



Cisco Video Analytics User Guide

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GLOSSARY

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Preface

Overview

This document, *Cisco Video Analytics User Guide*, provides information about using the video analytics, and describes how to configure and manage the video analytics portion of an IP camera.



Note

For information about configuring the other features besides video analytics that are available in an IP camera, see the camera user guide.

Organization

This manual is organized as follows:

Chapter 1, “Introduction”	Provides an introduction to the Cisco Video Surveillance IP Camera Analytics Home window that you use to configure and manage the video analytics portion of the IP camera.
Chapter 2, “Device Configuration”	Provides information about the IP camera and describes how to edit channel settings.
Chapter 3, “Analytics License Configuration”	Provides information about analytics packages and licenses, and describes how to configure and upgrade an analytics package.
Chapter 4, “Rule Management”	Describes rules and explains how to view, create, and edit them.
Chapter 5, “Events and Objects”	Describes the available events and associated objects that you can configure when creating or editing a rule.
Chapter 6, “Parameters”	Describes the parameters that determine how a channel monitors video feeds.
Chapter 7, “Calibration”	Describes how to calibrate a channel so that it understands the average size of a person that appears in the camera field of view.
Chapter 8, “Troubleshooting Overview”	Provides basic video analytics troubleshooting information.

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For information about obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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CHAPTER 1

Introduction

This chapter includes these sections:

- [Analytics Home Window Overview, page 1-1](#)
- [Analytics Navigation Tree, page 1-3](#)
- [Accessing and Navigating the Analytics Home Window, page 1-4](#)
- [View Status, page 1-4](#)



Note

For information about configuring the other features besides video analytics that are available in an IP camera, see the camera user guide.

Analytics Home Window Overview

The Analytics Home window is one of the configuration windows that you can use to configure and manage analytics features on the Cisco Video Surveillance IP camera. It displays live video from the IP camera and allows you to create video analytics rules, configure which analytics package to use with the IP camera, and change parameters that control how events are detected.

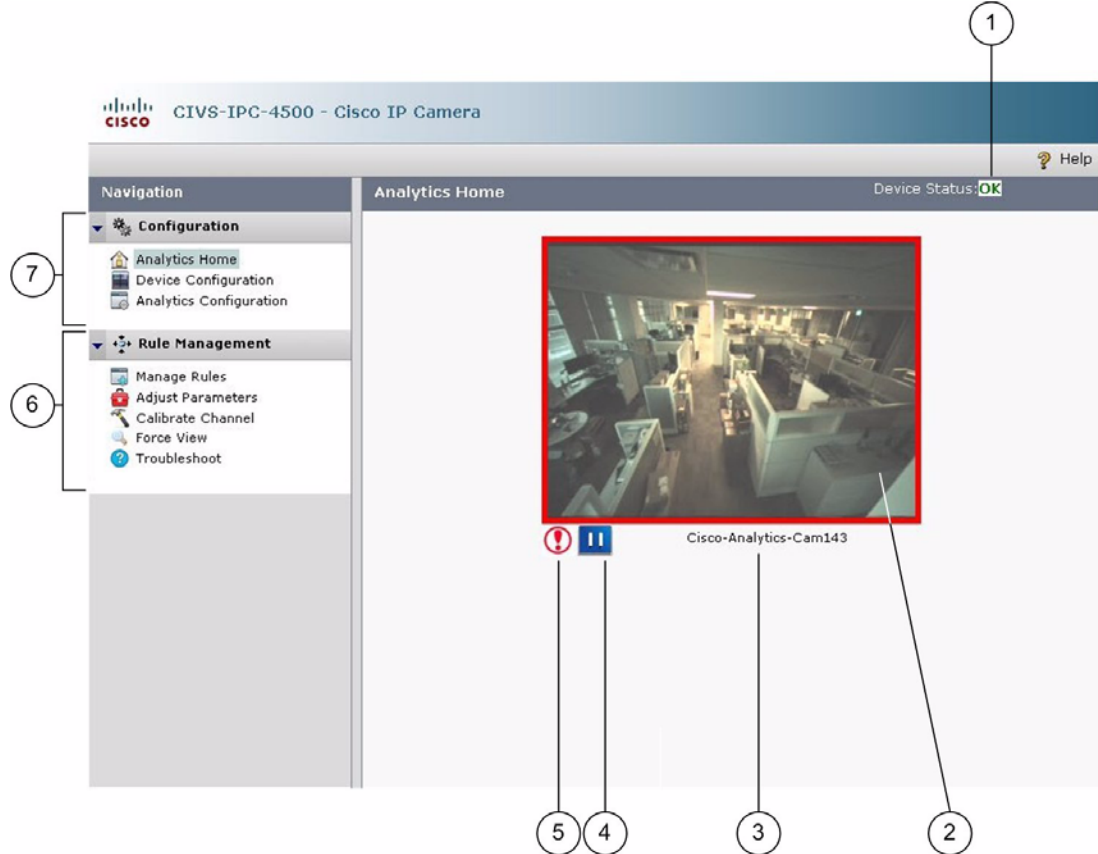
[Figure 1-1](#) describes the main features of the Analytics Home window.





Note

The controls that you see in the Analytics Home window depends on the analytics package used with the IP camera.

Figure 1-1 Analytics Home Window



1	Device status.
2	Video from the IP camera.
3	Text that you configured to display for the IP camera. For more information about configuring the text display, see the camera user guide.
4	Play and Pause buttons: <ul style="list-style-type: none"> The Play button  displays when the video from the IP camera is paused. Click the Play button to resume playing the video. The Pause button  displays when the video from the IP camera is playing. Click the Pause button to pause the video.

5	If the camera is not in a known view or has a bad signal, a red box appears around the view with exclamation icon under the view. You can click the exclamation icon to display the status message and the time the camera status changed. The red box and exclamation icon are not displayed when the camera is in a known view. For more information about views, see “View Status” section on page 1-4 .
6	The Rule Management drawer contains links to configuration windows related to rules management.
7	The Configuration drawer contains links to configuration windows related to analytics and device configuration.

Analytics Navigation Tree

The analytics navigation tree is located on the left side of the Analytics Home window, and is comprised of drawers and links to additional windows. Drawers are used to organize related links into logical groups. The links within a drawer appear only when the drawer is expanded; when a drawer is collapsed, the links within the drawer are hidden. To expand a drawer, click the drawer link or the right arrow next to the link. To collapse a drawer, click the down-arrow next to the drawer link.



Note

The analytics navigation tree is always displayed, regardless of which analytics window is active. This allows you to easily and quickly access any analytics window from any other analytics window.

The links within the drawers of the analytics navigation tree vary depending on which analytics package is being used and the current view status. [Table 1-1](#) lists all the available links in the navigation tree, and in which analytics packages the links can be found

Table 1-1 **Analytics Home Window Navigation Tree**











	Security Package	Counting Package
 Configuration drawer		
 Analytics Home—Displays live video from the IP camera.	Yes	Yes
 Device Configuration—Displaying information about the device and editing channel settings.	Yes	Yes
 Analytics Configuration—Configuring and upgrading analytics packages	Yes	Yes
 Rule Management drawer		
 Manage Rules—Editing, creating, and deleting rules.	Yes	Yes
 Adjust Parameters—Editing parameter values to modify video analytics.	Yes	Yes
 Calibrate Channel—Appears only for event counting when people-only classification is enabled. It allows you to specify the average size of people in the camera field of view.	No	Yes

Table 1-1 **Analytics Home Window Navigation Tree**

	Security Package	Counting Package
 Force View—Force an unknown view to become a known view.	Yes ¹	No
 Troubleshoot—Opens a page containing the analytics version, and a link to an online version of the Analytics User Guide, which contains troubleshooting information.	Yes	Yes

1. The Force View link appears only when an IP camera has an unknown view.

Accessing and Navigating the Analytics Home Window

To access the Analytics Home window, perform the following steps:

Procedure

-
- Step 1** Log in to the IP camera as a user with administrator privileges.
For more information about logging in to the IP camera, see the Accessing the IP Camera section in the IP camera user guide.
- Step 2** Click the **Setup** link at the top of an IP camera window.
- Step 3** Click the **Feature Setup** link or right arrow next to the link to expand the Feature Setup drawer.
- Step 4** In the Feature Setup drawer, click the **Analytics Configuration** link.

The Analytics Home window appears that includes these components:

- Analytics navigation tree—Appears at the left of the window and provides links to additional windows
 - Work area—Appears to the right of the navigation tree
-

View Status

Views are commonly referred to as known or unknown. Known views are actively being monitored for events. Unknown views are not recognized by the camera, so no event detection occurs for unknown views. When the view is unknown, you must take some kind of action to either return the system to the previous view or force the system to recognize the new view. For more information, see the [“Force a View” section on page 1-6](#).

Unknown views are represented by a red box around the camera snapshot in the Analytics Management 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. For more information about changing the view mode, see the [“Configuring the Device” section on page 2-2](#).

**Note**

The view mode field can be changed only when a security package is active.

The following view modes are available:

- [Auto-Force View Mode, page 1-5](#)
- [Auto-Acquire View Mode, page 1-5](#)
- [User-Controlled View Mode, page 1-5](#)
- [Force a View, page 1-6](#)

Auto-Force View Mode

**Note**

Auto-force View mode is the only applicable view option for counting packages.

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 ignored. Camera Tamper responses cannot be generated.

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 Analytics Management 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. For more information see the [“Force a View” section on page 1-6](#).

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.

**Note**

The view behavior can also be modified using parameters. For more information, see the [“View Troubleshooting” section on page 8-48](#).

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.



CHAPTER 2

Device Configuration

This chapter provides information about, and describes how to configure, the device and event push receivers. It includes the following sections:

- [Device Configuration Overview, page 2-1](#)
- [Configuring the Device, page 2-2](#)
- [Configuring Event Push Receivers, page 2-3](#)
- [Configuring Event Push Receivers for Cisco Video Surveillance Manager, page 2-4](#)

Device Configuration Overview

You view and edit the device configuration from the Device Configuration window. To access this window, click the **Device Configuration** link in the Configuration drawer. For more details on the information that you can view the Device Configuration window, see the following topics:

- [Viewing the Device Status, page 2-1](#)
- [Viewing Device Details, page 2-1](#)

Viewing the Device Status

The device status is always available at the upper right of the Device Configuration window. [Table 2-1](#) lists the available status states:

Table 2-1 **Device Status States**

State	Description
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.

Viewing Device Details

[Table 2-2](#) lists the device details that can be viewed on the Device Configuration window.

Table 2-2 **Device Details Field Descriptions**

Field	Description
Device Name	The device name.
Channel ID	The identification number given to the video channel.
Video Resolution	<p>The resolution currently being processed. For example, 320 x 240 would indicate a frame size of 320 pixels wide and 240 pixel high.</p> <p>Note This resolution is independent of the resolution of the host device.</p>
License Type	<p>The active analytics package, which can be any of the following values:</p> <ul style="list-style-type: none"> • Cisco_Base_Security—Cisco Base Security Package • Cisco_Base_Counting—Cisco Base Counting Package • OVSW-OB1000—Cisco Security Plus Package • OVSW-OBECS-Full—Cisco Counting Plus Package
People-only Classification	<p>Indicates whether People-only Classification is on (enabled) or off (disabled). If People-only Classification is on, you can click the Calibrate button to calibrate the channel.</p> <p>Note The People-only Classification field is displayed only when a counting package is active.</p>
View Mode	<p>Indicates the view mode used by the device, which can be any of the following:</p> <ul style="list-style-type: none"> • User-controlled • Auto-acquire • Auto-Force <p>For more information about view modes, see the “View Status” section on page 1-4.</p> <p>Note The View Mode field is displayed only when a security package is active.</p>
Event Push Receivers	The type of Event Push Receivers that this device supports (if any). For more information, see the “Configuring Event Push Receivers” section on page 2-3 .

Configuring the Device

To configure a device, perform the following steps:

Procedure

-
- Step 1** From the Configuration drawer, click **Device Configuration**.
- Step 2** Click **Configure** to configure the device settings.
- Step 3** If desired, edit the device name.
- Step 4** If desired, click the **People-only Classification** checkbox to turn on or off People-only Classification.

Enable this option only if you are counting people using an Event Counting channel. If you have an advanced Event Counting channel, this enables the Occupancy and Dwell rule types. For more information, see the [“About People-Only Classification” section on page 7-5](#). When this option is enabled, objects are counted as people based on the size of an average person that you calibrate. The Calibrate button appears after you save the changes to the channel. The channel must be calibrated to properly classify and detect people. For more information, see [Chapter 7, “Calibration.”](#)

If you do not use People-only Classification, the system will continue to use the standard classification that is appropriate for environments with both people and vehicles.

Do not turn on People-only Classification until you have reviewed the advantages and side effects listed in the [“About People-Only Classification” section on page 7-5](#). Major side effects include the deletion of all existing rules, no notification of Camera Tamper, filters being disabled, and major changes to how objects are tracked and classified.

Note This option is available only when a counting package is active.

Step 5 If desired, choose **User-controlled**, **Auto-acquire**, or **Auto-Force** from the View Mode drop-down list. For more information about view modes, see the [“View Status” section on page 1-4](#).

Note This option is available only when a security package is active.

Step 6 (Optional.) Configure the Event Push Receivers. For more information, see [“Configuring Event Push Receivers” section on page 2-3](#).

Step 7 Do one of the following:

- Click **Save**.
- Click **Cancel** to restore the previous settings.

Step 8 If you enabled People-only Classification, a verification dialog box appears to confirm that you want to turn on People-only Classification. Do one of the following:

- Click **Cancel** to keep People-only Classification disabled. Any other changes to the channel are still applied.
- Click **OK** to enable People-only Classification, restart the device, and delete all existing rules and filters.

Step 9 When People-only Classification is enabled, you must calibrate the channel before you can create any rules. Click **Calibrate** in the channel configuration, and then see [Chapter 7, “Calibration”](#) for instructions.

Configuring Event Push Receivers

The event push mechanism for delivering analytics events to an external application. The device pushes events as XML over HTTP.

Procedure

-
- Step 1** From the Configuration drawer, click **Device Configuration**.
- Step 2** Click **Configure** and locate the Primary Event Push Receiver area.
- Step 3** Complete the following information for the Primary Event Push Receiver.

- **Server address**—The IP address or domain name of the web server.
- **Server port**—The web server port.
- **Server URI**—The location where data should be posted.
- **Authentication Type**: Choose **HTTPBasic** or **None** from the drop-down list. If you choose **None**, you do not see the **User ID** and **Password** fields below.
- **User ID**—User identification which matches the credentials the device needs to connect to the receivers.
- **Password**—Authorized password which matches the credentials the device needs to connect to the receivers.

Step 4 If you would like a second receiver, choose **Redundant** or **Failover** from the Secondary Event Push Receiver drop-down list; otherwise, choose **None**.

In **Failover** mode, the secondary event push receiver is only used if the device cannot successfully post the XML message to the URI defined for the primary event receiver. If configured for **Redundant** mode, the device will send the message to all configured event receivers.

Step 5 If you chose to use a redundant or failover Secondary Event Push Receiver, complete the secondary information in the same manner that you completed Step 3.

Step 6 If you want to make the Secondary Event Push Receiver the Primary Event Push Receiver, click the **Make Primary Receiver** link and the position of the two receivers will switch automatically.

Step 7 Do one of the following:

- Click **Save** to apply the configuration.
- Click **Clear** to remove the current event push configuration and remain in the configuration window.
- Click **Cancel** to abandon any configuration changes and close the configuration window.

The device will continue to push events to the designated receivers until the Event Push configuration is removed. To remove the configuration, simply save an empty configuration.

Configuring Event Push Receivers for Cisco Video Surveillance Manager

You must enter specific values when configuring the event push mechanism to deliver analytics events to Cisco Video Surveillance Manager (VSM). To configure Event Push Receivers for VSM, perform the following steps:

Procedure

Step 1 From the Configuration drawer, click **Device Configuration**.

Step 2 Click **Configure** and locate the Primary Event Push Receiver area.

Step 3 Complete the following information for the Primary Event Push Receiver.

- **Server address**—Enter the hostname or IP address of the Cisco Video Surveillance Media Server (VSMS).
- **Server port**—Enter **80**.

- **Server URI**—Enter `/analytics.bwt?p=camera-name` where *camera-name* is the camera name that is specified when the camera is added to Cisco Video Surveillance Operations Manager (VSOM).
- **Authentication Type**: Choose **None** from the drop-down list.

Step 4 If you would like a second receiver, choose **Redundant** or **Failover** from the Secondary Event Push Receiver drop-down list.

In **Failover** mode, the secondary event push receiver is only used if the device cannot successfully post the XML message to the URI defined for the primary event receiver. If configured for **Redundant** mode, the device will send the message to all configured event receivers.

Step 5 If you chose to use a redundant or failover Secondary Event Push Receiver, complete the secondary information in the same manner that you completed Step 3.

Step 6 If you want to make the Secondary Event Push Receiver the Primary Event Push Receiver, click the **Make Primary Receiver** link and the position of the two receivers will switch automatically.

Step 7 Do one of the following:

- Click **Save** to apply the configuration.
- Click **Clear** to remove the current event push configuration and remain in the configuration window.
- Click **Cancel** to abandon any configuration changes and close the configuration window.

The device will continue to push events to the designated receivers until the Event Push configuration is removed. To remove the configuration, simply save an empty configuration.

What to do next

Ensure that VSM has been configured to work with video analytics. For more information, see the “Using Cisco Video Analytics” section in the [Cisco Video Surveillance Manager User Guide](#), Release 6.3.1 or higher.



CHAPTER 3

Analytics License Configuration

This chapter provides information about analytics packages and licenses, and describes how to configure and upgrade an analytics package. It includes the following sections:

- [Analytics License Overview, page 3-1](#)
- [Supported Analytics Features, page 3-2](#)
- [Viewing the Installed Analytics Licenses, page 3-2](#)
- [Upgrading an Analytics Package, page 3-3](#)
- [Changing Analytics Behavior, page 3-3](#)

Analytics License Overview

You view, configure, and upgrade analytics packages from the Analytics Configuration window. To access this window, click the **Analytics Configuration** link in the Configuration drawer.

All devices that support video analytics are shipped with the complete video analytics software library, which includes the following packages:

- Cisco Base Security Package
- Cisco Base Counting Package
- Cisco Security Plus Package
- Cisco Counting Plus Package

The two base packages (Base Security Package and Base Counting Package) are unlocked and do not require any additional licensing. When an IP camera is shipped, the Cisco Base Security Package is the initial active package.

Moving from a base package (Base Security or Base Counting) to a plus package (Security Plus or Counting Plus) is considered an upgrade that requires additional licensing. You must obtain and activate an upgraded license to unlock the additional features in a plus package. For a list of features supported in each package, see the “[Supported Analytics Features](#)” section on page 3-2. For more information on upgrading an analytics package, see the “[Upgrading an Analytics Package](#)” section on page 3-3.

A security package and a counting package cannot be active at the same time. Only one package can be active at any time. You can change the analytics behavior to switch between a security package and a counting package. For more information on upgrading an analytics package, see the “[Changing Analytics Behavior](#)” section on page 3-3.

Supported Analytics Features

Table 3-1 lists the analytics features supported for each analytics package:

Table 3-1 *Supported Analytics Features per Package*

Behavior	Security Base Package	Security Plus Package	Counting Base Package	Counting Plus Package
Object Classification	X	X	X	X
Camera Tamper Detection	X	X		
Object Size Filters	X	X		
Object Size Change Filters	X	X		
Tide Filters	X	X		
Night Enhanced Snapshots	X	X		
Image Stabilization	X	X		
Take-Away Event (AOI)	X	X		
Loitering Event	X	X		X
Tripwire Event	X	X	X	X
Multiline Tripwire Event		X	X	X
“Enters” Event		X		X
“Exits” Event		X		X
“Appears” Event (Full View)		X		
“Appears” Event (AOI)		X		
“Disappears” Event (Full View)		X		
“Disappears” Event (AOI)		X		
“Inside of” Event		X		
Leave-Behind Event (Full View)		X		
Leave-Behind Event (AOI)		X		
Configurable Leave-Behind Time		X		
Take-Away Event (Full View)		X		
Enhanced People-Only Object Classification			X	X
People/Object Counting			X	X
Occupancy Monitoring				X
Dwell Time				X

Viewing the Installed Analytics Licenses

In the Installed Analytics Licenses area of the Analytics Configuration window, you can view the list of analytics packages installed on the device, which analytics packages have been unlocked, and which analytics package is currently active on the device. Consider the following when viewing the list:

- Unlocked packages are listed as regular (not dimmed) text.
- Locked packages are dimmed.
- The currently active analytics package is indicated with “(Active)”.

Devices are shipped with the all four analytics packages installed. The two base packages are always unlocked and are therefore listed as regular text. The two plus packages are dimmed until they are unlocked; when unlocked, they are listed as regular text.

Upgrading an Analytics Package

To upgrade an analytics package from the base version to the plus version, perform the following steps:

Before you begin

Place an order on www.cisco.com for a license upgrade. Cisco will generate and send you a Product Authorization Key (PAK).



Note

If order two license upgrades separately, you will receive two PAKs for two license files; however, If you order both licenses at the same time, you will receive one PAK for one license file that can activate both analytics packages.

After you receive the PAK, go to www.cisco.com/go/license to generate a license file that Cisco will e-mail to you. Be sure to save the license file to your computer so that you can use it to upgrade your analytics license.

Procedure

- Step 1** In the Configuration drawer, click **Analytics Configuration**.
- Step 2** In the Analytics License Upgrade area, click **Browse**.
- Step 3** In the Choose File to Upload dialog box, navigate to the license file you received from Cisco, then click **OK**.
- Step 4** Click **Upload**.

The camera installs the license and unlocks the features in the package upgrade.

Changing Analytics Behavior

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 an analytics package is upgraded, the plus package supersedes the base package. So, when you change the analytics behavior, the plus package will be used if it has been unlocked.

To change the analytics behavior, perform the following steps:

Procedure

-
- Step 1** From the Configuration drawer, click **Analytics Configuration**.
- Step 2** In the Analytics Behavior area, click the desired analytics package.
- Step 3** Click **Apply**.
- The software reboots with the selected analytics package active and displays the logon window.
- Step 4** (Optional.) Log back in to the IP camera and navigate to the Analytics Home window. For more information, see the [“Accessing and Navigating the Analytics Home Window”](#) section on page 1-4
-



CHAPTER 4

Rule Management

This chapter describes the management of rules, which tell the IP camera what events to look for in the camera field of view. It includes the following topics:

- [Rule Management Overview, page 4-1](#)
- [Working with Rules, page 4-2](#)
- [Working with Video Tripwires, page 4-7](#)
- [Working with Areas of Interest, page 4-12](#)
- [Working with Schedules, page 4-18](#)
- [Working with Custom Response Fields, page 4-21](#)
- [Working with Filters, page 4-22](#)

Rule Management Overview



You create rules from the Rule Management window. To access this window, click the **Manage Rules** link in the Rule Management drawer.

You can perform the following actions on the Rule Management page:

- **View Rules**—The list of all the 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, delete, and copy.
- **Create Rules**—You can create a new rule by selecting a rule category from the Create new rule drop-down list. For information about the rule creation process, see the [“Creating or Editing a Rule” section on page 4-2](#).
- **Edit Rules**—You can edit a rule by clicking rule name in the rule list. For information about how to edit a rule, see the [“Creating or Editing a Rule” section on page 4-2](#).



Note 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 .
- **Delete Rules**—You can permanently delete a rule by clicking the Delete icon . For information about deleting rules, see the [“Deleting a Rule” section on page 4-4](#).
- **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**—By default, live video of the camera view is displayed on the left side of the Rule Management page.

- Click the Play button  to play a paused video feed:

- Click the Pause button  to pause a video feed:

You may want to play or pause video when you are positioning objects in the field of view during rule or object filter creation. For example, you could pause 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 Analytics Management Console, and it does not modify the actual operation of the camera.

- **Show and Hide Rule Overlay**—Rule overlay displays video tripwires and areas of interest from rules created for the channel on the camera snapshot. For more information, see the [“Showing or Hiding the Rule Overlay”](#) section on page 4-5.

Working with Rules

This section includes the following topics:

- [Creating or Editing a Rule, page 4-2](#)
- [Testing a Rule, page 4-4](#)
- [Activating and Deactivating a Rule, page 4-4](#)
- [Deleting a Rule, page 4-4](#)
- [Copying a Rule, page 4-5](#)
- [Rule Editing Options, page 4-5](#)

Creating or Editing a Rule



Note

This section provides a general overview of how to create a rule. If you already know the type of event you want to create, see [Chapter 5, “Events and Objects”](#) and select the option for that specific event type for detailed instructions.

To create or edit a rule, perform the following steps:

Procedure

- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
 - In the Create new rule drop-down on the Rule Management page, choose a rule type:
 - **Video Tripwire**—Draw the video tripwires. For more information, see the [“Working with Video Tripwires”](#) section on page 4-7.

- Camera Tamper—The Camera Tamper rule is automatically created and added to the rule list when you choose this option. For more information, see the [“Camera Tamper Events” section on page 5-6](#).
- Area—Draw an area of interest or (if the option is available) apply the rule to the whole view. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Click the name of an existing rule in the Rule Management page. Based on the type of rule, do one of the following:
 - Edit the video tripwires. For more information, see the [“Working with Video Tripwires” section on page 4-7](#).
 - Edit the area. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).



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

- Step 3** Enter a rule name.
- Step 4** Check one or more object types (may not be available for all event types). For more information, see the [“Object Types” section on page 5-2](#).
- Step 5** If you created an **Area** type of rule, select the events that you want to apply to the rule and complete any extra rule specifications that appear when you select the event type. For more information, see [Chapter 5, “Events and Objects”](#).
- Step 6** (Optional.) Enter details about the rule or other descriptive text in the Alert text field.
- Step 7** (Optional.) Enter custom response fields (may not be available for all event types).
- Step 8** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 9** If desired, add filters (may not be available for all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 10** 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 the [“Activating and Deactivating a Rule” section on page 4-4](#) for instructions on how to deactivate the rule.
 - Click **Cancel** to abandon changes and return to the Rule Management window.
- Step 11** Test the rule. For more information see the [“Testing a Rule” section on page 4-4](#).



Tip

The following options available on the Edit Rule page may make it easier to create or edit 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. For more information, see the [“Expanding a Snapshot” section on page 4-5](#).
- You can see whether other rules have been drawn on this channel using the Rule overlay option. For more information, see the [“Showing or Hiding the Rule Overlay” section on page 4-5](#).

- When drawing the area of interest, it may be helpful to have objects in the field of view. You can play and pause the video when positioning objects in the view. For more information, see the [“Playing or Pausing Video” section on page 4-7](#).

Testing a Rule

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

Use the following 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.

If false alarms are received, see the [“False Alarm Troubleshooting” section on page 8-2](#).

If a response is not triggered as expected, see the [“Missed Events Troubleshooting” section on page 8-27](#).

After using any of the solutions in these troubleshooting sections, test the rule again to ensure that the system is detecting events properly.

Activating and Deactivating a Rule

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 scheduled 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 the [“Deleting a Rule” section on page 4-4](#).



Note

Each device supports a maximum of five active or inactive rules.

Deleting a Rule

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


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

**Note**

Be aware that deleting a rule permanently removes it from the system. There is no way to recover deleted rules. If you prefer to deactivate rules, see the [“Activating and Deactivating a Rule”](#) section on page 4-4.

Copying a Rule

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 button  appears next to the rule in the rule list. When you click the Copy button, 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 camera, you cannot copy a Camera Tamper rule.


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


Rule Editing Options

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

- [“Expanding a Snapshot”](#) section on page 4-5
- [“Showing or Hiding the Rule Overlay”](#) section on page 4-5
- [“Playing or Pausing Video”](#) section on page 4-7

Expanding a Snapshot

You can click the Expand button , to expand the view 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.

After you are in the expanded view, you can click the Minimize button  to return to the normal snapshot size. You must return the snapshot to the normal size in order to save the rule.

Showing or Hiding the 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 checked, all 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:



**Note**

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

Playing or Pausing Video

Wherever you see the Play button  or Pause button  below a camera view, you can play live video from the camera field of view. You can also click the Pause button to freeze the view at the current frame of video.

You may want to play or pause video when you are positioning objects in the field of view during rule or object filter creation. For example, you could pause 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 Analytics Management Console, and it does not modify the actual operation of the camera.

Working with Video Tripwires

A video tripwire is a line drawn within the camera field of view in the Edit Rule page. An object triggers a response by crossing the tripwire. For more information, see the [“Video Tripwire Events” section on page 5-32](#).


This section includes the following topics:

- [Drawing a Single Segment Video Tripwire, page 4-7](#)
- [Drawing a Multiple Segment Video Tripwire, page 4-8](#)
- [Changing a Video Tripwire Direction, page 4-9](#)
- [Editing a Video Tripwire, page 4-10](#)
- [Deleting a Video Tripwire, page 4-10](#)
- [Video Tripwire Tips, page 4-10](#)

Drawing a Single Segment Video Tripwire

To draw a single segment video tripwire, perform the following steps:

Procedure


- Step 1** Click the video tripwire Drawing tool .
- Step 2** Left-click your mouse on the camera 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.

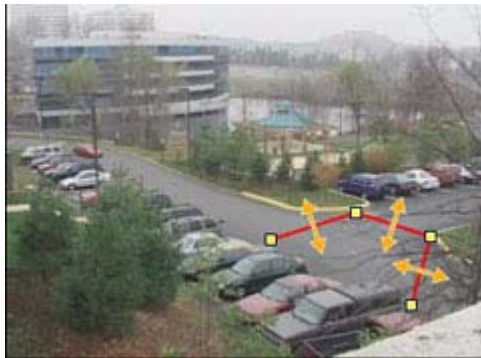


Drawing a Multiple Segment Video Tripwire

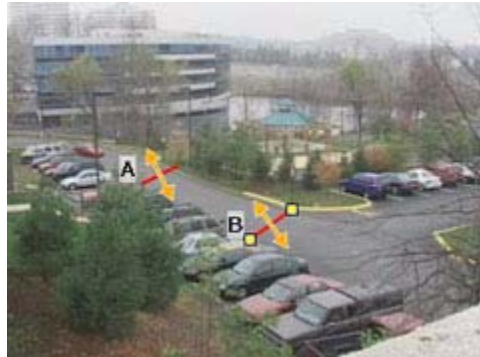
To draw a multiple segment video tripwire, perform the following steps:

Procedure

- Step 1** Click the video tripwire Drawing tool .
- Step 2** 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.
- Step 3** To end the video tripwire on the last point shown, right-click the mouse or double-click the left mouse button.



- Step 4** 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 Step1 through Step 3. For information on when to use multiple video tripwires vs. a single video tripwire, see the [“Video Tripwire Events”](#) section on page 5-32.




After 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.

Step 5 When you are finished drawing video tripwires, determine their direction using the instructions below.




Changing a Video Tripwire Direction

To change a video tripwire direction, perform the following steps:

Procedure

- Step 1** Click the Select tool , and then click on the video tripwire you want to modify.
- Step 2** 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.

Editing a Video Tripwire

To edit a video tripwire, perform the following steps:

Procedure



- Step 1** Click the Select tool , and then click a point on the video tripwire.
- Step 2** Drag a point with the mouse button pressed, and then release the mouse when you have the point in the new position.



Deleting a Video Tripwire

To delete a video tripwire, perform the following steps:

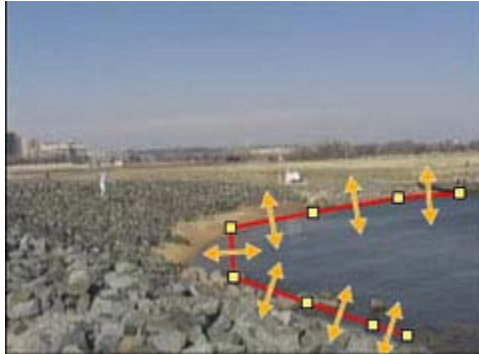
Procedure

- Step 1** Click the Select button , and then click on the video tripwire you want to delete.
- Step 2** Click the Delete button  to permanently remove the video tripwire.
-

Video Tripwire Tips

- 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, which 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 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.
- For more information about on when to use Multiple video tripwires vs. a single video tripwire, see the [“Video Tripwire Events” section on page 5-32](#).
- 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. For more information, see the [“Expanding a Snapshot” section on page 4-5](#).
- You can see where other rules have been drawn on this channel using the Rule overlay option. For more information, see the [“Showing or Hiding the Rule Overlay” section on page 4-5](#).
- When drawing video tripwires, it may be helpful to have objects in the field of view. You can play and pause the video when positioning objects in the view. For more information, see the [“Playing or Pausing Video” section on page 4-7](#).

For more troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Working with Areas of Interest

You can draw an area of interest using the snapshot and drawing tools on the left side of the Edit Rule page. The area of interest indicates where you want the system to monitor for events. For more information, see the [“Area of Interest Overview” section on page 4-12](#). 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.


This section includes the following topics:

- [Area of Interest Overview, page 4-12](#)
- [Monitoring the Full View, page 4-16](#)
- [Monitoring Only an Area of Interest, page 4-16](#)
- [Editing an Area of Interest, page 4-17](#)
- [Deleting an Area of Interest, page 4-17](#)
- [Area of Interest Tips, page 4-17](#)

Area of Interest Overview

An area of interest is a square, a rectangle, or another multi-sided shape drawn within the camera 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 [Chapter 5, “Events and Objects.”](#)

For some types of channels, you can specify whether an area of interest is ground plane or image plane. You specify the area of interest type when a 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 drawing toolbar. In the Options dialog box, select **Ground plane** or **Image plane**, then 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.

The figure below illustrates this concept. The left half of the figure shows a person approaching the area of interest. He is not considered within the area of interest yet, since his feet are not in the area. Once his feet enter the area of interest, the response is triggered, as shown in the right half of the figure.

