AXIS Camera Station

User's Manual

About This Document

This manual is intended for administrators and users of the AXIS Camera Station, and is applicable for software release 2.00. It includes instructions for using and managing the AXIS Camera Station on your network. Previous experience of networking will be of use when using this product. Later versions of this document will be posted to the Axis Website, as required. See also the product's online help, available via the 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.

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Legal Considerations

Camera 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.

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Axis Customer 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 software 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/

AXIS Camera Station User's Manual
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Requirements and Recommendations

Install AXIS Camera Station on a stand-alone computer dedicated mainly for running this application

Hardware:

- Intel Pentium 4 with 2 GHz processor
- CD-drive
- 512 MB RAM
- Hard disk: 1 GB available space for installation
- NTFS file system
- XGA (1024 x 768) or higher resolution monitor
- Separate graphics card, Direct Draw with 32 MB or more memory
- 100 MB Ethernet with a static IP address

System:

- Microsoft Windows XP Professional SP2, 2000 (SP4) 2003 Server (SP1), Internet Explorer Version 6.0 or later, DirectX 9.0c or later
- TCP/IP support
- Internet Information Server (IIS) - for Web client
- Microsoft .NET 1.1 runtime environment (included in installation package)

Minimum recommended requirements for a full 25 camera system:

- Dual XEON 3 Ghz, 1024 MB RAM, Multiple SCSI disks
- 1000 Mbit Ethernet backbone

Recommendations

For optimal software performance, use these PC setup conditions:

- When more than 16 cameras are enabled, use dual processors and/or hard disk controllers for optimal performance.
- Install one hard disk for each 6-8 cameras enabled for optimal performance.
- SCSI disks perform better than IDE disks, since no PC processor power is used to control the disks and the access time is shorter than IDE. Hard disks should be minimum 7,200 RPMs.
- Better performance and less bandwidth usage can be obtained using cameras with built-in motion detection or external alarm detectors like PIRs.
- For optimal network performance, 100 Mbit switches should be used. Hubs can be used for installation using less than 6-8 cameras. There are no known limitations on networks when switches are used. If this software is installed in an existing network with high traffic, consider using a dedicated switch and add a second network adapter to the PC.
- As preventative maintenance, it is recommended that you regularly check that cameras, recordings, triggered events, motion detection, etc. are functioning properly.
- It is recommended to install a UPS to secure camera operation in case of power failure.

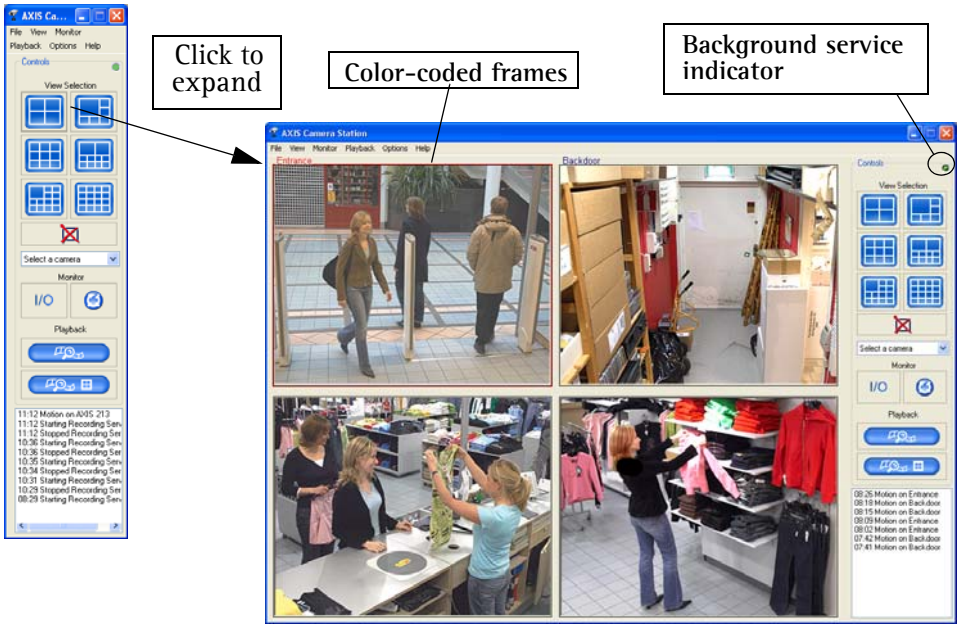
Important!

It is recommended that you defragment your hard drives on a regular basis to improve system performance. See your Windows documentation for instructions

User's Interface

This chapter provides a brief description of AXIS Camera Station user's interface, control buttons and menu options from the main view. For a more detailed description of buttons and menu items refer to the online help. To configure your cameras and video servers see *How to...*, on page 9 for detailed instructions.

AXIS Camera Station - Extended and contracted views



The frames surrounding the images are color-coded:

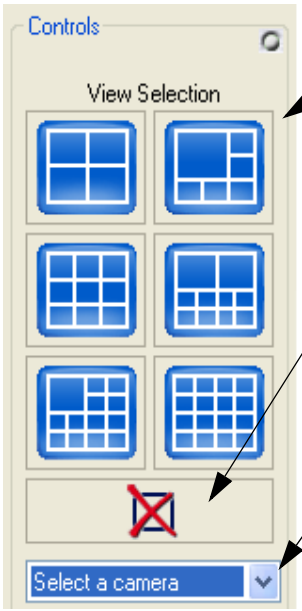
- Blue frame: Camera connection OK, no motion detected.
- Red frame: Camera connection OK, alarm or motion triggered recording has started.
- Yellow frame: Camera network connection problem.

Background service:

- The background service retrieves images from the connected cameras and stores them on the hard disk. From the AXIS Camera Station you can start or stop the background service, click **File > Start Server** or **Stop Server.**
- A flashing green indicator in the upper right corner of the window and the icon in the taskbar show that the service is running, where red means the service is not running and yellow indicates that the service is starting up or experiencing problems connecting to one of the cameras.
- Recording is only possible if the background service is running, and will continue even after logging out from the PC where AXIS Camera Station is installed.

Controls

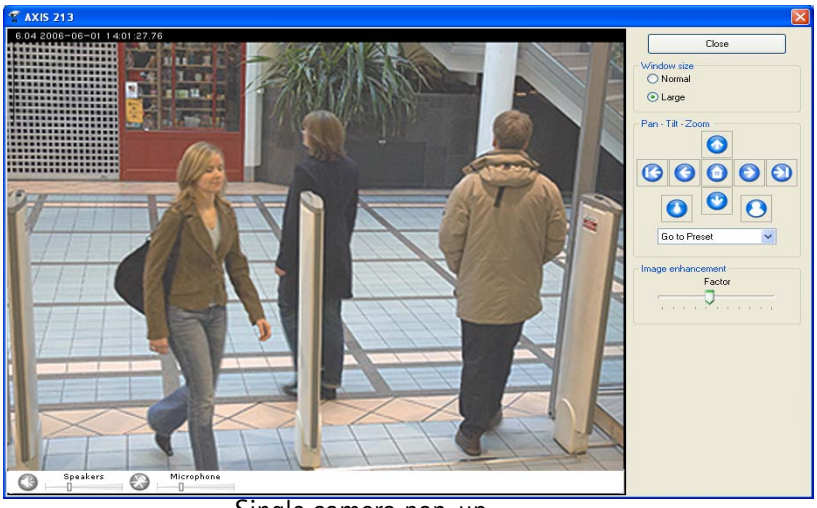
The control pad contains buttons for quick access to the many functions of AXIS Camera Station.



View Selection – Select one of the layouts for viewing live images from multiple network cameras. The views are configured under **Options** > **Views**. See *Views*, on page 17 for instructions.

No Live Images – Click the **No Live Images** button to close the camera window views. Not displaying live images reduces the amount of process power and bandwidth required by the application. In the **Views** section under **Options** it is possible to set up AXIS Camera Station to always startup in this mode, see *Views*, on page 17.

Select Camera – Selecting a network camera from the drop-down list will open a new window showing the live image from the chosen camera. Depending on the network camera/video server model and settings, controls for Pan/Tilt/Zoom, audio and AXIS Image Enhancer may also be visible.



Single camera pop-up

Monitor Buttons

I/O

I/O Status – Opens a window displaying the status of the Input/Outputs defined in AXIS Camera Station. Each I/O is shown on one line, along with a colored indicator.

- **Green** - the I/O is in its normal state
- **Red** - the I/O is active. Recording may be in progress depending on the setup
- **Yellow** - there is a connection problem with the I/O device.

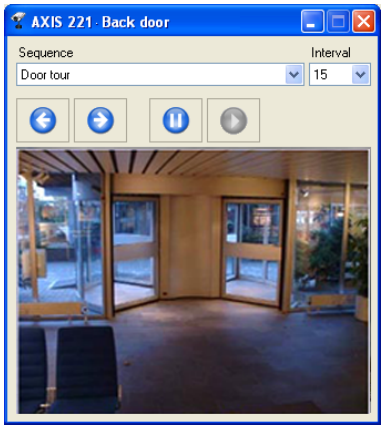
click to open camera view

Click on the camera button to open the device's window with live image stream. Buttons for starting and stopping an output are also shown. I/O Status window can also be opened by selecting menu items Views > Show I/O Status.

See *External I/Os,* on page 19 for configuration of inputs and outputs.

Camera Sequence - Opens the Camera sequence window. A camera sequence is a defined "tour" or configuration that automatically switches through the cameras included in the tour. Select the sequence to view from the Camera Sequence drop-down list.

The configured switching interval can be overridden by clicking the command buttons, or by changing the interval in the Switching Interval drop-down list. See *How to set up a sequence*, on page 19.



Playback Buttons

Recorded Events - Opens the Event Search window. An event is a recording which is triggered by an alarm or scheduled. See *How to search using Event Search,* on page 20

4-camera playback - search through recorded events from four cameras simultaneously. Click on the 4-camera playback button and a new window opens, showing images from the recorded files.

Event log - shows recent events in the server. By clicking on a recorded event item the Recorded Event Window opens. See *How to search using Event Search,* on page 20.

Taskbar icon menu - The icon in the task bar indicates the status of the service. Green indicates that the service is running, red that it is stopped and yellow means the service is starting up or experiencing a problem connecting to a camera. Right-click on the icon to bring up options to start/stop the recording server. Hide removes the icon from the taskbar, but the service continues. Icon will re-appear when the computer is restarted.

File menu

In the menu you will find many of the functions that are located in the control panel as well as all the configuration windows for AXIS Camera Station.

Start/Stop Server

From the File menu you can start or stop AXIS Camera Station as a background service. This is the part of the program that gets images from the cameras and stores them to hard disk. Images are available in the main window at any time, but images are only saved to disk when the service is running.

Note: The service is automatically restarted after changes have been made.

View menu

Select the view according to the number of cameras you want to show. See *Views,* on page 17.

No Live Images- Closes the camera window views. Not displaying live images reduces the amount of processor power required by the service, while not affecting recordings in any way. The amount of bandwidth required is also less when live images are not displayed. Under **Options > Views** it is possible to set up the system so that it always starts in this mode, see *Views,* on page 17.

Show I/O status - This option opens a window that displays the I/O Status of all units. See *I/O Status,* on page 6.

Camera Sequences - Click to open the Camera Sequence window. See *Camera Sequence,* on page 7.

Event Log - The Event log tracks camera and server events. Use the drop-down lists to choose date, time, type and source of the events to list. The generated list can be saved as a text file by clicking **Save As**.

Audit Log - This useful tool allows you to search User actions by time, user, type of happening or camera. The generated list with the chosen criteria can be saved as a text file by clicking **Save As**.

Monitor menu

Select the number of cameras from this menu to view in a new window that occupies the entire screen and shows live images from the cameras on the AXIS Camera Station server. Press Alt+F4 or **Esc** to exit the monitor mode.

Playback Menu

Open **Events** or **4-Camera Playback** window. See *Recorded Events*, page 7.

Options Menu

This is the administration section of AXIS Camera Station. A detailed description of the steps to setup and maintain AXIS Camera Station are found in *How to...,* on page 9. For detailed descriptions of the menu items see AXIS Camera Station online help pages.

Help Menu

A full descriptive help is available online.

Server report - If you are in need of support, Server Report prepares a .zip file containing parameter and log files that can be sent to Axis Customer Support for analysis of your system.

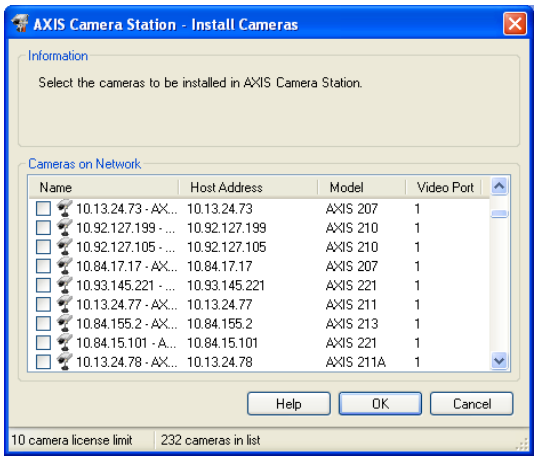
Configuration Sheet - Compiles a report in HTML format of your network camera/video server, recording and motion detection settings. This report may be helpful in support issues.

