AXIS 2130R PTZ Network Camera

User's Manual

About This Document

This manual is intended for administrators and users of the AXIS 2130 PTZ Network Camera and the AXIS 2130R PTZ Network Camera, and is applicable for software release 2.32. The manual includes instructions for installing and using the product on your network.

Previous experience of networking will be of use to the reader when installing and using this product. Some knowledge of UNIX or Linux-based systems would also be beneficial, for developing custom PHP-based programming scripts and applications.

Readers should use this document as a supplement to the Wizards and other on-line information available via the Web-based interface. Later versions of this document will be posted to the Axis Web site, as required.

Safety Notices

Please observe all safety markings when using this product.
Caution! - Potential hazard that can damage the product.

Important! - Potential hazard that can seriously impair operation.
Do not proceed beyond any of the above notices until you have fully understood the implications.

Legal Considerations

Camera surveillance can be prohibited by laws that vary from country to country. Check the laws in your local region before using the AXIS 2130 for surveillance.

Electromagnetic Compatibility (EMC)

USA – This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A 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. Shielded cables should be used with this unit to ensure compliance with the Class A limits.

Europe $C\epsilon$ **–** This digital equipment fulfills the requirements for radiated emission according to limit B of EN55022/1994, and the requirements for immunity according to EN50082-1/1992 residential, commercial, and light industry.

Liability

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

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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/

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Product Overview

The AXIS 2130 PTZ Network Camera is a combined Network Camera and Pan/Tilt/Zoom device. It plugs directly into an Ethernet network and delivers clear and sharp surveillance images to any browser on the network.

The AXIS 2130 includes its own, built-in Web server that enhances traditional surveillance systems by distributing monitored images over a secure intranet network. The unit's Pan/Tilt/Zoom functions are controlled directly from the browser window, as are all of the other available configuration options. All that is required is a standard browser such as Netscape Navigator or Microsoft Internet Explorer.

The AXIS 2130 is supplied in the following variants:

- The AXIS 2130 PTZ Network Camera - Connecting directly to Ethernet or Fast Ethernet networks, the AXIS 2130 is designed for conventional mounting on horizontal surfaces.
- The AXIS 2130R PTZ Network Camera has the same features and capabilities as the AXIS 2130, but is designed for ceiling mounting only. The degree of pan and tilt is different to that of the AXIS 2130 - please see the technical specifications on page 37 for full details.

The Web-based interface in both models features several user-friendly Wizards that simplify the installation process and provide for a seamless integration into your networking environment and custom applications. The open-network structure minimizes the need for costly coax cabling, to offer remote imaging over the network for a minimal connection overhead.

The AXIS 2130/2130R is the smart and cost-effective solution for meeting the sophisticated demands expected of a modern interactive surveillance and remote monitoring system. It is simple to install - and easy to use!

Features and Benefits

Ease of Use – The AXIS 2130/2130R has Plug-and-Watch functionality; which means that all you need do before using the product is connect it to your network and assign it a valid IP address. The only software needed for viewing images or configuring the product is Microsoft Internet Explorer 4.x (used with Axis' ActiveX component), or Netscape 4.x or above. No other software required.

Cost-effective – Provides image distribution over your network for a minimal connection overhead and offers a reliable and low-cost resource for remote network imaging. There are no hidden accessory costs involved; such as expensive software, management workstations, or dedicated video cabling.

Open Standards Environment – Supporting TCP/IP networking, SMTP e-mail, HTTP and other Internet-related protocols, the AXIS 2130/2130R can be used in mixed operating system environments; such as Windows and UNIX.

Simple Administration – Using a standard Web browser, you configure and manage the AXIS 2130/2130R directly from its own Web pages. When a new firmware release becomes available, you simply upgrade your AXIS 2130/2130R remotely over the network.

Standard Image Format – The AXIS 2130/2130R generates high-quality pictures in standard JPEG format that can be viewed using any standard Web browser.

Picture Updating – The on-board ETRAX 100 LX processor and revolutionary AXIS ARTPEC-1 Real Time Picture Encoder provide an amazing power-synergy to deliver up to 30 frames over 10Mbps or 100Mbps networks.

Wide Range of Applications – The AXIS 2130/2130R offers live video over the network for extending and enhancing any traditional CCTV system. Use it for verifying intruder alarms; for traffic surveillance; banking applications; remote monitoring of parking lots, buildings and factories; industrial process control; visual security; image archiving... and much more besides! The SMTP e-mail support also allows images to be sent as e-mail attachments, or identified within an e-mail, using a hypertext link to any target server on your network.

External Device Connection – Supporting an auxiliary Input/Output Connector, you can connect your AXIS 2130/2130R to a variety of external devices; such as IR-sensors, switches and alarm relays.

Security – The AXIS 2130/2130R provides multi-user password protection, so that access can be limited to specified individuals or groups.

Linux Operating System – Including a Boa Web server, the Linux operating system provides a stable platform for open-source development in future releases of the product. In accordance with the *GNU General Public License*, Axis have published the kernel for this product at **http://developer.axis.com/**. Axis would like to thank Paul Phillips, who wrote Boa; and Larry Doolittle, who is now enhancing and maintaining this free program software - published at **http://www.boa.org/**.

Product Description

Read the following information to familiarize yourself with the AXIS 2130/2130R, making particular note of where the connectors and indicators are located.

Front

● **Power Indicator**
The power indicator flashes green during power-up and shows a steady green during normal operation.

Rear Panel

● **I/O Terminal Block**
The I/O Terminal Block connector provides the physical interface to one relay switch output and one digital opto-coupled input. This connector is used for receiving external triggers and for controlling output devices.

● **Network Connector**
The AXIS 2130/2130R is designed for 10 Mbps Ethernet and 100 Mbps Fast Ethernet networks and connects to the network via a standard RJ45 connector. Supporting NWAY, the AXIS 2130/2130R detects the speed of the local network segment and varies the speed of data communication accordingly (between 10 Mbps and 100 Mbps).

● **Power Supply Connector**
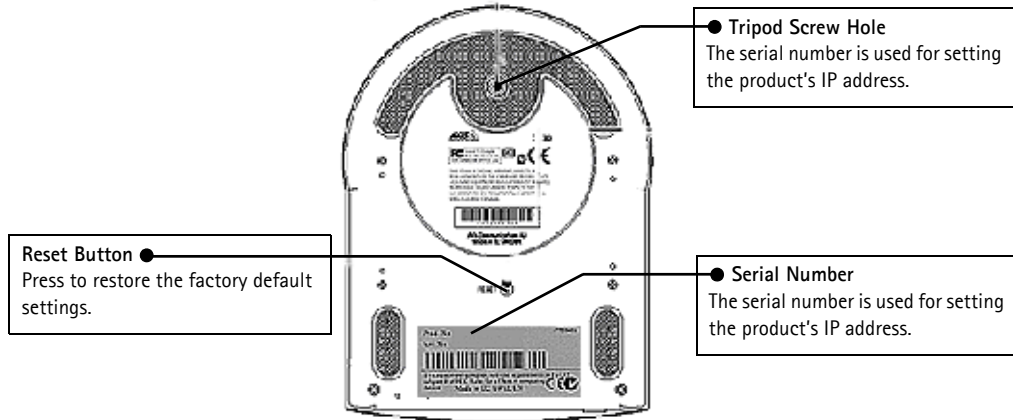A single Jack socket for connection of the AXIS 2130/2130R power supply (Canon K30120).

