AVIGILON™

# Pro Cameras

Web Interface User Guide

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# Pro Cameras Web Interface User Guide

You can use the camera's web interface to check the camera’s online status and image quality, configure network settings, manage features and upgrade firmware. Make sure you have completed the installation procedure and added the device to the network before you try to access the web interface.

The settings and features available in the web interface depend on the specific device. The information in this guide is relevant to Pro Cameras using the latest firmware. You can download the latest firmware at avigilon.com/software-downloads.

Camera Models:

- H5 Pro

# System Requirements

You can access the web interface from any Windows, Mac, or mobile device using one of the following browsers:

- Microsoft Edge
- Mozilla Firefox
- Google Chrome

Configure your web browser to accept cookies or the web interface will not function correctly.

Other browsers might work but this has not been verified.

# Initializing a Camera

The first time you log into a camera it will be in the factory default state. Cameras in the factory default state do not have a default username and password and will be prompted to create an account. The initial account must be an administrator account.

1. Enter the camera's IP address into your web browser. The system will redirect you to the Add User page to create an account.
2. Enter a new **User Name** or keep the default administrator name.
3. Enter a new **Password** for the user. We recommend you use a secure and complex password.
4. Confirm the new password by re-entering it.
5. Make sure the Security Group is set to Administrator.
6. Click **Apply** to save.

You can now log into the camera.

See *Logging Into the Camera Web Interface* below next for instructions.

# Logging Into the Camera Web Interface

You can access the camera web interface by entering the camera's IP address into a web browser and logging in. The camera's IP address is automatically assigned once the camera is discovered on the network. You can use Camera Configuration Tool (CCT), Avigilon Unity or ACC to discover cameras and obtain their IP address. If you are using CCT to set cameras, see Sending a Discovery Broadcast from the *Camera Configuration Tool User Guide* for instructions.

If you are setting up the camera for the first time, you will have to create the initial user before the camera becomes operational. See *Initializing a Camera* above for instructions.

Follow these steps to access the camera web interface:

1. Find the camera's IP address using either CCT, Unity Video or ACC.
2. Copy and paste the IP address into a web browser: http://<device IP address>/
   Example: http://192.168.1.40/
3. Log in to the camera using your username and password.

The first page you will see is the *Live View* page. See *Live View* on the next page next for instructions on using the Live Viewer.

## Logging Into the Camera Web Interface Using SSO

Single Sign-On (SSO) lets you log in to a camera's web interface with just one set of credentials. Instead of needing a different username and password for each camera, an external service handles user authorization.

After logging in, the authorization service sends a secure code back to the camera. The camera uses this code to get special tokens that verify your identity and give you a secure session. If a refresh token is included, the camera can automatically get a new token before the current one expires, so users do not have to keep logging in.

Follow these steps to log in using SSO:

1. Enter the camera's IP address in a web browser to open the camera web interface.
2. Click **Single Sign-On** on the camera log in page.
   If you do not see a **Single Sign-On** option, the camera has not been set up to use SSO.
3. You will be redirected to the company login page.
4. Log in with your company account credentials.

If user authorization is successful, you will have access to the camera's web interface.

The first page you will see is the *Live View* page. See *Live View* below next for instructions on using the Live Viewer.

# Live View

On the *Live View* page, you can preview the live video, check storage status, download saved footage from the SD card and modify basic camera settings to enhance the image quality.

## Downloading Saved Images

If the camera has an SD card installed and SD card storage is turned on, you can download saved images from on the *Live View* page.

- Click **Download** in the *Download Still from Camera* area.

The files will be downloaded in .JPG format.

## Enhancing Camera Image Quality

On the *Live View* page, users can quickly enhance the overall image quality. For more image settings, see *Image and Display* on page 28.

Follow these steps to use the image controls:

1. To zoom in, move the **Zoom** slider to the right.
2. To zoom out, move the **Zoom** slider to the left.
3. Click **Auto Focus** to let the camera focus itself.
4. To focus the camera, move the **Focus** slider to the right or left.

Changes are saved automatically.

See *Setup* on the next page next for instructions on setting up your camera.

## Enabling Analytics Overlays

On the *Live View* page, you can turn on analytics overlays to help visualize the analytic rules on the Live Viewer. When analytics overlays are turned on, overlays will appear around objects that meet the criteria defined by the analytic rules.

- To turn on analytics overlays, toggle the **Analytics Overlays** option. Changes are saved automatically.

> **NOTE**
>
> You must enable Analytics XML Metadata on the *Extended Settings* page before you can enable analytics overlays. See *Extended Settings* on page 48 for more information.

# Setup

Every Avigilon camera has a web interface which you can use to edit camera settings for just that camera. Refer to the sections below for detailed instructions for configuring Pro Cameras cameras.

# General

In the *General Settings* area, administrators can configure settings that apply to the camera's identity and essential functions, e.g., the camera's name, location, power state, and change the camera's mode. See *Camera Mode below* for instructions on changing the camera's mode.

## Editing the Camera's Name and Location

Changing the camera's name and location helps identify the source when multiple cameras create events.

1. Navigate to *Setup* > *General*.
2. Enter a new camera name in the **Name** field.
3. Enter a new location in the **Location** field.
4. Click **Apply** to save.

## Changing the Camera's Power State

You can change the camera's power state from Aux to PoE on the *General* page.

If the camera is connected to both PoE and an External Aux Power Supply, the camera will draw power from Aux. If you prefer the camera to use PoE, you can manually change the power state to use PoE.

- To change the camera's power state, select **Force PoE** from the **Device Power State** drop-down list and click **Apply**.

The camera will transition to using PoE instead of Aux power.

## Camera Mode

On the *General* page, you can change the camera mode to prioritize different features on a per camera basis. For example, if you want to increase the framerate on a camera you can set it to High Framerate mode. However, this turns off certain features. For information on how the different camera modes impact analytic features, see Camera Modes and Features Compatibility Matrix.

You can only change the camera mode on cameras with higher bandwidth usage. You will not see this feature if the camera model does not support it.

1. Navigate to *Setup* > *General*.
2. In the *Settings* area, click the **Mode** drop-down list and select a different camera mode:
    a. Full Feature – Offers the full functionality of the camera. Full Feature is the default camera mode.
    b. High Framerate – Uses the maximum image rate possible but may disable some features on the camera.
    c. No Video Analytics – Turns off video analytics. This option is for deployments where camera-based video analytics would interfere with other analytics integrations.
    d. Dynamic Privacy Masks – Enables dynamic privacy masks. Dynamic privacy masks can detect when the object, e.g., a person or vehicle, is moving and adjust so that the object remains masked.
3. Click **Apply** to save.

The camera will reboot after you change the camera mode.

Refresh the browser and log in again once the camera has finished rebooting.

## Time Settings

You can change the camera's time zone to align with its geographic location. This ensures that the camera can synchronize with other devices on the network. Clocks must be synchronized between all of the cameras, devices and servers on the network for the site to operate effectively.

You can access these settings by navigating to: *Setup* > *General*.

1. Navigate to *Setup* > *General*.
2. In the *Time Settings* area, click the **Time Zone** drop-down list and select the appropriate time zone.
3. You can toggle the **Automatically adjust clock for Daylight Savings Time** to the OFF position if required. However, we recommend keeping this ON.
4. Click **Apply** to save.

The camera's clock will now show the time relative to its time zone.

## GPS Settings

You can use the GPS Settings to input the camera's geolocation information as decimal values. The GPS information can be useful for mapping and other location-based applications.

You can access these settings by navigating to: *Setup* > *General*.

1. Navigate to *Setup* > *General*.
2. In the *GPS Settings* area, enter a value for the Latitude (-90-90).
3. Enter a value for the Longitude (-180-180).
4. Enter a value for the Elevation, which is calculated in meters above sea level. Only takes positive values.
5. Click **Apply** to save.

The camera will change its GPS coordinates to align with its geographic location.

# Network

On the *Network* page, you can change how the camera connects to the server network and camera time syncing behavior.

Most of the camera's network settings can be configured for many cameras at once using the Camera Configuration Tool (CCT). However, certain settings can only be configured in the camera's web interface. HTTPS port, RTSP port, and NTP Server settings can only be set in the camera web interface. See *Network* above for instructions.

## Network Settings

On the *Network Settings* page, you can configure a number of network and security settings to improve network performance and bolster security.

### *Turning on IPv6*

You can turn on IPv6 to accommodate more devices on the network.

> **NOTE**
> Enabling IPv6 does not disable IPv4 settings.

Follow these steps to turn on IPv6:

1. Navigate to *Setup* > *Network*.
2. Select the **Enable IPv6** checkbox and click **Apply**. Additional settings will appear.
3. The **Accept Router Advertisements** checkbox should remain selected if you are using **Auto** as the DHCPv6 state.
4. Select the DHCPv6 State from the drop-down menu:
    a. Auto – DHCPv6 state is determined by router advertisements (RA). The Accept Router Advertisements setting is required for this setting to perform as expected.
    b. Stateless – The camera only receives DNS and NTP information from the DHCPv6 server. It does not accept an IP address from the DHCPv6 server.
    c. Stateful
    d. Off
5. Enter the Static IPv6 Addresses.
6. Enter the Default Gateway Address.
7. Click **Apply** to save.

### *Turning Off WS Discovery*

WS Discovery Protocol is required for multicast communication and discovery. WS Discovery is enabled by default so cameras can be discovered by CCT or certain VMS's once they are added to the network. You can turn off WS Discovery after you add the camera to the network for security reasons.

- Uncheck the **Enable WS Discovery** checkbox to turn off WS Discovery protocol.

The camera will no longer be discoverable on the network.

### *Changing the Camera's Hostname*

You can change the camera's Hostname by editing the text in the Hostname field.

### *Configuring DNS Lookup Settings*

By default, cameras obtain an DNS Server address automatically. You can change the camera's DNS Server address or assign the camera to alternate DNS server.

1. Select **Use the following DNS server addresses** to manually assign DNS servers.
2. Enter the server address for the Preferred DNS server. This is the first DNS server the camera will try to connect to.
3. Enter the server address for the Alternate DNS server 1. This is the first fall back server.
4. Enter the server address for the Alternate DNS server 2. This is the second fall back server.
5. Click **Apply** to save.

### *Configuring Control Ports*

You can configure the Control Port settings to assign certain connection types to certain ports.

Follow these steps to configure the control ports:

1. Make sure the **Enable HTTP connections** checkbox is turned on.
2. You can change the ports if required (1..65534). These are the default ports:
    a. HTTP Port: 80
    b. HTTPS Port: 443
    c. RTSP Port: 554
    d. RTSP Replay Port: 555
    e. WebRTC Port: 9090
3. Click **Apply** to save.

### *Configuring the NTP Server*

You can configure the External NTP Server Configuration settings so the camera's sync with the NTP server. This allows camera's to retain the correct date and time. This is important to avoid time syncing issues.

Follow these steps to configure the NPT server:

1. Select the **Manual** button to manually assign an NTP server.
2. Enter the NTP Server address to assign the server.
3. Click **Apply** to save.

### *Adjusting MTU Size*

You can adjust the Maximum Transmission Unit (MTU) size to reduce network congestion.

- To adjust the MTU size, enter a value (576 - 1500) i n the MTU size field. The default is 1500.



**TIP**

Lower the MTU size if the network is slow.

### *Changing Ethernet Settings*

You can change the Ethernet settings to turn on duplex and adjust link tolerance.

Follow these steps to adjust the Ethernet settings:

1. Select the **Speed & Duplex** drop-down menu and choose **100M full duplex** if you want to turn on duplex. The Auto-negotiation (default) setting is preferred for most cameras, and will negotiate the optimal speed and duplex setting for your network connection.
2. Select the **Link Tolerance** drop-down menu and change the link tolerance percentage. Increasing Link Tolerance means the network can tolerate a wider range of variations before resulting in an error.
3. Click **Apply** to save.

