AXIS Q1798–LE Network Camera

User Manual

AXIS Q1798-LE Network Camera
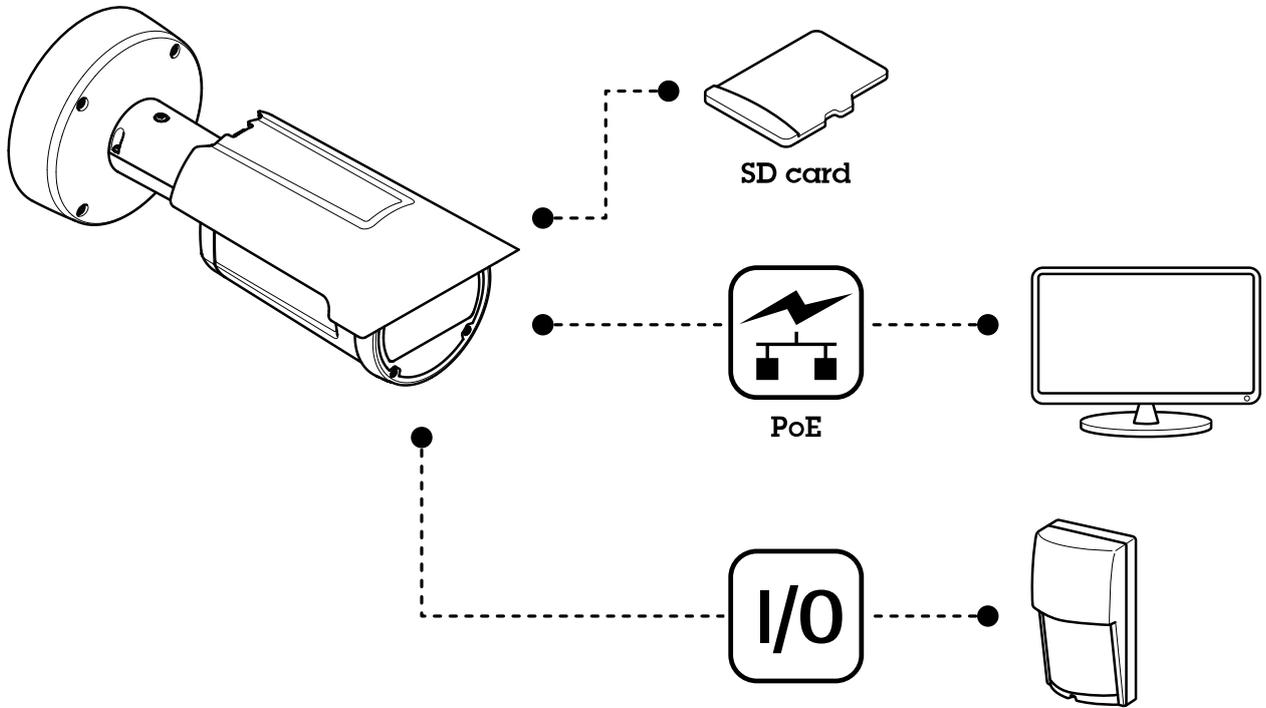
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Find the device on the network

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*.

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*.

Browser support

You can use the device with the following browsers:

	Chrome™	Firefox®	Edge®	Safari®
Windows®	recommended	x	x	
OS X®	recommended			x
Other operating systems	x	x		

If you need more information about recommended browsers, go to *axis.com/browser-support*.

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 4* .

3. The live view page opens in your browser.

Verify that no one has tampered with the firmware

To make sure that the device has its original Axis firmware, 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 26*.

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

2. Configure and install the device.

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 *Secure passwords on page 5* .

2. Retype the password to confirm the spelling.

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

Get started

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:

- 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.

