AXIS 231D/232D

Network Dome Camera

User's Manual

2 About This Document

This manual is intended for administrators and users of the AXIS 231D/232D Network Dome Camera, and is applicable for software release 4.02. It includes instructions for using and managing the AXIS 231D/232D on your network. Previous experience of networking will be of use when installing and using this product. Some knowledge of UNIX or Linux-based systems would also be beneficial, for developing shell scripts and applications. Later versions of this document will be posted to the Axis Website, as required. See also the product's online help, available via the Web-based interface.

Safety Notices Used In This Manual

Caution! - Indicates a potential hazard that can damage the product.
Important! - Indicates a hazard that can seriously impair operation.
Do not proceed beyond any of the above notices until you have fully understood the implications.

Intellectual Property Rights

Axis AB has intellectual property rights relating to technology embodied in the product described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the patents listed at http://www.axis.com/patent.htm and one or more additional patents or pending patent applications in the US and other countries.
This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit: http://www.openssl.org/

Legal Considerations

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

Electromagnetic Compatibility (EMC)

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Re-orient or relocate the receiving antenna. Increase the separation between the equipment and receiver. Connect the equipment to an outlet on a different circuit to the receiver. Consult your dealer or an experienced radio/TV technician for help. Shielded (STP) network cables must be used with this unit to ensure compliance with EMC standards.

USA - This equipment has been tested and found to comply with the limits for a Class 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.

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

Japan - This is a class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Australia - This electronic device meets the requirements of the Radio communications (Electromagnetic Compatibility) Standard 1998 AS/NZS 3548.

Liability

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

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Axis Customer Services

Should you require any technical assistance, please contact your Axis reseller. If your questions cannot be answered immediately, your reseller will forward your queries through the appropriate channels to ensure a rapid response. If you are connected to the Internet, you can:
- download user documentation and firmware updates
- find answers to resolved problems in the FAQ database. Search by product, category, or phrases
- report problems to Axis support staff by logging in to your private support area
- visit the Axis Support Web at www.axis.com/techsup/

Safety Notice - Battery Replacement

The AXIS 231D/232D uses a 3.0V CR2032 Lithium battery as the power supply for its internal real-time clock (RTC). This battery will, under normal conditions, last for a minimum of 5 years. Low battery power affects the operation of the RTC, causing it to reset at every power-up. A log message will appear when battery replacement is required.

The battery should not be replaced unless required!
If the battery does need replacing, please observe the following points:

Caution!
- Danger of Explosion if battery is incorrectly replaced
- Replace only with the same or equivalent battery, as recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

Table of contents

Product Description

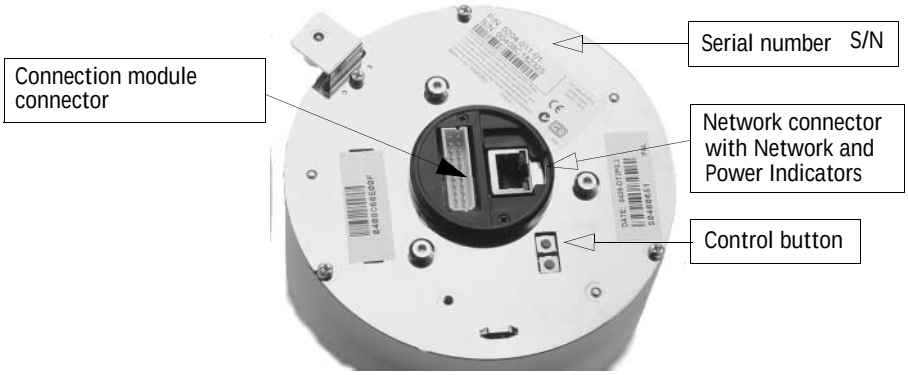
The AXIS 231D/232D is a full-featured Network Dome Camera for security surveillance and remote monitoring needs. It has the ability to make real time full frame rate Motion JPEG video available on the network.

The AXIS 231D/232D is equipped with a connection module with a 4 alarm inputs and 4 alarm outputs, which can be connected to external devices, e.g. door sensors and alarm bells.

Video can be viewed in 10 resolutions (up to 768x576), each with 5 quality levels. As the AXIS 231D/232D is designed for use in security systems, it is equipped with several security features, such as IP address filtering, multilevel password and HTTPS.

The AXIS 231D/232D has a built-in Web server, providing full access to all features through the use of a standard Web browser. The built-in script tool allows basic applications to be created, providing basic surveillance solutions. For advanced functionality, the Network Dome Camera is easy to integrate through the use of AXIS HTTP API. For more information, refer to http://www.axis.com/developer

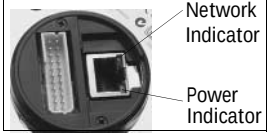
AXIS 231D/232D - Hardware Description



Network Connector- After completion of the startup and self test routines, the Network and Power Indicators on the network connector flashes as follows:

Network	Green	Flashes for network activity
	Red	Flashes rapid red for hardware error
	None	No connection
Power	Green	Normal operation
	Amber	Flashes green/amber during upgrade and when connecting to AXIS Internet Dynamic DNS Service

Detail - network connector:

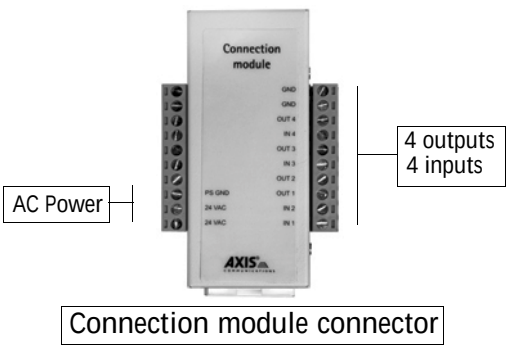


Control Button - Press this button to restore the factory default settings, as described in *Resetting to Factory Default Settings, on page 31* or for installation as described in the provided AXIS 231D/232D Installation Guide and also available from the Axis Web site at http://www.axis.com.

The Serial Number (S/N) is located on the label on the unit.

Network Connector - The AXIS 231D/232D connects to the network via a standard RJ45 connector. Supporting NWAY, the AXIS 231D/232D detects the speed of the local network segment (10BaseT/100BaseTX Ethernet).

Connection Module - The connection module provides the physical interface to 4 transistor outputs, 4 digital inputs and is the connection point for AC power. See *Connection Module*, on page 32.



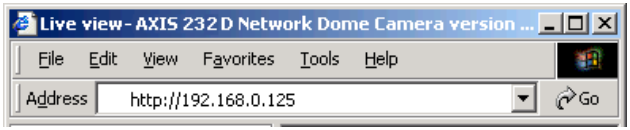
Using the Network Dome Camera

This document includes instructions for using and managing the AXIS 231D/232D. Instructions on how to install the AXIS 231D/232D on your network are provided in the AXIS 231D/232D Installation guide which is available on the Axis Web site. The AXIS 231D/232D can be used with most standard operating systems and supports Microsoft Internet Explorer 6.x or later, Netscape 7.x or later and Mozilla 1.4 or later.

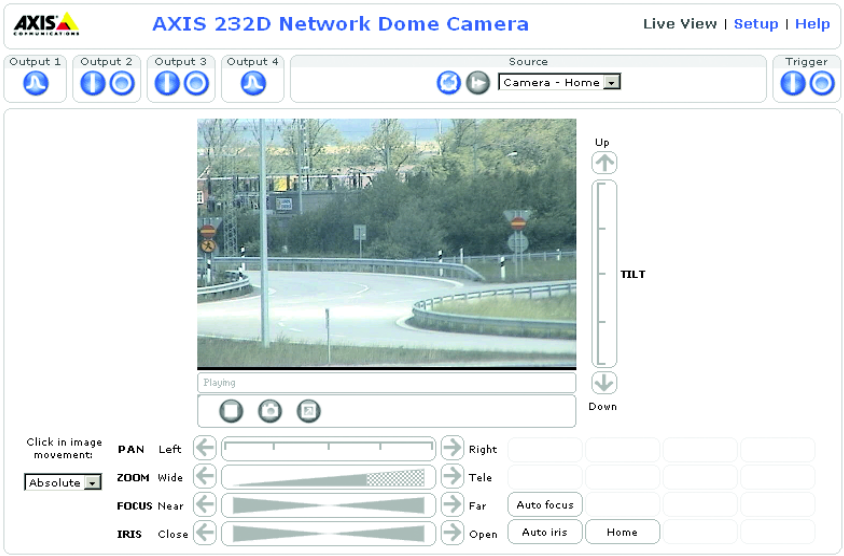
Note: To be able to view streaming video in Microsoft Internet Explorer, you must set your Web browser to allow ActiveX controls and also allow that AXIS Media control (AMC) is installed on your workstation. If your working environment restricts the use of additional software components, you can configure the AXIS 231D/232D to use a Java applet for updating images. Please refer to the online help files for more information.

