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Important Notices

Regulatory Notices

This device complies with Part 15 of the **FCC Rules**. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radio and Television Interference

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

CAN ICES-3 (A)/NMB-3(A)

Warranty Statement

For information about Pelco's product warranty and thereto related information, refer to www.pelco.com/warranty.

Legal Notice

SOME PELCO EQUIPMENT CONTAINS, AND THE SOFTWARE ENABLES, AUDIO/VISUAL AND RECORDING CAPABILITIES, THE IMPROPER USE OF WHICH MAY SUBJECT YOU TO CIVIL AND CRIMINAL PENALTIES. APPLICABLE LAWS REGARDING THE USE OF SUCH CAPABILITIES VARY BETWEEN JURISDICTIONS AND MAY REQUIRE, AMONG OTHER THINGS, EXPRESS WRITTEN CONSENT FROM RECORDED SUBJECTS. YOU ARE SOLELY RESPONSIBLE FOR INSURING STRICT COMPLIANCE WITH SUCH LAWS AND FOR STRICT ADHERENCE TO ANY/ALL RIGHTS OF PRIVACY AND PERSONALTY. USE OF THIS EQUIPMENT AND/OR SOFTWARE FOR ILLEGAL SURVEILLANCE OR MONITORING SHALL BE DEEMED UNAUTHORIZED USE IN VIOLATION OF THE END USER SOFTWARE AGREEMENT AND RESULT IN THE IMMEDIATE TERMINATION OF YOUR LICENSE RIGHTS THEREUNDER.

Audio Notice

Improper use of audio/visual recording equipment may subject you to civil and criminal penalties. Applicable laws regarding the use of such capabilities vary between jurisdictions and may require, among other things, express written consent from the recorded subjects. You are solely responsible for insuring strict compliance with such laws and for strict adherence to any/all rights of privacy and personality.

Video Quality Caution

Frame Rate Notice Regarding User Selected Options

Pelco systems are capable of providing high quality video for both live viewing and playback. However, the systems can be used in lower quality modes, which can degrade picture quality, to allow for a slower rate of data transfer and to reduce the amount of video data stored. The picture quality can be degraded by either

lowering the resolution, reducing the picture rate, or both. A picture degraded by having a reduced resolution may result in an image that is less clear or even indiscernible. A picture degraded by reducing the picture rate has fewer frames per second, which can result in images that appear to jump or move more quickly than normal during playback. Lower frame rates may result in a key event not being recorded by the system. Judgment as to the suitability of the products for users' purposes is solely the users' responsibility. Users shall determine the suitability of the products for their own intended application, picture rate and picture quality. In the event users intend to use the video for evidentiary purposes in a judicial proceeding or otherwise, users should consult with their attorney regarding any particular requirements for such use.

Open Source Software

This product includes certain open source or other software originated from third parties that is subject to the GNU General Public License (GPL), GNU Library/Lesser General Public License (LGPL) and different and/or additional copyright licenses, disclaimers, and notices. The exact terms of GPL, LGPL, and some other licenses are provided to you with this product. Please refer to the exact terms of the GPL and LGPL at <http://www.fsf.org> (Free Software Foundation) or <http://www.opensource.org> (Open Source Initiative) regarding your rights under said license. You may obtain a complete corresponding machine-readable copy of the source code of such software under the GPL or LGPL by sending your request to digitalsupport@pelco.com; the subject line should read Source Code Request. You will then receive an email with a link for you to download the source code. This offer is valid for a period of three (3) years from the date of the distribution of this product by Pelco.

Power Source

This product is intended to be supplied by a Listed Power Adapter or DC power source marked "L.P.S." (or "Limited Power Source"), rated according to the camera specification document. If you need further assistance with purchasing the power source, please contact Pelco, Inc. for further information.

CCC Power Cord Statement

Models shipped to China do not include power cords.



Warning: A CCC approved power cord must be used to power the equipment when used in China.

Korean Class A EMC

이 기기는 업무용 (A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

ESD Warning



Warning: This product is sensitive to Electrostatic Discharge (ESD). To avoid ESD damage to this product, use ESD safe practices during installation. Before touching, adjusting or handling this product, correctly attach an ESD wrist strap to your wrist and appropriately discharge your body and tools. For more information about ESD control and safe handling practices of electronics, please refer to ANSI/ESD S20.20-1999 or contact the Electrostatic Discharge Association (www.esda.org).

Accessing the Camera



Note: For security purposes, it is required that you create a user account when you access the camera for the first time. In its out-of-the-box configuration, the camera has no user name and password assigned. In this state the camera does not allow for video to stream or configurations to change. It is required that you set an administrative user name and password at this time. Creation of an administrative user changes the state of the camera to its “operational mode,” where credentials must be provided in order to view live video or change its configuration. This first user configuration can also be done in VxToolbox software.

There is no provision for recovering a forgotten administrator user name or password. The camera can be restored to its out-of-the-box, no user name and password configuration by powering down, depressing the Factory Defaults button, and holding the button down for at least four seconds while powering the camera back up.

Once the camera is powered back up the user will be prompted to create a username and password.

The recommended browsers for your camera are Mozilla® Firefox®, Google Chrome™, or Microsoft™ Edge™ for Microsoft® Windows® operating systems; and Firefox for Mac® operating systems. For supported browser versions, refer to the Specification Sheet for your product.

1. Open a web browser.
2. If a user name and password exist, a log in dialog box appears. Otherwise a user creation dialog box appears, and the user will be required to create an administrative user to proceed.

Accessing Camera Settings

Access to camera settings is determined by user permissions. If you do not have access to camera settings, the **Settings** option will not appear in the center of the Live View window.

1. Log in.
2. Click **Settings**.
3. Click the setting you want to change. Place your mouse pointer over any menu on the page to reveal submenus.

Understanding the Camera Configuration Sequence

After the camera is installed and power is applied, the camera undergoes a configuration sequence, taking approximately 30-seconds to complete. The camera will come online after the configuration sequence is complete.



Note: If the camera connected to a network without a DHCP server and DHCP is enabled, the configuration sequence can take up to two minutes to complete.

Accessing the Live

The live video page provides access to video streams and, where applicable, to PTZ controls.

The camera defaults to the live video page, but can be accessed by clicking **Live** at the upper right corner of the window.

From the Live video page, you can clean the camera with the Wiper. Click and release to activate Wash and Wipe.

Live Video Controls

Viewable controls are based on camera model and user permissions.

	Open Stream in New Window: Opens the video stream in an independent window.
	Take a Snapshot: Captures a still image from the video stream and saves it as a JPEG file.
	Center Viewing Area: Engages select-to-center functionality. select the icon, and then select within the video stream to center the camera's field of view.
	Pan and Tilt: Engages pan and tilt functions. select the icon, and then select and drag the mouse within the video stream to pan and tilt the camera.
	Resize Viewing Area: Allows you to zoom in on an area of interest. select the icon, and then select and drag over the area in the video on which you want to center the camera's field of view and zoom in.

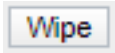
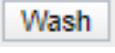
PTZ Controls

PTZ Controls are based on camera model and user permissions.



Note: PTZ controls are available only after you have logged in to the camera.

Focus, Zoom, and Brightness Controls	
	Zoom In: Click and hold to zoom in. You can also use the mouse scroll wheel to zoom in.
	Zoom Out: Click and hold to zoom out. You can also use the mouse scroll wheel to zoom out.
	Focus Near: Click and hold to focus on an object near the camera.
	Focus Far: Click and hold to focus on an object far away from the camera.
	Iris Open: Click and hold to open the iris and brighten the image.
	Iris Close: Click and hold to close the iris and darken the image.

	Wipe: Click to turn the wiper on and off.
	Wash: Click to turn the washer on and off.
	On: click to turn the illuminators on.
	Off: click to turn illuminators off.

Using the System Menu

The *System* menu provides access to the **General Settings**, **Backup and Restore**, **Firmware**, **OSDi**, **Snapshot Viewer**, and **Storage Management** pages.

Changing the Camera Name

Providing a user-friendly name might help you and other users identify the camera on the network, and within other applications. The camera name is the name that appears both in the Web interface and within other applications that can find the device.

1. Click **General Settings** from the *System* menu.
2. Provide a user-friendly name in the *Device Name* box (between 2 and 63 alphanumeric characters).
3. Click **Save**.

Enabling and Disabling LEDs

You can turn your camera's LEDs on or off. By default, your camera's LEDs are off. LED settings do not affect your camera's network status and activity LEDs.

1. Click **General Settings** from the *System* menu.
2. Select **On** or **Off** beside **Enable LEDs**.
3. Click **Save**.

Understanding the Pressure Sensor

Pressure Sensor (psi): This displays the pressure reading. For pressurized camera models, a reading greater than zero indicates positive pressure.

Configuring Time Settings

You can set your camera to discover a network time server (NTP) automatically, manually provide the address of your network time server, or select no time server.

1. Go to **System > General Settings**.
2. Select your time server setting:
 - **Auto**: Allows your camera to discover and synchronize with your network time server (over IPv4 or IPv6).
 - **Manual**: Requires you to provide the address of your network time server.
 - **None**: Camera date format defaults to mm/dd/1970.
3. Select the *Time Zone*.
4. Select **Save**.

Generating a System Log

If technical difficulties occur, a system log might help Pelco Product Support troubleshoot problems with your camera. You can contact Pelco Product Support at 1-800-289-9100 (USA and Canada) or +1-559-292-1981 (international).

1. Click **General Settings** from the *System* menu.
2. select **Generate System Log**.

3. Select the location in which to save the log file.
4. Click **Save**.

Restarting the Camera

If you are recording video from your camera, restarting the camera will cause a gap in video recording. It is important that you schedule maintenance before restarting the camera.

1. Click **General Settings** from the *System* menu.
2. Click **Reboot Camera**.

Restoring All Camera Defaults

If necessary, you can reset your camera settings to the factory defaults.

1. Go to **System > General Settings**.
2. Click **Restore All Camera Defaults**.
3. Click **Hard** or **Soft** Restore.
 - **Soft Restore** will reset the camera back to factory defaults with the exception of network settings. All user settings and customizations will be lost and cannot be recovered.
 - **Hard Restore** will reset the camera back to factory defaults. All user settings and customizations and network settings will be lost and cannot be recovered.
4. Click **Upload and Restore** to restart and restore you camera's settings.

Backing Up and Restoring Settings

You can create a backup file of your device's configuration so that if you accidentally change a setting or need to recover from a factory reset, you can revert back to this saved configuration. Camera backup files are stored in bin format.



Note: The restore feature is not intended to automatically configure multiple devices or to recover settings following a firmware upgrade.

Back Up Camera Settings

1. Got to **System > Backup and Restore**.
2. Click **Generate Backup File**.
3. Click **Download Now**, and then specify the directory in which to save your backup file.