### *Change Security Settings*

Under Security settings, you can change the minimum TLS version and adjust the login session timeout.

Follow these steps to change the camera's security settings:

1. Select the **Minimum TLS versions** drop-down list and choose TLS 1.3 if you want to restrict the camera to using a minimum TLS version.
    a. **TLS 1.3** is recommended for increased security.
    b. **TLS 1.2** can be selected if it is required for backwards compatibility.
2. Enter a the max idle time (minutes) in the **Login session timeout** field before a user is logged out. This helps avoid unauthorized access.
3. Click **Apply** to save.

## Configuring SNMP

On the *SNMP* page, you can configure the device's SNMP settings and choose the status information that is sent to the management station page. For more details on the status information or traps that will be sent, see the device's Management Information Base (MIB) file on the Avigilon website: avigilon.com/support-and-downloads.

You can turn on the Simple Network Management Protocol (SNMP) to help manage devices that are connected to the network. When SNMP is enabled, device status information can be sent to an SNMP management station.

Follow these steps to enable and configure SNMP:

1. On the *SNMP* page, toggle **Enable SNMP** to enable SNMP.
2. Select a different SNMP version from the *Version* drop-down list if required:
    a. SNMP v2c – Use SNMP v2c to make a request to the device for status information through an SNMP Get request and receive trap notifications from the device.
    b. SNMP v3 – Use SNMP v2c to make a request to the camera for status information through an SNMP Get request and receive trap notifications from the camera. SNMP v3 offers greater security by allowing you to set a username and password for the camera. This camera uses SHA-1 type authentication and AES type encryption
3. If you selected SNMP v2c, complete the required fields:
    a. Read community – enter the read community name for the device. The name is used to authenticate SNMP traffic. Only SNMP management stations with the same read community name will receive a response from the device.
    b. Write community – enter the IP address of the management station where the traps will be sent. In the Available Traps area, select the traps that will be sent. For information on the different types of Traps, see *Available Traps* on the next page.
    c. Trap destination IP – enter the IP address of the management station where the traps will be sent.
4. If you selected SNMP v3, complete the required fields:

a. Username – enter the username that the management station must use when sending the SNMP Get request to the camera.
b. Password – enter the password the management station must use with the chosen username.

5. Click **Apply** to save.

### Available Traps

The following Traps are available:

- Temperature Alert – a trap notification will be sent when the camera temperature rises above or falls below the supported threshold. A notification will also be sent when the camera temperature returns to normal.
- Camera Tampering – a trap notification will be sent when the camera's video analytics detects a sudden scene change.
- Edge Storage Status – a trap notification will be sent when the status of the SD card changes.

## Configuring DSCP

On the *DSCP* page, you can activate the DSCP feature, choose values for the traffic types listed below, and restore the default values.

Differentiated services (DiffServ) helps manage network traffic and provides quality of service (QoS) on modern IP networks. DiffServ can be used to lower latency to critical network traffic, such as voice or streaming media, while providing simplified best-effort service to non-critical services, such as web traffic or file transfers.

For Primary, Secondary, Tertiary, and Replay Stream, it is very important to prepare and set up stream traffic. In case of stream over TCP (one common socket with RTSP), the DSCP value will be taken from the Primary stream and propagated to the other streams. Setting up a stream over UDP enables the user to specify different DSCP values for all streams.

Follow these steps to enable and configure DSCP:

1. Navigate to *Setup* > *Network* > *DSCP*.
2. In the *DSCP* area, toggle **Activate feature** if it is not already enabled. DSCP is enabled by default.
3. In the **ONVIF protcol** drop-down menu, click to select one of the options:
    a. DF (0)
    b. CS2 (16) (This is the default option)
4. In the **Web interface** drop-down menu, click to select one of the options:
    a. DF (0)
    b. AF21 (18) (This is the default option)
5. In the **SNMP protocol** drop-down menu, click to select one of the options:
    a. DF (0)
    b. CS2 (16) (This is the default option)
6. In the **Primary Stream** drop-down menu, click to select one of the options:
    a. CS3 (24)
    b. AF31 (26)
    c. CS4 (32)
    d. AF41 (34) (This is the default option)
7. In the **Secondary Stream** drop-down menu, click to select one of the options:
    a. CS3 (24)
    b. AF31 (26)
    c. CS4 (32)
    d. AF41 (34) (This is the default option)
8. In the **Tertiary Stream** drop-down menu, click to select one of the options:
    a. CS3 (24) (This is the default option)
    b. AF33 (30)
9. In the **Replay Stream** drop-down menu, click to select one of the options:
    a. CS3 (24) (This is the default option)
    b. AF33 (30)
    c. CS4 (32)

d. AF43 (38)

10. Click **Apply** to save.

***Restoring Defaults***

You can restore default settings if required:

- Click **Restore Defaults** and then click **Apply**.

The camera will restore default DSCP settings.

## IP Filter

On the *IP Filter* page, you can control which IP addresses are able to connect to your camera. The IP filter limits access to certain IP addresses by either denying access to certain IP addresses or restricting access to certain IP addresses. You can also include deny or permit access to ranges of IP addresses. You can access these settings by navigating to: *Setup* > *Network* > *IP Filter*.

> **IMPORTANT**
>
> If you choose to filter IP access using the **Allow Access** option, make sure that you configure the correct addresses to be allowed or you may be locked out of your camera.

You can configure 802.1x port-based authentication to set up the appropriate camera credentials so the video stream is not blocked by the switch.

Follow these steps to use the IP Filter:

1. Navigate to *Setup* > *Network* > *IP Filter*.
2. In the *Settings* area, toggle the **Enable IP filter** button to enable IP filter.
3. Select the **Allow access** option to allow access to a limited number of IP addresses.
4. Select the **Deny access** option to deny access to a limited number of IP addresses.
5. In the IP filter entries area, click the **+** icon to add IP addresses.
6. Enter the IP address in the field.
7. Continue clicking the **+** icon to add IP addresses. You can add up to 256 IP Filter Entries.
8. You can select the **—** icon to remove IP addresses from the list of entries.
9. Click **Apply** to save.

***Restoring Defaults***

You can restore default settings if required:

- Click **Restore Defaults** and then click **Apply**.

The camera will restore the default IP filter settings.

## Configuring WebRTC

On the *WebRTC* page, you can enable WebRTC using either STUN or TURN servers. You can configure WebRTC by adding either STUN or TURN servers. Typically, you would use STUN servers unless client IP addresses or server port numbers are hidden on the network, i.e., firewalls. You can access these settings by navigating to: *Setup* > *Network* > *WebRTC*.

Follow these steps to configure WebRTC:

1. Navigate to *Setup* > *Network* > *WebRTC*.
2. In the *General Settings* area, select which type of servers you want to use:
    a. STUN servers – uses direct communication between WebRTC clients using public IP addresses and ports.
    b. TURN servers – provides a fallback when there is a lack of direct communication.

    **NOTE**

    You must turn off HTTP connections if you want to manage and use TURN servers.
3. If you are using STUN servers, enter the STUN server address using this format: stun[s] : <host> [ :<port>]
4. If you are using TURN servers, enter the STUN server address using this format: turn[s]: <host> [: <port>] [?transport =<protocol>]
5. Use the **+ Add STUN Server** button to continue adding server addresses.
6. Click **Apply** to save.

The new server will be added to the list.

***Removing Servers***

If you want to remove a server, select the **Trash** icon to remove it.

## Changing the Encryption Engine

On the *Security* page, you can change encryption methods to enable FIPS compliance or NXP TPM. Select a different encryption engine to ensure network communication is secure. You can access these settings by navigating to: *Setup* > *Network* > *Security*.

Follow these steps to change the encryption engine:

1. Navigate to *Setup* > *Network* > *Security*.
2. In the *Security* area, click the **Encryption Engine** drop-down list and select a different option:
    a. OpenSSL – FIPS is not enabled. OpenSSL is enabled by default.
    b. FIPS 140-2 – FIPS 140-2 is enabled.
    c. FIPS 140-3 – FIPS 140-3 level 1 is enabled by putting the OpenSSL library into FIPS mode.
    d. NXP TPM – FIPS 140-2 level 3 is enabled by using the TPM. For newer cameras with FIPS 140-3 TPM, this option enables FIPS 140-3 level 3 instead.

    **NOTE**

    In the event of a TPM error, you will see the following message: "Trusted Platform Module tamper error. This camera is untrusted. Power cycle is required." You must reboot the camera to resolve the issue. The camera can still record footage until rebooted. See *System* on page 58 for instructions.
3. Click **Apply** to save.

Changing this setting on your camera will require your camera to reboot and you will lose the video stream for that time. Avigilon recommends that you apply this setting during non-critical operating times.

### *Licensing FIPS*

You must purchase a FIPS camera license to use these:

- FIPS 140-2 Level 1
- FIPS 140-2 Level 3 on cameras with an onboard TPM
- FIPS 140-3 Level 3 on cameras with an onboard TPM

Contact an Avigilon Sales Representative to provision additional licenses.

## Identity and Trust

On the *Identity and Trust* page, you can add certificates, download certificates, view details, or download a Certificate Signing Request (CSR). Some certificates cannot be deleted, such as preloaded certificates provided with third-party libraries or those with a "preloaded" prefix from MPI (in the future). You can access these settings by navigating to: *Setup* > *Network* > *Identity and Trust*.

The *Certificate* table lists all certificates on the camera along with the following information:

- Name – The Certificate name.
- Type – The type of certificate, i.e., trusted or not trusted.
- Expiry Date – The date that the certificate will expire.

### *Adding a New Certificate*

On the *Certificates* page, you can create new certificates for authentication. You can access these settings by navigating to: *Setup* > *Network* > *Certificates*.

#### Uploading a Self-Signed Certificate

You can upload a self-signed certificate for authentication.

1. Navigate to *Setup* > *Network* > *Certificates*.
2. Click **Add new certificate**.
3. To create a self-signed certificate, click **Next**.
    a. Enter the Name: The certificate name. This field is required.
    b. Enter the Common Name: The primary hostname of the server. This field is required.
    c. Enter the Valid through (years): The number of years the certificate is valid for.
    d. Enter the Country: The Country where the organization is located.
    e. State or Province: The State (United States) or Province (Canada) associated with the organization.
    f. Enter the City or Locality (if required): The geographic locality of the organization.
    g. Enter the Organization (if required): The name of the organization requesting the certificates.
    h. Enter the Organizational Unit (if required): The name of the unit within the organization that is requesting the certificates.
    i. Select a Key Type: Select from the list of Key types.
    j. Click **Next**.
4. If you want to create a new validation path using just this certificate, select the **Yes, create a new validation path upon Save** checkbox.

> **NOTE**
>
> If you want to create a Certificate Validation Path with additional certificates, use the *Certificate Validation Path* tab. See *Certificate Validation Paths* on page 24 for instructions.

5. Click **Save**.

Activating the new certificate will deactivate any certificates that were being used by the same service.

### Uploading a Client-Server Certificate Using a Signing Request

You can upload a client-server certificate for authentication.

1. Click **Add new certificate**.
2. To create a self-signed certificate, click **Next**.
3. To upload a client-server certificate created using a signing request, select **Upload a client-server certificate created using a signing request** and click **Next**.
    a. Enter the Name: The certificate name. This field is required.
    b. Enter the Common Name: The primary hostname of the server. This field is required.
    c. Enter the Valid through (years): The number of years the certificate is valid for.
    d. Enter the Country: The Country where the organization is located.
    e. State or Province: The State (United States) or Province (Canada) associated with the organization.
    f. Enter the City or Locality (if required): The geographic locality of the organization.
    g. Enter the Organization (if required): The name of the organization requesting the certificates.
    h. Enter the Organizational Unit (if required): The name of the unit within the organization that is requesting the certificates.
    i. Select a Key Type: Select from the list of Key types.
    j. Click **Next**.
4. If you want to create a new validation path using just this certificate, select the **Yes, create a new validation path upon Save** checkbox.