● **Network Indicator**
After completion of the startup and self test routines, the multi-colored Network Indicator provides the following indications:

• flashing yellow - indicates activity on a 10Mbps Ethernet network

• flashing green - indicates activity on a 100Mbps Fast Ethernet network

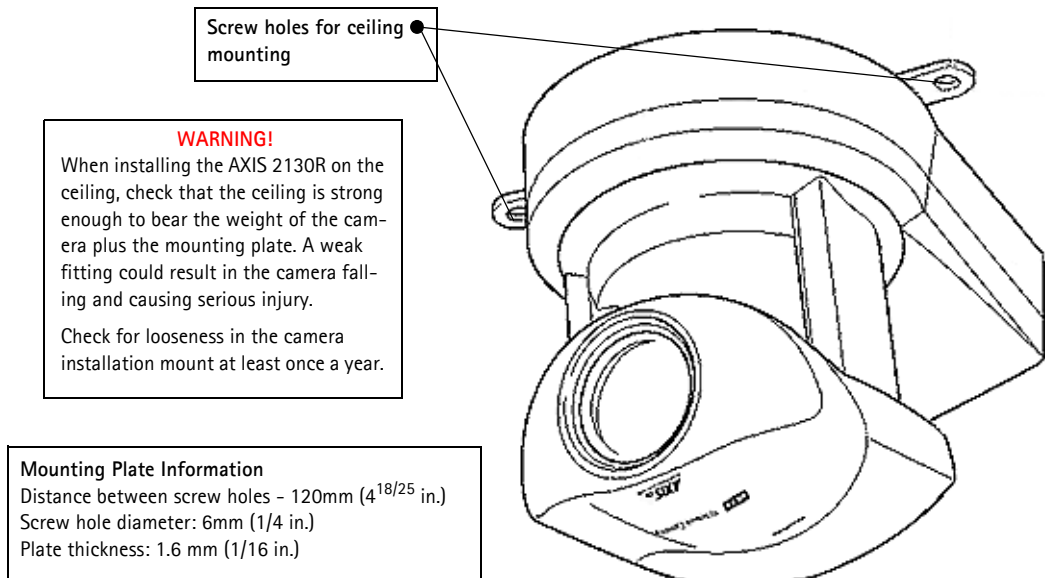• steady orange - disconnected from the network.

Tripod Mounting

The AXIS 2130 is supplied with a screw hole for tripod mounting. The screw hole is located on the base of the unit, as shown below. The base plate of the AXIS 2130R is similar, but is supplied with a ceiling mounting plate instead of the tripod screw hole.

Tripod Screw Hole
The serial number is used for setting the product's IP address.

Reset Button
Press to restore the factory default settings.

Serial Number
The serial number is used for setting the product's IP address.

Ceiling Mounting the AXIS 2130R

The AXIS 2130R is designed exclusively for ceiling mounting and a special mounting plate is supplied for the purpose. Screw the plate (screws not supplied) to the ceiling at the point of installation.

Screw holes for ceiling mounting

WARNING!
When installing the AXIS 2130R on the ceiling, check that the ceiling is strong enough to bear the weight of the camera plus the mounting plate. A weak fitting could result in the camera falling and causing serious injury.

Check for looseness in the camera installation mount at least once a year.

Mounting Plate Information
Distance between screw holes - 120mm ($4^{18/25}$ in.)
Screw hole diameter: 6mm (1/4 in.)
Plate thickness: 1.6 mm (1/16 in.)

Installation

- Quick installation - Follow the instructions below to quickly install on an Ethernet network.
- Easy installation - See *The AXIS IP Installer,* on page 24.

Before connecting the hardware

1. Note the serial number on the underside of the unit. You need to know this to set the IP address**.** The 12-digit serial number is the same as the Ethernet address, e.g. Ser.No: 00408C1A2B3C = Ethernet Address: 00-40-8c-1A-2B-3C

   > Prod. No: 0130-001-01
   > Ser. No: 00408C1A2B3C
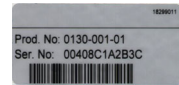
2. From a computer on your network, assign your AXIS 2130 with a unique IP address using the appropriate method for your operating system.

Windows only **– Start a Command Prompt and type these commands:**

Syntax:

```
arp -s <Server IP address> <Ethernet address> <my PC IP address>
ping -t <Server IP address>
```

Example:

```
arp -s 172.21.1.200 00-40-8c-10-00-86 172.21.1.193
ping -t 172.21.1.200
```

UNIX only **– Type this in your command line:**

Syntax:

```
arp -s <IP address> <Ethernet address> temp
ping <IP address>
```

Example:

```
arp -s 172.21.1.200 00:40:8c:10:00:86 temp
ping 172.21.1.200
```

Note: In some Unix systems, the ARP command can be located in a directory that is not on the command path. Administrator rights may be required.

Connecting the hardware

1. Connect an Ethernet cable to the Ethernet connector and attach it to the network.

2. Connect the power cable to the power supply connector and connect it to the main power supply.

3. Ensure that the **Power Indicator** (on the front panel) is permanently lit and that the **Network Indicator** flashes intermittently.

Power supply   Terminal connector   Ethernet Connector   Network Indicator

4. Approximately 10-15 seconds after connecting the power supply, the following message (or similar) is returned:'Reply from 172.21.1.200'

5. Exit Ping.
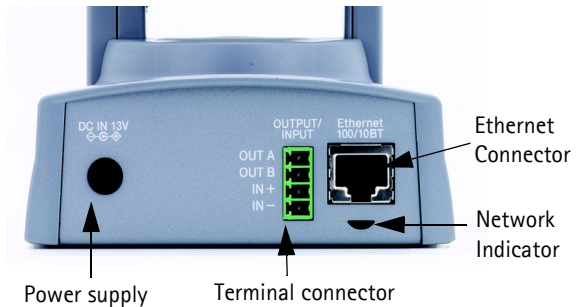
The initial installation is complete. You can now access the AXIS 2130 directly from your browser, as described below.

Accessing the AXIS 2130 from a browser

Start your browser (e.g. Internet Explorer or Netscape) and enter the IP address of the AXIS 2130 in the location/address field.
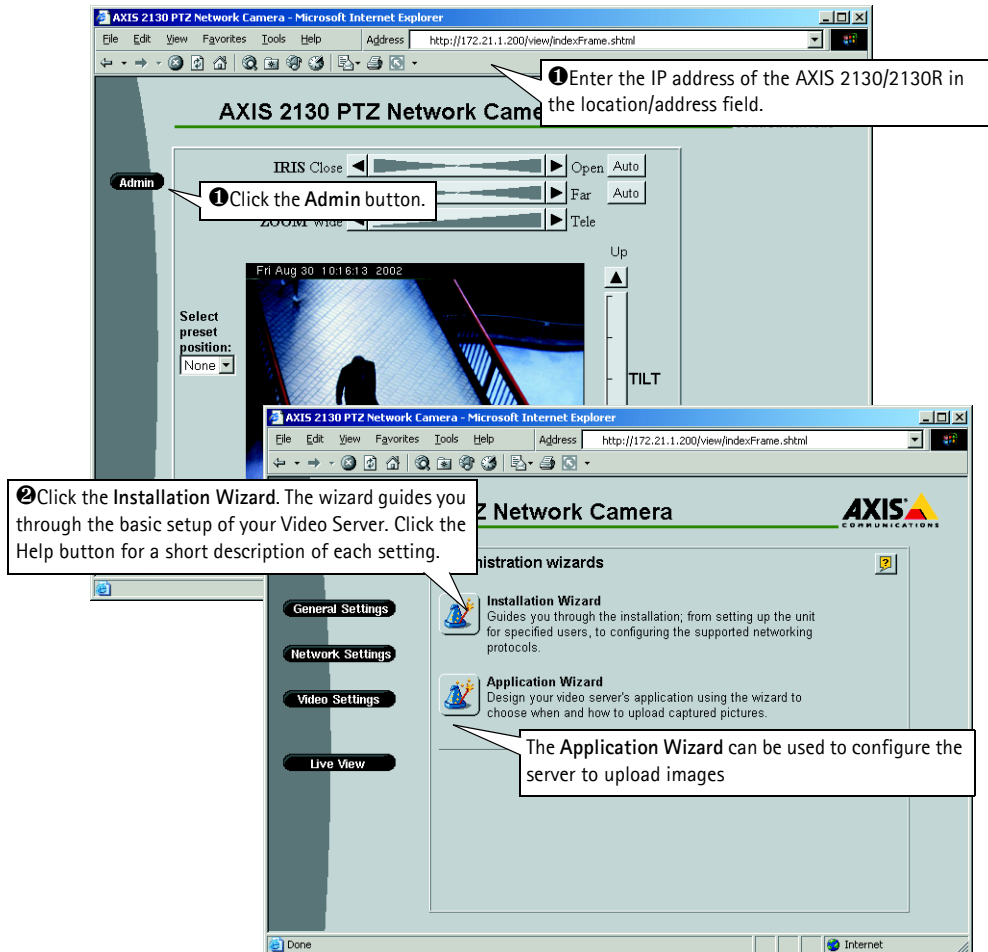
Important!

