

AXIS 200+ and 240 Camera Server User's Guide

Quick Installation Procedure

To get your camera server up and running on an ethernet network, follow these instructions:

1. Note the serial number found on the underside label of the camera server. The serial number equals the Ethernet address of the unit.
2. *AXIS 240 only:* Connect the camera(s) to the camera server.
3. Connect your camera server to the network.
4. Connect the external power supply. **Note:** The power supply supplied with your product is country specific. Refer to *Appendix A - Hardware Inventory* and check that the type of power supply is correct.
5. Acquire a valid and unused IP address for the camera server from your Network Administrator.
6. Assign the IP address using your preferred method, the **AXIS IP Installer** program or **ARP**:

Easy - AXIS IP Installer

- 7.a *Windows 95/98 & NT* - Install the **AXIS IP Installer**. You will find the installation program on the **AXIS Online CD** and on the **Axis Web Site** at <http://www.axis.com>
- 7.b Run the **AXIS IP Installer** from the **Start** menu.
- 7.c Restart your camera server.



- 7.d Locate the serial number of your camera server in the list.
- 7.e Enter the desired IP address, and click **Set IP address**.
8. To access the camera server Home Page, click **Home page of selected Axis-server...**
9. Adjust the focus of the camera(s). Click **Reload/Refresh** in your Web browser to test your adjustments.

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

Modem Only Installation

See *Appendix C - Modem Installation* on how to install your camera server if you are using a modem.

Quick - ARP/ping

7. *Windows 95/98 & NT* - Start a DOS window and type these commands:

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

Example

```
arp -s 192.168.3.191 00-40-8c-10-00-86
    192.168.3.193
ping 192.168.3.191
```

UNIX & OS/2 - Type these commands:

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

Example

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

8. To access the camera server Home Page, start your Web browser and enter the IP address in the location/address field:

```
http://<IP address>/
```

Example

```
http://192.168.3.191/
```

About This Document

This guide is applicable for software releases 1.41 and 1.12 and above for the AXIS 200+ and 240 Camera Servers respectively.

The document provides introductory information as well as instructions on how to set up and manage the camera server. It is intended for anyone involved in installing and using the camera server.

For more detailed instructions, refer to the User's Manuals for the AXIS 200+ and 240 that are available in on-line format at the Axis Website and on the AXIS Online CD.

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 beyond any of the above notices until you have fully understood the implications.

Legal Considerations

Camera surveillance can be prohibited by laws that vary from country to country. Check out the laws in your local region before using the AXIS 200+ and 240 for surveillance.

Electromagnetic Compatibility (EMC)

USA - This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference. Shielded cables should be used with this unit to ensure compliance with the Class A limits.

Europe  - This digital equipment fulfils the requirements for radiated emission according to limit B of EN55022/1994, and the requirements for immunity according to EN50082-1/1992 residential, commercial, and light industry.

Liability

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

Year 2000 Compliance

Axis Communications AB warrants that the AXIS 200+ and 240 are Year 2000 compliant.

Trademark Acknowledgments

Acrobat, Adobe, Ethernet, IBM, Internet Explorer, LAN Manager, Macintosh, Microsoft, Netscape Navigator, OS/2, UNIX, Windows, WWW are registered trademarks of the respective holders.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries. Axis Communications AB is independent of Sun Microsystems Inc.

Support Services

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

If you are connected to Internet, you can obtain on-line manuals, technical support, software updates, application software and general corporate information from any of the locations listed below.

WWW:	http://www.axis.com
FTP:	ftp://ftp.axis.com/pub/axis

AXIS 200+ and 240 User's Guide

Revision 1.0

Part No: 16500

Dated: January 1999

Copyright © Axis Communications AB,
1996 - 1999

Table of Contents

Product Overview	4
The AXIS 200+ and 240 Network Camera Servers	4
The AXIS Online CD	5
Installation Summary	6
Connecting the Hardware	6
Connecting the AXIS 200+ to a Mounting Assembly	6
Connecting Your Cameras to the AXIS 240	6
Connecting the Camera Server to Your Network	7
Assigning an IP Address	7
Using the AXIS IP Installer	8
Using ARP in Windows 95/98 and Windows NT	8
Using ARP in UNIX and OS/2	9
Verifying the Installation	9
Adjusting the Focus	11
Configuring the Camera Server	12
Using a Web Browser	12
Using the Camera Server	12
Snapshots	13
Automatic Picture Updating	15
Pan/Tilt Control	18
External Web Sites	19
CRON Scripts	19
Application Examples	24
Appendix A - Hardware Inventory	25
Connectors and Indicators	26
Appendix B - Auto Iris	29
General	29
Connecting an Auto Iris Lens to the AXIS 200+	29
Level Adjustment	30
ALC Adjustment	30
Appendix C - Modem Installation	31
Using the Camera Server without a Network	31
Setting the IP Address Using a Null Modem Cable	37
Index	38

Product Overview

The AXIS 200+ and 240 Network Camera Servers

With built-in Web servers, the AXIS 200+ and 240 offer easy and cost-effective solutions for interactive surveillance and remote monitoring. Connected directly to Ethernet networks, they provide a source for live color pictures over the network or even over the Internet.



AXIS 200+



AXIS 240

The AXIS 200+ is a self-contained network camera with interchangeable optics.

The AXIS 240 is a small, high performance camera server that can service up to four PAL/NTSC video source and one S-video camera.

Caution!

The CCD (charged coupled device) within the AXIS 200+ can become permanently damaged if the camera lens is exposed to too much direct sunlight or halogen light! If this is the case use an Auto Iris Lens. See *Appendix B - Auto Iris* for more information.

The 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.x** users should navigate to the CD using File Manager and click the *setup31.exe* file.

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 the intranet by simply broadcasting a URL reference.

Installation Summary

You install your camera server in these steps:

- Connecting the hardware
- Assigning an IP address
- Verifying the installation
- Configuring the camera server
- Adjusting the focus

Connecting the Hardware

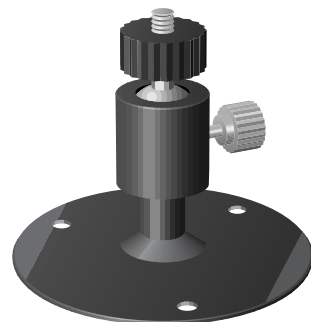
Connecting the AXIS 200+ to a Mounting Assembly

Fasten the camera server to the supplied mounting assembly and position it appropriately for your application.

