

**AXIS 292**  
**Network Video Decoder**  
**User's Manual**

## About This Document

This manual is intended for administrators and users of the AXIS 292 Network Video Decoder, and is applicable for software release 4.xxx. It includes instructions for installing, using and managing the AXIS 292 on your network. Previous experience of networking will be of use when installing and 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.

### 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.

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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.

### Electromagnetic Compatibility (EMC)

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Re-orient or relocate the receiving antenna. Increase the separation between the equipment and receiver. Connect the equipment to an outlet on a different circuit to the receiver. Consult your dealer or an experienced radio/TV technician for help. Shielded (STP) network cables must be used with this unit to ensure compliance with EMC standards.

**USA** - This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

**Europe** -  This digital equipment fulfills the requirements for radiated emission according to limit B of EN55022/1998, and the requirements for immunity according to EN55024/1998 residential, commercial, and light industry.

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The WEEE marking on this product (see right) or its documentation indicates that the product must not be disposed of together with household waste. To prevent possible harm to human health and/or the environment, the product must be disposed of in an approved and environmentally safe recycling process. For further information on how to dispose of this product correctly, contact the product supplier, or the local authority responsible for waste disposal in your area.

Business users should contact the product supplier for information on how to dispose of this product correctly. This product should not be mixed with other commercial waste.

### 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/](http://www.axis.com/techsup/)

AXIS 292 User's Manual

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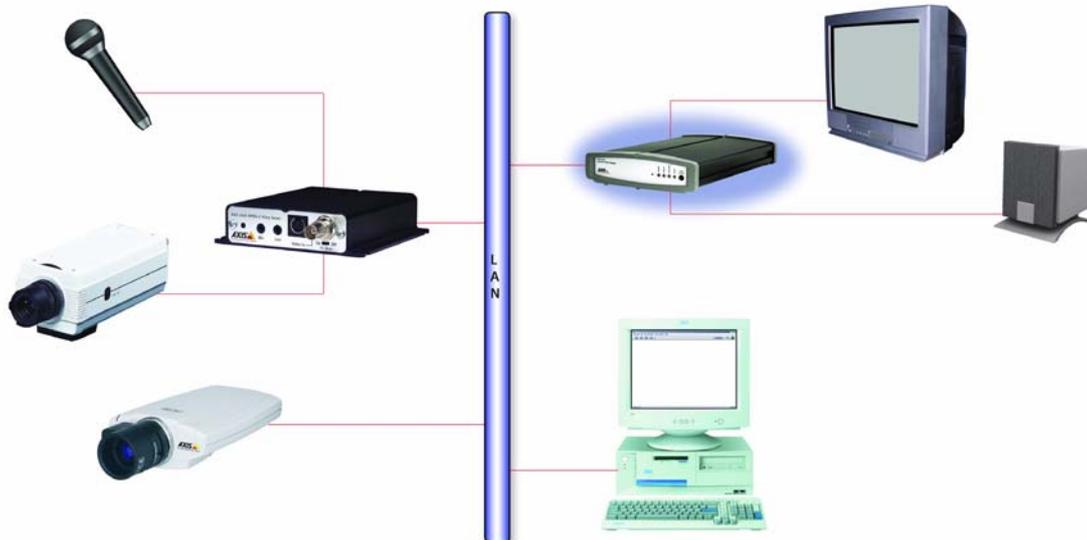
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## Product Description

The AXIS 292 Network Video Decoder is a one-port network video decoder that allows real-time decoding of MPEG-2, MPEG-4 and Motion JPEG video streams received from a video encoder over a TCP/IP network (LAN). The encoder can be an Axis Video Server or an Axis Network Camera. The AXIS 292 also allows real-time audio decoding.

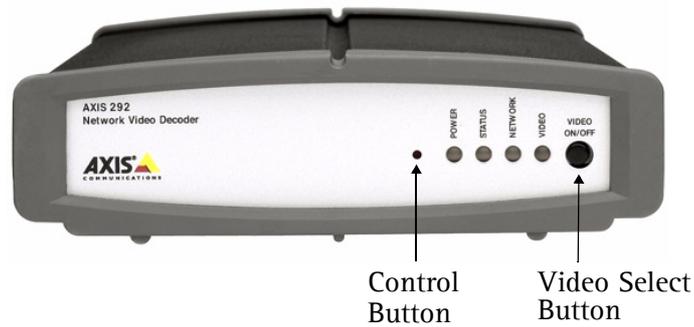
The decoder can be connected to various analog video devices, such as a monitor, video switch or standard television, ensuring full flexibility in terms of image quality and bandwidth usage. The video and audio streams are converted into high resolution, superior image quality analog video in both composite and Y/C (S-Video) video format, at full frame rate (30/25 fps).



The AXIS 292 includes all of the required networking connectivity for receiving and decoding content over the network. It has a built-in web server that provides full management access through the use of a standard web browser. It supports all Axis Motion JPEG, MPEG-2 and MPEG-4 based products.

Read the following information to familiarize yourself with the AXIS 292, making particular note of where the connectors and indicators are located.

## AXIS 292 Front Panel



**Indicators** - After completion of the startup and self test routines, the multi-colored Network, Status, Power and Video LED's indicate the following:

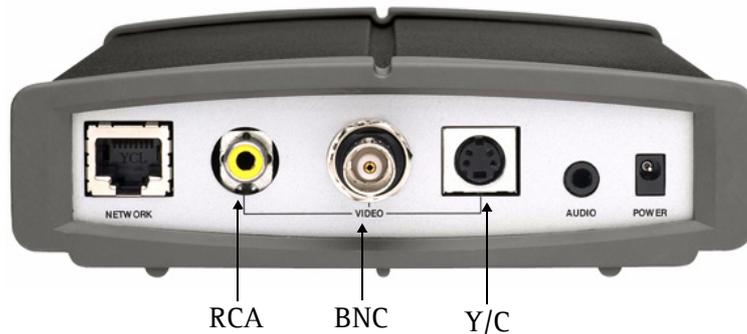
Power	Green	Continuous for normal operation
	Green/Amber	Flashes green/amber during upgrade
Status	Green	Continuous for normal operation
	Green/Amber	Flashes green/amber during startup
	Amber	Continuous when resetting to factory default
	Red	Continuous for hardware error
Network	Green	Flashes for activity on a 100 Mbit/s network
	Amber	Flashes for activity on a 10 Mbit/s network
	None	No connection
Video	Green	Continuous for video connected
	Amber	Continuous when connecting
	Red	Continuous when video disconnected

**Control Button** - Press this button to restore the factory default settings, as described on page 17.

**Video Select Button** - When in manual mode, pressing this button connects to the next video source. In auto mode, the button pauses/resumes the automatic cycling of the video sources. If the AXIS 292 is disconnected, pressing the button makes the unit connect to the first encoder in the video source list, in both manual and auto mode.

