

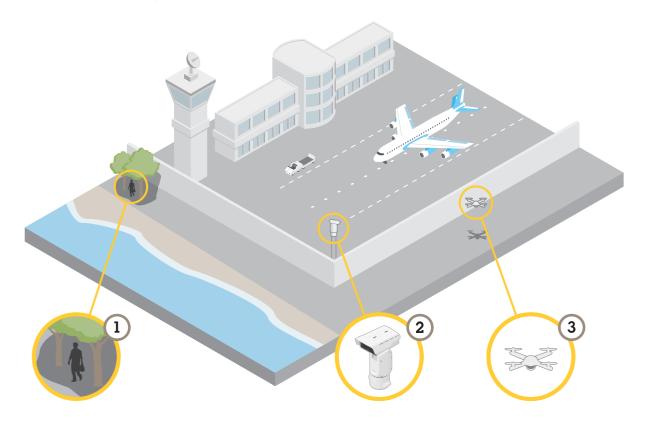
## Table of Contents

Solution overview	3
Get started	4
Find the device on the network	4
Access the device	4
Webpage overview	6
Additional settings	8
Adjust the image	8
Adjust the camera view (PT7)	10
view and record video	11
Set up rules and alerts	13
Cleaning recommendations	15
Set up daily cleaning of the visual window	15
Learn more	16
Color palettes	16
Privacy masks	16
Pan, tilt, and zoom (PTZ)	16
Streaming and storage	16
_ Applications	18
Troubleshooting	19
Reset to factory default settings	19
Firmware options	20
Check the current firmware	20
Ungrade the firmware	20
Upgrade the firmware	21
Performance considerations	21
	22
Contact support	23
Specifications	
Product overview	23
LED indicators	24
SD card slot	25
Buttons	25
Connectors	25

## Solution overview

## Solution overview

The AXIS Q87 Bispectral PTZ Network Camera is intended for mission-critical surveillance that demands 24-hour monitoring of restricted areas, such as airports.



In difficult lighting conditions, the thermal channel can detect objects (1) that the visual channel can't. To take advantage of this, you can set up the thermal channel to automatically detect motion, and send a signal to the visual channel to zoom in and record. To find out more, go to page 13.

The camera (2) is often installed in inaccessible locations. With the built-in wiper and optional washer you can remove, for example, sea salt from the front window without physically accessing the camera. To find out more, go to Set up daily cleaning of the visual window on page 15.

Thanks to the wide tilt range you can, for example, detect various flying objects (3).

### Get started

#### Get started

#### Find the device on the network

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

For more information about how to find and assign IP addresses, see the document How to assign an IP address and access your device.

#### **Browser support**

You can use the device with the following browsers:

	Chrome <sup>TM</sup>	Firefox <sup>®</sup>	Edge <sup>®</sup>	Safari <sup>®</sup>
Windows®	recommended	х	Х	
macOS <sup>®</sup>	recommended			х
Other operating systems	х	х		

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.
- 2. Enter the username and password. If you access the device for the first time, you must set the root password. See Set a new password for the root account on page 4.

#### 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 19.
- After the reset, secure boot guarantees the state of the device.
- 2. Configure and install the device.

#### Set a new 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



To watch this video, go to the web version of this document.

www.axis.com/products/online-manual/53779

## 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.

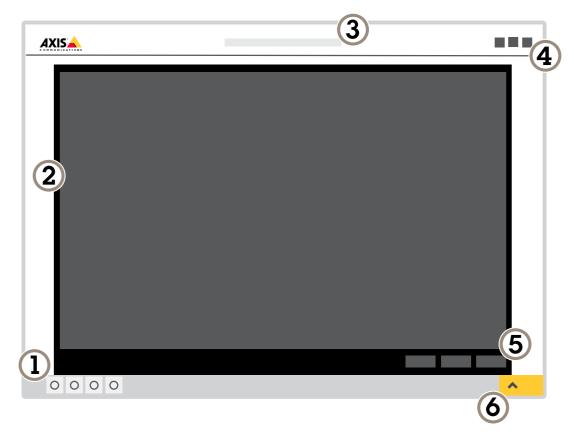
The device password is the primary protection for your data and services. Axis devices do not impose a password policy as they may be used in various types of installations.

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.

## Get started

# 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

## Get started



7 Settings tabs

## Additional settings

## Additional settings

## Adjust the image

If you want to know more about different image settings, see Learn more on page 16.

#### Select exposure mode

#### Note

The exposure modes are only available for the visual channel.