Restore Camera Settings from a Backup

1. Go to **System > Backup and Restore**.
2. Click **Browse**, click the desired backup file, and then click **Open**.
3. Click **Upload and Restore**; to restart the camera and restore the camera settings.

Firmware

The Firmware page includes read-only fields for the firmware version, hardware version, model number, and serial number of the camera. This information is typically required by Pelco Product Support for troubleshooting purposes.

There is also a firmware update section that allows you to upgrade the firmware on your camera.

Configuring OSDi Overlays

The OSDi (Intelligent On Screen Display) feature allows the camera to imbed pertinent information as overlays into the streamed video. You can define up to four overlay rules. You can also determine the position of each overlay within the scene.

If using PTZ Preset or Zone overlays, the overlay will use the name of the zone or PTZ preset for the overlay; ensure you set relevant names for zones and presets.

If using the Current Zone Label overlay, and multiple zones are in the field of view, the camera will display the labels in order of size, smallest to largest; if all zones in the field of view are the same size, the camera will display zone labels in order of creation, oldest to newest. If the *Duration* field is set to 0 seconds, the overlay will only display the first zone label using the rules above until the zone is no longer in the field of view.

1. Go to the *OSDi* page from the *System* menu.
2. Check the box next to the overlay you want to enable.
3. Select the type of overlay you want to show.
4. Select the location of the overlay within the field of view. You can select the *Metadata* option to send the overlay within the camera's event or metadata stream (for use within a video management system).



Note: You cannot have metadata and a visible overlay for the same overlay type, even if you configure the overlay types separately.

5. Set details for the overlay.
 - For *Name*, *Date*, and *Time* overlays, provide the text or format for the overlay.
 - For *PTZ* or *Zone Label* overlays, select the duration for which the overlay will appear when active.
 - For Image overlays, provide the image file.
6. Set the font size for the overlay.
7. Set the Opacity Color Settings.
8. Click **Save**.

Snapshot Viewer

The Snapshot Viewer page displays a list of snapshots saved to the SD card when a "Write JPEG to SD Card" event handler is activated. From this page, you can open, download, or delete snapshots from the SD card. By default, it is set to 15 snapshots. The maximum allowed is 100 snapshots per page.

Onboard Storage Management

The Onboard Storage Management page displays storage device information, storage settings and actions as well as exporting stored recordings. From this page, you can view storage device information, format your storage device, and export recordings from a time range.

Using the Network & Security Menu

The *Network & Security* menu contains Network configuration Settings and options for your camera; from this menu, you can set static IP addressing, create User & Security levels, enable TLS and SSH, add Traffic Shaping, configure 802.1x port security, point your camera to an SNMP manager, and configure Firewall settings. By default, your camera receives an address over DHCP and all other network features are disabled.

Changing General Network Settings

Network Hostname

You can configure a hostname for your camera containing up to 63 alphanumeric characters. At least one character in the host name must be a letter.

Port Settings

Port settings determine the ports over which users communicate with the camera.

HTTP: Do not change the HTTP when connecting to a Pelco video management system (VMS); doing so might prevent you from viewing or recording video from your imaging camera. The default HTTP port is 80.

HTTPS: Set TLS to Optional or Required and install a security certificate before altering the HTTPS port. The default HTTPS port is 443.

RTSP: Cameras communicate with video management systems over RTSP. Do not change the RTSP port. The default RTSP port is 554.

Link Settings

Link Speed: The default setting for the camera throughput speed is 100 MB.

IPv4 Settings

By default, cameras are configured to obtain network settings over DHCP. If a DHCP server is not available, the camera defaults to an address of 192.168.0.20 on a 255.255.255 subnet. If 192.168.0.20 is already in use on the network, the camera will increment the address by one until it finds an unused address (for example, 192.168.0.21 if 192.168.0.20 is in use).

Set DHCP to Off to configure a static address and manually set the subnet mask, gateway, and DNS Server settings.

IPv6 Settings

(Optional): Your camera supports IPv6 configurations in conjunction with IPv4; the device does not support IPv6-only network deployments. The camera will accept up to sixteen IPv6 addresses, three IPv6 DNS servers, and three IPv6 gateways.

There are two configuration modes for IPv6 address assignment:

- **Auto:** Enables automatic configuration using router advertisement. Additional configuration can be provided over DHCPv6 (if available on your network). Selecting **Auto** still allows you to manually configure additional address, DNS servers, and gateways.
- **Manual Only:** Provides a link-local address for the device, and it requires you to manually configure all other IPv6 address settings for the camera. Manually specified addresses require a prefix and must be input in the format *prefix/IPv6Address*. The camera will reject addresses that do not contain prefix information.



Note:

- Cameras do not accept multicast, localhost, or undefined IPv6 addresses.
- Manually specified DNS servers are not validated by the camera and supersede automatically discovered DNS servers; verify your DNS addresses before saving IPv6 settings.
- Manually specified gateways must be on the same network as the camera's IPv6 addresses. Behavior for a gateway that is not on the same network as the camera's IPv6 addresses is undefined.
- Some video management systems (VMS), including some Pelco systems, do not support connections to cameras and encoders over IPv6.

Managing Network and Security

To manage user accounts and establish how your camera authenticates users (locally or remotely) go to **Network & Security > Users & Security**. This gives you the options for User Management and Security authentication.

User Management

Initially, the camera authentication is closed for viewing and configuring without a user name and password. No user accounts exist in the default factory state. Once the Admin role is created and Local Mode User Management is enabled, your camera will authenticate local user accounts.

If you are a user with Admin permissions, you can configure, edit, and delete local user accounts at any time. When authenticating users locally, you will assign a role to each individual user. User permissions are governed by the role assigned to them. When authenticating users remotely, users will be assigned roles based on their CN and DN assignments.

Your camera supports the following four roles:

- **Admins:** Can access and change all camera settings. They can use all functionality of the camera. They can configure, edit, and delete local user accounts at any time.
- **Managers:** Can access and change all settings, except user permissions. Managers are also unable to restore factory default settings.
- **Operators:** Can view video and have access to the Live View page controls.
- **Viewers:** Can view video.

Configuring Users

1. Go to **Network & Security > Users & Security**.
2. Select **New User** or select the user whose permissions and settings you want to edit.
3. Select an Access Level for the user.
4. Provide a user name between 2 and 32 alphanumeric characters for the user. User names are not case-sensitive and are saved in lowercase characters.
5. Provide a password between 4 and 64 alphanumeric characters for the user. Passwords are case-sensitive.
6. Re-type your password in the appropriate box to confirm your password.
7. Select **Save**.

Setting Security/Authentication

Security settings for the Pelco API and RTSP/JPEG include a choice of Open Authentication or Closed/Require Authentication:

- **Pelco API:** Changes whether credentials are required when accessing the device via the Pelco API. The *Open Authentication* setting leaves your camera open to various intrusions and is not recommended.
- **RTSP/JPEG:** Changes whether credentials are required when streaming video via RTSP or JPEG pull. The *Open Authentication* setting leaves your camera open to various intrusions and is not recommended.

A user must be created before the security settings can be changed.

Configuring TLS

The TLS settings page includes TLS configuration modes and certificate generation. The camera can generate a certificate signing request (CSR) that can be sent to a certificate authority for a signature (for example, VeriSign®), or it can generate a self-signed certificate using the Generate Self-Signed Certificate option.

- **Disabled:** Disables HTTPS communications with the device.
- **Optional:** Requires that you install a signed TLS certificate and enables HTTPS access to the device, however the device will still be available over HTTP.
- **Required:** Requires that you install a signed TLS certificate and enables HTTPS access to the camera.

TLS is disabled by default. You must enable TLS to access the camera over HTTPS.

1. Select **TLS** from the *Network* menu.
2. If no certificate has been installed, install one now:
 - a. Click **Install New Certificate**.
 - b. Select the appropriate certificate installation method: Generate Self-signed Certificate, Generate Certificate Request, or Upload Certificate.

Upload Certificate should only be used if you have already generated a certificate using Generate Certificate Request.
 - c. Click **Next**.
 - d. Enter information requested in the Certificate area.
 - e. Click **Generate Certificate**.
3. Select your TLS mode:
 - **Disabled:** Disables HTTPS communications with the device.
 - **Optional:** Requires that you install a signed TLS certificate and enables HTTPS access to the camera; however, the camera will still be available over HTTP.
 - **Required:** Requires that you install a signed TLS certificate and enables HTTPS access to the camera.
4. Click **Save**.

Enabling SSH

Advanced troubleshooting for problems that cannot be addressed through the camera interface can be performed by establishing an SSH connection into the camera. By default, SSH is off. The user name for SSH connections is *root*, and cannot be changed.

1. Select **SSH** from the **Network** menu.
2. Select **Enabled**.
3. Provide a password for the root user. Passwords are case-sensitive.
4. Confirm your password.
5. Click **Save**.

Configuring Traffic Shaping

Your camera can produce large I-frames, resulting in a traffic burst within each group of pictures as the camera transmits the frame; if your network infrastructure does not have the speed or buffering capacity to smooth out the traffic, you might experience slow or jittery video. Use this function if the frame rate at your client is significantly lower than you would expect from the camera.

The screenshot shows the 'Network & Security' configuration page. The 'Traffic Shaping' section is active, with the 'Disabled' radio button selected. Below it, the 'Settings' section shows a 'Rate' of '1000 Mbps' and a 'Full Link Speed' with a link to 'change link speed setting'. The 'Alerts' section states 'There are no alerts resulting from the current configuration.' At the bottom, there are 'Save' and 'Reset' buttons. The footer indicates 'Copyright © 2007-2019, PELCO · Pelco.com'.

1. Go to **Network & Security > Traffic Shaping**.
1. Enable **Traffic Shaping** with or without bursts, depending on your need.
 - **Disabled:** Camera will send data at full network hardware link speed (For example: 100 Mbps or 1 Gbps).
 - **Enabled:** Camera will limit the rate at which it sends data. In this setting, the “averaging period” (the period over which the rate limit is valid) is 1 ms. The rate limit for this setting is 12.5 Mbps < R < 100 Mbps.
 - **Enabled with Bursts:** This advanced setting allows you to specify the maximum burst size that the camera can send at the hardware link speed. This balances video latency with the transmission rate.
2. Set the average transmission rate over a 2 ms period in Mbps when enabled with bursts.
3. If you enabled traffic shaping with bursts, set the maximum size of bursts coming from the camera in kilobytes.
4. Click **Save**.

Configuring 802.1x Security

By default, 802.1x security is off. Cameras support EAP-MD5, EAP-TLS, EAP-TTLS, EAP-PEAP, and EAP-FAST protocols.

By default, 802.1x security is off. Cameras support EAP-MD5, EAP-TLS, EAP-TTLS, and EAP-PEAP protocols.

1. Go to **Network & Security > 802.1x**.
2. Select the (EAP) method from the *Protocol* drop-down menu.
3. Provide the authentication information for the EAP method you selected.
4. Click **Save**.