> **NOTE**
>
> If you want to create a Certificate Validation Path with additional certificates, use the *Certificate Validation Path* tab. See *Certificate Validation Paths* on page 24 for instructions.

5. Click **Save**.

Activating the new certificate will deactivate any certificates that were being used by the same service.

### Uploading a Client-Server Certificate Using PKCS#12

You can upload a client-server certificate for authentication using PKCS#12.

1. Click **Add new certificate**.
2. To upload a client-server certificate with private key using PKCS#12, select **Upload a client-server certificate with private key using PKCS#12** and click **Next**.
    a. Enter the Name: The certificate name. This field is required.
    b. Select **Click to upload certificate file** and chose a file on the local machine.
    c. Click **Next**.
3. Click the **Click to upload certificate file** button and select the .p12 or .pfx file on your local computer.
4. Enter the Password if required. If a password is not required, uncheck the **Password** button.
5. Click **Next**.
6. Click **Save**.

Activating the new certificate will deactivate any certificates that were being used by the same service.

### Uploading a Client-Server Certificate Using PKCS8

You can upload a client-server certificate for authentication using PKCS8:

1. Click **Add new certificate**.
2. To upload a client-server certificate with private key using PKCS8, select **Upload a client-server certificate with private key using PKCS8** and click **Next**.
    a. Enter the Name: The certificate name. This field is required.
    b. Select **Click to upload certificate file** and chose a file on the local machine.
    c. Select **Click to upload a key file** and chose a file on the local machine.
    d. Enter the password if required.
    e. If a password is not required, deselect the **Password** checkbox.
    f. Click **Next**.
3. Click the **Click to upload certificate file** button and select the .pem, .crt, .cer or .der file on your local computer.
4. Click the **Click to upload key file** button and select the .key, .pem, or .rsa file on your local computer.
5. Enter the Password if required. If a password is not required, uncheck the **Password** button.
6. Click **Next**.
7. Click **Save**.

Activating the new certificate will deactivate any certificates that were being used by the same service.

### Uploading a CA Certificate

You can upload a CA certificate for authentication.

1. Click **Add new certificate**.
2. To upload a CA certificate, select **CA certificate** and click **Next**.
    a. Enter the Name: The certificate name. This field is required.
    b. Select **Click to upload certificate file** and chose a file on the local machine.
    c. Click **Next**.
3. Click the **Click to upload certificate file** button and select the .pem, .crt, .cer or .der file on your local

computer.

4. Click **Next**.
5. Click **Save**.

Activating the new certificate will deactivate any certificates that were being used by the same service.

### *Downloading Certificate Signing Requests*

You can download certificate signing requests on the *Identity and Trust* page.

1. Click **Download CSR** and enter the following information:
    - Common Name – The primary hostname of the server. This field is required.
    - Subject Alternative Name (DNS) – The alternative values associated with the certificate, e.g., email address, IP addresses, URIs, DNS names.
    - Organizational Unit – The name of the unit within the organization that is requesting the certificates.
    - Organization – The name of the organization requesting the certificates.
    - Locality – The geographic locality of the organization.
    - State or Province – The State (United States) or Province (Canada) associated with the organization.
    - Country – The Country where the organization is located.
2. Click the **Download** button to download the Certificate Signing Request.

The Certificate Signing Request will download as a .csr file.

### *Certificate Validation Paths*

On the *Certificate Validation Paths* tab, you can add new paths and manage saved paths. You can select from the saved certificate validation paths on the *TLS* page. See *TLS* on page 26 for more information. You can access the *Certificate Validation Paths* tab on the *Identity and Trust* page.

Make sure you add new certificate validation paths in the following order:

- Place Root CA first
- Place Intermediate CA in between (optional)
- Place End-Entity last

### Adding a New Certificate Validation Path

You can upload a new Certificate Validation Path.

1. Navigate to *Setup* > *Network* > *Identity and Trust* > *Certificate Validation Paths*.
2. Click **Add New Path**.
3. Enter a name for the path in the Path Details.
4. Search through the list of Available Certificates and select the certificates you want to add.
5. Use the > button to move the certificates to the Certificate Path Order area on the right.
6. Use the < button if you need to move certificates back to the Available Certificate area on the left.
7. Click and drag the ⠿ icon to reorder the list of certificates.
8. Click **Save**.

The new certificate validation path will be added to the list.

### Managing Certificate Validation Paths

You can manage Certificate Validation Paths using the options in the list:

- To view a Certificate Validation Paths, click the ⋮ icon and select **View**.
- To delete a Certificate Validation Paths, click the ⋮ icon and select **Delete**.

You will not be able to delete a certificate validation path if the camera is currently using it.

#### *Certificate Validation Policies*

On the *Certificate Validation Policies* tab, you can add new policies and manage saved policies. You can access the *Certificate Validation Paths* tab on the *Identity and Trust* page.

1. Navigate to *Setup* > *Network* > *Identity and Trust* > *Certificate Validation Policies*.
2. Click **Add New Policy**.
3. Enter a name for the path in the Policy Details.
4. Search through the list of Available Certificates and select the certificates you want to add.
5. Use the > button to move the certificates to the Selected Certificate area on the right.
6. Use the < button if you need to move certificates back to the Available Certificate area on the left.
7. Click and drag the ⠿ button to reorder the list of certificates.
8. Click **Save**.

The new certificate validation policy will be added to the list.

### Managing Certificate Validation Policies

You can manage Certificate Validation Policies using the options in the list:

- To view a Certificate Validation Policy, click the ⋮ icon and select **View**.
- To delete a Certificate Validation Policy, click the ⋮ icon and select **Delete**.

You will not be able to delete a certificate validation policy if the camera is currently using it.

## Configuring 802.1X Profiles

On the *802.1x* page, you can configure 802.1x profiles and manage saved 802.1x configurations. You can access these settings by navigating to: *Setup* > *Network* > *802.1x*.

You can configure 802.1x port-based authentication to set up the appropriate camera credentials so the video stream is not blocked by the switch.

1. Navigate to *Setup* > *Network* > *802.1x*.
2. In the **Configure 802.1X profiles** area, click the **Protocol** drop-down list and select a different protocol:
    a. PEAP – for username and password authentication.
    b. EAP-TLS – for certificate authentication.
3. If you selected PEAP, complete the required fields:
    a. Configuration Name – give the profile a name.
    b. EAP Identity – enter the username that will be used to authenticate the camera.
    c. Password – enter the password that will be used to authenticate the camera.
    d. Authenticate Server – check this box if you need to add a certificate.

4. If you selected EAP-TLS, complete the required fields:
    a. Configuration Name – give the profile a name.
    b. EAP Identity – enter the username that will be used to authenticate the camera.
    c. TLS Client Certificates – select the PEM-encoded certificate file to authenticate the camera.
    d. Private Key – select the PEM-encoded private key file to authenticate the camera.
    e. Private Key Password – if the private key has a password, enter the password here.
5. Click **Upload Files** and the TLS client certificate and private key are uploaded to the camera. The uploaded files are used to generate a unique certificate to authenticate the camera. The unique certificate is displayed in the Uploaded Certificate field.
6. Click **Apply** to save.

If this is the first profile added to the camera, it is automatically enabled.

Saved configurations are listed under Saved 802.1x Configurations. To switch between authentication profiles or delete them, see *Managing Saved 802.1X Configurations* below.

#### *Managing Saved 802.1X Configurations*

You can manage your authentication profiles in the *Configure 802.1X profiles* area:

- To select a different authentication profile, select the saved configuration then click **Enable**.
- To delete one of the authentication profiles, select the saved configuration then click **Remove**.

These changes will be saved automatically.

## TLS

On the *TLS* page, you can select from a list of saved certificate validation paths. You can access TLS settings by navigating to: *Setup* > *Network* > *TLS*.

> **NOTE**
> You must create the certificate validation path under *Identity and Trust* > *Certificate Validation Paths* before it is available in the list. See *Certificate Validation Paths* on page 24 for more information.

## Single Sign-On (SSO)

Single Sign-On (SSO) allows system administrators to configure cameras to use a single set of credentials for login. This simplifies access by having an external identity provider handle user authentication. The implementation relies on an OpenID Connect compliant authorization provider that uses JWT access tokens and supports an ONVIF roles claim.

#### *Compatibility*

The camera can be configured with most OpenID Connect-compliant authorization providers, provided they use JWT access tokens and support an ONVIF roles claim. While the compatibility has been verified with Keycloak, Ping One, Microsoft Entra ID, and Okta, other compliant providers are also expected to be compatible.

### *Authentication Requirements*

Setting up SSO for the first time involves similar steps across platforms, though specific steps will differ. Avigilon cameras require these settings to authenticate users:

1. Register Cameras as Client Applications – The camera must be registered as a client application with the third-party authorization service.
2. Configure Parameters – You will need to configure parameters such as the Authorization Server address, Client ID, Client Secret, Scope, Certificate path validation policy, Audiences, JWT signature verification method and Custom claims (optional).
3. Token Validation – The camera validates the ID and Access Tokens by checking their signature, issuer, audience, expiration and any custom claims. For ID Tokens, a unique "nonce" value is used to prevent security risks like replay attacks.
4. ONVIF Roles for Authorization – User authorization is managed by mapping the user's identity to an ONVIF user level (e.g., onvif:Administrator, onvif:Operator, onvif:User). This mapping happens through a "roles" claim within the Access Token. Access will be denied if this claim is missing or invalid.

### *Setting Up SSO In The Camera Web Interface*

You can set up Single Sign-On (SSO) in the camera web interface with third-party OpenID Connect authorization providers. Administrator account permissions are required for both the Avigilon camera and the third-party authorization provider.

The steps for configuring SSO for Avigilon cameras depends on the third-party authorization set up and requirements. In general, the cameras must be set up as client applications with the authorization service, cameras will validate ID and access tokens, the access token must support ONVIF roles claims.

> **IMPORTANT**
> To configure Single Sign-On settings, you need to access the web interface via HTTPS.

Follow these steps to set up SSO:

1. Navigate to *Setup* > *Network* > *Single Sign-On*.
2. If required, click **Redirect to HTTPS** and re-enter your camera log in credentials.
3. In the *OIDC Authorization Server* area, enter the Authorization Server address.
4. In the *Authorization Code flow configuration* area, enter the following parameters:
    a. Client ID
    b. Client secret
    c. Scope
5. In the *Server certificate validation* area, select a **Certificate path validation policy** from the drop-down list.
6. In the *JWT validation* area, click **Add** to add the required policies:
    a. Supported audiences
    b. Custom claims
    c. Supported Values
7. Select a **JWT signature verification method** from the drop-down list.
8. Click **Apply** to save.

Once these requirements are met, you can return to this section to complete the camera-side configuration.

# Image and Display

On the *Image and Display* page, you can edit General Image Settings, Day/Night settings, Exposure Settings and enable Advanced Filters, such as digital defog and image stabilization.

## Live Preview

The Live Preview displays the live footage from the camera. Below the Live Preview you will find the following camera information:

- Current Exposure – the camera's current light exposure levels measured in milliseconds (ms).
- Current Iris – the camera's current iris shown as an F-number (f/#). The F-number measures the lens's focal length over the aperture's diameter. The smaller the f-number the larger the aperture opening relative to the focal length, meaning more light can enter the lens.
    - A small F-number means objects further away will appear blurry while the subject is in focus.
    - A large F-number means better depth of field meaning more of the scene will be in focus.
- Current Gain – the camera's current gain controls the amplification of the signal from the camera sensor measured in decibels (dB).
- Last Known Light Level – the camera's exposure value (EV) at a recent high point.