How to...

After installing the software, it must be configured for your cameras and video servers. Among other things this chapter describes how to configure and maintain AXIS Camera Station as well as how to set up recording, motion detection, and alarms. For installation instructions refer to AXIS Camera Station Installation Guide.

Add cameras/video servers

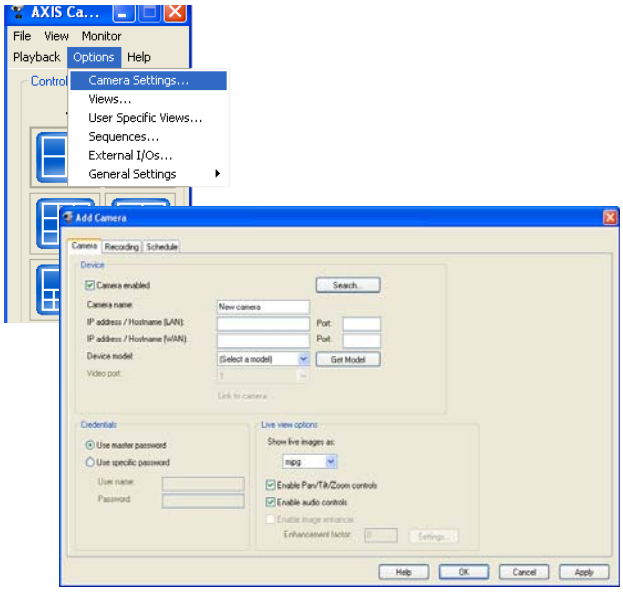
The first time AXIS Camera Station is started, a search function automatically finds and adds cameras/video servers that are on your network to AXIS Camera Station. If there are more cameras on your network than you have a license for, an **Install Cameras** dialog opens automatically. Simply check the boxes of the camera/video servers you would like to add in AXIS Camera Station.



Note: If a camera/video server is accessed through a proxy server you must change the service logon account from" System". See *Problems with remote disks or proxy servers.*, on page 33.

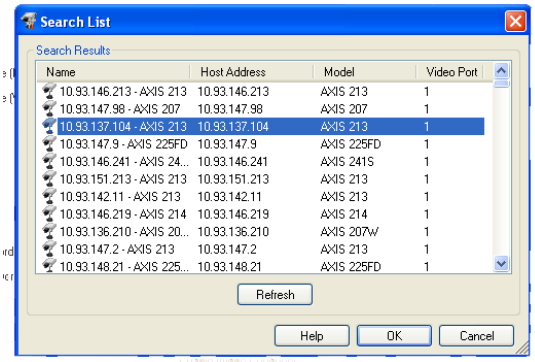
Add a camera/video server - using search

1. From AXIS Camera Station, select **Options > Camera settings** from the menu and click on the **Add** button.
2. The camera's details can be entered manually or click on the **Search** button to get a list of available cameras/video servers.

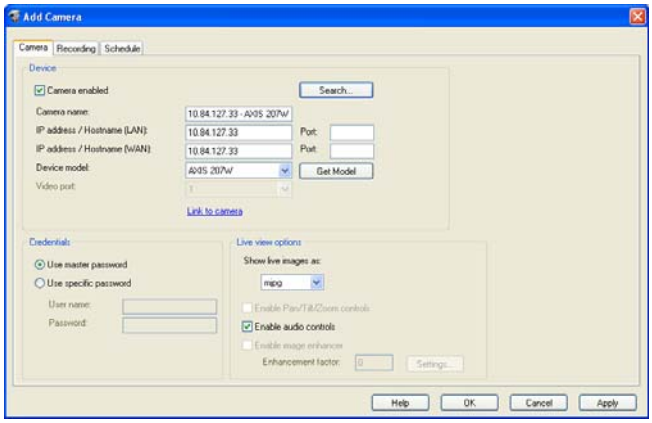


3. A **Search List** window opens with a list of the cameras found on your local subnet and all the devices with routers that support multicast traffic. Double-click on the desired camera/video server or click on the camera and the **OK** button.

   Search function supports AXIS 2XX video products with firmware version of 4.03/4.10 or higher except AXIS 205/230/250S.



4. All pertinent information appears in the window, such as the camera/video server's name, IP address, Device model and Video Port. The **Camera enabled** box must be checked to make recordings and viewing images possible. **Camera name** is how the camera will appear in AXIS Camera Station. If you like, you may change the name to something more descriptive. The change will only affect AXIS Camera Station and not the camera.



Note: The WAN IP address is where AXIS camera Station will get live images. This might be the same as your LAN IP address, but depends on your network/Firewall/NAT. The WAN must be specified if a Client or Web Interface Client is run from another network than AXIS Camera Station. If no WAN address is available, enter the LAN address. See *Network Configuration,* on page 27 for more information.

5. **Credentials** - If the camera is setup to use a common user name and password check the **Use Master Password** box under Credentials. Master Credentials is set up under **Options** > **General Settings** > **General**. If the camera has a unique password, check **Use Specific Password** and enter **User Name** and **Password** information.
6. **Live View Options** - Specify the file format to show images in. The options that appear in the drop-down list are dependant on what is available for the camera. File formats MJPG, MPEG-2 and MPEG-4 are supported.

If applicable for the model of camera chosen, you can enable Pan/Tilt/Zoom and Audio. Note, that audio must be enabled in the camera as well. Image Enhancer is enabled if you have installed your AXIS Image Enhancer license in AXIS Camera Station. By enabling these features the controls are displayed when viewing the camera's image in the Live View window (see **Select Camera** on page 6).

Add a camera/video server - manually

1. Make sure **Camera Enabled** box is checked to make recordings and viewing live images possible.
2. Enter **Camera name**. This is how the camera will appear in AXIS Camera Station and will not affect the camera's settings.
3. Enter the camera's **IP addresses** and **Port** number. If Port is left blank, AXIS Camera Station will assume the default number 80. The WAN IP address is where AXIS camera Station will get live images. This might be the same as your LAN IP address, but depends on your network/Firewall/NAT. The WAN must be specified if a Client or Web Interface Client is run from another network than AXIS Camera Station. If no WAN address is available, enter the LAN address. See *Network Configuration,* on page 27 for more information.
4. Enter **Device model**. Select a model from the drop-down list or click on **Get Model** button.
5. Enter **Video port** number if you are adding a multiport video server.
6. Follow steps 5-6 in **Add a camera/video server - using search** to enter **Credentials**, and **Live View Options**.

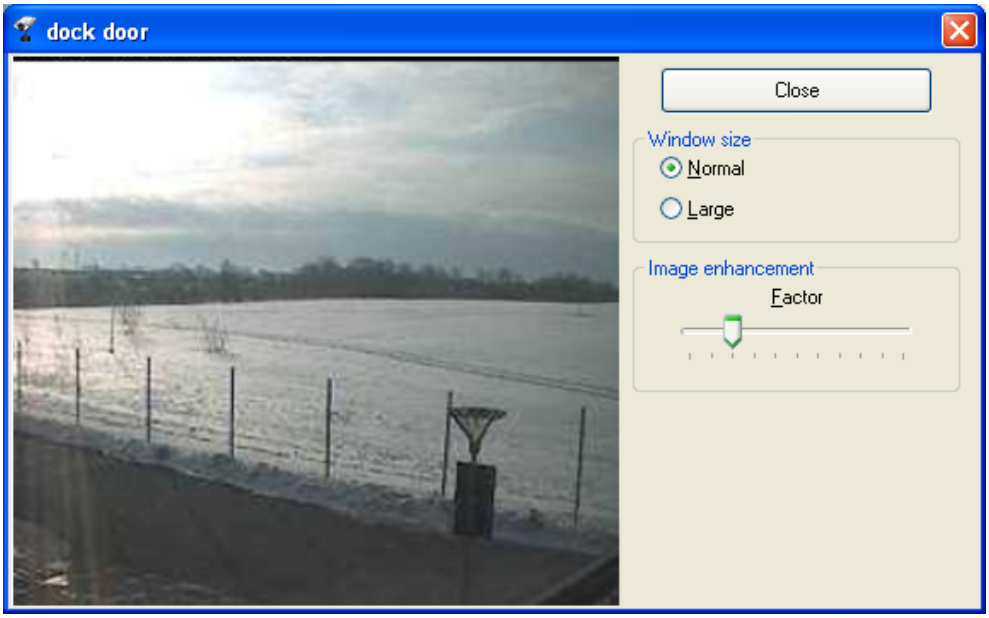
AXIS Image Enhancer

AXIS Image Enhancer improves the quality of images taken in conditions such a fog, smoke, rain and snow. If you have a registered license for AXIS Image Enhancer follow these steps to enable it for a device. To register your license for AXIS Image Enhancer, Select menu item **Options** > **General Settings** > **License**.

Set up AXIS Image Enhancer

1. From AXIS Camera Station, select **Options** > **Camera settings**. Select the camera to configure image enhancing by double-clicking on it or click on the camera and the **Edit** button.
2. Under **Live view options**, check the box for **Enable image enhancement**.
3. By clicking on **Settings**, the camera's Live View window opens. Move the slider to find the level of enhancement that gives the best image

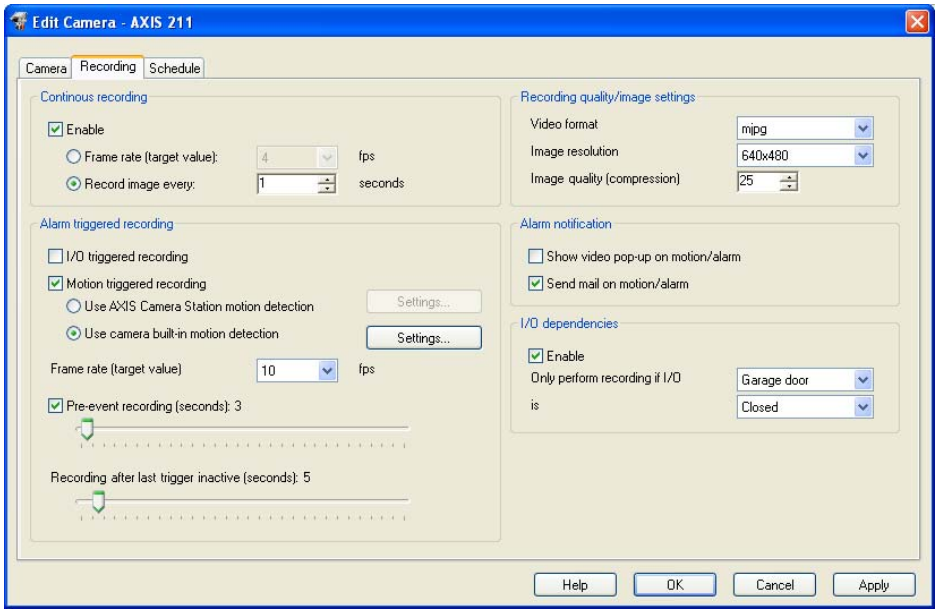
.



4. When satisfied with image, click on the **Close** button. The **Enhancement factor** in numeric form now appears in the textbox.

Note: Setting the Image enhancement factor here is for viewing live images. The setting can be adjusted in Playback mode.

Recording



Recording can be set up as continuous, scheduled or triggered by motion or alarm. For information about setting up the database for recorded events see *Recording Database,* on page 15.

Set up continuous recording

With this procedure you can set the server to continuously save images. Note that this option uses more disk space than an Alarm triggered recording.

1. From the AXIS Camera Station, click **Options > Camera settings.** Select the camera to configure by double-clicking on it or click on the camera then the **Edit** button.
2. Click on the **Recording** tab and check **Enable** under **Continuous Recording.**
3. If you would like to record every few seconds. Check the radio button for **Record image every** and select the number of seconds between image recordings. If you would like to set a higher frame rate than 1 per second, choose **Frame rate** and select how many frames to record per second.

Note: The Frame rate is a target value. The actual frame rate depends on the type of camera, network conditions and your PC configurations. If you are running on a powerful server and using only a few cameras, the frame rate can be set high.

Choosing recording quality/image settings

4. Choose a **Video format**. MPEG-4 video quality is comparable to MJPG, but often requires less bandwidth.
5. Choose the resolution or pixel size for recordings from the **Image resolution** drop-down list. The resolution available can fall into different ranges dependant on the camera. For more information consult your network camera's user manual.
6. Set **Image quality (compression).** Changing the compression level affects the amount of bandwidth required. Lower compression improves image quality, but uses more bandwidth.
7. Click the **Apply** button.