Configuring SNMP

Your camera supports No SNMP, SNMP V2c, and V3, and it can be configured to send traps. The MIB file for your camera is available at www.pelco.com.

Configuring SNMP V2c

1. Go to **Network & Security > SNMP**.
2. Click **SNMP V2c**.
3. Provide the community string for your SNMP manager. The default community string is “public.”
4. Provide the *Read/Write Community String*.
5. Fill in the IP address of the host server.
6. Fill in the *Community String*.
7. Select the network protocol (NTCIP, Kapsch)
8. Click **Save**.

Configuring SNMP V3

1. Go to **Network & Security > SNMP**.
2. Click **SNMP V3**.
3. Enter the SNMP user name the camera will use to authenticate with the SNMP server.
4. Select the encryption algorithm for authentication from the *Authentication* drop-down . If using MD5 or SHA authentication methods, enter your authentication code in the box provided.
5. Select the privacy protocol setting from the *Privacy* drop-down menu. If using DES or AES protocols, enter your privacy key in the box provided.
6. Enter the host name or IP address of your trap server in the *Address* box under *Trap Configuration*.
7. Select the network protocol (NTCIP, Kapsch).
8. Click **Save**.

Configuring the SMTP Server

Providing the address of an SMTP server enables your camera to send email notifications when using the Send Email event handler.

1. Select *SNMP* from the *Network and Security* menu.
2. Type the address of your SMTP server in the SMTP Server box.
3. Click **Save**.

Firewall Configuration

Your camera supports Firewall Configuration and it can be configured to block or allow up to 10 IP addresses to access the camera.



Note: Incorrect configuration of these settings can result in being locked out of the camera.

Using the Imaging Menu

Configuring General Imaging Settings

1. Select **General** from the **Imaging** menu.
2. Select a Freeze Frame setting.
3. Select an Electronic Image Stabilization setting.
4. Select a Highlight mode.
5. Select a Defog mode.
6. Select a Noise Reduction mode.
7. Set your camera's digital processing settings. For some models, setting a custom value for your camera's sharpness, saturation, contrast, or brightness settings will engage the Custom Quick Setup mode.

Freeze Frame

The **Freeze Frame** feature freezes video output when a preset is called, resuming video when the camera completes the preset operation. This allows for a smooth transition between preset scenes, reduces bandwidth consumption, and guarantees that blanked areas are not inadvertently revealed when a preset is called.

Electronic Image Stabilization

Electronic Image Stabilization attempts to compensate for vibrations that interfere with your camera and video output. Enable it by choosing **On** or disable it by choosing **Off**.



Note: High WDR and Image Stabilization cannot be used at the same time.



Note: Digital Zoom and Image Stabilization cannot be used at the same time.

Highlight Mode

The **Highlight Mode** feature allows you to choose from four different lighting modes for your camera including **Off**, **Visibility Enhancement**, **Backlight Compensation**, and **WDR**.

- Use **Off** for normal lighting situations.
- Use **Visibility Enhancement** to automatically correct brightness and contrast and show bright zones more clearly.
- Use **Backlight Compensation** to enhance objects in the center of the picture when a bright backlight causes subjects in the picture to appear dark or silhouetted.
- Use **WDR** (Wide Dynamic Range) to automatically balance the bright and dark zones in the image, increasing the dynamic range.

Defog Mode

The **Defog Mode** feature allows you to make the subject appear clearer when the surrounding area of the subject is foggy and low contrast. Choose **Off**, **Low**, **Medium**, or **High** for this mode. **Low** is used for slightly hazy conditions. It does a minimum amount of correction. **High** is used for more foggy conditions. It does the maximum amount of correction.

Noise Reduction

Noise Reduction: Adjusts for video noise in the scene.

- **Normal:** Adjusts for noise in low-light scenes.
- **High:** Adjusts for a greater amount of noise in low-light scenes.
- **Off:** The camera does not compensate for video noise.

Configuring Digital Processing

Digital Processing settings adjust the color and detail of captured video. The availability of settings might change based on your camera model.

Quick Setup: Contains presets for digital processing settings. You can use any of the quick setup modes as starting points for custom settings; changing sharpness, saturation, contrast, or brightness settings automatically engages the Custom mode.

- **Normal:** A baseline setting in which sharpness, saturation, contrast, and brightness are all set to zero.
- **Vivid:** A setting that enhances color quality, lightens whites, and darkens blacks.
- **Custom:** Allows you to set your own, unique image quality settings.

Sharpness: Controls the clarity of detail in the scene. Increasing video sharpness increases video noise.

Saturation: Controls the intensity of colors in the scene.

Contrast: Controls the gradation between the darkest and lightest portions of the scene.

Brightness: Controls the lighting detail of the scene.

Restore Settings to Defaults: Restores the Imaging General page settings to the camera's default settings.

Restore All Imaging Settings: Restores all of the camera's Imaging settings to default imaging settings for that camera.

Configuring Exposure Settings

Exposure settings, accessed from the Imaging tab, Exposure option, help ensure that video contains an adequate level of detail and contrast between light and dark values.

1. Select Exposure from the *Imaging* menu.
2. Select your camera's Exposure Mode.
 - **Auto:** Allows you to set maximum Gain limit and Exposure Time limit settings, while retaining the full range of Day/Night controls.
 - **Manual:** Allows you to specify the Exposure Time and adjust the Gain. You should only engage this mode if fixed exposure time is a priority.
3. Set the *Max Exposure Time* or the *Exposure Time*, depending on the exposure mode you selected. The maximum exposure time determines the time, in milliseconds, that the imaging sensor is exposed to light. Decreasing the maximum exposure time reduces motion blurring; increasing the maximum exposure time could help capture more detailed still images in low light.
4. Set the *Max Gain* or the *Gain*, depending on the exposure mode you selected. Increasing the gain allows for better sensitivity in low-light scenes, but also increases video noise.
5. Set *WDR* to *On* or *Off*. WDR balances the bright and dark areas of a scene.
6. Set your *Day/Night Mode*. If you've set your camera's exposure mode to the *Exposure Time/Gain*

Control setting (*Manual Mode*), the *Day/Night Mode* setting becomes the *Position* setting.

- **Auto:** Engages day or night mode based on the *Transition Level* setting; this allows you to capture color video (Day) when enough light is available, and automatically switch to black and white video (Night) when light is unavailable.
 - **Manual/Position:** Requires you to choose a *Day* or *Night* mode. *Day* captures color video; *Night* captures grayscale video.
7. (Optional) If you selected the *Day/Night Auto Mode*, set the *Transition Level*, determining whether the transition is *Lighter*, *Default*, or *Darker*. *Lighter* settings cause the camera to change modes at higher lux values.
 8. Set the **External IR Illuminator** mode to *Auto*, *Manual* (only available if you have selected *Day/Night Manual Mode*), or *Off*.
 9. If necessary, use **Restore Settings to Defaults** to reset the camera settings to the factory defaults on the current page only, or use **Restore All Imaging Settings** to reset all of the camera settings to the factory defaults on all Imaging pages.

Configuring Focus Settings

Focus Settings affect your camera's focusing behaviors. If you set all focus behavior settings to Off, you must manually focus your camera.

- **Auto:** Automatically back-focuses the camera on the subject in the center of the scene.
- **Manual:** Locks the camera's focus at a specified position. Manual focus is recommended only for indoor applications with a single, unchanging light source or when using analytics.
- **Sure Focus:** When set to On, causes your camera to auto focus when pan, tilt, and zoom (PTZ) operations are complete or if the IR cut filter changes state. When your camera achieves an auto focus lock, auto focus is turned off and the focal position will remain until the next PTZ operation. If 30 seconds pass without an auto focus lock, your camera will retain its focal position until the next PTZ action.
- **Focus Trace:** Enables your camera to use a focus trace curve when zooming based on the distance to ground-level targets in the scene; distance to ground-level targets is determined by the Install Height setting. If Auto Focus is disabled, set to Off, your camera will not perform auto-focus operations, but will perform focus trace corrections when the tilt angle of your camera changes.
- **Min Focus Distance (m):** Default setting of 10m (meters) improves low light auto focus. Change the Min Focus Distance (m) to an expected minimum distance that the camera will need to focus on.

If necessary, use **Restore Settings to Defaults** to reset the camera settings to the factory defaults on the current page only, or use **Restore All Imaging Settings** to reset all of the camera settings to the factory defaults on all Imaging pages.

Setting White Balance

Each Sensor has its own white balance settings. Auto mode is the default setting for each sensor. Selecting Manual mode allows you to adjust white balance settings for the sensor.

1. Select *White Balance* from the *Imaging* menu.
2. Select a white balance mode:
 - **Auto:** The recommended setting for most lighting conditions. It has a color temperature range from 7,500K to 2,500K. It can be used to properly white balance scenes illuminated by daylight to warm white sources.

- **Auto Tracking White (ATW):** Has the largest color temperature range.
- **Cool White:** A fixed white balance mode for cooler (more blue) sources such as true daylight, daylight fluorescent, white light LEDs, or metal halide sources.
- **Warm White:** A fixed white balance mode for warmer (more yellow) sources such as incandescent, tungsten-halogen, warm white compact florescent, or LED lighting.
- **Manual:** Allows manual adjustment of the red and blue range; this may be helpful in areas where lighting does not change, such as inside a casino or mall. Move the Red and Blue sliders to change color levels.
- **Extended Color Temp:** Maintains color balance in outdoor settings where sodium vapor lighting is widely used, such as parking lots or street lights.

Using the Window Blanking Feature

Window Blanks, or privacy masks, will block sections of your camera's image from being viewed. Blanked areas persist in all video produced from the camera, whether viewing video directly through the camera's interface or from a higher-level recording device or system.



Note: For cameras that physically pan, tilt and zoom, window-blanking regions will not scale proportionally with changes in zoom. Set the zoom level for the camera before defining window-blanking regions.

To create window blanks:

1. Go to **Imaging > Window Blanking**.
2. Select **On** to enable Window Blanking.
3. Click and drag the mouse across the video area that you want to blank. Select an existing blanking region to delete it, or edit its size and position. You can create up to 16 window blanks.
4. Where available, a Set Zoom Point panel and a Set Blanking Type panel appear after you draw a blanking region.
 - a. Select the Set Zoom Point zone to enable the zoom level, and drag the slider or enter a value in the appropriate box to set the zoom factor that will activate the blanking level at which the blanking region is activated.
 - b. Where available, in the Set Blanking Type zone, select the appropriate blanking type you prefer from the drop-down menu.
5. Click **Save**.

The Edit Window displays each blanking window you have set. To edit a blanking window:

1. Select a window in the *Edit Window* or in the *Preview Display* to move or resize the blanking window.
2. Select **X** to erase and close a blanking window.

Calibrating Window Blanking

Calibrating the window blanking feature prevents blanked areas from shifting when you zoom the camera. You only need to calibrate the window blanking feature once, and you can calibrate before or after configuring blanking areas. If you notice blanked areas shifting after you have calibrated the window blanking feature, you should recalibrate.