- Upon delivery, the AXIS 2130 is configured for open access (anonymous users). The unit is supplied with one pre-configured Administrator user name and password, set to root and pass, respectively. The Administrator password should be changed as soon as possible, to prevent unauthorized access to the Admin Tools and/or product images. Change the password in **Admin**>**General Settings**>**Security.**
- To enable the updating of images in Microsoft Internet Explorer, set your browser to allow ActiveX controls and perform a once-only installation of Axis' ActiveX component onto your workstation. If your working environment restricts or prohibits the downloading of additional software components, you can alternatively, from the Image Settings, configure your AXIS 2130 to use a Java applet for updating the images. Refer to the online Help for more information.

Configuration

This section describes how to configure the AXIS 2130/2130R and is intended specifically for product *Administrators* – who have high-level privileges denied to ordinary *users*.

The AXIS 2130/2130R is configured from a standard browser (Netscape Navigator 4.x or Microsoft Internet Explorer 4.x/5.x), by using the **Administration Tools.**

Important!

To access the AXIS 2130/2130R admin tools, you must first set the IP address, as described in *Installation,* on page 9.

The Administration Tools

The Web-based Administration tools are displayed in an intuitive graphical user interface that allows simple point-and-click system configuration.

Tip! On-line help is available on every page of the AXIS 2130/2130R web interface. This information is useful when configuring the unit and should be used as a first point of reference for resolving any queries. The help system is stored internally in the unit.

Accessing the Tools

Follow the instructions below to access the Administration Tools from a browser:

1. Start your browser and enter the IP address of the AXIS 2130/2130R in the location/address field.

Example!

```
http://172.21.1.200/
```

2. The main **Application** page is now displayed. Click the **Admin** button to display the **Administration Overview** page and the **Administration Tools.**

3. The server's various settings are reached by clicking on the relevant button.

Important!

Administrators can choose <u>not</u> to display the Administration and other navigational buttons from the user interface. Selecting this feature ultimately means that the Administration tools can then only be accessed by entering the full *Admin* address into the browser's URL field; for example: http://172.21.1.200/admin/.

Admin Tools – Overview

The **Administration Tools** provide access to the following tools and parameters:

Admin Wizards

Installation Wizard → Sets all of the parameters required for securely viewing images directly in a browser; including: TCP/IP (Network), Date/Time, and System Security settings.

Application Wizard → Use the *Application Wizard* for developing the following applications:
- transmitting images to a remote server on your network
- sending e-mails with embedded images, or links to recorded video streams
- developing alarm or time-based image applications

General Settings

Date and Time → Set the system date & time, manually or automatically.

Security → Define the user name and password for administratrors and users.

Layout → Choose your default viewer and personal settings.

View Parameter List   View Log File

View Server Report

View Release Notes

These 4 buttons show various product information.

Restart   Factory Default → Set camera parameters to the factory default values.

→ Restart the camera.

Network Settings

Network → Specify settings for the supported network protocols; TCP/IP, DNS and SMTP (E-Mail).

Dynamic IP Address Notification → Set up IP address notification so that you will be notified if the IP address for the camera changes.

Video Settings

Image settings → Set the image features; such as: displaying text, clock, color, Black & White etc. Flicker reduction is also available from here.

Preset Positions → Create and recall Pan/Tilt/Zoom preset conditions

Using the Wizards to Design your Application

Click the **Admin** button and use the **Wizards** (described below) to quickly establish the necessary parameters for your application:

Wizard	Parameters / Options	Description
Installation Wizard Sets all of the parameters required for securely viewing images directly in a browser.	Users	Define or edit the Administrator password (the Administrator user name is permanently set to root, and the default password is set to pass), or define, add and delete user names and passwords.
	TCP/IP	Specify the IP address for your AXIS 2130/2130R. If you intend to use DNS names, specify the Domain Name and the IP addresses for the primary and secondary DNS servers. You may also optionally specify a Host Name for the AXIS 2130/2130R. There are also options for restricting the network bandwidth usage, for selecting the appropriate media and for changing the HTTP port number.
	Date and Time	Synchronize the internal clock of the AXIS 2130/2130R. This can be done manually or automatically, from an NTP server or your computer clock. There is also an option that automatically adjusts the time for daylight saving.
	Image Settings	Display the date and time and your own text in the image. Select monochrome or color images, and set the resolution and compression for the images. Remember: the higher the quality of the images – the greater the file sizes and the network bandwidth requirements.
Application Wizard Use this wizard to develop applications for: • transmitting images to a remote server on your network • sending e-mails with embedded images or links to recorded video streams, and/or developing alarm or time-based image applications	Upload	Define how and when your images will be transmitted, by choosing to either: • upload images continuously, or • upload images only when an alarm event occurs.
	Alarms, buffers, and destination	Depending upon the choice of application made above, continue with the wizard to define: • digital input alarm conditioning • pre- and post-alarm buffer settings • the network protocol to use for upload • the e-mail recipient, subject and own text • FTP path name and security settings (if used) Refer to the appropriate settings page for full details on each of the above parameters.

Tip!

Having used the Wizards for initially configuring your application, refer to the on-line Help and use the Administration Tools for refining the application to meet your specific requirements.

General Settings

General Settings

Click the **General Settings** button to display and/or edit the following settings:

Date and Time

Click this icon to set the date and time, automatically, or manually. Automatic setting of the date and time requires you to either synchronize the time with that on your computer or, alternatively, to provide the IP address of an NTP server. To automatically adjust the time to reflect changes made by daylight saving, check the box provided. Click **Save** to register the settings.

Security

To prevent unauthorized use of the camera, access is password-protected and restricted to defined *Users* and *Administrators*. *Administrators* have unrestricted access to the Administration Tools and can determine the registration of all other *users*.

As an *Administrator*, click the **Security** icon to either:

• define or edit the *Administrator* password (the Administrator user name is permanently set to *root*, with the default password set to *pass*)

• configure, add or delete user names and passwords

Important!

Upon delivery, the AXIS 2130/2130R is configured for open access (anonymous users), with one pre-configured Administrator user name and password, set to *root* and *pass*, respectively. The Administrator password **should always be changed**, to prevent unauthorized access to the Admin Tools and/or product images. Furthermore, all Axis products are supplied with these defaults.

By default, the AXIS 2130/2130R supports anonymous user access, which means that anybody on the network has access to the video images and Admin Tools from a browser. Entering at least one user name and password for an authorized user in the Security page will disable anonymous access, and thereafter only allow defined users. If the anonymous user service is satisfactory for your application, do not add any users. The Administrator password should, however, still be changed.

