AXIS 282/AXIS 282A
Video Server

Integrator and User's Manual

About This Document

This manual is intended for integators building the AXIS 282/AXIS 282A into a product or system, and administrators and users of the product or system that includes the AXIS 282/AXIS 282A as a component. The use of "AXIS 282/AXIS 282A" and "Video Server" thoughout this manual refers to the AXIS 282/AXIS 282A as an integrated component of an end product or system. This manual applies to AXIS 282/AXIS 282A firmware release 4.30. It includes instructions for integrating, using and managing the AXIS 282/AXIS 282A on your network. Previous experience of networking will be of use when installing and using this product. Some knowledge of UNIX or Linux-based systems would also be beneficial for developing shell scripts and applications. Later versions of this document will be posted to the Axis Website (http://www.axis.com/techsup/index.htm) as required. Also, see the online help for the AXIS 282/AXIS 282A available via its Web-based interface.

Safety Notices Used In This Manual

Caution! - Indicates a potential hazard that can damage the product.
Important! - Indicates a hazard that can seriously impair operation.
Do not proceed beyond any of the above notices until you have fully understood the implications.

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 http://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.

Legal Considerations

Camera and audio surveillance can be prohibited 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) MPEG-4 decoder license. To purchase further licenses, contact your reseller.

Electromagnetic Compatibility (EMC)

This equipment generates, uses, and can radiate radio frequency energy. The AXIS 282/AXIS 282A is delivered as a component for the sole purpose of being integrated into an end product or system. The foregoing implies an obligation on behalf of the integrator (Buyer of the AXIS 282/AXIS 282A component) to obtain any approvals from authorities or governmental bodies that may be required for the lawful use of the finished product or system, which includes the AXIS 282/AXIS 282A as a component. Resale and use of the AXIS 282/AXIS 282A on a stand-alone basis is not allowed. For the final products and solutions, responsibility for fulfillment of safety, EMC, and other regulatory standards controlled by law, is therefore passed on to the integrator (Buyer of the AXIS 282/AXIS 282A component).

Liability

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Support Services

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 firmware updates
- find answers to resolved problems in the FAQ database. Search by product, category, or phrases
- report problems to Axis support staff by logging in to your private support area
- visit the Axis Support Web at www.axis.com/techsup/

Safety Notice - Battery Replacement

The AXIS 282/AXIS 282A uses a 3.0V CR2032 Lithium battery as the power supply for its internal real-time clock (RTC). This battery will, under normal conditions, last for a minimum of 5 years. Low battery power affects the operation of the RTC, causing it to reset at every power-up. A log message will appear when battery replacement is required.

The battery should not be replaced unless required!
If the battery does need replacing, observe the following points:

Caution!
- Danger of Explosion if battery is incorrectly replaced
- Replace only with the same or equivalent battery, as recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

AXIS 282/AXIS 282A Video Server User's Manual
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Product Description

This manual is applicable for the following Axis Video Servers:

- AXIS 282: 1-port bare board video server
- AXIS 282A: 1-port bare board video server, including 2-way audio

The information provided in this manual applies to both models, unless otherwise indicated.

The AXIS 282/282A is a small form factor video server board designed to be built into domes, fixed view cameras, PTZs, analog devices, etc., and is fully featured for security surveillance and remote monitoring needs. The AXIS 282/282A is based on the AXIS ETRAX 100LX network optimized system-on-a-chip (SOC), and the AXIS ARTPEC-2 compression chip. The AXIS 282/282A can digitize one analog video source and make it available on the network as real-time, full frame rate Motion JPEG and/or MPEG-4 video streams.

The AXIS 282/282A is equipped with RS-232 or RS-485 ports for connecting third party PTZ systems. It also has 1 alarm input and 1 alarm output, which can be used to connect various third party devices, e.g., door sensors and alarm bells.

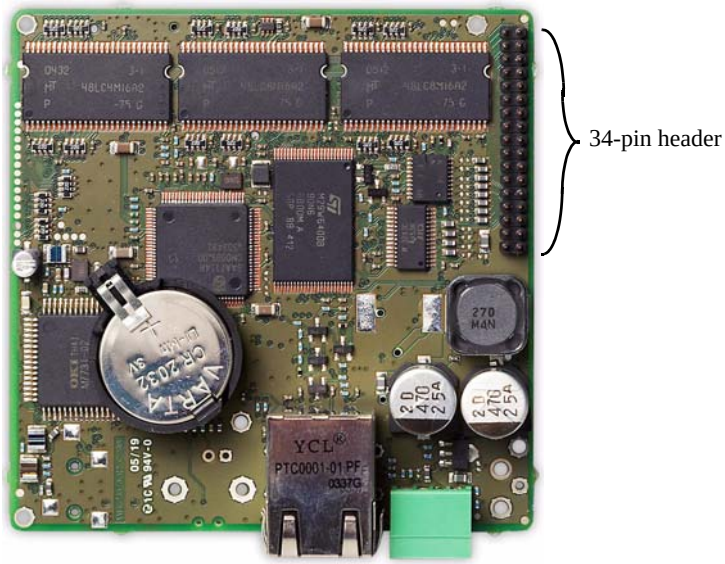
The AXIS 282A has a Line/Mic In (mono), via the internal connector I/O pins, for connecting an external microphone or other source producing a line level signal. An active speaker with a built-in amplifier can be connected to Line Out (mono) to enable two-way communication. Audio communication can be bi-directional (full-duplex), push to talk (half-duplex) or in one direction only (simplex).

Up to 20 viewers can access the AXIS 282/282A simultaneously when using Motion JPEG and MPEG-4 unicast. Each MPEG-4 viewer requires a separate MPEG-4 decoder license, of which one is included. Additional licenses can be purchased separately from your Axis dealer. If using other clients to view the MPEG-4 video stream, no further MPEG-4 decoder licenses are required.

Video can be viewed in 5 resolutions (up to 4CIF), and image compression is configurable. The AXIS 282/282A contains support for video motion detection, which allows the unit to trigger on activity in the video image, and advanced scheduling tools which can also be used to trigger an event. As the AXIS 282/282A is designed for use in security systems, it is equipped with several security features, such as IP address filtering, several user levels with passwords and HTTPS.

The AXIS 282/282A has a built-in web server, providing full access to all features through the use of a standard browser. The built-in scripting tool allows basic applications to be created, providing basic surveillance solutions. For advanced functionality, the Video Server can be integrated via the use of the AXIS HTTP API (see www.axis.com/developer).

AXIS 282/282A Top

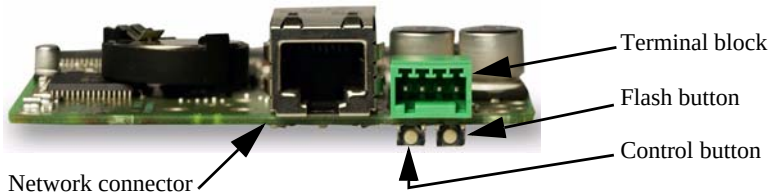


The AXIS 282/282A has 34-Pin Header for several connections including:

- Serial port, configurable as RS-232 or RS-485, which is typically used for connecting Pan/Tilt/Zoom devices.
- Video in and out connections.
- Audio in and out connections.
- LED outputs
- An auxiliary connection point for DC power.

See *The Terminal I/O Connector*, on page 58 and *The 34-Pin Header*, on page 59 for more information.

AXIS 282/282A Front



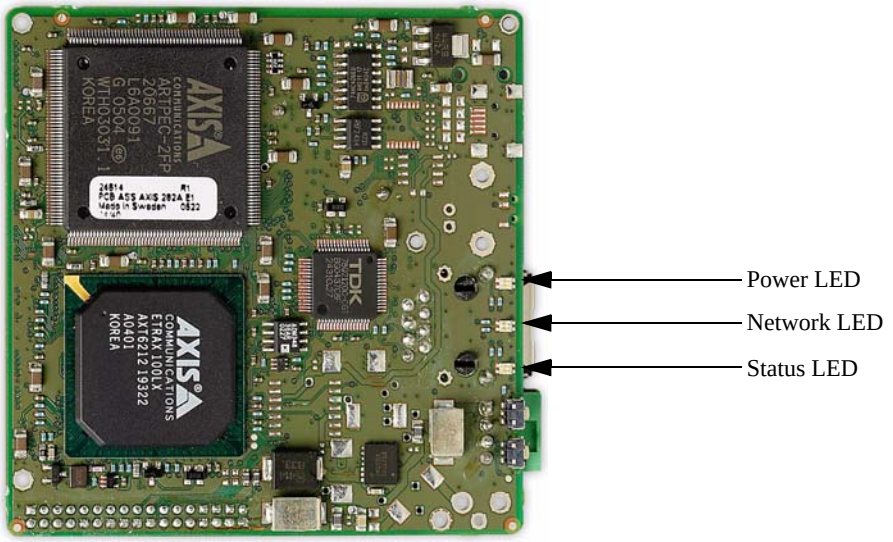
Terminal block - The front of the AXIS 282/282A has one each in- and out connector, and a power and GND connection.

Control button - Press this button to restore the factory default settings, as described in *Resetting to the Factory Default Settings,* on page 57, or to install using AXIS Internet Dynamic DNS Service (page 14).

Flash button - The AXIS 282/282A has a flash button. However, it is only used for firmware programming in the factory. It is not used when upgrading the firmware!

Network connector - The AXIS 282/282A connects to the network via a standard network cable, and automatically detects the speed of the local network segment (10BaseT/100BaseTX Ethernet).

AXIS 282/282A Bottom



LED indicators - After completion of the startup and self-test routines, the multi-colored Status, Network, and Power idicators flash as follows:

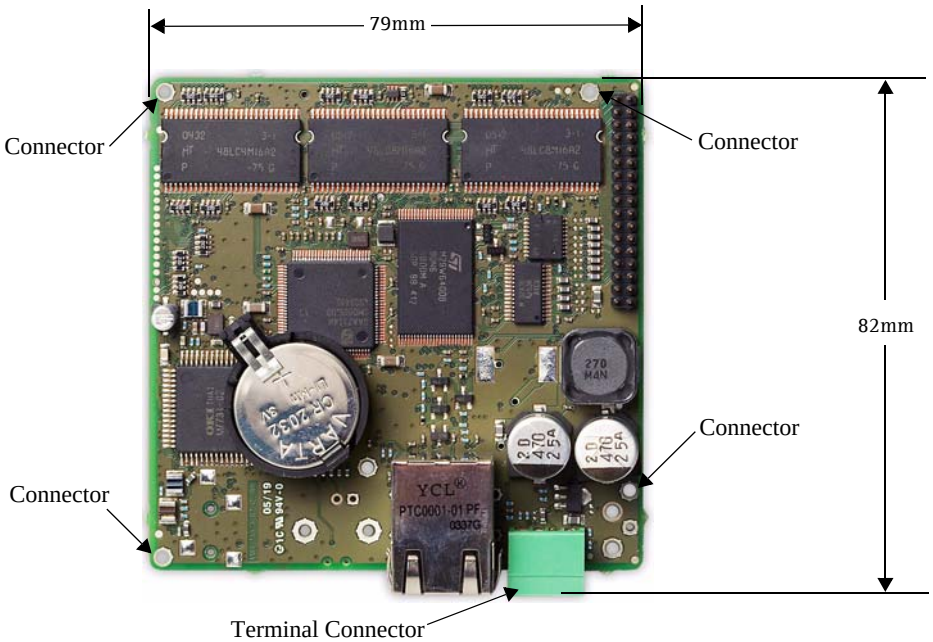
Status	Unlit	When configured for "no flash" on camera access.
	Green	Steady for normal operation. Can be configured to flash green at intervals whenever the camera is accessed. See the online help for more information.
	Amber	Steady during startup, reset to factory default or when restoring settings.
	Red	Slow flash for failed upgrade.
Network	Unlit	No connection
	Green	Steady for connection to a 100 Mbit/s network. Flashes for network activity.
	Amber	Steady for connection to a 10 Mbit/s network. Flashes for network activity.
	Red	Flashes rapid red for hardware error, together with the Status indicator
Power	Green	Normal operation
	Amber	Flashes green/amber during firmware upgrade

Integration of the AXIS 282/282A into end products or systems

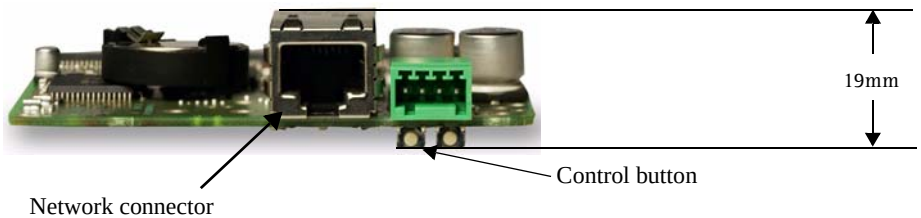
Electrical integration of the AXIS 282/282A is done through any of the connectors described in the previous sections above.

Mechanical integration may be done through the 4 mounting holes on the AXIS 282/282A, shown in the figure below.

The video server measures 82mm in length from the outside edge of the Terminal Connector, to the top of the AXIS 282/282A. The width of the AXIS 282/282A is 79mm.



The height of the AXIS 282/282A, from the top of the network connector to the bottom of the control button is 19 mm as seen in the figure below.



Installation

Installation Methods

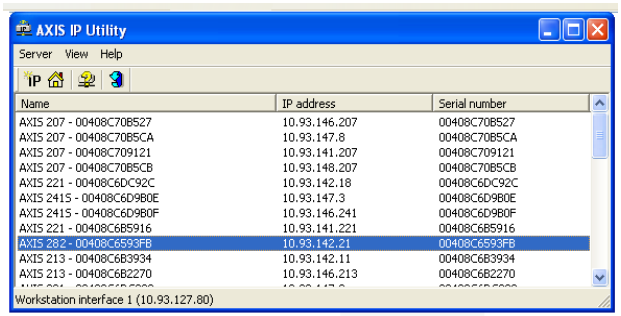
The AXIS 282/282A is designed for installation on an Ethernet network. This involves assigning it an IP address, either manually or via an automated network service (DHCP). Select one of the following procedures depending on your network:

- In Windows, use AXIS IP Utility to discover a dynamic IP address, or to set the IP address manually.
- If your network uses a DHCP server, view its administration pages to discover which IP address has been assigned to your AXIS 282/282A.
- If your network uses a DHCP server and your computer is running UPnP™, the AXIS 282/282A will automatically be detected and displayed on your screen. See page 11.
- Assign an IP address manually using the ARP/Ping method, as described on page 12.
- If your network has an Internet connection (with no HTTP proxy) and uses a DHCP server to assign IP addresses, use the One-Click installation procedure. See page 14.

Notes:
- The AXIS 282/282A has a default IP address: **192.168.0.90**
- DHCP is enabled by default in the AXIS 282/282A
- UPnP™ is enabled by default in the AXIS 282/282A

AXIS IP Utility

AXIS IP Utility is a free Windows application that discovers and displays Axis devices on your network. The application can also be used to manually set a static IP address. Download AXIS IP Utility from the support pages at: www.axis.com/techsup/software



Automatic discovery

1. Check that the network and power cables are connected to the AXIS 282/282A.
2. Start AXIS IP Utility. When the AXIS 282/282A appears in the window, double-click it to open the home page.

Set the IP address manually

If the AXIS 282/282A does not appear in the window, click the **Refresh** button to try again. If it still does not appear, set the IP address manually.

1. Acquire an unused IP address. AXIS IP Utility detects the subnet your computer is

connected to. The AXIS 282/282A must be installed on the same network segment.

2. Click the button "**Set IP address using serial number**" and enter the serial number and the IP address for the AXIS 282/282A. The serial number is located on the memory capsules on top of the AXIS 282/282A.
3. Click the **Set IP** button and then restart the AXIS 282/282A (within 2 minutes).
4. Click **View Home Page** to access the AXIS 282/282A Web pages.
5. Enter a password for the **root** user (administrator).
6. If required, accept the installation of **AMC** onto your workstation.

Notes:
- AXIS IP Utility can also be used to change the IP address of a previously discovered Axis device.
- AMC (AXIS Media Control) must be installed to view live video in Microsoft Internet Explorer. If your working environment restricts additional software components, you can configure your AXIS 282/282A to use a Java applet for updating the images. See the help file Live View Config > Layout > Default Viewer for Internet Explorer, or use another supported Web browser, see *Technical Specifications*, on page 66.

7. The installation is now complete. Proceed to *Using the Video Server*, on page 15.

The serial number (S/N) is located on the memory capsules on top off the AXIS 282/282A.

UPnP™

UPnP functionality is enabled by default in the AXIS 282/282A. If also enabled on your computer (Windows ME or XP), the video server will automatically be detected and a new icon will be added to "My Network Places." Click this icon to access the AXIS 282/282A.

Note:

To install the UPnP service on your computer, open the Control Panel from the Start Menu and select **Add/Remove Programs**. Select **Add/Remove Windows Components** and open the **Networking Services** section. Click Details and then select **UPnP** as the service to add.