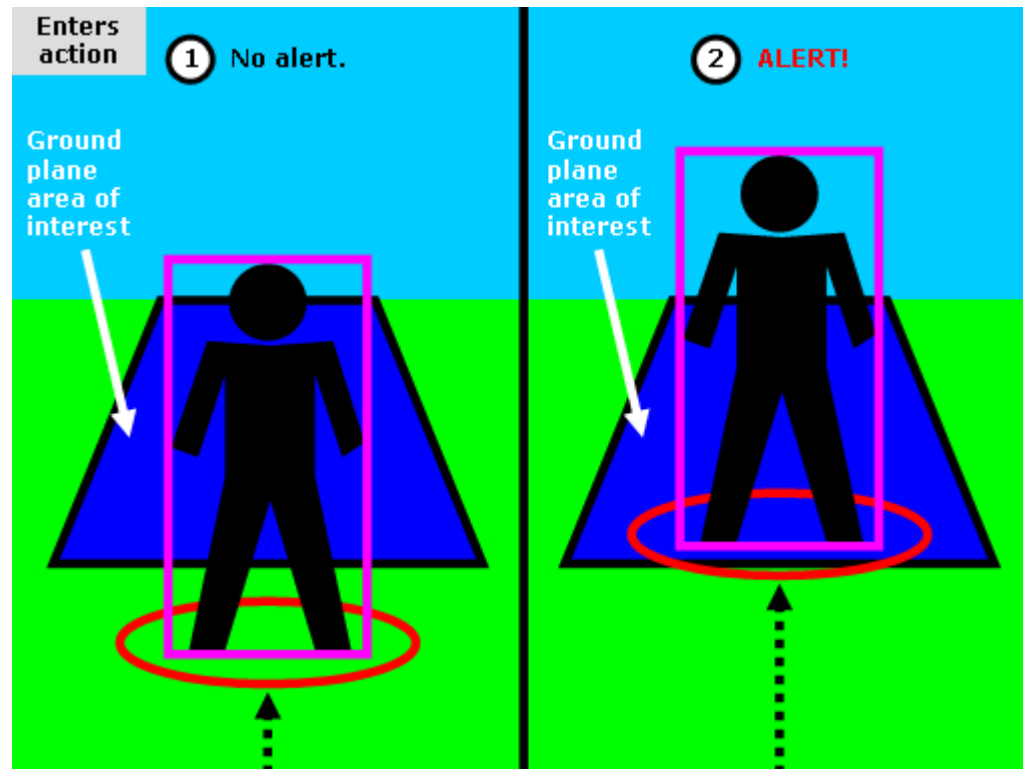


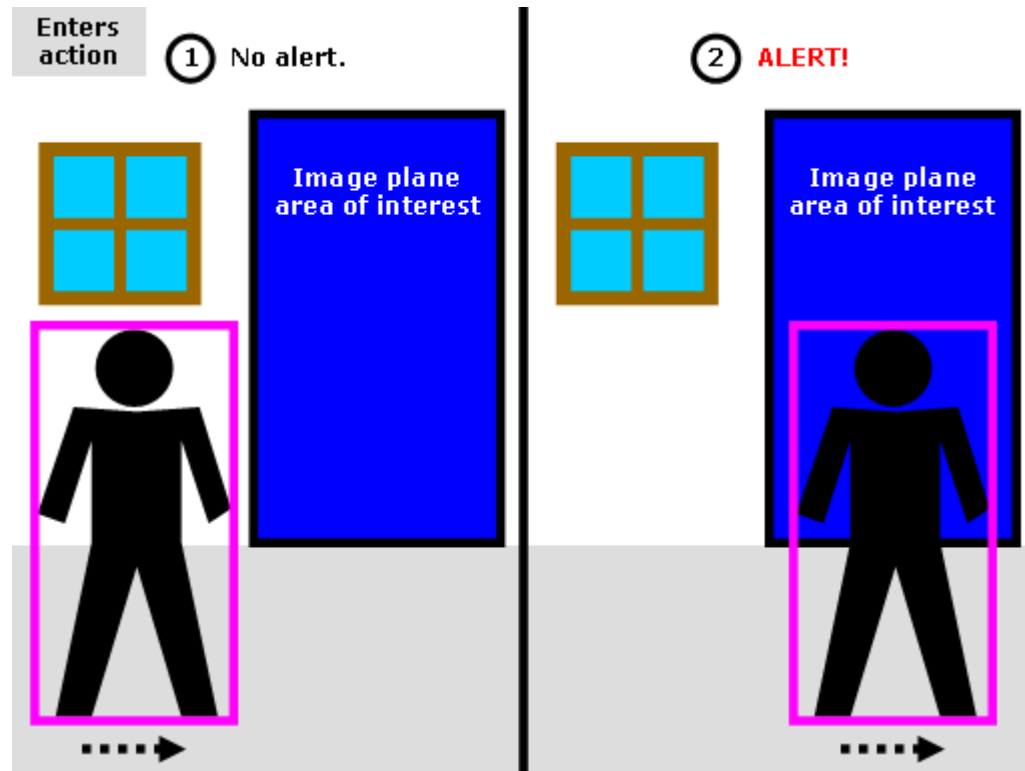
Image Plane Areas of Interest

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.

The following figure illustrates an image plane area of interest event. A rule has been created specifying that the system generate a response whenever a person enters an image plane area of interest that has been drawn around a door within the camera's field of view. The left half of the figure shows a person approaching the area of interest. When approximately half of the object has entered the image plane area of interest, a response is generated, as shown in the right half of the figure.

**Note**

How much does an object have to overlap with an image plane area of interest in order for the system to detect an event? Half of the object or more, depending on the event. This setting can be adjusted under special circumstances (see the [“Change Video Tripwire and Ground Plane Event Triggering”](#) section on page 8-16), but the default settings are usually adequate. The default behavior is described in detail in the [“Ground vs. Image Plane”](#) section on page 4-14.

For a more detailed comparison of ground plane and image plane detection for each type of event, see the [“Ground vs. Image Plane”](#) section on page 4-14.

Ground vs. Image Plane

Table 4-1 contrasts events in terms of how the system detects them for image plane and ground plane areas of interest. When creating some types of events, you specify whether an area of interest is ground plane or image plane.


Table 4-1 *Event Detection Differences Between Image Plane and Ground Plane Areas of Interest*

This event...	Means this if it happens in an image plane area of interest...	Means this if it happens in a ground plane area of interest...
Enters Events, page 5-13	At least half of the object has entered the area of interest. An object can enter an area of interest from any direction.	The object's footprint has entered the area of interest. An object can enter an area of interest from any direction.
Exits Events, page 5-16	Most of the object is no longer in the area of interest. An object can exit an area of interest in any direction.	The object's footprint has left the area of interest. An object can exit an area of interest in any direction.
Inside Events, page 5-18	Most of the object either appeared in the area of interest or entered the perimeter of the area of interest from any direction.	The object's footprint either appeared in the area of interest or entered the perimeter of the area of interest from any direction.
Appears Events, page 5-4	Most of the object has appeared within the area of interest. The object has not appeared anywhere within the camera's field of view previously.	The object's footprint has appeared within the area of interest. The object has not appeared anywhere within the camera's field of view previously.
Disappears Events, page 5-7	The object disappeared from the camera's field of view completely after most of the object was detected within the area of interest. The object did not move out of the area of interest and into another part of the camera's field of view. Rather, it disappeared from the camera's field of view by going through an entryway such as a window or a doorway or behind an obstacle within the camera's field of view.	The object disappeared from the camera's field of view completely after its footprint was detected within the area of interest. The object did not move out of the area of interest and into another part of the camera's field of view. Rather, it disappeared from the camera's field of view by going through an entryway such as a window or a doorway or behind an obstacle within the field of view.
Taken Away Events, page 5-30	The object was moved after at least half of the object was detected inside the area of interest.	The object was moved after its footprint was detected inside the area of interest.
Left Behind Events, page 5-19	At least half of the object was inserted into the area of interest and has been inside the area for a user-specified duration.	The object's footprint was inserted into the area of interest and has been inside the area for a user-specified duration.
Loiters Events, page 5-22	Most of the object has remained in the area of interest for a specified period of time. A different Loiters time can be specified for each event you create.	The object's footprint has remained in the area of interest for a specified period of time. A different Loiters time can be specified for each event you create. You may detect more events if you use a ground plane area of interest for loiters rules.
Dwell Time Data Events, page 5-11	Each object (or a significant portion of each object) has appeared within the area of interest.	The footprint of each object has appeared within the area of interest.
Dwell Time Threshold Events, page 5-9	Each object (or a significant portion of each object) has appeared within the area of interest. A different dwell time can be specified for each event you create.	The footprint of each object has appeared within the area of interest. A different dwell time can be specified for each event you create.

Table 4-1 *Event Detection Differences Between Image Plane and Ground Plane Areas of Interest*

This event...	Means this if it happens in an image plane area of interest...	Means this if it happens in a ground plane area of interest...
Occupancy Data Events, page 5-24	Each object (or a significant portion of each object) has appeared within the area of interest.	The footprint of each object has appeared within the area of interest.
Occupancy Threshold Events, page 5-26	Each object (or a significant portion of each object) has appeared within the area of interest. If desired, you may specify the amount of time each object remains in the area of interest before being counted.	The footprint of each object has appeared within the area of interest. If desired, you may specify the amount of time each object remains in the area of interest before being counted.

Monitoring 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.

Monitoring Only an Area of Interest

To monitor only an area of interest, perform the following steps:

Procedure

- Step 1** 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. 
- Step 2** Click the Area Drawing tool .
- Step 3** Left-click on the snapshot where you want to begin the area. Drag the mouse to extend the side of the area.



- Step 4** Left-click again to add additional points to the area.
You must create at least three sides for the area.
- Step 5** To close the area of interest, right-click the mouse or double-click the left mouse button.

The area closes 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, see the [“Editing an Area of Interest”](#) section on page 4-17.

Editing an Area of Interest

To edit an area of interest, perform the following steps:

Procedure

-
- | | |
|---------------|---|
| Step 1 | Click the Select tool  . |
| Step 2 | Click and drag the points (yellow controls) along the edges of the shape. |
-

Deleting an Area of Interest

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

Area of Interest Tips

Use the following tips when drawing an area of interest:

- Expand the camera view to draw your area of interest on a larger image. This allows you to see the scene in more detail. For more information, see the [“Expanding a Snapshot”](#) section on page 4-5.
- You can see whether other rules have been drawn on this channel using the **Rule overlay** option. For more information, see the [“Showing or Hiding the Rule Overlay”](#) section on page 4-5.
- Although you can create a maximum of 15 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. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).
- When drawing the area of interest, it may be helpful to have objects in the field of view. You can play and pause the video when positioning objects in the view. For more information, see the [“Playing or Pausing Video” section on page 4-7](#).

For more troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Working with Schedules

This section includes the following topics:

- [Schedules Overview, page 4-18](#)
- [Creating a New Custom Schedule, page 4-19](#)
- [Editing an Existing Schedule, page 4-20](#)
- [Copying a Schedule from Another Rule, page 4-20](#)

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 choose any other schedule, a graphical view of the schedule appears in the schedule area.

[Table 4-2](#) describes the available schedule options:

Table 4-2 **Schedule Options**

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

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

**Note**

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

Creating a New Custom Schedule


To create a new custom schedule, perform the following steps:

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** From the Schedule drop-down list, choose **Custom**.
- 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.
- Step 4** Click **Edit**.
- A table appears to allow you to enter time blocks in the schedule.
- Step 5** In the first **Start** time block, enter the day of the week the rule should start running on.
- Step 6** Enter the time on the start day the rule should begin running.
- Step 7** In the first **End** time block, enter the day of the week the rule should stop running on.
- Step 8** 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.

- Step 9** 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.
-

Editing an Existing Schedule

When you edit any existing custom schedule or schedule template, it becomes the custom schedule. To edit an existing schedule, perform the following steps:

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** From the Schedule drop-down list, choose the schedule you want to customize.
- A graphical view of the schedule appears.
- Step 4** Click **Edit**.
- Step 5** 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.
- Step 6** 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.
-

Copying 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. To copy a schedule from an existing rule, perform the following steps:

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** From the Schedule drop-down list, choose **Copy Schedule from Rule**.
- Step 4** Select the channel containing the rule from which you want to copy the schedule.
- Step 5** 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**.

Step 6 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.

What to do next

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

Working with Custom Response Fields

This section includes the following topics:

- [Custom Response Fields Overview, page 4-21](#)
- [Creating a Custom Response, page 4-21](#)
- [Deleting a Custom Response, page 4-21](#)

Custom Response Fields Overview

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 box opens. This dialog box 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.

Creating a Custom Response

To create a custom response, perform the following steps:


Procedure

-
- | | |
|---------------|--|
| Step 1 | In the Custom Response Field screens, enter a key in the Key column. |
| Step 2 | Enter the value for the key in the Value column.
The system will not let you enter blank or duplicate keys. |
| Step 3 | If you want to add additional responses, click add row . |
| Step 4 | Repeat steps 1-3 until you have entered all the responses. |
| Step 5 | When you are finished entering keys and values, click OK to close the dialog box. |
-

Deleting a Custom Response

To delete a custom response, perform the following steps:

Procedure

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

Working with Filters

This section includes the following topics:

- [Filters Overview, page 4-22](#)
- [Object Size Change Filter, page 4-23](#)
- [Irregular Shape or Motion Filters, page 4-27](#)
- [Minimum and Maximum Size Filters, page 4-28](#)
- [Recommended Representative Objects, page 4-36](#)
- [Copying a Filter, page 4-37](#)
- [Deleting a Filter, page 4-38](#)

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. For more information about how to replicate a filter set from another rule, see the [“Copying a Filter” section on page 4-37](#).

**Note**

Not all channel types and channel configurations support object filters. If you are using People-Only Classification rules, all filters are disabled. For more information, see the [“About People-Only Classification” section on page 7-5](#). Object filters do not affect Camera Tamper events, because these events do not involve objects.

[Table 4-3](#) lists the available object filters:

Table 4-3 **Object Filters**

Filter	Definition
“Minimum and Maximum Size Filters” section on page 4-28 ¹	Eliminates objects that are larger than the size you specify, or smaller than the size you specify.
“Object Size Change Filter” section on page 4-23 ¹	Eliminates objects that change in size too rapidly to be objects of interest.
“Irregular Shape or Motion Filters” section on page 4-27	Eliminates objects that do not have a consistent shape or direction of motion (e.g., trees moving in the wind).

1. 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

This section includes the following topics:

- [Object Size Change Filters Overview, page 4-23](#)
- [Drawing an Object Size Change Filter, page 4-24](#)
- [Size Change Filter Example, page 4-25](#)
- [Object Size Change Ratio Examples, page 4-26](#)

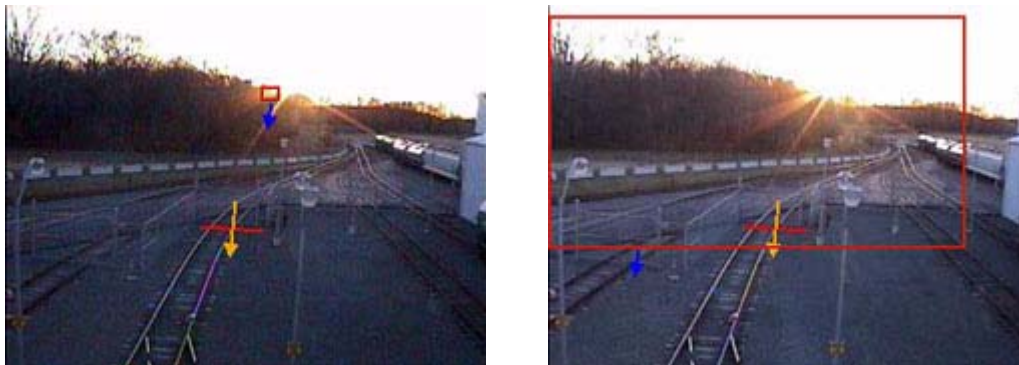
Object Size Change Filters Overview

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.



Drawing an Object Size Change Filter

To draw a object size change filter, perform the following steps:

Procedure

Step 1 From the Rules Management drawer, click **Manage Rules**.

Step 2 Do one of the following:

- From the Create new rule drop-down list, choose a rule type.
- Click the name of an existing rule on the Rule Management page.

The Edit Rule page appears.

Step 3 Do one of the following on the filters area of the Edit Rule page:

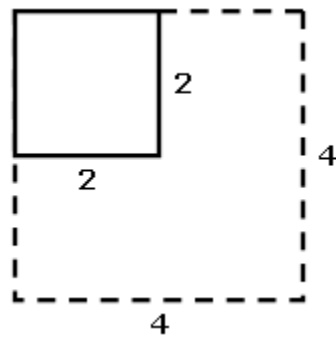
- To edit an existing filter, click the Size change filter in the filters list.
- To create a new filter, choose **Size Change** from the **Create new filter** drop-down list.

A Size change filter appears in the filters list.

Step 4 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.

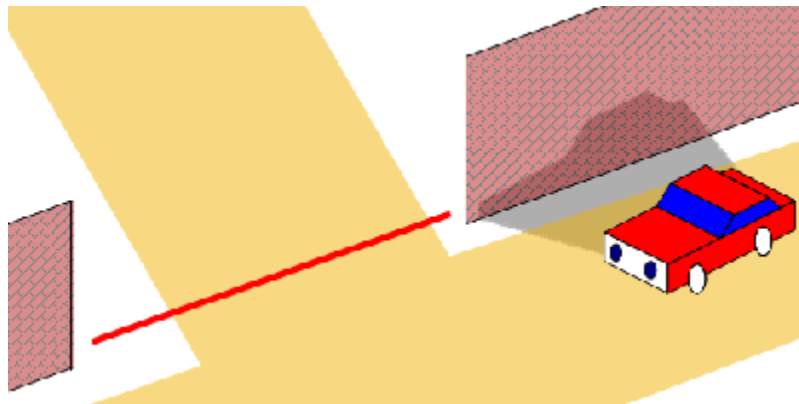


Divide 100 by the **Change ratio limit** value to determine the maximum possible decrease in size between frames. For example, if you specify a **Change ratio limit** of **2**, the device will ignore objects that increase in size by 200% or more between frames, and they will ignore objects that decrease in size by 50% or more between frames. The [“Object Size Change Ratio Examples” section on page 4-26](#) provides some examples of what different values mean. The highest available **Change ratio limit** value is 100. The lowest available **Change ratio limit** value is 1.5.

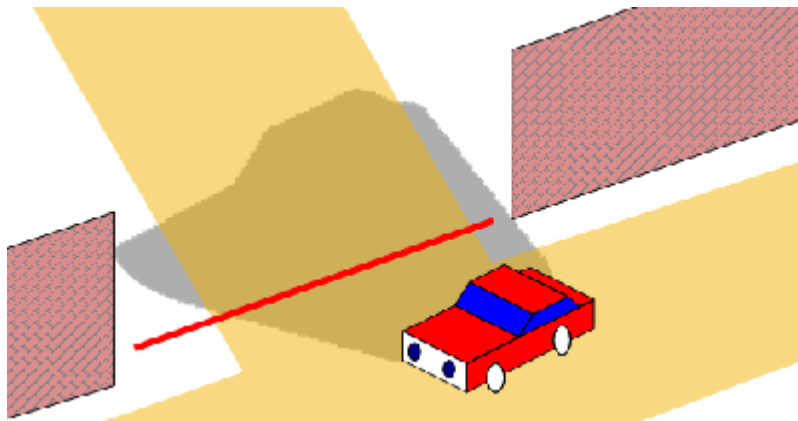
Size Change Filter Example

An example of when you would use an object size filter would be if a shadow is blocked by something in the scenery and suddenly increases in size when the obstacle is removed. This would cause a false alarm to be generated.

The figure below depicts a car driving along a wall. The car's shadow is blocked by the wall.



When the car drives past an opening in the wall, the shadow increases in size and crosses a video tripwire, triggering a false alarm. With proper object size filtering in place, this event would not trigger a response, because the system would be set up to ignore objects that change in size too quickly.



Object Size Change Ratio Examples

Table 4-4 provides some examples of what several **Change ratio limit** values mean. These values are specified for object size change filters in the Edit Rule page. The highest available value is 100. The lowest available value is 1.5.

Table 4-4 Object Size Change Ratio Value Examples

Size Change Value	Maximum Size Increase Between Frames (100 x Multiplier)	Maximum Size Decrease Between Frames (100/Multiplier)
1.5	150%	66.67%
1.75	175%	57.14%
2	200%	50%
2.25	225%	44.44%
2.5	250%	40%
2.75	275%	36.36%
3	300%	33.33%
3.25	325%	30.77%
3.5	350%	28.57%
3.75	375%	26.67%
4	400%	25%
4.25	425%	23.53%
4.5	450%	22.22%
4.75	475%	21.05%
5	500%	20%

Table 4-4 Object Size Change Ratio Value Examples (continued)

Size Change Value	Maximum Size Increase Between Frames (100 x Multiplier)	Maximum Size Decrease Between Frames (100/Multiplier)
10	1,000%	10%
20	2,000%	5%
30	3,000%	3.33%
40	4,000%	2.5%
50	5,000%	2%
60	6,000%	1.67%
70	7,000%	1.43%
80	8,000%	1.25%
90	9,000%	1.1%
100	10,000%	1%

Irregular Shape or Motion Filters

This section includes the following topics:

- [Irregular Shape or Motion Filters Overview, page 4-27](#)
- [Creating an Irregular Shape or Motion Filter, page 4-28](#)
- [Irregular Shape or Motion Filters Example, page 4-28](#)

Irregular Shape or Motion Filters Overview

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. For more information, see the [“Video Tripwire Events” section on page 5-32](#).



Note

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.

**Note**

If you are using People-Only Classification, filters are disabled. For more information, see the [“About People-Only Classification”](#) section on page 7-5.

Creating an Irregular Shape or Motion Filter

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

Irregular Shape or Motion Filters Example

An example of a situation in which an irregular shape or motion filter would need to be defined would be if the glitter caused by the sun shining on water was triggering false alarms. The snapshots below are two sequential frames of video. Notice that although the glitter is in the same general area, it actually shifts shape and moves around the field of view between frames.



Without the appropriate object filter in place, the system might mis-classify the glitter as a real object. If the glitter crosses a video tripwire designed to detect a real object, false alarms may result.

With an irregular shape and motion filter in place, this event would not trigger a response, because the system would be set up to ignore objects that change shape and direction too quickly to be real objects.

Minimum and Maximum Size Filters

This section includes the following topics:

- [Minimum and Maximum Size Filters Overview, page 4-28](#)
- [Drawing a Maximum Size Filter, page 4-29](#)
- [Drawing a Minimum Size Filter, page 4-31](#)
- [Maximum Size Filter Example, page 4-32](#)
- [Minimum Size Filter Example, page 4-34](#)

Minimum and Maximum Size Filters Overview

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. For more information about the types of representative objects to use when setting up filters, see the [“Recommended Representative Objects” section on page 4-36](#).

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 pause the video when objects are in a position where you can draw filters around them. For more information, see the [“Playing or Pausing Video” section on page 4-7](#). It may also be helpful to expand the camera's view to see the scene in more details. For more information, see the [“Expanding a Snapshot” section on page 4-5](#). 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 the [“Object Size Change Filter” section on page 4-23](#).

You can also specify in what dimensions (width and/or height) the object must be larger or smaller than the specified filter box size. For more information, see the [“Specify Width and/or Height for Size Filters” section on page 8-26](#).

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).



Note

If you are using People-Only Classification, filters are disabled. For more information, see the [“About People-Only Classification” section on page 7-5](#).

Drawing a Maximum Size Filter

To draw a maximum size filter, perform the following steps:

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Do one of the following on the filters area of the Edit Rule page:
- To edit an existing filter, click the Maximum Size filter in the filters list.
 - To create a new filter, choose **Maximum Size** from the **Create new filter** drop-down list.

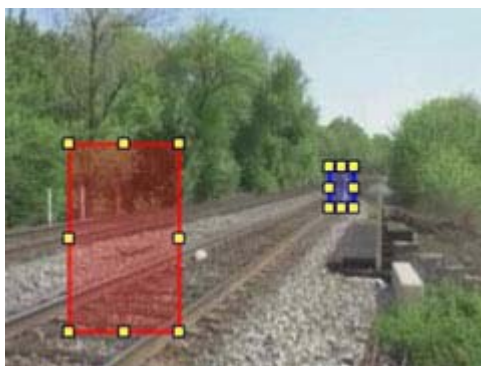
The snapshot area becomes the only editable area of the page. On the camera snapshot, you need to position the blue and red boxes to indicate the maximum size of objects in the foreground and background.

Step 4 Resize the blue background box based on a representative object that is farther from the camera.

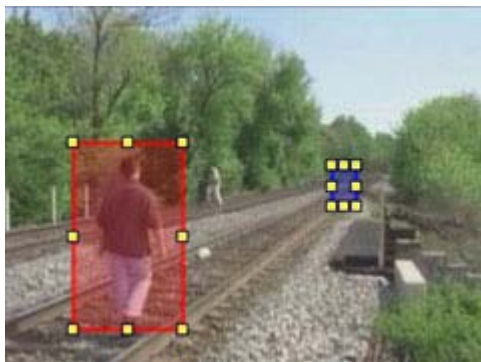
Any object that is not fully contained within the box you draw will be ignored by the system. The entire object (i.e., the top, bottom, and sides of the object) must be visible in order for this setting to be accurate.

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.



Step 5 Resize the red foreground box based on a representative object that is closer to the camera.



Step 6 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.

Drawing a Minimum Size Filter

To draw a maximum size filter, perform the following steps:

Procedure

Step 1 From the Rules Management drawer, click **Manage Rules**.

Step 2 Do one of the following:

- From the Create new rule drop-down list, choose a rule type.
- Click the name of an existing rule on the Rule Management page.

The Edit Rule page appears.

Step 3 Do one of the following on the filters area of the Edit Rule page:

- To edit an existing filter, click the Minimum Size filter in the filters list.
- To create a new filter, choose **Minimum Size** from the **Create new filter** drop-down list.

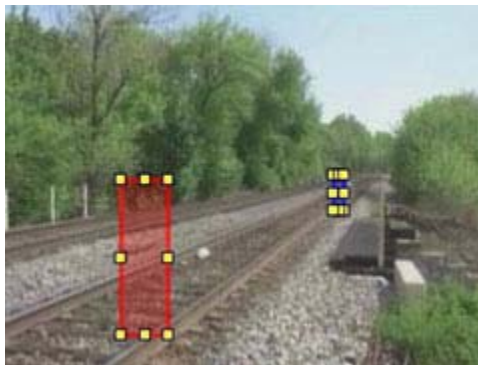
The snapshot area becomes the only editable area of the page. On the camera snapshot, you need to position the blue and red boxes to indicate the minimum size of objects in the foreground and background.

Step 4 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.



Step 5 Resize the red foreground box based on a representative object that is closer to the camera.

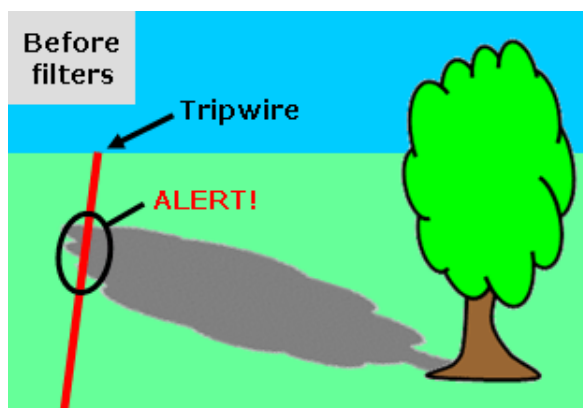


Step 6 Do one of the following:

- 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.

Maximum Size Filter Example

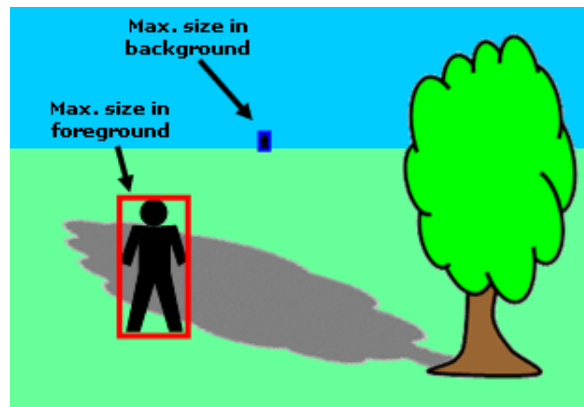
An example of a situation in which a maximum object size filter would need to be defined would be if a tree's shadow was triggering false alarms. Without the appropriate object filter in place, the system might mis-classify the shadow of a tree or a tree branch as a person or some other object because it appears to have the characteristics of a person or another object. If the tree is blown by the wind and its shadow crosses a video tripwire (as shown in the figure below), false alarms may result.



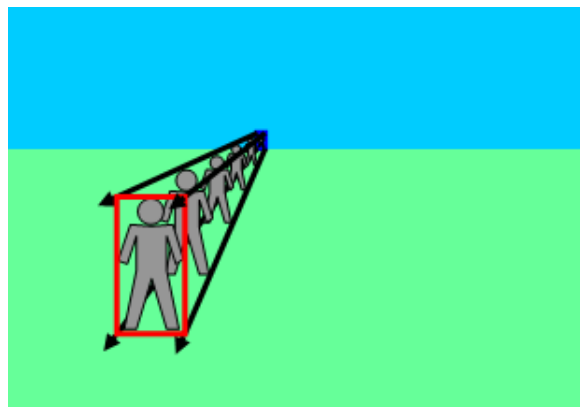
To the human eye, it is obvious that the tree's shadow is too large to be a person, but the system needs more information in order to know the maximum size of the objects that can reasonably trigger responses. In this case, an object filter could be defined for this view to tell the system the maximum size of objects, so that the system has enough information to disregard excessively large objects that cross the video tripwire.

To set the maximum object size for the view, you would define a maximum object size filter. This involves looking at the camera's field of view and resizing two boxes, one that represents the maximum size of an object close to the camera and another that represents the maximum size of an object farther away from the camera. (In horizontal fields of view, the bottom of the view is closer to the camera and the top of the view is farther away from the camera.) The system then filters out any objects that exceed the maximum size.

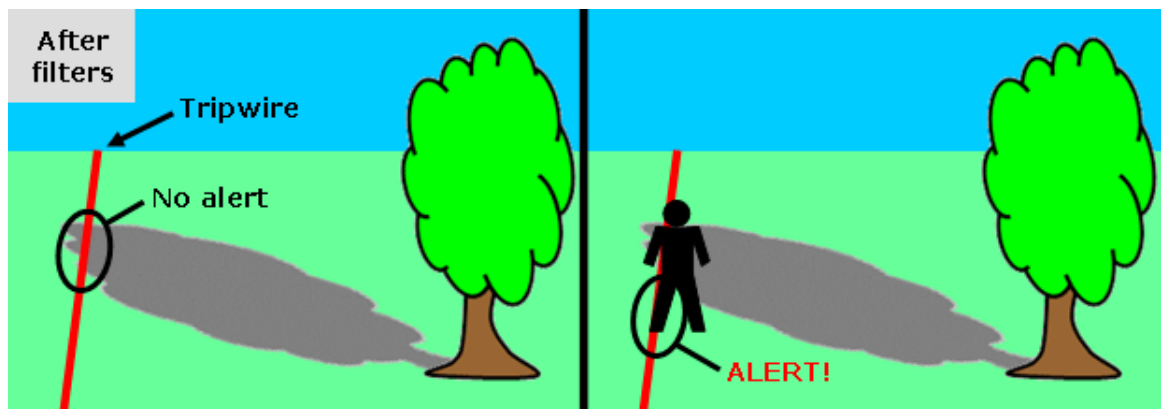
The figure below is a conceptual depiction of how this is accomplished. The red box represents the maximum size of an object that is closer to the camera, and the blue box represents the maximum size of an object that is farther away from the camera.



After the user has defined the maximum size filter, the system infers the maximum size of objects in three dimensional space throughout the camera's field of view based on the two boxes that have been drawn, as shown in the figure below. The boxes in the figure are connected to form a cube so that you can see the variety of object sizes that the system can infer based on the two boxes.

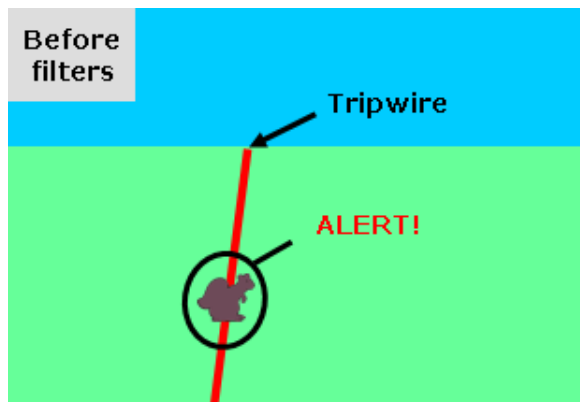


After the maximum size filter has been defined, the system will no longer generate false alarms when the tree's shadow crosses the video tripwire, although it will generate responses based on people crossing the video tripwire, as shown in the following figure.



Minimum Size Filter Example

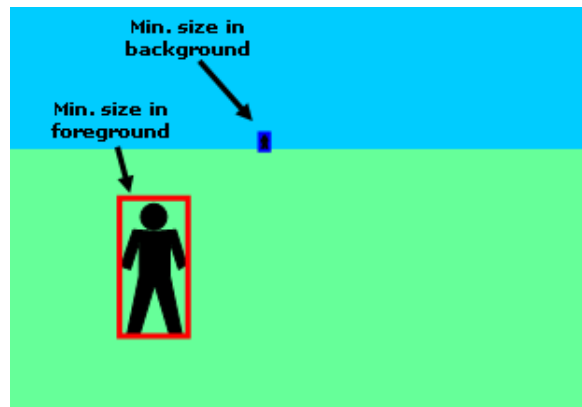
An example of a situation in which a minimum object size filter would need to be defined would be if a squirrel moving across a video tripwire was triggering false alarms. Without the appropriate object filter in place, the system might mis-classify the squirrel as some other object because it appears to have the characteristics of another object. If the squirrel crosses a video tripwire (as shown in the following figure), false alarms may result.



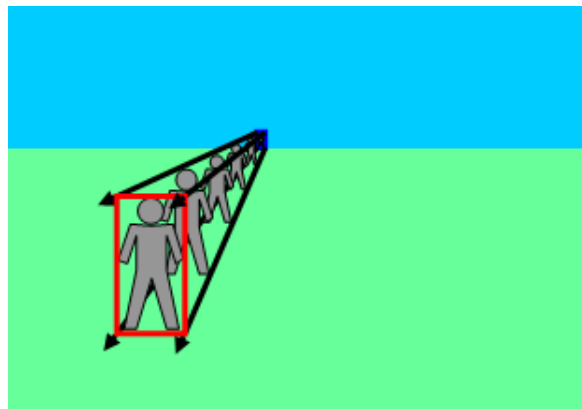
To the human eye, it is obvious that it is squirrel crossing the video tripwire, but the system needs more information in order to know the minimum size of the objects that can reasonably trigger responses. In this case, an object filter could be defined to tell the system the minimum size of objects, so that the system has enough information to disregard small objects that cross the video tripwire.