Note: The AXIS 200+ can be mounted on any standard mount.

Tip!

To make the camera stand smaller, remove the middle part of the mounting assembly. The camera holder can now be attached directly to the foot. See the illustration.



Caution!

The CCD (charged coupled device) within the AXIS 200+ can become permanently damaged if the camera lens is exposed to too much direct sunlight, or halogen light! If this is the case, please use an Auto Iris Lens. See *Appendix B - Auto Iris* for more information.

If used outdoors or in extreme environments, the camera server must be housed in an outdoor casing. For more information, please refer to the camera server product pages at <http://www.axis.com/>

Connecting Your Cameras to the AXIS 240

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

It is possible to connect a Pan/Tilt device to the RS-232 Pan/Tilt port of the AXIS 240 for remote adjustment of the camera position. The AXIS 240 can control one Pan/Tilt device at a time, or several if they are daisy chained. Refer to the Pan/Tilt Control information provided in the User's Manual and/or your camera supplier's documentation for further details on connecting the cameras.

Connecting the Camera Server to Your Network

1. Note the serial number of your camera server for future reference during the installation procedure. This is located on the underside label of the camera server.
2. Connect your camera server to the network using an Ethernet 10baseT connector.
3. Connect the power supply to the camera server.
4. Check that the Power indicator is constantly lit.

Assigning an IP Address

To enable access to your camera server you must first assign it an appropriate IP address.

Before You Begin

Make sure the camera server is powered up and attached to the network.

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

System Privileges - You need *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 camera server. The Ethernet address is based on the serial number found on the underside label of the unit.

Important!

Do not use the default or example IP address when installing your camera server. Always consult your Network Administrator before assigning an IP address.

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 8
ARP	Windows 95/98 & Windows NT	"Using ARP in Windows 95/98 and Windows NT" on page 8
	UNIX, OS/2	"Using ARP in UNIX and OS/2" on page 9
BOOTP	UNIX	Refer to the User's Manual.
RARP	UNIX	

Using the AXIS IP Installer

The AXIS IP Installer is a Windows 95/98 & NT program that sets 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/>

Installing the AXIS IP Installer

1. On the AXIS Online CD, click on the **Software** button.
2. Select the IP Installer and click **Install**. The **AXIS IP Installer - Setup** dialog is displayed on the screen.
3. Follow the instructions as they appear on the screen.
4. Click **Finish** to complete the setup.

Setting the IP Address

1. Run the **AXIS IP Installer** from the **Start** menu. The **AXIS IP Installer** dialog is displayed on the screen.
2. Restart your camera server.
3. Select the serial number of your camera server in the list. The serial number is identical to the Ethernet address of the unit.
4. Enter the desired IP address. Click **Set IP address**. The IP address will now be set.
5. 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.
6. Click **OK** to exit the program.

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

Using ARP in Windows 95/98 and Windows NT

To download the IP address and verify the communication, start a DOS window and type the following commands:

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

Example:

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

The host will return 'Reply from 192.16.253.80 ...' or some similar message. This means that the address has been set and the communication is established.

Important!

Windows 95 only: When using the Windows 95 implementation of ARP, change the first line to:
arp -s <camera IP address> <Ethernet address> <w95host IP address>, where <w95host IP address> is the IP address of your Windows 95 host.

Example:

```
arp -s 192.16.253.80 00-40-8c-10-00-86 192.16.253.81
ping 192.16.253.80
```

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

To download the IP address and verify the communication, type the following commands:

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

Example:

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

The host will return '192.16.253.80 is alive', or some similar message to indicate that the address has been set and the communication is established.

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

Verifying the Installation

After assigning an IP address, verify the connection between your camera server and the network.

1. Start your Web browser and enter the name or IP address in the location/address field:

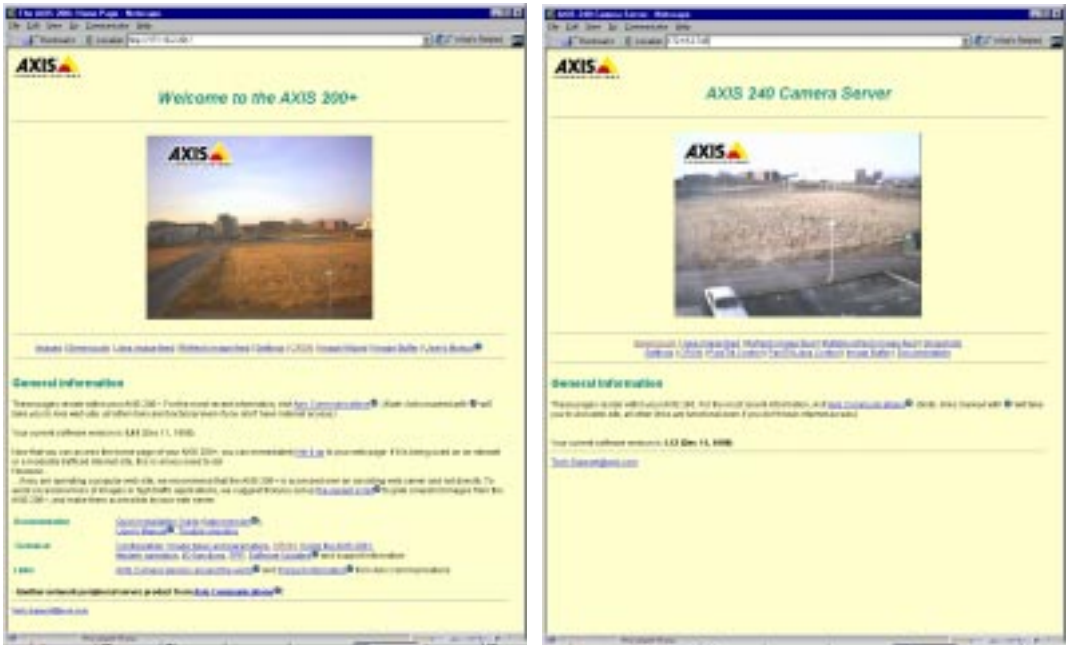
Example

```
http://cameraserv/
```

or:

```
http://192.16.253.80/
```

2. The Home Page of your camera server showing a snapshot just taken is displayed:



3. To further test your camera server, take some more snapshots. Simply click Reload/Refresh in your Web browser to do that.

