AXIS Q6075-S PTZ Network Camera

User manual

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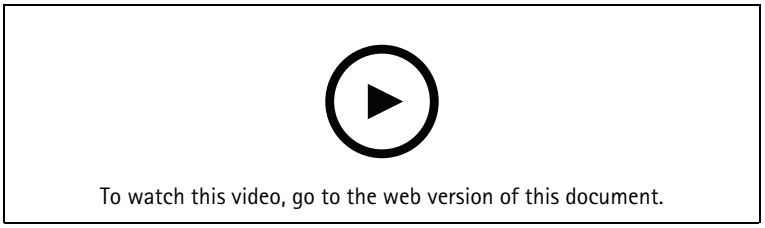
Installation

Preview mode

Preview mode is ideal for installers when fine tuning the camera view during the installation. No login is required to access the camera view in preview mode. It is available only in factory defaulted state for a limited time from powering up the device.



This video demonstrates how to use preview mode.

Get started

Find the device on the network

To find Axis devices on the network and assign them IP addresses in Windows®, use AXIS IP Utility or AXIS Device Manager. Both applications are free and can be downloaded from *axis.com/support*.

To find Axis devices on the network and assign them IP addresses in Windows®, use AXIS IP Utility or AXIS Device Manager Extend. Both applications are free and can be downloaded from *axis.com/support*.

For more information about how to find and assign IP addresses, go to *How to assign an IP address and access your device*.

Browser support

AXIS OS 7.10 and higher
Video products with AXIS OS 7.10 or higher include the new web interface, which comes with an overall improved and simplified graphical user interface and focuses on camera installation, configuration, and troubleshooting. The web interface is tested and optimized for chromium browsers. It is platform-independent and works with Windows® (versions 7 and up) as well as Linux® and macOS®. If you use other browsers, you could experience limitations in functionality and support. You can find more information about the latest AXIS OS version of your Axis product *here*.

You can use the device with the following browsers:

	Chrome™	Edge™	Firefox®	Safari®
Windows®	✓	✓	*	*
macOS®	✓	✓	*	*
Linux®	✓	✓	*	*
Other operating systems	*	*	*	*

✓: Recommended

*: Supported with limitations

To find out more about how to use the device, see the user manual available at *axis.com*.

Known limitations

- No support for H.264 video streaming in Apple mobile (iOS) devices.
- Audio: No support for sending audio to the camera through the browser (i.e. through a computer microphone).
- Video: Some browser plugins are known to cause problems with live streaming. Try uninstalling plugins if the video does not play as it should.
- Video: H.265 video streaming is currently not supported in any browser.
- Firefox: You might experience issues streaming live video with audio enabled. Refresh the stream if it freezes.
- Safari (macOS): You might experience issues with H.264 streaming. Refresh the stream if it freezes.
- AV1 support is limited to certain products.
- Depending on your macOS or iOS version, you might encounter additional login prompts when using the web interface on AXIS OS versions earlier than 10.12.
- On some Linux systems, you might experience flickering when you use MJPEG. To resolve this, turn off hardware acceleration in your browser.

AXIS OS 6.5X or lower
Video products with AXIS OS 6.5X or lower are tested and optimized for the latest version of Internet Explorer*, Windows, and AXIS Media Control (AMC). Although you can use other browsers, versions and operating systems, you might experience limitations in functionality and support. You can find more information about the latest AXIS OS version of your Axis product *here*.

Highlights
- Recommended browser: Internet Explorer* with AXIS Media Control
- Recommended for Windows operating system

Known limitations
- QuickTime player introduces a 3-second video delay when streaming
- Java applet-based clients only support one-way audio, and the audio quality, as well as the frame rate, might be reduced
- When using video products with AXIS OS 5.50 or lower and IE10, compatibility mode is recommended

Video streaming
AXIS Media Control and Internet Explorer* is required for video streaming H.264 over HTTP/RTSP/RTP. MJPEG video streaming is supported by Chrome, Firefox and Safari.

* Read more about Internet Explorer limitations in *Internet Explorer mode in Edge*.

Create an administrator account

The first time you log in to your device, you must create an administrator account.

1. Enter a username.
2. Enter a password. See *Secure passwords, on page 6*.
3. Re-enter the password.
4. Accept the license agreement.
5. Click **Add account**.

Important

The device has no default account. If you lose the password for your administrator account, you must reset the device. See *Reset to factory default settings, on page 49*.

Secure passwords

Important

Use HTTPS (which is enabled by default) to set your password or other sensitive configurations over the network. HTTPS enables secure and encrypted network connections, thereby protecting sensitive data, such as passwords.

The device password is the primary protection for your data and services. Axis devices do not impose a password policy as they may be used in various types of installations.

To protect your data we strongly recommend that you:

- Use a password with at least 8 characters, preferably created by a password generator.
- Don't expose the password.
- Change the password at a recurring interval, at least once a year.

Make sure that no one has tampered with the device software

To make sure that the device has its original AXIS OS, or to take full control of the device after a security attack:

1. Reset to factory default settings. See *Reset to factory default settings, on page 49*.
   After the reset, secure boot guarantees the state of the device.
2. Reset to factory default settings. See .

After the reset, secure boot guarantees the state of the device.

3. Configure and install the device.

Web interface overview

This video gives you an overview of the device's web interface.

Axis device web interface

Configure your device

Basic settings

Set the capture mode

1. Go to **Video > Installation > Capture mode**.
2. Click **Change**.
3. Select a capture mode and click **Save and restart**.
   See also *Capture modes, on page 25*.

Set the power line frequency

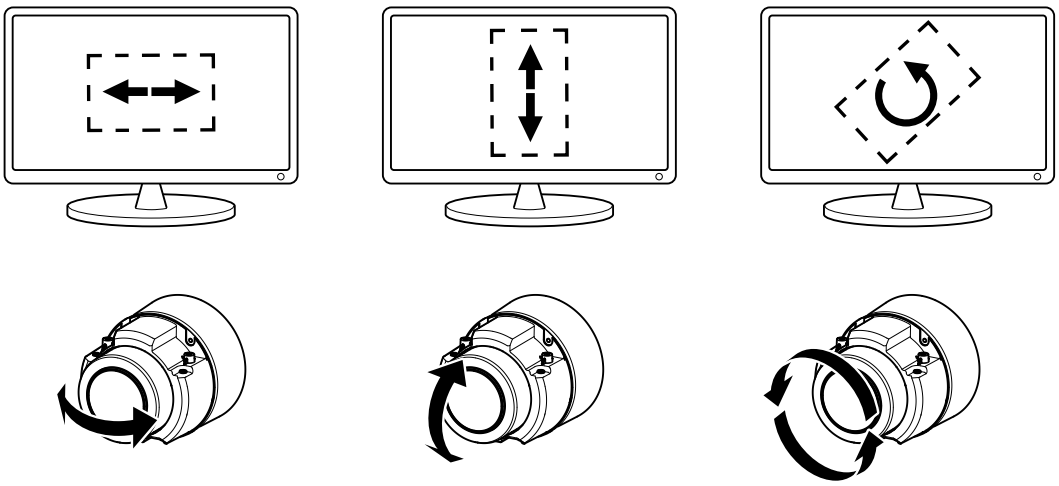
1. Go to **Video > Installation > Power line frequency**.
2. Select a power line frequency and click **Save and restart**.

Set the orientation

1. Go to **Video > Installation > Rotate**.
2. Select **0** , **90**, **180** or **270** degrees.
   See also .

Remote view setup (PTRZ)

Remote view setup lets you complete the installation of your camera without physically accessing it. You adjust the live view through the web interface. The different movements are:



The illustration shows how pan, tilt, and roll affect the live view.

Pan – moves the camera side to side

Tilt – moves the camera up or down

Roll – rotates the lens about its center

Zoom – makes the image larger and nearer, or smaller and further away

Set up the camera view

Important

Only use PTRZ during the installation phase.

Use the remote pan, tilt, roll, and zoom (PTRZ) functionality to complete the installation of your camera.

The camera scans its surroundings and generates an overview image. Use this image to select the part of the scene that you want to monitor.

Note

During the scan, the camera determines if it's wall or ceiling mounted. This is important if you want to be able to click the live view to pan and tilt.

1. Go to **Video > Installation**.
2. Optionally, click and turn off **Adaptive stream**.
3. Click **Scan to generate overview image**.
4. Click in the circular overview image to pan and tilt the camera.
5. Click in the live view to fine-tune the camera's view.
6. Use the zoom slider to zoom in or out.
7. If the image is unfocused, click **Autofocus**.
8. If the image doesn't look straight, click the **Roll** buttons to adjust it.

Adjust the image

This section includes instructions about configuring your device. If you want to learn more about how certain features work, go to *Learn more, on page 25*.

Configure the quad view

Note

Quad view is available in these mounting positions:

- Desk
- Ceiling

1. Click and select **Legacy device interface**.
2. Select **Quad view** among the live feed sources.
3. Go to **Settings > System > Orientation** and click .
4. To change the view order, drag and drop the yellow boxes.

Level the camera

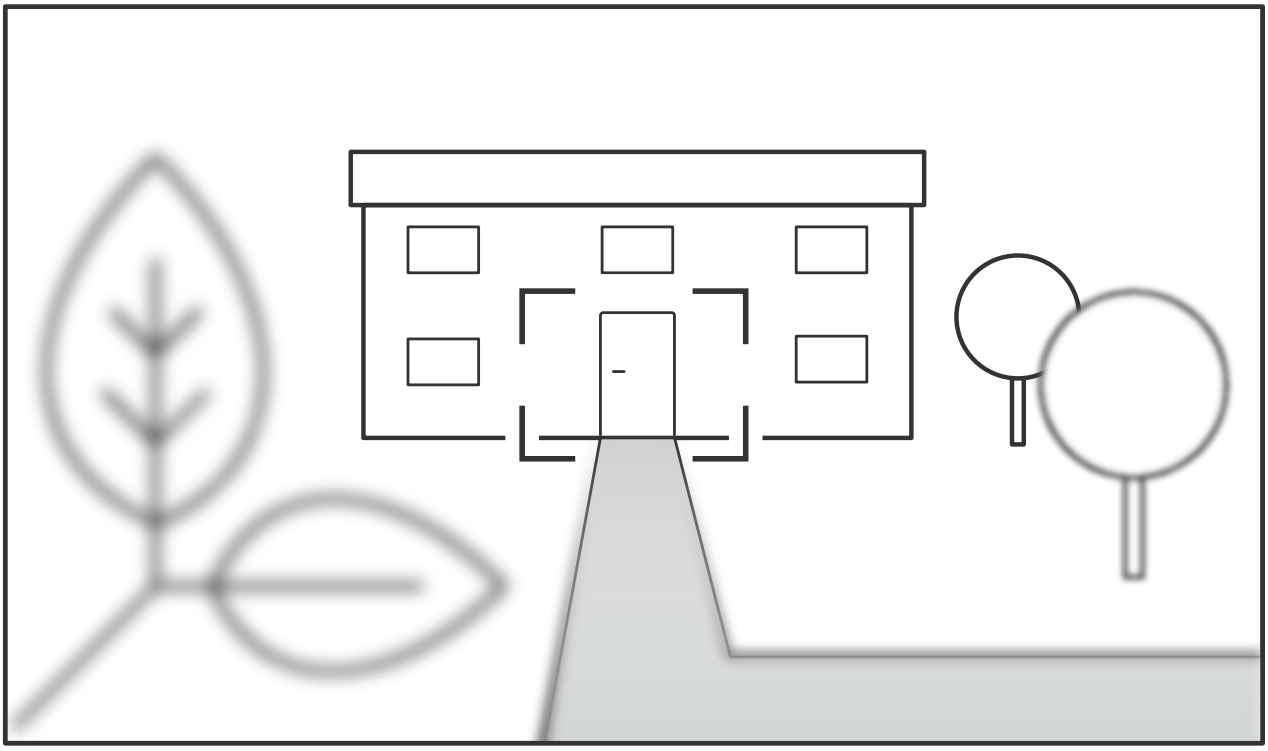
To adjust the view in relation to a reference area or an object, use the level grid in combination with a mechanical adjustment of the camera.

1. Go to **Video > Image >** and click .
2. Click to show the level grid.
3. Adjust the camera mechanically until the position of the reference area or the object is aligned with the level grid.

Adjust the focus

This product can have four focus modes:

- **Auto**: The camera automatically adjusts focus based on the entire image.
- **Area**: The camera automatically adjusts focus based on a selected area of the image.
- **Manual**: The focus is set manually at a fixed distance.
- **Spot**: The focus is set to a fixed area in the center of the image.



Spot focus

To turn off autofocus and adjust the focus manually:

1. In the live view window, if the **Zoom** slider is visible, click **Zoom** and select **Focus**.
2. Click  and use the slider to set the focus.

Adjust the focus faster with focus recall areas

To save the focus settings at a specific pan/tilt range, add a focus recall area. Each time the camera moves into that area it recalls the previously saved focus. It's enough to cover half of the focus recall area in the live view.

We recommend the focus recall feature in the following scenarios:

- When there is a lot of manual operation in live view, for example with a joystick.
- Where PTZ preset positions with manual focus are not efficient, for example movements where the focus setting changes continuously.
- In low-light scenarios, where the autofocus is challenged by the lighting conditions.

