

AXIS Q3708-PVE Network Camera

User Manual

About this Document

This manual is intended for administrators and users of AXIS Q3708-PVE Network Camera, and is applicable to firmware 5.90 and later. It includes instructions for using and managing the product on your network. Previous experience of networking will be of use when using this product. Some knowledge of UNIX or Linux-based systems may also be useful when developing shell scripts and applications. Later versions of this document will be posted at www.axis.com. See also the product's online help, available through the web-based interface.

Legal Considerations

Video surveillance can be regulated by laws that vary from country to country. Check the laws in your local region before using this product for surveillance purposes.

This product includes one (1) H.264 decoder license. To purchase further licenses, contact your reseller.

Liability

Every care has been taken in the preparation of this document. Please inform your local Axis office of any inaccuracies or omissions. Axis Communications AB cannot be held responsible for any technical or typographical errors and reserves the right to make changes to the product and manuals without prior notice. Axis Communications AB makes no warranty of any kind with regard to the material contained within this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Axis Communications AB shall not be liable nor responsible for incidental or consequential damages in connection with the furnishing, performance or use of this material. This product is only to be used for its intended purpose.

Intellectual Property Rights

Axis AB has intellectual property rights relating to technology embodied in the product described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the patents listed at www.axis.com/patent.htm and one or more additional patents or pending patent applications in the US and other countries.

This product contains licensed third-party software. See the menu item "About" in the product's user interface for more information.

This product contains source code copyright Apple Computer, Inc., under the terms of Apple Public Source License 2.0 (see www.opensource.apple.com/aps/). The source code is available from <https://developer.apple.com/bonjour/>

Equipment Modifications

This equipment must be installed and used in strict accordance with the instructions given in the user documentation. This equipment contains no user-serviceable components. Unauthorized equipment changes or modifications will invalidate all applicable regulatory certifications and approvals.


Trademark Acknowledgments

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Regulatory Information

Europe

 This product complies with the applicable CE marking directives and harmonized standards:

- Electromagnetic Compatibility (EMC) Directive 2004/108/EC. See *Electromagnetic Compatibility (EMC) on page 2*.
- Low Voltage (LVD) Directive 2006/95/EC. See *Safety on page 2*.
- Restrictions of Hazardous Substances (RoHS) Directive 2011/65/EU. See *Disposal and Recycling on page 3*.

A copy of the original declaration of conformity may be obtained from Axis Communications AB. See *Contact Information on page 3*.

Electromagnetic Compatibility (EMC)

This equipment has been designed and tested to fulfill applicable standards for:

- Radio frequency emission when installed according to the instructions and used in its intended environment.
- Immunity to electrical and electromagnetic phenomena when installed according to the instructions and used in its intended environment.

USA

This equipment has been tested using a shielded network cable (STP) and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The product shall be connected using a shielded network cable (STP) that is properly grounded.

Canada

This digital apparatus complies with CAN ICES-3 (Class A). The product shall be connected using a shielded network cable (STP) that is properly grounded. Cet appareil numérique est conforme à la norme NMB ICES-3 (classe A). Le produit doit être connecté à l'aide d'un câble réseau blindé (STP) qui est correctement mis à la terre.

Europe

This digital equipment fulfills the requirements for RF emission according to the Class A limit of EN 55022. The product shall be connected using a shielded network cable (STP) that is properly grounded. Notice! This is a Class A product. In a domestic environment this product may cause RF interference, in which case the user may be required to take adequate measures.

This product fulfills the requirements for emission and immunity according to EN 50121-4 and IEC 62236-4 railway applications.

This product fulfills the requirements for immunity according to EN 61000-6-1 residential, commercial and light-industrial environments.

This product fulfills the requirements for immunity according to EN 61000-6-2 industrial environments.

This product fulfills the requirements for immunity according to EN 55024 office and commercial environments.

Australia/New Zealand

This digital equipment fulfills the requirements for RF emission according to the Class A limit of AS/NZS CISPR 22. The product shall be connected using a shielded network cable (STP) that is properly grounded. Notice! This is a Class A product. In a domestic environment this product may cause RF interference, in which case the user may be required to take adequate measures.

Japan

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。本製品は、シールドネットワークケーブル(STP)を使用して接続してください。また適切に接地してください。

Korea

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다. 적절히 접지된 STP (shielded twisted pair) 케이블을 사용하여 제품을 연결 하십시오.

Safety

This product complies with IEC/EN/UL 60950-1 and IEC/EN/UL 60950-22, Safety of Information Technology Equipment. The product shall be grounded either through a shielded network cable (STP) or other appropriate method.

The power supply used with this product shall fulfill the requirements for Safety Extra Low Voltage (SELV) and Limited Power Source (LPS) according to IEC/EN/UL 62368-1 or IEC/EN/UL 60950-1.



In areas where the temperature is above 50 °C (122 °F), the product shall be placed in a restricted access location.

Battery

Low battery power affects the operation of the RTC, causing it to reset at every power-up. When the battery needs replacing, a log message will appear in the product's server report. For more information about the server report, see the product's setup pages or contact Axis support.

The battery should not be replaced unless required, but if the battery does need replacing, contact Axis support at www.axis.com/techsup for assistance.

Lithium coin cell 3.0 V batteries contain 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME), CAS no. 110-71-4.

▲WARNING

- Risk of explosion if the battery is incorrectly replaced.
- Replace only with an identical battery or a battery which is recommended by Axis.
- Dispose of used batteries according to local regulations or the battery manufacturer's instructions.

Disposal and Recycling

When this product has reached the end of its useful life, dispose of it according to local laws and regulations. For information about your nearest designated collection point, contact your local authority responsible for waste disposal. In accordance with local legislation, penalties may be applicable for incorrect disposal of this waste.

Europe



This symbol means that the product shall not be disposed of together with household or commercial waste. Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) is applicable in the European Union member states. To prevent potential harm to human health and the environment, the product must be disposed of in an approved and environmentally safe recycling process. For information about your nearest designated collection point, contact your local authority responsible for waste disposal. Businesses should contact the product supplier for information about how to dispose of this product correctly.

This product complies with the requirements of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

China



This product complies with the requirements of the legislative act Administration on the Control of Pollution Caused by Electronic Information Products (ACPEIP).

Contact Information

Axis Communications AB
Emdalavägen 14
223 69 Lund
Sweden

Tel: +46 46 272 18 00

Fax: +46 46 13 61 30

www.axis.com

Support

Should you require any technical assistance, please contact your Axis reseller. If your questions cannot be answered immediately, your reseller will forward your queries through the appropriate channels to ensure a rapid response. If you are connected to the Internet, you can:

- download user documentation and software updates
- find answers to resolved problems in the FAQ database. Search by product, category, or phrase
- report problems to Axis support staff by logging in to your private support area
- chat with Axis support staff
- visit Axis Support at www.axis.com/techsup/

Learn More!

Visit Axis learning center www.axis.com/academy/ for useful trainings, webinars, tutorials and guides.

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Safety Information

Safety Information

Hazard Levels

▲DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

▲WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

▲CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation which, if not avoided, could result in damage to property.

Other Message Levels

Important

Indicates significant information which is essential for the product to function correctly.

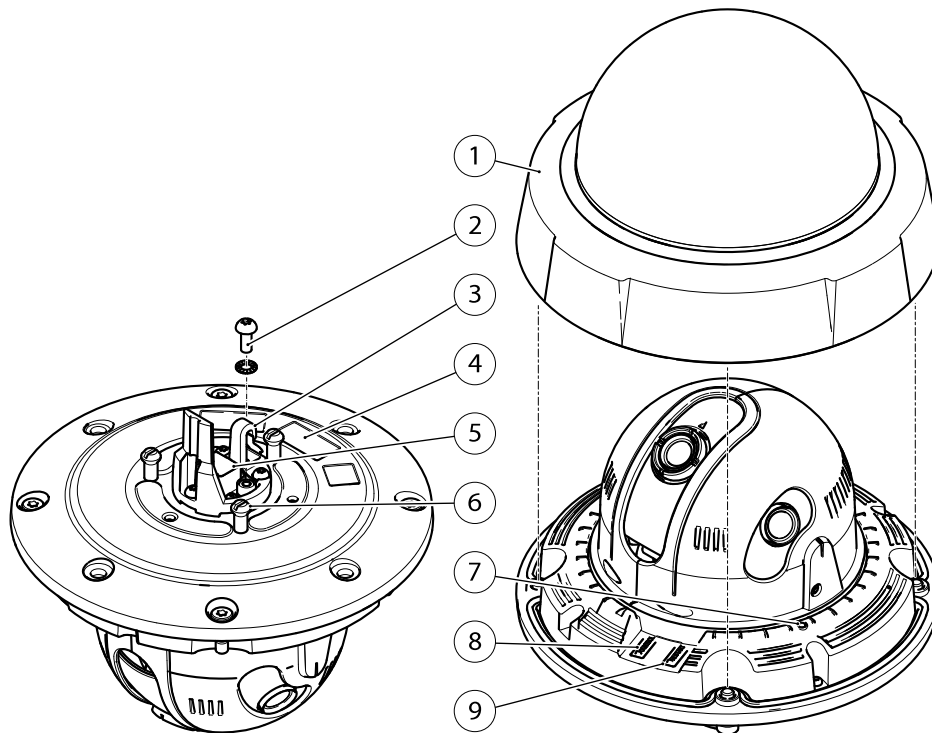
Note

Indicates useful information which helps in getting the most out of the product.

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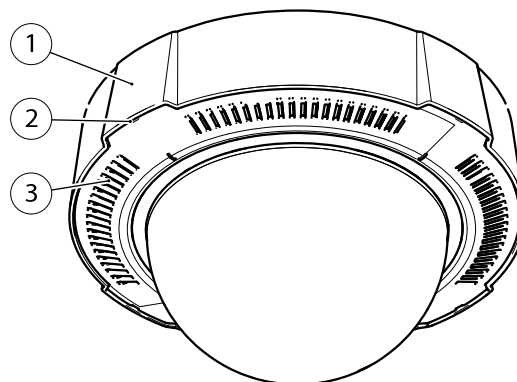
Hardware Overview

Hardware Overview



- 1 Dome cover
- 2 Ground screw
- 3 Hook for safety wire
- 4 Part number (P/N) & Serial number (S/N)
- 5 Network connector
- 6 Unit holder (3x)
- 7 Status LED indicator
- 8 Control button
- 9 Restart button

Weather Shield



- 1 Weather shield (top)

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Hardware Overview

- 2 Slot for removing Weather shield (bottom)
- 3 Weather shield (bottom)

Connectors and Buttons

For technical specifications, see *page 53*.

Network Connector

RJ45 with High Power over Ethernet (High PoE).

NOTICE

The product shall be connected using a shielded network cable (STP). All cables connecting the product to the network shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see *Electromagnetic Compatibility (EMC) on page 2*.

Control Button

For location of the control button, see *Hardware Overview on page 7*.

The control button is used for:

- Resetting the product to factory default settings. See *page 49*.
- Connecting to an AXIS Video Hosting System service. See *page 43*. To connect, press and hold the button for about 3 seconds until the Status LED flashes green.
- Connecting to AXIS Internet Dynamic DNS Service. See *page 43*. To connect, press and hold the button for about 3 seconds.

Restart Button

Press the restart button to restart the product.

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 **Setup > System Options > Maintenance**.

Status LED	Indication
Unlit	Connection and normal operation.
Green	Shows steady green for 10 seconds for normal operation after startup completed. Flashes before startup if the temperature is below -20 °C and heating is required. The product starts when it reaches operating temperature.
Amber	Steady during startup. Flashes during firmware upgrade.
Amber/Red	Flashes amber/red if network connection is unavailable or lost.

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Access the Product

Access the Product

To install the Axis product, see the Installation Guide supplied with the product.

The product can be used with most operating systems and browsers. We recommend the following browsers:

- Internet Explorer® with Windows®
- Safari® with OS X®
- Chrome™ or Firefox® with other operating systems.

To view streaming video in Internet Explorer, allow installation of AXIS Media Control (AMC) when prompted.

The Axis product includes one (1) H.264 decoder license for viewing video streams. The license is automatically installed with AMC. The administrator can disable the installation of the decoders to prevent installation of unlicensed copies.

Note

- QuickTime™ is also supported for viewing H.264 streams.

Access from a Browser

1. Start a web browser.
2. Enter the IP address or host name of the Axis product in the browser's Location/Address field.

To access the product from a Mac computer (OS X), go to Safari, click on Bonjour and select the product from the drop-down list.