Note: Web pages are kept locally for fast browsing, and your browser may occasionally display a cached image as opposed to a newly taken snapshot. When this happens, simply click Reload/Refresh in your Web browser. Some browsers may even force you to clear the cache, or use forced reload, e.g. Shift+Reload in Netscape.

Using the Server Push and ActiveX Links

Click **Server push** from the Server push page to start automatic picture updating using Netscape Navigator. Click **ActiveX** to enable automatic picture updating using Microsoft Internet Explorer.

Notes: The AXIS Camera Control software is pre-requisite for automatic picture updating using Microsoft Internet Explorer, and must be installed on your client prior to enabling ActiveX. This software is available on the AXIS Online CD and via the Axis Website.

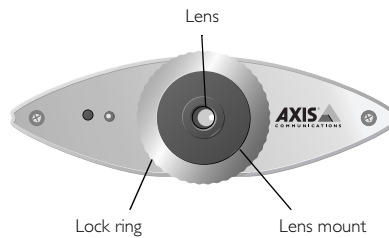
See also, *Automatic Picture Updating*, on page 15.

Adjusting the Focus

AXIS 200+ Camera Server

Your AXIS 200+ is delivered in approximate focus position, with focus set to infinity. The lens has rotational focus control. To fine adjust to close focus, carefully turn the smaller lens.

If you cannot get 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.



Note: The lens assembly rotates on a screw fitting and can be completely removed. If you need to remove the lens, take care not to let any dust enter the lens as this will effect the quality of your snapshots.

Check the result of the adjustments by taking some new pictures. Use one of the automatic updating functions to monitor the focus changes.

Because the AXIS 200+ is designed with a CS-mount, the lens supplied with your product can be replaced with any standard CS lens, typically used within the surveillance industry. A C-mount lens will also work with the AXIS 200+ Camera Server if used with an adaptor that effectively provides a spacer with two female 1-32 threads and moves a lens 5mm farther from the camera. See Appendix B or the AXIS 200+ Camera Server User's Manual for more information.

AXIS 240 Camera Server

Adjust the focus of the camera(s) connected to your AXIS 240. Refer to your camera documentation for information on how to do this.

Configuring the Camera Server

You can configure the camera server via hyperlinks from its own web pages using any standard Web browser. Alternatively, you can configure the camera server using FTP. See the User's Manual for more information on how to do this.

Note: For the latest technical information, refer to the camera server Website at http://www.axis.com/products/camera_servers/

Using a Web Browser

To configure the camera server, enter the name or IP address into the location/address field of your Web browser, as detailed below:

Example

```
http://192.16.253.80/
```

On the AXIS 200+ and 240 Home Pages, click on the **Settings** link to reach the Configuration pages. Log on as user **root** and use the default password **pass**. In the Configuration pages you can change all unit parameters, including the password.

Notes: It is recommended that you change the password of your camera server as all Axis products are shipped with the same password as default.

For optimized performance, it is additionally recommended that all unused video inputs are disabled from the AXIS 240 Configuration - Video page.

Using the Camera Server

After installing the AXIS 200+ and 240 and assigning an appropriate IP address, you are ready to use the camera server in your own applications.

This section describes how to use the AXIS 200+ and 240 effectively to realize its full potential, including:

- Snapshots - Taking snapshots of various formats and including them on your web pages.
- Automatic picture updating - Various methods for continuously updating images are available, including, Server push, Java image feed and Refresh image feed functions.
- Pan/Tilt control - Supports input/output operations via the HTTP protocol - applicable to the AXIS 240 only.
- External Web sites - Using snapshot files on the Internet.
- CRON scripts - Triggering the camera server by times or input events.

Further information on how to use your camera server is provided in the User's Manual.

Snapshots

Throughout this user guide, an image generated by the camera server 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 camera server generates a JPEG file and stores it within its internal memory.

Home Page Snapshots

To produce a snapshot within the AXIS 200+ and 240 Home Pages, simply enter the name or IP address of the unit into the location/address field of your Web browser:

Example

```
http://192.16.253.80/
```

This causes the camera server to generate a fullsize JPEG image. Each time you reload the page, a new snapshot is displayed within the camera server Home Pages.

Clean Snapshots

To generate clean snapshots that are not embedded within the camera server 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 sizes, e.g. fullsize, halfsize etc.

Example

```
http://192.16.253.80/fullsize.jpg
```

```
http://192.16.253.80/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 image files are available within your AXIS 200+ and 240.

File name	Description
fullsize.jpg	The standard resolution. Hardware generated in about 0.5 seconds.
halfsize.jpg	Excellent for thumbnails. Hardware generated in about 0.3 seconds.
lastshot.jpg	The last snapshot taken, either a 'fullsize' or 'halfsize' snapshot. Primarily intended for software applications for archiving a buffered image.
hugesize.jpg	The highest resolution snapshot available. As opposed to the 'fullsize' and 'halfsize' images, the 'hugesize' image is software generated which takes about 10 seconds.
zoom.jpg	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.
2. In your Web browser, enter the name or IP address of your camera server together with the preferred snapshot type.

Example

```
http://192.16.253.80/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://192.16.253.80/fullsize.jpg">
</BODY>
</HTML>
```

Each time anyone visits this page, a new fullsize snapshot will be generated and displayed in the Web browser. Since Web pages are kept locally for fast browsing, your browser may sometimes display a cached image as opposed to a newly taken snapshot. When this happens, simply click Reload/Refresh in your Web browser.

You can easily change the size of your snapshot.

Example

```
<HTML>
<HEAD>
<TITLE>Axis Camera Server Page</TITLE>
</HEAD>
<BODY>
<H1>Welcome to the enlarged Axis Web Camera Demo</H1>
<IMG ALT="Fullsize JPEG Image"
SRC="http://192.16.253.80/fullsize.jpg"
WIDTH="704" HEIGHT="576">
</BODY>
</HTML>
```

In this example the width of the image has been doubled from normal fullsize 352 to 704 pixels and the height from normal (PAL) fullsize 288 to 576 pixels.

Automatic Picture Updating

The camera server supports several methods for automatic picture updating:

- Server push
- ActiveX
- HTML refresh image feed
- CamImg Java applet
- CamCtrl Java applet (includes Pan/Tilt control for the AXIS 240)

Server Push

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

Example