Important

- The focus recall overrides the camera's autofocus at the specific pan/tilt range.
- A preset position overrides the focus setting saved in the focus recall area.
- The maximum number of focus recall areas is 20.

Create a focus recall area

1. Pan, tilt, and zoom into the area where you would like to have focus.

As long as the focus recall button shows a plus  , you can add a focus recall area in that position.

2. Adjust the focus.
3. Click the focus recall button.

Delete a focus recall area

1. Pan, tilt, and zoom into the focus recall area you want to delete.

   The focus recall button toggles to minus when the camera detects a focus recall area:  .
2. Click the focus recall button.

Select scene profile

A scene profile is a set of predefined image appearance settings including color level, brightness, sharpness, contrast and local contrast. Scene profiles are preconfigured in the product for quick setup to a specific scenario, for example **Forensic** which is optimized for surveillance conditions. For a description of each available setting, see *The web interface, on page 24*.

You can select a scene profile during the initial setup of the camera. You can also select or change scene profile later.

1. Go to **Video > Image > Appearance**.
2. Go to **Scene profile** and select a profile.

Reduce image processing time with low latency mode

You can optimize the image processing time of your live stream by turning on low latency mode. The latency in your live stream is reduced to a minimum. When you use low latency mode, the image quality is lower than usual.

1. Go to **System > Plain config**.
2. Select **ImageSource** from the drop-down list.
3. Go to **ImageSource/IO/Sensor > Low latency mode** and select **On**.
4. Click **Save**.

Select exposure mode

Note

Exposure modes are only available for the visual channel.

To improve image quality for specific surveillance scenes, use exposure modes. Exposure modes lets you control aperture, shutter speed, and gain. Go to **Video > Image > Exposure** and select between the following exposure modes:

- For most use cases, select **Automatic** exposure.
- For fast moving objects that require a fast or fixed shutter, select **Automatic aperture**.
- To maintain a longer depth of field or focus range, select **Automatic shutter**.
- For environments with certain artificial lighting, for example fluorescent lighting, select **Flicker-free**. Select the same frequency as the power line frequency.
- For environments with certain artificial light and bright light, for example outdoors with fluorescent lighting at night and sun during daytime, select **Flicker-reduced**.
  Select the same frequency as the power line frequency.
- If you need full control of all parameters, select **Manual**. This is mostly useful for scenes with little change in lighting.

- To lock the current exposure settings, select **Hold current**.

Benefit from IR light in low-light conditions by using night mode

Your camera uses visible light to deliver color images during the day. But as the visible light diminishes, color images become less bright and clear. If you switch to night mode when this happens, the camera uses both visible and near-infrared light to deliver bright and detailed black-and-white images instead. You can set the camera to switch to night mode automatically.

1. Go to **Video > Image > Day-night mode**, and make sure that the **IR-cut filter** is set to **Auto**.
2. To set at what light level you want the camera to switch to night mode, move the **Threshold** slider toward **Bright** or **Dark**.
3. To use the built-in IR light when the camera is in night mode, turn on **Allow illumination** and **Synchronize illumination**.
4. If you use an accessory IR illuminator, turn on **Allow illumination** and **Synchronize illumination** to use IR light when the camera is in night mode.

Note

If you set the switch to night mode to occur when it's brighter, the image remains sharper as there is less low-light noise. If you set the switch to occur when it's darker, the image colors are maintained for longer, but there is more image blur due to low-light noise.

Maximize the details in an image

Important

If you maximize the details in an image, the bitrate will probably increase and you might get a reduced frame rate.

- Make sure to select the capture mode that has the highest resolution.
- Go to **Video > Stream > General** and set the compression as low as possible.
- Below the live view image, click  and in **Video format**, select **MJPEG**.
- Go to **Video > Stream > Zipstream** and select **Off**.

Handle scenes with strong backlight

Dynamic range is the difference in light levels in an image. In some cases the difference between the darkest and the brightest areas can be significant. The result is often an image where either the dark or the bright areas are visible. Wide dynamic range (WDR) makes both dark and bright areas of the image visible.

Image without WDR.

Image with WDR.

Note

- WDR can cause artifacts in the image.
- WDR may not be available for all capture modes.

1. Go to **Video > Image > Wide dynamic range**.
2. Turn on WDR.
3. Use the **Local contrast** slider to adjust the amount of WDR.
4. Use the **Tone mapping** slider to adjust the amount of WDR.
5. To set the amount of WDR, select Low, Medium or High from the **WDR level** list.
6. If you still have problems, go to **Exposure** and adjust the **Exposure zone** to cover the area of interest.

Find out more about WDR and how to use it at *axis.com/solutions/wide-dynamic-range-wdr*.

Stabilize a shaky image with image stabilization

Image stabilization is suitable in environments where the product is mounted in an exposed location where vibrations can occur, for example, due to wind or passing traffic.

The feature makes the image smoother, steadier, and less blurry. It also reduces the file size of the compressed image and lowers the bitrate of the video stream.

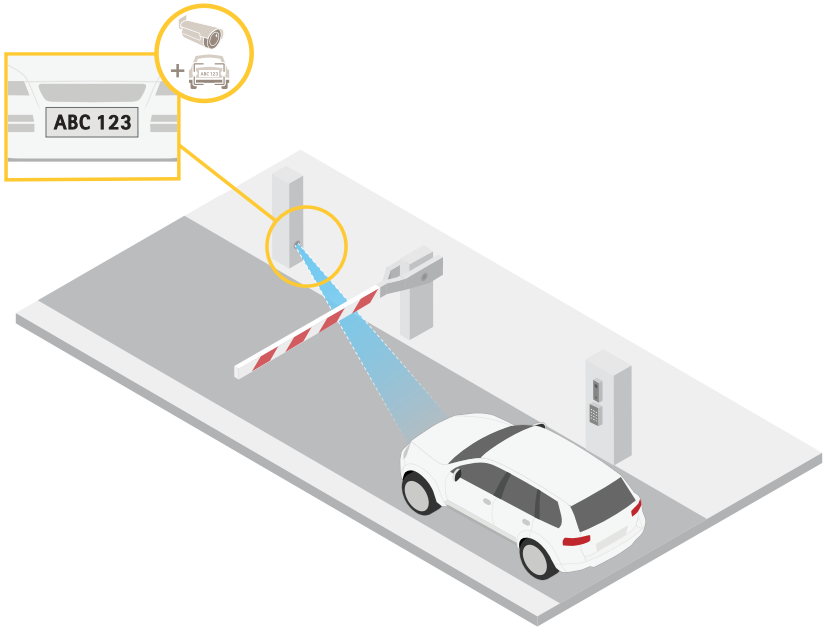
Note

When you turn on image stabilization, the image is slightly cropped, which lowers the maximum resolution.

1. Go to **Video > Installation > Image correction**.
2. Turn on **Image stabilization**.

Verify the pixel resolution

To verify that a defined part of the image contains enough pixels to, for example, recognize license plates, you can use the pixel counter.



1. Go to **Video > Image**.
2. Click .
3. Click for **Pixel counter**.
4. In the camera's live view, adjust the size and position of the rectangle around the area of interest, for example where you expect license plates to appear.
5. You can see the number of pixels for each of the rectangle's sides, and decide if the values are enough for your needs.

Hide parts of the image with privacy masks

You can create one or several privacy masks to hide parts of the image.

1. Go to **Video > Privacy masks**.
2. Click .
3. Click the new mask and type a name.
4. Adjust the size and placement of the privacy mask according to your needs.
5. To change the color for all privacy masks, click **Privacy masks** and select a color.

See also *Privacy masks, on page 26*

Show an image overlay

You can add an image as an overlay in the video stream.

You can add an image as an overlay in the radar stream.

1. Go to **Video > Overlays**.
2. Go to **Radar > Overlays**.
3. Click **Manage images**.
4. Upload or drag and drop an image.
5. Click **Upload**.

6. Select **Image** from the drop-down list and click + .
7. Select the image and a position. You can also drag the overlay image in the live view to change the position.

Show a text overlay

You can add a text field as an overlay in the video stream. This is useful for example when you want to display the date, time or a company name in the video stream.

You can add a text field as an overlay in the radar stream. This is useful for example when you want to display the date, time or a company name in the radar stream.

1. Go to **Video > Overlays**.
2. Go to **Radar > Overlays**.
3. Select **Text** and click + .
4. Type the text you want to display, or select modifiers to show for example the current date.
5. Select a position. You can also click-and-drag the overlay in the live view to change the position.

Show the pan or tilt position as a text overlay

You can show the pan or tilt position as an overlay in the image.

1. Go to **Video > Overlays** and click + .
2. In the text field, type `#x` to show the pan position.
   Type `#y` to show the tilt position.
3. Choose appearance, text size, and alignment.
4. **Include** the text overlay.
5. The current pan and tilt positions show up in the live view image and in the recording.

Add street names and compass direction to the image

Note

The preset positions and compass direction will be visible in the compass field in all video streams and recordings.

To activate the compass:

1. Go to **PTZ > Orientation aid**.
2. Turn on **Orientation aid**.
3. Position the camera view at north with the crosshair. Click **Set north**.

To add a preset position to show in the compass field:

1. Go to **PTZ > Preset positions**.
2. Use the crosshair to position the view where you want to add a preset position.
3. Click + **Add preset position** to create a new preset position.

Adjust the camera view (PTZ)

Limit the pan, tilt, and zoom movementsLimit the zoom movements

If there are parts of the scene that you don't want the camera to reach, you can limit the pan, tilt, and zoom movements. For example, you want to protect the privacy of residents in an apartment building, which is located close to a parking lot that you intend to monitor.

To limit the movements:

If there are parts of the scene that you don't want the camera to be able to zoom in on, you can limit the maximum zoom level. For example, you want to protect the privacy of residents in an apartment building, which is located close to a parking lot that you intend to monitor.

To limit the maximum zoom level:

1. Go to **PTZ > Limits**.
2. Set the limits as needed.

Create a guard tour with preset positions

A guard tour displays the video stream from different preset positions either in a predetermined or random order, and for configurable periods of time.

1. Go to **PTZ > Guard tours**.
2. Click + **Guard tour**.
3. Select **Preset position** and click **Create**.
4. Under **General settings**:
   - Enter a name for the guard tour and specify the pause length between each tour.
   - If you want the guard tour to go to the preset positions in a random order, turn on **Play guard tour in random order**.
5. Under **Step settings**:
   - Set the duration for the preset.
   - Set the move speed, which controls how fast to move to the next preset.
6. Go to **Preset positions**.
   6.1. Select the preset positions that you want in your guard tour.
   6.2. Drag them to the View order area, and click **Done**.
7. To schedule the guard tour, go to **System > Events**.

Create a recorded guard tour

1. Go to **PTZ > Guard tours**.
2. Click + **Guard tour**.
3. Select **Recorded** and click **Create**.
4. Enter a name for the guard tour and specify the pause length between each tour.
5. Click **Start recording tour** to start recording the pan/tilt/zoom movements.
6. When you're satisfied, click **Stop recording tour**.
7. Click **Done**.
8. To schedule the guard tour, go to **System > Events**.

View and record video

This section includes instructions about configuring your device. To learn more about how streaming and storage works, go to *Streaming and storage, on page 27*.

Reduce bandwidth and storage

Important

Reducing the bandwidth can lead to loss of detail in the image.

1. Go to **Video > Stream**.
2. Click in the live view.
3. Select **Video format AV1** if your device supports it. Otherwise select **H.264**.
4. Go to **Video > Stream > General** and increase **Compression**.
5. Go to **Video > Stream > Zipstream** and do one or more of the following:

   Note

   The **Zipstream** settings are used for all video encodings except MJPEG.

   - Select the Zipstream **Strength** that you want to use.
   - Turn on **Optimize for storage**. This can only be used if the video management software supports B-frames.
   - Turn on **Dynamic FPS**.
   - Turn on **Dynamic GOP** and set a high **Upper limit** GOP length value.

Note

Most web browsers don't support H.265 decoding and because of this the device doesn't support it in its web interface. Instead you can use a video management system or application that supports H.265 decoding.

Set up network storage

To store recordings on the network, you need to set up your network storage.

1. Go to **System > Storage**.
2. Click **Add network storage** under **Network storage**.
3. Type the IP address of the host server.
4. Type the name of the shared location on the host server under **Network share**.
5. Type the username and password.
6. Select the SMB version or leave it on **Auto**.
7. Select **Add share without testing** if you experience temporary connection issues, or if the share is not yet configured.
8. Click **Add**.

Record and watch video

Record video directly from the camera
Record video directly from the radar

1. Go to **Video > Stream**.
2. Go to **Radar > Stream**.
3. To start a recording, click .

If you haven't set up any storage, click and . For instructions on how to set up network storage, see *Set up network storage, on page 17*

4. To stop recording, click again.

Watch video

1. Go to **Recordings**.
2. Click for your recording in the list.

Set up rules for events

You can create rules to make your device perform an action when certain events occur. A rule consists of conditions and actions. The conditions can be used to trigger the actions. For example, the device can start a recording or send an email when it detects motion, or show an overlay text while the device is recording.

You can create rules to make your device perform actions when certain events occur. A rule consists of conditions and actions. The conditions can be used to trigger the actions. For example, the device can play an audio clip according to a schedule or when it receives a call, or send an email if the device changes IP address.