If you do not know the IP address, use AXIS IP Utility to locate the product on the network. For information about how to discover and assign an IP address, see the document *Assign an IP Address and Access the Video Stream* on Axis Support web at www.axis.com/techsup

Note

To show Bonjour as a browser bookmark, go to **Safari > Preferences**.

3. Enter your user name and password. If this is the first time the product is accessed, the root password must first be configured. For instructions, see *Set the Root Password on page 10*.
4. The product's Live View page opens in your browser.

Note

The controls and layout of the Live View page may have been customized to meet specific installation requirements and user preferences. Consequently, some of the examples and functions featured here may differ from those displayed in your own Live View page.

Access from the Internet

Once connected, the Axis product is accessible on your local network (LAN). To access the product from the Internet you must configure your network router to allow incoming data traffic to the product. To do this, enable the NAT-traversal feature, which will attempt to automatically configure the router to allow access to the product. This is enabled from **Setup > System Options > Network > TCP/IP Advanced**.

For more information, see *NAT traversal (port mapping) for IPv4 on page 44*. See also AXIS Internet Dynamic DNS Service at www.axiscam.net

For Technical notes on this and other topics, visit the Axis Support web at www.axis.com/techsup

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Access the Product

Set the Root Password

To access the Axis product, you must set the password for the default administrator user **root**. This is done in the **Configure Root Password** dialog, which opens when the product is accessed for the first time.

To prevent network eavesdropping, the root password can be set via an encrypted HTTPS connection, which requires an HTTPS certificate. HTTPS (Hypertext Transfer Protocol over SSL) is a protocol used to encrypt traffic between web browsers and servers. The HTTPS certificate ensures encrypted exchange of information. See *HTTPS on page 39*.

The default administrator user name **root** is permanent and cannot be deleted. If the password for root is lost, the product must be reset to the factory default settings. See *Reset to Factory Default Settings on page 49*.

To set the password via a standard HTTP connection, enter it directly in the dialog.

To set the password via an encrypted HTTPS connection, follow these steps:

1. Click **Use HTTPS**.

A temporary certificate (valid for one year) is created, enabling encryption of all traffic to and from the product, and the password can now be set securely.

2. Enter a password and then re-enter it to confirm the spelling.
3. Click **OK**. The password has now been configured.

Set Power Line Frequency

Power line frequency is set the first time the Axis product is accessed and can only be changed from Plain Config (see *page 49*) or by resetting the product to factory default.

Select the power line frequency (50 Hz or 60 Hz) used at the location of the Axis product. Selecting the wrong frequency may cause image flicker if the product is used in fluorescent light environments.

When using 50 Hz, the maximum frame rate is limited to 25 fps.

Note

Power line frequency varies depending on geographic region. The Americas usually use 60 Hz, whereas most other parts of the world use 50 Hz. Local variations could apply. Always check with the local authorities.

Configure Capture Mode

Capture mode defines the maximum resolution and maximum frame rate available in the Axis product. The capture mode setting also affects the camera's angle of view.

Select the desired capture mode from the drop-down list and click **OK**.

See also *Capture Mode on page 18*.

The Live View Page

The controls and layout of the Live View page may have been customized to meet specific installation requirements and user preferences. Consequently, some of the examples and functions featured here may differ from those displayed in your own Live View page. The following provides an overview of each available control.

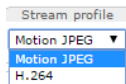
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Access the Product

Controls on the Live View Page



Click the **View size** buttons to show the image in full size (right button) or to scale down the image to fit the browser window (left button).



Select a stream profile for the Live View page from the **Stream Profile** drop-down list. For information about how to configure stream profiles, see [page 18](#).



The **Manual Trigger** button is used to trigger an action rule from the Live View page. For information about how to configure and enable the button, see [Manual Trigger on page 11](#).



Click **Snapshot** to save a snapshot of the video image. This button is primarily intended for use when the AXIS Media Control viewer toolbar is not available. Enable this button from **Live View Config > Action Buttons**.



The product's fan is controlled by the ambient temperature and is turned on and off automatically. If required, the fan can be activated manually by clicking the **Fan** button. To show the button, go to **Setup > Live View Config**. Under **Action Buttons**, select **Show fan button** and specify the number of minutes the fan should be activated.



The product's heater is controlled by the ambient temperature and is turned on and off automatically. If required, the heater can be activated manually by clicking the **Heater** button. To show the button, go to **Setup > Live View Config**. Under **Action Buttons**, select **Show heater button** and specify the number of minutes the heater should be activated.



Click **Divider** to display partition lines between the images. This can be useful for instance when identifying potential blind spots between the images during installation.

Manual Trigger

The **Manual Trigger** is used to trigger an action rule from the Live View page. The manual trigger can for example be used to validate actions during product installation and configuration.

To configure the manual trigger:

1. Go to **Setup > Events**.
2. Click **Add** to add a new action rule.
3. From the **Trigger** drop-down list, select **Input Signal**.
4. From the second drop-down list, select **Manual Trigger**.
5. Select the desired action and configure the other settings as required.

For more information about action rules, see [Events on page 31](#).

To show the manual trigger buttons in the Live View page:





1. Go to **Setup > Live View Config**.
2. Under **Action Buttons**, select **Show manual trigger button**.

AXIS Media Control viewer toolbar

The AXIS Media Control viewer toolbar is available in Internet Explorer only. See [AXIS Media Control \(AMC\) on page 13](#) for more information. The toolbar displays the following buttons:

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Access the Product

-  The **Play** button connects to the Axis product and starts playing a media stream.
-  The **Stop** button stops the media stream.
-  Click the **View Full Screen** button and the video image will fill the entire screen. Press ESC (Escape) on the computer keyboard to cancel full screen view.
-  The **Record** button is used to record the current video stream on your computer. The location where the recording is saved can be specified in the AMC Control Panel. Enable this button from **Live View Config > Viewer Settings**.

Channel Configuration

Where applicable, the Axis product enables individual setup for the different channels; Left Channel, Center Channel and Right Channel.

On pages, such as Privacy Masks the channels are represented by tabs, on which the individual settings are made.

Settings, such as Image Appearance and White Balance, can be expanded or collapsed to enable individual or common configuration respectively. To expand the settings for the individual channels select **Expand all channels** above the current setting.

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Media Streams

Media Streams

The Axis product provides several video stream formats. Your requirements and the properties of your network will determine the type you use.

The Live View page in the product provides access to H.264 and Motion JPEG video streams, and to the list of available stream profiles. Other applications and clients can access video streams directly, without going via the Live View page.

How to Stream H.264

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

Deciding which combination of protocols and methods to use depends on your viewing requirements, and on the properties of your network. The available options in AXIS Media Control are:

AXIS Media Control negotiates with the Axis product to determine the transport protocol to use. The order of priority, listed in the AMC Control Panel, can be changed and the options disabled, to suit specific requirements.

Note

H.264 is 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.

MJPEG

This format uses standard JPEG still images for the video stream. These images are then displayed and updated at a rate sufficient to create a stream that shows constantly updated motion.

The Motion JPEG stream uses considerable amounts of bandwidth, but provides excellent image quality and access to every image contained in the stream. The recommended method of accessing Motion JPEG live video from the Axis product is to use the AXIS Media Control in Internet Explorer in Windows.

AXIS Media Control (AMC)

AXIS Media Control (AMC) in Internet Explorer in Windows is the recommended method of accessing live video from the Axis product.

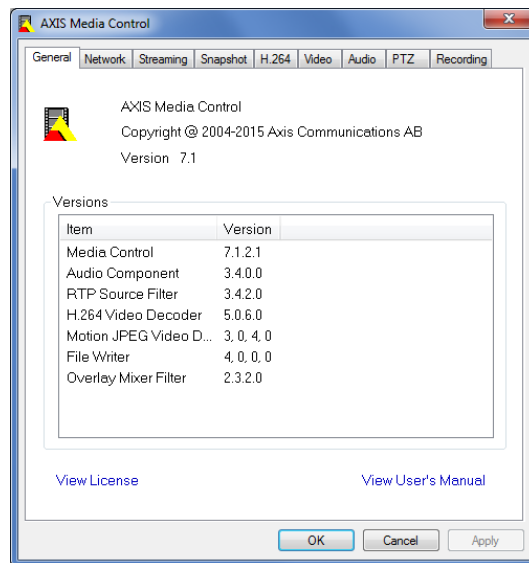
The AMC Control Panel can be used to configure various video settings. Please see the AXIS Media Control User's Manual for more information.

The AMC Control Panel is automatically installed on first use, after which it can be configured. Open the AMC Control Panel from:

- Windows Control Panel (from the Start screen or Start menu)
- Alternatively, right-click the video image in Internet Explorer and click **Settings**.

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Media Streams



Alternative Methods of Accessing the Video Stream

You can also access video and images from the Axis product in the following ways:

- **Motion JPEG server push** (if supported by the client, Chrome or Firefox, for example). This option maintains an open HTTP connection to the browser and sends data as and when required, for as long as required.
- **Still JPEG images in a browser.** Enter the path `http://<ip>/axis-cgi/jpg/image.cgi?camera=<source no>`
- **Windows Media Player.** This requires AXIS Media Control and the H.264 decoder to be installed. The following paths can be used:
 - Unicast via RTP: `axrtpu://<ip>/axis-media/media.amp?camera=<source no>`
 - Unicast via RTSP: `axrtsp://<ip>/axis-media/media.amp?camera=<source no>`
 - Unicast via RTSP, tunneled via HTTP: `axrtsphhttp://<ip>/axis-media/media.amp?camera=<source no>`
 - Multicast: `axrtpm://<ip>/axis-media/media.amp?camera=<source no>`
- **QuickTime™.** The following paths can be used:
 - `rtsp://<ip>/axis-media/media.amp?camera=<source no>`
 - `rtsp://<ip>/axis-media/media.3gp?camera=<source no>`

Note

- <ip>= IP address
- <source no> = 1/2/3/4/quad
- The Axis product supports QuickTime 6.5.1 and later.
- QuickTime may add latency to the video stream.
- It may be possible to use other players to view the H.264 stream using the paths above, although Axis does not guarantee this.


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Set Up the Product

Set Up the Product

The Axis product can be configured by users with administrator or operator rights. To open the product's Setup pages, click **Setup** in the top right-hand corner of the Live View page.

- **Administrators** have unrestricted access to all settings.
- **Operators** have restricted access to settings, see *Users on page 39*

See also the online help  .

Basic Setup

Basic Setup provides shortcuts to the settings that should be made before using the Axis product:

1. **Users.** See *page 39*.
2. **TCP/IP.** See *page 42*.
3. **Date & Time.** See *page 41*.
4. **Video Stream.** See *page 16*.

The Basic Setup menu can be disabled from **System Options > Security > Users**.

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Video

Video

It is possible to configure the following video features in your Axis product:

- Video stream. See *page 16*.
- Stream profiles. See *page 18*.
- Camera settings. See *page 18*.
- Overlay image. See *page 20*.
- Privacy mask. See *page 21*.

Set Up Video Streams

To set up the product's video streams, go to **Video > Video Stream**.

The video stream settings are divided into the following tabs:

- Image. See *page 16*.
- H.264. See *page 17*.
- MJPEG. See *page 17*.

Pixel Counter

The pixel counter shows the number of pixels in an area of the image. The pixel counter is useful in situations where there is a specific size requirement, for example in face recognition.

The pixel counter can be used:

- When setting up a video stream, see *Set Up Video Streams on page 16*. Under **Preview**, click **Open** and select the **Show pixel counter** option to enable the rectangle in the image. Use the mouse to move and resize the rectangle, or enter the number of pixels in the **Width** and **Height** fields and click **Apply**.
- When accessing the Live View page in Internet Explorer with AXIS Media Control (AMC) in Windows. Right-click in the image and select **Pixel counter**. Use the mouse to move and resize the rectangle.

Image

The default image settings can be configured under **Video > Video Stream**. Select the **Image** tab.

The following settings are available:

- **Resolution**. Select the default resolution.
- **Compression**. The compression level affects the image quality, bandwidth and file size of saved images; the lower the compression, the higher the image quality with higher bandwidth requirements and larger file sizes.
- **Maximum frame rate**. To avoid bandwidth problems, the frame rate allowed to each viewer can be **Limited** to a fixed amount. Alternatively, the frame rate can be set as **Unlimited**, which means the Axis product always delivers the highest frame rate possible under the current conditions.
- **Overlay settings**. See *About overlay text on page 20*.

Click **Save** to apply the new settings.