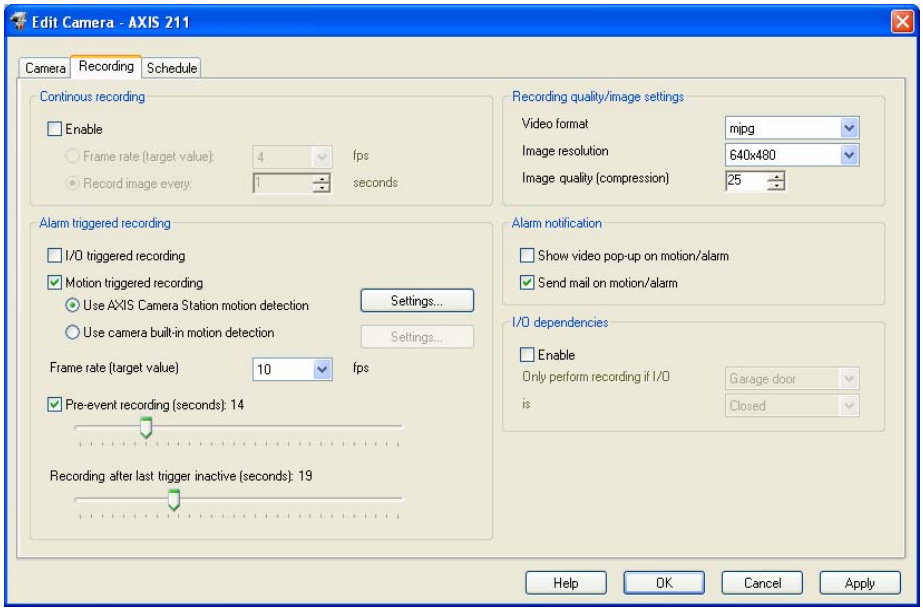
Note: A high frame rate and image resolution will require more bandwidth, processor power and hard disk space. Lower compression improves image quality, but uses more bandwidth.

Motion triggered recording

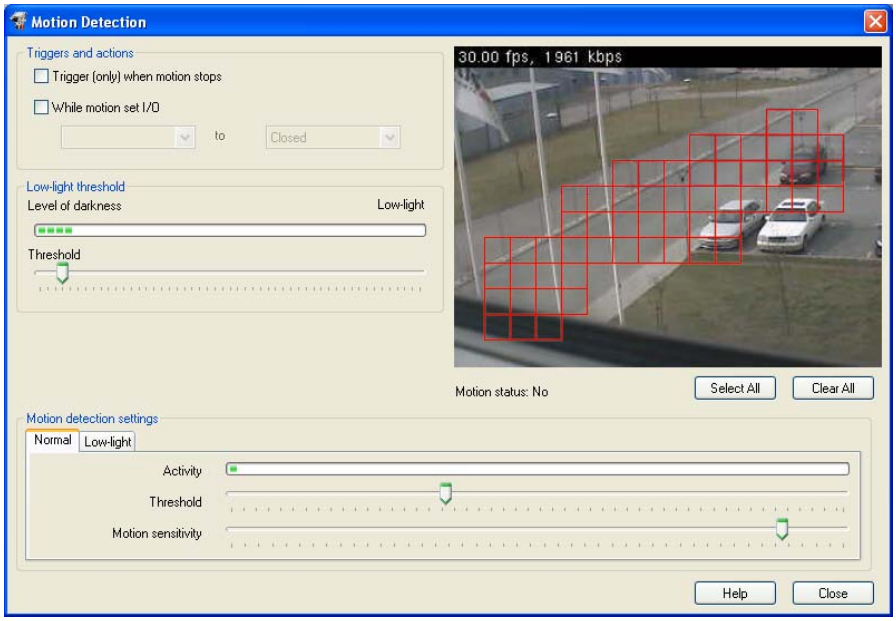
Motion detection can be triggered by AXIS Camera Station or AXIS Network Cameras that have built-in motion detection software. Use of the feature is recommended, as it saves on hard disk space than continuous recording. The advantage of having the camera trigger the motion detection is that takes the processing load off the server. There is also the option to send alarms when motion is detected.

Note: To set up motion detection in MPEG-4 follow the instructions for **Set up motion detection using the camera's built-in motion detection.**

Set up motion detection in AXIS Camera Station



1. Under **Alarm triggered recording**, check the **Motion triggered recording** box and **Use AXIS Camera Station motion detection** radio button.
2. Click on the **Settings** button that became active and the Motion Detection dialog opens.



3. Set the **Motion detection grid** for the area in the image that will react on motion detection. Left-click and drag to add area blocks and right-click and drag to remove blocks.

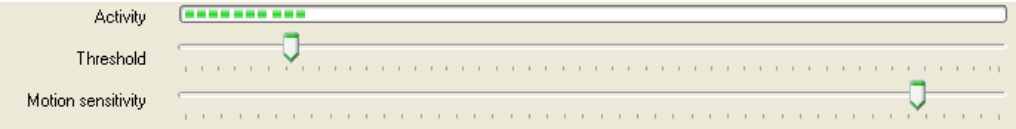
Set up motion detection for different light conditions

Different motion detection settings are used for when it's dark as images become more noisy or grainy at night which would be misinterpreted as movement. The **Low-light threshold** or the point set on the slide bar will instruct AXIS Camera Station to which **Motion detection settings** to use (Normal or Low-light) when detecting movement.

1. Set the Low-light threshold when **Normal** light becomes **Low-light**, during conditions such as dawn or dusk. Low-light is defined as when the green bars go over the threshold point.

Motion detection in Low-light conditions:

2. Click on the **Low-light** tab under **Motion detection settings.** Set **Motion sensitivity** so that the green bars in the **Activity** bar reach the threshold during no movement. Smaller movements will be detected as the sensitivity is increased.
3. When there is motion in the camera's image, set the **Threshold** slider to level where you want the recording to be triggered.



Motion detection in Normal conditions:

4. Under the **Normal** tab Set the **Motion sensitivity** level so that a few green bars appear in the **Activity** bar when there is no motion in the camera's image.Smaller movements will be detected as the sensitivity is increased.
5. When there is motion in the camera's image, set the **Threshold** slider to level where you want the recording to be triggered.
6. Continue at step 4 of *Set up continuous recording,* on page 12, to enter recording quality and image settings.

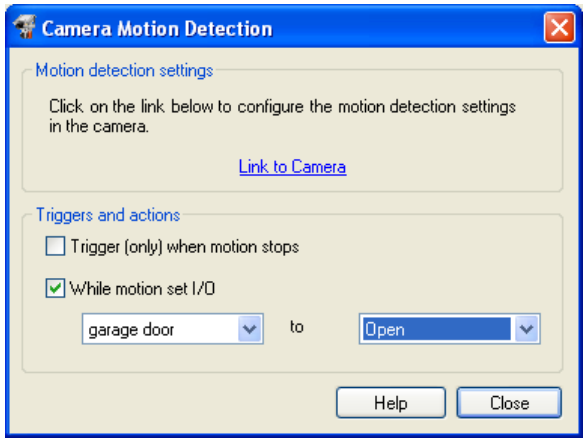
Triggers and actions

Trigger (only) when motion stops - Check this box if you would like an alarm when motion stops. This is useful, for example, in factory situations, where it would be beneficial to receive an alarm if a conveyor belt or other moving machinery stops.

While motion set I/O - Here you can set a defined alarm to be Open or Closed when motion is detected. An example of this could be, motion is detected and an alarm or siren should go off or recording from another camera should be triggered.

Set up motion detection using the camera's built-in motion detection

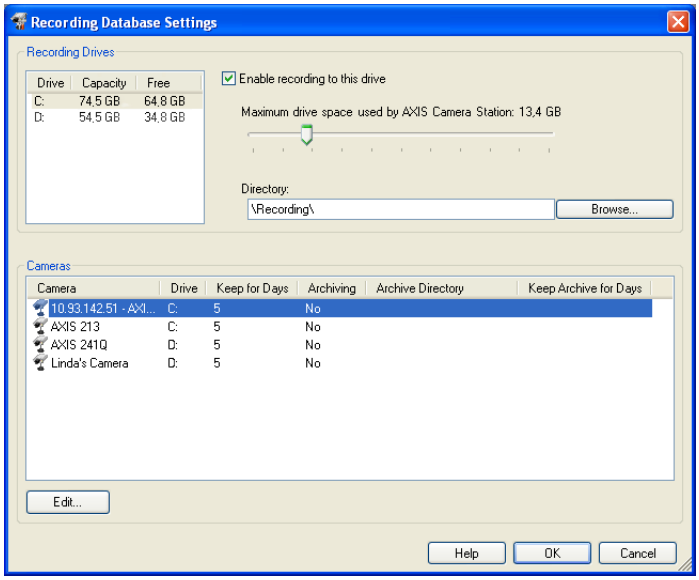
1. Under **Alarm triggered recording**, check the **Motion triggered recording** box and the **Use camera built-in motion detection** radio button. Click on the **Settings** button that became active and the Camera Motion Detection dialog opens.
2. Click on **Link to camera** to configure the motion detection settings in the camera's Setup pages. See the camera's online help for more information.
3. See Triggers and actions above to set up recordings when motion stops or to set another alarm's state as **Open** or **Closed**.



Recording Database

Specify where to store your images. Recordings will be deleted when the reserved hard disk space for AXIS Camera Station is full, or when the recording is older than the amount of days specified in **Keep for Days.**

Set up a recording database



1. Select **Options** > **General Settings** > **Recording Database.**
2. Recording drives are listed with capacity and the amount of free space. Select a drive in the drive list and check the box **Enable recording to this drive.**
3. With the slide bar **Maximum drive space used by AXIS Camera Station,** specify the maximum amount of drive space allowed for the Recording Database.

Note: Maximum drive space has precedence over **Keep for days. Images will be deleted if there is no room left in the allotted drive space.**

4. Specify which **Directory** to store your images by clicking on the Browse button.

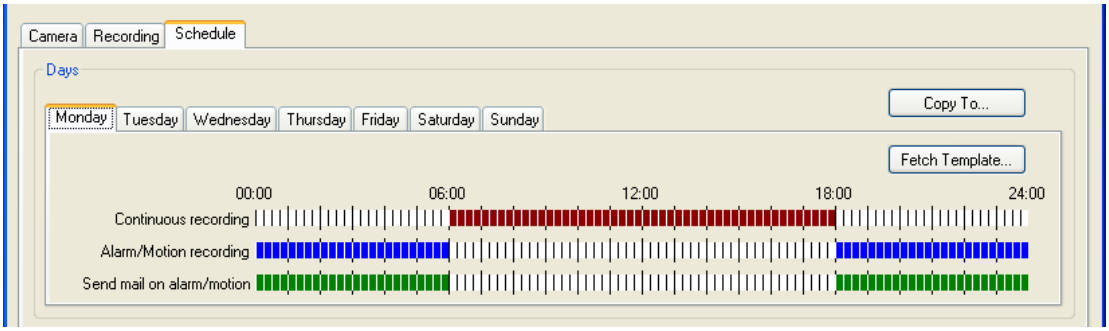
Camera Storage Settings

The cameras included in the recording database are listed in the combo box. Listed are the camera names, the drives where the recordings are stored, number of days to keep recordings in storage, if archiving is activated, the directory to store the archived recordings, and the number of days archives are to be kept.

How to edit Camera Storage Settings

1. From **Recording Database Settings**, select one or more cameras and click the **Edit** button or double-click on the camera name. The Camera Storage Settings window opens.
2. Specify where to archive your images in **Record to drive and number of days to keep recordings.**

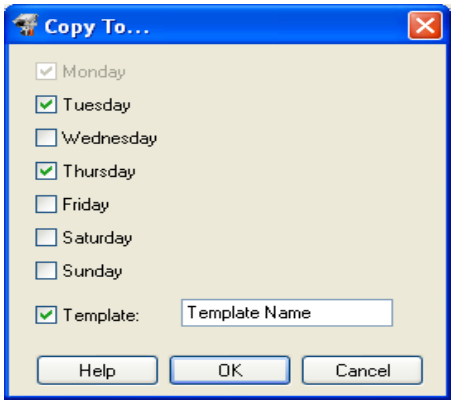
Schedules



Under **Schedule** you can set up timetables for **Continuous recording**, **Alarm/Motion recording** and **Send mail on alarm/motion**. Depending on the types of recordings that were enabled under **Recordings** (see page 12) interval bars become active.

How to set up a schedule.

1. Click on a day of the week you would like to make a schedule for.
2. Left-click and drag time bar to define intervals.
3. If you want to use the same settings for several days, you can copy a schedule from one day to another or make a new template. Click on **Copy To.** A new dialog opens where you can check the days to apply the schedule
4. .If you would like to make a Schedule Template, check Template and give it a descriptive name.
5. Click **OK** to save settings.