Webpage overview

1   *Live view control bar*
2   *Live view*
3   *Product name*
4   *User information, color themes, and help*
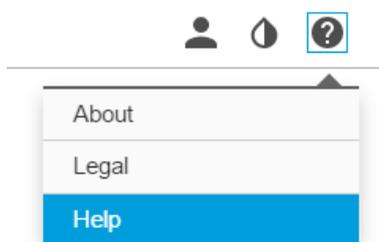5   *Video control bar*

6   Settings toggle
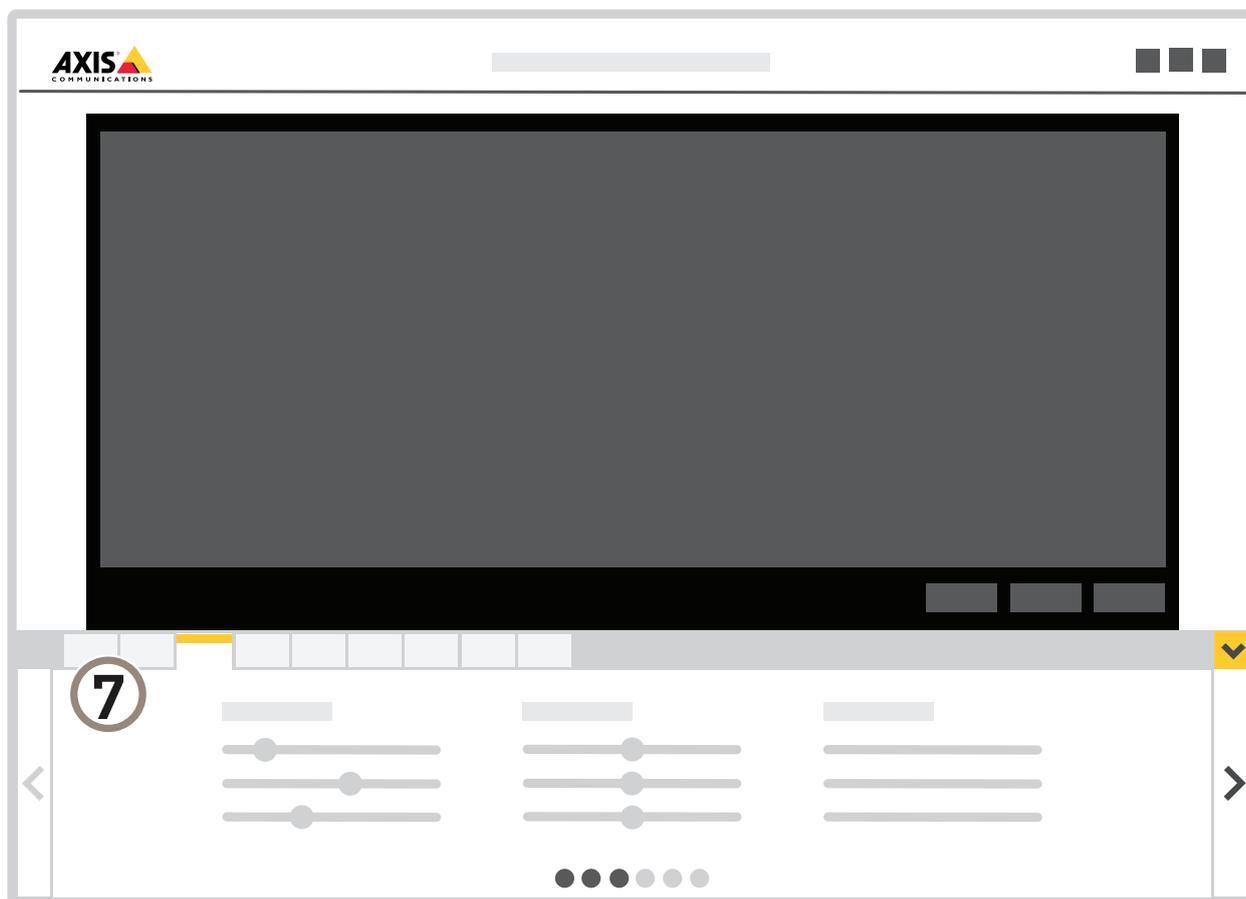
7   Settings tabs

Need more help?