To set the minimum object size for the view, you would define a minimum object size filter. This involves looking at the camera's field of view and resizing two boxes, one that represents the minimum size of an object close to the camera and another that represents the minimum size of an object farther away from the camera. (In horizontal fields of view, the bottom of the view is closer to the camera and the top of the view is farther away from the camera.) The system then filters out any objects that are smaller than the minimum size.

The figure below is a conceptual depiction of how this is accomplished. The red box represents the minimum size of an object that is closer to the camera, and the blue box represents the minimum size of an object that is farther away from the camera.



After the user has defined the minimum size filter, the system infers the minimum size of objects in three dimensional space throughout the camera's field of view based on the two boxes that have been drawn, as shown in the figure below. The boxes in the figure are connected to form a cube so that you can see the variety of object sizes that the system can infer based on the two boxes.



After the minimum size filter has been defined, the system will no longer generate false alarms when a squirrel crosses the video tripwire, although it will generate responses based on people crossing the video tripwire, as shown in the following figure.



Recommended Representative Objects

The representative objects you use while setting up object filters will depend on the kinds of objects that will be involved in the events you plan to create (or have created) for the view. The table below provides recommendations to help you decide which types of objects you should use while setting up object filters.

Table 4-5 *Representative Object Size Recommendations*

Object Type(s) Being Detected	Minimum Object Size Recommendation	Maximum Object Size Recommendation
People only	Set the boxes to a size slightly shorter and narrower than an average-size person. If you want to detect events involving children, use a child instead of an adult as the representative object.	Set the boxes to a size slightly larger and wider than an average-size person. If you want to detect events involving children, use a child instead of an adult as the representative object.
Vehicles only	Set the boxes to a size smaller than a compact car. If you need the system to detect even smaller vehicles like motorcycles, make the box slightly smaller than a motorcycle.	If you need the system to detect larger vehicles like box trucks and 18-wheelers, set the boxes to a size that is slightly larger than the largest vehicle that might be involved in an event. Otherwise, set the boxes to a size that is slightly larger than a large vehicle like a pick-up truck or a van.
Small objects only	Set the boxes to a size slightly smaller than a small object of the type you want the system to recognize (e.g., a duffel bag).	Set the boxes to a size slightly larger than the small object you want the system to recognize (e.g., a duffel bag).
People and vehicles	Do not use a vehicle to set the minimum size. Instead, set the boxes to a size slightly shorter and narrower than an average-size person.	Do not use a person to set the maximum size. Instead, set the boxes to the size of a larger vehicle. If larger vehicles like box trucks or 18-wheelers are a concern, set the boxes to a size slightly larger than the largest vehicle that might be involved in an event. Otherwise, set the boxes to a size that is slightly larger than a large vehicle like a pick-up truck or a van.
People and small objects	Do not use a person to set the minimum size. Instead, set the boxes to a size slightly smaller than the small object you want the system to recognize (e.g., a duffel bag for left item events).	Do not use a small object to set the maximum size. Instead, set the boxes to a size slightly larger and wider than an average-size person.

Table 4-5 *Representative Object Size Recommendations (continued)*

Object Type(s) Being Detected	Minimum Object Size Recommendation	Maximum Object Size Recommendation
Vehicles and small objects	Do not use a vehicle to set the minimum size. Instead, set the boxes to a size smaller than a small object you want the system to recognize (e.g., a duffel bag).	Do not use a small object to set the maximum size. Instead, set the boxes to the maximum vehicle size. If larger vehicles like box trucks or 18-wheelers are a concern, set the boxes to a size that is slightly larger than the largest vehicle that might be involved in an event. Otherwise, set the boxes to a size that is slightly larger than a large vehicle like a pick-up truck or a van.
All object types	Set the boxes to a size smaller than a small object you want the system to recognize (e.g., a duffel bag).	Set the boxes to the size recommended as a maximum vehicle size. If larger vehicles like box trucks or 18-wheelers are a concern, set the boxes to a size that is slightly larger than the largest vehicle that might be involved in an event. Otherwise, set the boxes to a size that is slightly larger than a large vehicle like a pick-up truck or a van.

Copying a Filter

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



Note


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.

Procedure

- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
 - From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
 The Edit Rule page appears.
- Step 3** From the Create new filter list, choose **Copy from another rule**.
- Step 4** From the **Copy Filters From Rule** dialog box, select the rule that contains the filters you want to copy. Only rules with existing filters appear in the rule list.
- Step 5** 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.

Deleting a Filter

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.



CHAPTER 5

Events and Objects

This chapter provides information about events and objects, and describes how to configure and troubleshoot different event types. It includes the following sections:

- [Event and Object Type Overview, page 5-1](#)
- [Object Types, page 5-2](#)
- [Event Types, page 5-3](#)
- [Appears Events, page 5-4](#)
- [Camera Tamper Events, page 5-6](#)
- [Disappears Events, page 5-7](#)
- [Dwell Time Threshold Events, page 5-9](#)
- [Dwell Time Data Events, page 5-11](#)
- [Enters Events, page 5-13](#)
- [Exits Events, page 5-16](#)
- [Inside Events, page 5-18](#)
- [Left Behind Events, page 5-19](#)
- [Loiters Events, page 5-22](#)
- [Occupancy Data Events, page 5-24](#)
- [Occupancy Threshold Events, page 5-26](#)
- [Taken Away Events, page 5-30](#)
- [Video Tripwire Events, page 5-32](#)

Event and Object Type Overview

You view and edit the object and event options from the Edit Rule window. To access this window, click the **Manage Rules** link in the Rule Management drawer.

The object and event options available in the Edit Rule page are determined by the type of channel (license type—security or accounting) and the category of event you decide to create on the Rule Management page.

An event is an activity of interest that takes place within the field of view of a camera. 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. For more information, see the following sections:

- [Object Types, page 5-2](#)
- [Event Types, page 5-3](#)

**Note**

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. For example, you can simultaneously detect a vehicle and a person.

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.

**Note**

Not all channel configurations support the classification of objects. Other channels only support the classification of certain objects. Whether or not objects are classified is determined by the channel type, channel configuration, and rule type. For example, person is the only object option if you have People-Only Classification turned on.

Table 5-1 *Event Object Types*

Object Type	Meaning
Person	The object has some characteristics of a human being.
Vehicle	The object is a mechanism that carries people or other cargo, such as 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. For more information, see the [Filters Overview, page 4-22](#).
- 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.
- You can change the active/passive designation of Anything objects using the instructions in the [“How to Specify Active or Passive for Anything Objects” section on page 8-47](#).

Event Types

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

Table 5-2 *Event Type Descriptions*

Event Category	Description
Video Tripwire	A video tripwire is a line drawn within the camera's field of view. An object triggers a response by crossing the line. 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. For more information, see the Video Tripwire Events, page 5-32 .
Area Events	<p>An area event occurs within a user-defined portion of the camera's field of view called an area of interest. For more information, see the “Area of Interest Overview” section on page 4-12. You may also have the option of applying the rule to the entire camera view for the following event types:</p> <ul style="list-style-type: none"> • Enters Events—An object enters the perimeter of an area of interest from any direction within the camera's field of view. For more information, see the “Enters Events” section on page 5-13. • Exits Events—An object exits the perimeter of an area of interest in any direction. For more information, see the “Exits Events” section on page 5-16. • Inside Events—An object appears in an area of interest or enters the perimeter of an area of interest. For more information, see the “Inside Events” section on page 5-18. • Appears Events—An object appears in an area of interest without previously appearing within the camera's field of view or an area of interest. For more information, see the “Appears Events” section on page 5-4. • Disappears Events—An object is no longer visible within the camera's field of view or an area of interest. For more information, see the “Disappears Events” section on page 5-7. • Taken Away Events—An object in the camera's view or an area of interest is moved. For more information, see the “Taken Away Events” section on page 5-30. • Left Behind Events—An object is placed in the camera's view or an area of interest for a user-specified period of time. For more information, see the “Left Behind Events” section on page 5-19. • Loiters Events—An object remains within an area of interest for a user-specified period of time. For more information, see the “Loiters Events” section on page 5-22. • Dwell Time Data Events—The device records the amount of time each object spends in an area of interest. For more information, see the “Dwell Time Data Events” section on page 5-11. • Dwell Time Threshold Events—The device determines that one or more objects have exceeded a time threshold for loitering in an area of interest. For more information, see the Dwell Time Threshold Events, page 5-9. • Occupancy Data Events—The device tracks the number of objects in an area of interest. For more information, see the Occupancy Data Events, page 5-24. • Occupancy Threshold Events—The device determines that a user-specified number of objects have occupied an area of interest for a user-specified period of time. For more information, see the Occupancy Threshold Events, page 5-26.
Camera Tamper	An event that significantly changes the camera's field of view. For more information, see the “Camera Tamper Events” section on page 5-6 .

Appears Events

This section includes the following topics:

- [Appears Events Overview, page 5-4](#)
- [Creating or Editing an Appears Rule, page 5-4](#)
- [Appears Events Examples, page 5-5](#)
- [Appears Events Tips and Troubleshooting, page 5-5](#)

Appears Events Overview

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.

Creating or Editing an Appears Rule

To create an Appears rule, perform the following steps:

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Do one of the following:
- Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
 - Click full view  to apply the rule to the entire camera view.
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** Check **Appears** as the event type.

- Step 7** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 8** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 9** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 10** If desired, create filters (may not be available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Appears Events Examples

The following are a few examples of where you might want to know if someone appeared:

- on a building roof anytime
- in bank teller area or vault after hours
- in a hallway during a fire alarm
- on subway tracks or in a subway tunnel
- on a tarmac

The following are a few examples of where you might want to know if a vehicle appeared:

- evacuated area
- shopping center parking lot after hours
- closed parking garage

Appears Events Tips and Troubleshooting

- Consider setting up your Appears events so that they detect all object types. Not all objects will be classified accurately as soon as they appear. For example, if a person's foot appears in the camera's field of view first (as is often the case), the foot may be classified as another type of object, but it would represent the first instance that the person entered the field of view of the camera. The person would be categorized as a person a moment later, when he or she actually enters the camera's field of view completely.
- 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 an Appears in area of interest event with an area of interest that excludes the area of unwanted activity.
- There is an important distinction between Appears in area of interest events and Enters events. Appears in area of interest events occur when an object appears in an area of interest without previously appearing within the camera's field of view. In other words, the first time the object appears within the camera's field of view is when it appears in the area of interest (for example, by

walking through a doorway within the area of interest). Enters events occur when an object enters the area of interest, only if the object has already been detected within the camera's field of view before entering the area. For more information, see the [“Enters Events” section on page 5-13](#).

- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).

For more troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and the [“False Alarm Troubleshooting” section on page 8-2](#).

Camera Tamper Events

This section includes the following topics:

- [Camera Tamper Events Overview, page 5-6](#)
- [How to Create a Camera Tamper Rule, page 5-7](#)
- [Camera Tamper Examples, page 5-7](#)
- [Camera Tamper Events Tips and Troubleshooting, page 5-7](#)

Camera Tamper Events Overview

These events may not be supported by every channel.

A Camera Tamper event is any 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.

A Camera Tamper event can cause some channels to stop monitoring a camera. The channel's response to a Camera Tamper event differs based on how your system handles views. For more information, see the [“View Status” section on page 1-4](#).



Note

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 list on the Rule Management page, choose **Camera Tamper**. The rule appears automatically in the rule list.

Camera Tamper Examples

The following list illustrates examples of when you may want to use a Camera Tamper event:

- The lights are turned on or off in a secure facility.
- A camera is panned, zoomed, or jostled from an automated teller machine or emergency door.
- A device loses the signal from a camera, which occurs when the camera is turned off or loses its power source (e.g., by being unplugged).

Camera Tamper Events Tips and Troubleshooting

- Only one Camera Tamper rule is needed per channel. If you already have a Camera Tamper rule on the channel, the option is no longer available from the **Create new rule** drop-down list.
- Camera Tamper events are not detected if the view is unknown.
- You can adjust the degree of the system's sensitivity to Camera Tamper events by modifying the view sensitivity. For more information, see the [“How to Adjust View Sensitivity” section on page 8-49](#).
- Keep in mind that Camera Tamper events are not detected at all if your channel is configured to use Auto-force views. For more information, see the [“View Status” section on page 1-4](#).

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Disappears Events

This section includes the following topics:

- [Disappears Events Overview, page 5-7](#)
- [How to Create or Edit a Disappears Rule, page 5-8](#)
- [Disappears Events Tips and Troubleshooting, page 5-8](#)

Disappears Events Overview


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

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Do one of the following:
- Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
 - Click full view  to apply the rule to the entire camera view.
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** Check **Disappears** as the event type.
- Step 7** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 8** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 9** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 10** If desired, create filters (may not be available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Disappears Events Tips and Troubleshooting

- Rules configured to detect events in the whole view are useful for general event detection. Keep in mind that because device is monitoring the entire scene, choosing this event type can result in 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 draw an area of interest that excludes the area of unwanted activity.

- 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 area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- There is an important distinction between Disappears from area of interest events and Exits events. Disappears from area of interest events occur when an object was last detected in an area of interest. In other words, the last time the system detected the object, it was present in the area of interest. Exits events occur whenever an object exits through the perimeter of the area of interest. For more information, see the [“Exits Events” section on page 5-16](#).
- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Dwell Time Threshold Events

This section includes the following topics:

- [Dwell Time Threshold Events Overview, page 5-9](#)
- [How to Create or Edit a Dwell Time Threshold Rule, page 5-10](#)
- [Dwell Time Threshold Examples, page 5-10](#)
- [Dwell Time Threshold Events Tips and Troubleshooting, page 5-11](#)

Dwell Time Threshold Events Overview

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

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Step 4** Enter a rule name.
- Step 5** Check **Dwells** as the event type.
- Step 6** Check the option that begins with **Output event when...**
- Step 7** Enter the number of people that must dwell in the area of interest for a response to be triggered.
- Step 8** Enter the length 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.
- Step 9** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 10** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Dwell Time Threshold Examples

An example of Dwell Time Threshold event would be if you create a rule to detect when customers have to stand in line in front of a bank teller for a certain amount of time. For example, you could define the event so that an area of interest appears in front of the teller, with a threshold of one person waiting for over five minutes.

You could also create a rule to detect when customers have to wait for an excessive amount of time. This could include waiting for the arrival of a train or bus, or queuing in front of a ticket booth or vending machine. To do this, create a Dwell Time Threshold rule which includes a desired number of people waiting (or dwelling) and the amount of time you deem excessive.

For example, you might define the event so that a ticket machine is enclosed in the area of interest, with a threshold of 10 people waiting for over 30 minutes.

Dwell Time Threshold Events Tips and Troubleshooting

- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- You will achieve the best results by testing your newly created rules. Have authorized personnel replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).
- 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. 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 (see [“Occupancy Threshold Events” section on page 5-26](#)).
- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#), [“False Alarm Troubleshooting” section on page 8-2](#), and [“Improve Counting Results” section on page 8-30](#).

Dwell Time Data Events

This section includes the following topics:

- [Dwell Time Data Events Overview, page 5-11](#)
- [How to Create or Edit a Dwell Time Data Rule, page 5-12](#)
- [Dwell Time Data Examples, page 5-12](#)
- [Dwell Time Data Events Tips and Troubleshooting, page 5-13](#)

Dwell Time Data Events Overview

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

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Step 4** Enter a rule name.
- Step 5** Check **Dwells** as the event type.
- Step 6** Check **Output dwell data**.
- Step 7** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 8** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 9** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Dwell Time Data Examples

The following are examples of when you may want to use Dwell Time Data rules:

- Dwell Time Data could be used to analyze customer traffic patterns. This is possible because Dwell Time Data includes how much time people spend in an area of interest, and the area of interest can be placed strategically around a display, area of shelving, digital sign, promotional area, etc. A marketing group may use such data to determine the effectiveness of a store's spatial layout. In the example scene below, an area of interest could be placed immediately in front of a section of store shelving and the amount of time customers spend in that area could be recorded.



- Dwell Time Data could also be used to analyze ATM usage patterns. For example, if you place the area of interest in front of the ATM, the system will record how much time each person spends at the ATM. In the example scene below, an area of interest could be created immediately in front of one (or both) of the ATMs to record the amount of time it takes for customers to make transactions.



- As another example, Dwell Time Data could be used to analyze customer traffic patterns in casino/gaming environments. This is possible because Dwell Time Data includes how much time people spend in an area of interest, and the area of interest can be placed strategically around a certain area of the casino. Using data about how long someone spends in an area, one could determine the effectiveness of the casino's spatial layout.

Dwell Time Data Events Tips and Troubleshooting

- 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. 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 (see the [“Occupancy Data Events” section on page 5-24](#)).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- You will achieve the best results by testing your newly created rules. Have authorized personnel replicate the events you are trying to detect to make sure that the intended data is being collected. For more information, see the [“Testing a Rule” section on page 4-4](#).
- If you receive false alarms caused by spurious objects that do not appear for long in the field of view, see the [“How to Improve Dwell Time Data Results” section on page 8-38](#).
- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#), [“False Alarm Troubleshooting” section on page 8-2](#), and [“Improve Counting Results” section on page 8-30](#).

Enters Events

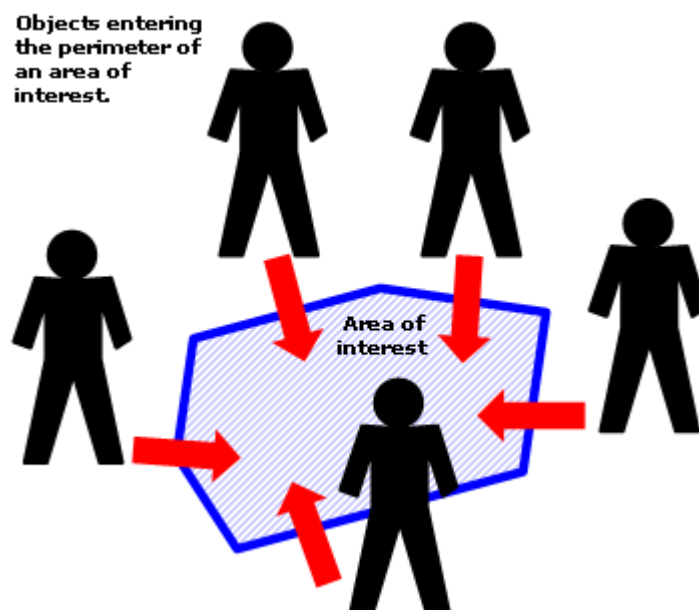
This section includes the following topics:

- [Enters Events Overview, page 5-14](#)
- [How to Create or Edit an Enters Rule, page 5-14](#)
- [Enters Event Examples, page 5-15](#)
- [Enters Events Tips and Troubleshooting, page 5-15](#)

Enters Events Overview

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

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.

The Edit Rule page appears.

- Step 3** Draw an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** Check **Enters** as the event type.
- Step 7** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 8** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 9** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 10** If desired, create filters (may not be available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Enters Event Examples

You could use an Enters event to detect when a person enters a bank vault, emergency exit hallway, school after hours, stairwell, fire escape, rail, subway track, etc.

If you were monitoring vehicles, for example, you could use an Enters rule to detect when a car enters a runway or a lane reserved for buses.

Enters Events Tips and Troubleshooting

- Be aware of the distinction between Enters events and Appears in area of interest events. Appears in area of interest events occur when an object appears in an area of interest without appearing within the camera's field of view previously. In other words, the first time the object appears within the field of view is when it appears in the area of interest (for example, by walking through a doorway within the area of interest). Enters events occur whenever an object enters the area of interest, if the object has already been detected within the camera's field of view before entering the area. A response would not be triggered for an Enters event if the object involved in the event was inside of the area of interest the first time it appeared within the camera's field of view. For more information, see the [“Appears Events” section on page 5-4](#).
- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).

- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting”](#) section on page 8-27 and [“False Alarm Troubleshooting”](#) section on page 8-2.

Exits Events

This section includes the following topics:

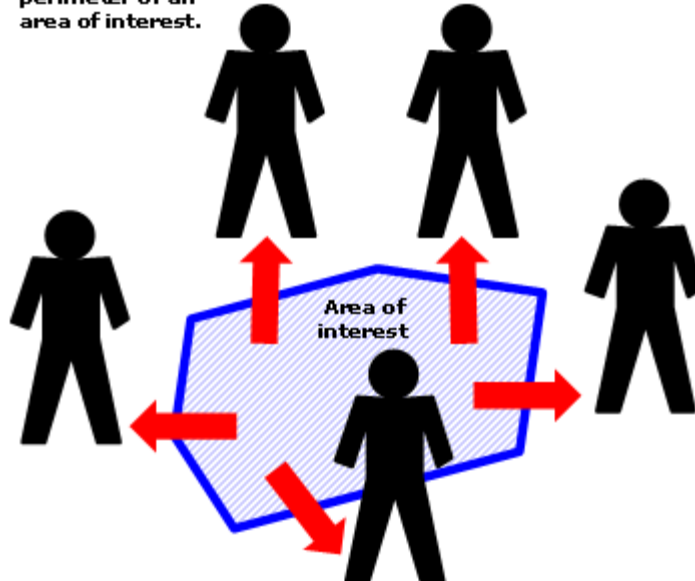
- [Exits Events Overview, page 5-16](#)
- [How to Create or Edit an Exits Rule, page 5-17](#)
- [Exits Events Tips and Troubleshooting, page 5-17](#)

Exits Events Overview

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.

Objects exiting the perimeter of an area of interest.



How to Create or Edit an Exits Rule

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Draw an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** Check **Exits** as the event type.
- Step 7** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 8** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 9** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 10** If desired, create filters (may not be available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Exits Events Tips and Troubleshooting

- The device detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).
- Be aware of the distinction between Exits events and Disappears from area of interest events. Disappears from area of interest events occur when an object disappears within an area of interest. In other words, the last time the object was tracked within the camera's field of view, the object was present in the area of interest. This can occur when an object disappears through a doorway within the area of interest or behind scenery. For more information, see the [“Disappears Events” section on page 5-7](#). In contrast, Exits events do not include objects disappearing through doorways and windows or behind scenery within the area of interest. The object must exit through the perimeter of the area of interest in order to trigger a response.
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.

- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).
- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Inside Events

This section includes the following topics:

- [Inside Events Overview, page 5-18](#)
- [How to Create or Edit an Inside Rule, page 5-18](#)
- [Inside Event Examples, page 5-19](#)
- [Inside Events Tips and Troubleshooting, page 5-19](#)

Inside Events Overview

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. For more information, see the [“Enters Events” section on page 5-13](#) and [“Appears Events” section on page 5-4](#).

How to Create or Edit an Inside Rule

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** Check **Is Inside** as the event type.
- Step 7** If desired, enter details about the rule or other descriptive text in the **Alert text** field.

- Step 8** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 9** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 10** If desired, create filters (may not be available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Inside Event Examples

You could use an Inside event to detect if a vehicle entered a school parking lot after hours. If you are monitoring for people, you could use this type of event to tell if a person was inside an airport hanger or ticket counter area.

Inside Events Tips and Troubleshooting

- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Ground vs. Image Plane” section on page 4-14](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).
- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Left Behind Events

This section includes the following topics:

- [Left Behind Events Overview, page 5-20](#)
- [How to Create or Edit a Left Behind Rule, page 5-20](#)
- [Left Behind Event Examples, page 5-21](#)
- [Left Behind Events Tips and Troubleshooting, page 5-21](#)

Left Behind Events Overview

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

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Do one of the following:
- Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
 - Click full view  to apply the rule to the entire camera view.
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** Check **Is Left Behind** as the event type.
- Step 7** 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.
- Step 8** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 9** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 10** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).

Step 11 If desired, create object filters. For more information, see the [“Filters Overview” section on page 4-22](#).

Step 12 Do one of the following:

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

Left Behind Event Examples

You could use a Left Behind event to detect the following:

- A person remaining in a subway car after hours



- A vehicle left on a run way
- Boxes placed in front of an emergency exit
- Objects left on subway tracks, on a bridge, or in a bank lobby

Left Behind Events Tips and Troubleshooting

- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Ground vs. Image Plane” section on page 4-14](#).
- If the camera's field of view changes before the object has remained stationary long enough to be considered an event and the camera returns to the view again later, the object will not be detected as left behind. The system 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 for events.
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.
- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).

- Rules configured to detect events in the full 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 a Left Behind in area of interest event with an area of interest that excludes the area of unwanted activity.

For additional troubleshooting information, see the [“Missed Events Troubleshooting”](#) section on page 8-27 and [“False Alarm Troubleshooting”](#) section on page 8-2.

Loiters Events

This section includes the following topics:

- [Loiters Events Overview, page 5-22](#)
- [How to Create or Edit a Loiters Rule, page 5-22](#)
- [Loiters Event Examples, page 5-23](#)
- [Loiters Events Tips and Troubleshooting, page 5-23](#)

Loiters Events Overview

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

Procedure

-
- | | |
|---------------|---|
| Step 1 | From the Rules Management drawer, click Manage Rules . |
| Step 2 | Do one of the following: <ul style="list-style-type: none">• From the Create new rule drop-down list, choose a rule type.• Click the name of an existing rule on the Rule Management page. The Edit Rule page appears. |
| Step 3 | Create an area of interest. For more information, see the “Working with Areas of Interest” section on page 4-12. |
| Step 4 | Enter a rule name. |
| Step 5 | Check one or more object types. For more information, see the “Object Types” section on page 5-2. |
| Step 6 | Check Loiters as the event type. |
| Step 7 | 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. |
| Step 8 | If desired, enter details about the rule or other descriptive text in the Alert text field. |

- Step 9** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 10** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 11** If desired, create filters (not available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 12** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Loiters Event Examples

Here are some examples of when you may want to create a Loiters event:

- Person loitering at a walk-up or drive-up ATM lane.
- Vehicles loitering in a fire lane.
- Person loitering in a high-theft area of a store
- Person loitering near a parked plane.
- Person pulled over on the side of the highway (could indicate a broken down vehicle).

Loiters Events Tips and Troubleshooting

- The device detects events differently based on whether you use a ground plane or image plane area of interest for the event. You may detect more events if you use a ground plane area of interest for Loiters rules. For more information, see the [“Ground vs. Image Plane” section on page 4-14](#).
- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Occupancy Data Events

This section includes the following topics:

- [Occupancy Data Events Overview, page 5-24](#)
- [How to Create or Edit an Occupancy Data Rule, page 5-24](#)
- [Occupancy Data Examples, page 5-25](#)
- [Occupancy Data Events Tips and Troubleshooting, page 5-25](#)

Occupancy Data Events Overview

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.

**Note**

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. For more information, see the [“Dwell Time Data Events” section on page 5-11](#).

How to Create or Edit an Occupancy Data Rule

Procedure

-
- | | |
|---------------|---|
| Step 1 | From the Rules Management drawer, click Manage Rules . |
| Step 2 | Do one of the following: <ul style="list-style-type: none">• From the Create new rule drop-down list, choose a rule type.• Click the name of an existing rule on the Rule Management page. The Edit Rule page appears. |
| Step 3 | Create an area of interest. For more information, see the “Working with Areas of Interest” section on page 4-12 . |
| Step 4 | Enter a rule name. |
| Step 5 | Check Occupies as the event type. |
| Step 6 | Check Output occupancy data . |
| Step 7 | Specify the number of minutes and/or seconds for which the object must occupy the area. |
| Step 8 | If your system supports custom response fields, you can enter them using the instructions in the “Custom Response Fields Overview” section on page 4-21 . |

Step 9 Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).

Step 10 Do one of the following:

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

Occupancy Data Examples

Occupancy Data could be used in the following scenarios:

- To analyze how many people enter a certain area of a store. By strategically placing the area of interest around a display, area of shelving, digital sign, promotional area, etc., the device will generate data about traffic volume in that area. A marketing group may use such data to determine the effectiveness of a store's spatial layout.



Note

Occupancy Data differs from Dwell Time Data (see the [“Dwell Time Data Events” section on page 5-11](#)) in that it is concerned with the *number* of people in the area of interest, while Dwell Time Data is concerned with the amount of *time* each person spends in the area of interest. These two types of data can be used together to give a more complete picture of customer traffic patterns.

- To analyze how many people enter a certain area of a casino. By strategically placing the area of interest, you can determine the effectiveness of a casino's spatial layout.
- To analyze how many people are near a transportation vehicle or facility. For example, an Occupancy Data event could include an area of interest on a train platform and record the number of people spending time on that platform. This data can be used to monitor passenger volume at different times of day.



Occupancy Data Events Tips and Troubleshooting

- You will achieve the best results by testing your newly created rules. Have authorized personnel or replicate the events you are trying to detect to make sure that the intended data is being collected. For more information, see the [“Testing a Rule” section on page 4-4](#).

- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

For additional troubleshooting information, see the [“How to Detect Noise in Video Signal”](#) section on page 8-67, [“False Alarm Troubleshooting”](#) section on page 8-2, and [“Improve Counting Results”](#) section on page 8-30.

Occupancy Threshold Events

This section includes the following topics:

- [Occupancy Threshold Events Overview, page 5-26](#)
- [How to Create or Edit an Occupancy Threshold Rule, page 5-27](#)
- [Occupancy Threshold Event Examples, page 5-27](#)
- [Occupancy Threshold Events Tips and Troubleshooting, page 5-30](#)

Occupancy Threshold Events Overview

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.



Note

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. For more information, see the [“Dwell Time Threshold Events”](#) section on page 5-9.

How to Create or Edit an Occupancy Threshold Rule

Procedure

- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Create an area of interest. For more information, see the [“Working with Areas of Interest” section on page 4-12](#).
- Step 4** Enter a rule name.
- Step 5** Check **Occupies** as the event type.
- Step 6** Check **Output event when Occupancy is**.
- Step 7** From the first drop-down list, choose the option that describes how the number of people (which you determine in step 7) relates to the event occurrence.
- Choose one of the following options:
- **at least**
 - **exactly**
 - **no more than**
- Step 8** Enter the number of people that must occupy the area.
- Step 9** Specify whether the event could happen **at any time** or **for** a specific duration.
- Step 10** If you selected **for** in the previous steps, enter a duration for the event.
- The default duration is **0 minutes** and **10 seconds**.
- Step 11** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview” section on page 4-21](#).
- Step 12** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 13** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Occupancy Threshold Event Examples

The following examples describe scenarios where you could use Occupancy Threshold rules:

- [Queue Length, page 5-28](#)
- [Crowding Around Sales Counters, page 5-28](#)
- [Two-Person Rule, page 5-29](#)
- [Tailgating, page 5-29](#)

- [More Than One Person Required, page 5-30](#)

Queue Length

You can create a rule to detect when the queue in front of a cashier station reaches a certain length. Create an Occupancy Threshold event which will detect when a certain number of people have been queuing in the area of interest for a certain amount of time.

In the example scene below, you could create an area of interest where people queue in front of the cashier's station, and have the system detect when more than a certain number of people are in that area.



You can create a rule to detect when the queue in front of a bank teller reaches a certain length. In the example scene below, you could create an area of interest where people queue in front of the teller, and have the device detect when more than a certain number of people are in that area.



You could also create a rule to detect when the queue for people to be seated in a restaurant reaches a certain length, or when the queue in front of a ticket counter reaches a certain length.

Crowding Around Sales Counters

You could create an Occupancy Threshold event to detect when the number of people around a sales counter reaches a critical level.



Note

If you are primarily concerned with a high volume of people around the sales counter for any amount of time, the number of people you set in the event specification is more important than the duration setting.

Two-Person Rule

You can create an Occupancy Threshold rule in which the area of interest is around the immediate vicinity of the ATM. Then, specify that the device will detect when more than one person is in that area of interest. While this will detect cases when people approach the ATM accompanied by a companion, it will also detect those cases when a stranger is too close to a person performing an ATM transaction.

In the example scene below, you could create an area of interest in front of the ATM and a threshold event to detect when more than one person is in that area.



Tailgating

In an access-controlled setting, tailgating refers to more people entering than have obtained legitimate access. If used in conjunction with access control system data, an Occupancy Threshold event can detect when tailgating occurs. For example, create an area of interest in front of a door with a card sweeper. As the device detects how many people move through the area, you can compare this number with the number of people who swiped their cards. Any discrepancy between these numbers indicates possible tailgating.

In the example scene below, an Occupancy Threshold event used in conjunction with the access control device could detect when more people have entered the area than have swiped their cards.



More Than One Person Required

You can create a rule to detect whenever a person is left alone in a cash room, or a lab where there are sensitive or dangerous materials. To do this, create an Occupancy Threshold event in which an area of interest is drawn in the cash room or lab, and an event is triggered when the number of occupants is less than two.

Occupancy Threshold Events Tips and Troubleshooting

- You will achieve the best results by testing your newly created rules. Have authorized personnel replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#), [“False Alarm Troubleshooting” section on page 8-2](#), and [“Improve Counting Results” section on page 8-30](#).

Taken Away Events

This section includes the following topics:

- [Taken Away Events Overview, page 5-30](#)
- [How to Create or Edit a Taken Away Rule, page 5-31](#)
- [Taken Away Event Examples, page 5-31](#)
- [Taken Away Events Tips and Troubleshooting, page 5-32](#)

Taken Away Events Overview

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 the [“Reduce Taken Away False Alarms”](#) section on page 8-15.

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. For more information, see the [“Ground vs. Image Plane”](#) section on page 4-14.

How to Create or Edit a Taken Away Rule

Procedure

-
- Step 1** From the Rules Management drawer, click **Manage Rules**.
- Step 2** Do one of the following:
- From the Create new rule drop-down list, choose a rule type.
 - Click the name of an existing rule on the Rule Management page.
- The Edit Rule page appears.
- Step 3** Do one of the following:
- Create an area of interest. For more information, see the [“Working with Areas of Interest”](#) section on page 4-12.
 - Click full view  to apply the rule to the entire camera view.
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types”](#) section on page 5-2.
- Step 6** Check **Is Taken Away** as the event type.
- Step 7** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 8** If your system supports custom response fields, you can enter them using the instructions in the [“Custom Response Fields Overview”](#) section on page 4-21.
- Step 9** Create a schedule. For more information, see the [“Schedules Overview”](#) section on page 4-18.
- Step 10** If desired, create filters. For more information, see the [“Filters Overview”](#) section on page 4-22.
- Step 11** Do one of the following:
- Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.
-

Taken Away Event Examples

Taken Away events commonly involve detecting thefts. For example, in a campus setting, you can create a rule to monitor high-risk areas for theft, such as administrative offices, computer labs, or science laboratories.