Layout Settings

Using the Layout settings, you can define your default viewer for Internet Explorer and enable a wide range of personal features for inclusion on the product's **Home Page**.

Default viewer for Internet Explorer

To enable the updating of images in Microsoft Internet Explorer, you must set your browser to allow ActiveX controls and perform a once-only installation of the Axis ActiveX component onto your workstation. If your computer restricts the downloading of additional software components, you can instead configure your AXIS 2130/2130R to use a Java applet for updating the images. Click the appropriate radio button for your choice and then click **OK**.

Personal Settings

Many of the features on the Home page can be customized. For example, you can quickly change the background color and include your corporate logo by clicking the appropriate radio buttons and providing the appropriate URL for any given object.

Refer to the on-line help for more information on personal settings.

Caution!

Unchecking the **Show Admin** box removes the Admin button from the product Home Page, and effectively means that the Administration Tools can then only be accessed by entering the full Admin address into the browser's URL-field; for example: http://172.21.1.200/admin/.

View Parameter List

The Parameter List provides a comprehensive list of all of the system parameters and their current settings. Click **View Parameter List** to display the list.

View Log File

System messages are recorded in a single log file and stored in product memory. Consequently, the file can be used for examining system events. The log file also serves as a useful diagnostic tool when attempting to resolve any problem that might occur. See also *Troubleshooting,* on page 25.

To display the latest server messages since the last *Restart* of the system, click the **View Log File** button.

View Server Report

This button shows important information about the server status and settings.

View Release Notes

This button opens a window showing the release notes for the installed firmware.

Emergency Actions

In certain circumstances, it may be necessary to reinstate the **Factory Default** settings for your AXIS 2130. This is performed in one of two ways:

- By clicking the **Factory Default** button on the **General Settings** admin page. This will reset most of the unit's parameters but will save the IP address, the Subnet mask, the Default Router and the Mac (Ethernet) address.
- By pressing the **Reset Button**, located on the underside of the unit. This option will reset **ALL** the parameters currently configured in the unit. To reset the unit using the reset button, please see *Reinstating the Factory Default Settings,* on page 20.

Network Settings

Network Settings

Click the **Network Settings** button to display, edit and refine the settings for:

- **TCP/IP** - used by the camera for transmitting data over the network.
- **DNS (Domain Name System)** - the network service used by the product for translating domain names into IP addresses.
- **SMTP (E-mail)** - this is the protocol for sending e-mail messages between mail servers on the network.
- **Miscellaneous** - set the network media and to restrict the bandwidth used by the product.

Configure the Network Settings with reference to the on-line help and the table below:

TCP/IP Parameters	Description
DHCP	Enable DHCP to allow centralized assignation of IP addresses. Requires a DHCP server on the network.
BOOTP	Enable the BOOTP protocol for setting the IP address automatically. For further information on using BOOTP, see *Other IP Setup Methods,* on page 23. If you intend to use the AXIS IP Installer, BOOTP <u>must</u> be enabled.
IP address	Specifies the unique 32-bit IP address of your unit.
Default Router	Specifies the network router your video server will use.
Subnet Mask	If unsure what value to use, contact your system administrator.
Host Name	If you are using a DNS server on your network (see below), this is usually the same as the assigned DNS Name.

DNS Parameters	Description
Domain Name	Enter the name of the domain your AXIS 2130 belongs to.
Primary DNS	Defines the IP address of the primary DNS server. This is used for identifying a computer by name instead of IP address.
Secondary DNS	The IP address of the secondary DNS server. This will be used if the primary DNS server is unavailable.

SMTP Parameters	Description
Primary Mail Server	Defines the server that provides your mail facilities.
Secondary Mail Server	Defines a secondary server that can provide mail facilities in the event of the primary server being unavailable.
Return Email Address	The reply address for e-mails sent by the AXIS 2130; that is, the name that will appear in the 'From' field of the dispatched email.

Miscellaneous	Description
Select Media	This does not normally need to be changed, but if you have specific needs - due to the use of network switches or similar equipment, select the type of network media here.
Max Bandwidth	With the default set to unlimited, this parameter defines a restriction on the network bandwidth used by the camera; particularly useful for a connection to a busy network.
HTTP Port Number	This does not normally need to be changed, but can be, if you have particular requirements.

DHCP

DHCP (Dynamic Host Configuration Protocol) is a protocol that lets network administrators centrally manage and automate the assignment of IP addresses in an organization's network.

Important!

DHCP should only be enabled if you know which IP address the AXIS 2130/2130R will get from the DHCP server, or if your version of DHCP can update a DNS server, which then allows you to access the AXIS 2130/2130R by name. If DHCP is enabled and you cannot access the unit, you may have to reset it to the factory default settings (see page 20) and then perform the installation again (see page 9).

Dynamic IP Address Notification Settings

When the IP address changes by means beyond your control, such as by DHCP or PPP, you can choose to be notified of the change via HTTP, FTP or SMTP. Click the icon to display, edit and refine the settings for address notification.

Referring to the on-line help and the table below, configure the dynamic IP address notification settings.

Parameter	Description
HTTP	Enabling HTTP means the server will send an HTTP GET request to the specified URL. This can then easily be taken care of by a designated cgi-script, which registers the request by some means. Custom parameters can be used by entering them in the field provided. The fields User Name and Password, (located directly below the field for Custom Parameters) should be used if the script is password protected. If you need to pass a proxy server to connect to the URL for the host, provide your user information in the relevant fields. See also the On-line help for more information.
SMTP	Enabling SMTP will send an email notification of any change in IP address. Enter the recipient's address and a sender's address, as well as any text you want to appear in the subject of the email. Note that you must configure a mail server under Network Settings. See also the On-line help for more information.
FTP	Saves a notification file on an FTP server. Provide the connection details for the server and your user name and password. If there is a firewall between the server and the FTP server, it is recommended that Passive Mode is enabled. There are 3 levels of **TXT Type** to choose from; **Short** - the IP address only; **Extended** - multi-line file; and **HTML** - contains the same information as Extended, but includes HTML tags. See also the On-line help for more information.
TXT Field	Specify your own text to include in the notification. This text is included in notifications sent by all of the above methods.

Video Settings

Video Settings

Click the **Image Settings** button to configure the image settings to your requirements.

Header	Description
Date & time	Check to enable time display in the video source.
Text	Enable or disable the display of a text string in the video image. Type the text string that you want to display in the adjacent field.
Image	
Color	Display *Color* or *Black and White* video images.
Resolution	Set the required resolution for your images.
Compression	Determines the compression factor (0-100) for the selected video source. Lower compression optimizes picture quality, but generates larger image file sizes, requiring greater network bandwidth and storage space.
Flicker reduction	Description
Enable	When fluorescent lighting at 50 Hz is used to illuminate the scene displayed in the image from the camera, there may be an irritating flicker present in the image. This can be reduced by checking the Enable box.

Notes:
- Image control can also be achieved directly using CGI parameters in the image URL.