1. Select Window Blanking from the *Imaging* menu.
2. Click **Calibration**.

3. Click within the scene to center the camera on an object you want to cover, and then select **Ok**.
4. Click and drag to draw a blanking region within the camera's field of view, and then click **Ok**. The camera will zoom in, and the blanking region you drew will shift.



Note: The blanking region that you draw should be small enough that it does not fill the field of view when the camera is fully zoomed. If the blanked region fills the screen when the camera zooms in, you will have to recalibrate.

5. Redraw the blanking region now that the camera has zoomed in, and then click **OK**. Redrawing the region accounts for the shift that can occur when zooming the camera.
6. Click **Done**, or click the **Start Over** button to recalibrate.

Configuring Options in the PTZ Menu

The PTZ Menu provides configuration options for *Positioning*, *Presets*, *Preset Tours*, *Patterns*, *Scans*, *PTZ Zones*, and *Pelco Camera Link*.

Configuring Pelco Camera Link

The Pelco Camera Link automatically tracks objects of interest. You can link Pelco's Optera™ and a nearby, mounted Enhanced Series camera. Optera provides seamless panoramic coverage for total situational awareness while the Enhanced Series camera with 30x optical zoom provides detail and automatic object tracking.

When Auto tracking is enabled, Pelco Camera Link acts as an automatic PTZ operator. Pelco Camera Link uses the analytic information from Optera™ to enable point and zoom so the camera will follow moving objects in the scene.

To setup Pelco Camera Link:

1. Establish a connection with Optera by specifying the address and credentials of the Optera system. Enter the IP Address, Username, and Password.
2. Alternatively, you can click the **Advanced** button to specify the IP Address, Username, Password, SSL/TLS, and HTTP Port parameters.
3. Click **Connect** to link the camera with the Optera system.
4. Click **Disconnect** to disconnect the link between the camera and the Optera system.
5. Configure the Optera Analytics by selecting **Go to Optera Analytics™ Page**. Once you are at the *Pelco Camera Link* configuration page, you can establish a connection by activating and enabling '2-Camera Tracking' as an Optera Analytic profile, and then return to this page and refresh.
6. Calibrate the connected cameras by clicking the **Calibrate** button. Doing so will calibrate the connected cameras so that they know where they are relative to one another.

Configuring a Preset

A **preset** is a camera position that you can configure and call as a single command, allowing users to quickly move the camera to common positions.

To establish a new preset:

1. Select *Presets* from the *PTZ* menu.
2. Provide a name for the preset.
3. Select the *Focus Lock* mode:

- **On:** The camera's focus settings are saved with the preset, and are called with the preset. This ensures that the camera uses the expected focal point any time the preset is selected.
- **Off:** The preset does not retain focus settings. This mode requires the camera to use current focus setting when the preset is selected.

If an operator has changed the focus of the camera before the preset is selected, it is possible that the camera will be out of focus when the camera displays the preset position later. Turn on Focus Lock to avoid this problem.

4. If appropriate, select to select this as the Washer Preset

A washer is in a fixed location of your choice. Before using the washer, pan and tilt the camera to point at the washer, and then use this location to create the Washer Preset.

When activating the Washer, the PTZ unit will go to the washer preset position, wipe, and then return to it's original position.

5. Position the camera using the pan and tilt controls.
6. Adjust the zoom and focus controls as necessary.
7. Click **Save**.
8. To delete a preset, select to select the preset in the Presets area, and then select **Delete Preset**.

Configuring a Preset Tour

You must configure presets before adding them to a preset tour. A **preset tour** is a series of presets through which your camera will cycle. You can configure the length of time for which the camera will remain at each preset position in the tour.

1. select **New Tour** or select the preset tour you want to edit.
2. Provide a name for the tour.
3. For each preset to add to the tour:
 - a. select and drag the preset to the *Tour workspace* section of the page.
 - b. Set the dwell time for the preset. **Dwell time** is the length of time (in minutes or seconds) the camera will remain at a preset position before engaging the next preset in the tour.
 - c. Set the transition speed for the preset.
4. select >> in the *Transition preview* area to review the tour.
5. Click **Save**.

Configuring Pan/Tilt/Zoom Patterns

A pattern uses the path of motion recorded by the operator during configuration of the pattern.

This is different from a Preset Tour in that a preset tour begins at one spot and ends at another, using the most direct path between them.

1. Select **Patterns** from the *PTZ* menu.
2. To create a new PTZ pattern:
 - a. select **New**.
 - b. In the *Create New Pattern* dialog box, type in a name for the pattern.
 - c. select **Create Pattern** and **Start Recording**.

- d. If appropriate, add a Scan, a Preset, or a Preset Tour as part of the pattern.
 - e. When appropriate, in the PTZ Patterns task bar, select **Stop**.
3. To run an existing PTZ pattern:
 - a. Select a pattern from the drop-down box to the right of the **New** button.
 - b. Select the name of the existing pattern from the list in the *PTZ Patterns* area.
 - c. select **Run** to start the pattern.
 - d. select **Stop** to stop the pattern.
 - e. If necessary, select **Re-record** to record over the current configuration, and then select **OK** in the confirmation dialog box.
4. If appropriate, rename an existing pattern:
 - a. Select a pattern from the drop-down box to the right of the **New** button.
 - b. Select the name of the existing pattern from the list in the *PTZ Patterns* area.
 - c. select **Rename**.
 - d. Type the new name into the *Name* field in the *Rename Pattern* dialog box.
 - e. Click **Save**.
5. If appropriate, delete an existing pattern:
 - a. Select a pattern from the drop-down box to the right of the **New** button.
 - b. Select the name of the existing pattern from the list in the *PTZ Patterns* area.
 - c. select **Delete**.
 - d. select **OK** in the confirmation dialog box.

Configuring Pan/Tilt/Zoom Scans

A Scan is a pan movement between two limits at a defined speed and a defined dwell time (pause) at each frame.

- When configured with limits, when a limit is reached the Scan will bounce back in the other direction, to the other limit, to start the pan movement again. It will continue until interrupted by a manual movement or a stop.
 - A Scan can be started at any tilt angle, and will maintain that tilt angle throughout the pan Scan.
1. To create a new PTZ Scan:
 - a. select **New**.
 - b. In the *New Scan* area of the window, type in a name for the scan.
 - c. (Optional) Type in a value for the Left Pan Limit, and then select **Save as Left Pan Limit**.
 - d. (Optional) Type in a value for the Right Pan Limit, and then select **Save as Right Pan Limit**.
 - e. Type in a *Speed* in Degrees/Seconds.
 - f. Type in a *Dwell Time* in Seconds.
 - g. You can include a pattern, preset, or preset tour in the Scan. At the lower left corner of the page, select a pattern, preset, or preset tour from the drop-down menu. select **Start** to start the scan. select the adjacent **Stop** button to end the scan.
 - h. Click **Save**.

2. To edit an existing scan:
 - a. Select the scan from the **PTZ Scans** area.
 - b. In the **Scan Name** field, type in the name for the scan to edit.
 - c. (Optional) Type in a value for the Left Pan Limit, and then select **Save as Left Pan Limit**.
 - d. (Optional) Type in a value for the Right Pan Limit, and then select **Save as Right Pan Limit**.
 **Note:** Scan limits are optional. Scan limits will be disabled if the Left and Right Pan limits are set to the same value.
 - e. Type in a **Speed** in Degrees/Seconds.
 - f. Type in a **Dwell Time** in Seconds.
 - g. You can include a pattern, preset, or preset tour in the Scan. At the lower left corner of the page, select a pattern, preset, or preset tour from the drop-down menu. select **Start** to start the scan. select the adjacent **Stop** button to end the scan.
3. To run an existing scan:
 - a. Select the scan from the **PTZ Scans** area.
 - b. select **Run**.
 - c. When appropriate, select **Stop**.
4. If appropriate, delete an existing scan:
 - a. Select the scan from the **PTZ Scans** area.
 - b. select **Delete**.
 - c. select **OK** in the confirmation dialog box.

Configuring Positioning

1. Select Positioning from the **PTZ** menu.
2. Enable **Digital Zoom** by selecting **On**. select **Off** to enable optical zoom.



Note: Digital Zoom and Image Stabilization cannot be used at the same time.

3. Select the **Pan/Tilt Speed Control** type:
 - **A: Linear:** Pan and tilt speeds accelerate at a fixed rate.
 - **B: Exponential:** Pan and tilt speeds accelerate at a rate corresponding to the length of time for which a user engages pan and tilt controls; the longer a user engages pan and tilt controls, the faster the camera will pan and tilt.
 - **Proportional Velocity:** Automatically reduces pan and tilt speeds proportional to the camera's zoom level.
 - **Auto Flip:** Allows the camera to rotate 180 degrees when the tilt is pointing straight down (e.g. -90 degrees tilt angle).
 - **PTZ Resume:** Allows the dome to recover the last PTZ action requested before the camera loses power. The camera will resume the previous action upon start-up.
 - **Max Zoom Speed:** The numeric values that can be selected using the slider bar represents a percentage of the maximum zoom speed. Values range from 10 to 100. For example, setting the slider to 50 for 50% tells the camera to zoom at half the speed.

4. Use the *Pan Center Point* to determine the zero point for pan operations. Setting a new center point automatically adjusts Pan Limit Stop settings to account for the new center point.
 - To determine the current center point, select **Go To Pan Center Point**.
 - To establish a new pattern center point, use the cursor or joystick to pan to the new center point location and select **Set New Pattern Center Point**.
 - select **Restore Default Center Point** to restore the camera's default center position.
5. Set *Limit Stops* to limit the range of motion for your camera. Pan and tilt limit values are provided in degrees.
 - a. select **Start Configuring Limits**.



Note: During configuration, limits are disabled on the camera. You must complete the configuration process before limits will be enabled.
 - b. Configure the left and right pan limits and the top and bottom tilt limits. You can provide a value, in degrees, for each limit, or select **Get Current Pan/Tilt** to retrieve the current value from the video preview window.
 - c. select **Save Limits**.
 - d. To remove all limits on the camera and restore default values, select **Remove Limits**.
6. Click **Save**.

Using the A/V Streams Menu

The A/V Streams menu provides access to *Video Preset Configurations*, *Video Configurations*, *Audio Configurations*, *Local Recording*, *RTP Settings*, and *Smart Compression* settings for your device's video and audio streams.

Selecting Preset Video Configurations

The Video Presets page contains fully-configured video configurations, offering a balance between video performance and bandwidth. These presets can also be used as a starting point for a custom video configuration. Video preset configurations can vary depending on the camera model.

1. Select *Video Presets* from *A/V Streams* menu.
2. Select your desired video preset stream configuration.
3. Click **Save**.

Configuring Presets

Click your desired *Preset Configurations* of **High**, **Medium**, or **Low** and select **Save**.