> **TIP**
>
> Auto focus ROI is used to automatically focus the camera as temperature fluctuates. Ensure the ROI contains sufficient contrast during both the day and night.

## Adjusting Image Settings

On the *Image and Display* page, you can adjust image settings using the options under the Live Preview. You can also move and configure the Auto Focus Zone. Administrator or operator permissions are required.

1. To zoom in, move the **Zoom** slider to the right.
2. To zoom out, move the **Zoom** slider to the left.
3. Click **Auto Focus** to let the camera focus itself.
4. To focus the camera, move the **Focus** slider to the right or left.
5. To use Image Rotation, select the **Image Rotation** drop-down menu and select an option.
6. To use Temperature Refocus, toggle the **Enable Temperature Refocus** option to the ON position.
7. Click **Apply** to save.

### *Configuring the Auto Focus Zone*

You can change the shape and location of the Auto Focus Zone using the Live Viewer.

1. If you can not see the Auto Focus Zone on the Live Viewer, toggle the **Show Auto Focus Zone** button to the **On** position.
   You should see a blue box in the middle of the Live Viewer.
2. To move the Auto Focus Zone, click and drag the blue box.
3. To resize the Auto Focus Zone, click the blue box to highlight it and click and drag the four corners to change

the shape.

4. Click **Apply** to save.

## Changing Day/Night Settings

In the *Day/Night* area, you can configure the camera's behavior when switching between day time and night time settings.

### *Changing Day/Night Modes*

You can change the camera's Day/Night Mode to determine how the camera will switch between light and dark image settings. This improves the image for 24 hour visibility.

1. Select an option from the **Mode** drop-down list:
    a. Automatic – When the light level is above the day/night threshold, the video image will be in color. When the light level goes below the day/night threshold, the camera will automatically open the IR cut filter and switch to monochrome mode. For camera with no IRCF, the camera will just switch to monochrome.
    If IR illuminators are enabled, they also turn on.
    When the Day/Night Mode setting is set to **Automatic** you can use the **Day/Night Threshold (EV)** slider to set the day/night threshold. Move the slider to set the light level when the camera switches between day mode and night mode. The slider value is in Exposure Values (EV).
    In day mode, the last known light level is displayed under the image panel and is also shown as a blue bar on the Day/Night Threshold slider.
    b. Color – The video image will always be in color.
    c. Monochrome – The video image will always be monochrome.
    d. External – The camera will open the IR cut filter and switch to monochrome mode based on the digital input circuit state. For camera with no IRCF, the camera will just switch to monochrome.

    > **NOTE**
    > You can set the default digital input circuit state on the Digital Inputs and Outputs page. See *Digital Inputs and Outputs* on page 53 for more information.

2. Click **Apply** to save.

### *Enabling IR LEDs*

This feature allows you to manually enable or disable the IR illuminators that are installed on the camera.

- To enable IR LEDs in night mode, toggle Enable IR LED in Night Mode and click **Apply**.

### *Adjusting the Day/Night Threshold (EV)*

To adjust the Day/Night Threshold (EV), use the slider to increase or decrease the minimum threshold required for the camera to change modes. Alternatively, you can enter a value (-8 and 8) in the EV field.

- Moving the slider to the right decreases the threshold required for the camera to switch to daytime settings.
- Moving the slider to the left decreases the threshold required for the camera to switch to night time settings.

### *Enabling Adaptive IR Compensation*

Enabling automatic infrared adjustments through Adaptive IR Compensation allows the camera to automatically adjust the video image for saturation caused by IR illumination.

- To enable Adaptive IR Compensation, toggle the **Enable Adaptive IR Compensation** button and click **Apply**.

### *Enabling Night Visibility Check*

The night visibility check, when enabled, performs a periodic test switching between day/night mode to check if there is sufficient light level to switch from night mode to day mode. When turned off, the camera will use a less optimal method to determine if the light level is sufficient to switch to day mode.

- To enable Night Visibility Check, toggle the Enable Night Visibility Check button and click **Apply**.



**NOTE**

Disabling the night visibility check could delay the camera from transitioning between night and day modes and make the transition time less optimal. For example, the camera stays in night mode 30 minutes longer than it needs to.

## Adjusting Exposure Settings

In the *Exposure Settings* area, you can adjust the camera's exposure settings to optimize visibility in very bright or very dark environments.

### *Using Flicker Control*

Use Flicker Control in scenes where the camera image appears to flicker. Flickering is often caused by fluorescent lights. You can reduce the flickering effect by setting the Flicker Control to the same frequency as the lights. Generally, Europe is 50Hz and North America is 60Hz.

- Click the **Flicker Control** drop-down list and select a frequency (Hz). Click **Apply** to save.

The camera will start using the new frequency.

### *Changing Exposure*

Exposure determines how much light reaches the camera's sensor. Exposure is set to Automatic by default which allows the camera to control the exposure. You can change the exposure rate to allow more light to hit the camera sensor which brightens the image. Alternatively, you can decrease the exposure to darken the image. Manually increasing the exposure time may affect the image rate.

- Click the **Exposure** drop-down list and select a value (milliseconds). Click **Apply** to save.

The camera will adjust the sensor for the new exposure level.

### *Setting a Maximum Exposure Level*

Maximum Exposure limits the exposure when the camera is set to Automatic. In low-light situations, set a maximum exposure level so you can manually control the camera's exposure time without creating blurry images.

The Maximum Exposure drop-down list is only available when the Exposure setting is set to Automatic.

- Click the **Maximum Exposure** drop-down list and select a value (milliseconds). Click **Apply** to save.

The camera will apply the maximum exposure setting to avoid blurry images.

### *Setting a Maximum Gain*

Maximum Gain limits the automatic gain setting by selecting a maximum gain level. In low-light situations, set a maximum gain to maximize the detail without creating excessive noise in the images.

- Click the **Maximum Gain** drop-down list and select a value (milliseconds). Click **Apply** to save.

The camera will apply the maximum gain setting to avoid excessive visual noise in the image.

### *Changing Priority*

The Priority feature lets you prioritize Image Rate or Exposure. When Priority is set to Image Rate, the camera will maintain the set image rate as the priority and will not adjust the exposure beyond what can be recorded for the set image rate. When Priority is set to Exposure, the camera will maintain the exposure setting as the priority, and will override the set image rate to achieve the best image possible.

- Click the **Priority** drop-down list and select either Image Rate or Exposure. Click **Apply** to save.

The camera will switch to prioritizing the selected option, either Image Rate or Exposure.

### *Changing Iris Mode*

Iris Mode determines how the camera's iris is controlled. You can allow the camera to control the iris by selecting Auto. If you want to manually control the Iris, select either Open or Closed.

- If you want the camera to control the iris while you control other settings, select **Auto**.
- If you want the iris to open so you can manually start closing it, select **Open**.
- If you want the iris to close so you can manually start opening it, select **Open**.

### *Using WDR*

Wide Dynamic Range (WDR) allows the camera to adjust the video image to accommodate scenes where bright light and dark shadow are clearly visible.

- Toggle **WDR** to the ON position. Click **Apply** to save.

The camera will start using WDR.

### *Using Backlight Compensation*

Backlight Compensation helps brighten dark areas when there is strong background lighting, for example, a large window in the background. You can enable Backlight Compensation to brighten the dark areas and achieve a well exposed image.

- Toggle **Backlight Compensation** to the ON position. Click **Apply** to save.

The camera will start using backlight compensation.

### *Using Iris Priority*

Iris Priority mode allows you to manually control the camera's F-stop (aperture) at a fixed setting. This means you determine how open or closed the lens's iris is, directly impacting the depth of field. While the F-stop remains constant, the camera automatically adjusts the shutter speed and gain to maintain proper exposure.

Features like Wide Dynamic Range (WDR) and Backlight Compensation are not available when Iris Priority mode is active.

- Toggle **Iris Priority** to the ON position. Click **Apply** to save.

If you attempt to enable Iris Priority mode through an ONVIF call while simultaneously enabling WDR, auto exposure, or Backlight Compensation, those latter settings will take precedence, and Iris Priority mode will be ignored.

## Advanced Filters

In the *Advanced Filters* area, you can enable digital defog and image stabilization features to improve visibility.

### *Using Digital Defog*

If the camera is installed in a foggy environment, you can use Digital Defog increase the video contrast to help make objects more visible in the scene.

1. Toggle the **Enable Digital Defog** button to enable Digital Defog.
2. From the **Defog Level** drop-down list, select one of the available options: Low, Medium, High.
3. Click **Apply** to save.

The camera will apply Digital Defog to help clarify foggy images.

### *Using Image Stabilization*

If the camera is mounted to a pole or other surface that is prone to shaking or vibrating, you can use image stabilization allows the camera's built-in image stabilization feature to compensate for the motion, improving the footage.

- Toggle the **Image Stabilization** button to enable image stabilization. Click **Apply** to save.

The camera will apply electronic image stabilization to compensate for camera movement.

## Adjustments

In the *Adjustments* area, you can adjust image settings to fine tune the image and optimize visibility.

### *Rotating Image*

Image rotation rotates the camera image when the camera is installed upside down or sideways.

- To use Image Rotation, select the **Image Rotation** drop-down menu and select an option. Click **Apply** to save.

You can rotate the image by 90°, 180° and 270°.

### *Adjusting Basic Image Settings*

In the *Basic Settings* area, you can control the camera's sharpness, saturation, contrast and brightness.

1. Use the sliders to adjust the following settings:
    a. Sharpness – increasing sharpness will help clarify fine details.
    Adjusting the sharpness will make the image blurry initially. Refocus the camera after adjusting the sharpness.
    b. Saturation – increasing saturation will enhance the color intensity. Lowering the saturation will reduce the intensity.
    c. Contrast – increasing contrast can emphasize certain aspects of the image. Lowering the contrast can make the image softer. The right level of contrast depends on the subjects you want to see clearly as well as the setting.
    d. Brightness – increasing brightness cam make dark scenes easier to see. If increasing brightness makes the dark areas harder to see, due to a strong back light for example, you can use Backlight Compensation instead. See *Adjusting Exposure Settings* on page 30 for instructions.
2. Click **Apply** to save.

### *Zoom and Focus*

In the *Zoom & Focus* area, you can zoom and focus the camera.

1. Use the zoom and focus controls to adjust the following settings:
    a. To zoom in, move the **Zoom** slider to the right.
    b. To zoom out, move the **Zoom** slider to the left.
    c. Click **Auto Focus** to let the camera focus itself.
    d. To decrease focus, use the **<** to make a small change and **<<** to make a large change. Click **0** to focus at zero.
    e. To increase focus, use the **>** to make a small change and **>>** to make a large change. Click **Inf** to focus at the highest level.
2. Click **Apply** to save.

### *White Balance*

In the *White Balance* area, you can assign a White Balance mode to compensate for discoloration in the image. For example, florescent lights can cast a green hue on the scene. White Balance corrects this effect and makes objects in the field of view appear as they normally would.

1. Click the White Balance drop-down list and select one of the following modes:
    a. Automatic – Allows the camera to automatically control the red, green and blue color channels to neutralize the color cast and achieve a more accurate white.
    b. Manual – Allows you to manually set the Red and Blue levels.
2. You can select the Dominant Color Compensation checkbox if available. Select this option if the scene contains a large area in the field of view contains one color. For example, a large grassy area contains a lot of green.
3. If you selected Manual as the White Balance mode, use the Red and Blue sliders to manually compensate for discoloration in the image.
4. Click **Apply** to save.