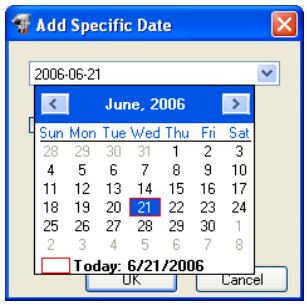


To apply a previously defined template click on **Fetch Template**.

Set up a schedule for specific dates

To define unique schedules for specific dates:

1. Under **Specific Dates**, click **Add**.
2. Click the drop-down list in the **Add Specific Date** pop-up window and a scheduler opens.
3. Select a date and the calender closes. Click on **Recurrence Yearly** if you would like to use the schedule annually. Click the **OK** button, the specified date will appear in the listbox and the schedule bars become visible.
4. Left-click and drag to define recording/notification intervals or click **Fetch Template** to apply a pre-defined template.



Templates can be design in step 4 of **Setting up a Schedule** or click on the **Schedule Templates** button under **Options** > **Camera Settings**

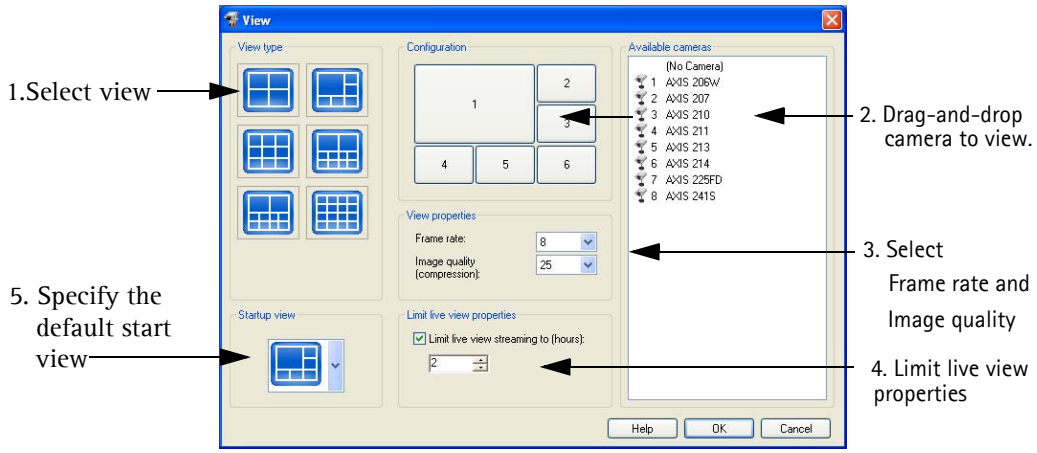
5. Click **Apply** to save your settings.

Views

Set up camera views from AXIS Camera Station

To define the camera views as seen from the main AXIS Camera Station user interface, click on **Options** > **Views** from the file menu.

1. Select the view according to the number of cameras you want to set up.



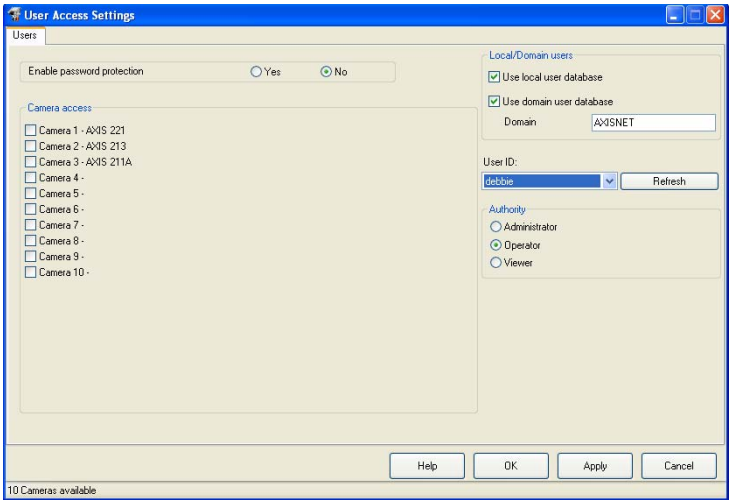
2. Arrange cameras in the view by clicking first on the position in the view and then the desired camera in the **Available Cameras** list. You can also drag-and-drop a camera to the desired position in the view.
3. Select **Frame Rate** (number of frames per second) and **Image Quality** for live video. A high value will give lower quality images and a low value will give better images due to less compression.
4. **Limit live view properties** - When enabled, the main form is collapsed into "No live images" mode after a specified amount of idle hours.
5. Specify the default view to display from the drop-down list when AXIS Camera Station is started. The **No Live Images** option is when only the controls are visible.
6. Click on **OK** to accept.

Users

Using the integrated Windows user database, a high level of security can be implemented in AXIS Camera Station where users are granted or denied access to a specific camera. Before a user can be granted access to AXIS Camera Station, users must be registered on the local computer or have an Active Directory user account. Set up users under **Options** > **General Settings** > **Users**.

Note: AXIS Camera Station users must have full rights to the **C:\TempACS** directory

How to set up Users

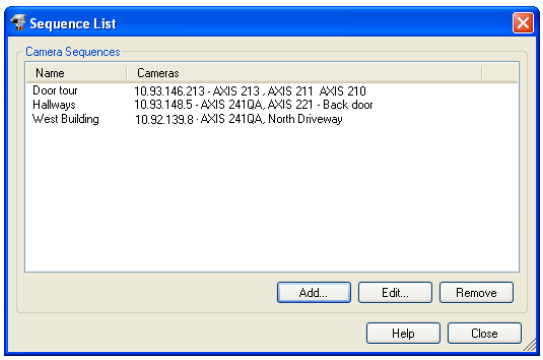


1. Check the box for local and/or domain user database and enter the name of the Domain depending on where the user is located in your system.
2. Select a user from drop-down list under **User ID**.
3. Select the user access level under **Authority**.
   - Administrator - Full access to all functionality of AXIS Camera Station.
   - Operator - Access to all functionality except the configuration pages under **Options**.
   - Viewer - Access only to live video.
4. Choose to Enable password protection.
5. Choose which cameras user will be allowed access under **Camera access**.
6. Click on **Apply** or **OK** to save settings.

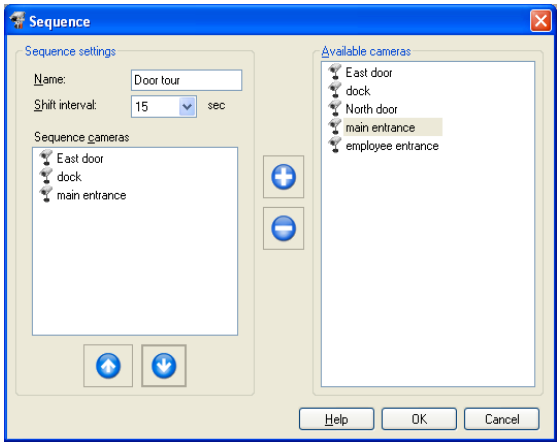
Sequences

A camera sequence is a pre-defined ” tour” or a configuration that automatically switches through all the cameras included in the tour. Once added, the operator simply selects it from **View > Camera Sequences** or by clicking on the **Camera Sequences** button under **Monitor** to view a camera sequence.

How to set up a sequence



1. Select **Options** > **Sequences** and the Sequence List window opens. Click on the **Add** button. Give your camera sequence a descriptive name under Sequence settings. Define a **Shift interval** in seconds from the drop-down list. The value set here determines the number of seconds the view from each camera is displayed.



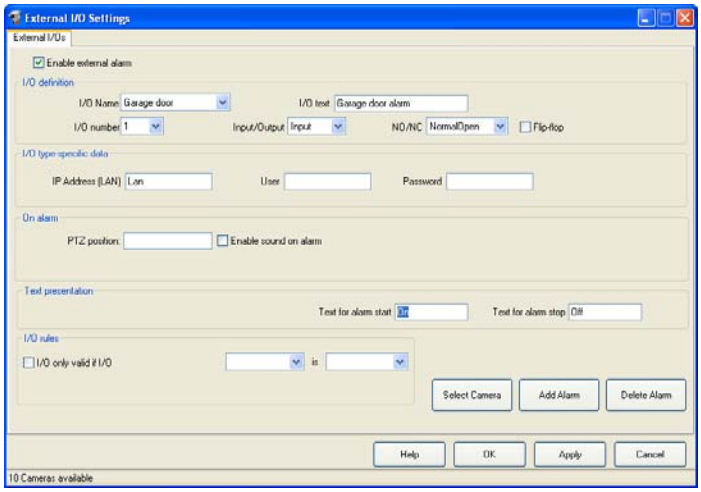
2. Double-click or drag-and-drop the desired cameras from the **Available Cameras** list to **Sequence Cameras** or click on camera and click on “+” to add and “-” to take away. You can change the order of the cameras by drag-and-drop within the list or by using the arrow buttons.
3. Click **OK** to save the new Sequence Settings.

External I/Os

This section defines alarms coming from devices connected to Axis network camera and video server I/Os in the system.

Set up a new alarm

1. Click the **Add Alarm** button. Give the alarm a descriptive name in the pop-up window and click **OK**. The new alarm appears in **I/O name** under **I/O definition**.
2. Enter the parameters, according to the descriptions below.
3. Select the camera(s) that will record when this alarm is triggered by clicking on **Select Camera**.
4. Click the **Apply** button. .



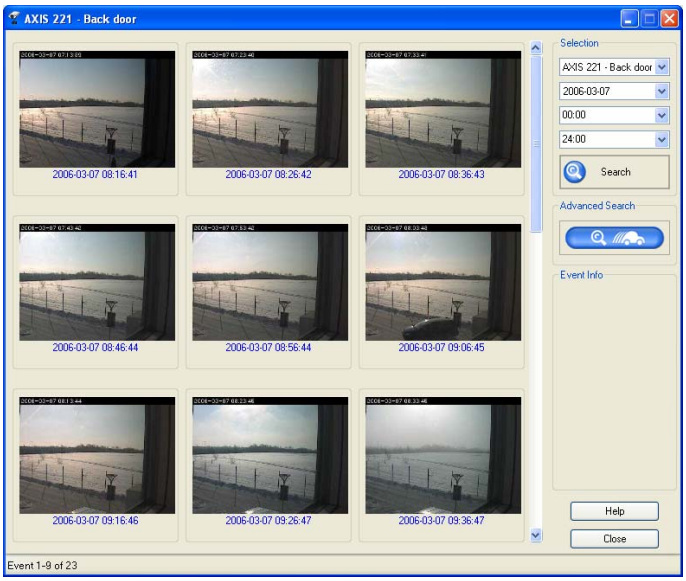
Event Search

An event is a recording which is triggered by an alarm or scheduled. AXIS Camera Station offers easy ways to search for recorded events in **Event Search** and **4-Camera Playback**. 4-Camera Playback enables a user to view simultaneous recordings from different cameras to get a comprehensive picture of an event.

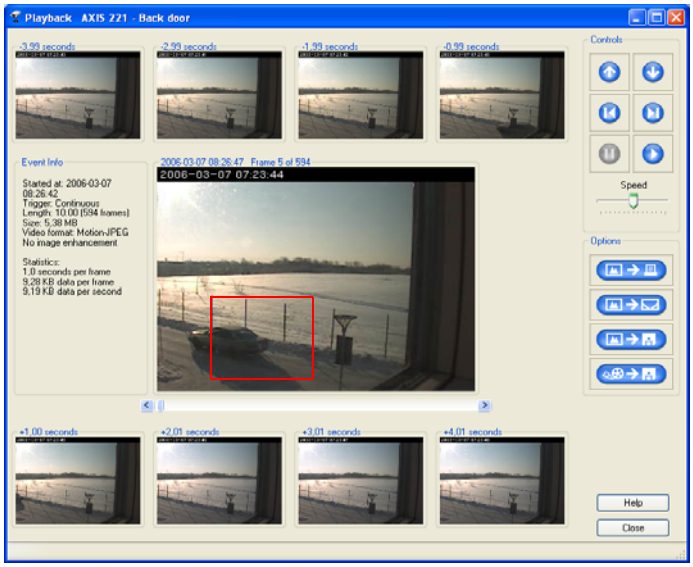
How to search using Event Search

Select the menu option **Playback > Events from the menu or click on the Event playback button on the Control panel.**  **The Event Search window opens.**

1. Set the search criteria. Under Selection, choose the camera, date and time period to search from the drop-down lists.
2. Click on the **Search** button.
3. Sample images of all events found are shown by date and time.