- Using CGI parameters embedded in a URL request will temporarily override any parameters defined in the Image Settings dialog. For detailed CGI information, refer to the Axis Camera API, HTTP - Interface Specification, available from our web site at www.axis.com
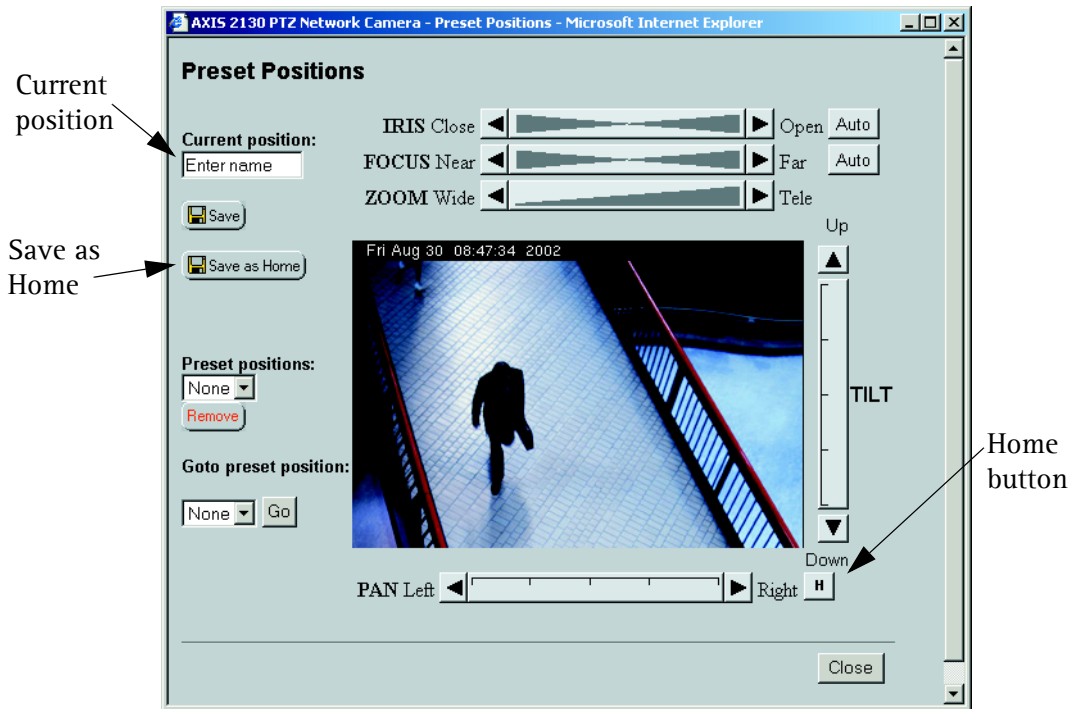
Preset Positions

To enable quick and accurate camera PTZ positioning to known camera *hotspots*, the Administrator can set any camera position as a named entity - creating up to forty **Preset Positions** that can be used at any time from the drop-down list on the Live View page.

Defining Preset Positions

The camera's orientation is controlled by Pan Tilt and Zoom control bars. Follow the instructions below to create a preset position:

1. Click the **Preset Position** button. An image from the camera is displayed in a new window.

2. By clicking in the image or by using the **Pan Tilt** and **Zoom** control bars, move the camera to the desired position.

3. Enter a descriptive name in the **Current Position** field.

4. Click **Save** to register the new preset position with the AXIS 2130/2130R and then check that the new name is included in the **Preset Positions** drop-down list. You can alternatively choose to save the position as a new **Home** position. Click **Remove** to remove this or any other preset position in the list.

Reinstating the Factory Default Settings

In certain circumstances, it may be necessary to reinstate the **Factory Default** settings for your AXIS 2130/2130R. This is performed by clicking the appropriate button within the **Administration Tools**, *or* by using the **Reset Button**.

Follow the instructions below to reinstate the product factory default settings using the Reset Button on the underside of the unit:

1. Using a pointed object (e.g. a paper clip) press the Reset Button and keep it pressed while you disconnect and reconnect the power.

2. Keep the button pressed for <u>at least five seconds</u> and then release it.

Note: Reinstating the factory default settings with the aid of the Reset Button will cause <u>all</u> parameters (including the IP address) to be reset. Refer to *Installation,* on page 9, or *Other IP Setup Methods,* on page 23, for information on how to set the IP address. To reset to the factory default settings, but with certain parameters saved, reset instead with the help of the button provided in the General Settings.

Using the AXIS 2130 PTZ Network Camera

This section is intended specifically for system *Users*; that is, personnel responsible for using the AXIS 2130/2130R as part of an integrated surveillance system.

Important!

- Your system *Administrator* has installed the AXIS 2130/2130R on your computer network, and tailored the user functions and general look and feel of the system to meet your specific surveillance needs. Consequently, some of the functions and examples provided within the section may differ from those displayed in your system.
- Any deficiencies or shortcomings in your application should be referred to the system administrator, who has high-level privileges that are normally denied to ordinary users.
- On-line help 🔲 may not be available from the user interface, as access to this information may be denied by your system administrator.

Accessing your Surveillance Images

The AXIS 2130/2130R can be used with many operating systems; e.g. Windows, Linux, and UNIX. You can access the AXIS 2130/2130R from Netscape Navigator 4.x or Internet Explorer 4.x or 5.x (see note below).

Follow the instructions below to access your surveillance images:

1. Start your browser.

2. Enter the name or IP address of the AXIS 2130/2130R into the **Location/Address** field (URL) of your browser:

Example!

```
http://172.21.1.200/
```

A video image, similar to the example featured on page 22, is now displayed in your browser.

Note: To enable the updating of images in Microsoft Internet Explorer, you must set your browser to allow ActiveX controls and perform a once-only installation of Axis' ActiveX component onto your workstation. If your computer prohibits the downloading of additional software components, you can alternatively configure your AXIS 2130/2130R to use a Java applet for updating the images. For more information on this, please refer to the on-line Help.

Positional Control of the Camera

The camera's Pan/Tilt/Zoom (PTZ) device is controlled directly from the unit's web interface, as shown in the illustration below:

Focus
Allows smooth or stepped camera focus between near and far focus.

Iris
Controls the amount of light that enters the camera through the lens. Set to **Auto** for optimum performance.

Zoom
Allows smooth or stepped camera zoom between telescopic and wide viewing.

Select Preset Position
To enable quick and accurate camera positioning, up to 40 specific positions can be saved as presets, which are created by the Administrator. Selecting a preset position from the drop-down dialog immediately causes the selected camera to assume the predefined position.

Tilt
Allows smooth or stepped vertical panning of the camera.

Home (H)
Returns the camera to the 'Home' position.

Click-in-image
For direct control of the Pan/Tilt/Zoom device.

Pan
Allows smooth or stepped horizontal panning of the camera.

Notes:
- Clicking anywhere on the toolbar's gradient allows for a "smooth" PTZ adjustment; whereas clicking on the left or right arrows causes a stepped incremental change.
- Pan/Tilt/Zoom control can be disabled by the Administrator and may be unavailable in the user interface.

Appendix A – Other IP Setup Methods

As an alternative to the ARP command (described earlier in the Installation section of this manual), you can set the IP address for your AXIS 2130/2130R using any of the following methods - as appropriate for your operating system:

Method	Operating Systems	Refer to...
AXIS IP Installer	Windows	*The AXIS IP Installer,* on page 24.
BOOTP Requiring a BOOTP daemon on your system, this method operates over the entire network. A request to an active daemon initiates a search of the boot table to find an entry matching the unit's Ethernet address. The daemon downloads the IP address to the device if a match is found.	UNIX	

Notes: • Make sure the AXIS 2130/2130R is powered up and connected to the network.

• IP Address: Acquire an unused IP address from your Network Administrator, and do NOT use the default IP address featured in the following examples when installing your AXIS 2130/2130R.

• Server Privileges: Although no special privileges are required for Windows 95/98/ME or XP (Home), you will need *Administrator* privileges for Windows NT/2000 and XP (Professional). UNIX systems require *Root* privileges.

Ethernet/Mac Address: The AXIS 2130/2130R is pre-configured with a unique Ethernet/Mac Address based upon the serial number printed on the underside label of the unit; where the serial number typically follows the format 00-40-8c-xx-yy-zz. You need this address to complete the installation.