Taken Away Events Tips and Troubleshooting

- Rules configured to detect events anywhere in the entire camera view are useful for general event detection. Keep in mind that because 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 that you instead create a Taken Away from area of interest event with an area of interest that excludes the area of unwanted activity.
- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.
- For all area of interest events, you must determine if a ground plane or image plane is more applicable. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- See the [“Reduce Taken Away False Alarms” section on page 8-15](#) to modify the conditions that must exist before a Taken Away event is detected.
- 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 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 (e.g., two different colors of carpeting).

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

Video Tripwire Events

This section includes the following topics:

- [Video Tripwire Events Overview, page 5-32](#)
- [How to Create or Edit a Video Tripwire Rule, page 5-33](#)
- [Video Tripwire Examples, page 5-34](#)
- [Video Tripwire Events Tips and Troubleshooting, page 5-37](#)

Video Tripwire Events Overview

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. For information about Loiters events, see the [“Loiters Events” section on page 5-22](#). For information about Left Behind events, see the [“Left Behind Events” section on page 5-19](#).

How to Create or Edit a Video Tripwire Rule

Procedure

Step 1 From the Rules Management drawer, click **Manage Rules**.

Step 2 Do one of the following:

- From the Create new rule drop-down list, choose a rule type.
- Click the name of an existing rule on the Rule Management page.

The Edit Rule page appears.

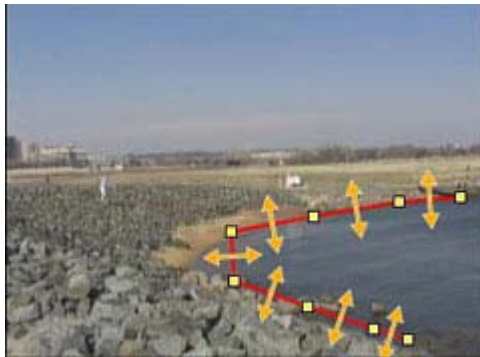
- Step 3** Draw one or more video tripwires. For more information, see the [“Working with Video Tripwires” section on page 4-7](#).
- Step 4** Enter a rule name.
- Step 5** Check one or more object types. For more information, see the [“Object Types” section on page 5-2](#).
- Step 6** If you drew two video tripwires, select the order in which an object must cross the video tripwires.
- Step 7** Enter how long in a minutes and/or seconds the object has to cross both video tripwires.
- Step 8** If desired, enter details about the rule or other descriptive text in the **Alert text** field.
- Step 9** Create a schedule. For more information, see the [“Schedules Overview” section on page 4-18](#).
- Step 10** If desired, create filters (may not be available on all channels). For more information, see the [“Filters Overview” section on page 4-22](#).
- Step 11** Do one of the following:
 - Click **Save**.
 - Click **Cancel** to abandon changes and return to the Rule Management page.

Video Tripwire Examples

Here is an example of a single-line, single-segment video tripwire to detect if a vehicle enters a secure parking area.



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, which do not appear to be straight in a camera's field of view.

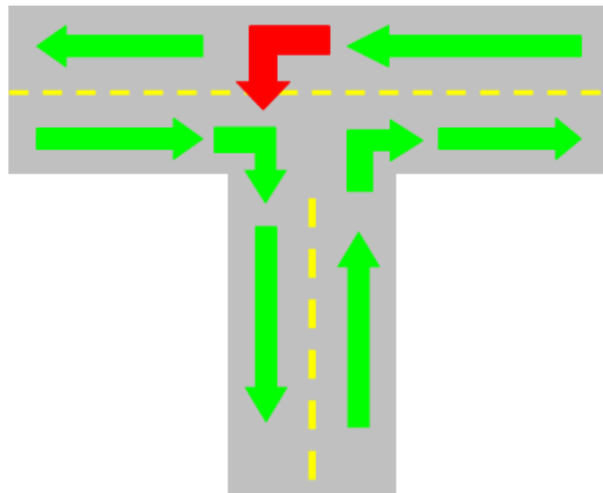


Multi-line video tripwires can be useful in situations where excessive numbers of false alarms would be triggered by single-line video tripwires. Shadows, foliage, and waves are common reasons for such false alarms.

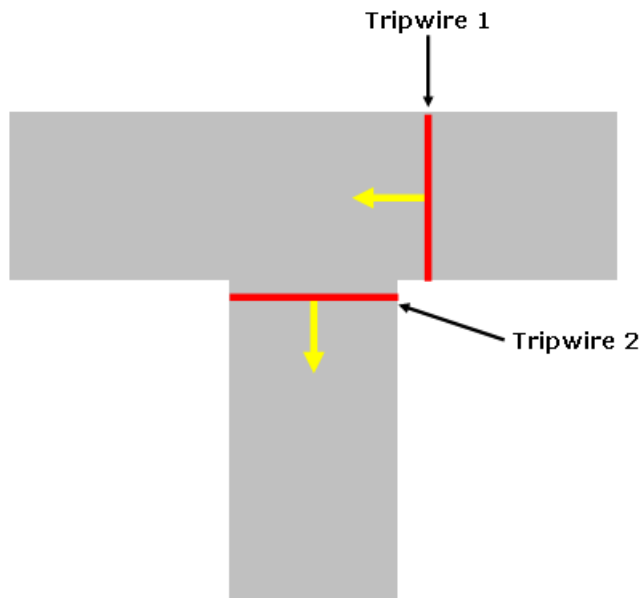
You may find a single video tripwire is insufficient because of environmental complexities. For example, waves crashing on the beach may be enough to trigger a single video tripwire, but not enough to trigger a multi-line video tripwire.



Multi-line video tripwires can be used in complex perimeter breach situations, where a change in the direction in which an object is moving can trigger a response. For example, some vehicles may be prohibited from turning onto a particular road while other vehicles are allowed to turn onto that road. The figure below shows such an example. The green arrows identify the permitted vehicular traffic patterns, and the red arrow identifies the prohibited traffic pattern.



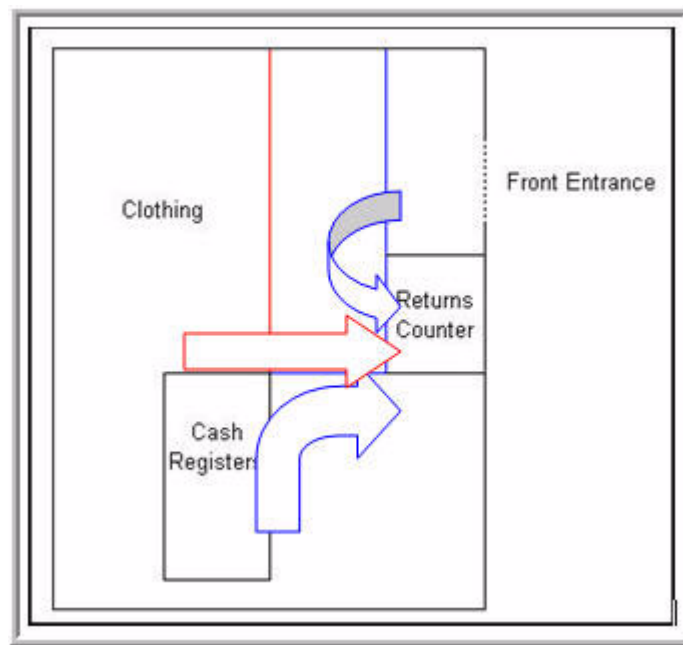
To detect only vehicles making this unauthorized turn, you could create a multi-line video tripwire, as shown in the figure below. The rule you create would specify that a response is triggered when a vehicle crosses video tripwire A before crossing video tripwire B. You specify the directions in which the video tripwires must be crossed in order for a response to be triggered, which are indicated by the yellow arrows.



In the example alert below, the rule was configured to detect cars turning left from a particular lane.



You could also create a rule to detect if an employee returns merchandise from within the store. As the diagram below shows, there are several paths to the returns counter. Customers often return items immediately upon entering the store, or after paying for other merchandise, on their way to the parking lot. Neither approach is flagged as a rule violation. A video tripwire along the floor between the merchandise area and another at the return counter, with a direction of approaching the return counter, would trigger any person who crossed both video tripwires. This would indicate a possible situation of an employee making a return from within the store, and rule out common consumer activity.



Video Tripwire Events Tips and Troubleshooting

- If you have created a video tripwire rule, first 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.
- The video tripwire should be placed along the ground plane. video tripwires placed along the top of objects (e.g., the top of a wall) are ineffective. For a definition of ground plane, see the [“Area of Interest Overview”](#) section on page 4-12.
- 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.
- You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule”](#) section on page 4-4.
- 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.
- 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.
- 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.

- 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. For information about Loiters events, see the [“Loiters Events” section on page 5-22](#). For information about Left Behind events, see the [“Left Behind Events” section on page 5-19](#).
- You may have ordered the multi-line video tripwires incorrectly. This can happen if you use Before or After incorrectly in the Event Specification area when the rule is created. If you use Before, the object must cross video tripwire A before video tripwire B. If you use After, video tripwire B must be crossed before video tripwire A. Be sure that you have specified the correct order for the video tripwires.
- If you are using a multi-line video tripwire to detect events on a shoreline, you can try combining an irregular shape or motion filter with a multi-line video tripwire to reduce false alarms. For more information, see the [“Irregular Shape or Motion Filters” section on page 4-27](#).

For additional troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).



CHAPTER 6

Parameters

This chapter describes parameters and how to use them, and provides sorted parameter lists for quick reference. It includes the following sections:

- [Parameters Overview, page 6-1](#)
- [Parameter Quick Reference, page 6-2](#)
- [Filter the Parameter List, page 6-15](#)
- [Restoring Default Parameter Values, page 6-16](#)
- [Saving Parameters, page 6-17](#)
- [Testing Parameter Changes, page 6-17](#)

Parameters Overview

Each channel has an associated list of parameters that determines how the channel monitors video feeds. You can access the parameter list by hovering your mouse over a channel snapshot in the Home page, and then selecting **Adjust Parameters**. A snapshot of the channel appears on the parameter list to remind you of which channel's values you are modifying.

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


You should only make changes to the parameter values if you have one of the problems covered in the troubleshooting (see [“Parameter Quick Reference” section on page 6-2](#)) and the problem cannot be corrected using any other method, such as adjusting the rule or changing a camera contrast setting. For troubleshooting information, see the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

For instance, an occasional false Camera Tamper event detection would not be a sufficient justification for making a parameter change that would turn off all Camera Tamper alerts. Making such a parameter change would cause you to miss all the real Camera Tamper alerts that notify you that the camera has been moved or covered.

It is essential that you consult the appropriate troubleshooting section before modifying the parameter. The section lists the acceptable values, dependencies, and side effects associated with the parameter. There are also a few parameters that just turn on or off specific functionality.

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 the  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. For a listing of each parameter default value, see the [“Default Parameter Values” section on page 6-12](#).
- When you change a value and click outside of the value field, the value becomes bold to indicate that a change has been made. The troubleshooting section indicates whether you need to change multiple parameters at a time or only one parameter at a time. Values are not applied to the channel until they are saved.

For more information about Parameter page functionality, see the following sections:

- [Filter the Parameter List, page 6-15](#)
- [Restoring Default Parameter Values, page 6-16](#)
- [Saving Parameters, page 6-17](#)
- [Testing Parameter Changes, page 6-17](#)

Parameter Quick Reference

This section summarizes troubleshooting sections related to parameters. Before modifying any parameters, be sure that you have looked at the other troubleshooting options in the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#).

The beginning of this section lists all the troubleshooting sections in which parameters are used as part of the solution. The sections are divided into categories of problems (Bad Signal, False Alarms, etc.).

This section also lists the parameters that are commonly used for troubleshooting by parameter number.



Note

Depending on your version of the Video Analytics Device, it is possible that you will see a different parameter list on the Parameter page.

Only modify undocumented parameters if instructed to do so by your system integrator or customer support. The [“Default Parameter Values” section on page 6-12](#) lists the default value for each individual parameter.

It is essential that you consult the troubleshooting section before modifying the parameter. The section lists the acceptable values, dependencies, and side effects associated with the parameter.

This section includes the following topics:

- [Parameters by Troubleshooting Category, page 6-3](#)
- [Parameters by Number, page 6-4](#)
- [Rarely Used Parameters, page 6-12](#)
- [Default Parameter Values, page 6-12](#)

Parameters by Troubleshooting Category

Table 6-1 lists all the troubleshooting sections in which parameters are used as part of the solution. The sections are divided into the following problem categories:

- [Bad Signal and Contrast, page 6-3](#)
- [Counting, page 6-3](#)
- [False Alarms, page 6-3](#)
- [Image Stabilization, page 6-3](#)
- [Objects, page 6-4](#)
- [Channel Status/Views, page 6-4](#)
- [Other, page 6-4](#)

Table 6-1 *Parameters by Troubleshooting Category*

Category	Troubleshooting Section	Parameter(s)
Bad Signal and Contrast	How to Adjust Bad Signal Sensitivity, page 8-40	14
	How to Adjust Contrast Sensitivity, page 8-38	1, 2, 3
	How to Turn On and Off Bad Signal Status for Contrast, page 8-41	13
Counting	How to Adjust Camera Settings for People-Only Classification, page 8-33	141, 142, 143, 144, 145
	How to Adjust Counting Sensitivity, page 8-35	1, 2, 3, 146-152
	How to Specify a Duration People Are Usually Stationary, page 8-37	153, 154
	How to Turn On and Off People-Only Classification, page 8-32	16, 20, 103, 134, 135, 140
	How to Improve Dwell Time Data Results, page 8-38	187
False Alarms	How to Adjust Contrast Sensitivity, page 8-38	1, 2, 3
	Reduce False Alarms at Coastline, page 8-4	17, 18
	Reduce False Alarms from Shadows, page 8-14	1, 2, 3
	Reduce Taken Away False Alarms, page 8-15	66, 67
	How to Turn On and Off People Verification, page 8-42	98, 191
	Reduce Duplicate Alerts, page 8-13	87, 88, 89
Image Stabilization	How to Improve Image Stabilization in Busy Scenes, page 8-66	172
	How to Adjust Pixel Border for Image Stabilization, page 8-65	173
	How to Turn Image Stabilization On and Off, page 8-64	103

Table 6-1 *Parameters by Troubleshooting Category (continued)*

Category	Troubleshooting Section	Parameter(s)
Objects	How to Adjust the Minimum Object Detection Size, page 8-44	5, 6, 64
	How to Adjust the Stationary Object Monitoring Time, page 8-45	118
	Change Video Tripwire and Ground Plane Event Triggering, page 8-16	91
	How to Make Whole Object Appear in Snapshot, page 8-45	29
	How to Prevent Unknown View/Camera Tamper for Large Objects, page 8-46	9, 10, 31
	How to Specify Active or Passive for Anything Objects, page 8-47	68
	Specify Width and/or Height for Size Filters, page 8-26	75, 76
Channel Status/Views	How to Adjust View Sensitivity, page 8-49	9, 10, 31
	How to Turn on Automatic View Forcing, page 8-58	11, 19, 46
	How to Stop Automatic View Forcing, page 8-57	11, 19, 46
	How to Distinguish Between Similar Views, page 8-53	55 or 10
	How to Improve Known View Recognition, page 8-54	10
	How to Improve Unknown View Recognition, page 8-54	55
	How to Minimize Unknown Views without Automatic Forcing, page 8-56	93
	How to Adjust View Matching When in an Unknown View, page 8-51	104, 184
	How to Prevent Unknown View/Camera Tamper for Large Objects, page 8-46	9, 10, 31
	How to Shorten Downtime After View Change, page 8-55	27, 28
Other	How to Detect Noise in Video Signal, page 8-67	16
	How to Turn On and Off Enhanced Night Snapshots, page 8-68	95

Parameters by Number

Table 6-2 lists the parameters commonly used for troubleshooting and the sections that reference them.


Note

Because this list contains only the commonly used parameters, additional parameters may appear on the Parameter page. Do not modify these parameters unless instructed to do so by customer support.

Table 6-2 *Parameters by Number*

Parameter	Description	Troubleshooting sections of Interest
1	Recommended range 6-20. Decrease to detect more low contrast objects.	Reduce False Alarms from Shadows, page 8-14 How to Adjust Contrast Sensitivity, page 8-38 How to Adjust Counting Sensitivity, page 8-35
2	Recommended range 3-10. Decrease to detect more low contrast objects.	Reduce False Alarms from Shadows, page 8-14 How to Adjust Contrast Sensitivity, page 8-38 How to Adjust Counting Sensitivity, page 8-35

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of interest
3	Recommended range 0-50. Decrease to detect more low contrast objects.	Reduce False Alarms from Shadows, page 8-14 How to Adjust Contrast Sensitivity, page 8-38 How to Adjust Counting Sensitivity, page 8-35
5	Recommended range 30-200. Continuous area (in pixels) large enough to be an object.	How to Adjust the Minimum Object Detection Size, page 8-44
6	Recommended range 10-150. Minimum size (in pixels) an object must be in order to be classified. Objects smaller than this size are considered transient objects.	How to Adjust the Minimum Object Detection Size, page 8-44
9	Recommended range .04-.09. Percentage (0.4 = 40%) of how much of the view must change for the device to consider it a totally different view. Increase to reduce the number of Camera Tamper events and view changes.	How to Prevent Unknown View/Camera Tamper for Large Objects, page 8-46 How to Adjust View Sensitivity, page 8-49
10	Recommended range .01-.09. Sets a percentage (.01 = 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.	How to Improve Known View Recognition, page 8-54 How to Prevent Unknown View/Camera Tamper for Large Objects, page 8-46 How to Distinguish Between Similar Views, page 8-53 How to Adjust View Sensitivity, page 8-49
11	Enables or disables Camera Tamper detection.	How to Turn on Automatic View Forcing, page 8-58 How to Stop Automatic View Forcing, page 8-57
13	Enables or disables the device's ability to detect contrast problems and report Bad Signal.	How to Turn On and Off Bad Signal Status for Contrast, page 8-41
14	Recommended range 1-10. 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).	How to Adjust Bad Signal Sensitivity, page 8-40
16	Enables or disables the detection of noisy imagery.	How to Detect Noise in Video Signal, page 8-67 How to Turn On and Off People-Only Classification, page 8-32
17	Enables or disables the tide filter. If the filter is enabled, no objects are detected in the area specified in Parameter 18.	Reduce False Alarms at Coastline, page 8-4
18	Specifies the direction from which water enters the view when a tide filter (Parameter 17) is turned on.	Reduce False Alarms at Coastline, page 8-4
19	Recommended range 1-30. How often (in seconds) the device checks whether the view is known. Do not modify if using People-Only Classification.	How to Turn on Automatic View Forcing, page 8-58 How to Stop Automatic View Forcing, page 8-57
20	Enables or disables Irregular shape or motion filters. You can add filters during rule creation.	How to Turn On and Off People-Only Classification, page 8-32

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of Interest
24	One of the parameters that determines how long (in seconds) the device has to detect motion.	Rarely Used Parameters, page 6-12
27	Recommended range 2-3.5. Used to control the amount of time it takes for the channel to warm up. Multiply this parameter value by two to determine the number of seconds of delay (a value of 3.5 is 7 seconds of delay). Reduce this value to shorten the channel downtime after a view change.	How to Shorten Downtime After View Change, page 8-55
28	Recommended range 8-25. The initial value of pixels in the background model. Reduce this value to shorten the channel downtime after a view change.	How to Shorten Downtime After View Change, page 8-55
29	Recommended range 0-2. How long (in seconds) the device should wait to report an Appear event. Increasing the time may result in a more informative alert snapshot, but it will also delay notification of the event.	How to Make Whole Object Appear in Snapshot, page 8-45
31	Recommended range .01-1. How much (.01 = 1%) a view can move or jitter from the original position in any direction without a view change.	How to Prevent Unknown View/Camera Tamper for Large Objects, page 8-46 How to Adjust View Sensitivity, page 8-49
46	One of the parameters that determines whether a camera always remains in a known view (besides camera warm-up).	How to Turn on Automatic View Forcing, page 8-58 How to Stop Automatic View Forcing, page 8-57
55	Recommended range -0.5 to -0.01. Helps distinguish between similar views if the channel is in a known view. If two similar views are being identified as the same view, increase the value. A negative value represents a percentage of the view (example -0.5 equals 50% of the view).	How to Improve Unknown View Recognition, page 8-54 How to Distinguish Between Similar Views, page 8-53
63	Recommended range 1-5. Amount of time (in seconds) an object is stationary before it is considered part of the background.	Rarely Used Parameters, page 6-12
64	Recommended range 30-200. Smallest object size (in pixels) that can be detected and monitored as being stationary.	How to Adjust the Minimum Object Detection Size, page 8-44
66	Control-click to select multiple options. Determines what conditions must first exist before Taken Away events are detected. Objects must: be first inserted for a minimum time (set time in Parameter 67), detected as Left Behind by an active rule, and/or have never been seen before.	Reduce Taken Away False Alarms, page 8-15
67	Recommended value of 10 or greater. If Inserted for Minimum Time is selected for Parameter 66, Parameter 67 determines the minimum time (in seconds) before an object could be detected by a Taken Away rule.	Reduce Taken Away False Alarms, page 8-15

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of Interest
68	Specifies whether only Active objects (an object that moves on its own, such as a parked car), only Passive objects (an object that does not move on its own, such as a bag a person has Left Behind), or all Active and Passive objects are detected when an Anything classification is selected for the rule.	How to Specify Active or Passive for Anything Objects, page 8-47
73	One of the settings that determines how the device handles objects that split apart (i.e., a dog that runs away from an owner). Select Reduce false alarms if there are many false alarms caused by new objects splitting from existing objects and alerts are already being generated for the parent object. This setting may miss separate events caused by split objects (like a dog or child that runs away from an adult and causes an event of their own).	Rarely Used Parameters, page 6-12
75	Determines whether an object must be GREATER than the maximum rectangle (drawn when a filter is created) in both width AND height, or if only exceeding one dimension (width OR height) is enough reason to filter out the object.	Specify Width and/or Height for Size Filters, page 8-26
76	Determines whether an objects must be SMALLER than the minimum size rectangle (drawn when a filter is created) in both width AND height, or if only exceeding one dimension (width OR height) is enough reason to filter out the object.	Specify Width and/or Height for Size Filters, page 8-26
86	If an object that appears in an area of interest ceases to exist before the reporting latency time elapses (Parameter 29), this setting determines if the channel should still report that an event has occurred. This parameter is relevant only when Parameter 29 is not set to 0.	Rarely Used Parameters, page 6-12
87	The same object re-crossing a video tripwire within this time period (in seconds) is not reported. Decrease to detect more events. Decreasing this parameter may result in false alarms when an object repeatedly crosses a video tripwire. Increase the value to reduce the number of alerts caused by the same object crossing the video tripwire within a short period of time.	Reduce Duplicate Alerts, page 8-13
88	The same object re-entering or re-exiting an area of interest within this time period (in seconds) is not reported. Decrease to detect more events. Decreasing this parameter may result in false alarms when an object repeatedly enters/exits the area of interest. Increase to reduce the number of alerts caused by the same object entering/exiting within a short period of time.	Reduce Duplicate Alerts, page 8-13

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of Interest
89	Specifies how much time needs to elapse between the end of a Taken Away, Left Behind, or Inside event and the start of a new event by the same object in order for the second event to be considered a separate event. Increase the duration to detect fewer events (missed detections may result). Decrease to detect more events (false alarms may result).	Reduce Duplicate Alerts, page 8-13
90	How confident the device has to be about object classification. This confidence is expressed as a threshold (percent of confidence, .4 = 40%). For example, the device may determine that 55% of an object has the characteristics of a human and 45% the characteristics of a vehicle. If that object crosses a video tripwire and an active rule detects vehicles crossing the video tripwire, the object crossing the video tripwire would generate an event because the device was at least 40% (by default) certain the object was a vehicle. Increasing the value may result in fewer false alarms based on misclassification, but it also may cause you to miss some events.	Rarely Used Parameters, page 6-12
91	When using rules involving a video tripwire or an area of interest with a ground plane, this value determines what part of the object should trigger the event.	Change Video Tripwire and Ground Plane Event Triggering, page 8-16
93	Recommended range .01-.05. For channels in a known view, sets the maximum offset (0.01 = 1%) that determines if a particular frame of video matches the current view. Increase if the view becomes unknown when the video feed does not really change. Decrease if two video feeds are being identified as the same view. In order for Parameter 93 to influence view behavior, it must have a smaller absolute value than Parameter 55.	How to Minimize Unknown Views without Automatic Forcing, page 8-56
95	Enables or disables the capability for night enhanced snapshots. When an alert is generated at night, a nighttime snapshot of the camera's field of view displaying the event is transposed over a daytime snapshot of the camera's field of view. You can only enable this feature if it is allowed by your license.	How to Turn On and Off Enhanced Night Snapshots, page 8-68
96	How well humans are classified.	Rarely Used Parameters, page 6-12
97	Determines whether all objects are classified as people or unknown.	Rarely Used Parameters, page 6-12
98	Notifies the device whether the camera is located indoor or outdoor. If set to indoor, the device assumes people are closer to the camera than people in an outside view.	How to Turn On and Off People Verification, page 8-42

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of interest
103	Enables and disables Image Stabilization. Image Stabilization mitigates the effects of camera jitter by compensating for slight variations in the camera view. You can only enable this feature if it is allowed by your license.	How to Turn On and Off People-Only Classification, page 8-32 How to Turn Image Stabilization On and Off, page 8-64
104	Recommended range -0.05 or -0.01. Sets the area of the current live feed (as a percentage, -0.01=1%) that must be searched when matching the current view with a recognized, existing view in the system. A higher percentage results in a stricter match.	How to Adjust View Matching When in an Unknown View, page 8-51
118	Recommended range 0-3600. Determines the maximum duration (in seconds) a stationary object is monitored. Side effects may occur if you raise this value above the recommended range.	How to Adjust the Stationary Object Monitoring Time, page 8-45
135	Enables or disables object classification and the capability to use Shape and Direction filters. Do not enable this parameter if you are using People-Only Classification.	How to Turn On and Off People-Only Classification, page 8-32
140	Enables or disables People-Only Classification. Only modify this setting if you are using an Event Counting channel.	How to Turn On and Off People-Only Classification, page 8-32
141	When People-Only Classification is enabled, sets the distance (in feet) from the camera center to the ground. This value is determined automatically via calibration.	How to Adjust Camera Settings for People-Only Classification, page 8-33
142	When People-Only Classification is enabled, sets the camera tilt-up angle (in degrees). The angle for a camera looking straight down is 0 degrees. This value is determined automatically via calibration.	How to Adjust Camera Settings for People-Only Classification, page 8-33
143	When People-Only Classification is enabled, sets the camera CCD width (in millimeters). This value is determined automatically via calibration.	How to Adjust Camera Settings for People-Only Classification, page 8-33
144	When People-Only Classification is enabled, sets the camera CCD height (in millimeters). This value is determined automatically via calibration.	How to Adjust Camera Settings for People-Only Classification, page 8-33
145	When People-Only Classification is enabled, sets the camera focal length (in millimeters). This value is determined automatically via calibration.	How to Adjust Camera Settings for People-Only Classification, page 8-33
146	Recommended range: 0.6-0.9. Helps determine counting sensitivity. If an object's size is LESS than this percentage (.75 = 75%) of an average human size, it will be ignored. The average human size is determined by calibration. Increase to reduce detection of small, noisy objects. Decrease if actual people are not being detected.	How to Adjust Counting Sensitivity, page 8-35

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of Interest
147	Recommended range: 1.1-1.4. Helps determine counting sensitivity. If an object's size is LESS than this percentage (1.25 = 125%) of an average human size (determined by calibration), it may be merged with other objects to create a larger object. If it is greater than the size specified, it will not be merged. Increase if smaller parts of people, such as a hand, are counted as separate objects. Decrease if multiple people are detected as one object.	How to Adjust Counting Sensitivity, page 8-35
148	Recommended range: 0.15-0.4. Helps determine counting sensitivity. If the part of an object in motion is GREATER than this percentage (0.25 = 25%) of the average human size (determined by calibration), a new object is created by splitting off from the original object. Decrease to encourage splitting and correct undercounting. Increase to discourage splitting and correct over-counting.	How to Adjust Counting Sensitivity, page 8-35
149	Recommended range: 0.3-0.75. Helps determine counting sensitivity. If the foreground area of an object is GREATER than this percentage (0.5 = 50%) of the average human size (determined by calibration), a new object is created. Decrease to detect smaller size people. Increase to reduce detection of small, noisy objects.	How to Adjust Counting Sensitivity, page 8-35
150	Recommended range: 0.1-0.45. Helps determine counting sensitivity. If the foreground area of an object is greater than this percentage (0.25 = 25%) of the average human size (determined by calibration), a new object is created. Decrease to detect more slowly moving or close-to-stationary objects. Increase to reduce detection of small, noisy objects.	How to Adjust Counting Sensitivity, page 8-35
151	Recommended range: 1.3-1.9. Helps determine counting sensitivity. If an object's size is GREATER than this percentage (1.6 = 160%) of the average human size (determined by calibration), it may be split from another object to create two smaller objects. If the size is smaller, it is not split. Increase if smaller parts of people, such as a hand, are causing over-counting. Decrease if multiple people are counted as one object.	How to Adjust Counting Sensitivity, page 8-35
152	Recommended range: 0.1-0.5. Helps determine counting sensitivity. When People-Only Classification is enabled, this parameter sets the time (in seconds) an object must be visible before it is recognized as an object of interest.	How to Adjust Counting Sensitivity, page 8-35
153	Recommended range: 0-60. When People-Only Classification is used, sets the minimum time (in seconds) stationary objects are definitely monitored. The time stationary objects are monitored is between Parameter 153 and Parameter 154, so Parameter 153 must be lower than Parameter 154.	How to Specify a Duration People Are Usually Stationary, page 8-37

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of Interest
154	Recommended range: 1-600. When People-Only Classification is used, sets the maximum time (in seconds) stationary objects are definitely monitored. The time stationary objects are monitored is between Parameter 153 and Parameter 154, so Parameter 154 must be higher than Parameter 153.	How to Specify a Duration People Are Usually Stationary, page 8-37
160	Recommended range: 3-9. Smallest object size (in pixels) that can be detected and monitored as stationary.	Rarely Used Parameters, page 6-12
172	Recommended range: 30-150. Controls how many points are used to stabilize an image when Image Stabilization is enabled. Increase in busy scenes.	How to Improve Image Stabilization in Busy Scenes, page 8-66
173	Recommended range: 1-8. Defines the maximum amount of camera jitter (in pixels) that Image Stabilization can compensate for. The value specifies the number of pixels that are ignored around the border of the camera's field of view. You cannot detect events in this area. Increase to make it less likely that camera jitter will cause a Camera Tamper event.	How to Adjust Pixel Border for Image Stabilization, page 8-65
178	Recommended range: 3-3.5. Adjusts the device's sensitivity for edge detection. Edges are the outline of objects in the field of view (curbs, line markers, etc.). Increase if the device is confusing views with similar edges.	Rarely Used Parameters, page 6-12
182	Determines how frequently (in seconds) the device should check for a Bad Signal.	Rarely Used Parameters, page 6-12
184	Recommended range: .02-1. For channels in an unknown view, this sets the maximum percentage offset (.01 = 1%) that determines if the current view matches a stored view. Increase if the view remains unknown when it should be recognized as known.	How to Adjust View Matching When in an Unknown View, page 8-51
187	Objects that Dwell for less than this duration (in seconds) are not counted.	How to Improve Dwell Time Data Results, page 8-38
191	Enables or disables People Verification. Turning on People Verification improves the device's ability to identify and properly classify people. It significantly reduces false alarms caused by other types of objects. You cannot enable this feature on Event Counting channels.	How to Turn On and Off People Verification, page 8-42
192	Disabling the Head Detector saves processing time per video frame, but humans may not to be classified with as much confidence. Your tracker type may not allow you to modify this setting.	Rarely Used Parameters, page 6-12
198	Increase to make it more likely objects will be considered stationary and generate a Left Behind event. Decrease to reduce false alarms for Left Behind events.	Rarely Used Parameters, page 6-12

Table 6-2 *Parameters by Number (continued)*

Parameter	Description	Troubleshooting sections of Interest
199	Decrease to make it more likely objects will be considered stationary and generate a Left Behind event. Increase to reduce false alarms for Left Behind events.	Rarely Used Parameters, page 6-12
200	Increase to make it more likely objects will be considered stationary and generate a Left Behind event. Decrease to reduce false alarms for Left Behind events.	Rarely Used Parameters, page 6-12
201	Increase to make it more likely objects will be considered stationary and generate a Left Behind event. Decrease to reduce false alarms for Left Behind events.	Rarely Used Parameters, page 6-12
202	Decrease to reduce Left Behind false alarms caused by high contrast problems. Increase to detect more stopped objects (may result in more false alarms).	Rarely Used Parameters, page 6-12
203	Minimum size requirement for stationary objects in pixels. Decrease to detect smaller objects (may cause more false alarms). Increase to reduce false alarms from small objects (may cause missed detections).	Rarely Used Parameters, page 6-12

Rarely Used Parameters

This parameter rarely requires adjustment. In most cases, you should only modify this parameter if you are instructed to do so by customer support.

Default Parameter Values

The default value for each parameter is listed below. For information on how to set an individual parameter or all parameters to their default values, see the [“Restoring Default Parameter Values” section on page 6-16](#).



Note

Depending on your version of the Video Analytics Device, it is possible that you will see a different parameter list and default values on the Parameter page. In this case, refer to the Default values that appear next to each modified parameter on the Web Console to determine the original values.