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

Setup

Adjust the image

To find out more about what you can do with the image, see *Learn more on page 22*.

Level the camera

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

Adjust the focus

This product has three 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.

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 **M** and use the slider to set the focus.

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:

*   For most use cases, select **Automatic** exposure.

*   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.

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

Optimize IR illumination

In most cases, the exposure of the image is automatically adjusted to obtain optimal image quality. If the camera is placed close to a wall or a corner, it can sometimes result in saturation of parts of the image. When this happens, the LED's closest to the wall or corner are automatically dimmed to avoid saturating the image.

Depending on the installation environment and the conditions around the camera, for example external light sources in the scene, you can sometimes improve the IR illumination if you manually adjust the intensity of the LED's.

1. Go to **Settings > Image > Day and night**, and turn on **Allow IR illumination**.

2. Turn on **Live view control**.

3. Minimize **Settings**.

4. In the live view, click the **Illumination** button, turn on **IR light** and select **Manual**.

5. Adjust the intensity.

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. To determine at what light level you want the camera to shift to night mode, move the **Threshold** slider toward **Bright** or **Dark**.

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

Note

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

Reduce noise in low-light conditions

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

- Set the exposure mode to automatic.

Note

> A high max shutter value can result in motion blur.

- To slow down the shutter speed, set max shutter to the highest possible value.

- Reduce sharpness in the image.

- Set the max gain to a lower 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.

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.

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.

- Set the compression as low as possible.

- Select MJPEG streaming.

- Turn off Zipstream functionality.

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 > Wide dynamic range**.

2. If required, turn on 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*.

Stabilize a shaky image with Electronic Image Stabilization (EIS)

Electronic Image Stabilization (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 > Image correction**.

2. Turn on EIS.

Compensate for barrel distortion

Barrel distortion is a phenomenon where straight lines appear increasingly bent closer to the edges of the frame. A wide field of view often creates barrel distortion in an image. Barrel distortion correction compensates for this distortion.

Note

> Barrel distortion correction affects the image resolution and field of view.

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

2. Turn on **Barrel distortion correction (BDC)**.

3. Set the level of correction that gives you the best image.

Monitor long and narrow areas

Use corridor format to better utilize the full field of view in a long and narrow area, for example a staircase, hallway, road, or tunnel.
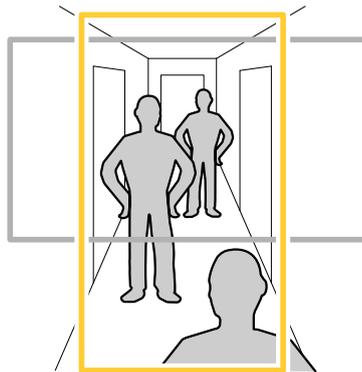
1. Depending on your device, turn the camera or the 3-axis lens in the camera 90° or 270°.

2. If the device doesn't rotate the view automatically, log in to the webpage and go to **Settings** > **System** > **Orientation**.

3. Click ⊡▲ .

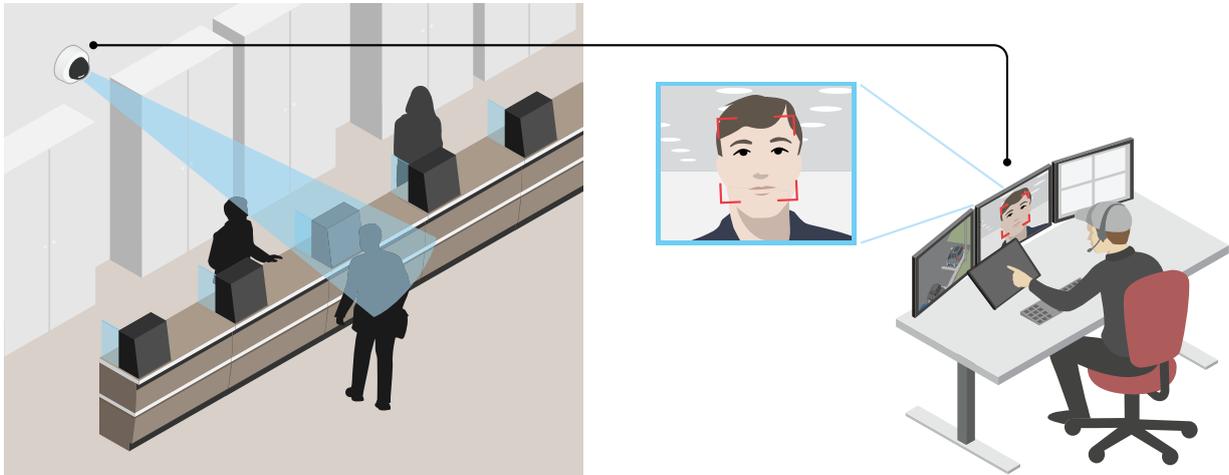4. Rotate the view 90° or 270°.