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.

#### Hide parts of the image with privacy masks

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

- 1. Go to Settings > Privacy mask.
- 2. Click New.
- 3. Adjust the size, color, and name of the privacy mask according to your needs.



To watch this video, go to the web version of this document.

www.axis.com/products/online-manual/53779

How to create a privacy mask

## Additional settings



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www.axis.com/products/online-manual/53779

How to change the appearance of the mask

## Reduce noise in low-light conditions

Note

Low-light settings are only available for the visual channel.

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

- Adjust the trade-off between noise and motion blur. Go to Settings > Image > Exposure and move the Blur-noise trade-off slider toward Low noise.
- 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.
- Open the aperture.

### Handle scenes with strong backlight

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



Image without WDR.

## Additional settings



Image with WDR.

#### Note

- WDR can cause artifacts in the image.
- WDR may not be available for all capture modes.
- 1. Go to Settings > Image > Wide dynamic range.
- 2. Turn on WDR.
- 3. If you still have problems, go to Exposure and adjust the Exposure zone to cover the area of interest.

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

#### Use external illumination when it's dark

The visual channel uses visible light to deliver color images during the day. With external illuminators, the visual channel can be used also during the night. To turn on the illuminators when it gets dark and turn them off when it gets light:

- 1. Go to Settings > System > Accessories.
- 2. Under External illuminators, select the type of light coming from each of the illuminators.
- 3. Turn on Use illuminators.
- 4. Go to Image > Day and night and make sure that the IR-cut filter is set to Auto.
- 5. To determine at what light level you want the illuminators to turn on and off, move the Threshold slider toward Bright or Dark.
- 6. Turn on Allow illumination and Synchronize illumination.

## Adjust the camera view (PTZ)

To learn more about different pan, tilt, and zoom settings, see Pan, tilt, and zoom (PTZ) on page 16.

## Limit the pan, tilt, and zoom movements

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

### Create a quard 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.

## Additional settings

- 2. Click +.
- 3. To edit the guard tour's properties, click
- 4. Type a name for the guard tour and specify the pause length in minutes between each tour.
- 5. If you want the guard tour to go to the preset positions in a random order, turn on Shuffle.
- 6. Click Done.
- 7. Click Add to add the preset positions that you want in your guard tour.
- 8. Click Done to exit the guard tour settings.
- 9. To schedule the guard tour, go to System > Events.



To watch this video, go to the web version of this document.

www.axis.com/products/online-manual/53779

### View and record video

To learn more about settings for viewing and recording video, see Streaming and storage on page 16.

## Insert an SD card

You can use an SD card to store recordings locally in the device. The SD card is not included.

#### **▲**CAUTION

- Risk of injury. Moving parts. Keep your body parts away from the device when in operation. Disconnect from power supply before installing or performing maintenance on the device.
- Risk of injury. Hot surface. Do not touch the device when in operation. Disconnect from power supply and allow the surfaces to cool before performing maintenance on the device.

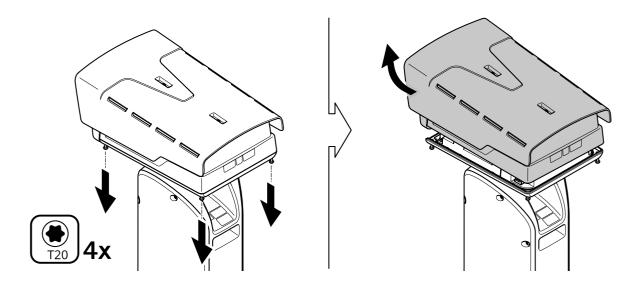
#### NOTICE

When you remove the top cover you expose parts of the camera that are sensitive to impact. Make sure you don't hit the unprotected camera with the top cover when you remove it.

To insert an SD card in the device:

1. Disconnect power from the device.

## Additional settings



- 2. Loosen the four top cover screws and remove the top cover.
- 3. Insert the SD card. To find out where the SD card slot is placed, see Product overview on page 23.
- 4. Put back the top cover and tighten the screws (torque 2.0 Nm).
- 5. Reconnect power to the device.

### 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:

#### 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.

## Additional settings

- 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 12, or have an SD card installed.

#### Record video

- 1. Go to the live view.
- 2. To start a recording, click Record. Click again to stop the recording.

#### Watch video

- 1. Click 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.