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Video

H.264

H.264, also known as MPEG-4 Part 10/AVC, is a video compression standard that provides high quality video streams at low bit rates. An H.264 video stream consists of different types of frames such as I-frames and P-frames. An I-frame is a complete image whereas P-frames only contain the differences from previous frames.

The H.264 stream settings can be configured from the **Video > Video Stream** page. Select the **H.264** tab. The settings defined in this page will apply to all H.264 streams that do not use a stream profile.

The **GOP length** is the number of frames between two consecutive I-frames. Increasing the GOP length may save considerably on bandwidth requirements in some cases, but may also have an adverse affect on image quality.

The Axis product supports the following **H.264 profile(s)**:

- **Baseline.** The Baseline profile is recommended for clients that don't support CABAC entropy coding.
- **Main.** The Main profile provides higher compression with maintained video quality compared to the Baseline profile but requires more processing power to decode.
- **High.** The High profile provides reduced bit rate and higher compression with maintained video quality compared to the Main profile but requires more processing power to decode.

To apply the settings, click **Save**.

MJPEG

Sometimes the image size is large due to low light or complex scenery. Adjusting the maximum frame size helps to control the bandwidth and storage used by the Motion JPEG video stream in these situations. Setting the frame size to the **Default** setting provides consistently good image quality at the expense of increased bandwidth and storage usage in low light. Limiting the frame size optimizes bandwidth and storage usage, but may give poor image quality. To prevent increased bandwidth and storage usage, the maximum frame size should be set to an optimal value.

Axis' Zipstream Technology

Zipstream is a bit rate-reduction technology optimized for video surveillance. Zipstream reduces the average bit rate in the H.264 stream by removing unnecessary data and makes it possible to allow higher resolutions, reduce storage cost or to keep recordings for a longer time. To reduce the bit rate, Zipstream reduces the number of bits in the areas of the image that are less interesting from a video surveillance perspective, for example the background. Image details that are important for forensic video analysis, for example faces and license plates, are preserved with enough number of bits.

These Zipstream strength options are available:

- **Off.** Zipstream disabled.
- **Lowest Zipstream strength.** Low bandwidth reduction. No visible quality degradation in most scenes
- **Medium Zipstream strength.** Medium bandwidth reduction. Limited visual quality degradation in not prioritized areas in some scenes
- **Highest Zipstream strength.** High bandwidth reduction. Visible quality degradation in not prioritized areas in many scenes

Lowest Zipstream strength is the default setting for the product. This configuration is very safe to use in all applications while still reducing the bit rate.

For cloud-connected cameras or cameras using edge storage that need to limit the bit rate for increased storage time it is recommended to select the **Highest Zipstream strength**. This setting is very good to combine with motion detection triggering and variable bit rate (VBR) where the bit rate is allowed to adapt to changes in complexity in the scene.

Axis' Zipstream Technology for H.264 conforms to the H.264 standard and is compatible with third-party clients and VMS solutions that decode H.264 video.

The bit rate controller built into the product can be combined with Zipstream to enforce a maximum bit rate (MBR) limit. Axis Communications recommends using VBR or MBR with a rather high bit rate limit to enable the full potential of Axis' Zipstream Technology.

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Video

Stream Profiles

A stream profile is a set of predefined stream settings including resolution, compression, frame rate and overlay settings. Stream profiles can be used:

- When setting up recording using action rules. See *Events on page 31*.
- When setting up continuous recording. See *Continuous Recording on page 37*.
- In the Live View page – select the stream profile from the **Stream profile** drop-down list.

For quick setup, use one of the predefined stream profiles. Each predefined profile has a descriptive name, indicating its purpose. If required, the predefined stream profiles can be modified and new customized stream profiles can be created.

To create a new profile or modify an existing profile, go to **Setup > Video > Stream Profiles**.

To select a default stream profile for the Live View page, go to **Setup > Live View Config**.

ONVIF Media Profiles

An ONVIF media profile consists of a set of configurations that can be used to change media stream settings. ONVIF media profiles can be set through the ONVIF Media Profile Settings page and be used by a client to configure media stream properties.

The **ONVIF Media Profiles** page lists all such pre-configured profiles. These profiles cannot be removed. Pre-configured media profiles have been included in the product for quick setup. It is also possible to configure new ONVIF media profiles as per required specifications. To add a new ONVIF media profile, click **Add** and enter the required information. You can also modify or remove a profile from this page.

Camera Settings

The **Video > Camera Settings** page provides access to advanced image settings for the Axis product.

Capture Mode

Capture mode defines the maximum resolution and maximum frame rate available in the Axis product. A capture mode with a large maximum resolution has a reduced maximum frame rate and vice versa. The capture mode setting also affects the camera's angle of view as the effective size of the image sensor differs between capture modes.

Capture mode is set the first time the product is accessed. Select the desired capture mode and click **OK**.

Important

Changing capture mode when the product has been configured is not recommended as most other settings will be either removed or reset.

To change capture mode, follow these steps:

1. Go to **Setup > Video > Camera Settings**.
2. Select the new capture mode.
3. Click **Save**.

Image Appearance

To change Image Appearance go to the menus under **Setup > Video > Camera Settings**.

Increasing the **Color** level increases the color saturation. The value 100 gives maximum color saturation and the value 0 gives minimum color saturation.

The image **Brightness** can be adjusted in the range 0–100, where a higher value produces a brighter image.

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Increasing the **Sharpness** can increase bandwidth usage. A sharper image might increase image noise especially in low light conditions. A lower setting reduces image noise, but the whole image will appear less sharp.

The **Contrast** changes the relative difference between light and dark. It can be adjusted using the sliderbar.

White Balance

To change this setting go to **Setup > Video > Camera Settings**

White balance is used to make colors in the image appear the same regardless of the color temperature of the light source. The Axis product can be set to automatically identify the light source and compensate for its color. Alternatively, select the type of light source from the drop-down list. For a description of each available setting, see the online help [?](#).

The **white balance window** is enabled for the Automatic and Automatic outdoor options that appear in the **White balance** drop-down list. Select one of the options from the drop-down list to set the white balance window properties. Select **Automatic** to use the default settings for the Automatic and Automatic outdoor options (in the White balance drop-down list). Select **Custom** to manually set a reference window for white balance in the view area.

Wide Dynamic Range

Wide dynamic range (**WDR – Forensic Capture**) provides balanced images in scenes when there is a considerable contrast between light and dark areas in the image. The camera automatically handles the transition between such scenes and low-light conditions. In rare light conditions disabling WDR might give a better image.

Important

Use WDR in combination with automatic exposure control. Other exposure settings could give undesirable results.

Exposure Settings

Exposure is the amount of light the camera's sensor captures for a scene. Too much light results in a washed out image and too little light results in a dark image.

Exposure value – Use the **Exposure value** slider to adjust the overall brightness of the image.

Exposure control – Select a suitable option to control exposure.

For most scenes the **Automatic** option will provide the best results. The shutter speed is automatically set to produce optimum image quality.

If the image flickers that can be caused by fluorescent lamps or other light sources. To reduce flicker in the image, select the **Flicker** option that matches the power line frequency.

The **Hold current** option locks the current exposure settings.

Max exposure time – Shutter speed, also called 'exposure time' stands for the length of time the camera shutter is open, thereby exposing the camera sensor to light. If shutter speed is fast it can freeze action effectively. If shutter speed is slow, it can cause moving objects to appear blurred. Decreasing the exposure time will reduce motion blur.

Exposure zones – This setting determines which part of the image is used to calculate the exposure. For most situations, the **Auto** setting can be used.

You can select a predefined area by defining **Include** and **Exclude** windows within the image. **Exclude** windows exclude areas that are too bright or dark, and **Include** windows include areas in the scene that have better lighting which will contribute to the exposure data. There must be at least one **Include** window. There can be a total of ten **Include** and **Exclude** windows to tailor the exposure zone.

Note that an **Exclude** window is effective only when placed inside an **include** window.

Tip: If an area is extremely bright draw an **Include** window to cover the whole area and define **Exclude** windows within it to block out the bright areas.

Shutter & Gain

Normal Light – Use the slider to set the **Priority** between **Low motion blur** and **Low noise**. When prioritizing low noise (slider all the way to the left) the Axis product will automatically decrease shutter speed as brightness decreases. When the shutter speed reaches 1/30 s the Axis product will increase gain until the set maximum gain for normal light is reached. Select the **Max gain** value from the drop-down list. This defines the upper limit for gain in the context of normal light. **Max fast shutter** sets

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shutter speed limit in normal light conditions. Depending on a scenario, the shutter speed limit may need to be defined. This is done through **System Options > Advanced > Plain Config**.

Low Light – Use the slider to set the **Priority** between **Low motion blur** and **Low noise**. When prioritizing low motion blur (slider all the way to the right) the camera will automatically increase gain as brightness decreases. When the gain reaches the set maximum gain for low light, the camera will decrease shutter speed until the set maximum shutter for low light is reached. This is the default priority setting for low light.

Day/Night

The IR cut filter prevents infrared (IR) light from reaching the image sensor. In poor lighting conditions, for example at night, or when using an external IR lamp, set the IR cut filter to **Off**. This increases light sensitivity and allows the product to “see” infrared light. The image is shown in black and white when the IR cut filter is off.

If using automatic **Exposure control**, set the IR cut filter to **Auto** to automatically switch between **On** and **Off** according to the lighting conditions.

The **Day/Night shift level** bar helps determine when the camera will shift from day mode to night mode. Normally, the camera automatically changes mode from day to night when very dark (level 100 in the slider). By setting **Day/Night shift level** to a lower value, the camera will change to night mode earlier.

Align the Channel Images

The lenses in the Axis product are aligned during production. However fine tuning of the image alignment may be required depending on, for instance, the distances within the scene. Also a larger overlap between the images will guarantee a complete coverage of the whole scene to a larger extent.

To set the individual image alignment for each channel go to **Setup > Video > Capture Alignment** and use the **LEFT/RIGHT** and **UP/DOWN** buttons or enter a value in pixels directly.

About overlay text

An overlay text can display the current date and time, or a text string. When using a text string, so-called modifiers can be used to display information such as the name of the current week or month.

It is also possible to display text when an action rule is triggered, see *How to include overlay text in an action rule on page 20*.

About overlay images

An overlay image is a static image superimposed over the video stream. The image, for example a company logo, is first uploaded to the Axis product and then used to provide extra information or to mask a part of the image.

Image specifications:

- The uploaded image should be a Windows 24-bit BMP image with maximum 250 colors.
- The image width and height, in pixels, must be exactly divisible by four.
- The image cannot be larger than the maximum image resolution.
- If combining text and image overlays, take into consideration that the text overlay occupies 16 or 32 pixels in height (depending on the resolution) and has the same width as the video image.

To always cover a selected part of the monitored area, use a privacy mask. See *Privacy Mask on page 21*.

How to include overlay text in an action rule

1. Go to **Video > Video Stream** and select the **Image** tab.
2. Under **Overlay Settings**, select **Include text**.

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3. Enter the modifier #D. When the rule is triggered, #D is replaced by the text specified in the action rule.
Additional text in this field will be displayed also when the action rule is not active.
4. Go to **Events > Action Rules** and create your action rule.
5. From the **Actions** list, select **Overlay Text**.
6. Enter the text to display in the **Text** field.
7. Specify the **Duration**. The text can be displayed while the rule is active or for a fixed number of seconds.


Privacy Mask

A privacy mask is a user-defined area that prevent users from viewing parts of the monitored area. Privacy masks appear as blocks of solid color and are applied on the video stream. Privacy masks cannot be bypassed using the VAPIX® application programming interface (API).

The Privacy Mask List (**Video > Privacy Mask**) shows all the masks that are currently configured in the Axis product and indicates if they are enabled.

You can add a new mask, re-size the mask with the mouse, choose a color for the mask, and give the mask a name.

The grey bar on the edge of the image represents a privacy mask in an adjacent video stream and it enables you to align a new privacy mask to the existing one.

For more information, see the online help 

Important

Adding many privacy masks may affect the product's performance.

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Configure the Live View Page

Configure the Live View Page

You can customize the Live View page and alter it to suit your requirements. It is possible to define the following features of the Live View page.

- Stream Profile. See *page 18*.
- Default Viewer for Browser. See *page 22*.
- Viewer Settings. See *page 22*.
- Action Buttons. These are the buttons described in *Controls on the Live View Page on page 11*.
- User Defined Links. See *page 22*.

Default Viewer for Browsers

From **Live View Config > Default Viewer** select the default method for viewing video images in your browser. The product attempts to show the video images in the selected video format and viewer. If this is not possible, the product overrides the settings and selects the best available combination.

