Axis Camera Servers

**The First Plug-and-Picture
Web Camera**

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

AXIS
COMMUNICATIONS

AXIS 200+
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 200+ 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). $C\epsilon$

Liability

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

Year 2000 Compliance

Axis Communications warrants that the AXIS 200+ is Year 2000 compliant.

Trademark Acknowledgments

Acrobat, Adobe, Apple, Chimera, Ethernet, IBM, Internet, Internet Explorer, LAN Manager, LAN Server, Macintosh, Microsoft, NCSA Mosaic, Netscape Navigator, Novell NetWare, Oracle Power Browser, OS/2, UNIX, Windows, WWW are registered trademarks of the respective holders.

Preface

Thank you for purchasing the AXIS 200+ 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 200+ in various network environments. It is intended for everyone involved in installing and managing the AXIS 200+. To fully benefit from the manual, you should be familiar with basic networking principles.

This manual applies to the AXIS 200+, with software release 1.41.

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.

Table of Contents

Section 1   Introduction

The AXIS 200+ Camera Server

The AXIS 200+ Camera Server is a digital snapshot camera with a built-in web server. It connects directly to Ethernet networks and provides a source for live color pictures over the Internet.

The AXIS 200+ Camera Server

In the past, network imaging solutions have required cumbersome, complicated systems involving PCs or workstations with specific video cabling. The AXIS 200+ eliminates the cost, management and maintenance issues commonly associated with those types of solutions.

Traditional surveillance systems often limit camera access to a specific monitor i.e. the control room. However, the AXIS 200+ 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.

Technically, the AXIS 200+ is a microprocessor-based device that includes:

- A digital color camera

- Optimised hardware for image compression

- Standalone web server functionality

- Physical Ethernet connection for modem

Features and Benefits

Easy Installation
Connecting the AXIS 200+ to the network is easy. It does not require the use of a PC frame grabber card or interaction with any other server. No additional software or hardware is needed. You can actually install it in a single minute - all you need to do is assign a valid Internet address.

Cost-effective
With all necessary features included, the AXIS 200+ provides a reliable and low cost alternative for publication of pictures on the network.

Standard Image Format
The AXIS 200+ generates pictures in standard JPEG format which means that users can take and view pictures over the network using any standard Web browser. Pictures taken by the AXIS 200+ can be displayed in your web pages by creating HTML links.

The AXIS 200+ provides high-quality snapshot pictures for any Internet/intranet client that cares to visit it. Primarily designed to produce a 'live' snapshot for each occasion it is accessed, it can also broadcast recently generated pictures upon request.

Fast JPEG Compression
The AXIS 200+ has hardware support for the JPEG compression as well as a 32-bit high speed RISC CPU. This results in fast JPEG compression. The AXIS 200+ provides JPEG images directly, without the need for manual conversion between image formats. A full size JPEG image is compressed in less than one second.

Operating Environments   The AXIS 200+ supports TCP/IP and Internet-related protocols. It can therefore be used in mixed operating system environments such as Windows, Macintosh, UNIX and OS/2.

Using a standard Web browser, the AXIS 200+ can be configured and managed directly from its own web pages.
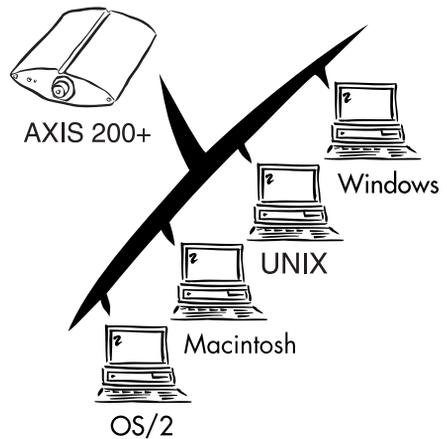
The AXIS 200+ also supports FTP so that snapshots can be taken and saved locally.

Dial-up Connection   The Point to Point Protocol (PPP) support allows you to use your AXIS 200+ remotely over a serial link, just as if it were located on your local network. By connecting the AXIS 200+ to a modem, snapshot images can be downloaded to remote computers using standard modem equipment.

External Device Connection   The auxiliary input makes it possible to control the AXIS 200+ from external devices, i.e. IR-sensors, switches, alarm relays etc.

Security   The AXIS 200+ 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 your company's Internet firewall.

Web Forum   Axis Communications will be running a web forum for ideas and
Discussions   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, FAQ:s and other
related information.

Section 2 Installing the AXIS 200+

This section provides a brief description of the unit connectors and indicators, and describes the AXIS 200+ installation procedures.

Installation Summary

The AXIS 200+ is installed in these stages:

Stage 1. Unpacking and Checking the Hardware.

Stage 2. Identifying the Connectors and Indicators

Stage 3. Installing the Hardware

Stage 4. Assigning an Internet Address

Stage 5. Verifying the Installation

Stage 6. Adjusting the Focus

Stage 7. Adjusting the Image Parameters

Stage 8. Replacing the Lens

Stage 1. 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 200+	0064-2
Mounting Assembly		15104
Power Supply	Europe	14233
	UK	14234
	Australia	14255
	USA	14253
	Japan	14254
Extension Cord	10 feet (3 m)	15187
Media	**Title**	**Part Numbers**
CD-ROM	AXIS Online CD	15926
Printed Material	AXIS 200+ Quick Installation Guide	15846
	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.

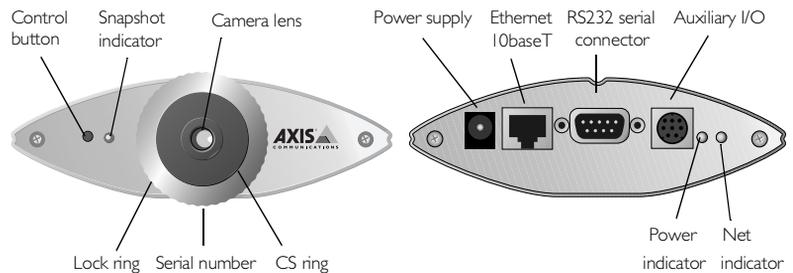**Startup Procedures for Macintosh, UNIX and OS/2**

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 path name 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

Please read the following information to familiarize yourself with the AXIS 200+, making particular note of where the connectors and indicators are located. This information provide a useful reference when performing the remaining stages of the installation.

Control button Snapshot indicator Camera lens Power supply Ethernet 10baseT RS232 serial connector Auxiliary I/O

Lock ring Serial number CS ring Power indicator Net indicator

Connectors

Auxiliary I/O Connector A Mini-DIN 8-pole external connector for auxiliary connection to the AXIS 200+. The functionality of this connector is fully discussed in *Appendix D - The Auxiliary IO Port.*

RS232 Serial
Connector

A 9 pin D-sub connector provides the physical RS232 serial interface to a modem server within the AXIS 200+. This connector is discussed in detail in *Appendix E - The RS232 Serial Port.*

Ethernet 10BaseT
Connector

10BaseT (RJ-45) twisted pair Ethernet connector for connection to the network.

Power Supply
Connector

Jack socket for connection of AXIS 200+ power supply.

Caution!

The power supply delivered with your AXIS 200+ is country specific. Please check that the type of power supply you are using is correct against the checklist.

Indicators

Snapshot Indicator

The Snapshot indicator will flash on every occasion the AXIS 200+ takes a snapshot.

Power Indicator

The Power indicator is normally lit while power is applied. If it is not lit, or it flashes, there is problem with the AXIS 200+ power supply.

Net Indicator

The Net indicator flashes to indicate network activity.

Camera Lens

Wide angle lens with rotational-focus control. Refer to *Appendix C - Technical Specifications* for complete specification. Possible to mount standard C/CS lenses. See *Stage 8. Replacing the Lens,* on page 19.

Serial Number

The serial number is located on the underside label of the AXIS 200+. Please note that the serial number of your AXIS 200+ is identical to the Ethernet address of the unit.

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

Stage 3. Installing the Hardware

To connect your AXIS 200+ to the network, follow these instructions:

1. Note the serial number of your AXIS 200+ for future reference during the installation procedure. This is located on the underside label of the AXIS 200+.