#### Trigger an action

- 1. Go to Settings > System > Events to set up a rule. The rule defines when the device will perform certain actions. Rules can be setup as scheduled, recurring, or for example, triggered by motion detection.
- 2. Select the Condition that must be met to trigger the action. If you specify more than one condition for the rule, all of the conditions must be met to trigger the action.
- 3. Select which Action the device should perform when the conditions are met.

#### Note

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

#### Detect motion with the thermal channel and zoom in and record with the visual channel

In difficult lighting conditions the thermal channel can detect objects that the visual sensor can't. This example explains how to use the thermal channel to detect motion, and then use the visual channel to zoom in and record. In the example, the camera monitors a gate.

#### Create a motion detection profile:

#### Note

If you run AXIS Motion Guard on both channels simultaneously, it can affect the frame rate and the general performance. Therefore, we recommend you to remove all AXIS Motion Guard profiles on the visual channel.

- 1. Go to Settings > Apps and open AXIS Video Motion Detection.
- 2. Select Thermal.
- 3. Create a profile named Gate profile that covers the area of interest. Find out more in the user manual for AXIS Motion Guard at axis.com/products/online-manual/.

#### Create the preset positions:

## Additional settings

- 1. Go to Settings > PTZ > Preset positions.
  - Both channels share the same preset configurations.
- 2. Create the home position that includes the area of interest.
- 3. Create a zoomed-in preset position, called Gate position, that covers the area in the image where you predict that the moving object will appear.

#### Create a rule to zoom in with the visual channel when the thermal channel detects motion:

- 1. Go to Settings > System > Events and add a rule.
- 2. Name the rule Gatekeeper.
- 3. In the list of conditions, under Applications, select Motion Guard: Gate profile (Thermal).
- 4. In the list of actions, under Preset positions, select Go to preset position.
- 5. Under Video channel, select Camera 1.
- 6. Under Preset position, select Gate position.
- 7. Select **Home timeout** and set the duration for the camera to stay in the gate position (wait at least 30 seconds before returning to home position).
- 8. Click Save.

#### Create a rule to record video to the SD card:

- 1. Create a rule and name it Record video.
- 2. In the list of conditions, under PTZ, select PTZ preset position reached: Camera 1.
- 3. Under Preset position, select Gate position.
- 4. In the list of actions, under Recordings, select Record video while the rule is active.
- 5. Under Camera, select Camera 1.
- 6. Under Storage, select SD card.
- 7. Click Save.

## Cleaning recommendations

## Cleaning recommendations

## Set up daily cleaning of the visual window

The camera is often installed in inaccessible locations. This example explains how you can set up the built-in wiper and optional washer to remove for instance sea salt, from the visual window daily without physically accessing it.

#### Configure the washer:

- 1. Point the camera at the nozzle. Make sure that the nozzle is located in the center of the image.
- 2. Go to Settings > System > Accessories.
- 3. Turn on Nozzle Position.
- 4. Select the washer pump pin that the washer is connected to.

#### Set up daily cleaning:

- 1. Go to Settings > System > Events > Schedules and add a new schedule.
- 2. Select Schedule and click Create.
- 3. Give the schedule a name, for example Wash.
- 4. Under Repeat, select Daily.
- 5. Set Start time: 12:00 and End time: 12:01.
- 6. Select all Days.
- 7. Click Save.
- 8. Click Rules and create a new rule.
- 9. Give the rule a name, for example Window wash.
- 10. In the list of conditions, under Scheduled and recurring, select Scheduled event.
- 11. In the list of schedules, select Wash
- 12. In the list of actions, under Washer, select Use washer.

### Learn more

#### Learn more

## Color palettes

Color palettes applied to thermal images help the human eye distinguish image details. The colors in the palette are artificially created pseudocolors that emphasize temperature differences.

The product has several color palettes to choose from. If an operator watches the video stream, you can choose any of the palettes. If the video stream is only used by applications, select the white-hot palette.

### Privacy masks

#### Note

Privacy masks are only available for the visual channel.

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

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.

### Pan, tilt, and zoom (PTZ)

#### **Guard tours**

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

### Streaming and storage

#### Video compression formats

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

#### Motion JPEG

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.

#### Learn more

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.

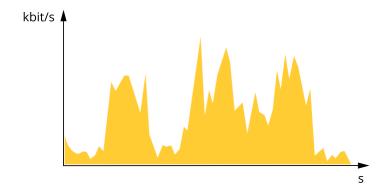
The **Stream profiles** settings override the settings from the **Stream** tab. If you request a stream with a specific stream profile, the stream contains the settings of that profile. If you request a stream without specifying a stream profile, or request a stream profile that doesn't exist in the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

#### Bitrate control

With bitrate control, you can manage the bandwidth consumption of your video stream.