Browser	Viewer	Description
Windows Internet Explorer	AMC	Recommended viewer in Internet Explorer (H.264/Motion JPEG).
	QuickTime	H.264.
	Still image	Displays still images only. Click the Refresh button in your browser to view a new image.
Other browsers	Server Push	Recommended viewer for other browsers (Motion JPEG).
	QuickTime	H.264.
	Still image	Displays still images only. Click the Refresh button in your browser to view a new image.

For more information, please see the online help .

Viewer Settings

To configure options for the viewer, go to **Live View Config > Viewer Settings**.

- Select **Show viewer toolbar** to display the AXIS Media Control (AMC) or the QuickTime viewer toolbar under the video image in your browser.
- **H.264 decoder installation**. The administrator can disable installation of the H.264 decoder included with AXIS Media Control. This is used to prevent installation of unlicensed copies. Further decoder licenses can be purchased from your Axis reseller.
- Select **Enable recording button** to enable recording from the Live View page. This button is available when using the AMC viewer. The recordings are saved to the location specified in the AMC Control Panel. See *AXIS Media Control (AMC) on page 13*.

User Defined Links

To display user-defined links in the Live View page, select the **Show custom link** option, give the link a name and then enter the URL to link to. When defining a web link do not remove the 'http:/' from the URL address. Custom links can be used to run scripts or activate external devices connected to the product, or they can link to a web page. Custom links defined as cgi links will run the script in the background, in a hidden frame. Defining the link as a web link will open the link in a new window.

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Detectors

Detectors

Camera Tampering

Camera Tampering can generate an alarm whenever the camera is repositioned, or when the lens is covered, spray-painted or severely defocused. To send an alarm, for example an email, an action rule must be set up.

To configure tampering detection:

1. Go to **Detectors > Camera Tampering**.
2. Set the **Minimum duration**, that is, the time that must elapse before an alarm is generated. Increase time to prevent false alarms for known conditions that affect the image.
3. Select **Alarm for dark images** if an alarm should be generated if lights are dimmed or turned off, or if the lens is sprayed, covered, or rendered severely out of focus.
4. Click **Save**.

To configure the product to send an alarm when tampering occurs:

1. Go to **Events > Action Rules**.
2. Click **Add** to set up a new action rule.
3. Enter a **Name** for the action rule.
4. Under **Condition**, select **Detectors** from the **Trigger** list.
5. Select **Tampering** from the list of detectors.
6. Optionally, select a schedule and set additional conditions.
7. Select the action. To send an email, select **Send Notification** and select a **Recipient** from the list of defined recipients.

Note

The **While the rule is active** option under **Duration** cannot be used with camera tampering, since camera tampering does not have a duration and once it has been triggered it will not automatically return to its untriggered state.

For more information on actions rules, see *Events on page 31*.

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Applications

Applications

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

Note

- The application AXIS Video Motion Detection is included with this product. See *AXIS Video Motion Detection*.
- 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.

Application Licenses

Some applications need a license to run. Licenses can be installed in two ways:

- Automatic installation – requires access to the Internet
- Manual installation – obtain the license key from the application vendor and upload the key to the Axis product

To request a license, the Axis product serial number (S/N) is required. The serial number can be found on the product label and under **System Options > Support > System Overview**.

Upload Application

To upload and start an application:

1. Go to **Setup > Applications**.
2. Under **Upload Application**, click **Browse**. Locate the application file and click **Upload Package**.
3. Install the license (if applicable). For instructions, see the documentation provided by the application vendor.
4. Start the application. Go to page **Applications**, select the application in the list of installed applications and click **Start**.
5. Configure the application. For instructions, see the documentation provided by the application vendor.

Note

- Applications can be uploaded by product administrators.
- Applications and licenses can be installed on multiple products at the same time using AXIS Camera Management, version 3.10 and later.

To generate a log file for the application, go to **Applications**. Select the application and click **Log**.

Application Considerations

If an application is upgraded, application settings, including the license, will be removed. The license must be reinstalled and the application reconfigured.

If the Axis product's firmware is upgraded, uploaded applications and their settings will remain unchanged, although this is not guaranteed by Axis Communications. Note that the application must be supported by the new firmware. For information about firmware upgrades, see *Upgrade the Firmware*.

If the Axis product is restarted, running applications will restart automatically.

If the Axis product is restored, uploaded applications remain unchanged but must be restarted. To start the application, go to **Setup > Applications**. Select the application in the list of installed applications and click **Start**. For information about restoring the Axis product, see *Maintenance*.

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Applications

If the Axis product is reset to factory default, uploaded applications and their settings are removed. For information about factory default, see *Reset to Factory Default Settings*.

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AXIS Video Motion Detection

AXIS Video Motion Detection

AXIS Video Motion Detection is an application that detects moving objects in the camera's field of view. When a moving object is detected, AXIS Video Motion Detection sends an alarm that can be used by the Axis product or by third-party software to for example, record video or send a notification.

AXIS Video Motion Detection 3 is included with the Axis product and is available under **Setup > Applications**. To use AXIS Video Motion Detection, the application must first be started. To avoid detecting unwanted objects, the application should be configured. During configuration, visual confirmation can be used to help understand the effect of the different filters. When visual confirmation is enabled, red polygons show which objects the application detects and green polygons show which objects the application ignores.

Considerations

Before using AXIS Video Motion Detection 3, take the following into consideration:

- Small and distant objects might not be detected.
- Detection accuracy may be affected by weather conditions such as heavy rain or snow.
- Make sure that the lighting conditions are within the Axis product's specification. Add additional lighting if needed.
- Make sure that the camera is not subject to excessive vibrations. Vibrations might cause false detections.

Start and Stop the Application

To start the application, select it in the **Installed Applications** list on the **Applications** page and click **Start**.

To stop the application, select it in the list and click **Stop**.

Configure Application

The application is available from **Setup > Applications > Motion Detection 3**. Go to **Settings** and then click **AXIS Video Motion Detection settings** to open the application's webpage.

To configure AXIS Video Motion Detection 3, follow these steps:

1. Modify the size and position of the include area. This is the area in which moving objects will be detected. See *Include Area on page 27*.
2. Optionally, add one or more exclude areas. Objects in an exclude area will be ignored. See *Exclude Area on page 27*.
3. Click **Save** to apply the changes.
4. Use visual confirmation to verify the settings. See *Visual Confirmation on page 27*.
5. If too many unwanted objects are detected, enable and configure one or more of the ignore filters. See *Ignore Filters on page 28*.

After modifying a setting, click **Save** to apply the changes. The video stream will be restarted and it may take a few seconds before the change is applied.

Multichannel Products

To use the application on multiple channels, the application must be enabled and configured for each channel.

- To switch between channels, click on the tabs below the video image.
- To enable the application on a channel, switch to that channel and click **Enable**.

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AXIS Video Motion Detection

It is recommended to only enable visual confirmation for one channel at a time. Make sure to disable visual confirmation before starting configuring another channel.


Clicking **Save** will save changes on all channels.

Include Area

The include area is the area in which moving objects will be detected. Objects moving outside the include area will be ignored. The object will be detected also if only a part of the object is inside the include area.

Note

To modify the include area, Internet Explorer and AXIS Media Control (AMC) must be used.

The default include area is a square that covers the whole image. Click on the  icon to highlight the area.

Use the mouse to reshape and resize the area so that it only covers the part of the image in which moving objects should be detected. The default square can be changed to a polygon with up to 20 points (corners).

- To add a new point, click on the include area border. Drag the point to the desired position.
- To remove a point, right-click on the point.
- To move a point, drag the point to the new position.
- To move the entire include area, place the mouse pointer inside the area. When the pointer becomes a cross, drag the area to the new position.
- To select the include area, click on the border.

To reset the include area to its default size, click **Reset**.

Exclude Area

An exclude area is an area in which moving objects will be ignored. Use exclude areas if there are areas inside the include area that trigger a lot of unwanted detected objects. Up to 10 exclude areas can be used.


Note

To add and modify exclude areas, Internet Explorer and AXIS Media Control (AMC) must be used.

To add an exclude area, click **Add**. The default exclude area is a rectangle placed in the center of the image. Use the mouse to move, reshape and resize the area so that it covers the desired part of the image. The default square can be changed to a polygon with up to 20 points (corners).

- To move the exclude area, place the mouse pointer inside the area. When the pointer becomes a cross, drag the area to the new position.
- To add a new point, click on the exclude area border. Drag the point to the desired position.
- To remove a point, right-click on the point.
- To move a point, drag the point to the new position.
- To select an exclude area, click on the border.

To remove an exclude area, select the area and then click **Remove**.

To highlight the exclude areas, click on the  icon.

Visual Confirmation

Visual confirmation is used to validate that the settings are correct, that is, that all objects that should be detected are detected.

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AXIS Video Motion Detection

Note

To use visual confirmation, Internet Explorer and AXIS Media Control (AMC) must be used.

When visual confirmation is enabled, all moving objects found by the application will be encircled and followed by polygons. A red polygon indicates that the object is found and is detected as a moving object. A green polygon indicates that the object is found but is ignored because it is not in the include area or because of one of the ignore filters.

To enable visual confirmation:

1. Select the **Enable visual confirmation** option.
2. Click **Save**.

Note

- Visual confirmation is disabled after 15 minutes.
- After modifying a setting, click **Save** to apply the change. The video stream will be restarted and it may take a few seconds before the change is applied.
- Enabling visual confirmation may introduce video latency.

Ignore Filters

If AXIS Video Motion Detection 3 detects too many unwanted objects, start by modifying the include and exclude areas. If still too many objects are detected, use one or more of the ignore filters.

Supported ignore filters:

- **Swaying objects** – Used to ignore objects that only move a short distance
- **Short-lived objects** – Used to ignore objects that only appear in the image for a short period of time
- **Small objects** – Used to ignore small objects

Ignore filters are applied to all moving objects found by the application and should be configured with care to ensure that no important objects are ignored.


Only use ignore filters if needed and use as few filters as possible. Enable and configure one filter at a time and use visual confirmation to verify the settings before enabling another filter. When configuring a filter, start with a small filter size, click **Save** and use visual confirmation to verify the settings. If required, increase the filter size in small steps until the number of unwanted objects is reduced.

Swaying Object Ignore Filter

The swaying object filter is used to avoid detecting objects that only move a short distance, for example moving trees, flags and their shadows. Use the filter if such objects cause a lot of false detections. If the swaying objects in the scene are large, for example large ponds or large trees, use exclude areas instead of the filter. The filter will be applied to all moving objects in scene and, if set to a value too large, important objects might not be detected.

When the swaying object filter is enabled and the application finds a moving object, the object will not be reported as detected (red polygon in visual confirmation) until it has travelled a distance larger than the set filter size. The alarm sent by the application will be sent when the object is detected. If the alarm is used to start a recording, configure the pre-trigger time so that the recording also includes the time the object moved in the scene before being detected.

To enable the filter:

1. Select the **Swaying objects** option.
2. Click on the  icon to show the filter size in the image.
3. Use the mouse to adjust the filter size. Start with a small size. Objects moving a distance shorter than the distance from the center of the cross to one of the arrowheads will be ignored. The filter can be moved to the location of a swaying object to make it easier to adjust the size. Note that the filter will be applied to all objects in the image, not only to the ones at the location where the filter is placed.

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AXIS Video Motion Detection

4. Click **Save** to apply the filter.
5. Use visual confirmation to verify the settings.
6. If the result is not satisfactory, increase the filter size in small steps.

The filter size can also be set by entering a value between 10 and 50 in the field. The value corresponds to the distance from the center of the cross to one of the arrowheads. The value 100 implies that an object must travel from its initial point to one third of the image width or height before being detected. The value 50 implies half that distance, that is, the object must travel a distance of one sixth of the image width or height before being detected.

Short-Lived Object Ignore Filter

The short-lived object filter is used to avoid detecting objects that only appear for a short period of time, such as light beams from a passing car and quickly moving shadows. Use the filter if such objects cause a lot of false detections.

When the short-lived object filter is enabled and the application finds a moving object, the object will not be reported as detected (red polygon in visual confirmation) until the set time has passed. The alarm sent by the application will be sent when the object is detected. If the alarm is used to start a recording, configure the pre-trigger time so that the recording also includes the time the object moved in the scene before being detected.

To enable the filter:


1. Select the **Short-lived objects** option.
2. Enter the number of seconds in the field. The number of seconds is the minimum time that must pass before the object is detected. Start with a small number.
3. Click **Save** to apply the filter.
4. Use visual confirmation to verify the settings.
5. If the result is not satisfactory, increase the filter size in small steps.