Find out more at *axis.com/axis-corridor-format*.

Improve 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. In the camera's live view, adjust the size and placement of the rectangle 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.

Improve 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

Optimize the image for traffic surveillance

To get the best possible image for traffic surveillance, use the AXIS Traffic Wizard in combination with the Traffic overview scene profile.

1. Go to **Settings > Apps > AXIS Traffic Wizard**.

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

3. To set up the application, click **Open**.

4. Select units (metric or imperial).

5. Enter the values for Road distance, Camera height, Vehicle distance and Max speed.

6. To make both dark and bright areas of the image visible, turn on WDR.

7. Set the level of low-light gain depending on the light conditions.

8. If external IR illumination is available, select the **Supplemental IR illumination** checkbox.

9. Click **Save**.

10. Go to **System** > **Orientation**.

11. Select **Traffic overview** under **Scene profile**.

12. Click **Done**.

Hide parts of the image with privacy masks

Create a privacy mask to hide a part of the image:

1. Go to **Settings > Privacy mask**.

2. Click **New**.

Show an image overlay

To add an image as an overlay in the video stream:

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

2. Click **Image list**.

3. Upload an image and click **Done**.

4. Click **Create overlay**.

5. Select **Image** and click **Create**.

6. Select the image from the drop-down list.

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

8. Click **Create**.

Show a text overlay in the video stream when the device detects motion

This example explains how to display the text "Motion detected" when the device 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. Select **Create overlay** and select **Text** overlay.

6. Enter #D in the text field.

7. Choose text size and appearance.

8. To position the text overlay, choose **Custom** or one of the presets.

Create an action rule:

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

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

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

12. Type "Motion detected".

13. Set the duration.

Note

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

To learn more about different pan, tilt, and zoom settings, see .

Limit the zoom 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, go to **Settings > PTZ > Limits**.

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 **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**.

View and record video

To learn more about settings for viewing and recording video, see *Streaming and storage on page 24*.

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.

   Note

   The zipstream settings are used for both H.264 and H.265.

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

   - Increase the compression.

   - Turn on dynamic FPS.

Note

Web browsers do not support H.265 decoding. Use a video management system or application supporting H.265 decoding.

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**.

Record and watch video

To record video you must first set up network storage, see *Set up network storage on page 14*, 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.

Set up rules and alerts

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 when it records.

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Setup

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.

Note

If you change the definition of a stream profile that is used in a rule, then you need to restart all the rules that use that stream profile.

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:

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

2. Type a name for the action rule.

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

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

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

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

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

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

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

10. Click **Ok**.

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.
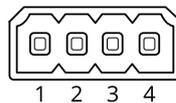
Connect the wires to the camera's I/O connector

Note

For information on the I/O connector, see *Connectors on page 32*.

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.

Record video when the camera detects loud noises

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

Note

The following instructions require that a microphone is connected to audio-in.

Turn on audio:

1. Set up the stream profile to include audio, see *Add audio to your recording on page 21*.

Set up audio detection:

2. Go to **Settings > System > Detectors > Audio detection**.

3. Adjust the alarm level according to your needs.

Create a rule:

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

5. Type a name for the rule.

6. In the list of triggers, select **Detectors** and then select **Audio Detection**.

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

8. Select the stream profile where audio has been turned on 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 **SD card** from the list of storage options.

