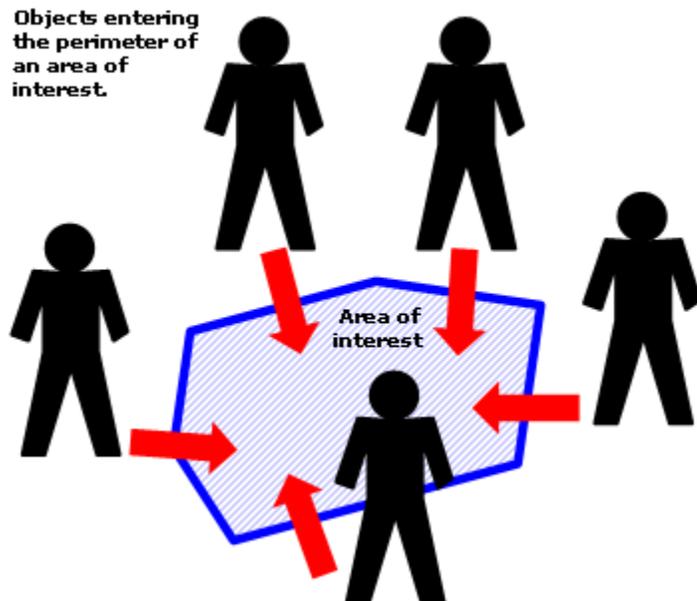
- Click **Save**.

- Click **Cancel** to abandon changes and return to the Rule Management page.

## Enters Events

These events may not be supported by every channel.

Enters events occur when an object enters an area of interest from any direction within the camera's field of view. A response is triggered when an object enters the perimeter of the area of interest. In the example shown in the figure, one response would be triggered per object entering the area of interest.



Enters events are generally set up in areas where there is little activity expected, and a response needs to be generated whenever an object enters the area. For example, a rule could be created to trigger a response when someone enters an area of interest near a restricted room.

### How to Create or Edit an Enters Rule

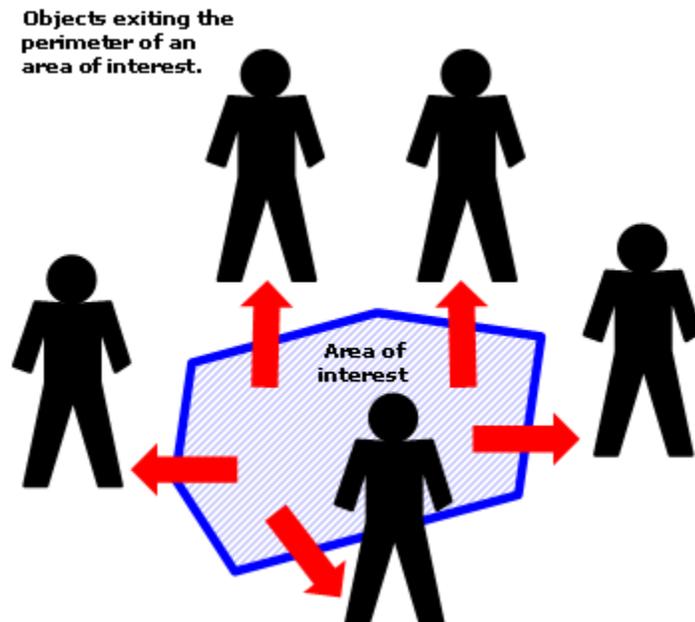
1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Draw an area of interest. See "Draw an Area" on page 41.
3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. Select **Enters** as the event type.

6. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
8. Create a schedule. See "Schedules Overview" on page 45.
9. If desired, create filters (may not be available on all channels). See "Filters Overview" on page 48.
10. Do one of the following:
  - Click **Save**.
  - Click **Cancel** to abandon changes and return to the Rule Management page.

## Exits Events

These events may not be supported by every channel.

Exits events occur when an object exits the perimeter of the area of interest. In the example shown in the figure, one response would be triggered per object exiting the area of interest.



### How to Create or Edit an Exits Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.

- To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Draw an area of interest. See "Draw an Area" on page 41.
  3. Enter a rule name.
  4. Select one or more object types. See "Object Types" on page 60.
  5. Select **Exits** as the event type.
  6. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
  7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
  8. Create a schedule. See "Schedules Overview" on page 45.
  9. If desired, create filters (may not be available on all channels). See "Filters Overview" on page 48.
  10. Do one of the following:
    - Click **Save**.
    - Click **Cancel** to abandon changes and return to the Rule Management page.

## Inside Events

Inside events occur when an object appears in an area of interest or enters the perimeter of an area of interest. You can think of an inside event as a combination of an Enters area of interest event and an Appears in area of interest event. See "Enters Events" on page 70 and "Appears Events" on page 62 for details.

### How to Create or Edit an Inside Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.
3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. Select **Is Inside** as the event type.

6. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
8. Create a schedule. See "Schedules Overview" on page 45.
9. If desired, create filters (may not be available on all channels). See "Filters Overview" on page 48.
10. Do one of the following:
  - Click **Save**.
  - Click **Cancel** to abandon changes and return to the Rule Management page.

### Left Behind Events

These events may not be supported by every channel.

Left Behind in area of interest events occur when an object is left in an area of interest. For a response to be triggered, the object must be inside the area of interest and remain stationary for a specific duration of time. An area of interest event should be used if a left object represents an event in only part of the camera's field of view. A Left Behind in full view event occurs when an object is Left Behind and remains stationary anywhere within the camera's field of view.

The time the object must be stationary is specified when the rule is created. By default, the object must be stationary for at least 15 seconds.

Events of this kind are typically set up to detect suspicious objects that transition from being in motion to being stationary. For instance, you could use a Left Behind rule to detect when a car parks near a security checkpoint.