To learn more, see *Get started with rules for events*.

Trigger an action

1. Go to **System > Events** and add a rule. The rule defines when the device will perform certain actions. You can set up rules as scheduled, recurring, or manually triggered.
2. Enter a **Name**.
3. Select the **Condition** that must be met to trigger the action. If you specify more than one condition for the rule, all of the conditions must be met to trigger the action.
4. Select which **Action** to perform when the conditions are met.

Note

- If you make changes to an active rule, the rule must be turned on again for the changes to take effect.
- If you change the definition of a stream profile that is used in a rule, you need to restart all the rules that use that stream profile.

Record video when the camera detects an object

This example explains how to set up the camera to start recording to the SD card when the camera detects an object. The recording will include five seconds before detection and one minute after detection ends.

Before you start:

- Make sure you have an SD card installed.

Make sure that AXIS Object Analytics is running:
Make sure that AXIS Video Motion Detection is running:

1. Go to **Apps > AXIS Object Analytics**.
2. Go to **Apps > AXIS Video Motion Detection**.
3. Start the application if it is not already running.
4. Make sure you have set up the application according to your needs.

Create a rule:

1. Go to **System > Events** and add a rule.
2. Type a name for the rule.
3. In the list of conditions, under **Application**, select **Object Analytics**.

4. In the list of conditions, under **Application**, select **VMD4**.
5. In the list of actions, under **Recordings**, select **Record video while the rule is active**.
6. In the list of storage options, select **SD_DISK**.
7. Select a camera and a stream profile.
8. Set the prebuffer time to 5 seconds.
9. Set the postbuffer time to 1 minute.
10. Click **Save**.

Show a text overlay in the video stream when the device detects an object

This example explains how to display the text "Motion detected" when the device detects an object.

Make sure that AXIS Object Analytics is running:
Make sure that AXIS Video Motion Detection is running:
1. Go to **Apps > AXIS Object Analytics**.
2. Go to **Apps > AXIS Video Motion Detection**.
3. Start the application if it is not already running.
4. Make sure you have set up the application according to your needs.

Add the overlay text:
1. Go to **Video > Overlays**.
2. Under **Overlays**, select **Text** and click + .
3. Enter `#D` in the text field.
4. Choose text size and appearance.
5. To position the text overlay, click and select an option.

Create a rule:
1. Go to **System > Events** and add a rule.
2. Type a name for the rule.
3. In the list of conditions, under **Application**, select **Object Analytics**.
4. In the list of conditions, under **Application**, select **VMD4**.
5. In the list of actions, under **Overlay text**, select **Use overlay text**.
6. Select a video channel.
7. In **Text**, type "Motion detected".
8. Set the duration.
9. Click **Save**.

Note

If you update the overlay text it will be automatically updated on all video streams dynamically.

Direct the camera to a preset position when the camera detects motion

This example explains how to set up the camera to go to a preset position when it detects motion in the image.

Make sure that AXIS Object Analytics is running:
Make sure that AXIS Video Motion Detection is running:
1. Go to **Apps > AXIS Object Analytics**.
2. Go to **Apps > AXIS Video Motion Detection**.
3. Start the application if it is not already running.

4. Make sure you have set up the application according to your needs.

Add a preset position:

Go to **PTZ** and set where you want the camera to be directed by creating a preset position.

Create a rule:

1. Go to **System > Events** and add a rule.
2. Type a name for the rule.
3. In the list of conditions, under **Application**, select **Object Analytics**.
4. In the list of conditions, under **Application**, select **VMD4**.
5. In the list of actions, select **Go to preset position**.
6. Select the preset position you want the camera to go to.
7. Click **Save**.

Provide visual indication of an ongoing event

You have the option to connect the AXIS I/O Indication LED to your network camera. This LED can be configured to turn on whenever certain events occur in the camera. For example, to let people know that video recording is in progress.

Required hardware

- AXIS I/O Indication LED
- An Axis network video camera

Note

AXIS I/O Indication LED should be connected to an output port.

Note

For instructions on how to connect the AXIS I/O Indication LED, see the installation guide provided with the product.

The following example shows how to configure a rule that turns on the AXIS I/O Indication LED to indicate that camera is recording.

1. Go to **System > Accessories > I/O ports**.
2. For the port that you connected the AXIS I/O Indication LED to, click  to set the direction to **Output**, and click  to set the normal state to **Circuit open**.
   Make sure that the port you connected the AXIS I/O Indication LED to is set to **Output**. Set the normal state to **Circuit open**.
3. Go to **System > Events**.
4. Create a new rule.
5. Select the **Condition** that must be met to trigger the camera to start recording. It can, for example, be a time schedule or motion detection.
6. In the list of actions, select **Record video**. Select a storage space. Select a stream profile or create a new. Also set the **Prebuffer** and **Postbuffer** as required.
7. Save the rule.
8. Create a second rule and select the same **Condition** as in the first rule.
9. In the list of actions, select **Toggle I/O while the rule is active**, and then select the port the AXIS I/O Indication LED is connected to. Set the state to **Active**.
10. Save the rule.

Other scenarios where AXIS I/O Indication LED can be used are for example:

- Configure the LED to turn on when the camera starts, to indicate the presence of the camera. Select **System ready** as a condition.
- Configure the LED to turn on when live stream is active to indicate that a person or a program is accessing a stream from the camera. Select **Live stream accessed** as a condition.

Record video when the camera detects impact

Shock detection allows the camera to detect tampering caused by vibrations or shock. Vibrations due to the environment or to an object can trigger an action depending on the shock sensitivity range, which can be set from 0 to 100. In this scenario, someone is throwing rocks at the camera after hours and you would like to get a video clip of the event.

Turn on shock detection:

1. Go to **System > Detectors > Shock detection**.
2. Turn on shock detection, and adjust the shock sensitivity.

Create a rule:

3. Go to **System > Events > Rules** and add a rule.
4. Type a name for the rule.
5. In the list of conditions, under **Device status**, select **Shock detected**.
6. Click **+** to add a second condition.
7. In the list of conditions, under **Scheduled and recurring**, select **Schedule**.
8. In the list of schedules, select **After hours** .
9. In the list of actions, under **Recordings**, select **Record video while the rule is active**.
10. Select where to save the recordings.
11. Select a **Camera**.
12. Set the prebuffer time to 5 seconds.
13. Set the postbuffer time to 50 seconds.
14. Click **Save**.

Zoom in on a specific area automatically with gatekeeper

This example explains how to use the gatekeeper functionality to make the camera zoom in automatically on the license plate of a car that passes through a gate. When the car has passed, the camera zooms out to the home position.

Create the preset positions:

1. Go to **PTZ > Preset positions**.
2. Create the home position that includes the entrance of the gate.
3. Create the zoomed-in preset position so that it covers the area in the image where you assume that the license plate will appear.

Create a motion detection profile:

1. Go to **Apps** and start and open **AXIS Video Motion Detection**.
2. Create a profile that covers the entrance of the gate and then save the profile.

Set up motion detection:

1. Go to **Apps** and start and open **AXIS Object Analytics.**
2. Create an object in area scenario for vehicles, with an include area that covers the entrance of the gate.

Create a rule:

1. Go to **System > Events** and add a rule.
2. Name the rule “Gatekeeper”.

3. In the list of conditions, under **Application**, select the **Object Analytics** scenario.
4. In the list of conditions, under **Application**, select **VMD4**.
5. In the list of actions, under **Preset positions**, select **Go to preset position**.
6. Select a **Video channel**.
7. Select the **Preset position**.
8. To make the camera wait a while before it returns to the home position, set a time for **Home timeout**.
9. Click **Save**.

Set up the intrusion alarm

Important

To set up an intrusion alarm you need the AXIS Dome Intrusion Switch C.

With a dome intrusion switch mounted inside the camera, you can receive a notification if someone removes the camera dome.

Use the intrusion alarm switch to, for example, send a notification if someone opens the camera housing.

Before you start

- Connect the intrusion alarm switch to pin 1 (ground) and pin 3 (digital input) of the camera's I/O connector.
- Connect the intrusion alarm switch to pin 1 (ground) and pin 3 (digital I/O) of the camera's I/O connector.

Configure the input port:

1. Go to **System > Accessories > I/O ports**.
2. For **Port 1**:
   2.1. Select **Input**.
   2.2. Select **Circuit closed**.

Add an email recipient:

3. Go to **System > Events > Recipients** and click **Add recipient**.
4. Type a name for the recipient.
5. Select **Email** as the notification type.
6. Type the recipient's email address.
7. Type the email address that you want the camera to send notifications from.
8. Provide the login details for the sending email account, along with the SMTP hostname and port number.
9. To test your email setup, click **Test**.
10. Click **Save**.

Create a rule:

11. Go to **System > Events > Rules** and add a rule.
12. Type a name for the rule.
13. In the list of conditions, under **I/O**, select **Digital input**.
14. In the list of ports, select **Port 1**.
15. In the list of actions, under **Notifications**, select **Send notification to email**.
16. Select a recipient from the list or go to **Recipients** to create a new recipient.

    To create a new recipient, click + . To copy an existing recipient, click .

17. Type a subject line and message for the email.
18. Click **Save**.

Audio

Connect to a network speaker

Network speaker pairing allows you to use a compatible Axis network speaker as if it is connected directly to the camera. Once paired, the speaker acts as an audio out device where you can play audio clips and transmit sound through the camera.

Important

For this feature to work with a video management software (VMS), you must first pair the camera with the network speaker, then add the camera to your VMS.

Pair camera with network speaker

1. Go to **System > Edge-to-edge > Pairing**.
2. Click  **Add** and select the pairing type **Audio** from the drop-down list.
3. Select **Speaker pairing**.
4. Type the network speaker's IP address, username and password.
5. Click **Connect**. A confirmation message appears.

The web interface

To read about all the features and settings available in the web interface of devices with AXIS OS, go to *AXIS OS web interface help*.

Learn more

Long-distance connections

This product supports fiber-optic cable installations through a media converter. Fiber-optic cable installations offer a number of benefits such as:

- Long-distance connection
- High speed
- Long lifetime
- Large capacity of data transmission
- Electromagnetic interference immunity

Find out more about fiber-optic cable installations in the white paper "Long distance surveillance - Fiber-optic communication in network video" at *axis.com/learning/white-papers*.

For information about how to install the media converter see the Installation Guide for this product.

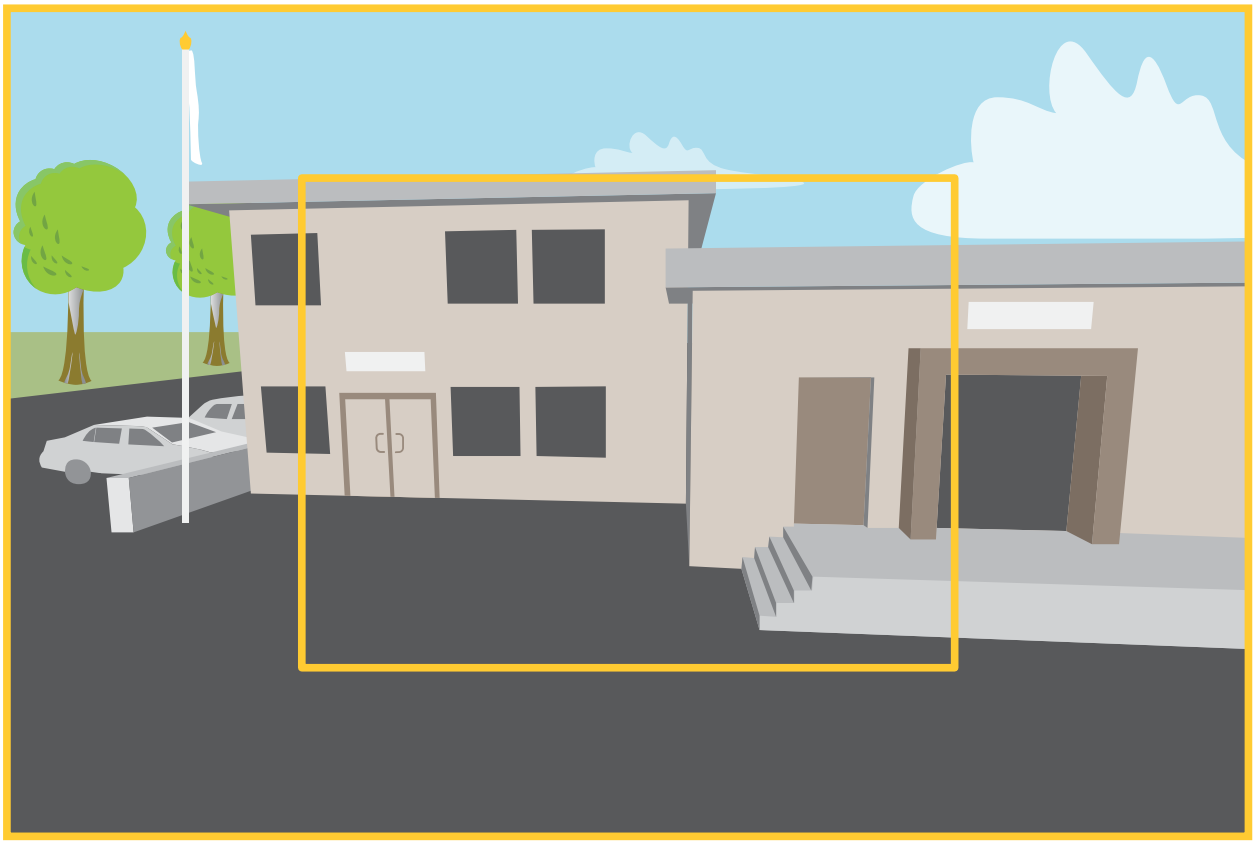
Capture modes

A capture mode is a preset configuration that defines how the camera captures images.