### *Temporal Filter Strength*

A temporal filter reduces image noise by averaging the noise over several frames. This can reduce blurriness and decrease bandwidth usage.

**TIP**

Start by making small adjustments because applying excessive changes may degrade the overall image quality.

- Move the Temporal Filter Strength slider to the right to decrease the amount of visual noise in the scene.
- Move the Temporal Filter Strength slider to the left to decrease temporal strength filter. This will restore the image quality if the filter strength was too high but it will reintroduce visual noise in the image.

## Overlays

On the *Overlays* page, you can add custom overlays and show or hide the cross hair. To add an overlay from the camera web interface, see Adding New Overlays. If you want to add other types of overlays, including Analytics information, you can do so from Unity Video or ACC. See Video Overlays in the Unity Video Client User Guide.

Overlays are text or symbols that are displayed on the camera's Live View. You can add helpful information such as the date and time. When you download still images, the image files will contain the overlay information.

### *Adding New Overlays*

On the *Overlays* page, you can add custom overlays.

1. To add an overlay, click **Add new overlay**.
2. Select the **Location** drop-down menu and choose a location on the screen where the overlay will appear.
3. Select the **Overlay Type** drop-down menu and choose one or more options:
    a. Custom Text – Add a text field and enter the text you want shown.
    b. Date – Add the date.
    c. Time – Add the time.
    d. Camera Name – Add the camera's name. The camera's name is set on the General page, under Settings.
    e. Location – Add the location.
    f. Compass – Add the compass overlay.
4. If you chose Custom Text, enter the text in the **Overlay Text** field.
5. If you chose Date, you can select a different date format from the **Date Format** drop-down menu.
6. If you chose Time, you can select a different time format from the **Time Format** drop-down menu.
7. To change the font size, change the font value (between 12 - 80 pt) in the **Font Size** field. The default font size is 24.
8. To change the text color, select the **Text Color** drop-down menu and choose a different color.
9. To change the background color, select the **Background Color** drop-down menu and choose a different color.
10. Click **Save Overlay**.

If you added a compass overlay, you must calibrate the compass before it is usable. See Compass Calibration for instructions.

# Compression and Image Rate

On the *Compression and Image Rate* page, you can change the camera's compression and image quality settings. You change the compression and image quality settings separately for primary, secondary, tertiary and quaternary streams. However, quaternary steams are only available on H6SL 5MP camera models at this time.

Changing compression and image rate settings will impact image quality and bandwidth usage. Typically, settings that improve image quality will increase the bandwidth usage, due to the increased file size. The goal is to optimize image quality without causing network congestion.

Updating the image rate and compression settings can cause Self Learning progress to reset automatically.

Changing the streaming format to H.264 or H.265 will only affect the footage in the VMS. The web interface only displays video in JPEG format to reduce bandwidth usage.

**IMPORTANT**

If you are using HDSM, adjusting the stream settings with HDSM enabled while connected to the Unity Video or ACC can cause undesired behavior in camera operation and missing recordings. Camera stream settings should only be configured in Unity Video or ACC.

## Configuring General Compression and Image Rate Settings

On the *General* page, you can configure the camera streaming settings to optimize video quality in light of network constraints. The camera will automatically adjust compression quality in order to abide by the bandwidth cap specified.

Avigilon cameras can have primary, secondary, tertiary and quaternary streams. Not all camera models have quaternary streams. Refer to the Avigilon Unity Camera Datasheets for your camera's specification.

To configure a camera stream, select the stream and edit the following settings:

1. In the **Compression Standard** drop-down list, select the preferred streaming format for compressing video files.
   If you are using Onboard Storage, make sure you select **H.264**.
2. Select the **Rate Control** drop-down list, and select one of the following options:
   a. CVBR – Uses VBR to adjust the bitrate based on the complexity of the scene.
   b. CBR – Uses a fixed bitrate to produce smaller video files.
3. Select the **Resolution** drop-down list, and select the image resolution.
4. Select the **Frame Rate** drop-down list, and select the frame rate. Choose a value between 1-30 seconds. This determines how many images per second you want the camera to stream over the network. The default frame rate is 30.
5. In the **Quality** drop-down list, select the desired image quality. Setting the Image quality to 1 will produce the highest quality video but will require the most bandwidth.
6. In the **Max Bitrate** field, enter the maximum bandwidth the camera can use. You can enter any number between 200-12000 kbps.
7. In the **Min Keyframe Interval** field, enter the number of frames between each keyframe. You can enter any number between 2-64.

8. If you want to configure QoS (DSCP), enter the QoS codepoint in the **QoS (DSCP) Codepoint** field.
9. If you want to change camera profiles, select a different profile from the **Profile** field.
10. Click **Apply** to save.

This applies the compression and image rate settings to the camera stream.

You can configure these settings individually for primary, secondary, tertiary and quaternary streams if available.

## Advanced Compression and Image Rate Settings

On the *Advanced* page, you can configure more advanced streaming and image rate settings, like Smart Codec and Idle Scene Mode. These settings change the streaming behavior during periods of low activity to reduce bandwidth usage.

### *Using HDSM SmartCodec*

You can enable and configure HDSM SmartCodec settings on the Video Configuration page. HDSM SmartCodec helps isolate objects from the background areas. This reduces the camera's bandwidth usage by concentrating on the subjects of interest.

HDSM SmartCodec is turned off by default.

1. In the HDSM SmartCodec area, toggle the **Enable HDSM SmartCodec** option to enable it.
2. Click **Apply** to save.

Enabling HDSM SmartCodec will turn on Idle Scene Mode. See *Using Idle Scene Mode* below for instructions.

#### Turning Off Idle Scene Mode

If you want to continue using HDSM SmartCodec without Idle Scene mode you can turn it off.

- Toggle the **Idle Scene Mode** option to turn off this feature.

### *Using Idle Scene Mode*

After you enable HDSM SmartCodec, Idle Scene mode is enabled automatically. Idle Scene mode conserves bandwidth by reducing the analytic functions during periods of inactivity. You can configure Idle Scene Mode to set the image quality standards when there is no activity in the scene.

1. In the On Idle Scenes area, you can configure the following settings:
    a. Min Image Rate – The encoding frame rate (images per second) when there is no motion in the scene.
    b. Keyframe Interval – The number of frames between each keyframe when there is no motion in the scene (between 1 and 254 frames).
    c. Post Motion Delay – The delay (in seconds) after motion has ended before the camera drops into idle scene settings (between 5 and 60).
    d. Quality – The compression quality when there is no motion in the scene (between 6 and 20).
    e. Max Bitrate – The maximum number of kilobytes per second when there is no motion in the scene.
2. Click **Apply** to save.

## Viewing the Camera Live Stream Using the RTSP Stream URI

You can view the camera's live video stream from any application that supports RTSP streams, including video players, by using the Real Time Streaming Protocol (RTSP) address.

1. To watch the camera's live video stream from an external video player, click the **Generate RTSP Stream URI** button. If the button is not available, the URI is auto-generated.
2. In the *RTSP Stream URI* area, the generated address is displayed at the bottom of the section. If the URIs are auto-generated, they are also shown here.
3. Select **Unicast** if you only plan to view the video stream from one video player at a time.
4. Select **Multicast** if you plan to view the video from more than one video player simultaneously.
5. Copy and paste the generated address into your video player. Do not open the live video stream yet.
6. Add your username and password to the beginning of the address in the following format: rtsp://<username>:<password>@<generated RTSP Stream URI>/.
7. Here is an example: rtsp://admin:admin@192.168.1.79/defaultPrimary?streamType=u.
8. Open the live video stream.

The live stream will show the live video stream from the camera.

# Streaming Settings

On the *Streaming Settings* page, you can set the ONVIF Media Profile and configure Profile Settings.

1. Select an **ONVIF Media Profile** from the **Profiles** drop-down menu.
2. Select a profile from the **Video Source** drop-down menu.
3. Select a profile from the **Audio Source** drop-down menu.
4. To enable **Metadata**, select metadata0 from the drop-down menu.
5. To disable **Metadata**, select None.
6. Select a profile from the **Video Encoder** drop-down menu.
7. Click **Apply** to save.

# Motion Detection

On the *Motion Detection* page, you can configure the motion detection feature by creating areas called Regions of Interest (ROI). The ROIs are shown as green boxes in the Live Preview. The camera analytics will ignore motion detected outside these areas. For more advanced analytic features or detailed configurations, make sure you use Unity Video or ACC to edit the settings.

## Configuring Motion Detection

You can configure motion detection in two stages: defining the Motion Detection zones and then configure sensitivity and threshold. Sensitivity determines how much each pixel must change before the analytic detects motion.

Follow these steps to configure Motion Detection:

1. Add Motion Detection zones:
    a. Make sure the **Select Zone** option is selected.
    b. Click an area on the Live Preview and drag your cursor to create a green square. This green square is a motion detection zone. Motion in this zone will trigger an event.
    c. Continue clicking and dragging to create zones where you want motion detected.
    d. If you want to start over, you can click **Select Full** to restore the motion detection zones.
2. Clear zones from within the Motion Detection zones:

a. Select the **Clear Zone** option.
b. Click an area on the Live Preview where you see green squares and drag your cursor to clear the area. This creates a hole in the Motion Detection zone. Motion in the cleared zone will not trigger an event.
c. Continue clicking and dragging to clear the zones where you do not want motion to trigger an event.
d. If you want to start over, you can click **Clear All Zones** to clear the motion detection zones.

3. To configure Sensitivity:
   a. Click and drag the **Sensitivity** slider to increase the sensitivity (0-100). The higher the sensitivity, the smaller the amount of pixel change is required before motion is detected. Threshold determines how many pixels must change before the image is considered to have motion. The default value is 50.
4. To configure Threshold:
   a. Click and drag the **Threshold** slider to increase the threshold (0-100). The higher the threshold, the higher the number of pixels must change before the image is considered to have motion. The default value is 20.
5. Toggle the **Show Motion in Video** option to show motion in the Live Preview.
6. Click **Apply** to save.

This updates the Motion Detection event.

### *Enabling ONVIF Motion Alarm Event*

Enable ONVIF Motion Alarm Events so the camera can send ONVIF events. Many third-party Video Management Systems require the ONVIF protocol to process events.

- Toggle the **Enable Onvif MotionAlarm Event** option to enable the ONVIF Motion Alarm Event protocol.

The camera will start sending ONVIF Motion Alarm Events.

## Tamper Detection

Tamper Detection detects human tampering by detecting when the camera shakes or jerks from side to side in a way that is characteristic of human interference. Enabling Tamper Detection allows the camera to forward event notifications to an integrated system, such as ACC integrated with ACM, and send alarms to operators.

# Analytics

On the *Analytics* page, you can create and manage analytic events.

## Motion Events

On the *Analytics* page, you can create Motion Events to trigger alarms when a certain types of activity occur.

### *Creating Motion Events*

Follow these steps to create a Video Analytic Event:

1. Click **Add Event** in the Events area.
2. Enter a name for the Event in the Name field.
3. Select an activity type from the **Activity** drop-down list.
4. Select the **Object Types** you want the analytic to detect:
    a. Person
    b. Vehicle
    c. Vehicle sub-types (if available): Bicycle, Car, Motorcycle, Bus, Large Truck, Pickup Truck, Van
5. Click and drag the slider to adjust the **Sensitivity** level. Lowering the sensitivity increases the chances of false negatives.
6. Configure Number of Objects:
    a. Enter the number of objects required to detect an alarm in the **No. of objects** field. You can also use the up and down arrows to set the **No. of Objects**.
7. Configure Threshold Time:
    a. Enter the minimum amount of time required before the event is triggered in the **Threshold Time** field. You can also use the up and down arrows to set the **Threshold Time**.
8. Toggle the **Enabled** button to enable the event.
9. Click **Apply** to save.