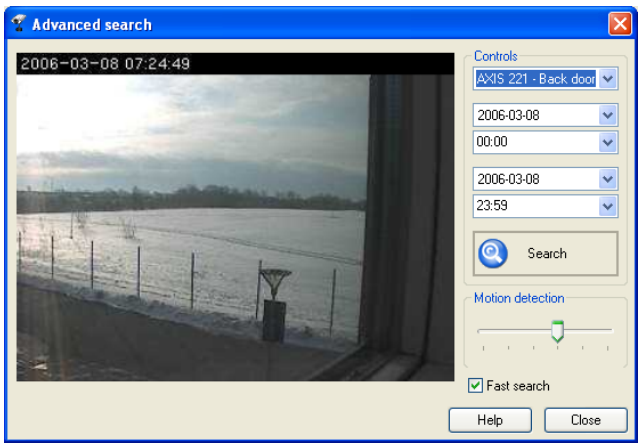
4. Double-click on an image to open the **Playback** window.



5. To enlarge the view drag a square over the image with your mouse. Right-click to minimize again.
6. Print, e-mail, or save as a single image or video to disk.

How to do an advanced search

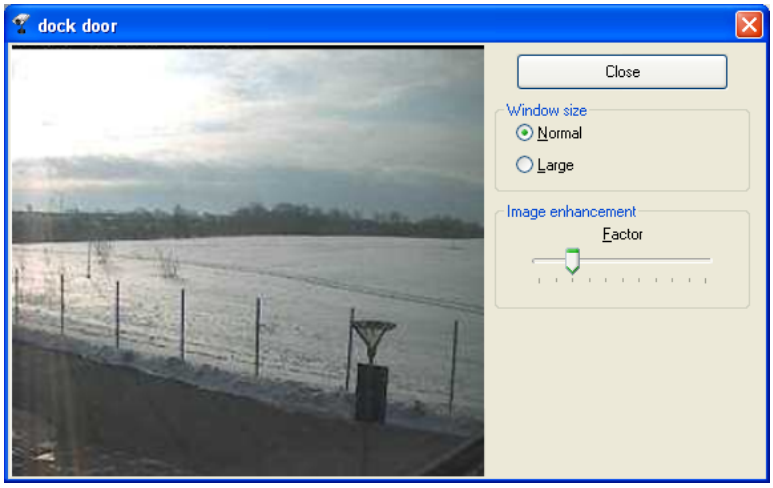
1. From the **Event search** window click on the **Advanced Search** button 
2. The Advance Search window opens
3. Under **Controls** select the camera and the interval to search by choosing FROM date/time and TO date/time from the drop-down lists.
4. If you would like to include a motion search left-click and drag where motion detection should be performed. Set the sensitivity for motion detection with the slide bar.
5. To speed up searches in recordings with high frame rate, check the Fast Search box. Note that searches done with Fast Search are not as accurate.



Note: This feature is not available for MPEG-4 recordings.

6. Click on the Search button.

AXIS Image Enhancer



An integrated component of AXIS Camera Station, AXIS Image Enhancer improves the quality of images taken in conditions such a fog, smoke, rain and snow. Applied to live or recorded color video, it delivers real-time result and displays visual details that would otherwise have been difficult to see under poor visibility conditions.

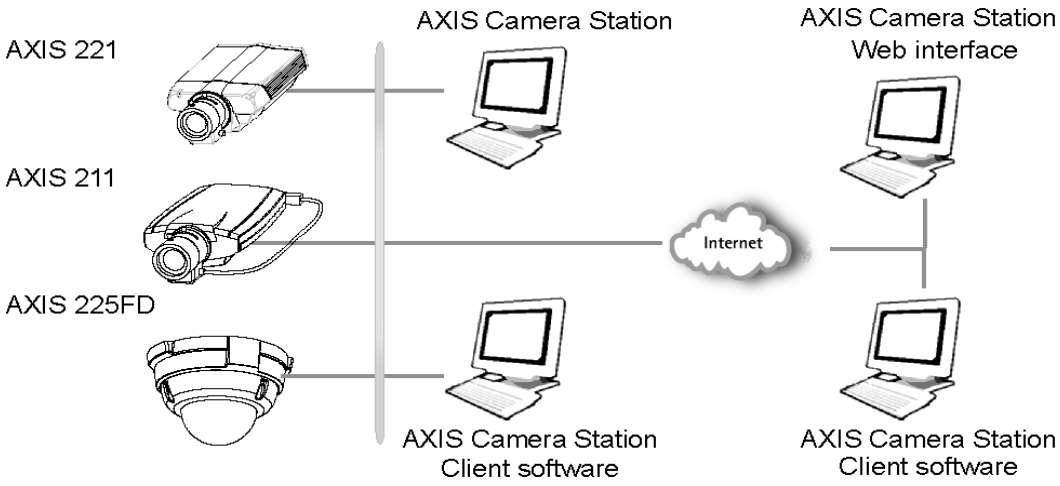
AXIS Image Enhancer is ideal for remote monitoring or surveillance situations where image clarity is needed for a safe and smooth operation, such as securing parking lots, harbors, airports, road tolls and other facilities.

The unique AXIS Image Enhancer functionality within the AXIS Camera Station software is activated with a separate license key. Refer to your AXIS Camera Station Installation guide for information on activating your license. It works with color digital or analog video sources, operates with all Axis network cameras and video servers (except MPEG-2 products) and supports full frame rate for live viewing. See page 11 for instructions on setting up your AXIS Image Enhancer.

AXIS Camera Station Client

The AXIS Camera Station Client application is used for remote operations on client workstations, where you can perform the same tasks as from AXIS Camera Station.

From a client PC you can acquire and save images, detect motion and save alarms and images without having to access the server PC where settings and recordings are stored.



Important!

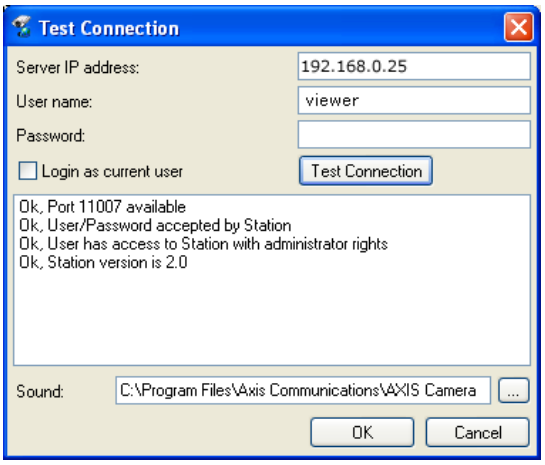
AXIS Camera Station uses port 11007 to communicate with the client. On the server (dedicated PC where AXIS Camera Station is installed), make sure that port 11007 is open and available for the clients in your network and in your firewall. See *Network Configuration*, **on page 27.**

Notes:
- A maximum of 10 AXIS Camera Station Clients can connect to AXIS Camera Station simultaneously.
- A PIII 500 MHz PC with 128 MB is the minimum hardware requirement for AXIS Camera Station Client.

AXIS Camera Station Client Interface

The AXIS Camera Station Client interface is similar to that of the AXIS Camera Service with a few differences under file menu that are described here.

Connection - To establish a connection between the AXIS Camera Station (server application) and AXIS Camera Station Client, the server's IP address and password must be entered under **File** > **Connection**.



Get Configuration - Every time you start AXIS Camera Station Client, new updates are sent to it from the server, containing e.g. camera configuration settings. You can download configuration settings from AXIS Camera Station to AXIS Camera Station Client by selecting this menu item.

Install MPEG-4 - This menu item is enabled when AXIS MPEG-4 decoder hasn't been installed. Click on this option to register and install the MPEG-4 decoder license included in AXIS Camera Station Client software.

Pop-up on Motion/Alarm - Check to enable the display of a pop-up window showing the video image when there is an alarm. Use **Camera pop-up filter...** to set which cameras will use this feature.

Sound on Alarm - Select this menu item to play the sound file specified in **Test Connection** above, whenever there is an alarm.

To Get and Upload configuration settings from the server, the user must first be granted Administration rights in AXIS Camera Station, see *How to set up Users,* on page 18. To allow configuration changes from AXIS Camera Station Client select **Options** >**General Settings** > **General** in AXIS Camera Station, check **Allow clients to update configuration**.

AXIS Camera Station Client Configuration

Client users can be granted access to the AXIS Camera Station Client configuration pages, which contain the exact same parameters and settings as the AXIS Camera Station. For Clients who have not been granted access to the configuration pages, the Options menu is not available.

Important!

Permission to access the configuration pages in AXIS Camera Station Client are defined from AXIS Camera Station under Options > General Settings > General.

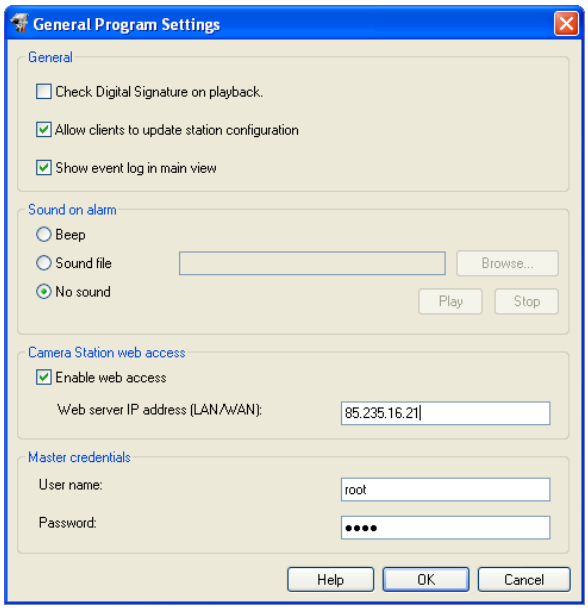
AXIS Camera Station Web Application

An Internet Explorer Web browser can be used on client workstations to view live video, recordings and I/O status.

To enable **Live View**, a set of IP addresses and port numbers must be opened in your firewall; there must be an open port for each camera and one port for AXIS Camera Station. See *Network Configuration*, on page 27. Simply viewing recorded events/images does not require the firewall configurations.

Enable Web Access

If you want to allow clients access to AXIS Camera Station Web, proceed with these steps.

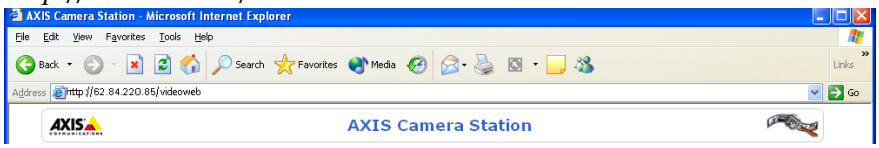


1. Under **Options** > **General Settings** > **General**, check **Enable Web access** under Camera Station Web access.
2. In the **Web server IP address** field, make sure the correct IP address that Clients will use to connect to the server is entered. Make a note of the IP address.
   - For internal Web access from a LAN, enter the LAN IP address of the dedicated PC.
   - For external Web access from a WAN, enter the WAN IP address.
3. The installation of the Web interface will start. When the Web interface is installed on the server, Web sharing is enabled

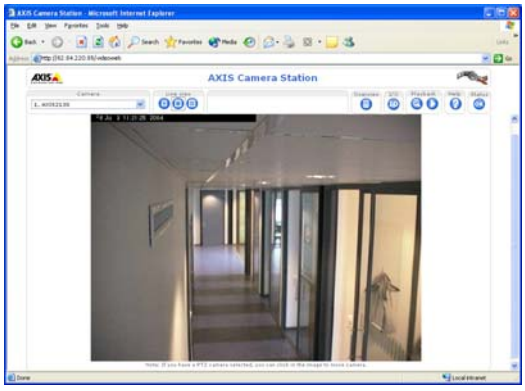
Notes:
- In Windows XP Professional, a maximum of five users can access to the Web interface simultaneously. This limitation is not present in other operating systems.
- To be able to log into AXIS Camera Station from a Web browser, the user must be created in the Windows user database. See *How to set up Users*, on page 18.

Access AXIS Camera Station Web from a client PC

1. Open a Web browser on the client computer.
2. In the **Address** field, write **http://server IP address/videoweb**
   Example: http://10.13.6.128/videoweb



3. The AXIS Camera Station Web interface will appear:



AXIS Camera Station Web Control Buttons

Select a camera before clicking the control buttons.

Camera Selection - A list of cameras is displayed for the user, showing cameras according to his/her user rights

Open in new window - Click this button to open a small window showing a live image from the selected camera. If the camera has PTZ (Pan/Tilt/Zoom) or audio enabled, the controls are shown here.

Open in main window - Click this button to see live images from the selected camera in the main window.

Quad view – View live images from four cameras in one window. Select a camera from the camera list and then click one of the positioning buttons to position the live image.

Overview – all cameras –Click this button to get a still image from all the cameras in the selected camera group. Click on the still images to see live images from the camera.

I/O Controls – Click this button to get the I/O controls. In this view you can see if an I/O port is open/closed or if the alarm is on. You can change the I/O port status if it is defined as an output port. A live image from the camera connected to the I/O can be activated using the push button with the camera number.