ARP and Ping in Windows

Assign your product a unique IP address from a computer on your network as follows:

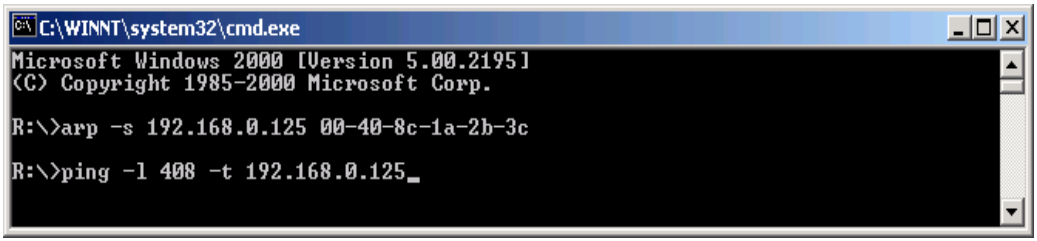
1. Acquire an unused IP address for the AXIS 282/282A from your network administrator.
2. Connect the AXIS 282/282A to the network using a standard network cable.
3. Find the serial number (S/N) located on the memory capsules on top of the AXIS 282/282A.
4. From a computer on your network, open a Command Prompt, i.e. from the Windows **Start** menu, select **Run...** and type **cmd** (**command** in Windows 98/ME). Click **OK**.
5. Enter the commands:

   Syntax:

   ```
   arp -s <IP address> <Serial number>
   ping -l 408 -t <IP address>
   ```

   Note: The ping command is followed by -l (lower case L)

   Example

6. Start/restart the AXIS 282/282A. This must be done no later than 2 minutes after entering the ARP and Ping commands.
7. When 'Reply from 192.168.0.125: ...' is displayed (approximately 10-15 seconds), type **Ctrl+C** to stop Ping.
8. Start a browser and enter the IP address in the Address/Location field.
9. Press **Enter**.
10. Enter a password for the **root** user (administrator).
11. If required, accept the installation of AMC onto your workstation.

Note: AMC must be installed to view live video images in Microsoft Internet Explorer. If your working environment restricts additional software components, you can configure your AXIS 282/282A to use a Java applet for updating the images. See the help file under **Live View Config > Layout > Default Viewer for Internet Explorer** for information. Or use another supported Web browser, see *Technical Specifications*, on page 66.

12. The installation is now complete. Proceed to *Using the Video Server*, on page 15.

ARP and Ping in UNIX/Linux

Assign your product with a unique IP address from a computer on your network, as follows:

1. Acquire an unused IP address for the AXIS 282/282A from your network administrator.
2. Connect the AXIS 282/282A to the network using a standard network cable.
3. Find the serial number (S/N) located on the memory capsules on top of the AXIS 282/282A..

   Syntax:

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

   Example:

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

4. Start/restart the AXIS 282/282A. This must be done no later than 2 minutes after entering the ARP and Ping commands.
5. Close the ARP/Ping session when 'Reply from 192.168.0.125: ...' (or similar) is displayed (approximately 10-15 seconds).
6. Start a browser and enter the IP address in the Address/Location field.
7. Press **Enter**.
8. Enter a password for the **root** user (administrator).
9. The installation is now complete. Proceed to *Using the Video Server*, on page 15.

AXIS Internet Dynamic DNS Service

The AXIS Internet Dynamic DNS Service is a free service provided by Axis. The service allows you to quickly and simply install your video server, which then receives a static name (DNS name) and a dynamic IP address. More information about the AXIS Internet Dynamic DNS Service is available at www.axiscam.net

The video server can be unregistered from the service at any time.

Please visit **www.axiscam.net** for more details on the AXIS Internet Dynamic DNS Service.

Requirements

Using the AXIS Internet Dynamic DNS Service requires an Internet connection that does not require a proxy server for HTTP access. A DHCP server in the network for assigning IP addresses is recommended.

Installation Procedure

Please note that this procedure will send the AXIS 282/282A's IP address, firmware version, product type and serial number to the Axis Internet Dynamic DNS Service. **No personal information will be transferred**.

1. Connect the AXIS 282/282A to your local network, using a standard network cable.
2. Connect power to the video server.
3. Wait for the Status indicator on the front of the video server to show a steady green, whereupon it will have received a dynamic IP address from a DHCP server on your network.
4. Wait 60 seconds and push the control button on the front panel once. The Status indicator on the front of the video server will flash green while it connects to the AXIS Internet Dynamic DNS service. When the registration process is complete, the indicator will return to steady green.
5. Visit **www.axiscam.net** where you will be guided through the remainder of the installation. Please have the serial number of your product ready and follow the instructions on the screen.

   The serial number (S/N) is located on the memory capsules on top off the AXIS 282/282A.

6. Enter a password for the **root** user (administrator).
7. If required, accept the installation of **AMC** onto your workstation.

Note: AMC must be installed to view live images in Microsoft Internet Explorer. If your working environment restricts additional software components, you can configure your AXIS 282/282A to use a Java applet for updating the images. See the help file under **Live View Config > Layout > Default Viewer for Internet Explorer** for information. See also the *Technical Specifications*, on page 66.

8. The installation is now complete. Proceed to *Using the Video Server*, on page 15.

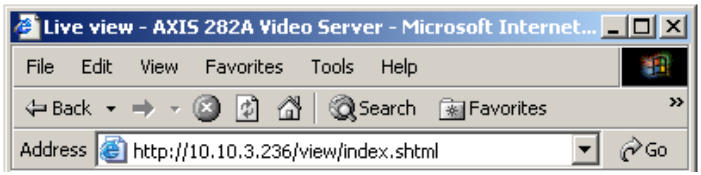
Using the Video Server

The AXIS 282/AXIS 282A can be used with most standard operating systems and browsers. The recommended browser is Internet Explorer with Windows, and Mozilla with other operating systems. See also the *Technical Specifications*, on page 66.

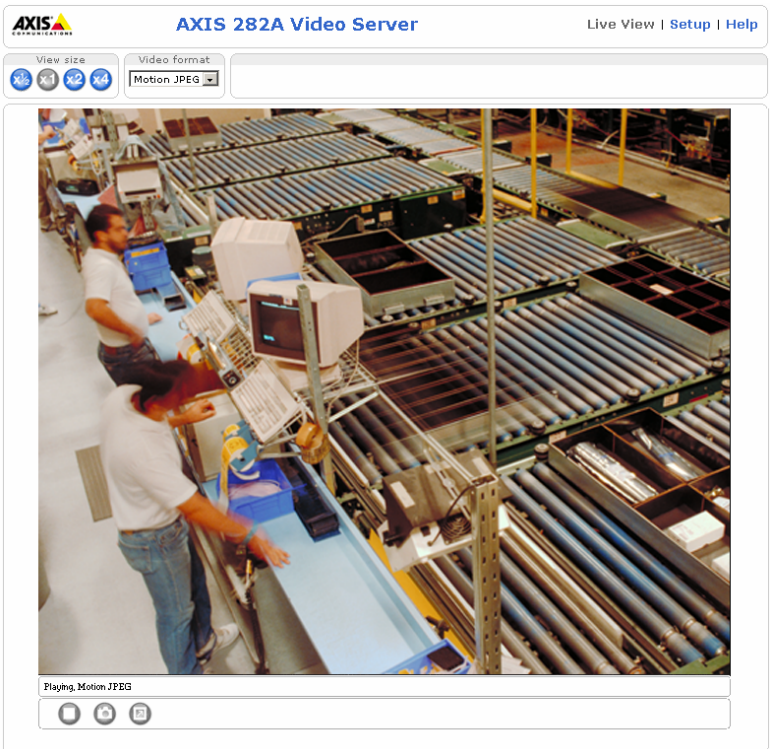
Note: For information on installing the Video Server, please refer to *Installation*, on page 10.

Accessing the Video Server

1. Start your browser.
2. Enter the IP address or host name of the AXIS 282/AXIS 282A in the **Location/Address** field of your browser.



3. Enter the user name and password set by the administrator.
4. A video image is displayed in your browser.

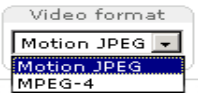


Notes:
- To view streaming video in Microsoft Internet Explorer, you must set your browser to allow the AXIS Media Control (AMC) to be installed on your computer. AMC also provides an MPEG-4 decoder for viewing MPEG-4 video streams. This decoder is installed the first time an MPEG-4 video stream is accessed. Please note that the product administrator may have disabled the installation of the decoder, as a license is required for each instance. See page 35 for more information.
- If your workstation restricts the use of additional software components, the AXIS 282/AXIS 282A can be configured to use a Java applet for updating JPEG images. Please see the online help for more information.

The Live View page

If your AXIS 282/AXIS 282A has been customized to meet specific requirements, the buttons and other items described below may or not be displayed on the Live View page. The following provides an overview of each available button:

To resize the displayed image, click the **View Size** buttons: half-size (x1/2), full-size (x1), x2 or x4. This will not change the resolution of the image (not available in Sequence Mode).



The Video Format drop-down list allows the video format on the Live View page to be temporarily changed.

The **Output buttons** control an output directly from the **Live View** page. These buttons are configured under **Setup > Live View Config > Layout**.

Pulse - click this button to activate the port for a defined period of time, e.g. to switch on a light for 20 seconds.
Active/Inactive - click these buttons to manually start and stop a connected device, e.g. switch a light on/off.

These buttons start/stop the **Sequence Mode**. This mode is created in **Setup > Live View Config > Sequence mode** and automatically displays the view from 2 or more video sources at set intervals.

From the **Source** list, select the desired video image(s). The list can contain internal video sources, external video sources, or PTZ presets.

The **Action buttons** trigger an event directly from the **Live View** page. These buttons are configured under **Setup > Live View Config > Layout**. Click these buttons to manually start and stop events.

Use the **Snapshot** button to capture a snapshot of the image currently being displayed in the window. Right-click on the image to save it in on your computer.

The **AMC viewer toolbar** (AXIS Media Control) is available in **Microsoft Internet Explorer only** and displays the following buttons:

The **Play/Stop** buttons start and stop the media stream.

The **Snapshot** button takes a snapshot of the currently displayed image. The Snapshot function and the target directory for saving snapshots can be configured from AMC (AXIS Media Control), which is available from the Windows Control Panel (Internet Explorer only).

Click the **View Full Screen** button and the video image will fill the entire screen area. No other windows will be visible. Press **Esc** (Escape) on your keyboard to cancel full screen view.

Audio controls for AXIS 282A

Click the **Speaker** and **Microphone** buttons to switch the sound off and on for the speaker and microphone, respectively.

Use the slider to control the volume on the speaker and microphone. The volume can be set between 0 and 100.

When using **Half-duplex** mode this button toggles between allowing you to speak and listen. The first icon indicates that you can talk and the speaker attached to the Video Server will play your voice. The second indicates that you will hear audio from the Video Server, but no audio will be sent to any web clients. When in **simplex** talk mode, the icon toggles between allowing you to speak and is dimmed when you do not want other clients to receive any audio.

Note that these AMC toolbar functions can also be accessed by right-clicking in the image.

For information on using Pan/Tilt/Zoom controls, please see page 42.

Video and Audio Streams

The AXIS 282/AXIS 282A provides several different video and audio stream formats. The type to use depends on your requirements and on the properties of your network.

The Live View page in the AXIS 282/AXIS 282A provides access to Motion JPEG and MPEG-4 video and audio streams, as well as to single JPEG images. Other applications and clients can also access these video and audio streams/images directly, without going via the Live View page.

Video Stream Types

Motion JPEG

This format uses standard JPEG still images in 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 also provides excellent image quality and access to each and every individual image contained in the stream.

Note also that multiple clients accessing Motion JPEG streams can use different image settings.

MPEG-4

This is a video compression standard that makes good use of bandwidth, and which can provide high-quality video streams at less than 1 Mbit/s.

The MPEG-4 standard provides scope for a large range of different coding tools for use by various applications in different situations, and the AXIS 282/AXIS 282A provides certain subsets of these tools. These are represented as **Video object types**, which are selected for use with different viewing clients. The supported video object types are:

- **Simple** - sets the coding type to H.263
- **Advanced Simple** - in Axis products, this sets the coding type to MPEG-4 Part 2

AMC (AXIS Media Control) supports both object types, whilst e.g. QuickTime™ requires the Simple object type.

When using MPEG-4 it is also possible to control the bit rate, which in turn allows the amount of bandwidth usage to be controlled. CBR (constant bit rate) is used to achieve a specific bit rate by varying the quality of the MPEG-4 stream. When using VBR (variable bit rate), the quality of the video stream is kept as constant as possible, at the cost of a varying bit rate.

Notes:
- MPEG-4 is licensed technology. The AXIS 282/AXIS 282A includes one license for the decoder required for viewing in AMC. Installing additional unlicensed copies of this decoder is prohibited. To purchase more decoder licenses, contact your Axis reseller.
- All clients viewing the MPEG-4 stream must use the same image settings.

Audio Stream Types

The three stream types for audio are:

- G.711 - International standard for encoding wired-telephone audio. Uses PCM samples to compress audio where higher signal values are compressed more than lower values. In Axis products, this sets the coding type to µ-law 64 kbit/s.
- G.726 - Uses PCM samples to code the difference between samples (ADPCM). Reduces bandwidth without losing too much useful audio. In Axis products, this sets the coded bitrate to 24 or 32 kbit/s.

All stream types are ITU-T standards and operate on frequencies up to 4 kHz.

MPEG-4 protocols and communication methods

To deliver live streaming video over IP networks, various combinations of transport protocols and broadcast methods are employed.

- RTP (Real-Time Transport Protocol) is a protocol that allows programs to manage the real-time transmission of multimedia data, via unicast or multicast.
- RTSP (Real-Time Streaming Protocol) serves as a control protocol, to negotiate which transport protocol to use for the stream. RTSP is thus used by a viewing client to start a unicast session, see below.
- UDP (User Datagram Protocol) is a communications protocol that offers limited service for exchanging data in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP). The advantage of UDP is that it is not required to deliver all data and may drop network packets when there is e.g. network congestion. This is suitable for live video, as there is no point in re-transmitting old information that will not be displayed anyway.
- Unicasting is communication between a single sender and a single receiver over a network. This means that the video stream goes independently to each user, and each user gets their own stream. A benefit of unicasting is that if one stream fails, it only affects one user.
- Multicast is bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients. This technology is used primarily on delimited networks (intranets), as each user needs an uninterrupted data flow and should not rely on network routers.

How to stream MPEG-4

Deciding on the combination of protocols and methods to use depends on your viewing requirements, and on the properties of your network. Setting the preferred method(s) is done in the control applet for AMC, which is found in the Windows Control Panel. When this has been set, AMC will test all the selected methods in the specified order, until the first functioning one is found.

RTP+RTSP

This method (actually RTP over UDP and RTSP over TCP) should be your first consideration for live video, especially when it is important to always have an up-to-date video stream, even if some images do get dropped. This can be configured as multicast or unicast.

Multicasting provides the most efficient usage of bandwidth, especially when there are large numbers of clients viewing simultaneously. Note however, that a multicast broadcast cannot pass a network router unless the router is configured to allow this. It is thus not possible to multicast over e.g. the Internet.

Unicasting should be used for video-on-demand broadcasting, so that there is no video traffic on the network until a client connects and requests the stream. However, if more and more unicast clients connect simultaneously, the server will at some point become overloaded. There is also a maximum of 20 simultaneous viewers to be considered.

RTP/RTSP

This unicast method is RTP tunneled over RTSP. This can be used to exploit the fact that it is relatively simple to configure firewalls to allow RTSP traffic.

RTP/RTSP/HTTP or RTP/RTSP/HTTPS

These two methods can also be used to traverse firewalls. Firewalls are commonly configured to allow the HTTP protocol, thus allowing RTP to be tunneled.

The AXIS Media Control

The recommended method of accessing live video (MPEG-4 and/or Motion JPEG) and audio from the AXIS 282/AXIS 282A is to use the AXIS Media Control (AMC) in Microsoft Internet Explorer in Windows. This ActiveX component is automatically installed on first use, after which it can be configured by opening the AMC Control Panel applet from the Windows Control Panel. Alternatively, right-click the video image in Internet Explorer.

Other methods of accessing the video stream

Video/images from the AXIS 282/AXIS 282A can also be accessed in the following ways:

- If supported by the client, the AXIS 282/AXIS 282A can use Motion JPEG server push to display video. This option maintains an open HTTP connection to the browser and sends data as and when required, for as long as required.
- As single JPEG images in a browser. Enter e.g. the path: http://<ip>/axis-cgi/jpg/image.cgi?resolution=CIF
- Windows Media Player. This requires AMC and the MPEG-4 decoder to be installed. The paths that can be used are listed below, in the order of preference.
    - Unicast via RTP: axrtpu://<ip>/mpeg4/media.amp
    - Unicast via RTSP: axrtsp://<ip>/mpeg4/media.amp
    - Unicast via RTSP, tunneled via HTTP: axrtsphttp://<ip>/mpeg4/media.amp
    - Unicast via RTSP, tunneled via HTTPS: axrtsphttps://<ip>/mpeg4/media.amp
    - Multicast: axrtpm://<ip>/mpeg4/media.amp

Note: <ip> = IP address.