2. Fasten the AXIS 200+ to the mounting assembly and position it appropriately for your application.

Note:　❏　The intermediate part of the mounting assembly is detachable. If more convenient, you can take the mounting assembly apart and attach the camera holder directly to the foot. See the picture.
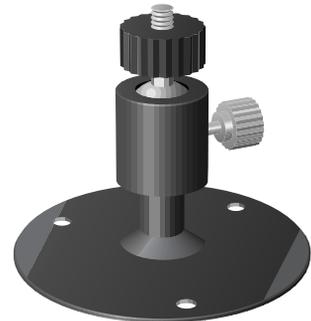
Caution!　❏　Please note that the CCD (charged coupled device) within the AXIS 200+ can become permanently damaged if the camera lens is exposed to too much direct sunlight!
If you operate the AXIS 200+ in very bright light, we recommend that you use a lens with adjustable iris (auto or manual). If your application demands prolonged exposure to sunlight, you should consider the purchase of a visor. Refer to this link for further information:
http://www.axis.com/products/camera_servers/applic/housing. htm

3. Connect your AXIS 200+ to the network using an Ethernet 10baseT connector.

4. Connect the power supply to the AXIS 200+.

5. Check that the Power indicator is constantly lit.

Stage 4. Assigning an Internet Address

To access the AXIS 200+ from a Web browser, you must first assign a valid Internet address.

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

Stage 5. Verifying the Installation

After assigning an Internet address, verify the connection between your AXIS 200+ and the network. Follow these steps:
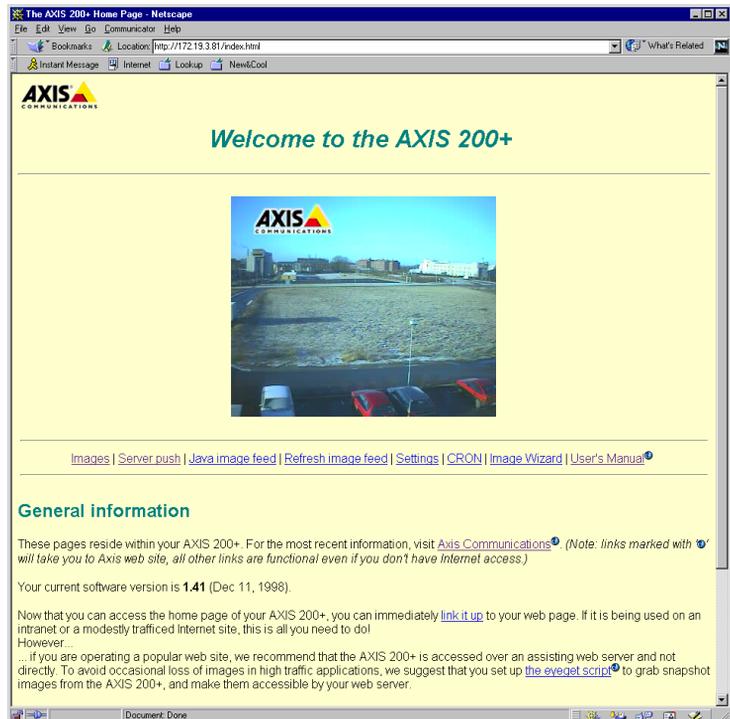
1. Start your Web browser and enter the name or Internet address:

```
http://cameraname/
```

or

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

The AXIS 200+ Home Page that includes a snapshot just taken is displayed:

2. To further test your AXIS 200+, take some more pictures. Simply click Refreh/Reload in your Web browser to do that.

Notes: ❏ If you are using Netscape Navigator, you can click the **Server push** link to start automatic picture updating. If you are using Internet Explorer, you must first download an ActiveX component from the AXIS 200+ web site to enable automatic picture updating. Then click **ActiveX** on the Server push page. The automatic updating functions are described in *Automatic Picture Updating,* on page 47.

❏ Web pages are kept locally for fast browsing. Thus, in some instances your AXIS 200+ may display a cached image as opposed to a newly taken snapshot. In these circumstances, simply reload your Web browser.

Stage 6. Adjusting the Focus

The AXIS 200+ is delivered in approximate focus position, with focus set to infinity.

The AXIS 200+ lens has rotational focus control. To fine adjust to close focus, carefully turn the smaller lens.

If you cannot obtain a sharp picture, screw the smaller lens to its end and loosen the lock ring. Direct the camera towards a distant object and bring the camera into focus by turning the entire lens mount. Remember to tighten the lock ring afterwards.

smaller lens

Lock ring   Lens mount
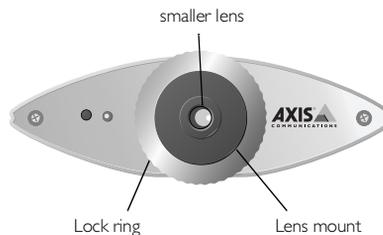
Note: ❏ The lens assembly rotates on a screw fitting and can be completely removed if taken to the end of its thread. Should you need to remove the lens, take care not to let any dust enter the lens as this will adversely effect the quality of your snapshots.

Test the results of the adjustments by taking some new pictures. To do this, simply reload the URL in your Web browser. Use one of the automatic updating functions to monitor the changes to focus.

The installation is complete and you can now include pictures into your own applications.

Optionally, you can replace the basic lens delivered with the AXIS 200+ with another lens. See *Stage 8. Replacing the Lens,* on page 19.

Stage 7. Adjusting the Image Parameters

To automatically adjust the image parameters, click the **Image Wizard** link. Screen by screen, the wizard will display a number of samples and ask you to choose the best picture with respect to brightness, white balance, color etc. You can also set a time period for automatically adjusting the color in the image to the environment.

Stage 8. Replacing the Lens

You can replace the basic lens with any industry standard C or CS lens.

Note: ❏   To mount a C lens, you will need a C/CS ring adapter.

Follow these steps to replace the lens:

1.   Unscrew the AXIS 200+ lens assembly.

2.   Detach the plastic lens fitting from the CS ring.

3.   *C lens only:* Attach the new lens to a C/CS ring adapter.

4. Screw the new lens onto the AXIS 200+ CS ring, with the flat side
    of the lock ring directed towards the new lens.
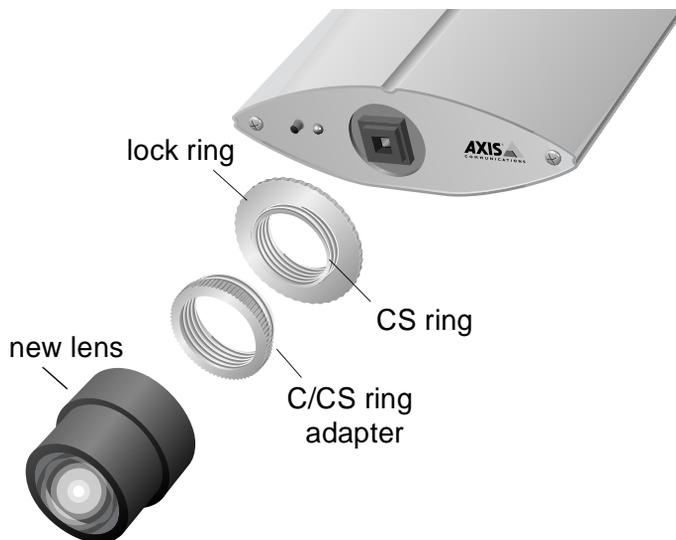
5. Screw the new lens assembly onto the AXIS 200+ unit.

6. If applicable, adjust the iris according to the lens documentation.

7. Adjust the focus. Reload your Web browser to monitor the results.
    Zoom lens only: Turn the lens to maximum telephoto zoom and set
    focus to infinity. Direct the camera towards a distant object and
    adjust the back focus. Check that you obtain sharp pictures at
    various zoom grades and various distances.

8. Tighten the lock ring.

Section 3   Assigning an IP Address
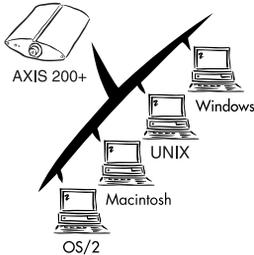
To enable access to your AXIS 200+, you must first assign it an appropriate IP address.

This section describes how to assign and download an IP address for your AXIS 200+.

Downloading the IP Address

You can set the IP address of the AXIS 200+ 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 200+ is powered up and attached to the network.