Accessing the AXIS 231D/232D

1. Start a Web browser (Internet Explorer, Mozilla, Netscape Navigator).
2. Enter the IP address or host name of the AXIS 231D/232D in the Location/Address field of your Web browser.



3. Enter the user name and password set by the administrator.
4. A video image is displayed in your Web browser.



Note: User functions in the AXIS 231D/232D may have been customized to meet the specific requirements of the application. Consequently, many of the examples and functions in this section may differ from those displayed in your Live View page.

If the AXIS 231D/232D has been customized, the buttons described below will be displayed accordingly, on the Live View page:

The Output buttons control an output directly from the Live View page. These buttons are configured under Setup | Live View Config | Layout.

Pulse - click this button to activate the port for a defined period of time, e.g. to switch on a light for 20 seconds.
Active/Inactive - click these buttons to manually start and stop a connected device, e.g. switch a light on/off.

These buttons start/stop the Sequence Mode. This mode is created in Setup | Live View Config | Sequence mode and automatically displays the view from preset positions at set intervals.

The Action buttons trigger an action directly from the Live View page. These buttons are configured under Setup | Live View Config | Layout. Click these buttons to manually start and stop events.

Use the Snapshot button to capture a snapshot of the image currently being displayed in the window. Right-click on the image to save it in JPEG format on your computer.

The AMC viewer toolbar (AXIS Media Control) is available from Microsoft Internet Explorer only and displays the following buttons:

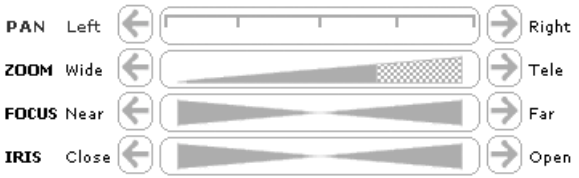
The Play/Stop buttons start and stop the live video stream.

The Snapshot button takes a snapshot of the currently displayed image. The Snapshot function and the target directory for saving snapshots can be configured from AMC (AXIS Media Control), which is available from the Windows Control Panel (Internet Explorer only).

Click the View Full Screen button and the video image will fill the entire screen area. No other windows will be visible. Press Esc (Escape) on the computer keyboard to cancel full screen view.

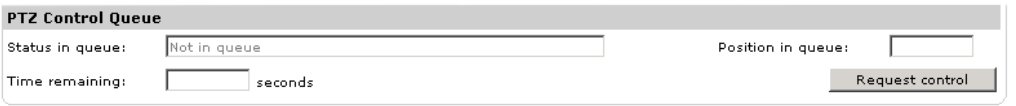
Pan/Tilt/Zoom Controls

The Live View page also displays the Pan/Tilt/Zoom controls. The administrator can enable/disable the control for specified users under System Options | Security | Users | User List.



Pan/Tilt/Zoom Control Queue

This means that the time the user is in control of the PTZ settings is limited and that a queue of users has been set up. Use the buttons to request or release control of the Pan/Tilt/Zoom controllers.



The Pan/Tilt/Zoom Control Queue is set up by the administrator under: Dome Configuration | Advanced | PTZ Control Queue.

Configuring the Network Dome Camera

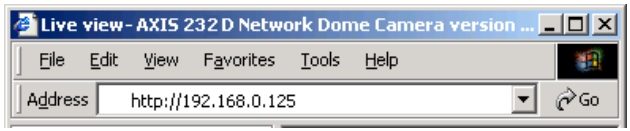
This section describes how to configure the AXIS 231D/232D and is intended for the product administrator who has unrestricted access to all Setup tools and Operator who has access to Video & Image, Live View Config and Event Configuration. See the section on *Security*, on page 25 for more information on user access control.

The AXIS 231D/232D is configured under Setup from a standard browser.

Accessing the Setup Tools

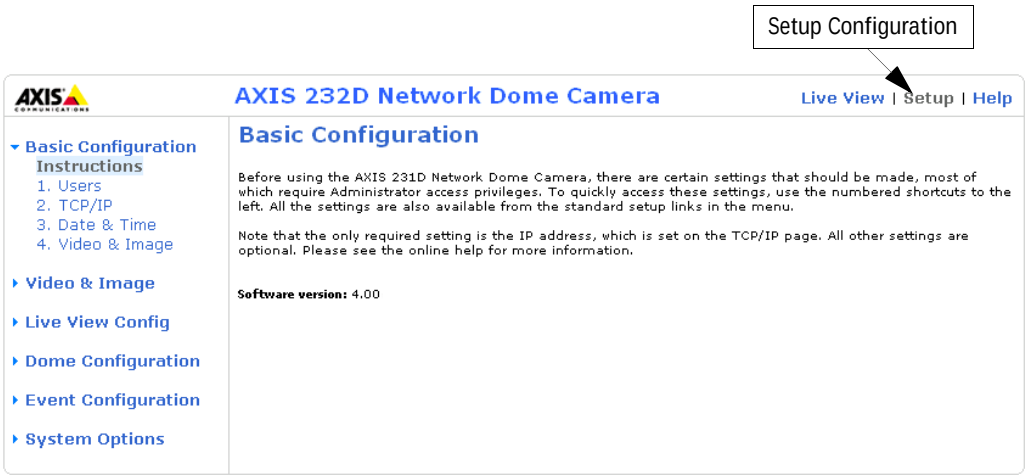
Follow the instructions below to access the Setup Tools from a Web browser.

1. Start the Web browser and enter the IP address or domain name of the AXIS 231D/232D in the location/address field.



2. The Live View page is now displayed. Click Setup to display the Setup configuration tools.

Overview of the Setup Tools



The following table is an overview of the functionality and features available in the AXIS 231D/232D. The functionality is described in detail in the following sections and in the online help files available from each page in the Web interface.

Basic Configuration

Note: The links under Basic Configuration are shortcuts to the necessary basic settings the first time the unit is configured.

Tools	Settings / Options / Description
Instructions	General Instructions
Users	See System Options | Security | Users below
TCP/IP	See System Options | Network | TCP/IP below
Date & Time	See System Options | Date & Time below
Video & Image	See Video & Image | Image below

Video & Image (Administrator/Operator)

Tools	Settings / Options / Description	
Image	Image Settings	Basic image settings; Resolution, compression, color settings, rotate image. Overlay settings places an overlay (e.g. a logotype) in the video image. Video stream - setting to limit the video stream display time
Overlay Image	An overlay image is, e.g. a company logo added to the video image	
Advanced	Camera	Settings for white balance, exposure control, shutter speed and backlight compensation. Settings for the IR Cut Filter (AXIS 232D only).

Live View Config (Administrator/Operator)

Tools	Settings / Options / Description
Layout	Customize the features, add custom links, manual trigger buttons and manual output control buttons to the Live View page Default Viewer: set your preferred method of viewing moving images.
HTML Examples	Add live video from your AXIS 231D/232D Network Dome Camera to your own Web site or save an HTML page on your local hard disk to display live images from the AXIS 231D/232D.

Dome Configuration (Administrator/Operator)

Tools	Settings / Options / Description
Preset Positions	Define and save preset positions for quick access to certain camera views.
Sequence Mode	'Guard Tour' where the AXIS 231D/232D can rotate through the preset positions in a set order or randomly.
Limits	Set Pan/Tilt/Zoom and Focus limits to restrict the viewing areas. Set the speed for camera movement
Advanced	Pan/Tilt/Zoom control queue settings

Event Configuration (Administrator/Operator)

Tools	Settings / Options / Description
Instructions	General Instructions
Event Servers	Specify destinations for uploaded image files and/or notification messages from the Network Dome Camera. FTP servers and HTTP servers are intended for saving image files and HTTP servers and TCP servers are intended for receiving notification messages.
Event Types	Set the Network Dome Camera to act on Triggered or Scheduled Event Types, e.g. to upload images to a specified destination when an alarm is activated or at a set time
Port Status	Shows the status for the inputs and outputs connected to the Network Dome Camera - see Ports & Devices under System Options.