- Notes:**
- If the Motion JPEG settings in a connected video encoder are changed, you must disconnect and then reconnect that video source for the settings to take effect.
  - Holding the video select button pressed for 2 seconds will disconnect the unit.

## AXIS 292 Rear Panel



**Network Connector** - The AXIS 292 connects to the network via a standard CAT-5 network cable connected to the RJ-45 connector on the rear panel. The speed of the local network segment (10BaseT/100BaseTX Ethernet) is automatically detected.

### Video Connectors

- **RCA** - Standard phono-type connector for composite video in PAL/NTSC. Allows direct connection of an analog TV device.
- **BNC** - Coaxial BNC connector for composite video in PAL/NTSC. Allows direct connection of an analog TV device.
- **Y/C** - Mini-DIN connector for S-Video in PAL/NTSC. Allows direct connection of an analog TV device.

**Note:** The RCA and BNC connectors should not be used simultaneously. The Y/C connector can be used simultaneously with any one of the other connectors.

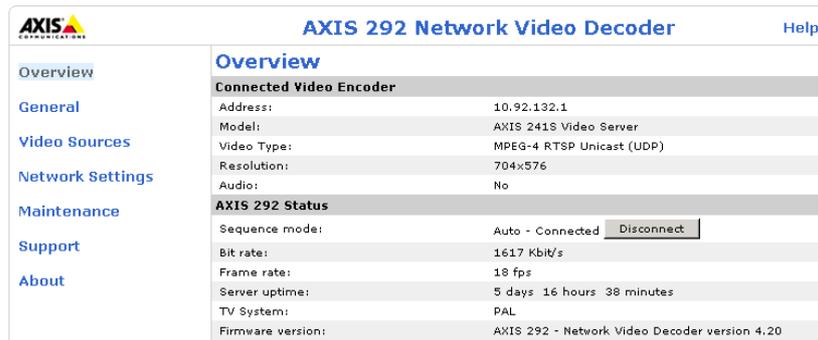
**Audio Output** - Analog stereo audio with Line levels. Allows connection to external audio equipment.

**Power Connector** - Socket for connection of the PS-K power adapter.

## Accessing the AXIS 292

The AXIS 292 can be used with most standard operating systems and supports Microsoft Internet Explorer 5.x or later, Netscape 7.1 or later, and Mozilla 1.4 or later.

1. Start a browser (Netscape Navigator, Internet Explorer, Mozilla).
2. Enter the IP address or host name of the AXIS 292 in the Location/Address field of your Web browser.
3. Enter the user name and password set by the administrator.
4. The overview page is displayed in your Web browser.



### Menu structure

The navigation menu is available on the left hand side of the overview page.

- **Overview** - Shows the status for the AXIS 292, and Information on the connected video source
- **General** - Configuration of the startup mode, alarm notifications, video and audio outputs
- **Video Sources** - Shows the video source list, from which video sources can be added and managed
- **Network Settings** - Tools for configuring the TCP/IP and HTTPS network settings
- **Maintenance** - Tools for changing the password and for maintaining and upgrading the AXIS 292
- **Support** - Instructions for troubleshooting and access to server log files

## Overview page

The overview page provides general status information, and also shows information on the video source currently connected to the AXIS 292 Network Video Decoder. The 10 latest entries from the system log are displayed at the bottom of the page. More log information can be found on the support page. Online help pages are available from each web page.

Connected Video Encoder	
Address:	10.92.132.1
Model:	AXIS 241S Video Server
Video Type:	MPEG-4 RTSP Unicast (UDP)
Resolution:	704x576
Audio:	No

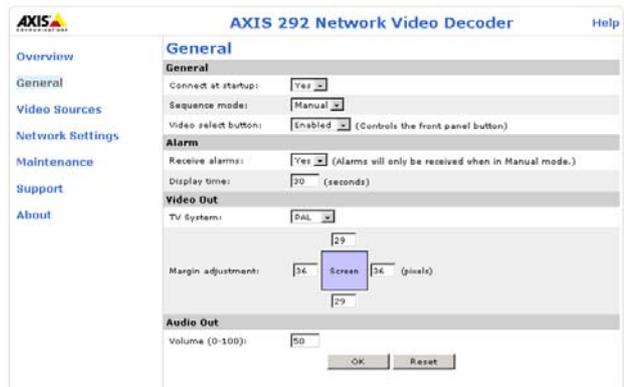
AXIS 292 Status	
Sequence mode:	Auto - Connected <input type="button" value="Disconnect"/>
Bit rate:	1617 Kbit/s
Frame rate:	18 fps
Server uptime:	5 days 16 hours 38 minutes
TV System:	PAL
Firmware version:	AXIS 292 - Network Video Decoder version 4.20

## General page

This page provides settings for configuring the start up mode, alarm notification, video and audio output.

**Connect at startup** - When set to Yes, the AXIS 292 will automatically connect to the first video source in the video source list at startup. When set to No, it will stay disconnected and wait for user input or alarms.

**Sequence mode** - When set to *Auto*, the AXIS 292 automatically cycles through the video sources in the list on the Video Sources page. In *Manual* mode, the next source is displayed when the video select button is pressed. See page 14 for more information.



**Video select button** - Enables or disables the video select button on the front panel of the AXIS 292.

### Alarm

The AXIS 292 can automatically switch to a video source that sends an alarm. See page 15 for more information.