The AXIS IP Installer

The AXIS IP Installer is a Windows program that is ideal for setting the IP addresses for multiple Axis networking products. Allowing you to conveniently access the home page of any Axis ThinServer device connected to your network, this freely distributed software is available for download from the Axis Website at www.axis.com.

Installing the AXIS IP Installer:

1. Download the latest version of the AXIS IP Installer onto your desktop and run **Setup_IPInstaller.exe** to start the installation.

2. The AXIS IP Installer setup dialog is displayed on the screen.

3. Follow the instructions as they appear. Click **Finish** to complete the installation.

Setting the IP Address with the AXIS IP Installer:

1. Run the **AXIS IP Installer** from the **Start** menu. The **AXIS IP Installer** dialog is displayed on the screen.
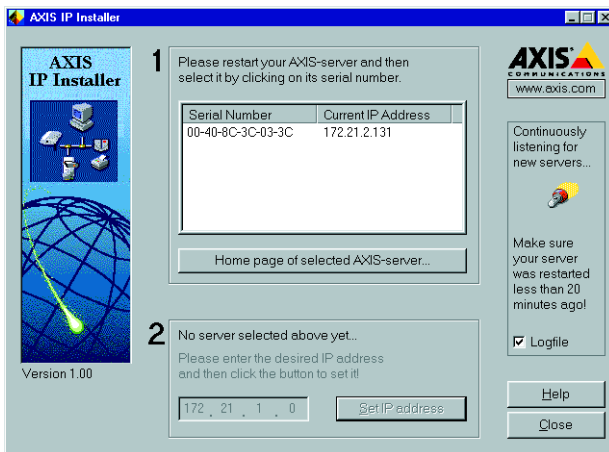
2. Restart your AXIS 2130/2130R.

3. Select the serial number of your AXIS 2130/2130R in the list. The serial number is identical to the unit's Ethernet address.

4. Enter the IP address. Click **Set IP address**. The IP address will now be set.

5. To access the home page of the AXIS 2130/2130R, click **Home page of selected Axis-server...** You can now configure the AXIS 2130/2130R to your requirements.

6. Click **OK** to exit the program.

For more help during the installation of the IP address, click **Help** or use the **F1** key.

Appendix B – Troubleshooting

This appendix provides useful information to help you to resolve any difficulty you might have with your AXIS 2130/2130R. Symptoms, possible causes and remedial actions are provided in a quick reference table.

Checking the Firmware

One of your first actions when attempting to solve a problem should be to check the firmware version currently installed. An updated version may contain a correction that fixes your particular problem. For more information, please see *Updating the Firmware,* on page 29.

Support

If you cannot solve your problem after reading the information in this appendix or after referring to the AXIS 2130/2130R FAQ, you can pass the problem to the AXIS support desk. To help us help you resolve your problems expediently, please be sure to provide the following information:

- a brief description of the problem
- the Server Report
- the log file
- if relevant, an example of a poor image.

Server Report

The server report contains important information about the server and its software, as well as a list of the current parameters.

The Log File

The AXIS 2130/2130R log file records events within the unit and can prove a useful diagnostic tool when attempting to resolve any problems that might occur.

Viewing the File

To display the latest log entries since the last *Restart* of the system:

1. In the admin tools, click the button for **General Settings**.

2. Click the **View Log File** button. All server commands executed since the last *Restart* of the system are displayed in a separate window.

Alternatively, get a copy of the log file by typing the following command directly into the location/Address field (URL) of your browser:

```
http://<servername>/support/messages
```

The log file can be read in any text editor and will look something like this:

```
Log file Events
Sep 13 11:30:01 AxisProduct syslogd 1.3-3: restart.
Sep 13 11:30:02 AxisProduct camd[22]: camd $Revision: 1.66 $ starting up
Sep 13 11:30:03 AxisProduct sh: Firmware release: Axis 2130 PTZ Network Camera 2.32
Sep 13 11:30:03 AxisProduct sh: Network configuration for AxisProduct
Sep 13 11:30:03 AxisProduct sh: IP: 10.13.10.153 MAC: 00:40:8c:47:00:ba
Sep 13 11:30:03 AxisProduct sh: Netmask: 255.0.0.0 Broadcast: 10.255.255.255
Sep 13 11:30:03 AxisProduct sh: Network: 10.0.0.0 Gateway: 10.1.1.1
Sep 13 11:30:03 AxisProduct parhand[21]: starting server
Sep 13 11:30:03 AxisProduct dstd[31]: Starting $Revision: 1.7 $
Sep 13 11:30:03 AxisProduct ssid[32]: "Starting" 16:15:32  $Revision: 1.14 $  0
Sep 13 11:30:04 AxisProduct phpd: "Starting" 16:17:07  $Revision: 1.3 $  0
Sep 13 11:30:04 AxisProduct boa[34]: starting server
Sep 13 11:30:04 AxisProduct iod[36]: iod: Starting 16:19:35  $Revision: 1.16 $
Sep 13 11:30:05 AxisProduct sftpd[24]: sftpd $Revision: 1.109 $ starting up
```

Typical AXIS 2130/2130R Log File

PINGing Your IP Address

By sending a packet to the specified address and waiting for a reply, the PING utility can determine whether a specific IP address is accessible. It also provides a particularly useful method for confirming addressing conflicts with your AXIS 2130/2130R on the network.
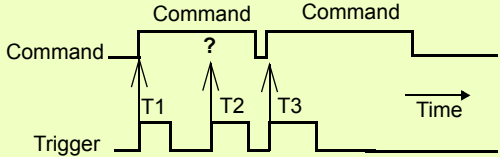
Having disconnected your AXIS 2130/2130R, follow the instructions below in association with *Symptoms, Possible Causes and Remedial Actions,* on page 27, and run the PING utility to troubleshoot TCP/IP problems on your network:

1. Start a Command window and type `ping x.x.x.x`, where `x.x.x.x` is the IP address of the AXIS 2130/2130R.

2. If you receive the reply `destination host unreachable`, then the AXIS 2130/2130R is not accessible on your subnet. You must obtain a new IP address and reinstall the unit.

3. If this does not solve the problem, <u>disconnect</u> the AXIS 2130/2130R from the network and run PING again. See the table below for an interpretation of the results.

PING Reply	Interpretation and recommendation
Reply from <IP address>: bytes = 32; time = 10 ms.....	The IP address is already used and cannot be used again. You must obtain a new IP address.
Request timed out	This IP address is not in use and is available for use with your AXIS 2130/2130R. If you already installed the unit using this IP address, the installation may have failed. Reinstall the unit. Also check all cabling.

Symptoms, Possible Causes and Remedial Actions

Symptoms	Possible causes	Remedial actions
The AXIS 2130/2130R cannot be accessed from a browser.	The IP address is already being used by another device.	Run the PING utility (as described above) and follow the appropriate recommendations.
	The IP address is located on a different subnet.	Run the PING utility (as described in *PINGing Your IP Address,* on page 26). If you get "no response" or similar, the diagnosis is probably correct. In Windows, check that the IP address for your AXIS 2130/2130R is on the same subnet as your workstation. Exactly how this is done varies from one version of Windows to another. See Windows' help for more information. If your AXIS 2130/2130R and your workstation are on different subnets, you will not be able to set the IP address. Contact your network administrator.
	In Windows 95, the ARP table was empty when you tried to set the IP address.	In Windows 95, the ARP command cannot be used if you have an empty ARP table. If the table is empty, re-install the product ensuring that the IP address for your own PC is also used. Type `arp -a` to view the ARP table. If it is empty, you must ping an existing unit on your network before you can download the IP address to the AXIS 2130/2130R, using ARP. **Note:** The AXIS IP Installer is an easy-to-use alternative for installing the unit.
	The IP address has changed.	Check that there is no DHCP server running on the network and disable BOOTP in the admin tools (Network>TCP). Note: The AXIS IP Installer will not work with DHCP.
	Other networking problems.	Test the network cable by connecting it to some other network device and then PINGing that device from your workstation. Test the unit's network interface by connecting a local computer to the unit, using a standard *Crossover (hub-to-hub) Cable.*
	A programming script is locking the unit.	Restore the unit to the factory default settings.
The Power indicator is not constantly lit.	Faulty power supply.	Verify that you are using an Axis PS-D power supply.
The Network indicator displays red.	Faulty cabling.	See *Other networking problems,* above.
Your AXIS 2130/2130R works locally, but not externally.	Firewall protection.	Check the Internet firewall with your system administrator.
	Default routers required.	Check if you need to configure the default router settings.
	The Internet site is too heavily loaded.	Use a script running on your web server to relay images from the AXIS 2130/2130R to the Internet.