System Options (Administrator)

Tools	Settings / Options / Description	
Security	Users	Access to the Network Dome Camera can be restricted to defined users only (maximum of 20). The administrator has unrestricted access to the Setup tools and determines rights for users at 3 levels; Administrator, Operator, Viewer.
	IP Address Filter	Once enabled, only the IP addresses shown in the list of allowed addresses will be permitted to access the Network Dome Camera. All others will be blocked.
	HTTPS	The AXIS 231D/232D can be configured for use over HTTPS which provides encrypted Web pages.
Date & Time	Define the date and time settings for your Network Dome Camera, manually or automatically.	
Network	TCP/IP	Specify IP address configuration, DNS configuration, Host Name configuration, Notification of changed IP address. Register/unregister for AXIS Internet Dynamic DNS Service. Specify HTTP port and network traffic preferences.
	SOCKS	Specify SOCKS server to use when communicating with hosts on the other side of a firewall/proxy server.
	SMTP	Specify the host names or addresses for your primary and secondary mail servers in the fields provided to allow the Network Dome Camera to send event and error email messages to predefined email addresses.
	UPnP	The Network Dome Camera includes support for Universal Plug and Play (UPnP). Enable UPnP (enabled by default) and enter a user friendly name for the AXIS 231D/232D.
Ports & Devices	I/O Ports	Configure the 4 transistor outputs and 4 digital inputs supported by the AXIS 231D/232D.
Maintenance	Maintenance functions to restart the Network Dome Camera, restore settings, upgrade the firmware, backup the parameters and restore to previous settings. Also self test function for dome mechanics and camera.	
Support	Support Overview	Troubleshooting, Server report (always attach the Server Report when contacting your support channel) and Axis Support Services.
	Logs & Reports	Logs (all log information is shown in one file), Server Report (important information about the server's status) and a parameter list (the unit's parameters and current settings).
Advanced	Scripting	This powerful function allows users to customize and use their own scripts to create specialized applications.
	Plain Config	Plain config allows direct access to all the configurable parameters.

About (Administrator)

Tools	Settings / Options / Description
About	Third Party Software Licenses - the source code for the Linux kernel, Boa and more.

Using the Setup Tools

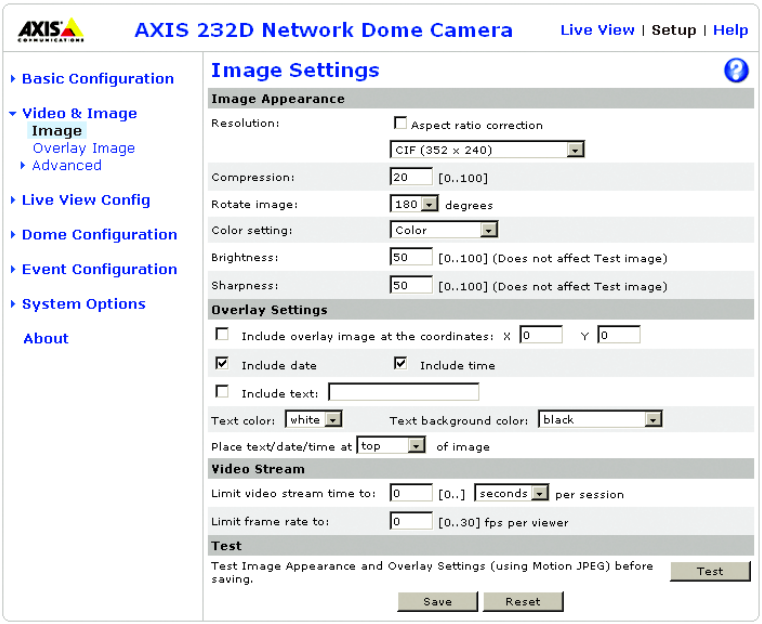
The following descriptions offer examples of the available features in the AXIS 231D/232D. For details of each setting, please refer to the online help files which are available from each page. Click to access the help files.

Note: The links under Basic Configuration are shortcuts to the necessary basic settings the first time the unit is configured.

Video & Image

To optimize the video images according to your requirements, modify the following settings under Image Appearance. Each setting is described in the online help files

- Resolution (including Aspect ration correction)
- Compression
- Rotate Image
- Color Setting
- Brightness
- Sharpness



Note: All configuration of images and overlays will affect the performance of the Network Dome Camera, depending on the usage and the available bandwidth. Please keep in mind the following when changing the image settings:

- Lower compression improves image quality, but generates larger files
- Color uses more bandwidth than Black & White
- Rotating the image 90 or 270 degrees will lower the maximum frame rate

Overlay Settings

Include an image, e.g. your company logo and date and time with your own text which is placed on one line at the top or bottom of the video image.

See *Overlay Image Settings*, on page 13 for instructions on how to upload an overlay image to the AXIS 231D/232D.

Video Stream

Define the maximum video stream time per session in seconds, minutes or hours. When the set time has expired, a new stream can be started by refreshing the page in the Web browser. For unlimited video stream time, set this value to 0.

Define the maximum frame rate (fps - frames per second) allowed for each viewer, to avoid bandwidth problems on the network.

Test

For a preview of the image and overlay settings before saving, click Test. The Brightness and Sharpness settings do not affect the Test image. When you are satisfied with the settings, click Save.

Overlay Image Settings

An overlay image is an image included in the video image. This might, for example, be your own company logo. Follow these instructions to upload and use an overlay image:

1. Go to Setup | Video & Image | Overlay Image.
2. To upload the file (a logo or image) to the AXIS 231D/232D, click the Browse button and locate it on your computer or server.
3. Click the Upload button and follow the on-screen instructions.
4. The image is now available in the Use overlay image drop-down list.
5. Click Save.
6. Go to Setup | Video & Image and modify the parameters under Overlay Settings.

Overlay image requirements:

Image Formats	Image Size
• Windows 24-bit BMP (full color) • Windows 4-bit BMP (16 colors) • OS/2 4-bit BMP (16 colors)	The height and width of the overlay image in pixels must be exactly divisible by 4.

Overlay image limitations:

- If the image overlay and text overlay are larger than the video image, no overlay will be displayed. When also using a text overlay, this will occupy 16 pixels in height and as many in width as the video image. Please consider this when configuring the overlay image.
- If the overlay is initially positioned so that part of it is outside the video image, it will be relocated so that it appears over the video image, i.e. the entire image is always displayed.
- The maximum overlay image size supported by the AXIS 231D/232D is the same as the maximum image resolution. See Technical Specifications, on page 46.

Please use the online help files for more information.

Advanced

To optimize the lighting settings according to your requirements, modify the following settings under Lighting Conditions:

- White balance - the white balancing system in the AXIS 231D/232D can automatically detect white in the image and intelligently use this as a reference for other colors.
- Exposure control - this setting is used to adapt to the amount/type of light being used. Allow slow shutter can be enabled/disabled when the exposure control is set to Automatic.
- IR cut filter (AXIS 232D only)- when the IR cut filter is set to OFF, the camera will be able to 'see' infrared light, e.g. at night, thus making the image clearer. The image is shown in black & white when the IR cut filter is off.
  Note: If set to Auto, the camera will automatically switch between IR cut filter ON and OFF, according to the current lighting conditions. This is only possible when the iris is set to Auto Iris, and the exposure control is set to Automatic.
- Backlight compensation - this setting is used to make the subject appear clearer. against e.g. a bright background.

Image Settings

- Auto focus enabled (default setting).
- Sensitivity - sets the speed of the auto focus. High is used when focusing on objects that move frequently. Low improves the stability of the focus.

Note: In certain situations, the white balancing system will not operate effectively. Problems may occur if the image contains no white color at all, or if the dominant color is not white. In these circumstances, the white balance may incorrectly be based on another visible color in the image, and colors may become distorted. A pale background picture with reddish or blue foreground objects is very symptomatic of this condition. In such cases it is recommended that a fixed white balance setting is selected.