The motion event will send an alert when the criteria is met.

If you want to limit the inclusion area to certain regions in the camera's field of view, see *Modifying the Inclusion Area* on the next page.

If you want to test the analytic event, see *Testing Analytic Events* on page 42.

## Classified Object Motion Detection

Classified Object Motion Detection analyzes the video footage but only reports the motion of vehicles or persons. This option is only available to Avigilon self-learning video analytics devices.

When using Unity Video or ACC, you must set up Classified Object Motion Detection in Unity Video or ACC. However, administrators and operators can configure this event in the camera web interface.

### *Editing the Classified Object Motion Detection Event*

The Classified Object Motion Detection event is listed on the Events table on the Analytics page. The default name is Smart Motion Rule. You can not edit the name of this rule.

Follow these steps to edit the Classified Object Motion Detection event:

1. Navigate to the *Analytics* page.
2. Click the ✎ icon next to Classified Object Motion Detection to edit the event.
3. Select the **Object Types** you want the analytic to detect:
    a. Person
    b. Vehicle
    c. Vehicle sub-types (if available): Bicycle, Car, Motorcycle, Bus, Large Truck, Pickup Truck, Van
4. Click and drag the slider to adjust the **Sensitivity** level. Lowering the sensitivity increases the chances of false negatives.
5. Configure Number of Objects:
    a. Enter the number of objects required to detect an alarm in the **No. of objects** field. You can also use the up and down arrows to set the **No. of Objects**.
6. Configure Threshold Time:
    a. Enter the minimum amount of time required before the event is triggered in the **Threshold Time** field. You can also use the up and down arrows to set the **Threshold Time**.
7. Click **Save**.

This will update the event configuration.

If you want to limit the inclusion area to certain regions in the camera's field of view, see *Modifying the Inclusion Area* below.

If you want to test the analytic event, see *Testing Analytic Events* on page 42.

## Modifying the Inclusion Area

You can edit the inclusion area to make sure that the scene is monitored appropriately. The inclusion area looks like a green box on the Live Preview. You can edit the inclusion area to cover areas they want monitored and add exclusion areas to exclude areas they do not monitored, for that particular event.

Use your cursor to modify the shape and location of the inclusion area on the Live Preview. Reshape the inclusion area until every region you want monitored is covered by the green shape. You can exclude areas afterward.

1. Edit the Inclusion Area:
    a. Click and drag the middle of the green square on the screen to move the inclusion area.
    b. Click and drag the Blue nodes to reshape the inclusion area.
    c. Click and drag the Green nodes to create additional Blue and Green nodes.

2. Add Exclusion Areas:
    a. Click **+ Add Exclusion Area** if you want to add a new exclusion area. The exclusion areas create holes in the inclusion area. Events in the exclusion zone will not trigger an event.
    b. Click and drag the middle of the green square on the screen to move the exclusion area.
    c. Reshape the exclusion area the same way you reshaped the inclusion area.
    d. Continue clicking and dragging to exclude the areas where you do not want the activity to trigger an event.
    e. Click **Delete Exclusion Area** to remove the selected exclusion area.
3. If you want to start over, you can click **Reset Areas** and select one of the following options:
    a. Reset Inclusion Area – Resets the inclusion area to cover the entire field of view.
    b. Reset Exclusion Areas – Deletes the exclusion areas.
    c. Reset All Areas – Resets the inclusion area and deletes the exclusion areas. You can not delete the inclusion area is required.
4. Click **Apply** to save.

This updates the event so only events detected in the inclusion areas will trigger this particular event configuration.

## Self-Learning

On the *Analytics* page, you can configure Self Learning Analytics on the Analytics page. Self Learning allows the camera to learn the scene and perform self adjustments based on the activity in the scene. Self Learning significantly improves the accuracy of classified object detection.

Scenes with less activity will require staging during the learning phase. Staging involves directed activity to show the camera what activity to detect. One example of staging would involve having a person walk through the field of view during learning.

Follow these steps to enable self-learning:

1. Toggle the **Enable Self Learning** checkbox to enable Self Learning analytics.
2. Toggle the **Suspend Self Learning** checkbox to suspend self learning.
3. If you want to reset self learning, click the **Reset Self Learning** button. This erases previous self learning.

> **IMPORTANT**
> This action can not be undone.

4. Click **Apply** to save.

Self-learning will progress based on activity detected in the camera's field of view.

## Analytic Scene Mode

In the *Scene Mode* area, you can change the analytic scene mode. The right analytic scene mode will improve analytics results.

1. Click the **Scene Mode** drop-down list and select on of the following options:
    a. Large Indoor Area
    b. Outdoors
2. Click **Save**.

The camera will change analytic scene modes.

For best practices on optimizing Avigilon camera analytics, see the Designing a Site with Avigilon Self-Learning Video Analytics User Guide.

## Testing Analytic Events

There are two ways to test analytic events:

- After you save the event, you can test it by selecting the ►**Test** button on the configuration page.
- Alternatively, you can refer to the *Events* table on the *Analytics Events* page. Locate the analytic rule you want to test and click the ►button.

Clicking the Test button will send a "Test" event to the VMS. Navigate to the VMS to verify that the event was received.

## Analytic Event Types

### *Video Analytics*

| Motion Events | |
|---|---|
| Objects in area | The event is triggered when the selected object type moves into the region of interest |
| Objects crossing beam | The event is triggered when the specified number of objects have crossed the directional beam that is configured over the camera's field of view. The beam can be unidirectional or bidirectional. |
| Objects enter area | The event is triggered when the specified number of objects have entered the region of interest. |
| Objects leave area | The event is triggered when the specified number of objects have left the region of interest. |
| Object loitering | The event is triggered when the selected object type moves into the region of interest and then stays for an extended amount of time. |
| Object not present in area | The event is triggered when no objects are present in the region of interest. |
| Object appears or enters area | The event is triggered by each object that enters the region of interest. This event can be used to count objects |
| Object stops in area | The event is triggered when an object moves into a region of interest and then stops moving for the specified threshold time. |
| Objects too close | The event is triggered when two objects are too close together, based on the specified distance set for the event.<br>Newer camera models only. |
| Direction violated | The event is triggered when an object moves in the prohibited direction of travel. |
| Unusual crowd size | This event is triggered when an unusual crowd size is detected |
| Unusual crowd growth | This event is triggered when a crowd size grows unexpectedly. |
| Crowd size | This event is triggered when the number of people is exceeded over a configurable duration.<br>H5A Multisensor and H5A Modular cameras only. |

# Camera Automation

Camera Automation allows you to create rules and assign actions that the camera will perform automatically in response to specific triggers.

Each rule specifies an action for the camera to perform each time the specified trigger occurs when a specified condition is true. Some actions come pre-defined and available to be used in rules, while others must be defined by the user before they can be used in rules.

**IMPORTANT**

Any changes you make to the actions will affect all of the camera rules using them.

## Create Rules and Assign Actions

Rules define the trigger and conditions required to initiate actions. You can create rules based on camera analytics, digital inputs, PTZ behavior and system status. You can create user-defined actions when creating rules or they can create the actions first.

Follow these steps to create a new rule:

1. Click the **+ Add New** button to create a new Rule.
2. Enter the required information in the Camera Automation pop-up window:
    a. Enter a name for the Rule in the Rule Name field.
3. Define the Trigger in the *When the following trigger happens* area by selecting an option from the drop-down list:
    a. Analytics – Creates an Analytics rule.
    b. DigitalInput – Creates a Digital Input rule.
    c. SystemStatus – Creates a System Status rule.
4. If you chose Analytics as the Trigger, select one of the saved Analytics types from the list. If you have created other analytic events, those will appear in the list as well.
    a. Smart Motion Rule – when the camera detects a specific motion event, e.g., classified objects in the scene. You can select from the list of motion rules you created on the *Analytics* page.
    b. Camera Tampering Rule – when the camera detects a person tampering with the camera itself.
    c. Motion Detector – when the camera detects motion in the scene.
5. If you chose SystemStatus as the Trigger, select SystemBooted from the drop-down list. This triggers an action when the camera reboots.
6. Click the **Simulate Trigger** button if you want to test any rules that you have already defined using that trigger.

    **NOTE**

    Simulate Trigger only causes the rules engine to execute the rules that depend on the chosen trigger. It does not simulate the underlying event that would cause the trigger to fire in real life.
7. Define the condition in the *And the following condition is true* area by selecting an option from the drop-down list:

a. Always – the rule will perform the action every time the selected trigger occurs.
b. Never – the rule will never perform the action, even if the selected trigger occurs. This can be used to temporarily disable a rule.

8. Click the **Evaluate** button if you want to check whether the selected condition is true or false.
9. Define the action in the *Then perform this action* area by selecting an option from the drop-down list:
    a. Digital Output – triggers a digital output. DigitalOutput only appears on cameras that have one or more digital outputs.
    b. Email – sends an email when the selected trigger occurs and the condition is true.
    c. FTP – triggers an FTP action sent to a subdirectory.
    d. Sequence – initiates a sequence of actions when the selected trigger occurs and the condition is true.
10. After you select from the list of available action categories, you can either chose from the available actions or create a new one. Select **+ Add New** and fill out the fields as described in the section titled *Create and Manage Sequences* under User-Defined Actions.
11. Click the **Invoke** button if you want to test the action.
12. Click **Save**.

The new rule will appear in the list of rules.

### *Managing Rules*

If you need to modify an existing rule, use the operations in the Rules table:

- Click the icon to edit a rule.
- Click the icon to delete a rule.

Editing or deleting rules will affect all the camera currently using the rule.

### *Adding New Sequences*

Camera sequences automate a series of actions. These actions include digital outputs, sending emails, or transferring files via FTP. You can create and customize sequences, even setting delays between each step. You can use these sequences when creating camera rules.

Follow these steps to add a new sequence:

1. Navigate from *Setup* > *Camera Automation* > *User-Defined Actions*.
2. Select **Sequence** to show the settings area.
3. Click the **+ Add Sequence** button.
4. Enter a name for the Sequence.
5. Select from the list of actions or click **Add action** to create one.
6. Enter the required information in the Sequence table:
    a. Delay – Enter the number of minutes you want the sequence to wait before performing the action.
    b. Category – Specifies a category, for example, "PTZ".
    c. Name – Specifies the specific action within the category, for example, "GoHome".
7. Click the **Test** button to test the sequence.
8. Click **Save**.

The new sequence will appear in the Sequence area and it will be listed as an option when creating or editing rules.

### Managing Sequences

To modify a sequence, use the operations in the table:

- Click and drag the ⠿ icon to reorder the sequences.
- Click the 🗑 icon to delete a sequence.

Editing or deleting sequences will affect all the camera rules currently using the sequence.

#### *Adding New Email Actions*

Email actions automate email outputs in response to camera rules, via the SMTP server. The email actions can be used as the User-Defined Actions when creating rules. You must configure SMTP server information before they can create email actions.

> **IMPORTANT**
>
> Any changes made to the SMTP server information will affect any rules that are already using that email.

#### Configuring SMTP Server Information

Follow these steps to configure SMTP server information:

If you are adding the SMTP server for the first time, the button is labeled **Configure SMTP**. You must configure SMTP before you can access the **Add Email** option.

Follow these steps to configure SMTP Server information for the first time:

1. Navigate from *Setup* > *Camera Automation* > *Email Actions*.
2. Click the **Configure SMTP** button.
3. Enter the following information:
    a. Enter the SMTP Server URL.
    b. Enter the Username on the server url you provided.
    c. Enter User password or app password for the username.
    d. Enter an email address for the sender's email.
4. Click **Save**.

You can now add emails using this STMP server configuration.

## Managing STMP Server Information

You can manage existing SMPT settings in the Email area:

- Click the **Edit SMTP** button to edit the SMTP server information and click **Apply**.

