AXIS Q8685–LE PTZ Network Camera

User Manual

AXIS Q8685-LE PTZ Network Camera
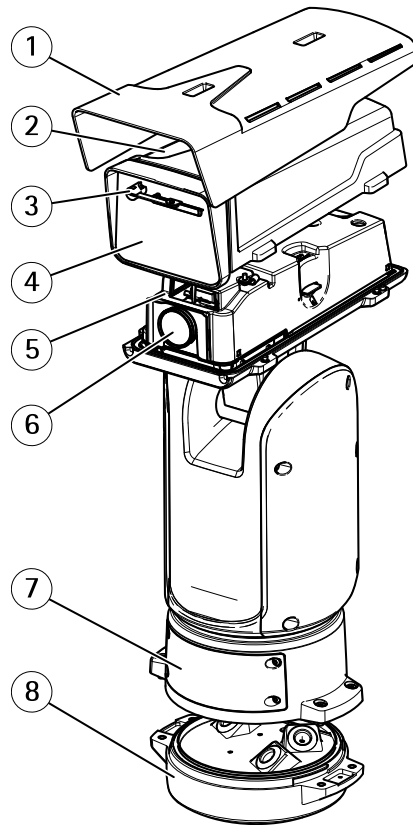
Table of Contents

AXIS Q8685-LE PTZ Network Camera

Product overview

1	Sunshield
2	Top cover
3	Wiper
4	Front window
5	Inner cover
6	Lens
7	Lid
8	Base unit

AXIS Q8685-LE PTZ Network Camera

Product overview
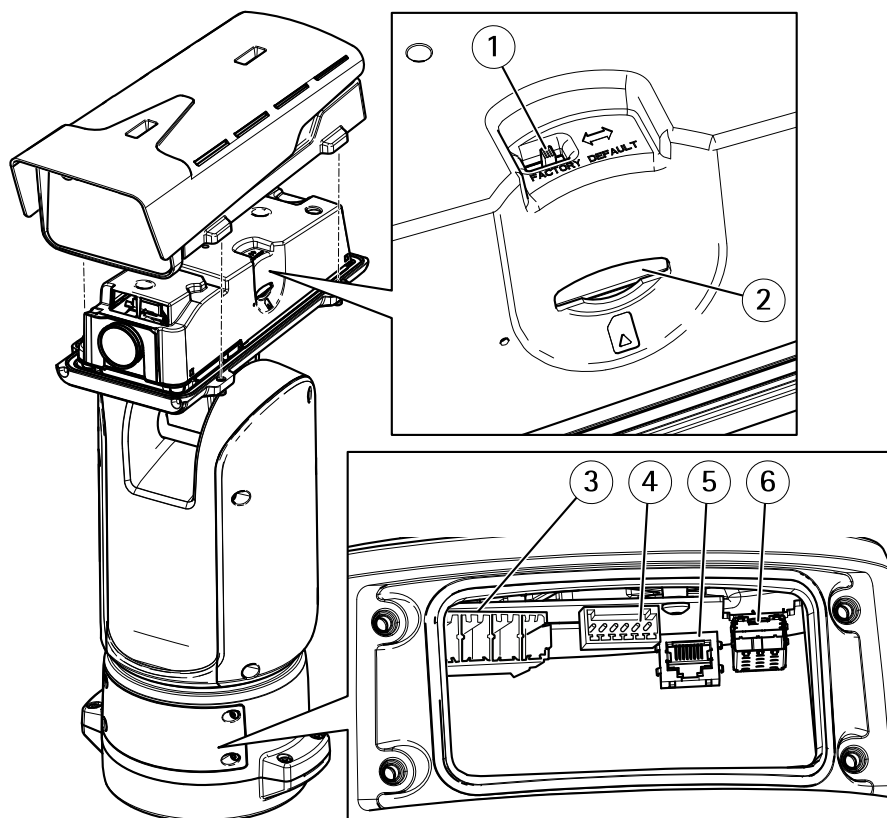
1   Factory default switch
2   SD memory card slot
3   Input power connector
4   I/O connector
5   RJ45 connector
6   SFP slot for SFP module (SFP module not included)
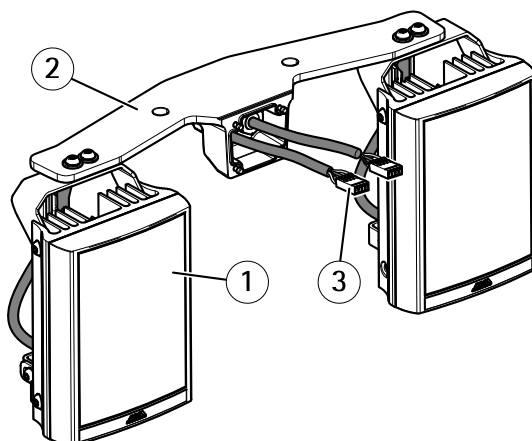
1   Illuminator (x2)
2   Illuminator bracket
3   Illuminator connector (x2)