Small Object Ignore Filter

The small object filter is used to avoid detecting objects that are too small. For example, if only moving cars should be detected, the small object filter can be used to avoid detecting people and animals.

If using the small object filter, take into consideration that an object far from the camera appears smaller than an object close to the camera. If the filter is set to ignore objects the size of a person, people that are close to the camera can still be detected because they are larger than the filter size.

To enable the filter:

1. Select the **Small objects** option.
2. Click on the  icon to show the filter size in the image.
3. Use the mouse to adjust the filter size. Start with a small size. Moving objects that fit inside the rectangle will be ignored. The filter displayed in the image can be moved to make it easier to compare the filter size with the size of objects in the image. Note that the filter will be applied to all objects in the image, also to objects that are not located at the position of the displayed filter.
4. Click **Save** to apply the filter.
5. Use visual confirmation to verify the settings.
6. If the result is not satisfactory, increase the filter size in small steps.

The filter size can also be set by entering the width and height in the fields. The width and height are the maximum width and maximum height of the objects to ignore and are measured in percent of the image width and height. Values between 5 and 100 can be used.

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AXIS Video Motion Detection

Using the Application in an Action Rule

The following example shows how to configure the Axis product to record video when AXIS Video Motion Detection 3 detects motion.

1. Go to **Setup > System Options > Storage** in the Axis product's webpages and configure the product to use a network share.
2. Optionally, go to **Setup > Video > Stream Profiles** and create a stream profile to use for recording.
3. Go to **Setup > Events > Action Rules** and click **Add** to create a new action rule.
4. From the **Trigger** drop-down list, select **Applications** and then select **VMD 3**.
5. Configure other settings as required. For example, to only record video during certain time periods, select a **Schedule**.
6. Under **Actions**, select **Record Video** from the **Type** drop-down list.
7. Select the stream profile and storage device to use and configure the pre- and post-trigger times.
8. Make sure that the rule is enabled and then click **OK**.

Note

To appear in the **Trigger** list, the application must be started and its status must be **Idle** or **Running**.

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Events

Events

The Event pages allow you to configure the Axis product to perform actions when different events occur. For example, the product can start a recording or send an email notification when motion is detected. The set of conditions that defines how and when the action is triggered is called an action rule.

Set Up Action Rules

An action rule defines the conditions that must be met for the product to perform an action, for example record video or send an email notification. If multiple conditions are defined, all of them must be met to trigger the action.

For more information about available triggers and actions, see *Triggers on page 31* and *Actions on page 32*.

The following example describes how to set up an action rule to record video to a network share if there is movement in the camera's field of view.

Set up motion detection and add a network share:

1. Go to **Applications** to start and configure AXIS Video Motion Detection 3. See *AXIS Video Motion Detection*.
2. Go to **System Options > Storage** and set up the network share. See *page 47*.


Set up the action rule:

1. Go to **Events > Action Rules** and click **Add**.
2. Select **Enable** rule and enter a descriptive name for the rule.
3. Select **Applications** from the **Trigger** drop-down list and then select **VMD3**
4. Optionally, select a **Schedule** and **Additional conditions**. See below.
5. Under **Actions**, select **Record Video** from the **Type** drop-down list.
6. Select a **Stream profile** and configure the **Duration** settings as described below.
7. Select **Network Share** from the **Storage** drop-down list.

To use more than one trigger for the action rule, select **Additional conditions** and click **Add** to add additional triggers. When using additional conditions, all conditions must be met to trigger the action.

To prevent an action from being triggered repeatedly, a **Wait at least** time can be set. Enter the time in hours, minutes and seconds, during which the trigger should be ignored before the action rule can be activated again.

The recording **Duration** of some actions can be set to include time immediately before and after the event. Select **Pre-trigger time** and/or **Post-trigger time** and enter the number of seconds. When **While the rule is active** is enabled and the action is triggered again during the post-trigger time, the recording time will be extended with another post-trigger time period.

For more information, see the online help .

Triggers

Available action rule **triggers** and **conditions** include:

- **Applications** – Use installed applications to trigger the rule. See *Applications on page 24*.
 - **VMD3** – Trigger the rule when AXIS Video Motion Detection detects a moving object. See *AXIS Video Motion Detection*.
- **Detectors**

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Events

- **Day/Night Mode** – Trigger the rule when the product switches between day mode (IR cut filter on) and night mode (IR cut filter off). This can for example be used to control an external infrared (IR) light connected to an output port.
- **Live Stream Accessed** – Trigger the rule when any stream is accessed and during edge storage playback. This can for example be used to send notifications.
- **Tampering** – Trigger the rule when tampering is detected. See *Camera Tampering on page 23*.
- **Hardware**
 - **Fan** – Trigger the rule if the fan is malfunctioning. This can for example be used to send maintenance notifications.
 - **Network** – Trigger the rule if network connection is lost or restored.
 - **Temperature** – Trigger the rule if the temperature falls outside or inside the operating range of the product. This can for example be used to send maintenance notifications.
- **Input Signal**
 - **Manual Trigger** – Trigger the rule using the **Manual Trigger** button in the Live View page. See *Controls on the Live View Page on page 11*. This can for example be used to validate actions during product installation and configuration.
 - **Virtual Inputs** – can be used by a VMS (Video Management System) to trigger actions. Virtual inputs can, for example, be connected to buttons in the VMS user interface.
- **Storage**
 - **Disruption** – Trigger the rule if storage problems are detected, for example if the storage device is unavailable, removed, full, locked or if other read or write problems occur. This can for example be used to send maintenance notifications.
 - **Recording** – Triggers the rule when the Axis product records to the storage device. The recording status trigger can be used to notify the operator, for example by flashing LED lights, if the product has started or stopped to record to the storage device. Note that, this trigger can be used only for edge storage recording status.
- **System**
 - **System Ready** – Trigger the rule when the product has been started and all services are running. This can for example be used to send a notification when the product restarts.
- **Time**
 - **Recurrence** – Trigger the rule periodically. See *Set Up Recurrences on page 35*. This can for example be used to upload an image every 5 minutes.
 - **Use Schedule** – Trigger the rule according to the selected schedule. See *Create Schedules on page 34*.

Actions

Available actions include:

- **Day/Night Vision Mode** – Set day mode (IR cut filter on) or night mode (IR cut filter off).
- **Overlay Text** – Display an overlay text. See *How to include overlay text in an action rule on page 20*.
- **Record Video** – Record video to a selected storage.
- **Send Images** – Send images to a recipient.
- **Send Notification** – Send a notification message to a recipient.

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- **Send SNMP Trap** – Send an SNMP trap message to the operator. Make sure that SNMP is enabled and configured under **System Options > Network > SNMP**.
- **Send Video Clip** – Send a video clip to a recipient.
- **Status LED** – Flash the LED indicator. This can for example be used to validate triggers such as motion detection during product installation and configuration.

Add Recipients

The product can send media files and messages to notify users about events. Before the product can send media files or notification messages, you must define one or more recipients. For information about available options, see *Recipient Types on page 33*.

To add a recipient:

1. Go to **Events > Recipients** and click **Add**.
2. Enter a descriptive name.
3. Select a recipient **Type**.
4. Enter the information needed for the recipient type.
5. Click **Test** to test the connection to the recipient.
6. Click **OK**.

Recipient Types

The following recipients are available:

Recipient	Use with action	Notes
Email	Send Images Send Notification Send Video Clip	An email recipient can contain multiple email addresses.
FTP	Send Images Send Video Clip	
SFTP	Send Images Send Video Clip	Encrypted file transfer using SSH File Transport Protocol (SFTP). SFTP is a more secure method than FTP but file transfer might be slower, especially for large files such as high resolution video. Specify login information for the SFTP server and the server's public key MD5 fingerprint (32 hexadecimal digits). The SFTP recipient supports SFTP servers using SSH-2 with RSA and DSA host key types. RSA is the preferred method. To use DSA, disable the RSA key on the SFTP server.
HTTP	Send Images Send Notification Send Video Clip	

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HTTPS	Send Images Send Notification Send Video Clip	Encrypted file transfer using HyperText Transfer Protocol Secure (HTTPS). Specify login information for the HTTPS server and validate the server's certificate. If there is a proxy between the Axis product and the HTTPS server, also specify the proxy settings.
Network Share	Send Images Send Video Clip	A network share can also be used as a storage device for recorded video. Go System Options > Storage to configure a network share before setting up a continuous recording or an action rule to record video. For more information about storage devices, see <i>Storage on page 47</i> .
TCP	Send Notification	

Set Up Email Recipients

Email recipients can be configured by selecting one of the listed email providers, or by specifying the SMTP server, port and authentication used by, for example, a corporate email server.

Note

Some email providers have security filters that prevent users from receiving or viewing large amount of attachments, from receiving scheduled emails and similar. Check the email provider's security policy to avoid delivery problems and locked email accounts.

To set up an email recipient using one of the listed providers:

1. Go to **Events > Recipients** and click **Add**.
2. Enter a **Name** and select **Email** from the **Type** list.
3. Enter the email addresses to send emails to in the **To** field. Use commas to separate multiple addresses.
4. Select the email provider from the **Provider** list.
5. Enter the user ID and password for the email account.
6. Click **Test** to send a test email.

To set up an email recipient using for example a corporate email server, follow the instructions above but select **User defined as Provider**. Enter the email address to appear as sender in the **From** field. Select **Advanced settings** and specify the SMTP server address, port and authentication method. Optionally, select **Use encryption** to send emails over an encrypted connection. The server certificate can be validated using the certificates available in the Axis product. For information on how to upload certificates, see *Certificates on page 40*.

Create Schedules

Schedules can be used as action rule triggers or as additional conditions, for example to record video if motion is detected outside office hours. Use one of the predefined schedules or create a new schedule as described below.

To create a new schedule:

1. Go to **Events > Schedules** and click **Add**.
2. Enter a descriptive name and the information needed for a daily, weekly, monthly or yearly schedule.
3. Click **OK**.

To use the schedule in an action rule, select the schedule from the **Schedule** drop-down list in the Action Rule Setup page.

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Events

Set Up Recurrences

Recurrences are used to trigger action rules repeatedly, for example every 5 minutes or every hour.

To set up a recurrence:

1. Go to **Events > Recurrences** and click **Add**.
2. Enter a descriptive name and recurrence pattern.
3. Click **OK**.

To use the recurrence in an action rule, first select **Time** from the **Trigger** drop-down list in the Action Rule Setup page and then select the recurrence from the second drop-down list.

To modify or remove recurrences, select the recurrence in the **Recurrences List** and click **Modify** or **Remove**.

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Recordings

Recordings

The Axis product can be configured to record video continuously or according to an action rule:

- To start a continuous recording, see *page 37*.
- To set up action rules, see *page 31*.
- To access recordings, see *Find Recordings on page 36*.
- To play recordings, see *Play Recording on page 36*.
- To export a recording as a video clip, see *Export Video Clip on page 37*.
- To configure camera controlled storage, see *Storage on page 47*.

Find Recordings

Recordings made to the network share can be accessed from the **Recordings > List** page. The page lists all recordings and shows each recording's start date and time, duration and the event that triggered the recording.

Note

The recording's start date and time is set according to the Axis product's date and time settings. If the Axis product is configured to use a time zone different from the local time zone, make sure to configure the **Recording time** filters according to the product's time zone. Date and time settings are configured under **System Options > Date & Time**, see *Date & Time on page 41*.

To find a recording, follow these steps:

1. Go to **Recordings > List**.
2. To reduce the number of recordings displayed, select the desired options under **Filter**:
 - Recording time** – List recordings that started between the **From** and **To** times.
 - Event** – List recordings that were triggered by a specific event. Select **continuous** to list continuous recordings.
 - Storage** – List recordings from a specific storage device.
 - Sort** – Specify how recordings should be sorted in the list.
 - Results** – Specify the maximum number of recordings to display.
3. To apply the filters, click the **Filter** button. Some filters may take a long time to complete.
4. The recordings are displayed in the **Recording** list.

To play a recording, select the recording and click **Play**. See also *Play Recording on page 36*.

To view detailed information about a recording, select the recording and click **Properties**.

To export a recording or a part of a recording as a video clip, select the recording and click **Export**. See also *Export Video Clip on page 37*.

To remove a recording from the storage device, select the recording and click **Remove**.

Play Recording

Recordings on the network share can be played directly from the Axis product's webpages.