Event Log search – This page will show you all logged events sent from the camera to AXIS Camera Station. Initially the logged events from the selected camera are shown. Press **Show all cameras** to see the log of the entire camera group. If you click on one of the logged events, you will be guided to the recorded images showing an overview of all events at the selected date/time.

Find recorded events – From this page you can search through the recorded events. Select date and time and click the Search button. You will get an overview of all recorded events. Select one of the events and you will see the actual images in the selected event. Date is entered in the format yyyy-mm-dd, time in hh:mm.

Status

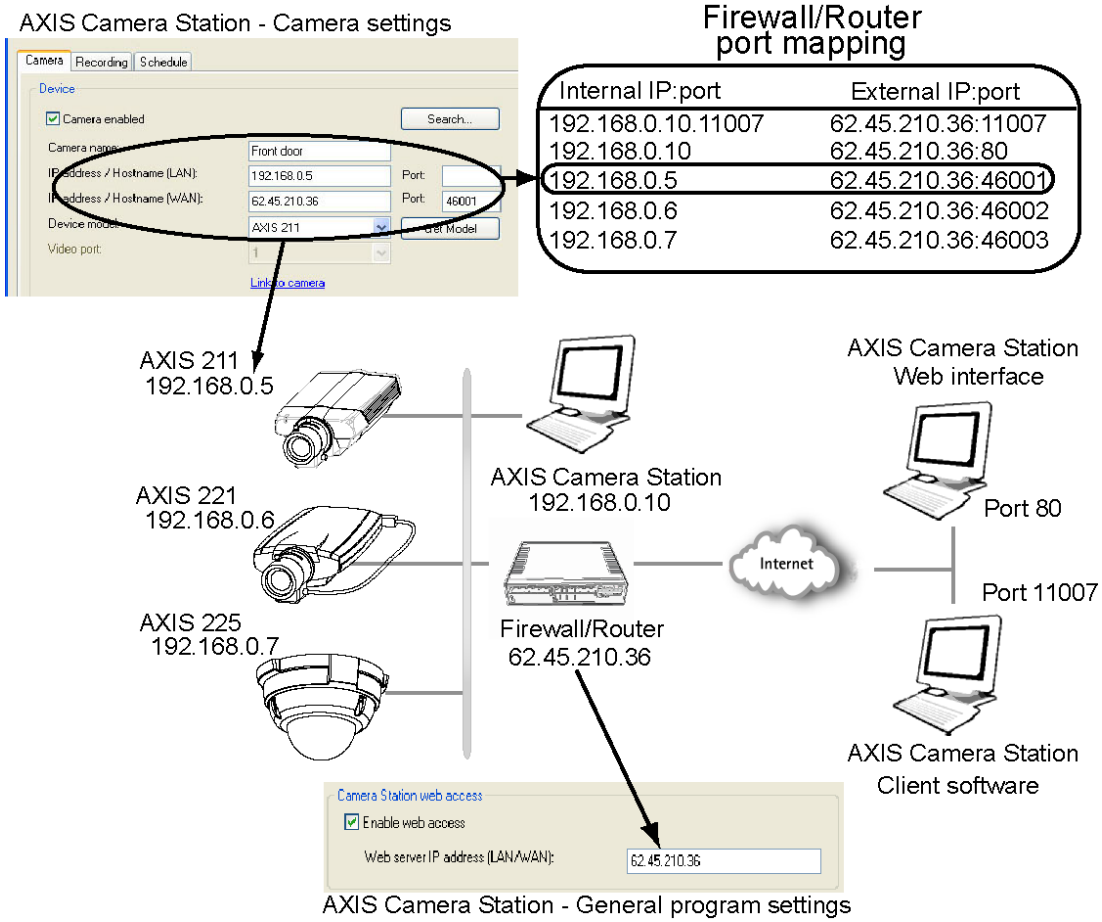
- **OK** indicates that the AXIS Camera Station recording server is running.
- **A red exclamation mark (!)** indicates that the recording server is not running.

Click on the icon to refresh the view and update the icons.

Network Configuration

To access AXIS Camera Station from the Internet and get live images from the cameras you must open a set of IP addresses and port numbers in your firewall configuration.

Basically there must be an HTTP port open for each Axis network camera/video server and one port for AXIS Camera Station. In order for AXIS Camera Station Client to have access to AXIS Camera Station over the Internet, port 11007 must be opened in the firewall/router. See the diagram below for an example of a firewall configuration.



Note: Both AXIS Camera Station and AXIS ThinWizard software use port 80 as default. You must change the port on one of these programs if you intend to install them on the same server.

NTFS file system

The NTFS file system must be implemented on your PC and the Indexing Service must be activated. This is done from the computer administration.

The partition of the hard disk where you save images must be NTFS formatted, which is the default in Windows 2000/XP and 2003 Server. For example, if the partition where you save images is "D:" and it is formatted as FAT32, you can convert it to NTFS by opening a command prompt and type: "convert D: /FS:NTFS /V". Make sure you type in the correct partitioned area of your hard disk.

Windows security

The AXIS Camera Station has a Windows-integrated security system. If you want to enable secure login facilities, you must authorize the administrative users in Windows:

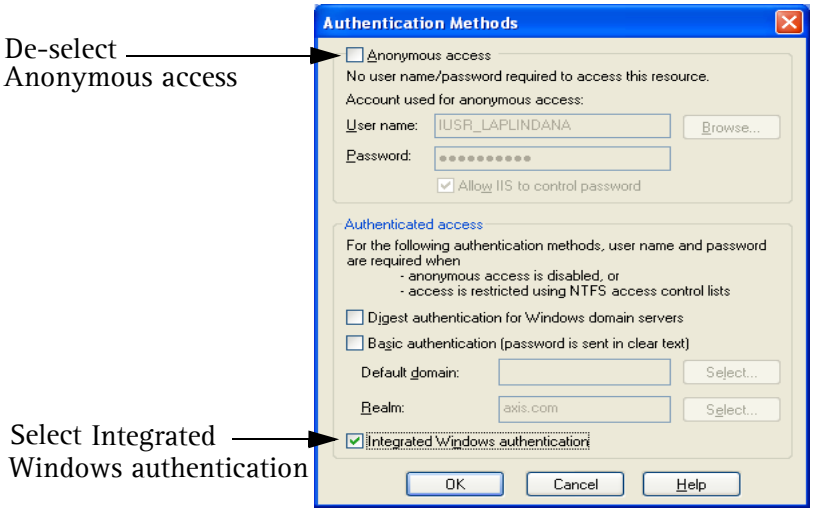
1. Go to the **Control Panel**, choose **Administrative Tools > Local Security Policy.**
2. Select **Local Policies > User Rights Assignment > Act as part of the operating system.** Add the users you want to have administrative rights in AXIS Camera Station.

IIS Secure Login from the AXIS Camera Station Web interface

For secure and encrypted login, set up the IIS to use Windows login.

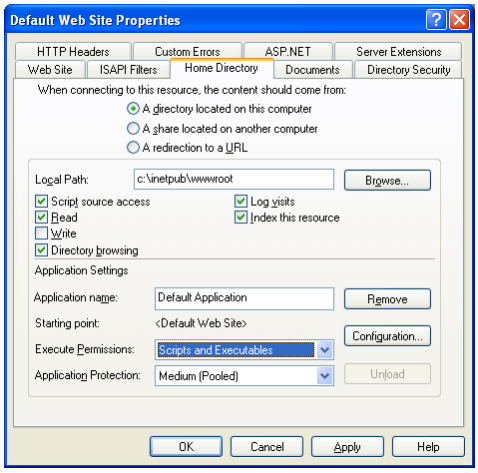
1. Go to **Start > Control Panel > Administrative Tools > Internet Information Services.**
2. Click on **Local Computer > Web Sites.**
3. Right-click on **Default Web Site** choose properties. Select **Directory Security** and click on the **Edit** button for **Anonymous access and authentication control**

4. Select **Integrated Windows authentication** and de-select **Anonymous access.**



This will prompt the user for login every time the Web site is started from the Client Web browser. The user must also be configured in AXIS Camera Station.

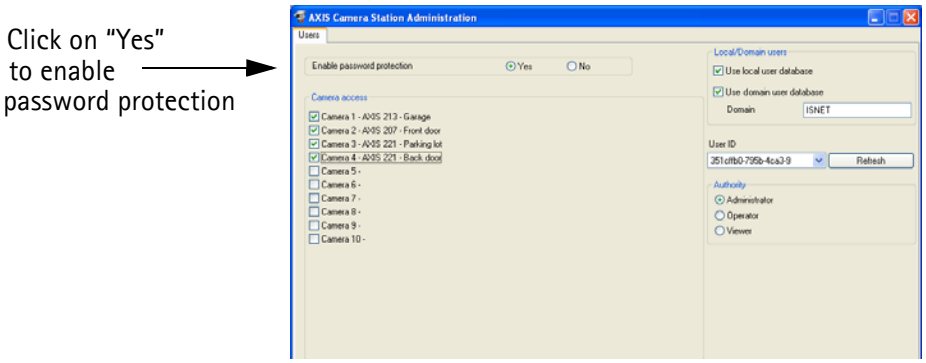
5. To enable the live streaming engine, click on the **Home Directory** tab. Make sure that the Local path section is set as shown and that Execute permissions is set to Scripts and executables.



6. Click the **Apply** button.

The Internet information Server is now ready for use.

7. In **AXIS Camera Station** to enable the security and camera access check every time a user logs in to the system, under **Options** > **General Settings** > **Users**, click on **Yes** for **Enable password protection.** This means that all users must be created as Windows users to gain access to the AXIS Camera Station.



Some difficulties may arise in Windows XP to login to the Web site, although the Anonymous login is unchecked and Windows integrated security is selected. Windows XP is by default set up in the IIS so that even though you have logged in as a user, you may only be granted access as a guest. This is solved by giving the necessary access to "Guest".

Alternatively,

1. Go to Control Panel > Administrative tools > Local Security policy.
2. Select Local Policies > Security Options > Network access: Sharing and security model for local accounts. Choose "Guest only- local users authenticate as Guest" from drop-down list.

Multi-user login

If you want multiple users to have access to login on the AXIS Camera Station PC and differentiate the camera access, follow these steps:

1. Make sure that Simple File sharing mode is disabled. You can disable simple file sharing like this:
   - Click Start > My computer
   - Choose Tools > Folder options > View tab > Advanced settings
   - Clear the Use simple file sharing check box
2. Right-click on AXIS Camera Station program icon. Select Properties > Security. Make sure that all users have access and can execute the program.

3. Right-click on the folder C:/TempACS and go to Settings > Security. Make sure that all users have access to read and write to the TempACS folder.

All users defined in the AXIS Camera Station, should now be able to access the it. Only users with Windows Administrator rights, can start/stop the background service.

Removing AXIS Camera Station

In the Windows Add/Remove programs menu, AXIS Camera Station has two entries: **AXIS Camera Station** and **AXIS Camera Station Web**.

To remove the entire program

1. Open **Add/Remove Programs** from the Windows Control Panel.
2. Select **AXIS Camera Station** and click **Remove**.
3. Click **Yes** when asked if you want to remove AXIS Camera Station. This will remove AXIS Camera Station, AXIS Camera Station Web and the background service.

Notes: Some files may need to be removed manually from these locations:

- **C:\Program Files\Axis Communications\AXIS Camera Station**
- **C:\TempACS**

The location for recordings is defined in AXIS Camera Station on the server: **Options > General Settings > Recording Database**, the default is **C:\Recording**.

Deleting recordings may take a while if the files are large.

To remove AXIS Camera Station Web

1. Open **Add/Remove Programs** in the Control Panel.
2. Select **AXIS Camera Station Web** and click **Remove**.
3. Click **Yes** when asked if you want to remove AXIS Camera Station Web.