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*

For more information about how to find and assign IP addresses, see the document *How to assign an IP address and access your device* on the device page at *axis.com*

Access the device

1. Open a browser and enter the IP address or host name of the Axis device.

   If you have a Mac computer (OS X), go to Safari, click on Bonjour and select the device from the drop-down list. To add Bonjour as a browser bookmark, go to **Safari > Preferences**.

   If you do not know the IP address, use AXIS IP Utility or AXIS Device Manager to find the device on the network.

2. Enter the username and password. If you access the device for the first time, you must set the root password. See *Set a secure password for the root account on page 5* .

3. The live view page opens in your browser.

About secure passwords

Important

   Axis devices send the initially set password in clear text over the network. To protect your device after the first login, set up a secure and encrypted HTTPS connection and then change the password.

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:

- Change the default password that comes with each device.

- 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.

Set a secure password for the root account

Important

   The default administrator username is **root**. If the password for root is lost, reset the device to factory default settings.

1. Type a password. Follow the instructions about secure passwords. See *About secure passwords on page 5* .

2. Retype the password to confirm the spelling.

3. Click **Create login**. The password has now been configured.

AXIS Q8685-LE PTZ Network Camera

Setup

Setup

Product webpage overview

1	*Live view control bar*
2	*Live view*
3	*Product name*
4	*Controls*
5	*Video control bar*
6	*Settings toggle*
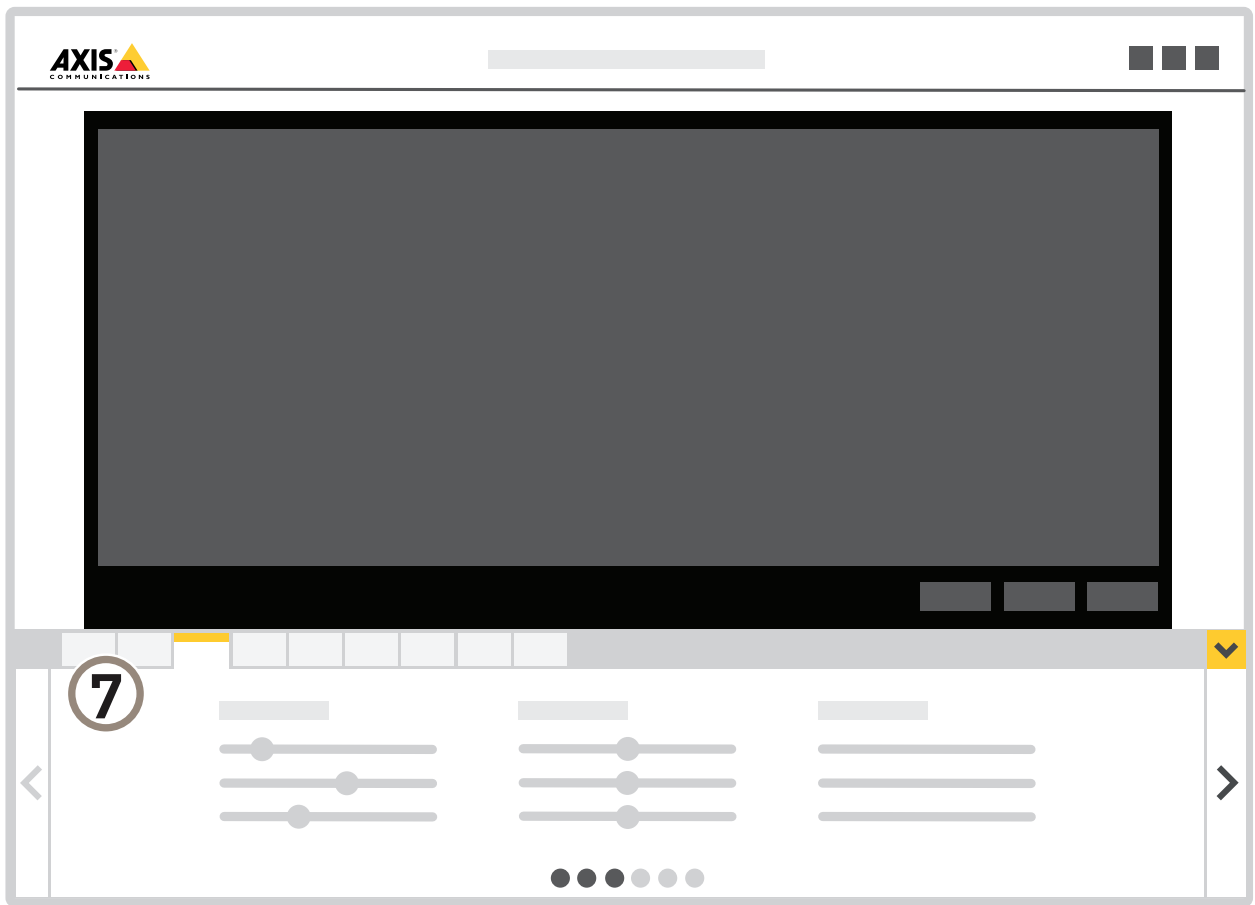
7   Settings tabs

