

Axis Camera Servers

The First Plug-and-Picture
Web Camera



U s e r ' s
M a n u a l

AXIS 240
Network Camera Server
User's Manual

Safety Notices

Please observe all safety markings and instructions when using this product.

Caution! - potential hazard that can damage the product.

Important - potential hazard that can seriously impair operation.

Do not proceed 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 out the laws in your country before using the AXIS 240 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 - This digital equipment fulfils 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 (Compliance is not valid for unshielded network and printer cables).



Liability

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Year 2000 Compliance

Axis Communications warrants that the AXIS 240 is Year 2000 compliant.

Trademark Acknowledgments

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AXIS 240 User's Manual

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Preface

Thank you for purchasing the AXIS 240 Network Camera Server. This product has been developed to connect your cameras anywhere in your network, allowing all users to take high quality snapshot pictures around the globe over Internet and intranet networks.

About This Manual

The manual provides introductory information as well as detailed instructions on how to set up and manage the AXIS 240 in various network environments. It is intended for everyone involved in installing and managing the AXIS 240. To fully benefit from the manual, you should be familiar with basic networking principles.

This manual applies to the AXIS 240, with software release 1.12.

About Axis

Axis Communications is dedicated to providing innovative solutions for network-connected computer peripherals. Since the start in 1984, Axis has been one of the fastest growing companies in the market and is now a leader in its field.

ThinServer™ Technology - Being the core of all Axis' products, the ThinServer™ technology enables them to act as intelligent file server independent ThinServer™ devices. A ThinServer™ device is a network server which includes "thin" embedded server software capable of simultaneous multiprotocol communication, scalable RISC hardware and a built-in Web server which allows easy access and management via any standard Web browser. The ThinServer™ technology makes it possible to connect any electronic device to the network, thus providing "Access to everything".

Today, Axis Communications is offering the ThinServer™ technology as well as six major ThinServer™ product lines consisting of:

Network Print Servers - offer you a powerful and cost-efficient method for sharing printer resources in your network. They connect to any standard printer, featuring high performance, simple management and easy upgrading across the network. The print servers are available in Ethernet, Fast Ethernet and Token Ring versions.

IBM Mainframe and S/3x - AS/400 Print Servers and Protocol Converters - includes a wide range of LAN, coax and twinax attached print servers for the IBM host environment. By emulating IBM devices, these servers provide conversion of the IPDS, SCS and 3270DS data streams to the major ASCII printer languages.

Network Attached Optical Media Servers - provide you with a flexible and cost-efficient solution for sharing CD-ROMs, DVD-ROMs and other optical media across the network. They are available in Ethernet, Fast Ethernet and Token Ring versions.

Network Attached Storage Servers - offer network connectivity for re-writable media such as hard disks and Iomega Jaz cartridges, which, via the storage server, can be backed up on DAT tapes. They are only available in Ethernet versions.

Network Camera Servers - provide live images using standard Internet technology, thus enabling access to live cameras via any standard Web browser. They offer a perfect solution for remote surveillance over the Internet and their sharp images can bring life into any web site. These servers support Ethernet as well as PSTN and GSM phone lines.

Network Scan Servers - enable easy distribution of paper-based information across workgroups and the enterprise. By sending the scanned documents to your destination via the Internet/intranet, you will reduce your faxing/mailing costs, as well as save time, thus improving your organization efficiency.

Support Services

Should you require any technical assistance, please contact your local dealer. If your questions cannot be answered immediately, your local dealer will forward your queries through the appropriate channels to ensure you a rapid response.

WWW:	http://www.axis.com
FTP server:	ftp://ftp.axis.com/pub/axis
Support e-mail address:	tech-sup@axis.com

If you are connected to Internet, you can find online manuals, technical support, firmware updates, application software, company information, on any of the addresses listed to the left.

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Section I Introduction

The AXIS 240 Camera Server

The AXIS 240 Camera Server connects video cameras to Ethernet networks. The AXIS 240 can service up to 4 coax/BNC cameras and one S-video camera.

With its built-in web server, it provides an easy and cost-effective solution for interactive surveillance and remote monitoring. Images can be captured and distributed over the local network or Internet using a standard Web browser.



Traditional surveillance systems often limit camera access to a specific monitor i.e. the control room. However, the AXIS 240 can be used for both industrial and security operations over a secure intranet system, or allow open access via the Internet. This means that you can monitor operations remotely from within the comfort of your own home, headquarters, or indeed from any workstation of your choosing that supports a Web browser.

Features and Benefits

- | | |
|-----------------------------------|--|
| Ease of Use | The AXIS 240 requires no additional software. Plug and picture - basically all you need to do is assign a valid IP address. |
| Cost-effective | Without involving unnecessary equipment such as expensive software or specific video cabling, the AXIS 240 provides a reliable and low cost resource for network imaging. |
| Operating Environments | <p>The AXIS 240 supports TCP/IP and Internet-related protocols. It can therefore be used in mixed operating system environments such as Windows, UNIX, Macintosh and OS/2.</p> <p>Using a standard Web browser, you can configure and manage the AXIS 240 directly from its own web pages. The AXIS 240 also supports FTP so that snapshots can be taken and saved remotely.</p> |
| Standard Image Format | The AXIS 240 generates high-quality pictures in standard JPEG format, which can be viewed using a standard Web browser. |
| Fast JPEG Compression | The AXIS 240 provides JPEG images directly, without the need for manual conversion between image formats. Its RISC-based hardware results in fast JPEG compression. A fullsize JPEG image is compressed in less than one second! |
| Wide Range of Applications | The AXIS 240 can be used for factory monitoring, industrial surveillance, visual security systems, image archiving etc. |
| Dial-up Connection | The Point to Point Protocol (PPP) support allows you to use your AXIS 240 remotely over a serial link, just as if it were located on your local network. By connecting the AXIS 240 to a modem, snapshot images can be downloaded to remote computers using standard modem equipment. |

- External Device Connection** The auxiliary inputs makes it possible to trig the AXIS 240 from external devices, e.g. IR-sensors, switches, alarm relays etc.

- Pan/Tilt Device Connection** Via an RS232 (or RS485 + converter) serial interface, you can combine the AXIS 240 with a Pan/Tilt device for automatically adjusting the camera orientation.

- Security** The AXIS 240 is a self-contained web server. This means that the camera server is secured like any other Internet host. The Network Administrator can decide whether individuals, groups, the whole company or the whole world may access your camera server. Normally this is done in the company's Internet firewall.

- Web Forum Discussions** Axis Communications will be running a web forum for ideas and suggestion notes for possible camera applications. Axis will also maintain a link collection where you can insert your own link to your application and keep lists of application notes, FAQs and other related information.

Section 2 Installing the AXIS 240

This section provides a brief description of the AXIS 240 connectors and indicators, and details the installation procedures.

Installation Summary

You install the AXIS 240 in these stages:

- Stage 1. Unpacking and Checking the Hardware
- Stage 2. Identifying the Connectors and Indicators
- Stage 3. Connecting the AXIS 240 to your Cameras
- Stage 4. Connecting the AXIS 240 to your Network
- Stage 5. Assigning an IP Address
- Stage 6. Verifying the Installation

Stage I. Unpacking and Checking the Hardware

Unpack and check all the items against the list below. Contact your dealer if anything is missing or damaged. All packing material is recyclable.

Hardware	Model Variants	Part Numbers
Camera Server	AXIS 240	0072-1
Power Supply	Europe	14233
	UK	14234
	Australia	14255
	USA	14253
	Japan	14254
Media	Title	Part Numbers
CD-ROM	AXIS Online CD	15926
Printed Materials	AXIS 240 Quick Installation Guide	15807
	Product Brochure	14412
	AXIS User Group Registration Leaflet	15119

AXIS Online CD

The AXIS Online CD provides an easy-to-use electronic catalogue, that includes all of the latest AXIS product software, utilities software, white papers, user documents, technical references etc. It can be used within all of the supported Axis computing environments.

Startup Procedures for Windows

The AXIS Online CD will autostart from a local CD drive on **Windows 95/98** and **NT** platforms. **Windows 3.1** users are required to navigate to the CD root directory and click on the `setup31.exe` file from within the Windows File Manager.

Startup Procedures for Macintosh, UNIX and OS/2

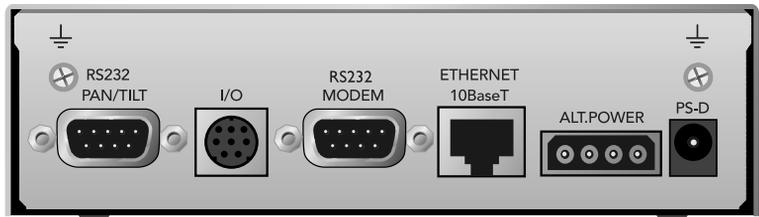
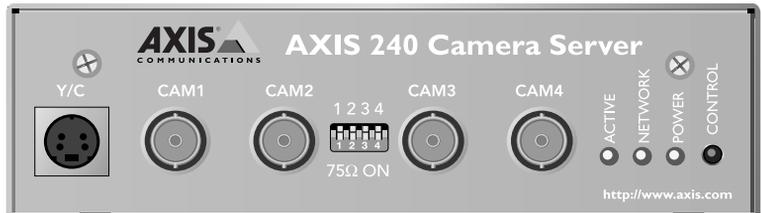
Navigate to the CD root directory and click on the `start.pdf` file from within your preferred file manager application.

- Note:** If the Adobe Acrobat Reader 3.0 is not installed on your system, locate and run the appropriate installer from the `tools/Acrobat/` folder. Refer to the `readme.txt` file for full pathname details.

HTML Interface You can access a Web browser interface to the contents of the AXIS Online CD by clicking the **HTML** button from within the main installation dialog. This interface allows Network Administrators to distribute the CD contents over intranet networks by simply broadcasting a URL reference.

Stage 2. Identifying the Connectors and Indicators

Read the following information to familiarize yourself with the AXIS 240, making particular note of where the connectors and indicators are located. This information provide a useful reference during the remaining stages of the installation.



Connectors

- Camera Inputs** The AXIS 240 is equipped with 4 CAM coax/BNC connectors and one S-video connector (Y/C). The inputs are autosensing for the video format used in the connected cameras, i.e. NTSC, PAL, Black/white 50Hz or Black/white 60Hz.
- Dip Switches** Each of the CAM coax inputs has a 75 ohm terminator resistor. Normally, the resistors are switched on with the corresponding dip switches down. If the AXIS 240 is connected in parallel with other equipment, you are recommended to turn off the resistors using the dip switches. Otherwise, the picture quality might be reduced.
- I/O** A Mini-DIN 8-pole external connector with four inputs for auxiliary connection to the AXIS 240. The functionality of this connector is fully discussed in *Appendix E - The Auxiliary IO Port*.
- Pan/Tilt Modem** Two 9 pin D-sub connectors provides RS232 serial connections, normally to a Pan/Tilt device and a modem. The connectors are discussed in detail in *Appendix F - The RS232 Serial Ports*.
- 10BaseT** 10BaseT (RJ-45) twisted pair Ethernet connector for connection to the network.
- Power** Jack socket (PS-D) for connection of AXIS 240 power supply. An alternative power connector is also provided.
- Caution!** The power supply delivered with your AXIS 240 is country specific. Please check that the type of power supply you are using is correct against the list on page 12.

Indicators

- Active** The Active indicator flashes on every occasion one of the connected cameras takes a snapshot.

- Power** The Power indicator is normally lit while power is applied. If it is not lit, or it flashes, there is problem with the AXIS 240 power supply.

- Network** The Network indicator flashes to indicate network activity.

Control Button

The Control button is used for multiple purposes, e.g. restoring the factory default settings, triggering CRON scripts. Refer to the appropriate sections of the manual.

Serial Number

The serial number is located on the underside label of the AXIS 240. Please note that the serial number of your AXIS 240 is identical to the Ethernet address of the unit.

Stage 3. Connecting the AXIS 240 to your Cameras

Connect the cameras to the AXIS 240 using the appropriate cables/connectors. The AXIS 240 can service up to 4 coax/BNC cameras and one S-video camera.

Optionally, you can connect a Pan/Tilt device to the RS232 Pan/Tilt port of the AXIS 240 for automated adjustment of the camera position. The AXIS 240 can control one Pan/Tilt device at a time, or several if they are daisy chained. Refer to the Pan/Tilt documentation on how to connect the cameras.

Stage 4. Connecting the AXIS 240 to your Network

To connect your AXIS 240 to the network, follow these steps:

1. Connect your AXIS 240 to the network using an Ethernet 10baseT connector.
2. Connect the power supply to the AXIS 240.
3. Check that the Power indicator is constantly lit.

Stage 5. Assigning an IP Address

To access the AXIS 240 from a Web browser, you must first assign and download a valid IP address.

Refer to *Section 3 - Assigning an IP Address* on how to do this.

Stage 6. Verifying the Installation

After assigning a valid IP address, you are now ready to test the connection between your AXIS 240 and the network.

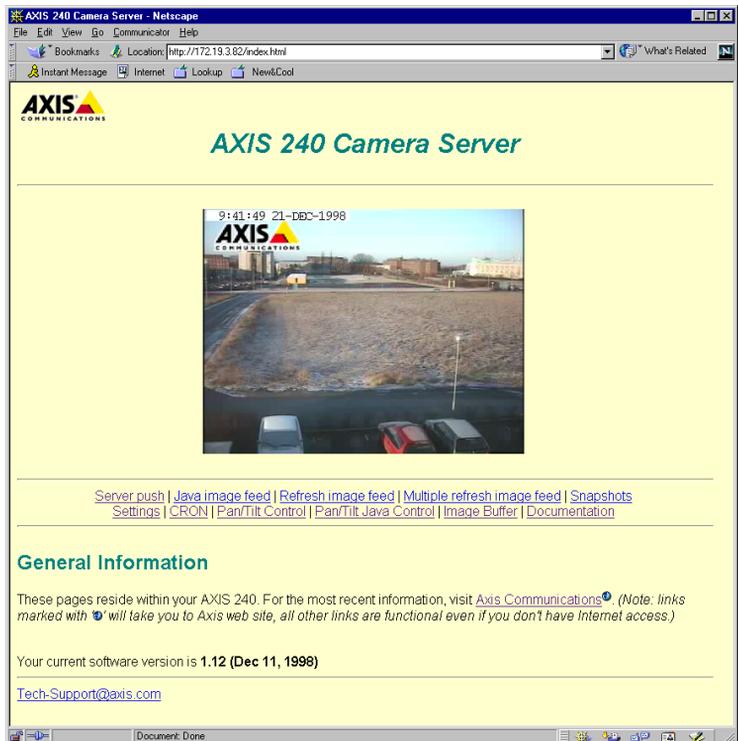
1. Start your Web browser and enter the name or IP address:

http://camserv/

or

http://172.16.253.80/

The Home Page of your AXIS 240 appears:



2. The camera ports are enabled by default. Click on the **Settings** link and then the **Video** button to display the Configuration - Video page. Select the default camera, and disable the unused camera ports.
3. If you are using a Pan/Tilt device, you must configure the AXIS 240 according to the description in *Appendix F - Setting Up the AXIS 240 for Pan/Tilt Connection*.

4. Return to the AXIS 240 Home Page. A picture just taken by the default camera will be displayed.
5. To obtain sharp pictures, adjust the focus of your cameras. Refer to the camera documentation on how to do this.
6. Test the results of your adjustments by taking some new pictures. To do this, simply reload your Web browser.

Note: If you are using Netscape Navigator, you can simultaneously monitor the changes by clicking on the **Server push** link. If you are using Internet Explorer, you must first download an ActiveX component from the AXIS 240 web site to enable automatic picture updating. Then click **ActiveX** from within the Server push page. The automatic updating functions are described in *Automatic Picture Updates*, on page 45.

7. If you have attached several cameras to your AXIS 240, click the **Pan/Tilt Control** link to display snapshots from all the cameras. Click on one of the images to the left to display it in the main window. If a camera is combined with a Pan/Tilt device, you can adjust its orientation using the control buttons. Note that the Pan/Tilt Control page can be protected by password. You specify the password on the Configuration - Pan/Tilt page.

The installation is complete and snapshots can now be included into your own video applications.

Note: Web pages are kept locally in your computer for fast browsing and in some instances your AXIS 240 may display a cached image as opposed to a newly taken snapshot. In these circumstances, simply click Refresh/Reload in your Web browser.

Section 3 Assigning an IP Address

To enable access to your AXIS 240, you must first assign it an appropriate IP address.