The SMTP server information will show the new configuration.

### Adding an Email Action

Once an SMTP server has been set up, the **Configure SMTP** button changes to **Edit SMTP**, and the **Add Email** button becomes enabled.

Follow these steps to create a new email action:

1. Click the **Add Email** button.
2. Enter a name for the Email Action.
3. Enter a recipient email address in the **Email To** field.
4. You can enter another email address in the **Email Cc** field, if required.
5. Enter the text that you want to use for the email's subject line in the **Email Subject** field.
6. Enter the text that you want the email to contain into the **Email Body** section.
7. Click **Save**.

The new email action will be listed as an option when users create or edit rules.

### *Adding New FTP Actions*

You can create FTP actions to use when assigning actions to the rules engine. Select the **FTP** row to show the FTP area. You can enable FTP by configuring FTP server information.

### Configuring FTP Server Information

If you are adding the FTP server for the first time, the button is labeled **Configure FTP**. You must configure an FTP server before you can access the **Add FTP** option.

Follow these steps to configure FTP Server information:

1. Navigate from *Setup* > *Camera Automation* > *FTP Actions*.
2. Click **Configure FTP Server**.
3. Enter the Server URL.
4. Enter the Username for the Server URL you provided.
5. Enter the FTP user password associated with the Username.
6. Click **Save**.

You can add FTP actions using this FTP server configuration.

# Managing FTP Server Information

You can manage existing FTP settings in the FTP area:

- Click the **Edit FTP** button to edit the FTPserver information and click **Apply**.

The FTP server information will show the new configuration.

### Adding an FTP Action

After you add the FTP server information and enable FTP, you can create a new FTP action.

1. Click **Add FTP Action**.
2. Enter a name for the FTP Action.
3. Enter the Subdirectory.
4. Enter the Filename Pattern.
5. Select a File Type from the drop-down menu:
    a. Snapshot – Sends a JPEG image from the camera to the FTP server.
    b. hiResSnapshot – Sends a larger, higher-resolution image versus the smaller, downsized image that the Snapshot option produces.
6. Click **Save**.

The new FTP action will be listed as an option when users create or edit rules.

# Extended Settings

On the *Extended Settings* page, you can configure ONVIF Settings. The ONVIF Settings allow you to enable certain features and capabilities that require specific ONVIF configurations.

1. Toggle the **Enable Multi-Packet XML Documents** button to reduce metadata size. Only for Video Management systems that support multi-packet XML documents.
2. Toggle the **Enable Analytics Options Requests** button to enable the GetAnalyticsModuleOptions and GetRuleOptions Requests.
3. Toggle the **Enable Analytics XML Metadata** button if you want to enable XML metadata. This is required to turn on bounding boxes.
4. Toggle the **Enable Run-Length Encoding of Motion Mask** button to enable run-length encoding of the motion mask. Only for Video Management Systems that do not require an un-encoded mask.
5. Toggle the **Enable Supplemental Events** button to send supplemental events not defined by ONVIF that may be useful to some Video Management Systems.
6. Toggle the **Enable Singleton Analytics Events** button to send singleton Analytics events instead of property events.
7. Click **Apply** to save.

# Privacy Zones

On the *Privacy Zones* page, you can set privacy zones in the camera's field of view to block out areas that you do not want to see or record. You can create up to 64 privacy zones.

## Creating Privacy Zones

You can create privacy zones to hide areas of the camera's video stream. Use Privacy Zones when there is an area on screen that contains sensitive information, for example: a computer monitor.

Follow these steps to create Privacy Zones:

1. To add a privacy zone, click **Add**. The privacy zone will appear as a blue box on the Live Viewer.
2. To define the privacy zone area, perform any of the following:
    a. Click and drag the blue box to move the privacy zone.
    b. Select the blue box to show the nodes on each corner. Click and drag the corner of the box to resize the privacy zone. Privacy zones can only be rectangular in shape. Multiple privacy zones can be used to obscure other shapes.
3. For fine tuning, you can use the **Zoom** slider to zoom in or out.
4. Click **Apply** to save.

### *Managing Privacy Zones*

You can manage the saved Privacy Zones in the *Privacy Zone* list:

- If you want a privacy zone to appear blurry instead of opaque, select the **Blur** checkbox.
- If you want to delete a privacy zone, click the 🗑 icon.

## Setting Up Removable Privacy Zones For Specific Users

When using ACC, you can configure Removable Privacy Zones for specific users. Removable privacy zones are only applied to the secondary and tertiary video streams so that ACC group and privilege settings can be used to define which users can view the primary stream. The primary stream contains the footage without the privacy zones.

> **NOTE**
> Other VMS systems may have similar user privilege settings that can be used as a similar method to define which stream users can view. Check your VMS documentation for how to configure which streams users have access to view.

The ACC View high-resolution images group privilege gives users in that group access to the primary high-resolution stream of the cameras. This primary high-resolution stream will not have the removable privacy zones applied to it. This privilege should only be granted to administrators or similar users that might have a need to view the private areas of the image. General operators and other ACC users that do not have the View high-resolution images privilege will always have the removable privacy zones applied. See your ACC documentation for more information on setting up group privileges.

### *Removable Privacy Zone Limitations*

Keep the following limitations in mind when using removable privacy zones:

- ACC High Definition Stream Management (HDSM)™ will display primary, secondary, or tertiary streams based on the zoom level and viewing portal size when viewing live or recorded video. Make sure to remove the View high-resolution images privilege from ACC users that do not need to see the unblurred video.
- Certain ACC user groups can be granted Emergency Privilege Override which can be used to see the primary unblurred video stream. This feature logs each use of the emergency override, including the username and time of access, in the ACC event logs.
- When ACC operators with access to the primary stream play back recorded video in a small video panel, they will see the blurred privacy zone. The blurred zone will disappear when the privileged operator pauses or scrubs through video on the timeline. The privileged operator can also switch to the full screen view and/or zoom in on the video to make HDSM display the unblurred primary stream.

# Storage

On the *Storage* page, you can enable the onboard storage and download recorded video directly from the camera. Onboard storage is only available on cameras with an SD card or microSD card slot. The SD card will record from the highest resolution, non-tiled stream. Typically, the best stream to record from is the camera's primary stream.

Insert the SD card into the camera before you can use the onboard storage feature. Refer to the Camera's Installation Guide for the location of the SD card slot. For cameras with 2 microSD card slots, the camera will record video to SD cards in both slots. The total storage capacity of the system is the combined storage capacity of each of the two individual cards.

> **IMPORTANT**
>
> SD card failures can cause the camera to continuously reboot. To prevent this, the SD card will be disabled if persistent failures are detected. For more information, see *Troubleshooting SD Card Failures* on page 53.

## Storage Information

In the *Onboard Storage* area, you can view device information and format the SD card.

Onboard Storage information:

- Status – The camera's storage status. For example: Recording, Recording when server connection is lost, etc.
- Total Capacity – The total storage capacity (GB) with one or more SD cards installed.
- Current Usage – The current storage (GB) usage.
- Remaining Capacity – The remaining storage capacity (hours).

## Formatting The SD Card

On the *Storage* page, you can format the SD Card to reset it to its factory default state. This erases all data and sets up a new file system.

- Click **Format Card** in the Onboard Storage area.

The camera will reboot and footage stored on the card will be erased.

## SD Card Information

In the *Card Information* area, you can view the following SD card information:

- Model – The SD card model number.
- Serial Number – The SD card serial number.
- Capacity – The SD card's storage capacity (GB).
- Free Space – The available storage space on the SD card (MB).
- Measured Write Speed – The card's write speed (MB/s).

## SD Card Encryption

You can enable SD card encryption to encrypt the video files as a security precaution.

**IMPORTANT**

Enabling or disabling encryption will format all inserted cards and erase all files on them.

1. Select the **Card Encryption** checkbox in the *Onboard Storage* area to enable card encryption.
2. Click **Apply** to save.

The SD card(s) will be reformatted and the files stored on them will be erased.

## Configuring Recording Mode

In the *Recording Mode* area, you can enable Onboard Storage and configure the recording mode, as well as the retention period.

Follow these steps to configure recording mode:

1. Toggle the **Enable Onboard Storage** button.
2. Toggle the **Record only when server connection is interrupted** button to have the camera record video to both the VMS and the SD card. By default, the camera will only record to the SD card when it is disconnected from the VMS.
3. Select one of the following recording modes:
    a. Continuous – The camera will record to the SD card continuously, without interuption.
    b. On Motion – The camera will record only when there is motion in the scene. The recorded video will be divided into files no more than five minutes in length or 100 MB in size.
    If you are configuring an Avigilon video analytics camera, the On Motion setting will record either pixel change in the scene or analytics motion events depending on how the camera is configured in the ACC Client software.
4. Toggle the **Enable Recordings Retention** button to store recordings for a set amount of time (5 minutes to 2 years). You can assign the number of days, hours and minutes that the recordings will be stored.
5. Click **Apply** to save.

After configuring the recording mode, check the Compression and Image Rate Settings to make sure the format is set to **H.264** or **H.265** to maximize the SD card recording capacity and performance.

## Download Recordings From The Web Interface

In the *Recording List* area, you can view and download the recorded footage on the SD card(s).

If the camera has two SD cards installed, select the SD card that you want to download video from. You may have to check both SD cards for the recording you want to download. The camera can record video to either SD card based on the remaining capacity of the SD cards.

We recommend that you download recorded video from the web interface. If your bandwidth is limited, you can choose to download the recorded video directly from the SD card. See Downloading Recorded Video from the SD Card for instructions.

Follow these steps to download recorded video from the web interface:

1. In the Recording List, select the check box beside all the video files you want to download. To help you find the video you want, you can filter the videos by date and time. Select the **Filter** check box then select the time range.
2. Click **Download**.

The selected video files are automatically downloaded to your browser's default Downloads folder. If you are prompted by the browser, allow the download to occur.

> **NOTE**
>
> Do not close your browser window until the download is complete or the file may not download correctly. This is important if you are downloading multiple video files because the files are downloaded one by one.

## Downloading Recorded Video From The SD Card

On the *Storage* page, you can download recorded video directly from the SD card if there is not enough bandwidth to download from the web interface.

To download recorded video directly from the SD card, perform the following:

1. In the *Settings* area, clear the **Enable Onboard Storage** check box to turn off Onboard Storage and then click **Apply**.
2. Remove the SD card from the camera.
3. Insert the SD card into a card reader.
4. When the Windows AutoPlay dialog box appears, select **Open folder** to view files.
5. Open the Avigilon Camera Footage application. The Avigilon Camera Footage window lists all the video files that are stored in the SD card.
    a. To download all the recorded videos, click **Download All**.
    b. To download specific video, select the video files you want then click **Download Selected**.
6. When you are prompted, choose a location to save the video files.
7. The files start downloading from the SD card and are saved to the selected location.
8. When you are ready, eject the SD card.
9. Insert the SD card back into the camera then select **Enable Onboard Storage**.

The SD card will start recording again.

## ONVIF Profile G

ONVIF Profile G allows video management systems to retrieve video from onboard storage when there is a gap in the VMS video due to a network outage or similar event.

- Cameras with firmware versions 4.4.0.X or later will have ONVIF Profile G already enabled.
- Cameras with firmware older than 4.4.0.X will have the option to **Enable ONVIF Profile G** when they upgrade their firmware.

> **NOTE**
>
> Enabling ONVIF Profile G will require reformatting the SD card. You will lose all footage currently recorded on the SD card. Ensure that you download any required video clips before enabling Profile G.

### Troubleshooting SD Card Failures

SD card failure can result in camera failure by causing the camera to continuously reboot. If the camera detects persistent failures, the SD card will be turned off automatically.