About the product's built-in help

You can access the built-in help from the product's webpage. The help provides more detailed information on the product's features and their settings.

Image quality

How to use leveling guide

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

1. Go to **Settings > System > Orientation** and click ⬜ .

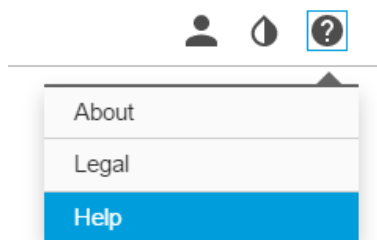2. Adjust the camera mechanically until the position of the reference area or object, is aligned with the leveling guide.

About capture modes

Capture mode defines the maximum resolution and maximum frame rate available in the Axis product. If using a capture mode with a smaller resolution than the maximum resolution, the angle of view is reduced. The capture mode also affects light sensitivity. A capture mode with a high maximum frame rate has reduced light sensitivity and vice versa.

The lower resolution capture mode is cropped out from the highest resolution.

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

How to select capture mode

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

How to focus faster using 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 amount of focus recall areas is 20.

How to add a focus recall area

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

2. Set the focus, either use the autofocus or adjust manually. As long as the focus recall button shows a plus, you can add a focus recall area in that position.

3. Click on the focus recall button.

How to remove a focus recall area

1. Pan, tilt and zoom into the focus recall area you want to remove. The focus recall button toggles to minus when the camera detects a focus recall area.

2. Click on the focus recall button.

How to select exposure mode

There are different exposure mode options in the camera that adjusts aperture, shutter speed, and gain to improve image quality for specific surveillance scenes. Go to **Settings > Image > Exposure** and select between the following exposure modes:

How to benefit from IR light in low-light conditions using night mode

Your camera uses visible light to deliver color images during the day. As the available light diminishes, you can set the camera to automatically shift to night mode, in which the camera uses both visible light and near-infrared light to deliver black-and-white images. Since the camera uses more of the available light it can deliver brighter, more detailed, images.

1. Go to **Settings > Image > Day and night**, and make sure that the **IR cut filter** is set to **Auto**.

2. Enable **Allow IR illumination** and **Synchronize IR illumination** to use the camera's IR light when night mode is activated.

How to reduce noise in low-light conditions

To reduce noise in low-light conditions, you can adjust one or more of the following settings:

Note
Increasing the max shutter value can result in motion blur.

- The shutter speed should be as slow as possible, which means you should set max shutter to the highest possible value.

- Reduce sharpness in the image.

- Try lowering the max gain value.

Reduce motion blur in low-light conditions

To reduce motion blur in low-light conditions, you can adjust one or more of the following settings:

Note
Image noise will increase if you increase the gain.

- Increase shutter speed and gain. Go to **Settings > Image** > **Exposure** and set **Max shutter** to a shorter time, and **Max gain** to a higher value.

Note

The depth of field will get shallower if you open the aperture.

- Open the aperture. Go to **Settings > Image** > **Exposure** and move the **Target aperture** slider toward **Open**.

If you are still experiencing motion blur, you can try one of the following:

- Increase the light level in the scene.

- Mount the camera so that objects move toward it or away from it rather than sideways.

How to maximize details in an image

Important

If you maximize 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.

- Set the compression as low as possible.

- Select MJPEG streaming.

- Turn off Zipstream functionality.

How to 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.

1. Go to **Settings > Image**.

2. If required, turn on WDR under **Wide dynamic range**.

3. Use the **Local contrast** slider to adjust the amount of WDR.

Image without WDR.

Image with WDR.

Note

 WDR may cause artifacts in the image.