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Recordings

To play a recording, follow these steps:

1. Go to **Recordings > List**.
2. To reduce the number of recordings displayed, select the desired options under **Filter** and click the **Filter** button to apply the filters. See also *Find Recordings on page 36*.
3. Select the recording and click **Play**. The recording will be played in a new browser window.

Export Video Clip

Recordings on the network share can be exported as video clips. It is possible to export a complete recording or a part of a recording.

Note

The exported recording is a Matroska video file (.mkv). To play the recording in Windows Media Player, AXIS Matroska File Splitter must be installed. AXIS Matroska File Splitter can be downloaded from www.axis.com/techsup/software

To export a video clip, follow these steps:

1. Go to **Recordings > List**.
2. To reduce the number of recordings displayed, select the desired options under **Filter** and click the **Filter** button to apply the filters. See also *Find Recordings on page 36*.
3. Select the recording and click **Export**. The **Export Recording** dialog opens.
4. By default, the complete recording is selected. To export a part of the recording, modify the start and stop times.
5. Optionally, enter a file name for the recording.
6. Click **Export**.

Note

Recordings can also be exported from the playback window.

Continuous Recording

The Axis product can be configured to continuously save video to a storage device. For information about storage devices, see *Storage on page 47*. To prevent the disk from becoming full, it is recommended to configure the disk to automatically remove old recordings.

If a new stream profile is selected while a recording is ongoing, the recording will be stopped and saved in the recording list and a new recording with the new stream profile will start. All previous continuous recordings will remain in the recording list until they are removed manually or through automatic removal of old recordings.

To start a continuous recording, follow these steps:

1. Go to **Recordings > Continuous**.
2. Select **Enabled**.
3. Select the type of storage device from the **Storage** list.
4. Select a **Stream profile** to use for continuous recordings.
5. Click **Save** to save and start the recording.

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Languages

Languages

Multiple languages can be installed in the Axis product. All web pages including the online help will be displayed in the selected language. To switch languages, go to **Setup > Languages** and first upload the new language file. Browse and locate the file and click the **Upload Language** button. Select the new language from the list and click **Save**.

Note

- Resetting the product to factory default settings will erase any uploaded language files and reset the product language to English.
- Clicking the **Restore** button on the Maintenance page will not affect the language.
- A firmware upgrade will not affect the language used. However if you have uploaded a new language to the product and later upgrade the firmware, it may happen that the translation no longer matches the product's web pages. In this case, upload an updated language file.
- A language already installed in the product will be replaced when a current or a later version of the language file is uploaded.

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System Options

System Options

Security

Users

User access control is enabled by default and can be configured under **System Options > Security > Users**. An administrator can set up other users by giving them user names and passwords. It is also possible to allow anonymous viewer login, which means that anybody may access the Live View page.

The user list displays authorized users and user groups (access levels):

- Viewers have access to the Live View page
- Operators have access to all settings except:
 - creating and modifying privacy mask settings
 - uploading applications and language files
 - any of the settings included in the **System Options**
- Administrators have unrestricted access to all settings. The administrator can add, modify and remove other users.

Note

Note that when the option **Encrypted & unencrypted** is selected, the webserver will encrypt the password. This is the default option for a new unit or a unit reset to factory default settings.

Under **HTTP/RTSP Password Settings**, select the type of password to allow. You may need to allow unencrypted passwords if there are viewing clients that do not support encryption, or if you upgraded the firmware and existing clients support encryption but need to log in again and be configured to use this functionality.

Under **User Settings**, select the **Enable anonymous viewer login** option to allow anonymous users access to the Live View page.

Deselect the **Enable Basic Setup** option to hide the Basic Setup menu. Basic Setup provides quick access to settings that should be made before using the Axis product.

ONVIF

ONVIF (Open Network Video Interface Forum) is a global interface standard that makes it easier for end users, integrators, consultants, and manufacturers to take advantage of the possibilities offered by network video technology. ONVIF enables interoperability between different vendor products, increased flexibility, reduced cost and future-proof systems.

By creating a user you automatically enable ONVIF communication. Use the user name and password with all ONVIF communication with the product. For more information see www.onvif.org

IP Address Filter

IP address filtering is enabled on the **System Options > Security > IP Address Filter** page. Once enabled, the listed IP address are allowed or denied access to the Axis product. Select **Allow** or **Deny** from the list and click **Apply** to enable IP address filtering.

The administrator can add up to 256 IP address entries to the list (a single entry can contain multiple IP addresses).

HTTPS

HTTPS (HyperText Transfer Protocol over Secure Socket Layer, or HTTP over SSL) is a web protocol providing encrypted browsing. HTTPS can also be used by users and clients to verify that the correct device is being accessed. The security level provided by HTTPS is considered adequate for most commercial exchanges.

The Axis product can be configured to require HTTPS when users from different user groups (administrator, operator, viewer) log in.

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To use HTTPS, an HTTPS certificate must first be installed. Go to **System Options > Security > Certificates** to install and manage certificates. See *Certificates on page 40*.

To enable HTTPS on the Axis product:

1. Go to **System Options > Security > HTTPS**
2. Select an HTTPS certificate from the list of installed certificates.
3. Optionally, click **Ciphers** and select the encryption algorithms to use for SSL.
4. Set the **HTTPS Connection Policy** for the different user groups.
5. Click **Save** to enable the settings.

To access the Axis product via the desired protocol, in the address field in a browser, enter `https://` for the HTTPS protocol and `http://` for the HTTP protocol.

The HTTPS port can be changed on the **System Options > Network > TCP/IP > Advanced** page.

IEEE 802.1X

IEEE 802.1X is a standard for port-based Network Admission Control providing secure authentication of wired and wireless network devices. IEEE 802.1X is based on EAP (Extensible Authentication Protocol).

To access a network protected by IEEE 802.1X, devices must be authenticated. The authentication is performed by an authentication server, typically a **RADIUS server**, examples of which are FreeRADIUS and Microsoft Internet Authentication Service.

In Axis implementation, the Axis product and the authentication server identify themselves with digital certificates using EAP-TLS (Extensible Authentication Protocol - Transport Layer Security). The certificates are provided by a **Certification Authority (CA)**. You need:

- a CA certificate to authenticate the authentication server.
- a CA-signed client certificate to authenticate the Axis product.

To create and install certificates, go to **System Options > Security > Certificates**. See *Certificates on page 40*. Many CA certificates are preinstalled.

To allow the product to access a network protected by IEEE 802.1X:

1. Go to **System Options > Security > IEEE 802.1X**.
2. Select a **CA Certificate** and a **Client Certificate** from the lists of installed certificates.
3. Under **Settings**, select the EAPOL version and provide the EAP identity associated with the client certificate.
4. Check the box to enable IEEE 802.1X and click **Save**.

Note

For authentication to work properly, the date and time settings in the Axis product should be synchronized with an NTP server. See *Date & Time on page 41*.

Certificates

Certificates are used to authenticate devices on a network. Typical applications include encrypted web browsing (HTTPS), network protection via IEEE 802.1X and secure upload of images and notification messages for example via email. Two types of certificates can be used with the Axis product:

Server/Client certificates – To authenticate the Axis product.

CA certificates – To authenticate peer certificates, for example the certificate of an authentication server in case the Axis product is connected to an IEEE 802.1X protected network.

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Note

Installed certificates, except preinstalled CA certificates, will be deleted if the product is reset to factory default. Preinstalled CA certificates that have been deleted will be reinstalled.

A **Server/Client** certificate can be self-signed or issued by a Certificate Authority (CA). A self-signed certificate offers limited protection and can be used before a CA-issued certificate has been obtained.

To install a self-signed certificate:

1. Go to **Setup > System Options > Security > Certificates**.
2. Click **Create self-signed certificate** and provide the requested information.

To create and install a CA-signed certificate:

1. Create a self-signed certificate as described above.
2. Go to **Setup > System Options > Security > Certificates**.
3. Click **Create certificate signing request** and provide the requested information.
4. Copy the PEM-formatted request and send to the CA of your choice.
5. When the signed certificate is returned, click **Install certificate** and upload the certificate.

Server/Client certificates can be installed as **Certificate from signing request** or as **Certificate and private key**. Select **Certificate and private key** if the private key is to be upload as a separate file or if the certificate is in PKCS#12 format.

The Axis product is shipped with several preinstalled CA certificates. If required, additional CA certificates can be installed:

1. Go to **Setup > System Options > Security > Certificates**.
2. Click **Install certificate** and upload the certificate.

Date & Time


The Axis product's date and time settings are configured under **System Options > Date & Time**.

Current Server Time displays the current date and time (24h clock). The time can be displayed in 12h clock in the text overlay (see below).

To change the date and time settings, select the preferred **Time mode** under **New Server Time**:

- **Synchronize with computer time** – Sets date and time according to the computer's clock. With this option, date and time are set once and will not be updated automatically.
- **Synchronize with NTP Server** – Obtains date and time from an NTP server. With this option, date and time settings are updated continuously. For information on NTP settings, see *NTP Configuration on page 44*.
If using a host name for the NTP server, a DNS server must be configured. See *DNS Configuration on page 43*.
- **Set manually** – Allows you to manually set date and time.

If using an NTP server, select your **Time zone** from the drop-down list. If required, check **Automatically adjust for daylight saving time changes**.

The **Date & Time Format Used in Images** is the date and time format displayed as a text overlay in the video stream. Use the predefined formats or see *File Naming & Date/Time Formats* in the online help  for information on how to create custom date and time formats. To include date and time in the overlay text, go to **Video** and select **Include date** and **Include time**.

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System Options

Network

Basic TCP/IP Settings

The Axis product supports IP version 4 and IP version 6. Both versions can be enabled simultaneously, and at least one version must always be enabled.

IPv4 Address Configuration

By default, the Axis product is set to use IPv4 (IP version 4) and to obtain the IP address automatically via DHCP. The IPv4 settings are configured under **System Options > Network > TCP/IP > Basic**.

DHCP (Dynamic Host Configuration Protocol) allows network administrators to centrally manage and automate the assignment of IP addresses. DHCP should only be enabled if using dynamic IP address notification, or if the DHCP can update a DNS server. It is then possible to access the Axis product by name (host name).

If DHCP is enabled and the product cannot be accessed, run **AXIS IP Utility** to search the network for connected Axis products, or reset the product to the factory default settings (see *page 49*) and then perform the installation again.

To use a static IP address, check **Use the following IP address** and specify the IP address, subnet mask and default router.

IPv6 Address Configuration

If IPv6 (IP version 6) is enabled, the Axis product will receive an IP address according to the configuration in the network router.

To enable IPv6, go to **System Options > Network > TCP/IP > Basic**. Other settings for IPv6 should be configured in the network router.

ARP/Ping

The product's IP address can be assigned using ARP and Ping. For instructions, see *Assign IP Address Using ARP/Ping on page 42*.

The ARP/Ping service is enabled by default but is automatically disabled two minutes after the product is started, or as soon as an IP address is assigned. To re-assign IP address using ARP/Ping, the product must be restarted to enable ARP/Ping for an additional two minutes.

To disable the service, go to **System Options > Network > TCP/IP > Basic** and clear the option **Enable ARP/Ping setting of IP address**.

Pinging the product is still possible when the service is disabled.

Assign IP Address Using ARP/Ping

The product's IP address can be assigned using ARP/Ping. The command must be issued within 2 minutes of connecting power.