```
<HTML>
<HEAD>
<TITLE>Axis Camera Server Page</TITLE>
</HEAD>
<BODY>
<H1>Welcome to the Server Push Demo</H1>
<IMG
SRC="http://192.16.253.80/cgi-bin/fullsize.srvpushb"
</BODY>
</HTML>
```

The frame rate depends on how fast the AXIS 200+ and 240 can deliver the snapshot data over the available network bandwidth. Therefore, you cannot adjust the frequency of the Server push snapshots within your Web browser.

In order to limit the memory overhead that this facility demands, no more than five clients can simultaneously activate a Server push link to the same camera server. Once this client threshold has been exceeded, a single snapshot image is produced for all additional clients that are trying to activate the link.

ActiveX

The Server push function is currently supported by Netscape Navigator only. However, installing the AXIS Camera Control software onto your client and using the ActiveX function provides the same functionality within Microsoft Internet Explorer on a Windows 95/98 or NT PC.

Note: The AXIS Camera Control software is pre-requisite for automatic picture updating using Microsoft Internet Explorer, and must be installed on your client prior to enabling ActiveX. This software is available on the AXIS Online CD and via the Axis Website.

Including ActiveX into an HTML page

To include ActiveX into an HTML page, use the OBJECT and PARAM tags in your HTML code, as defined in the example below.

Example

```
<HTML>
<HEAD>
<TITLE>Axis Camera Server Page</TITLE>
</HEAD>
<BODY>
<H1>Welcome to the ActiveX Camera Server Demo page</H1>
<OBJECT ID="Axis Camera" WIDTH=352 HEIGHT=288
CLASSID="CLSID:1773DB27-C4D2-11D1-87CE-00805FD85E14">
<PARAM NAME="AutoSize" VALUE=1>
<PARAM NAME="CamAddress" VALUE="192.16.253.80"
<OBJECT>
</BODY>
</HTML>
```

192.16.253.80 is an example of a camera IP address. For more information about ActiveX and the OBJECT and PARAM tags, please refer to the Network Camera Servers Developers' pages at http://www.axis.com/products/camera_servers/

Server Push or ActiveX?

You can also direct your HTML page to choose either Server Push or ActiveX, depending on the browser viewing your page. To do this you need to include a JavaScript in your html file, as described in the example below.

Example

```
<HTML>
<HEAD>
<TITLE>Choose the right browser</TITLE>
</HEAD>
<BODY>
<SCRIPT LANGUAGE="JavaScript">
if (navigator.appName == "Microsoft Internet Explorer")
{ document.write("<OBJECT ID=Axis Camera
CLASSID=CLSID:1773DB27-C4D2-11D1-87CE-00805FD85E14>");
document.write("<PARAM NAME=CamAddress VALUE=192.16.253.80>");
document.write("<PARAM NAME=AutoSize VALUE=0>");
document.write("<BR>Download the <B> Axis ActiveX Camera
Control</B><BR>from the <B>Server push page. <B></OBJECT>");
}
else {document.write("<IMG
SRC=http://192.16.253.80/cgi-bin/fullsize.srvpushb>");
}
</SCRIPT>
</BODY>
</HTML>
```

HTML 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.

Notes: To terminate automatic picture updating, you can click Stop or enter another URL.

The Java script code example detailed below, is used to bypass browser image caching.

Example

```
<HTML>
<HEAD>
<META http-equiv="Refresh" content="5">
<TITLE>Refresh image feed</TITLE>
</HEAD>
<BODY>
<SCRIPT LANGUAGE="JavaScript">
day = new Date()
document.write("<IMG SRC=\"http://192.16.253.80/fullsize.jpg?dummy=\"");
document.write(day.getHours());
document.write(day.getMinutes());
document.write(day.getSeconds());
document.write("<br>");
</SCRIPT>
</BODY>
</HTML>
```

CamImg Java Applet

CamImg is a Java applet supplied with your Axis Camera Server. It automatically updates images (default=fullsize.jpg) and can be started from anywhere on the network. The image refresh rate is programmable.

Should you choose to use the CamImg applet on a remote server, it is necessary to copy the *CamImg.class* file and all other associated files from your Axis Camera Server to the target server where your images are to be kept.

Simply insert the following piece of code in your HTML file where you want the images to appear.

```
<APPLET CODEBASE="http://www.yoursite.com/classes/"
  CODE="CamImg.class" WIDTH=362 HEIGHT=328>
  <PARAM NAME = "Image" VALUE = "/img/image1.jpg | /img/image2.jpg">
  <PARAM NAME = "ImageLabel" VALUE = "First image | Second 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>
```

Note: The CamImg parameters defined above are optional. Please refer to the User Manual for a full description of the available parameter options.

CamCtrl Java Applet

CamCtrl is a Java applet supplied with your Axis Camera Server. It is an easy-to-use Java applet that continuously loads live from Axis Camera Servers and enables Pan/Tilt control of connected cameras via the AXIS 240. Please refer to the User's Manual for a full description of the available parameters.

Simply insert the following piece of code in your HTML file where you want the images to appear

```
<APPLET CODEBASE="http://192.16.253.80/classes/"
  CODE="CamCtrl.class" WIDTH=512 HEIGHT=478>
</APPLET>
```

Note: A number of optional parameters can be included into your CamCtrl applet. Please refer to the User's Manual for a full description of the available parameter options.

Pan/Tilt Control

Clicking the Pan Tilt link from the AXIS 240 Home page activates a Pan/Tilt facility that allows connected cameras to be controlled using a simple graphical Web interface. The Pan/Tilt Control function is only supported in the AXIS 240.

For further information on this facility, please refer to the Pan/Tilt/Zoom support pages at http://www.axis.com/products/camera_servers/

External Web Sites

If your Website is not adversely effected by heavy traffic, and your camera server is connected directly to an Ethernet network, it is possible to fetch images directly from the camera server. However, it is recommended that images are accessed over an assisting Web server and not directly, when:

- modem connected,
- located behind a firewall,
- subject to high volume traffic,
- used for generating large files, such as hugesize.jpg which is very time consuming.

If any of the above circumstances prevail, the best way to transfer images from the camera server to an assisting Web server, is to use CRON scripts.

Note: You can use the CRON script facility to collect snapshots periodically.

CRON Scripts

Embedded within your Axis camera server is a time/event based scripting language, CRON. This service allows you to program event and/or time triggered functions within the camera server.

Any of the following tools can be used for generating a CRON script file:

- **The Online Editor.** An easy-to-use on-line editor available via the Cron Script - Cron Configuration pages.
- **TheText Editor.** An integrated text editor available via the Cron Script - Cron Configuration pages.
- **CRON Script Maker.** Fully documented CRON applications available in a form-format from the Network Camera Servers Developers' pages at <http://www.axis.com/> Each form includes a CRON Script Maker containing several interactive fields for generating custom CRON scripts.
- **Any common text editor.** Edit using any common text editor and download the file using FTP.

Script Format

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

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

Note: Only one CRON script can be resident within the camera server at a time.

Comments

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