Note: Preset Configuration details are displayed in the user interface next to the desired profile.

Preset Configurations include:

- **High:** Primary Stream H264, 30 IPS, 1920x1080, 6000 kbps | Secondary Stream H264, 30 IPS, 1920x1080, 6000 kbps | Tertiary Stream H264, 30 IPS, 640x360, 1250 kbps
- **Medium:** Primary Stream H264, 15 IPS, 1920x1080, 3850 kbps | Secondary Stream H264, 15 IPS, 1920x1080, 3850 kbps | Tertiary Stream H264, 15 IPS, 640x360, 900 kbps
- **Low:** Primary Stream H264, 15 IPS, 1280x720, 2400 kbps | Secondary Stream H264, 10 IPS, 1280x720, 2050 kbps | Tertiary Stream H264, 10 IPS, 640x360, 600 kbps

Configuring Custom Video Streams

Custom Video Stream Configuration contains settings for customizing your camera's primary, secondary, and tertiary video streams. Each stream can be configured independently, although the Aspect Ratio and Maximum Frame Rate settings will limit the options available for the remaining setting and depending on the processing demands of your stream settings.

By default, all fields under Video Configuration are populated with settings from your Video Presets. You can clear all fields or use the default settings as a starting point for your custom stream.

1. Set the Maximum Frame Rate and Aspect Ratio settings.
 - **Maximum Frame Rate:** The maximum number of video frames contained per second. Higher values result in higher quality video with less flicker but consume more bandwidth.
 - **Aspect Ratio:** The ratio of height to width of the video frame.
2. Configure the following video stream settings:
 - **Stream Name:** This setting is typically Primary, Secondary, or Tertiary, however you can enter any stream name of your choosing.
 - **Enable:** This setting provides the ability to turn any stream ON or OFF. Select Enable from the drop down menu to turn the stream on or Disable to turn it off.

- **Compression Standards:** Available compression standards include MJPEG, H.264, and H.265.
 - **H.264:** Compression standard used in high-definition video players such as Blu-ray™ and HD-DVD. H.264 is the most processor-intensive compression.
 - **H.265:** An improvement of H.264 that provides better compression efficiency while improving image quality and lowering processor workload.
 - **MJPEG:** Provides the least impact on the camera's processor, but it requires the most bandwidth.
 - **Resolution:** The quality of the video stream, rendered in pixels for both width and height. Higher values result in greater video quality but consume more bandwidth.
 - **Image Rate:** The number of frames per second (fps) available for the video stream configuration. Available image rates depend upon the model of the device that you are using.
 - **Bit Rate:** The quality of the video stream, rendered in kilobits per second. Higher values result in greater video quality but consume more bandwidth.
 - **I-Frame Interval:** Determines the number of partial frames that occur between intra-coded frames (I-frames) in your video stream. I-frames are complete images, used as a reference for change. Following an I-frame, the camera will capture and encode only video data in the scene differing from the I-frame until the next I-frame.
-  **Note:** The I-Frame Interval setting is only available for H.264 and H.265 video streams. Increasing the I-frame interval can improve video compression rates and reduce the size of video data; however, higher values are recommended only for highly-reliable networks.
- **Profile:** Defines the subset of bit stream features in an H.264 or H.265 stream, which includes color reproduction and additional video compression. It is important to select a profile that is compatible with your recording device(s) in order to ensure that your camera's video stream can be decoded and viewed.
 - **Main:** An intermediate profile with a moderate compression ratio. This profile is compatible with most recorders and uses fewer bits to compress video than the baseline profile. The main profile supports I-frames, P-frames, and B-frames.
 - **High:** A complex profile with a high compression ratio. This is the primary profile for high-definition television applications. The high profile supports I-frames, P-frames, and B-frames.
 - **QoS (DSCP) Codepoint:** A mechanism for prioritizing network traffic. This setting is available with H.264 and H.265 compression standards. Your network must be QoS-aware to take advantage of this setting.
 - **Endura Signing:** Endura signing is a technology designed to prevent the tampering of video and ensure video authenticity for use in legal proceedings. Only exported video is validated in the Pelco export player when the user selects on the "Authenticate" button. Live View is not validated. This setting is available only with H.264 and MJPEG compression standards.
 - **Rate Control:** Determines the bit rate and quality of each frame in the H.264 or H.265 video stream. Rate control settings are a compromise between image quality and the resources required for video storage. The availability of rate control settings depends upon the model of the camera that you are using.
 - **CBR:** The constant bit rate (CBR) streams video at a fixed number of bits per second. CBR uses the full capacity of the bit rate setting for scenes with or without motion. Video is always streamed at the user bit rate setting.
 - **CVBR:** The constrained variable bit rate (CVBR) provides high-quality video and long recording time of variable bit rate while limiting variations in recording capacity consumption.



Note: When you change video stream configuration settings, the camera automatically adjusts the bit rate. Choosing a bit rate below the camera's automatic setting might reduce video quality and limit stream configuration options.

Configuring Audio

You can only enable audio through the primary video stream.

Audio is disabled by default, but you can enable and configure audio streams from the Audio Configuration page.

Audio and video might not be synchronized when viewing the primary stream through a Web browser. You might experience up to a 3-second delay in video when viewing the primary stream with audio enabled.



Note: Improper use of audio/visual recording equipment may subject you to civil and criminal penalties. Applicable laws regarding the use of such capabilities vary between jurisdictions and may require, among other things, express written consent from the recorded subjects. You are solely responsible for ensuring strict compliance with such laws and for strict adherence to any/all rights of privacy and personality.

1. Go to **A/V Streams > Audio Configuration**.
2. Enable Audio.
3. Select your sample rate. The sample rate is the quality of the audio stream (measured in hertz per second).
4. Select your Audio Device.

- **Native Line In:** Enables audio from a microphone connected to the audio-in connector.



Note: Only available for products with built-in audio support.

- **Microphone:** Enables audio from the internal microphone.



Note: Only available for products with a built-in microphone.

5. Select the encoding method.
6. Set the Input Level. Input sensitivity is measured on a scale from 0 to 100 (low to high).



Note: If the camera is installed in a noisy environment or the connected microphone has a built-in line amplifier, you should lower audio sensitivity.

7. Click **Save**.

Managing Local Recording

1. Place your mouse pointer over the A/V Streams tab, and select Local Recording from the drop-down menu.
2. Click the **REC** button to enable or disable local recording. The following colors indicate the status of the local recording feature:

Red: Recording enabled.

Gray: Recording disabled.

Yellow: An error has occurred, typically caused by a missing micro SD card, a micro SD card that was previously used or reformatted and has reached the end of its life, or the camera's time settings being improperly configured.

Configuring Local Recording

The number of hours of video you can store on the micro SD card depends on several factors besides the capacity of the micro SD card.

There is, however, a limit on the total number of frames that can be stored on the micro SD card. For example, below a bit rate of 1.5 Mbps, you can store a maximum of 48 hours of video at 30 fps on a 32 GB card. You can increase the maximum available hours of storage by decreasing the frame rate.

The number of hours of video you can store on the SD card is established with recording bit limits. A bit rate limit below 1.5 Mbps allows a maximum of 48 hours of video at 30 fps regardless of resolution. You can increase the maximum available hours of storage by decreasing the frame rate.

Managing RTP Settings

The RTP Settings page provides access to advanced multicast and MTU (TCP/IP) settings.

Setting Static Multicast Addresses

A multicast stream sends video data to multiple users from the same transmission. Each multicast user connecting to the camera consumes no additional processing power.

You can set static multicast addresses and ports for all of your camera's multicast streams (primary, secondary, tertiary, audio).

Default, automatically-assigned multicast addresses are confined to the 239.x.x.x block in a scheme matching your IP address and network settings; you can determine the automatically-assigned multicast address(es) for your camera from the RTP page.

1. Go to **A/V Streams > RTP Settings**.
2. Enter static multicast addresses and ports for your streams as necessary.
3. Set the *Time to Live (TTL)* for each stream; this is the number of routers the stream can pass through before it expires.
4. Determine whether or not to *Always Multicast* this stream. This setting eliminates the need for a client to connect to the camera to initiate a stream; when enabled, the camera begins sending the multicast stream when it starts up, without requiring initiation from a client.
5. Click **Save**.

Setting the Maximum Transfer Unit Size (TCP/IP)

You can adjust the maximum transfer unit size to adjust to your network's constraints. Changing the MTU setting will require your camera to restart. This could take several minutes.

1. Go to **A/V Streams > RTP Settings**.
2. Set the *Max Transfer Unit* size.
3. Click **Save** or **Save and Reboot Camera**, depending on your camera.

Smart Compression

Smart Compression can greatly reduce the bit rates produced by your camera at the potential cost of a slight to moderate degradation in video quality, depending on the compression level you set. This change in

video quality is dependent on the complexity of the scene and the compression level you select. The *High* Smart Compression setting can reduce the bit rate up to 90% of the expected bit rate.

From the *Smart Compression* page, you can also set a dynamic group of pictures (GoP) length, allowing the camera to update picture groups depending on scene composition and motion. A dynamic GoP can further reduce bit rates produced by the camera, by allowing the camera to increase the GoP length when there is little action in the scene.



Note: Dynamic or long GoP lengths may cause compatibility issues with some video management systems (VMS). Ensure your VMS supports dynamic GoP settings before enabling this setting.

Configuring Smart Compression

Pelco Smart Compression Technology lowers bandwidth and storage requirements while retaining image quality and critical information for forensic purposes. Benefits include reduced storage capacity requirements and high resolution.

To work correctly, gathering bitrate statistics requires the date and time to be set correctly. If you have not set your time zone, you will receive an “Inaccurate Date and Time” message. Date and time can be set in General Settings.

Prior to establishing settings for Pelco Smart Compression, use A/V Streams to configure the video and audio streams for the camera.

1. Go to **A/V Streams > Smart Compression**.
2. Select **Settings** and **Short-Term Graph**.
3. Select the *Smart Compression Level*.

The Smart Compression level allows you additional control to balance video quality versus bit rate. The smart compression settings determine how aggressively the camera will drop the bit rate on easily compressed scenes and how aggressively it will adjust image processing settings to make the scene more compressible. If the scene is difficult to compress (high motion, high noise), the camera will use the full bit rate allowed by the stream bit rate settings. The “off” and “low” settings will have a similar, minor effect on the image; the “medium” and “high” settings will have correspondingly more effect on the image and greater savings on storage.

- Off—no bitrate reduction
 - Low—no visible effect on video quality in most scenes
 - Medium—visible effect on video quality in some scenes
 - High—video degraded in many scenes
4. (Optional) Enable Dynamic GoP Length.



Note: The option to establish the Dynamic GoP Length is enabled when compression levels are set to Low, Medium, or High.

5. (Optional) Set the maximum GoP length for your streams if you want to impose an upper limit on the dynamic GoP setting.
By enabling a dynamic Group of Pictures (GoP), the number of I-frames are automatically reduced in scenes with minimal motion. Based on the complexity of scenes and the amount of motion occurring, such as in a storage room that has limited activity, up to 70% bandwidth savings can be achieved.

