

AXIS M3104-L

AXIS M3104-LVE

AXIS M3105-L

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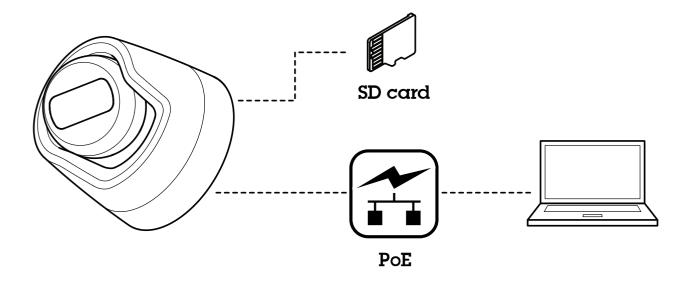
AXIS M3106-LVE

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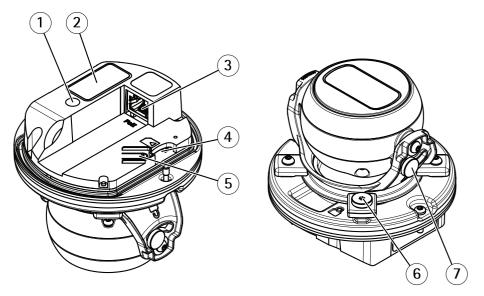
Solution overview

Solution overview



Product overview

Product overview



- Status LED indicator
- Part number (P/N) & Serial number (S/N)
- Network connector (PoE) SD card slot
- Control button
- 6 Pan lock screw
- Tilt lock screw

Find the device on the network

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 TM	Firefox®	Edge [®]	Safari [®]
Windows®	recommended	х	Х	
OS X®	recommended			х
Other operating systems	X	х		

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

Access the device

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 6.
- 3. The live view page opens in your browser.

Set a secure password for the root account

Important

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

- 1. Type a password. Follow the instructions about secure passwords. See About secure passwords on page 6.
- 2. Retype the password to confirm the spelling.
- 3. Click Create login. The password has now been configured.

About secure passwords

Important

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

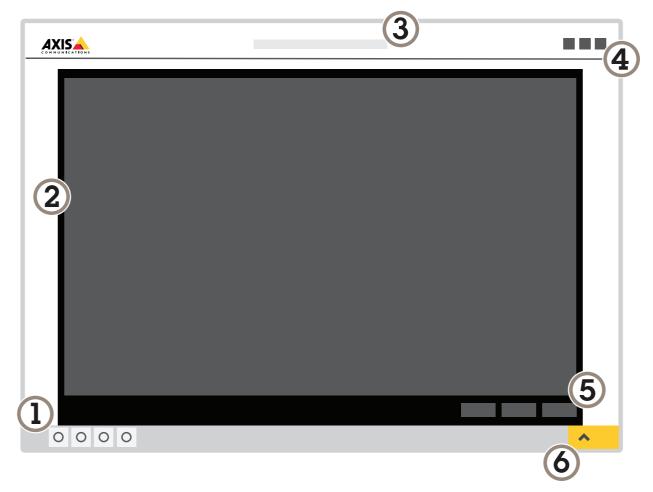
The device password is the primary protection for your data and services. Axis devices do not impose a password policy as they may be used in various types of installations.

To protect your data we strongly recommend that you:

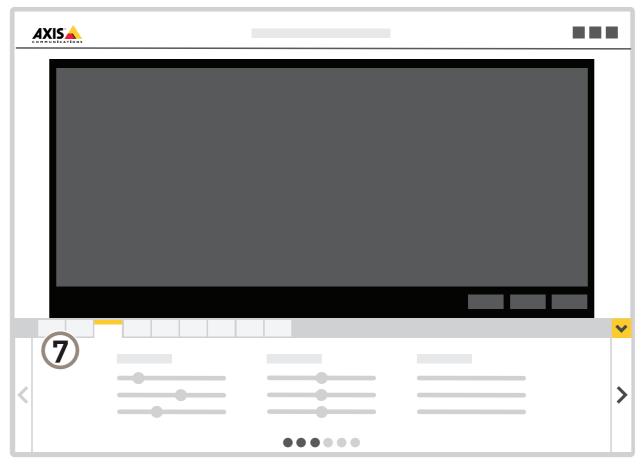
- Use a password with at least 8 characters, preferably created by a password generator.
- Don't expose the password.
- Change the password at a recurring interval, at least once a year.

Setup

Webpage overview



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



7 Settings tabs

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.

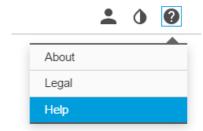


Image quality

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.

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.

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.

- Make sure to select the capture mode that has the highest resolution.
- Set the compression as low as possible.
- Select MJPEG streaming.
- Turn off Zipstream functionality.

Handle scenes with strong backlight

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

- 1. Go to Settings > Image.
- 2. If required, turn on WDR under Wide dynamic range.
- 3. Use the Local contrast slider to adjust the amount of WDR.



Image without WDR.



Image with WDR.

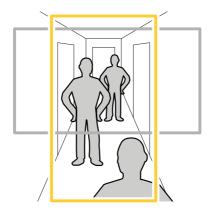
Note

WDR may cause artifacts in the image.