```
# <comment>
```

Example:

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

Trigger Condition

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

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

Time and Date Event Fields

The first five fields specify the time and date events, i.e. Minute, Hour, Day, Month and Day of the week.

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+ and 240 to trigger at startup or on the logical states present on the Control button and digital input ports, using the trigger variables **boot**, **B**, **I1** and **I2** respectively. The **B**, **I1** and **I2** trigger variables must be preceded by an activate condition, /, \, 0 or 1, to indicate when the trigger variable is activated.

Note: The AXIS 240 has input ports 1 - 4.

The table below outlines the available trigger variables and their possible combinations:

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 camera server polls the input ports every 0.2 seconds. Thus, more rapid logical transitions will not be detected.

By conjugating 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
```

CRON 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 small message to a remote host.
buffer_init	Initiates an image buffer.
buffer_start	Stores snapshots in the image buffer.
buffer_stop	Ends the storing of snapshots in the image buffer.
ftp	Transfers an image to a remote host using FTP.
log	Writes a message to the camera server log file
mail	Sends an e-mail using SMTP.
offline	Terminates the current PPP connection.
online	Dials up a modem for PPP connection.
ptz - applies to 240 only	Pans, tilts and zooms connected video cameras.
reset	Restarts the unit.
sleep	Makes a pause in the CRON script execution.
snapshot	Updates the last snapshot image.

Notes: 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.

The Help pages accessible via the camera server Web interface describe CRON command syntax in detail.

Sample CRON Scripts

Example 1

The following script will:

1. Execute every 10 minutes during daylight (5 AM - 9 PM).
2. Take a snapshot of the fullsize.jpg image and store it internally in the camera as lastshot.jpg.
3. Dial up over a modem and connect to an Internet Service Provider (ISP).

Note: The ISP dialed in this example supports CHAP login and does not require a script part. An example of the on-line command to an ISP that requires a log on script could be:

```
online -dial 1234567 -user "USER" -pass "PASS" -timeout m6s40 -script
''' 'ogin:' '$(USER)' 'assword:' '$(PASS)'''
```

4. After log on we send the image taken previously to an ftp server. It is first stored with the temporary name tmp.jpg and later renamed to **image** followed by the year, month, day, hour, minute and second. An example filename would be **image1998-11-23_08_34_00.jpg**

5. Disconnect from the ISP.

```
# Dial to an ISP:
0,10,20,30,40,50 5-21 1-31 1-12 1-12 0-6:
snapshot fullsize.jpg;
online -dial 1234567 -user "USER" -pass "PASS" -timeout m2;
ftp -host 207.242.7.186 -user ftpuser -pass PASS -src lastshot.jpg
-dest images$Y-$n-$d_$h_$m_$s.jpg -temp tmp.jpg;
offline;
%
```

Example 2 (AXIS 240 only)

When executing the following script, a PTZ (Pan/Tilt/Zoom) camera is moved to a predefined position. While the camera is moving, the script pauses for several seconds until it is certain that the camera has reached the desired position. A snapshot is taken and sent via ftp to a server. The camera then moves to the next position and a new snapshot is taken and sent. In this example, this procedure is repeated every hour.

```
# This is an example of an Axis extended CRON script:
0 0-23 1-31 1-12 0-6:
ptz -preset 1;
sleep 5;
ftp -host 207.242.7.186 -user USER -pass PASS -src fullsize.jpg
-dest myDestinationFile1.jpg -cam 1;
ptz -preset 2;
sleep 5;
ftp -host 207.242.7.186 -user USER -pass PASS -src fullsize.jpg
-dest myDestinationFile2.jpg -cam 1;
%
```


Example 3

At start-up a buffer for 10 fullsize images from camera 1 is created, and a process to continually fill this buffer is initiated. A state change of logic state from 0 to 1 at digital input 1, causes five more snapshots to be added to the buffer. The process is then stopped. At this time, the buffer holds five snapshots taken before the event, and five snapshots taken after the event. These snapshots are then sent to the designated e-mail address. The process to fill the buffer is then started again.

```
# This is an example of an Axis extended CRON script:
0-59 0-23 1-31 1-12 0-6 BOOT:
buffer_init 1,2,10;
buffer_start -src fullsize.jpg -duration inf;
%

0-59 0-23 1-31 1-12 0-6 \I1 :
buffer_stop -src fullsize.jpg -store 5;
mail -s "A subject" -a images/buffer.jpg -t someone@somewhere.com
-b fullsize.jpg -n 10;
buffer_start -src fullsize.jpg -duration inf;
%
```

Application Examples

The application possibilities are unlimited. Security professionals use the AXIS 240 for general surveillance, monitoring of medical equipment, industrial production flows, conference rooms, parking facilities and badge recognition.

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

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

Tip! For interesting application ideas, visit the Network Camera Servers Developer's Pages at our Website <http://www.axis.com/>

Appendix A - Hardware Inventory

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

The AXIS 200+

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	-
Printed Material	This User's Guide	16500

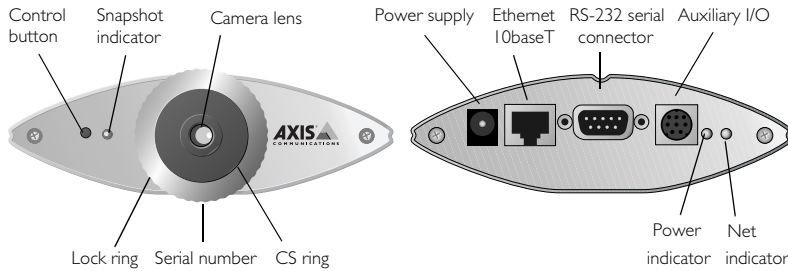
The AXIS 240

Hardware	Model Variants	Part Numbers
Camera Server	AXIS 240	0072-1
Power Supply	Europe	14233
	UK	14234
	Australia	14255
	USA	14253
	Japan	14254
Media	Title	Part Numbers
CD-ROM	AXIS Online CD	-
Printed Materials	This User's Guide	16500

Connectors and Indicators

This information provides a useful reference when performing the remaining stages of the installation.