Dynamic GOP allows the camera to update picture groups depending on scene composition and motion. A dynamic GoP can further reduce bit rates produced by the camera by allowing the camera to increase the GOP length when there is little action in the scene.

For each video stream, you can enable Dynamic GoP Length as well as establish an Optional Maximum GoP Length. GoP length will change dynamically based on variable conditions that your camera might be monitoring.



Note: Dynamic or long GoP lengths may cause compatibility issues with some video management systems (VMS). Ensure your VMS supports dynamic GoP settings before enabling this setting.

Configuring Long-Term Rate Control

Set Long-Term Rate Control if you must ensure storage does not exceed a specific size.

1. After ensuring the date and time have been set on the camera, run the camera for multiple days which should represent multiple times the length of the observation period you will be using.
2. Go to the *Smart Compression* page from the *A/V Streams* page.
3. On the Pelco *Smart Compression* page, select Long-Term Rate Control.
4. Select the Video Stream to which you will apply the settings.
5. Select the *Bitrate Units*: either total kbps or Gbytes/day.
6. In the *Long-Term Rate Controls* area:
 - a. Enable the Controls.



Note: You can disable the Controls at any time.

- b. Use the slider bar to select the Average Bitrate Limit, type in a value, or select Copy to Slider.
 - c. Use the slider bar to select the *Observation Period in Days*, or type in a value.
7. Click Save.
 8. To view the *Long-Term Graph* for either stream:
 - a. Select the Primary Video Stream or Secondary Video Stream at the top of the page.
 - b. Select the *Bitrate Units*: either total kbps or Gbytes/day.
 - c. To the right of the *Long-Term Graph* title, select Update.

The graph helps you understand how much storage the camera will use.
 - d. If appropriate, select Delete Long-Term Data for [Secondary or Primary, whichever is selected].

Using the Events Menu

The **Events** menu contains settings for camera events and analytics pages.

An event is a user-defined occurrence, consisting of a source and a handler. A **source** defines the trigger for an event; a **handler** defines the action your camera will take when the event source occurs. When configuring a source, you can link the source to multiple handlers, providing multiple outcomes for the event. When configuring a Handler, you can link the handler to multiple sources, providing a single outcome for multiple events.

Analytics are specialized event sources that are triggered by the user-defined behaviors or scenarios occurring within your camera's field of view. Analytics are compatible with VideoXpert™ or third-party systems that support events using ONVIF or Pelco's API. The analytic behaviors available for your camera are dependent on your model and firmware version.

Configuring Sources

An event source defines the trigger for an event, something that must occur before your camera takes action (defined by a handler). Event Sources that can be configured include Alarm, Analytics, Timer, and System events.

Configuring an Alarm Event Source

An alarm source triggers an event upon a signal from external signaling devices, such as a door contact or a motion detector.

1. Go to **Events > Sources**.
2. Click **New** or select the source you want to edit.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the **Name** box.
4. Select **Alarm** from the source **Type**.
5. Set the dwell time for the alarm between 1 and 25 seconds. Dwell time is the amount of time that the source will remain active during an alarm event.
6. Select the polarity of your alarm input (normally open or normally closed).
7. Select either **True** or **False** from the **Supervised** drop-down menu.
8. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the Events menu **Handlers** page.
9. Click **Save**.

Configuring an Analytic Event Source

An analytic event source triggers an event when a behavior defined by a video analytic occurs.

1. Go to **Events > Sources**.
2. Click **New**, or select the existing source you want to edit.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the **Name** box.
4. Select **Analytics** from the source **Type**.
5. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the **Events** menu **Handlers** page.
6. **Save**.

Configuring a Timer Event Source

A timer event source triggers an event at specified intervals of time.

1. Go to **Events > Sources**.
2. Click **New**, or select the source you want to edit.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the **Name** box.
4. Select **Timer** from the source **Type**.
5. Configure the frequency of the event, including the units of time available, in the pull-down menu.
6. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the **Events** menu **Handlers** page.
7. Click **Save**.

Configuring a System Event Source

A system source triggers an event when your camera boots.

1. Go to **Events > Sources**.
2. Select **New Source**, or select the source you want to edit.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the **Name** box.
4. Select **System** from the source **Type**.
5. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the **Events** menu **Handlers** page.
6. Click **Save**.

Configuring a Park Action Event Source

A park action event source triggers an event if the camera is inactive for a specified period of time.

1. Click **New Source**, or select the source you want to edit.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the **Name** box.
3. Select **Park Action** from the **Type** menu.
4. Configure the dwell time (the amount of inactivity before the event handler starts).
5. (Optional) If available, select the handler(s) that you want to associate with this source.

Deleting an Event Source

1. Go to **Events > Sources**.
2. Select the source that you want to delete.
3. Click **Delete** to remove the event source.

Configuring Handlers

Event handlers are the actions that your camera takes when an event source occurs. The availability of handlers might change based on your camera model.

Configuring an Event Handler: Send Email

The Send Email event handler sends an email from your camera when a source event is triggered.



Note: You must have provided your camera with the address of an SMTP mail server on the **System > General Settings** page for your camera to send email notification for events.

1. Go to **Events > Handlers**.
2. Click **New** or select the handler you want to reconfigure.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
4. Select the **Send Email** handler Type.
5. Provide the necessary information for your email in the **To**, **From**, **Subject**, and **Message** boxes.
6. (Optional) Select the **JPEG Snapshot** box if you want to send a JPEG snapshot as an attachment to the email.
7. (Optional) Select the **Attach Raw Event Data** box if you want the email to include extra data about the event. For example, select this box if the event is triggered by an alarm and you want to receive data about the state, time, or type of alarm.
8. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
9. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page. Sources are configured from the **Events** menu *Sources* page.
10. Click **Save**.

Configuring an Event Handler: Upload JPEG to FTP Server

This event handler captures and uploads a JPEG to an FTP server when an event source is triggered. JPEG files are named according to the date and time at which they are recorded; although, you can determine the order of factors in the date-and-time filename.

1. Go to **Events > Handlers**.
2. Click **New** or select the handler you want to reconfigure.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the **Name** box.
4. Select the **Upload JPEG to FTP Server** handler Type.
5. Provide the address of your FTP server in the **Server** box.
6. Provide the credentials the camera will use to authenticate with the FTP server; the **User Name** must be between 1 and 32 alphanumeric characters, and the **Password** must be between 4 and 16 alphanumeric characters.
7. Provide the path in which to store JPEG files on your FTP server in the **Base Path** box.
8. Select the **File Name** for your JPEG snapshots.
9. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
10. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.
11. Click **Save**.

Configuring an Event Handler: Write JPEG to SD Card

This event handler captures and saves a JPEG to a micro SD card when an event source is triggered. JPEG files are named according to the date and time at which they are recorded; although, you can determine the order of factors in the date-and-time filename.



Note: Do not use the "Write JPEG to SD Card" handler if you enabled local storage through the

ONVIF API. Writing JPEGs to the micro SD card disables local storage.

1. Install a micro SD card in the slot located on the back of the camera.



Note: The micro SD card must be formatted as FAT32 or reformatted to ext4.

2. Select **Handlers** from the *Events* menu.
3. Click **New Handler** or select the handler you want to reconfigure.
4. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
5. Select the *Write JPEG to SD Card* handler type.
6. Select a time standard from the *File Name* menu. The JPEG files saved to the micro SD card will be given file names corresponding to the date and time of the event.
7. Provide a size limit for the JPEG images, including the units available, from the pull-down menu. Do not select a size limit that exceeds the available memory on the micro SD card.
8. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
9. (Optional) Select one or more sources that you want to trigger this event handler. Sources are configured from the *Events* tab **Sources** page.
10. Click **Submit**.

Configuring an Event Handler: Run Pattern

This event handler runs a selected pattern.

1. Select **New Handler** or select the handler you want to reconfigure.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
3. Select the *Run Pattern* handler type.
4. Select a pattern from the drop-down menu.
5. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
6. (Optional) Select one or more sources that you want to trigger this event handler. Sources are configured from the *Events* tab **Sources** page.

Configuring an Event Handler: Go to Preset

You must define a preset before you can create a Go to Preset event handler. Presets are configured from the *Imaging* tab **Preset** page.

The Go to Preset handler activates a camera preset when a source event occurs.

1. Select **New Handler** or select the handler you want to reconfigure.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
3. Select the *Go to Preset* handler type.
4. Select a preset from the *Preset* drop-down menu.
5. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

6. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** tab **Sources** page.

Configuring an Event Handler: Run Tour

You must define a Preset Tour before you can create a Run Tour event handler. Preset tours are configured from the **Imaging** tab **Preset Tours** page.

1. Select **New Handler** or select the handler you want to reconfigure.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
3. Select the **Run Tour** handler type.
4. Select a tour from the **Tour** drop-down menu.
5. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
6. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** tab **Sources** page.

Configuring an Event Handler: Run Scan

This event handler runs a preset scan when an event source is triggered. You must define a Scan before you can create a Run Scan event handler. Scans are configured from the **Imaging** tab **Scans** page.

1. Select **New Handler** or select the handler you want to reconfigure.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
3. Select the **Run Scan** handler type.
4. Select the scan from the pull-down menu.
5. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
6. (Optional) Select one or more sources that you want to trigger this event handler. Sources are configured from the **Events** tab **Sources** page.

Configuring an Event Handler: Wiper

This event handler will trigger the wiper sequence.

1. Select **New Handler** or select the handler you want to reconfigure.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
3. Select the Wiper handler Type.
4. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
5. Click **Save**.

Configuring an Event Handler: Washer

This event handler will trigger the wiper sequence.

1. Select **New Handler** or select the handler you want to reconfigure.
2. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the **Name** box.
3. Select the Washer handler Type.

4. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
5. Click **Save**.

Configuring an Event Handler: Open/Close Relay

The Open/Close handler opens or closes a relay when a source event occurs.

1. Go to **Events > Handlers**.
2. Click *New* or select the handler you want to reconfigure.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the *Name* box.
4. Select the *Open/Close Relay* handler type.
5. Select the individual relay you want to trigger when an event occurs from the *Relay* handler Type.
6. Select the *Relay Mode*: Pulse or Trigger.
7. If you selected Pulse, use the *On Time* controls to set the amount of time the relay will remain open, up to 200 seconds.
8. If you selected Pulse, use the *Off Time* controls to set the amount of time the relay will remain closed, up to 200 seconds.
9. Set the *Pulse Count* for the relay. The pulse count is the number of relay pulses (number of on and off cycles).
10. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
11. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.
12. Click **Save**.

Deleting an Event Handler

1. Go to **Events > Handlers**.
2. Select the handler that you want to delete.
3. Click **Delete**.

Analytic Configuration

The Analytic Configuration page allows you to analyze the camera's field of view to detect and trigger events or alarms when specific activity occurs.