13. Click **OK**.

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**.

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

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

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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 **Settings > System > I/O Ports**.

3. Go to **Settings > 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 stream profile or create a new. Also set duration 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 **Output port**, and then select the port the AXIS I/O Indication LED is connected to. Set the state to**Active** and set duration as required.

11. 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.

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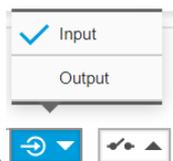
2. Select **Input** in the **Port 1** drop-down list.

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
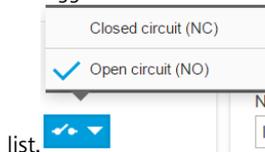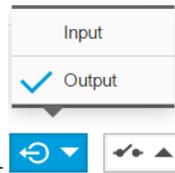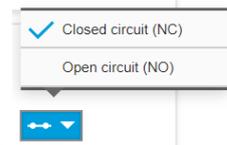

list.

Set the switch relay to an output port

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

Setup

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 rules

For the camera to open the gate when the PIR detector senses someone nearby, you need to create a 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. In the **Trigger** drop-down menu, 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 menu.

8. In the **Port** drop-down menu, 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.
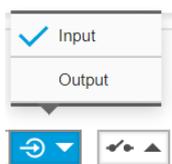
12. Click **Ok**.

Set up intrusion alarm

Before you start

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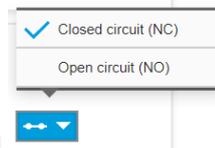
Configure the input port

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

2. For **Port 1**:

2.1 Select **Input** in the drop-down menu .

2.2 Select **Closed circuit (NC)** in the drop-down menu .

Create a rule

1. Go to **Settings > System > Events** and create an action rule.

2. Type a name for the action rule.

3. From the **Trigger** drop-down list, select **Input signal** and **Digital Input Port**.

4. Set **Active** to **Yes**.

5. From the **Schedule** drop-down list, select **Send Notification** and select a recipient or create a new recipient.

6. Click **OK**.

Detect tampering with input signal

This example explains how to trigger an alarm when the input signal has been cut or short-circuited. For more information about the I/O connector, see *page 33*.

1. Go to **Settings > System > I/O Ports** and turn on **Supervised I/O** for one of the ports.

Create an action rule:

1. Go to **Settings > System > Events** and create an action rule.

2. Type a name for the action rule.

3. From the list of triggers, select **Input Signal** and then **Supervised input port**. Set **Tampered** to **Yes**.

4. From the list of schedules, select **Always**.

5. From the list of actions, select **Send Notification** and then select a recipient or create a new recipient.

6. Click **OK**.

Send an email automatically if someone spray paints the lens

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

2. Turn on **Trigger on dark images**. This will trigger an alarm if the lens is sprayed, covered, or rendered severely out of focus.

3. Set a duration for **Trigger after**. The value indicates the time that must pass before an email is sent.

Create an action rule:

1. Go to **Events > Action rules** and add an action rule.

2. Enter a name for the action rule.

3. From the list of triggers, select **Detectors** and then select **Tampering**.

4. From the list of actions, select **Send Notification** and then select a recipient from the list or click **New Recipient** to create a new recipient.

5. Enter name and address for the email.

6. Click **Ok**.

Add audio

Add audio to your recording

Edit the stream profile which is used for the recording:

1. Go to **Settings > Stream** and click **Stream profiles**.

2. Select the stream profile and click **Audio**.

3. Select the checkbox and select **Include**.

4. Click **Save**.

5. Click **Close**.

Learn more

Cleaning recommendations

If the camera gets grease stains or becomes heavily soiled, you can clean it with mild, solvent-free soap or detergent.

⚠WARNING

Never use harsh detergent, for example gasoline, benzene or acetone.