Other MPEG-4 clients

Although it may be possible to use other clients to view the MPEG-4 stream, it is not guaranteed to work in all cases.

For some other clients, e.g. QuickTime™ the Video Object Type must be set to *Simple*. It may also be necessary to adjust the advanced MPEG-4 settings.

To assess the video stream from e.g. QuickTime™ the following path can be used:

rtsp://<ip>/mpeg4/media.amp

This path is for all supported methods, and the client will negotiate with the AXIS 282/AXIS 282A to determine exactly which transport protocol to use.

Note: <ip> = IP address.

Audio transmission methods

For the AXIS 282A, the audio stream can be accessed in the Live View page when viewing either Motion JPEG or MPEG-4.

Using Motion JPEG

The basic transmission method of audio used in conjunction with Motion JPEG video streaming is transmission over HTTP. The video and audio streams are not synchronized when using Motion JPEG so the streams may be slightly out of sync. The latency in any stream should be low, but this will depend on the network infrastructure.

Using MPEG-4

When using MPEG-4, audio is streamed using the same protocol as the video stream.

When audio is transmitted using MPEG-4, the Axis product sends synchronization information along with the streams to the client that is performing the synchronization.

Note: Audio is streamed from the client to the server over HTTP when using Motion JPEG and MPEG-4.

Accessing the Audio Streams

In addition to accessing audio in the Live View page using AMC, audio from the AXIS 282A can also be accessed in the following ways:

HTTP-API

You can read about accessing audio for the other protocols through the HTTP-API at http://www.axis.com/techsup

QuickTime/Windows Media Player

It is possible to use QuickTime and Windows Media Player to listen to the audio stream using the same methods to access video streams.

Configuring the Video Server

This section describes how to configure the AXIS 282/AXIS 282A and is intended for:

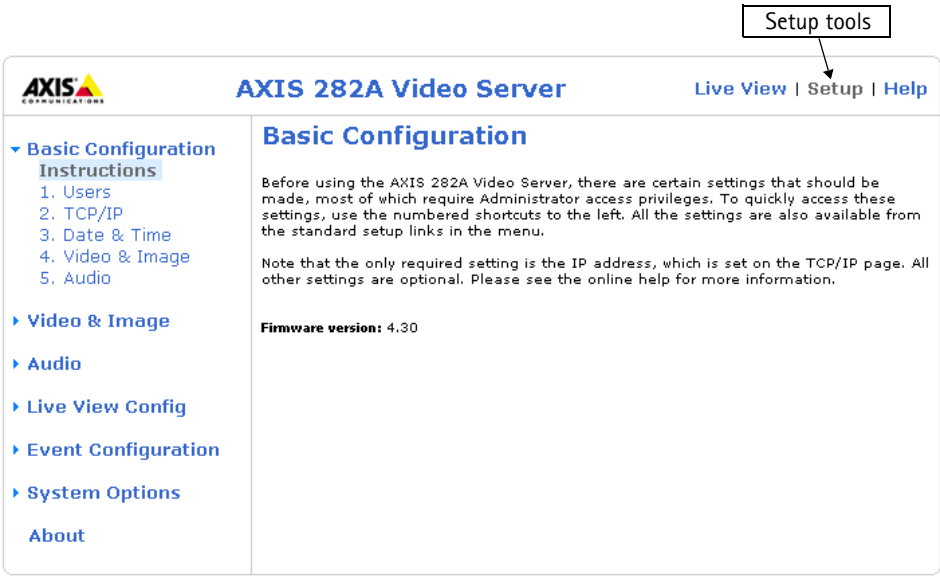
- **administrators**, who have unrestricted access to all the Setup tools
- **operators**, who have access to the Video & Image, Audio, Live View Config and Event Configuration settings.

The AXIS 282/AXIS 282A is configured from the **Setup link, in** a standard browser (see also the Technical Specifications on page 66).

Accessing the Setup tools

Follow the instructions below to access the Setup Tools from a browser.

1. Start the browser and enter the IP address or host name of the AXIS 282/AXIS 282A in the location/address field.
2. The **Live View** page is now displayed. Click **Setup** to display the **Setup** tools.



Video & Image Settings

The following descriptions show examples of the available features in the AXIS 282/AXIS 282A. For details of each setting, please refer to the online help available from each page. Click to access the online help.

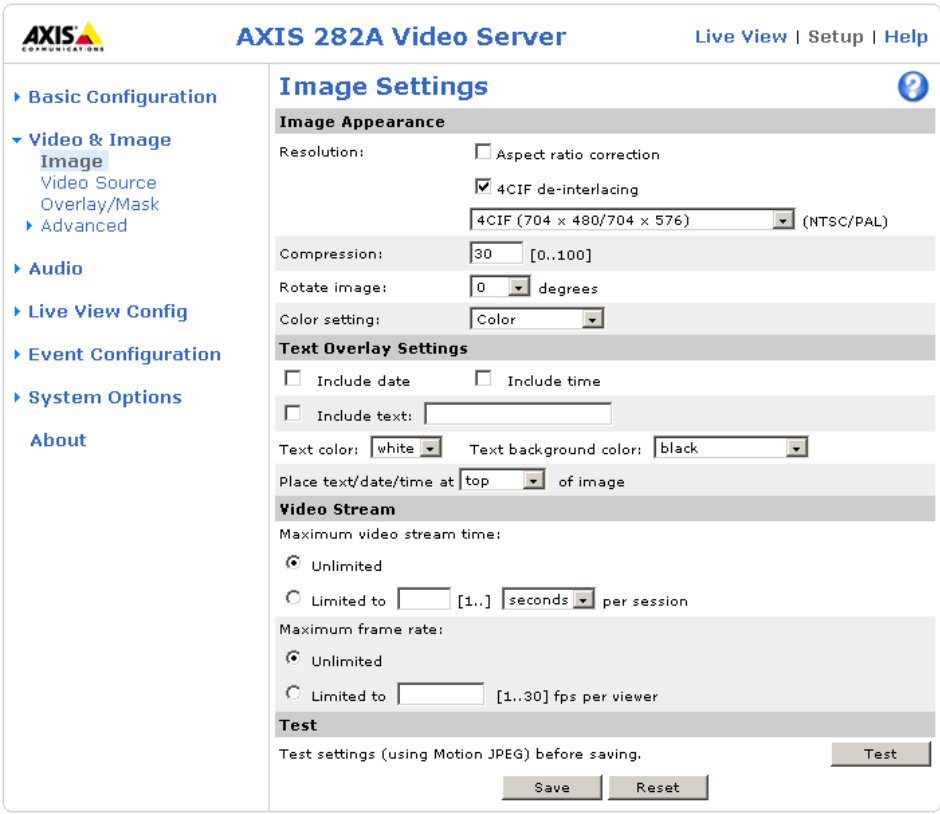


Image Settings

Image Appearance

Modify the **Image Appearance** to optimize the video images according to your requirements.

All configuration of images and overlays will affect the performance of the Video Server, depending on the usage and the available bandwidth.

- High resolution generates larger files
- Lower compression improves image quality, but generates larger files
- Black & White uses less bandwidth than Color
- Rotating the image 90 or 270 degrees will lower the maximum frame rate

See also the specifications for frame rates and bandwidth on page 70.

Text Overlay Settings

Include date, time and/or text of your choice to be viewed on the image. The color of the text may be set to white or black, while background color may be set to white, black, transparent or semitransparent. The position of the text is set either to the top or the bottom of the image.

Video Stream

The **Maximum video stream time** can be set as *Unlimited*, or a **maximum stream time** per session in seconds, minutes or hours can be defined. When the set time has expired, a new stream can be started by refreshing the page in the Web browser. Note that the maximum video stream time does not apply to clients connecting via multicast.

To avoid bandwidth problems on the network, the **frame rate** allowed to each viewer can also be limited. Select either *Unlimited* or define a maximum frame rate per viewer.

Test

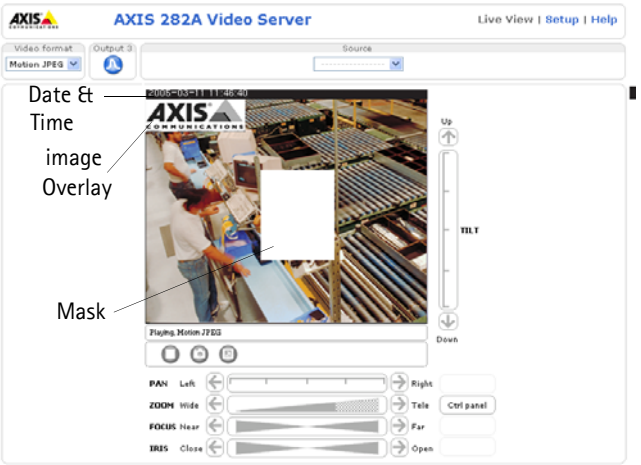
For a preview of the image and overlay settings before saving, click **Test**. When you are satisfied with the settings, click **Save**.

Video Source Settings

These settings allow you to eliminate any black borders surrounding the image, by making **Offset adjustments**. See the online help for more information.

Select the physical connector the video source is connected to, composite video or Y/C (s-video).

Overlay/Mask Settings



Overlay/Mask Type

Overlay/Mask Type allows you to place an overlay, or up to three privacy masks over the video image:

- Upload and place an image as an overlay - usually used to provide extra information in the video image.
- Place up to three privacy masks - up to 3 configurable masks can be used to conceal different areas of the video image.

Selecting the overlay/mask type from the menu will display further settings available for the selected type. See the online help for further information.

Note: If you need to see an area of the video that is covered by an overlay or mask, a privacy mask cannot be bypassed. An overlay image, however, can be bypassed with the help of the AXIS HTTP API.

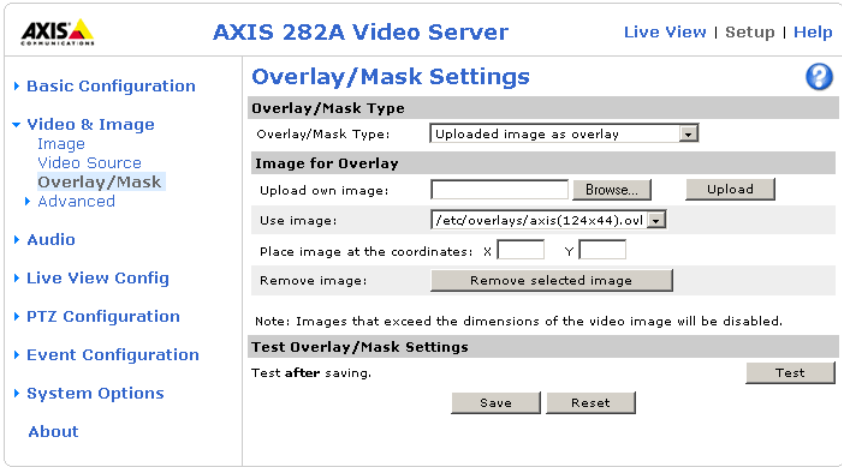
Upload and use an overlay

To upload an overlay image to the camera:

1. Select **Uploaded image as overlay** in the drop-down list for **Overlay/Mask Type**. New options appear.
2. In the field **Upload own image**, click the **Browse** button and locate the image file on your computer or server.
3. Click the **Upload** button and follow the on-screen instructions.

To use an already uploaded image:

1. Select an uploaded image from the **Use image** drop-down list.
2. Place the image at the required location by entering the x and y coordinates.
3. Click **Save**.



Overlay image requirements:

Image Formats	Image Size
• Windows 24-bit BMP (full color) • Windows 4-bit BMP (16 colors)	The height and width of the overlay image in pixels must be exactly divisible by 4.

Overlay image limitations:

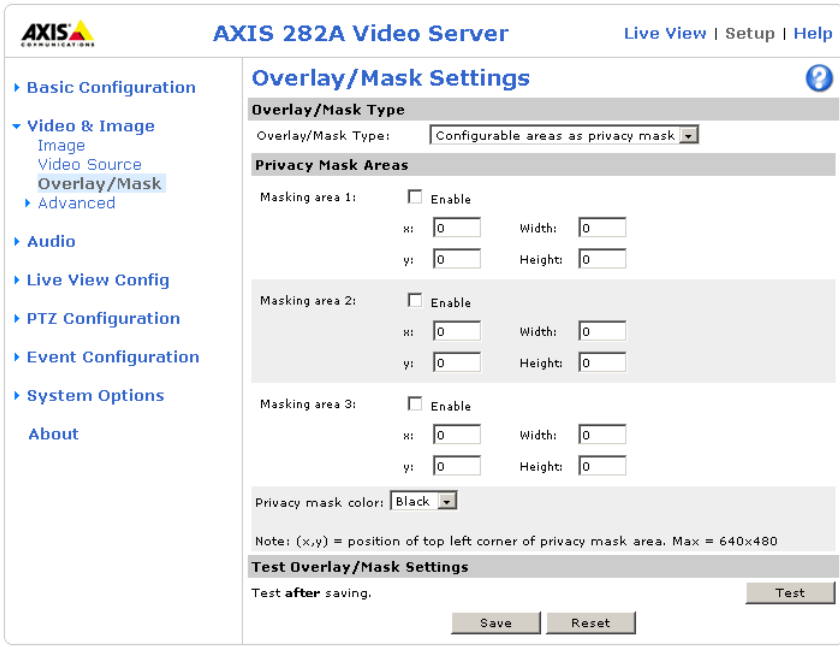
- The maximum overlay image size supported by the AXIS 282/AXIS 282A is the same as the maximum image resolution. See Technical Specifications, on page 66.
- When a text overlay is also used, this reduces the amount of space available to the overlay image. To keep the text readable at lower resolutions, the text overlay occupies proportionally more of the image at lower resolutions.
- If the overlay is initially positioned so that part of it is outside the video image, it will be relocated so that it appears over the video image, i.e. it is always the entire image that is displayed.

Please see the online help for more information.

Use a Privacy Mask

To use privacy masks to hide different areas of the video image:

1. Select **Configurable areas as privacy mask** in the drop-down list for **Overlay/Mask Type**. New options appear.
2. Enter the (x,y) coordinates of the top left hand corner of the mask, and the height and width to define the masks' placement and size.
3. Select the privacy masks' color: black, grey, white, or red.
4. Click in the box beside **Enable** to enable one or more of the masks you have defined and click on **Save**.



Advanced - MPEG-4 Settings

Tools for adjusting the MPEG-4 settings and for controlling the video bit rate.

The MPEG-4 standard provides many different coding tools for various applications in different situations. As most MPEG-4 clients do not support all of these tools, it is usual to instead define and use subsets for different clients or groups of clients. These settings allow you to define the type of viewing client to use.

Adjusting the maximum bit rate and setting it to variable or constant is a good way of controlling the bandwidth used by the MPEG-4 video stream.

For more information on these advanced settings, please see the online help.

Audio (AXIS 282A only)

The AXIS 282A can transmit audio to other clients using an external microphone and can play audio received from other clients by attaching a speaker. The Setup page for the AXIS 282A has an additional menu item called Audio, that allows different audio configurations to be set up, e.g. full duplex, half duplex and simplex.

Note: The speaker attached to the audio output of the AXIS 282A must have a built-in amplifier, e.g. some PC speakers.

Audio Settings

This section describes how to configure the basic audio settings for the AXIS 282A, e.g. set the communication mode and adjust the sound levels in the microphone and speaker connected to the camera.

Enable Audio

Check the box **Enable Audio** to enable audio functionality.

Audio Channels

There are two mono audio channels between the AXIS 282A and other clients, one for receiving audio and one for transmitting audio. Each audio channel can be turned on or off, which means that there are four **audio mode** options that can be used.

Full-duplex mode means that you can transmit and receive audio (talk and listen) at the same time, without having to use any of the controls. This is just like having a telephone conversation. The only controls you may wish to use are the mute buttons to turn off the sound, and the sliders, to adjust the input/output volume levels. This mode requires that the client PC has a sound card with support for full-duplex audio. If your available bandwidth is 0.2 Mbit/s or less, it is recommended that you use **Half-duplex** mode instead.

Half-duplex mode also transmits and receives audio in both directions, but only in one direction at a time. This means that you must select when to receive or transmit audio with the help of the push-to-talk button. To speak, press and hold the button (check that the microphone is not muted). When finished speaking, release the button. You will now be receiving audio from the other end of the connection.

Note that the push-to-talk button is configured from AMC, see *The AXIS Media Control*, on page 20. It is also possible to configure the push-to-talk button so that it toggles between speaking and listening modes. Half-Duplex mode is best if you only have limited bandwidth available.

When you select **Simplex - AXIS 282A speaker only** mode, the speaker connected to the AXIS 282A will play audio, but no audio will be transmitted from the AXIS 282A to other web clients. This could be used to e.g. provide spoken instructions to a person seen in a camera. This mode requires you to use the push-to-talk button.