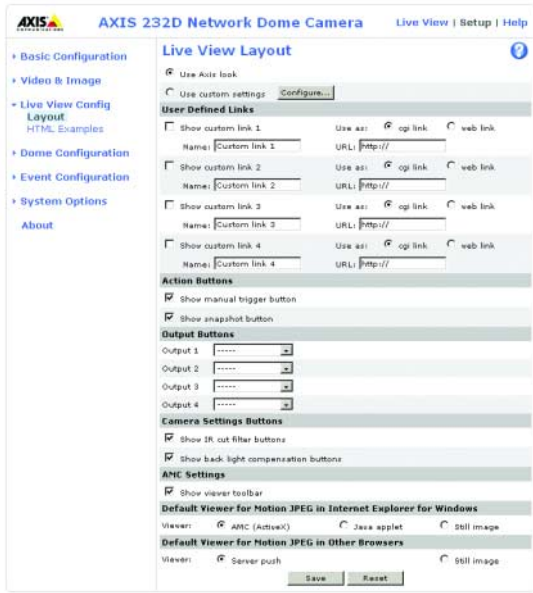
Please use the online help files for more information.

Live View Config - Live View Layout

Select whether to Use Axis look for the whole product, or select Use Custom settings.

Use Axis look

Select Use Axis look and customize the features on the AXIS 231D/232D Live View page to suit your requirements. The following features can be customized:



- User Defined Links - see description on page 17.
- Action Buttons - the manual trigger buttons are used to manually start and stop events. The snapshot button is used to save Motion JPEG snapshots from the video stream.
- Output Buttons - the manual output buttons are used to control an output directly from the Live View page.
- Camera Settings Buttons - buttons used to manually control Backlight compensation and IR Cut Filter for better images in poor lighting conditions.
- AMC Settings - AXIS Media Control toolbar provides various controls for e.g. pausing the video stream, switching to full screen mode, etc. Only available when using AMC.
- Default Viewer for your Browser - select the appropriate radio button to define your method for viewing moving images depending on your Web browser and settings.
- Default Viewer for Motion JPEG in Other Browsers - when using any other browser than Internet Explorer (IE), select the appropriate radio button to define your preferred method for viewing Motion JPEG images.

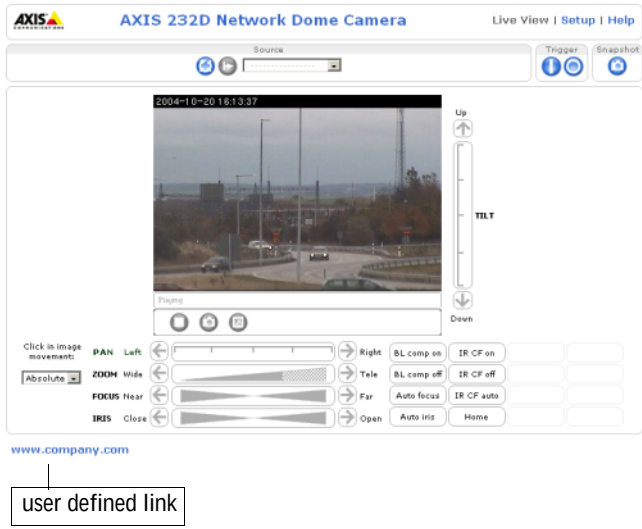
Please use the online help files for more information.

User Defined Links

Custom links can be used to e.g. run scripts or activate external devices connected to the server, or they can link to a standard web URL, i.e. to a web page.

Enter a descriptive name and enter the URL in the provided field. The link will appear on the Live View page.

User defined CGI links can also be used to issue HTTP API requests, e.g. PTZ commands.



Example:

1. Check Show Custom Link 1
2. Enter a descriptive name, e.g. CAM START.
3. Select the Use as cgi link radio button and enter the cgi link in the field:

```
http://192.168.0.125/axis-cgi/com/ptz.cgi?continuouspantiltmove=-30,-30
```

4. Check Show Custom Link 2.
5. Enter a descriptive name, e.g. CAM STOP.
6. Select the Use as cgi link radio button and enter the cgi link in the field:

```
http://192.168.0.125/axis-cgi/com/ptz.cgi?continuouspantiltmove=0,0
```

7. These links will appear in the web interface and can be used to control the PTZ camera

For more information on the Axis HTTP API, see the Support / Developer pages on the Axis Web site at http://www.axis.com.

Please use the online help files for more information.

Custom Settings

Alternatively, select Use custom settings to use a custom web page and click Configure...

To be made available for selection in the Custom Settings setup dialog, your own web files, background pictures, colors etc. must first be uploaded to the AXIS 231D/232D. Once uploaded, the files are shown in the drop-down list.

1. Click the Upload/Remove button.
2. Enter the path to the file, e.g. a file located on your workstation or click Browse.
3. Select the user level for the uploaded file. Setting the user access level means that you have complete control over which pages can be viewed by which users.
4. Click the Upload button.
   All uploaded files are shown in the list in the lower section of the page. To remove a file, check the box provided next to it and then click the Remove button.
5. Click Close to close the window.
   - To use your uploaded file, click the radio button and select the file from the drop-down list by Own:
   - To use an External file located somewhere other than in the AXIS 231D/232D, click the radio button and enter the URL by External:

Own Home Page

To use an uploaded web page as the default page, check the checkbox, select the page from the drop-down list and click OK to close the Custom Settings window.

HTML Examples

You can add live video from your AXIS 231D/232D to your own web site. The AXIS 231D/232D can send Motion-JPEG to up to 20 simultaneous connections, although an administrator can restrict this to fewer.

Enter the Image Type, Image size and Optional settings to suit your Web page and click Update.

Copy the source code as displayed on the HTML examples page and paste it into your own Web page code.

Please use the online help files for more information.

Dome Configuration

Preset Positions - a preset position is a pre-defined camera view than can be used to quickly move the camera to a specific location.

From Preset Position Setup, use the Pan, Tilt and Zoom (PTZ) controls to steer the camera to the required position. When satisfied with the camera's position, enter a descriptive name. The camera position, iris and focus settings are then saved as a preset position.

The position can be assumed at any time, by selecting the preset's name from the Preset positions drop-down list. Preset positions can be selected in Live View, from events and in Sequence mode.

One position can be set as the Home position, which is readily accessible by clicking on the H button in both the Preset Position Setup window and the Live View window. The position's name will have (H) added, e.g. Office Entrance (H).

Sequence Mode

The Live View page can be configured to rotate through the selected preset positions, in a set order or randomly.

Select the desired preset positions and enter the time in seconds to display each position (up to 59 minutes). Click Save.

The Sequence buttons will appear on the Live View page to enable the viewer to start and stop the sequence mode.

Limits

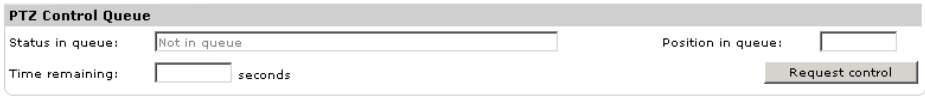
Define the pan, tilt, zoom and focus limits for the AXIS 231D/232D. Movements to the left and right, up and down can be restricted to narrow the area under surveillance. The near focus limit can be set to avoid focusing on objects too close to the camera.

Note: Once a limit has been saved, this position can not be exceeded by the dome camera unless the values have been reset and saved to a greater value first (i.e. reset the default values of the mechanical restrictions).

Move speed sets the speed of the camera's Pan/Tilt movements. The default setting is maximum speed.

Advanced

PTZ Control Queue - The administrator can set up a queue for the PTZ controllers. Once set up, the PTZ Control Queue buttons will appear on the Live View page offering one viewer exclusive control for a limited amount of time. Other users will be placed in the queue.



PTZ Control Queue on Live View page

Please use the online help files for more information.

Event Configuration

This section describes how to configure the AXIS 231D/232D for alarm handling. The AXIS 231D/232D can be configured to perform certain actions when certain types of events occur.

Event type	A set of parameters describing how and when the Network Dome Camera is to perform certain actions	
Triggered Event page 22	the circumstances that start an event	e.g. at a signal from an external device, such as a door switch or a motion sensor
Scheduled Event page 24	the circumstances that start an event	e.g. at a pre-programmed time
Action	what occurs when the event triggers	e.g. uploaded video images to an FTP server, email notification, etc.