Find out more about WDR and how to use it at *axis.com/web-articles/wdr*

How to stabilize a shaky image with Electronic Image Stabilization (EIS)

EIS can be used in environments where the product is mounted in an exposed location and subject to vibrations, for example, wind or passing traffic. Turn on EIS to get a smoother and steadier image without blur.

EIS also reduces the file size of the compressed image and lowers the bitrate of the video stream.
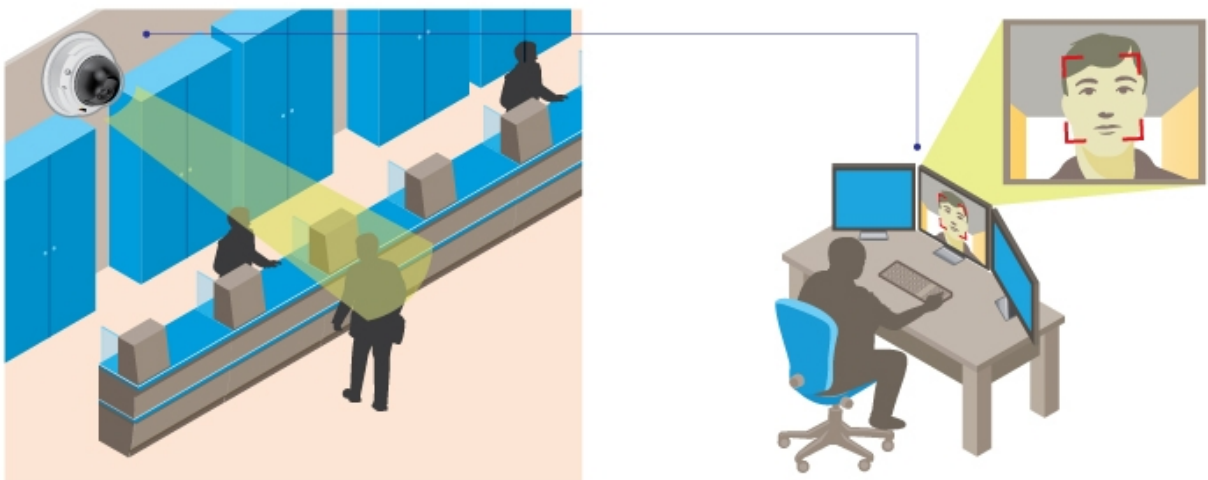
Note

 When EIS is turned on the image is cropped slightly, lowering the maximum resolution.

1. Go to **Settings > Image**.

2. Turn on **EIS**.

How to enhance facial recognition

To better recognize the face of a person passing by the camera, you can set the optimal pixel resolution with the camera's pixel counter.

1. Go to **Settings > System > Orientation** and click .

2. Adjust the size and placement of the rectangle in the camera's live view around the area of interest, for example where the faces of passing persons are expected to appear. You can then see the number of pixels represented by the sides of the rectangle.

Note

You can use an object of a known size in the view as a reference to decide how much resolution is needed for recognition.

How to enhance license plate recognition

To better recognize the license plate of a car passing by the camera, you can apply and adjust a number of things.

One option is to use the pixel counter in your camera to set the optimal pixel resolution:

1. Go to **Settings > System** > **Orientation** and click ⬜.

2. Adjust the size and placement of the rectangle in the camera's live view around the area of interest, for example where the license plates of passing cars are expected to appear. You can then see the number of pixels represented by the sides of the rectangle.

Note

You can use an object of a known size in the view as a reference to decide how much resolution is needed for recognition.

In addition, you can try to adjust the following to optimize license plate recognition:

*   Shutter speed

*   Gain

*   Zoom

Privacy masks

How to hide parts of the image with privacy masks

What is a privacy mask?

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.

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 turn off the privacy masks.

Important

Using multiple privacy masks may affect the product's performance.

How to create a privacy mask

To create a privacy mask, go to **Settings > Privacy mask** .

Overlays

About overlays

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.

How to show an image overlay

1. Go to **Settings > Overlay**.

2. Select **Create overlay** and select **Image** overlay.

3. Choose **Import**.

4. Upload own overlay image.

5. Choose the image from the list of images.

6. To position the image overlay, choose **Custom** or one of the presets.

How to show a text overlay when the camera detects motion

This example explains how to display the text "Motion detected" when the camera detects motion:

Make sure the AXIS Video Motion Detection application is running:

1. Go to **Settings > Apps** > **AXIS Video Motion Detection**.

2. Start the application if it is not already running.

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

Add the overlay text:

4. Go to **Settings > Overlay**.

5. Enter #D in the text field.

6. Choose text size and appearance.

Create an action rule:

7. Go to **System > Events** > **Action rules**.

8. Create an action rule with AXIS Video Motion Detection as trigger.

9. From the list of actions, select **Overlay text**.

10. Type "Motion detected".

11. Set the duration.

Display the pan or tilt position as a text overlay

It may be useful to retrieve, for instance from a recorded video, the pan or tilt position in degrees in which an event has taken place. This can be obtained by including the position in the image as a text overlay, using a so-called modifier.