#### Variable bitrate (VBR)

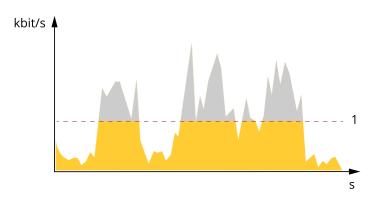
With variable bitrate, the bandwidth consumption varies based on the level of activity in the scene. The more activity in the scene, the more bandwidth you need. You are guaranteed constant image quality but it requires storage margins.



#### Maximum bitrate (MBR)

With maximum bitrate, you can set a target bitrate to handle bitrate limitations in your system. You may see a decline in image quality or frame rate when the instantaneous bitrate is kept below the specified target bitrate. You can choose to either prioritize image quality or frame rate. We recommend that you configure the target bitrate to a higher value than the expected bitrate. This gives you a margin for additional complexity that needs to be captured.

#### Learn more



1 Target bitrate

## **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.



How to download and install an application

## Troubleshooting

## Troubleshooting

## Reset to factory default settings

#### **▲**CAUTION

- Risk of injury. Moving parts. Keep your body parts away from the product when in operation. Disconnect from power supply before installing or performing maintenance on the product.
- Risk of injury. Hot surface. Do not touch the product when in operation. Disconnect from power supply and allow the surfaces to cool before performing maintenance on the product.

### NOTICE

When you remove the top cover you expose parts of the visual camera that are sensitive to impact. Make sure you don't hit the unprotected camera with the top cover when you remove it.

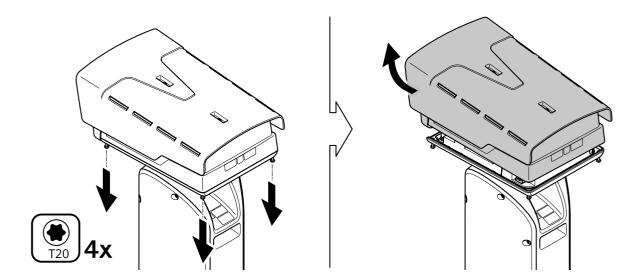
#### Important

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

#### Note

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

1. Disconnect power from the product.



- 2. Loosen the four top cover screws and remove the top cover.
- 3. Press the control button. To find out where the control button is placed, see *Product overview on page 23*
- 4. Put back the top cover and tighten the screws (torque 2.0 Nm).
- 5. Reconnect power to the product.

You can also reset to factory default through the product's web page. Go to Settings > System > Maintenance and click Default.

## **Troubleshooting**

## 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.



To watch this video, go to the web version of this document.

www.axis.com/products/online-manual/53779

## **Troubleshooting**

### 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 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 .

The IP address has been changed by DHCP

#### 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/vms.

#### 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.

## Troubleshooting

- 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.
- Running multiple AXIS Camera Application Platform (ACAP) applications on the Visual and Thermal channels simultaneously may affect the frame rate and the general performance.

## Contact support

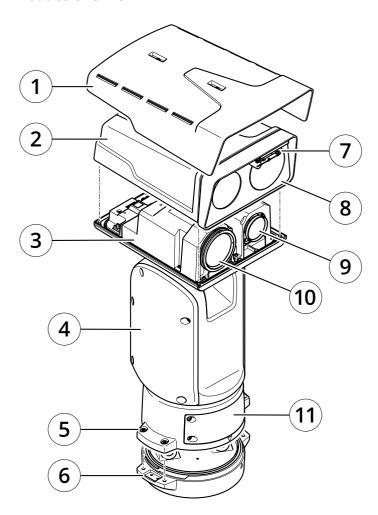
Contact support at axis.com/support.

## **Specifications**

## Specifications

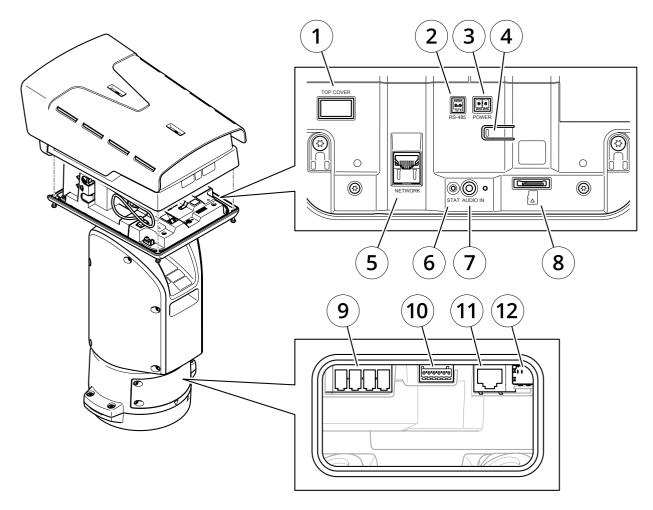
To find the latest version of the product's datasheet, go to the product page at axis.com and locate Support & Documentation.