Event Servers

Event Servers are used, e.g. for receiving uploaded image files and/or notification messages. To set up Event server connections in your AXIS 231D/232D, go to Setup | Event Configuration | Event Servers and enter the required information according to the selected server type.

Server type	Purpose	Requires information
FTP Server	• used for uploading saved images	• Descriptive name of your choice • User Name and Password (to FTP server) • Upload path e.g. images/ • Port number e.g. port 21 • Use passive mode if there is a firewall between the dome camera and the FTP server
HTTP Server	• used for notification messages • used for uploading saved images	• Descriptive name of your choice • URL • User Name and Password (to HTTP server) • Proxy address/Proxy port (if required) • Proxy User Name and Password (if required)
TCP Server	• used for notification messages	• Descriptive name of your choice • User Name and Password (to TCP server) • Port number e.g. port 80

For details on each setting, please refer to the online help files which are available from each web page.

Note: Pre-trigger and Post-trigger buffers will be lost if the connection to the event server fails.

When the setup is complete, the connection can be tested by clicking the Test button (the connection test will take approximately 10 seconds).

Event Types

An Event Type is a set of parameters describing how and when the Network Dome Camera is to perform certain actions.

Example: If somebody passes the connected camera, and an event has been configured to act on this, the Network Dome Camera can e.g. record and save video images to an FTP server or send a notification email to a pre-configured email address with a pre-configured message.

Triggered Event

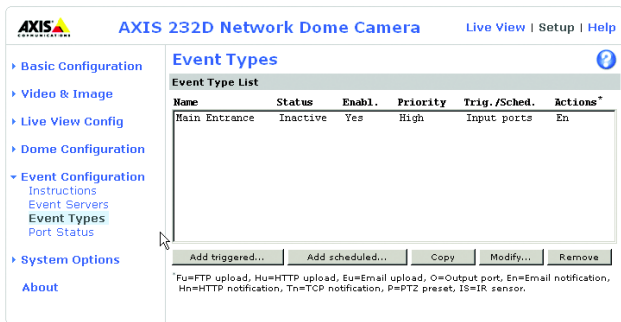
A Triggered event is activated from, e.g :

- a switch (doorbell) connected to an input port on the Network Dome Camera
- lost signal from the camera
- a manually activated action e.g. from an action button in the web interface
- on restart (reboot) after e.g. power loss

How to set up a triggered event

This example describes how to set the Network Dome Camera to upload images when the main door is opened:

1. Click Add triggered on the Event types page.
2. Enter a descriptive name for the event, e.g. Main door.
3. Set the priority - High, Normal or Low (see online help files).
4. Set the Respond to Trigger... parameters when the event is to be active, e.g. only after office hours

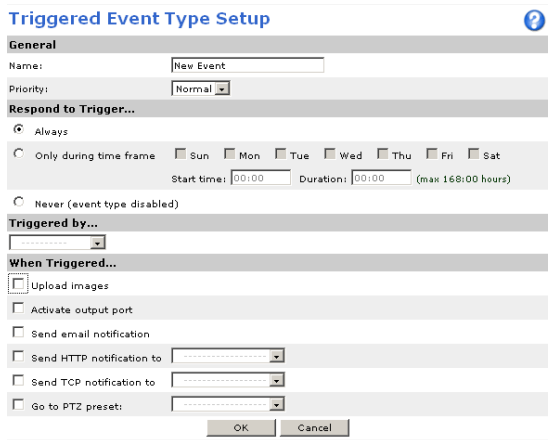


5. Select the trigger alternative from the Triggered by... drop-down list, e.g. an Input port with a connected sensor if the door is opened.
6. Set the When Triggered... parameters i.e. set what the Network Dome Camera is to do if the main door is opened e.g. upload images to an FTP server.
7. Click OK to save the Event in the Event Types list.

Please use the online help files for descriptions of each available option.

Pre-trigger and Post-trigger buffers
This function is very useful when checking to see what happened immediately before and after a trigger, e.g. 2 minutes before and after a door has been opened.

Go to Event Types | Add Triggered... | When Triggered ... and check the Upload images checkbox to expand the web page with the available options.



Buffer size - up to 9 MB buffer. The maximum length of time of the pre-/post-buffer depends on the image size and selected frame rate.

Include pre-trigger buffer - images stored internally in the server from the time immediately preceding the trigger. Check the box to enable the pre-trigger buffer, enter the desired length of time and specify the required image frequency.

Include post-trigger buffer - contains images from the time immediately after the trigger. Configure as for pre-trigger.

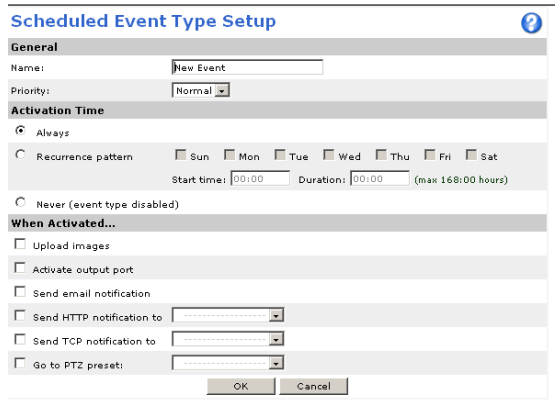
Note: If the pre- or post-buffer is too large for the internal memory, the frame rate will be reduced and individual images may be missing. If this occurs, an entry will be created in the unit's log file.

Continue image upload (unbuffered) - enable the upload of images for a fixed length of time. Specify the length of time for the uploaded recording, in seconds, minutes or hours, or for as long as the trigger is active. Finally, set the desired image frequency to the maximum (the maximum available) or to a specified frame rate. The frame rate will be the best possible, but might not be as high as specified, especially if uploading via a slow connection.

Scheduled Event
A Scheduled event can be activated at pre-set times, in a repeating pattern on selected weekdays.

How to set up a scheduled event
This example describes how to set the Network Dome Camera to send an email notification with saved images from at a set time:

1. Click Add scheduled on the Event types page.
2. Enter a descriptive name for the event, e.g. Scheduled email.
3. Set the priority (High, Normal or Low).
4. Set the Activation Time parameters (24h clock) when the event is to be active, e.g. start on Fridays at 18.00 with a duration of 62 hours.
5. Set the When Activated... parameters i.e. set what the Network Dome Camera is to do at the specified time e.g. send uploaded images to an email address.



6. Click OK to save the Event in the Event Types list.

Please use the online help files for descriptions of each available option.

Port Status

Under Event Configuration | Port Status there is a list that shows the status for the connected inputs and outputs of the AXIS 231D/232D for the benefit of the Operator who cannot access the System Options section.

Example: If the Normal state for a doorbell push button connected to an input is set to Open circuit - as long as the button is not pushed, the state is inactive. If the doorbell button is pushed, the state of the input changes to active.

System Options

Security

User access control is enabled by default, the administrator sets the root password on first access. Other users are authorized with user names and passwords, or the administrator can choose to allow anonymous viewer login to the Live View page, as described below:

Users - the user list displays the authorized users and access levels:

Viewer	Provides the lowest level of access, which only allows the user access to the Live View page
Operator	An Operator can view the Live View page, create and modify event types and adjust certain other settings. The Operator does not have access to the Systems Options configuration pages.
Administrator	An administrator has unrestricted access to the Setup Tools and can determine the registration of all other users.

User Settings - check the corresponding checkboxes to enable:

- Anonymous viewer login - allows any viewer direct access to the Live View page.
- Anonymous PTZ control login - allows any viewer access to the Pan/Tilt/Zoom controllers on the Live View page.

IP Address Filter - The administrator can add up to 256 IP addresses to the Allowed IP Addresses list. If the IP address filtering checkbox is checked, the AXIS 231D/232D will only allow access to requests coming from the IP addresses in the list.

The users from these IP addresses need to be specified in the user list with the appropriate access rights (User, Operator or Administrator).

Referrals - to prevent unauthorized sources from including the video stream from the AXIS 231D/232D into external Web pages, check the Referrals checkbox and enter the IP address or Host name of the computer that hosts the Web pages with the included video stream. Several IP addresses/host names can be defined and are separated by semicolons(;)

HTTPS - provides encryption for user page requests to and from the AXIS 231D/232D. The AXIS 231D/232D can be configured for use with HTTPS, as described below.