Keep in mind that if the camera's field of view changes before the object has remained stationary long enough to be considered an event and if the camera returns to the view again later, the object will not be detected as Left Behind. The device does not know the object is the same object left behind before, and the object was already stationary in the camera's field of view when the device began monitoring that channel for events.

#### How to Create or Edit a Left Behind Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Do one of the following:

- Create an area of interest. See "Draw an Area" on page 41.
  - Select full view to apply the rule to the entire camera view. 
3. Enter a rule name.
  4. Select one or more object types. See "Object Types" on page 60.
  5. Select **Is Left Behind** as the event type.
  6. Specify the number of minutes and/or seconds for which the object must be left behind.

The duration must be between 1 second and 60 minutes.
  7. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
  8. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
  9. Create a schedule. See "Schedules Overview" on page 45.
  10. If desired, create object filters. See "Filters Overview" on page 48.
  11. Do one of the following:
    - Click **Save**.
    - Click **Cancel** to abandon changes and return to the Rule Management page.

 For the channel to be able to detect Left Behind events, the channel's settings will be automatically adjusted (see Left Behind Object Detection).

## Loiters Events

These events may not be supported by every channel.

Loiters in events occur when an object remains within an area of interest for a user-specified period of time. A different Loiters time can be specified for each event. Most often, Loiters rules are set up to detect people staying in an area too long.

### How to Create or Edit a Loiters Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.

3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. Select **Loiters** as the event type.
6. Specify the number of minutes and/or seconds for which the object must loiter in the area of interest.  
  
The duration can range from 1 second to 60 minutes.
7. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
8. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
9. Create a schedule. See "Schedules Overview" on page 45.
10. If desired, create filters (not available on all channels). See "Filters Overview" on page 48.
11. Do one of the following:
  - Click **Save**.
  - Click **Cancel** to abandon changes and return to the Rule Management page.

## Occupancy Data Events

These events may not be supported by every channel.

Occupancy refers to the number of objects that occupy an area of interest. When an Occupancy Data event exists, the system records as objects enter, leave, and remain in the area of interest.

Occupancy Data collection can be applied in a variety settings. For example, Occupancy Data can communicate how many people frequent a retail counter, and at what times of day the counter is busiest.

Occupancy Data does not result in event responses (such as alerts), but Occupancy Data could be stored and retrieved later. For example, it could be stored and retrieved from a database for reporting purposes. These reports may be customized according to factors such as the time range and crowd size.

 For Occupancy Data rules, the device is determining the overall occupancy of the area without regard to which particular objects come and go from the area. In Dwell Time Data rules, the device is monitoring the dwell time of particular objects. If a particular object leaves the area of interest, the dwell time for that object ends. See "Dwell Time Data Events" on page 69 for details.

### How to Create or Edit an Occupancy Data Rule

1. Do one of the following:
-

- To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.
  3. Enter a rule name.
  4. Select **Occupies** as the event type.
  5. Select **Output occupancy data**.
  6. Specify the number of minutes and/or seconds for which the object must occupy the area.
  7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
  8. Create a schedule. See "Schedules Overview" on page 45.
  9. Do one of the following:
    - Click **Save**.
    - Click **Cancel** to abandon changes and return to the Rule Management page.

## Occupancy Threshold Events

These events may not be supported by every channel.

Occupancy Threshold events occur when a certain Occupancy Threshold is reached for an area of interest. An Occupancy Threshold involves a certain number of objects occupying an area of interest, for a configurable period of time.

Occupancy Threshold rules can be set up to detect a wide variety of different activities, depending on where you place the area of interest and how you define the event. For example, you might create a rule to detect when a security post is unmanned. Alternatively, you could create a rule to detect a crowd of a certain volume gathering by a store display for a given amount of time.

Occupancy Threshold data does not result in event responses (such as alerts), but Occupancy Threshold data could be stored and retrieved later. For example, it could be stored and retrieved from a database for reporting purposes.

 For Occupancy Threshold rules, the device is determining the overall occupancy of the area without regard to which particular objects come and go from the area. In Dwell Time Threshold rules, the device is monitoring the dwell time of particular objects. If a particular object leaves the area of interest, the dwell time for that object ends. See "Dwell Time Threshold Events" on page 68 for more information.

[How to Create or Edit an Occupancy Threshold Rule](#)

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1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Create an area of interest. See "Draw an Area" on page 41.
3. Enter a rule name.
4. Select **Occupies** as the event type.
5. Select **Output event when Occupancy is**.
6. From the first drop-down list, select the option that describes how the number of people (which you determine in step 7) relates to the event occurrence.

Select one of the following options:

- **at least**
  - **exactly**
  - **no more than**
7. Enter the number of people that must occupy the area.
  8. Specify whether the event could happen **at any time** or **for** a specific duration.
  9. If you selected **for** in the previous steps, enter a duration for the event.

The default duration is **0 minutes** and **10 seconds**.
  10. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
  11. Create a schedule. See "Schedules Overview" on page 45.
  12. Do one of the following:
    - Click **Save**.
    - Click **Cancel** to abandon changes and return to the Rule Management page.

## Taken Away Events

These events may not be supported by every channel.

A Taken Away from area event occurs when an object is taken away from an area of interest or anywhere within the camera's field of view. A Taken Away event could be set up so that a response is triggered when an item is removed or stolen from within the camera's

field of view. Events of this kind are typically set up to detect theft and items that transition from being stationary to being in motion.

Events are only detected for objects that meet **one** of the following conditions.

- Before being taken away, the object was in the field of view of the camera when the channel was first monitored for events (the device was restarted, channel changed views, etc.).
- The object remained stationary for at least 10 seconds in the field of view of the camera before being taken away.

By default, if an object is not in the field of view when the device begins monitoring or is not left behind for 10 seconds before it is taken away, it will not be detected. Although the default settings are usually sufficient, you can modify the conditions that must exist before a Taken Away event is detected using the instructions in Reduce Taken Away False Alarms.

