AXIS M30 Network Camera Series

    AXIS M3015 Network Camera

    AXIS M3016 Network Camera

    ExCam XF M3016 Explosion-protected Camera

User Manual

AXIS M30 Network Camera Series

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About this manual

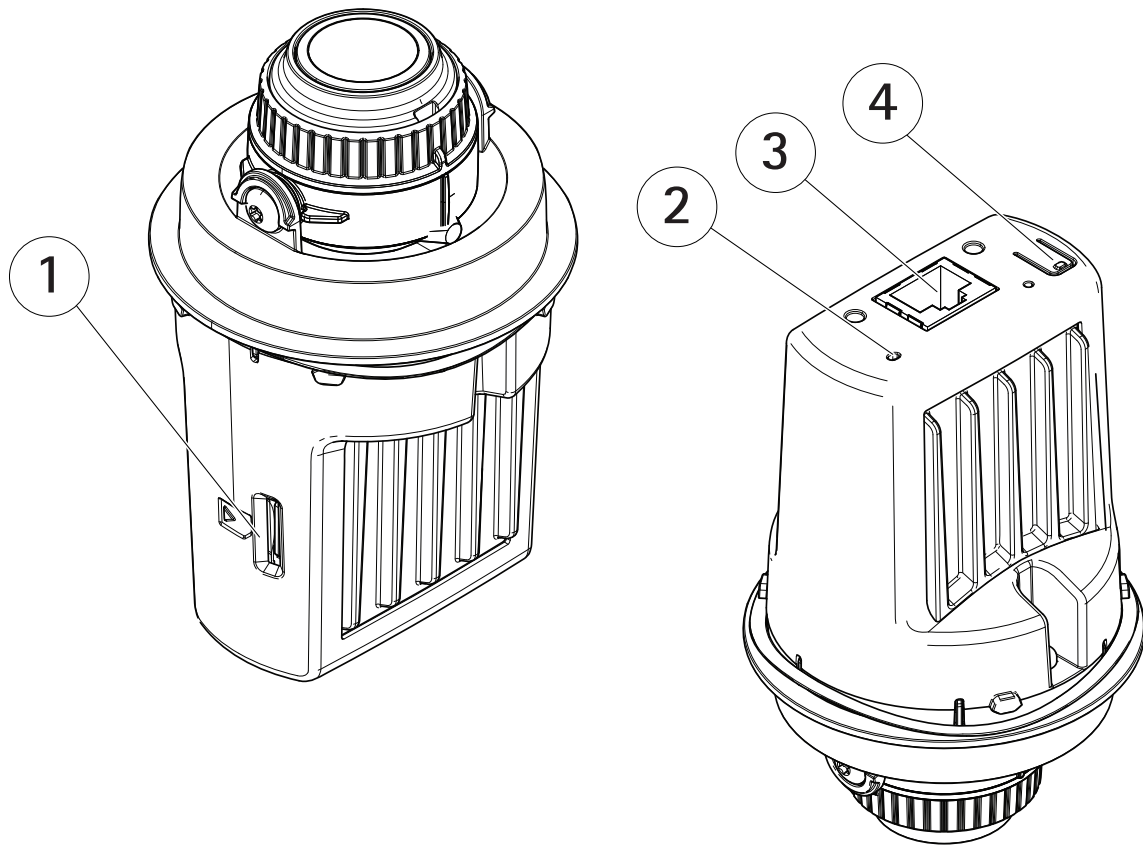This user manual describes several products. This means you may find instructions that aren't applicable to your product.

Product overview

1   SD card slot (microSD)
2   Status LED
3   RJ45 connector
4   Control button

Installation

Installation video for the product.

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

www.axis.com/products/online-manual/42067#t10170567

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, go to *How to assign an IP address and access your device*.

Access the device

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

    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 new password for the root account on page 6* .

3. The live view page opens in your browser.

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.

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. See *Reset to factory default settings on page 18*

Support tip: Password security confirmation check

1. Type a password. Follow the instructions about secure passwords. See *Secure passwords on page 6* .

2. Retype the password to confirm the spelling.

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

Additional settings

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.
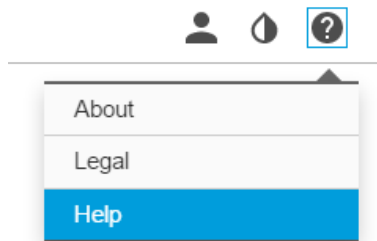
Image quality

Capture modes

A capture mode consists of a resolution and the corresponding frame rate available in the product. The capture mode setting affects the camera's field of view and aspect ratio.

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

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

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

Hide parts of the image with privacy masks

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

Additional settings

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

www.axis.com/products/online-manual/42067#t10106902

How to create a privacy mask

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/42067#t10106902

How to change the appearance of the mask

Reduce noise in low-light conditions

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.