This section describes how to assign and download an IP address to your AXIS 240.

Downloading the IP Address

You can set the IP address of the AXIS 240 in three different ways, using either ARP, RARP or BOOTP. All methods are enabled by default. The main characteristics of each of these methods are described below:

- ARP** ARP is available in Windows 95/98, Windows NT, UNIX and OS/2. It requires the IP address for each new device to be downloaded individually. It is not appropriate to use this method over routers.
- RARP** RARP is available in UNIX. It downloads the IP address to each device automatically. It requires a RARP daemon on your system, and operates within a single network segment only.
- BOOTP** BOOTP is available in UNIX and is similar to RARP, although it can operate on the entire network. It requires a BOOTP daemon on your system. A request made to an active BOOTP or RARP daemon initiates a search of the Ethernet address table (RARP daemon), or boot table (BOOTP daemon) for an entry matching the unit's Ethernet address. If a matching entry is found, the daemon then downloads the IP address to the device.

Before you begin Make sure the AXIS 240 is powered up and attached to the network.

IP Address Acquire an unused IP address from your Network Administrator.

System Privileges You will require *root* privileges on your UNIX system and *administrator* privileges on the Windows NT servers.

Ethernet Address Depending on the method you are using, you will need to know the Ethernet address of your AXIS 240. The Ethernet address is based upon the serial number found on the underside label of the unit.

Important! Do **not** use the default or example IP address when installing your AXIS 240. Always consult your Network Administrator before assigning an IP address.

Mapping a Host Name to the IP Address If you are using host names, you can map a unique host name to the acquired IP address. Refer to your system manuals or to your Network Administrator for instructions on how to perform the name mapping on your particular system.

Note: If the host name has not been included in the system host table, you can still perform the following instructions on how to download the IP address. In this case, simply replace the host name entry with the IP address wherever required.

Procedures

Set the IP address using one of these methods, depending on your network environment:

Method	Network environments	See ...
AXIS IP Installer	Windows 95/98 & Windows NT	"Using the <i>AXIS IP Installer</i> " on page 22
ARP	Windows 95	"Using <i>ARP in Windows 95</i> " on page 23
	Windows 98 & Windows NT	"Using <i>ARP in Windows 98 and Windows NT</i> " on page 24
	UNIX, OS/2	"Using <i>ARP in UNIX and OS/2</i> " on page 25
RARP	UNIX	"Using <i>RARP in UNIX</i> " on page 26
BOOTP	UNIX	"Using <i>BOOTP in UNIX</i> " on page 27

Using the AXIS IP Installer

The AXIS IP Installer is a program that installs the camera server IP address for you. It also allows you to access the camera server home page via a Web browser. The program is available on the AXIS Online CD and on the Axis Web Site at <http://www.axis.com>

1. On the AXIS Online CD, click on the **Software** button.
2. Select the IP Installer and click **Install**. The **AXIS IP Installer - Setup** dialog is displayed on the screen.
3. Follow the instructions as they appear on the screen.
4. Click **Finish** to complete the setup.
5. Run the **AXIS IP Installer** from the **Start** menu. The **AXIS IP Installer** dialog is displayed on the screen.
6. Restart your camera server.
7. Select the serial number of your camera server in the list. The serial number is identical to the Ethernet address of the unit.
8. Enter the desired IP address. Click **Set IP address**. The IP address will now be set.
9. To access the home page of the camera server, click **Home page of selected Axis-server...** You can now configure the camera server according to your requirements.
10. Click **OK** to exit the program.

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

Using ARP in Windows 95 Follow these instruction to download the IP address and verify the communication.

Start a DOS window and type the following commands:

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

Example:

```
arp -s 192.16.253.80 00-40-8c-10-00-86 171.16.6.40  
ping 192.16.253.80
```

The host will return 'Reply from 172.16.253.80 ...' or some similar message. This indicates that the address has been set and the communication is established.

- Note:** When you execute the ping command for the first time, you will experience a significantly longer response time than usual.

Using ARP in
Windows 98 and
Windows NT

Perform the following commands to download the IP address and verify correct Internet communication:

1. Start a DOS window and type the following command:

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

2. Ping the unit as follows:

```
ping <IP address>
```

Example:

```
arp -s 192.168.3.191 00-40-8c-10-00-86  
ping 192.168.3.191
```

The host will return 'Reply from 192.168.3.191 ...' or some similar message. This indicates that the address has been set and the communication is established.

- Note:** When you execute the `ping` command for the first time, you will experience a significantly longer response time than usual.

Using ARP in UNIX and OS/2

Follow these steps to download the IP address and verify the communication:

1. Type the following command:

```
arp -s <host name> <Ethernet address> temp
```

2. Ping the unit as follows:

```
ping <host names>
```

Example:

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

The host will return 'camserv is alive', or some similar message to indicate that the address has been set and the communication is established.

- Notes:**
- Please note that when you execute the ping command for the first time, you may experience a significantly longer response time than is usual.
 - The arp -s command may vary from system to system. Some BSD-type systems expect the host name and Ethernet address in reverse order, whereas IBM AIX systems require the additional argument ether. For example:

```
arp -s ether <host name> 00:40:8c:10:00:86 temp
```

Using RARP in UNIX Follow these steps to use the RARP method in UNIX:

1. Append the following line to your Ethernet Address table. This is typically performed using the command `/etc/ethers:`

```
<Ethernet address> <host name>
```

Example:

```
00:40:8c:10:00:86 camserv
```

2. If necessary, update your host table and alias name databases as described required by your system.
3. If it is not already running, start the RARP daemon. This is typically done using the command `rarpd -a`.
4. Restart the AXIS 240 to download the IP address.

Using BOOTP in UNIX

Follow these steps to use the BOOTP method:

1. Append the following entry to your boot table. This is typically done using the command `/etc/bootptab:`

```
<host name>:ht=<hardware type>:vm=<vendor magic>:\
:ha=<hardware address>:ip=<IP address>:\
:sm=<subnet mask>:gw=<gateway field>
```

where:

ht = ether
vm = rfc1048
ha = The Ethernet address of the AXIS 240
ip = The IP address of the AXIS 240
sm = The subnet mask
gw = The default router address

Example:

```
camserv:ht=ether:vm=rfc1048:\
:ha=00408c100086:ip=192.168.3.191:\
:sm=255.255.255.0:gw=192.168.1.1
```

2. If necessary, update your host table and alias name databases as described required by your system.
3. If it is not already running, start the BOOTP daemon. This is typically done using the command `bootpd`.
4. Restart the AXIS 240 to download the IP address, default router address, and subnet mask.

Section 4 Configuring the AXIS 240

This section includes an overview of the AXIS 240 parameters.

You can configure the AXIS 240 via hyperlinks from within its own web pages from any standard Web browser. Alternatively, you can configure the AXIS 240 using FTP.

Refer to *Appendix B - The Parameter List* for a full listing of the configuration parameters.

- Note:** For the latest technical information, access the AXIS 240 web site at http://www.axis.com/products/cam_240/

Configuring using a Web browser

To configure the AXIS 240, enter the name or IP address into the location/address field of your Web browser:

```
http://camserv/
```

On the AXIS 240 Home Page, click on the **Settings** link to reach the Configuration pages.

The configuration parameters are grouped into these pages:

- Image
- Date & Time
- Security
- TCP/IP
- Modem
- Video
- Pan/Tilt
- Preset Position
- Viewing Angle

Note: When configuring the AXIS 240 for the first time, log on as user `root` and use the default password `pass`. You are recommended to change the root password, since all Axis products are shipped with the same password as default.

Image Page

You can specify the default image settings on the Configuration - Image page. Click **Image** at the top of the Configuration page.

Click **General** to set the Image parameters that applies to all connected cameras.

The buttons **Camera 1** to **Camera 5** each represent a camera connected to your AXIS 240. Click one of the buttons to configure the Image parameters for this particular camera. Select the cameras you want the settings to apply to by checking the appropriate buttons.

The following is a description of the Image parameters:

Parameter name	Description
Rotation	Presents snapshots with a varied degree of rotation: normal, upsidedown, 90 deg or 270 deg.
Mirror	With Mirror set to on, your snapshot images will be mirrored horizontally.
Color	With Color set to none, the AXIS 240 generates a black and white snapshot image.
Compression	Determines the compression factor for the resulting JPEG images: low, medium or high. Low compression produces an optimum picture quality, but generates larger snapshot file sizes.
Image Cache time	Determines for how long a snapshot file will remain in the internal memory before an access request causes a new file to be created. The valid range is 0 - 999 seconds. The default value is 0, and causes the AXIS 240 to generate a new snapshot file for each access.
Front panel LED	Enables the Active indicator on the front panel.

- Note:** If you use CGI parameters within a URL request, these will override any parameters defined within the Configuration - Image Page. You will find more information on the CGI parameters on page 59.

Date & Time Page

You can specify the current date and time via the Configuration - Date & Time page. Click **Date & Time** at the top of the Configuration page.

The following is a description of the Date & Time parameters:

Parameter name	Description
Date	The current date .
Time	The current time. The time must be specified in 24 hour format, e.g. 5 pm should be entered as 17 in the hour field.
Datesync Server	To activate the integrated date and time synchronization mechanism, you must provide the IP address of a date server, a synchronization period (in minutes) bigger than zero, the synchronization protocol and time zone adjustment. The date server provides the actual time and date when connected at TCP port 13 (Daytime protocol), TCP port 37 (Time protocol) or UDP port 123 (NTP protocol), respectively. The date and time will be automatically updated in intervals as specified by the synchronization period. Default values are 0.0.0.0, 0, Time and 0, respectively.
Datesync Period	
Datesync Protocol	
Datesync Time Zone	
Display Date/Time	When set to yes, a date and time stamp will be superimposed upon the snapshot image, displayed in the format Hour:Minute:Second Day-Month-Year.
Time format	Presents time in either of these formats: 24 hours or AM/PM.
Clock Position x	These settings determine where the date and time stamp will be placed within the snapshot. The stamp will always appear within the snapshot area, regardless of whether one or more of the co-ordinates are out of limit. If they are, the stamp will be displayed as close as possible to the furthest co-ordinate within the snapshot boundary.
Clock Position y	

Security Page

You can specify the configuration password for your AXIS 240 on the Configuration - Security page. Click **Security** at the top of the Configuration page.

The following is a description of the Security parameters:

Parameter name	Description
Root password	The password for the Administrator. When configuring the unit for the first time, log on as user <code>root</code> and use the default password <code>pass</code> . It is recommended that you change the root password later, since all Axis products are shipped with this password as default.
Username and passwords	By default, the AXIS 240 supports anonymous user access, which means that anybody on the Internet/intranet have access to the AXIS 240 snapshot files from a Web browser. Should you wish to restrict access to specific users, enter the user names and passwords of only those authorized users. If the anonymous user service is satisfactory to your system, simply do not add any users. Note: Only characters a - z, A - Z and 0 - 9 are valid.

TCP/IP Page

You can specify the Internet-related parameters on the Configuration - TCP/IP page. Click **TCP/IP** at the top of the Configuration page.

The following is a description of the TCP/IP parameters:

Parameter name	Description
IP Address	Defines the IP address of the AXIS 240.
Default Router	Defines the default router for the AXIS 240. By default the parameter is set to automatic router search.
Net Mask	Defines the subnet mask for the AXIS 240. Used for determining when the traffic should be sent via a router. The default 0.0.0.0 indicates automatic router sensing.
Primary DNS	The IP address of the primary DNS server. Used for identifying computers with names instead of IP addresses.
Secondary DNS	The IP address of the secondary DNS server. The secondary DNS server will be used in case the primary DNS server is unavailable or disconnected.
SMTP Mail Server	Name of the server that provides your e-mail facilities.
SMTP Return Address	The reply address for e-mails sent by the AXIS 240.
Enable BOOTP	Enables the BOOTP protocol for downloading the IP address.
Enable RARP	Enables the RARP protocol for downloading the IP address.

Modem Page

Should you wish to transfer snapshot and configuration data via a connecting modem, you must enable the serial link to the AXIS 240. You do this by specifying the settings on the Configuration - Modem page. Click **Modem** at the top of the Configuration page.

The following is a description of the Modem parameters:

Parameter name	Description
[Mode]	
Serial Mode	When set to Disabled, PPP or zmodem access is not allowed. When set to Full Support, serial mode is enabled for both incoming and outgoing modem connection. When set to Inbound only, the AXIS 240 answers incoming calls, but does not dial up. When set to Outbound only, the AXIS 240 dials up according to the behavior programmed in a CRON script, but does not answer incoming calls.
[Settings]	
Modem Type	Specifies the modem type: Autodetected Modem or Null Modem.
Detected Modem	Set internally by the AXIS 240.
Baud Rate	19200 or 38400 is recommended. When used with GSM/cellular phones, always set the Baud rate to 9600.
Flow Control	Specifies the modem server operation mode. Set to Hardware (RTS/CTS)
Modem Init String	String of setup commands to be sent to the modem. Used for non-US Robotics modems.
Busy Redial Attempts	The number of additional attempts the AXIS 240 will make in order to establish a connection in case the line is busy.
Link Quality	Determines the link quality in PPP. Enabled is default. Only disable when connecting your camera server to a Macintosh.

- Notes:**
- To ensure that the new configuration is activated within the AXIS 240, you must reset the unit after the serial mode has been enabled. To do this, remove and then re-insert the power connector. Alternatively, you can type the following command in your URL:

```
http://<camserv>/hardreset
```

where `camserv` is the name or IP address of your AXIS 240.

- Do not enable serial mode unless you intend to connect your AXIS 240 to a modem.

- ❑ Only disable Link Quality if you intend to connect your AXIS 240 to a Macintosh via a modem.

Refer to “*Setting Up the AXIS 240 Modem Server*” on page 92 for more information on how to connect the AXIS 240 to a modem.

Video Page

You can specify the video parameters on the Configuration - Video page. Click **Video** at the top of the Configuration page.

The following is a description of the Video parameters:

Parameter name	Description
Default Port	Defines the port for the default camera. The default camera is used e.g. for taking the snapshots displayed on the AXIS 240 Home Page.
CAM<n> Port	Enables the camera port on camera <n>.
Image Text, Position x y	Optionally specify a descriptive text to appear on the snapshots. Specify where the text should be placed on the snapshot.
Detect Video Modulation at startup	Enables automatic detection of video modulation at startup. Useful if you frequently change the connected cameras. Note: You can perform an instant detection of the video modulation by pressing the button at the bottom of the page.
Video Modulation	Specifies the video modulation used by each connected camera: PAL, NTSC, Black&White 50 or Black&White 60.

Pan/Tilt Page

You can specify the parameters for Pan/Tilt connection on the Configuration - Pan/Tilt page. Click **Pan/Tilt** at the top of the Configuration page.

The following is a description of the Pan/Tilt parameters:

Parameter name	Description
[Driver]	
Pan/Tilt Driver	Specify the driver for the attached Pan/Tilt device or enable input/output operation via the HTTP or TCP protocols.
[Settings]	
Canon	Specify the camera input source for the Canon device.
Sony	The Sony devices can connect up to three video cameras, if daisy chained. The cameras must be identified to the Pan/Tilt device with a camera ID 1 - 3.
Videmech	It is possible to connect up to five Videmech units to the AXIS 240, if connected via an RS485 adapter. For each camera that you intend to use, enable Pan/Tilt and specify an address 1-255. For each camera, you should also define the Special Videmech Settings, e.g. SafeMode, soft stops for end positions, zoom and focus etc.
Ernitec	It is possible to connect up to five Ernitec units to the AXIS 240, if connected via an RS485 adapter. For each camera that you intend to use, enable Pan/Tilt and specify an address 1-255.
Pelco Digital Coaxitron	It is possible to connect up to five Pelco Digital Coaxitron units to the AXIS 240, if connected via an RS485 adapter. For each camera that you intend to use, enable Pan/Tilt and specify an address 1-255.
TCP	Specify the TCP port number.
[Port]	
Baud Rate Data Bit Stop Bit Parity	If required, specify the Pan/Tilt port parameters.
[Protection]	
Protect page Password	Allows you to protect the Pan/Tilt Control Page with a password. The user will be prompted to enter the password when trying to access the page.

Preset Position Page

You can define up to 10 camera positions on the Configuration - Preset Position page. Click **Preset Position** at the top of the Configuration page.