The AXIS 200+ Camera Server



Auxiliary I/O Connector - A Mini-DIN 8-pole external connector with two alarm inputs, one relay output and an Auto-Iris connector for the AXIS 200+.

RS-232 Serial Connector - A 9 pin D-sub connector provides the physical RS-232 serial interface to a modem server within the AXIS 200+.

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

Power Supply Connector - Jack socket for connection of the AXIS 200+ power supply.

Note: The power supply supplied with your AXIS 200+ is country specific. Please check that the type of power supply you are using is correct. See page 25.

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.

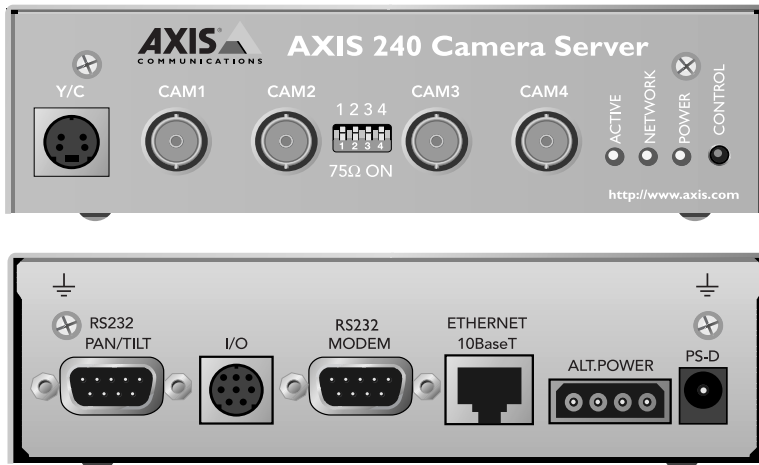
Net Indicator - The Net indicator flashes to indicate network activity.

Camera Lens - Wide angle lens with rotational-focus control. Possible to mount standard C/CS lenses.

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, triggering CRON scripts.

The AXIS 240 Camera Server



Video Inputs - The AXIS 240 is equipped with four coax/BNC video-in connectors (CAM1-CAM4) and one S-video connector (Y/C). The video inputs are equipped with signal autosensing to provide full connectivity to cameras using different video formats, e.g. NTSC, PAL, Black/white 50Hz or Black/white 60Hz. Physical connections made using RG59, 75 ohm coax cable Video Cable, have a recommended maximum length of 800 feet (250 m).

DIP Switches - Each video input is normally terminated with a 75 ohm resistor via an associated DIP switch, connected in the down-position. If the AXIS 240 is to be connected in parallel with other equipment, disable the input termination by turning the corresponding DIP switch to the up-position. Otherwise, the picture quality might be reduced.

I/O Connector - A Mini-DIN 8-pole external connector with four alarm inputs and one relay output.

RS-232 Serial Connectors - Two 9 pin D-sub connectors providing RS-232 serial connection, typically to a Pan/Tilt device and modem.

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

Power Supply Connector - Jack socket (PS-D) for connection of AXIS 240 power supply. An alternative power connector is also provided.

Note: The power supply supplied with your AXIS 240 is country specific. Please check that the type of power supply you are using is correct. See page 25.

Active Indicator - The Active indicator flashes on every occasion one of the connected cameras 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 240 power supply.

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

Control Button - The Control button is used for multiple purposes, e.g. restoring the factory default settings, triggering CRON scripts.

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

Appendix B - Auto Iris

General

The CCD (charged coupled device) supplied with the AXIS 200+ can become permanently damaged if the camera lens is exposed to too much direct sunlight or halogen light. In extreme and outdoor environments such as these, it is recommended that the AXIS 200+ is fitted with an Auto Iris lens. An Auto Iris lens also improves image quality during high and low light conditions.

The AXIS 200+ is designed with a CS-mount which means that the lens supplied with your product can be replaced with any standard CS lens, typically used within the surveillance industry.

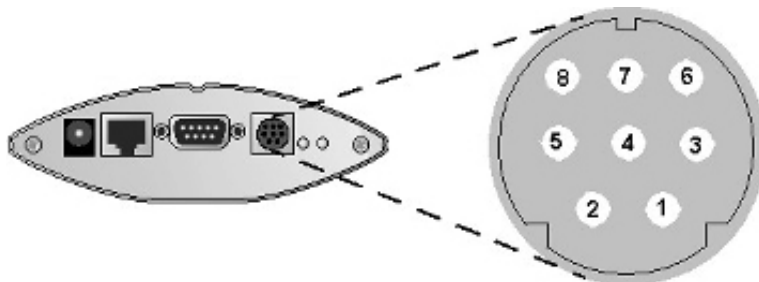
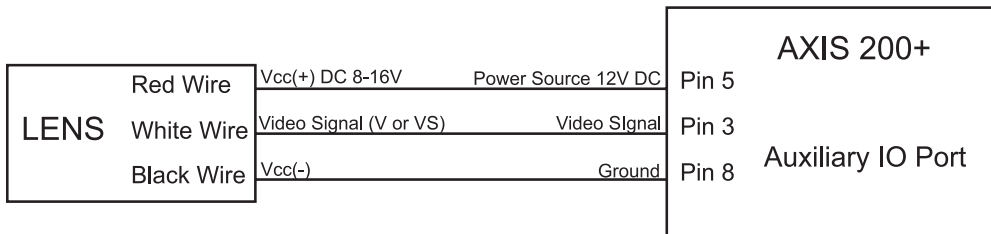
Notes: A C-mount lens will also work with the AXIS 200+ Camera Server if used with an adaptor that effectively provides a spacer with two female 1-32 threads and moves a lens 5mm farther from the camera.

DC type lenses are not supported. Use an Auto Iris type lens.

An Auto Iris lens can be distinguished from a DC-type lens by the LEVEL and ALC adjustment screws. These screws are not fitted to DC-type lenses. An Auto Iris lens additionally uses the video signal as feedback to the lens.

Connecting an Auto Iris Lens to the AXIS 200+

- Red wire connects to PIN # 5 power source 12 V DC (+)
- White wire connects to pin # 3 video signal
- Black wire connects to pin # 8 ground for lens power



Level Adjustment

It is very important that you make the following adjustments in the brightest light condition (bright sun light) that you intend to use the AXIS 200+.