- The capture mode setting can affect the maximum resolution and maximum frame rate available in the device.
- The capture mode with a lower resolution than the maximum can reduce the field of view.
- The capture mode also affects the shutter speed, which in turn affects the light sensitivity. This is because a capture mode with a high maximum frame rate has a reduced light sensitivity, and the other way around.
- With some capture modes you can't use WDR.

A capture mode is a preset configuration that defines how the camera captures images. The capture mode setting can affect the camera's field of view and aspect ratio. The shutter speed can also be affected, which in turn affects the light sensitivity.

The lower resolution capture mode might be sampled from the original resolution, or it might be cropped out from the original, in which case the field of view could also be affected.



The image shows how the field of view and aspect ratio can change between two different capture modes.

What capture mode to choose depends on the requirements for the frame rate and resolution of the specific surveillance setup. For specifications about available capture modes, see the product's datasheet at *axis.com*.

Privacy masks

Note

Privacy masks are only available for the visual channel.

A privacy mask is a user-defined area that prevents users from viewing a part of the monitored area. In the video stream, privacy masks appear as blocks of solid color.

A privacy mask is a user-defined area that prevents users from viewing a part of the monitored area. In the video stream, privacy masks appear as blocks of solid color or blurred image elements.

A privacy mask is a user-defined area that covers a part of the monitored area. In the video stream, privacy masks appear either as blocks of solid color or with a mosaic pattern.

A privacy mask is a user-defined area that covers part of the monitored area. In the video stream, privacy masks can appear as blocks of solid color, mosaic patterns, or in chameleon mode, which dynamically adapts to the scene to enhance privacy protection.

The privacy mask is relative to the pan, tilt, and zoom coordinates, so regardless of where you point the camera, the privacy mask covers the same place or object.

You'll see the privacy mask on all snapshots, recorded video, and live streams.

You can use the VAPIX® application programming interface (API) to hide the privacy masks.

Important

If you use multiple privacy masks it may affect the product's performance.

You can create several privacy masks. Each mask can have 3 to 10 anchor points.

Important

Set the zoom and focus before you create a privacy mask.

Note

You can't add privacy masks to the quad stream, but it will show all privacy masks configured on the individual channels.

Note

Privacy masks may appear warped in some view modes.

Overlays

Note

Overlays are not included in the video stream when using SIP calls.

Note

Image and text overlay will not be displayed on video stream over HDMI .

Note

Image and text overlay will not be displayed on video stream over SDI.

Overlays are superimposed over the video stream. They are used to provide extra information during recordings, such as a timestamp, or during product installation and configuration. You can add either text or an image.

The video streaming indicator is another type of overlay. It shows you that the live view video stream is live.

Pan, tilt, and zoom (PTZ)

Guard tours

A guard tour displays the video stream from different preset positions either in a predetermined or random order, and for configurable periods of time. Once started, a guard tour continues to run until stopped, even when there are no clients (web browsers) viewing the images.

The guard tour function includes tour recording. This allows recording a custom tour using an input device, such as a joystick, a mouse, or a keyboard, or through using the VAPIX® Application Programming Interface (API). A recorded tour is a replay of a recorded sequence of pan/tilt/zoom movements, including their variable speeds and lengths.

Note

The pause between successive guard tours is at least 10 minutes, and the fixed minimum viewing time is 10 seconds.

Streaming and storage

Video compression formats

Decide which compression method to use based on your viewing requirements, and on the properties of your network. The available options are:

Motion JPEG

Note

To ensure support for the Opus audio codec, the Motion JPEG stream is always sent over RTP.

Motion JPEG, or MJPEG, is a digital video sequence that is made up of a series of individual JPEG images. These images are then displayed and updated at a rate sufficient to create a stream that shows constantly updated motion. For the viewer to perceive motion video the rate must be at least 16 image frames per second. Full motion video is perceived at 30 (NTSC) or 25 (PAL) frames per second.

The Motion JPEG stream uses considerable amounts of bandwidth, but provides excellent image quality and access to every image contained in the stream.

H.264 or MPEG-4 Part 10/AVC

Note

H.264 is a licensed technology. The Axis product includes one H.264 viewing client license. To install additional unlicensed copies of the client is prohibited. To purchase additional licenses, contact your Axis reseller.

H.264 can, without compromising image quality, reduce the size of a digital video file by more than 80% compared to the Motion JPEG format and by as much as 50% compared to older MPEG formats. This means that less network bandwidth and storage space are required for a video file. Or seen another way, higher video quality can be achieved for a given bitrate.

H.265 or MPEG-H Part 2/HEVC

H.265 can, without compromising image quality, reduce the size of a digital video file by more than 25% compared to H.264.

Note

- H.265 is licensed technology. The Axis product includes one H.265 viewing client license. Installing additional unlicensed copies of the client is prohibited. To purchase additional licenses, contact your Axis reseller.
- Most web browsers don't support H.265 decoding and because of this the camera doesn't support it in its web interface. Instead you can use a video management system or application supporting H.265 decoding.

AV1

AV1 (AOMedia Video 1) is a license -free video coding format optimized for streaming media. AV1 enables high-quality video streaming even in bandwidth-constrained environments. By reducing a video's bitrate, AV1 preserves video quality while minimizing data usage.

AV1 supports all major browsers, computer operating systems and mobile platforms.

Note

AV1 requires more processing power for encoding and decoding compared to some other codecs.

How do Image, Stream, and Stream profile settings relate to each other?

The **Image** tab contains camera settings that affect all video streams from the product. If you change something in this tab, it immediately affects all video streams and recordings.

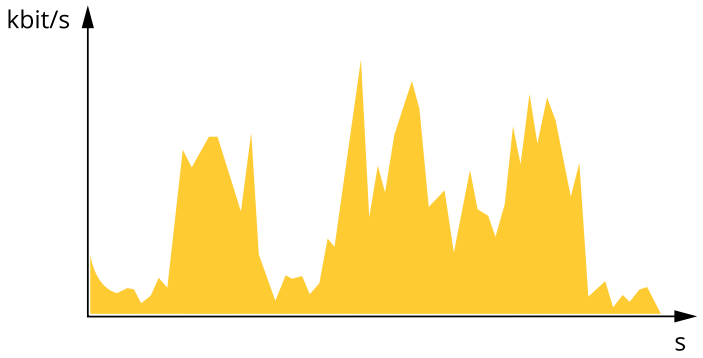
The **Stream** tab contains settings for video streams. You get these settings if you request a video stream from the product and don't specify for example resolution, or frame rate. When you change the settings in the **Stream** tab, it doesn't affect ongoing streams, but it will take effect when you start a new stream.

The **Stream profiles** settings override the settings from the **Stream** tab. If you request a stream with a specific stream profile, the stream contains the settings of that profile. If you request a stream without specifying a stream profile, or request a stream profile that doesn't exist in the product, the stream contains the settings from the **Stream** tab.

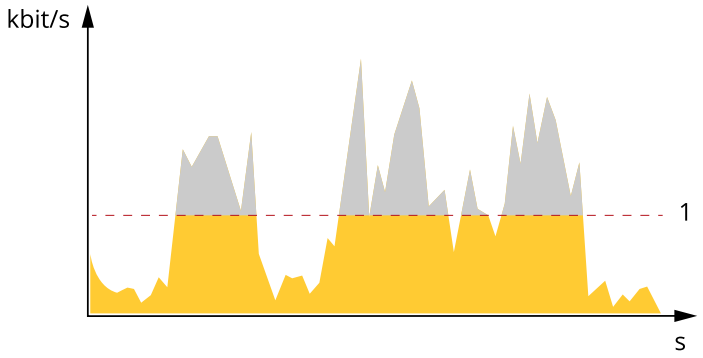
Bitrate control

Bitrate control helps you to manage the bandwidth consumption of your video stream.

Variable bitrate (VBR)
Variable bitrate allows the bandwidth consumption to vary depending on the level of activity in the scene. The more activity, the more bandwidth you need. With variable bitrate you are guaranteed constant image quality, but you need to make sure you have storage margins.



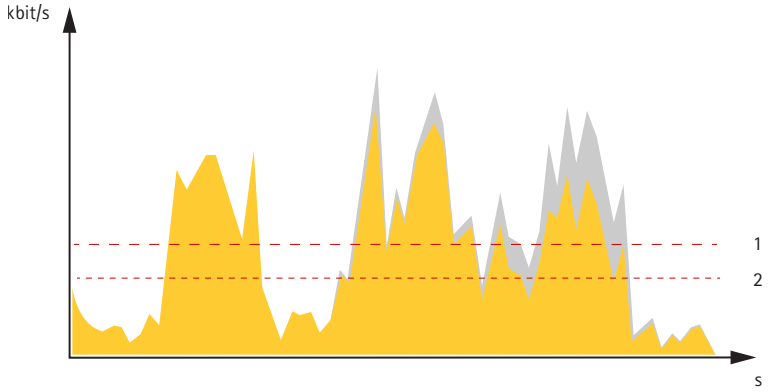
Maximum bitrate (MBR)
Maximum bitrate lets you set a target bitrate to handle bitrate limitations in your system. You might see a decline in image quality or frame rate as the instantaneous bitrate is kept below the specified target bitrate. You can choose to prioritize either image quality or frame rate. We recommend that you configure the target bitrate to a higher value than the expected bitrate. This gives you a margin in case there is a high level of activity in the scene.



1 Target bitrate

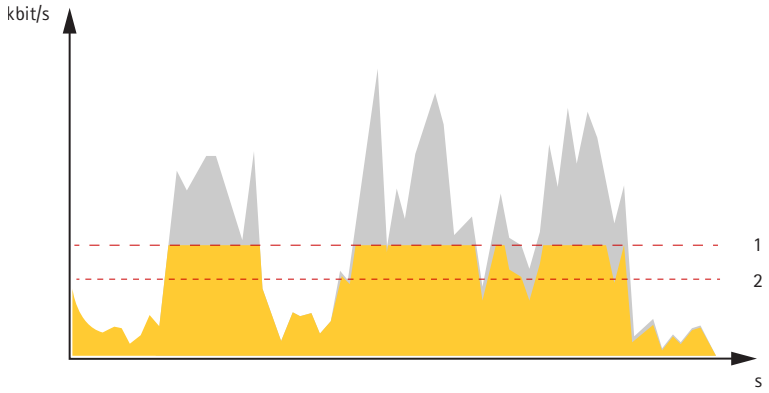
Average bitrate (ABR)
With average bitrate, the bitrate is automatically adjusted over a longer period of time. This is so you can meet the specified target and provide the best video quality based on your available storage. Bitrate is higher in scenes with a lot of activity, compared to static scenes. You are more likely to get better image quality when in scenes with a lot of activity if you use the average bitrate option. You can define the total storage required to store the video stream for a specified amount of time (retention time) when image quality is adjusted to meet the specified target bitrate. Specify the average bitrate settings in one of the following ways:

- To calculate the estimated storage need, set the target bitrate and the retention time.
- To calculate the average bitrate, based on available storage and required retention time, use the target bitrate calculator.



1 Target bitrate
2 Actual average bitrate

You can also turn on maximum bitrate and specify a target bitrate within the average bitrate option.



1 *Target bitrate*
2 *Actual average bitrate*

Analytics and apps

With analytics and apps you can get more out of your Axis device. AXIS Camera Application Platform (ACAP) is an open platform that makes it possible for third parties to develop analytics and other apps for Axis devices. Apps can be preinstalled on the device, available for download for free, or for a license fee.

To find the user manuals for Axis analytics and apps, go to *help.axis.com*.

Note

- We recommended running one app at a time.
- Several apps can run at the same time but some apps might not be compatible with each other. Certain combinations of apps might require too much processing power or memory resources when run in parallel. Verify that the apps work together before deployment.
- Avoid running apps when the built-in motion detection is active.
- Apps are supported on channel 1.

Important

AXIS 3D People Counter is an app that is embedded in the device. We don't recommend you to run any other apps on this device since it can affect the performance of the AXIS 3D People Counter.

Autotracking

With autotracking, the camera automatically zooms in on and tracks moving objects, for example a vehicle or a person. You can manually select an object to track, or set up trigger areas and let the camera detect moving objects. The application is best suited for open areas with no obscuring objects and where movement is unusual. When the camera doesn't track an object, it returns to its connected preset position.

Important

- Autotracking is designed for areas with a limited amount of movement.
- Autotracking does not track objects behind privacy masks.
- If both autotracking and guard tour are enabled, guard tour takes priority over autotracking. This means autotracking stops if a guard tour starts.