1. Go to **Settings > Overlay**.

2. In the text field, enter #x to show the pan position.

   Enter #y to show the tilt position.

3. Choose alignment, text size and appearance.

4. **Include** the text overlay.

5. The current pan and tilt positions show up in the live view image and in the recording.

PTZ (Pan Tilt Zoom)

Limit the pan, tilt, and zoom movements

As an example, you might need to protect the privacy of residents living in apartment buildings located close to a parking lot that you wish to surveil. To do this, you can limit the pan, tilt, and zoom movements, so that the view does not cover the apartment buildings. Go to **Settings > PTZ > Limits**.

About 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.

How to create a guard tour with preset positions

1. Go to **Settings > PTZ > Guard tours**

2. Click **+**.

3. Select **Preset position**.

4. To edit the guard tour's properties, click ⚙

5. Type a name for the guard tour and specify the pause length in minutes between each tour.

6. If you want the guard tour to go to the preset positions in a random order, turn on **Shuffle**.

7. Click **Done**.

8. Click **Add** to add the preset positions that you want in your guard tour.

9. Click **Done** to exit the guard tour settings.

10. To schedule the guard tour, go to **System > Events**.

About autotracking

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 product 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 using the PTZ control queue. In the control queue, guard tour has lower priority than autotracking, preventing the product from stopping autotracking to maintain or start a guard tour.
- Autotracking does not follow object behind privacy masks or objects in exclude areas. You can also set up maximum limits so that the autotracking only triggers within a certain range in the live view.

How to set up the wiper

1. Go to **Settings > System > Accessories**.

2. To set the duration of the wiper sequence in seconds, enter a value for the **Wiper dwell time**.

Note

The set value applies only to the wiper sequence and has no effect on how long the wiper operates as part of the washer sequence, if the optional washer is being used.

How to set up the washer

Note

The washer is optional.

1. Go to **Settings > System > I/O Ports**.

2. For the port used with the washer — set **Output** as the direction.

3. Now go to the **Live View**.

4. Use the joystick (or mouse) to position the washer nozzle in the center of the image.

5. Go to **Settings > System > Accessories**.

6. Set **Nozzle Position** to **ON**.

7. Select the pin (I/O port) the washer is connected to.

8. To set the duration of the the washer sequence in seconds, enter a value for the **Washer pump time**. The wiper starts when there is 5 seconds left of this time.

9. To set the duration of the wiper sequence in seconds, enter a value for the **Washer wiper time**.

The below table provides some examples of different washer-wiper sequence setups.

Time elapsed (seconds)	Washer pump time: 10 s Washer wiper time: 10 s	Washer pump time: 20 s Washer wiper time: 12 s
0	Washer starts	Washer starts
5	Wiper starts	—
10	Washer stops	—
15	Wiper stops	Wiper starts
20	—	Washer stops
22	—	Wiper stops

Streaming and storage

How to choose video compression format

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

Motion JPEG

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. Installing 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 the MPEG-4 standard. 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.

How to reduce bandwidth and storage

Important

> If you reduce the bandwidth it can result in loss of details in the picture.

1. Go to live view and select **H.264**.

2. Go to **Settings > Stream**.

3. Do one or more of the following:

   - Turn on the Zipstream functionality and select the desired level.

   - Turn on dynamic GOP and set a high GOP length value.

   - Increase the compression.

   - Turn on dynamic FPS.

How to set up network storage

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

1. Go to **Settings > System > Storage**.

2. Click **Setup** under **Network storage**.

3. Enter the IP address of the host server.

4. Enter the name of the shared location on the host server.

5. Move the switch if the share requires a login, and enter username and password.

6. Click **Connect**.

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.

How to record and watch video

To record video you must first set up network storage, see *How to set up network storage on page 16*, or have an SD card installed.

1. Go to the camera's live view.

2. Click on **Record** once to start recording and one more time to stop recording.

To watch your recording:

1. Click on **Storage > Go to recordings**.

2. Select your recording in the list and it will play automatically.

Events

Events

The event pages allow you to configure your product to perform actions when different events occur. For example, the product can start a recording or send an email notification when motion is detected. The set of conditions that defines how and when the action is triggered is called an action rule.

How to trigger an action

1. Go to **Settings > System > Events** to set up an action rule. The action rule defines when the camera will perform certain actions. Action rules can be setup as scheduled, recurring, or for example, triggered by motion detection.