If an area of interest is used, the system detects events differently based on whether you use a ground plane or image plane area of interest for the event. Refer to Ground vs Image Plane for more information.

### How to Create or Edit a Taken Away Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Area**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Do one of the following:
  - Create an area of interest. See "Draw an Area" on page 41.
  - Select full view to apply the rule to the entire camera view. 
3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. Select **Is Taken Away** as the event type.
6. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
7. If your system supports custom response fields, you can enter them using the instructions in "Custom Response Fields" on page 47.
8. Create a schedule. See "Schedules Overview" on page 45.
9. If desired, create filters. See "Filters Overview" on page 48.

10. Do one of the following:

- Click **Save**.
- Click **Cancel** to abandon changes and return to the Rule Management page.

### Video TripWire™ Events

A Video TripWire is a line drawn within the camera's field of view. An object triggers a response by crossing the line. Video TripWires can be created along perimeters (such as fence lines), in front of entryways, and along other restricted areas. A response can be triggered when an object crosses the Video TripWire from only certain directions. Also, Video TripWires can consist of one or more segments.

A Multi-line Video TripWire is two lines drawn within the camera's field of view. An object triggers a response by crossing both lines within a user-specified period of time. Multi-line Video TripWires are used for the same purposes as a single-line Video TripWires, such as perimeter protection and the protection of other restricted areas.

Remember that there is a difference between Multi-line Video TripWire events and multiple segment Video TripWires. Multi-line Video TripWire events are events that require an object to cross more than one Video TripWire. A Multi-segment Video TripWire is a Video TripWire that is made of multiple segments. Multi-segment Video TripWires can be used in single or Multi-line Video TripWire events.

The most common reasons to use a Multi-line Video TripWire instead of a single-line Video TripWire are as follows:

- You can use Multi-line Video TripWires in areas where you have tried to use single-line Video TripWires, but too many false alarms are being generated because of waves, shadows, trees blowing in the wind, etc.
- When using Video TripWires to count events, events are being over counted.
- You need to create a rule that detects changes in the direction in which objects are moving, such as a car turning down a restricted roadway.

Be aware of the following disadvantages of using Multi-line Video TripWires that can make them less desirable than single-line Video TripWires in some cases:

- Multi-line Video TripWire rules must be created in such a way that the duration between when the Video TripWires are crossed is neither too long nor too short and the two Video TripWires are likely to be crossed in the order specified. Some testing is required to determine the appropriate duration between crossing the two Video TripWires. If you misestimate the duration, events may be missed.
- In order to trigger a response for a Multi-line Video TripWire event, the system must track an object as it crosses both Video TripWires. Most often, the reason an object is not tracked is that it is not visible within the camera's field of view at some point. For example, if there is a boulder between the two Video TripWires and an object is blocked from the camera's view because it moves behind the boulder before crossing

the second Video TripWire, the system may not be able to track the object, and a response may not be triggered.

- An individual who knows about a Multi-line Video TripWire can avoid detection by waiting long enough between crossing the two Video TripWires. For this reason, you may want to use Multi-line Video TripWires in conjunction with events that detect objects waiting, to detect objects stopping between the Video TripWires. See "Loiters Events" on page 74 for information about Loiters events. See "Left Behind Events" on page 73 for information about Left Behind events.

### How to Create or Edit a Video TripWire Rule

1. Do one of the following:
  - To create a new rule: In the **Create new rule** drop-down on the Rule Management page, select **Video TripWire**.
  - To edit an existing rule: Select the underlined rule name in the Rule Management page.
2. Draw one or more Video TripWires. See "Draw a Video TripWire™" on page 38.
3. Enter a rule name.
4. Select one or more object types. See "Object Types" on page 60.
5. If you drew two Video TripWires, select the order in which an object must cross the Video TripWires.
6. Enter how long in a minutes and/or seconds the object has to cross both Video TripWires.
7. If desired, enter details about the rule or other descriptive text in the **Alert text** field.
8. Create a schedule. See "Schedules Overview" on page 45.
9. If desired, create filters (may not be available on all channels). See "Filters Overview" on page 48.
10. Do one of the following:
  - Click **Save**.
  - Click **Cancel** to abandon changes and return to the Rule Management page.

# Performance Options

The Performance Options page allows you to adjust frequently changed channel settings without modifying parameters individually.

**Cisco Analytics Management Console** Configuration | Help  
App Status: **OK**

Home ▶ Default Name ▶ Performance Options

Display: All [Advanced View](#)

**Contrast Sensitivity** ?  
Decrease to detect events more accurately when there are shadows or reflections present. Increase to detect more events in a low contrast environment (i.e., a scene where objects are hard to distinguish from the background).  
Less More

**Monitor Stopped Objects (Duration)** ?  
Decrease to ignore stationary objects sooner and save system resources. Increase to monitor stationary objects longer.  
Less More

**View Sensitivity** ?  
Decrease to make the system less sensitive to scene changes (camera movement, camera blocked, or other significant view changes) and more likely to continue monitoring when changes occur. Increase to make the system more sensitive to scene changes and more likely to stop monitoring when changes occur.  
Less More

**Bad Signal Sensitivity** ?  
Decrease to make it less likely that the Bad Signal status will appear. This allows monitoring to continue when the scene suffers from extreme lighting conditions or contrast problems. Increase to make it more likely Bad Signal will appear and detection will stop when contrast problems occur.  
Less Default

**Report Bad Signal** ?  
Controls if Bad Signal is reported for contrast and interference problems (e.g., loss of signal or camera covered). Turning this off may mask problems that prevent proper detection.