Autotracking detects movement in the camera's field of view, for example a moving vehicle or person, and follows the moving object until it stops or disappears from the monitored area. In case there is much simultaneous movement, the camera selects the area with the most amount of motion. When there are no moving objects in the field of view, the camera returns to the home position.

Important

- The autotracking feature is designed for areas where there is a limited amount of movement.
- If both autotracking and guard tour are enabled, we recommend you to use the PTZ control queue. In

the control queue, guard tour has lower priority than autotracking, which prevents the camera from stopping autotracking to maintain or start a guard tour.

- Autotracking does not follow objects behind privacy masks or in exclude areas. You can also set maximum limits so that autotracking only triggers within a certain range in the live view.

Metadata visualization

Analytics metadata is available for moving objects in the scene. Supported object classes are visualized in the video stream through a bounding box surrounding the object, along with information about the object type and confidence level of the classification. To learn more about how to configure and consume analytics metadata, see *AXIS Scene Metadata integration guide*.

Cybersecurity

For product-specific information about cybersecurity, see the product's datasheet at axis.com.

For in-depth information about cybersecurity in AXIS OS, read the *AXIS OS Hardening guide*.

TPM module

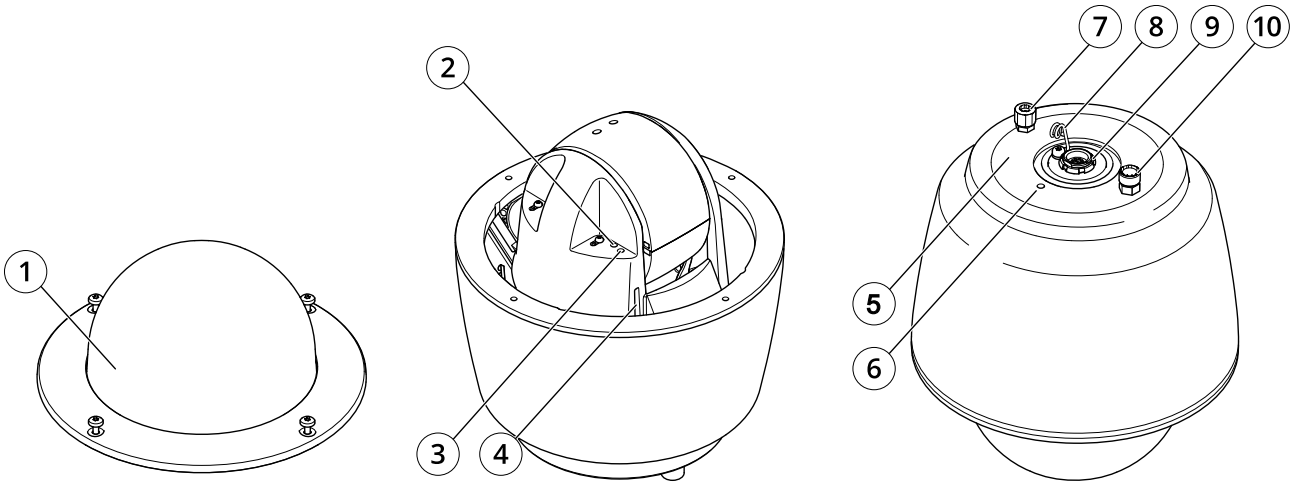
The TPM (Trusted Platform Module) is a component that provides cryptographic features to protect information from unauthorized access. It is always activated and there are no settings you can change.

Specifications

Product overview

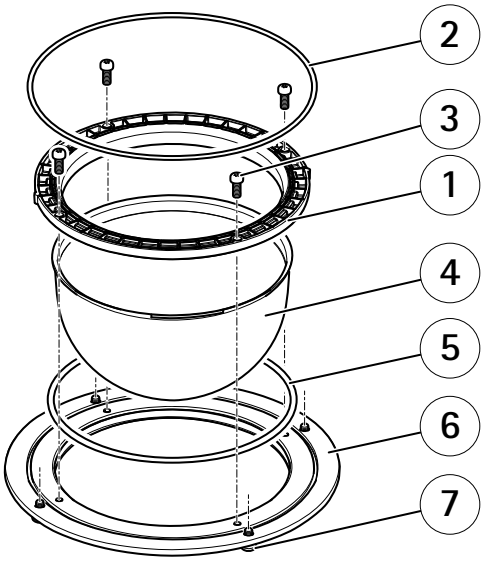
NOTICE

Make sure the dome is attached in operation mode, otherwise focus may be affected.



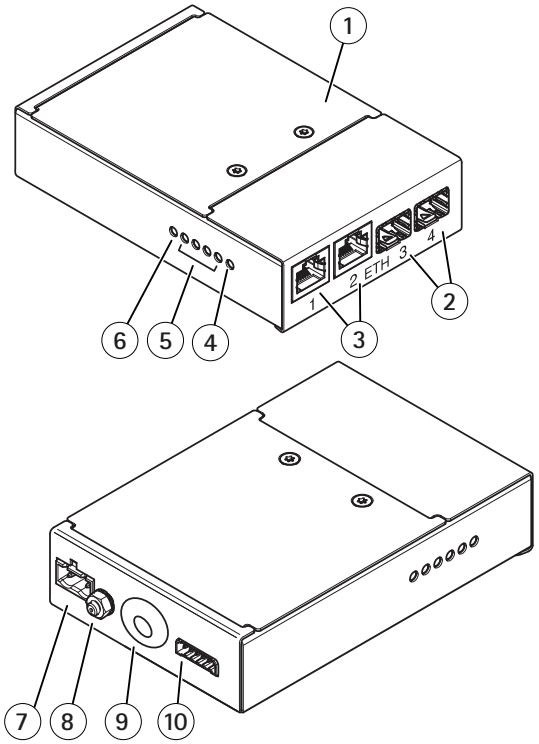
1 Dome
2 Control button
3 Status LED indicator
4 SD card slot
5 Part number (P/N) and serial number (S/N)
6 Mounting hole (3x)
7 Pressure relief valve
8 Hook for safety wire
9 Multiconnector
10 Inlet valve

Dome cover



1 Dome attachment ring
2 O-ring
3 Dome bracket screw T20 (4x)
4 Dome
5 O-ring
6 Dome ring
7 Dome ring screw T25 (4x)

AXIS T8607 Media Converter Switch – external view



1 *Cover*
2 *Network connector SFP (2x)*
3 *Network connector RJ45 (2x)*
4 *Camera network LED indicator*
5 *Network LED indicator (4x)*
6 *Power LED indicator*
7 *Power connector (DC input)*
8 *Grounding screw*
9 *Multicable inlet*
10 *I/O terminal connector*

How to pressurize the camera (recommended)

The camera housing can be filled with Nitrogen gas to prevent condensation.

The filling process is repeated three times, releasing the pressure between fillings, to make sure that all air and humidity is purged from the housing.

Note

The camera housing has an pressure relief valve that limits the filling pressure to 0.5 bar (7 psi). During normal use the pressure inside the camera housing may drop below that pressure. For full protection make sure that the pressure is above 0.2 bar (3 psi) .

1. Set the regulator gauge on the gas cylinder to 0.5 bar (7 psi).
2. Remove the caps from the inlet valve and the pressure relief valve.
3. Place the chuck on the inlet valve and press down to fill the camera with nitrogen.
4. When the pressure inside the camera housing reaches 0.5 bar (7 psi) the pressure relief valve will open. Place your hand over the pressure relief valve to verify that the gas is flowing out.
5. Lift the pressure relief valve to let the overpressure out of the camera unit.
6. Repeat the filling process a total of 3 times, leaving the the camera pressurized the last time.
7. Put the caps back on the inlet valve and the pressure relief valve.

LED indicators

Note

- The Status LED can be configured to flash while an event is active.
- The LEDs turn off when you close the casing.

Status LED	Indication
Unlit	Unlit for normal operation.
Unlit	Connection and normal operation.
Green	Connection and normal operation. Shows steady green for 10 seconds for normal operation after startup completed. Flashes green during wireless network pairing. Steady green for normal operation. Steady green for normal operation. Flashes before startup if the temperature is below -20 °C and heating is required. The product starts when it reaches operating temperature.
Amber	Steady during startup and when restoring settings.
Amber	Steady during startup, during reset to factory default or when restoring settings.
Amber	Steady during startup. Flashes during device software upgrade or reset to factory default. Steady during startup. Flashes when restoring settings.
Amber	Steady during startup. Flashes during device software upgrade.
Amber/Red	Flashes amber/red if network connection is unavailable or lost.
Amber/Red	Flashes amber/red if network connection is unavailable or lost.
Red	Steady for hardware error on the corresponding channel.
Green/Red	Flashes for identification purposes.
Red	Slow flash for failed upgrade.
Red	Device software upgrade failure.
Red	Flashes red for device software upgrade failure.

Network LED	Indication
Green	Steady for connection to a 100 Mbit/s network. Flashes for network activity. Steady for connection to a 1 Gbit/s network. Flashes for network activity.
Amber	Steady for connection to a 10 Mbit/s network. Flashes for network activity. Steady for connection to a 10/100 Mbit/s network. Flashes for network activity.
Unlit	No network connection.

Power LED	Indication
Green	Normal operation.
Amber	Flashes green/amber during device software upgrade.

Microphone power LED	Indication
Unlit	Phantom power off.
Blue	Phantom power on. Steady when the phantom power is on and the microphone is connected. Flashes when the phantom power is on and the microphone is disconnected.

Wireless LED	Indication
Unlit	Wired mode.
Green	Steady for connection to a wireless network. Flashes for network activity.
Red	Steady for no wireless network connection. Flashes while scanning for wireless networks.
Amber	Steady or flashing during wireless network pairing.

Note

- The tally LED (indication LED) only indicates network transmission. If video or audio is only transmitted through HDMI or SDI the tally LED will be unlit.

Tally LED	Indication
Unlit	Camera idle.
Red	Active network transmission or recording.

Media converter switch LED indicators

LED	Color	Indication
Power	Unlit	DC power unconnected or current protection engaged (power overload)
	Green	DC power connected.
Network (4x)	Amber	10 Mbit connection. Flashes during activity.
	Green	100/1000 Mbit connection. Flashes during activity.
Camera network (AXIS T8607 only)	Green	100 Mbit connection. Flashes during activity.

SD card slot

⚠ CAUTION

⚠ Moving parts. Risk of injury. Keep your body parts away from the product when it's in operation. Disconnect from power supply before installing or performing maintenance on the product.

⚠ CAUTION

Hot surface. Risk of injury. Don't touch the product when it's in operation. Disconnect from power supply and allow the surfaces to cool before performing maintenance on the product.

NOTICE

- Risk of damage to SD card. Don't use sharp tools, metal objects, or excessive force when inserting or removing the SD card. Use your fingers to insert and remove the card.
- Risk of data loss and corrupted recordings. Unmount the SD card from the device's web interface before removing it. Don't remove the SD card while the product is running.

This device supports SD/SDHC/SDXC cards.

This device supports microSD/microSDHC/microSDXC cards.

This device supports microSD/microSDHC/microSDXC cards (not included). For information about limitations and updates, see the device's release notes.

For SD card recommendations, see *axis.com*.

For SD card recommendations, see *axis.com/products/axis-companion*.

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microSD, microSDHC, and microSDXC Logos are trademarks of SD-3C LLC. microSD, microSDHC, microSDXC are trademarks or registered trademarks of SD-3C, LLC in the United States, other countries or both.

Buttons

Control button

The control button is used for:

- Enabling the Focus Assistant. Press and very quickly release the Control button.
- Calibrating the speaker test. Press and release the control button and a test tone is played.
- Resetting the product to factory default settings. See *Reset to factory default settings, on page 49*.
- Ensuring the camera is level. Press the button for not more than two seconds to start the leveling assistant and press again to stop. The status LED and buzzer signal (see) assist leveling of the camera. The camera is level when the buzzer beeps continuously.
- Ensuring the camera is level. Press the button for not more than two seconds to start the leveling assistant and press again to stop. The buzzer signal (see) assist leveling of the camera. The camera is level when the buzzer beeps continuously.
- Resetting the product to factory default settings. See or
- Connecting to an AXIS Video Hosting System service. To connect, press and hold the button for about 3 seconds until the status LED flashes green.
- Connecting to a one-click cloud connection (O3C) service over the internet. To connect, press and release the button, then wait for the status LED to flash green three times.

Connectors

Network connector

The Axis product is available with:

RJ45 Ethernet connector.

RJ45 Ethernet connector with Power over Ethernet (PoE).

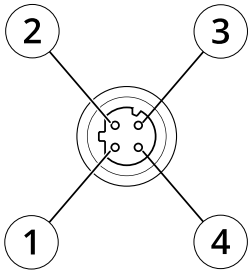
RJ45 Ethernet connector with Power over Ethernet Plus (PoE+).

RJ45 with High Power over Ethernet (High PoE).

RJ45 Push-pull Connector (IP66) with High Power over Ethernet (High PoE).

RJ45 Ethernet service port.

D-coded M12 connector with Power over Ethernet (PoE).



1 *TX+*
2 *RX+*
3 *TX-*
4 *RX-*

SFP connector.

Input: RJ45 Ethernet connector with Power over Ethernet (PoE).

Output: RJ45 Ethernet connector with Power over Ethernet (PoE).

NOTICE

Use the supplied midspan.