*   Reduce sharpness in the image.

Note

When you reduce the max gain, the image can become darker.

*   Set the max gain to a lower value.

*   Open the aperture.

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**.

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.
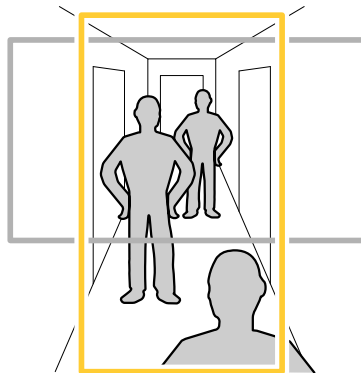
1. Depending on your device, turn the camera or the 3-axis lens in the camera 90° or 270°.

2. If the device doesn't have automatic rotation of the view, log in to the webpage and go to **Settings** > **System** > **Orientation**.

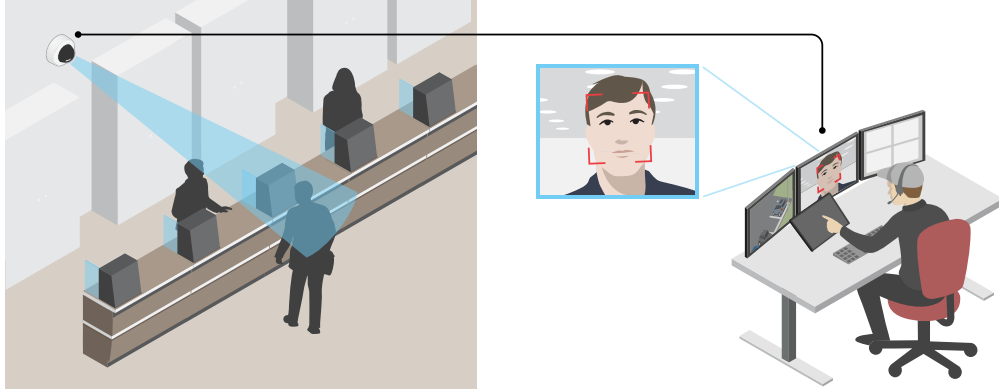3. Click [icon].

4. Rotate the view 90° or 270°.

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

Verify the pixel resolution

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

Additional settings

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

2. Click ⬜ .

3. In the camera's live view, adjust the size and position of the rectangle around the area of interest, for example where you expect faces to appear.

   You can see the number of pixels for each of the rectangle's sides (**X** and **Y**), and decide if the values are enough for your needs.

View area

A view area is a cropped part of the full view. You can stream and store the view area instead of the full view to minimize bandwidth and storage needs. If you enable PTZ for the view area, you can pan, tilt and zoom within it. By using a view area you can remove parts of the full view, for example, the sky.

When you set up a view area, we recommend you to set the video stream resolution to the same size as or smaller than the view area size. If you set the video stream resolution larger than the view area size it implies digitally scaled up video after sensor capture, which requires more bandwidth without adding image information.

Handle scenes with strong backlight

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

Image without WDR.

Image with WDR.

- 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*.

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.

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.

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

www.axis.com/products/online-manual/42067#t10103832

How to show text overlay when the camera detects motion

Make sure that AXIS Video Motion Detection is running:

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

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

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

Add the overlay text:

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

5. Enter #D in the text field.

6. Choose text size and appearance.

Create a rule:

7. Go to **System > Events > Rules** and add a rule.

8. Type a name for the rule.

9. In the list of conditions, select AXIS Video Motion Detection.

10. In the list of actions, select **Use overlay text**.

11. Select a view area.

12. Type "Motion detected".

13. Set the duration.

14. Click **Save**.

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.

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.

Reduce bandwidth and storage

Important

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

Additional settings

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 your network storage.

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

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

3. Enter the IP address of the host server.

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

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

6. Click **Connect**.

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

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

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

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

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.

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.

Events

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 while the device is recording.

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, you have to restart the rule for the changes to take effect.

Note

If you change the definition of a stream profile that is used in a rule, you have to 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.

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

www.axis.com/products/online-manual/42067#t10106619

How to record a video stream when the camera detects motion

Make sure that AXIS Video Motion Detection 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. If you need help, see the *user manual for AXIS Video Motion Detection 4*.

Create a rule:

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

2. Type a name for the rule.

3. In the list of conditions, under **Application**, select **AXIS Video Motion Detection (VMD)**.

4. In the list of actions, under **Recordings**, select **Record video while the rule is active**.

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

6. Set the prebuffer time to 5 seconds.

7. Set the postbuffer time to 60 seconds.

8. In the list of storage options, select **SD card**.

9. Click **Save**.

Applications

Applications

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

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

Note

- We recommended running one application at a time.
- Avoid running applications when the built-in motion detection is active.