Resets to default  
Opens Help browser

## To Modify a Performance Option

To modify an option with a slider simply click and drag the slider's control to the desired location. To change the status of an option with a checkbox click the checkbox to toggle between the checked or unchecked setting. Once the performance option is modified you will be in edit mode, and the Save or Cancel buttons will appear:

- To save your changes click the **Save** button.
- To exit the edit mode without saving your changes click the **Cancel** button.

Click the reset to default icon  to return that specific option back to its default setting.

Click the help icon  for more detailed help for each option.

## To Filter the Display

To change which options are displayed, select the desired display filter by choosing from the **Display** drop-down box. The Display selection acts as a filter showing only the performance options you want to see, for example, select **Views** to only see the options that effect view handling.

### Customized Values

If the option has been modified outside of the Performance Options page, it is listed as customized. Verify with your organization that it is appropriate to override these values before making changes.

Clicking the **customized** link takes you to the advanced parameter view for editing the individual parameters associated with that performance option. See "Advanced Performance Options Overview" on page 89 for more details on how to configure individual parameters.

Alternately, clicking the **Advanced View** link at the top right of the Performance Options page will take you to Advanced Performance Options page, and will display the full list of supported parameters. See "Advanced Performance Options Overview" on page 89 for more details on how to configure individual parameters.

 Some options may not be supported by a specific channel type or configuration. For this reason, some options may not appear on the Performance Options page.

 You can see the default value for options with sliders by hovering over the slider control tab. A tooltip indicates if the setting is the default setting.

## Performance Options Descriptions

Performance Options allow you to customize the behavior of the channel. Since these changes modify the detection capabilities of the channel, be sure that you test and compare the behavior of the system before and after making the changes. Also, pay careful attention to the side effects of each modification.

 If the option has been modified outside the Performance Options page it will be listed as customized. Verify with your organization that it is appropriate to override these values before making changes.

 Some options may not be supported by your channel type and/or configuration. For this reason, some options may not appear. Other options may appear but cannot be modified. The default value for each setting is indicated by a tooltip that appears above the default performance option position when moving the option's slider control tab.

Option	Description
<b>Contrast Sensitivity</b>	<p>You can improve detection accuracy by experimenting with Contrast Sensitivity. In most cases, the default setting should be optimal for event detection.</p> <p>Move the setting to the right to detect more objects in environments where there is low contrast between objects and the background.</p> <p>Click here for examples of views with low contrast.</p>

Option	Description
	 <p data-bbox="409 1318 1377 1377">Move the setting to the left to detect more events when there are many shadows or reflections in the field of view.</p> <p data-bbox="409 1409 1406 1470">Click <a href="#">here</a> for examples of scenarios in which you may want to modify this setting.</p> <p data-bbox="409 1501 1360 1562">Scenario 1: It is harder to identify objects in the field of view when the scene gets dark in the evening.</p> <p data-bbox="409 1593 808 1623">Solution: Decrease sensitivity</p> <p data-bbox="409 1654 1406 1715">Scenario 2: You do not get the detections you expect when long afternoon shadows appear in the field of view.</p> <p data-bbox="409 1747 800 1776">Solution: Increase sensitivity</p> <div data-bbox="409 1801 1440 1871" style="background-color: #ffffcc;"><p data-bbox="409 1808 1344 1871"> If problems remain after modifying this setting, see <a href="#">False Alarm Troubleshooting</a> and <a href="#">Missed Events Troubleshooting</a> for other troubleshooting</p></div>

Option	Description
	options.
<b>Monitor Stopped Objects (Duration)</b>	<p>Determines the amount of time an object that is not moving is monitored by the system.</p> <p>Decreasing the amount of time objects are monitored (moving the setting towards the left) will decrease the amount of system resources used to track objects.</p> <p>The values available (from left to right) are 5, 15, 30, 45, and 60 minutes.</p> <p>If you change this value, remember to consider the impact on existing and new rules. If you set Loiter or Left Behind rules to a duration higher than the value, the channel will never trigger responses for objects that have been stationary the entire time they are in the view.</p> <p>For instance, you may have set the <b>Monitor Stopped Objects</b> setting to 30 minutes. You create a rule to detect when someone has remained for 35 minutes. A person that is stationary for the first 30 minutes does not trigger a response even if they remain stationary for more than 35 minutes. The channel stopped monitoring the person at 30 minutes.</p> <p>In the next example, assume you set the option to 10 minutes. The rule is created with a duration of 15 minutes. An object is stationary for 5 minutes, moving for 5 minutes, and then stationary for 6 minutes. A response would be triggered because the object was never stationary for more than 10 minutes at a time. The stationary time must be continuous.</p>
<b>View Sensitivity</b>	<p>When a camera's field of view changes significantly (a scene change occurs), the system compares the new view of the camera to the stored view it can monitor. This option determines how different the new and stored views need to be for the system to consider the new view as different.</p> <p>Depending on your environment and security needs, you may or may not want to make the system sensitive to view changes.</p> <p>If the system is frequently recognizing that a Camera Tamper has occurred (the system is determining the new view does not match the stored view), you can move the value to the left. You may receive fewer notifications of view changes, and you may not have to manually force the view as often if you are using User-controlled views. Monitoring will be more likely to continue during a minor scene change. On the other hand, you may not be notified of real scene changes that could represent a security risk.</p> <p>If the system does not notice when the scene changes (determines the new view is very similar to the stored view), you can increase sensitivity. If you move the value to the right, you may be notified of more view changes.</p>