NOTICE

Due to local regulations or the environmental and electrical conditions in which the product is to be used, a shielded network cable (STP) may be appropriate or required. All cables connecting the product to the network and that are routed outdoors or in demanding electrical environments shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see .

NOTICE

The product shall be connected using a shielded network cable (STP). All cables connecting the product to the network shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see .

NOTICE

The product shall be connected using a shielded network cable (STP) or an optical fiber cable. All cables connecting the product to the network shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see .

NOTICE

To comply with the IP66-rated design of the camera and maintain the IP66 protection, the supplied RJ45 Push-pull Connector (IP66) shall be used. Alternatively, use the RJ45 IP66-rated cable with premounted connector which is available from your Axis reseller. Do not remove the plastic network connector shield from the camera.

NOTICE

The product shall be connected using a shielded network cable (STP). All cables connecting the product to the network shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see the Installation Guide at *www.axis.com*.

I/O connector

Use the I/O connector with external devices in combination with, for example, motion detection, event triggering, and alarm notifications. In addition to the 0 VDC reference point and power (12 V DC output), the I/O connector provides the interface to:

Use the I/O connector with external devices in combination with, for example, event triggering and alarm notifications. In addition to the 0 VDC reference point and power (DC output), the I/O connector provides the interface to:

Digital input – For connecting devices that can toggle between an open and closed circuit, for example PIR sensors, door/window contacts, and glass break detectors.

Supervised input – Enables possibility to detect tampering on a digital input.

Digital output – For connecting external devices such as relays and LEDs. Connected devices can be activated by the VAPIX® Application Programming Interface, through an event or from the device's web interface.

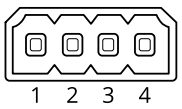
A digital light sensor – For receiving a value of the ambient light intensity from an external light sensor. This is used to control the device's day and night functionality.

Note

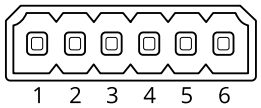
The I/O connector is connected to the housing (fan/heater) on delivery. In case of a fan or heater error, an input signal will be triggered in the camera. Set up an action rule in the camera to configure which action the signal shall trigger.

The I/O connector is connected to the housing (fan/heater) on delivery. In case of a fan or heater error, an input signal will be triggered in the camera. Set up an action rule in the camera to configure which action the signal shall trigger. For information about events and action rules, see the user manual available on *axis.com*.

4-pin terminal block



6-pin terminal block

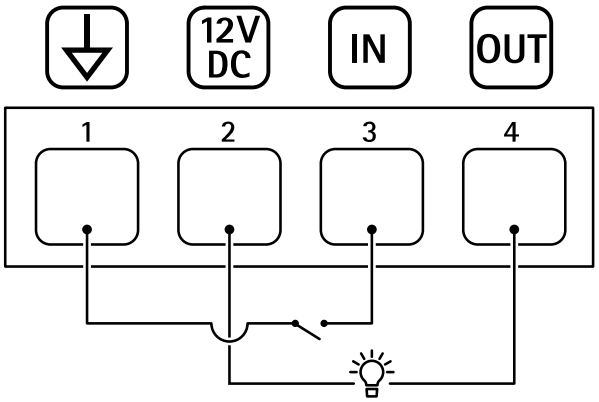


Function	Pin	Notes	Specifications
DC ground	1		0 VDC
DC output	2	⚠ Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	12 VDC Max load = 25 mA
Digital Input	3	Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 30 VDC
Digital Output	4	Internally connected to pin 1 (DC ground) when active, and floating (unconnected) when inactive. If used with an inductive load, e.g., a relay, connect a diode in parallel with the load, to protect against voltage transients.	0 to max 30 VDC, open drain, 100 mA

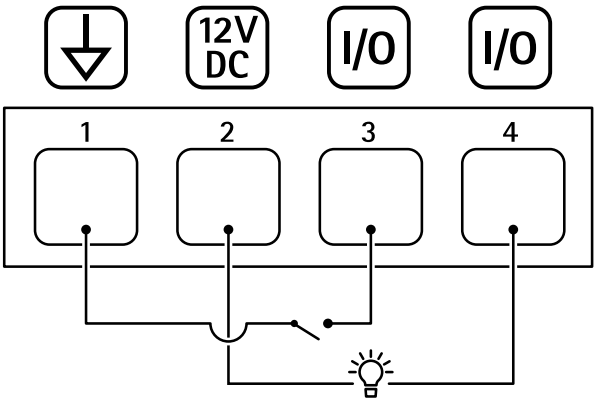
Function	Pin	Notes	Specifications
DC ground	1		0 VDC
DC output	2	⚠ Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	12 VDC Max load = 50 mA
Configurable (Input or Output)	3–4	Digital input – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 30 VDC
		Digital output – Internally connected to pin 1 (DC ground) when active, and floating (unconnected) when inactive. If used with an inductive load, e.g., a relay, connect a diode in parallel with the load, to protect against voltage transients.	0 to max 30 VDC, open drain, 100 mA

Function	Pin	Notes	Specifications
DC ground	1		0 VDC
DC output	2	⚠ Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	12 VDC Max load = 50 mA
Configurable (Input or Output)	3–6	Digital input – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 30 VDC
		Digital output – Internally connected to pin 1 (DC ground) when active, and floating (unconnected) when inactive. If used with an inductive load, e.g., a relay, connect a diode in parallel with the load, to protect against voltage transients.	0 to max 30 VDC, open drain, 100 mA

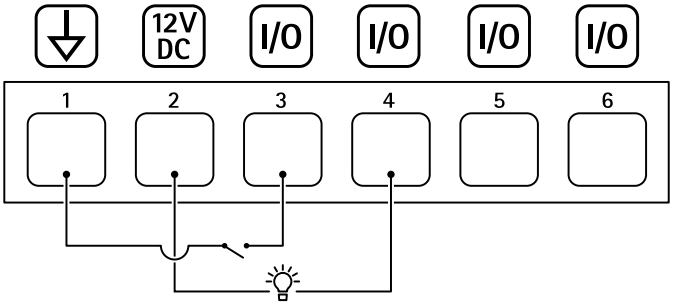
Example:



1 *DC ground*
2 *DC output 12 V, max 25 mA*
3 *Digital input*
4 *Digital output*



1 *DC ground*
2 *DC output 12 V, max 50mA*
3 *I/O configured as input*
4 *I/O configured as output*



1 *DC ground*
2 *DC output 12 V, max 50 mA*
3 *I/O configured as input*
4 *I/O configured as output*
5 *Configurable I/O*
6 *Configurable I/O*

Power connector

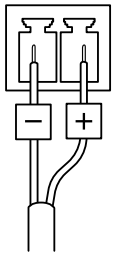
Terminal connector for connecting AC/DC power supply.

DC connector. Use the supplied adapter.

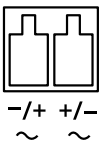
This microUSB type B connector is for power only. We recommend using Axis microUSB power supply.

AC/DC connector. Use the supplied adapter.

2-pin terminal block for DC power input. Use a Safety Extra Low Voltage (SELV) compliant limited power source (LPS) with either a rated output power limited to ≤100 W or a rated output current limited to ≤5 A.

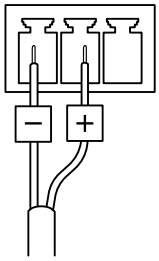


2-pin terminal block for AC/DC power input. Use a Safety Extra Low Voltage (SELV) compliant limited power source (LPS) with either a rated output power limited to ≤100 W or a rated output current limited to ≤5 A.

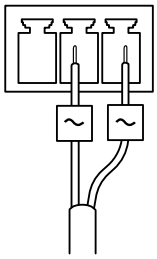


3-pin terminal block for power input. Use a Safety Extra Low Voltage (SELV) compliant limited power source (LPS) with either a rated output power limited to ≤100 W or a rated output current limited to ≤5 A.

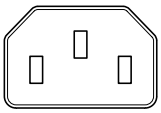
DC power input:



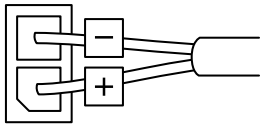
AC power input:



AC connector for power input. Use the supplied cable.



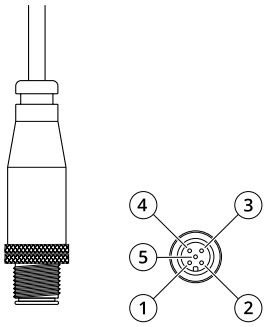
2-pin terminal block for DC power output.



4-pin terminal block for power input.

DC power input:

5–pin DC connector



Pin	Function
1, 2	+24 V
3, 4	GND
5	N.C.

Multiconnector

Terminal connector for connecting external equipment:

- Audio equipment
- Input/Output (I/O) devices
- DC power supply
- AC/DC power supply

Terminal connector for connecting the supplied media converter switch, which provides the following signals:

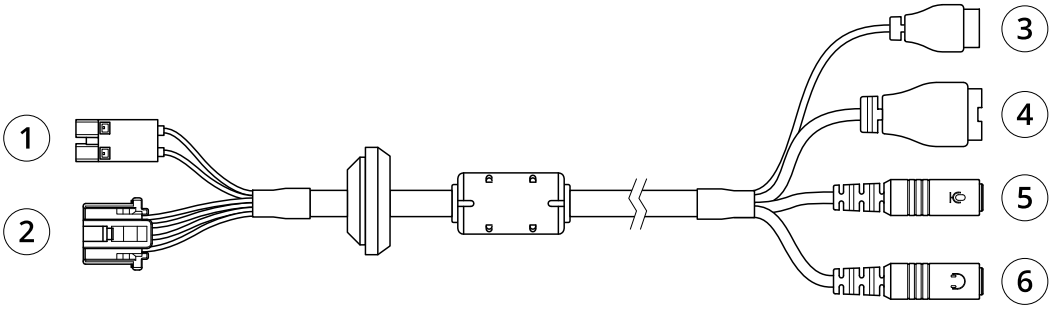
- DC Power
- Network (Ethernet 10/100Base-T)
- Input/Output (I/O)

When connecting external equipment, a separately sold Axis multicable is required in order to maintain the product's IP rating. For more information, see *Multicable connectors, on page 42*.

When connecting external equipment, a separately sold Axis Multicable C I/O Audio Power 1 m/ 5 m or a separately sold Axis 10-pin Push-pull System Connector is required in order to maintain the product's IP rating. For more information, see *Multicable connectors, on page 42* and .

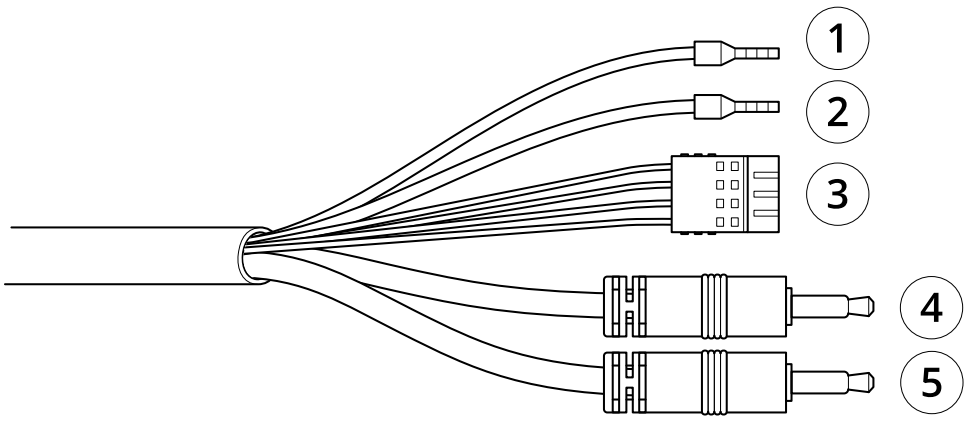
When connecting external equipment, the supplied multicable is required in order to maintain the product's NEMA/IP rating. For more information, see *Multicable connectors, on page 42*.