Once an SD card has been turned off, the camera and web interface will notify you of the issue:

- The video footage will show the following message: `SD Card Recording Disabled! Replace card to re-enable.`
  You can turn off video overlays on the *Storage* page by deselecting the **Enable video alert overlay on severe SD card failure** option.
- The Storage page will show the following message: `SD card slot was disabled due to card errors, please replace card.`

Follow these steps to re-enable the SD card:

1. Remove the SD card from the camera slot and replace it with a working SD card. A speed test will be run on the new card when it is inserted to determine if it will function without any issues.
2. You can also force the SD card to be re-enabled in the web interface by selecting **Force Re-Enabled SD Card Slot** on the Storage page.

> **IMPORTANT**
> Forcing the SD card to be re-enabled is not recommended unless you are sure there are no problems with the card. If the card continues to fail, it may cause the camera to enter a reboot loop and after continued persistent failures, the SD card will be disabled again.

## Digital Inputs and Outputs

On the *Digital Inputs and Outputs* page, you can set up the external input and output devices that are connected to the camera. This option does not appear in the web interface if the camera does not support digital inputs and outputs.

### Configuring Digital Inputs

Follow these steps to configure a digital input:

1. In the *Digital Inputs* area, enter a name for the digital input in the **Name** field.
2. Click the **Type** drop-down list, and select a Digital Input Type:
   a. Force IRCF – Use this type if the digital input will be used to control the Day/Night settings. For Day/Night switching controlled by an external digital input, select External when configuring Day/Night mode. See *Changing Day/Night Settings* on page 29 for more information.
   b. General
3. Click the **Circuit state** drop-down list, and select a Circuit State:

a. Normally Open
b. Normally Closed

> **NOTE**
> Some cameras can detect the circuit state of the digital inputs automatically and the input will trigger when a change in state is detected. For these cameras, the Circuit State setting will have no effect on the digital input function.

4. Click **Apply** to save.

Once the digital input is connected to the camera, you will see the connection status in the **Circuit Current State** area. The status is typically *Open* or *Closed*.

### Configuring Digital Output

Follow these steps to configure a digital output:

1. In the *Digital Inputs* area, enter a name for the digital input in the **Name** field.
2. Click the **Circuit state** drop-down list, and select a Circuit State:
   a. Normally Open
   b. Normally Closed

> **NOTE**
> Some cameras can detect the circuit state of the digital inputs automatically and the input will trigger when a change in state is detected. For these cameras, the Circuit State setting will have no effect on the digital input function.

3. Toggle the **IRCF to out** to enable IRCF to out.
4. To set a Duration, enter a value (100-86400000) measured in milliseconds.
5. Click Trigger to manually trigger a digital output and test the configuration.
6. Click **Apply** to save.

## Audio

On the *Audio* page, you can adjust various audio settings to optimize audio quality and define the behavior of the Video Intercom's built-in microphone and speaker.

Follow these steps to configure the audio settings:

1. In the *Audio Settings* field, specify the audio encoder to use:
   - Opus: Default high-quality audio codec that generally produces superior sound. Use if you are running software Release 6.10 or later or using a third-party video management system that supports the Opus protocol.
   - G.711: Supported on various platforms. Use if your software version or third-party VMS does not support Opus.
2. Clear the **Echo Cancellation & Processing** check box to disable all audio processing, including echo cancellation, noise reduction, and auto gain control. This setting is enabled by default.
3. In the *Noise Reduction* field to manage background noise.

The default setting of 7 is generally suitable for a moderately noisy environment. For very quiet indoor environments with little background noise, a lower value in the range of 1 to 3 is more appropriate. If you hear strange or distorted background noise, you should increase the Noise Reduction level. Be aware that using a setting higher than the default may negatively affect overall audio quality. Set the value to OFF to turn off this feature.

4. Click **Apply** to save.

## Configuring Device Speaker

In the *Device Speaker* section, use the **Volume** slider to adjust the volume on the speaker (from 0 to 100) and click **Apply**.

## Configuring Device Microphone

In the *Device Microphone* section, you can adjust Gain, Output Level, Auto Gain Control, and Muting behavior.

Follow these steps to configure the device microphone:

1. In the Device microphone area, you can set the microphone volume:
    a. Click and drag the **Gain for microphone External Input** slider to set the value (-15-16 dB). The default value is 0.
    b. Click and drag the **Gain for microphone Internal Mic** slider to set the value (-24-24 dB). The default value is 0.
2. Click **Apply** to save.

## Configuring Multicast

Follow these steps to configure multicast behavior:

1. To configure Multicast, enter the required information in the following fields:
    a. Address – Enter the server address.
    b. Port – Enter the server port number (1024...65534). Only accepts even values.
    c. Time to live – Enter the number of seconds (1-255).
2. Click **Apply** to save.

# Users

On the *Users* page, you can add new users and manage user accounts. You can choose to preserve user accounts and passwords when completing a firmware revert. You can also change the password complexity requirements to make sure that users create complex passwords.

When creating new users, you must assign the user to a Security Group: user, operator or administrator. The Security Groups are associated with different levels of access to camera settings. See *Security Groups* on the next page for information on access and permissions.

## Adding New Users

Follow these steps to add a new user:

1. Click the **Add new user** button.
2. Enter a username.
3. Enter a password.

   > **TIP**
   >
   > The password must include uppercase characters, lowercase characters, numerical digits and symbols. Check the Relative password strength indicator to determine how strong the password is.

4. Re-enter the password to confirm.
5. Select a security group from the **Security Group** drop-down menu.
6. Toggle the **Use PTZ controls** to grant the user permission to operate ptz camera controls.
7. Click **Apply** to save.

The new user will appear in the Users list.

### *Managing Users*

You can edit and delete user accounts on the Users page.

- To edit the account username, click the icon and type the new username into the field.
- To delete an account, click the icon and click **Delete** in the confirmation dialog.

## Preserve User Accounts On Firmware Revert

On the *Users* page, you can perform firmware reverts as a part of troubleshooting camera issues. When completing a firmware revert, user accounts and passwords are wiped from the camera. Administrators permissions are required.

Make sure to select this option before completing a firmware revert. User accounts and passwords can not be restored after the camera settings are wiped.

- To keep the user accounts and passwords from being wiped, make sure you select the **Do not clear usernames or passwords on firmware revert** checkbox before completing a firmware revert.

## Changing Password Complexity Requirements

On the *Users* page, you can change the password complexity requirements. Administrator permissions are required.

1. Enter the minimum password length (0-128 characters) in the *Minimum Length* field.
2. Enter the minimum number of uppercase characters (0-128 characters) in the *Uppercase* field.
3. Enter the minimum number of numerical characters (0-128 characters) in the *Number* field.
4. Enter the minimum number of symbols (0-128 characters) in the *Symbols* field.
5. Select the **Lock Password Complexity configuration** check box to prevent other users from editing it.
6. Click **Save**.

Users will have to meet these requirements when changing their passwords.

## Security Groups

| Permissions | Users | Operators | Administrators |
|---|---|---|---|
| Live View | Yes | Yes | Yes |
| PTZ Controls | Yes[1] | Yes | Yes |
| General Settings | No | No | Yes |
| Network Settings | No | No | Yes |
| Image and Display | No | Yes | Yes |
| Compression and Image Rate | No | Yes | Yes |
| Motion Detection | No | Yes | Yes |
| Tamper Detection | No | Yes | Yes |
| Analytics | No | Yes | Yes |
| Camera Automation | No | No | Yes |
| Privacy Zones | No | Yes | Yes |
| Digital Inputs and Outputs | No | Yes | Yes |
| Audio Settings | No | Yes | Yes |
| Storage | No | Yes[2] | Yes |
| Digital Inputs & Outputs | No | No | Yes |
| Licensing | No | No | Yes |
| Users | No | No | Yes |
| System | No | No | Yes |
| Device Logs | No | No | Yes |

[1] Users can use the PTZ controls if the administrator gives them permission by selecting the Use PTZ Controls check box under *User Settings*.
[2] Operators can configure onboard storage settings but cannot delete video recordings or format the SD card.

# System

On the *System* page, you can view system information, manually upgrade the firmware, reboot the device and restore the camera to the factory defaults.

You can view the following system information:

- Firmware version – shows the firmware version installed on the camera.
- Model Number – the camera's model number will indicate whether it has certain functionalities, e.g, IR LEDs.
- Hardware version – the hardware version number can help when contacting Avigilon support with firmware related questions.
- Serial Number – the camera's unique serial number.

## Updating Firmware

Follow these steps to manually upgrade the camera firmware:

1. Download the latest version of the firmware .bin file from the Avigilon website at avigilon.com/software-downloads.
2. Click **Browse**, and then browse to and locate the firmware file on your computer.
3. Click **Upload Firmware**. Wait until the camera upgrade is complete.

## Rebooting the Camera

If the camera is behaving strangely, you might want to use Reboot to troubleshoot the issue.

- To reboot the camera, click **Reboot**.

The camera will start rebooting. This can take several minutes.



**TIP**

Refresh your browser once the camera has finished rebooting. You will need to log in again.

## Clearing All Settings

You can clear all settings from the camera to restore the camera to factory default settings:

1. Select the **Preserve Network Configurations** checkbox if you want to keep the network settings configuration on the camera from being reset.
2. Click **Clear All Settings** to reset camera settings.
3. Click **OK** in the confirmation dialog.

The camera will perform a factory reset.

# Device Logs

On the *Device Logs* page, you can view, update or download the device log on the *Device Information* page. You can use the filters to narrow the logs shown in the table. You can filter by Log Type, Minimum Log Level and change the number of logs shown at one time.

## Updating Device Logs

You can refresh the list of device logs.

- Refresh the list of device logs, click **Update**.

Any logs logged since the last refresh will be added to the table.

## Downloading Log

You can download the current list of device logs.

- To download logs, click **Download Log**.

> **TIP**
> Make sure you have selected the right filters before downloading.

# About

| **Device Information** | |
|---|---|
| Name | The camera's name. |
| Location | The camera's location |
| Part number | The camera's part/model number. |
| Orderable part number | The camera's alternate part number. |
| Serial number | The camera's unique serial number. |
| Device UUID | Universally unique identifier |
| Firmware version | The firmware version running on the camera |
| Vasys version | The Val System software version on the camera. |
| Build hash | A unique digital fingerprint for that specific software or firmware build. |
| MAC address | The unique, hard-coded identifier assigned to a network interface controller (NIC) on the camera. |
| Licenses | The Third-Party License library for Third-Party Components and associated information. |
| ONVIF conformance | The ONVIF profiles supported by the camera. |
| Power source | The power source currently supplying power to the camera. |
| Operation mode | The camera's current operating mode. |

# Account

On the *User* page, you can change your password or log out of the camera web interface.

# Changing Your Password

If you remember your current password, you can change your password while logged into the camera web interface. If you do not remember your password, you will have to contact your system administrator.

1. Select the icon on the bottom-left corner of the window.
2. Enter your current password in the **Old Password** field.
3. Enter a new password in the **New Password** field.
4. Check the Relative password strength indicator to make sure your password is strong enough.
5. Re-enter the new password in the **Re-type password** field.
6. Click **Save**.

Your new password will take effect next time you log in.

# Logging Out

Logging out of the web interface is straightforward.

1. To log out of the web interface, click the icon in the bottom-left corner of the window.
2. Click **Logout**.

> **NOTE**
> Users will be automatically logged out of the web interface after 15 minutes of inactivity.

## Logging Out After Using SSO

When you log out, you are logged out of both the camera and the external login service at the same time.

# More Information & Support

For additional product documentation and software and firmware upgrades, visit support.avigilon.com.

# Technical Support

Contact Avigilon Technical Support at support.avigilon.com/s/contactsupport.