Certificate - to use HTTPS for communication with the AXIS 231D/232D, a Certificate must be created using one of the following methods:

- An official certificate issued by a CA (Certificate Authority). A CA issues and manages security credentials and public keys for message encryption.
- A self-signed certificate can be created in the Network Dome Camera but this can not guarantee the same level of security as an official certificate.

1. Click either Create self-signed certificate or Create Certificate Request and enter the required information in the provided fields.

2. Click OK.
3. Create self-signed certificate generates and installs a certificate which will be displayed under Installed Certificate.
   Create Certificate Request generates a PEM formatted request which you copy and send to a CA for signing. When the signed certificate is returned, click Install signed certificate... to install the certificate in the AXIS 231D/232D.
4. Set the HTTPS Connection Policy for the administrator, Operator and Viewer to enable HTTPS connection (set to HTTP by default)

Please refer to the home page of your preferred CA for information on where to send the request etc. For more information, please refer to the online help files

Date & Time

Current Server Time - displays the current date and time (24h clock). If this has not been configured, the time displayed is the default setting. The time can be displayed in 12h clock format in the Overlay Images (see below).

New Server Time - Select your time zone from the drop-down list and check the day-light saving time changes, if desired.

From the Time Mode section, select the preferred method to use for setting the time:

- Synchronize with computer time - sets the time from the clock on your computer.
- Synchronize with NTP Server - the Network Dome Camera will obtain the time from an NTP server every 60 minutes. Specify the NTP server's IP address or host name. Note that if using a host name for the NTP server, a DNS server must be configured under TCP/IP settings. See Network | TCP/IP below.
- Set manually - this option allows you to manually set the time and date.

Date & Time Format Used in Images - specify the formats for the date and time (12h or 24h) displayed in the Live View video streams.

Use the predefined formats or use your own custom date and time formats. See Advanced File Naming & Date/Time Formats in the help files for information on how to create your own file formats.

Network - TCP/IP Settings

IP Address Configuration - the IP address of the Network Dome Camera can be set automatically via DHCP, or a fixed IP address can be set manually. A host name can be used and there are options for setting up notification of changes in the IP address. DHCP is enabled by default.

Note: DHCP is a protocol for automatic IP address assignment on a network. IP address assignment via DHCP may lead to the situation where the IP address is changed and you lose contact. Configure the options for notification of IP address change (see Services below) to receive notification from the Network Dome Camera, when the IP address has been changed.

Alternatively, if your DHCP server can update a DNS server, you can access the AXIS 231D/232D by host name which is always the same, regardless of the IP address.:

- Auto-Configure Link-Local Address is enabled by default and assigns the AXIS 231D/232D with an additional IP address for the UPnP protocol. The AXIS 231D/232D can have both a Link-Local IP and a static/DHCP IP address at the same time - these will not affect each other. See *Network - UPnP*, on page 29.

DNS Configuration - DNS (Domain Name Service) provides the translation of host names to IP addresses on your network.

- Obtain DNS server address via DHCP - automatically use the DNS server settings provided by the DHCP server. Click the View button to see the current settings.
- Use the following DNS server address - enter the desired DNS server by specifying the following:

- Domain name - enter the domain(s) to search for the host name used by the AXIS 231D/232D. Multiple domains can be separated by semicolons (;). The host name is always the first part of a Fully Qualified Domain Name, e.g. myserver is the host name in the Fully Qualified Domain Name myserver.mycompany.com where mycompany.com is the Domain name.
- Primary DNS server - enter the IP address of the primary DNS server.
- Secondary DNS server - will be used if the primary DNS server is unavailable.

Host Name Configuration - The AXIS 231D/232D can be accessed using a host name, instead of an IP address. The host name is usually the same as the assigned DNS Name. It is always the first part of a Fully Qualified Domain Name and is always one word, with no period. For example, myserver is the host name in the Fully Qualified Domain Name myserver.mycompany.com.

For more information, please refer to the online help files

Services - Options for notification of IP address change and AXIS Internet Dynamic DNS Service

- Options for notification of IP address change - if the IP Address for the Network Dome Camera is changed automatically, e.g. by DHCP, you can choose to be notified. Click Settings... and enter the required information.
- AXIS Internet Dynamic DNS Service - If the AXIS 231D/232D Network Dome Camera has been registered with the Axis Internet Dynamic DNS service and the IP address for the product changes, the service is updated to reflect the change. Check the box to enable/disable automatic updates.

  The domain name currently registered at the Axis Internet Dynamic DNS service for your product can at any time be removed. To do this click Settings... and follow the instructions.

For more information, please refer to the online help files

HTTP - The default HTTP port number (port 80) can be changed to any port within the range 1024-65535. This is useful for e.g. simple security port mapping.

Network Traffic - The default setting is Auto-negotiate which means that the correct speed is automatically selected. If necessary, you can set the connection speed by selecting it from the drop-down list. 10BaseT (Half/Full Duplex), 100BaseTX (Half/Full Duplex).

- Maximum bandwidth - Specify, in Mbit/s or kbit/s, the maximum bandwidth that the Network Dome Camera is allowed to use on your network. This is a useful function when connecting your Network Dome Camera to busy or heavily loaded networks. The default setting is Unlimited.

For more information, please refer to the online help files

Network - SOCKS

SOCKS is a networking proxy protocol. The AXIS 231D/232D can be configured to use a SOCKS server to reach networks on the other side of a firewall/proxy server. This functionality is useful if the Network Dome Camera is located on a local network behind a firewall, but notifications, uploads, alarms, etc., need to be sent to a destination outside the local network (e.g. to the Internet).

Network - SMTP (email)

(Simple Mail Transfer Protocol) Enter the host names or addresses for your primary and secondary mail servers in the fields provided to enable event and error email messages from the Network Dome Camera to predefined addresses, via SMTP.

Network - UPnP

(Universal Plug and Play) The Network Dome Camera includes support for Universal Plug and Play (UPnP) in Windows Millennium and Windows XP. UPnP is enabled by default.

Note: UPnP must be installed on your workstation. To do this, open the Control Panel from the Start Menu and select Add/Remove Programs. Select Add/Remove Windows Components and open the Networking Services section. Click Details and then select UPnP as the service to add. Refer to the Windows help files for more information.

Ports & devices - I/O Ports

The pinout, interface support and the control and monitoring functions are described in the section on the *Connection Module*, on page 32.

Maintenance

Maintain Server -

- Restart - The unit is restarted without changing any of the settings. Use this method if the unit is not behaving as expected.
- Restore - The unit is restarted and most current settings are reset to factory default values. The following settings will not be reset: boot protocol (DHCP or static), the static IP address, the default router, the subnet mask, the system time
- Factory Default - The Factory default button should be used with caution. Pressing this button will reset all of the Network Dome Camera's settings to the factory default values (including the IP address)

Dome Status - if you experience unexpected Pan Tilt Zoom (hardware) behavior, click the Test button to test the camera and dome mechanics for errors. Contact Axis Customer Services if you receive an error report from this test function.

Upgrade Server - See *Updating the Firmware*, on page 34.

Backup - click the Backup button to take a backup of all of the parameters, and any user-defined scripts. This makes it possible to return to the previous settings if the settings are changed and there is unexpected behavior.

Restore - click the Browse button to locate the saved backup file (see above) and then click the Restore button. The settings will be restored to the previous configuration.

Note: Backup and Restore can only be used on the same unit running the same firmware. This feature is not intended for multi-configurations or for firmware upgrades.

Support

The support overview page provides valuable information on troubleshooting and contact information, should you require technical assistance.

Logs & Reports - when contacting Axis Customer Services, please be sure to provide a valid Server Report and the result from the Dome Status Test (see *Maintenance*, on page 29).

View Information - The Log report and the Parameter List also provide valuable information for troubleshooting and when contacting Axis Customer Services.

Configuration -

- Log Level for Log Files - from the drop-down list, select the level of information to be added to the Log file
- Log Level for Email - from the drop-down list, select the level of information to send as email and enter the destination email address.

Advanced

Programming Script Editor - Administrators and developers wishing to create a special level of customization within their applications can create their own programming scripts using the embedded PHP-based Script Editor. These scripts are configured into the file system of the AXIS 231D/232D.