### Video Out

**TV System** - Select the TV system type to use. Most western European countries use the PAL system, whereas the system in the United States is NTSC.

**Margin adjustment** - As video monitors often use too much of the available screen area, some parts of the monitored scene might not be visible. To correct this, the AXIS 292 allows the margin to be adjusted on all 4 sides, so that the image is forced more towards the center of the screen. A margin is added by default, and values (number of TV-lines) in the following ranges are allowed:

- PAL - Vertical: 0 till 575, Horizontal: 0 till 719. The sum of the vertical values cannot exceed 575. The sum of the horizontal values cannot exceed 719.
- NTSC- Vertical: 0 till 479, Horizontal: 0 till 719. The sum of the vertical values cannot exceed 479. The sum of the horizontal values cannot exceed 719.

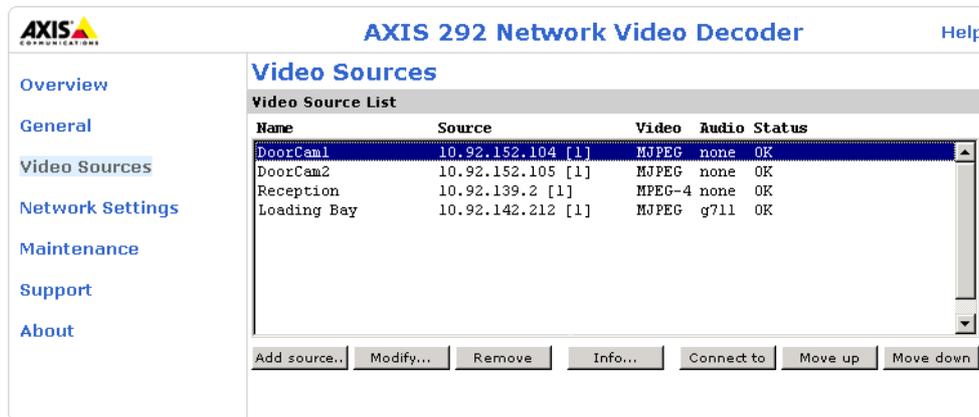
### Audio out

**Volume (0-100)** - Set the level of the audio output on the AXIS 292. The default value is 50.

## Video Sources

This section describes how to add and manage video sources (encoders) in the AXIS 292 Network Video Decoder.

The Video Source List shows all of the sources currently added to the system. Various information about each source is shown, including the source's last known status.



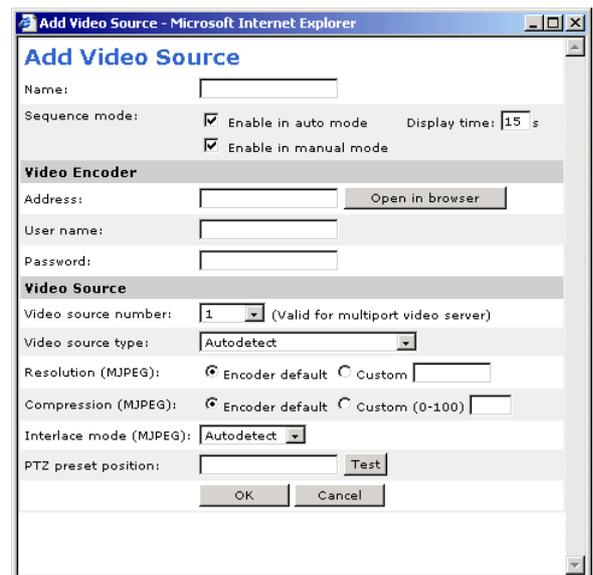
### Adding a video source

Click the **Add source...** button to open the Add dialog.

When adding a new video source, ensure that it is correctly connected and powered up before attempting configuration. The following settings need to be made:

**Name** - Provide a unique name for the new video source.

**Sequence mode** - Select whether or not to include the video source in auto and/or manual sequence mode. If *Auto* is selected, also enter a Display time, to set how long the video source will be displayed for, before switching to the next source in the list. Note that if neither sequence mode is selected, the video source will only be displayed if the **Connect to** button in the video source list is clicked, or if an alarm triggers display of the source. See also page 14 for more information on sequence mode.



#### Video Encoder

**Address** - Enter the IP address (or host name) of the video encoder to add. If the encoder is mapped to a port, you can enter the port number after the IP address, separated by a colon:

Example: 192.168.0.90:8080

**User Name and Password** - If authentication is required by the video encoder, enter the user name and password to access it.

- Notes:**
- Selecting a user with viewing rights only on the encoder is recommended.
  - The video encoder's home page can be opened in your browser by clicking the provided button.

#### Video Source

**Video Source Number** - Some video encoders support multiple video channels and/or quad streams. If this is available, select the channel to connect to. This value has no effect if the video encoder only supports one channel.

**Video Source Type** - Set the AXIS 292 to automatically detect the video source format, or select the required format from the drop-down list. Autodetect attempts to detect formats in the following order:

- MPEG-4 RTP multicast
- MPEG-4 RTP unicast
- MPEG-4 RTP over RTSP
- MPEG-4 RTP over RTSP over HTTP
- MPEG-4 RTP over RTSP over HTTPS
- MPEG-2 multicast
- MPEG-2 unicast
- Motion JPEG
- Motion JPEG over HTTPS

Selecting Autodetect is recommended in most cases, but there are exceptions. For example, if Autodetect is selected and the video source supports MPEG-2 Multicast, then that format will automatically be selected. However, if the multicast data is not correctly routed, the video stream from the encoder will not reach the AXIS 292. In this case, the format should instead be set to MPEG-2 unicast.

As video sources are added to the AXIS 292 they are stored in the unit's cache. This makes reconnecting to a source much faster. Note that performing certain actions will empty the unit's cache and start a new round of autodetection.

**Note:** When autodetect is used to connect to a new encoder for the first time, the connection will take longer to complete.

**Resolution** - This setting is only valid for Motion JPEG video sources. To use a resolution other than the source's default value, check the Custom box and enter the required resolution. If the selected resolution is not available in the encoder, the current setting will be used instead.