Option	Description
	<p>This will keep you better informed about the state of the view.</p> <p>When the view changes the following happens:</p> <ul style="list-style-type: none"> <li>•User-controlled views: The system stops monitoring the view when it changes. This will indicate that you need to take some action to correct the situation and continue monitoring.</li> <li>•Auto-acquire views: The system stops monitoring for a few seconds and responses will be triggered if you created a Camera Tamper rule.</li> </ul> <p>Be aware that when the system becomes too sensitive, minor scene changes may cause the system to not recognize the view.</p> <p><a href="#">Click here for examples of scenarios in which you might want to modify this value.</a></p> <p>Scenario 1: You know the camera's view will change frequently. You really do not need to be notified.</p> <p>Solution: Decrease sensitivity</p> <p>Scenario 2: The camera moving at all could represent a major security risk.</p> <p>Solution: Increase sensitivity</p> <p> If adjusting the value does not result in the system performing how you would expect, you may want to try using a different overall view behavior (see "Channel Configuration" on page 8).</p>
<p><b>Bad Signal Sensitivity</b></p>	<p>Contrast problems may occur because of the quality of the camera or extreme lighting conditions. Contrast problems can interfere with event detection. Depending on your environment and security needs, you may or may not want to be notified of contrast problems by receiving the Bad Signal channel status.</p> <p>Move the value to the left to make it less likely Bad Signal will appear. This allows monitoring to continue when the scene suffers from extreme lighting conditions or contrast problems.</p> <p>Move the value to the right to make it more likely Bad Signal will appear and detection will stop when contrast problems occur.</p> <p><a href="#">Click here for examples of views with contrast problems.</a></p>

Option	Description
	 <p data-bbox="407 1318 1425 1346"><a href="#">Click here for examples of scenarios in which you might modify this setting.</a></p> <p data-bbox="407 1377 1430 1470">Scenario 1: Car headlights are causing the channel status to become Bad Signal. Cars enter the view frequently, and you do not need to be alerted to their arrival.</p> <p data-bbox="407 1501 808 1528">Solution: Decrease sensitivity</p> <p data-bbox="407 1560 1401 1621">Scenario 2: You have to be notified immediately if the camera's view gets too dark for the system to identify people.</p> <p data-bbox="407 1652 800 1680">Solution: Increase sensitivity</p> <div data-bbox="407 1711 1414 1780" style="background-color: #ffffcc;"><p data-bbox="407 1711 1414 1780"> You can turn off the Bad Signal status using the <b>Report Bad Signal</b> checkbox described below.</p></div> <div data-bbox="407 1812 1369 1845" style="background-color: #ffffcc;"><p data-bbox="407 1812 1369 1845"> For optimal results, try modifying this value while modifying the <b>Contrast</b></p></div>

Option	Description
	<p><b>Sensitivity</b> slider control.</p>
<p><b>Report Bad Signal</b></p>	<p>Controls whether the Bad Signal sensor status ever appears. Event detection stops when the system reports a Bad Signal.</p> <p>Selected (on): If there are contrast problems in the video feed (e.g., loss of video signal or covered camera), the Bad Signal channel status is displayed.</p> <p> See the <b>Contrast Sensitivity</b> Performance Option description for instructions on how to adjust the system's sensitivity to contrast problems without turning off the Bad Signal status.</p> <p>Unselected (off): The Bad Signal status will never appear because of contrast problems or noise in the video. If you use this option you may detect more events (since a Bad Signal status will not stop the channel from monitoring), but you may be unaware of contrast problems that prevent the system from detecting some events. You may want to use this setting when there are frequent, unavoidable contrast problems during which you do not want to interrupt detection.</p>
<p><b>Counting Sensitivity</b></p>	<p>Enables the channel to more accurately count people detected in an area of interest (such as people who occupy a lobby). Move the setting value to the left if the counting results are higher than expected. Move the setting value to the right if the counting results are lower than expected.</p> <p> Before modifying this setting, be sure that you have calibrated the sensor properly. See <a href="#">Calibration Overview</a> for details.</p>
<p><b>Busy Scenes</b></p>	<p>This setting adjusts the maximum crowd size for alerting. It defines how large a gathering must be before the system no longer recognizes it as a high density crowd. In areas that are very busy (lots of activity and movement), density levels may fluctuate. If you are not receiving the density results you expect in these areas, you can modify this setting to improve results and ignore busy scenes that do not really represent what you consider a large crowd.</p> <p>Decrease the value if you are getting fewer-than-expected density alerts in busy scenes. Be aware that in very busy scenes this may result in a higher volume of alerts. You may receive more high density alerts.</p> <p>Increase the value if you are getting more-than-expected density alerts in busy scenes. You may receive fewer high density alerts. If this value is raised too high for your view, you may not be notified of some real density events.</p>
<p><b>Density Thresholds</b></p>	<p>How to control the system's designation of density levels as low, medium,</p>

## Performance Options

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Option	Description
	<p>or high. If you are not getting the results you expect, you can adjust the thresholds using this Performance Option slider.</p> <p>Increase the values to expand the low and high density categories. Decrease the values to narrow the low and high density categories.</p>

# Advanced Performance Options Overview

Each channel has an associated list of parameters that determines how the channel monitors video feeds. You can access the parameter list by clicking the **Advanced View** link on the Performance Options page. A snapshot of the channel appears on the parameter list to remind you of which channel's values you are modifying.

**Cisco Analytics Management Console** Configuration | Help  
Home ▶ Default Name ▶ Performance Options App Status: **OK**

Display: All Parameters

001:	<input type="text" value="12"/>	Recommended range 6 to 20. Decrease to detect more low contrast objects.
002:	<input type="text" value="6"/>	Recommended range 3 to 10. Decrease to detect more low contrast objects.
004:	<input type="text" value="1.0000"/>	Recommended range 0.0000 to 1.5000. Any object that is visible for less than the amount of time (in seconds) specified in this parameter will be considered to be a spurious object. Increasing this value improves classification accuracy but will delay how long it takes to classify an object. Conversely, decreasing this value speeds the detection time but may also decrease detection accuracy.
010:	<input type="text" value="0.3500"/>	Recommended range 0.1000 to 0.9000. Sets a percentage (.01 equals 1%) indicating how closely the current view and a stored view match. This percentage determines how confident the device is that the current view is a known view.
013:	<input type="button" value="Detect contrast problems"/>	Enables or disables the device's ability to detect contrast problems and report Bad Signal.
014:	<input type="text" value="8.0000"/>	Recommended range 0.0000 to 8.0000. Determines how sensitive the device is to low contrast, and how often a Bad Signal status appears. Increase to raise sensitivity (more likely to see Bad Signal). Decrease to lower sensitivity (less likely to see Bad Signal).
016:	<input type="button" value="Disable noise detection"/>	Enables or disables the detection of noisy imagery.
019:	<input type="text" value="30.0000"/>	Recommended range 1.0000 to 30.0000. How often (in seconds) the device checks whether the view is known.