The following is a description of the Preset Position parameters:

Parameter name	Description
Position	You can select an entry in the dropdown list. The AXIS 240 allows you to define 10 different camera positions. These positions can be used from the Pan/Tilt Control page for directing a camera to a predefined position.
New Name	Name for the selected position
Source	The camera input source. Note that the camera must be connected to a Pan/Tilt device.
Pan, Tilt	The desired pan and tilt value in degrees relative to the home position. The valid range depends on the connected Pan/Tilt device.
Zoom	The desired zoom value in the range 1-999, where 1 corresponds to wide and 999 corresponds to tele.

Note: The preset position can also be entered as a CGI parameter directly in your URL. See page 59 for more information.

Viewing Angle Page

You can define restrictions for the movements and zoom of your cameras on the Configuration - Viewing Angle page. Click **Viewing Angle** at the top of the Configuration page.

Check the **Disable Viewing Angles** box to disable the viewing angles for all connected camera sources.

The following is a description of the Viewing Angle parameters:

Parameter name	Description
Source	The camera input source.
Top, Bottom, Left, Right	Specify end positions for all the movement directions. These restrictions will assure that the swing of the camera will be kept within certain bounds. The values are specified in degrees and the valid range depends on the connected Pan/Tilt device. Click Get Current to retrieve the value of the current camera position. The values are specified in degrees and the valid range depends on the connected Pan/Tilt device.
Max Zoom, Min Zoom	Restrictions for the camera zoom. The valid range is 1-999, where 1 corresponds to wide and 999 corresponds to tele.

Zooming When zooming, you can continue moving the camera head within the defined viewing limits. This is because the view angle limits define the visual limits of an area and not the physical limits for the camera head.



The camera is panned to the its right view angle limit.



The camera is now zoomed.



The camera can now be moved to the right until stopped by the view angle limit.

Configuring using FTP

The configuration parameters of your AXIS 240 can be modified using the File Transfer Protocol (FTP). FTP is supported by most operating environments.

Modifying the Configuration File

Follow these instructions to modify the configuration file using FTP:

1. In a DOS or UNIX window, type `ftp camserv`, where `camserv` is the name or IP address of your AXIS 240.
2. Login using the user `root` and the root password. Default password is `pass`. You are highly recommended to change the root password, since all Axis products are shipped with this password as default.
3. *Windows 95 only:* Change directory not to overwrite any of your system files. See the caution note below.
4. Use the `get config` to access the configuration file.
5. Edit the `config` file using any text editor. In Windows 95/98 and Windows NT environments, you can for example use Notepad.

6. Once the editing is complete, save the file as `config`. Type `put config CONFIG` to save the configuration file permanently. Note that if the last uppercase `CONFIG` is omitted, the file will only be stored temporarily until the next time the product is powered off.
7. To exit FTP, type the command `quit`, `bye`, or `exit`.

Caution! Windows 95 has a directory called `config` that contains important system files. It is therefore important to change to another directory using the `cd` command before modifying your AXIS 240 configuration file from within a Windows 95 environment. Failure to do this may result in some of your system files to be overwritten.

Section 5 Using the AXIS 240

After installing the AXIS 240 and assigning it an appropriate IP address, you are ready to use it in your own video applications.

This section describes how to use the AXIS 240 effectively to realize its full potential, including:

- **Snapshots** - Taking snapshots of various formats and including them on your own web pages
- **Automatic picture updates** - Using the Server push, Java image feed and Refresh image feed functions
- **Pan/Tilt control** - Adjusting the camera orientation via the Web browser interface
- **External web sites** - Using snapshot files on the Internet
- **CRON script** - Triggering the AXIS 240 by time or input events
- **CGI parameters** - Defining special snapshot features and input/output operations within embedded URL requests
- **Point to Point Protocol (PPP)** - Accessing the AXIS 240 remotely over a serial link
- **Zmodem** - Downloading snapshot images to remote computers using standard modem equipment

Note: □ How to assign the IP address of your AXIS 240 is described in *Section 3 - Assigning an IP Address*.

Snapshots

Taking snapshots

For each snapshot taken, the AXIS 240 creates a JPEG file and stores it within its internal memory.

Home Page Snapshots

To produce a snapshot that is presented within the AXIS 240 Home Page, you simply enter the name or IP address of your AXIS 240 into the URL of your Web browser.

Example

```
http://172.16.253.80/
```

This causes the AXIS 240 to generate a fullsize JPEG image. Each time you reload the page, a new snapshot will be displayed within the AXIS 240 Home Page.

Clean Snapshots

To generate “clean” snapshots that are not embedded within the AXIS 240 Home Page, you must specify the preferred snapshot type for the target JPEG file within the URL of your Web browser. You can create snapshots in different file sizes, e.g. fullsize, halfsize etc.

Examples

```
http://172.16.253.80/fullsize.jpg
```

```
http://172.16.253.80/halfsize.jpg
```

Camera Specified Snapshots

From the **Snapshots** page it is possible to specify with which camera you want to take a snapshot. Select the camera you want to use from the **Camera** drop down list. Define the file size for the snapshot, e.g. fullsize, halfsize etc. by clicking on the corresponding button.

Snapshot Types

You can adjust the size and appearance of your AXIS 240 snapshots, ranging from small, highly compressed to large, high-quality images.

The file sizes depend on several factors. Low compression and large images result in larger files, but the images will be of better quality. Images with a lot of details will also generate larger files. As always on the web, the price for size and quality is time!

These snapshot types are available within the AXIS 240:

File name	Size in pixels (PAL)	Size in pixels (NTSC)	Description
fullsize.jpg	352 x 288 (30 kBytes)	320 x 240	The standard resolution. Hardware generated in 0.5 seconds.
halfsize.jpg	176 x 144 (15 kBytes)	160 x 112	Excellent for thumbnails. Hardware generated in 0.3 seconds.
lastshot.jpg	352 x 288 or 176 x 144	320 x 240 or 160 x 112	The last snapshot taken from any camera, either as 'fullsize' or 'halfsize' snapshot. Primarily intended for software applications for archiving a buffered image.
hugesize.jpg	704 x 576	640 x 480	The highest resolution snapshot available. As opposed to the 'fullsize' and 'halfsize' images, the 'hugesize' image is software generated which takes about 18 seconds.
zoom.jpg	352 x 288	320 x 240	A cutout from the center of 'hugesize'. It takes about 8 seconds to generate.

Including Snapshots in Web Pages

Follow these steps to integrate live snapshots into your own web pages:

1. Create your web page using your preferred HTML creation tool, i.e. an ordinary text editor or a dedicated HTML design application such as Microsoft Internet Assistant, Front Page or Adobe PageMill.
2. In your Web browser, enter the URL that defines the name or IP address of your AXIS 240 and the snapshot type that you wish to create. For example:

```
http://camserv/fullsize.jpg
```

3. Add an HTML reference to the snapshot within the target web page, as detailed below:

```
<HTML>
<HEAD>
<TITLE>Sample page</TITLE>
</HEAD>
<BODY>
<H1>Welcome to my camera server demo</H1>
<IMG ALT="Fullsize JPEG Image"
SRC="http://camserv/fullsize.jpg?camera=1"
WIDTH="320" HEIGHT="240">
</BODY>
</HTML>
```

Each time anyone visits this page, a new `fullsize.jpg` snapshot will be generated and displayed in the Web browser.

Automatic Picture Updates

The AXIS 240 supports five methods for automatic picture updates, namely:

- Server push
- Java image feed
- Pan/Tilt Java Control
- Refresh image feed
- Multiple refresh image feed

These are available from links on the AXIS 240 Home Page.

Server Push

The Server push function pushes new snapshots to your Web browser continuously.

The frame rate depends on how fast the AXIS 240 can deliver the snapshot data over the available network bandwidth. Therefore, you cannot adjust the frequency of the Server push snapshots within your Web browser.

In order to limit the memory overhead that this facility demands, a maximum number of 5 clients can simultaneously activate a Server push link to the same camera. Once this client threshold has been exceeded, a single snapshot image is produced for all additional clients that are trying to activate the link.

- Note:** The Server push function is currently supported by Netscape Navigator only. However, you can download an ActiveX component from the Axis camera server web site that will provide the same function.

Java Image Feed

This function is implemented within a Java applet, CamImg, that can be started from anywhere on the network. The refresh rate is programmable.

CamImg CamImg is an easy-to-use Java applet that continuously displays a set of images.

- Using CamImg**
1. Place the CamImg.class on the same server where your images are kept.
 2. Insert the following piece of code in your HTML file where you want the images to appear

```
<APPLET
CODEBASE="http://www.yoursite.com/classes/CamImg"
CODE="CamImg.class" WIDTH=362 HEIGHT=328>
  <PARAM NAME = "Image"
    VALUE = "/img/image1.jpg | /img/image2.jpg |
/img/image3.jpg">
  <PARAM NAME = "ImageLabel"
    VALUE = "First image | Second image | Third
image">
  <PARAM NAME = "Interval"
    VALUE = "5">
  <HR>
  If you were using a Java-enabled browser, you would
see a
  continuously updating image instead of this
paragraph.
  <HR>
</APPLET>
```

- Notes:**
- ❑ CODEBASE specifies the full URL where your copy of the CamImg applet is located. The applet must be on the same server where your images are kept.
 - ❑ The WIDTH and HEIGHT values specifies the size of the applet frame. To fit the images exactly in the frame without resizing, use these values:
 frame width = image width + 10 pixels
 frame height = image height + 10 pixels
 To add a status bar to the image, use these values:
 frame height = image height + 40 pixels

Parameters The CamImg parameters are optional. If a parameter is omitted, the default value will be used. Some of the parameters can be overridden at runtime. Click the **Options button under the image frame above for a demo.**

Note: If the "Image" parameter is omitted, the image file `fullsize.jpg` must be present in the same directory as the CamImg applet.

	Specifies a list of images to display. Multiple file names must be separated by vertical bars ' '. <i>Syntax:</i> <PARAM NAME="Image" VALUE="imgfile1 [imgfile2 ...]">
Image	Default value: "fullsize.jpg" Specifies a label for each image. Multiple labels must be separated by vertical bars ' '. <i>Syntax:</i> <PARAM NAME= "ImageLabel" VALUE="label1 [label2 ...]">
ImageLabel	Default value: The file names specified by the Image parameter.
	Specifies the background color of the applet frame. <i>Syntax:</i> <PARAM NAME= "bgcolor" VALUE= "#ffffff">
Bgcolor	Default value: "ffffce"
Image_Width	See page 43.
Image_Height	See page 43.
Interval	Default value: 10 sec.

Pan/Tilt Java Control

This function is implemented within a Java applet, CamCtrl, that can be started from anywhere on the network. The refresh rate is programmable.

CamCtrl CamCtrl is an easy-to-use Java applet that continuously displays and controls a set of images.

	Specifies a list of images to display. Multiple file names must be separated by vertical bars ' '. <i>Syntax:</i> <code><PARAM NAME="Image" VALUE="imgfile1 [imgfile2 ...]"></code>
Image	Default value: "fullsize.jpg"
	Specifies a label for each image. Multiple labels must be separated by vertical bars ' '. <i>Syntax:</i> <code><PARAM NAME= "ImageLabel" VALUE="label1 [label2 ...]"></code>
ImageLabel	Default value: The file names specified by the Image parameter.
	Specifies the background color of the applet frame. <i>Syntax:</i> <code><PARAM NAME= "bgcolor" VALUE= "#ffffff"></code>
Bgcolor	Default value: "ffffce"
	Specifies the camera connected to the network. If not listed, the camera default will be used. <i>Syntax:</i> <code><PARAM NAME= "camera" VALUE= "1"></code>
Camera	
Image_Width	See page 43.
Image_Height	See page 43.

Refresh Image Feed

This function instructs your Web browser to collect a new snapshot at an adjustable rate. It is supported by most standard Web browsers.

Multiple Refresh Image Feed

This function instructs your Web browser to collect new snapshots at every 15 seconds from the cameras connected to your AXIS 240. It is supported by most standard Web browsers.

Note: To terminate the automatic picture updating, you can click **Stop** or enter another URL in the location/address field.

Pan/Tilt Control

If you are using a Pan/Tilt device, the AXIS 240 web interface allows you to adjust the orientation of the connected cameras remotely.

Follow these steps:

1. On the AXIS 240 Home Page, click **Pan/Tilt Control**.
2. To the left, thumbnail images of the enabled cameras are displayed. Click on the camera you want to adjust.
3. The image will be displayed to the right. Optionally click **Start server push** to obtain automatic picture updating, or **Update picture** to generate a new snapshot.

Canon, Sony

Click in the image or on the position bars to move the camera to the desired position. The indications on the position bars correspond to absolute camera positions. This means that if you click on the left arrow, the camera pans to its left view angle limits. Click **Home H** to move the camera to its home position, which is defined by the Pan/Tilt device.



Videmech

Click on the position bars to move the camera to the desired position. The position bars corresponds to absolute camera positions. This means that if you click on the left arrow, the camera pans to its left view angle limit. Click **Home H** to move the camera to its home position, which is located between the view angle limits.

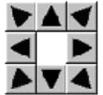


Adjust the zoom and focus settings by clicking on the zoom and focus bars, respectively.

- Note:** The soft stops for movement, focus and zoom are specified on the Configuration Pan/Tilt - Special Videmech Settings page.

Ernitec

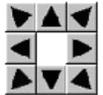
Click on the arrows to move the camera step by step in the preferred direction. The adjustments are relative to the current camera position. This means that each time you click on the left arrow, the camera will pan one step to the left regardless of its current position.



To adjust the camera zoom, click **Wide** or **Tele** respectively.

**Pelco Digital
Coaxitron**

Click on the arrows to perform a rough adjustment of the camera position in the preferred direction. The adjustments are relative to the current camera position. This means that each time you click on the left arrow, the camera will pan one step to the left regardless of its current position. If you wish to perform a more accurate adjustment of the camera position, click inside the actual picture. The further away you click from the center of the picture, the further you move the camera position.



To adjust the camera zoom, click **Wide** or **Tele** respectively.



- Notes:**
- Optionally the Pan/Tilt control page can be protected by a password. On the AXIS 240 Home Page, click **Settings**, **Pan/Tilt** and then **Protection** to set the password.
 - Refer to “*Setting Up the AXIS 240 for Pan/Tilt Connection*” on page 100 on how to configure the AXIS 240 for Pan/Tilt control.
 - The Pan/Tilt control page cannot be used with the HTTP and TCP drivers.

External Web Sites

When using the AXIS 240 over the Internet, we recommend that it is accessed over an assisting web server and not directly. This is because the AXIS 240 has limited capacity for handling the extra amount of buffering that might be required.

- Note:** You can use the CRON script facility to collect snapshots periodically. See “*CRON Script*” on page 51.

If your web site does not have heavy traffic, it is possible to use the URL directly to the AXIS 240. However, this has three main drawbacks:

- Your AXIS 240 may be located on the other side of a firewall.
- The AXIS 240 cannot handle more than 5 simultaneous requests.
- Generating large files, such as the `hugesize.jpg`, is very time consuming. If used with a CRON script, the delay will not be noticed.

CRON Script

Axis has developed an extended CRON service to facilitate periodic command execution within the AXIS 240. In practice, the CRON service allows you to program event and/or time triggered functions within the AXIS 240.

Script Format

A CRON script can include one or several entries. Each entry is composed of the following elements:

- Comment(s)
- A trigger condition
- Command(s)
- An entry termination character %

A typical CRON script construction is detailed below:

```
# <comment>   (first entry)
  <trigger condition> :
    <command 1> ;
    <command 2> ;
    .
    .
    <command n> ;

%
# <comment>   (second entry)
  <trigger condition> :
    <command 1> ;
    <command 2> ;
    .
    .
    <command n> ;

%
# <comment>   (...nth entry)
  <trigger condition> :
    <command 1> ;
    <command 2> ;
    .
    .
    <command n> ;

%
```

CRON script syntax

Comments

It is good programming practice to start each new entry with a comment to describe its function. Comments are optional, but must be preceded by a # character, as detailed below:

```
# <comment>
```

Example:

```
# This cron entry will...
```

Trigger Condition

The commands contained within each specific entry are triggered by a defined trigger condition. The trigger condition is specified by six separate fields and must be terminated with a colon “:”.

```
<Minute> <Hour> <Day> <Month> <Day of the week>
<Input and Boot (optional)> :
```

**Time and Date
Event Fields**

The first five fields specify the time and date events, i.e. Minute, Hour, Day, Month and Day of the week. Note that the CRON script uses the 24 hr clock.