The resolutions available depend on the encoder being used. Please see the encoder's online help for the available resolutions.

**Compression** - This compression setting is only valid for Motion JPEG video sources. To use a compression other than the source's default value, check the Custom box and enter a custom compression value (0-100).

**Interlace Mode** - The interlace mode is only valid for Motion JPEG video sources, and is used mainly when the video stream is from an encoder with a high resolution (e.g. 4CIF) and an external analog camera is in use. Leave as *Autodetect* (recommended), or if moving objects appear to shake, select *Interlaced* or *Progressive* (depending on the camera's mode) to obtain a better image. See the online help for more information.

**PTZ preset** - If the video source has Pan/Tilt/Zoom capability, it is also possible to select a PTZ preset position view, by entering the name of the preset here. To add new preset positions, please refer to the manual for the video source. To check that the PTZ preset works, click the Test button after entering the preset name. The PTZ device/camera should then move to the selected view.

# Network Settings

The IP address for the AXIS 292 Network Video Decoder can be set automatically via DHCP, or a fixed IP address can be set manually. See the following descriptions of the TCP/IP network settings:

## TCP/IP Network Settings

If a DHCP server is available on the network, you can use this to assign an IP address, DNS server addresses and a host name to the AXIS 292. To see the current settings, click the View buttons. The network settings can also be configured manually as follows:

### IP Address Configuration

**IP Address** - Specify a unique IP address for the AXIS 292. To check if the specified IP address is available, click the Test button.

**Subnet Mask** - Specify the subnet mask for the subnet the AXIS 292 is located on.

**Default Router** - The default router (Gateway) used for connecting to other networks and network segments.

### DNS configuration

**Domain Name** - When using a host name that is not fully qualified (see below), enter the domain(s) in which to search for the host name used by the AXIS 292. Multiple domains can be separated by semicolons (;)

**Primary/Secondary DNS Server** - This specifies the IP address(es) of the server(s) that normally provide the translation of domain names to IP addresses on your network.

**Note:** If no DNS server is available, the address for e.g. a video source must be an IP address.

### Host Name Configuration

**Host Name** - If you are running a DNS server on your network and wish to connect to the AXIS 292 using a name, enter the product's host name here. The host name is usually the same as the assigned DNS Name. A host name is always the first part of a Fully Qualified Domain Name and is always one word, with no period. For example, myserver is the host name in the Fully Qualified Domain Name myserver.axis.com.

### HTTP

**Port number** - The AXIS 292 will use the HTTP port entered here. The default setting is 80. Alternatively, any port in the range 1024-65535 may be used, but check first with your network administrator before changing the default setting.

### Alarm

**Alarm Port** - This is the port the AXIS 292 will use for incoming alarm events. The default setting is 2048. Any port in the range 1024-65535 may be used, but check with your network administrator before changing the default setting.

The screenshot shows the 'TCP/IP Settings' page for the 'AXIS 292 Network Video Decoder'. On the left is a navigation menu with links for Overview, General, Video Sources, Network Settings (with sub-links for TCP/IP - Settings and HTTPS - Settings), Maintenance, Support, and About. The main content area is titled 'TCP/IP Settings' and contains several sections:

- IP Address Configuration:** Radio buttons for 'Obtain IP address via DHCP' (unchecked) and 'Use the following IP address:' (checked). Below are input fields for IP address (10.92.132.3), Subnet mask (255.255.0.0), and Default router (10.92.0.1). A 'Test' button is next to the IP address field.
- DNS Configuration:** Radio buttons for 'Obtain DNS server address via DHCP' (unchecked) and 'Use the following DNS server address:' (checked). Below are input fields for Domain name, Primary DNS server, and Secondary DNS server. A note '(use ; to separate names)' is next to the Domain name field.
- Host Name Configuration:** Radio buttons for 'Obtain host name via DHCP' (unchecked) and 'Use the following host name:' (checked). Below is an input field containing 'AxisProduct'.
- HTTP:** Input field for 'HTTP port:' set to '80'.
- Alarm:** Input field for 'Alarm port:' set to '2048'.
- Network Traffic:** A dropdown menu for 'Connection type:' set to 'Auto-Negotiate'.

At the bottom of the settings area are 'Save' and 'Reset' buttons.

## Network Traffic

**Connection type** - This can be used to change the network speed for the AXIS 292. There is normally no need to use anything other than **Auto-negotiate**, which automatically selects the correct media type. However, if you are using a switch or similar device on your network and need to specify the media type, this can be done by selecting the correct type from the drop-down list.

## HTTPS Settings

HTTPS (Hypertext Transfer Protocol over Secure Socket Layer, or HTTP over SSL) is a web protocol that provides encryption for page requests from users and for the pages returned by the server. The Secure Socket Layer (SSL) as used by HTTPS uses a 40-bit key size for encryption, a level considered adequate for most commercial exchanges.

The encrypted exchange of information between server and client is governed by the use of an **HTTPS certificate**, which guarantees the authenticity of the server. To install a certificate on the AXIS 292 you will need to create and send a certificate request to a Certificate Authority (CA).

To use HTTPS for communication with the AXIS 292, a **Certificate** must be created using one of these methods:

- A self-signed certificate created in the video server. Note that 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.

Follow these steps to set up HTTPS in the AXIS 292.

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 292.
4. Set the **HTTPS Connection Policy** to enable HTTPS connection (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.

Note that viewing encrypted web pages via HTTPS is almost certain to cause a slight drop in performance, especially when requesting a page for the first time.

## Sequence Mode

The AXIS 292 displays the video from the connected sources in 2 different sequence modes - *auto* mode and *manual* mode.

### Auto sequence mode

In this mode, the video sources in the list on the Video Sources page are automatically cycled through, one by one. Auto mode can be paused and resumed by pressing the Video Select button on the front panel.