Table 6-3 *Default Parameter Values*

Parameter	Default Value	Requires Restart
1	12	
2	6	
3	30	
5	50	
6	10	
9	0.4	

Table 6-3 **Default Parameter Values (continued)**

Parameter	Default Value	Requires Restart
10	0.75	
11	Enable Camera Tamper (OnBoard) Disable Camera Tamper (Event Counting)	
13	Detect contrast problems	
14	10	
16	Disable noise detection	
17	Disable tide filter	X
18	None	X
19	30 (OnBoard) 157680000 (Event Counting)	
20	Enable Irregular Shape or Motion filters (OnBoard) Disable Irregular Shape or Motion filters (Event Counting)	
24	1.5	X
27	3.5	
28	25	
29	1	
31	0.01	
46	Always remain in known view (Event Counting) Allow unknown view (OnBoard)	
55	-0.05	
63	1	
64	50	
66	Inserted for Minimum Time, Never Seen Before	
67	10	
68	Passive	
73	Detect missed events from split objects	
75	Width OR Height	
76	Width AND Height	
78	0.15	
79	0.65	
80	0.95	
81	0.28	
82	0.0	
83	0.0	
84	0.0	

Table 6-3 *Default Parameter Values (continued)*

Parameter	Default Value	Requires Restart
86	Report	
87	1	
88	1	
89	1	
90	0.4	
91	Footprint	
93	0.03	
95	Disable night enhancement	X
96	Improved classification for humans	
97	People Verification disabled	
98	Indoor	
103	Disable Image Stabilization	X
104	-0.75	
118	1800	
134	Enable pixel grouping	
135	Enable object classification (OnBoard) Disable object classification (Event Counting)	
140	Disable People-Only Classification (OnBoard) Enable People-Only Classification (Event Counting)	X
141	12	X
142	0	X
143	4.8	
144	3.6	
145	2.8	X
146	0.75	
147	1.25	
148	0.25	
149	0.5	
150	0.25	
151	1.6	
152	0.25	
153	10	
154	150	
155	False	
156	0.3	

Table 6-3 *Default Parameter Values (continued)*

Parameter	Default Value	Requires Restart
157	50	
158	100	
159	8	
160	6	
172	25	X
173	5	
178	3	
179	0.1	
180	1	
182	30	
183	60	X
184	0.01	
185	0.0667	
187	2	
190	2	
191	Disable People Verification	
192	Enable Head Detector	
194	10	
197	0	
198	0.02	
199	0.95	
200	0.02	
201	3	
202	0.5	
203	50	

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**.



Note

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.


Note

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 [Figure 6-1](#)). For more information, see the “[Restoring Default Parameter Values](#)” section on page 6-16.

Figure 6-1 Parameter Displaying Current and Default Values




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).

Restoring 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. You can do either of the following to restore a parameter to its default value.

- If a parameter value is not default, the Reset icon  appears on the parameter list. Click this icon to automatically restore the parameter value.
- Click the **Reset All to Default** button to set every parameter to the default value for the channel.

**Note**

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

Saving 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.

Testing 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 section 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 section 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.

Read the parameter troubleshooting section carefully for information about these interactions.

If the changes you make do not improve the system performance, see [“Restoring Default Parameter Values” section on page 6-16](#) for information on how to set the parameters back to their default values.



CHAPTER 7

Calibration

This chapter describes channel calibration and includes the following sections:

- [Calibration Overview, page 7-1](#)
- [Calibrating a Channel, page 7-1](#)
- [About People-Only Classification, page 7-5](#)

Calibration Overview

When you enable People-Only Classification for a channel, you must calibrate the channel so that it understands the average size of a person that appears in the camera field of view. This is how the system knows how large of an object to consider one person. You must position a box around at least three representative people (or one person in three different positions) during calibration. If you wish, you can use more than three boxes to improve system performance.

After you have identified the size of a typical person by drawing boxes in the camera's field of view, the system infers the approximate size of people in three dimensional space throughout the view. The device may ignore objects that are significantly smaller than the average object size. The device may count objects that are larger than the average object size as two or more people.

Calibrating for People-Only Classification requires some preparation, and it frequently involves more than one person. It is best if at least one person is in front of the camera while another sets up the calibration.



Note

If you do not receive the counts you expect after calibration, see the [“Improve Counting Results” section on page 8-30](#)





Calibrating a Channel

- Step 1** Do one of the following to access the Calibration page:
- From the Device Configuration window, Click **Calibrate**.
 - From the Rule Management drawer, click **Calibrate Channel**.
- Step 2** Position a standing person in the field of view.


**Note**

It may be helpful to play the video when a person is moving into position, and then pause the video when you are ready to draw boxes around the person. For more information, see the [“Playing or Pausing Video” section on page 4-7](#).

For the best results, follow all these guidelines when calibrating:

- Always calibrate using *standing* people. Even if the people in your field of view are usually sitting, use standing people during the calibration.
- The camera view must be large enough for each object to be tracked for a meaningful amount of time before the object triggers an event. If the object is not tracked long enough before it crosses a video tripwire or enters an area of interest, the person may not be counted. The longer the device is able to track the person before it triggers an event, the better the counting results. To maximize the amount of time the object is in view, rules should be drawn in the middle or near the middle of the camera multi- field of view, rather than at or near the view edge. Be sure that occlusions do not jeopardize the camera multi- view of the person as it is counted.
- Select people from different parts of the camera view. For instance, identify a box for a person in the left, right, and center of the field of 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.
- Giving the system consistent references will enable the device to more accurately extrapolate object size information across the view. Therefore, if possible, use the same person when defining each calibration point. If using the same person is not an option, use people of the same height to calibrate each point.
- Select people that are standing on the same 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.
- Use the most common types of people that usually appear in the view. For instance, if you were monitoring a childcare facility, it might be appropriate to calibrate to the size of a child instead of an adult.
- Place the head and feet crosshairs with care. The crosshairs in the circle  represents the top and center of the head. This is not usually the same as placing the circle around the person's face. The crosshairs in the square  represents the bottom of the person (usually between the feet). Confusing these two settings will result in a poor calibration. Keep in mind that, depending on the angle of the camera, the head may appear above the feet in the camera's view.
- It may be easiest to calibrate if the entire person (head and feet) is visible. If this is not the case, move the box and crosshairs to the approximate location of where you think the head and feet would be located. For instance, if a person is standing behind a counter, you could place the foot marker approximately where you think the feet would be.
- If you decide you want to delete a box, use the Select tool  to click inside the box. Click the Delete tool  to remove the box.

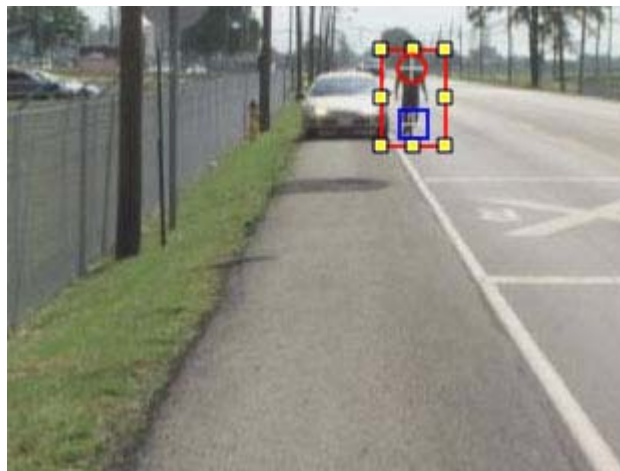
Step 3 Click the Person Drawing tool , and then resize the red box over the person.

You can reposition the entire box by clicking the Select tool , and then dragging the box. As needed, 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).

In the following example, a box appears around a person in a nearly overhead view. The head and feet are not properly identified yet.



In the following example, a box appears around a person in a side view of the camera. The head and feet are not properly identified yet.



Step 4 Drag the crosshairs in the circle directly over the center of the top of the person's head.

If the camera is not directly overhead, you should approximate where the middle and top of the head would be located.

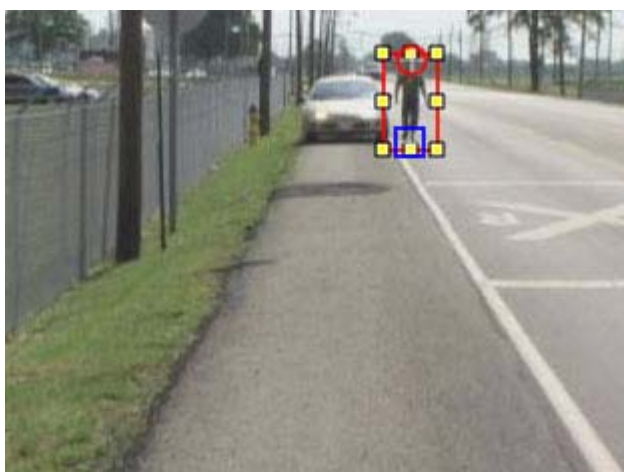
Step 5 Drag the crosshairs in the square directly between the person's feet.

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, very close.

In a nearly overhead view, the head and feet are very close together. Also, notice that in the following example the feet are above the head. Depending on the camera view, the head may be above or below the feet.



The following example shows the head and feet crosshairs properly positioned in a side view of the camera.



Step 6 Do one of the following:

- If you have not positioned all three boxes, you need to continue calibrating. Move the person in the camera's field of view to another location, or identify another person in camera's view for calibration. Return to step 3 to repeat this procedure for the new position.

The following example shows a complete calibration with three people identified:



- If you have drawn three boxes in separate positions, you can continue to draw boxes (see step 3) or continue to step 7 to apply your changes.

You only have to position three calibration boxes, but you may find that you can get better results by adding additional boxes. You may want to try drawn another box or two in order to troubleshoot inaccurate counting results. If you add more boxes, you are more likely to cover additional areas of the camera view. If people are more dispersed in the camera's view, a better calibration will result. Also, more samples will provide a more accurate definition of the average size of a person.

Step 7 Do one of the following:

- Click **Cancel** to close the page without saving changes.
- Click **Clear** to remove all existing calibration boxes from the camera view snapshot.
- Click **Save**. Be aware that no events will be detected while the device restarts.

About People-Only Classification

People-Only Classification is turned on in the Device Configuration page. This feature improves the accuracy of counting results. It also enables occupancy and dwell rule types for advanced Event Counting channels. People-Only Classification is only available for Event Counting channels.

When People-Only Classification is turned on, you will only have an object choice of person when you create the rule. Inaccurate event counts may result for other object types that enter the camera's field of view (such as vehicles). For this reason, you should not select this option if objects other than people appear in the part of the camera view you are monitoring for events. Since there tends to be fewer occlusions (other objects blocking people) in an overhead camera view, you may receive better results if your camera is placed overhead or nearly overhead.

The guidelines above mean that People-Only Classification is best suited to an indoor view of the camera, but it can also be utilized in outdoor settings where only people are present and the camera position is appropriate. For instance, you could have an overhead camera positioned over a gate to count the number of people entering a park.

When you turn on People-Only Classification, you must calibrate the channel to the size of an average object that appears in the camera's field of view. This tells the device the size of an object to count as one person. For more information, see the [Chapter 7, “Calibration.”](#)

Turning on People-Only Classification significantly impacts how the system classifies objects and detects events. Keep in mind the following effects of using People-Only Classification:

- **Rules:** Any rules that are currently applied to the channel are permanently deleted when you turn People-Only Classification on or off. If you are using a counting plus license, occupancy and dwell event types become available.
- **Camera Views:** If the camera's field of view changes, the channel will automatically start monitoring the new view. You will not be notified if a channel's field of view changes. This is called Auto-force views.
- **Object Classification:** The device identifies all objects as people. The size of a person is determined by the People-Only Classification calibration. As a result, if you had People-Only Classification turned on when a vehicle enters the camera field of view, the system may count the object as multiple people. For this reason, only use this type of classification when people are the only object type in the area you are monitoring.
- **Image Stabilization:** Since stabilization is automatically incorporated into this kind of event detection, the Image Stabilization feature will no longer be used. For more information, see the [“How to Turn Image Stabilization On and Off” section on page 8-64.](#)
- **Do not use People Verification with People-Only Classification.** For more information, see the [“How to Turn On and Off People Verification” section on page 8-42.](#)
- **Object Filters:** All filters are disabled when People-Only Classification is used. Calibration replaces the need for filters.

If you do not receiving the results you expect using People-Only Classification, see the [“Improve Counting Results” section on page 8-30.](#)



CHAPTER 8

Troubleshooting Overview

This chapter includes the following sections:

- [False Alarms and Missed Events, page 8-1](#)
- [Counting Issues, page 8-29](#)
- [Contrast Issues, page 8-38](#)
- [Object Issues, page 8-42](#)
- [View Troubleshooting, page 8-48](#)
- [Analytics Management Console Troubleshooting, page 8-60](#)
- [Other Issues, page 8-64](#)
- [Missed Events Troubleshooting, page 8-27](#)
- [False Alarm Troubleshooting, page 8-2](#)
- [Improve Counting Results, page 8-30](#)



Note

For some advanced troubleshooting, you may need to use parameters. For a categorized list of troubleshooting sections that require the use of parameters, see the [“Parameter Quick Reference” section on page 6-2](#).

False Alarms and Missed Events

This section includes the following troubleshooting topics that pertain to false alarms and missed events:

- [False Alarm Troubleshooting, page 8-2](#)
- [Reduce False Alarms at Coastline, page 8-4](#)
- [Improve Rule Configuration, page 8-5](#)
- [Reduce Duplicate Alerts, page 8-13](#)
- [Reduce False Alarms from Shadows, page 8-14](#)
- [Reduce Taken Away False Alarms, page 8-15](#)
- [Change Video Tripwire and Ground Plane Event Triggering, page 8-16](#)
- [Choose the Correct Event Type, page 8-20](#)
- [Camera Placement Considerations and Workarounds, page 8-22](#)

- [Camera Hardware Considerations, page 8-24](#)
- [Insufficient Lighting, page 8-25](#)
- [Specify Width and/or Height for Size Filters, page 8-26](#)
- [Missed Events Troubleshooting, page 8-27](#)

False Alarm Troubleshooting

Summary

You receive too many alerts or the system is counting too many events. When too many events are detected, the excess events can be considered either false alarms or nuisance alarms.

A false alarm occurs when an event is detected even though it does not correspond to a created rule (e.g., detecting a vehicle crossing a video tripwire when a rule is set to only detect people). The software has a very low false alarm rate.

Nuisance alarms occur when an event is triggered that you do not desire, but is consistent with your rule settings. An example of a nuisance alarm is creating a rule to detect any object that enters the view, and then receiving constant alerts for cars on a busy highway behind the area you want to monitor.

Solution

This section provides guidelines for decreasing the number of unwanted events detected, regardless of whether they are false or nuisance alarms.



Note

If you are counting events, see the [“Improve Counting Results” section on page 8-30](#) for troubleshooting specific to counting inaccuracies.

Consider the following when minimizing the number of unwanted events:

- [Rule Configuration, page 8-2](#)
- [Environment and Scene, page 8-3](#)

Rule Configuration

- You may have set up a rule that is not appropriate for the types of events you want the system to detect. For advice on selecting the correct rule type, see the [“Choose the Correct Event Type” section on page 8-20](#). To review the full list of event types, see [Chapter 5, “Events and Objects.”](#) If you need to create a new rule, see the [“Creating or Editing a Rule” section on page 4-2](#).
- You may have chosen the right type of event, but you may not have configured it properly. For event-specific troubleshooting, see the [“Improve Rule Configuration” section on page 8-5](#).
- The system may be mis-classifying objects based on how they appear in the camera view.
 - Try using a different combination of object types when you create the rule. For instance, you could try detecting Person instead Anything. For more information, see the [“Object Types” section on page 5-2](#).
 - If you are using People-Only Classification, the system assumes all objects are people. For more information, see the [“Improve Counting Results” section on page 8-30](#).

- If you only need to detect people and it is very important that there are no false alarms, you may be able to use People Verification. For more information, see the [“How to Turn On and Off People Verification”](#) section on page 8-42.
 - You can adjust whether Anything objects are considered active or passive to detect only events of a certain type. For more information, see the [“How to Specify Active or Passive for Anything Objects”](#) section on page 8-47.
- Try creating object filters to eliminate objects that are not real objects of interest. For more information, see the [“Filters Overview”](#) section on page 4-22. For example:
 - If you are detecting too many events involving large objects, check to see if a maximum size filter is present, and if so, decrease the maximum size of detectable objects. For more information, see the [“Minimum and Maximum Size Filters”](#) section on page 4-28. You can also adjust the system's response to large objects using the instructions in the [“How to Prevent Unknown View/Camera Tamper for Large Objects”](#) section on page 8-46.
 - If you are detecting too many events involving small objects, check to see if a minimum size filter is present, and if so, increase the minimum size of detectable objects. For more information, see the [“Minimum and Maximum Size Filters”](#) section on page 4-28. You may also want to adjust the parameter setting described in the [“How to Adjust the Minimum Object Detection Size”](#) section on page 8-44.
- If you think the system is monitoring stationary objects too long, see the [“How to Adjust the Stationary Object Monitoring Time”](#) section on page 8-45.
- If you are receiving multiple alerts for the same object in a short period of time, see the [“Reduce Duplicate Alerts”](#) section on page 8-13.
- Video tripwires and ground plane areas of interest typically assume that for an event to occur, the bottom of the object must intersect with the video tripwire or area of interest. By default, the point of intersection is the footprint. Specifically, the footprint is the midpoint of the bottom edge of the object. If this setting is causing you to detect too many events, you can change the requirement by following the instructions in the [“Change Video Tripwire and Ground Plane Event Triggering”](#) section on page 8-16.

Environment and Scene

Factors in the scene's background may create unique issues. The amount of lighting and light effects such as shadows, glare, and reflections may cause issues. In outdoor environments, weather phenomena such as rain or snow, wind, and foliage can all pose additional challenges to detecting the objects as you intend. When troubleshooting such issues, as a general rule you should first seek to resolve the issue by moving the camera, then by evaluating your rules, then your filters, and finally, your channel configuration.

- The camera may not be placed in the appropriate position to detect events. For a description of some of the factors that should determine the camera view, see the [“Camera Placement Considerations and Workarounds”](#) section on page 8-22. This section also suggests ways to compensate for poor camera position, such as the use of object filters.
- Eliminate any obvious camera occlusions. The angle of the camera affects target occlusion. The general rule is that the more overhead the camera, the less target occlusion and better separation of targets. Conversely, as the camera angle becomes more offset from overhead, other objects and obstacles from the environment are more likely to occlude objects of interest.

- Be sure you test during similar lighting conditions. If you are detecting events you do not wish to detect, pay attention to whether or not the unwanted events tend to occur at a particular time of day. If they do, there may be light-related issues responsible for the detection problems. For more information, see the [“Insufficient Lighting” section on page 8-25](#).
- If you are experiencing false alarms near the edge of the view, try moving the camera so that those events would occur in the center of the view. If this is not possible, try changing your Image Stabilization setting. Image Stabilization is not available on all devices. See your device specification for details, and then for more information, see the [“How to Turn Image Stabilization On and Off” section on page 8-64](#), [“How to Improve Image Stabilization in Busy Scenes” section on page 8-66](#), and [“How to Adjust Pixel Border for Image Stabilization” section on page 8-65](#).
- To improve detection when there is low contrast, shadows, or reflections in the camera view, see the [“How to Adjust Contrast Sensitivity” section on page 8-38](#), [“How to Adjust Bad Signal Sensitivity” section on page 8-40](#), and [“How to Turn On and Off Bad Signal Status for Contrast” section on page 8-41](#).
- The camera view must be large enough for each object to be tracked for a meaningful amount of time before the object triggers an event. If the object is not tracked long enough before the event occurs, the object may not be properly classified.

Reduce False Alarms at Coastline

Summary

A camera field of view has a coastline and the motion of the water lapping the land is causing false alarms.

Solution

On a coastline, the amount of land that is exposed varies significantly according to the tides. During high tide, less land is exposed. During low tide, more land is exposed. The movement of the water can cause false alarms to be generated as the tide moves forward and backward. For instance, a wave may cross a video tripwire at high tide.

You can avoid this problem by turning on the tide filter. When a tide filter is specified, the system attempts to identify where the waves and land meet and ignore events that take place in the water. For this reason, the waves lapping the shore will no longer cause false alarms. You can draw a video tripwire that at high tide covers land and water. Waves lapping the shore will be ignored. As the tide gets lower, more of the video tripwire will be exposed on land.

If you are experiencing false alarms at a coastline, modify the parameter in [Table 8-1](#).

Table 8-1 *Parameter Values for Reducing False Alarms at Coastline*

Parameter Name	Default Value	New Value
Parameter 17	Disable tide filter	Enable tide filter
Parameter 18	None	Left, Right, Top, or Bottom

In Parameter 18, indicate the direction in which water is entering the field of view. For instance, if waves were coming onto the land from the right edge of the view, you would select **Right**. The direction of the waves is an important distinction, because the system will not monitor for events in the water area.

The following snapshot shows a field of view where waves are entering from the right.



False alarms caused by the movement of the water at the coastline will decrease, but no events will be detected on the water side of the coastline. You must determine if it is more important to eliminate nuisance event detection at the coastline or potentially miss events within this area.

You may also be able to eliminate false alarms near a coastline using multi-line tripwires. For an example, see the [“Video Tripwire Events” section on page 5-32](#).

**Note**

Be sure that you change Parameter 17 and Parameter 18 at the same time. Changing only one parameter will not correct the problem, and may cause false or missed alerts.

Improve Rule Configuration

Summary

Tips for creating effective rules.

Solution

There are some principles to keep in mind to maximize rule effectiveness. The following are some general tips, as well as helpful hints specific to different event types:

- [Keep it Simple, page 8-6](#)
- [Test Your Rules, page 8-6](#)
- [Appears in Full View, page 8-6](#)
- [Appears in Area of Interest, page 8-6](#)
- [Disappears from Full View, page 8-7](#)
- [Disappears from Area of Interest, page 8-7](#)
- [Dwell Time Data, page 8-8](#)
- [Dwell Time Threshold, page 8-8](#)
- [Enters Area of Interest, page 8-8](#)
- [Exits Area of Interest, page 8-9](#)
- [Inside Area of Interest, page 8-9](#)
- [Left Behind in Full View, page 8-9](#)
- [Left Behind in Area of Interest, page 8-10](#)

- [Loiters in Area of Interest, page 8-10](#)
- [Multi-Line Video Tripwire, page 8-10](#)
- [Occupancy Data, page 8-11](#)
- [Occupancy Threshold, page 8-11](#)
- [Camera Tamper, page 8-12](#)
- [Taken Away from Full View, page 8-12](#)
- [Taken Away from area of interest, page 8-12](#)
- [Video Tripwire, page 8-12](#)

**Note**

Before looking into any of the following tips, you may need to first check and make sure you are using the event type that best fits your situation. For more information, see the [“Choose the Correct Event Type” section on page 8-20](#).

Keep it Simple

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.

Test Your Rules

You will achieve the best results by testing your newly created rules. Have authorized personnel or vehicles replicate the events you are trying to detect to make sure that the intended events are being detected with a minimal number of unwanted event detections. For more information, see the [“Testing a Rule” section on page 4-4](#).

Appears in Full View

- Consider setting up your Appears events so that they detect all object types. Not all objects will be classified accurately as soon as they appear. For example, if a person's foot appears in the camera's field of view first (as is often the case), the foot may be classified as another type of object, but it would represent the first instance that the person entered the field of view of the camera. The person would be categorized as a person a moment later, when he or she actually enters the camera's field of view completely.
- 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 an Appears in area of interest event with an area of interest that excludes the area of unwanted activity.

Appears in Area of Interest

- Consider setting up your Appears events so that they detect all object types. Not all objects will be classified accurately as soon as they appear. For example, if a person's foot appears in the camera's field of view first (as is often the case), the foot may be classified as another type of object, but it

would represent the first instance that the person entered the field of view of the camera. The person would be categorized as a person a moment later, when he or she actually enters the camera's field of view completely.

- There is an important distinction between Appears in area of interest events and Enters events. Appears in area of interest events occur when an object appears in an area of interest without previously appearing within the camera's field of view. In other words, the first time the object appears within the camera's field of view is when it appears in the area of interest (for example, by walking through a doorway within the area of interest). Enters events occur when an object enters the area of interest, only if the object has already been detected within the camera's field of view before entering the area. For more information, see the [“Enters Events” section on page 5-13](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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 device detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).

Disappears from Full View

Rules configured to detect events in the whole view are useful for general event detection. Keep in mind that because device is monitoring the entire scene, choosing this event type can result in 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 draw an area of interest that excludes the area of unwanted activity.

Disappears from Area of Interest

- 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 area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- There is an important distinction between Disappears from area of interest events and Exits events. Disappears from area of interest events occur when an object was last detected in an area of interest. In other words, the last time the system detected the object, it was present in the area of interest. Exits events occur whenever an object exits through the perimeter of the area of interest. For more information, see the [“Exits Events” section on page 5-16](#).
- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).

Dwell Time Data

- 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. 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. For more information, see the [“Occupancy Data Events” section on page 5-24](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

Dwell Time Threshold

- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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. 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. For more information, see the [“Occupancy Threshold Events” section on page 5-26](#).
- 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.

Enters Area of Interest

- Be aware of the distinction between Enters events and Appears in area of interest events. Appears in area of interest events occur when an object appears in an area of interest without appearing within the camera's field of view previously. In other words, the first time the object appears within the field of view is when it appears in the area of interest (for example, by walking through a doorway within the area of interest). Enters events occur whenever an object enters the area of interest, if the object has already been detected within the camera's field of view before entering the area. A response would not be triggered for an Enters event if the object involved in the event was inside of the area of interest the first time it appeared within the camera's field of view. For more information, see the [“Appears Events” section on page 5-4](#).
- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.

- 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.

Exits Area of Interest

- The device detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).
- Be aware of the distinction between Exits events and Disappears from area of interest events. Disappears from area of interest events occur when an object disappears within an area of interest. In other words, the last time the object was tracked within the camera's field of view, the object was present in the area of interest. This can occur when an object disappears through a doorway within the area of interest or behind scenery. For more information, see the [“Disappears Events” section on page 5-7](#). In contrast, Exits events do not include objects disappearing through doorways and windows or behind scenery within the area of interest. The object must exit through the perimeter of the area of interest in order to trigger a response.
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

Inside Area of Interest

- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Ground vs. Image Plane” section on page 4-14](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

Left Behind in Full View

- If the camera's field of view changes before the object has remained stationary long enough to be considered an event and the camera returns to the view again later, the object will not be detected as left behind. The system 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 for events.
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.

- Rules configured to detect events in the full 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 a Left Behind in area of interest event with an area of interest that excludes the area of unwanted activity.

Left Behind in Area of Interest

- The system detects events differently based on whether you use a ground plane or image plane area of interest for the event. For more information, see the [“Ground vs. Image Plane” section on page 4-14](#).
- If the camera's field of view changes before the object has remained stationary long enough to be considered an event and the camera returns to the view again later, the object will not be detected as left behind. The system 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 for events.
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.

Loiters in Area of Interest

- The device detects events differently based on whether you use a ground plane or image plane area of interest for the event. You may detect more events if you use a ground plane area of interest for Loiters rules. For more information, see the [“Ground vs. Image Plane” section on page 4-14](#).
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

Multi-Line Video Tripwire

- 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.
- The video tripwire should be placed along the ground plane. video tripwires placed along the top of objects (e.g., the top of a wall) are ineffective. For a definition of ground plane, see the [“Area of Interest Overview” section on page 4-12](#).
- 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.

- 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.
- 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. For information about Loiters events, see the [“Loiters Events” section on page 5-22](#). For information about Left Behind events, see the [“Left Behind Events” section on page 5-19](#).
- You may have ordered the multi-line video tripwires incorrectly. This can happen if you use Before or After incorrectly in the Event Specification area when the rule is created. If you use Before, the object must cross video tripwire A before video tripwire B. If you use After, video tripwire B must be crossed before video tripwire A. Be sure that you have specified the correct order for the video tripwires.
- If you are using a multi-line video tripwire to detect events on a shoreline, you can try combining an irregular shape or motion filter with a multi-line video tripwire to reduce false alarms. For more information, see the [“Irregular Shape or Motion Filters” section on page 4-27](#).

Occupancy Data

- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

Occupancy Threshold

- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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.

Camera Tamper

- Only one Camera Tamper rule is needed per channel. If you already have a Camera Tamper rule on the channel, the option is no longer available from the **Create new rule** drop-down list.
- Camera Tamper events are not detected if the view is unknown.
- You can adjust the degree of the system's sensitivity to Camera Tamper events by modifying the view sensitivity. For more information, see the [“How to Adjust View Sensitivity” section on page 8-49](#).
- Keep in mind that Camera Tamper events are not detected at all if your channel is configured to use Auto-force views. For more information, see the [“View Status” section on page 1-4](#).

Taken Away from Full View

- Rules configured to detect events anywhere in the entire camera view are useful for general event detection. Keep in mind that because 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 that you instead create a Taken Away from area of interest event with an area of interest that excludes the area of unwanted activity.
- To modify the conditions that must exist before a Taken Away event is detected, see the [“Reduce Taken Away False Alarms” section on page 8-15](#).
- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.

Taken Away from area of interest

- Make sure that the duration you set is just long enough to catch the majority of events, but not so long that you miss events.
- For all area of interest events, you must determine if a ground plane or image plane is more applicable. For more information, see the [“Area of Interest Overview” section on page 4-12](#) and [“Ground vs. Image Plane” section on page 4-14](#).
- The area of interest should be large enough to include the entire area where activities will likely appear, while being small enough to not include parts of the scene where you would never want to detect the event.
- 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 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 (e.g., two different colors of carpeting).
- to modify the conditions that must exist before a Taken Away event is detected, see the [“Reduce Taken Away False Alarms” section on page 8-15](#).

Video Tripwire

- 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.

- The video tripwire should be placed along the ground plane. video tripwires placed along the top of objects (e.g., the top of a wall) are ineffective. For a definition of ground plane, see the [“Area of Interest Overview” section on page 4-12](#).
- 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.
- 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.

Reduce Duplicate Alerts

Summary

You may receive duplicate alerts that appear to be false alarms if the same object repeatedly causes an event in a short period of time. For instance, a person may be loitering near a Video Tripwire or area of interest. Every time they cross the Video Tripwire or into the area, the system will detect an event. You may only be interested in the first event performed by the object.

Solution

You can use the following parameters to set the duration for how long after an event the system will not detect the same type of event performed by the same object. This may reduce the number of alerts, but be aware that it may cause you to miss similar events within this time period.

For Tripwire Events

The same object re-crossing a video tripwire within this time period (in seconds) is not reported. Decrease to detect more events. Decreasing this parameter may result in false alarms when an object repeatedly crosses a video tripwire. To reduce the number of events caused by the same object crossing the video tripwire within a short period of time, increase the value of the parameter in [Table 8-2](#).

Table 8-2 *Parameter Values for Reducing Duplicate Alerts for Tripwire Events*

Parameter Name	Default Value	New Value
Parameter 87	1	Varies.

For Exits and Enters Events

The same object re-entering or re-exiting an area of interest within this time period (in seconds) is not reported. Decrease to detect more events. Decreasing this parameter may result in false alarms when an object repeatedly enters/exits the area of interest. To reduce the number of events caused by the same object entering/exiting within a short period of time, increase the value of the parameter in [Table 8-3](#).

Table 8-3 *Parameter Values for Reducing Duplicate Alerts for Exits and Enters Events*

Parameter Name	Default Value	New Value
Parameter 88	1	Varies.

For Taken Away, Left Behind, and Inside Events

Specifies how much time period needs to elapse (in seconds) between the end of a Taken Away, Left Behind, or Inside event and the start of a new event by the same object in order for the second event to be considered a separate event. Increase the duration to detect fewer events (missed detections may result). To detect more events (false alarms may result), decrease the value of the parameter in [Table 8-4](#).

Table 8-4 *Parameter Values for Reducing Duplicate Alerts for Taken Away, Left Behind, and Inside Events*

Parameter Name	Default Value	New Value
Parameter 89	1	Varies.

Reduce False Alarms from Shadows

Summary

You may want to adjust these parameters if shadows in the camera's field of view are frequently causing false alarms. Shadows can be cast by objects in or out of the camera's field of view. For example, objects above the camera, such as planes or clouds, may generate shadows in the camera's view.

**Note**

Do not modify these parameters if you are using People-Only Classification. Use the Counting Sensitivity settings instead. For more information, see the [“How to Adjust Counting Sensitivity”](#) section on page 8-35.

Before Using this Solution

See the following sections:

- [How to Adjust Contrast Sensitivity](#), page 8-38
- [Camera Placement Considerations and Workarounds](#), page 8-22
- [False Alarm Troubleshooting](#), page 8-2

Solution

If you are repeatedly receiving false alarms generated by shadows, you can make the system less sensitive to such events by adjusting the contrast-related parameters in [Table 8-5](#).

Table 8-5 *Parameter Values for Reducing False Alarms from Shadows*

Parameter Name	Default Value	New Value (Range)
Parameter 1	12	13-15
Parameter 2	6	8
Parameter 3	30	38-40

Be sure that you change Parameter 1, Parameter 2, and Parameter 3 at the same time. Changing only one parameter will not correct the problem, and may cause other system errors. If a pixel has a value higher than Parameter 1, it is considered foreground. If a pixel has a value lower than Parameter 2, it is

considered background. These are thresholds relative to the normal variation of the pixel. Pixels with values between Parameter 1 and Parameter 2 may be considered foreground or background based on a variety of other factors. Parameter 3 is an absolute threshold relative to the normal variation of a pixel.

Parameter 1 and Parameter 3 have suggested ranges. Experiment with different values within these ranges to find the optimal event detection configuration. The greater you make the value within the range, the fewer false alarms you may receive. The system stops detecting as many false alarms due to events triggered by shadows. Keep in mind that a higher value may also increase the number of real events that are missed.

**Note**

Do not enter a value outside of the ranges suggested in this section.

Reduce Taken Away False Alarms

Summary

How to decrease the number of false alarms caused by objects that only stop moving briefly in the camera's field of view before they are Taken Away. For instance, you can reduce the number of Taken Away events detected for people who pause for a few seconds and then exit the field of view. Often Taken Away events are only valid if the object has remained in the field of view for a certain period of time before being Taken Away.

Before Using this Solution

Be sure that **Inserted for Minimum Time** is one of the options selected for Parameter 66. An insertion time requirement only exists for Taken Away events if this option is selected. This value specifies that there is a period of time that an object must be stationary in the field of view before it can trigger a Taken Away event.

The following options are available for Parameter 66:

Detected as Inserted: An object will only be detected as Taken Away if it has first been detected as Left Behind by an active Left Behind rule. You will have to be sure you always have an active Left Behind rule for the same type of object that you want to detect being Taken Away. This value only has an effect if the Left Behind rule has a shorter duration (in seconds) than the value in Parameter 67. See below for more information about Parameter 67.

Never Seen Before: Before being Taken Away, the object was in the field of view of the camera when the device began monitoring the channel for events (the device was restarted, changed views, etc.).

**Note**

An object only needs to meet one of the conditions specified in Parameter 66 for it to be considered Taken Away.

Solution

You can extend the time that an object must remain stationary before the system notices when it is Taken Away.

Adjust parameter value in [Table 8-6](#) to increase the amount of time (in seconds) it takes for an object that is not moving to be considered stationary by the system.

Table 8-6 *Parameter Values for Reducing Taken Away False Alarms*

Parameter Name	Default Value	New Value
Parameter 67	10	greater than 10

Once an object has remained stationary for the amount of time specified in Parameter 67, the device will detect that it has been Taken Away if it is removed.

You may receive fewer false alarms caused by objects that pause briefly in the field of view.