The syntax for each field within a trigger condition is governed by the following rules:

- Each time and date field can contain several numerical event variables that are delimited by commas and hyphens.
- Each field is delimited by an open space.
- An asterisk (*) represents the full range of event variables within the relative time and date field, i.e. ***** means every minute, every hour, every day, every month, every day of the week.
- Numerical event variables separated by a hyphen indicates an inclusive range, i.e. 2-6 = 2 to 6.

Example:

Trigger every month, between the fourth and eighth at 10.03, 12.03 and 14.03:

```
3 10,12,14 4-8 * * :
```

Input and Boot Field The sixth field consists of a character array. It is optional and defines the input and boot trigger functions.

You can program the AXIS 240 to trigger at startup or on the logical states present on the Control button and digital input ports, using the trigger variables `BOOT`, `B`, `I1`, `I2`, `I3` and `I4` respectively. The `B`, `I1`, `I2`, `I3` and `I4` trigger variables must be preceded by an activate condition, `/`, `\`, `0` or `1`, to indicate when the trigger variable is activated.

This table outlines the available trigger variables and their possible combinations:

Trigger Variable	Description
<code>BOOT</code>	Activate at startup.
<code>\B</code>	Activate after high-low logical transition of Control button.
<code>/B</code>	Activate after low-high logical transition of Control button.
<code>1B</code>	Activate when Control button is logically high (pressed).
<code>0B</code>	Activate when Control button is logically low (released).
<code>\I1</code>	Activate after high-low logical transition on Input port 1.
<code>/I2</code>	Activate after low-high logical transition on Input port 2.
<code>1I3</code>	Activate when Input port 3 is logically high.
<code>0I4</code>	Activate when Input port 4 is logically low.
... etc.	

Note: The AXIS 240 polls the input ports every 0.2 seconds. Thus, more rapid logical transitions will not be detected.

By combining the trigger variables using the logical AND function, `&`, you can develop complex triggering mechanisms.

Example 1

Activate on Control button transition from high to low and Input port 1 high.

```
\B&1I1
```

Example 2

Activate on Input port 2 low and Input port 4 high.

```
0I2&1I4
```

Triggering Fields Summary

This table summarizes the valid values of the triggering event fields:

Field #	Time and Date Fields					Input and Boot Field (Optional)
	1	2	3	4	5	6
Description	Minute	Hour	Day	Month	Day of the Week	Conditional Tag
Valid values	0-59	0-23	1-31	1-12	0-6 0 = Sunday	BOOT B I1, I2, I3, I4

Commands

Several CRON script commands can be used within each entry. All commands must be terminated with a semicolon “;”.

This table lists the available commands:

Command	Description
alert	Sends a small message to a remote host.
buffer_init	Initiates an image buffer.
buffer_start	Stores snapshots in the image buffer.
buffer_stop	Ends the storing of snapshots in the image buffer.
ftp	Transfers an image to a remote host using FTP.
log	Writes a message to the camera server log file
mail	Sends an e-mail using SMTP.
offline	Terminates the current PPP connection.
online	Dials up a modem for PPP connection.
ptz	Pans, tilts and zooms connected video cameras.
reset	Resets the software or hardware of the unit.
sleep	Makes a pause in the CRON script execution.
snapshot	Updates the last snapshot image.

- Notes:** Refer to the *Appendix H - CRON Script Command Reference* for a description of the syntax of the commands.

- ❑ Although the downloaded entries are executed in parallel, the commands included within each entry are executed sequentially, i.e. the second command is not executed until the first is finished.

Editing a CRON Script

From the AXIS 240 Home Page, click **CRON** to access an online editor for generating a CRON script. The new CRON script will then be automatically downloaded to the AXIS 240.

Alternatively, you can use a standard text editor and download the CRON script file via FTP. See “*Downloading the CRON Script via FTP*” on page 58.

- Notes:**
- ❑ If the camera number is not explicitly specified in a command, the CRON script will apply to the camera defined as the default camera.
 - ❑ Only one CRON script can be resident within the AXIS 240 at a time. Once a new script is installed, the active entries contained in a previously downloaded CRON script will be stopped and automatically erased from memory.
 - ❑ An erroneous CRON file will not be accepted by the AXIS 240 and consequently will not erase a previously loaded script.

Example:

```
# This is an example of a CRON script:

# Once a day I want my mother to receive an e-mail
# containing the lastshot.jpg image.
0 0 * * * * :
mail -s "Hi mom! Look what my little camera has taken
for you." -a lastshot.jpg -t mother@some.site;
%

# This, the second entry will store a fullsize image
# using ftp on the ftp server an.ftp.site in
# /home/snapshots when input 1 goes high.
* * * * * /11 :
ftp -host an.ftp.site -user aUser -pass aPass -src
fullsize.jpg -dest home/snapshots;
%

# This, the third entry will dial up an ISP and store
# an image on the ftp server an.ftp.site every
# hour. It will then disconnect.
0 * * * * :
online -dial aNumber -user aUser -pass aPass;
ftp -host an.ftp.site -user aUser -pass aPass -src
fullsize.jpg -dest home/snapshots;
offline;
%
```

Downloading the CRON Script via FTP

Follow these steps to download a CRON script file, e.g. `cron.txt`, to the AXIS 240 via FTP:

1. Start an FTP session using the command
`ftp <camserv>`
2. You will be prompted for user name and password. By default, these are `root` and `pass`.
3. Change to binary mode using the command
`bin`
4. Download the script using the command
`put cron.txt cronscript`

FTP will indicate “File transfer complete” or similar when the file transfer is complete. The CRON script becomes active within one minute after it has been downloaded to the AXIS 240.

Example:

```
C:\Temp>ftp 171.16.3.30
Connected to 171.16.3.30.
220 AXIS 240 Jun 6 1998 ready.
User (171.16.3.30:(none)): root
331 User name ok, need password
Password:
230 Root user logged in
ftp> bin
200 TYPE set to I.
ftp> put cron.txt cronscript
200 PORT command successful.
150 Opening data connection for cronscript
(171,16,4,70,4,6), (mode binary).
226- Compilation OK
    Events initiated
226 File transfer complete
112 bytes sent in 0.00 seconds (112000.00 Kbytes/sec)
ftp> quit
221 Goodbye.
```

FTP session downloading a CRON script

Common Gateway Interface (CGI) parameters

The Common Gateway Interface (CGI) is a standard for interfacing external applications with information servers, such as HTTP or Web servers.

A CGI program within the AXIS 240 allows you to define special snapshot features within an embedded URL request. You generate these requests in the form of query strings appended to the URL of the AXIS 240.

You can also use CGI parameters for simple HTTP input/output operations on the Pan/Tilt port.

CGI Parameters for Snapshot Requests

For snapshot requests, use this syntax:

```
http://<cameraname>/<imagefile>?cgi-bin/control?
<parameter>=<value>[&<parameter>=<value>...]
```

This table lists the CGI parameters for snapshot requests:

Parameter/Syntax	Description	Values
camera=<n>	Selects the source for generating snapshots. If omitted, the default camera is used.	1/2/3/4/5
compression=<value>	Adjusts the image quality and file size.	medium/high/low
color=<value>	Selects color or grayscale.	normal/none
axislogo=<value>	Shows/hides the Axis logotype.	off/on
clock=<value>	Shows/hides the time stamp.	off/on
rotation=<value>	Rotates the image.	normal/upsidedown/90deg/270deg
mirror=<value>	Mirrors the image horizontally.	off/on

Cropping/ top=<value> &left=<value> &width=<value> &height=<value>	Crops a 'hugesize' type image.	Parameter values expressed in number of pixels and truncated to multiples of 8 (e.g. 45 is truncated to 40). Top+height must not exceed the 'hugesize' height (i.e. 576 for PAL, 480 for NTSC). Left+width must not exceed the 'hugesize' width. (i.e. 704 for PAL, 640 for NTSC)
move=<x>	Moves the Pan/Tilt device 5 degrees in the specified direction.	up/down/left/right/home
pan=<n>	Pans the Pan/Tilt device <n> degrees relative to the home position.	-180 ... 180
tilt=<n>	Tilts the Pan/Tilt device <n> degrees relative to the home position.	-180 ... 180
rpan=<n>	Pans the Pan/Tilt device <n> degrees relative to the current position.	-180 ... 180
rtilt=<n>	Tilts the Pan/Tilt device <n> degrees relative to the current position.	-180 ... 180
zoom=<n>	Adjusts the camera zoom to the specified angle.	1 ... 999 where 1 is full zoom out

- Notes:**
- ❑ CGI parameters embedded in URL requests temporarily override the image parameters previously established within the Configuration - Image page.
 - ❑ The CGI parameters that adjust the camera position are only applicable when using one of the supported Pan/Tilt devices. Refer to the Pan/Tilt documentation on how to define the camera home position.

Example 1

Request a fullsize JPEG snapshot from the default camera connected to the AXIS 240 `camserv` that contains a clock reference and is rotated 270 degrees:

```
http://camserv/fullsize.jpg?clock=on&rotation=270deg
```

Example 2

Request a highly compressed hugesize JPEG snapshot from the camera connected to CAM2 on `camserv`:

```
http://camserv/hugesize.jpg?camera=2&compression=high
```

Example 3

Move the camera connected to CAM3 on `camserv` 45 degrees to the right:

```
http://camserv/fullsize.jpg?camera=3&pan=45
```

CGI Parameters for Input/Output Operations

For HTTP input/output operations on the Pan/Tilt port, use this syntax:

```
http://<cameraname>/cgi-bin/control?<parameter>=<value>[&<parameter>=<value>...]
```

This table lists the CGI parameters for input/output operations

Parameter/Syntax	Description	Values
<code>dataout=<string></code>	Writes the specified data string to the Pan/Tilt serial port. Maximum 128 bytes.	Hexadecimal coded bytes {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, a, b, c, d, e, f}
<code>read=<n></code>	Reads the specified number of bytes from the Pan/Tilt port. The returned value will be hexadecimal coded and placed between #s, e.g. #3A#.	1 ... 128
<code>wait=<n></code>	Waits the specified number of seconds before reading from the Pan/Tilt port. Used together with the "read" parameter.	1 ... 9

flush=<value>	Empties the input buffer for the Pan/Tilt port. Always performed first when combined with other parameters.	yes/no
---------------	---	--------

Example 1

Write the data stream 430001FF to the Pan/Tilt port:

```
http://camserv/cgi-bin/control?dataout=430001FF
```

Example 2

Clears the input buffer, writes the data string 2B004C4C4F to the Pan/Tilt port and waits 5 seconds for a reply. The AXIS 240 will return a value to the Web browser:

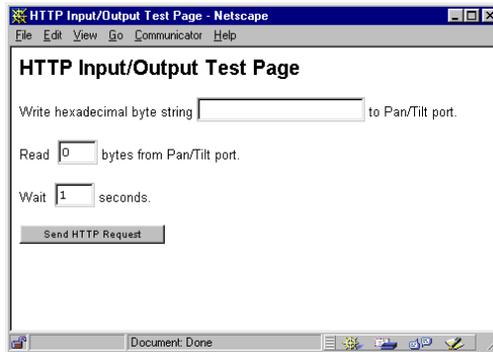
```
http://camserv/cgi-bin/control?flush=yes
&dataout=2B004C4C4F&wait=5&read=20
```

Example 3

An HTML page for reading and writing to the Pan/Tilt port:

```
<HTML>
<HEAD>
<TITLE>HTTP Input/Output Test Page</TITLE>
</HEAD>
<BODY>
<H2>HTTP Input/Output Test Page</H2>
<FORM ACTION="http://camserv/cgi-bin/control"
method=post>Write hexadecimal byte string&nbsp;
<input type=text size=20 maxsize=19 name="dataout">
to Pan/Tilt port.
<P>Read &nbsp;<input type=text name=read value="0"
size=4> bytes from Pan/Tilt port.
<P>Wait &nbsp;<input type=text name=wait value="1"
size=4> seconds.
<P><input type=submit name="Send" value="Send HTTP
Request"></FORM>
</BODY>
</HTML>
```

In a Web browser, the page will look like this:



- Note:** To enable input/output operations using HTTP, the AXIS 240 must be configured properly. See “*Setting Up the AXIS 240 for Pan/Tilt Connection*” on page 100.

CGI Parameters for Preset Positions

For preset position requests, use this syntax:

```
http://<cameraname>/<imagefile>?cgi-bin/control?
presetposname=<position name>
```

It is also possible to use an index number instead of the preset position name:

```
http://<cameraname>/<imagefile>?cgi-bin/control?
presetposno=<1-10>
```

- Note:** It may take a few seconds for the camera to adjust itself to the new position but the snapshot is taken immediately. Therefore you need to update the snapshot in the application after a while.

Point to Point Protocol (PPP)

The AXIS 240 supports the Point to Point Protocol (PPP) which is a mechanism for creating and running the Internet Protocol and other network protocols over a serial link. This can be either:

- A direct serial connection that uses a null-modem cable, or
- A connection established using modems and telephone lines (including digital lines such as ISDN).

PPP can transport any IP based protocol and allows the AXIS 240 to be remotely accessed almost as if it were directly connected to the network. However, the major difference between PPP and an Ethernet connection is of course speed. A standard Ethernet connection operates at 10 Mbps (maximum theoretical throughput), whereas an analog modem only operates at speeds up to 56 kbps.

PPP Setup for Windows 95/98

Follow these instructions to configure PPP from a Windows 95/98 host:

1. Connect the remote modem to the serial port of the AXIS 240 (US Robotics modem recommended).
2. From the Windows desktop, double click on the **My Computer** icon and then open **Dial-Up Networking**.
3. Double-click **Make New Connection**. From within this dialog, define a name that describes the connection you are creating in the 'Type name for the computer you are using' field. Select a local modem from the displayed modem list.
4. Click **Configure...** to enter the modem Properties page. Accept all default settings but ensure that modem speed is compatible with your modem and does not exceed 38,400 bps, which is the maximum serial port speed for the AXIS 240.
5. Click the **Connection** tab and then click the **Advanced** button. Check 'Use flow control' and select Hardware (RTS/CTS). Click **OK** to return to the 'Make new connection' dialog.

6. Enter the relevant phone number information for the remote modem connected to your AXIS 240. Click **Next**.
7. Click **Finish**. The system then proceeds to build the Driver information database and your connection dialog will then subsequently appear in the Dial-Up Networking dialog.

**Accessing the Remote
AXIS 240**

Follow this procedure to dial out to a remote AXIS 240:

1. Double click on the newly created icon to establish a modem connection for your remote AXIS 240.
2. Enter your user name and password and then click **Connect**. The status dialogs "Dialing" and "Logging onto the network" are presented prior to the display of a Connected to <name> dialog that will confirm a successful connection.

You can now access the AXIS 240 by entering the IP address (URL) of your camera into the location field of your Web browser. Please ensure that you are not using a proxy server (Netscape: Options menu\Select Network\Proxies).

PPP Setup for Linux

Follow these instructions to connect a Linux host to the AXIS 240 to your network using PPP:

1. Create a file using the following commands:

```
ABORT BUSY ABORT 'NO CARRIER' '' ATDT<phone  
number> CONNECT
```

2. Save the file as `.DIAL_240` within root home directory. This script dials out to <phone number> and then waits for a connection before proceeding to the PPP negotiation phase.

3. To open the connection, enter:

```
pppd connect '/usr/sbin/chat -f DIAL_240' 115200
/dev/modem

or

pppd connect '/usr/sbin/chat -f DIAL_240'
:192.168.3.219 115200 /dev/modem
```

The latter variation on this command causes the AXIS 240 to temporarily have the IP address 192.168.3.219. If an address is not specified, as displayed in first form of this command, the unit will then use its default address that was previously assigned using `arp`.

Please note that you will probably have to be `root` user to establish the connection. The modem will try to connect and the PPP process will then fork off into the background. A shell prompt will be returned immediately. You may suppress this behavior by giving the switch `-detach`.

4. After approximately 20 seconds, the connection should be ready for service. You should then try pinging the AXIS 240, and make sure that it is online. The ping response times should be similar to those below:

```
64 bytes from 192.168.3.219: icmp_seq=0 ttl=15
time=197.0 ms

64 bytes from 192.168.3.219: icmp_seq=1 ttl=15
time=180.0 ms
```

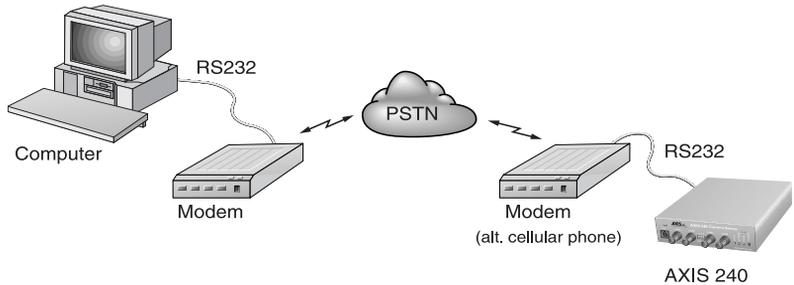
5. Type the following to terminate the connection:

```
kill -TERM `cat /var/run/ppp0.pid`
```

Zmodem

Modem Connection

By connecting the AXIS 240 to a modem, it is possible to download snapshot images to remote computers using standard modem equipment.