Symptoms	Possible causes	Remedial actions
Triggering difficulties with programming scripts.	Unable to trigger on both positive and negative transitions of the I/O ports (double-edged triggering).	Repetitive trigger conditions that occur in quick succession can be missed. This is because the command initiated by the first trigger event may not have been fully executed before the second event starts. This scenario is demonstrated in the illustration below: This feature has particular significance when using commands that take a relatively long time to process, e.g. mail or FTP, especially if they are transmitting a pre/post alarm buffer.
Bad snapshot images.	Display incorrectly configured on your workstation.	In Display Properties, configure your display to show at least 65000 colors, i.e. at least 16-bit. Using only 16 or 256 colors on your display will produce dithering artifacts in the image.

Note: If you still have a problem after reading this information, please contact your reseller or visit the Axis Support Web at www.axis.com/techsup/

Appendix C – Updating the Firmware

The AXIS 2130/2130R firmware is stored in Flash memory. This memory is provided by a silicon chip that, just like any other ROM device, retains data content even after power is removed. Flash memory is unique because it allows its data to be erased and re-written. This means you can install firmware updates for your AXIS 2130/2130R as they become available - without having to replace any parts. New firmware can be simply loaded into the AXIS 2130/2130R over the network.

Obtaining Updated firmware

The latest version of the AXIS 2130/2130R firmware is available free of charge from the Axis website at www.axis.com or from your local distributor.

Updating the firmware

The AXIS 2130/2130R Flash memory is updated over the network using FTP. See the detailed instructions supplied with each new firmware release.

Important!

- Always read the upgrade instructions available with each new release, before updating the firmware.
- Upgrading normally takes between 30 seconds and 10 minutes, although it can take longer. After starting the process, you should always wait at least 20 minutes before power-cycling the AXIS 2130/2130R - even if you suspect the procedure has failed.
- In controlled environments, flash memory updates provide a very safe way of updating the firmware. However, flash products can become damaged if the update is not performed correctly. Your dealer reserves the right to charge for any repair attributable to faulty updating by the user.

Appendix D – Customizing The Video Server

Modifying the File System

The Linux-based operating system and flash memory file system make it possible for advanced users and application developers to customize the AXIS 2130/2130R by adding additional files to the read-write area of the flash memory.

Important!

- Modification of the flash file system is NOT supported by Axis. In practice, this means that Axis will not answer questions relating to custom script or Web page development, but merely wishes to inform potential application developers of the possibilities afforded by the Linux-based file structure of the AXIS 2130/2130R.
- When attempting to modify the product, you may inadvertently create a problem that will require you to return the AXIS 2130/2130R to its factory default settings. At worst, you may even cause permanent damage to the unit that renders it unusable. Consequently, Axis strongly recommends that inexperienced users DO NOT modify the file system.

Although modification of the file system is not supported, the Axis web at www.axis.com does maintain various documents designed to assist third-party development, for example, the Axis Camera API, HTTP-Interface Specification.

Configuring using FTP

As an alternative to configuring the AXIS 2130/2130R using a browser, the configuration parameters of your unit can be modified using the File Transfer Protocol (FTP).

FTP is supported by most operating environments and is a useful method for quickly downloading standard pre-configurations to one or more units.

Custom Web Pages

The AXIS 2130/2130R contains a re-writable flash memory file system that allows some directories and files to be changed by the *root* user, using FTP. This strictly non-supported product functionality, makes it possible for advanced users and application developers to add their own Web pages, scripts, and other files to the Axis product.

Customizing Procedures

The existing Administration pages are stored in a compressed read-only area of the file system. If you intend to try changing them you must adhere strictly to the instructions provided here and ensure that you DO NOT inadvertently change any files other than those featured in this section. Failure to comply with this notice may render your product unusable.

All files stored in the `/etc/httpd/html` directory are available through the product Web server in the virtual directory `/local/`. The URL to resident pages in the `/etc/httpd/html` directory is `http://IP/local/<filename>.htm`.

Editing and Storing Your Web pages

Follow the instructions below to create and save customized pages to the AXIS 2130/2130R:

1. Using a html editor, create your html file and store it on your local PC hard drive.

2. Now use ftp to upload the file to the AXIS 2130/2130R. Enter the following on the command line:

    ```
    ftp <server ip address >
    ```

Example!

```
ftp 172.21.1.200
```

3. Log on as `root` with the root password `pass`.

4. Change to the correct directory within the AXIS 2130/2130R by entering the following command:

    ```
    cd /etc/httpd/html
    ```

5. For binary storage of the files (not absolutely necessary, but good practice), type `bin`.

6. Upload your html files by entering:

    ```
    put <filename.html>
    ```

7.   Start your browser and view the Web pages you uploaded, by entering the following URL in the location/Address field:

```
http://<server ip address>/local/<filename.html>
```

Example!

```
http://172.21.1.200/local/index.html
```

The images are now updated in your browser.

8.   Enter `bye` in the command window to exit the ftp program.

Note: You can change the html files as and when you like, but remember that the available flash memory is limited.

Creating a New Home Page

Having created and stored your new custom Web pages in product memory, you then proceed to assign one of these pages as your default Home page in the AXIS 2130/2130R, as described below:

Caution!

Adding a new Web page to your AXIS 2130/2130R is not something that should be undertaken lightly. Remember: Axis does not support the personalization of product Web pages and strongly recommends that inexperienced users <u>DO NOT</u> perform such modifications.

1. Start a new ftp session to the AXIS 2130/2130R, by entering:

```
ftp <camera ip address >
```

2. Type `bin`

3. Navigate your way to the appropriate directory, entering:

```
cd /etc/httpd/conf/
```

4. Fetch the `boa.conf` file, by typing:

```
get boa.conf
```

5. Edit `boa.conf` and add the following line to the end of the file:

```
Alias /index.html /etc/httpd/html/index.html
Alias / /etc/httpd/html
```

This will create an alias to your own "homemade" `index.html` file stored in the `/etc/httpd/html/` directory and redirect access to it. Replace the edited `boa.conf` in the video server, by using the `Put` command.

Note: As an alternative to the above, you might like to edit the line starting with `Document Root` so that it points directly to the local directory. However, after doing this you will then be unable to access the original Home pages - so be warned!

6. After making these changes, you will not be able to automatically access the default index page. Instead you must type in the complete URL to access it:

```
http://IP#/view/indexFrame.shtml
```

Appendix E – The I/O Terminal Block Connector

A 4-pole connector is provided for external I/O connections to the AXIS 2130/2130R. The connector provides the interface to a single output and a single input. A diagram for the connector, complete with a pinout table is provided below.

| Pins	Function
OUT A OUT B	The two external device output terminals (A and B) are automatically switched to the connected or disconnected postion - there is no distinction between + and -. The terminals use optocouplers and are electrically insulated from the other internal circuitry. The maximum load should not exceed 100mA and the maximum voltage should be no higher than 50V DC. **Note:** Connecting AC to the output will damage the unit.
IN+ IN -	The external device input terminals consist of a + terminal and a - teminal. The - terminal is grounded on the inside of the main unit. Interupts are generated by connecting cables to the terminals and shorting (ON) or breaking (OFF) the circuit. Sensors and switches should be connected to these terminals with electrically isolated GND and power supplies.