Internet 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 200+. 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 200+. Always consult your Network Administrator before assigning an IP address.

Mapping a Host Name to the Internet 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 AXIS IP Installer*" on page 24
ARP	Windows 95	"*Using ARP in Windows 95*" on page 25
	Windows 98 & Windows NT	"*Using ARP in Windows 98 and Windows NT*" on page 26
	UNIX, OS/2	"*Using ARP in UNIX and OS/2*" on page 27
RARP	UNIX	"*Using RARP in UNIX*" on page 28
BOOTP	UNIX	"*Using BOOTP in UNIX*" on page 29

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. Locate the setup file xxxxx.exe.

2. Choose **Run...** from the **Start** menu. 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

Follow these instructions to download the IP address and verify the communication.

Start a DOS window and type the following commands:

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

Example:

```
arp -s 172.16.253.80 00-40-8c-10-00-86
ping 172.16.253.80
```

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 UNIX and OS/2

Follow these instructions to download the IP address and verify the communication.

Type the following commands:

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

Example:

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

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

Notes: ❏ 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 cameraname
```

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 performed using the command `rarpd -a` .

4. Restart the AXIS 200+ 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 performed 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 200+
`ip`	= The IP address of the AXIS 200+
`sm`	= The subnet mask
`gw`	= The default router address

Example:

```
cameraname:ht=ether:vm=rfc1048:\
:ha=00408c100086:ip=172.16.253.80:\
:sm=255.255.255.0:gw=172.16.1.1
```

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 performed using the command `bootpd` .

4. Restart the AXIS 200+ to download the IP address, default router address, and subnet mask.

Section 4 Configuring the AXIS 200+

This section includes an overview of the AXIS 200+ configuration parameters.

You can configure the AXIS 200+ via hyperlinks from within its own web pages from any standard Web browser. Alternatively, you can configure the AXIS 200+ using FTP.

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

Note: ❏ For the latest technical information, refer to the AXIS 200+ web site at **http://www.axis.com/products/cam_200p/** .

Configuring using a Web Browser

To configure the AXIS 200+, enter the name or Internet address into the location/address field of your Web browser:

```
http://cameraname/
```

or

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

The Home Page

The Home Page for your AXIS 200+ will be displayed:
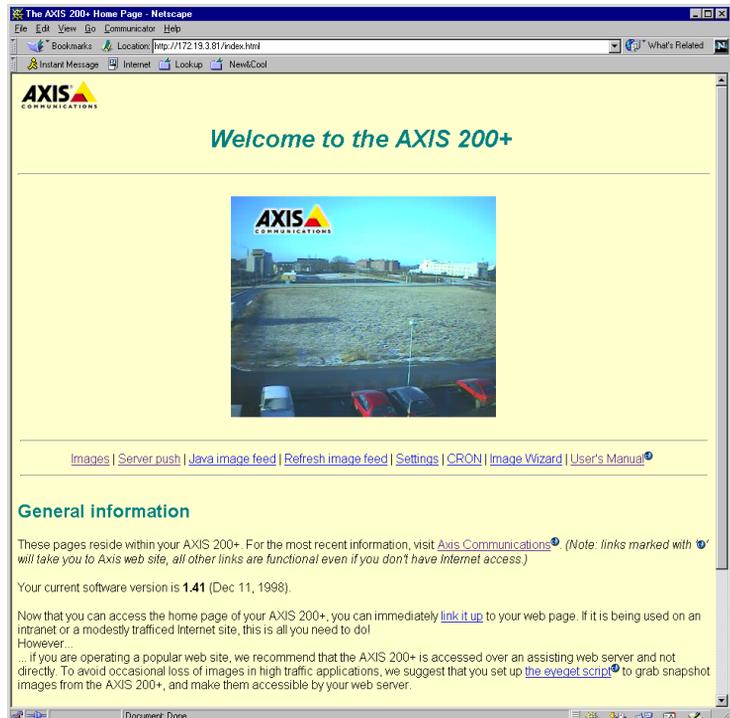
On the AXIS 200+ Home Page, click on the **Settings** link to reach the Configuration pages.

The configuration parameters are grouped into these pages:

- Image
- Date & Time
- Security
- TCP/IP
- Serial port

Note: ❏   When entering the configuration pages for the first time during a session, you will be prompted for username and password. 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

To specify the default image settings, click **Image** at the top of the Configuration page.

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	Enables your snapshots to be mirrored horizontally.
Color	Specifies the color settings: none or Color Level 1 - 7. Where level 1 is the lowest and level 7 the greatest. When set to None, the AXIS 200+ will produce a black/white snapshot file.
Compression	Determines the compression factor for the resulting JPEG image: low, medium or high. Low compression produces an optimum picture quality, but creates larger snapshot file sizes.
White balance	The white balance is the reference color to which all other colors in an image are compared. See further description on page 35.
Brightness	Standard brightness parameter with a range setting of 0-9 and default value 5.
Image Text Position x position y	Text to be displayed on the image at the position specified by the x and y coordinates.
Image Cache time	Determines for how long a snapshot image will remain in the internal memory before an access request will cause a new file to be generated. The valid range is 0 - 999 seconds. The default value is 0, and causes the AXIS 200+ to generate a new snapshot for each access.
Front panel LED	Enables the Snapshot indicator on the front panel.
Autoadapt period	Specifies a time period for automatically adjusting the color in the image to the environment.
[Advanced Settings]	
Sharpness	A higher value results in a sharper image, but makes the JPEG compression more complicated and increases the file size.
Exposure Mode	If you specify Auto, the AXIS 200+ will control the shutter speed and gain automatically. Set to Shutter Control to control the shutter speed manually. Set to Manual to control both shutter speed and image gain manually.
Shutter Speed	Specifies the shutter speed. **Note:** This setting will be ignored if the Exposure Mode is set to Auto .
Gain	A higher value results in a lighter image. **Note:** This setting will be ignored if the Exposure Mode is set to Auto or Shutter Control.

Notes: ❏ From the AXIS 200+ Home Page, you can access the Image Wizard that allows you to tune the image parameter settings iteratively. See "*Stage 7. Adjusting the Image Parameters*" on page 19.

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

White Balance　　White balance can be described as the reference color against which all other colors in an image are compared. In considering the operational aspects of the AXIS 200+, the white balance is of particular importance. You set the white balance parameter on the Configuration - Image page.

The resident white balancing system within the AXIS 200+ automatically detects white colors in any image and uses these intelligently as a reference for other colors. However, in certain situations, this system will not operate effectively.

Generally, problems will occur if the viewed image does not contain any white color at all, or if the dominant color is another than white. In such circumstances, the AXIS 200+ might erroneously base the white balance on another visible color in the image. Consequently, the colors will become distorted. A pale background picture with foreground objects of an acute reddish or blue hue are symptomatic of this condition. In this case, you are recommended to operate the AXIS 200+ in a fixed white balance mode.

White Balance Modes　　You can specify one of these white balance modes:

Mode	Description
Automatic Normal	Automatic color adjustment. The camera tries to find a white area in the image within normal limits.The color in the identified area is defined as white and all other colors are adjusted proportionally.
Automatic Narrow	Automatic color adjustment. The camera tries to find a white area in the image within narrow limits. The color in the identified area is defined as white and all other colors are adjusted proportionally. If the camera cannot identify such a white area, the automatic color adjustment is turned off.

Automatic Wide	Automatic color adjustment. The camera tries to find a white area in the image. No limits are used. The color in the identified area is defined as white and all other colors are adjusted proportionally. This setting gives natural colors in most environments. **Note:** In environments with no white areas, another color will be defined as white, i.e. a red object which covers the entire image will turn gray.
Automatic Fast	As Automatic Wide, but with faster adjustment.
Indoor Light Bulbs	Fixed color adjustment. Good for normal light bulb light (color temperatures of 3200K).
Indoor Fluorescent 1	Fixed color adjustment. Good for fluorescent tube light (color temperatures of 4200K).
Indoor Fluorescent 2	Fixed color adjustment. Good for fluorescent tube light (color temperatures of 4700K).
Outdoor	Fixed color adjustment. Good for sky light (color temperatures of 6300K).

Date & Time Page

To set the current date and time, 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 is displayed in this format: day-month-year.
Time	The current time is displayed in this format: hour:minute:second. The time must be specified in 24 hour format, e.g. 5 pm should be entered as 17 in the hour field.
Datesync Server Datesync Period Datesync Protocol Datesync Time Zone	To activate the integrated date and time synchronization mechanism, you must provide the Internet address of a date server, a synchronization period (in minutes) greater than zero, the synchronization protocol and time zone adjustment. The date server provides the actual time and date when connected to TCP port 13 (Daytime protocol), TCP port 37 (Time protocol) or UDP port 123 (NTP protocol). The date and time will be automatically updated in intervals as specified in the synchronization period field. Default values are 0.0.0.0, 0, Time and 0, respectively.
Display Date/Time	Allows a time stamp to be superimposed upon the picture image in the format Hour:Minute:Second Day-Month-Year.
Time format	Presents the time in either of these formats: 24 hours or AM/PM.
Clock Position x Clock Position y	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 clock 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.

Security Page

To change the security parameters, 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 of the Administrator. When configuring the unit for the first time, you log on as user root and use the default password pass. You are recommended to change the root password later, since all Axis products are shipped with this password as default.
Usernames and passwords	By default, the AXIS 200+ supports anonymous user access, which means that anybody on the Internet/intranet may access the AXIS 200+ snapshots from a Web browser. Should you wish to restrict access to specific users, enter the usernames and passwords of only those authorized users. If anonymous user service is satisfactory to your system, simply do not add any users. **Note:** Only characters a-z, A-Z or 0-9 are valid.

TCP/IP Page

To set the Internet parameters, click **TCP/IP** at the top of the Configuration page.

The following is a description of the Internet parameters

Parameter name	Description
IP Address	Defines the Internet address of the AXIS 200+.
Default Router	Defines the default router for the AXIS 200+. By default the parameter is set to automatic router search.
Net Mask	Defines the subnet mask for the AXIS 200+. 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 Internet address of the primary DNS server. Used for identifying computers with names instead of IP addresses.
Secondary DNS	The Internet 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 Path	The reply address for e-mails sent by the AXIS 200+.
Enable BOOTP	Enables the BOOTP protocol for downloading the Internet address.
Enable RARP	Enables the RARP protocol for downloading the Internet address.

Serial Port Page

To enable a serial link to the AXIS 200+, click **Serial port** at the top of the Configuration page. This is needed if you want to transfer snapshots and configuration data via a connecting modem. You can also use the serial port for input/output operation via a TCP client application.

The following is a description of the Serial port parameters:

Parameter name	Description
[Mode]	
Serial Mode	When set to Disabled, PPP or zmodem access is not available. When set to Full Support, serial mode is enabled for both incoming and outgoing modem connection. When set to Inbound only, the AXIS 200+ answers incoming calls, but does not dial up. When set to Outbound only, the AXIS 200+ dials up according to the behavior programmed in the cronscript, but does not answer incoming calls. When set to TCP input/output or HTTP input/output, the serial port can be used for input/output operation via a TCP or HTTp client application respectively.
[Settings]	
TCP Port	The TCP port number in the range 1-65535 to be used for communication between the AXIS 200+ and a TCP client application. When set to 0, the TCP input/output operation is disabled.
Modem Type	Autodetected Modem or Null Modem.
Detected Modem	Set internally by the AXIS 200+.
Baud Rate	19200 or 38400 is recommended. When used with GSM/cellular phones, always set the Baud rate to 9600.
Flow Control	Modem server operation mode. Always 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	Specifies how many additional attempts the AXIS 200+ will make to establish a connection in case the line is busy.
Link Quality	Determines link quality in PPP. Enabled is default. Only disable when connecting to your camera from a Macintosh.

Notes: ❑ To ensure that the new configuration is activated within the AXIS 200+, you must restart the unit after the serial mode has been enabled. To do this, simply remove and then re-insert the power connector. Alternatively, you can type the following command in the URL of your Web browser:

```
http://<cameraname>/hardreset/
```

❑   Do not enable serial mode for modem connection unless you
     intend to connect your AXIS 200+ to a modem.

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

Refer to "*Setting Up the AXIS 200+ Modem Server*" on page 90 for
more information on how to connect the AXIS 200+ to a modem.

Configuring using FTP

The configuration parameters of your AXIS 200+ can be modified using the File Transfer Protocol (FTP). FTP is supported by most operating environments.

Modifying the Configuration File

The instructions below describe how to modify the configuration file using FTP:

1. In a DOS or UNIX window, type `ftp cameraname`, where `cameraname` is the name or Internet address of your AXIS 200+.

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.

4. Use the `get config` to access the configuration file.

5. Edit the config file using any editor. In Windows 95/98 and Windows NT environments, you can use the Notepad editor to edit the parameters you wish.

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 95/98 has a library called `config` that contains important system files. It is therefore important to change this directory using the `cd` command before modifying your AXIS 200+ configuration file from within a Windows 95/98 environment. Failure to do this may result in some of your system files to be overwritten.

Section 5 Using the AXIS 200+

After installing the AXIS 200+ and assigning it an appropriate Internet address, you are ready to use it in your own applications.

This section describes how to use the AXIS 200+ 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
- **External web sites** - Using snapshot files on the Internet
- **CRON script** - Triggering the AXIS 200+ by time or input events
- **CGI parameters** - Defining special snapshot features within embedded URL requests
- **Point to Point Protocol (PPP)** - Accessing the AXIS 200+ remotely over a serial link
- **Zmodem** - Downloading snapshot images to remote computers using standard modem equipment

Note: ❏ How to assign the Internet address of your AXIS 200+ is described in *Section 3 - Assigning an IP Address.*

Snapshots

Throughout this manual, a picture image generated by the AXIS 200+ is referred to as a snapshot. The following information describes how to take a snapshot and also defines the various types of snapshots files that can be produced.

Taking Snapshots

For each snapshot taken, the AXIS 200+ generates a JPEG file and stores it within its internal memory.

Home Page Snapshots

To produce a snapshot within the AXIS 200+ Home Page, simply enter the name or Internet address of the unit into the location/address field of your Web browser:

Example

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

This causes the AXIS 200+ to generate a fullsize JPEG image. Each time you reload the page, a new snapshot is displayed within the AXIS 200+ Home Page.

Clean Snapshots

To generate clean snapshots that are not embedded within the AXIS 200+ Home Page, you must specify the preferred snapshot type for the target JPEG file within the URL of your Web browser. Snapshots can be created in different file sizes, e.g. fullsize, halfsize etc.

Examples

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

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

Snapshot Types

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

The file size depends on several factors. Low compression and large images result in larger files, but higher quality. Images with a lot of detail will also generate larger files.

These snapshot types are available within your AXIS 200+:

File name	Size (pixels)	Description
fullsize.jpg	352 x 288 (30 kBytes)	The standard resolution. Hardware generated in 0.5 seconds.
halfsize.jpg	176 x 144 (15 kBytes)	Excellent for thumbnails. Hardware generated in 0.3 seconds.
lastshot.jpg	352 x 288 or 176 x 144	The last snapshot taken, either a 'fullsize' or 'halfsize' snapshot. Primarily intended for software applications for archiving a buffered image.
hugesize.jpg	704 x 576	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	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, Adobe PageMill, etc.

2. In your Web browser, enter the name or Internet address of your AXIS 200+ together with the preferred snapshot type.

   Example

   ```
   http://cameraname/fullsize.jpg
   ```

3. Add an HTML reference to the snapshot within the target web page.

   Example

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

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

Automatic Picture Updating

The AXIS 200+ supports three methods for automatic picture updating, namely:

- Server push
- Java image feed
- Refresh image feed

These are available from links on the AXIS 200+ Home Page.

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

The frame rate depends on how fast the AXIS 200+ 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 camera server web site that will provide the same function within Internet Explorer.

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

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.

Note: ❏   To terminate the automatic picture updating, you can click **Stop** or enter another URL in the Web browser.

External Web Sites

When using the AXIS 200+ over the Internet, we recommend that it is accessed over an assisting web server and not directly. This is because the AXIS 200+ has limited capacity for handling the extra amount of buffering 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 200+. However, this has three main drawbacks:

- Your AXIS 200+ may be located on the other side of the firewall.
- The AXIS 200+ cannot handle more than 5 simultaneous requests.
- Generating large files, such as hugesize.jpg, is very time consuming. However, when 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. In practice, the CRON service allows you to program event and/or time triggered functions within the AXIS 200+.

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

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 proceeded 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 means 2 to 6.

Example:
Trigger every month, between the fourth and eighth at 10.03, 12.03 and 14.03, using the 24 hr clock:

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

Input and Boot Field

The sixth field is an optional Input and Boot field that defines the input and boot trigger functions.

You can program the AXIS 200+ 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 and I2 respectively. The B, I1 and I2 trigger variables must be proceeded by an activate condition, /, \, 0 or 1, to indicate when the trigger variable is activated.

This table outlines the available trigger variables:

Trigger Variable	Description
BOOT	Activate at startup.
\B	Activate after high-low logical transition of Control button.
/B	Activate after low-high logical transition of Control button.
1B	Activate when Control button is logically high (pressed).
0B	Activate when Control button is logically low (released).
\I1	Activate after high-low logical transition on Input Port 1.
/I2	Activate after low-high logical transition on Input Port 2.
1I1	Activate when Input Port 1 is logically high.
0I2	Activate when Input Port 2 is logically low.
... etc.	

Note: ❑ The AXIS 200+ polls the input ports every 0.2 seconds. Thus, more rapid logical transitions will not be detected.

By combining the trigger variables using a 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 1 low and Input port 2 transition from low to high.