Snapshot data and configuration data can be transferred over the serial link using the zmodem protocol. This protocol is supported by most UNIX and PC/Mac communications packages.

File Transfer

To initiate a file transfer, type the `sz` command followed by the filename of file you wish to transfer, as follows:

```
sz fullsize.jpg
```

Many communication packages allow automatic download of snapshot files, i.e. the program will detect the file transfer starting, and then proceed to take care of it. However, should your communications package not support this, you will need to manually select 'receive zmodem' (or similar) from within the program.

The successfully transferred snapshot file is in JPEG compressed image format, i.e. the downloaded file is an identical copy of a snapshot representation held within your AXIS 240 file system.

- Notes:**
- ❑ Before files can be transferred from your AXIS 240, the host and remote modems must be configured correctly. Refer to *Appendix E - The Auxiliary IO Port* for further details.
 - ❑ A typical zmodem session is displayed on page 99.

Appendix A Troubleshooting

This appendix provides useful information to help you resolve any difficulty you might have with your AXIS 240.

Symptoms, possible causes and remedial actions are listed within a reference table.

The Log File

The AXIS 240 log file records commands executed within the unit and can prove a useful diagnostic tool when attempting to resolve any problems that might occur.

If you cannot resolve your problem after referencing the information contained in this appendix or on the AXIS 240 FAQ, we suggest that you send the following to the AXIS support desk:

- A brief description of the problem
- The log file
- The config file
- If relevant, an example of a poor image

See “*Support Services*” on page 4 on how to contact your local support center.

Obtaining the File

To obtain a copy of the log file, simply type the following command into the URL of your Web browser:

```
http://<camserv>/log/messages
```

Examining the File

The file can be examined directly using any text editor and would typically contain information as detailed below:

```
Wed Nov 5 15:12:18 Info: BOOT
Wed Nov 5 15:12:36 Warning: Modem failed to
acknowledge hangup.
Wed Nov 5 15:12:48 Warning: Modem not responding
at 9600 BPS.
Wed Nov 5 15:12:56 Warning: Modem failed to
acknowledge hangup.
Wed Nov 5 15:13:01 Info: Modem ready for incoming
calls.
Wed Nov 5 15:13:16 Info: SMTPC.exec, trying to
connect to (193.13.178.2)
Wed Nov 5 15:13:24 Info: SMTPC.exec, mail sent
Wed Nov 5 15:13:34 Error: FTPC.exec, failed to
put
"tmp/fullsize151320.jpg", (def)
```

Typical AXIS 240 Log File

Symptoms, Possible Causes and Remedial Actions

Symptoms	Possible causes	Remedial actions
The AXIS 240 cannot be accessed from a Web browser.	The IP address is already used by another device.	<p>To check that the IP address for your AXIS 240 is unique:</p> <ol style="list-style-type: none"> 1. Start a DOS window. 2. Type <code>ping x.x.x.x</code>, where x.x.x.x is the IP address of the AXIS 240. <p>The reply subsequently returned will provide an explanation as to the cause of the problem. The possible replies can be interpreted as follows:</p> <p><code>bytes = 32 time = 2 ms.....</code> The IP address is already used and cannot be used again. You must obtain a new IP address.</p> <p><code>destination host unreachable</code> The AXIS 240 is not within a reachable network node. You must obtain a new IP address.</p> <p><code>request timed out</code> This IP address is not used by anyone and is available for use with your AXIS 240.</p>
	The IP address is located within a different subnet.	<p>In Windows 95/98 or Windows NT, check that the IP address for your AXIS 240 is within the same subnet as your workstation:</p> <ol style="list-style-type: none"> 1. Click "Start", "Settings", "Control Panel" and "Network". 2. Specify the TCP/IP adapter and click on "Properties". In Properties, click "IP Address". 3. Check that the first 3 numbers within the IP address of your AXIS 240 matches the first 3 of your workstation. If not, your AXIS 240 is in a different subnet and the IP address cannot be set from this workstation. You must then obtain a new IP address.
	In Windows 95, the ARP table was empty when you tried to set the IP address.	<p>In Windows 95, the ARP command cannot be used if you have an empty ARP table.</p> <p>Type <code>arp -a</code> 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 240 using ARP.</p>
The CRON script is not working.		<p>Wait approximately one minute for the CRON script to activate.</p>

Symptoms	Possible causes	Remedial actions
The Power indicator is not constantly lit	Faulty power supply.	Verify that you are using an Axis PS-D power supply.
The Network indicator is not flashing randomly.	Faulty cabling.	<ol style="list-style-type: none"> To verify that the cables work, ping the address of a known existing unit on your network. If the cabling is OK and your network is reachable, you should receive the reply similar to this: <pre>...bytes = 32 time = 2 ms,</pre>
The Active and Network indicators are flashing every 0.5 seconds	Hardware failure.	Contact your Axis dealer.
Your AXIS 240 works locally, but not externally.	Firewall protection	Check the Internet firewall with your system manager.
	Default routers required	Check whether you need to configure the default routers settings.
	The Internet site is too heavily loaded.	Use a script running on your web server to relay images from the AXIS 240 to the Internet. This is particularly important when generating zoom and huge size images. See <i>"Point to Point Protocol (PPP)"</i> on page 64
No image using Refresh and/or Slow updating of snapshots using the Server push function.	Complex images, i.e. those containing great picture contrasts, have greater file size and thus place greater demand on the available file space within the AXIS 240.	<p>The memory constraints become significantly more acute if multiple clients try to access the same snapshot.</p> <p>Try limiting the number of clients.</p>
Triggering difficulties with CRON scripts	Unable to triggering on both positive and negative transitions of the Control Button and/or IO ports (double-edged triggering).	<p>Repetitive trigger conditions that occur in quick succession of one another can be missed. This is because the command initiated by the first trigger event may not have been fully executed prior to the second event. This scenario is demonstrated in the illustration below:</p> <p>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 conjugated with a loop statement. See also <i>Appendix H - CRON Script Command Reference</i>.</p>
Bad focus.	Focus is not adjusted correctly	Refer to the camera documentation on how to adjust the focus of your cameras.

Symptoms	Possible causes	Remedial actions
Bad snapshot images.	Display configured incorrectly.	Within Display Properties, configure your display to show at least 65'000 colors, i.e. at least 16-bit. Using only 16 or 256 colors on your computer will produce dithering artifacts in the image.
Cannot access the modem connected to the serial port of the AXIS 240.	<ul style="list-style-type: none"> • Modem not set for RTS/CTS • Local echo not disabled 	<ol style="list-style-type: none"> 1. Ensure that the modem is set for RTS/CTS serial communication. For US Robotics modems, you do this using the command <code>AT&I1</code>. 2. Disable Local echo mode using the command <code>ATE0</code>. 3. Save the changes in the NVRAM of the modem using the command <code>AT&W</code>.

If you still have a problem, you will qualify for the “More than a minute program” which will give you a gift for a registered installation that requires more than a few minutes. If this fails, please contact your reseller or check the FAQ for more help.

Appendix B The Parameter List

This appendix contains a listing of the AXIS 240 configuration parameters and also describes how to restore the factory default settings for the unit.

The Configuration File

This table shows the AXIS 240 parameter list. The left and middle columns show the parameter names and their default values as they appear in the config file. The right column contains brief descriptions of the parameters.

Parameter name	Value	Description
--- CONFIG MENU		
NODE_ADDR.	= 00 40 8C 18 00 86	Node address. Use when the unit is configured. Cannot be changed.
ROOT_PWD.	= PASS	Root password. Always change the default password.
USERS.	=	User names and passwords of users that are authorized to access the pictures taken by the AXIS 240. If empty, all users have full access.
--- TCP/IP MENU		
TCP_ENB.	= YES	Enables the TCP protocol.
INT_ADDR.	= 0.0.0.0	The AXIS 240 IP address.
DEF_ROUT.	= 0.0.0.0	All traffic directed outside the local network (according to the NetMask) is sent to the default router. Any re-routing via other routers is done automatically. The default 0.0.0.0 indicates that no default router is set.
DNS1_ADDR.	= 0.0.0.0	The IP address of the primary DNS server, identifying computers with names instead of IP addresses.
DNS2_ADDR.	= 0.0.0.0	The IP address of the secondary DNS server.
MAIL_SERVER_ADDR.	= 0.0.0.0	Name of the server that provides e-mail facilities.
RETURN_PATH.	=	The reply address for e-mails sent by the AXIS 240.
NET_MASK.	= 0.0.0.0	Used to determine when the traffic should be sent via a router. For example the normal class C mask is 255.255.255.0. The default 0.0.0.0 indicates that automatic router sensing is used.
BOOTP_ENB.	= yes	Enables BOOTP IP address setup.
RARP_ENB.	= yes	Enables RARP IP address setup.

Parameter name	Value	Description
--- Camera specific parameters		
LOGO_X.	= 10	Axis logo position in pixels, the horizontal coordinate.
LOGO_Y.	= 10	Axis logo position in pixels, the vertical coordinate.
LOGO_SHOWN.	= NO	Enables Axis logo display.
CLOCK_X.	= 1	Clock position in pixels,, the horizontal coordinate.
CLOCK_Y.	= 1	Clock position in pixels, the vertical coordinate.
CLOCK_SHOWN.	= NO	Enables clock display.
CLOCK_MODE.	= AM/PM	AM/PM or 24 hours time format.
Image appearance parameters		
LIGHT_FRONT_LED.	= YES	Enables the Active indicator.
CACHE_TIME.	= 0	Determines maximum cache period for snapshots, e.g the same snapshot will be displayed for all requests within a 3 seconds period.
System Parameters		
MODEM_TYPE.	=	Autodetect Modem or Null Modem.
SERIAL_MODE.	= DISABLED	Enables serial mode for PPP or Zmodem access when set to FULL_SUPPORT, INBOUND_ONLY or OUTBOUND_ONLY.
SERIAL_BAUD.	= 9600	Baud rate.
SERIAL_FLOW.	=	Modem server operation mode. Set to Hardware (RTS/CTS).
MODEM_INIT.	=	String of commands to be sent to the modem for setup. Used for non-US Robotics modems.
BUSY_REDIAL.	=	The number of additional attempts the AXIS 240 will make in order to establish a connection in case the line is busy.
TCP_SERVPORT.	= 0	The TCP port used together with the TCP driver.
TIME.	=	The current time.
DATE_SERVER.	= 0.0.0.0	IP address of the date server that provides the actual time and date.
DATESYNC_PERIOD.	= 0	The date and time will be automatically updated according to the specified intervals.
DATESYNC_PROTOCOL.	= TIME	The synchronization protocol used. Time (serial port 37), Daytime (serial port 13) or NTP (UDP port 123).
DATESYNC_TIME_ZONE.	= 0	The time zone adjustment as number of hours +/- UTC.
TIMEADJ_WEEK.	= 0	The time adjustment per week. Valid range is 0 to (-)32000 seconds.
WATCHDOGTIME.	= 12000	Do not change.
INDEX_FILE.	= INDEX	Do not change.
Video parameters		
DEFAULT_CAM.	= 1	Specifies the default camera and enables video modulation detection. Do not change.
CAM1.	= 0	Enables the camera 1 input.

Parameter name	Value	Description
CAM2 .	= 0	Enables the camera 2 input.
CAM3 .	= 0	Enables the camera 3 input.
CAM4 .	= 0	Enables the camera 4 input.
CAM5 .	= 0	Enables the camera 5 input.
CAM1ID .	= 0	Specifies the camera 1 video modulation and Pan/Tilt connection. Do not change.
CAM2ID .	= 0	Specifies the camera 2 video modulation and Pan/Tilt connection. Do not change.
CAM3ID .	= 0	Specifies the camera 3 video modulation and Pan/Tilt connection. Do not change.
CAM4ID .	= 0	Specifies the camera 4 video modulation and Pan/Tilt connection. Do not change.
CAM5ID .	= 0	Specifies the camera 5 video modulation and Pan/Tilt connection. Do not change.
CAMMODEL .	= 0	Specifies the connected Pan/Tilt device. Do not change.
SECCODE .	= 0	Enable password protection of the Pan/Tilt control page. Disabled by default
SECPASS .	=	Password for the Pan/Tilt control page.
PAREA .	=	Pan/Tilt driver information. Do not change.
IMGTEXTAREA .	=	Optional descriptive text to appear on the snapshot.
IMGTEXTPOSITION .	=	Position for text on the snapshot.
PREPOSAREA0 .	=	Preset camera position 1.
PREPOSAREA1 .	=	Preset camera position 2.
PREPOSAREA2 .	=	Preset camera position 3.
PREPOSAREA3 .	=	Preset camera position 4.
PREPOSAREA4 .	=	Preset camera position 5.
PREPOSAREA5 .	=	Preset camera position 6.
PREPOSAREA6 .	=	Preset camera position 7.
PREPOSAREA7 .	=	Preset camera position 8.
PREPOSAREA8 .	=	Preset camera position 9.
PREPOSAREA9 .	=	Preset camera position 10.
VIEWANGLE0 .	=	Viewing angle for camera 1.
VIEWANGLE1 .	=	Viewing angle for camera 2.
VIEWANGLE2 .	=	Viewing angle for camera 3.
VIEWANGLE3 .	=	Viewing angle for camera 4.
VIEWANGLE4 .	=	Viewing angle for camera 5.

Factory Default Settings

If you should need to reset the AXIS 240 to its factory default settings, you can use the Control button. Follow these steps:

1. Switch off the AXIS 240 by unplugging the power cord.
2. Press and hold the Control button while you switch on the AXIS 240. Keep the Control button pressed until the Active indicator flashes at regular two second intervals.
3. Release the Control button and wait at least two seconds (one flash of the Active indicator).
4. Press and hold the Control button for at least five seconds until the Active indicator remains constantly lit.
5. If you need to restore the default IP address, press and hold the Control button once again until the Active indicator starts flashing. Otherwise, the IP address setting will remain unchanged.
6. The AXIS 240 is now reset to factory default settings. Restart the AXIS 240 by switching it off and on.

Note: The node address (`NODE_ADDR` parameter) remains unchanged, but all other parameters are reset.

Appendix C Updating the Software

The AXIS 240 is equipped with *Flash Memory* which means that its server software can be updated using FTP. This appendix describes how this operation can be performed.

Obtaining Updated Software

The latest version of the AXIS 240 server software is available free of charge from Axis or your local distributor. You may obtain this software over the Internet or via anonymous FTP.

The *npsload* program used for downloading the AXIS 240 software via the parallel port, is also available free of charge at ftp://ftp.axis.com/pub/axis/software/cam_srv/

Over the Internet

Simply follow the appropriate hyperlinks, starting with "Support" from within the AXIS 240 Home Page, or enter http://www.axis.com/techsup/cam_servers/cam_240/ within the URL of your Web browser.

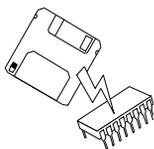
Typically, the software update file is called `240_x_xx.exe`, where `x_xx` indicates the software version. This self extracting archive file unpacks the associated data and text files upon execution. It is recommended that you save this file in your root directory.

Flash Memory The AXIS 240 server software 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. However, Flash memory is unique because it allows its data to be erased and re-written. This means that you can install software updates for your AXIS 240 as soon as they become available, without having to replace any parts. The new software can be simply loaded into the AXIS 240 over the network.

Anonymous FTP

Log in to `ftp.axis.com` and go to the `/pub/axis` directory. Download the software update file `240_x_xx.exe`, where `x_xx` indicates the software revision. It is recommend that you save this file in your root directory. Proceed then by unpacking the `.exe` file to create the associated binary and text files.

Upgrading the Software



Theoretically, there are two methods with which to update to the AXIS 240 Flash memory:

- over the network using FTP or
- through the parallel port LPT1.

Normally, AXIS 240 should be upgraded over the network using FTP. However, if for some reason the AXIS 240 becomes unavailable over the network, it may be necessary to reload the software through the parallel port.

Note: Updating instructions are also supplied with the software update.