A
B
+
–
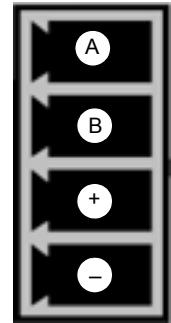
Input

Used for connecting external alarm devices and triggering images for specific alarm-based events, the input is typically connected to a motion detector - or any other external security device - for saving images on each occasion the detector is activated.

Output

The output can drive a maximum load of 50V DC at 100mA directly, and by connecting additional relay circuitry, it can drive even heavier loads. If the output is used with an external relay, a diode must be connected in parallel with the load for protection against any voltage transients.

Schematic Connection Diagram of the I/O Connector
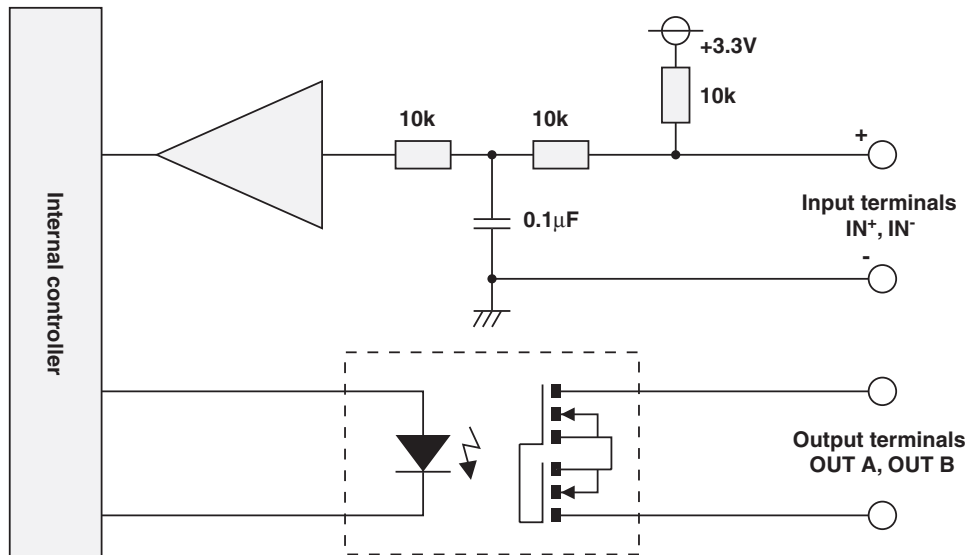
Controlling and Monitoring

By entering http requests in your browser's URL field, you can:

• drive the relay output high or low

• monitor the status of the digital input

This requires you to have root access to the AXIS 2130/2130R and consequently, to supply a user name and password. Login as *root* and supply the root password (default = *pass*).

Tip!

> Developers wishing to create applications incorporating sophisticated alarm conditioning using the relay output and digital input are encouraged to read the Camera API, HTTP-Interface Specification, available from the Axis Web at www.axis.com.

Relay Output

The relay output can be used to directly drive a maximum load of 50V DC at 100mA. By connecting additional relay circuitry, it can also drive heavier loads.

The output relay is controlled using http requests, as defined in the following examples:

Example 1: – Set output 1 ON

```
http://myserver/axis-cgi/io/output.cgi?action=1:/
```

Example 2: – Set two 300ms pulses with 500ms delay between the pulses on output 1.

```
http://myserver/axis-cgi/io/output.cgi?action=1:/300\500/300\
```

Example 3: – Wait 1 second before setting output 1 ON.

```
http://myserver/axis-cgi/io/output.cgi?action=1:1000/
```

Digital Input

The digital input is programmed using the **Application Wizard,** allowing the AXIS 2130/2130R to be configured for time and alarm-based image recording. For example, by connecting a motion detector to the digital input, it is a relatively simple procedure to send a single image (or video stream) to a remote imaging library each time the detector is activated.

Querying the Status of Digital Inputs

The status of the digital input can be queried in exactly the same way as the relay output. Simply enter the following URL to query the status of the digital input:

Example: – Monitor data on input port 1:

```
http://myserver/axis-cgi/io/input.cgi?check=1
```

The AXIS 2130/2130R then displays the status of the input, as follows:

```
Input 1 = 0
```

Appendix F – Technical Specifications

System Requirements

- Windows 98, Windows 2000, Windows XP, Windows NT, Windows ME, Linux, or UNIX.
- Microsoft Internet Explorer 4.x/5.x or Netscape 4.x

Network

- Supported protocols - 10baseT Ethernet or 100baseTX Fast Ethernet, TCP/IP, HTTP, FTP, SMTP, NTP, ARP, CHAP, MAP, DHCP, BOOTP
- Network connection - RJ-45 twisted pair cable

Camera

- Image sensor - 1/4 inch CCD photo-sensitive element
- Resolution (pixels) - 704x480
- Backlight Compensation, Automatic Gain Control (AGC), Automatic White Balance (AWB)
- Illumination range - min 6 lux

Image

- Compression - 5 user-controlled compression levels.
- Frame rate - Up to 30 frames/sec at 352x240 resolution, up to 12 frames/second at 704x480 resolution.
- Motion-JPEG and single snapshot JPEG images.
- Bandwidth - 30 frames/second typically requires approximately 1,5 Mbps. Bandwidth control available from admin tools.
- Time stamp and text overlay. Color control (B/W or color).

Pan/Tilt/Zoom

- Optical zoom - 16x
- Pan angle range AXIS 2130: 200° (+/-100°)
- Pan angle range AXIS 2130R: 340° (+/-170°)
- Tilt angle range AXIS 2130: 60° (+10°, -50°)
- Tilt angle range AXIS 2130R: 100° (+10°, -90°)
- 40 preset positions. Home Position Function.

Operating Environment

- Temperature: +40° to +125°F (0° to +40°C)
- Humidity: 20-80% RH non-condensing.
- Approved environmental housing required for outdoor use.

Hardware

- ARTPEC-1 compression chip
- ETRAX 100 LX, 32-bit RISC, 100 MIPS CPU
- 16MB RAM
- 4MB FLASH memory.

I/O

- 1 input and output on a single terminal connector.
- Event-triggered actions for remote image storage via FTP or e-mail (SMTP), pre/post alarm image storage.

Pre/Post Alarm Buffer

- Up to 4 MByte memory available for pre/post alarm image storage.

Power

- Power supply - 13V DC
- Power consumption - max 25W

Approvals – EMC

- FCC Class B (DoC)
- VCCI Class B
- AS/NZS3548 Class B (C-tick)
- EN55022/1994, EN50024/1998
- EN61000-3-2/1998
- EN61000-3-3/1995

Approvals – Safety

- EN60950, UL, CSA (Japan)

Dimensions & Weight

- Height – AXIS 2130: 4.2" (10.7cm), AXIS 2130R: 5.4" (13.7cm)
- Width – 4.4" (11.2cm) – both models
- Depth – 5.6" (14.3cm) – both models
- Weight – 1.41lb. (0.64 kg) – both models

Security
Multi-user password protection.

Management
Remote configuration and status using Web-based tools.

File Sizes
The AXIS 2130/2130R delivers the following file sizes:

AXIS 2130/2130R		
Resolution	File size (kb)	Max fps
704 x 480	7 - 150	10
352 x 240	1.4 - 40	30
176 x 112	0.3 - 10	30

All specifications are subject to change without prior notice.

Index