Action/event	Result in auto sequence mode
Connection established.	Video source displayed.
Connection to currently playing source is lost.	Screen goes blank and, depending on the remaining display time, the decoder either tries to reconnect or goes to the next source. The source cache is cleared, resulting in a new autodetection. See also <i>Adding a video source, on page 10</i> .
Video select button is pressed during display.	Automatic cycling is paused.
Video select button is pressed during pause.	Automatic cycling is resumed directly at the next source.
Parameters are changed.	The connection cache is cleared and all sources are autodetected again upon the next connection.
User presses <b>Connect to</b> button in web interface to connect to a video source not included in the auto mode list.	The decoder connects to that source. After the display time has elapsed, the next source in the auto list is selected.
Alarm received from video encoder.	Alarm is ignored.

### Manual sequence mode

When in manual mode, the AXIS 292 displays a single video source and only skips to the next source when the video select button is pressed.

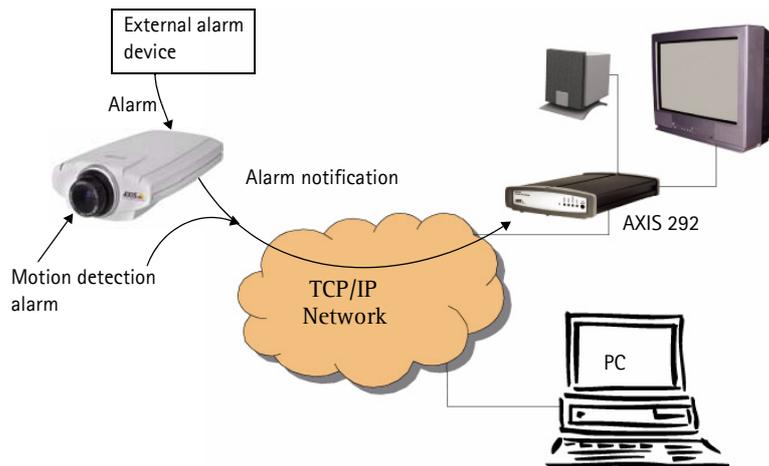
Action/event	Result in manual sequence mode
Connection established.	Video source displayed.
Connection to currently playing source is lost.	The screen goes blank and the decoder attempts to reconnect. The source cache is cleared, resulting in a new autodetection.
Video select button is pressed during display.	Decoder cycles to next source. If the next source is not already cached, autodetection will occur.
Video select button is pressed during autodetect of next source.	Autodetect is aborted on that source and the decoder attempts to go to the next source.
Parameters are changed.	The connection cache is cleared and all sources are autodetected again, upon the next connection.
User uses <b>Connect to</b> button in web interface to connect to a video source not included in the manual mode list.	The decoder connects to that source. When the video select button is pressed, the next source in the manual mode list is selected.
Alarm notification received from video encoder.	Decoder switches to display from the encoder that sent the alarm.

Note that keeping the video select button pressed for more than 2 seconds will disconnect the AXIS 292.

## Alarms

Many Axis video encoders (network cameras and video servers) can send notification messages whenever certain types of events occur. These messages can be received by the AXIS 292 and used as alarms. The incoming alarm causes the AXIS 292 to switch to the video source in the alarm message. The AXIS 292 automatically switches to the video source in the alarm message.

The notification messages sent by the video decoders are the result of events occurring in those devices. These events may be triggered by an incoming signal on an input on the encoder, or they may be the result of detected motion in the scene monitored by the encoder.



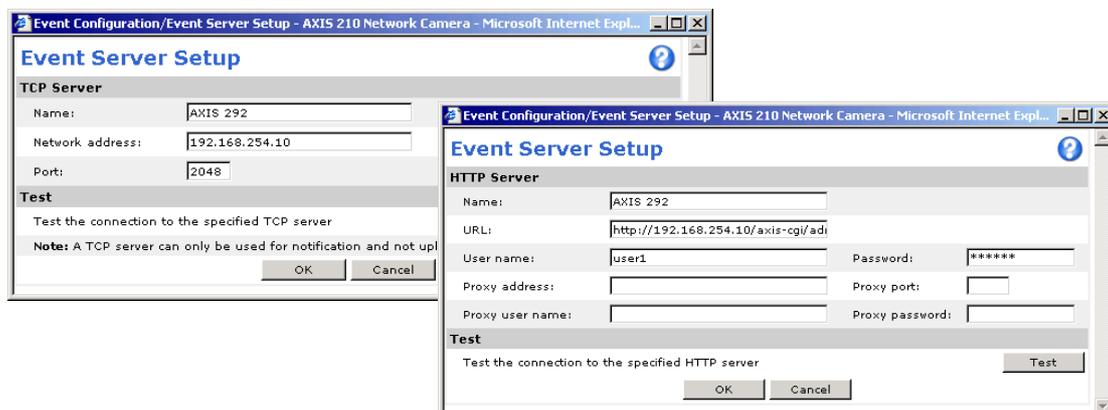
To allow alarms to be received by the AXIS 292, the **Sequence mode** must be set to *Manual*, and **Receive alarms** must be set to *Yes*. Both settings are found on the General settings page. When enabled, the AXIS 292 automatically switches to the video source specified in the alarm message.

- Notes:**
- The ability to send TCP and HTTP notification messages depends on the Axis video encoder being used.
  - Alarm events are always ignored when the sequence mode is set to *Auto*.

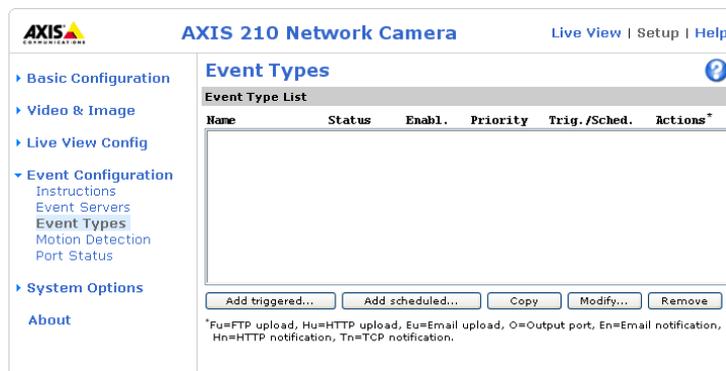
## Setting up alarms

For the AXIS 292 to respond correctly to alarms, the following steps need to be taken:

1. To configure the AXIS 292, add the video encoder to the list of video sources. Refer to *Adding a video source*, on page 10 for instructions.
2. To configure the video encoder (network camera / video server), add the AXIS 292 as a TCP or HTTP Event Server. These screen shots show examples of both types of servers. Refer to the documentation of the video encoder for instructions on how to set up an Event Server.