Simplex - AXIS 282A microphone only mode only transmits audio from the AXIS 282A to any web clients. It will not receive audio from any other web clients. This can be used in remote monitoring, web attractions etc., to provide live audio, as well as video, of a monitored situation.

When using half-duplex, the **Send the sound from the active client to all other clients** option transmits the audio signal from the client that is talking to all the other clients.

Audio Input

Audio from an external microphone or a line **source** can be connected to the MIC pin of the AXIS 282A. The audio source can be set to **Microphone** or **Line**. If you are using a microphone, the **input sensitivity** can be set to **High** or **Low**. See *Technical Specifications*, on page 55 for the exact maximum levels.

The **Enable microphone power** option provides DC power for the external microphone. If you use a small electret condenser microphone such as a clip-on mic or a PC microphone, this option needs to be enabled.

To use a high impedance dynamic microphone, DC power should not be enabled. DC power will not harm the microphone, but if you are uncertain, try switching it off and on. By default value is DC power enabled. To use a professional microphone requiring 48V phantom power, you need an external power supply and must use a balanced-unbalanced converter (audio transformer) in between.

If there are problems with the sound input being too low or high, it is possible to adjust the input gain for the microphone attached to the AXIS 282A.

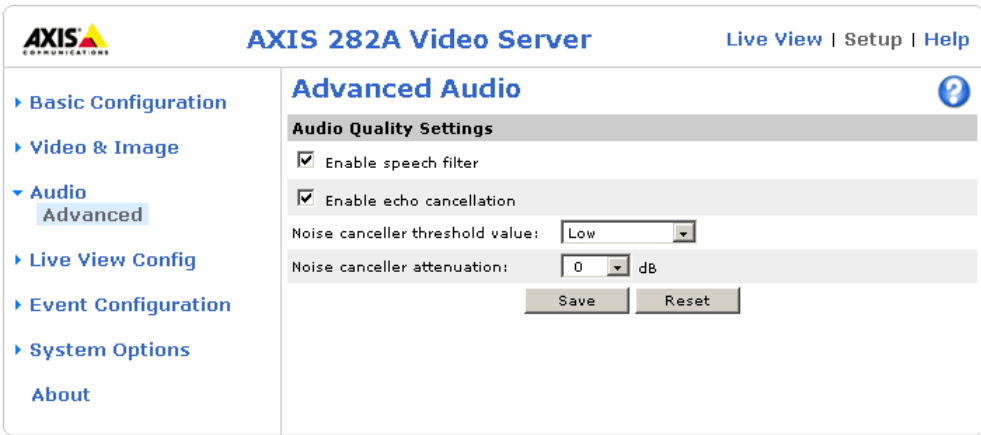
Audio Output

If the sound from the speaker is too low or high it is possible to adjust the **output gain** for the active speaker attached to the AXIS 282A.

When satisfied with the settings, click **Save**, or click **Reset** to revert to the previously saved settings.

Advanced Audio Settings

The **Advanced Quality Settings** allows you to tune the audio input to suit your environment.



Enable speech filter improves the sound quality if using a microphone that is placed close to the person talking and can also help reduce background noise. The filter cuts the lowest and the highest frequencies. The bypass frequency range is approximately 250Hz to 3700Hz (measured at -10dB cut-off break points).

Enable echo cancellation can reduce the feedback generated when using full duplex. If sound distortion is encountered, turning echo cancellation off may improve the sound quality.

Noise canceling is a way of reducing the background noise when there is no useful audio present. A typical application could be when there a noisy environment and you are only interested in hearing the sound when someone is speaking close to a microphone. There are two adjustable parameters available to optimize this function:

- **Noise canceller threshold value**
- **Noise canceller attenuation**

When the incoming sound is louder than the threshold, it will pass without any changes. When lower than the threshold, the incoming sound will be reduced by a certain attenuation factor. The threshold value should be set higher than the background noise, but lower than the useful audio.

The **noise canceller threshold value** can be set to **High**, **Medium High**, **Medium low** and **Low**. A lower threshold will accept most of the audio to pass. Only the weakest background noise will be reduced. A higher threshold will make the noise canceller act on even stronger background noise. At the maximum level **High**, there is a risk of reducing useful audio as well.

There is a trade-off between noise canceling and sound quality. In other words, increasing the **noise canceller attenuation** deteriorates sound quality. Adjust the threshold and the attenuation to an optimum by listening and changing the levels.

Live View Config

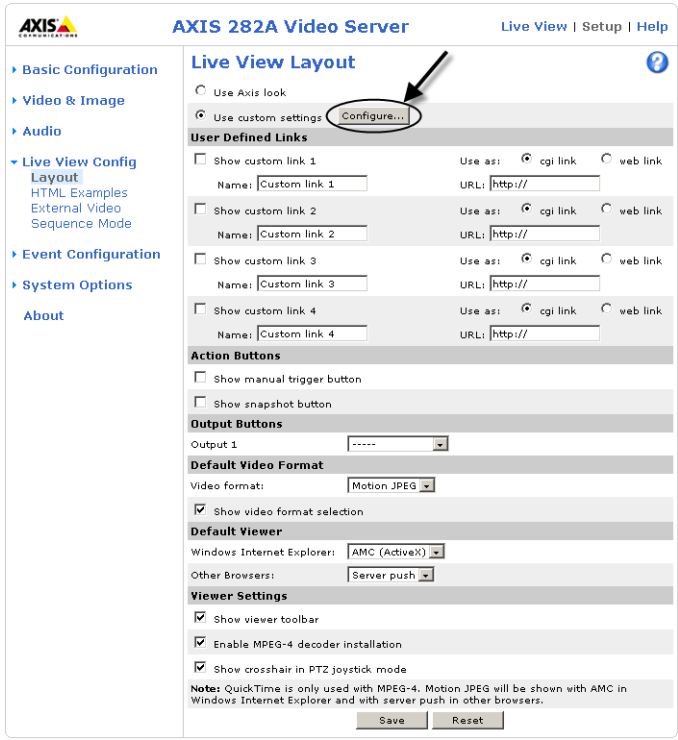
Layout

These are the tools for deciding the layout of the Live View page.

The layout can be set in 3 ways:

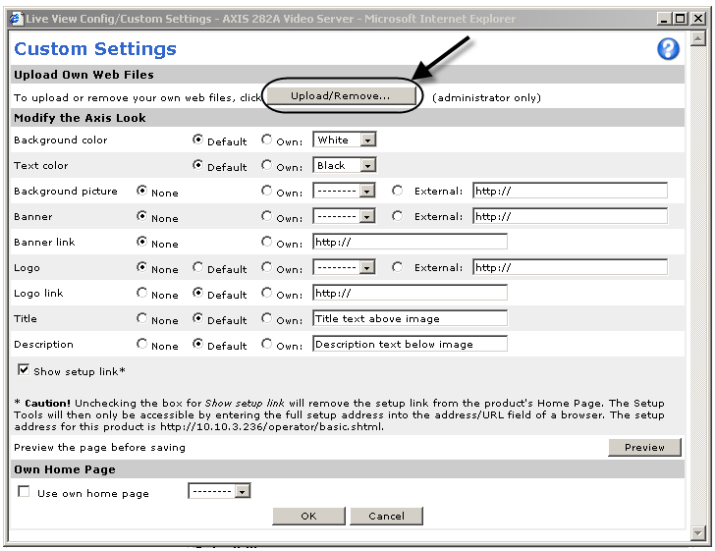
- Use Axis look - the layout is unchanged.
- Use custom settings - modify the default page with your own colors, images etc. Click the **Configure** button and see the following page.
- Own Home Page - Upload and use your own custom made page as the default web page. Click the **Configure** button and see the following page.

The other settings on this page concern which other features to include, e.g. buttons and links. See page 34 for more information.



Customizing the default page

The appearance of the default AXIS 282/AXIS 282A Live View page can be customized to suit your own requirements, or you can upload and use your own home page. To upload your own files, click the **Upload/Remove** button and see the description below.



Note that the setup address is http://<ip address>/operator/basic.shtml

Upload Own Web Files

Your own web files, background picture, color etc. must first be uploaded to the AXIS 282/AXIS 282A in order to be available for selection in the **Custom Settings setup** dialog. Once uploaded, the files are shown in the drop-down list.

1. Enter the path to the file, e.g. a file located on your workstation or click the **Browse** button.
2. Select the user level for the uploaded file. Setting the user access level means that you have complete control over which pages can be viewed by which users.
3. When the path is shown correctly in the text field, click the **Upload** button.

All uploaded files are shown in the list in the lower section of the page. To remove a file, check the box provided next to it and then click the **Remove** button.

- To use your uploaded file, click the radio button and select the file from the drop-down list by **Own:**
- To use an external file located somewhere other than in the AXIS 282/AXIS 282A, click the radio button and enter the URL by **External:**

Own Home Page

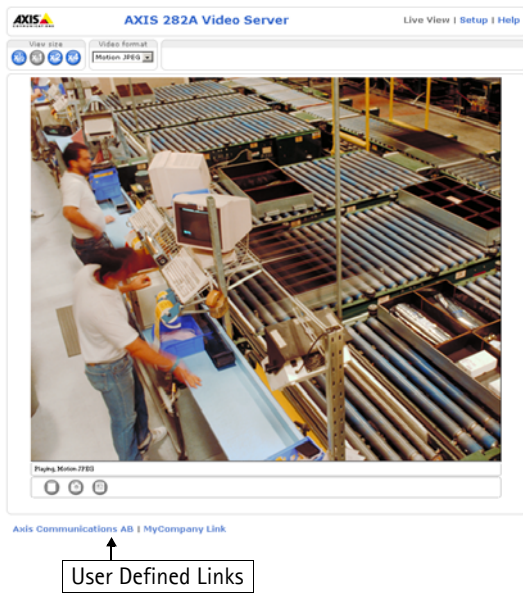
To use a previously uploaded web page as the default page, check the checkbox, select the page from the drop-down list and click OK.

User Defined Links

Enter a descriptive name and enter the URL in the provided field. The link will appear on the **Live View** page.

User defined CGI links can be used to issue HTTP API requests, e.g. PTZ commands. Example:

1. Check **Show Custom Link 1**
2. Enter a descriptive name, e.g. CAM1 Start PTZ.
3. Enter the cgi link: http://192.168.0.125/axis-cgi/com/ptz.cgi?camera=1&continuouspantiltmove=30,-30
4. Check **Show Custom Link 2.**
5. Enter a descriptive name, e.g. CAM1 Stop PTZ.



6. Enter the cgi link:
   http://192.168.0.125/axis-cgi/com/ptz.cgi?camera=1&continuouspantiltmove=0,0
7. These links will appear in the web interface and can be used to control the PTZ camera

For more information on the Axis HTTP API, see the Support / Developer pages on the Axis Web site at http://www.axis.com. See also the section on PTZ, on page 42.

Action Buttons

These buttons can be used to manually trigger and stop an event from the Live View page. See *Event Servers*, on page 37. The snapshot button allows you to take a snapshot of the video stream and save it to a computer.

Output Buttons

These buttons are used to control the output on the AXIS 282/AXIS 282A and thus the equipment connected to them, for example, to switch a light on or off:

- The Pulse button activates the port for a defined period
- Active/Inactive displays 2 buttons, one for each action (on/off)

Default Video Format in Internet Explorer for Windows

Select the default format to use on the Live View page. Checking the box for Show video format selection displays a drop-down list on the Live View page allowing you to temporarily change the format.

AMC (AXIS Media Control) Settings

Checking the **Show viewer toolbar box** displays the AMC toolbar under the video stream.

By checking the **Enable MPEG-4 decoder installation** box, it is also possible for the Administrator to enable or disable the installation of the MPEG-4 decoder. This is used to prevent the installation of unlicensed copies. Further decoder licenses can be purchased from your Axis dealer.

Default Viewer for Motion JPEG

Select the appropriate radio button to define the method for viewing moving video images, depending on your browser and settings.

Please see the online help for more information.

HTML Examples

You can add live video from your AXIS 282/AXIS 282A to your own web site. The AXIS 282/AXIS 282A can send Motion-JPEG or MPEG-4 images to up to 20 simultaneous connections, although an administrator can restrict this to fewer. This does not affect or include the number of multicast viewers.

Enter the **Image Type**, **Image size** and other settings to suit your web page and click **Update**.

External Video

You can add links to other Axis network devices available over the network. These sources can be displayed on the Live View page, just as if they were video sources connected directly to the AXIS 282/AXIS 282A.

Click the **Add** button to open the External Video Source Setup dialog, which is used to make all the necessary settings.

Example of a path to an external video source:

```
http://192.168.0.125/axis-cgi/mjpeg/video.cgi
```

Sequence Mode

The live view page can be configured to rotate through selected internal and/or external video sources, in order or randomly. PTZ preset positions can also be included.

Select the desired video sources and enter the time in seconds to display each source (up to 59 minutes). Click **Save**.

The Sequence buttons will appear on the Live View page to allow the viewer to start and stop the sequence mode.

Please see the online help for more information.

Event Configuration

This section describes how to configure the AXIS 282/AXIS 282A for alarm handling. Various actions can be configured to run when certain types of events occur.

Event type	A set of parameters describing how and when the Video Server is to perform certain actions	
Triggered Event (see page 38)	- the circumstances that start an event	e.g. at a signal from an external device, such as a door switch or a motion sensor
Scheduled Event (see page 39)	- the circumstances that start an event	e.g. at a pre-programmed time
Action	- what occurs when the event runs	e.g. video images uploaded to an FTP server, email notification sent, etc.

Event Servers

Event Servers are used for e.g. receiving uploaded image files and/or notification messages. To set up Event server for your AXIS 282/AXIS 282A, go to **Setup > Event Configuration > Event Servers** and enter the required information according to the selected server type.

Server type	Purpose	Information required
FTP Server	• receives uploaded images	• Descriptive name of your choice • User Name and Password (to FTP server) • Upload path, e.g. images/ • Port number • Use passive mode if there is a firewall between the Video Server and FTP server • Use temporary file if your FTP server doesn't allow an existing file to be overwritten by a new file with the same name.
HTTP Server	• receives notification messages • receives uploaded images	• Descriptive name of your choice • URL (address) • User Name and Password (to HTTP server) • Proxy address/Proxy port (if required) • Proxy User Name and Password (if required)
TCP Server	• receives notification messages	• Descriptive name of your choice • User Name and Password (for TCP server) • Port number

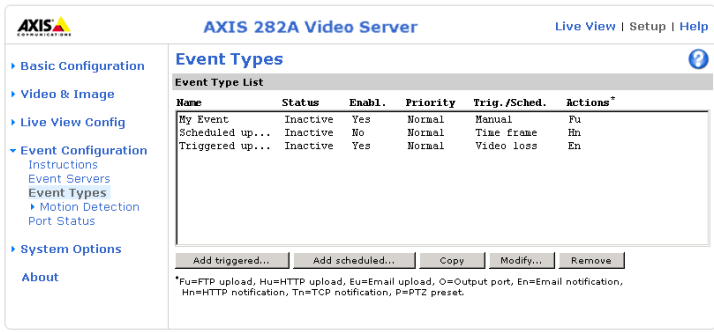
For details on each setting, please refer to the online help available from each web page.

Note: Pre-trigger and Post-trigger buffers will be lost if the connection to the event server fails.

When the setup is complete, the connection can be tested by clicking the **Test** button (the connection test takes approximately 10 seconds).

Event Types

An **Event Type** is a set of parameters describing how and when the Video Server is to perform certain actions.



Example: If somebody walks past the connected camera, and an event has been configured to act on this, the Video Server can e.g. record and send video images to an FTP server, or send a notification email to a pre-configured email address with a pre-configured message. Video images can be sent as an attachment with the email.

Triggered Event

A triggered event is activated by e.g:

- a push button connected to an input port on the Video Server
- detected movement in a configured motion detection window
- a lost video signal
- a manually activated action e.g. from an action button in the web interface
- on restart (reboot) after e.g. power loss

How to set up a triggered event

This example describes how to set the AXIS 282/AXIS 282A to upload images when the main door is opened:

1. Click **Add triggered** on the **Event types** page.
2. Enter a descriptive **name** for the event, e.g. Main door.
3. Set the **priority** - High, Normal or Low (see online help files).
4. Select which **Video Source** the event is to act on, e.g. Video 1 on Main door.
5. Set the **Respond to Trigger...** parameters when the event is to be active, e.g. only after office hours
6. Select the trigger alternative from the **Triggered by...** drop-down list, e.g. an Input port with a connected sensor if the door is opened.
7. Set the **When Triggered...** parameters, i.e. set what the Video Server should do if the main door is opened, e.g. upload images to an FTP server or send an email.
8. Click **OK** to save the event in the Event Types list.

Please see the online help for descriptions of each available option.

Pre-trigger and Post-trigger buffers

This function is very useful when checking to see what happened immediately before and after a trigger, e.g. 2 minutes before and after a door was opened. Check the **Upload images** checkbox under **Event Types > Add Triggered... > Triggered by...** to expand the web page with the available options.