**The Performance Options page allows you to adjust frequently changed channel settings without modifying parameters individually. See "Performance Options" on page 81 and "Performance Options Descriptions" on page 82 for details on how you can more easily modify channels settings using the Performance Options page.**

In the parameter list, enter or select new values for the parameters you wish to modify.

Be aware that not every parameter is applicable to every channel. A parameter may only impact, for instance, the detection of an event that your channel is not licensed to detect.

The Parameter page includes the following information about each parameter:

- A description is listed below the value for many of the parameters. Descriptions typically include a recommended range, the type of value (percentage, number, etc.), and information about what the parameter does.

- If a parameter change requires a channel restart, this is represented by an icon preceding the parameter number. You will be prompted to allow the channel to restart when you save the parameter changes. 
- If a parameter value is not default, the default value appears next to the parameter's current value.
- When you change a value and click outside of the value field, the value becomes bold to indicate that a change has been made. Values are not applied to the channel until they are saved.

Select one of the following sections for more information about Parameter page functionality:

- "Filter the Parameter List" on page 90
- "Restore Default Parameter Values" on page 91
- "Save Parameters" on page 92
- "Test Parameter Changes" on page 92

## Filter the Parameter List

In order to quickly access the parameters you wish to change, you can modify which parameters appear in the parameter list using the **Display** field. By default, all parameters applicable to the channel are displayed in the parameter list. If you filter the list using a different display option, you can show the full list again by selecting **All Parameters**.

 **Parameters that are not valid to your installation are not shown. Gaps in the numbering of the parameter list do not indicate an error.**

The second group of options in the **Display** list contains categories of parameters. These are groupings of parameters that control similar functionality.

The following is a sample of categories that may be available:

- Contrast: Parameters used to improve detection accuracy in areas with contrast problems, shadows, or reflections.
- Counting: Parameters applicable only to Event Counting channels.
- Image Stabilization: Parameters controlling the Image Stabilization feature.
- Objects: Parameters controlling how objects are detected and classified.
- Views: Parameters influencing how the system reacts to changes to the camera's field of view.

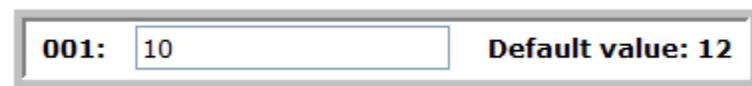
 Every category of parameters may not be applicable to your channel.

Parameters may appear in multiple categories if there are different applications for their use. There are also some rarely used parameters that are not applicable to any category. These parameters only appear when **All Parameters** is selected.

There are also two dynamic filter options that indicate modifications you have made to the parameter values. **Modified from Default** displays only the parameters that do not have the default parameter values for the channel. This list may be helpful for customer support during troubleshooting. Also, it provides a summary of the changes you have made in case you want to use a similar configuration for other channels.

You can identify parameters modified from default because they indicate the default value next to the current parameter value. See "Restore Default Parameter Values" on page 91 for details.

**Unsaved Changes** displays the parameters you have changed. Once the parameter values are saved, they no longer appear in this list. Unsaved changes are also indicated by a bold parameter value and default value (if applicable).



## Restore Default Parameter Values

There is a default value assigned to each parameter. This is determined by the channel type. If your parameter modifications do not have the intended results or the channel is monitoring a different scene where the default values may be more appropriate, you may want to reset one or more parameters to their default values.

When a parameter value is not default, the default value appears next to the current value.



The default value next to the current value disappears when the parameter value is default.

To Restore a Single Parameter Value

If a parameter value is not default, a Reset icon appears on the parameter list. Click this icon to automatically restore the parameter value. 

To Restore All Parameter Values

Click the **Reset All to Default** button to set every parameter to the default value for the channel.

 You can only reset all parameters when **All Parameters** is selected as the **Display** option.

## Save Parameters

Parameter changes are not applied to the channel until they are saved. Click the **Save** button below the parameter list to apply your changes.

All parameters must have a value. When you save, you are notified in an error message if any parameters do not have values. Parameters also have different types of values (number, text, etc.). If the type of value you enter is not valid, an error message next to the current value indicates the required value type.

Some parameters require a channel restart. This is indicated by an icon preceding the parameter number.

When you click **Save**, a **Save and Restart?** confirmation window appears if a channel restart is required. Click **No** to return to the Parameter page without saving your changes. Click **Yes** to restart the channel with the new parameter values.

You can click the **Cancel** button below the parameter list anytime to return to the Home page without apply parameter changes.

## Test Parameter Changes

You should test to ensure that the device is detecting events properly after a parameter change. Changing parameter values may impact the whole system. Changing even one parameter may affect how the system operates in ways you would not expect. For instance, a change that allows the system to detect smaller objects may result in more false alarms for certain event types.

Since every environment is different, it is good practice to test the system thoroughly after any parameter changes. Side effects listed in the troubleshooting article often provide important clues into what to look for when testing.

Make sure that you are testing in the same environment in which you experienced a problem. For instance, make sure that you are using the same rules and similar objects, lighting, and weather conditions. Compare the behavior from before the parameter change to the test results after the parameter change.