- Notes:**
- The URL for an HTTP event server should be set to: `http://<IP address>/axis-cgi/admin/alarm.cgi`
  - The TCP alarm port on the AXIS 292 is configured on the Network Settings page.
3. Configure the Event Type to send a notification message to the event server (i.e. the AXIS 292).



## Notification syntax

The notification message is formatted differently for TCP and HTTP.

- **TCP notification syntax**  
Enter the notification message in the Message field, in the format:

---

`sourcename=<name from list>&textmessage=<my message>`

For example: `sourcename=DoorCam1&textmessage=Door is open`

---

The message is sent to the TCP port (default 2048) on the AXIS 292.

- **HTTP notification syntax**  
Enter the notification message in the Custom parameters field, in the format:

---

`sourcename=<name from list>&textmessage=<my message>`

For example: `sourcename=DoorCam1&textmessage=Door%20is%20open`

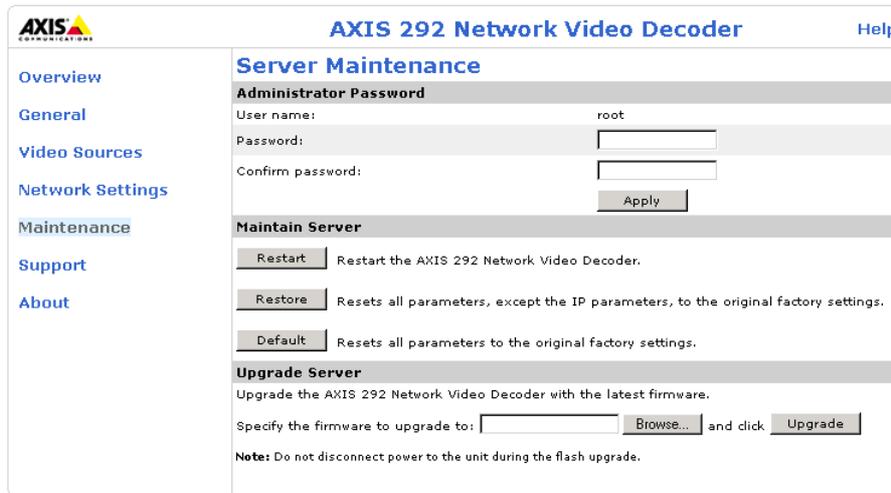
---

The message is sent to the HTTP port (default 80) on the AXIS 292.

**Note:** All non-alphanumerical characters included in an HTTP notification message must be URL-encoded.  
For example, a blank space must be written as `%20`, as in `Door%20is%20open`.

For more information, please see the online help. For more information concerning the video encoder, see that product's documentation and online help.

# Maintenance



## Administrator Password

To change the password for the administrator (*root*), enter a new password and confirm it. Click the **Apply** button.

### Important!

The default password for the preconfigured user (*root*) should be changed as soon as possible – all Axis products are shipped with the same default password.

## Maintain Server

This section provides tools for the following:

**Restart** – Click this button to restart the AXIS 292. The settings will not change.

**Restore** – This button resets all parameters (except IP parameters) to the factory default settings.

**Default** – In certain circumstances, it may be necessary to reinstate the **Factory Default** settings for the AXIS 292. This is performed in one of two ways:

- click the **Default** button on the Maintenance page
- press the **Control** button, located on the front panel, and follow the instructions below.

Both of these options will reset ALL the parameters currently configured in the unit, i.e. network settings, etc.

## Factory default settings

Follow the instructions below to reinstate the product factory default settings using the **Control** button:

1. Remove power to the AXIS 292.
2. Press and keep the Control button pressed, and reconnect power.
3. Keep the Control button pressed until the Status Indicator displays steady *amber* (note that this may take up to 15 seconds), then release the button. When the Status Indicator displays *green* (which can take up to several minutes) the AXIS 292 will then have been reset to its original factory default settings.

## Upgrade Server

New firmware can be loaded into the AXIS 292 over the network. The latest version of the AXIS 292 firmware is available free of charge from the Axis Web site at <http://www.axis.com/techsup>

**Note:** Pre-configured and customized settings will be retained for use when the new firmware is running (providing the required features are available in the new firmware) although this is not guaranteed by Axis Communications. Always read the upgrade instructions and release notes available with each new release, before updating the firmware.

1. Obtain the latest version of the firmware from the Axis Web site and save it to your computer.
2. Open the **Maintenance** page in the network video decoder's web pages.
3. In the **Upgrade Server** section, browse to the downloaded firmware file on your computer. Click **Upgrade**. The upgrade commences, and may last for up to 20 minutes.
4. The AXIS 292 restarts automatically after the upgrade has completed.

**Upgrade Server**

Upgrade the AXIS 292 Network Video Decoder with the latest firmware.

Specify the firmware to upgrade to:   and click

**Note:** Do not disconnect power to the unit during the flash upgrade. The unit restarts automatically after the upgrade has completed. (1-10 minutes.)

### Important!

- Be sure to read the release notes provided with each new release, before upgrading the firmware.
- The upgrade process normally takes from 30 seconds to 10 minutes, although it can also take longer.
- After starting the process, you should always wait at least 20 minutes before power-cycling the AXIS 292 - even if you suspect the procedure has failed.
- In case of failure, refer to *Emergency Recovery Procedure*, on page 20.

# Support

**AXIS 292 Network Video Decoder** Help

**Support Overview**

**Troubleshooting**

If you have problems, please try the troubleshooting [guide](#) before contacting your local supplier.

**Server Report/Logs**

Always attach the [Server Report](#) when contacting your support channel.

<a href="#">Server Log</a>	View the server log file.
<a href="#">Parameter List</a>	View the parameters and their current settings.