Buffer size - Both the AXIS 282 and the AXIS 282A each have a 9 MB buffer.
The maximum length of time of the pre-/post-buffer depends on the selected image size and frame rate.

Include pre-trigger buffer - images stored internally in the server from the time immediately preceding the trigger. Check the box to enable the pre-trigger buffer, enter the desired length of time and specify the required image frequency.

Include post-trigger buffer - contains images from the time immediately after the trigger. Configure as for pre-trigger.

Note: If the pre- or post-buffer is too large for the AXIS 282/AXIS 282A's internal memory, the frame rate will be reduced and individual images may be missing. If this occurs, an entry will be created in the unit's log file.

Continue image upload (unbuffered) - enable the upload of images for a fixed length of time. Specify the length of time for the uploaded recording, in seconds, minutes or hours, or for as long as the trigger is active. Finally, set the desired image frequency to the maximum (the maximum available) or to a specified frame rate. The frame rate will be the best possible, but might not be as high as specified, especially if uploading via a slow connection.

Scheduled Event

A **Scheduled event** can be activated at pre-set times, in a repeating pattern on selected weekdays.

How to set up a scheduled event

This example describes how to set the Video Server to send an email notification with saved images from a set time:

1. Click **Add scheduled** on the **Event types** page.
2. Enter a descriptive **name** for the event, e.g. Scheduled email.
3. Set the **priority** (High, Normal or Low).
4. Set the **Activation Time** parameters (24h clock) when the event should be active, e.g. start on Sundays at 13.00 with a duration of 12 hours.
5. Set the **When Activated...** parameters i.e. set what the Video Server should do at the specified time e.g. send uploaded images to an email address.
6. Click **OK** to save the Event in the Event Types list.

Please see the online help for descriptions of each available option.

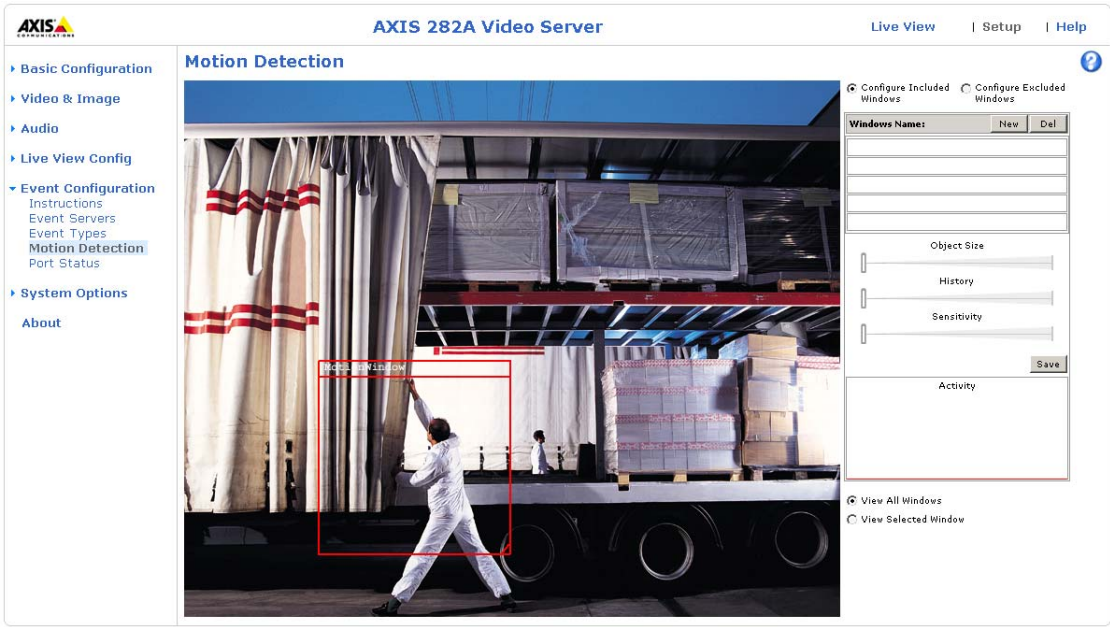
Motion Detection

In the Motion Detection menu, you can configure the video source(s) for motion detection. The motion detection feature is used to generate an alarm whenever movement occurs (or stops) in the image. The AXIS 282/AXIS 282A can use a maximum of 10 Include/Exclude windows.

- **Include** windows target specific areas within the image
- **Exclude** windows are areas to be ignored within the Include window

Once configured, the motion detection windows will appear in a list when motion detection is selected to trigger an event. See *How to set up a triggered event* above.

Note: Using the motion detection feature may decrease overall performance in the Video Server.



How to configure Motion Detection

This example describes how to configure motion detection:

1. Click **Motion Detection** in the **Event Configuration** menu.
2. Click the **Configure Included Windows** radio button.
3. Click **New**.
4. Enter a descriptive name of your choice under **Windows name**.
5. Adjust the size (drag the bottom right-hand corner) and position (click on the text at the top and drag to the desired position).

6. Adjust the Object size, History and Sensitivity profile sliders (see table below for details). Any detected motion within an active window is then indicated by red peaks in the **Activity** window (the active window has a red frame).
7. Click **Save**.

> If there are parts of the Include window that you wish to exclude, click the **Configure Excluded Windows** radio button and repeat steps 1-8 above.

Please use the online help for descriptions of each available option.

Parameter	Size	History	Sensitivity
High	Only very large objects trigger motion detection	An object that appears in the region will trigger the motion detection for a long period	Ordinary colored objects against ordinary backgrounds will trigger the motion detection
Low	Even very small objects trigger motion detection	An object that appears in the region will trigger motion detection for only a very short period	Only very bright objects against a dark background will trigger motion detection
Default values	Low	Medium to High	Medium to High

Examples:

- Avoid triggering on small objects in the image by selecting a high **size** level.
- To trigger motion detection as long as there is activity in the area, select a high **history** level.
- To only detect flashing light, low **sensitivity** can be selected. In other cases, a high **sensitivity** level is recommended.

Port Status

Under **Event Configuration > Port Status**, there is a list that shows the status for the connected inputs and outputs of the AXIS 282/AXIS 282A. This is for the benefit of an operator, who cannot access the System Options section.

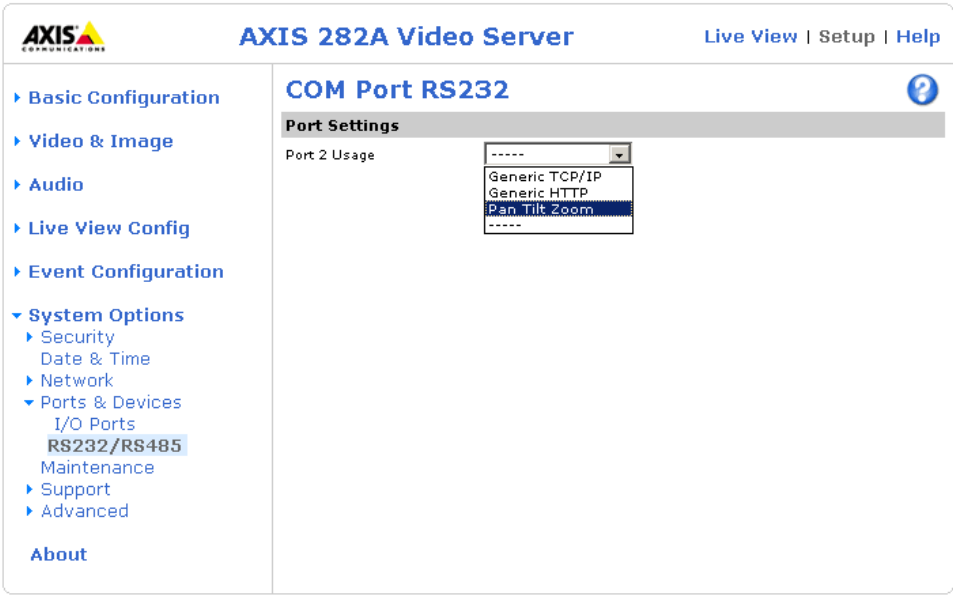
Example: If the Normal state for a push button connected to an input is set to Open circuit, as long as the button is not pushed, the state is inactive. If the button is pushed, the state of the input changes to active.

Pan Tilt Zoom

Installing PTZ Devices

The AXIS 282/AXIS 282A supports several PTZ devices. Please see www.axis.com for a complete list of supported devices, and to obtain the correct driver. Follow the instructions below to install a PTZ device:

1. Using an appropriate cable, connect the device to your selected port (RS-232 or RS-485). This configurable port is available via the 34 I/O pins. See pages 58 and 59 for more information.
2. In the setup tools, go to **Setup > System Options > Ports & Devices** and then select the port (RS-232/RS-485) to configure.

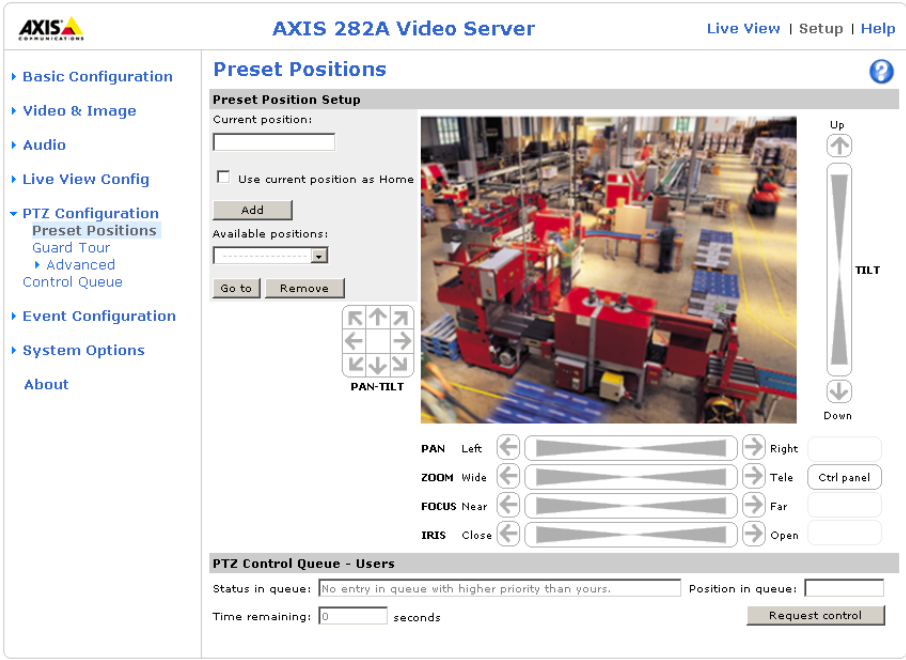


3. Select **Pan Tilt Zoom** from the **Usage** drop-down list.
4. Click **Upload** to install a PTZ driver.
   (PTZ drivers are available from the Axis Web site at www.axis.com)
5. Click **Port Options...** to modify the port settings. The default values correspond to the values specified by the PTZ driver.
6. From **System Options > Ports & Devices**, select the port configured for PTZ and then select the video source to use with the device.
7. If required, click the Advanced Options button to make further settings and see the online help.

Note: Advanced users and application developers can also use the Axis Application Programming Interface and HTTP specification for generic control of PTZ devices using CGI commands or a TCP/IP client. Please refer to the Axis Website at www.axis.com for further information.

PTZ Configuration

Once PTZ has been installed for the AXIS 282/AXIS 282A, *PTZ Configuration* now appears in the menu to the left along with the following submenus.



Preset Positions

A preset position is a pre-defined camera view than can be used to quickly move the camera to a specific location.

From **Preset Position Setup**, use the Pan, Tilt and Zoom (PTZ) controls to steer the camera to the required position. When satisfied with the camera's position, enter a descriptive name. The camera position, iris and focus settings are then saved as a preset position.

The position can be assumed at any time, by selecting the preset's name from the Preset positions drop-down list. Preset positions can be selected in **Live View**, from **events** and in **Sequence mode**.

One position can be set as the **Home** position, which is readily accessible by clicking in the box beside **Use current position as Home**. The position's name will then have (H) added, e.g. Office Entrance (H).

PTZ Controls

If the AXIS 282/AXIS 282A has been appropriately configured, the Live View page will display the controls available for the installed Pan Tilt Zoom (PTZ) device. The administrator can enable/disable the controls for specified users.

The exact controls shown depends on the make and model of PTZ device. There may be e.g. Focus and Iris bars available as well, but the most common controls are;

- the Pan bar - moves the camera to the right and left
- the Tilt bar - tips the camera up and down
- the Zoom bar - zooms the view in and out. Note that this is only available if the camera is fitted with a zoom lens.
- the Iris bar - adjusts the brightness of the image

Clicking on the bars themselves or on the arrows at the end of the bars will move the camera to a new position. The type of movement and the location of this new position depends on the type of PTZ driver.

When controlling the camera using a **relative** PTZ driver (see the bars in the illustration above) the new position will be relative to the previous position, e.g. left of, below, above, etc. Clicking the bar further from the center results in a larger movement.

In contrast, when using an **absolute** driver, each position on the bar (see right) represents a defined position in the device's range of movement, with the center of the bar representing the point midway between the two extremes of movement.

Clicking a position directly on the bar moves the camera directly to the new position in one smooth movement. Clicking on the arrows at the ends of a bar causes a stepped, incremental change.

Using CGI links to control PTZ devices

User-defined CGI links on the Live View page can be used to issue HTTP API requests, e.g. PTZ commands. These links are configured in the Live View Layout settings, see page 34.

PTZ Control Modes

The PTZ device can also be controlled using **click-in-image** movement, which has two different types of navigation; **Center** and **Joystick.**

Center mode means that when clicking in the image, the camera view will center on the absolute position that was clicked.

Joystick mode moves the camera in the direction of the mouse pointer. By clicking and holding the mouse button down in the image, the PTZ device moves the camera in that direction, relative to the center of the image. The further from the center the image is clicked, the greater the movement. The camera stops moving when the button is released.

Control Panel

The Focus and Iris (image brightness) can be adjusted manually by using the control bars, or they can be set for automatic adjustment, by clicking the **Auto Iris** and **Auto Focus** buttons.

To access the **Auto Iris** and **Auto Focus** buttons, click on the **Ctrl Panel** button. the menu to the right will then appear in the upper left hand corner of the screen.

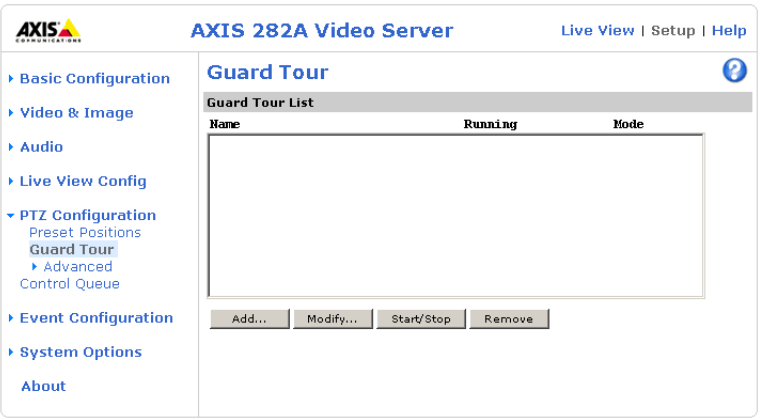
There are also driver specific shortcuts that can appear in the Control Panel. In the screen to the right, a driver has been installed that brings up the **Wiper** shortcut button, which allows the user to configure and use a windshield wiping action with the AXIS 282/AXIS 282A .

Preset Positions

Also available with many PTZ devices are **Preset positions**. These presets are selected from the drop-down **Source** list on the Live View page and will move and/or zoom the camera to a pre-defined position, i.e. to cover an area of particular interest. Events can also be configured to go to preset positions when triggered. For information on setting up preset positions, please see *Preset Positions,* on page 43 and the online help.

Guard Tour

A guard tour moves between chosen **Preset Positions**, one-by-one, in a pre-determined order or randomly, and for configurable time periods. Unlike the **Sequence Mode**, which is a viewing application under **Live View Config** (see *Live View Config*, on page 33), the guard tour sequence will keep running after the user has logged off or closed the Web browser.