```
0I1&/I2
```

Triggering Fields
Summary

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

	Time and Date Fields					**Input and Boot Field (Optional)**
Field #	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

Commands

Several CRON script commands can be used within an entry. All commands must be terminated with a semi-colon ";".

This table lists the available commands:

Command	Description
alert	Sends a 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.
mail	Sends an e-mail using the Simple Mail Transfer Protocol (SMTP).
offline	Terminates the current PPP connection.
online	Dials up a modem for PPP connection.
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 G - CRON Script Command Reference* description of the syntax of the commands.

❏ Although the downloaded entries are effectively 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 200+ 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 200+.

Alternatively, you can use a standard text editor and download the CRON script file via FTP. See "*Downloading the CRON Script*" on page 57.

Notes:

❏ Only one CRON script can be resident within the AXIS 200+ 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 200+ and consequently will not erase a previously loaded script.

Example:

```
# This is an example of an Axis extended 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.
* * * * * /I1 :
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

Follow these steps to download a CRON script file, e.g. `cron.txt`, to the AXIS 200+ 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 200+.

Example:

```
C:\Temp>ftp 172.16.253.80
Connected to 172.16.253.80.
220 AXIS 200+ Jun 6 1998 ready.
User (172.16.253.80:(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
(172,16,4,70,4,6), (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)

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 200+ allows users to define special snapshot features within an embedded URL request. These requests are generated in the form of query strings that are appended to the chosen URL of your AXIS 200+. You can also use CGI parameters for writing data to the AXIS 200+ serial port.

Snapshot Requests

For snapshot requests, use this syntax:

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

Example
Request a fullsize JPEG snapshot from the AXIS 200+ with host name mycam where the image contains a clock reference and is rotated by 270 degrees.

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

CGI Parameters for Input/Output Operations

For HTTP input/output operations, use this syntax:

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

Note: ❏ If you have not selected the HTTP driver it is possible to force output by defining force=yes.

This table lists the CGI parameters for input/output operations

Parameter/Syntax	Description	Values
dataout=<string>	Writes the specified data string to the 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}
read=<n>	Reads the specified number of bytes from the serial port. The returned value will be hexadecimal coded and placed between #'s, e.g. #3A#.	1 ... 128
wait=<n>	Waits the specified number of seconds before reading from the serial port. Used together with the "read" parameter.	1 ... 9
flush=<value>	Empties the input buffer for the serial port. Always performed first when combined with other parameters.	yes/no

CGI Parameter Summary

This table summarizes the available CGI parameters:

Parameter/Syntax	Description	Values
Compression/ compression=<value>	Adjusts the image quality and file size.	medium/high/low
Color/ color=<value>	Selects color or grayscale image.	normal/none
AXIS Logo/ axislogo=<value>	Shows/hides the Axis logotype.	off/on
Clock/ clock=<value>	Shows/hides the timestamp.	off/on
Rotation/ rotation=<value>	Rotates the image.	normal/upsidedown/90deg/ 270deg
Mirror/ 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 (45 is truncated to 40). Top+height must not exceed 576 pixels (hugesize height). Left+width must not exceed 704 pixels (hugesize' width).

Click on the **Images** link on the AXIS 200+ Home Page for further details and sample images.

Note: ❏   CGI parameters embedded in URL requests override image parameters previously established within the Configuration - Image page.

Point to Point Protocol

The AXIS 200+ 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 200+ 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 200+ (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 on **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 dialing' field. Select a local modem from the displayed modem list.

4. Click **Configure...** to open the Modem Properties dialog box. 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 200+.

5. Click the **Connection** tab and then click **Advanced...** 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 200+. 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 200+

Follow this procedure to dial out to a remote AXIS 200+.

1. Double click on the newly created icon to establish a modem connection for your remote AXIS 200+.

2. Enter your username 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 200+ by entering the name or Internet address (URL) into the location field of your Web browser. Please ensure that you are not using a proxy server (Netscape: Options menu\Select Network\Proxies)

Follow these instructions to connect a Linux host to the AXIS 200+ to your network using PPP:

1. Create a file containing the following lines:

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

2. Save the file as .DIAL_AXIS200P within the 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_AXIS200P'
38400 /dev/modem

or,

pppd connect '/usr/sbin/chat -f DIAL_AXIS200P'
:172.16.3.219 38400 /dev/modem
```

   The latter variation on this command causes the AXIS 200+ to temporarily have the Internet address 172.16.3.219. 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 the arp command.

Note: ❏ 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 10 seconds, the connection should be ready for service. You should then try pinging the AXIS 200+, and make sure that it is online. The ping response times should be similar to those below:

```
64 bytes from 172.16.3.219: icmp_seq=0 ttl=15
time=197.0 ms

64 bytes from 172.16.3.219: 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 200+ to a modem as detailed below, it is possible to download snapshot images to remote computers using standard modem equipment.

Snapshot data and configuration data may 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, simply 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.

A successfully transferred snapshot file is in JPEG compressed image format, which is precisely the same as if the picture were saved from within a browser. Consequently, the downloaded file is an identical copy of a snapshot representation held within your AXIS 200+ file system.

Notes: ❏   Before files can be transferred from your AXIS 200+, the host and remote modems must be configured correctly. Refer to *Appendix E - The RS232 Serial Port* for further details.

A typical zmodem session is displayed on page 97.

Appendix A Troubleshooting

This appendix describes some of the common problems that AXIS 200+ users have experienced previously and aims to provide useful information that will help you resolve any difficulty you may have, as expediently as possible.

Symptoms, possible causes and remedial actions are listed within a reference table and references to other information sources are also discussed.

If you cannot resolve your problem after referencing the information contained in this appendix and on the AXIS 200+ FAQ, we suggest that you send the following to your local dealer:

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

The Log File

The log file records errors within the AXIS 200+ and can prove a useful diagnostic tool when attempting to resolve any problems that might occur.

Obtaining the File

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