Upgrading using FTP

Having obtained the upgrade software, install it into the AXIS 240 by following the instructions below:

1. Reset the AXIS 240 by powering it off and then on again.
2. Start an FTP session and log in to the AXIS 240 as `root`, using the root password. By default this is set to `pass`.
3. Set FTP to binary mode using the command `bin`.
4. Download the new camera server software to you AXIS 240 by using the command `put 240_1_00.bin flash`. This process takes 30 - 60 seconds. The LEDs will flash slowly during programming.

Note: If you need to force a download, e.g. when degrading to an older software, use the syntax `put 240_1_00.bin FLASH`

5. The AXIS 240 will report "Transfer complete, flash programming finished OK", once the programming is complete.

Caution! In controlled environments, Flash memory upgrades provide a very safe method for updating software. However, Flash products may easily become damaged if this operation is left to inexperienced persons. Units that become damaged due to misuse will need to be sent back to your dealer who in such circumstances, may charge for any necessary repairs. Therefore, it is highly recommended that Flash memory upgrades are performed by persons knowledgeable in this area.

Upgrading via the Parallel Port

You should only need to upgrade the AXIS 240 via the parallel port if it is impossible to download the software using FTP. Therefore, you are strongly advised to talk with your local distributor prior to commencing with the procedures defined below:

1. Disconnect the power supply and the other external connectors.
2. Remove the four screws securing the top cover of the enclosure.
3. Remove the top cover.
4. Connect the parallel cable between the PC LPT1 port of your workstation and the 26-pin array of the AXIS 240 circuit board. Make sure the parallel cable connector is mounted with the arrow close to pin 1, facing backwards, towards the 10baseT connector.
5. Reconnect the power cord to the AXIS 240.
6. Issue the following command from the DOS prompt to commence the loading sequence:

```
npsload -l -n 240_1_00.bin
```

Notes: Do not forget to use the -n switch that indicates that the firmware file has a built-in loader.

The network LED will flash during the loading sequence. This normally takes between 30 seconds and 4 minutes to complete.

Appendix D Technical Specifications

Network Systems	All systems running TCP/IP using a HTTP browser and supporting JPEG files, HTML version 0.9 or higher, e.g. Netscape Navigator 1.22 or higher, and Microsoft Internet Explorer 1.0 or higher. However, Netscape Navigator 4.0 or Microsoft Internet Explorer 4.0 is recommended.
Web Browsers	Netscape Navigator, Microsoft Internet Explorer and Web TV, Oracle Power Browser, NCSA Mosaic, Chimera
Protocols	HTTP, FTP, TCP, IP, ARP, RARP, BOOTP, SMTP, PPP and ICMP.
Installation	Assign an IP address using ARP, RARP or BOOTP. Connect to Ethernet or a modem for remote application.
Network Management	Configuration and status via standard Web browser or FTP.
Software Updates	Flash memory allows central and remote software updates over the network using FTP over TCP/IP. All software upgrades are free of charge and are available from the Axis WWW server.
Camera Inputs	4 standard coax inputs with 75 ohm (can be used without terminator, Hi-Z) and one S-video (Y/C) input.
Video Formats	NTSC, PAL, Black/white 50Hz or Black/white 60Hz.
Video Cable	Max length: 800 feet (250 m) RG59, 75 ohm coax cable.

Images Using CGI parameters, the image size can be set to a maximum size of 768 x 576 pixels. It can also be zoomed in to a size of 352 x 288 pixels. In addition, CGI parameters for quality, rotation, mirroring, colors etc. can be specified. For live updated images, a server push function is available.

Resolution The AXIS 240 supports these snapshot types:

File types	Size in pixels (PAL)	Generation time	Size in pixels (NTSC)	Generation time
JPEG	192 x 144	0.5 sec	160 x 112	0.5 sec
JPEG	384 x 288	0.7 sec	320 x 240	0.7 sec
JPEG, BMP	768 x 576	16 sec	640 x 480	15 sec

The resultant file size depends on the AXIS 240 settings, lightning conditions and the snapshot objects. However, objects of a uniform shape generally require less details and consequently generate smaller snapshot files.

Performance A full size, full color JPEG file is updated in 0.7 seconds. Using the server push function, up to 6 frames/second can be transmitted.

Network Connector 10baseT (RJ-45) twisted pair Ethernet.

Hardware CPU: 32-bit RISC processor (ETRAX).
Flash PROM: 2.0 Mbyte
RAM: 8 Mbytes

Auxiliary Input/Output A Mini-DIN 8-pole external connector is provided for auxiliary connections to the AXIS 240. The functionality of this connector is fully discussed in *“Appendix E - The Auxiliary IO Port”*.

Modem Connector A 9 pin D-sub connector provides the physical RS232 serial interface to a modem for remote connection. The functionality of this connector is fully discussed in *“Appendix F - The RS232 Serial Ports”*.

Pan/Tilt Devices One Pan/Tilt device, or several if they are daisy chained, can be controlled via an RS232 or RS485 serial interface. The Canon VC-C3, Sony EVI-D30/D31, Sony EVI-G20/G21, Ernitec ICU, Videmech and Pelco Digital Coaxitron have direct support.

Operating Temperature 40-125°F (5-50°C).

Humidity 20-80% RHG, non-condensing.

Approvals EMC: FCC Class A, CE:EN 55022/1987,EN50082- 1/1992
 Safety: EN 60950, UL, CSA.



Size Height: 1.5 in (4.0 cm)
 Length: 5.7 in (14.5 cm)
 Width: 7.7 in (19.5 cm)

Weight 1.0 lb. (0.5 kg), excluding power supply.

Power Supply 12V AC, 9.6 VA, via external power supply (PS-D).

Alternative power input on PS-D connector:

11 - 18V DC, min 600 mA

10 - 15 V AC, min 7 VA

Does not use the same GND as the video inputs, chassis, etc.

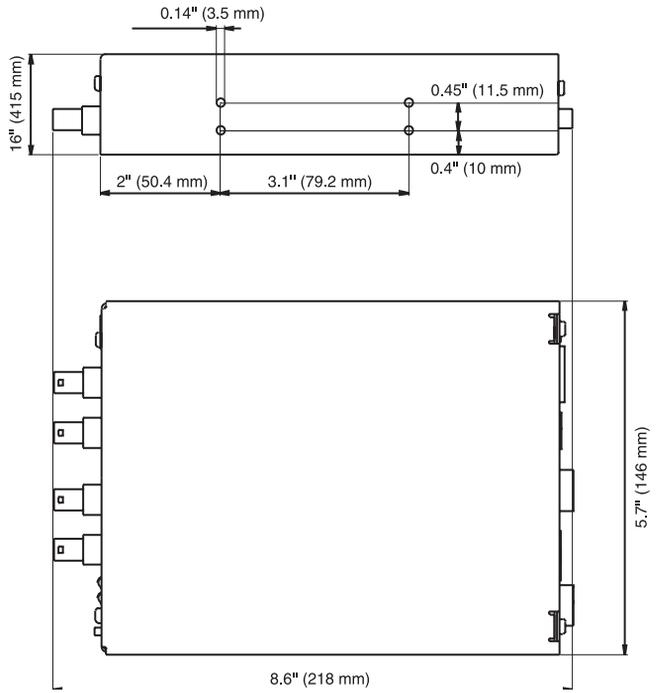
Alternative power input on ALT. POWER connector:

4.9 - 5.2V DC, min 1A

Use a PC-standard power supply, pin 4 =+5V, pin 2 and pin 3 = GND. Uses the same GND as the video inputs, chassis, etc.

All specifications are subject to change without prior notice.

Dimensions



Appendix E The Auxiliary IO Port

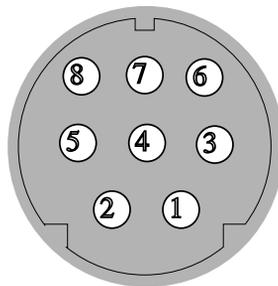
A Mini-DIN 8-pole external connector is provided for auxiliary IO connections to the AXIS 240. This appendix discusses the additional functionality that this connector provides.

Physical Connection

The auxiliary IO connector provides the interface to one relay switch output and four digital inputs.

Pinout

A diagram for the auxiliary IO connector and a pinout table are detailed below:



Pin	Function
1	Relay switch (Max 24V AC/DC, 100mA)
2	Relay switch (Max 24V AC/DC, 100mA)
3	NC
4	Input 3
5	Input 4
6	Input 1
7	Input 2
8	GND

Caution! GND on the IO connector is not connected directly to the power connector. **Always use two independent power sources!** Connecting GND to the power connector will permanently damage your AXIS 240.

Note: □ The inputs are connected between the input pin and GND, and must be potential free switches, i.e. push button switches or relay switches. The input switch circuit current is 1mA.

Controlling and Monitoring

IO Files

The status of the input/output interface can be monitored and controlled by the IO software within your AXIS 240. From your Web browser, you can access the IO control file in order to either drive the relay output or monitor the status of the digital inputs.

To access the IO file, enter the following URL:

```
http://camserv/io/
```

You will require `root` access to reach these files and will now be asked to supply a username and password. Login as `root` and supply the root password (default = `pass`).

Once access is granted, the following files are displayed:

```
relayon.txt
relayoff.txt
input.txt
```

Relay Output

You can use the relay output to drive directly a maximum load of 24V AC/DC at 100mA. By connecting additional relay circuitry, you can also use this output to drive heavier loads.

You can drive the relay off and on simply by clicking `relayoff.txt` or `relayon.txt` in the above URL. Clicking on either of these will return either of the following messages, respectively:

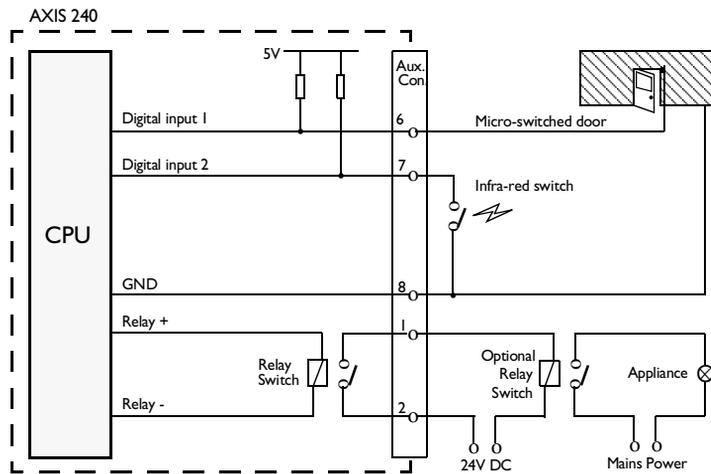
```
Relay is Off
Relay is On
```

- Note:** You can also control the relay switch via a CRON script using the snapshot command.

Digital Inputs

The four digital inputs make it possible to trigger your snapshots on chosen events. However, you must use a CRON script to implement this functionality. See “CRON Script” on page 51.

By connecting a digital microcircuit to a particular door for example, it is possible to take a snapshot on each occasion that it opens or closes.



Schematic diagram of the AXIS 240 Auxiliary Connector
- displaying a possible application

Status information for each of the digital inputs is presented within a text string. The status of the inputs can be ‘read’ by clicking on the `input.txt` link in the IO file URL. The string will amongst other things define the time and duration of the last trigger event for each input:

```
input:1 current:0 last:1 pulse:2 time_of_change:12.22
input:2 current:1 last:0 pulse:6 time_of_change:14.43
input:3 current:0 last:1 pulse:1 time_of_change:09.13
input:4 current:0 last:1 pulse:4 time_of_change:12.25
```

This table describes each digital input text string:

String	Description
input:	Input reference (Input 1 = pin 6, Input 2 = pin 7, Input 3 = pin 4, Input 4 = pin 5)
current	Current port status (Logical high = 1, Logical low = 0)
last	Result of previous 'read' operation
pulse	The number of logical one-to-zero transitions on the I/O pin, since the last read.
time_of_change	The time of the last change on the input pin.

- Note:** □ The way in which you use the auxiliary connector is of course, for you to decide. Axis does not provide any application software, but instead allows you to determine how this connector is best utilized. Naturally, we would be more than pleased to learn of any interesting applications that you might develop!

Appendix F The RS232 Serial Ports

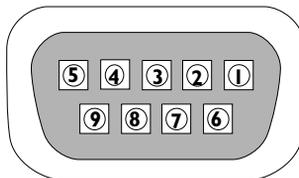
Two 9 pin D-sub connectors provides the physical connection for the RS232 serial interface of the AXIS 240. These connectors are provided for connecting accessory equipment such as modems and Pan/Tilt devices.

This appendix discusses the functionality of the RS232 serial interface. It provides instructions on how to set up a modem connection, install a Pan/Tilt device and configure the AXIS 240 for Pan/Tilt control.

Physical Connector

Pin Assignment

A diagram of an RS232 connector and the AXIS 240 pin assignment table are detailed below.

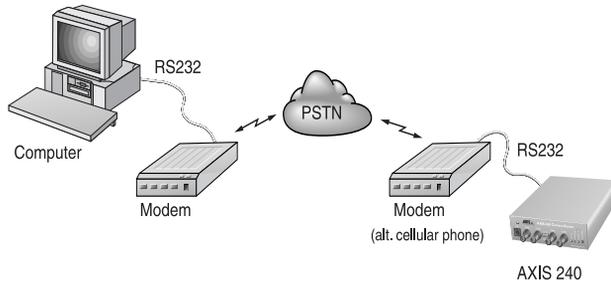


Pin	Function
1	CD
2	- RXD
3	- TXD
4	DTR
5	GND
6	NC
7	RTS
8	CTS
9	RI

Caution! GND on the serial port is not connected directly to the power connector. **Always use two independent power sources!** Connecting GND to the power connector will permanently damage your AXIS 240.

Setting Up the AXIS 240 Modem Server

A modem server provided within your AXIS 240 makes it possible to transmit snapshot images over the PSTN. By connecting the AXIS 240 to a modem, it is possible to download snapshot images to remote computers using standard modem equipment.



Configuration of the serial port for modem connection

RTS/CTS The AXIS 240 modem server utilizes hardware (RTS/CTS) handshaking. In this mode of operation, a straight-through RS232 cable is all that is required for connecting the modems to both the computer and the AXIS 240.

Wiring This is the common wiring schedule for RS232 cables supplied with most of today's popular modems:

Signal name	Server pin	Modem pin
CD	1	8
-RXD	2	3
-TXD	3	2
DTR	4	20
GND	5	7
NC	6	6
RTS	7	4
CTS	8	5
RI	9	22

- Notes:**
- ❑ Some modems are supplied with a cable equipped with 25 pin DSUB connectors at both ends. Should you have a cable similar to this, you will need to use a 25 pin Male - 9 pin Female 'gender-bender' with the pin assignment detailed above. Null modem cables will not work!
 - ❑ Contact Axis for information about supported cellular phones and modems.

Configuring the Modem

Before files can be transferred from your AXIS 240, the host and remote modems must be configured correctly.

Follow these instructions to configure a US Robotics 28k8+ modem:

1. Connect the modem to your terminal.
2. Check that the modem is responding by issuing the **at** command.
3. Continue your configuration in accordance with the session detailed below (user commands are written in **bold** text):

```

at
OK
at&f           ;load factory default settings
OK
at&b1         ;lock DTE-DCE baud rate
OK
at&h1       ;CTS handshaking on
OK
atm0        ;turn speaker off
OK
ate0        ;command echo off
Note: this inhibits the display
       of entered commands.
OK
at&w       ;save settings to modem
OK
-----ready ----
    
```

4. To make sure that your modem reloads the established settings on each occasion it powers up, issue the **ati4** command once the configuration is complete.

5. To check that the settings have been saved, turn the modem off and power it on again.
6. Type `ati4`. You should not see your own typing at this point, but if you do, check your modem DIP switches and make sure that the `ate0` command was issued successfully.

The new settings dump that is displayed should be identical to those previously saved. If it is, your modem is now ready to be connected to the AXIS 240!

- Notes:**
- The above session was performed on a US Robotics modem. Please be aware that the required settings for other types of modems may differ from those defined above. Axis are currently checking the compatibility of the AXIS 240 with other popular modem types and will release configuration details for these shortly.
 - Some modem manufacturers require you to set a DIP switch to disable command echoing. e.g. USR Sportster 28k8 modems require DIP switch 4 to be set to the DOWN position.

