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This User Manual provides information on the product regarding:

- Access
- Main use cases
- Troubleshooting
- Specifications

Note
The User Manual may include more than one product. Part of the content, e.g. some use cases or specifications, may only apply to some of them. For more information on the exact feature set and specifications, see the product’s web page and datasheet at www.axis.com
Solution overview
AXIS M30 Network Camera Series

Product overview

AXIS M3044–V Network Camera

1 Dome cover
2 Status LED
3 microSD card slot
4 Control button
5 Network connector (PoE)
6 Focus ring

AXIS M30445–V Network Camera

1 Dome cover
2 HDMI connector
3 Status LED
4 microSD card slot
5 Control button
6 Network connector (PoE)
7 Focus ring
**AXIS M30 Network Camera Series**

**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

**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.

**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.

**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.
**Setup**

**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.

**Select capture mode**

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

**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.
AXIS M30 Network Camera Series

Setup

- For environments with certain artificial lighting, for example fluorescent lighting, select Flicker-free.
- For environments with certain artificial light and bright light, for example outdoors with fluorescent lighting at night and sun during daytime, select Flicker-reduced.
- To lock the current exposure settings, select Hold current.

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.

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.

Note

If you view the video stream over HDMI and restart the product, the privacy masks will disappear. To show the privacy masks again, restart the video stream.

Create a privacy mask

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

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.
AXIS M30 Network Camera Series

Setup

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.

**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
AXIS M30 Network Camera Series

Setup

Reduce noise in low-light conditions

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

- Make sure that the exposure mode is automatic.

**Note**

Increasing the max shutter value can result in motion blur.

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

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.

*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
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.

Overlays

About overlays

**Note**
Image and text overlay will not be displayed on video stream over HDMI.

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.
AXIS M30 Network Camera Series

Setup

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.

View a live video stream on a monitor

Your camera can transmit a live video stream to an HDMI monitor even without a network connection. The monitor can be used for surveillance purposes or for public viewing, e.g. in a store.

1. Connect an external monitor using the HDMI connector.
2. Change the HDMI settings under Settings > System > HDMI.

Important

In order to view the video stream via the HDMI connector, be sure to select a capture mode that supports HDMI.

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.

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.

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

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 5.
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 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 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
AXIS M30 Network Camera Series

Troubleshooting

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 15. |

| 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
AXIS M30 Network Camera Series

Troubleshooting

Problems with streaming

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multicast H.264 only accessible by local clients</td>
<td>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.</td>
</tr>
<tr>
<td>No multicast H.264 displayed in the client</td>
<td>Check with your network administrator that the multicast addresses used by the Axis device are valid for your network.</td>
</tr>
<tr>
<td>Poor rendering of H.264 images</td>
<td>Check with your network administrator to see if there is a firewall preventing viewing.</td>
</tr>
<tr>
<td>Color saturation is different in H.264 and Motion JPEG</td>
<td>Ensure that your graphics card is using the latest driver. The latest drivers can usually be downloaded from the manufacturer’s website.</td>
</tr>
<tr>
<td>Lower frame rate than expected</td>
<td>Modify the settings for your graphics adapter. Go to the adapter’s documentation for more information.</td>
</tr>
<tr>
<td>• See Performance considerations on page 17.</td>
<td></td>
</tr>
<tr>
<td>• Reduce the number of applications running on the client computer.</td>
<td></td>
</tr>
<tr>
<td>• Limit the number of simultaneous viewers.</td>
<td></td>
</tr>
<tr>
<td>• Check with the network administrator that there is enough bandwidth available.</td>
<td></td>
</tr>
<tr>
<td>• Lower the image resolution.</td>
<td></td>
</tr>
<tr>
<td>• Log in to the device’s webpage and set a capture mode that prioritizes frame rate.</td>
<td></td>
</tr>
<tr>
<td>Changing the capture mode to prioritize frame rate might lower the maximum resolution depending on the device used and capture modes available.</td>
<td></td>
</tr>
<tr>
<td>• The maximum frames per second is dependent on the utility frequency (60/50 Hz) of the Axis device.</td>
<td></td>
</tr>
</tbody>
</table>

Problems retrieving additional video streams

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Video Error’ displayed in AXIS Companion, or</td>
<td>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:</td>
</tr>
<tr>
<td>‘Stream: Error. Something went wrong. Maybe there are too many viewers.’ in Chrome/Firefox, or</td>
<td>• Live viewing in a web browser or other application</td>
</tr>
<tr>
<td>‘503 service unavailable’ error in Quick Time, or</td>
<td>• While recording – continuous or motion triggered recording</td>
</tr>
<tr>
<td>‘Camera not available’ displayed in AXIS Camera Station, or</td>
<td>• An event using images on the camera, for example an event sending an e-mail with an image every hour</td>
</tr>
<tr>
<td>‘Error reading video stream’ message in browser when using the Java applet</td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>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 the same resolution, frame rate, compression, video format, rotation etc. For more information see the white paper &quot;Max number of unique video stream configurations&quot;, available at axis.com</td>
</tr>
</tbody>
</table>

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.
AXIS M30 Network Camera Series

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.
AXIS M30 Network Camera Series

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

Note
• The Status LED can be configured to flash while an event is active.
• The Status LED can be configured to flash for identifying the unit. Go to Settings > System > Plain config.

<table>
<thead>
<tr>
<th>Status LED</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlit</td>
<td>Connection and normal operation.</td>
</tr>
<tr>
<td>Green</td>
<td>Steady green for 10 seconds for normal operation after startup completed.</td>
</tr>
<tr>
<td>Amber</td>
<td>Steady during startup. Flashes during firmware upgrade or reset to factory default.</td>
</tr>
<tr>
<td>Amber/Red</td>
<td>Flashes amber/red if network connection is unavailable or lost.</td>
</tr>
<tr>
<td>Red</td>
<td>Firmware upgrade failure.</td>
</tr>
<tr>
<td>Purple</td>
<td>Steady for more than 10 seconds for hardware failure.</td>
</tr>
</tbody>
</table>

Note
Amber is a combination of red and green, and can be perceived as either of these colors depending on viewing angle.

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 15.
• 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.
AXIS M30 Network Camera Series

Specifications

Connectors

HDMI connector
Use the HDMI™ connector to connect a display or public view monitor.

Network connector
RJ45 Ethernet connector with Power over Ethernet (PoE).