Note

Parameter 67 must not exceed the stationary object monitoring time. For more information, see the [“How to Adjust the Stationary Object Monitoring Time”](#) section on page 8-45.

Change Video Tripwire and Ground Plane Event Triggering

Summary

How to determine which part of the object must intersect with the video tripwire or ground plane area of interest to constitute an event occurrence.

Solution

Video tripwires and ground plane areas of interest typically assume that for an event to occur, the bottom of the object must intersect with the video tripwire or area of interest. By default, the point of intersection is the footprint. Specifically, the footprint is the midpoint of the bottom edge of the object.

The footprint is not always the optimal point of intersection. This is the case when the camera is placed overhead in the scene, or in some cases when you are mostly concerned with detecting vehicles. For more information, see the following sections:

- [Overhead Camera Placement, page 8-16](#)
- [Vehicle Direction Considerations, page 8-17](#)
- [Parameter Adjustment, page 8-19](#)

Overhead Camera Placement

If the camera is mounted directly overhead, it makes little sense for the object's footprint to trigger the event, since the part of the object closest the bottom of the screen may not even intersect with the video tripwire/area of interest. Instead, the point at the center of the object's mass, the centroid, is a better trigger point.

For example, in the figures below, a green cross shows where an object's footprint (left image) and centroid (right image) would apply for a person being monitored by an overhead camera. Because the person appears upside-down due to the camera angle, the footprint does not accurately represent the point at which a person would likely trigger an event. Instead, in this case a centroid would be a more reliable way of ensuring that an object actually triggers an event.



Vehicle Direction Considerations

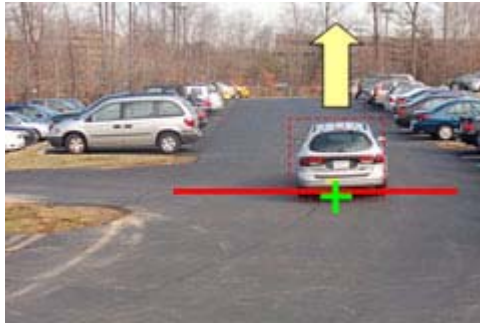
Because vehicles are wider than they are tall, the point at which they trigger video tripwires or areas of interest depends on the direction they are traveling relative to the camera. If a vehicle travels from left to right or right to left in front of the camera, the footprint would trigger the event when about half the vehicle had crossed the video tripwire/edge of the area of interest (see following figure).



If, on the other hand, the vehicle is heading directly toward the camera, the footprint would trigger the event immediately, with very little of the vehicle having crossed (see following figure).



And if the vehicle is traveling directly away from the camera, the entire vehicle will have to cross before an event is detected (see following figure).



Because a centroid is placed at the center of an object's mass and is not always placed along the bottom edge, it can provide greater consistency on how vehicles trigger events. As you can see in the examples that follow, regardless of a vehicle's direction, a centroid would place the trigger point so that a more central point of the vehicle will cross the video tripwire/area of interest.



Parameter Adjustment

Use the Parameter 91 setting (see [Table 8-7](#)) to change the trigger point from Footprint to Centroid (or another value).

Table 8-7 *Parameter 91 Setting*

Parameter Name	Default Value	New Value
Parameter 91	Footprint	Varies. See Table 8-8 for a descriptions of all possible values.

In most cases, using either Footprint or Centroid will suffice. There are, however, cases where you may want the object to trigger the event in one particular (left, right, top, or bottom) extremity of the object. For example, if most objects in the scene are elongated by long shadows, to ensure that the objects and not their shadows trigger events, the trigger point should be at the extremity of the object opposite the shadow.

[Table 8-8](#) describes all possible parameter 91 values.

Table 8-8 *Parameter 91 Value Descriptions*

Value	Description
Footprint	The default setting. The footprint is the midpoint of the lower edge of the area covered by the object.
Centroid	The centroid is an object's center of mass. Note that because objects such as people and vehicles have an irregular shape, the centroid is not necessarily the center (i.e., the midpoint of the object's height and width).
Top-left	The X coordinate matches the part of the object closest to the left side of the view, the Y coordinate matches the part of the object closest to the top of the view.
Centroid-left	The X coordinate matches the part of the object closest to the left side of the view, the Y coordinate matches the centroid's Y coordinate.
Bottom-left	The X coordinate matches the part of the object closest to the left side of the view, the Y coordinate matches the part of the object closest to the bottom of the view.
Top-right	The X coordinate matches the part of the object closest to the right side of the view, the Y coordinate matches the part of the object closest to the top of the view.
Centroid-right	The X coordinate matches the part of the object closest to the right side of the view, the Y coordinate matches the centroid's Y point.
Bottom-right	The X coordinate matches the part of the object closest to the right side of the view, the Y coordinate matches the part of the object closest to the bottom of the view.
Top-centroid	The X coordinate matches the centroid's X coordinate, the Y coordinate matches the part of the object closest to the top of the view.
Bottom-centroid	The X coordinate matches the centroid's X coordinate, the Y coordinate matches the part of the object closest to the bottom of the view. Note that Bottom-centroid is not the same thing as the Footprint, since the Footprint's X coordinate is the object's center, and the Bottom-centroid's X coordinate matches the centroid's X coordinate.

Choose the Correct Event Type

Summary

How to determine whether the event type you selected during rule creation is the best type available for what you are trying to detect.

Solution

This section lists the following important distinctions between different event types:

- [Difference Between Appears in Area of Interest and Enters Area of Interest Events](#) , page 8-20
- [Difference Between Disappears from Area of Interest Events and Exits Area of Interest Events](#), page 8-20
- [Difference Between Inside Area of Interest Events and Left Behind in Area of Interest Events](#), page 8-21
- [Difference Between Loiters in Area of Interest Events and Dwell Time Threshold Events](#), page 8-21
- [Difference Between Dwell Time Events and Occupancy Events](#), page 8-21
- [Difference Between Video Tripwires, Multi-Segment Video Tripwires, and Multi-Line Video Tripwires](#), page 8-21
- [General Difference Between Full View Events and Area of Interest Events](#), page 8-21

Difference Between Appears in Area of Interest and Enters Area of Interest Events

There is an important distinction between Appears in area of interest events and Enters events. Appears in area of interest events occur when an object appears in an area of interest without previously appearing within the camera's field of view. In other words, the first time the object appears within the camera's field of view is when it appears in the area of interest (for example, by walking through a doorway within the area of interest). For more information, see the [“Appears Events” section on page 5-4](#). Enters events occur when an object enters the area of interest, only if the object has already been detected within the camera's field of view before entering the area. For more information, see the [“Enters Events” section on page 5-13](#).

Often, people will create an Appears rule when the event they are trying to detect is really an Enters event.

Difference Between Disappears from Area of Interest Events and Exits Area of Interest Events

There is an important distinction between Disappears from area of interest events and Exits events. Disappears from area of interest events occur when an object was last detected in an area of interest. In other words, the last time the system detected the object, it was present in the area of interest. For more information, see the [“Disappears Events” section on page 5-7](#). Exits events occur whenever an object exits through the perimeter of the area of interest. For more information, see the [“Exits Events” section on page 5-16](#).

Often, people will create a Disappears rule when the event they are trying to detect is really an Exits event.

Difference Between Inside Area of Interest Events and Left Behind in Area of Interest Events

An Inside area of interest event occurs when a moving object appears in or enters an area of interest. For more information, see the [“Inside Events” section on page 5-18](#). A Left Behind in area of interest event occurs when an object within the area of interest goes from being in motion to being stationary. For more information, see the [“Left Behind Events” section on page 5-19](#).

Difference Between Loiters in Area of Interest Events and Dwell Time Threshold Events

Loiters in area of interest events and Dwell Time Threshold events are similar in that they both are related to the amount of time objects remain in the area of interest. The main difference is that in Dwell Time Threshold events, you can specify a number of people to be involved in the event for it to trigger. Also, Dwell Time Threshold events are only available on Event Counting channels. Alert responses and detection of non-human objects are only available with Loiters in area of interest.

Difference Between Dwell Time Events and Occupancy Events

Dwell Time events and Occupancy events are both related to counting events. Dwell Time events focus on the amount of time objects spend in an area of interest, while Occupancy events focus on the number of objects that are in the area of interest. Also, in Dwell Time 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. For Occupancy rules, the device is determining the overall occupancy of the area without regard to which particular objects come and go from the area.

Difference Between Video Tripwires, Multi-Segment Video Tripwires, and Multi-Line Video Tripwires

Video tripwires are useful to detect objects in a very particular motion. The multi-line video tripwire is made up of two separate video tripwires. Multi-line video tripwires are useful in scenes with lots of environmental motion (e.g., waves at that beach), since they help establish an object's continual direction. Multi-line video tripwires, however, may be vulnerable to those who know about them and thus loiter between the two video tripwires for longer than the duration setting.

Both video tripwires and multi-line video tripwires can include multi-segment video tripwires, which may be necessary for detecting events along a curved transition point. For more examples of when you would use the different types of tripwire events, see the [“Video Tripwire Events” section on page 5-32](#).

General Difference Between Full View Events and Area of Interest Events

Rules configured to detect events in the Full View are usually more useful in stable views where there is not a lot of activity. Since for Full View events 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 an area of interest event with an area of interest that excludes the area of unwanted activity. For more information, see the [“Area of Interest Overview” section on page 4-12](#).

Camera Placement Considerations and Workarounds

Summary

When determining whether your camera is placed at the optimum position to detect events, there are general guidelines to follow, as well as certain guidelines specific to different aspects of the scene. If you are unable to change the camera placement, there are also rule, filter, and device settings that you can use to compensate for a non-optimal camera placement.

Solution

Camera placement considerations include the camera angle and height, the distance from the area where you want to detect events, the quality of video feeds (including the amount of lighting), and the type of camera being used (infrared, thermal, color, black and white).

The camera may also need to be repositioned because of any one of the following environmental factors in the scene. [Table 8-9](#) lists other workarounds involving rule and filter placement.

Table 8-9 **Rule and Filter Placement Workarounds**

Factor	Workaround
Foliage (Leaves, Brush, etc.)	<p>When surveying your site, consider the placement of foliage. Bear in mind the fact that foliage may change seasonally; what may be an effective camera position in the Winter might not work in the Summer.</p> <p>Applying an Irregular shape and motion filter can help limit the number of events generated by this kind of movement. For more information, see the Irregular Shape or Motion Filters, page 4-27.</p>
Glare	<p>Glare is a lighting condition that can result in the device either missing events or detecting events that you do not intend to detect. This is because glare may be detected as one or more objects, or it may obstruct the view. You can mitigate the effects of glare by:</p> <ul style="list-style-type: none">• Repositioning the camera.• Adding a polarizing filter to the lens.• Using object filters (see the “Filters Overview” section on page 4-22).• Avoiding placement of your camera facing oncoming traffic or objects that generate excessive glare.• Reducing the camera brightness to eliminate the glare (especially when using overhead cameras with polished floors).
Rain or Snow	<p>If the camera must be exposed to precipitation, it should be facing downward or be accompanied with adequate shelter so that water droplets are not misidentified as objects.</p>

Table 8-9 Rule and Filter Placement Workarounds (continued)

Factor	Workaround
Shadows	<p>Shadows can be caused by stationary objects (e.g., buildings), moving objects within the camera view (e.g., a person entering the scene), and moving objects outside of the camera view (e.g., a plane flying overhead).</p> <p>You can mitigate the effects of shadows by:</p> <ul style="list-style-type: none"> • Repositioning the camera. • Adding a polarizing filter to the lens. • Using object filters (see the “Filters Overview” section on page 4-22). • Avoiding placement of your camera facing oncoming traffic or objects that generate excessive glare. • Reducing the camera brightness to eliminate the glare (especially when using overhead cameras with polished floors). • Creating a Maximum size filter for large shadows. For more information, see the “Minimum and Maximum Size Filters” section on page 4-28. • Creating an Irregular shape or motion filter and/or Minimum size filter for small objects like the shadows from birds flying overhead. For more information, see the “Minimum and Maximum Size Filters” section on page 4-28 and “Irregular Shape or Motion Filters” section on page 4-27. <p>You can also experiment with contrast settings:</p> <ul style="list-style-type: none"> • How to Adjust Contrast Sensitivity, page 8-38 • How to Adjust Bad Signal Sensitivity, page 8-40 • How to Turn On and Off Bad Signal Status for Contrast, page 8-41 • Reduce False Alarms from Shadows, page 8-14
Walls/Fences	<p>If the camera is looking down a stretch of wall or fencing, a video tripwire rule will not be effective. Instead, consider placing a Loiters in area of interest event on the ground where a person might begin scaling the wall or fence.</p>

Table 8-9 **Rule and Filter Placement Workarounds (continued)**

Factor	Workaround
Waves	<p>If you must include a coastline within the camera field of view, try the following:</p> <ul style="list-style-type: none"> Applying an Irregular shape or motion filter can help limit the number of events generated by this kind of movement. For more information, see the “Irregular Shape or Motion Filters” section on page 4-27. Creating a tide filter. For more information, see the “Reduce False Alarms at Coastline” section on page 8-4. Using a size filter. For more information, see the “Minimum and Maximum Size Filters” section on page 4-28. If you are using a video tripwire along the edge of water, try using a multi-line video tripwire. For more information, see the Chapter 5, “Video Tripwire Events.” Increasing the contrast sensitivity. See the “How to Adjust Contrast Sensitivity” section on page 8-38.
Moving Lights (such as car headlights and blinkers or roaming spotlights)	<p>Moving lights in the camera field of view can at times be erroneously interpreted as separate objects or obstruct actual objects of interest. You can mitigate the effects of moving lights by:</p> <ul style="list-style-type: none"> If possible, moving the camera so that it is not directly facing oncoming traffic. Adding a polarizing filter to the camera lens. Using Irregular shape or motion filters to filter out objects created by the moving lights. For more information, see the “Irregular Shape or Motion Filters” section on page 4-27.

Camera Hardware Considerations



Note

If you are using a Cisco video analytics enabled camera, please disregard this section.

Summary

The video analytics does not require any particular type of camera to detect events. There are, however, some general camera hardware considerations that influence event detection capability.

Solution

The single most important factor in determining whether or not a camera will be able to effectively detect objects is the camera's lux requirement.

Lux is the measure of light intensity, and in this context refers to the minimum amount of light required for the camera to produce images. Each camera has a recommended minimum lux. The lower this lux requirement, the lower the amount of light required by the camera.

The lux reading in the camera's field of view should be at least 10 times the minimum lux rating required by the camera. For example, if the camera requires a minimum lux of 0.01 (the amount of light produced by the quarter moon), the lux reading in the area where objects appear should be 0.1 for the device to properly detect objects.

It is recommended that you use a light meter to take the lux reading at a particular point in the camera field of view. If you are not able to take a reading with a light meter, refer to the following approximate lux readings for a variety of outdoor settings:

- Sunlight on an average day = 32000-100000
- Sunrise or sunset on a clear day = 400
- Indoors (well-lit) = 400
- Dusk = 108
- Twilight = 11
- Deep twilight = 1.1
- Full moon = .12
- Quarter moon = .01
- Moonless clear night = .001
- Overcast night = .0001

**Note**

Bear in mind that these values are approximations. To conduct an accurate site survey, you should use a light meter.

When determining the lux, you may need to factor in the reflectance (i.e., light absorption or reflection) of the dominant material in the camera field of view. For example, a highly reflective surface (such as new snow) or a highly absorptive surface (such as black asphalt) can have a significant effect on the ambient lighting.

In addition to the overall lux setting, you can use other camera accessories to mitigate certain light effects. For example, if the scene includes a large amount of glare, you may want to use a polarizing filter.

The size of the Charged Coupled Device (CCD) chip in the camera can also affect the dimensions of the camera's effective monitoring range.

Insufficient Lighting

Summary

Because of insufficient lighting in the camera field of view, the channel is not detecting all events.

Solution

The device can only detect events if there is enough light to observe objects within the camera field of view. This means that the device's effectiveness is at least partially reliant on the quality of the video feed coming from the camera.

To ensure that there is adequate lighting in the camera field of view, check the camera's lux requirement. For more information about lux requirements, see the [“Camera Hardware Considerations” section on page 8-24](#).

If there is inadequate lighting, first try to supplement the existing lighting by adding additional lighting to the area of the scene where you are missing events.

If you are unable to address the issue with additional lighting, you may need to upgrade the camera hardware to an IDN, thermal, or infrared camera.

**Note**

You may find it helpful to use the Night Enhancement feature. This feature can improve the clarity of alert snapshots by transposing a snapshot of how the area looks during the day over the view of an event occurring at night. Note that this feature only affects the way alert snapshots are displayed; the Night Enhancement feature does not improve event detection at night. For more information, see the [“How to Turn On and Off Enhanced Night Snapshots”](#) section on page 8-68.

Specify Width and/or Height for Size Filters

Summary

When you create size filters, you specify a minimum or maximum size for objects that are real objects of interest you want to detect by drawing boxes around representative objects. For instructions on how to create size filters, see the [“Minimum and Maximum Size Filters”](#) section on page 4-28.

You can specify in what dimensions (width and/or height) the object must be larger or smaller than the boxes in order to be filtered.

Solution

The parameter in [Table 8-10](#) is used with maximum size filters. If an object is greater in size in the dimension(s) you specify in this parameter, it will not be detected. If you select width and height, the object must be larger than the maximum size filter box in both width and height to be ignored. If you select width or height, only being longer or taller than the filter box will cause the object to be ignored.

Table 8-10 *Parameter Values for Specifying Width and/or Height for Maximum Size Filters*

Parameter Name	Default Value	Other Value
Parameter 75	Width OR Height	Width AND Height

The parameter in [Table 8-11](#) is used with minimum size filters. If an object is smaller in size in the dimension(s) you specify in this parameter, it will not be detected. If you select width and height, the object must be smaller than the minimum size filter box in both width and height to be ignored. If you select width or height, only being thinner or shorter than the specified filter box will cause the object to be ignored.

Table 8-11 *Parameter Values for Specifying Width and/or Height for Minimum Size Filters*

Parameter Name	Default Value	Other Value
Parameter 76	Width AND Height	Width OR Height

Missed Events Troubleshooting

Summary

This section describes how to troubleshoot the system when you are not receiving alerts for events that you believe the system should be detecting.

Solution

If no events are detected for any channel on the device, this may indicate a device problem.

Check the device status that appears in the top right corner of the Analytics Management Console. If the status is not **OK**, there may be a problem. For more information, see [Chapter 2, “Device Configuration.”](#)



Note

If you are counting events, see the [“Improve Counting Results”](#) section on page 8-30 for troubleshooting specific to counting inaccuracies.

If no events are detected on an entire channel, this may indicate problem with the camera hardware or the camera field of view. Consider the following:

- [Unknown View Issues, page 8-27](#)
- [Rule Configuration, page 8-27](#)
- [Environment and Scene Considerations, page 8-29](#)

Unknown View Issues

Open the Home page and look at the snapshot/video of the camera's field of view. If a red border is around the snapshot, the device is not detecting events because it does not recognize the camera view and is considering it to be an unknown view.

To learn more about unknown views, see the [“Unknown View Channel Status”](#) section on page 8-50. If you are User-controlled view mode, you may need to move the camera back to the known view or force the view to continue monitoring. To learn more about User-controlled views, see the [“View Status”](#) section on page 1-4.

A Camera Tamper event may have occurred, such as the camera being panned away from a known view, the camera zooming, the camera being jostled, the camera being turned off or unplugged, or the lights being turned on or off. This can cause some channels to stop monitoring for events. If you have created a Camera Tamper rule, a Camera Tamper alert would have occurred. For more information, see the [“Camera Tamper Events”](#) section on page 5-6.

If you are having problems staying in a known view, see the [“View Troubleshooting”](#) section on page 8-48.

Once you have established that the device is operating properly and camera is pointed at a known view, you need to verify that you have set up the rules correctly for the particular scene you are monitoring:

Rule Configuration

- Be sure you have activated the rule. For more information about activating rules, see the [“Activating and Deactivating a Rule”](#) section on page 4-4.
- Be sure the rule is scheduled to run when you are expecting to see events. Rules are scheduled during rule creation. For more information, see the [“Schedules Overview”](#) section on page 4-18.

- You may have set up a rule that is not appropriate for the types of events you want the system to detect. For advice about selecting the correct rule type, see the [“Choose the Correct Event Type” section on page 8-20](#). To review the full list of event types, see the [“Events and Objects” section on page 5-1](#). If you need to create a new rule, see the [“Creating or Editing a Rule” section on page 4-2](#).
- You may have chosen the right type of event, but you may not have configured it properly. For event-specific troubleshooting, see the [“Improve Rule Configuration” section on page 8-5](#).
- Be sure you have enabled the type of responses (such as alerts) you expect to receive.
- The system may be mis-classifying objects based on how they appear in the camera view.
 - Try using a different combination of object types when you create the rule. For instance, you could try detecting Anything instead of just people. Be aware this may increase the number of false alarms. For more information, see the [“Object Types” section on page 5-2](#).
 - If you are using People-Only Classification, the system assumes all objects are people. For more information, see the [“Improve Counting Results” section on page 8-30](#).
 - If you only need to detect people, you may be able to use People Verification. For more information, see the [“How to Turn On and Off People Verification” section on page 8-42](#).
 - You can create object filters to eliminate objects that are not real objects of interest. For more information, see the [“Filters Overview” section on page 4-22](#).
 - You can adjust whether Anything objects are considered active or passive to detect more events of a certain type. For more information, see the [“How to Specify Active or Passive for Anything Objects” section on page 8-47](#).
- Be sure you are not over filtering events. Object filters are used to reduce the number of false alarms caused by objects that you are not interested in. For more information, see the [“Filters Overview” section on page 4-22](#). Check all the filters on the rule to be sure that they are not eliminated real objects of interest.
 - If you are not detecting many events involving large objects, check to see if a maximum size filter is present, and if so, increase the maximum size of detectable objects. For more information, see the [“Minimum and Maximum Size Filters” section on page 4-28](#).
 - If you are not detecting many events involving small objects, check to see if a minimum size filter is present, and if so, decrease the minimum size of detectable objects. For more information, see the [“Minimum and Maximum Size Filters” section on page 4-28](#). You may also want to adjust the parameter setting described in the [“How to Adjust the Minimum Object Detection Size” section on page 8-44](#). If the problem continues, you may have to move the camera because the objects may be too small for the system to detect.
- If you are monitoring stationary objects and you think they are being ignored by the system too quickly, see the [“How to Adjust the Stationary Object Monitoring Time” section on page 8-45](#).
- Video tripwires and ground plane areas of interest typically assume that for an event to occur, the bottom of the object must intersect with the video tripwire or area of interest. By default, the point of intersection is the footprint. Specifically, the footprint is the midpoint of the bottom edge of the object. If this requirement is causing you to miss events, you can change the requirement by following the instructions in the [“Change Video Tripwire and Ground Plane Event Triggering” section on page 8-16](#).
- If you notice that many of the missed events are occurring near the edges of the view, this may be addressed by reconfiguring the rule. If you are using a full view event, you can try instead defining an area of interest event. This area of interest event should include an image plane area of interest covering most of the camera view, except for a buffer around the edges of the view.

Environment and Scene Considerations

Factors in the scene's background may create unique issues. The amount of lighting and light effects such as shadows, glare, and reflections may cause issues. In outdoor environments, weather phenomena such as rain or snow, wind, and foliage can all pose additional challenges to detecting the objects as you intend. When troubleshooting such issues, as a general rule you should first seek to resolve the issue by moving the camera, then by evaluating your rules, then your filters, and finally, your channel configuration.

- The camera may not be placed in the appropriate position to detect events. For a description of some of the factors that should determine the camera view, see the [“Camera Placement Considerations and Workarounds” section on page 8-22](#). This section also suggests ways to compensate for poor camera position, such as the use of object filters.
- Eliminate any obvious camera occlusions. The angle of the camera affects target occlusion. The general rule is that the more overhead the camera, the less target occlusion and better separation of targets. Conversely, as the camera angle becomes more offset from overhead, other objects and obstacles from the environment are more likely to occlude targets of interest.
- Be sure you test during similar lighting conditions. If you are missing events, pay attention to whether or not the unwanted events tend to occur at a particular time of day. If they do, there may be light-related issues responsible for the detection problems. For instance, increasing the illumination of a camera's field of view may result in fewer missed events if the view was dimly lit. For more information, see the [“Insufficient Lighting” section on page 8-25](#).
- If you are missing events near the edge of the view, try moving the camera so that those events would occur in the center of the view. If this is not possible, try changing your Image Stabilization setting. Image Stabilization is not available on all devices. See your device specification for details, and then for more information, see the [“How to Turn Image Stabilization On and Off” section on page 8-64](#), [“How to Improve Image Stabilization in Busy Scenes” section on page 8-66](#), and [“How to Adjust Pixel Border for Image Stabilization” section on page 8-65](#).
- If the objects you wish to detect blend in with their background, it may be more likely that you will miss events. You can help correct this effect by modifying the contrast sensitivity and Bad Signal sensitivity settings. See the [“How to Adjust Contrast Sensitivity” section on page 8-38](#), [“How to Adjust Bad Signal Sensitivity” section on page 8-40](#), and [“How to Turn On and Off Bad Signal Status for Contrast” section on page 8-41](#).
- The camera view must be large enough for each object to be tracked for a meaningful amount of time before the object triggers an event. If the object is not tracked long enough before it crosses a video tripwire or enters an area of interest, the event may not be detected. The longer the device is able to track the object before it triggers an event, the better the detection results. To maximize the amount of time the object is in view, rules should be drawn in the middle or near the middle of the camera multi- field of view, rather than at or near the view edge. Be sure that occlusions do not jeopardize the camera multi- view of the object as it triggers an event.

Counting Issues

This section includes the following troubleshooting topics that pertain to counting issues:

- [Improve Counting Results, page 8-30](#)
- [How to Turn On and Off People-Only Classification, page 8-32](#)
- [How to Adjust Camera Settings for People-Only Classification, page 8-33](#)
- [How to Adjust Counting Sensitivity, page 8-35](#)

- [How to Specify a Duration People Are Usually Stationary, page 8-37](#)
- [How to Improve Dwell Time Data Results, page 8-38](#)

Improve Counting Results

Summary

Counts are not accurate.



Solution

For any type of event detection error, you should look through the troubleshooting in the [“Missed Events Troubleshooting” section on page 8-27](#) and [“False Alarm Troubleshooting” section on page 8-2](#). This section contains the following additional troubleshooting steps specific to Event Counting channels:

- [Calibration Troubleshooting, page 8-30](#)
- [Camera Position and Environment, page 8-31](#)
- [Rule Issues, page 8-31](#)

Calibration Troubleshooting

If counts are consistently inaccurate, it may be because a channel using People-Only Classification was not calibrated properly. For detailed calibration instructions, see [Chapter 7, “Calibration.”](#) Be sure you have used the following guidelines:

- Giving the channel consistent references will enable the device to more accurately extrapolate object size information across the view. Therefore, if possible, use the same person when defining each calibration point. If using the same person is not an option, use people of the same height to calibrate each point.
- Always calibrate using *standing* people. Even if the people in your field of view are usually sitting, use standing people during the calibration.
- While a minimum of three calibration points is required, more calibration points (four to six are recommended) will result in better system performance.
- Select people from different parts of the camera view. For instance, identify a box for a person in the left, right, and center of the field of view. If the objects are too close together, they will not provide the data needed for the device to infer the person size throughout the view.
- Select people that are standing on the same 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.
- Use the most common types of people that usually appear in the view. For instance, if you are monitoring a childcare facility, it might be appropriate to calibrate to the size of a child instead of an adult.
- Place the head and feet crosshairs with care. The crosshair in the circle  represents the top and center of the head. This is not usually the same as placing the circle around the person's face. The crosshair in the square  represents the bottom of the person (usually between the feet). Confusing these two settings will result in a poor calibration. Keep in mind that, depending on the angle of the camera, the head may appear above the feet in the camera's view.

- If you are having problems calibrating, you can also try entering calibration data via parameters instead of using the Calibration page. For more information, see the [“How to Adjust Camera Settings for People-Only Classification”](#) section on page 8-33.

Camera Position and Environment

- The primary influence on Event Counting performance is the camera having a clear view of all valid people to be counted. Without a clear view of each object, the device will simply not be able to count that object. For example, objects that are partially blocked or not clearly discernible in the camera view may not be counted.
- Environmental conditions frequently create object occlusions. Environmental conditions are defined as non-human objects in the scene that block the camera multi-view of objects. Environmental conditions include, but are not limited to, promotional displays, product shelving, bank teller counters, kiosks, office furniture (e.g., tables, chairs), cube walls, and partitions of any kind. If you cannot remove these obstacles from the scene or change the camera location, these types of physical restrictions – while out of your control – may prevent the camera from seeing the entire object and therefore may result in less than accurate results.
- The angle of the camera affects object occlusion. The general rule is that the more overhead the camera, the less object occlusion and better separation of objects. Conversely, as the camera angle becomes more offset from overhead, other objects and obstacles from the environment are more likely to occlude objects of interest. In a retail environment, for example, a product display may block the camera multi-view of a shopper. This situation would cause the system to not count that object. Similarly, in an office environment, a conference room table or chair may block the camera multi-view of an object multi-lower body, causing the system to not count that person.
- Overhead cameras often experience glare on polished floors. Reduce the camera brightness to help reduce glare.
- You may have People-Only Classification turned on when there are objects that are not people in the area of interest. In this case, the device may count the objects as two or more people based on the average person size you have calibrated.
- A busier scene places a higher premium on a more overhead camera position. For example, a busy scene with a lower angled camera may not work well because there are too many occlusions (e.g., objects block each other, stationary objects block objects).
- Heavy traffic, where multiple objects simultaneously move randomly (e.g., crisscross, indirect path) over a video tripwire or area of interest boundary, result in less accurate counts. Placing the camera overhead or nearly overhead may help in this situation.
- The camera view must be large enough for each object to be tracked for a meaningful amount of time before the object triggers an event. If the object is not tracked long enough before it crosses a video tripwire or enters an area of interest, the person may not be counted. The longer the device is able to track the object before it triggers an event, the better the counting results. To maximize the amount of time the object is in view, rules should be drawn in the middle or near the middle of the camera multi-field of view, rather than at or near the view edge. Be sure that occlusions do not jeopardize the camera multi-view of the object as it is counted.

Rule Issues

- You can try adjusting the counting sensitivity. Increase the setting if the device is not counting enough people. Decrease the setting if the device is counting too many people. For more information, see the [“How to Adjust Counting Sensitivity”](#) section on page 8-35.

- Rules must be created such that the device can accurately track an object both before the object triggers an event and as the object is triggering an event.
- The longer the device is able to track the object before it triggers an event, the better. To maximize the amount of time the object is in view, rules should be drawn in the middle or near the middle of the camera multi- field of view, rather than at or near the view edge.
- Place the area of interest or video tripwire such that occlusions do not block the camera multi- view of the object as it triggers an event. For example, a non-overhead camera may not be able to clearly view an area of interest if it is drawn such that other objects occlude the view of the rule. Similarly, a non-overhead camera may not be able to detect an object crossing a video tripwire if the video tripwire is drawn such that the object is occluded just before crossing the line.
- If you are using a video tripwire to count events and over-counting is occurring, try using a multi-line video tripwire. If you are using a multi-line video tripwire and events are being undercounted, try using a single video tripwire. For examples of both types of video tripwires, see the [Chapter 5, “Video Tripwire Events.”](#)
- If you are having problems with Dwell Time Data events in particular, see the [“How to Improve Dwell Time Data Results” section on page 8-38](#). The parameter change explained in this section allows you to set a minimum time objects must dwell in the area of interest before the device will count them leaving the area.
- You can try adjusting the Duration People Are Usually Stationary setting. Decrease if most people in the area of interest are moving. Increase if most people occupying an area of interest remain stationary for a long time (e.g., sitting or standing still). For more information, see [“How to Specify a Duration People Are Usually Stationary” section on page 8-37](#).

How to Turn On and Off People-Only Classification

Summary

People-Only Classification is only available for Event Counting channels.

This feature improves the accuracy of people counting results and enables Occupancy and Dwell Time rule types for advanced Event Counting channels. Carefully review the benefits and side effects of this change in the [“About People-Only Classification” section on page 7-5](#).

You can also turn on and off People-Only Classification in the Device Configuration page. For instructions, see the [“Configuring the Device” section on page 2-2](#).

Solution

Adjust the People-Only Classification settings listed in [Table 8-12](#).

Table 8-12 **Parameter Values for Adjusting People-Only Classification**

Parameter Name	Definition	To Turn On Standard Classification	To Turn On People-Only Classification (default for Event Counting channels)
Parameter 16	Enables or disables the detection of noisy imagery.	Varies	Disable noise detection
Parameter 20	Enables or disables Irregular Shape or Motion filters. You can add filters during rule creation.	Enable Irregular Shape or Motion filters	Disable Irregular Shape or Motion filters

Table 8-12 *Parameter Values for Adjusting People-Only Classification (continued)*

Parameter Name	Definition	To Turn On Standard Classification	To Turn On People-Only Classification (default for Event Counting channels)
Parameter 103	Enables and disables Image Stabilization. Image Stabilization mitigates the effects of camera jitter by compensating for slight variations in the camera view.	Varies	Disable Image Stabilization
Parameter 135	Enables or disables object classification and the capability to use irregular shape and motion filters.	Enable object classification	Disable object classification
Parameter 140	Enables or disables People-Only Classification for Event Counting channels.	Disable People-Only Classification	Enable People-Only Classification

**Note**

When you turn on People-Only Classification, you must calibrate the channel to the size of an average object that appears in the camera's field of view. This tells the device the size of an object to count as one person. For more information, see [Chapter 7, “Calibration.”](#)

If you do not use People-Only Classification, the system will continue to use the standard classification that is appropriate for mixed object (people and vehicle) environments. Occupancy and Dwell Time rules will no longer be available.

How to Adjust Camera Settings for People-Only Classification

Summary

How to modify camera hardware settings for People-Only Classification.

**Note**

Normally calibration is performed from the Analytics Management Console Calibration page. For more information, see [Chapter 7, “Calibration.”](#) Manually entering these camera hardware and placement settings may allow you to calibrate with more precision. On the other hand, using the Calibration page to identify the size of objects does not require you to know any hardware settings.

Only modify these settings if you have already turned on People-Only Classification. For more information, see the [“How to Turn On and Off People-Only Classification”](#) section on page 8-32.

Solution

In order for the People-Only Classification feature to function properly, you must configure the system according to your camera hardware and placement settings.

The parameter value in [Table 8-13](#) designates how far, in feet, the center of the camera lens is from the ground.