Troubleshooting

Symptoms, Possible Causes and Remedial Actions

Known limitation in Windows 2000 Server and Windows 2003 Server	If the server is used as a domain controller and the local users are registered in Active Directory they cannot be reached from AXIS Camera Station.
No motion detection/recording after AXIS Camera Station is started	If AXIS Camera Station doesn't detect motion or doesn't record, please check the following: • **The background service is started: File > Start Server.** • **You have enough disk space available (minimum 2 Gb per camera**
Hard disks fill up or no recording is saved	To prevent this from happening, set the **Maximum drive space used by AXIS Camera Station under Options > General Settings > Recording Database**. You can also set the **Save event in days** to minimize the use of the hard disk. There is a Bandwidth/Storage calculator available at www.axis.com/techsup under Network Servers > Tools to get an estimation of the required hard disk space. Also consider changing the settings for frame rate, compression and image size to reduce the storage space needed. The application will cleanup recordings automatically if these settings are set correctly. If not, and the PC gets locked, you will have to delete the recordings manually or reformat the hard disk.
No images are shown in the Web interface	• **Verify that the IP address of the AXIS Camera Station server under Options > General Settings > General > Camera Station Web Access.** • **Enable the Web interface under Administration > General > Enable Web Access.** • **A virtual directory <ip address>\TempACS pointing to C:\TempACS must be available in your www root**.
I can not access the Web site, even though I have created a User	In some cases you can not login to Web site, although the **Anonymous login** is unchecked and **Windows integrated security** is selected. This usually happens on Windows XP because the IIS will only grant you access as a guest even if you have logged in as a user. You can circumvent the problem by giving the guest the necessary access in the AXIS Camera Station Administration. Alternatively, 1. **Go to Control Panel > Administrative tools > Local Security policy.** 2. **Select Local policies > Security Options > Setting for network access and choose Classic - user acts as itself.**
Event log shows recording storage error for a camera	Open Recording Database dialog (Options > General Settings > Recording Database). Double-click on the camera in question to open Camera Storage Settings. Check that the settings are correct and press **OK** to leave the dialog even if no settings were changed.
Event log shows no signal from a camera	If "No signal from {camera}" appears frequently in the Event log, but you are able to view live images, check the camera's proxy settings and that it has the latest firmware version. Restart the camera.
Black image during playback of events.	Check that your graphic card meets AXIS Camera Station requirements.

Problems with remote disks or proxy servers.	If you are logged in as a User on the network you may experience problems with remote disks or proxy servers. This can be solved as follows: **1.** From the Windows Control Panel select **Administrative tools > Services > AXIS Camera Station Service.** 2. Select the Log On tab. **3.** Select **This Account** and enter a valid Windows user with administration rights. **4. OK** to close dialog.
Customer Support	Before contacting technical support please create a Server Report of your system by selecting Help > Server Report from AXIS Camera Station's main menu. Screen shots (copying what is currently displayed on a screen to a file) will assist Customer Support in assessing your problem. • Press Alt - Prt Scr • Open Wordpad • In Wordpad select Edit > Paste • Save as text file. Attach the text file and Server Report to your support case.

Glossary of Terms

ActiveX - A standard that enables software components to interact with one another in a networked environment, regardless of the language(s) used to create them. Web browsers may come into contact with ActiveX controls, ActiveX documents, and ActiveX scripts. ActiveX controls are often downloaded and installed automatically as required.

AF (Autofocus) - A system by which the camera lens automatically focuses on a selected part of the subject.

Angle - The field of view, relative to a standard lens in a 35mm still camera, expressed in degrees, e.g. 30°. For practical purposes, this is the area that a lens can cover, where the angle of view is determined by the focal length of the lens. A wide-angle lens has a short focal length and covers a wider angle of view than standard or telephoto lenses, which have longer focal lengths.

ARP (Address Resolution Protocol) - This protocol is used to associate an IP address to a hardware MAC address. A request is broadcast on the local network to discover the MAC address for an IP address.

ARTPEC (Axis Real Time Picture Encoder) - This chip is used for image compression.

ASIC (Application Specific Integrated Circuit) - A circuit designed for a specific application, as opposed to a general purpose circuit, such as a microprocessor.

Aspect ratio - A ratio of width to height in images. A common aspect ratio used for television screens and computer monitors is 4:3. High-definition television (HDTV) uses an aspect ratio of 9:16.

Autoiris (or DC-Iris) - This special type of iris is electrically controlled by the camera, to automatically regulate the amount of light allowed to enter.

AVI (Audio Video Interleave) - A video format that supports simultaneous playback of audio and video.

Bitmap - A bitmap is a data file representing a rectangular grid of pixels. It defines a display space and color for each pixel (or "bit") in the display space. This type of image is known as a "raster graphic." GIF's and JPEG's are examples of image file types that contain bitmaps.

Because a bitmap uses this fixed raster method, it cannot easily be rescaled without losing definition. Conversely, a vector graphic image uses geometrical shapes to represent the image, and can thus be quickly rescaled.

Bit rate - The bit rate (in kbit/s or Mbit/s) is often referred to as speed, but actually defines the number of bits/time unit and not distance/time unit.

Bluetooth - Bluetooth is an open standard for wireless transmission of voice and data between mobile devices (PCs, handheld computers, telephones and printers).

Bonjour - Also known as zero-configuration networking, Bonjour enables devices to automatically discover each other on a network, without having to enter IP addresses or configure DNS servers. Bonjour is a trademark of Apple Computer, Inc.

Broadband - In network engineering terms, this describes transmission methods where two or more signals share the same carrier. In more popular terminology, broadband is taken to mean high-speed data transmission.

CCD (Charged Coupled Device) - This light-sensitive image device used in many digital cameras is a large integrated circuit that contains hundreds of thousands of photo-sites (pixels) that convert light energy into electronic signals. Its size is measured diagonally and can be 1/4", 1/3", 1/2" or 2/3".

CGI (Common Gateway Interface) - A specification for communication between a Web server and other (CGI) programs. For example, a HTML page that contains a form might use a CGI program to process the form data once it is submitted.

CIF (Common Intermediate Format) - CIF refers to the analog video resolutions 352x288 pixels (PAL) and 352x240 pixels (NTSC). See also *Resolution*.

Client/Server - Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfils the request. Typically, multiple client programs share the services of a common server program. A Web browser is a client program that requests services (the sending of Web pages or files) from a Web server.

CMOS (Complementary Metal Oxide Semiconductor) - A CMOS is a widely used type of semiconductor that uses both negative and positive circuits. Since only one of the circuit types is on at any given time, CMOS chips require less power than chips using just one type of transistor. CMOS image sensors also allow processing circuits to be included on the same chip, an advantage not possible with CCD sensors, which are also much more expensive to produce.

Codec - In communications engineering, a codec is usually a coder/decoder. Codecs are used in integrated circuits or chips that convert e.g. analog video and audio signals into a digital format for transmission. The codec also converts received digital signals back into analog format. A codec uses analog-to-digital conversion and digital-to-analog conversion in the same chip.

Codec can also mean compression/decompression, in which case it is generally taken to mean an algorithm or computer program for reducing the size of large files and programs.

Compression - See *Image Compression*.

Contrast - Defines the degree of difference between the lightest and darkest parts of an image or video stream.

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

DHCP (Dynamic Host Configuration Protocol) - DHCP is a protocol that lets network administrators automate and centrally manage the assignment of Internet Protocol (IP) addresses to network devices in a network.

DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary, depending on how long a user is likely to require the network connection at a particular location.

DHCP also supports static addresses for e.g. computers running Web servers, which need a permanent IP address.

DNS (Domain Name System) - DNS is used to locate and translate Internet domain names into IP (Internet Protocol) addresses. A domain name is a meaningful and easy-to-remember name for an Internet address. For example the domain name www.example.com is much easier to remember than 192.0.34.166. The translation tables for domain names are contained in Domain name servers.

Domain Server - Domains can also be used by organizations who wish to centralize the management of their (Windows) computers. Each user within a domain has an account that usually allows them to log in to and use any computer in the domain, although restrictions may also apply. The domain server is the server that authenticates the users on the network.

Duplex - See *Full-duplex*.

Ethernet - Ethernet is the most widely installed local area network technology. An Ethernet LAN typically uses special grades of twisted pair wires. The most commonly installed Ethernet systems are 10BASE-T and 100BASE-T10, which provide transmission speeds up to 10 Mbps and 100 Mbps respectively.

ETRAX (Ethernet Token Ring AXIS) - Axis' own microprocessor.

Factory default settings - These are the settings that originally applied for a device when it was first delivered from the factory. If it should become necessary to reset a device to its factory default settings, this will, for many devices, completely reset any settings that were changed by the user.

Firewall - A firewall works as a barrier between networks, e.g. between a Local Area Network and the Internet. The firewall ensures that only authorized users are allowed to access the one network from the other. A firewall can be software running on a computer, or it can be a standalone hardware device.

Focal length - Measured in millimeters, the focal length of a camera lens determines the width of the horizontal field of view, which in turn is measured in degrees.

FTP (File Transfer Protocol) - An application protocol that uses the TCP/IP protocols. It is used to exchange files between computers/devices on networks.

Frame - A frame is a complete video image. In the 2:1 interlaced scanning format of the RS-170 and CCIR formats, a frame is made up of two separate fields of 262.5 or 312.5 lines interlaced at 60 or 50 Hz to form a complete frame, which appears at 30 or 25 Hz. In video cameras with a progressive

scan, each frame is scanned line-by-line and not interlaced; most are also displayed at 30 and 25 Hz.

Frame rate - The frame rate used to describe the frequency at which a video stream is updated is measured in frames per second (fps). A higher frame rate is advantageous when there is movement in the video stream, as it maintains image quality throughout.

Full-duplex - Transmission of data in two directions simultaneously. In an audio system this would describe e.g. a telephone systems. Half-duplex also provides bi-directional communication, but only in one direction at a time, as in a walkie-talkie system. See also *Simplex*.

Gain - Gain is the amplification factor and the extent to which an analog amplifier boosts the strength of a signal. Amplification factors are usually expressed in terms of power. The decibel (dB) is the most common way of quantifying the gain of an amplifier.

Gateway - A gateway is a point in a network that acts as an entry point to another network. In a corporate network for example, a computer server acting as a gateway often also acts as a proxy server and a firewall server. A gateway is often associated with both a router, which knows where to direct a given packet of data that arrives at the gateway, and a switch, which furnishes the actual path in and out of the gateway for a given packet.

GIF (Graphics Interchange Format) - GIF is one of the most common file formats used for images in Web pages. There are two versions of the format, 87a and 89a. Version 89a supports animations, i.e. a short sequence of images within a single GIF file. A GIF89a can also be specified for interlaced presentation.

GOV (Group Of VOPs) - A group of VOP's is the basic unit of an MPEG-4 video stream. The GOV contains different types and numbers of VOP's (I-VOP's, P-VOP's, etc.) as determined by the GOV length and GOV structure. See also *VOP*.

GOV length - The GOV length determines the number of images (VOP's) in the GOV structure. See also *GOV* and *VOP*.

GOV structure - The GOV structure describes the composition of an MPEG-4 video stream, as regards the type of images (I-VOP's or P-VOP's) included in the stream, and their internal order. See also *GOV* and *VOP*.

Half-duplex - See *Full-duplex*.

HTML (Hypertext Markup Language) - HTML is the set of "markup" symbols or codes inserted in a file intended for display in Web browser. The markup tells the browser how to display the page's words and images for the user.

HTTP (Hypertext Transfer Protocol) - HTTP is the set of rules for exchanging files (text, graphic images, sound, video, and other multimedia files) on the Web. The HTTP protocol runs on top of the TCP/IP suite of protocols.

Hub - A (network) hub is used to connect multiple devices to the network. The hub transmits all data to all devices connected to it, whereas a switch will only transmit the data to the device it is specifically intended for.

IEEE 802.11 - A family of standards for wireless LANs. The 802.11 standard supports 1 or 2 Mbit/s transmission on the 2.4 GHz band. IEEE 802.11b specifies an 11 Mbit/s data rate on the 2.4 GHz band, while 802.11a allows up to 54 Mbit/s on the 5 GHz band.

Image compression - Image compression minimizes the file size (in bytes) of an image. Two of the most common compressed image formats are JPEG and GIF.

Interlacing - Interlaced video is video captured at 50 pictures (known as fields) per second, of which every 2 consecutive fields (at half height) are then combined into 1 frame. Interlacing was developed many years ago for the analog TV world and is still used widely today. It provides good results when viewing motion in standard TV pictures, although there is always some degree of distortion in the image.

To view interlaced video on e.g. a computer monitor, the video must first be de-interlaced, to produce progressive video, which consists of complete images, one after the other, at 25 frames per second. See also *Progressive scan*.

IP (Internet Protocol) - The Internet Protocol is a method transmitting data over a network. Data to be sent is divided into individual and completely independent "packets." Each computer (or host) on the Internet has at least one address that uniquely identifies it from all others, and each data packet contains both the sender's address and the receiver's address.

The Internet Protocol ensures that the data packets all arrive at the intended address. As IP is a connectionless protocol, which means that there is no established connection between the communication end-points, packets can be sent via different routes and do not need to arrive at the destination in the correct order.

Once the data packets have arrived at the correct destination, another protocol - Transmission Control Protocol (TCP) - puts them in the right order. See also *TCP*.

IP Address - An IP address is simply an address on an IP network used by a computer/device connected to that network. IP addresses allow all the connected computers/devices to find each other and to pass data back and forth.

To avoid conflicts, each IP address on any given network must be unique. An IP address can be assigned as fixed, so that it does not change, or it can be assigned dynamically (and automatically) by DHCP.

An IP address consists of four groups (or quads) of decimal digits separated by periods, e.g. 130.5.5.25. Different parts of the address represent different things. Some part will represent the network number or address, and some other part will represent the local machine address.

See also *IP (Internet Protocol)*.

I-VOP - See *VOP*.