Note: PHP is a server-side scripting language that is both open-source and cross-platform. You can obtain further information and a free download of the complete hypertext preprocessor software from the official PHP Website at: http://www.php.net/

More Scripting Information
Axis maintains a specialist site for users and developers who want to create their own scripts at: http://www.axis.com/

Using these programming scripts, you can develop applications for event triggering, alarm notification via e-mail, picture storage to FTP locations - and many other functions.

The available commands and programming syntax is described in detail, and several practical examples are available. Detailed instructions on how to download complete scripts into the file system are also provided.

Caution!

Improper use may cause unexpected behavior or even cause loss of contact with the unit. If a script does cause problems, reset the unit to its factory default settings (in which case, a backup file may be of use to return the unit to its latest configuration). Axis strongly recommends that you do not use this function unless you fully understand the consequences. Note that Axis Customer Services will not assist with customized scripts. For more information, please visit the Developer pages at http://www.axis.com/developer

Plain Config - this function is for the advanced user. All parameters can be set and modified from this page, help is available from the standard help pages.

About

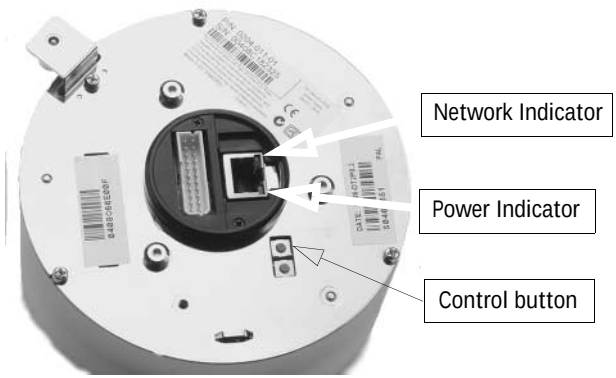
Third Party Software Licenses - click View licenses for a list of the licensed software used in the AXIS 231D/232D Network Dome Camera.

Resetting to Factory Default Settings

To reset the AXIS 231D/232D to the original default settings, go to the System Options | Maintenance web page (described in *Maintenance*, on page 29) or use the control button on the AXIS 231D/232D as described below:

Using the Control Button
Follow the instructions below to reset the AXIS 231D/232D to factory default settings using the Control Button.

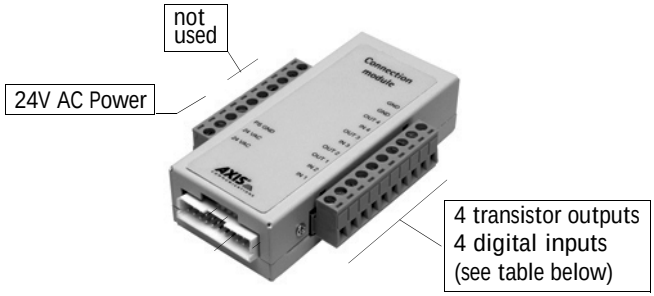
1. Switch off the AXIS 231D/232D by disconnecting the power.
2. Press and hold the Control button while you reconnect the power.
3. Keep the Control button pressed until the Power Indicator flashes amber (this may take up to 15 seconds).
4. Release the Control button.
5. When the Power Indicator changes to green (may take up to 1 minute), the process is complete and the AXIS 231D/232D has been reset.



Connection Module

This section describes the pinout provided by the Connection module consisting of:

- 4 transistor outputs
- 4 digital inputs
- power and GND (ground)



The inputs/outputs are used in applications for, e.g. event triggering, time lapse recording, alarm notification via email, picture storage to FTP locations.

- Input - e.g. a doorbell. If the doorbell is pressed, the state changes, and the input will be active (shown under Event Configuration | Port Status).
- Output - e.g. an alarm device that can be activated from Output buttons from the Live View page or as an action to an Event Type. The output will show as active (under Event Configuration | Port Status), if the alarm device is activated.

Connection Module Pinout

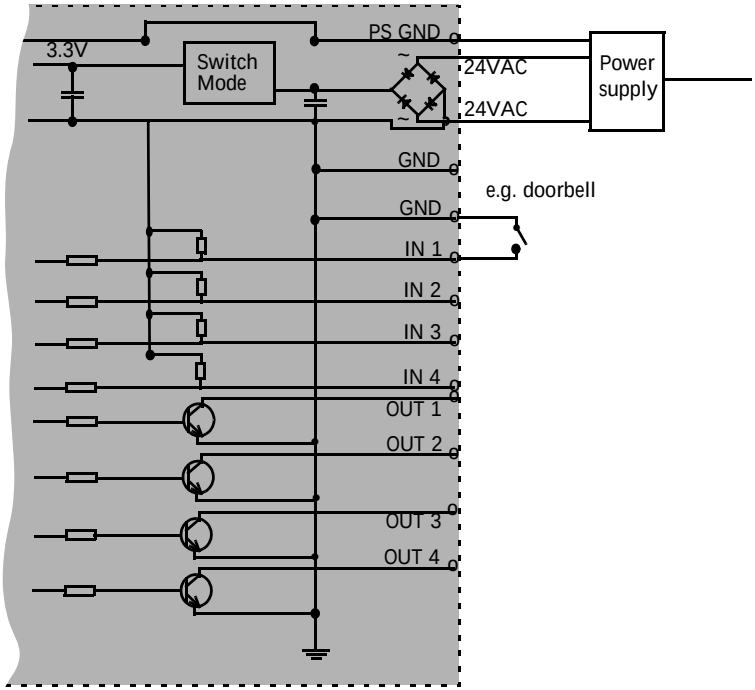
Function	Description	Function	Description
n/a	not used	GND	ground
n/a	not used	GND	ground
n/a	not used	Transistor Output 4	See below
n/a	not used	Digital Input 4	See below
n/a	not used	Transistor Output 3	See below
n/a	not used	Digital Input 3	See below
n/a	not used	Transistor Output 2	See below
PS GND	ground	Transistor Output 1	See below
24 VAC	24 VAC	Digital Input 2	See below
24 VAC	24 VAC	Digital Input 1	See below

Digital Input (1-4)- connect to GND to activate or leave floating (unconnected) to deactivate

Transistor Output (1-4)- Max. load 100mA, max. voltage 24V DC. An open-collector NPN transistor with the emitter connected to pin 2 (GND). If used with an external relay, a diode must be connected in parallel with the load for protection against any voltage transients.

1. Loosen the corresponding screw on top of the pin (see the table above to determine which pin to use).
2. Push the cable into the connector and secure it by fastening the screw.

Schematic Diagram - AXIS 231D/232D I/O connectors and power



Note: Unmarked I/O connectors on the connection module can not be used.

Troubleshooting

Checking the Firmware

One of your first actions when troubleshooting a problem should be to check the currently installed firmware version. The latest version may contain a correction that fixes your particular problem. See the support section at http://www.axis.com/techsup for information on the latest available firmware version. The current software version in your AXIS 231D/232D is available from the product Web pages under Setup | Basic Configuration.

Updating the Firmware

The firmware is software that determines the functionality of the AXIS 231D/232D. When you upgrade to the latest available firmware from the Axis Web site, your Axis product will receive the latest available functionality. Always read the upgrade instructions and release notes available with each new release, before upgrading the firmware.

New firmware can be uploaded to the AXIS 231D/232D over the network.

Note: Preconfigured and customized settings will be retained for use when the new firmware is running (providing that the features are available in the new firmware) although this is not guaranteed by Axis Communications.

1. Save the firmware file to your computer. The latest version of the AXIS 231D/232D firmware is available free of charge from the Axis Web site at http://www.axis.com/techsup or from your local distributor.
2. Go to Setup | System Options | Maintenance in the AXIS 231D/232D Web pages.
3. In the Upgrade Server section and browse to the desired firmware file on your computer. Click Upgrade.

Notes: After starting the process, you should always wait at least 20 minutes before restarting the AXIS 231D/232D, even if you suspect the procedure has failed.

Your dealer reserves the right to charge for any repair attributable to faulty updating by the user.

Support

If you contact Axis Customer Services, please help us help you resolve your problems expediently by providing a server report, log file and a brief description of the problem.

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

Log file - go to Setup | System Options | Logs & Reports. The Log file records events within the unit since the last restart of the system and can prove a useful diagnostic tool for troubleshooting.