1. Use a can of compressed air to remove any dust or loose dirt from the device.

2. Clean the device with a soft cloth dampened with mild detergent and lukewarm water.

3. Wipe carefully with a dry cloth.

Note

Avoid cleaning in direct sunlight or at elevated temperatures, as this may cause stains when the water droplets have dried.

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 on *axis.com/technologies/fiber-optics*.

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

Image quality

Remote focus and zoom

The remote focus and zoom functionality allows you to make focus and zoom adjustments to your camera from a computer. It is a convenient way to ensure that the scene's focus, viewing angle and resolution are optimized without having to visit the camera's installation location.

Left: no focus. Right: remote focus applied.

Left: no zoom. Right: remote zoom applied.

Privacy masks

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.

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

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

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. You can add either text or an image.

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.

Streaming and storage

Bitrate control

By setting the bitrate control you can manage the bandwidth consumption for your video stream.

Variable bitrate (VBR)
With variable bitrate the bandwidth varies based on the level of activity in the scene. The more activity in the scene, the more bandwidth is required. This option guarantees that image quality is constant but requires storage margins.

Maximum bitrate (MBR)
The maximum bitrate option allows you to set a target bitrate value to be able to handle system bitrate limitations. To keep the instantaneous bitrate below the specified target bitrate, there may be a decrease in image quality or the frame rate may decrease. You have the option to prioritize either image quality or frame rate. It is recommended to configure the target bitrate higher than the expected bitrate to have margins for additional complexity that needs to be captured.

Average bitrate (ABR)
With average bitrate, the bitrate is automatically adjusted over a longer timescale to meet the specified target and provide the best quality on the video stream based on available storage. Image quality is decreased uniformly. You can still get good image quality when there is activity in the scene. The average bitrate option allows you to 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:

- Set the target bitrate and the retention time to calculate the estimated storage need.

- Use the target bitrate calculator to calculate the average bitrate, based on available storage and desired retention time.

You have also the option to turn on maximum bitrate to specify a bitrate limit.

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 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.

H.265 or MPEG-H Part 2/HEVC

Note

H.265 is licensed technology. The Axis product includes one H.265 viewing client license. To install additional unlicensed copies of the client is prohibited. To purchase additional licenses, contact your Axis reseller.

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.

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. A reset to factory default resets all settings, including the IP address, to the factory default values.

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 30*.

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. The product has been reset to the factory default settings. If no DHCP server is available on the network, the default IP address is `192.168.0.90`.

5. Use the installation and management software tools to assign an IP address, set the password, and access the video stream.

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

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

Firmware options

Axis offers product firmware 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 firmware 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 product firmware strategy, go to *axis.com/support/firmware*.

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 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 upgrading the firmware. To find the latest firmware and the release notes, go to *axis.com/support/firmware*.

1. Download the 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 device 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 device and try again.
Problems after firmware upgrade	If you experience problems after a firmware upgrade, roll back to the previously installed version from the **Maintenance** page.

Problems setting the IP address

The device is located on a different subnet	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 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 device from the network. Run the ping command (in a Command/DOS window, type `ping` and the IP address of the device): - 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 device. - 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.
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 may be problems accessing the device.

The device 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 device must be reset to the factory default settings. See *Reset to factory default settings on page 26*.
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 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, a static IP address can be assigned manually. For instructions, go to *axis.com/support*.

The device is accessible locally but not externally

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

- AXIS Companion: free of charge, ideal for small systems with basic surveillance needs.
- AXIS Camera Station: 30-day trial version free of charge, ideal for small to mid-size systems.

For instructions and download, go to *axis.com/products/axis-companion*.

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 device 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 device 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 28*. - 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.
Can't select H.265 encoding in live view	Web browsers do not support H.265 decoding. Use a video management system or application supporting H.265 decoding.

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 image in the GUI will increase the product's CPU load.

- 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.

Need more help?