Typical Modem Settings

Typical US Robotics Sportster Vi 33600 Faxmodem settings are defined below:

```

B0 E0 F1 M0 Q0 V1 X1 Y0
BAUD=115200 PARITY=N WORDLEN=8
DIAL=PULSE ON HOOK
&A1 &B1 &C1 &D2 &H2 &I0 &K1 &M4 &N0 &R1
&S0 &T5 &U0 &Y1
S00=000 S01=000 S02=043 S03=013 S04=010
S05=008 S06=002 S07=059 S08=002 S09=006
S10=007 S11=070 S12=050 S13=000 S14=000
S15=000 S16=000 S17=000 S18=000 S19=000
S20=000 S21=010 S22=017 S23=019 S24=000
S25=005 S26=000 S27=001 S28=008 S29=020
S30=000 S31=000 S32=000 S33=000 S34=000
S35=000 S36=000 S37=000 S38=000 S39=000
S40=000 S41=000 S42=000 S43=200 S44=015
S45=000 S46=050 S47=000 S48=084 S49=000
S50=000 S51=000 S52=000 S53=000 S54=064
S55=000 S56=000 S57=000

LAST DIALED #:
OK
    
```

Note: The screen dump for your modem might differ from the above, as the settings can vary between modem types.

Configuring the AXIS 240

Once you have set up your modems, you need to configure your AXIS 240 for modem control. You can use any of these methods:

- Web browser
- Control button
- FTP

Web Browser

1. On the Configuration - Modem page, enable serial mode by setting the Serial mode parameter to Full Support.
2. Connect the modem to the AXIS 240.
3. Turn the modem on.
4. Wait a few seconds and then power up the AXIS 240.

The new settings will now take effect.

Control Button

For remote installations that are not directly connected to a LAN, you can alternatively configure the AXIS 240 for serial mode operation as follows:

1. Restart the AXIS 240 by removing and then re-inserting the power connector.
2. Wait 10 seconds.
3. Press and hold the Control button until the Active indicator flashes.
4. Release the Control button.
5. Double click the Control button while the Active indicator continues to flash.
6. Wait until the Active indicator stops flashing.
7. Restart the AXIS 240 by removing and then re-inserting the power connector.

- FTP**
1. Log in to the AXIS 240 with the command `ftp camserv` where `camserv` is the AXIS 240 host name or IP address.
 2. You will be prompted for user name and password. Use the user id `root`, which has the default password `pass`.
 3. Issue the command `get config` to copy the AXIS 240 config file to a directory on your workstation.
 4. Log out using any of the commands `quit`, `bye` or `exit` depending on your FTP version.
 5. Edit the AXIS 240 config file by setting the `SERIAL_MODE` parameter to `FULL_SUPPORT`.
 6. Start a new FTP session.
 7. When you are logged in, issue the command `put config` to download the edited file to the AXIS 240.
 8. Log out again.

Dialing the Server

You will reach the AXIS 240 modem server by dialing `ATDTnnnnnn`, where `nnnnnn` is the modem phone number, e.g. `ATDT555-1212`. The AXIS 240 will then answer the call, and establish the connection.

Once the connection has been established, the AXIS 240 welcome banner is displayed:

```

Welcome!
You are connected to the host shell of your AXIS
Camera Server.
Try 'help' for a list of available commands, or
just 'sz fullsize.jpg' to download an image.
```

Help Menu Type the following to view the help menu:

```

$ he
```

The help menu is displayed:

Help	Display help text
Date	Get current date and time
SetDate	Set current date and time
Version	Print current software version
Su	Become super-user or another user
Login	Become a specific user
Sz	Send a file using zmodem protocol
SoftReset	Protocol reinit
HardReset	Complete reboot
Exit	Disconnect
Ip	Print current IP address
Ppp	Initiate PPP connection
Exit	Disconnect
Quit	Disconnect
Goodbye	Disconnect

- Access rights** The commands available to each user from within the welcome menu will depend upon their user privileges.
- Abbreviations** All non-destructive commands can be abbreviated to shortest unambiguous form. However, because of their severity, the `HardReset` and `SoftReset` commands must be entered in the entirety.
- Super-user** The `Su[username]` command is used to become another user, e.g. `Su root` will, if you supply the correct password when prompted for it, give you root access and enable use of the `Reset` and `SetDate` commands.

Zmodem Once connection to the AXIS 240 has been established, you can initiate a file transfer. Simply type the `sz` command followed by the filename of file you wish to transfer, as follows:

```
sz fullsize.jpg
```

A typical zmodem session is detailed below:

```
at
OK
atdt555-1212
Welcome!
You are connected to the host shell of your AXIS
Camera Server.
Try 'help' for a list of available commands, or
just 'sz fullsize.jpg' to download an image.
$ sz fullsize.jpg
**B000000000000000
>> Notice: Redirecting stdin/stdout.
>> Notice: Executing the command ``cd ~/dl/modem
; rz ; xv *& ; sleep 2;
rm *''.
rz waiting to receive.
Receiving: fullsize.jpg
Bytes received: 24188/ 24188: 3020 Bytes per
sec
Transfer complete.
Transfer complete.
$
```

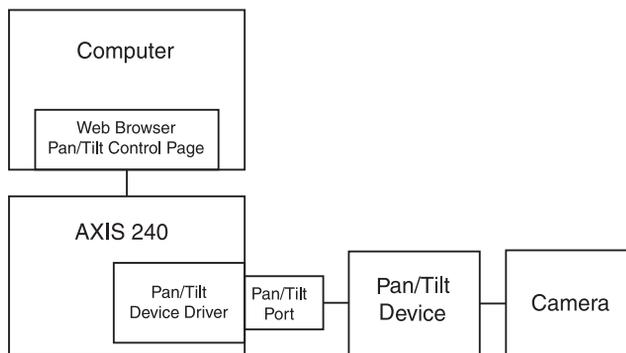
Typical zmodem session

Setting Up the AXIS 240 for Pan/Tilt Connection

The AXIS 240 allows various ways of controlling the camera position via the Pan/Tilt port:

- Connecting the AXIS 240 to a camera via a Pan/Tilt device, and controlling the position from the Pan/Tilt control page
- Connecting the AXIS 240 directly to a camera, and using CGI parameters in a web application for controlling the position
- Connecting the AXIS 240 directly to a camera, and using a TCP client application for controlling the position

Pan/Tilt Device



To install a Pan/Tilt device, follow these steps:

1. Attach the Pan/Tilt device to the Pan/Tilt port of the AXIS 240 using an RS232 cable.
2. On the AXIS 240 Home Page, click **Settings**. You will be prompted to supply a username and password. By default, these are set to `root` and `pass`.
3. Click **Pan/Tilt**.
4. Click **Driver**. Select the driver that corresponds to your Pan/Tilt device from the pulldown menu. Click **Store driver and restart**.
5. Click **Settings**.

Canon Specify which camera should use the Pan/Tilt device. Click **Store device settings**.

Sony The Sony devices can connect up to three video cameras, if daisy chained. Specify the camera sources for each camera ID 1-3. Click **Store device settings**.

Videmech It is possible to connect up to five Videmech units to the AXIS 240, if connected via an RS485 adapter. For each camera that you intend to use, enable the corresponding Pan/Tilt device and specify an address 1-255. Note that the address 255 implies that the control signals will be broadcast to all the connected Pan/Tilt devices.

1. Click **Store device settings**.
2. Then click **Special Videmech Settings**. Specify the following parameters:

Parameter	Description
SafeMode	To avoid any undesired camera movements, you can enable the SafeMode function. However, the traffic will increase and normally you can keep SafeMode disabled.
Movement SoftStops	These soft stops indicate the end position in all directions; i.e. left, right, up and down. The soft stops will assure that the camera is kept within certain bounds.
Focus & Zoom SoftStops	These soft stops indicate the end position for focus and zoom. In order not to stall the motors when approaching max zoom or max tele, it is important that you limit the zoom/tele interval in accordance with the capabilities of your specific lenses. Note: If you are not using a zoom lens, set the ZoomWide parameter to 1.
Optical Data	The MaxDeg setting should correspond to the angle at max zoom. The MinDeg setting should correspond to the angle at max tele.
Show Zoom & Focus bars	If enabled, the zoom and focus bars will be displayed on the Pan/Tilt Control page.

3. Click **Store Special Settings**. Click **Back to Configuration Pan/Tilt page**.

Ernitec It is possible to connect up to five Ernitec units to the AXIS 240, if connected via an RS485 adapter. For each camera that you intend to use, enable Pan/Tilt and specify an address 1-255. Click **Store device settings**.

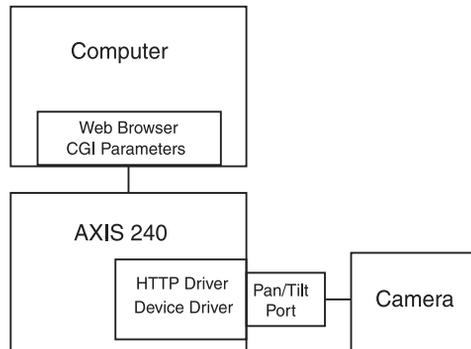
1. Click **Port**. If required, adjust the parameters for Baud rate, Data bit, Stop bit and Parity for the Pan/Tilt port. Click **Store port settings**.
2. Click **Pan/Tilt control page** to verify that the Pan/Tilt installation is working properly.

Pelco Digital Coaxitron

It is possible to connect up to five Pelco Digital Coaxitron units to the AXIS 240, if connected via an RS485 adapter. For each camera that you intend to use, enable Pan/Tilt and specify an address 1-255. Click **Store device settings**.

1. Click **Port**. If required, adjust the parameters for Baud rate, Data bit, Stop bit and Parity for the Pan/Tilt port. Click **Store port settings**.
2. Click **Pan/Tilt control page** to verify that the Pan/Tilt installation is working properly.

HTTP Protocol The AXIS 240 supports input/output operations on the Pan/Tilt port via the HTTP protocol. The functionality can be used for adjusting the camera position or for controlling a simple device, such as a relay switch.



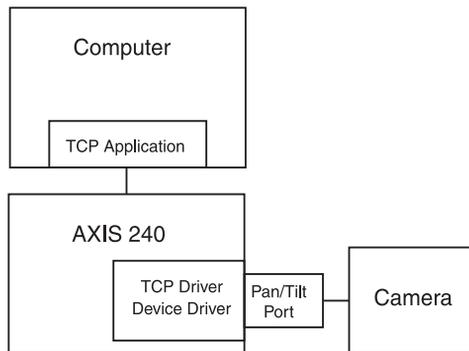
To enable HTTP input/output operations on the Pan/Tilt port, follow these steps:

1. Click on the **Settings** link on the AXIS 240 Home Page. You will be prompted to supply the username and password. By default, these are set to `root` and `pass`.
2. Click **Pan/Tilt**.
3. Click **Driver**. As Pan/Tilt device, select HTTP input/output driver. Click **Store driver and restart**.
4. Click **Port**. Adjust the parameters for Baud rate, Data bit, Stop bit and Parity. Click **Store device settings**.

The Pan/Tilt port is now enabled for input/output operations via HTTP. Refer to “*Common Gateway Interface (CGI) parameters*” on page 59 for a list of the CGI parameters you can use.

TCP Protocol

Instead of using a specific Pan/Tilt driver, the camera position can be controlled through a TCP client application via the Pan/Tilt serial port.



To enable TCP input/output operations on the Pan/Tilt port, follow these steps:

1. Connect the Pan/Tilt port of the AXIS 240 to the Pan/Tilt port of the camera using an RS232 cable.

2. Click on the **Settings** link on the AXIS 240 Home Page. You will be prompted to supply the username and password. By default, these are set to `root` and `pass`.
3. Click **Pan/Tilt**.
4. Click **Driver**. Select the TCP input/output driver. Click **Store driver and restart**.
5. Click **Settings**. Specify the TCP port number. Note that your TCP client application must also use this TCP port when communicating with the AXIS 240. Click **Store TCP port and restart**.
6. Click **Port**. Adjust the parameters for Baud rate, Data bit, Stop bit and Parity. Click **Store port settings**.

Appendix G Camera Applications

Traditional surveillance systems often limit camera access to a specific monitor, i.e. the control room. However, the AXIS 240 applies to industrial and security operations over a secure intranet, as well as to live publishing via the Internet.

This means that you can now monitor operations remotely from within the comfort of your own home, headquarters, or indeed from any workstation of your choosing that supports a Web browser. Just think... no more late trips to the factory to investigate problems !

The only real limitation for the number of applications to which the AXIS 240 can be suited is your fantasy.

Some of the more obvious application ideas are:

- Visual security systems.
- Monitoring and surveillance of medical equipment.
- Monitoring the production flow in any kind of industry.
- Integrating the AXIS 240 into CGI scripts in order to create your own web applications.
- Monitoring of conference rooms.
- Monitoring of parking facilities.
- Fun applications. Who visits the coffee machine most in your organization?

Application Examples

The list below contains links to a number of web sites, and illustrates the wide range of applications suitable for the AXIS 240:

- Surveillance of the company entrance door:
http://www.axis.com/neteye/rm_demo/front_doors.html
- Child monitoring system for daycare centers and preschools:
<http://www.kindercam.com/>
- Construction pictures from the Riverview Wastewater treatment plant project:
<http://www.pirnie.com/pws/riverview.cfm>
- Traffic monitoring in New York City:
<http://www.mte.com/webcam/>

Note: Axis is not responsible for maintaining the web sites listed above. However, you will find links to AXIS 240 applications at http://www.axis.com/products/cam_240

Appendix H CRON Script Command Reference

This appendix details the syntax of the CRON script commands.

For information on how to use the CRON scripts with your AXIS 240, refer to “*CRON Script*”, on page 51.

Script Format

A CRON script for the AXIS 240 can include one or several entries. The CRON script entries use this format:

```
# <comments>
<triggering condition> :
<commands>;
%
```

where:

- The <comments> are optional.
- The <triggering condition> includes the following fields:
<minute> <hour> <day> <month> <weekday> <optional input/boot event>
- The <commands> include one or several CRON script commands.

Commands

alert The alert command sends a message to a remote host.

Syntax alert [-host HOST] [-port PORTNUMBER]
[-message STRING];

Options -host Specifies the host name or IP address of the remote host.
-port Specifies the TCP port number in the range [0..65534].
-message Specifies the message that will be sent to the remote host. The message must be surrounded by quotation marks. Hexadecimal coded messages must be preceded by \0x, e.g. "\0x04" for the non-printed character EOT. To include a quotation mark, it must be preceded by a backslash, e.g. \".

Example

```
# This command will send the message "Alarm
# "0013" from AXIS 240" to the remote host when
# input port 1 goes high.
* * * * * /11:
alert -host 172.16.253.80 -port 2703 -message "Alarm
\"0013\" from AXIS 240";
%
```

buffer_init The buffer_init command initiates or clears the image buffers. This is needed in order to store images using the buffer_start and buffer_stop commands.

Syntax buffer_init
[[CAMERANUMBER],[IMAGE],[SIZE]][:[CAMERANUMBER],[IMAGE],
[SIZE]]];

Options CAMERANUMBER
Specifies the camera source, i.e. 1-5.

IMAGE

Specifies the image type 1-3, where:

- 1 = halvesize.jpg
- 2 = fullsize.jpg
- 3 = hugesize.jpg

SIZE

Specifies the maximum number of images that can be stored in the buffer. Valid range is 0-255.

To initiate several buffers, you can stack multiple statements separated by colon.

- Notes:**
- To clear the image buffer, you simply do not specify any arguments.
 - To initiate several buffers, you can stack multiple statements separated by colon.

Example 1

```
# At startup, this command will initiate one
# buffer for camera 1 with 25 fullsize.jpg images
# and one buffer for camera 2 with 5 hugesize.jpg
# images.
* * * * * BOOT:
buffer_init 1,2,25:2,3,5;
%
```

Example 2

```
# This command will clear the buffer every Sunday.
0 0 * * 0 * :
buffer_init;
%
```

buffer_start

The `buffer_start` command stores snapshots in a specific image buffer. Before the command can be used, the buffer facility must be initiated using the `buffer_init` command.

When invoked, the `buffer_start` command is executed in the background. Any subsequent command in the event entry will be executed immediately.

To retrieve the stored images, specify the source using this syntax:

```
http://<camera>/images/buffer.jpg?imagetype=<value>
```

Example:

```
http://mycam/images/buffer.jpg?imagetype=fullsize.jpg
```

You can also retrieve the images using the `mail` or the `ftp` commands.