Multicable connectors



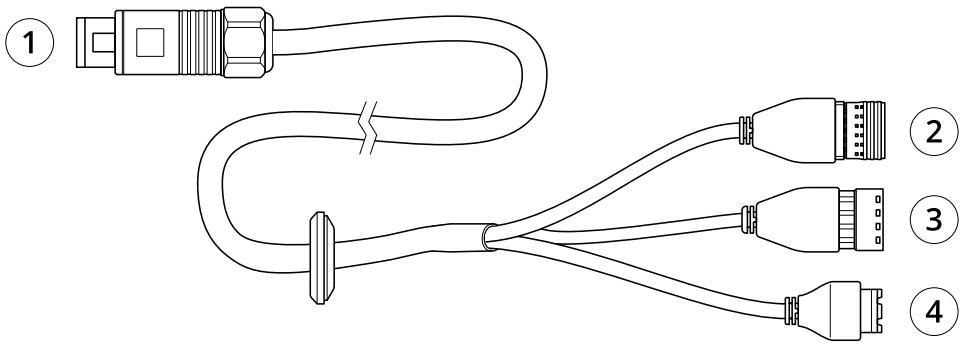
Multicable overview

1 *Camera power connector*
2 *Camera multiconnector*
3 *Power connector*
4 *I/O terminal connector*
5 *Audio in (pink)*
6 *Audio out (green)*



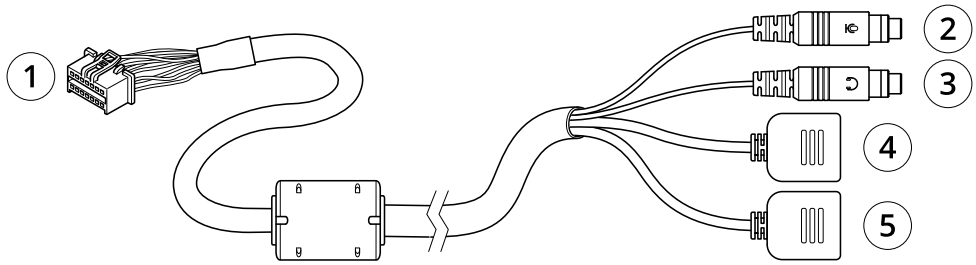
Multicable overview

1 *Insulator (black)*
2 *Insulator (red)*
3 *I/O terminal block*
4 *Audio in (pink)*
5 *Audio out (green)*



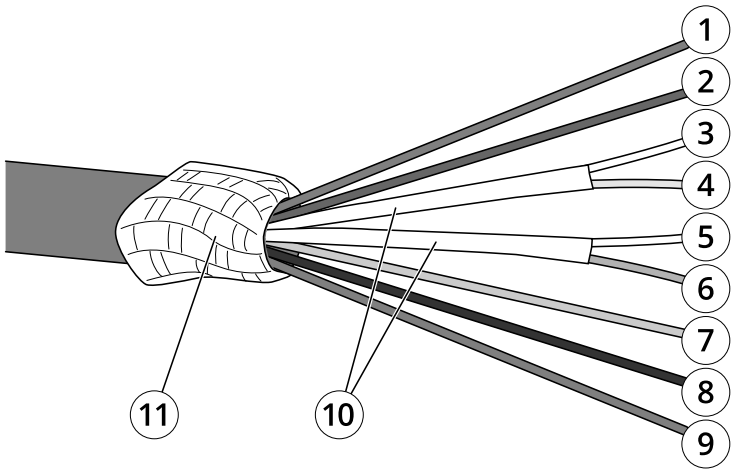
Multicable overview

1 *Camera multiconnector*
2 *I/O terminal block*
3 *Audio terminal block*
4 *Power connector*



Multicable overview

1 *Camera multiconnector*
2 *Audio in (pink)*
3 *Audio out (green)*
4 *Power connector, 3-pin*
5 *I/O terminal block, 6-pin*



Multicable overview

1 *Power wire (red)*
2 *Digital I/O wire (blue)*
3 *Ethernet wire (green/white)*
4 *Ethernet wire (green)*

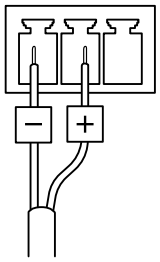
5 *Ethernet wire (orange/white)*
6 *Ethernet wire (orange)*
7 *Digital I/O wire (yellow)*
8 *Ground wire (black)*
9 *Power wire (red)*
10 *Ethernet wire foil shield (2x)*
11 *Braided shield coil*

Function	Wire	Connect to	Specifications
Configurable (Input or Output)	2 – blue 7 – yellow	Digital input – I/O terminal connector	0 to max 30 V DC
		Digital output – I/O terminal connector	0 to max 30 V DC, open drain, 100 mA
RX+	3 – green/white	Ethernet – receiving	
RX-	4 – green	Ethernet – receiving	
TX+	5 – orange/white	Ethernet – transmitting	
TX-	6 – orange	Ethernet – transmitting	
0 V DC (-)	8 – black		0 V DC
DC output (24 V)	1, 9 – red	Power connector	24 V DC

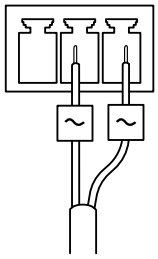
The multicable provides the following connectors:

Power connector – 3-pin terminal block used for power input. Use a Safety Extra Low Voltage (SELV) compliant limited power source (LPS) with either a rated output power limited to ≤100 W or a rated output current limited to ≤5 A.

DC power input



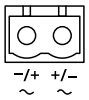
AC power input



Power connector – Connector for AC and DC power for connection to the not included AXIS T8051 Power Converter AC/DC to DC wires.

Wires	Specifications
Red	+ DC or AC
Black	– DC or AC

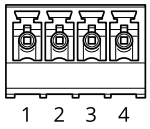
Power connector – 2-pin terminal block used for power input. The polarity of the cables does not matter. Use a Safety Extra Low Voltage (SELV) compliant limited power source (LPS) with either a rated output power limited to ≤100 W or a rated output current limited to ≤5 A.



Audio in (pink) – 3.5 mm input for a mono microphone, or a line-in mono signal (left channel is used from a stereo signal).

Audio out (green) – 3.5 mm output for audio (line level) that can be connected to a public address (PA) system or an active speaker with a built-in amplifier. A stereo connector must be used for the audio out.

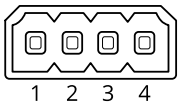
Audio connector – 4–pin terminal block used for audio in and audio line out. This can be connected to a public address (PA) system or an active speaker with a built-in amplifier.

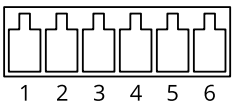


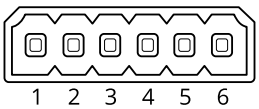
Function	Pin	Notes
Audio In	1	Balanced or unbalanced input for a mono microphone or line signal
Audio Line Out	3	Can be connected to a public address (PA) system or an active speaker with a built-in amplifier
GND	2, 4	Ground

I/O terminal connector – Use with external devices in combination with, for example, tampering alarms, motion detection, event triggering, and alarm notifications. In addition to the 0 V DC reference point and power (DC output), the I/O connector provides the interface to:

- Digital output — For connecting external devices such as relays and LEDs. Connected devices can be activated by the VAPIX® Application Programming Interface or from the device's web interface.
- Digital input — For connecting external devices that can toggle between an open and closed circuit, for example PIR detectors, door/window contacts, and glass break detectors.





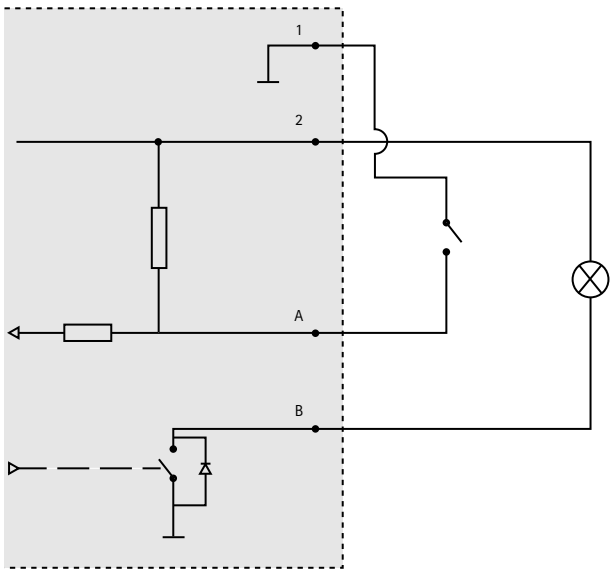


Function	Pin	Notes	Specifications
0 V DC (-)	1		0 V DC
DC output	2	Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	12 V DC Max load =50 mA
Configurable (Input or Output)	3–4	Digital input – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 30 V DC

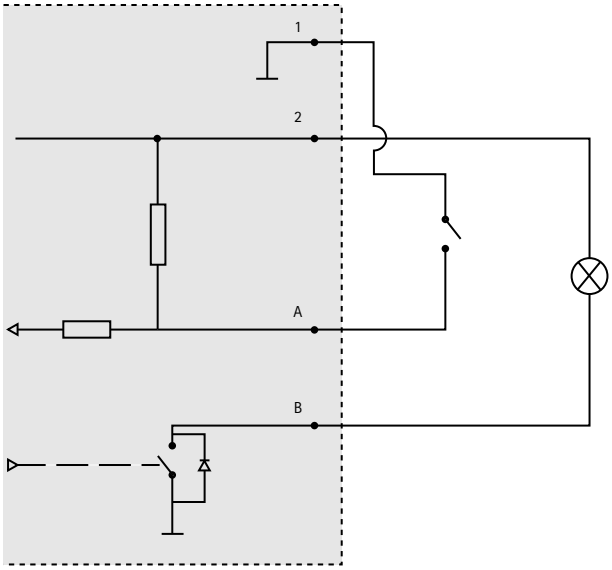
		Digital output – Internally connected to pin 1 (DC ground) when active, and floating (unconnected) when inactive. If used with an inductive load, e.g. a relay, a diode must be connected in parallel with the load, for protection against voltage transients.	0 to max 30 V DC, open drain, 100 mA

Function	Pin	Notes	Specifications
0 V DC (-)	1		
DC output	2	Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	3.3 V DC Max load = 250 mA
Configurable (Input or Output)	3–6	Digital input – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 40 V DC
		Digital output – Internally connected to pin 1 (DC ground) when active, and floating (unconnected) when inactive. If used with an inductive load, e.g. a relay, a diode must be connected in parallel with the load, for protection against voltage transients.	0 to max 40 V DC, open drain, 100 mA

Function	Pin	Notes	Specifications
0 V DC (-)	1		0 V DC
DC output	2	Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	12 V DC Max load =50 mA
Configurable (Input or Output)	3–6	Digital input – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 30 V DC
		Digital output – Internally connected to pin 1 (DC ground) when active, and floating (unconnected) when inactive. If used with an inductive load, e.g. a relay, a diode must be connected in parallel with the load, for protection against voltage transients.	0 to max 30 V DC, open drain, 100 mA



1 0 V DC (-)
2 DC output 12 V, max 50 mA
A I/O configured as input
B I/O configured as output



1 0 V DC (-)
2 DC output 3.3 V, max 250 mA
A I/O configured as input
B I/O configured as output

Clean your device

You can clean your device with lukewarm water.

You can clean your device with lukewarm water and mild, nonabrasive soap.

You can clean your device with lukewarm water and detergents that contain any of the following chemicals:

- isopropanol 70% (IPA)
- hydrogen peroxide 3% (H_2O_2)
- sodium hypochlorite <5% (NaClO)

You can clean your device with high-pressure water and detergent.

⚠ CAUTION

Before you use a detergent, read and adhere to the safety data sheet (SDS) provided by the detergent manufacturer.

NOTICE

- High-pressure water can damage the device. Keep a distance of at least 1 m (3.3 ft) between the nozzle and the device.
- Hot water can damage the device. Don't use water that is hotter than 80° C (176° F).
- Harsh chemicals can damage the device. Don't use chemicals such as window cleaner or acetone to clean your device.
- Harsh chemicals can damage the device. Don't use chemicals such as acetone or gasoline to clean your device.
- Don't spray detergent directly on the device. Instead, spray detergent on a nonabrasive cloth and use that to clean the device.
- Avoid cleaning in direct sunlight or elevated temperatures, since this can cause stains.

1. Use a can of compressed air to remove dust and loose dirt from the device.
2. Use a water hose or high-pressure water to rinse the device.
3. If necessary, clean the device with a soft microfiber cloth dampened with lukewarm water.
4. If necessary, clean the device with a soft microfiber cloth dampened with lukewarm water and mild, nonabrasive soap.
5. If necessary, clean the device with a soft microfiber cloth dampened with lukewarm water and detergent.
6. If necessary, apply detergent according to the detergent manufacturer's instructions.
7. To avoid stains, dry the device with a clean, nonabrasive cloth.

Troubleshooting

Reset to factory default settings

⚠ WARNING

⚠ Possibly hazardous optical radiation is emitted from this product. It can be harmful to the eyes. Don't stare at the operating lamp.

Important

Reset to factory default should be used with caution. A reset to factory default resets all settings, including the IP address, to the factory default values.

Note

The camera has been preconfigured with AXIS License Plate Verifier. If you reset to factory default, you need to reinstall the license key. See .

Note

For products with multiple IP addresses and AXIS OS 11.11 or earlier, channel 1 will have the address 192.168.0.90, channel 2 will have the address 192.168.0.91 and so on. Products with AXIS OS 12.0 and later will obtain a distinct IP address obtained from the link-local address subnet for each channel (169.254.x.x).

To reset the product to the factory default settings:

1. Disconnect power from the product.
2. Press and hold the control button while reconnecting power. See *Product overview, on page 32*.
3. Keep the control button pressed for 15–30 seconds until the status LED indicator flashes amber.
4. Release the control button. The process is complete when the status LED indicator turns green. If no DHCP server is available on the network, the device IP address will default to one of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.0.0/16)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90/24
5. Use the installation and management software tools to assign an IP address, set the password, and access the device.
   The installation and management software tools are available from the support pages on *axis.com/support*.
6. Refocus the product.

1. Press and hold the control button and the restart button at the same time.
2. Release the restart button but continue to hold down the control button for 15–30 seconds until the status LED indicator flashes amber.
3. Release the control button. The process is complete when the status LED indicator turns green. If no DHCP server is available on the network, the device IP address will default to one of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.0.0/16)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90/24
4. Use the installation and management software tools to assign an IP address, set the password and access the video stream.
5. Release the restart button and hold the control button.
6. Keep the control button pressed until the power LED indicator turns green and the 4 status LED indicators turn amber (this may take up to 15 seconds).
7. Keep the control button pressed until the power LED indicator turns green and the 6 status LED indicators turn amber (this may take up to 15 seconds).
8. Release the control button. When the status LED indicators display green (which can take up to 1 minute) the process is complete and the unit has been reset.