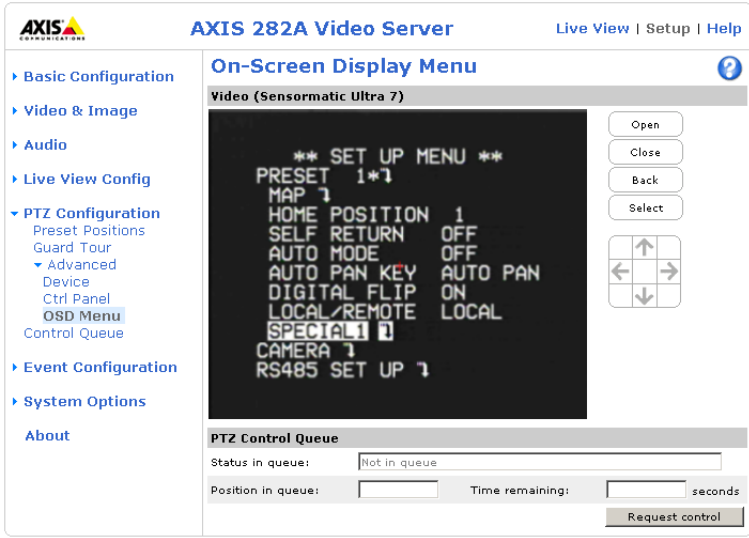
Advanced

Device Settings - The device settings window is for driver specific settings, so the appearance of this window can vary depending on the driver installed. Options that can be configured include: **Driver Specific Settings for Video Source 1**, **Mechanical Limits for Moving Video Source 1**, **Light Control for Video Source 1**, and **Extended Driver Specific Settings for Video Source 1**.

Ctrl Panel - The **Panel View Settings** contains tools for creating and saving short command buttons are located under **Ctrl Panel**. These buttons provide direct access to various built-in auxiliary commands provided by the PTZ driver and are displayed in the PTZ Panel.

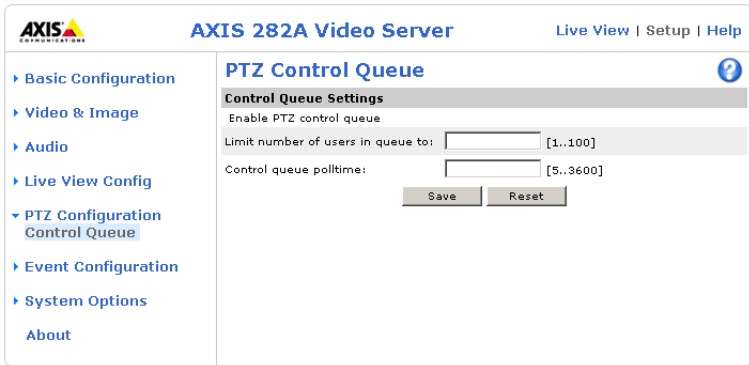
Limits - Define the pan, tilt, zoom and focus limits for the AXIS 282/AXIS 282A. Movements to the left and right, up and down can be restricted to narrow the area under surveillance. The near focus limit can be set to avoid focusing on objects too close to the camera.

OSD Menu - If the PTZ unit supports an internal configuration menu, this can be accessed using the On-Screen Display (OSD). Configure the analog camera by opening and navigating through its internal menu in this display.



PTZ Control Queue

Use the PTZ Control Queue window to enable and disable PTZ queueing. This window allows you to set up a queue for viewers wanting to access the AXIS 282/AXIS 282A, and limits the number of viewers and the length of time each viewer can access and control the video stream. For more information on how to set up the control queue, please see the online help.



Note also that a viewer who belongs to a group (see *Users*, on page 49) that has a higher PTZ priority can go in front of other users in the queue and take control of the AXIS 282/AXIS 282A.

The order of priority for taking control of the queue is listed below:

1. Administrators - An administrator may take the PTZ control regardless of who is currently first in queue. The administrator will be removed from queue 60 seconds after the their last PTZ control command.
2. Event - You can set up the AXIS 282/AXIS 282A to take control of the queue and move to a specific position for 20 seconds when triggered by an alarm. The event will immediately be place first in queue except when an administrator is in control. For more information see *How to set up a triggered event*, on page 38.
3. Operator - Same as administrator with lower priority.
4. Guard Tour - Guard tour has control of PTZ for an indefinite period of time. It may be overridden by, Operator, Event or administrator. Guard Tour will resume when higher priority groups leaves the queue. For more information see *Guard Tour*, on page 46.
5. Viewer - Multiple viewers will need to wait for their turn. The viewer has 60 seconds to control PTZ until control is passed to the next viewer in queue.

Note: In order to be able to identify different users in the viewer group, cookies need to be enabled on the client.

System Options

Security

User access control is enabled by default, when the administrator sets the root password on first access. New users are authorized with user names and passwords, or the administrator can choose to allow anonymous viewer login to the Live View page, as described below:

Users

User list displays the authorized users and access levels:

Viewer	Provides the lowest level of access, which only allows the user access to the Live View page
Operator	An Operator can view the Live View page, create and modify event types and adjust certain other settings. The Operator does not have access to the Systems Options configuration pages.
Administrator	An administrator has unrestricted access to the Setup Tools and can determine the registration of all other users.

User Settings - check the corresponding checkboxes to enable:

- **Anonymous viewer login** - allows any viewer direct access to the Live View page.
- **Anonymous PTZ control login** - allows any viewer access to the Pan Tilt Zoom controllers on the Live View page (if Pan/Tilt/Zoom is available).

IP Address Filtering

Checking the **Enable IP address filtering** box enables the IP address filtering function. Up to 256 IP address entries may be specified (a single entry can contain multiple IP addresses). Click the **Add** button to add new filtered addresses.

When the IP address filter is enabled, addresses added to the list are set as allowed **or** denied addresses. All other IP addresses not in this list will then be allowed or denied access accordingly, i.e. if the addresses in the list are allowed, then all others are denied access, and vice versa. See also the online help for more information.

Note that users from IP addresses that will be allowed must also be registered with the appropriate access rights (**User**, **Operator** or **Administrator**). This is done from **Setup > System Options > Security > Users**.

Referrals - to prevent unauthorized sources from including the video stream from the AXIS 282/AXIS 282A into external Web pages, check the **Referrals** box and enter the IP address or Host name of the computer that hosts the Web pages with the included video stream. Multiple IP addresses/host names can be defined and are separated by semicolons(;)

Notes:
- If the referrals feature is enabled and you wish to also allow normal access to the Live View page, the product's own IP address or host name must be added to the list of allowed referrers.
- Restricting referrers has no effect on an MPEG-4 video stream. To restrict an MPEG-4 stream, IP address filtering must be enabled.
- Restricting referrers is of greatest value when not using IP address filtering. If IP address filtering is used, then the allowed referrers are automatically restricted to those allowed IP addresses.

HTTPS

For greater security, the AXIS 282/AXIS 282A can be configured to use HTTPS (Hypertext Transfer Protocol over SSL (Secure Socket Layer)). That is, all communication that would otherwise go via HTTP will instead go via an encrypted HTTPS connection.

Certificate - to use HTTPS for communication with the AXIS 282/AXIS 282A, a **Certificate** must be created using one of these methods:

- A self-signed certificate can be created in the Video Server, but this does not guarantee the same level of security as an official certificate.
- An official certificate issued by a CA (Certificate Authority). A CA issues and manages security credentials and public keys for message encryption.

1. Click either **Create self-signed certificate** or **Create Certificate Request** and enter the required information in the provided fields
2. Click **OK**.
3. **Create self-signed certificate** generates and installs a certificate which will be displayed under **Installed Certificate**.
   Create Certificate Request generates a PEM formatted request which you copy and send to a CA for signing. When the signed certificate is returned, click **Install signed certificate...** to install the certificate in the AXIS 282/AXIS 282A.
4. Set the **HTTPS Connection Policy** for the administrator, Operator and Viewer to enable HTTPS connection (set to HTTP by default)

Please refer to the home page of your preferred CA for information on where to send the request etc. For more information, please see the online help

Date & Time

Current Server Time - displays the current date and time (24h clock). The time can be displayed in 12h clock format in overlay images.

New Server Time - Select your time zone from the drop-down list and check the daylight saving time changes, if desired.

From the **Time Mode** section, select the preferred method to use for setting the time:

- **Synchronize with computer time** - sets the time from the clock on your computer.
- **Synchronize with NTP Server** - the Video Server will obtain the time from an NTP server every 60 minutes. Specify the **NTP server**'s IP address or host name.

Note: Note that if using a host name for the NTP server, a DNS server must be configured under **TCP/IP** settings. See **Network > Advanced TCP/IP Settings** below.

- **Set manually** - this option allows you to manually set the time and date.

Date & Time Format Used in Images - specify the formats for the date and time (12h or 24h) displayed in the Live View video streams.

Use the predefined formats or use your own custom date and time formats. See **File Naming & Date/Time Formats** in the online help for information on how to create your own file formats.

Network - Basic TCP/IP Settings

IP Address Configuration

The IP address of the Video Server can be set automatically via DHCP, or a fixed IP address can be set manually. DHCP is enabled by default. To use a fixed IP address, you must also enter the correct subnet mask and default router.

Notes:
- DHCP is a protocol for automatic IP address assignment on a network. IP address assignment via DHCP may lead to the situation where the IP address changes and you lose contact. Configure the options for notification of IP address change (under Services) to receive notification from the Video Server when the IP address changes.
- Alternatively, if your DHCP server can update a DNS server, you can access the AXIS 282/AXIS 282A by host name which is always the same, regardless of the IP address.

Services

Options for notification of IP address change - if the IP address for the Video Server changes, e.g. automatically by DHCP, you can choose to be notified of the change. Click **Settings...** and enter the required information.

AXIS Internet Dynamic DNS Service - If the AXIS 282/AXIS 282A Video Server has been registered with the Axis Internet Dynamic DNS service and the IP address for the product changes, the service is updated to reflect the change. Check the box to enable/disable automatic updates.

The domain name currently registered at the Axis Internet Dynamic DNS service for your product can at any time be removed. To do this click **Settings...** and follow the instructions.

For more information, please refer to the online help.

Network - Advanced TCP/IP Settings

DNS Configuration

DNS (Domain Name Service) provides the translation of host names to IP addresses on your network.

Obtain DNS server address via DHCP - automatically use the DNS server settings provided by the DHCP server. Click the View button to see the current settings.

Use the following DNS server address - enter the desired DNS server by specifying the following:

Domain name - enter the domain(s) to search for the host name used by the AXIS 282/AXIS 282A. Multiple domains can be separated by semicolons (;). The host name is always the first part of a Fully Qualified Domain Name, e.g. **myserver** is the host name in the Fully Qualified Domain Name **myserver.mycompany.com** where mycompany.com is the Domain name.

DNS servers - enter the IP addresses of the primary and secondary DNS servers.

NTP

Obtain NTP server address via DHCP - use a DHCP server to auotmatically find an NTP server to synchronize clock of the AXIS 282/AXIS 282A with the other devices on the network

Use the following NTP server address - use the host name or IP address of a specific NTP server for time synchronization.

Host Name Configuration

The AXIS 282/AXIS 282A can be accessed using a host name, instead of an IP address. The host name is usually the same as the assigned DNS Name.

For more information, please see the online help

Link-Local Address

This is enabled by default and assigns the AXIS 282/AXIS 282A an additional IP address for use with UPnP™. The AXIS 282/AXIS 282A can have both a Link-Local IP and a static/DHCP-supplied IP address at the same time - these will not affect each other.

HTTP

The default HTTP port number (80) can be changed to any port within the range 1024-65535. This is useful for e.g. simple port mapping.

HTTPS

The default HTTP port number (443) can be changed to any port within the range 1024-65535. This is useful for e.g. simple port mapping.

RTSP

The RTSP protocol allows a connecting client to start an MPEG-4 stream. Enter the RTSP port number to use. The default setting is 554.

Network Traffic

The default setting is **Auto-negotiate** which means that the correct speed is automatically selected. If necessary, you can set the connection speed by selecting it from the drop-down list.

Maximum bandwidth - Specify, in Mbit/s or kbit/s, the maximum bandwidth that the Video Server is allowed to use on your network. This is a useful function when connecting your Video Server to busy or heavily loaded networks. The default setting is **Unlimited**.

Note: When using MPEG-4 as the video format, remember that setting a maximum bandwidth value here may create problems for individual video streams if the maximum value is less than the sum of the bit rates set for the video streams.

For more information, please see the online help 

SOCKS

SOCKS is a networking proxy protocol. The AXIS 282/AXIS 282A can be configured to use a SOCKS server to reach networks on the other side of a firewall/proxy server. This functionality is useful if the Video Server is located on a local network behind a firewall, but notifications, uploads, alarms, etc., need to be sent to a destination outside the local network (e.g. to the Internet).

SMTP (email)

Enter the host names or addresses for your primary and secondary mail servers in the fields provided, to enable event and error email messages from the Video Server to predefined addresses, via SMTP.

If the mail server requires SMTP authentication, check the box for **Use authentication to log in to this server** and enter the user name and password used for logging in. Several different methods of authentication are available. See the online help for more information.

SNMP

The Simple Network Management Protocol (SNMP) allows the remote management of network devices. Select the version of SNMP to use, depending on the level of security required. Select the version of SNMP to use, by checking the appropriate box. The three levels of security are:

- SNMP V1 - includes no security
- SNMP V2c - uses very simple security, e.g. community name as password
- SNMP V3 - provides encryption and secure passwords. Use with HTTPS.

If using V1 and V2c, enter the community name for read-only access to all supported SNMP objects (except the root password and other objects that require write access). Default value = public. You can also specify the community name for read/write access to all supported SNMP objects (except read-only objects). Default value = pass.

If using HTTPS enter the password if it has not already been set. To set the password again, the AXIS 282/AXIS 282A must be reset to the factory default settings.

UPnP™

The Video Server includes support for UPnP™ in Windows ME and Windows XP. UPnP™ is enabled by default.

Note: UPnP™ must be installed on your workstation if running Windows XP. To do this, open the Control Panel from the **Start Menu** and select **Add/Remove Programs**. Select **Add/Remove Windows Components** and open the **Networking Services** section. Click **Details** and then select **UPnP™** as the service to add.

RTP/MPEG-4

These settings are the IP address, port numbers, and Time-To-Live values to use for the media stream(s) in the MPEG-4 format. Only certain IP addresses and port numbers should be used for these streams. For more information, please see the online help.

Ports & Devices

I/O Ports - the pinout, interface support and the control and monitoring functions provided by this connector are described in *Unit Connectors*, on page 58.

RS-232/RS-485 - The COM port on the AXIS 282/AXIS 282A, which can be configured as RS-232 or RS-485, supports several operational modes listed on this page. For more information, please see the online help.

Maintenance

- **Restart** - The unit is restarted without changing any of the settings. Use this method if the unit is not behaving as expected.
- **Restore** - The unit is restarted and most current settings are reset to factory default values. The settings that will not be reset are as follows:
  - the boot protocol (DHCP or static)
  - the static IP address
  - the default router
  - the subnet mask
  - the system time
- **Default** - The default button should be used with caution. Pressing this will return all of the Video Server's settings to the factory default values (including the IP address)

Upgrade Server - See *Upgrading the Firmware*, on page 61.

Backup - To take a backup of all of the parameters, and any user-defined scripts, click this button. If necessary, it is then possible to return to a previous configuration if settings are changed and there is unexpected behavior.

Restore - click the **Browse** button to locate the saved backup file (see above) and then click the **Restore** button. The settings will be restored to the previous configuration.

Note: **Backup** and **Restore** can only be used on the same unit running the same firmware. This feature is not intended for multi-configurations or for firmware upgrades.

Support

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

The **System Overview** gives a quick look over the status of the camera.

Logs & Reports - when contacting Axis support, please be sure to provide a valid Server Report with your query.

Information - The **Log** report and the **Parameter List** also provide valuable information for troubleshooting and when contacting Axis' support service.

Configuration:

Log Level for Log Files - from the drop-down list, select the level of information to be added to the Log file

Log Level for Email - from the drop-down list, select the level of information to send as email and enter the destination email address.

Advanced

Scripting is an advanced function that provides the possibility to customize and use scripts. This function is a very powerful tool.

Caution!

Improper use may cause unexpected behavior or even cause loss of contact with the unit. If a script does cause problems, reset the unit to its factory default settings. A backup file may be of use to return the unit to its latest configuration).

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

For more information, please visit the Developer pages at www.axis.com/developer

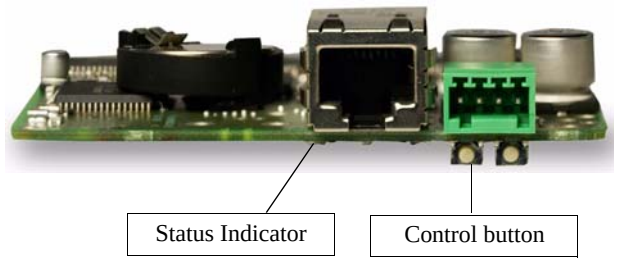
Plain Config - this function is for the advanced user with experience of Axis Video Server configuration. All parameters can be set and modified from this page, including the audio encoding format. Help is available from the standard help pages.

Resetting to the Factory Default Settings

To reset the AXIS 282/AXIS 282A to the original default settings, go to the **System Options > Maintenance** web page (described in *Maintenance*, on page 55) or use the control button on the AXIS 282/AXIS 282A, as described below:

Using the Control Button

Follow the instructions below to reset the AXIS 282/AXIS 282A to the factory default settings using the Control Button.