Multiple analytic behaviors can be configured (Go to **Events > Analytic Configuration**). However the complexity of active behaviors and zones per behavior may increase the processing load on your camera. Once configured, your camera will monitor your defined zones for activity violating the parameters of the behavior. You can view analytic events through your camera's event stream (Go to **Events > Event Streams**). However, analytic alarms are only transmitted through Pelco's API, and are therefore only available with compatible VMS systems or through direct integration.

You can configure multiple analytic behaviors. Each analytic behavior has its own settings, and many analytic behaviors also require you to configure zones that the camera will monitor for activity. The analytic behaviors available to your camera are dependent on your model and firmware version.

Configuring Basic Analytics

Configuring Motion Detection

1. Check Enabled.
2. Enter an *Event logging (profile) name*.
3. Establish an alarm priority by clicking *Alarm Severity* of Minor, Normal, Major, or Critical.
4. Choose a *Sensitivity* level of Low, Medium, or High to establish what amount of change in motion within the camera's field view that triggers a handler behavior.
5. Use the slider bar or text input box to set the *Threshold %* in how much motion needs to occur in order to trigger the alarm.

Configuring Edit Mask Mode

1. Select the *Edit Mask* mode option to Draw or Erase sections of the mask.
2. Select a Rectangle or Paintbrush (line) drawing *Tool*.
3. Use the mouse cursor to Draw the mask or Erase sections of the mask.
 - Revert back to a previous state by selecting Undo.
 - Selecting Redo will reverse the Undo action.
4. Click Save.

Configuring Sabotage Detection

1. Check Enabled.
2. Establish the sensitivity to motion that will trigger a handler behavior by choosing from Low, Medium, or High.
3. Enter an *Event logging (profile) name*.
4. Establish an alarm priority by clicking *Alarm Severity* of Minor, Normal, Major, or Critical.
5. Click Save.

Configuring Enhanced Analytics

To configure the scene settings:

1. Select a *Scene Type* of indoor or outdoor.
2. Choose a Still or Noisy background based on the expected amount of background movement in the scene. A stable background with few moving objects should be set to Still. A busy background, with many moving objects should be set to Noisy.
3. Use the *Fine tuning* option to define zone violation sensitivity. Available settings include Conservative, Normal, or Aggressive. The Conservative setting is the least sensitive setting, reducing the number of false alarms, but might prevent the camera from detecting zone violations. The Aggressive setting is the most sensitive setting, detecting all suspect violations, but might cause the camera to trigger more false alarms.
4. Establish the *Sensitivity* or relative amount of motion, between 1 (low) and 10 (high), that will trigger a behavior. The higher the setting, the greater the chance for false alarms; lower settings will reduce the chance of false alarms but might result in missed violations.
5. *Consistency* helps trigger a behavior when an object moves into the frame from a consistent direction. The sensitivity detection can be set from 0 (low) to 10 (high).

6. The **Calibration** function will show as **Not Completed** or **Completed**. If calibration is Not Completed, select **Calibrate Scene**. This will open a separate **Calibrate Scene** page.
7. Select **Set height**. This will bring up a blue square. Place the blue square over an object at a distance and set the **Real-world height** of the object in either feet or meters.
8. Select **Set width**. Two yellow lines appear. Measure the width of a far object using the line denoted by "Width of a far object" and the width of a near object using the line denoted by "Width of near object".
9. Select **Return to Main**.

The Calibration shows as **Completed**.

Applying Select Behaviors

Select Behaviors define the attributes of a scene within the field of view of your camera and provide context for analytic behaviors. Select Behaviors include **Abandoned Object**, **Adaptive Motion**, **AutoTracker**, **Directional Motion**, **Loitering Detection**, **Object Counting**, **Object Removal**, and **Stopped Vehicle**.

Each analytic behavior contains settings determining the conditions under which events are triggered. The settings available are dependent on the analytic behavior that you are configuring.

- **Sensitivity:** Overrides the global Profile sensitivity setting for the selected behavior, defining the relative amount of motion, between 1 (low) and 10 (high) that will trigger an event or alarm. Sensitivity is an advanced option for some behaviors.
- **Object speed:** Adjusts for speed if the scene is configured to track moving objects at a slower or faster rate than actual speed.

Using Zone Settings

You can establish the conditions under the Zone Settings section to determine which events are triggered for a Select Behavior. The availability of settings depends on the chosen Select Behavior.



Note: AutoTracker has its own behavior-specific settings as described in the [Using AutoTracker Zone Settings](#) section.

- **Name:** Type a name of your choosing for the selected Zone.
- **Enable Alarm:** Enables a zone alarm. Analytic events for the zone will appear in the event stream when viewing Live View and will trigger Event Handlers if the Analytic Event source is enabled.
- **Alarm Severity:** Sets the alarm priority as Minor, Normal, Major, or Critical.
- **Dwell time:** Defines the amount of time that an alarm will remain active when an alarm-triggering object exits the field of view or the zone. Dwell time can be set between 10 to 300 seconds.
- **Object Counting:** Determines the number of objects entering into a zone that will trigger an alarm.
- **Delay before alarm:** Defines the amount of time an object must remain in a zone before triggering an alarm.
- **Direction:** Determines the direction of motion a zone should track. Events will be triggered only when your camera detects motion in the specified direction.
- **Sensitivity:** Overrides the global Profile sensitivity setting for the selected behavior, defining the relative amount of motion, between 1 (low) and 10 (high) that will trigger an event or alarm. Sensitivity is an advanced option for some behaviors.
- **Object Speed:** Adjusts for speed if the scene is configured to track moving objects at a slower or faster rate than actual speed. Object Speed defines the relative speed, between 1 (low) and 10 (high), that will trigger an event or alarm.

- **Zone Sensitivity:** Defines the relative amount of motion within the selected zone that will trigger an event or alarm. Zone sensitivity can be set at a lower or higher setting than the overall sensitivity setting for the rest of the scene or the Profile sensitivity setting for the selected behavior.
- **Edit Mask:** Specifies which areas within the camera view to ignore so that alerts are triggered only if there is motion in the unmasked part of the video feed.

Using AutoTracker Behavior-Specific Settings

- **Name:** Type a name of your choosing for the selected Zone.
- **Sensitivity:** Overrides the global Profile sensitivity setting for the selected behavior, defining the relative amount of motion, between 1 (low) and 10 (high) that will trigger an event or alarm. Auto sets the sensitivity level from 1 to 10 automatically according to the amount of motion detected in a scene. Select Manual to set a user-defined sensitivity level from 1 to 10.
- **Dwell time:** Defines the amount of time that an alarm will remain active when an alarm-triggering object exits the field of view or the zone. Dwell time can be set between 10 to 300 seconds.
- **Follow Options:** Determines whether an object is tracked only within the current field of view or beyond. Choose Unlimited to continue to follow an object even when it moves beyond the present field of view. Choose Limit to current view to follow the object only while it is within the present field of view.
- **Camera Placement:** Defines the vertical height of the camera's location relative to the area being monitored.
- **Unit:** Defines the unit of measurement as either Meters or Feet.
- **Optimize Zoom Settings for Objects of this Type:** Defines the type of object to be tracked.
- **Average Width:** Defines the average width of objects to track.
- **Average Height:** Defines the average height of objects to track.

Using Drawing Tools

When configuring a zone-based analytic behavior, you can draw zones by clicking one of the zone-drawing tools and then clicking within the scene to draw the zone. The availability of zone drawing tools is dependent on the analytic behavior you are configuring. Drawing tools include:

- **Rectangle** Tracks objects in a defined rectangular zone and triggers an alarm if the objects move in the same direction as defined.
- **Polygon:** Tracks objects in a defined zone and triggers an alarm if the objects move in the same direction as defined.
- **Line:** Tracks objects that cross a line and triggers an alarm if the objects move in the same direction as defined.
- **Rectangular Excluded Zone:** Ignores objects inside a defined rectangular zone.
- **Polygon Excluded Zone:** Ignores objects inside a defined zone.
- **Set Object Size filters:** Allows the user to set the minimum and maximum object size for a zone. Objects that fall outside these limits will not be detected.

Using the Zone List

A zone drawn with any of the Drawing Tools will appear in the **Zone list** section.

1. select the zone from the list that you wish to configure.
2. select **Save** to activate the **Zone Settings** options for that particular zone.

3. select X to delete the zone from the *Zone list*.

Using AutoTracker Zone Settings

You can establish the conditions under the Zone Settings section to determine which events are triggered for a Select Behavior. The availability of settings depends on the chosen Select Behavior.

- **Name:** Type a name of your choosing for the selected Zone.
- **Direction:** Determines the direction of motion a zone should track. Events will only be triggered when your camera detects motion in the specified direction.
- **Enable Alarm:** Enables a zone alarm. Analytic events for the zone will appear in the event stream when viewing live video, and trigger event handlers if the Analytic Event source is enabled.
- **Alarm severity:** Defines the severity of alarms triggered. Alarm severity helps you and other users prioritize alarms.
- **Alarm at:** Determines the number of objects entered into a zone that will trigger an alarm.
- **Zone Sensitivity:** Defines the relative amount of motion within the selected zone that will trigger an event or alarm. Zone sensitivity can be set at a lower or higher setting than the overall sensitivity setting for the rest of the scene or the Profile sensitivity setting for the selected behavior.
- **Delay before alarm:** Defines the amount of time an object must remain in a zone before triggering an alarm.

Using Select Behaviors—Ideal Situations

The following sections describes the function of each Select Behavior and the ideal situation in which to use it.

Using Abandoned Object

The Abandoned Object behavior detects objects placed within a defined zone and triggers an alarm if objects remain in the zone longer than the user-defined time allows.

Ideal Scene Setup for Abandoned Object: An airport terminal is a typical installation for the Abandoned Object behavior. This behavior can also detect objects left behind at an ATM, signaling possible card skimming.

Adaptive Motion

The Adaptive Motion behavior detects and tracks objects that enter a scene and then triggers an alarm when the objects enter a user-defined zone.

The Adaptive Motion behavior is designed to work indoors and outdoors to track a few moving objects in uncrowded fields of view. The behavior learns the background scene over time and adjusts to changing conditions like snow, fog, wind, and rain.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity.

The ideal scene for Adaptive Motion behavior is one with light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place zones in a relatively stable area.

Avoid crowded scenes where people move in all directions or stand in place for long periods of time.



Note: Objects that are very small might not be classified as the correct object type. This could result in false alarms or alarms not being triggered. If objects appear too small in the scene, zoom in on the particular zone of interest or move the camera closer to the zone of interest to increase the relative size of the objects in the scene.

Auto Tracker

The AutoTracker behavior detects and tracks movement in the camera's field of view. When the AutoTracker behavior is configured, the system automatically pans and tilts to follow the moving object until the object stops or exits the monitored area.

The ideal scene for the AutoTracker behavior contains light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place zones relatively stable areas.