Useful links

- *How to assign an IP address and access your device*

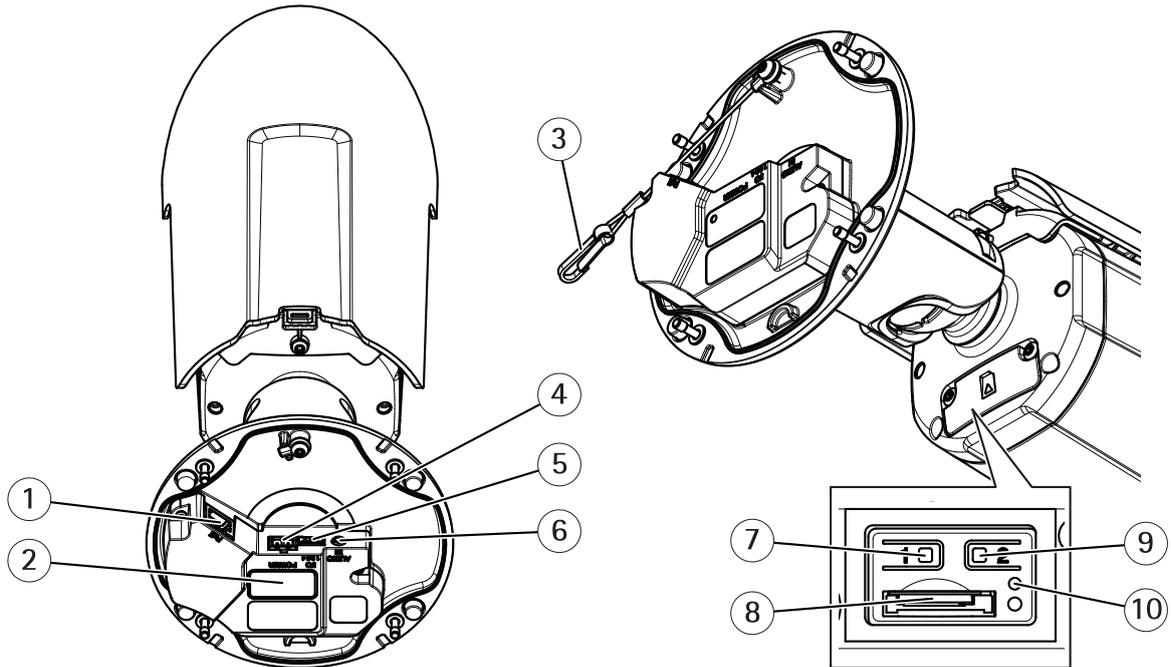### Contact support

Contact support at *axis.com/support*.

AXIS Q1798-LE Network Camera

Specifications

Specifications

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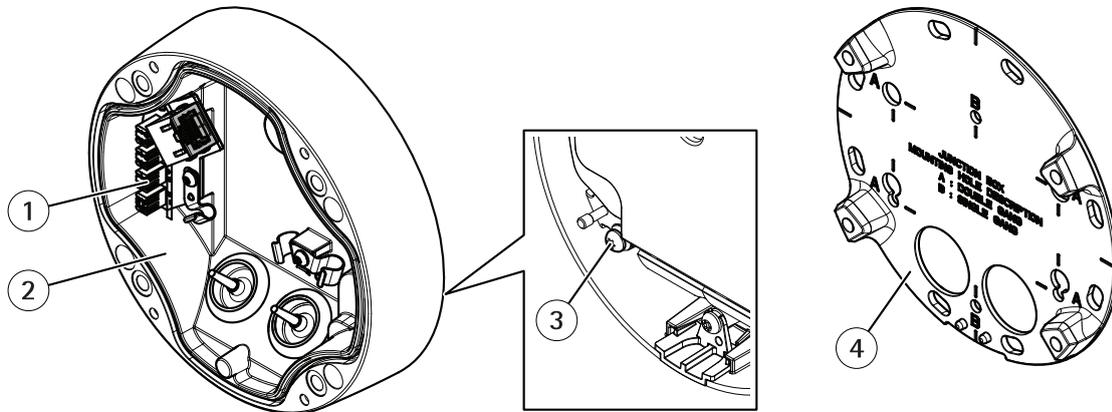
Product overview