JPEG (Joint Photographic Experts Group) - Together with the GIF file format, JPEG is an image file type commonly used on the Web. A JPEG image is a bitmap, and usually has the file suffix '.jpg' or ".jpeg." When creating a JPEG image, it is possible to configure the level of compression to use. As the lowest compression (i.e. the highest quality) results in the largest file, there is a trade-off between image quality and file size.

kbit/s (kilobits per second) - A measure of the bit rate, i.e. the rate at which bits are passing a given point. See also *Bit rate*.

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

Linux - Linux is an open source operating system within the Unix family. Because of its robustness and availability, Linux has won popularity in the open source community and among commercial application developers.

MAC address (Media Access Control address) - A MAC address is a unique identifier associated with a piece of networking equipment, or more specifically, its interface with the network. For example, the network card in a computer has its own MAC address.

Manual iris - This is the opposite to an autoiris, i.e. the camera iris must be adjusted manually to regulate the amount of light allowed to reach the image sensor.

Mbit/s (Megabits per second) - A measure of the bit rate, i.e. the rate at which bits are passing a given point. Commonly used to give the "speed" of a network. A LAN might run at 10 or 100 Mbit/s. See also *Bit rate*.

Monitor - A monitor is very similar to a standard television set, but lacks the electronics to pick up regular television signals.

Motion JPEG - Motion JPEG is a simple compression/decompression technique for networked video. Latency is low and image quality is guaranteed, regardless of movement or complexity of the image. Image quality is controlled by adjusting the compression level, which in turn provides control over the file size, and thereby the bit rate.

High-quality individual images from the Motion JPEG stream are easily extracted. See also JPEG.

Megapixel - See *Pixel*.

MPEG (Moving Picture Experts Group) - The Moving Picture Experts Group develops standards for digital video and audio compression. It operates under the auspices of the International Organization for Standardization (ISO). The MPEG standards are an evolving series, each designed for a different purpose.

MPEG-2 - MPEG-2 is the designation for a group of audio and video coding standards, and is typically used to encode audio and video for broadcast signals, including digital satellite and Cable TV. MPEG-2, with some modifications, is also the coding format used by standard commercial DVD movies.

MPEG-4 - MPEG-4 is a group of audio and video coding standards and

related technology. The primary uses for the MPEG-4 standard are Web (streaming media) and CD distribution, conversational (videophone), and broadcast television.

Most of the features included in MPEG-4 are left to individual developers to decide whether to implement them or not. This means that there are probably no complete implementations of the entire MPEG-4 set of standards. To deal with this, the standard includes the concept of "profiles" and "levels", allowing a specific set of capabilities to be defined in a manner appropriate for a subset of applications.

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

Multiplexer - A multiplexer is a high-speed switch that provides full-screen images from up to 16 analog cameras. Multiplexers can playback everything that happened on any one camera with no interference from the other cameras on the system.

Network connectivity - The physical (wired or wireless) and logical (protocol) connection of a computer network or an individual device to a network, such as the Internet or a LAN.

Noise -

NTSC (National Television System Committee) - NTSC is the television and video standard in the United States. NTSC delivers 525 lines at 60 half-frames/second. - OEM (Original Equipment Manufacturer) - This is a designation for companies that manufacture equipment which is then marketed and sold to other companies under their own names.

PAL (Phase Alternating Line) - PAL is the dominant television standard in Europe. PAL delivers 625 lines at 50 half-frames/second.

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 - Ping is a basic network program used diagnostically to check the status of a network host or device. Ping can be used to see if a particular network address (IP address or host name) is occupied or not, or if the host at that address is responding normally. Ping can be run from e.g. the Windows Command prompt or the command line in Unix.

PIRs - An electronic device used in some security alrm systems to detect motion.

Pixel - A pixel is one of the many tiny dots that make up a digital image. The color and intensity of each pixel represents a tiny area of the complete image.

PoE (Power over Ethernet) - Power over Ethernet provides power to a network device via the same cable as used for the network connection. This is very useful for IP-Surveillance and remote monitoring applications in places where it may be too impractical or expensive to power the device from a power outlet.

PPP (Point-to-Point Protocol) - A protocol that uses a serial interface for communication between two network devices. For example, a PC connected by a phone line to a server.

PPTP (Point-to-Point Tunnelling Protocol) - A protocol (set of communication rules) that allows corporations to extend their own corporate network through private "tunnels" over the public Internet. In this way a corporation can effectively use a WAN (Wide Area Network) as a large single LAN (Local Area Network). This kind of interconnection is known as a virtual private network (VPN).

Pre/post alarm images - The images from immediately before and after an alarm. These images are stored in a buffer for later retrieval.

Progressive scan - Progressive scan, as opposed to interlaced video, scans the entire picture, line by line every sixteenth of a second. In other words, captured images are not split into separate fields as in interlaced scanning.

Computer monitors do not need interlace to show the picture on the screen, but instead show them progressively, on one line at a time in perfect order, i.e. 1, 2, 3, 4, 5, 6, 7 etc., so there is virtually no "flickering" effect. In a surveillance application, this can be critical when viewing detail within a moving image, such as a person running. A high-quality monitor is required to get the best from progressive scan. See also *Interlacing*.

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.

Proxy server - In an organization that uses the Internet, a proxy server acts as an intermediary between a workstation user and the Internet. This provides security, administrative control, and a caching service. Any proxy server associated with a gateway server, or part of a gateway server, effectively separates the organization's network from the outside network and the local firewall. It is the firewall server that protects the network against outside intrusion.

A proxy server receives requests for Internet services (such as Web page requests) from many users. If the proxy server is also a cache server, it looks in its local cache of previously downloaded Web pages. If it finds the page, it is returned to the user without forwarding the request to the Internet. If the page is not in the cache, the proxy server, acting as a client on behalf of the user, uses one of its own IP addresses to request the page from another server over the Internet. When the requested page is returned, the proxy server forwards it to the user that originally requested it.

P-VOP - See *VOP*.

Resolution - Image resolution is a measure of how much detail a digital image can hold: the greater the resolution, the greater the level of detail. Resolution can be specified as the number of pixel-columns (width) by the number of pixel-rows (height), e.g. 320x240.

Alternatively, the total number of pixels (usually in megapixels) in the image can be used. In analog systems it is also common to use other format designations, such as CIF, QCIF, 4CIF, etc.

RTCP (Real-Time Control Protocol) - RTCP provides support for real-time conferencing of groups of any size within an intranet. This support includes source identification and support for gateways like audio and video bridges as well as multicast-to-unicast translators.

RTCP offers quality-of-service feedback from receivers to the multicast group as well as support for the synchronization of different media streams.

RTP (Real-Time Transport Protocol) - RTP is an Internet protocol for the transport of real-time data, e.g. audio and video. It can be used for media-on-demand as well as interactive services such as Internet telephony.

RTSP (Real Time Streaming Protocol) - RTSP is a control protocol, and a starting point for negotiating transports such as RTP, multicast and Unicast, and for negotiating codecs.

RTSP can be considered a "remote control" for controlling the media stream delivered by a media server. RTSP servers typically use RTP as the protocol for the actual transport of audio/video data.

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 creates and/or maintains a special routing table that stores information on how best to reach certain destinations. A router is sometimes included as part of a network switch. See also *switch*.

Server - In general, a server is a computer program that provides services to other computer programs in the same or other computers. A computer running a server program is also frequently referred to as a server. In practice, the server may contain any number of server and client programs. A Web server is the computer program that supplies the requested HTML pages or files to the client (browser).

Sharpness - This is the control of fine detail within a picture. This feature was originally introduced into color TV sets that used notch filter decoders. This filter took away all high frequency detail in the black and white region of the picture. The sharpness control attempted to put some of that detail back in the picture. Sharpness controls are mostly superfluous in today's high-end TVs. The only logical requirement for it nowadays is on a VHS machine.

Simplex - In simplex operation, a network cable or communications channel can only send information in one direction.

SMTP (Simple Mail Transfer Protocol) - SMTP is used for sending and receiving e-mail. However, as it is "simple," it is limited in its ability to queue messages at the receiving end, and is usually used with one of two other protocols, POP3 or IMAP. These other protocols allow the user to save messages in a server mailbox and download them periodically from the server.

SMTP authentication is an extension of SMTP, whereby the client is required to log into the mail server before or during the sending of e-mail. It can be used to allow legitimate users to send e-mail while denying the service to

unauthorized users, such as spammers.

SNMP (Simple Network Management Protocol) - SNMP forms part of the Internet Protocol suite, as defined by the Internet Engineering Task Force. The protocol can support monitoring of network-attached devices for any conditions that warrant administrative attention.

Sockets - Sockets are a method for communication between a client program and a server program over a network. A socket is defined as "the endpoint in a connection." Sockets are created and used with a set of programming requests or "function calls" sometimes called the sockets application programming interface (API).

SSL/TSL (Secure Socket Layer/Transport Layer Security)

These two protocols (SSL is succeeded by TSL) are cryptographic protocols that provide secure communication on a network. SSL is commonly used over HTTP to form HTTPS, as used e.g. on the Internet for electronic financial transactions. SSL uses public key certificates to verify the identity of the server.

Subnet/subnet mask - A subnet is an identifiably separate part of an organization's network. Typically, a subnet may represent all the machines at one geographic location, in one building, or on the same local area network (LAN). Having an organization's network divided into subnets allows it to be connected to the Internet with a single shared network address.

The subnet mask is the part of the IP address that tells a network router how to find the subnet that the data packet should be delivered to. Using a subnet mask saves the router having to handle the entire 32-bit IP address; it simply looks at the bits selected by the mask.

Switch - A switch is a network device that connects network segments together, and which selects a path for sending a unit of data to its next destination. In general, a switch is a simpler and faster mechanism than a router, which requires knowledge about the network and how to determine the route. Some switches include the router function. See also *Router*.

TCP (Transmission Control Protocol) - TCP is used along with the Internet Protocol (IP) to transmit data as packets between computers over the network. While IP takes care of the actual packet delivery, TCP keeps track of the individual packets that the communication (e.g. requested a Web page file) is divided into, and, when all packets have arrived at their destination, it reassembles them to re-form the complete file.

TCP is a connection-oriented protocol, which means that a connection is established between the two end-points and is maintained until the data has been successfully exchanged between the communicating applications.

Telnet - Telnet is a simple method with which to access another network device, e.g. a computer. The HTTP protocol and the FTP protocols allow you to request specific files from remote computers, but do not allow you logon as a user of that computer. With Telnet, you log on as a regular user with whatever privileges you may have been granted for specific applications and data residing on that computer.

TVL (TV Lines) - A method of defining resolutions in analog video.

UDP (User Datagram Protocol) - UDP 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.

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.

USB - (Universal Serial Bus) A plug-and-play interface between a computer and peripheral devices, e.g. scanners, printers, etc.

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

VPN (Virtual Private Network) - This creates a secure "tunnel" between the points within the VPN. Only devices with the correct "key" will be able to work within the VPN. The VPN network can be within a company LAN (Local Area Network), but different sites can also be connected over the Internet in a secure way. One common use for VPN is for connecting a remote computer to the corporate network, via e.g. a direct phone line or via the Internet.

VOP (Video Object Plane) - A VOP is an image frame in an MPEG-4 video stream. There are several types of VOP:

- An I-VOP is complete image frame.

- A P-VOP codes the differences between images, as long as it is more efficient to do so. Otherwise it codes the whole image, which may also be a completely new image.

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

W-LAN (Wireless LAN) - A wireless LAN is a wireless local area network that uses radio waves as its carrier: where the network connections for end-users are wireless. The main network structure usually uses cables.

Web server - A Web server is a program, which allows Web browsers to retrieve files from computers connected to the Internet. The Web server listens for requests from Web browsers and upon receiving a request for a file sends it back to the browser.

The primary function of a Web server is to serve pages to other remote computers; consequently, it needs to be installed on a computer that is permanently connected to the Internet. It also controls access to the server whilst monitoring and logging server access statistics.

WEP (Wireless Equivalent Privacy) - A wireless security protocol, specified in the IEEE 802.11 standard, which is designed to provide a wireless local area network (WLAN) with a level of security and privacy comparable to that usually expected of a wired LAN. Security is at two different levels; 40-bit and 128-bit encryption. The higher the bit number, the more secure the encryption.

WINS (Windows Internet Naming Service) - Part of the Microsoft Windows NT Server, WINS manages the association of workstation names and locations with IP addresses, without the user or administrator having to be involved in each configuration change.

WPA-PSK (Wi-Fi Protected Access - Pre-Shared Key) - This wireless encryption method uses a pre-shared key (PSK) for key management. Keys can usually be entered as manual hex values, as hexadecimal characters, or as a Passphrase. WPA-PSK provides a greater degree of security than WEP.

Zoom lens - A zoom lens can be moved (zoomed) to enlarge the view of an object to show more detail.

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