1. Close the lens completely by turning the LEVEL screw head towards low position. The image on your screen should now be black.
2. Carefully turn the LEVEL screw head towards high position until the image appears on the screen. The lens is now adjusted to protect the CCD sensor against being damaged by bright sun light.

ALC Adjustment

The ALC has been adjusted by the manufacturer and may not need to be adjusted for general use. With the ALC screw head you adjust the photometry between peak and average. See the lens documentation for more information.

Refer to the AXIS 200+ User's Manual for further information on fitting an Auto Iris lens to the AXIS 200+.

Appendix C - Modem Installation

Using the Camera Server without a Network

The RS-232 port of your Axis Camera Server can be used to communicate with the camera server, using an ordinary modem, an ISDN modem, a CDPD modem or a direct serial connection to a computer.

We will in this chapter describe how to connect your camera server to a standard modem and how to dial from a modem connected Microsoft Windows 95 PC, to your modem connected Axis Camera Server.

The Axis Camera Server has “plug-and-play” functionality for a few selected modems. We suggest you use one of the modems listed below since it makes installation and setup so much easier.

- USRobotics Courier 33600
- USRobotics Sportster 33600
- USRobotics Sportster Flash
- USRobotics Sportster MessagePlus
- USRobotics Sportster 28800
- USRobotics Sportster Voice 56k
- USRobotics 33600 Fax
- 3Com Impact IQ External ISDN Modem
- Diamond SupraExpress 56e

Notes: Although most external modems are known to work well with Axis' Camera Servers, only the modems listed above have been fully tested by Axis Communications.

Modems not featured in the above list will normally require the setting of a modem specific initialization string. Modem initialization takes place when the camera server starts up, during which the following parameters must be set:

- 1 - Flow control must be set to hardware flow control.
- 2 - Echo mode, all commands should be echoed.
- 3 - All replies from the modem must be in ASCII form.

Connecting Your Modem:

1. Connect modem to phone line.
2. Connect your modem to the RS-232 modem port on your camera server.
3. Connect your modem to Power and power up your modem.
4. Restart your Axis Camera Server.

If the modem you are using is one of the “plug and play” modems you should now be able to dial from a PC to your camera server and connect.

Note: the default IP number of your camera server is 192.36.253.80.

Changing the Modem Baud Rate

After successfully connecting to your camera server from a PC (as described in *Configuring the Dial-Up Adapter*, on page 33), you can now increase the baud rate of your modem. To do this, follow the instructions below:

1. From the Home page of your Axis Camera Server, click **Settings**.
2. Log on as *root* (default password is *pass*).
3. Click the Serial port/Modem button (AXIS 200+/AXIS 240) to go to the modem page and modify the baud rate so that it is compatible with your modem. The new port speed will take effect next time you restart your Axis Camera server.

Notes: The maximum baud rate for the Axis 200+ Camera Server is 38400bps and 115200bps for the Axis 240 Camera Server.

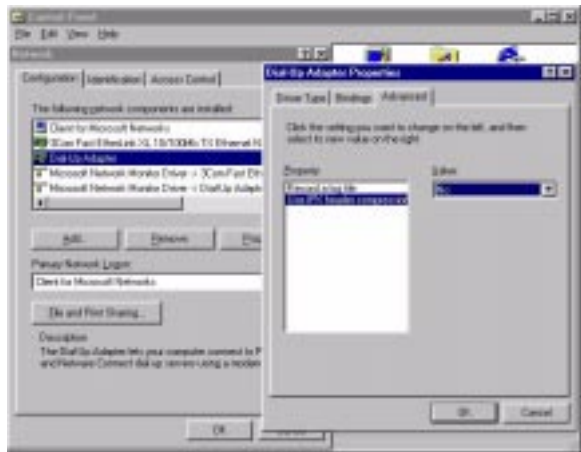
More information regarding CDPD and GSM modems is available on the Axis web site at <http://www.axis.com/>

Configuring the Dial-Up Adapter

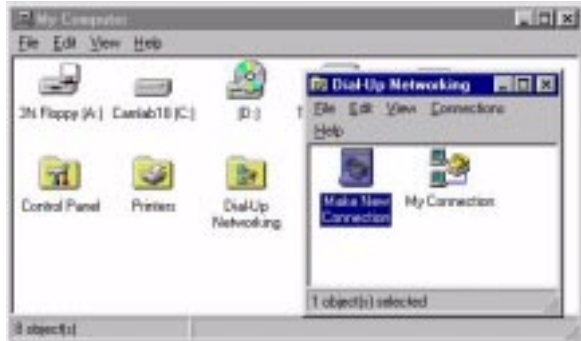
The following instructions describe how to set up a Microsoft Windows 95 PC for modem dial-up connection to an Axis Camera Server. Deviations from these instructions can be expected when using other operating systems.

It is assumed that the TCP/IP, dial-up networking, modem and serial port configurations are correctly installed. If this is not the case, please consult your Windows 95 documentation and install these before configuring the dial-up adapter for access to your Axis Camera Server.

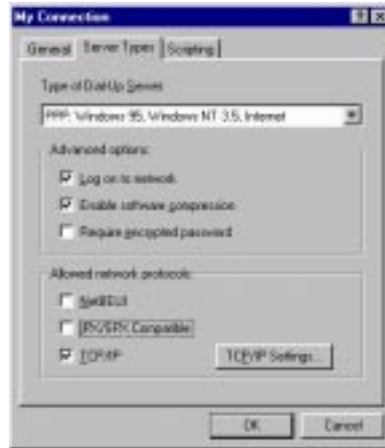
1. From the Control Panel, double click the **Network** icon and highlight your Dial-Up Adapter. Click **Properties**.
2. Go to the **Advanced** tab. Select **Use IPX header compression** from the **Property:** list, and enter the value **No** in the **Value:** drop down list. Click **OK**.



3. Double click **My Computer** on your desktop and double click the **Dial-Up Networking** icon.
4. Right click **Make New Connection**. Select **Properties**.
5. Enter the phone number to which your Axis Camera Server is connected.