**Axis 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/](http://www.axis.com/techsup/)

The **Support Overview** provides instructions for troubleshooting and access to the server log file which may be useful when troubleshooting or when contacting the Axis support services.

As well as the server log file, the following are also available:

- The **Server Report** - The Server Report displays a listing of important information about the AXIS 292. When contacting Axis support, please be sure to provide a valid Server Report with your query.
- The **Parameter List** - This link displays a listing of all of the AXIS 292's parameters and their current settings.

## Troubleshooting

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This section provides information to help you to resolve any difficulty you may have with your AXIS 292.

### Checking the Firmware

The first action when attempting to solve a problem should be to check the currently installed firmware version, which is available under **Overview > AXIS 292 Status**. Then check the version available at the Axis support pages at [www.axis.com/techsup/](http://www.axis.com/techsup/) to see if a newer version is available. A newer version may contain a correction that fixes your particular problem. To upgrade the firmware, see *Upgrade Server*, on page 18.

### Emergency Recovery Procedure

If power to the AXIS 292 is lost during the upgrade, the process will fail and the unit will become unresponsive. A flashing red Status LED indicates a failed upgrade and that the unit is now in rescue mode. This is also displayed on the connected monitor, along with the unit's IP address and instructions for recovery.

To recover the unit, follow the steps below. The serial number is found on the label on the product casing.

1. **Unix/Linux** - From the command line, type the following:  

```
arp -s <IP address of AXIS 292> <Serial number> temp
ping -s 408 <IP address of AXIS 292>
```
- Windows** - From a command/DOS prompt, type the following:  

```
arp -s <IP address of AXIS 292> <Serial number>
ping -l 408 -t <IP address of AXIS 292>
```
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 292's IP address. In the page that appears, use the **Browse** button to select the upgrade file to use, e.g. axis292.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. Repeat the ARP and Ping commands as described above.
6. Open a new browser and enter the unit's IP address.
7. Reconfigure your settings.
8. If the emergency recovery procedure does not get the AXIS 292 up and running again, please contact Axis support at [www.axis.com/techsup/](http://www.axis.com/techsup/)

## Support

If you contact the Axis support desk, please help us to resolve your problems by providing the following:

- server report
- log file
- brief description of the problem.

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

**Server log file** - go to **Support > Support Overview**. The Server 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 decoder.	Restart the unit and try again. Also, make sure the ping length is set to 408. For more information, see <i>Emergency Recovery Procedure</i> , on page 20.
The AXIS 292 is located on a different subnet.	If the IP address intended for the AXIS 292 and the IP address of your computer are located on different subnets, you will not be able to set the IP address using AXIS IP Utility or ARP Ping. If no DHCP server is available, 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	<b>Disconnect power from the AXIS 292.</b> Run the Ping command (in a Command/DOS window, type ping and the IP address of the unit).  If you receive: <b>Reply from &lt;IP address&gt;: bytes = 32; time = 10 ms.....</b> - this means the IP address is already in use by another device on your network. You must obtain a new IP address and reinstall the unit.  If you receive: <b>Request timed out</b> - 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 292 cannot be accessed from a browser

Proxy	If using a proxy server, try disabling the proxy setting in your browser
The IP address has been changed by DHCP	Press the Video Select button on the front of the AXIS 292 to see the IP address on the TV monitor screen.
Other networking problems	Test the network cable by connecting it to another network device, then Ping that device from your workstation. See instructions above.

#### The AXIS 292 can not be accessed via a host name.

Wrong host name	Check that the host name and DNS server settings are correct
-----------------	--

#### The Power indicator is not constantly lit

Faulty power supply	Verify that you are using an AXIS PS-K power adapter.
---------------------	---

#### The Status and network indicators flash at short intervals

Hardware failure	Contact your Axis dealer.
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#### The Status indicator LED is flashing red and the AXIS 292 is inaccessible

A firmware upgrade has been interrupted or the firmware has otherwise been damaged.	See the <i>Emergency Recovery Procedure</i> above.
---	--

#### No image or slow updating of images on video out

The video source is too heavily loaded	Try limiting the number of clients accessing the video source. Slow performance may be caused by e.g. heavy network traffic, many users with access to unit, low performing client, complexity and movement in the image etc.
Network bandwidth not sufficient	Adjust the video and audio settings of the video source to suit the prevailing conditions.

#### Poor image quality on monitor

Wrong PAL/NTSC settings	Check PAL/NTSC settings.
Video source has been configured with low resolution or high compression.	Adjust the video source configuration.
Wrong cabling	Check cabling, swap if necessary.

#### Cannot connect to the video source

Video source is no longer available.	Check if the video source is accessible from a PC. Check if the source has been turned off, if it has received a new IP address or if the password has changed. Change the AXIS 292 settings accordingly.
Wrong IP address to the video encoder.	Check the IP address to the encoder in the Video Source list in the AXIS 292. Ensure the address does not use an http:// prefix.
Wrong user/password to the video encoder.	Check that the user name and password for the encoder are correct.

Wrong source type selected. Select automatic detection of source type or specify the correct source type.

When modifying a source in the video source list, the AXIS 292 reconnects to a different source. The AXIS 292 always reconnects to the first source in the video source list.

**Initial connection very slow**

The initial connection to a new video source takes a long time. This is normal behavior, as caching a new source always takes longer. The decoder will connect much more quickly the second time.

**No audio out**

Audio not available. Check if audio is supported and enabled on the encoder. Check the cabling used. Check that the volume out from the decoder is high enough.

**Problems with alarms from video encoders**

Alarm has no effect Check that the correct source (video encoder) name is used.  
 The source may be out of service - check this by pressing the **Connect to** button in the video source list.  
 If using HTTP notification for the alarm, check that the message is correctly URL-encoded. See the online help in the video encoder.  
 See also the Server log, which may contain relevant information.