1. Switch off the AXIS 282/AXIS 282A by disconnecting power.
2. Press and hold the Control button while reconnecting the power.
3. Keep the Control button pressed until the **Status Indicator** displays yellow (this may take up to 15 seconds).
4. Release the Control button.
5. When the Status Indicator changes to Green (may take up to 1 minute), the process is complete and the AXIS 282/AXIS 282A has been reset.
6. Re-install the AXIS 282/AXIS 282A, as described in *Installation*, on page 10.

Unit Connectors

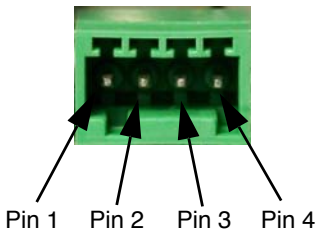
The following connectors are described in this section:

- *The Terminal I/O Connector*, on page 58
- *The 34-Pin Header*, on page 59

The Terminal I/O Connector

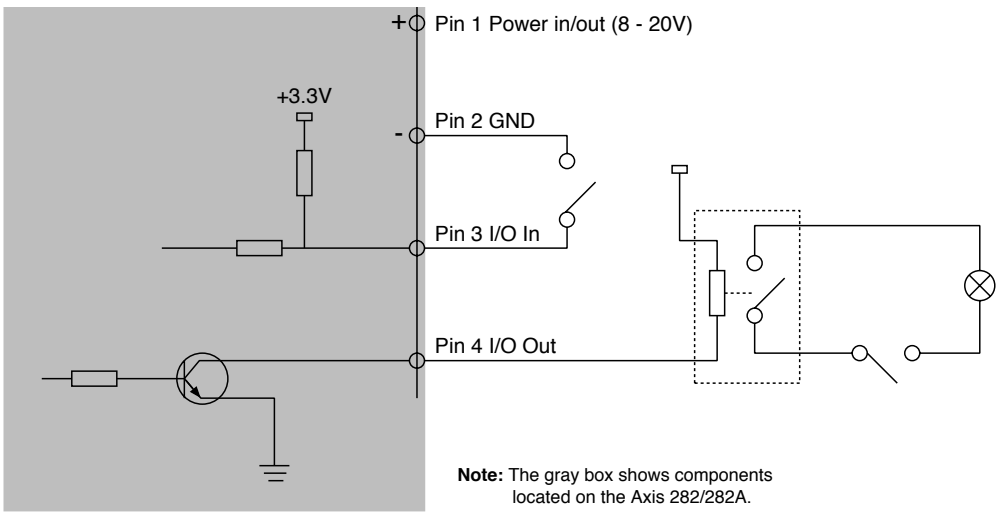
The AXIS 282/AXIS 282A provides one 4-pin terminal I/O connector.

Pin	Function
1	Power in/out (8 - 20V)
2	GND
3	I/O In
4	I/O Out



If the AXIS 282/AXIS 282A has been configured to have power going in through the 34 I/O pins see *Schematic Diagram - 34 I/O Pins*, on page 60, power can can be configured to go out through pin 1of the Terminal I/O Connector.

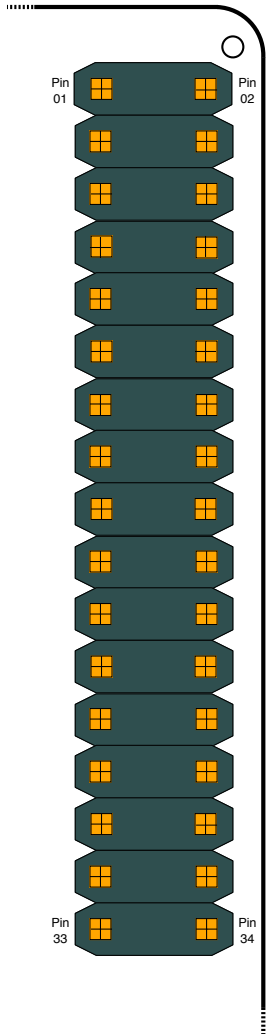
Schematic Diagram - Terminal I/O Connector



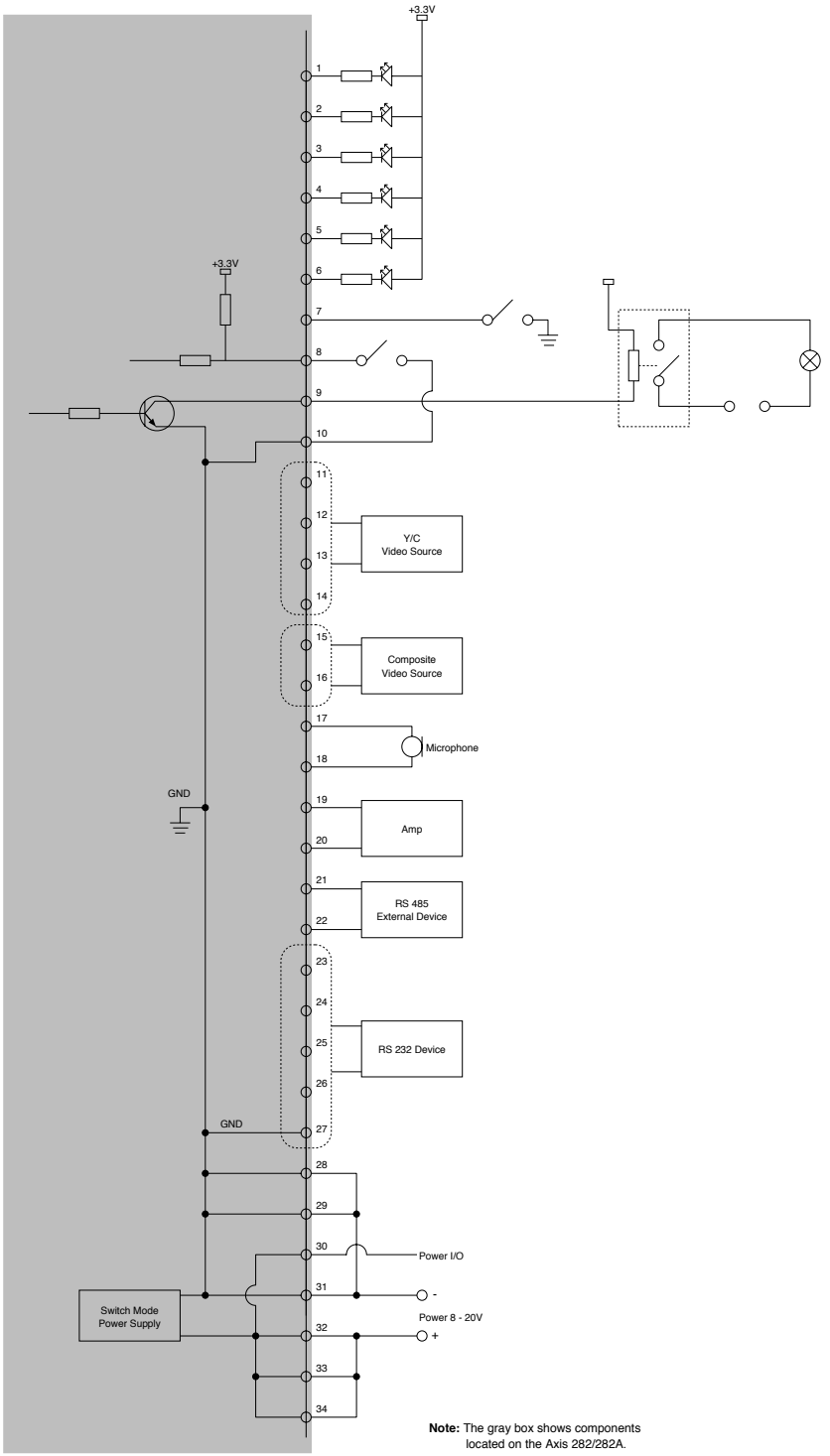
The 34-Pin Header

This section describes the pinout and interface support provided by the 34-pin I/O terminal connector:

Pin	Function	Pin	Function
1	Network LED green	18	Mic/Line in GND
2	Network LED red	19	•AXIS 282: Not used •AXIS 282A Line out (Audio)
3	Status LED green	20	Line out GND
4	Status LED red	21	RS-485 B
5	Flash LED	22	RS-485 A
6	Power LED	23	Serial port RTS (RS-232)
7	Control button	24	Serial port CTS (RS-232)
8	I/O IN	25	Serial port TXD (RS-232)
9	I/O OUT	26	Serial port RXD (RS-232)
10	I/O GND	27	Serial port GND
11	Y/C Video in (Y)	28	Power GND
12	Y/C GND	29	Power GND
13	Y/C Video in (C)	30	Power I/O
14	Y/C GND	31	Power GND
15	Composite video in	32	Power IN
16	Composite Video Source GND	33	Power IN
17	•AXIS 282: Not used •AXIS 282A MIC/Line in	34	Power IN



Schematic Diagram – 34 I/O Pins



Note: The gray box shows components located on the Axis 282/282A.

Troubleshooting

Checking the Firmware

Firmware is software that determines the functionality of the AXIS 282/AXIS 282A. One of your first actions when troubleshooting a problem should be to check the currently installed version. The latest version may contain a correction that fixes your particular problem. The current firmware version in your AXIS 282/AXIS 282A can be seen under **Setup > Basic Configuration.**

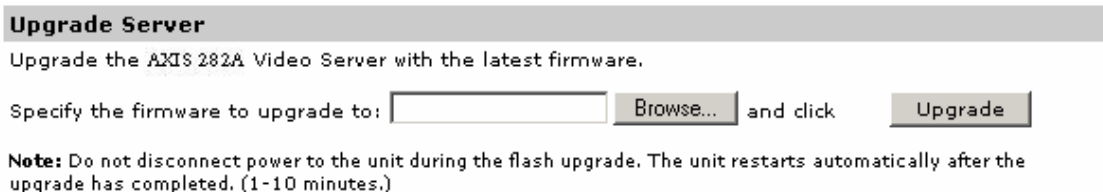
Upgrading the Firmware

When you download firmware from the Axis Web site, your Axis product will receive the latest available functionality. Always read the upgrade instructions and release notes available with each new release, before updating the firmware.

New firmware can be downloaded to the AXIS 282/AXIS 282A over the network.

Note: Pre-configured and customized settings will be retained for use when the new firmware is running (provided the features are available in the new firmware) although this is not guaranteed by Axis Communications.

1. Save the firmware file to your computer. The latest version of the AXIS 282/AXIS 282A firmware is available free of charge from the Axis Web site at **www.axis.com/techsup** or from your local distributor.
2. Go to **Setup > System Options > Maintenance** in the Video Server's Web pages.
3. In the **Upgrade Server** section and browse to the desired firmware file on your computer. Click **Upgrade**.



Notes:
- Always read the upgrade instructions available with each new release, before updating the firmware.
- After starting the process, you should always wait at least 20 minutes before restarting the AXIS 282/AXIS 282A, even if you suspect the procedure has failed.
- Your dealer reserves the right to charge for any repair attributable to faulty updating by the user.

Emergency Recovery Procedure

If power or the network connection to the AXIS 282/AXIS 282A is lost during the upgrade, the process will fail and the unit will become unresponsive. A flashing red Status LED indicates a failed upgrade. To recover the unit, follow the steps below. The serial number is located on the memory capsules on top of the AXIS 282/282A..

1. **Unix/Linux** - From the command line, type the following:
   arp -s <IP address of AXIS 282/AXIS 282A> <Serial number> temp
   ping -s 408 <IP address of AXIS 282/AXIS 282A>

   Windows - From a command/DOS prompt, type the following:
   arp -s <IP address of AXIS 282/AXIS 282A> <Serial number>
   ping -l 408 -t <IP address of AXIS 282/AXIS 282A>

2. If the unit does not reply within a few seconds, restart it and wait for a reply. Press CTRL+C to stop Ping.
3. Open a browser and type in the AXIS 282/AXIS 282A's IP address. In the page that appears, use the **Browse** button to select the upgrade file to use, e.g. axis282qa.bin or axis282sa.bin. Then click the **Load** button to restart the upgrade process.
4. After the upgrade has completed (1-10 minutes), the unit will automatically restart and show a steady green on the Power and Status LEDs and flashing green or amber on the Network LED.
5. Reinstall the AXIS 282/AXIS 282A.

If the emergency recovery procedure does not get the AXIS 282/AXIS 282A up and running again, please contact Axis support at www.axis.com/techsup/

Support

If you contact Axis support, please help us help you resolve your problems expediently by providing a server report, log file and a brief description of the problem.

Server Report - go to **Setup > System Options > Support Overview**. The server report contains important information about the server and its software, as well as a list of the current parameters.

Log file - go to **Setup > System Options > Logs & Reports**. The Log file records events within the unit since the last restart of the system and can prove a useful diagnostic tool for troubleshooting.

Symptoms, Possible Causes and Remedial Actions

Problems setting the IP address

Using ARP/Ping – the IP address must be set within two minutes after power has been applied to the Video Server	Restart the server and try again. Ensure also the ping length is set to 408. See or *ARP and Ping in Windows* on page 12, or *ARP and Ping in UNIX/Linux* on page 13.
The Video Server is located on a different subnet.	If the IP address intended for the AXIS 282/AXIS 282A and the IP address of your computer are located on different subnets, you will not be able to set the IP address. Contact your network administrator for an IP address on the same subnet as the computer you are performing the installation from.
The IP address is being used by another device	Disconnect power from the AXIS 282/AXIS 282A. Run the Ping command (in a Command/DOS window, type **ping <IP address of unit>** If you receive: **Reply from <IP address>: bytes = 32; time = 10 ms.....** - this means that the IP address may already be in use by another device on your network. You must obtain a new IP address and reinstall the unit. If you receive: **Request timed out** - this means that the IP address is available for use with your Video Server. In this case, check all cabling and reinstall the unit.

The AXIS 282/AXIS 282A cannot be accessed from a Web browser

Cannot log in	If the AXIS 282/AXIS 282A has been configured to use HTTPS, check that the protocol in the URL used to access the unit is correct. You may need to type this in manually (i.e. http or https) in the browser's address field.
The IP address has been changed by DHCP	1) Move the AXIS 282/AXIS 282A to an isolated network or to one with no DHCP or BOOTP server. Set the IP address again, using the ARP Ping command. 2) Access the unit and disable BOOTP and DHCP in the TCP/IP settings. Return the unit to the main network. The unit now has a fixed IP address that will not change. 3) As an alternative to 2), if dynamic IP address via DHCP or BOOTP is required, select the required service and then configure IP address change notification from the network settings. Return the unit to the main network. The unit will now have a dynamic IP address, but will notify you if the address changes.
Other networking problems	Test the network cable by connecting it to another network device, then Ping that device from your workstation. See instructions above.

Cannot send notifications, uploads, alarms, etc, to a destination outside the local network

Firewall protection	The Video Server can be configured to use a SOCKS server to reach networks on the other side of a firewall/proxy server

Your AXIS 282/AXIS 282A is accessible locally, but not externally

Firewall protection	Check the Internet firewall with your system administrator.
Default routers required	Check if you need to configure the default router settings.
The Internet site is too heavily loaded	Use a script on your web server to relay images from the AXIS 282/AXIS 282A to the Internet.

The Power indicator is not constantly lit

Faulty power supply	Verify that you are using the correct power supply.

The Status and network indicators are flashing red

Hardware failure	Contact your Axis dealer.

The Status indicator is flashing red and the server is inaccessible

A firmware upgrade has been interrupted or the firmware has been damaged in some other way.	A rescue firmware is running in the product. First, set the IP address using AXIS IP utility or ARP and Ping, see page 10. Then, using a browser, access the unit and download the latest firmware to the product, see *Upgrading the Firmware*, on page 61.

No images displayed in the Web interface

Problem with AMC (*Internet Explorer only*)	To enable the updating of images in Microsoft Internet Explorer, set your Web browser to allow ActiveX controls. Also, make sure that AXIS Media Control (AMC) component is installed on your workstation.
Installation of additional ActiveX component restricted or prohibited	Configure your AXIS 282/AXIS 282A to use a Java applet for updating the images under Live View Config > Layout > Default Viewer for Internet Explorer. See the online help for more information.

Video Image Problems

Black borders around the video image	Adjust the X and/or Y offset, in the Video Source Settings. See the online help for information.
Problems uploading own files	There is only limited space available for the upload of your own files. Try deleting one or more existing files, to free up space
Missing images in uploads	This can occur when trying to use a larger image buffer than is actually available. Try lowering the frame rate or the upload period.
Slow image update	Configuring e.g. pre-buffers, motion detection, high resolution images, high frame rates, etc., will reduce the performance of the Video Server.
Slow performance	Slow performance may be caused by e.g. heavy network traffic, multiple users accessing the unit, low performance clients, use of features such as Motion Detection, Event handling, Image rotation.

Bad snapshot images

Display incorrectly configured on your workstation	In Display Properties, configure your display to show at least 65000 colors, i.e. at least 16-bit. Using only 16 or 256 colors on your display will produce dithering artifacts in the image.