- Go to the **Server Types** tab and disable the **NetBEUI** and **IPX/SPX Compatible** checkbox. Click **TCP/IP Settings...**

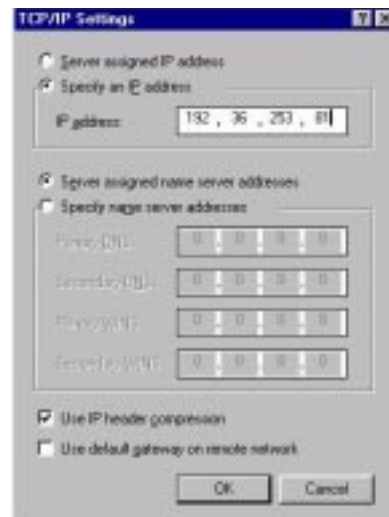


- Select **Specify an IP address**, and enter the IP address of your adapter.

Notes: The IP address selected must be on the same Network segment as the IP address of the Axis Camera Server that you intend to connect to.

If you have a network card installed on your PC, the IP address of your camera server and your dial-up adapter can not be on the same network segment as the network adapter.

- Uncheck **Use default gateway on remote network** and click **OK**.



9. In **My Connection** dialog, go to the **Scripting** tab and disable the **start terminal screen minimized** checkbox. Click **OK**.



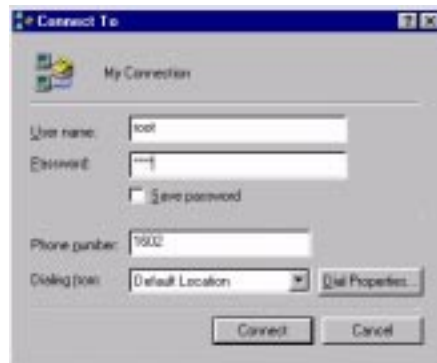
10. Go to the **General** tab. From the **Connect using...** dialog, click **Configure...**



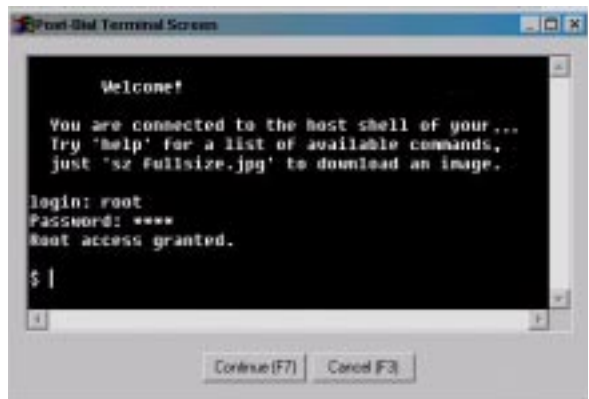
11. In the **Standard Modem Properties** dialog, go to the **Options** tab and check **Bring up terminal window after dialing**. Click **OK** twice.



12. Restart your computer.
13. Start the camera server dial-up connection created in the previous steps and click **Dial**. Your modem will now dial to your camera server.
14. After successful modem connection is established, a terminal window will appear. Log on as a *root* user (default password is *pass*.)



15. Type **ppp** and then return.
16. Press the continue button to close the terminal window.
17. Start your web browser. In the URL field enter the IP address of your Axis Camera Server (If your camera server still has the default IP address enter: **http://192.36.253.80/**). The internal Home page of your Axis Camera Server and an image is now displayed.
18. Click **Settings** if you want to change the image settings or adjust the RS-232 port speed.



Setting the IP Address Using a Null Modem Cable

The IP address of the camera server can be changed directly via direct serial connection, using a Null Modem cable and an appropriate terminal program. The instructions provided below are relevant to Microsoft's HyperTerminal.

Connecting the Camera Server

1. Attach the null modem cable to the RS-232 connector of the camera server and the serial port of your computer.
2. From the Windows Start Menu, start the HyperTerminal program.
3. Create a new connection description by selecting a name and icon. Click OK.
4. The Select To dialog is displayed. Select **Direct to Com1** from the drop-down **Connect using** menu. Click OK.
5. Configure the Port details as follows:

```
Connect using: Direct to Com1
Port Settings: bits per second=9600, data bits=8, parity=none,
stopbits=1, flow control=hardware
```

6. If you wish to retain the Port Settings for future use, save the connection description to your hard drive.
7. Click OK to initiate the HyperTerminal session and wait approximately 30 seconds to allow for the link to become established.
8. Type **CLIENT** at the command prompt (Note that HyperTerminal Commands are case sensitive).
9. At the Login prompt, type the login name and password of the camera server (default to *root* and *pass* respectively).
10. Type **ip** at the command prompt to check the current IP address:
11. You can change the IP address by typing the following:

```
set_ip <camera IP address>
```

Example:

```
set_ip 192.16.253.80
```

Note: It is not possible to have more than one concurrent HyperTerminal session running on the client.

Index

A

ActiveX 10, 16
Application examples 24
ARP 7, 8, 9
Auto Iris 29
AXIS IP Installer 7
AXIS Online CD 5

B

BOOTP 7

C

CamCtrl Java applet 18
Camera lens
 AXIS 200+ 26
CamImg applet 18
CCD 4, 29
Configuring 12
Connectors
 AXIS 200+ 26
 AXIS 240 27
CRON
 Commands 22
 Input and Boot 20, 21
 Online Editor 19
 Script format 19
 Text Editor 19
 Time and Date 20
 Trigger 20

D

DIP switches 27

E

Ethernet address 7

F

Focus 11

H

Home page 10
HTML refresh image feed 17
http
 //www.axis.com/ 24

I

Indicators
 AXIS 200+ 26
 AXIS 240 28
Inventory 25
IP address 7

L

Lens
 ALC adjustment 29, 30
 C-mount 11, 29
 CS-mount 11, 29
 DC-type 29
 LEVEL adjustment 29, 30

M

Modem
 ASCII 31
 Baud Rate 32
 CDPD 31
 Dial-Up Adapter 33
 GSM 32
 Initialization 31
 ISDN 31
 RS-232 31
Mounting assembly 6, 25

O

OBJECT tags 16
Optics 4
OS/2 9

P

Pan/Tilt 6, 18
PARAM tags 16
Ping command 9
Power supply 25
PTZ 23

R

RARP 7
Refresh image feed 17
Reload/Refresh 10
RS-232 6, 37

S

Serial number
 AXIS 200+ 26
 AXIS 240 28
Server push 10, 15
Snapshots 13

U

UNIX 9
URL 13

V

Video inputs 27