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

## Technical Specifications

Detail	Specification
Video input	Any Axis network camera or video server.
Video output	PAL or NTSC. Resolution > 500 TVL (depending on source resolution). Adjustable margins for different monitor types.
Video decoding	Motion JPEG, MPEG-2 and MPEG-4 (Auto detection). Unicast and multicast connection. Frame rates up to 30/25 (NTSC/PAL). Bit rates up to 8 Mbit/s.
Audio decoding	Stereo and mono. G.711, G.721, G723 and MPEG-1 Layer-2.
Video sequence	128 different video sources can be preconfigured. Manual cycling (video select button). Automatic cycling (configurable time interval). Auto connection on alarm from video source.
Image	Maximum image size for decoding: 720x576
Security	Password protection for restricted access to setup and management. HTTPS for encrypted web pages.
Installation, management and maintenance	Internet Explorer 5.x or later. For other operating systems and browsers see <a href="http://www.axis.com/techsup">www.axis.com/techsup</a> Support for firmware upgrades over HTTP or FTP, firmware available at <a href="http://www.axis.com">www.axis.com</a>
System integration	Axis HTTP API Version 2.
Supported protocols	HTTP, HTTPS, SSL/TLS*, TCP, RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, ARP, DNS  *This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. See <a href="http://www.openssl.org">www.openssl.org</a>
Connectors	Ethernet 10Base-T/100Base-TX (RJ-45 connector). Video output: - BNC Composite Video - RCA Composite Video - 4-pole Mini-DIN Y/C S-Video (S-VHS) Audio output: 3.5 mm stereo (line level). Power 7-20 V DC, min 7 W.
Processors & memory	CPU: National Semiconductors SC1200 Decoder: Sigma Designs System: Linux 2.4 kernel RAM: 32MB Flash memory: 32MB
Operating conditions	Temperature: 5°C (41°F) to 50°C (122°F) Humidity: 20-80% RH (non-condensing)
Included accessories	Power supply 9V DC. Mounting brackets. User's Manual.
Approvals - EMC	EN55022/1998 Class B EN55024/1998 EN61000-3-2:2000 EN61000-3-3:2000 FCC Subpart B Class A, B, VCCI Class B C-tick AS/NZS 3548
Approvals - safety	EN60950 UL, CSA (PS-K power adapter)
Dimensions (HxWxD) & weight	42x140x228 mm (1.7"x5.5"x8.9") Weight: 732g (1.6 pounds), excluding power adapter.

# 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." GIFs and JPEGs 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.

**BOOTP (Bootstrap Protocol)** – A protocol that can automatically configure a network device (give it an IP address). BOOTP is the basis for the Dynamic Host Configuration Protocol (DHCP).

**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.

**Coaxial cable** – Coaxial cable is the standard means of transmitting analog video in a CCTV system. Coaxial is also used by cable companies to distribute television in residential buildings.

**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.

**Composite video** – A type of video signal in which the red, blue and green signals (sometimes audio signals too) are mixed together.

**Compression** – See *Image Compression*.

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

**Control unit** – If a CCTV system has more than one camera, there must be a way to control each video signal going to the VCR and the monitor. There are three basic types of Video Control Unit; Multiplexer, Switch and Quad.

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

**Decoder** – See *video decoder*.

**De-interlacing** – See *interlacing*.

**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*.

**Encoder** – See *video encoder*.

**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.

**Fixed iris** – See *autoiris*.

**Focal length** – Measured in millimetres, 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)** – FTP is 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 VOPs is the basic unit of an MPEG-4 video stream. The GOV contains different types and numbers of VOPs (I-VOPs, P-VOPs, etc) as determined by the GOV length and GOV structure. See also *VOP*.

**GOV length** – The GOV length determines the number of images (VOPs) 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-VOPs or P-VOPs) 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.

**HTTPS (Hypertext Transfer Protocol over SSL)** – HTTPS is a web protocol used by browsers and web servers to encrypt and decrypt user page requests and the pages returned by the server.

The encrypted exchange of information is governed by the use of an HTTPS certificate (issued by a Certificate Authority), which guarantees the authenticity of the server.

**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)*.

**Infrared (IR)** – Infrared radiation is radiation at a longer wavelength than visible light, which means it cannot be seen by the naked human eye. As infrared radiation can be detected as heat, this can be shown on a screen or captured by a digital camera, with hotter objects showing up brighter against colder surroundings (e.g. a human body against a colder

background).

As color cameras can "see" infrared radiation as well as visible light, these cameras are equipped with an IR-cut filter, to prevent distortion of the colors the human eye can see. To use the camera in very dark locations or at night, this filter can be removed, to allow infrared radiation to hit the image sensor and thus produce images.

An infrared lamp can be used for improved illumination for night surveillance, whilst not producing any extra visible light.

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.

**Lux** – A standard unit of illumination measurement.

**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.

**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.

**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 Tunneling 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 enterprise network from the outside network and the local firewall. It is the firewall server that protects the enterprise network from 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*.

**Quad view** - A Quad view displays images from up to four cameras on a single screen; where the images from each camera take up approximately a quarter of the display area.

**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.

**RS-232** - RS-232 is a long-established standard that describes the physical interface and protocol for low-speed serial data communication between devices. This is the interface that e.g. a computer uses to talk to and exchange data with a modem and other serial devices.

**RS-422** - RS-422 is a serial data communication protocol that specifies 4-wire, full-duplex, differential line, multi-drop communications. It provides balanced data transmission with unidirectional/non-reversible, terminated or non-terminated transmission lines. RS-422 does not allow multiple drivers, only multiple receivers. Maximum recommended range is 4,000 feet (1200 meters). Maximum recommended baud rate is 10Mbit/s.

**RS-485** - RS-485 is an upgraded version of RS-422 that supports up to 32 devices on the same connection. RS-485 is an electrical specification of a two-wire, half-duplex, multipoint serial connection. It enables the configuration of inexpensive local networks and multidrop communications links. It offers high data transmission speeds (up to 10Mbit/s), and as it uses a differential balanced line over twisted pair (like RS-422), it can span relatively large distances (4000 feet or 1200 metres). RS-485 only specifies the electrical characteristics of the driver and the receiver. It does not specify or recommend any data protocol.

**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 email. It can be used to allow legitimate users to send email 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 log on 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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