Table 8-13 *Parameter Values for Specifying How Far the Camera Lens is From the Ground*

Parameter Name	Default Value	New Value
Parameter 141	12	Varies.

The parameter value in [Table 8-14](#) designates the camera angle. This is the angle the camera is tilted-up. A camera facing straight down would be 0 degrees.

Table 8-14 *Parameter Values for Specifying the Camera Angle*

Parameter Name	Default Value	New Value
Parameter 142	0	Varies.

The parameter value in [Table 8-15](#) designates the width, in millimeters, of the camera's Charge-Coupled Device (CCD).

Table 8-15 *Parameter Values for Specifying the Camera CCD Width*

Parameter Name	Default Value	New Value
Parameter 143	4.8	Varies.

The parameter value in [Table 8-16](#) designates the height, in millimeters, of the camera's CCD.

Table 8-16 *Parameter Values for Specifying the Camera CCD Height*

Parameter Name	Default Value	New Value
Parameter 144	3.6	Varies.



Note

Typically imagers are 1/3", 1/4", and 2/3".

The parameter value in [Table 8-17](#) designates the camera focal length (in millimeters).

Table 8-17 *Parameter Values for Specifying the Camera Focal Length*

Parameter Name	Default Value	New Value
Parameter 145	2.8	Varies.



Note

It is not advisable to use fisheye lenses.

How to Adjust Counting Sensitivity

Summary

Counting results are not what you expected.



Note

Only make these changes if you have turned on People-Only Classification. For more information, see the [“How to Turn On and Off People-Only Classification”](#) section on page 8-32.

Before Using this Solution

Consult the troubleshooting steps in the [“Improve Counting Results”](#) section on page 8-30, [“Missed Events Troubleshooting”](#) section on page 8-27, and [“False Alarm Troubleshooting”](#) section on page 8-2.

Be sure the People-Only Classification calibration is accurate. Most counting issues occur because the channel has not been properly calibrated to the size of an average person in the camera's field of view. For details about calibrating the channel, see [Chapter 7, “Calibration.”](#)

Also, verify that only people have appeared in the camera's field of view where event counting is occurring. Other types of objects may make the count inaccurate.

Solution

Modify the parameter values in [Table 8-18](#) to adjust the counting results.

Table 8-18 *Parameter Values for Adjusting the Counting Sensitivity*

Parameter Name	Definition	Less	<	Default	<	More
Parameter 146	If an object's size is LESS than this percentage (.75 = 75%) of an average human size, it will be ignored. The average human size is determined by calibration. Increase to reduce detection of small, noisy objects. Decrease if actual people are not being detected.	0.9	0.8	0.75	0.7	0.6
Parameter 147	If an object's size is LESS than the specified percentage (1.25 = 125%) of an average human size (determined by calibration), it may be merged with other objects to create a larger object. If it is greater than the size specified, it will not be merged. Increase if smaller parts of people, such as a hand, are counted as separate objects. Decrease if multiple people are detected as one object.	1.40	1.30	1.25	1.20	1.10

Table 8-18 *Parameter Values for Adjusting the Counting Sensitivity (continued)*

Parameter Name	Definition	Less	<	Default	<	More
Parameter 148	If the part of an object in motion is GREATER than this percentage (0.25 = 25%) of the average human size (determined by calibration), a new object is created by splitting off from the original object. Decrease to encourage splitting and correct undercounting. Increase to discourage splitting and correct over-counting.	0.4	0.3	0.25	0.2	0.15
Parameter 149	If the foreground area of an object is GREATER than this percentage (0.5 = 50%) of the average human size (determined by calibration), a new object is created. Decrease to detect smaller size people. Increase to reduce detection of small, noisy objects.	0.75	0.6	0.5	0.4	0.3
Parameter 150	If the foreground area of an object is greater than this percentage (0.25 = 25%) of the average human size (determined by calibration), a new object is created. Decrease to detect more slowly moving or close-to-stationary objects. Increase to reduce detection of small, noisy objects.	0.45	0.35	0.25	0.2	0.1
Parameter 151	If an object's size is GREATER than this percentage (1.6 = 160%) of the average human size (determined by calibration), it may be split from another object to create two smaller objects. If the size is smaller, it is not split. Increase if smaller parts of people, such as a hand, are causing over-counting. Decrease if multiple people are counted as one object.	1.9	1.7	1.6	1.5	1.3
Parameter 152	When People-Only Classification is enabled, this parameter sets the time (in seconds) an object must be visible before it is recognized as an object of interest.	0.5	0.35	0.25	0.2	0.1
Parameter 2	Decrease to detect more low contrast objects.	8	7	6	5	4
Parameter 1	Decrease to detect more low contrast objects.	14	13	12	11	10
Parameter 3	Decrease to detect more low contrast objects.	42	36	30	24	18

Compare counting results using the combinations of values listed above to find the optimal settings.

Increase sensitivity if the counting results are lower than expected. If the sensitivity is raised too high for your view, this may also result in false detections.

Decrease sensitivity if the counting results are higher than expected. If the sensitivity is lowered too much for your view, this may result in the system not counting some people.

How to Specify a Duration People Are Usually Stationary

Summary

The amount of time people spend standing still or sitting in the area of interest where you are monitoring occupancy can influence the results of the count. If counting results are not what you expect them to be and the people you are monitoring are collectively in a state of extreme motion or extreme lack of motion (sitting, standing in line, etc.), you should try modifying the parameters below.



Note

Only make these changes if you have turned on People-Only Classification. For more information, see the [“How to Turn On and Off People-Only Classification”](#) section on page 8-32.

Before Using this Solution

Be sure the People-Only Classification calibration is accurate. Most counting issues occur because the channel has not been properly calibrated to the size of an average person in the camera's field of view. For details about calibrating the channel, see [Chapter 7, “Calibration.”](#)

Also, verify that only people have appeared in the camera's field of view where event counting is occurring. Other types of objects may make the count inaccurate.

Solution

Modify the parameters in [Table 8-19](#) to indicate the stationary time.

Table 8-19 *Parameter Values for Specifying the Stationary Time*

Parameter Name	Shorter	<	<	<	<	Default	<	Longer
Parameter 153	0	1	2	3	5	10	30	60
Parameter 154	1	3	5	30	60	150	300	600

Increase the values if most people occupying an area of interest remain stationary for a long time (e.g., sitting or standing still). The device may ignore objects that appear for a short time. If you raise the values too much and an object that is not a person has not moved for a long time (such as a chair), it may eventually be included in the occupancy.

Decrease the values if most people in the area of interest are usually moving. This may result in more accurate counting results for areas with few people sitting or standing still, but the device may not count some people who remain stationary for an extended period of time.

Parameter 153 sets the minimum time (in seconds) stationary objects are definitely monitored. Parameter 154 sets the maximum time (in seconds) stationary objects are definitely monitored.



Note

The time stationary objects are monitored is between Parameter 153 and Parameter 154, so Parameter 153 must be lower than Parameter 154.

How to Improve Dwell Time Data Results

Summary

The results for Dwell Time Data rules are not what you expect. Unexpected results may be caused by spurious objects that do not appear for long in the field of view.



Note

Only make these changes if you have turned on People-Only Classification. For more information, see the [“How to Turn On and Off People-Only Classification”](#) section on page 8-32.

Before Using this Solution

Be sure the People-Only Classification calibration is accurate. Most counting issues occur because the channel has not been properly calibrated to the size of an average person in the camera's field of view. For details about calibrating the channel, see [Chapter 7, “Calibration.”](#)

Also, verify that only people have appeared in the camera's field of view where event counting is occurring. Other types of objects may make the count inaccurate.

Solution

Modify the parameter in [Table 8-20](#) to set a minimum time objects must dwell in the area of interest before the system will count them leaving the area.

Table 8-20 *Parameter Values for Improving Dwell Time Data Results*

Parameter Name	Default Value	New Value
Parameter 187	2	greater than 2

Enter a value in seconds. This will reduce the number of objects that are counted that only appear for a brief time and are likely not real objects of interest. Keep in mind that this setting will apply to all the rules on the channel. Also, people that dwell for less than the duration you enter will not be counted.



Note

If you want to detect very short dwell times, you could decrease the value. Keep in mind that this may result in a high volume of event detections.

Contrast Issues

This section includes the following troubleshooting topics that pertain to contrast issues:

- [How to Adjust Contrast Sensitivity, page 8-38](#)
- [How to Adjust Bad Signal Sensitivity, page 8-40](#)
- [How to Turn On and Off Bad Signal Status for Contrast, page 8-41](#)

How to Adjust Contrast Sensitivity

Summary

How to improve detection when there is low contrast, shadows, or reflections in the camera view.

**Note**

Do not modify these parameters if you are using People-Only Classification. Use the counting sensitivity settings instead. For more information, see the [“How to Adjust Counting Sensitivity”](#) section on page 8-35.

Before Using this Solution

If you are not detecting events because of contrast problems, see the [“Missed Events Troubleshooting”](#) section on page 8-27.

If you are receiving too many false alarms because of contrast problems, see the [“False Alarm Troubleshooting”](#) section on page 8-2.

For suggestions on how to modify the camera placement or channel settings to compensate for a less than ideal environment, see the [“Camera Placement Considerations and Workarounds”](#) section on page 8-22.

Solution

To verify a contrast problem is really occurring, look at the video signal. The field of view will appear washed out. There is not enough difference between light and dark pixels within the video signal for the system to detect objects properly. This may occur because of the quality of the camera or extreme lighting conditions.



You can improve detection accuracy in areas with contrast problems, shadows, or reflections by experimenting with contrast sensitivity. To adjust the contrast sensitivity, adjust the parameters in [Table 8-21](#).

Table 8-21 *Parameter Values for Adjusting Contrast Sensitivity*

Parameter Name	Less Sensitive	<	Default Value	<	More Sensitive
Parameter 1	16	14	12	10	6
Parameter 2	9	7	6	5	3
Parameter 3	42	35	30	25	15

Test the system with these different values to determine the ideal event detection settings. If a pixel has a value higher than Parameter 1, it is considered foreground. If a pixel has a value lower than Parameter 2, it is considered background. These are thresholds relative to the normal variation of the pixel. Pixels

with values between Parameter 1 and Parameter 2 may be considered foreground or background based on a variety of other factors. Parameter 3 is an absolute threshold relative to the normal variation of a pixel.

Increase sensitivity to detect more objects in environments where there is low contrast between objects and the background. You are more likely to detect low contrast objects. When the setting is too sensitive for your camera view, you may detect more events that are not real events of interest.

Decrease sensitivity to detect more events when there are many shadows or reflections in the field of view. You are less likely to detect low contrast objects. When the sensitivity is too low for your camera view, you may not be notified when some real events occur.


**Note**

If you continue to have problems and you suspect they are due to contrast issues, see the [“How to Adjust Bad Signal Sensitivity”](#) section on page 8-40.

How to Adjust Bad Signal Sensitivity

Summary

How to make the system more or less likely to report contrast problems in the camera's field of view.

The Bad Signal channel status indicates a problem with the video signal. A red box appears around the channel snapshot. When you hover over the exclamation point warning icon , a Bad Signal message appears. This may occur because a video signal is not being received or has low contrast. The video is not being checked against rules.

To verify a contrast problem is really occurring, look at the video signal. The field of view will appear washed out. There is not enough difference between light and dark pixels within the video signal for the system to detect objects properly. This may occur because of the quality of the camera or extreme lighting conditions.

Before Using this Solution

Attempt to fix the contrast problems in the environment. For more information, see the [“Camera Placement Considerations and Workarounds”](#) section on page 8-22.

Experiment with modifying the contrast sensitivity to fit your environment. See the [“How to Adjust Contrast Sensitivity”](#) section on page 8-38.

Solution

Modify the parameter in [Table 8-22](#) to modify the Bad Signal sensitivity.

Table 8-22 *Parameter Values for Adjusting Bad Signal Sensitivity*


Parameter Name	Less	<	<	<	More (Default)
Parameter 14	1	3	5	7	10

Decrease 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. The channel will display a status of Bad Signal less often, so you may be able to detect more events. Be aware that if you decrease the sensitivity too much for your camera view, you may not be notified of video signal and contrast problems that make the system unable to accurately detect events.

Increase to make it more likely Bad Signal will appear and detection will stop when contrast problems occur.

How to Turn On and Off Bad Signal Status for Contrast

Summary

In some cases, you may not want to be notified of contrast problems (e.g., loss of signal, a covered camera, or a pitch dark scene). These problems are usually indicated by the Bad Signal channel status. A red box appears around the channel snapshot. When you hover over the exclamation point warning icon , a Bad Signal message appears.

If the Bad Signal status has been turned off in the past, you can also turn it back on using this parameter.

Before Using this Solution

Attempt to correct the contrast problem or improve the environment using the following sections:

- [How to Adjust Bad Signal Sensitivity, page 8-40](#)
- [How to Adjust Contrast Sensitivity, page 8-38](#)
- [Camera Placement Considerations and Workarounds, page 8-22](#)

Solution

If you have been unable to correct the problem that caused a Bad Signal, it is possible to turn off the Bad Signal channel status.

To enable or disable the Bad Signal status, modify the parameter in [Table 8-23](#)

Table 8-23 *Parameter Values for Enabling/Disabling Bad Signal Status*

Parameter Name	Default Value (On)	Off
Parameter 13	Detect contrast problems	Ignore contrast problems

If you turn off Bad Signal, the channel will never have a Bad Signal channel because of low contrast. You may be able to detect more events. Depending on your camera view, keep in mind that turning off the status may leave you unaware of contrast problems that make the system unable to detect events.



Note

The setting also changes Parameter 16 to **Disable noise detection**. If Parameter 16 is set to **Enable noise detection**, you will still receive the Bad Signal channel status if there is noise in the video signal. For more information, see the [“How to Detect Noise in Video Signal” section on page 8-67](#).

If you change the value of Parameter 13 to **Ignore contrast problems**, the system will operate differently if a video signal is not being received when you are using User-controlled views (see the [“How to Stop Automatic View Forcing” section on page 8-57](#)). Normally the system reports a Bad Signal channel status if video is not received. If you change this parameter, the system will report an Unknown view channel status instead. If a blue screen (or other color or pattern) snapshot usually indicates that the video signal has been lost, it will still do so. An event response will also indicate that there has been a Camera Tamper if a Camera Tamper rule is active.

Object Issues

This section includes the following troubleshooting topics that pertain to object issues:

- [How to Turn On and Off People Verification, page 8-42](#)
- [How to Adjust the Minimum Object Detection Size, page 8-44](#)
- [How to Adjust the Stationary Object Monitoring Time, page 8-45](#)
- [How to Make Whole Object Appear in Snapshot, page 8-45](#)
- [How to Prevent Unknown View/Camera Tamper for Large Objects, page 8-46](#)
- [How to Specify Active or Passive for Anything Objects, page 8-47](#)

How to Turn On and Off People Verification

Summary

Turning on People Verification improves the device's ability to identify and properly classify people. This significantly reduces false alarms caused by other types of objects (trains, cars, transient objects, etc.) without the use of filters. A channel with People Verification enabled will optimally respond to events involving people, so it is recommended to be used for scenarios where you only want to detect people and you want to reduce false alarms generated by other objects in the scene.

Solution

People Verification will improve performance for human detection rules, but is specifically designed to significantly lower false alarms rates. Therefore, People Verification is ideally used under the following circumstances:

- Areas with other object movement, including environmental effects, where the appearance of a person is an exception.
- Scenarios where false alarm avoidance is at a premium and only people need to be detected.
- The appearance of any person in the area of interest should trigger a response.

People Verification is designed to be used with Inside events. For example, suppose a Person Inside area of interest rule is being used to monitor a train station for the presence of individuals on a track. If false alarms are generated due to passing trains or other objects, such as foliage next to the tracks or animals walking along them, this would be an appropriate setting for People Verification.

Security settings may be particularly sensitive to false alarms. Too many false alarms may be a nuisance, cause guards to have diminished confidence in the system and ignore real events of interest, or add to costs by requiring additional resources to investigate false alarms. For example, a closed retail store at night may need to be monitored for unauthorized entry. If a Person Inside area of interest rule was created with People Verification on, the guard would know that only a real event of interest involving a person in the store would be detected.

You may also be able to utilize People Verification for Loiter and Disappear rules, but be sure to test the system carefully with these event types to be sure detection is improved.

**Note**

Do not use this People Verification if you are doing any of the following:

- Using People-Only Classification. People-Only Classification and People Verification are meant for two different purposes, and you should not use them on a channel at the same time. People-Only Classification assumes all objects are people and determines how many people are present based on the user's calibration of the camera view. For more information, see the [“About People-Only Classification” section on page 7-5](#). People Verification, on the other hand, means the device looks at every object and identifies whether it is a person based on many attributes.
- Using Dwell Time, Appears, Occupancy, video tripwire, Exits, Enters, Taken Away, or Left Behind rules on the channel. Keep in mind that the parameter setting applies to every rule on the channel. Only use event types appropriate to People Verification on that channel.
- Monitoring for vehicles or other objects that are not people.

To activate People Verification, modify the parameter in [Table 8-24](#).

Table 8-24 *Parameter Values for Enabling/Disabling People Verification*

Parameter Name	Default Value (People Verification Off)	People Verification On
Parameter 191	Disable People Verification	Enable People Verification

People Verification operates differently based on the setting of Parameter 98. Parameter 98 specifies whether the camera's view is indoor or outdoor. By default, the camera view is assumed to be indoor. Each person is expected to be at least 500 pixels to be classified in an indoor view. If you are using a camera with an outdoor field of view, you should change Parameter 98 at the same time as Parameter 191. Each person is expected to be at least 200 pixels to be classified in an outdoor view.

If the camera is set to indoor, the system assumes people are closer to the camera than people in an outside view. If people are regularly close to the camera in an outside camera view, test which setting produces more reliable results. An accurate setting for Parameter 98 results in better performance for People Verification. To specify whether a camera is indoors or outdoors, modify the parameter in [Table 8-25](#).

Table 8-25 *Parameter Values for Specifying Whether Camera View is Indoors or Outdoors*

Parameter Name	Default Value	Other Value
Parameter 98	Indoor	Outdoor

**Note**

If you are running People Verification, you will probably not need to create object filters. Test how the system operates without object filters before adding them.

If a Camera Tamper rule is created, Camera Tamper events are still detected when People Verification is turned on. For more information, see the [“Camera Tamper Events” section on page 5-6](#).

How to Adjust the Minimum Object Detection Size

Summary

How to adjust the way small objects are detected and classified by the system. You can modify this setting if small objects that you want to detect are being ignored and/or small objects that you do not want to monitor are being detected.

Solution

In order to improve the system's ability to detect and properly classify small objects, change the following values. The smallest objects can be detected using the values on the left. As the values move to the right, the minimum size is raised. To adjust the minimum object detection size, modify the parameter in [Table 8-26](#).

Table 8-26 Parameter Values for Adjusting the Minimum Object Detection Size

Parameter Name	Definition	Smallest Minimum Object Size	<	Default	<	Largest Minimum Object Size
Parameter 5	Continuous area (in pixels) large enough to be an object.	30	40	50	100	200
Parameter 6	Minimum size (in pixels) an object must be in order to be classified. Objects smaller than this size are considered transient objects.	10	10	10	75	150
Parameter 64	Smallest object size (in pixels) that can be detected and monitored as being stationary.	30	40	50	100	200

Benefit of Parameter Change

If you lower the values (move towards the values on the left of the table), the system may detect more small objects. This is appropriate if the smaller objects are people or vehicles that the device should monitor. Be aware that if you lower the values too far for your scene, the device may misidentify more small objects (causing more false alarms).

If you raise the values (move towards the values on the right of the table), the system may ignore smaller objects. This may be an appropriate option if small objects in the camera's field of view are not objects that need to be monitored. Be aware that if you raise the values too high for your scene, the device may not detect some small objects of interest.



Note

In addition to changing these parameters, you may want to create minimum object size filters. Minimum object size filters allow you to specify the minimum size of objects that can trigger responses in the foreground and background of a camera's field of view. Be aware that object filters are not supported by every channel configuration. For more information, see the [“Minimum and Maximum Size Filters”](#) section on page 4-28.

How to Adjust the Stationary Object Monitoring Time

Summary

How to change the amount of time the system monitors an object that is not moving. Decreasing the amount of time objects are monitored will decrease the amount of system resources used to track objects.

Solution

To change the amount of time (in seconds) the system will monitor an object that is not moving, modify the parameter in [Table 8-27](#).

Table 8-27 *Parameter Values for Adjusting the Stationary Object Monitoring Time*

Parameter Name	Default Value (seconds)	New Value
Parameter 118	1800	Any value less than 3600

By default, the system will ignore objects that have been stationary for the default amount of time. If you decrease Parameter 118, more system resources may be available. As the value is increased, the system may require more memory.

If you change this value, remember to consider the impact on existing and new rules. If you set a Loiters or Left Behind rule to a duration higher than the setting value, the device will never trigger responses for objects that have been stationary the entire time they are in the view.

For instance, you may have set the value to 1800 seconds (30 minutes). You create a rule to detect when someone has loitered 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 device stopped monitoring the person at 30 minutes.

In the next example, assume you set the value to 600 seconds (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.

How to Make Whole Object Appear in Snapshot

Summary

How to include the whole object in the snapshot if only a small part of an object (such as a foot) is displayed in the snapshot for an Appears event.



Note

This change only applies to snapshots taken after the parameter change.

Solution

To make more of an object appear in a snapshot, modify the parameter in [Table 8-28](#).

Table 8-28 *Parameter Values for Making More of an Object Appear in Snapshot*

Parameter Name	Default Value	New Value
Parameter 29	1	2

This parameter determines how long (in seconds) the system should wait to report an Appears event. Delaying the time may result in a more informative alert snapshot, but it will delay notification of Appears events.

How to Prevent Unknown View/Camera Tamper for Large Objects

Summary

Camera Tamper events and/or the unknown view status is being reported when a large object enters a field of view.



Note

Do not modify these parameters if you are using Auto-force view behavior.

Before Using this Solution

Try to adjust view behavior using the solution in the [“How to Adjust View Sensitivity” section on page 8-49](#). If that solution does not fix the problem, attempt Solution 1 described below. If that fails, attempt Solution 2.

Solution 1

A Camera Tamper is an event that significantly changes the camera's field of view, such as the camera being panned, turned off, unplugged, jostled, or covered, or the lights being turned on or off within the field of view. A Camera Tamper event can potentially cause the system to stop monitoring a video feed for events.

If you are receiving false alarms because a large object, such as a train, enters the field of view, modify the parameter in [Table 8-29](#).

Table 8-29 Parameter Values for Adjusting the Large Object Threshold for Camera Tamper Event

Parameter Name	Default Value	New Value
Parameter 9	0.4	0.6

Parameter 9 determines the percentage of how much of the view must change for the device to consider it a Camera Tamper. For example, a value of .4 means that 40% of the view has to change for a Camera Tamper to take place.

If you continue to experience false alarms because of large objects, try changing the value to **0.8**. Large objects entering the field of view will be considered an event less often. This change may decrease the number of false Camera Tamper alarms, but it may also make it more difficult for the system to identify the channel's known view. As a result of this change, the system may not detect some Camera Tamper events.

If this solution does not correct the problem, see solution 2 below.

Solution 2

Only change these parameter values if the camera is going to remain in one stationary field of view.

If you change these parameter values, the following will occur:

- The channel will never have an unknown view status.
- Whenever the channel leaves the known view, events will not be detected for a few seconds.

- A few seconds after the channel leaves the known view, the current view of the camera becomes the known view. Events can be detected.

To prevent large objects entering the field of view from causing the channel to remain in an Unknown View, modify the parameter in [Table 8-30](#).

Table 8-30 *Parameter Values for Adjusting the Large Object Threshold for Unknown View*

Parameter Name	Default Value	New Value
Parameter 9	0.4	0.6
Parameter 10	0.75	0
Parameter 31	0.01	1

Parameters 9, 10, and 31 all represent percentages in decimal form (for example, 0.8=80%). Parameter 9 represents how much of the view must change for the device to consider it a Camera Tamper. Parameter 10 represents how close the current view and a recognized/known view match. This determines how confident the system is the two views match and the current view is a known view. Parameter 31 determines how much a view can move from its original position in any direction (example=0.01 equals 1% of the view). For instance, during camera jitter the view may change slightly.

If you are still experiencing problems after applying these parameter changes, try changing Parameter 9 to **0.8**. Continue to use the new values for Parameter 10 and Parameter 31.

As a result of these changes:

- Large objects entering the field of view will generate fewer Camera Tamper event responses.
- Large objects entering the field of view will no longer cause the channel to permanently enter an unknown view.
- Since the channel is returned to the known view status, more events may be detected.
- The system may not detect some Camera Tamper events. If the camera is completely covered or another drastic Camera Tamper occurs, the channel will still be in a known view. It is also possible that, after the few seconds it takes for detection to continue, the object causing the view change may still be in the camera's view. The view of the camera with the object will become the known view. For these reasons, even though the channel is in a known view, the rules created for that view may no longer be appropriate.
- Events will not be detected for the few seconds after the oversized object enters the view.

How to Specify Active or Passive for Anything Objects

Summary

You want to specify what type of object (active or passive) can be detected as Taken Away or Left Behind using a rule that has an **Anything** object.

Solution

The parameter change below only applies if you have selected **Anything** as an object type when creating a rule. An **Anything** object is any type of object of interest the system identifies. Usually, you use this object type if you want to detect all passive objects regardless of how the system classifies them. A passive object is an object that does not move on its own.

To change the type of objects that can be detected as **Anything** objects for Left Behind or Taken Away events., modify the parameter in [Table 8-31](#).

Table 8-31 *Parameter Values for Specifying Anything Objects*

Parameter Name	Value	Meaning
Parameter 68	Active	An object that moves on its own. For instance, this could be used to detect a car that has entered a parking lot and parked.
	Passive (default value)	An object that does not move on its own. For instance, this could be used to detect a bag a person has left behind.
	All	The system will detect active and passive objects.

Distinguishing between active and passive objects provides you with a method for reducing false alarms without using size filters. Object size filters often do not work across views because different types of objects may appear to have a similar size based on the angle of the camera. The number of false alarms caused by objects that should not be considered for Taken Away and Left Behind events should decrease if you select an appropriate value based on your camera view.

Remember that if you select only active or only passive, you prevent the system from detecting Left Behind and Taken Away events involving the other type of object.

View Troubleshooting

Channels views are commonly referred to as known or unknown. Known views are actively being monitored for events. Unknown views are not recognized by the device, so no event detection occurs for unknown views. A red box appears around the camera snapshot of an unknown view in the Analytics Management Console.

The type of view mode your channel is using determines what happens when the camera view changes significantly. For a detailed description of the view types, see the [“View Status” section on page 1-4](#). The default view behavior is controlled by the channel. In most cases the default view behavior should be appropriate, but you can modify this behavior in the Device Configuration page. The channel configuration area's **View Mode** drop-down list displays the available view options.

You can also modify the view mode using parameters:

- [How to Turn on Automatic View Forcing, page 8-58](#)
- [How to Stop Automatic View Forcing, page 8-57](#)

If you find that your channel is frequently staying in an unknown view or known view when it should not, there are other parameters that you can modify.

First, try adjusting the view sensitivity. For more information, see the [“How to Adjust View Sensitivity” section on page 8-49](#).

If the device is still having problems distinguishing between known and unknown views, see:

- [Unknown View Channel Status, page 8-50](#)
- [How to Adjust View Matching When in an Unknown View, page 8-51](#)
- [How to Distinguish Between Similar Views, page 8-53](#)

- [How to Minimize Unknown Views without Automatic Forcing](#), page 8-56
- [How to Improve Unknown View Recognition](#), page 8-54
- [How to Improve Known View Recognition](#), page 8-54

If you want to reduce the amount of time it takes for the device to start monitoring, see the [“How to Shorten Downtime After View Change”](#) section on page 8-55.

If you frequently experience a Camera Tamper event and/or unknown view when large objects enter the field of view, see the [“How to Prevent Unknown View/Camera Tamper for Large Objects”](#) section on page 8-46.

How to Adjust View Sensitivity

Summary

How to make the system more or less sensitive to changes in the camera's field of view.



Note

Do not modify these parameters if People-Only Classification is turned on, or if you are using Auto-force view mode. For more information, see the [“About People-Only Classification”](#) section on page 7-5 and [“View Status”](#) section on page 1-4.

Solution

When a camera's field of view changes (i.e., a Camera Tamper occurs), the system compares the new view of the camera to the recognized view. Certain parameters determine how the system compares the new and recognized view to determine if the new view is already known.

Keep in mind that you probably only want to adjust these parameters if the system is treating views in an unexpected manner. For instance, if the view really does change completely, it makes sense that the system is recognizing the view as different. However, if minor view changes are causing the system to not recognize the view or if the system is ignoring view changes, you might want to modify these settings.

If you want to modify view behavior, modify the parameter in [Table 8-32](#).

Table 8-32 *Parameter Values for Adjusting View Sensitivity*

Parameter Name	Definition	Least Sensitive	<	<	<	Most Sensitive (Default Value)
Parameter 9	Percentage (0.4 = 40%) of how much of the view must change for the device to consider it a totally different view. Increase to reduce the number of Camera Tamper events and view changes.	0.8	0.7	0.6	0.5	0.4

Table 8-32 *Parameter Values for Adjusting View Sensitivity (continued)*

Parameter Name	Definition	Least Sensitive	<	<	<	Most Sensitive (Default Value)
Parameter 10	Sets a percentage (.01 = 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.	0	0.15	0.35	0.55	0.75
Parameter 31	How much (.01 = 1%) a view can move or jitter from the original position in any direction without a view change.	1	0.1	0.05	0.03	0.01

If you make the system more sensitive, you may be notified of more view changes. This will better inform you if there are changes to the camera's field of view. If you are using User-controlled views, the system will stop monitoring the view when it changes. This will indicate that you need to take some action to correct the situation and continue monitoring. For more information, see the [“View Status” section on page 1-4](#). On the other hand, if the system becomes too sensitive, minor view changes may cause the system to frequently change views. It may become bothersome to have to take action to continue monitoring.


If you make the system less sensitive, you may have to manually force or correct the view less often if you are using User-controlled views. Monitoring will be more likely to continue during a minor view change. On the other hand, you may not be notified of real Camera Tamper events that could represent a security risk. Also, if the system does not recognize a view change, the wrong the rules could be applied to the view. At the least sensitive level, the system may only detect very severe Camera Tamper events.

If changing these parameters does not fix your particular problem, try one of the following (if applicable to your channel type):

- [How to Turn on Automatic View Forcing, page 8-58](#)
- [How to Minimize Unknown Views without Automatic Forcing, page 8-56](#)
- [How to Improve Known View Recognition, page 8-54](#)
- [How to Distinguish Between Similar Views, page 8-53](#)
- [How to Improve Unknown View Recognition, page 8-54](#)

Unknown View Channel Status

Summary

A red border around the camera snapshot indicates that the view is unknown. If you hover over the exclamation point icon  below the snapshot, a message indicating that the channel is **Out of view** appears.

If you are using Auto-acquire views, the channel will return to a known view in a few seconds. If you are using User-controlled views, you may need to take action to restore the camera view to a known view. Different causes of an unknown view and solutions to correcting the problem are listed below.

Solution

The channel does not recognize the camera's field of view as a known view. Until the camera's field of view becomes a view the device recognizes as a known view, the channel does not generate any responses.

An unknown view could have several causes:

- A Camera Tamper event has occurred to make the live camera feed unrecognizable to the device. A Camera Tamper event is any event in a known view that significantly changes the camera's field of view, such as the camera being panned, turned off, unplugged, jostled, or covered, or the lights being turned on or off within the field of view. For more information, see the [“Camera Tamper Events” section on page 5-6](#). If the camera movement is relatively small and temporary (such as camera jitter), you may want to enable Image Stabilization to avoid Camera Tamper events. For more information, see the [“How to Turn Image Stabilization On and Off” section on page 8-64](#).
- If the system is not recognizing the view due to changes in the camera's field of view, you can make the camera less sensitive to view changes using the **View Sensitivity** setting. This means the channel is more likely to remain in a known view when a Camera Tamper type event occurs. For more information, see the [“How to Adjust View Sensitivity” section on page 8-49](#). For a summary of other parameter modifications that apply to view changes, see the [“View Troubleshooting” section on page 8-48](#).
- If a PTZ camera is being used, the camera may have been moved away from a known view. You can move the camera back to a field of view the device recognizes as a known view. You can also force the field of view to become a known view. For instruction, see the [“View Troubleshooting” section on page 8-48](#).
- If a multiplexer is being used, the multiplexer may have switched to another camera that has no known view defined for it. You can switch to a camera that has a known view defined for it. You can also force the field of view to become a known view. For instruction, see the [“Force a View” section on page 1-6](#).
- If the system no longer recognizes the live camera feed as a known view (for example, an outdoor camera's feed after a heavy snowfall or at night when the scene is not lit) or if you want to change the camera position, you can also force the view. For instruction, see the [“Force a View” section on page 1-6](#).



Note

If you frequently have to make adjustments because the camera has gone to unknown view, you can force the system to always adopt the current view of the camera as the known view. For more information, see the [“How to Turn on Automatic View Forcing” section on page 8-58](#).

How to Adjust View Matching When in an Unknown View

Summary

This section applies if you are using Auto-acquire or User-controlled views. For more information about these view types, see the [“View Status” section on page 1-4](#).

In order for a device to monitor a video feed for events, the video feed must be recognized by the device. If a live camera view is not recognized, the view status is considered unknown. When the channel is in an unknown view, it will continue to actively monitor the video feed to determine if the channel can be restored to a known view status.

By modifying a parameter value, it is possible to modify the extent to which a channel that is in an unknown view will consider a modified camera view to see if it matches the view it recognizes.

Before Using this Solution

Try to adjust view behavior using the suggestions in the [“How to Adjust View Sensitivity”](#) section on page 8-49. If that solution does not fix the problem, use the solution below.

Solution

As the device monitors for Camera Tamperers, it is important that it can tolerate a certain level of minor scene modification, returning to a known view status when a scene has not been altered too significantly. For example, the channel should be able to recover a known view status after a camera is jostled (the view shifts only a few pixels along the X and/or Y axis).

To affect the device's flexibility in matching the current view to a recognized view, modify the parameter in [Table 8-33](#)

Table 8-33 *Parameter Values for Adjusting View Matching When in an Unknown View*

Parameter Name	Default Value	New Value
Parameter 104	-0.75	-0.05 or -0.01

The Parameter 104 value represents the extent to which the device will search for a recognized view that may have been offset due to camera jitter. A negative value represents a certain percentage of the image size. For example, if the Parameter 104 value is -0.01 and the video processing resolution is 320 x 240, the device will accommodate a shift of 3 pixels horizontally ($320 * .01 = 3.2$, which rounds to 3) and 2 pixels vertically ($240 * .01 = 2.4$, which rounds to 2).