2. Select what **Trigger** must be met to trigger the action. If you specify more than one trigger for the action rule, all of them must be met to trigger the action.

3. Select which **Action** the camera should perform when the conditions are met.

Note

If you make changes to an active action rule, the action rule needs to be restarted for the changes to take effect.

How to record video when the camera detects motion

This example explains how to set up the camera to start recording to the SD card five seconds before it detects motion and to stop one minute after.

Make sure the AXIS Video Motion Detection application is running:

1. Go to **Settings > Apps** > **AXIS Video Motion Detection**.

2. Start the application if it is not already running.

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

Create an action rule:

4. Go to **Settings > System > Events** and add an action rule.

5. Type a name for the action rule.

6. From the list of triggers, select **Applications** and then select **AXIS Video Motion Detection (VMD)**.

7. From the list of actions, select **Record video**.

8. Select an existing stream profile or create a new one.

9. Enable and set the pre-trigger time to 5 seconds.

10. Enable **While the rule is active**.

11. Enable and set the post-trigger time to 60 seconds.

17

12. Select **SD card** from the list of storage options.

13. Click **Ok.**

How to record video when a PIR detector senses motion

This example explains how to connect an Axis PIR detector to the camera, and set up the camera to start recording when the detector senses motion.

Required hardware

- 3-wire cable (ground, power, I/O)
- Axis PIR detector

NOTICE

Disconnect the camera from power before connecting the wires. Reconnect to power after all connections are done.
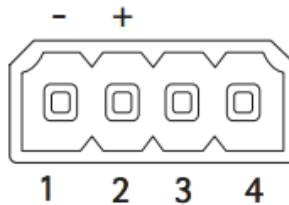
Connect the wires to the camera's I/O connector

Note

For information on the I/O connector, see *Connectors on page 26*

1. Connect the ground wire to pin 1 (GND/-).
2. Connect the power wire to pin 2 (12V DC output).
3. Connect the I/O wire to pin 3 (I/O input).

Connect the wires to the PIR detector's I/O connector

1. Connect the other end of the ground wire to pin 1 (GND/-).
2. Connect the other end of the power wire to pin 2 (DC input/+).
3. Connect the other end of the I/O wire to pin 3 (I/O output).

Configure the I/O port in the camera's webpage

1. Go to **Settings > System** > **I/O ports.**
2. Select **Input** in the **Port 1** drop-down list.
3. Give the input module a descriptive name.
4. To make the PIR detector send a signal to the camera when it senses motion, select **Closed circuit** in the drop-down list.

To trigger the camera to start recording when it receives a signal from the PIR detector, you need to create an action rule in the camera's webpage.

AXIS Q8685-LE PTZ Network Camera

Setup

How to 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 the AXIS Video Motion Detection application is running:

1. Go to **Settings > Apps** > **AXIS Video Motion Detection**.

2. Start the application if it is not already running.

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

Add a preset position:

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

Create an action rule:

5. Go to **Settings > System** > **Events > Action rules** and add an action rule.

6. Type a name for the action rule.

7. From the list of triggers, select **Applications** and then select **AXIS Video Motion Detection (VMD)**.

8. From the list of actions, select **PTZ Control** and then select **Preset Position**.

9. Select the preset position you want the camera to go to.

10. Click **Ok**.

How to automatically zoom in on a specific area 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 **Settings > 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:

4. Go to **Settings > Apps** and open AXIS Video Motion Detection.

5. Create a profile that covers the entrance of the gate and then save the profile.

Create an action rule:

6. Go to **Settings > System > Events** and add an action rule.

7. Name the action rule `Gatekeeper`.

8. From the trigger list, select **Applications** and then select the previously created motion detection profile.

9. From the action list, select the previously created preset position.

10. Click **OK**.

How to 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.

1. Go to **Settings > System** > **Detectors**.

2. Set shock detection to on, and set a value for the shock sensitivity.

Create an action rule:

3. Go to **Settings > System > Events** and add an action rule.

4. Type a name for the action rule.

5. From the list of triggers, select **Detectors** and then select **Shock detection**.

6. From the list of schedules, select **After Hours**.

7. From the list of actions, select **Send Video Clip**.

8. Select an existing stream profile or create a new one.

9. Enable and set the pre-trigger time to 5 seconds.

10. Enable **While the rule is active**.

11. Enable and set the post-trigger time to 60 seconds.

12. Select an existing recipient or create a new one.

13. Click **OK**.

How to direct the camera and open the lock to a gate when someone is nearby

This example explains how to direct the camera and open a gate when someone wants to enter during daytime. This is done by connecting a PIR detector to the product's input port and a switch relay to the product's output port.