Syntax `buffer_start [-src SOURCEFILE] [-cam CAMERANUMBER] [-interval TIME] [-duration TIME] [-store SIZE];`

- Options**
- `-src` Specifies the source file name, i.e. `halfsize.jpg`, `fullsize.jpg` or `hugesize.jpg`.
 - `-cam` Specifies the camera source, i.e. 1-5. If omitted, the default camera will be used.
 - `-interval` Specifies the time interval between consecutive snapshots. If omitted, new snapshots will be generated without any delay. Format: `h<hours>m<minutes>s<seconds>`.
 - `-duration` Specifies the total time for the command to run. If omitted, the `buffer_start` command will be issued only once. Format: `h<hours>m<minutes>s<seconds>`. If you specify `-duration inf`, the command will continue to be executed until it is interrupted by any of the commands `buffer_init`, `buffer_start` or `buffer_stop`.
 - `-store` Specifies the number of images to be stored in the buffer. This setting will override the duration. The maximum number of images is specified by the `buffer_init` command.

Example 1

```
# This command will keep loading fullsize.jpg images.
* * * * * :
buffer_start -src fullsize.jpg -cam 3 -interval s30
-duration inf;
%
```

Example 2

```
# When someone presses the Control button, this
# command will store 10 hugesize.jpg images.
* * * * * /B :
buffer_start -src hugesize.jpg -store 10;
%
```

Example 3

```
# At startup, the buffer is initialized to hold 15
# fullsize.jpg images. New images are captured once
# every second until another buffer_start or
# buffer_stop command is issued.
* * * * * BOOT :
buffer_init 1,2,15;
buffer_start -src fullsize.jpg -interval s1 -duration
inf;
%
# When port 1 is triggered, additional 5 images are
# captured before the buffer is locked. All the
# images in the buffer are then sent in an e-mail to
# someuser@somehost.com. Finally the buffer is
# restarted.
* * * * * /I1:
buffer_stop -src fullsize.jpg -store 5;
mail -s "Buffered images" -a images/buffer.jpg -t
someuser@somehost.com -b fullsize.jpg -n 15;
buffer_start -src fullsize.jpg -interval s1 -duration
inf;
%
```

buffer_stop

The `buffer_stop` command ends the storing of snapshots in an image buffer. Until completed, the `buffer_stop` command will block the execution of any subsequent commands in the event entry. Note that the `buffer_start` command behaves differently.

The command is typically used together with the `buffer_start` command.

Syntax `buffer_stop [-src SOURCEFILE] [-cam CAMERANUMBER] [-interval TIME] [-duration TIME] [-store SIZE];`

- Options**
- `-src` Specifies the source file name, i.e. `halfsize.jpg`, `fullsize.jpg` or `hugesize.jpg`.
 - `-cam` Specifies the camera source, i.e. 1-5. If omitted, the default camera will be used.
 - `-interval`
Specifies the time interval between consecutive snapshots. If omitted, new snapshots will be generated without any delay.
Format: `h<hours>m<minutes>s<seconds>`.
 - `-duration`
Specifies the total time for the command to run. If omitted, the `buffer_start` command will be issued only once. Format: `h<hours>m<minutes>s<seconds>`. If you specify `-duration inf`, the command will continue to be executed until it is interrupted by a `buffer_init` command.
 - `-store`
Specifies the number of images to be stored in the buffer. This setting will override the duration. The maximum number of images is specified by the `buffer_init` command.

Example

```
# This command initiates the buffer to hold 60
# halfsize.jpg and 5 hugesize.jpg images. New images
# are captured until the buffer_start command is
# interrupted.
* * * * * BOOT :
buffer_init 1,1,60:1,3,5;
buffer_start -src halfsize.jpg -interval s1 -duration
inf;
buffer_start -src hugesize.jpg -interval m1 -duration
inf;
%
# When port 1 is triggered, an alert message is sent
# to host 1.2.3.4. Another 10 halfsize.jpg images are
# captured and all the images are sent to an ftp
# server with the names "Halfsize_1" to
# "Halfsize_60". Then the buffer is restarted.
* * * * * /I1:
alert -host 1.2.3.4 -port 4000 -message "Alert! Input
on port 1.";
buffer_stop -src halfsize.jpg -store 10;
ftp -host somehost -user USER -pass PASS -src
images/buffer.jpg -dest Halfsize_$(r1-60) -time
h1 -buffer halfsize.jpg;
alert -host 1.2.3.4 -port 4000 -message "Alert!
Images sent to ftp server";
%
# When port 2 is triggered, the 5 most recent
# hugesize.jpg images are sent to an ftp server
# with the names "Picture_1" to "Picture5". Note that
# the buffer is not stopped.
* * * * * /I2:
ftp -host somehost -user USER -pass PASS -src
images/buffer.jpg -dest Picture_$(r1-5) -time h1
-buffer hugesize.jpg;
%
```

ftp The ftp command uses the standard File Transfer Protocol (FTP) for transferring an image from your AXIS 240 to a remote host.

Note: The ftp command keeps the connection open during each file transfer.

Syntax

```
ftp [-host HOST] [-user USERNAME] [-pass PASSWORD]
[-src SOURCEFILE] [-dest DESTINATIONFILE]
[-temp TEMPORARY_DESTINATION_NAME] [-loop LOOPTIME]
[-time TOTALTIME] [-cam CAMERANUMBER]
[-buffer BUFFERTYPE];
```

Options

- host Specifies the name or IP address of the remote host. If specifying the name, performance will be slightly decreased due to the DNS lookup. If no host is specified, the compiler will complain.
- user Specifies the user name for logging on to the remote host. If no user name is specified, the compiler will complain.
- pass Specifies the password for logging on to the remote host.
- src Specifies the source file name. If omitted, the `fullsize.jpg` file will be sent. To include the image buffer, specify `images/buffer.jpg`.
- dest Specifies the name and whole path of the destination file. If omitted, the destination file name will be the same as the source file name. The maximum length of a destination file name is 255 characters. You can add as many destination files as required, separated by a space.

You can add time stamps, such as time, date and file indexes, to the destination file name. This is useful for example when you are transferring a series of files.

The following table lists the available time stamp variables. Every substitution must be preceded by a dollar sign “\$”.

\$s

The current second in the range 00-59.

\$m
The current minute in the range 00-59.

\$h
The current hour in the range 00-23.

\$d
The current day of the month in the range 01-31.

\$n
The current month in the range 01-12.

\$Y
The current year without the century in the range 00-99.

\$Y
The current year including the century.

\$rS-E
Inserts an index number starting from number S through all the numbers including the number E. If you leave out number E, it will be interpreted as a very large number. **Note:** The rS-E substitution can be used with the first destination file only.

-temp Specifies a temporary name for the destination. This is to prevent someone else from accidentally reading the file during the download.

-loop Specifies the time interval within which the command should be repeated. Used together with the time attribute. If omitted, there will be no delay between repeated transfers. Format: h<hours>m<minutes>s<seconds>. Optional.

-time Specifies the total time the command should loop. Used together with the loop attribute. If omitted, the ftp command will be issued only once. Format: h<hours>m<minutes>s<seconds>. Optional.

-cam Specifies the camera source, i.e. 1 - 5. If omitted, the default camera will be used.

-buffer Specifies the buffer type, i.e. fullsize.jpg, halfsize.jpg or hugesize.jpg. Only valid if -src is set to images/buffer.jpg.

Additional Options In addition to the options described above, the following optional settings are also available:

`-ctrlport`

Specifies the TCP port number in the range [0..65534] to be used as the control port for the FTP server.

`-dataport`

Specifies the TCP port number in the range [0..65534] to be used as data port for the FTP server.

`-to` Specifies the timeout, i.e. the FTP session will terminate when the specified time limit has expired. Format:
`h<hours>m<minutes>s<seconds>`.

However, these options can only be used via a text editor.

Example 1

```
# This command will log in as "elvis" with the
# password "presley" on the host with the Internet
# address 123.123.123.123, download a hugesize
# image with the name "king.jpg" and put
# it in the directory "/home/elvis" on the remote
# host. During download, the file name "tmp.jpg"
# will be used.
* * * * * :
ftp -host 123.123.123.123 -user elvis -pass presley
-src hugesize.jpg -dest /home/elvis/king.jpg -temp
tmp.jpg;
%
```

Example 2

```
# This command will every hour, every five seconds
# for twenty minutes, download a fullsize image
# from camera 3 and save the images with a time
# stamp in the filename.
0 * * * * :
ftp -src fullsize.jpg -host an.interesting.site
-dest tmp/full$h$m$s.jpg -user billy -pass startrek
-loop s5 -time m20 -cam 3;
%
```

Example 3

```
# This command will send 1001 consecutive fullsize
# images to "funny.host.name". The first and last
# images will be named "fullsize1000.jpg" and
# "fullsize2000.jpg", respectively.
* * * * * :
ftp -host funny.host.name -user camera1 -pass secret
-src fullsize.jpg -dest
/home/camera1/tmp/fullsize$r1000-2000.jpg;
%
```

log This command writes a message to the camera server log file.

Note: To display the log file, you type the following in the address/location field of your Web browser:
<http://<camera server>/log/messages>

Syntax `log [MESSAGE];`

Options [MESSAGE]

The message string must be surrounded by quotation marks.

Example:

```
# This command will write a message to the log file
# when someone presses the Control button on the
# camera server front panel.
* * * * * /B :
log "The Control button was pressed." ;
%
```

mail This command uses the Simple Mail Transfer Protocol (SMTP) for sending images and files from your AXIS 240 to e-mail addresses.

Note: To use the mail command, you must specify the IP address of the mail server and a valid return address on the TCP/IP page.

Syntax `mail [-s SUBJECT] [-a ATTACHMENTS] [-t RECIPIENTS]
[-cam CAMERANUMBER] [-b BUFFERTYPE] [-n NUMBER];`

Options

- s Specifies the subject text for the e-mail. A simple one-word subject does not require quotation marks. A subject with multiple words must be surrounded by quotation marks.
- a Specifies attachments such as images or files. To include the image buffer, specify `images/buffer.jpg`.
- t Specifies the e-mail address of the recipient(s).

- cam Specifies the camera source, i.e. 1-5. If omitted, the default camera will be used.
- b Specifies the buffer type, i.e. `fullsize.jpg`, `halfsize.jpg` or `hugesize.jpg`. Only valid if `-a` is set to `images/buffer.jpg`.
- n Specifies the number of buffered images to be included in the e-mail. Only valid if `-src` is set to `images/buffer.jpg`.

Example 1

```
# This command will send an e-mail with the
# subject "Hello" and the attached file
# fullsize.jpg to someone@company.com
* * * * * :
mail -s Hello -a fullsize.jpg -t someone@company.com;
%
```

Example 2

```
# This command will send an e-mail with the
# subject "This "fullsize.jpg" was sent from my
# AXIS 240" to two recipients.
* * * * * :
mail -s "This \"fullsize.jpg\" was sent from my AXIS
240" -a fullsize.jpg -t someone@axis.com
anotherone@axis.com;
%
```

Example 3

```
# This command will send an e-mail with five
# attachments.
* * * * * :
mail -a fullsize.jpg halfsize.jpg hugesize.ppm
cronscript config -t me@at.home;
%
```

offline

This command terminates the current PPP connection. Used together with the online command.

Syntax `offline;`

online This command dials up a modem and establishes a PPP connection. Used together with the offline command.

Syntax `online [-dial NUMBER] [-user USERNAME -pass PASSWORD] [-timeout TIME] [-script "send expect send expect ..."];`

Options

- `-dial` Specifies the phone number that will be sent to the modem as ATDT<phone number>. The number cannot include spaces.
- `-user` Specifies the user name used for authentication. Note that spaces are not allowed in the user name. Optional.
- `-pass` Specifies the password. Required if a user name is specified.
- `-timeout`
Resets the AXIS 240 when the specified time limit has exceeded. Format: h<hours>m<minutes>s<seconds>. Optional.
- `-script`
Specifies an optional script string of expect-send pairs to be sent over the line. This must be the last option in the command.

If a send word is empty, i.e. if it contains single quotes ("), nothing will be sent until the expect word is received.

For a login sequence, you can use the words \$(USER) and \$(PASS). They will be replaced by the arguments specified in the -user and -pass options, respectively.

If the string does not include an escape code, a carriage return character will be appended automatically at the end of the string. Valid escape codes are: \r (carriage return), \n (line feed) and \t (tab).

At the end of the script, the AXIS 240 will enter the negotiation phase.

Example

```
# This command will dial up a modem with number
# aNumber, and login with user name aUser and
# password aPass. It will first wait for the
# string "ogin:" and send the user name. It
# will then wait for the string "ass:" and send
# the password.
* * * * * :
online -dial aNumber -user aUser -pass aPass
-script " " 'ogin:' '$(USER)' 'ass:' '$(PASS)' ";
%
```

ptz This command pans, tilts and zooms connected video cameras.

Syntax ptz [-speed VALUE[DEVICE]][-preset POSITION]
 [-cam CAMERANUMBER][-zoom VALUE][-move DIRECTION]
 [-pan ANGLE][-tilt ANGLE];

- Options**
- speed
 Specifies with which speed the camera source will move between the defined positions. Note that this option is device dependent and is supported by the drivers Sony G20, Sony E30 and VCC3.
 To specify the speed for Sony G20 and E30 enter a value between 1 - 16, where 1 is slow and 16 fast. For the VCC3, enter a value between 1 - 76, where 1 is slow and 76 fast.
 - preset
 Specifies the preset position, i.e. 1-10. Note that camera source must be defined on the **Configuration - Preset Position** page.
 - cam
 Specifies the camera source, i.e. 1 - 5. If omitted, the default camera will be used. This is the camera defined as default on the **Configuration - Video** page.
 - zoom
 Specifies the zoom value of the selected camera source, i.e. 1 - 999. Note that this option is device dependent and is supported by the drivers Sony, Canon and Videmech.

- move Specifies in which direction the selected camera source shall be moved, i.e. home, up, upleft, left, downleft, down, downright, right, upright. Note that the move home option is only supported by the drivers Sony, Canon and Videmech.
- pan Specifies the pan angle of the selected camera source, i.e. -180 - 180. Note that this option is device dependent and is supported by the drivers Sony, Canon and Videmech.
- tilt Specifies the tilt angle of the selected camera source, i.e. -180 - 180. Note that this option is device dependent and is supported by the drivers Sony, Canon and Videmech.

Example 1

```
# This command moves camera 2 up five degrees and
# zooms wide.
* * * * * :
ptz -cam 2 -move up -zoom 1
```

Example 2

```
# This command moves the camera source to preset
# position 1.
* * * * * :
ptz -preset 1;
```

Note: The options must be entered in the following order:

-speed, -preset, -cam, -zoom, -move, -pan, -tilt

For example, `ptz -tilt 10 -cam 4`, will not work, you must enter, `ptz -cam 4 -tilt 10`.

reset This command resets the software or hardware of the AXIS 240.

Syntax `reset [-soft | -hard];`

Options

- soft Reinitiates the AXIS 240 protocols.
- hard Performs a complete reboot of the AXIS 240.

Example

```
# This command will reset the AXIS 240 hardware
# once a day.
0 0 * * * :
reset -hard;
%
```

sleep

This command adds a pause to the CRON script execution. The command is typically used if you want to assure that the previous command is finished before continuing the script.

Syntax `sleep <seconds>;`

Options `<seconds>`
 Specifies the number of seconds to wait before proceeding with the next command in the event entry.

Example

```
# This command will result in a 30 seconds pause
# in the CRON script execution.
* * * * * :
sleep 30;
%
```

snapshot

This command updates the `lastshot.jpg` image. The command can also be used for controlling the relay switch.

Syntax `snapshot [-l LOOPTIME] [-t TOTALTIME]
 [-cam CAMERANUMBER] [FILE];`

Options
 -l Specifies the time between two consecutive image updates.
 -t Specifies the duration of the command. Format:
`h<hours>m<minutes>s<seconds>`.

`-cam` Specifies the camera source, i.e. 1-5. If omitted, the default camera will be used.

[FILE]

Specifies the image type: `fullsize.jpg`, `halfsize.jpg`, `hugesize.jpg`, or `zoom.jpg`.

If using the command for controlling the relay switch, you specify `io/relayon.txt` and `io/relayoff.txt`, respectively.

Example 1

```
# This command will update the lastshot.jpg image
# with a fullsize image from camera 2.
* * * * * :
snapshot fullsize.jpg -cam 2;
%
```

Example 2

```
# During one minute, the lastshot image will be
# updated as halfsize.jpg with two-seconds
# intervals.
* * * * * :
snapshot -l s2 -t m1 halfsize.jpg;
%
```

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