If there is no improvement in system performance and the troubleshooting article or description offers a range of options for a parameter, enter a different value within the recommended range.

Keep in mind that some parameter modifications only have the desired effect when they are applied with other parameters.

If the changes you make do not improve the system performance, see "Restore Default Parameter Values" on page 91 for information on how to set the parameters back to their default values.

# Troubleshoot

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## Camera Tamper Unavailable

Article Number: 2056

### Summary:

The **Camera Tamper** option is not available from the **Create new rule** drop-down menu.

### Description:

Camera Tamper only appears if you are licensed to create Camera Tamper events. Also, the Camera Tamper option is not available if you have already created a Camera Tamper rule on that channel. Only one Camera Tamper rule is necessary per channel.

## Cannot Combine Events

Article Number: 2061

### Summary:

When you select an event for a rule on the Edit Rule page, you cannot select additional event types for that rule.

### Description:

Only certain events can be combined in a single rule. For instance, due to the type of data collected for the event, you cannot combine an Occupancy Data event with any other type of event. If you need to monitor an area for two types of events that cannot be combined, create another rule applying to the same area with the second event type.

If you want to select a different event type that is unavailable, just deselect the existing event type. This should activate all the other event types available on the Edit Rule page.

## Cannot Create Rules

Article Number: 2059

### Summary:

You cannot select any rule categories from the **Create new rule** drop-down menu on the Rule Management page, and the copy rule icon is disabled.

### Description:

Each device has a limit on the number of rules that you can create. The maximum number of rules varies by device. Once this limit is reached, you cannot add any additional rules. You should be able to create a new rule if you delete an existing rule.

## Cannot Expand Snapshot

Article Number: 2060

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### Summary:

The Expand icon on the Edit Rule page is inactive, so you cannot expand the camera view.



### Description:

You can only expand the view when your browser window is large enough to show an expanded snapshot without scrolling. Extend the browser window until the icon becomes active.

## Cannot Save Parameters

Article Number: 2057

### Summary:

You receive an error dialog when you try to save parameters, or a validation error appears next to a parameter.

### Steps:

The following circumstances may cause an error:

- If a validation error appears next to the value, you have entered the wrong type of value for the parameter. For instance, you entered text when a number value was required. Enter the type of value indicated in the error message. Be sure you scroll through the entire parameter list to identify any parameters with errors.
- You tried to enable a feature that you are not licensed to use.
- You changed a parameter that cannot be modified with your current parameter settings.
- The Web Console was unable to communicate with the device, or the device experienced an error.

## Calibration Required

Article Number: 2058

### Summary:

The **Calibration required** dialog appears on the Rule Management page.

### Description:

This dialog appears when you have not calibrated the channel. You must calibrate the channel before you can create rules. Click **OK** to automatically access the Calibration page. You can also access the Calibration page from the **Calibrate** button on the Home page.

## Missing Parameters

Article Number: 2055

### Summary:

Some parameters do not appear in the Parameter page.

### Description:

First, be sure that you have selected **All Parameters** from the **Display** drop-down menu at the top of the Parameter page. This shows you all the parameters applicable to your installation. It is normal for there to be gaps in the parameter list. Parameters are "retired" when they do not apply to current version of the software.

## Missing Reset Button

Article Number: 2054

### Summary:

The **Reset All to Default** button or individual parameter row reset icons are missing from the Parameter page.

### Description:

This is not an error. A reset icon only appears on the parameter row if the parameter value is not default. 

The **Reset All to Default** button only appears when you are showing the entire parameter list. To show the full list, select **All Parameters** from the **Display** field. The button is only active if any parameter does not have a default value.

## Unable to Add Points to Video TripWires™ or Areas of Interest

Article Number: 2040

### Summary:

When creating a polygonal area of interest, you are unable to add additional points.

When drawing a Video TripWire, you cannot add an additional segment.

### Solution:

This does not indicate a problem; the maximum number of points is determined by the device. When creating rules, it is best to keep them as simple as possible. Often, it is better to use a less-precise event specification with less configuration elements rather than an event specification that attempts to be all-inclusive but entails many configuration elements.

# Supported Browsers

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The Web Console has been tested with the following browsers:

- Microsoft Internet Explorer® 8 or 9
- Mozilla® Firefox® 7 or higher
- Google™ Chrome 14 or higher