Required hardware

- Mounted PIR detector

- Switch relay connected to the gate lock, in this case the switch is normally closed (NC)

- Connecting wires

Physical connection

1. Connect the wires from the PIR detector to the input pin, see *I/O connector on page 26*.

2. Connect the wires from the switch to the output pin, see *I/O connector on page 26*
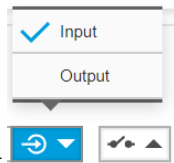
Configure I/O ports

You need to connect the switch relay to the camera from the camera's webpage. First, configure the I/O ports:
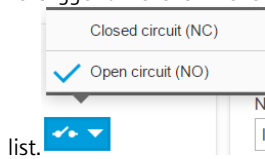
Set the PIR detector to an input port
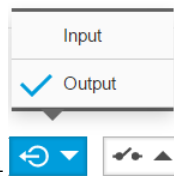
1. Go to **System > I/O ports**.

2. Select **Input** in the **Port 1** drop-down list.

3. Give the input module a descriptive name, for example "PIR detector".

4. To trigger an event whenever the PIR detector senses motion, select **Open circuit** in the drop-down
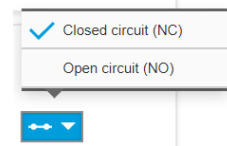list.

Set the switch relay to an output port

1. Go to **System > I/O ports**.

2. Select **Output** in the **Port 2** drop-down list.

3. Give the output module a descriptive name, for example "Gate switch".

4. To open the gate whenever an event is triggered, select **Closed circuit** in the drop-down list.

Create action rules

For the camera to open the gate when the PIR detector senses someone nearby, you need to create an action rule in the camera:

1. Go to **System > Events > Action rules**.

2. Click **Add**.

3. Give the action rule a name, for example "Open gate".

4. From the **Trigger** drop-down list, select **Input signal**.

5. Select **Digital input signal**.

6. Select "PIR detector", in this example connected to port 1.

7. Under **Actions**, select **Output port** from the **Type** drop-down list.

8. From the **Port** drop-down list, select "Gate switch" .

9. Click **Ok**.

10. Create another action rule with the name "Direct the camera to the gate"

11. Select the same input signal as before, but as action select the previously created "Gate entrance" preset position.

12. Click **Ok**.

Applications

Applications

AXIS Camera Application Platform (ACAP) is an open platform that enables third parties to develop analytics and other applications for Axis products. To find out more about available applications, downloads, trials and licenses, go to *axis.com/applications*

To find the user manuals for Axis applications, go to *axis.com*

Note

- Several applications can run at the same time but some applications might not be compatible with each other. Certain combinations of applications might require too much processing power or memory resources when run in parallel. Verify that the applications work together before deployment.

Troubleshooting

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

Reset to factory default settings

Important

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

Note

The installation and management software tools are available from the support pages on *axis.com/support/downloads*

To reset the product to factory default settings:

1. Disconnect power from the product.

2. Change the position of the factory default switch. For more information on how to access the switch, see the Installation Guide.

3. Re-connect power to the product.

It is also possible to reset parameters to factory default via the web interface. Go to **Setup > System Options > Maintenance** and click **Default**.

Check the current firmware

Firmware is the software that determines the functionality of network devices. One of your first actions when troubleshooting a problem should be to check the current firmware version. The latest version may contain a correction that fixes your particular problem.

To check the current firmware:

1. Go to the product's webpage.

2. Click on the help menu.

3. Click **About**.

Upgrade the firmware

Important

Preconfigured and customized settings are saved when the firmware is upgraded (provided that the features are available in the new firmware) although this is not guaranteed by Axis Communications AB.

Important

Make sure the product remains connected to the power source throughout the upgrade process.

Note

When you upgrade the product with the latest firmware, the product receives the latest functionality available. Always read the upgrade instructions and release notes available with each new release before upgrading the firmware. To find the latest firmware and the release notes, go to *axis.com/support/firmware*

1. Download the latest firmware file to your computer, available free of charge at *axis.com/support/firmware*

2. Log in to the product as an administrator.

3. Go to **Settings > System > Maintenance**. Follow the instructions on the page. When the upgrade has finished, the product restarts automatically.

AXIS Device Manager can be used for multiple upgrades. Find out more at *axis.com/products/axis-device-manager*

Technical issues, clues and solutions

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

Problems upgrading the firmware

Firmware upgrade failure	If the firmware upgrade fails, the product reloads the previous firmware. The most common reason is that the wrong firmware file has been uploaded. Check that the name of the firmware file corresponds to your product and try again.