```
http://<cameraname>/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)
```

Symptoms, Possible Causes and Remedial Actions

Symptoms	Possible causes	Remedial actions
The AXIS 200+ cannot be accessed from a Web browser.	The Internet address is already used.	To check that the Internet address for your AXIS 200+ is unique: 1. Start a DOS window. 2. Type ping x.x.x.x, where x.x.x.x is the Internet address of the AXIS 200+. The reply subsequently returned will provide some explanation as to the cause of the problem. The possible replies can be interpreted as follows: • bytes = 32 time = 2 ms... The Internet address is already used and cannot be used again. Obtain a new Internet address. • destination host unreachable The AXIS 200+ is not within a reachable network node. Obtain a new Internet address. • request timed out This Internet address is not in use by anyone and is available for use with your AXIS 200+.
	The Internet address is located within a different subnet.	In Windows 95/98 or Windows NT, check that the Internet address for your AXIS 200+ is within the same subnet as your workstation by following these steps: 1. Click **Start**, **Settings**, **Control Panel** and **Network**. 2. Specify the TCP/IP adapter and click **Properties**. In Properties, click **IP Address**. 3. Check that the first 3 numbers within the Internet address of your AXIS 200+ matches the first 3 of your workstation. If not, your AXIS 200+ is in a different subnet and the Internet address cannot be set from this workstation. Obtain a new Internet address.
	In Windows 95, the ARP table was empty when you tried to set the Internet address.	Type arp -a to display the ARP table. If the ARP table is empty, you must ping an existing unit on your network before you can download the Internet address to the AXIS 200+ using ARP.
The CRON script is not working.		Wait approximately one minute for the CRON script to activate.

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.	1. To verify that the cables work, ping the address of a known existing unit on your network.
		2. If the cabling is OK and your network is reachable, you should receive the reply similar to this: `...bytes = 32 time = 2 ms,`
The Snapshot and Net indicators are flashing every 0.5 seconds.	Hardware failure.	Contact your Axis dealer.
Your AXIS 200+ 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 200+ to the Internet. This is particularly important when generating zoom and hugesize images.
No image using Refresh and/or Slow updating of snapshots using Server Push.	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 200+.	The memory constraints become significantly more acute if the same snapshot is accessed by multiple clients. Try limiting the number of clients.
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).	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: This feature has particular significance when using commands that take a relatively long time to process, e.g. e-mail, ftp, especially if they are conjugated with a loop statement. See page 109.

Symptoms	Possible causes	Remedial actions
Cannot access the modem connected to the serial port of the AXIS 200+.	Modem not set for RTS/CTS.	Ensure that the modem is set for RTS/CTS serial communication.
	Local echo not disabled.	Disable Local echo mode using the command is ATE0.
		Save the changes in the NVRAM of the modem using the command AT&W.
A series broad vertical white lines appear across the image.	The CCD sensor becomes overloaded when the light is too bright. This can happen e.g. with sun light reflexes.	To solve the problem, turn the AXIS 200+ to avoid the reflexes. By replacing the basic lens with a lens with an iris, you can eliminate the problem. Lenses with both manual and automatic Iris are available.
Bad focus.	Focus has not been correctly adjusted.	*Basic lens:* Point the camera to a distant object. Turn the smaller lens to the bottom position. Loosen the lock ring (the biggest ring). Adjust the focus by rotating the entire lens mount. When focus is found, lock the position with the lock ring. Close up focus can be obtained by rotating the smaller lens outwards.
		C lens: When using a C-mount lens (Flange back 17.5mm), make sure that you use a 0.2in (5mm) C-mount (C-lens) adapter. The AXIS 200+ uses CS-standard (Flange back = 12.5mm)
		Zoom lens: The focus must be adjusted with the zoom lens set to maximum Zoom and the focus set to Infinity. If using C-mount lens, do not forget the 0.2 in (5mm) adapter.
Noisy snapshots.	If you use the AXIS 200+ in a low light environment the image might be noisy.	To solve this problem, you need more light. The performance of the camera is best in 100 - 1.000 lux. By replacing the basic lens with a more sensitive lens (Lower F-number), the problem can be reduced.
Bad snapshot images.	White balance set incorrectly.	Refer to page 35 for information on how to set the White balance.
	Display configured incorrectly.	Within the 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.
Black images.	Brightness set incorrectly.	Check the Brightness parameter setting.
		Auto iris lens: Check that the iris on the lens is open. Check that the Iris cable is connected.

Symptoms	Possible causes	Remedial actions
Wrong colors.	The camera adjusts its brightness and its colors automatically and can take up to several minutes for the camera to adjust.	Wait a couple of minutes and check the image again.
	Brightness parameter.	Modify the Brightness parameter. Refer to page 34 and try using the default value.
	White Balance parameter.	In some environments, you must modify the White Balance setting. Try various White balance modes in order to achieve the best image colors in your environment. For more information about the modes, refer to page 35.

Appendix B   The Parameter List

This appendix contains a listing of the AXIS 200+ configuration parameters and also describes how to restore the factory default settings for the unit.

The Configuration File

This table shows the AXIS 200+ 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.	=	Usernames and passwords of users that are authorized to access the pictures taken by the AXIS 200+. If empty, all users have full access.
TCPIP MENU		
TCP_ENB.	= YES	Enables the TCP protocol.
INT_ADDR.	= 0.0.0.0	The AXIS 200+ Internet 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.
DNS_ADDR.	= 0.0.0.0	The Internet address of the DNS server.identifying computers with names instead of IP addresses.
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 200+.
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 Internet address setup.
RARP_ENB.	= yes	Enables RARP Internet 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		
COMPRESSION.	= MEDIUM	Determines snapshot compression and consequently file size.
BRIGHTNESS.	= 5	Brightness control.
COLOR.	= LEVEL	Color control.
WHITE_BALANCE.	= AUTOMATIC	Control the white balance settings.
CONTRAST.	= 5	Not used in AXIS 200+.
LIGHT_FRONT_LED.	= YES	Enables Snapshot indicator.
ROTATION.	= NORMAL	Snapshots can have varied orientation.
MIRROR.	= NO	Enables mirroring of image from right to left.
CACHE_TIME.	= 0	Determines maximum cache period for snapshots, e.g the same snapshot will displayed for all requests within a 3 seconds period.
AUTOADAPT_PERIOD.	= 0	Period for automatically adjusting the image settings. Set within the Image Wizard.
SHARPNESS.	= 166	Image sharpness.
SHUTTER_SPEED.	= 1/50	Shutter speed.
AE_MODE.	= AUTO	Exposure mode. If set to Auto, the shutter speed and gain will be controlled automatically.
AGC_GAIN.	= 16dB	Image gain.
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. Enables input/output operation via a TCP client application when set to TCP_input_output.
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.	= 0	Specifies how many additional attempts the AXIS 200+ will make to establish a connection in case the line is busy.

Parameter name	Value	Description
TIME.	=	The current time.
DATE_SERVER.	= 0.0.0.0	Internet address of the 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), Day-time (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	

Factory Default Settings

If you should need to reset the AXIS 200+ to its factory default settings, you can use the Control button. Follow these steps:

1. Switch off the AXIS 200+ by unplugging the power cord.

2. Press and hold the Control button while you switch on the AXIS 200+. Keep the Control button pressed until the Snapshot indicator flashes at regular two second intervals.

3. Release the Control button and wait at least two seconds (one flash of the Snapshot indicator).

4. Press and hold the Control button for at least five seconds until the Snapshot indicator remains constantly lit.

5. If you need to restore the default Internet address, press and hold the Control button once again until the Snapshot indicator starts flashing. Otherwise, the Internet address setting remains unchanged.

6. The AXIS 200+ is now reset to factory default settings. Restart the AXIS 200+ by switching it off and on.

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

Section 6   Updating the Software

The AXIS 200+ 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 200+ 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 200+ software via the parallel port, is also available free of charge at **ftp://ftp.axis.com/pub/axis/software/prt_srv/utility/flash/**.

Over the Internet

Simply follow the appropriate hyperlinks, starting with "Software Updates" from within the Home Page of the AXIS 200+, or enter **http://www.axis.com/techsup/cam_servers/cam_200p/** within the URL of your Web browser.

Typically, the software update file is called `200_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 200+ 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 200+ as soon as they become available, without having to replace any parts. The new software can be simply loaded into the AXIS 200+ over the network.

Anonymous FTP

Log in to **ftp://ftp.axis.com** and go to the **/pub/axis/software/cam_srv/cam_200p/latest/** directory. Download the software update file `axis200p.exe`. Proceed then by unpacking the `.exe` file to create the associated binary and text files.

Upgrading the Software
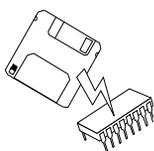
Theoretically, there are two methods for updating the AXIS 200+ Flash memory:

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

Normally, the AXIS 200+ should be upgraded over the network using FTP. However, if for some reason the AXIS 200+ becomes unavailable over the network, it may be necessary to reload the software through the parallel port. In this case, please contact your dealer.

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

Upgrading using FTP

Having obtained the upgrade software, install it into the AXIS 200+ by following the instructions below:

1. Reset the AXIS 200+ by powering it off and then on again.

2. Start an FTP session and log in to the AXIS 200+ 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 200+ by using the command:

Example

```
put axis200p.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:

Example

```
put axis200p.bin FLASH
```

5. The AXIS 200+ 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.

Appendix C 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, NTP and ICMP.