9. The process is now complete. If no DHCP server is available on the network, the device IP addresses will default to either of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.x.x)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90 to 192.168.0.93
10. The process is now complete. If no DHCP server is available on the network, the device IP addresses will default to either of the following:
    - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.x.x)
    - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90 to 192.168.0.95
11. Use the installation and management software tools to assign the IP addresses, set the password and access the video stream.

Note

To reset a single channel to the original factory default settings, log in to the device's web interface and use the provided button.

1. Press and hold the control button and the power button for 15–30 seconds until the status LED indicator flashes amber. See *Product overview, on page 32*.
2. Release the control button but continue to hold down the power button until the status LED indicator turns green.
3. Release the power button and assemble the product.
4. The process is now complete. The product has been reset to the factory default settings. If no DHCP server is available on the network, the device IP address will default to one of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.0.0/16)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90/24
5. Using the installation and management software tools to assign an IP address, set the password and access the video stream.

1. Press and hold the control button and the power button. See *Product overview, on page 32*.
2. Release the power button but continue to hold down the control button for 15–30 seconds until the status LED indicator flashes amber.
3. Release the control button.
4. The process is now complete. The product has been reset to the factory default settings. If no DHCP server is available on the network, the device IP address will default to one of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.0.0/16)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90/24
5. Using the installation and management software tools, assign an IP address, set the password and access the video stream.

1. Disconnect power from the product.
2. Press and hold the control button while reconnecting power. See *Product overview, on page 32*.
3. Keep the control button pressed for 25 seconds until the status LED indicator turns amber for the second time.
4. Release the control button. The process is complete when the status LED indicator turns green. If no DHCP server is available on the network, the device IP address will default to one of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.0.0/16)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90/24
5. Use the installation and management software tools, assign an IP address, set the password, and access the product.

1. Disconnect power from the product.
2. Press and hold the control button while reconnecting power. See *Product overview, on page 32*.
3. Keep the control button pressed for 10 seconds until the status LED indicator turns amber for the second time.
4. Release the control button. The process is complete when the status LED indicator turns green. If no DHCP server is available on the network, the device IP address will default to one of the following:
   - **Devices with AXIS OS 12.0 and later:** Obtained from the link-local address subnet (169.254.0.0/16)
   - **Devices with AXIS OS 11.11 and earlier:** 192.168.0.90/24
5. Use the installation and management software tools, assign an IP address, set the password, and access the product.

You can also reset parameters to factory default through the device's web interface. Go to **Maintenance** > **Factory default** and click **Default**.

AXIS OS options

Axis offers device software management according to either the active track or the long-term support (LTS) tracks. Being on the active track means continuously getting access to all the latest product features, while the LTS tracks provide a fixed platform with periodic releases focused mainly on bug fixes and security updates.

Using AXIS OS from the active track is recommended if you want to access the newest features, or if you use Axis end-to-end system offerings. The LTS tracks are recommended if you use third-party integrations, which are not continuously validated against the latest active track. With LTS, the products can maintain cybersecurity without introducing any significant functional changes or affecting any existing integrations. For more detailed information about Axis device software strategy, go to *axis.com/support/device-software*.

Check the current AXIS OS version

AXIS OS determines the functionality of our devices. When you troubleshoot a problem, we recommend that you to start by checking the current AXIS OS version. The latest version might contain a correction that fixes your particular problem.

To check the current AXIS OS version:

1. Go to the device's web interface > **Status**.
2. Under **Device info**, see the AXIS OS version.

Upgrade AXIS OS

Important

- When you upgrade the device software, your preconfigured and customized settings are saved. Axis Communications AB can't guarantee that the settings are saved, even if the features are available in the new AXIS OS version.
- Starting from AXIS OS 12.6, you must install every LTS version between your device's current version and the target version. For example, if the currently installed device software version is AXIS OS 11.2, you have to install the LTS version AXIS OS 11.11 before you can upgrade the device to AXIS OS 12.6. For more information, see *AXIS OS Portal: Upgrade path*.
- Make sure the device remains connected to the power source throughout the upgrade process.
- Make sure the cover is attached during upgrade to avoid installation failure.

Note

- When you upgrade the device with the latest AXIS OS version in the active track, the product receives the latest functionality available. Always read the upgrade instructions and release notes available with

each new release before you upgrade. To find the latest AXIS OS version and the release notes, go to *axis.com/support/device-software*.

- Because the database of users, groups, credentials, and other data are updated after a AXIS OS upgrade, the first start-up could take a few minutes to complete. The time required is dependent on the amount of data.

1. Download the AXIS OS file to your computer, available free of charge at *axis.com/support/device-software*.
2. Log in to the device as an administrator.
3. Go to **Maintenance > AXIS OS upgrade** and click **Upgrade**.

When the upgrade has finished, the product restarts automatically.

4. When the product has been restarted, clear the web browser's cache.

You can use AXIS Device Manager to upgrade multiple devices at the same time. Find out more at *axis.com/products/axis-device-manager*.

Technical problems and possible solutions

Problems upgrading AXIS OS

AXIS OS upgrade failed

If the upgrade fails, the device reloads the previous version. The most common reason is that the wrong AXIS OS file has been uploaded. Check that the name of the AXIS OS file corresponds to your device and try again.

Problems after AXIS OS upgrade

If you experience problems after the upgrade, roll back to the previously installed version from the **Maintenance** page.

Problems setting the IP address

Can't set the IP address

- If the IP address intended for the device and the IP address of the computer used to access the device are located on different subnets, you can't set the IP address. Contact your network administrator to obtain an IP address.
- The IP address could be in use by another device. To check:
  1. Disconnect the Axis device from the network.
  2. In a Command/DOS window, type `ping` and the IP address of the device.
  3. If you receive: `Reply from <IP address>: bytes=32; time=10...` this means that the IP address might already be in use by another device on the network. Obtain a new IP address from the network administrator and reinstall the device.
  4. If you receive: `Request timed out`, this means that the IP address is available for use with the Axis device. Check all cabling and reinstall the device.
- There could be a possible IP address conflict with another device on the same subnet. The static IP address in the Axis device is used before the DHCP server sets a dynamic address. This means that if the same default static IP address is also used by another device, there could be problems accessing the device.

Problems accessing the device

Can't log in when accessing the device from a browser

When HTTPS is enabled, make sure that you use the correct protocol (HTTP or HTTPS) when you try to log in. You might need to manually type `http` or `https` in the browser's address field.

If you've lost the password for the root account, you must reset the device to the factory default settings. For instructions, see *Reset to factory default settings, on page 49*.

The IP address has been changed by DHCP

IP addresses obtained from a DHCP server are dynamic and could change. If the IP address has been changed, use AXIS IP Utility or AXIS Device Manager to locate the device on the network. Identify the device using its model or serial number, or by the DNS name (if the name has been configured).

If required, you can assign a static IP address manually. For instructions, go to *axis.com/support*.

Certificate error when using IEEE 802.1X

For authentication to work properly, the date and time settings in the Axis device must be synchronized with an NTP server. Go to **System > Date and time**.

The browser isn't supported

For a list of recommended browsers, see *Browser support, on page 5*.

Can't access the device externally

To access the device externally, we recommend you to use one of the following applications for Windows®:

- AXIS Camera Station Edge: free of charge, ideal for small systems with basic surveillance needs.
- AXIS Camera Station Pro: 90-day trial version free of charge, ideal for small to mid-size systems.

For instructions and download, go to *axis.com/vms*.

Problems with streaming

Multicast H.264 only accessible by local clients

Check if your router supports multicasting, or if you need to configure the router settings between the client and the device. You might need to increase the TTL (Time To Live) value.

No multicast H.264 displayed in the client

Check with your network administrator that the multicast addresses used by the Axis device are valid for your network.

Check with your network administrator to see if there is a firewall that prevents viewing.

Poor rendering of H.264 images

Ensure that your graphics card uses the latest driver. You can usually download the latest drivers from the manufacturer's website.

Color saturation is different in H.264 and Motion JPEG

Modify the settings for your graphics adapter. Check the adapter's documentation for more information.

Lower frame rate than expected

- See *Performance considerations, on page 55*.
- Reduce the number of applications running on the client computer.
- Limit the number of simultaneous viewers.
- Check with the network administrator that there is enough bandwidth available.
- Lower the image resolution.
- Log in to the device's web interface and set a capture mode that prioritizes frame rate. If you change the capture mode to prioritize frame rate it might lower the maximum resolution, depending on the device used and capture modes available.
- The maximum frames per second is dependent on the utility frequency (60/50 Hz) of the Axis device.

Can't select H.265 encoding in live view

Web browsers don't support H.265 decoding. Use a video management system or application that supports H.265 decoding.

Problems retrieving additional video streams

I get an error message:

- in AXIS Camera Station Edge: 'Video Error', or
- in Chrome/Firefox: 'Stream: Error. Something went wrong. Maybe there are too many viewers.', or
- in Quick Time: '503 service unavailable', or
- AXIS Camera Station 5 or Pro: 'Camera not available', or
- in browser when using the Java applet: 'Error reading video stream'

The reason is that the camera is designed to deliver up to four different streams. If a fifth unique stream is requested, the camera can't provide it, and you get an error message. The error message depends on the way the stream is requested. The streams are used on a first come, first served basis. Examples of instances that use a stream are:

- live viewing in a web browser or other application
- while recording - continuous or motion triggered recording
- an event that uses images on the camera, for example an event that sends an e-mail with an image every hour
- an installed and running application, such as AXIS Object Analytics, always consumes a video stream whether it's used or not. A stopped application doesn't consume a video stream.

The camera can deliver more than four simultaneous streams provided the configuration of any additional stream is identical to any of the first four streams. Identical configuration implies exactly the same resolution, frame rate, compression, video format, rotation etc.

Problems with audio files

Can't upload media clip

The following audio clip formats are supported:

- au file format, encoded in µ-law and sampled with 8 or 16 kHz.
- wav file format, encoded in PCM audio. It supports encoding as 8 or 16-bit mono or stereo and sample rate of 8 to 48 kHz.
- mp3 file format, in mono or stereo with bitrate of 64 kbps to 320 kbps and sample rate of 8 to 48 kHz.

Media clips are played with different volumes

A sound file is recorded with a certain gain. If your audio clips have been created with different gains, they will be played with a different loudness. Make sure that you use clips with the same gain.

Problems with MQTT

Can't connect over port 8883 with MQTT over SSL

The firewall blocks traffic that uses port 8883 since it's regarded insecure.

In some cases the server/broker might not provide a specific port for MQTT communication. It might still be possible to use MQTT over a port normally used for HTTP/HTTPS traffic.

- If the server/broker supports WebSocket/WebSocket Secure (WS/WSS), typically on port 443, use this protocol instead. Check with the server/broker provider to see if WS/WSS is supported and which port and basepath to use.
- If the server/broker supports ALPN, the use of MQTT can be negotiated over an open port, such as 443. Check with your server/broker provider to see if ALPN is supported and which ALPN protocol and port to use.

Problems with operating the device

Front heater and wiper aren't working

If the front heater or wiper are not turning on, confirm that the top cover is properly fastened to the bottom of the housing unit.

If you can't find what you're looking for here, try the troubleshooting section at *axis.com/support*.

Performance considerations

When you set up your system, it's important to consider how different settings and situations affect performance. Some factors affect bandwidth (bitrate), others affect frame rate, and some affect both.

When you set up your system, it's important to consider how different settings and situations affect the required bandwidth (bitrate).

The most important factors to consider:

- High image resolution or lower compression levels result in images containing more data which in turn affects the bandwidth.
- Rotating the image in the GUI can increase the product's CPU load.
- Removing or attaching the cover will restart the camera.
- Access by large numbers of Motion JPEG clients or unicast H.264/H.265/AV1 clients affects the bandwidth.
- Simultaneous viewing of different streams (resolution, compression) by different clients affects both frame rate and bandwidth.
  Use identical streams wherever possible to maintain a high frame rate. Stream profiles can be used to ensure that streams are identical.
- Accessing video streams with different codecs simultaneously affects both frame rate and bandwidth. For optimal performance, use streams with the same codec.
- Heavy usage of event settings affects the product's CPU load which in turn affects the frame rate.
- Using HTTPS may reduce frame rate, in particular if streaming Motion JPEG.
- Heavy network utilization due to poor infrastructure affects the bandwidth.

- Viewing on poorly performing client computers lowers perceived performance and affects frame rate.
- Running multiple AXIS Camera Application Platform (ACAP) applications simultaneously may affect the frame rate and the general performance.
- Running multiple AXIS Camera Application Platform (ACAP) applications simultaneously may affect the general performance.
- Using palettes affects the product's CPU load which in turn affects the frame rate.
- Running multiple AXIS Camera Application Platform (ACAP) applications on the Visual and Thermal channels simultaneously may affect the frame rate and the general performance.

Contact support

If you need more help, go to *axis.com/support*.

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