## **Product overview**



- 1 Weathershield
- 2 Top cover
- 3 Inner cover
- 4 Positioning unit
- 5 Base unit screws
- 6 Base unit
- 7 Wiper
- 8 Front with protective foil
- 9 Visual lens
- 10 Thermal lens
- 11 Lid

## **Specifications**



- 1 Top cover connector
- 2 RS485 connector
- 3 Power connector
- 4 Control button
- 5 RJ45 connector
- 6 Status LED
- 7 Audio IN 3.5 mm connector
- 8 SD card slot (microSD, card not included)
- 9 Input power connector
- 10 I/O connector
- 11 RJ45 connector
- 12 SFP slot for SFP module (not included)

## **LED** indicators

Status LED	Indication	
Unlit	Normal operation	
Green	Steady during startup	
Amber	Steady during startup. Flashes during firmware upgrade or reset to factory default.	

## Specifications

Amber/Red	Flashes amber/red if network connection is unavailable or lost.
Red	Firmware upgrade failure.

### SD card slot

#### **▲**CAUTION

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

#### **▲**CAUTION

Risk of injury. Hot surface. Do not touch the product when in operation. Disconnect from power supply and allow the surfaces to cool before performing maintenance on the product.

#### NOTICE

- Risk of damage to SD card. 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.

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 19.

### **Connectors**

#### **Network connector**

RJ45 Ethernet connector.

SFP connector.

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



## Specifications

#### Audio input

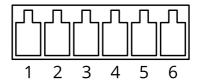
1 Tip	2 Ring	3 Sleeve
Digital signal	Ring power if selected	Ground

### 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:

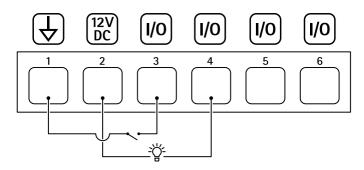
Digital input – For connecting devices that can toggle between an open and closed circuit, for example PIR sensors, door/window contacts, and glass break detectors.

**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.



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

#### Example



- 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

## **Specifications**

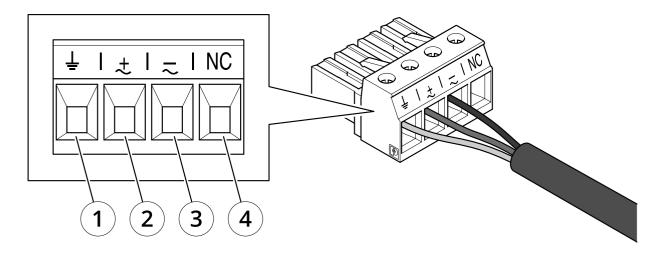
#### **Power connector**

4-pin terminal block for power input.

## 24 V AC/DC power connector

## NOTICE

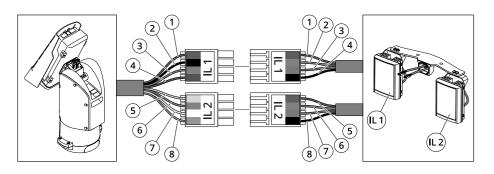
This section is valid for products powered by 24 V AC and 24 V DC only.



This table is only valid for the 24 V AC and the 24 V DC power connectors.

Position	24 V AC	24 V DC
1	Protective earth	Protective earth
2	24 V AC Phase	+ 24 V
3	24 V AC Neutral	0 V
4	Not connected	Not connected

## Illuminator connectors



# Specifications

	Position	Cable color (positioning unit)	Cable color (illuminators)	Description
	1	Red	Red	+24V IL
	2	Black	Orange	IL1 +VE
IL1	3	Gray	Purple	IL1 -VE
	4	Blue	Black	GND
IL2	5	Yellow	Red	+24V IL
	6	Orange	Orange	IL2 +VE
	7	White	Purple	IL2 -VE
	8	Green	Black	GND

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