# Index

---

## A

activate

analytics, 8

rule overlay, 56

rules, 55

add

Appears event, 62

Camera Tamper event, 63

Density event, 64

Disappears event, 66

Dwell Time Data event, 69

Dwell Time Threshold event, 68

Enters event, 70

event, 36

Exits event, 71

Inside event, 72

Left Behind event, 73

Loiters event, 74

Occupancy Data event, 75

Occupancy Threshold event, 76

rule, 36

schedules, 45

Taken Away event, 77

Video TripWire event, 38, 79

Anything objects, 60

Appears event, 62

add, 62

create, 62

edit, 62

area of interest, 41, 44, 95

Auto-acquire views, 5

Auto-force views, 5

automatic forcing of views, 5

## B

browsers, 96

## C

calibration, 8, 11, 21, 26, 94

Camera Tamper event, 63, 93

add, 63

create, 63

edit, 63

cannot

add Camera Tamper, 93

add rules, 93

combine events, 93

reset parameters, 95

save parameters, 94

channel

calibration, 8, 11, 21, 26

configuration, 8

ID, 8

name, 8

classification of objects, 60

configuration overview, 8

- copy
    - filters, 54
    - rules, 56
    - schedules, 45
  - create
    - Appears events, 62
    - Camera Tamper events, 63
    - Density event, 64
    - Disappears events, 66
    - Dwell Time Data events, 69
    - Dwell Time Threshold events, 68
    - Enters events, 70
    - Exits events, 71
    - Inside events, 72
    - Left Behind events, 73
    - Loiters events, 74
    - Occupancy Data events, 75
    - Occupancy Threshold events, 76
    - rules, 36
    - schedules, 45
    - Taken Away events, 77
    - Video TripWire events, 38, 79
  - crosshairs, 11, 21, 26
  - custom response fields, 47
  - D**
  - deactivate
    - analytics, 8
    - rule overlay, 56
    - rules, 55
  - default parameter values, 91
  - delete
    - area of interest, 41
    - filters, 54
    - object filters, 54
    - rules, 56
  - Density event, 64
    - add, 64
    - create, 64
    - edit, 64
  - device
    - configuration, 8
    - status, 8
  - Disappears event, 66
    - add, 66
    - create, 66
    - edit, 66
  - draw
    - area of interest, 41
    - Mullti-line TripWire, 38
    - Multi-segment TripWire, 38
    - Video TripWire, 38
  - Dwell Time Data event, 69
    - add, 69
    - create, 69
    - edit, 69
  - Dwell Time Threshold event, 68
-

add, 68

create, 68

edit, 68

**E**

edit

Appears events, 62

area of interest, 41

Camera Tamper events, 63

Channel Configuration, 8

Density event, 64

Disappears events, 66

Dwell Time Data events, 69

Dwell Time Threshold events, 68

Enters events, 70

events, 36

Exits events, 71

Inside events, 72

Left Behind events, 73

Loiters events, 74

Occupancy Data events, 75

Occupancy Threshold events, 76

rules, 36

schedules, 45

Taken Away events, 77

Video TripWire events, 38, 79

Enters event, 70

add, 70

create, 70

edit, 70

Error status, 8

event, 59, 61

add, 36

Appears, 62

Camera Tamper, 63

Disappears, 66

Dwell Time Data, 69

Dwell Time Threshold, 68

edit, 36

Enters, 70

Exits, 71

Inside, 72

Left Behind, 73

Loiters, 74

Multi-line TripWire, 79

Multi-segment TripWire, 79

Occupancy Data, 75

Occupancy Threshold, 76

Taken Away, 77

Video TripWire, 79

Exits event, 71

add, 71

create, 71

edit, 71

expand view, 55, 93

**F**

filters, 48, 50

---

add, 48  
copy, 54  
delete, 54  
irregular shape or motion, 48, 50  
maximum size, 48, 50  
minimum size, 48, 50  
parameter list, 90  
remove, 54  
size change, 48

Firefox, 96

force views, 7, 8

**G**

ground plane, 44

**H**

Home page, 5

Human objects, 60

**I**

image plane, 44

Inside event, 72

add, 72

create, 72

edit, 72

Internet Explorer, 96

irregular shape or motion filter, 48, 50

**K**

known view, 5

**L**

Left Behind event, 73

add, 73

create, 73

edit, 73

license type, 8

Loiters event, 74

add, 74

create, 74

edit, 74

**M**

manage rules, 35

maximum number of points, 95

maximum size filter, 48, 50

Microsoft Internet Explorer, 96

minimize view, 55

minimum size filter, 48, 50

missing parameters, 95

missing reset button, 95

modified from default, 90

Mozilla Firefox, 96

Multi-line TripWires, 38, 79

Multi-segment TripWires, 38, 79

**O**

object filters, 48, 50

add, 48

delete, 54

irregular shape and motion, 48, 50

maximum size, 48, 50

minimum size, 48, 50

remove, 54  
size change, 48  
objects, 59, 60  
Anything, 60  
calibration for, 11, 21, 26  
classification, 60  
Person, 60  
Vehicle, 60  
Occupancy Data event, 75  
add, 75  
create, 75  
edit, 75  
Occupancy Threshold event, 76  
add, 76  
create, 76  
edit, 76  
OK status, 8  
overlay, 56

**P**

parameters, 94, 95  
default values, 91  
filter list, 90  
modified from default, 90  
overview, 89  
restart required, 92  
restore default values, 91  
save, 92  
test changes, 92

unsaved changes, 90  
pause video, 55  
People-only Classification, 8, 11, 26  
Person objects, 60  
play video, 55

**R**

remove  
area of interest, 41  
filters, 54  
object filters, 54  
rules, 56  
Video TripWire, 38  
restart  
channel after parameter change, 92  
restart required, 92  
restore default parameter values, 91, 95  
rule overlay, 56  
rules, 36, 93  
activate, 55  
add, 36  
Appears, 62  
Camera Tamper, 63  
copy, 56  
create, 36  
deactivate, 55  
delete, 56  
Disappears, 66  
Dwell Time Data, 69

---

Dwell Time Threshold, 68  
edit, 36  
Enters, 70  
Exits, 71  
Inside, 72  
Left Behind, 73  
Loiters, 74  
management, 35  
Occupancy Data, 75  
Occupancy Threshold, 76  
overview, 35  
remove, 56  
schedules, 45  
Taken Away, 77  
Video TripWire, 79  
run schedule all the time, 45

**S**

save parameters, 92  
schedules, 45  
size change filter, 48  
stop video, 55  
supported browsers, 96

**T**

Taken Away event, 77  
add, 77  
create, 77  
edit, 77  
test

parameter changes, 92  
rules, 54  
troubleshoot  
calibration, 94  
Camera Tamper, 93  
cannot add points, 95  
expand snapshot, 93  
parameters, 94, 95  
rules, 93

**U**

unknown view, 5, 7  
unsaved parameter changes, 90  
User-controlled views, 5

**V**

Vehicle objects, 60  
video playing, 55  
video resolution, 8  
Video TripWire  
cannot add points, 95  
draw, 38  
edit, 38  
Video TripWire event, 79  
add, 79  
create, 79  
edit, 79  
view rules, 35  
views  
expand, 55, 93

---

force, 7, 8

playing video, 55

**W**

Warning status, 8