1	Network connector
2	Part nu mber (P/N) & Serial number (S/N)
3	Safety wire
4	Power connector
5	I/O connector
6	Audio connector
7	Control button
8	microSD card slot
9	Function button
10	Status LED indicator

Specifications

1 IDC network connector
2 Foot
3 Grounding screw
4 Mounting plate

LED indicators

Status LED	Indication
Unlit	Connection and normal operation.
Green	Shows steady green for 10 seconds for normal operation after startup completed.
Amber	Steady during startup. Flashes during firmware upgrade or reset to factory default.
Amber/Red	Flashes amber/red if network connection is unavailable or lost.

Buzzer

Buzzer signal for leveling assistant

For information on the function button used for leveling the camera, see *page 32*.

Press and hold the function button for more than two seconds to level the camera.

- When the camera is level, the beep is continuous.

- When the camera is not level, the beep occurs at slow intervals.

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. Unmount the SD card from the product's webpage before removal.

This product supports microSD/microSDHC/microSDXC cards.

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

Specifications

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:

- Resetting the product to factory default settings. See *Reset to factory default settings on page 26*.

- 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.

Function Button

The function button has multiple functions:

- **As leveling Assistant** – This function helps to ensure the camera is level. Press the button for about 3 seconds to start the leveling assistant and press again to stop. The status LED (see) and buzzer signal assist leveling of the camera. The camera is level when the buzzer beeps continuously.

- **To view the Status LED** – Press the button once to light up the Status LEDs. Press again to turn them off. The LEDs will turn off automatically after 10 seconds.

Connectors

Network connector

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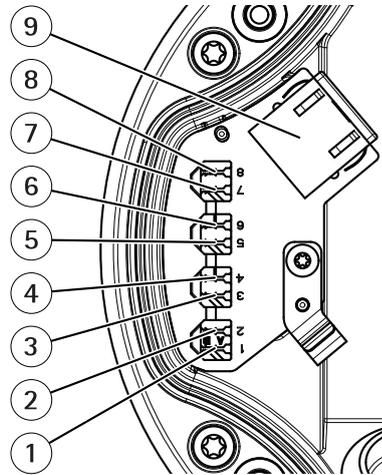
IDC connector

Use the insulation-displacement connector (IDC) to connect a network cable without an RJ45-connector.

Note

When using the IDC connector, connect a patch cable between the patch cable connector on the foot and the network connector on the camera assembly.

1–8 IDC connectors
9   Patch cable connector

Pin assignment

Position	T586A	T586B
1	Blue and white	Blue and white
2	Blue	Blue
3	Orange and white	Green and white
4	Orange	Green
5	Green and white	Orange and white
6	Green	Orange
7	Brown and white	Brown and white
8	Brown	Brown

Audio connector

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

	1 Tip	2 Ring	3 Sleeve
Audio Input	Microphone/Line in	Microphone bias voltage	Ground

For audio in, the left channel is used from a stereo signal.

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.
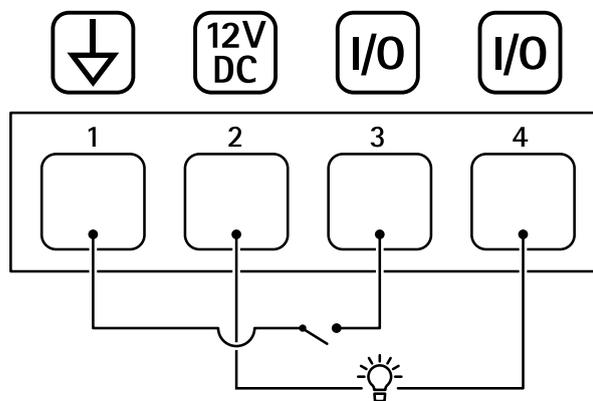
33

Specifications

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.

4-pin terminal block
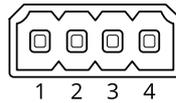
Example

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

Power connector

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.