Problems with the MPEG-4 format

Lower frame rate than expected.	Check with the administrator that there is enough bandwidth available. Check also the settings for bit rate control, in the **Video & Image > Advanced > MPEG-4** settings. Using an inappropriate video object type can also affect the frame rate. See the online help for more information. Check in the AMC control panel applet (MPEG-4 tab) that video processing is not set to **Decode only I frames**. Lower the image resolution. Reduce the number of applications running on the client computer.
No MPEG-4 displayed in the client.	Check that the correct network interface is selected in the AMC control panel applet (network tab). Check that the relevant MPEG-4 connection methods are enabled in the AMC control panel applet (network tab). In the AMC control applet, select the MPEG-4 tab and click the button Set to default MPEG-4 decoder.
No multicast MPEG-4 displayed in the client.	Check with your network administrator that the multicast addresses used by the AXIS 282/AXIS 282A are valid for your network. Check with your network administrator to see if there is a firewall preventing viewing.
Multicast MPEG-4 only accessible by local clients.	Check if your router supports multicasting, or if the router settings between the client and the server need to be configured. The TTL (Time To Live) value may need to be increased.
Poor rendering of MPEG-4 images.	Color depth set incorrectly on clients. Set to 16-bit or 32-bit color. If text overlays are blurred, or if there are other rendering problems, you may need to enable Advanced Video Rendering. This is done on the MPEG-4 tab in the AMC control panel applet. Ensure that your graphics card is using the latest device driver. The latest drivers can usually be downloaded from the manufacturer's web site.
Color saturation is different in MPEG-4 and Motion JPEG.	Modify the settings for your graphics adapter. Please see the adapter's documentation for more information.

No audio

Incorrect setup.	Check that the sound card in the PC and the connections to the speaker and microphone are working. Ensure that the mute button is not pressed and the volume settings are correct. Ensure that full-duplex is selected if you want to have two way audio communication.
Post Content Length in proxy server.	The Post Content Length set in the proxy server is too low. Set the value of the Post Content Length in your proxy server to 1MB or more. You may need to contact your system administrator to do this.
Full duplex not supported.	Sound card does not support full-duplex. For information on how to check if your sound card supports full-duplex, please visit http://support.microsoft.com
Firewall or router settings.	AXIS 282/AXIS 282A works locally, but not externally. Check the Internet firewall settings with your system administrator or reconfigure the default router settings.
DC power not enabled for microphone.	If the microphone has a built-in amplifier then the DC power must be enabled on the Audio Settings page.
Audio volume too low/high	
Volume settings incorrect.	The volume of the microphone or speaker connected to the AXIS 282/AXIS 282A is either too high or too low. Change the volume for the speaker or microphone in the Live View page.
Input and output gain set incorrectly.	Change the input gain for the microphone and the output gain for the speaker to adjust the audio levels on the Audio Settings page.
Poor audio quality	
Too many users.	Too many users/clients listening to audio from the AXIS 282/AXIS 282A may adversely affect the sound quality.
User too close to microphone.	Enable the speech filter in **Audio > Advanced Settings**.
Feedback from speaker.	Enable the echo cancellation filter in **Audio > Advanced Settings**.
Background noise.	Adjust the noise cancellation threshold and attenuation to reduce background noise levels in **Audio > Advanced Settings**.
CPU overloaded.	Reduce the number of listeners and viewers and decrease the image resolution and compression.

For additional assistance, please contact your reseller or check the product's support pages on the Axis Website at www.axis.com/techsup

Technical Specifications

Item	Specification
Models	• AXIS AXIS 282: 1-channel bare board video server • AXIS AXIS 282A: 1-channel bare board video server with two-way audio
Video compression	• Motion-JPEG • MPEG-4 Part2 (ISO/IEC 14496-2), Profiles: ASP and SP
Resolutions	• 4CIF, 2CIF Expanded, 2CIF, CIF, QCIF • Maximum 704x480 (NTSC) 768x576 (PAL) • Minimum 160x120 (NTSC) 176x144 (PAL)
Frame rates (NTSC/PAL)	• Motion JPEG: Up to 30/25 fps at 4CIF • MPEG-4: Up to 30/25 fps at 2CIF • MPEG-4: Up to 20/17 fps at 4CIF
Video streaming	• Simultaneous Motion JPEG and MPEG-4 • Controllable frame rate and total bandwidth • Constant and variable bit rate (MPEG-4)
Image settings	• Compression levels: 11 (Motion JPEG), 23 (MPEG-4) • Rotation: 90^{o}, 180^{o}, 270^{o} • Aspect ratio correction • Color and black/white • Overlay capabilities: time, date, text, image or privacy mask • Deinterlacing filiter
Audio features AXIS 282A only	• G.711 PCM 64kbit/s, G.726 ADPCM 32 or 24 kbit/s, full duplex, half duplex, simplex or audio off
Security	• Multiple user levels with password protection • IP address filtering • HTTPS encryption
Alarm and event management	• Events triggered by built-in motion detection, external inputs or according to a schedule • Image upload over FTP, email and HTTP • Notification over TCP, email, HTTP and external outputs • Pre- and post alarm buffer of 9 MB (approx. 4 min of CIF resolution video at 4 frames per second)
Pan/Tilt/Zoom	• A wide range of analog PTZ dome cameras are supported, free drivers available at www.axis.com • 20 presets, Guard tour, PTZ control queuefor all supported PTZ units available from www.axis.com

Item	Specification
Connectors	• One 34-pin I/O header - 1 analog composite or Y/C video input (NTSC/PAL autosensing) - RS-485 or RS-232 port - 1 alarm input, 1 alarm output - Power connection (input and output) - LED outputs - Audio input (282A): Microphone (54 mVpp) or Line in (8.0 Vpp), mono - Audio output (282A): Line out (2.6 Vpp), mono • Terminal block: - 1 alarm input, 1 alarm output - Alternative power connection - Ethernet 10BaseT/100BaseTX, RJ-45connector
Processors and memory	• CPU: ETRAX-100 LX 32-bit • Video processing and compression: ARTPEC-2 chip • RAM AXIS 282 - 32MB • RAM AXIS 282A - 32MB • Flash memory - 8 MB
Power	• Via pin 3 of the Terminal Block: 8 - 20V DC, max 8W • Via pins 32 - 34 of the 34-pin header: 8 -20V DC, max 8W
Operating conditions	• Temperature: 5ºC (41ºF) to 50ºC (122ºF) • Humidity: 20-80% RH (non-condensing)
Installation, management and maintenance	User's manual and installation tool available at www.axis.comWeb-based configurationConfiguration backup and restoreFirmware upgrades over HTTP or FTP, firmware available at www.axis.com
Video access from Web browser	• Camera live view • Sequence tour capability for up to 20 PTZ presets or other Axis video sources • Customizable HTML pages
Minimum web browsing requirements	• Pentium III 500 MHz or higher or equivalent AMD • 128 MB RAM • AGP graphics card, DirectDraw, 32 MB video RAM • Windows: XP, 2000, NT 4.0, ME or 98* • DirectX 9.0 or later • Internet Explorer 5.x or later. For other operating systems and browsers, see www.axis.com/techsup **Motion JPEG only*
System integration support	• Powerful API for software integration available at www.axis.com, including HTTP API, AXIS Media Control SDK • Event trigger data in video stream • Embedded scripting and access to serial port peripherals over HTTP/TCP • Watchdog secures continuous operation, and can be monitored by other systems via event notification • Embedded operating system: Linux 2.4

Item	Specification
Supported protocols	HTTP, HTTPS, SSL/TLS*, TCP, SNMPv1/v2cv/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS. More information on protocol usage available at www.axis.com **This product includes software developed by the Open SSL Project for use in the Open SSL Toolkit.*
Applications (not included)	• API AXIS Camera Station - Surveillance application for viewing, recording and archiving up to 25 cameras • AXIS Camera Management – Efficient installation and management tool for Axis network video products • AXIS Camera Explorer – Basic software for viewing and manual recording • See www.axis.com/partner/adp_partners.htm for more software applications via partners
Included Accessories	• Pentium MPEG-4 licenses (1 encoder, 1 decoder) • MPEG-4 decoder (Windows)
Accessories (not included)	• AXIS 292 Network Video Decoder • AXIS MPEG-4 Decoder 10 user license pack
Approvals	• AXIS AXIS 282/AXIS 282A is delivered as a component for the sole purpose of being integrated into a product or system. The foregoing implies an obligation on behalf of the integrator to obtain any approvals from authorities or governmental bodies that may be required for the lawful use of the finished product or system, which includes the AXIS 282/AXIS 282A as a component.Resale and use of the AXIS 282/AXIS 282A on a stand-alone basis is not allowed.
Dimensions	• HxWxD = 19 x 79 x 82mm (3/4" x 3 1/8" x 3 1/4") • Weight: 60g (2 1/8oz)

General 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 will 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 resolutions and/or lower compression levels result in larger images. Bandwidth affected.
- Access by large numbers of Motion JPEG and/or unicast MPEG-4 clients. Bandwidth affected.
- Simultaneous viewing of different streams (resolution, compression, etc.) by different clients. Frame rate and bandwidth affected.
- Accessing both Motion JPEG and MPEG-4 video streams simultaneously. Frame rate and bandwidth affected.
- Heavy usage of event settings affects the CPU load. Frame rate affected.
- Enabled motion detection. Frame rate and bandwidth affected.
- Heavy network utilization due to poor infrastructure. Bandwidth affected
- Viewing on poorly performing client PC lowers perceived performance. Frame rate affected.
- Access by large number of audio clients using full-duplex mode. Bandwidth affected.

Optimizing your system

To see the bandwidth and frame rate currently required by the video stream, the AXIS 282/AXIS 282A provides a tool that can be used to display these values directly in the video image.

To do this, special format strings are added as part of a text overlay. Simply add **#r** (average frame rate in fps) and/or **#b** (average bandwidth in Kbps) bandwidth in Kbps) to the overlay.

For detailed instructions, please see the online help for **Video & Image > Overlay Settings**, and the help for **File Naming & Date/Time Formats**.

Important!

- The figures displayed here are the values as delivered by the server. If other restrictions are currently in force, (e.g. bandwidth limitation) these values might not correspond to those actually received by the client.
- For Motion JPEG, these values will only be accurate as long as no frame rate limit has been specified.

Frame rates - Motion JPEG

The following test results show the frame rates in frames/second (fps) for Motion JPEG streams from the AXIS 282/AXIS 282A, using a compression level of 50%. Note that these values are guidelines only - actual values may vary.

	fps (PAL/NTSC) 1 channel
4CIF	25/30
2CIF expanded	25/30
2CIF	25/30
CIF	25/30
QCIF	25/30

Frame rates - MPEG-4

The following test results show the frame rates in frames/second (fps) for MPEG-4 streams from the AXIS 282/AXIS 282A. Note that these values are guidelines only - actual values may vary.

The MPEG-4 test conditions:

- Compression level = 50%
- Video Object Type = Advanced Simple
- GOV structure = IP*

	fps (PAL/NTSC) 1 channel
4CIF	17/21
2CIF expanded	17/21
2CIF	25/30
CIF	25/30
QCIF	25/30

*Note that setting the GOV structure to use "I-frames only" will increase the frame rate.

Bandwidth

As there are many factors affecting bandwidth, it is very difficult to predict the required amounts. The settings that affect bandwidth are:

- the image resolution
- the image compression
- the frame rate
- the MPEG-4 object type
- the MPEG-4 GOV structure
- the analog cameras connected to the Video Server
- the audio settings

There are also factors in the monitored scene that will affect the bandwidth. These are:

- the amount of motion
- the image's complexity
- the lighting conditions.

For MPEG-4, if there is only limited bandwidth available, and if this is more important than the image quality, using a constant bit rate (CBR) is recommended. Use a variable bit rate (VBR) if the image quality needs to be maintained at a higher level. If supported on the network, consider also using MPEG-4 multicasting, as the bandwidth consumption will be much lower.

Glossary

Active Speaker - a speaker with a built-in power amplifier.

ActiveX - A control (or set of rules) used by a browser. ActiveX controls are often downloaded and installed automatically as required.

AMC – AXIS Media Control. The control required for viewing video images in Internet Explorer. Installs automatically on first use.

API – Application Programming Interface. The Axis API can be used for integrating Axis products into other applications.

ARP - Address Resolution Protocol. Used to associate an IP address to a hardware MAC address. A request is broadcast on the local network to find out what the MAC address is for the IP address.

ARTPEC - Axis Real Time Picture Encoder - used for image compression.

BOOTP - A protocol that can automatically configure a network device (give it an IP address).

CGI - Common Gateway Interface. A set of rules (or a program) that allows a Web Server to communicate with other programs.

Client/Server - Describes the network relationship between two computer programs, in which one, the client, makes a service request from another - the server.

DC-Iris – This special type of iris is electrically controlled by the Axis camera, to automatically regulate the amount of light allowed to enter.

dB (Decibels) - A unit to measure sound level changes. A 3dB change is the smallest level change we can hear. A 3dB change is actually twice or half the audio power level. A gain of 0dB will leave the signal level unchanged.

De-interlacing - De-interlacing is the process taking a stream of interlaced frames and converting it to a stream of progressive frames.

DSL - Digital Subscriber Line. A means of transferring data via standard phone lines.

Ethernet - A widely used networking standard.

ETRAX - Axis' own microprocessor.

Firewall - A virtual barrier between a LAN (Local Area Network) and other networks, e.g. the Internet.

FTP - File Transfer Protocol. Used for the simple transfer of files to and from an FTP-server.

Full-duplex - Transmission of data, e.g. audio, in two directions simultaneously.

G.711 - G.711 is the international standard for encoding telephone audio on 64 kbps channel. It is a pulse code modulation (PCM) scheme operating at 8 kHz sample rate.

G.726 - Frequently used speech-compression algorithm in telecommunications due to its high perceived speech quality and low resource requirements.

Half-duplex- A half-duplex link communicates in one direction at a time only, much like a walkie-talkie. Two way communication is possible, but not simultaneously.

HTTP - Hypertext Transfer Protocol. The set of rules for exchanging files (text, images, sound, video, and other files) on the World Wide Web.

HTTP-S (HTTPS)- An extension to the HTTP protocol to support sending data securely over the World Wide Web.

Intranet - A private network limited to an organization or corporation. Usually closed to external traffic.

IP - Internet Protocol. See TCP/IP.

IP address - A unique number used by a computer on the network to allow it to be identified and found.

ISMA - Internet Streaming Media Alliance.

JPEG - A standard image format, used widely for photographs. Also known as JPG.

LAN - A local area network (LAN) is a group of computers and associated devices that typically share common resources within a limited geographical area.

Linux - A popular operating system that is "open source" and practically free of charge.

Lux - A standard unit for light measurement.

Mbit/s - Megabits per second. A unit for measuring speeds in networks. A LAN might run at 10 or 100 Mbit/s.

MPEG-4 - A video compression standard that makes good use of bandwidth, and which can provide DVD-quality video streams at less than 1 Mbit/s.

Multicast – A bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients.

PEM - Privacy Enhanced Mail. An early standard for securing electronic mail. The PEM-format is often used for representing an HTTPS certificate or certificate request.

Ping - A small utility used for sending data packets to network resources to check that they are working and that the network is intact.

Pre/post alarm image - The images from immediately before and after an alarm.

Protocol - A special set of rules governing how two entities will communicate. Protocols are found at many levels of communication, and there are hardware protocols and software protocols.

Router – A device that determines the next network point

to which a packet should be forwarded on its way to its final destination. A router is often included as part of a network switch (see below).

RTP- Real-Time Transfer Protocol. A transfer protocol designed for the delivery of live content, e.g. MPEG-4.

Simplex - In simplex operation, a network cable or communications channel can only send information in one direction; it's a "one-way street".

SMTP - Simple Mail Transfer Protocol is the protocol used to send e-mail across the Internet. SMTP authentication is a way of allowing people outside of a domain to use an SMTP server when sending e-mail.

SNMP - Simple Network Management Protocol. An application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite.

Subnet Mask - An IP address consists of two components: the network address and the host address. "Subnetting' enables a network administrator to further divide the host part of the address into two or more subnets. The subnet mask identifies the subnet to which an IP address belongs.

Switch - Whilst a simple hub transmits all data to all devices connected to it, a switch only transmits the data to the device it is specifically intended for.

TCP/IP - Transmission Control Protocol/Internet Protocol. A suite of network protocols that determine how data is transmitted. TCP/IP is used on many networks, including the Internet. TCP keeps track of the individual packets of information and IP contains the rules for how the packets are actually sent and received.

UDP - The User Datagram Protocol is a communications protocol that offers a limited amount of service when messages are exchanged between computers in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP) and, together with IP, is also known as UDP/IP.

Unicast - Communication between a single sender and a single receiver over a network. A new connection is established for each new user.

URL - Uniform Resource Locator. An "address" on the network.

Varifocal - A varifocal lens provides a wide range of focal lengths, as opposed to a lens with a fixed focal length, which only provides one.

WAN - Wide-Area-Network. Similar to a LAN, but on a larger geographical scale.

Web server - A program on a computer that delivers the resources (usually web pages) requested by the web user (the client).

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