1. Acquire a free static IP address on the same network segment as the computer.
2. Locate the serial number (S/N) on the product label.
3. Open a command prompt and enter the following commands:

Linux/Unix syntax

```
arp -s <IP address> <serial number> temp  
ping -s 408 <IP address>
```

Linux/Unix example

```
arp -s 192.168.0.125 00:40:8c:18:10:00 temp  
ping -s 408 192.168.0.125
```

Windows syntax (this may require that you run the command prompt as an administrator)

```
arp -s <IP address> <serial number>
```

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```
ping -l 408 -t <IP address>
```

Windows example (this may require that you run the command prompt as an administrator)

```
arp -s 192.168.0.125 00-40-8c-18-10-00  
ping -l 408 -t 192.168.0.125
```

4. Check that the network cable is connected and then restart the product by disconnecting and reconnecting power.
5. Close the command prompt when the product responds with `Reply from 192.168.0.125: . . .` or similar.
6. Open a browser and type `http://<IP address>` in the Location/Address field.

For other methods of assigning the IP address, see the document *Assign an IP Address and Access the Video Stream* on Axis Support web at www.axis.com/techsup

Note

- To open a command prompt in Windows, open the **Start menu** and type `cmd` in the **Run/Search** field.
- To use the ARP command in Windows 8/Windows 7/Windows Vista, right-click the command prompt icon and select **Run as administrator**.
- To open a command prompt in Mac OS X, open the **Terminal** utility from **Application > Utilities**.

AXIS Video Hosting System (AVHS)

AVHS used in conjunction with an AVHS service, provides easy and secure Internet access to live and recorded video accessible from any location. For more information and help to find a local AVHS Service Provider go to www.axis.com/hosting

The AVHS settings are configured under **System Options > Network > TCP IP > Basic**. The possibility to connect to an AVHS service is enabled by default. To disable, clear the **Enable AVHS** box.

One-click enabled – Press and hold the product's control button (see *Hardware Overview on page 7*) for about 3 seconds to connect to an AVHS service over the Internet. Once registered, **Always** will be enabled and the Axis product stays connected to the AVHS service. If the product is not registered within 24 hours from when the button is pressed, the product will disconnect from the AVHS service.

Always – The Axis product will constantly attempt to connect to the AVHS service over the Internet. Once registered the product will stay connected to the service. This option can be used when the product is already installed and it is not convenient to use the one-click installation.

AXIS Internet Dynamic DNS Service

AXIS Internet Dynamic DNS Service assigns a host name for easy access to the product. For more information, see www.axiscam.net

To register the Axis product with AXIS Internet Dynamic DNS Service, go to **System Options > Network > TCP/IP > Basic**. Under **Services**, click the **AXIS Internet Dynamic DNS Service Settings** button (requires access to the Internet). The domain name currently registered at AXIS Internet Dynamic DNS service for the product can at any time be removed.

Note

AXIS Internet Dynamic DNS Service requires IPv4.

Advanced TCP/IP Settings

DNS Configuration

DNS (Domain Name Service) provides the translation of host names to IP addresses. The DNS settings are configured under **System Options > Network > TCP/IP > Advanced**.

Select **Obtain DNS server address via DHCP** to use the DNS settings provided by the DHCP server.

To make manual settings, select **Use the following DNS server address** and specify the following:

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Domain name – Enter the domain(s) to search for the host name used by the Axis product. Multiple domains can be separated by semicolons. The host name is always the first part of a fully qualified domain name, for example, `myserver` is the host name in the fully qualified domain name `myserver.mycompany.com` where `mycompany.com` is the domain name.

Primary/Secondary DNS server – Enter the IP addresses of the primary and secondary DNS servers. The secondary DNS server is optional and will be used if the primary is unavailable.

NTP Configuration

NTP (Network Time Protocol) is used to synchronize the clock times of devices in a network. The NTP settings are configured under **System Options > Network > TCP/IP > Advanced**.

Select **Obtain NTP server address via DHCP** to use the NTP settings provided by the DHCP server.

To make manual settings, select **Use the following NTP server address** and enter the host name or IP address of the NTP server.


Host Name Configuration

The Axis product can be accessed using a host name instead of an IP address. The host name is usually the same as the assigned DNS name. The host name is configured under **System Options > Network > TCP/IP > Advanced**.

Select **Obtain host name via IPv4 DHCP** to use host name provided by the DHCP server running on IPv4.

Select **Use the host name** to set the host name manually.

Select **Enable dynamic DNS updates** to dynamically update local DNS servers whenever the Axis product's IP address changes.

For more information, see the online help .

Link-Local IPv4 Address

Link-Local Address is enabled by default and assigns the Axis product an additional IP address which can be used to access the product from other hosts on the same segment on the local network. The product can have a Link-Local IP and a static or DHCP-supplied IP address at the same time.

This function can be disabled under **System Options > Network > TCP/IP > Advanced**.

HTTP

The HTTP port used by the Axis product can be changed under **System Options > Network > TCP/IP > Advanced**. In addition to the default setting, which is 80, any port in the range 1024–65535 can be used.

HTTPS

The HTTPS port used by the Axis product can be changed under **System Options > Network > TCP/IP > Advanced**. In addition to the default setting, which is 443, any port in the range 1024–65535 can be used.

To enable HTTPS, go to **System Options > Security > HTTPS**. For more information, see *HTTPS on page 39*.

NAT traversal (port mapping) for IPv4

A network router allows devices on a private network (LAN) to share a single connection to the Internet. This is done by forwarding network traffic from the private network to the "outside", that is, the Internet. Security on the private network (LAN) is increased since most routers are pre-configured to stop attempts to access the private network (LAN) from the public network (Internet).

Use **NAT traversal** when the Axis product is located on an intranet (LAN) and you wish to make it available from the other (WAN) side of a NAT router. With NAT traversal properly configured, all HTTP traffic to an external HTTP port in the NAT router is forwarded to the product.

NAT traversal is configured under **System Options > Network > TCP/IP > Advanced**.

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System Options

Note

- For NAT traversal to work, this must be supported by the router. The router must also support UPnP™.
- In this context, router refers to any network routing device such as a NAT router, Network router, Internet Gateway, Broadband router, Broadband sharing device, or a software such as a firewall.

Enable/Disable – When enabled, the Axis product attempts to configure port mapping in a NAT router on your network, using UPnP™. Note that UPnP™ must be enabled in the product (see **System Options > Network > UPnP**).

Use manually selected NAT router – Select this option to manually select a NAT router and enter the IP address for the router in the field. If no router is specified, the product automatically searches for NAT routers on your network. If more than one router is found, the default router is selected.

Alternative HTTP port – Select this option to manually define an external HTTP port. Enter a port in the range 1024–65535. If the port field is empty or contains the default setting, which is 0, a port number is automatically selected when enabling NAT traversal.

Note

- An alternative HTTP port can be used or be active even if NAT traversal is disabled. This is useful if your NAT router does not support UPnP and you need to manually configure port forwarding in the NAT router.
- If you attempt to manually enter a port that is already in use, another available port is automatically selected.
- When the port is selected automatically it is displayed in this field. To change this, enter a new port number and click **Save**.

FTP

The FTP server running in the Axis product enables upload of new firmware, user applications, etc. The FTP server can be disabled under **System Options > Network > TCP/IP > Advanced**.

Note

This FTP server has nothing to do with the product's ability to transfer images via FTP to other locations and servers.

RTSP


The RTSP server running in the Axis product allows a connecting client to start an H.264 stream. The RTSP port number can be changed under **System Options > Network > TCP/IP > Advanced**. The default port is 554.

Note

H.264 video streams will not be available if the RTSP server is disabled.

SOCKS

SOCKS is a networking proxy protocol. The Axis product can be configured to use a SOCKS server to reach networks on the other side of a firewall or proxy server. This functionality is useful if the Axis product is located on a local network behind a firewall, and notifications, uploads, alarms, etc need to be sent to a destination outside the local network (for example the Internet).

SOCKS is configured under **System Options > Network > SOCKS**. For more information, see the online help .

QoS (Quality of Service)

QoS (Quality of Service) guarantees a certain level of a specified resource to selected traffic on a network. A QoS-aware network prioritizes network traffic and provides a greater network reliability by controlling the amount of bandwidth an application may use.

The QoS settings are configured under **System Options > Network > QoS**. Using DSCP (Differentiated Services Codepoint) values, the Axis product can mark different types of traffic.

SNMP

The Simple Network Management Protocol (SNMP) allows remote management of network devices. An SNMP community is the group of devices and management station running SNMP. Community names are used to identify groups.

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System Options

AXIS Video MIB (Management Information Base) for video hardware can be used to monitor Axis-specific, hardware-related issues that may need administrative attention. For more information about AXIS Video MIB and to download MIB files, go to www.axis.com/techsup

To enable and configure SNMP in the Axis product, go to the **System Options > Network > SNMP** page.

Depending on the level of security required, select the version on SNMP to use.

Traps are used by the Axis product to send messages to a management system on important events and status changes. Check **Enable traps** and enter the IP address where the trap message should be sent and the **Trap community** that should receive the message.

Note

If HTTPS is enabled, SNMP v1 and SNMP v2c should be disabled.

Traps for SNMP v1/v2 are used by the Axis product to send messages to a management system on important events and status changes. Check **Enable traps** and enter the IP address where the trap message should be sent and the **Trap community** that should receive the message.

The following traps are available:

- Cold start
- Warm start
- Link up
- Authentication failed

Note

All AXIS Video MIB traps are enabled when SNMP v1/v2c traps are enabled. It is not possible to turn on or off specific traps.

SNMP v3 provides encryption and secure passwords. To use traps with SNMP v3, an SNMP v3 management application is required.

To use SNMP v3, HTTPS must be enabled, see *HTTPS on page 39*. To enable SNMP v3, check the box and provide the initial user password.

Note

The initial password can only be set once. If the password is lost, the Axis product must be reset to factory default, see *Reset to Factory Default Settings on page 49*.

UPnP™

The Axis product includes support for UPnP™. UPnP™ is enabled by default and the product is automatically detected by operating systems and clients that support this protocol.

UPnP™ can be disabled under **System Options > Network > UPnP**

RTP/H.264

The RTP port range and multicast settings are configured under **System Options > Network > RTP**.

The RTP port range defines the range of ports from which the video ports are automatically selected. For multicast streams, only certain IP addresses and port numbers should be used.

Select **Always Multicast Video** to start multicast streaming without opening an RTSP session.

Bonjour

The Axis product includes support for Bonjour. Bonjour is enabled by default and the product is automatically detected by operating systems and clients that support this protocol.

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System Options

Bonjour can be disabled under **System Options > Network > Bonjour**.

Storage

Network Share

Network share allows you to add network storage such as a NAS (network-attached storage). The NAS shall be dedicated for recordings and data from the Axis products connected to the network. For information about reference NAS devices, go to www.axis.com/products/axis-camera-companion/support-and-documentation

Note

For NAS recommendations see www.axis.com

To add a network share:

1. Go to **System Options > Storage**.
2. Click **Network Share**.
3. Enter the IP address, DNS or Bonjour name to the host server in the **Host** field.
4. Enter the name of the share in the **Share** field. Sub folders cannot be used.
5. If required, select **The share requires login** and enter the user name and password.
6. Click **Connect**.

To clear all recordings and data from the Axis product's folder on the designated share, click **Clear** under **Storage Tools**.

To avoid filling the share, it is recommended to remove recordings continuously. Under **Recording Settings**, select **Remove recordings older than** and select the number of days or weeks.

To stop writing to the share and protect recordings from being removed, select **Lock** under **Recording Settings**.

Maintenance

The Axis product provides several maintenance functions. These are available under **System Options > Maintenance**.

Click **Restart** to perform a correct restart if the Axis product is not behaving as expected. This will not affect any of the current settings.

Note

A restart clears all entries in the Server Report.

Click **Restore** to reset most settings to the factory default values. The following settings are not affected:

- the boot protocol (DHCP or static)
- the static IP address
- the default router
- the subnet mask
- the system time
- the IEEE 802.1X settings
- uploaded applications are kept but must be restarted

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System Options

Click **Default** to reset all settings, including the IP address, to the factory default values. This button should be used with caution. The Axis product can also be reset to factory default using the control button, see *Reset to Factory Default Settings on page 49*.

To identify the product or test the Status LED, click **Flash LED** under **Identify** and specify the duration in seconds, minutes or hours. This can be useful for identifying the product among other products installed in the same location.

For information about firmware upgrade, see *Upgrade the Firmware on page 50*.

Support

Support Overview

The **System Options > Support > Support Overview** page provides information on troubleshooting and contact information, should you require technical assistance.

See also *Troubleshooting on page 50*.

System Overview

To get an overview of the Axis product's status and settings, go to **System Options > Support > System Overview**. Information that can be found here includes firmware version, IP address, network and security settings, event settings, image settings and recent log items. Many of the captions are links to the proper Setup page.

Logs & Reports