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

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.

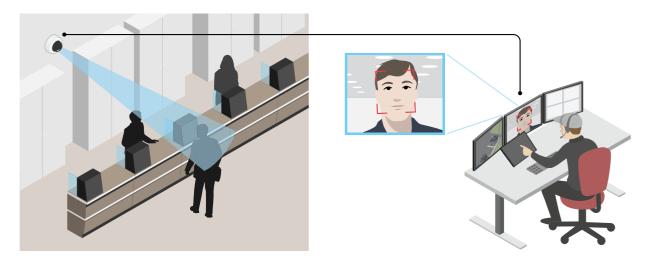


- 1. Depending on your device, turn the camera or the 3-axis lens in the camera 90° or 270° .
- 2. If the device doesn't rotate the view automatically, log in to the webpage and go to Settings > System > Orientation.
- 3. Click
- 4. Rotate the view 90° or 270°.

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

Note

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

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

View area

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

Privacy masks

Hide parts of the image with privacy masks

What is a privacy mask?

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

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

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

Important

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

Create a privacy mask

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

Overlays

About overlays

Overlays are superimposed over the video stream. They are used to provide extra information during recordings, such as a timestamp, or during product installation and configuration.

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. 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.

PTZ (Pan Tilt Zoom)

Limit the pan, tilt, and zoom movements

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

See above the horizon

In some cases, you might want to look above the default upper tilt limit to see above the horizon.

- 1. Go to Settings > PTZ > Limits
- 2. Set the upper limit to the maximum value and click Save.

About guard tours

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

Create a guard tour with preset positions

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

About autotracking

Streaming and storage

Choose video compression format

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

Motion JPEG

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

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

H.264 or MPEG-4 Part 10/AVC

Note

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

H.264 can, without compromising image quality, reduce the size of a digital video file by more than 80% compared to the Motion JPEG format and by as much as 50% compared to the MPEG-4 standard. This means that less network bandwidth and storage space are required for a video file. Or seen another way, higher video quality can be achieved for a given bitrate.

Reduce bandwidth and storage

Important

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

- 1. Go to live view and select H.264.
- 2. Go to Settings > Stream.
- 3. Do one or more of the following:
 - Turn on the Zipstream functionality and select the desired level.
 - Turn on dynamic GOP and set a high GOP length value.
 - Increase the compression.
 - Turn on dynamic FPS.

Set up network storage

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

- 1. Go to Settings > System > Storage.
- 2. Click Setup under Network storage.
- 3. Enter the IP address of the host server.
- 4. Enter the name of the shared location on the host server.
- 5. Move the switch if the share requires a login, and enter username and password.
- 6. Click Connect.

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

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

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

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

Record and watch video

To record video you must first set up network storage, see Set up network storage on page 15, or have an SD card installed.

- 1. Go to the camera's live view.
- 2. Click on Record once to start recording and one more time to stop recording.

To watch your recording:

- 1. Click on Storage > Go to recordings.
- 2. Select your recording in the list and it will play automatically.

Events

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 camera 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 camera 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.

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 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.

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 a rule:

Setup

- 1. Go to Events > Rules and add a rule.
- 2. Type a name for the rule.
- 3. In the list of conditions, select Tampering.
- 4. In the list of actions, select **Send notification to email** and then select a recipient from the list. Go to **Recipients** to create a new recipient.
- 5. Type a subject and a message for the email.
- 6. 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

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.

AXIS People Counter

AXIS People Counter is an analytic application that can be installed on a network camera.

The counter is embedded in the camera which means you do not need a dedicated computer to run the application. AXIS People Counter is intended for retail environments, like stores or shopping malls, or other environments where you want to count people.



Troubleshooting

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 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.

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.

Troubleshooting

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 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*.

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/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 20. 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.

Performance considerations

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

The following factors are the most important to consider:

- High image resolution or lower compression levels result in images containing more data which in turn affects the bandwidth.
- Rotating the lens manually will result in better performance compared to rotating the image from the GUI.
- Access by large numbers of Motion JPEG or unicast H.264 clients affects the bandwidth.
- Simultaneous viewing of different streams (resolution, compression) by different clients affects both frame rate and bandwidth.

Troubleshooting

Use identical streams wherever possible to maintain a high frame rate. Stream profiles can be used to ensure that streams are identical.

- Accessing Motion JPEG and H.264 video streams simultaneously affects both frame rate and bandwidth.
- Heavy usage of event settings affects the product's CPU load which in turn affects the frame rate.
- Using HTTPS may reduce frame rate, in particular if streaming Motion JPEG.
- Heavy network utilization due to poor infrastructure affects the bandwidth.
- Viewing on poorly performing client computers lowers perceived performance and affects frame rate.
- Running multiple AXIS Camera Application Platform (ACAP) applications simultaneously may affect the frame rate and the general performance.

Specifications

Specifications

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

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

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 18.
- 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.

Connectors

Network connector

RJ45 Ethernet connector with Power over Ethernet (PoE).

User Manual AXIS M31 Series © Axis Communications AB, 2017 - 2019 Ver. M8.2

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