Symptoms, Possible Causes and Remedial Actions

Problems setting the IP address	
Using ARP Ping	The IP address must be set within two minutes after the power has been applied to the AXIS 231D/232D, restart the server and try again. Also, make sure the ping length is set to 408. See the ARP ping description in the installation section.
The AXIS 231D/232D is located on a different subnet.	If the IP address intended for the AXIS 231D/232D and the IP address of your computer are located on different subnets, you will not be able to set the IP address. Contact your network administrator for an IP address on the same subnet as the computer you are performing the installation from.
The IP address is being used by another device	Disconnect the power from the AXIS 231D/232D. Run the Ping command (in a Command/DOS window, type ping and the IP address of the unit). If you receive: Reply from <IP address>: bytes = 32; time = 10 ms..... - this means that the IP address may already be in use by another device on your network. You must obtain a new IP address and reinstall the unit. If you receive: Request timed out - this means that the IP address is available for use with your AXIS 231D/232D. In this case, check all cabling and reinstall the unit.
The AXIS 231D/232D cannot be accessed from a Web browser	
The IP address has been changed by DHCP	1) Move the AXIS 231D/232D to an isolated network or to one with no DHCP or BOOTP server. Set the IP address again, using AXIS IP Utility or the ARP Ping command. 2) Access the unit and disable BOOTP and DHCP in the TCP/IP settings. Return the unit to the main network. The unit now has a fixed IP address that will not change. 3) As an alternative to 2), if dynamic IP address via DHCP or BOOTP is required, select the required service and then configure IP address change notification from the network settings. Return the unit to the main network. The unit will now have a dynamic IP address, but will notify you if the address changes.
Other networking problems	Test the network cable by connecting it to another network device, then Ping that device from your workstation. See instructions above.
Cannot send notifications, uploads, alarms, etc, to a destination outside the local network	
Firewall protection	The AXIS 231D/232D can be configured to use a SOCKS server to reach networks on the other side of a firewall/proxy server. See *Network - SOCKS*, on page 28 for more information.
Your AXIS 231D/232D is accessible locally, but not externally	
Firewall protection	Check the Internet firewall with your system administrator.
Default routers required	Check if you need to configure the default router settings.
The Internet site is too heavily loaded	Use a script running on your web server to relay images from the AXIS 231D/232D to the Internet.
The Power indicator is not constantly lit	
Faulty power supply	Verify that you are using the supplied power supply.
A firmware upgrade has been interrupted or the firmware has in some other way been damaged.	A rescue firmware is running in the product. First, set the IP address using AXIS IP utility or ARP and Ping, Then, from a Web browser, access the unit and upgrade the latest firmware to the product, see *Updating the Firmware*, on page 34.
No images are displayed in the Web interface	
Problem with AMC (*Internet Explorer only*)	To enable the updating of images in Microsoft Internet Explorer, set your Web browser to allow ActiveX controls. Also, make sure that AXIS Media Control (AMC) component is installed on your workstation.

Installation of additional ActiveX component restricted or prohibited	Configure yourAXIS 231D/232D to use a Java applet for updating the images under Live View Config | Layout | Default Viewer for Internet Explorer. See help files for more information.
Video Image Problems	
Image too dark or too light.	See the help files on Video & Image Settings
Problems uploading own files	There is only limited space available for the upload of your own files. Try deleting one or more existing files, to free up space.
Missing images in uploads	This can occur when trying to use a larger image buffer than is actually available. Try lowering the frame rate or the upload period.
Slow image update	Configuring, e.g. pre-buffers, hi-res images, high frame rate etc will reduce the performance of the AXIS 231D/232D.
Slow performance	Slow performance may be caused by e.g. heavy network traffic, many users with access to unit, low performing client, use of features such as Event handling., Image rotation.
Bad snapshot images	
Display incorrectly configured on your workstation	In Display Properties, configure your display to show at least 65000 colors, i.e. at least 16-bit. Using only 16 or 256 colors on your display will produce dithering artifacts in the image.
Unexpected PTZ behavior	
Problem with hardware	Go to System Options | Maintenance | Dome Status and click Test to test the camera and dome mechanics for errors. Contact Axis Customer Services if you receive an error message as the result of this test.

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

Technical Specifications

Detail	Specification	
System Requirements	Standard Internet TCP/IP suite of protocols	Windows, Linux, UNIX, Mac. etc.
Supported Web Browsers	Windows - Internet Explorer 5.x or later and Mozilla 1.4* or later Linux - Mozilla 1.4* or later Mac OSX - Mozilla 1.4* or later and Netscape 7.1* or later (* = limited functionality)	
Installation	Physical network connection using RJ-45 twisted pair cable. External connection module for power supply and I/O connectors	
Management	Remote configuration and status using Web-based tools	
Compression	Motion-JPEG, as well as single snapshot JPEG images. User-controlled compression level. See Video below for more information.	
Networking	10baseT Ethernet or 100baseTX Fast Ethernet, TCP/IP, HTTP, FTP, SMTP, NTP, ARP, BOOTP, DNS, UPnP, SOCKS v.4.0/v.5.0, HTTPS	
General I/O	4 alarm inputs and 4 outputs (terminal block) available on the connection module	
Security	Multi-user password protection, IP address filtering, HTTPS*	
Operating Conditions	Temp: 5°C (41°F) to 50°C (122°F), Humidity: 20-80% RHG.	
Approvals - EMC	EN55022/1998 Class A EN55024/1998 EN61000-3-2:2000 EN61000-3-3:2000	FCC Subpart B, Class A VCCI Class A C-tick AS/NZS 3548, Class A
Approvals - Safety	EN60950.	External power supply - UL, CSA
Metrics:	Height: 9.05” (230 mm) Width: 5.67” (144 mm),	Weight: 4.3 lbs. (193kg), excluding power supply & connection module
Hardware	1/4 ExView HAD CCD image sensor, 18x optical zoom, 12x digital zoom ARTPEC-2 compression chip ETRAX-100 LX (32-bit RISC, 100MIPS CPU) - 32MByte RAM, 8 MByte FLASH	
Power	External power supply included:	In: 230/110V AC 50/60Hz Out: 24V AC 1A
Complimentary Software	AXIS Media Control (AMC) - ActiveX component software required for Microsoft Internet Explorer - installed automatically on first use	Optional: AXIS IP Utility - Windows installation
Axis Chipset Technology	Axis renowned chipset technology is built upon an open architecture that is streamlined to provide device connectivity, independent of any file server. AXIS 231D/232D is driven by a powerful AXIS ETRAX 32-bit RISC processor and includes the AXIS ARTPEC-2 which is a dedicated digital video surveillance compression chip.	
Functions	Pre/post alarm buffer	Memory available for pre/post alarm image storage up to 9MB
	20 presets and 1 sequence Scheduled and triggered event functionality with preset call-up and alarm notification via email, TCP, HTTP and upload of images via email, FTP and HTTP. Up to 20 simultaneous users	

Detail	Specification
* This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)	
Video	Equal to 480TVL analog video Min. illumination: 0.3 lux at F1.4 (30IRE) Frame rate up to 25/30 frames per second See table below for image file sizes:

Image file sizes

The AXIS 231D/232D delivers the following file sizes (PAL):

PAL			PAL aspect ratio corrected		
	Resolution	Min-Max (KB)		Resolution	Min-Max (KB)
4CIF/4CIF-Quad	704x576	10 - 300	4CIF/4CIF-Quad	768x576	11 - 330
2CIF expanded	704x576	10 - 250	2CIF expanded	768x576	11 - 270
2CIF	704x288	5 - 150	2CIF	768x288	5.5 - 160
CIF/CIF-Quad	352x288	2.5 - 80	CIF/CIF-Quad	384x288	2.7 - 90
QCIF	176x144	1 - 20	QCIF	192x144	1.1 - 22

The AXIS 231D/232D delivers the following file sizes (NTSC):

NTSC			NTSC aspect ratio corrected		
	Resolution	Min-Max (KB)		Resolution	Min-Max (KB)
4CIF/4CIF-Quad	704x480	8 - 250	4CIF/4CIF-Quad	640x480	7 - 230
2CIF expanded	704x480	8 - 200	2CIF expanded	640x480	7 - 180
2CIF	704x240	4 - 125	2CIF	640x240	3.5 - 110
CIF/CIF-Quad	352x240	2 - 70	CIF/CIF-Quad	320x240	1.8 - 60
QCIF	176x120	0.8 - 15	QCIF	160x120	0.7 - 14

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