Problems setting the IP address

The product is located on a different subnet	If the IP address intended for the product and the IP address of the computer used to access the product are located on different subnets, you cannot set the IP address. Contact your network administrator to obtain an IP address.
The IP address is being used by another device	Disconnect the Axis product from the network. Run the ping command (in a Command/DOS window, type `ping` and the IP address of the product): - If you receive: `Reply from <IP address>: bytes=32; time=10...` this means that the IP address may already be in use by another device on the network. Obtain a new IP address from the network administrator and reinstall the product. - If you receive: `Request timed out`, this means that the IP address is available for use with the Axis product. Check all cabling and reinstall the product.
Possible IP address conflict with another device on the same subnet	The static IP address in the Axis product 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 may be problems accessing the product.

The product cannot be accessed from a browser

Cannot log in	When HTTPS is enabled, ensure that the correct protocol (HTTP or HTTPS) is used when attempting to log in. You may need to manually type `http` or `https` in the browser's address field. If the password for the user root is lost, the product must be reset to the factory default settings. See *Reset to factory default settings on page 23*.
The IP address has been changed by DHCP	IP addresses obtained from a DHCP server are dynamic and may change. If the IP address has been changed, use AXIS IP Utility or AXIS Device Manager to locate the product on the network. Identify the product using its model or serial number, or by the DNS name (if the name has been configured). If required, a static IP address can be assigned 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 product must be synchronized with an NTP server. Go to **Settings > System > Date and time**

The product is accessible locally but not externally

Router configuration	Check that your router allows incoming data traffic to the Axis product. The router must support UPnP®.
Firewall protection	Check the Internet firewall with your network administrator.

Problems with streaming	
Multicast H.264 only accessible by local clients	Check if your router supports multicasting, or if the router settings between the client and the product need to be configured. The TTL (Time To Live) value may need to be increased.
No multicast H.264 displayed in the client	Check with your network administrator that the multicast addresses used by the Axis product are valid for your network.
	Check with your network administrator to see if there is a firewall preventing viewing.
Poor rendering of H.264 images	Ensure that your graphics card is using the latest driver. The latest drivers can usually be downloaded from the manufacturer's website.
Color saturation is different in H.264 and Motion JPEG	Modify the settings for your graphics adapter. Go to the adapter's documentation for more information.
Lower frame rate than expected	• See *Performance considerations on page 25*. • 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 product's webpage and set a capture mode that prioritizes frame rate. Changing the capture mode to prioritize frame rate might lower the maximum resolution depending on the product used and capture modes available.

Performance considerations

When setting up your system, it is important to consider how various settings and situations affect the performance. Some factors affect the amount of bandwidth (the bitrate) required, others can affect the frame rate, and some affect both. If the load on the CPU reaches its maximum, this also affects the frame rate.

The following factors are the most important to consider:

- High image resolution or lower compression levels result in images containing more data which in turn affects the bandwidth.

- Rotating the lens manually will result in better performance compared to rotating the image from the GUI.

- Access by large numbers of Motion JPEG or unicast H.264 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 Motion JPEG and H.264 video streams simultaneously affects both frame rate and bandwidth.

- 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.

Specifications

Specifications

To find the latest version of the product's datasheet, go to the product page at *axis.com* and locate **Support & Documentation**.

SD card slot

NOTICE

- Risk of damage to SD card. Do not 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. Do not remove the SD card while the product is running. Disconnect power before removal.

This product supports SD/SDHC/SDXC cards.

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

Connectors

Network connector

RJ45 Ethernet connector.

SFP connector.

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 V DC 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.

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 product's webpage.

A digital light sensor – For receiving a value of the ambient light intensity from an external light sensor. This is used to control the product's day and night functionality.
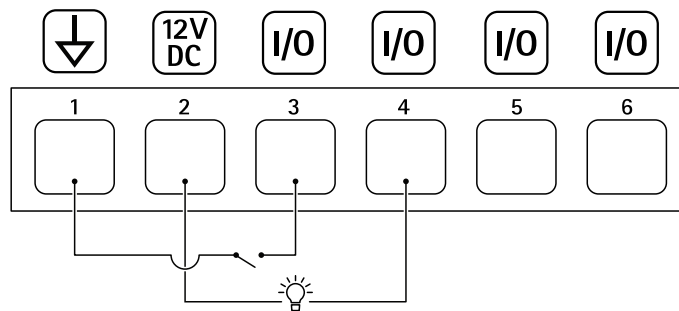
6-pin configurable terminal block
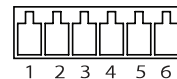
Example

Specifications

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

4-pin terminal block for power input.