Network Management   Configuration and status via standard HTTP or FTP browser.

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 web site.

Camera Resolution   The AXIS 200+ supports the following resolutions:

Format	Maximum Resolution	Picture Quality High	Picture Quality Medium	Picture Quality Low
JPEG	704 * 576	approx. 90 kbytes	approx. 60 kbytes	approx. 30 kbytes
BMP	704 * 576	1189 kbytes	-	-
JPEG	352 * 288	approx. 60 kbytes	approx. 30 kbytes	approx. 15 kbytes
JPEG	176 * 144	approx. 30 kbytes	approx. 15 kbytes	approx. 8 kbytes

The resultant file size depends on the camera settings, lighting conditions and the snapshot object. However, image objects of a uniform shape generally require less detail and consequently generate smaller snapshot files.

Performance The AXIS 200+ uses a RISC CPU and hardware compression chips for the JPEG transformation. A full size, full color JPEG file is created in less than a second. However, inherent delays created by your network and/or the Internet will also need to be added when considering the overall time required to generate a picture.

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

Hardware CPU: 32-bit RISC processor (ETRAX)
Flash PROM: 2Mbytes
RAM: 2 Mbytes.

Camera Unit Direct digital camera, 24-bit color
CCD: High quality 1/3", 768 x 582 pixels
Lens mount: CS mount (C mount with C/CS ring)
Lens iris: Auto iris lenses supported
Illumination range:5 - 5000 Lux (with delivered lens),
                   2 - 200.000 Lux (with F1.0 auto iris lens)
Optical filter: Quartz low pass filter with IR cut filtering.

Lens Delivered with a basic wide angle lens, approx. 45 degrees. Focus can be adjusted from 0.02 in (0.5mm) to infinity. The lens can be replaced with any industry standard C or CS lens.

Focal length: 5.5 mm
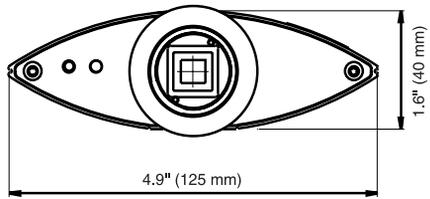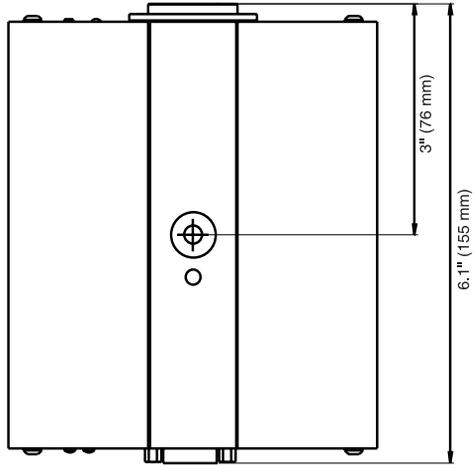Apperture: Fixed F2.0
Thread: M12P0.5 mm.

Auxiliary Input/Output A Mini-DIN 8-pole external connector is provided for auxiliary connections to the AXIS 200+. The functionality of this connector is fully discussed in "Appendix D - *The Auxiliary IO Port"*.

Serial Connector	A 9 pin D-sub connector provides the physical RS232 serial interface to a modem server within the AXIS 200+. The functionality of this connector is fully discussed in "Appendix E - *The RS232 Serial Port*".
Mounting Assembly	Can be used standalone or mounted on a wall. Uses a standard camera 1/4 inch nut.
Operating Temperature	40-105°F (5-40°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 1.6 in (4.0 cm) Width 4.9 in (12.5 cm) Length 6.1 in (15.5 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: 11 - 18V DC, min 600mA 10 - 15V AC, min 7VA

C E

All specifications are subject to change without prior notice.

Dimensions

3" (76 mm)

6.1" (155 mm)

1.6" (40 mm)

4.9" (125 mm)

# Appendix D The Auxiliary IO Port

A Mini-DIN 8-pole external connector is provided for auxiliary IO connections to the AXIS 200+. 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 two digital inputs.

Pinout   A diagram for the auxiliary IO connector and a pinout table are detailed below:
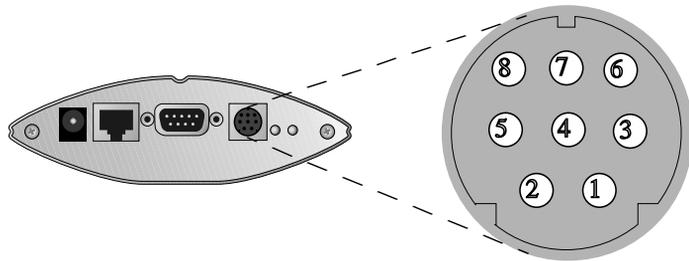
Pin	Function
1	Relay switch (Max 24V AC/DC, 100mA)
2	Relay switch (Max 24V AC/DC, 100mA)
3	Iris output signal
4	NC
5	Auto Iris Lens power (+12V max 50mA)
6	Input 1
7	Input 2
8	GND

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 200+.

Auto Iris Lenses   The AXIS 200+ supports 12V Auto Iris Lenses with standard video signal input. The IO connector includes an Iris output signal. Power for an Auto Iris Lens is available on pin 5 +12V (max 50mA).

Follow these steps:

1. Connect the Iris output (pin 3) to the lens video input.

2. Connect +12V (pin 5) to the Lens Voltage input and connect GND (pin 8) to the Lens Ground.

3. Trim the lens sensitivity according to the lens documentation.

Note: ❏ DC type lenses are not supported.

Controlling and Monitoring

IO Files   The status of the input/output interface can be monitored and controlled by the IO software within your AXIS 200+. 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://cameraname/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
```

Digital Inputs   The two digital inputs on pins 6 and 7 of the connector 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.
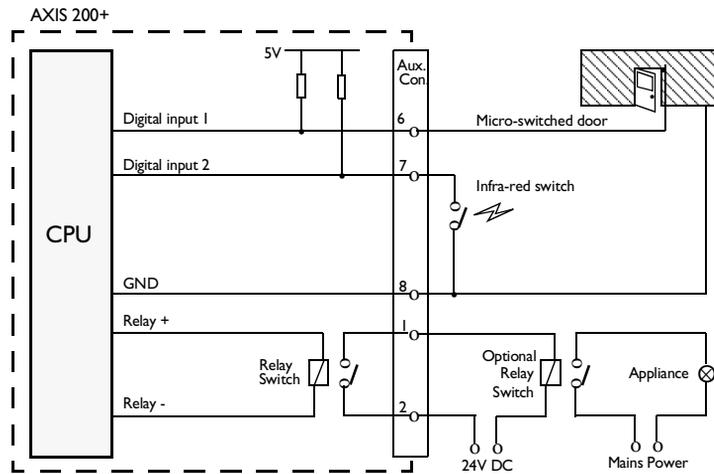
Schematic diagram of the AXIS 200+ auxiliary connector
- displaying a possible application

Status information for each of the two digital inputs is presented within a text string. The status of the inputs can be 'read' by clicking on the input.txt parameter in the above URL. The string will amongst other things define the time and duration of the last trigger event for the 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:14.46
```

This table describes each digital input text string:

String	Description
input:	Input reference (Input 1 = pin 6, Input 2 = pin 7).
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 E The RS232 Serial Port

A 9 pin D-sub connector provides the physical connection for the RS232 serial interface of the AXIS 200+. This connector is provided for connecting accessory equipment to the camera.

This appendix discusses the functionality of the RS232 serial interface and how to set up a modem connection for the AXIS 200+.

Physical Connector

Pin Assignment   A diagram of the connector and a pin assignment table for the AXIS 200+ are detailed below.
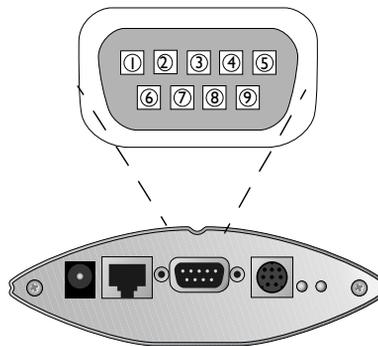
Pin	Function
1	CD
2	- RXD
3	- TXD
4	DTR
5	GND
6	NC
7	RTS
8	CTS
9	RI

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 200+.