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

www.axis.com/products/online-manual/42067#t10001688

How to download and install an application

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

www.axis.com/products/online-manual/42067#t10001688

*How to activate an application licence code on a device*

Additional settings

AXIS People Counter

AXIS People Counter is an analytic application that you can install on a network camera. You can use the application to count how many people pass through an entrance, in what direction they pass, and if more than one person passes during a predefined interval. You can also use it to estimate how many people are currently occupying an area, and the average visiting time.

The application runs embedded in the camera which means you don't need a dedicated computer to run the application. AXIS People Counter is suitable for any indoor environment, like stores, libraries, or gyms.
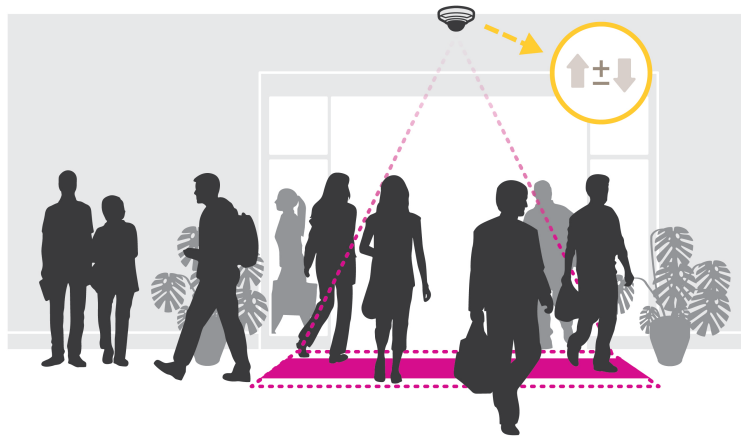
How does estimating occupancy work?

You can use the application to estimate occupancy in areas with one or several entrances and exits. Each entrance and exit needs to be equipped with a network camera with AXIS People Counter installed. If there are several cameras, they communicate with each other over the network in a primary and secondary concept. The primary camera continuously fetches data from the secondary cameras and presents the data in the live view. Every fifteen minutes, the primary camera sends the statistical data to AXIS Store Data Manager. Consequently, the reports generated from AXIS Store Data Manager can present the data in a minimum of 15 minutes time interval.

Troubleshooting

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 4* .

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**.

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 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*.

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

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

www.axis.com/products/online-manual/42067#t10095327

How to upgrade the 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.

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 *Reset to factory default settings on page 18.*

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Troubleshooting

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*.
Certificate error when using IEEE 802.1X	For authentication to work properly, the date and time settings in the Axis device must be synchronized with an NTP server. Go to **Settings > System > Date and time**.

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*.

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 21*. - Reduce the number of applications running on the client computer. - Limit the number of simultaneous viewers. - Check with the network administrator that there is enough bandwidth available. - Lower the image resolution. - Log in to the device's webpage and set a capture mode that prioritizes frame rate. Changing the capture mode to prioritize frame rate might lower the maximum resolution depending on the device used and capture modes available. - The maximum frames per second is dependent on the utility frequency (60/50 Hz) of the Axis device.
Can't select H.265 encoding in live view	Web browsers do not support H.265 decoding. Use a video management system or application supporting H.265 decoding.

Problems retrieving additional video streams

'Video Error' displayed in AXIS Companion, or 'Stream: Error. Something went wrong. Maybe there are too many viewers.' in Chrome/Firefox, or '503 service unavailable' error in Quick Time, or 'Camera not available' displayed in AXIS Camera Station, or	This camera is designed to deliver up to four different streams. If a fifth unique stream is requested, the camera will not be able to provide it, and an error message is displayed. The error message depends on the way the stream is requested. The streams are used on a first come, first served basis. Examples of instances using a stream are: - Live viewing in a web browser or other application - While recording - continuous or motion triggered recording - An event using images on the camera, for example an event sending an e-mail with an image every hour - An installed and running application, such as AXIS Video Motion Detection, will always consume a video stream, whether it is used or not. A stopped application does not consume a video stream. The camera can deliver more than four simultaneous streams provided the configuration of any additional stream is identical to any of the first four streams. Identical configuration implies exactly

'Error reading video stream' message in browser when using the Java applet	the same resolution, frame rate, compression, video format, rotation etc. For more information see the white paper "Max number of unique video stream configurations", available at *axis.com*.

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.

Specifications

Specifications

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.
Red	Firmware upgrade failure.

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*.

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Buttons

Control button

The control button is used for:

- Resetting the product to factory default settings. See *Reset to factory default settings on page 18*.

Connectors

Network connector

RJ45 Ethernet connector with Power over Ethernet (PoE).