Avoid crowded scenes where people move in all directions or stand in place for long periods of time.

Directional Motion

The Directional Motion behavior generates an alarm in a high traffic area when a person or object moves in a specified direction. Examples of typical installations for this behavior include airports, entrances and exits, and vehicle traffic through tunnels.

- In an airport installation, cameras observe passengers boarding a plane in a terminal. If a person moves in the opposite direction of the normal flow of traffic, an alarm triggers.
- In a tunnel installation, an operator wants to observe traffic flow. If a car enters a tunnel through an exit, an alarm alerts the operator to activate the traffic signals to stop all traffic in the tunnel.
- In an entrance or exit installation, a camera is pointed at an exit door. If a person tries to enter through the exit door, an alarm triggers.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity. The width of the object you want to detect should be at least one-tenth of the total width of the scene. To achieve increased accuracy in a crowded scene, set the width of the object to one-sixth of the total width of the scene.

The ideal scene selection for the Directional Motion behavior contains light traffic with all people and objects moving in the same direction, minimal obstructions, and a clean background; however, the behavior can be used in settings that do not meet all of these requirements. If heavy traffic or a busy background is unavoidable, place zones in a relatively stable area.

Avoid crowded scenes in which people move in all directions or stand in one place for long periods of time.

Loitering Detection

The Loitering Detection behavior identifies when people or vehicles remain in a defined zone longer than the user-defined time allows. This behavior is effective in real-time notification of suspicious behavior around ATMs, stairwells, and school grounds.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity.

The ideal scene for Loitering Detection behavior is one with light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place the user-defined zone in a relatively stable area.

Avoid crowded scenes where people move in all directions or stand in one place for long periods of time.

Object Counting

The Object Counting behavior counts the number of objects that enter a user-defined zone. This behavior can be used to count people at a store entrance/exit or inside a store where the traffic is light. It might also be used to monitor vehicle traffic on highways, local streets and roads, parking lots, and garages.

The ideal scene for the Object Counting behavior contains light traffic, minimal obstructions, and a clean background. If heavy traffic or a busy background is unavoidable, place zones (polygon or line) in relatively stable areas.

A one-directional motion scene (for example, a vertical hallway) is preferable. Avoid crowded scenes in which people or objects move in all directions or remain in place for long periods of time.

Object Removal

The Object Removal analytic behavior triggers an alarm if an object is removed from a user-defined zone. It is ideal for detecting the removal of high-value objects, such as a painting from a wall or a statue from a pedestal.

Install the camera in a high position looking down on the scene. The monitored object should occupy a quarter of the camera scene, and the field of view should be as wide as possible.

The ideal scene selection for the Object Removal behavior is a clean background with stable lighting and minimal obstruction.

Stopped Vehicle

The Stopped Vehicle behavior detects vehicles stopped near a sensitive area, and sets an alarm if the vehicle is present for longer than a user-specified period of time. This behavior is ideal for parking enforcement, identifying suspicious parking, finding traffic lane breakdowns, and spotting vehicles waiting at gates.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activities.

The ideal scene for the Stopped Vehicle analytic behavior contains light traffic in which vehicles are continually moving, there are minimal scene obstructions, and the background is clean. If heavy traffic or a busy background is unavoidable, place monitoring zones relatively stable areas.

Avoid crowded scenes where people or objects remain in place for long periods of time.

Configuring Profile Settings

Profile settings define the attributes of a normal scene within the field of view of your camera, providing context for analytic behaviors. Properly configured profile settings help ensure the accuracy of analytic behaviors. Each profile contains the following profile settings:

- **Camera Preset:** Selects a camera preset for the profile.
- **Scene Type:** Determines whether or not the scene is indoor or outdoor.
- **Background:** Determines the expected amount of background movement in the scene; the background can be still or noisy. A stable background with few moving objects should be set to Still. A busy background, with many moving objects should be set to Noisy.
- **Fine Tuning:** Defines zone violation sensitivity. Available settings include Conservative, Normal, or Aggressive. The Conservative setting is the least sensitive setting, reducing the number of false alarms, but might prevent the camera from detecting zone violations. The Aggressive setting is the most sensitive setting, detecting all suspect violations, but might cause the camera to trigger more false alarms.
- **Sensitivity:** Defines the relative amount of motion, between 1 (low) and 10 (high), that will trigger a behavior. The higher the setting, the greater the chance for false alarms; lower settings will reduce the chance of false alarms, but might result in missed violations.

Applying Select Behaviors

The settings available are dependent on the analytic behavior that you are configuring.

- **Alarm at (Object Counting):** Determines the number of objects entered into a zone that will trigger an alarm.

- **Alarm severity:** Defines the severity of alarms triggered. Alarm severity helps you and other users prioritize alarms.
- **Average Object Size:** Determines the average size of objects to be counted.
- **Camera Placement:** Defines the vertical height of the camera's location relative to the area being monitored.
- **Delay before alarm:** Defines the amount of time an object must remain in a zone before triggering an alarm. For the Camera Sabotage behavior, this defines the delay between a scene violation and the trigger of an alarm.
- **Direction:** Determines the direction of motion a zone should track. Events will only be triggered when your camera detects motion in the specified direction.
- **Dwell time:** Defines the amount of time that an alarm will remain active when an alarm-triggering object exits the field of view or the zone.
- **Enable Alarm:** Enables a zone alarm. Analytic events for the zone will appear in the event stream when viewing live video, and trigger event handlers if the Analytic Event source is enabled.
- **Follow Options:** Determines whether an object is tracked only within the current field of view or beyond.
- **Maximum Object Size:** Defines the maximum size of objects tracked. Observe the location of where you place this element and the relationship to the perspective of the scene.
- **Minimum Object Size:** Defines the minimum size of objects tracked. Observe the location of where you place this element and the relationship to the perspective of the scene.
- **Optimize Zoom Settings for Objects of this Type:** Defines the type of object to be tracked.
- **Sensitivity:** Overrides the global Profile sensitivity setting for the selected behavior, defining the relative amount of motion, between 1 (low) and 10 (high) that will trigger an event or alarm. Sensitivity is an advanced option for some behaviors.
- **Zone Sensitivity:** Defines the relative amount of motion within the selected zone that will trigger an event or alarm. Zone sensitivity can be set at a lower or higher setting than the overall sensitivity setting for the rest of the scene or the Profile sensitivity setting for the selected behavior.
- **Object speed:** Adjusts for speed if the scene is configured to track moving objects at a slower or faster rate than actual speed.

Abandoned Object

The Abandoned Object behavior detects objects placed within a defined zone and triggers an alarm if objects remain in the zone longer than the user-defined time allows.

Ideal Scene Setup for Abandoned Object Analytics

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activities.

The ideal scene for the Abandoned Object behavior contains light traffic where people or objects within the field of view are continually moving, there are minimal obstructions, and the background is clean. If heavy traffic or a busy background is unavoidable, place monitoring zones in relatively stable areas.

Avoid crowded scenes where people or objects remain in one place for long periods of time.

Adaptive Motion

The Adaptive Motion behavior detects and tracks objects that enter a scene and then triggers an alarm when the objects enter a user-defined zone.

The Adaptive Motion behavior is designed to work indoors and outdoors to track a few moving objects in uncrowded fields of view. The behavior learns the background scene over time and adjusts to changing conditions like snow, fog, wind, and rain.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity.

The ideal scene for Adaptive Motion behavior is one with light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place zones in a relatively stable area.

Avoid crowded scenes where people move in all directions or stand in place for long periods of time.



Note: Objects that are very small might not be classified as the correct object type. This could result in false alarms or alarms not being triggered. If objects appear too small in the scene, zoom in on the particular zone of interest or move the camera closer to the zone of interest to increase the relative size of the objects in the scene.

Auto Tracker

The AutoTracker behavior detects and tracks movement in the camera's field of view. When the AutoTracker behavior is configured, the system automatically pans and tilts to follow the moving object until the object stops or exits the monitored area.

The ideal scene for the AutoTracker behavior contains light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place zones relatively stable areas.

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Camera Sabotage

The Camera Sabotage behavior detects contrast changes in the field of view, and triggers an alarm if the lens is obstructed by spray paint, a cloth, or if it is covered with a lens cap. Any unauthorized repositioning of the camera also triggers an alarm.

Ideal Scene Setup for Camera Sabotage

Install the camera in a high position, looking down on the scene. The field of view should be as large as possible. A small field of view could result in the view being blocked by an adjacent object.

Avoid scenes with a dark, uniform background, low lighting, and large moving objects.

Directional Motion

The Directional Motion behavior generates an alarm in a high traffic area when a person or object moves in a specified direction. Examples of typical installations for this behavior include airports, entrances and exits, and vehicle traffic through tunnels.

- In an airport installation, cameras observe passengers boarding a plane in a terminal. If a person moves in the opposite direction of the normal flow of traffic, an alarm triggers.
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The ideal scene selection for the Directional Motion behavior contains light traffic with all people and objects moving in the same direction, minimal obstructions, and a clean background; however, the behavior can be used in settings that do not meet all of these requirements. If heavy traffic or a busy background is unavoidable, place zones in a relatively stable area.

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Loitering Detection

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Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity.

The ideal scene for Loitering Detection behavior is one with light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place the user-defined zone in a relatively stable area.

Avoid crowded scenes where people move in all directions or stand in one place for long periods of time.

Object Counting

The Object Counting behavior counts the number of objects that enter a user-defined zone. This behavior can be used to count people at a store entrance/exit or inside a store where the traffic is light. It might also be used to monitor vehicle traffic on highways, local streets and roads, parking lots, and garages.

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Install the camera in a high position looking down on the scene. The monitored object should occupy a quarter of the camera scene, and the field of view should be as wide as possible.

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Stopped Vehicle

The Stopped Vehicle behavior detects vehicles stopped near a sensitive area, and sets an alarm if the vehicle is present for longer than a user-specified period of time. This behavior is ideal for parking enforcement, identifying suspicious parking, finding traffic lane breakdowns, and spotting vehicles waiting at gates.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activities.

The ideal scene for the Stopped Vehicle analytic behavior contains light traffic in which vehicles are continually moving, there are minimal scene obstructions, and the background is clean. If heavy traffic or a busy background is unavoidable, place monitoring zones relatively stable areas.

Avoid crowded scenes where people or objects remain in place for long periods of time.

Configuring Wash & Wipe

1. Select *Wash and Wipe* from the *Events* menu.
2. Enter the Wash Time in seconds.
3. Enter the Wipe Delay in seconds.
4. Click to select 1 or 2 Washer Relays.
5. Click **Save**.

Contacting Pelco for Troubleshooting

For further instructions, contact Pelco Product Support at 1-800-289-9100 (USA and Canada) or +1-559-292-1981 (international) for assistance. Have the serial number available when calling.

Do not try to repair the unit yourself. Leave maintenance and repairs to qualified technical personnel only.



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