Setting Up the AXIS 200+ Modem Server

A modem server provided within your AXIS 200+ makes it possible to transmit snapshot images over the PSTN. By connecting the AXIS 200+ to a modem, it is possible to download snapshot images to remote computers using standard modem equipment.
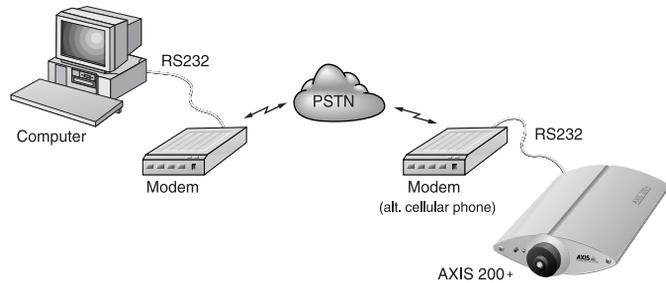
Configuration of the serial port for modem connection

RTS/CTS   The AXIS 200+ 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 200+.

Note: ❑   Contact Axis for information about supported cellular phones and modems.

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

Function	Pin - server	Pin - modem
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

Note: ❏ Some modems are supplied with a cable terminated by 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!

Configuring the Modem

Before files can be transferred from your AXIS 200+, 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 200+!

Notes: ❏ The described 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 200+ 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. For example, 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 200+

Once you have set up your modems, you need to configure your AXIS 200+ for modem control. You can use any of these methods:

- Web browser
- FTP
- The Control button

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 200+.

3. Turn the modem on.

4. Wait a few seconds and then power up the AXIS 200+.

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 200+ for serial mode operation as follows:

1. Restart the AXIS 200+ by removing and then re-inserting the power connector.

2. Wait 10 seconds.

3. Press the Control button and keep it pressed until the Snapshot indicator flashes.

4. Release the Control button.

5. Double click the Control button while the Snapshot indicator continues to flash.

6. Wait until the Snapshot indicator stops flashing.

7. Restart the AXIS 200+ by removing and then re-inserting the power connector.

FTP
1. Log in to the AXIS 200+ with the command `ftp cameraname` where `cameraname` is the AXIS 200+ host name or Internet 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 200+ 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 200+ 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 200+.

8. Log out again.

Dialing the Server
You will reach the AXIS 200+ modem server by dialing `ATDTnnnnnn`, where nnnnn is the modem phone number, e.g. `ATDT555-1212`. The AXIS 200+ will then answer the call, and establish the connection.

Once the connection has been established, the AXIS 200+ 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.
```

The 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
set_ip       Set new IP address
Ppp          Initiate PPP connection
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 their 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 200+ 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

**B00000000000000
>> 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

Appendix F Camera Applications

With an estimated 60 million Web sites on the Internet today, it is important that Internet advertisers create their Web pages in a way that is interesting to visitors. Web designers can benefit from adding attractive links to exciting 'live' pictures within their Web pages.

Live Internet and intranet picture publishing, visual surveillance and process monitoring represent just a few of the many applications for which you can use your AXIS 200+.

Application Ideas

The only real limitation for the number of applications to which the AXIS 200+ may be suited is your fantasy. Some of the more obvious applications ideas are:

- Adding 'live' pictures to your Web pages. Snapshot pictures may be triggered and viewed from anywhere in the world.

- Monitoring and surveillance of industrial processes. Monitor the production flow in any kind of industry. Let the AXIS 200+ save snapshots at specified times for quality control and generic surveillance purposes.

- Various kinds of security surveillance applications.

- Monitoring of conference rooms, e.g. how many and which people are present in a meeting.

- Creating a company photo catalog for use over the intranet.

- Integrating the AXIS 200+ into your CGI scripts in order to create your own applications.

- 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 200+:

- 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

- Elephant bath at the National Zoo, Washington D.C.:
  http://www.si.edu/organiza/museums/zoo/zooview/exhib-its/elehouse/elephant/bath.htm

- Underwater pictures at Hawaii's Waikiki Aquarium:
  http://waquarium.mic.hawaii.edu/coralcam/

- View of the prayers, celebrations and special ceremonies at the Jewish Kotel (the Western) Wall:
  http://www.virtual.co.il/city_services/kotel/kam/index.htm

- 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 a number of applications and demos at the AXIS 200+ web site at
http://www.axis.com/products/cam_200p/.

Appendix G 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 200+, refer to *"CRON Script"*, on page 51.

Script Format

A CRON script for the AXIS 200+ can include one or several entries. The CRON script entries use this format:

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

where `<triggering condition>` includes the following fields:

```
<minute> <hour> <day> <month> <weekday> <optional
input/boot event >
```

and `<commands>` includes 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 Internet 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 200+" to the remote host when
# input port 1 goes high.
* * * * * /I1:
alert -host 172.16.253.80 -port 2703 -message "Alarm
\"0013\" from AXIS 200+";
%
```

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

Syntax   `buffer_init [1,[IMAGE],[SIZE][:1,[IMAGE],[SIZE]]];`

Options   1   Refers to the camera number, which is always 1 for the AXIS 200+.

`[IMAGE]`
          Specifies the image type 1-3, where:

          1 = `halfsize.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.

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 a
# buffer with 25 fullsize.jpg images and 10
# hugesize.jpg images.
* * * * * BOOT:
buffer_init 1,2,25:1,3,10;
%
```

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 and ftp commands.

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

Options   -src   Specifies the source file name, i.e. halfsize.jpg, fullsize.jpg or hugesize.jpg.

-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 -interval s30
-duration inf;
%
```

Example 2

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

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] [-interval TIME]
[-duration TIME] [-store SIZE];
```

Options

-src   Specifies the source file name, i.e. `halfsize.jpg`, `fullsize.jpg` or `hugesize.jpg`.

-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 1

```
# 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;
%
```

Example 2

```
# 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;
%
```

ftp   The ftp command uses the standard File Transfer Protocol (FTP) for transferring an image from your AXIS 200+ to a remote host.

Syntax
```
ftp    [-host HOST] [-user USERNAME] [-pass PASSWORD]
[-src SOURCEFILE] [-dest DESTINATIONFILE]
[-temp TEMPORARY_DESTINATION_NAME] [-loop LOOPTIME]
[-time TOTALTIME] [-buffer BUFFERTYPE]
[-ctrlport NBR] [-dataport NBR] [-to TIMEOUT_TIME];
```

Options   -host Specifies the name or Internet 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`.
If an erroneous file name has been specified, no action will be taken during execution.

-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 proceeded 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.

-buffer

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

-ctrlport

Specifies connection to a nonstandard control port.

-dataport

Specifies the use of a nonstandard data port.

-to Specifies changes of the timeout time during the connection establishment phase. Could be useful when connecting modems. Format:

h<hours>m<minutes>s<seconds>

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

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
# 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;
%
```

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 camera -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 200+ to e-mail addresses.

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

Syntax   `mail [-s SUBJECT] [-a ATTACHMENTS] [-t RECIPIENTS] [-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).

-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 200+" to two recipients.
* * * * * :
mail -s "This \"fullsize.jpg\" was sent from my AXIS
200+" -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;`

<div align="right">online</div>

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 200+ 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 200+ 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)'";
%
```

reset   This command resets the software or hardware of the AXIS 200+.

Syntax   reset [-soft | -hard];

Options   -soft   Reinitiates the AXIS 200+ protocols.

-hard   Performs a complete reboot of the AXIS 200+.

Example

```
# This command will reset the AXIS 200+ 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.

Syntax   `snapshot [-l LOOPTIME] [-t TOTALTIME] [IMAGE];`

Options   -l   Specifies the time between two consecutive image updates.

-t   Specifies the duration of the command. Format:
      h<hours>m<minutes>s<seconds>.

[IMAGE]
      Specifies the image type: fullsize.jpg, halfsize.jpg,
      hugesize.jpg, or zoom.jpg.

Example 1

```
# This command will update the lastshot.jpg image
# with a fullsize image.
* * * * * :
snapshot fullsize.jpg;
%
```

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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