If the device is having difficulty recognizing a known view, try changing the value to -0.05. If the problem persists, try a value of -0.01.

Even if a matching view exists within the search range defined in Parameter 104, the device's ability to accept a match is constrained by the amount the image is offset from its original position. This constraint is controlled by adjusting the parameter in [Table 8-34](#).

Table 8-34 *Parameter Values for Adjusting View Matching Offset Constraint*

Parameter Name	Default Value	New Value
Parameter 184	0.01	0.02-0.05 (moderate) 0.05-0.1 (aggressive; see below)

Parameter 184 has a suggested range of 0.02 to 0.05. In most cases, applying parameter settings up to 0.05 will yield the desired effect of allowing a higher degree of offset.

If you have tried setting the parameter 184 value at 0.05 and are still seeing the problem, you can try setting the parameter as high as 0.1. Note that setting the parameter value this high is more likely to result in the device erroneously recognizing an unknown view. This may occur more frequently as the value of Parameter 184 is increased. If a view is misidentified, the appropriate rules may not be applied to the view.

**Note**

The relationship between parameter 104 and parameter 184 in controlling how an unknown view can change to known view is similar to the relationship between parameter 55 and parameter 93 in controlling how a known view can change to an unknown view (see the [“How to Distinguish Between Similar Views”](#) section on page 8-53 and [“How to Minimize Unknown Views without Automatic Forcing”](#) section on page 8-56). However, because the default value for parameter 104 is relatively high

and the default value for parameter 184 is relatively low, this means that by default it is easier for a known view status to change to unknown view than it is for an unknown view status to change to known view.

How to Distinguish Between Similar Views

Summary

When two camera views are similar, the device may misidentify one of the views as a recognized, known view. Since the device does not recognize the view correctly, monitoring may continue with rules applied that are no longer appropriate.



Note

This section only applies if you are using a channel with User-controlled views. If your views are automatically forced by the system, the device will monitor whatever appears in the field of view. For more information, see the [“View Status” section on page 1-4](#).

Before Using this Solution

Try to adjust view behavior using the solution in the [“How to Adjust View Sensitivity” section on page 8-49](#). If that solution does not fix the problem, use the solution below.

Solution 1

You can increase Parameter 10. Parameter 10 sets a percentage (example 0.75 equals 75%) indicating how closely the current view and a recognized view match. To specify a percentage that determines how confident the system is that the two views match and the current view is a known view, modify the parameter in [Table 8-35](#).

Table 8-35 Parameter Values for Adjusting Confidence of a Current and Recognized View Match

Parameter Name	Default Value	New Value (Range)
Parameter 10	0.75	0.75 to 0.90

Solution 2

To improve the system's ability to correctly identify similar views when in a known view, modify the parameter in [Table 8-36](#).

Table 8-36 Parameter Values for Correctly Identifying Similar Views When in a Known View

Parameter Name	Default Value	New Value (Range)
Parameter 55	-0.05	-0.01 to -0.05

A negative value represents a percentage of the view (for example, -0.05 equals 5% of the view).

This parameter has a suggested range. This means that you may need to adjust the value within this range to find an ideal solution to your problem. Test the system multi- ability to detect events within the field of view with values within this range. For more information, see the [“Testing Parameter Changes” section on page 6-17](#). You should try incrementing the value in steps of 0.1.

The higher the parameter value, the more likely it is that the views will be correctly identified. The system will more accurately match a camera's field of view to the correct known view. This could be particularly useful if you have adjusted Parameter 93. For more information, see the [“How to Minimize Unknown Views without Automatic Forcing”](#) section on page 8-56.

If the value is too high for your device, the device may begin identifying known views as unknown views.

This offset only applies when the channel begins in a known view. To change the percentage for when channels are in an unknown view, see the [“How to Adjust View Matching When in an Unknown View”](#) section on page 8-51.

How to Improve Known View Recognition

Summary

The status of a channel in a known view is not known view.

Before Using this Solution

Try to adjust view behavior using the solution in the [“How to Adjust View Sensitivity”](#) section on page 8-49. If that solution does not fix the problem, try the solution below.

Solution

If a field of view does not have many distinguishing features, the device may have difficulty recognizing what the known view should be. In such a case, the system may occasionally misidentify a known view as an unknown view. For example, if the known view only includes the surface of a body of water, the system may occasionally interpret the same scene as an unknown view.

To improve Know View recognition, modify the parameter in [Table 8-37](#).

Table 8-37 *Parameter Values for Improving Known View Recognition*

Parameter Name	Default Value	New Value
Parameter 10	0.75	0.35

Parameter 10 sets a percentage (example=.75 equals 75%) for how close the current view and a recognized view match. This determines how confident the system is the two views match and the current view is a known view. The system will correctly identify known views more often with the new value, but there may be an increase in false alarms because more views that resemble the known view may be misidentified as the known view.

How to Improve Unknown View Recognition

Summary

A view is not recognized as unknown even though it has changed significantly from the known view.



Note

This section only applies if you are using a channel with User-controlled views. If your views are automatically forced by the system, the device will monitor whatever appears in the field of view. The camera will never remain in an unknown view. For more information, see the [“View Status”](#) section on page 1-4.

Before Using this Solution

Try to adjust view behavior using the solution in the [“How to Adjust View Sensitivity”](#) section on page 8-49. If that solution does not fix the problem, use the solution below.

Solution

If the view does not change to unknown when a Camera Tamper event occurs and User-controlled views is being used, it is because the device is not sensitive enough to changes in the view.

To correct this problem, modify the parameter in [Table 8-38](#).

Table 8-38 *Parameter Values for Improving Unknown View Recognition*

Parameter Name	Default Value	Suggested Value
Parameter 55	-0.05	-0.04 to -0.01

This parameter sets a percentage (example=-.05 equals 5%) for how close the current view and a recognized/known view match. This determines how confident the system is the two views match and the current view is a known view. When this change is made, there is an increased likelihood the device will recognize a view as unknown after the video feed has changed. It is also possible that the device will mistakenly interpret the video feed as having changed when no change has occurred.

This offset only applies when the channel begins in a known view. To change the percentage for when channels are in an unknown view, see the [“How to Adjust View Matching When in an Unknown View”](#) section on page 8-51.

How to Shorten Downtime After View Change

Summary

If you are frequently moving the camera between views or frequently experiencing Camera Tamper events, you may want to decrease the amount of time it takes for the device to begin monitoring the channel after these events.

Solution

To recognize views and begin detecting events more quickly, modify the parameter in [Table 8-39](#).

Table 8-39 *Parameter Values for Shortening Downtime After a View Change*

Parameter Name	Definition	Default Value	New Value
Parameter 27	Used to control the amount of time it takes for the channel to warm up. Multiply this parameter value by two to determine the number of seconds of delay (a value of 3.5 is 7 seconds of delay). Reduce this value to shorten the channel downtime after a view change.	3.5	2
Parameter 28	The initial value of pixels in the background model. Reduce this value to shorten the channel downtime after a view change.	25	8

After four seconds, the number of events the device can detect after a view changes to a different view, a Camera Tamper event takes place, or the device restarts will increase if you make the changes above.

**Note**

The device may still not be able to detect all events for the first seven seconds after a view changes to a different view, a Camera Tamper event takes place, or the device restarts.

How to Minimize Unknown Views without Automatic Forcing

Summary

A channel is in an unknown view even though the field of view is in a known view and has not changed. These changes should only be made in cases where you do not want to use Auto-force or Auto-acquire views. In those view modes, unknown views become known automatically. For more information about this view mode, see the [“View Status” section on page 1-4](#).

**Note**

This section only applies if you are using User-controlled views, and People-Only Classification is turned off.

Before Using this Solution

Try to adjust view behavior using the suggestions in the [“How to Adjust View Sensitivity” section on page 8-49](#). If that solution does not fix the problem, use the solution below.

Solution

If there is a channel status of unknown view, the device does not recognize the camera's field of view as a known view and video is not being checked against rules. This means that, until the camera's field of view becomes a view the device recognizes as a known view, the device does not detect any events for that camera's video feed.

If the system is detecting view changes that do not take place and the Unknown View status is frequently interrupting the operation of the system, you may need to adjust the parameter in [Table 8-40](#).

Table 8-40 *Parameter Values for Minimizing Unknown Views without Automatic Forcing*

Parameter Name	Default Value	New Value (Range)
Parameter 93	0.03	0.03-0.05 (moderate)
		0.05-0.1 (aggressive; see below)

Parameter 93 sets the maximum offset (example 0.03 equals 3% of the view) that determines if a particular frame of video matches the current view. It determines how much a view can move and still be the same view. This parameter has a suggested range of 0.03 to 0.05. In most cases, applying parameter settings up to 0.05 will yield the desired effect (fewer transitions to an unknown view status). For more information about experimenting with different parameter values, see the [“Testing Parameter Changes” section on page 6-17](#).

If you have tried setting the parameter value as high as 0.05 and are still seeing the problem, you can try setting the parameter as high as 0.1.

Note that setting the parameter value this high is more likely to result in side effects. The system may recognize different views as the same view. This may occur more frequently as the value of Parameter 93 is increased. If a view is misidentified, the appropriate rules may not be applied to the view. For

information on how to mitigate this side effect using Parameter 55, see [“How to Distinguish Between Similar Views” section on page 8-53](#). In order for Parameter 93 to influence view behavior, it must have a smaller absolute value than Parameter 55. An absolute value is the value of a number regardless of its sign (positive or negative). For instance, 7 is the absolute value of -7 and 7.

Parameter 93 changes the offset when a channel starts in a known view. If you want to change the maximum offset for when channels are in an unknown view, see the [“How to Adjust View Matching When in an Unknown View” section on page 8-51](#).

How to Stop Automatic View Forcing

Summary



Note

Do not make this change if you have activated People-Only Classification.

This section tells you to turn on User-controlled views. For more information about User-controlled view mode, see the [“View Status” section on page 1-4](#). In User-controlled view mode, views are no longer automatically forced. During automatic forcing, the device will monitor whatever scene appears in the camera's field of view. If you turn off automatic forcing, you need to manually force views or return the camera to the recognized view to continue monitoring when the camera's field of view changes significantly.



Note

Instead of using parameters to turn on User-controlled views, you can select User-controlled from the View Mode drop-down list available for each channel on the Device Configuration page.

Solution

To enable user-controlled views, adjust the parameter values in [Table 8-41](#)

Table 8-41 *Parameter Values for Enabling User-Controlled Views*

Parameter Name	Definition	User-controlled Views Values
Parameter 11	Enables or disables Camera Tamper detection. If false, Camera Tamper rules will not function.	Enable Camera Tamper
Parameter 19	How often (in seconds) the device checks whether the view is known.	30
Parameter 46	One of the parameters that determines whether a camera always remains in a known view (besides camera warm-up).	Allow unknown view

As a result of these changes, if the camera's field of view changes due to a Camera Tamper and does not return to a recognized view, the view becomes an unknown view. You can tell that a view is unknown because a red box appears around the edges of the camera snapshot.

When using User-controlled views, you will be aware of situations where a Camera Tamper has occurred (the camera being blocked, moved, etc.). For more information, see the [“Camera Tamper Events” section on page 5-6](#). This gives you a chance to see the new field of view and modify the camera view (if

appropriate) before monitoring continues. Remember that after a Camera Tamper event the device will not check the video against rules until you manually force the view to become a known view or return to the recognized view.

**Note**

If you want to turn on automatic forced views, see the [“How to Turn on Automatic View Forcing” section on page 8-58](#).

How to Turn on Automatic View Forcing

Summary

If your camera's field of view changes frequently and you do not need to be notified of the change, you can modify the view behavior to Auto-acquire or Auto-force views. For a summary of all the different view mode options, see the [“View Status” section on page 1-4](#).

**Tip**

Instead of using parameters to change the view mode, you can choose **Auto-acquire** or **Auto-force** from the View Mode drop-down list that is available for each channel on the Device Configuration page.

Solution

You can modify parameter values so that the current field of view of the camera becomes the known view automatically. Monitoring will continue despite changes to the camera's view. TO do this, use one of the following methods:

- [Auto-Acquire Views, page 8-58](#)
- [Auto-Force Views, page 8-59](#)

Auto-Acquire Views

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 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.

To apply this change, adjust the parameter values in [Table 8-42](#).

Table 8-42 *Parameter Values for Enabling Auto-Acquire Views*

Parameter Name	Definition	Auto-acquire Views
Parameter 11	Enables or disables the capability to use Camera Tamper detection.	Enable Camera Tamper
Parameter 19	How often (in seconds) the device checks whether the view is known.	30
Parameter 46	One of the parameters that determines whether a camera always remains in a known view (besides camera warm-up).	Always remain in known view

**Note**

To manually control a channel's view behavior, see the [“How to Stop Automatic View Forcing”](#) section on page 8-57.

Benefits of using Auto-acquire views:

- A Camera Tamper will no longer cause the channel to permanently enter an unknown view.
- Since the channel is returned to a known view, more events may be detected.

Side effects of using Auto-acquire views:

- If the camera is completely covered or another drastic Camera Tamper occurs, the channel will still return to a known view after a few seconds. The field of view of the camera after the Camera Tamper will become the known view. For these reasons, even though the channel is in a known view, the rules created for that view may no longer be appropriate.
- Video will not be checked against rules in the few seconds following a Camera Tamper.

**Note**

Only change these values if the rules applied to the view are not specific to a particular field of view of the camera or area of interest. For instance, a video tripwire rule created for one view may not be appropriate for a different field of view once a camera has moved.

Auto-Force Views

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 ignored. Camera Tamper responses are not generated.

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 active for the current field of view.

To apply this change, adjust the parameter values in [Table 8-43](#).

Table 8-43 *Parameter Values for Enabling Auto-Force Views*

Parameter Name	Definition	Auto-force Views (Default for Event Counting channels)
Parameter 11	Enables or disables the capability to use Camera Tamper detection.	Disable Camera Tamper
Parameter 19	How often (in seconds) the device checks whether the channel is in a known view.	157680000
Parameter 46	One of the parameters that determines whether a camera always remains in a known view (besides camera warm-up).	Always remain in known view

**Note**

To change the channel to Auto-acquire view behavior, use the values listed in the Auto-acquire Views section above. To change the channel to User-controlled view behavior, see the [“How to Stop Automatic View Forcing”](#) section on page 8-57.

Benefit of using Auto-force views:

The device never stops monitoring the channel for events because of a view change.

Side effects of using Auto-force views:

No Camera Tamper events will be detected. The device will no longer notify you whether lights are turned on or off within a camera's field of view, a camera is panned, zoomed, or jostled from a known view, or if the system loses the signal from a camera, which occurs when the camera is turned off or loses its power source (e.g., by being unplugged).

**Note**

Only change these values if the rules applied to the view are not specific to a particular field of view of the camera or area of interest. For instance, a video tripwire rule created for one view may not be appropriate for a different field of view once a camera has moved.

You can also modify how views behave using other methods that do not impact the device behavior as drastically. For suggestions, see the [“View Troubleshooting”](#) section on page 8-48.

Analytics Management Console Troubleshooting

This section includes the following troubleshooting topics that pertain to the Analytics Management Console:

- [Camera Tamper Unavailable, page 8-60](#)
- [Cannot Combine Events, page 8-61](#)
- [Cannot Create Rules, page 8-61](#)
- [Cannot Expand Snapshot, page 8-61](#)
- [Cannot Save Parameters, page 8-61](#)
- [Calibration Required, page 8-62](#)
- [Enhanced Night Snapshots Do Not Appear, page 8-62](#)
- [Missing Parameters, page 8-63](#)
- [Missing Reset Button, page 8-63](#)
- [Person is the Only Classification Option, page 8-63](#)
- [Snapshots Appear with Black Stripes Around the Edges, page 8-63](#)
- [Unable to Add Points to Video Tripwires or Areas of Interest, page 8-64](#)

Camera Tamper Unavailable

Summary

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

Solution

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

Summary

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

Solution

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

Summary


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

Solution

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

Summary

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

Solution

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

Summary

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

Solution

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. For information about these dependencies, see the descriptions in [“Parameter Quick Reference” section on page 6-2](#).
- The Analytics Management Console was unable to communicate with the device, or the device experienced an error.

Calibration Required

Summary

The Calibration Required dialog box appears on the Rule Management page.

Solution

This dialog box appears when you have turned on People-Only Classification, but 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 Channel** button on the Home page.

Enhanced Night Snapshots Do Not Appear

Summary

No night enhanced snapshots appear on alerts.

Solution

- You are using a channel type that does not support enhanced night snapshots. Contact your system administrator or software vendor to see if your system can display night enhanced snapshots.
- You have not used parameter to turn on the night enhanced snapshots. For instructions, see the [“How to Turn On and Off Enhanced Night Snapshots” section on page 8-68](#).
- The device is still gathering data to produce night enhanced snapshots. The device has to run for a certain amount of time before it can produce night enhanced snapshots. The default amount of time is 20 hours. Contact your system administrator to find out if your system functions under a different time frame.
- It may not be dark enough in the camera's field of view. Whether or not enhancement is needed is determined by the level of light in the camera's field of view, not the time of day that the alert was generated.

Missing Parameters

Summary

Some parameters do not appear in the Parameter page.

Solution


First, be sure that you have selected **All Parameters** from the **Display** drop-down list 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

Summary

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

Solution

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.

Person is the Only Classification Option

Summary

In the Edit Rule page, your only object option is **Person**.

Solution

This is the expected behavior if People-Only Classification is turned on. The system assumes that all objects in the field of view are people, so there is never the option to count other objects. For more information, see the [“About People-Only Classification” section on page 7-5](#).

Snapshots Appear with Black Stripes Around the Edges

Summary

One or more of the edges of a snapshot appear cropped by a black stripe.

Solution

Image Stabilization is a channel configuration option that mitigates the effects of camera jitter. When image stabilization is enabled for a camera encountering camera jitter, black stripes may appear along the edges of the camera view.

These black stripes do not indicate a problem. They indicate the presence of Image Stabilization as the camera view experiences slight movement up and down or back and forth. Through Image Stabilization, the device can compensate for this movement without reporting a Camera Tamper event.

Unable to Add Points to Video Tripwires or Areas of Interest

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.

Other Issues

This section includes the following troubleshooting topics that pertain to other issues:

- [How to Turn Image Stabilization On and Off, page 8-64](#)
- [How to Adjust Pixel Border for Image Stabilization, page 8-65](#)
- [How to Improve Image Stabilization in Busy Scenes, page 8-66](#)
- [How to Detect Noise in Video Signal, page 8-67](#)
- [How to Turn On and Off Enhanced Night Snapshots, page 8-68](#)

How to Turn Image Stabilization On and Off

Summary

This option allows you to turn Image Stabilization on and off. Image Stabilization mitigates the effects of camera jitter by compensating for slight variations in the camera view. Camera jitter refers to slight movement or vibration of the video source. Significant camera jitter can lead to the system no longer recognizing the camera's field of view.

Only turn on Image Stabilization if it is supported by your device. See your device specification for details.

The system only recognizes camera jitter as temporary fluctuations along a horizontal and/or vertical axis. If the camera view rotates, the system will recognize this as a Camera Tamper event and not camera jitter. If the camera view makes a permanent rather than temporary shift in position, this will also be interpreted as a Camera Tamper and not camera jitter.

If Image Stabilization is turned on, the device will accept a certain degree of camera view displacement without detecting that the view has changed. This accepted degree of displacement can include any temporary shift to the left, right, up, or down. By default, the amount of displacement is five pixels or less. For more information about how to change the size of the pixel border, see the [“How to Adjust Pixel Border for Image Stabilization”](#) section on page 8-65.

When Image Stabilization is enabled for a channel encountering camera jitter, black stripes may appear along the edges of the camera view. These black stripes do not indicate a problem, but instead indicate the presence of Image Stabilization as the camera view experiences slight movement up and down or back and forth.

**Note**

If there is a great deal of activity in your camera's field of view and Image Stabilization does not seem to be effective, see the [“How to Improve Image Stabilization in Busy Scenes”](#) section on page 8-66.

If People-Only Classification is turned on, Image Stabilization should no longer be used. A different form of stabilization is used automatically by the system when People-Only Classification is activated. For more information, see the [“How to Turn On and Off People-Only Classification”](#) section on page 8-32.

If you experience many false or missed events around the edge of your camera view and you are using a full view event with Image Stabilization on, try creating an area of interest event for the same type of rule. You can draw your area of interest to include all of the view except the few pixels around the edge.

If you are receiving unexpected results with Image Stabilization on, you may want to create a maximum size filter. For instructions on how to create this filter, see the [“Minimum and Maximum Size Filters”](#) section on page 4-28.

Solution

To enable or disable image stabilization, modify the parameter in [Table 8-44](#).

Table 8-44 *Parameter Values for Adjusting Image Stabilization*

Parameter Name	Stabilization Off (Default Behavior)	Stabilization On
Parameter 103	Disable Image Stabilization	Enable Image Stabilization

Once Image Stabilization is on, the device compensates for minor camera jitter to prevent a Camera Tamper. Be aware that you cannot draw areas of interest or video tripwires in a five pixel border around the outside of the camera's field of view.

How to Adjust Pixel Border for Image Stabilization

Summary

If Image Stabilization is turned on, the device will accept a certain degree of camera view displacement without detecting that the view has changed. This accepted degree of displacement can include any temporary shift to the left, right, up, or down. By default, the amount of displacement is five pixels or less. You can adjust this value using the parameter described below.

**Note**

Only adjust this parameter if Image Stabilization is turned on. For more information, see the [“How to Turn Image Stabilization On and Off”](#) section on page 8-64.

The system only recognizes camera jitter as temporary fluctuations along a horizontal and/or vertical axis. If the camera view rotates, the system will recognize this as a Camera Tamper event and not camera jitter. If the camera view makes a permanent rather than temporary shift in position, this will also be

interpreted as a Camera Tamper and not camera jitter.

If you experience many false or missed events around the edge of your camera view and you are using a full view event with Image Stabilization on, try creating an area of interest event for the same type of rule. You can draw your area of interest to include all of the view except the few pixels around the edge.

If you are receiving unexpected result with Image Stabilization on, you may want to create a maximum size filter. For instructions on how to create this filter, see the [“Minimum and Maximum Size Filters” section on page 4-28](#).

Solution

The parameter in [Table 8-45](#) controls the number of pixels that are ignored around the border of the camera's field of view. You cannot detect events or draw areas of interest or video tripwires along the outside of the camera view in the number of pixels you specify in this parameter.

Table 8-45 *Parameter Values for Adjusting the Pixel Border for Image Stabilization*

Parameter Name	Stabilization Off (Default Behavior)	Stabilization On
Parameter 173	5	Value between 1 and 8

This parameter has a suggested range. This means that you may need to experiment with different values within this range to find an ideal value for stabilization.

Increasing pixels makes it less likely that camera jitter will cause the camera to experience a Camera Tamper. Be aware that increasing the pixel value from the default value may slow the system. If you observe a noticeable difference in system performance after increasing this parameter, return it to the default value.

Decreasing pixels allows more of the camera's field of view to be monitored for events. It may also slightly increase the speed of the system. Be aware that decreasing the pixel value may cause the system to experience more Camera Tamperers during camera jitter.

How to Improve Image Stabilization in Busy Scenes

Summary

In a busy scene, you may be able to improve the performance of Image Stabilization by modifying a parameter.



Only adjust this parameter if Image Stabilization is turned on. For more information, see the [“How to Turn Image Stabilization On and Off” section on page 8-64](#).

Solution

To improve stabilization in busy scenes, modify the parameter in [Table 8-46](#).

Table 8-46 *Parameter Values for Adjusting Image Stabilization in Busy Scenes*

Parameter Name	Default Value	New Value (Select from Range)
Parameter 172	25	Usually a value between 30 and 150

Parameter 172 controls how many points are used to stabilize an image when Image Stabilization is enabled. In most cases, the default value of 25 is acceptable. If your scene is very busy and Image Stabilization does not appear to be functioning properly (the system frequently experiences a Camera Tamper due to jitter), you can try raising this parameter value.

The table above contains a suggested range. In most views, a value between 25 and 100 should be sufficient. You would increase the value from 25 if your scene is busy. Experiment with slowly increasing this value to determine if Image Stabilization improves. Stop increasing the value as soon as the problem is solved.

If your scene is extremely busy, you can try raising the value to somewhere between 100 and 150. If Image Stabilization has still not improved with the value as high as 150, try lowering the value to between 30 and 50 instead. It may help to lower the value if you are looking at a scene that is mostly covered by water (such as a beach or pier).

You can also try lowering the value if you suspect Image Stabilization is slowing the system. The lower the value you enter, the more system resources may be available. Keep in mind that this may decrease the effectiveness of the stabilization.


How to Detect Noise in Video Signal

Summary

You want the system to notify you when there is interference (or noise) in the video signal.

Solution

If a camera you are using in the system has interference problems, you may want the system to notify you that interference is affecting the video signal. Only change this parameter if severe noise is interfering with the system's ability to detect events.

You will be notified of noise by the Bad Signal status. A red box appears around the channel snapshot. When you hover over the exclamation point warning icon , a Bad Signal message appears.

When the channel is in a Bad Signal status, video is not checked against rules.

To detect noise, modify the parameter in [Table 8-47](#)

Table 8-47 *Parameter Values for Enabling/Disabling Noise Detection*

Parameter Name	Off (Default Value)	On
Parameter 16	Disable noise detection	Enable noise detection

If you change this parameter, the system will notify you of noise. Be aware that in some camera views the channel status may change to Bad Signal frequently. When the Bad Signal channel status appears, the video is not checked against rules.

**Note**

Do not enable noise detection if most of the field of view contains water or foliage (leaves, branches, bushes, etc.).

How to Turn On and Off Enhanced Night Snapshots

Summary

How to turn on or off the ability to show enhanced night snapshots.

Solution

If an alert snapshot is taken at night, it may be difficult for you to tell what has taken place in the camera's field of view. Showing enhanced night snapshots can alleviate this problem. When an alert is generated at night, a nighttime snapshot of the camera's field of view that shows the event is transposed over a daytime snapshot of the camera's field of view. This allows you to see the event and the surrounding environment.

The snapshots below are of the same alert. The snapshot on the left was generated without the night enhanced snapshot option. The snapshot on the right was generated with the night enhanced snapshot option turned on. In the snapshot on the right, you can see more context in the scene. For instance, you can see that there is a building in the background.



To enable or disable night enhancement, adjust the parameter value in [Table 8-48](#).

Table 8-48 Parameter Values for Enabling/Disabling Night Enhancement

Parameter Name	Off (Default Value)	On
Parameter 95	Disable night enhancement	Enable night enhancement

**Note**

The device that generates the alert must be running for a certain amount of time to gather the information necessary to provide a night enhanced snapshot. You will not be able to see enhanced snapshots during this time.

It may take more system resources to process the video. If using this option slows your system considerably, you may want to consider not using these images.



GLOSSARY

A

Alert	A description of an event detected by a device.
Anything object	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.
Appears in Full View event	An event in which an object moves into the field of view of the camera for the first time. An object appeared the first time it moved into the view of the camera.
Appears in area of interest event	An event in which an object appears in an area of interest without appearing within the camera's field of view previously.
Area of interest	A square, rectangle, or other multi-sided shape drawn within the field of view of the camera. A response is triggered when an object performs an action involving the area of interest.
Auto-acquire Views	If the camera's field of view changes, the device begins monitoring the new view after a few seconds. If a Camera Tamper rule is active, a Camera Tamper response is generated when the channel changes views. There is only one view per channel.
Auto-force Views	The device always monitors the camera's field of view, regardless of whether or not a Camera Tamper event occurs. The system does not notify you when the camera's field of view changes (no view health monitor alerts, Camera Tamper responses, etc.). There is only one view per channel.

B

Background	The area of the view without any objects of interest.
Background model	A representation of the background of the view created by the system.
Bad Signal message	A channel status message indicating that there is a problem with the video signal. This may occur because a video signal is not being received or has a low dynamic range.

C

Camera	Devices monitor the video feeds from cameras for events.
Camera jitter	Slight movement or vibration of the video source. Significant camera jitter can lead to the system no longer recognizing the camera's field of view.

Camera Tamper event	Any event that significantly changes the camera multi- field of view, such as the camera being panned, turned off, unplugged, jostled, or covered, or the lights being turned on or off.
Channel	Depending on the context in which the word is used, a channel can be one of the following: <ul style="list-style-type: none"> • A video stream • A video analytics license type (security or counting)
Classification	See object classification.

D

Device	See Video Analysis Device.
Disappears from Full View event	An event in which an object disappears from anywhere within the field of view of the camera.
Disappears from area of interest event	An event in which an object is no longer in the camera's field of view, having last been detected within an area of interest.
Dwell Time Data event- The device detects how long one or more objects remain in an area of interest.	
Dwell Time Threshold event	An event in which one or more objects remain within an area of interest for a user-specified period of time.

E

Element	A shape drawn within the camera's field of view when creating an event, such as an area of interest or a video tripwire.
Enters area of interest event	An event in which an object enters an area of interest from any direction within the camera's field of view. For an event to occur, the object must have already been detected within the camera multi- field of view before entering the area.
Event	Activity of interest that takes place within a camera's field of view.
Exits area of interest event	An event in which an object exits the perimeter of an area of interest in any direction.

F

Field of view	The area visible through the lens of a camera.
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Filter	See object filter.
Footprint	Where the bottom of an object touches the ground.
Foreground	The area of the view containing objects of interest.
Frame	A still picture in a series of pictures that, when displayed in succession, depicts motion.
Full view events	An event that occurs anywhere in the field of view of the camera. The device looks at the entire field of view of the camera for this kind of event, and an area within the camera's field of view is not specified.

G

Ground plane	A type of area of interest used to detect when the bottom (footprint) of an object is within the area.
---------------------	--

H

HTML page	See Hypertext Markup Language page.
Hypertext Markup Language page	A type of file used on the World Wide Web that opens in Web browsers such as Microsoft® Internet Explorer® or Mozilla Firefox®. Most word processing programs, such as Microsoft® Word®, can also open an HTML page.

I

Image plane	A type of area of interest used to detect when any part of an object overlaps with the area, regardless of whether the bottom (footprint) of the object is within the area.
Image Stabilization	Image Stabilization mitigates the effects of camera jitter by compensating for slight variations in the camera view.
Inside area of interest event	An event in which an object appears in an area of interest or enters the perimeter of an area of interest.
Irregular shape and motion filter	A type of object filter that enables the device to ignore objects that change shape and move in different directions between frames of video too quickly to be of interest.

K

Known view	A camera field of view that is actively being monitored for events.
-------------------	---

L

Left Behind in Full View event	An event in which an object is left behind and remains stationary for a user-specified duration of time anywhere within the field of view of the camera.
Left Behind in area of interest event	An event in which an object is left behind in an area of interest and remains stationary for a user-specified duration of time.
Loiters in area of interest event	An event in which an object remains within an area of interest for a user-specified period of time.
Low dynamic range	A lack of contrast within video images.

M

Markup	Shapes and text on snapshots in alerts that provide more information about events.
Maximum object size filter	A type of object filter that eliminates false alarms caused by objects that are too large to be of interest.
Minimum object size filter	A type of object filter that eliminates false alarms caused by objects that are too small to be of interest.
Multi-line video tripwire	Two lines drawn within the camera's field of view. An event occurs when an objects crosses both lines within a user-specified period of time.
Multi-segment video tripwire	A line of more than one segment drawn within the view of the camera. An event occurs when an object crosses any segment of the line.
Multiplexer	A device that allows multiple video feeds to travel over a single line. The multiplexer switches between the video feeds either automatically (in rotation) or at the command of the person operating the camera.

N

Night enhanced snapshots	Night enhanced snapshots display an event transposed over a daytime snapshot of the camera's field of view. This allows you to see the event and the surrounding environment when the scene is dark.
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O

Object	A person or vehicle that acts or is acted on during an event.
Object classification	The device multi- identification of an object as having the characteristics of a person or vehicle.
Object filter	Reduces false alarms by giving the system a more realistic understanding of the characteristics of objects within the camera's field of view. Object filters filter out objects that have certain characteristics (too large, too small, etc.).

Object irregular shape or motion filter	A type of object filter that enables the device to ignore objects that change shape and move in different directions between frames of video too quickly to be of interest.
Object size change filter	A type of object filter that eliminates false alarms caused by objects that change in size too rapidly to be of interest.
Occupancy Data	The device detects how many objects occupy an area of interest.
Occupancy Threshold event	An event in which a certain number of objects occupy an area of interest for a configurable period of time

P

Parameter model	The list of parameters that determine how the device monitors the video feed and the values that have been selected for those parameters.
People-Only Classification	People-Only Classification is a rule setting that allows a device to track and count people more accurately. Rules that use People-Only Classification significantly impacts how the system classifies objects and detects events.
Person	An object with some characteristics of a human being.
Pixel	The smallest addressable element on a computer screen. The higher the pixel resolution, the more information displayed on the computer screen.
Polygon	A closed figure bound by straight lines, such as a square, rectangle, triangle, or another multi-sided shape.

R

Representative object	A person, vehicle, or other object that is the same type and size as the kinds of objects the system will be looking for.
Resolution	The number of pixels displayed on a computer screen, expressed as the number of pixels on the horizontal axis and the number of pixels on the vertical axis (e.g., 1024 x 768).
Response	The system's reaction to an event.
Rule	Tells the device which events to look for in the camera's field of view.

S

Snapshot	A digital picture created from video.
Spurious object	An object that may appear to have qualities of an object of interest, but is not a real object of interest.
Switcher	See multiplexer.

T

Taken Away from Full View event	An event in which an object is removed from anywhere within the camera's field of view.
Taken Away from area of interest event	An event in which an object within an area of interest is moved.
Transient object	An object that moves quickly out of view.

U

Unknown view	Unknown views are not recognized by the system, so no event detection occurs for unknown views. When the view is unknown, you must take some kind of action to either return the system to the previous view or force the system to recognize the new view.
User-controlled views	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. 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 stored view or force the current view to continue monitoring.

V

Vehicle	An object with some characteristics of a car, truck, airplane, or other vehicle.
Video Analytics Device	An intelligent device, such as a camera or a DVR, containing video analytics technology that enables the device to detect events.
Video Tripwire	A line drawn within the view of the camera. An event occurs when an object crosses the line.
View	The camera's field of view.



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