The **System Options > Support > Logs & Reports** page generates logs and reports useful for system analysis and troubleshooting. If contacting Axis Support, please provide a valid Server Report with your query.

System Log – Provides information about system events.

Access Log – Lists all failed attempts to access the product. The Access Log can also be configured to list all connections to the product (see below).

Server Report – Provides information about the product status in a pop-up window. The Access Log is automatically included in the Server Report.

You can view or download the server report. Downloading the server report creates a .zip file that contains a complete server report text file in UTF-8 format. Select the **Include snapshot with default image settings** option to include a snapshot of the product's Live View. The server report .zip file should always be included when contacting support.

Parameter List – Shows the product's parameters and their current settings. This may prove useful when troubleshooting or when contacting Axis Support.

Connection List – Lists all clients that are currently accessing media streams.

Crash Report – Generates an archive with debugging information. The report takes several minutes to generate.

Advanced

Scripting

Scripting allows experienced users to customize and use their own scripts.

NOTICE

Improper use may cause unexpected behavior and loss of contact with the Axis product.

Axis strongly recommends that you do not use this function unless you understand the consequences. Axis Support does not provide assistance for problems with customized scripts.

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System Options

To open the Script Editor, go to **System Options > Advanced > Scripting**. If a script causes problems, reset the product to its factory default settings, see *page 49*.

For more information, see www.axis.com/developer

File Upload

Files, for example webpages and images, can be uploaded to the Axis product and used as custom settings. To upload a file, go to **System Options > Advanced > File Upload**.

Uploaded files are accessed through `http://<ip address>/local/<user>/<file name>` where `<user>` is the selected user group (viewer, operator or administrator) for the uploaded file.

Plain Config

Plain Config is for advanced users with experience of Axis product configuration. Most parameters can be set and modified from this page.

To open Plain Config, go to **System Options > Advanced > Plain Config**. Axis Support does not provide assistance.

Reset to Factory Default Settings

Important

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

Note

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

For products with multiple IP addresses channel 1 will have the address 192.168.0.90, channel 2 will have the address 192.168.0.91 and so on.

To reset the product to the factory default settings:

1. Press and hold the control button and the restart button at the same time.
2. Release the restart button but continue to hold down the control button for 15–30 seconds until the status LED indicator flashes amber.
3. 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
4. Using the installation and management software tools, assign an IP address, set the password and access the video stream

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

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Troubleshooting

Troubleshooting

Check the Firmware

Firmware is 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. The current firmware version in the Axis product is displayed in the page **Setup > Basic Setup** and in **Setup > About**.

Upgrade the Firmware

Important

- Your dealer reserves the right to charge for any repair attributable to faulty upgrade by the user.
- Preconfigured and customized settings are saved when the firmware is upgraded (providing the features are available in the new firmware) although this is not guaranteed by Axis Communications AB.

Note

- After the upgrade process has completed, the product will restart automatically. If restarting the product manually after the upgrade, wait 10 minutes even if you suspect the upgrade has failed.
- When you upgrade the Axis product with the latest firmware from Axis website, 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 upgrade the product's firmware:

1. Download the latest firmware file to your computer, available free of charge at www.axis.com/techsup
2. Go to **Setup > System Options > Maintenance** in the product's webpages.
3. Under **Upgrade Server**, click **Browse** and locate the file on your computer.
4. Click **Upgrade**.
5. Wait approximately 10 minutes while the product is being upgraded and restarted. Then access the product.
6. Go to **Setup > Basic Setup** to verify the firmware upgrade.

AXIS Camera Management can be used for multiple upgrades. See www.axis.com for more information.

Symptoms, Possible Causes and Remedial Actions

Problems setting the IP address

When using ARP/Ping	Try the installation again. The IP address must be set within two minutes after power has been applied to the product. Ensure the Ping length is set to 408. For instructions, see <i>Assign IP Address Using ARP/Ping on page 42</i> .
The product is located on a different subnet	If the IP address intended for the product and the IP address of the computer used to access the product are located on different subnets, you will not be able to set the IP address. Contact your network administrator to obtain an IP address.

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Troubleshooting

The IP address is being used by another device	Disconnect the Axis product from the network. Run the Ping command (in a Command/DOS window, type <code>ping</code> and the IP address of the product): <ul style="list-style-type: none">If you receive: <code>Reply from <IP address>: bytes=32; time=10...</code> 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 product.If you receive: <code>Request timed out</code>, this means that the IP address is available for use with the Axis product. Check all cabling and reinstall the product.
Possible IP address conflict with another device on the same subnet	The static IP address in the Axis product 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 product.

The product 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 <code>http</code> or <code>https</code> in the browser's address field. If the password for the user <code>root</code> is lost, the product must be reset to the factory default settings. See <i>Reset to Factory Default Settings on page 49</i> .
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 Camera Management to locate the product on the network. Identify the product 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, see the document <i>Assign an IP Address and Access the Video Stream on Axis Support web at www.axis.com/techsup</i> .
Certificate error when using IEEE 802.1X	For authentication to work properly, the date and time settings in the Axis product should be synchronized with an NTP server. See <i>Date & Time on page 41</i> .

The product is accessible locally but not externally

Router configuration	To configure your router to allow incoming data traffic to the Axis product, enable the NAT-traversal feature which will attempt to automatically configure the router to allow access to the Axis product, see <i>NAT traversal (port mapping) for IPv4 on page 44</i> . The router must support UPnP™.
Firewall protection	Check the Internet firewall with your network administrator.
Default routers required	Check if you need to configure the router settings from System Options > Network > TCP/IP > Basic .

Problems with streaming H.264

Problems with AXIS Media Control (<i>Internet Explorer only</i>)	To enable the updating of video images in Internet Explorer, set the browser to allow ActiveX controls. Also, make sure that AXIS Media Control is installed on your computer.
No H.264 displayed in the client	Check that the relevant H.264 connection methods and correct interface are enabled in the AMC Control Panel (streaming tab). See <i>AXIS Media Control (AMC) on page 13</i> . In the AMC Control Panel, select the H.264 tab and click Set to default H.264 decoder . Check that RTSP is enabled under System Options > Network > TCP/IP > Advanced .
Multicast H.264 only accessible by local clients	Check if your router supports multicasting, or if the router settings between the client and the product 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 product are valid for your network. Check with your network administrator to see if there is a firewall preventing viewing.

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Troubleshooting

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. Refer to the adapter's documentation for more information.
Lower frame rate than expected	<p>See <i>Performance Considerations on page 54</i>.</p> <p>Reduce the number of applications running on the client computer.</p> <p>Limit the number of simultaneous viewers.</p> <p>Check with the network administrator that there is enough bandwidth available.</p> <p>Check in the AMC Control Panel (H.264 tag) that video processing is NOT set to Decode only key frames.</p> <p>Lower the image resolution.</p> <p>Set a Capture Mode that prioritizes frame rate. Changing the capture mode to prioritize frame rate will lower the maximum resolution. See <i>Capture Mode on page 18</i>.</p> <p>The maximum frames per second is dependent on the utility frequency (60/50 Hz) of the Axis product. See <i>Technical Specifications on page 53</i>.</p>

Product does not start up

Product does not start up	If the product does not start up keep the network cable connected and re-insert the power cable to the midspan.
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Video and image problems, general

Black image with text indicating inadequate power supply	Check cables and restart power sourcing equipment.
Image unsatisfactory	Check the video stream and camera settings under Setup > Video > Video Stream and Setup > Video > Camera Settings .

Storage and disk management problems

Storage disruption	<p>A storage disruption alarm is sent if a storage device is unavailable, removed, full, locked or if other read or write problems occur. To identify the source of the problem, check the System Log under System Options > Support > Logs & Reports. Depending on the problem, it might be necessary to re-mount the storage device.</p> <p>For information on how to set up a storage disruption alarm, see <i>Events on page 31</i>.</p>
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Product does not function

The ambient temperature is too low. Certain hardware functions are suspended.	Wait until the product is sufficiently heated.
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AXIS Q3708-PVE Network Camera

Technical Specifications

Technical Specifications

Camera	
Image sensor	3 x 1/1.8" progressive scan CMOS
Lens	3 x lenses, fixed focus, 5.0 mm, F2.8 Combined horizontal angle of view: 180°
Day and night	Automatically removable infrared-cut filter
Minimum illumination	Color: 0.3 lux, F2.8 B/W: 0.06 lux, F2.8
Shutter time	1/71500 s to 1 s
Camera angle adjustment	Pan +/- 180° Tilt 18°-75°
Video	
Video compression	H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles Motion JPEG
Resolutions	3 x (2560x1920 to 480x270)
Frame rate	3 x Quad HD (2560x1440): Up to 25/30 fps with power line frequency 50/60 Hz 3 x 5 MP: Up to 16/20 fps with power line frequency 50/60 Hz
Video streaming	Multiple, individually configurable streams in H.264 and Motion JPEG Controllable frame rate and bandwidth VBR/CBR H.264 Axis' Zipstream technology in H.264
Image settings	Compression, Color, Brightness, Sharpness, Contrast, White balance, Exposure control, Exposure zones, Fine tuning of behavior at low light, Text and image overlay, Privacy mask, Capture alignment WDR - forensic capture: Up to 110 dB depending on scene
Network	
Security	Password protection, IP address filtering, HTTPS ^a encryption, IEEE 802.1X ^a network access control, Digest authentication, User access log, Centralized Certificate Management
Supported protocols	IPv4/v6, HTTP, HTTPS ^a , SSL/TLS ^a , QoS Layer 3 DiffServ, FTP, CIFS/SMB, SMTP, Bonjour, UPnP TM , SNMP v1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, RTSP, RTP, SFTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS, SSH
System integration	
Application Programming Interface	Open API for software integration, including VAPIX [®] and AXIS Camera Application Platform; specifications at www.axis.com ONVIF Profile S, specification at www.onvif.org
Analytics	AXIS Video Motion Detection 3, Active tampering alarm Support for AXIS Camera Application Platform enabling installation of third-party applications, see www.axis.com/acap
Event triggers	Analytics, Edge storage events
Event actions	File upload: FTP, SFTP, HTTP, HTTPS, network share and email Notification: email, HTTP, HTTPS, TCP and SNMP trap Video recording to edge storage Pre- and post-alarm video buffering Overlay text

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Technical Specifications

Built-in installation aids Pixel counter

General	
Casing	IP66- and NEMA 4X-rated, IK10 impact-resistant aluminum casing with transparent, polycarbonate cover and dehumidifying membrane Encapsulated electronics Captive screws (T30) Color: White NCS 1002-B For repainting instructions and impact on warranty contact your Axis partner.
Memory	2.5 GB RAM, 512 MB Flash
Power	Power over Ethernet IEEE 802.3at Type 2 Class 4, max. 25.5 W, typical 18.3 W
Connectors	RJ45 10BASE-T/100BASE-TX/1000BASE-T
Storage	Support for recording to dedicated network-attached storage (NAS)
Operating conditions	-40 °C to 55 °C (-40 °F to 131 °F) Humidity 10–100% RH (condensing)
Storage conditions	-40 °C to 65 °C (-40 °F to 149 °F)
Approvals	EN 55022 Class A, EN 50121-4, IEC62236-4, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-6-1, EN 61000-6-2, FCC Part 15 Subpart B Class A, ICES-003 Class A, VCCI Class A, RCM AS/NZS CISPR 22 Class A, KCC KN32 Class A, KN35, IEC/EN/UL 60950-1, IEC/EN/UL 60950-22, EN 50581, IEC/EN 60529 IP66, NEMA 250 Type 4X, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-30, IEC 60068-2-78, IEC/EN 62262 IK10
Dimensions	205 x 205 x 172 mm (8.1 x 8.1 x 6.8 in)
Weight	2.5 kg (5.5 lb) including weather shield
Included accessories	RJ45 Push-pull connector (IP66), Torx L-key T30, Weather shield, Installation Guide, Windows decoder 1-user license
Optional accessories	Axis Mounts AXIS PoE+ Midspans For more accessories, see www.axis.com
Video management software	AXIS Camera Companion, AXIS Camera Station, Video management software from Axis' Application Development Partners available on www.axis.com/techsup/software
Languages	English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Traditional Chinese
Warranty	Axis 3-year warranty and AXIS Extended Warranty option, see www.axis.com/warranty

a. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (www.openssl.org), and cryptographic software written by Eric Young (ey@cryptsoft.com).

Environmental responsibility:
www.axis.com/environmental-responsibility

Performance Considerations

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

The following factors are among the most important to consider:

- High image resolution and/or lower compression levels result in images containing more data. Bandwidth affected.

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Technical Specifications

- Access by large numbers of Motion JPEG and/or unicast H.264 clients. Bandwidth affected.
- Simultaneous viewing of different streams (resolution, compression) by different clients. Effect on frame rate and bandwidth.
- Accessing Motion JPEG and H.264 video streams simultaneously. Frame rate and bandwidth affected.
- Heavy usage of event settings affect the product's CPU load. Frame rate affected.
- Using HTTPS may reduce frame rate, in particular if streaming Motion JPEG.
- Heavy network utilization due to poor infrastructure. Bandwidth affected.
- Viewing on poorly performing client computers lowers perceived performance. Frame rate affected.
- Running multiple AXIS Camera Application Platform (ACAP) applications simultaneously may affect the frame rate and the general performance.

