AXIS 211W
Network Camera

User's Manual

AXIS COMMUNICATIONS

About this Document

This manual is intended for administrators and users of the AXIS 211W Network Camera, and is applicable for firmware release 4.40 and later. It includes instructions for using and managing the camera on your network. Previous experience of networking will be of use when using this product. Some knowledge of UNIX or Linux-based systems may 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 contains licensed third-party software. See the menu item "About" in the product's user interface for more information.
This product contains source code copyright Apple Computer, Inc., under the terms of Apple Public Source License 2.0 (see http://www.opensource.apple.com/apsl/).
The source code is available from:
http://developer.apple.com/darwin/projects/bonjour/

Legal Considerations

Video and audio 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. This product includes one (1) MPEG-4 decoder license. To purchase further licenses, contact your reseller.

Radio Transmission Regulatory Information & EMC

This equipment generates and radiates radio frequency energy, and must be installed and operated while maintaining a minimum body-to-camera distance of 3 feet (1 meter).

If this equipment causes 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.

Tested to comply with FCC Standards FOR HOME OR OFFICE USE. This product must be installed and used in strict accordance with the instructions given in the user documentation. This Axis product complies with the following radio frequency and safety standards:

USA – Federal Communications Commission FCC
This device complies with Part 15 of FCC Rules. Operation of the device is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference that may cause undesired operation.

Europe – EU Declaration of Conformity. This device complies with the requirements of the R&TTE Directive 1999/5/EC with essential test suites as per standards:
EN 301 489 General EMC requirements for radio equipment,
ETS 300 328 Technical requirements for radio equipment.

Canada – This device complies with RSS-210 of Industry Canada. Operation is subject to the following conditions:
(1) This device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

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 4771.

Safety

Complies to EN 60950, Safety of Information Technology equipment.

Equipment Modifications

This equipment must be installed and used in strict accordance with the instructions given in the user documentation. This equipment contains no user-serviceable components. Unauthorized equipment changes or modifications will invalidate all applicable regulatory certifications and approvals.

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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UPnP™ is a certification mark of the UPnP™ Implementers Corporation. Bonjour is a trademark of Apple Computer Inc.

WEEE Directive

The European Union has enacted a Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE Directive). This directive is applicable in the European Union member states.

The WEEE marking on this product (see right) or its documentation indicates that the product must not be disposed of together with household waste. To prevent possible harm to human health and/or the environment, the product must be disposed of in an approved and environmentally safe recycling process. For further information on how to dispose of this product correctly, contact the product supplier, or the local authority responsible for waste disposal in your area.

Business users should contact the product supplier for information on how to dispose of this product correctly. This product should not be mixed with other commercial waste.

Support

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 by logging in to your private support area
- visit Axis Support at www.axis.com/techsup/

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February 2007

AXIS 211W
Network Camera

Installation Guide

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AXIS 211W Installation Guide

This installation guide provides instructions for installing the AXIS 211W Network Camera on your network. For all other aspects of using the product, please see the User's Manual, available on the CD included in this package, or from www.axis.com/techsup

Installation steps

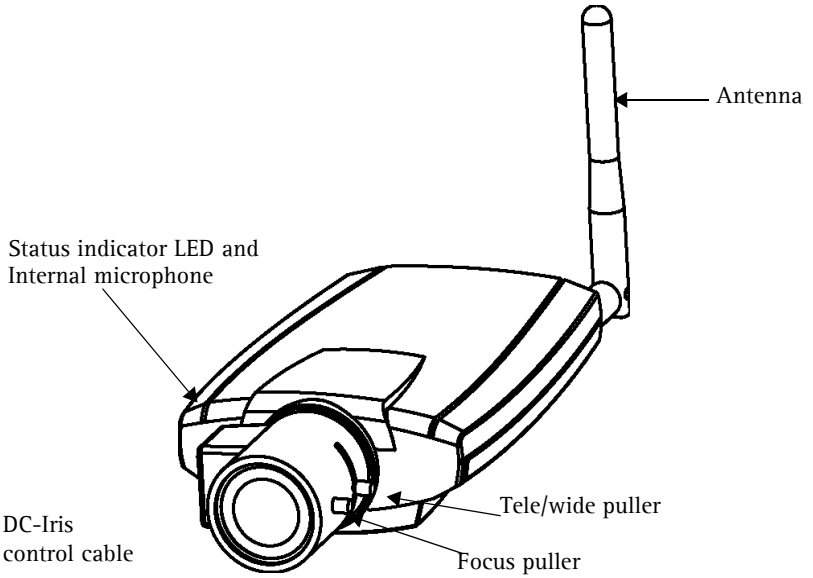
1. Check the package contents against the list below.
2. Hardware overview. See page 4.
3. Install the hardware. See page 5.
4. Set an IP address. See page 6.
5. Set the password. See page 9.
6. Configure the wireless connection. See page 9.
7. Adjust the focus. See page 11.

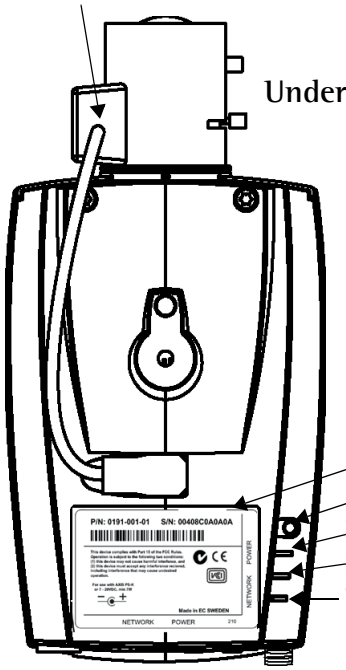
Important!
This product must be used in compliance with local laws and regulations.

1 Package contents

Item	Models/variants/notes
Network camera	AXIS 211W with antenna
PS-K indoor power supply (country specific)	Europe UK Australia USA/Japan Argentina Korea
Terminal block connector	4-pin connector block for connecting external devices to the I/O terminal connector
Camera stand	Supplied with mounting screws
CD	AXIS Network Video Product CD, including product documentation, installation tools and other software
Printed Materials	AXIS 211W Installation Guide (this document) Axis Warranty Document

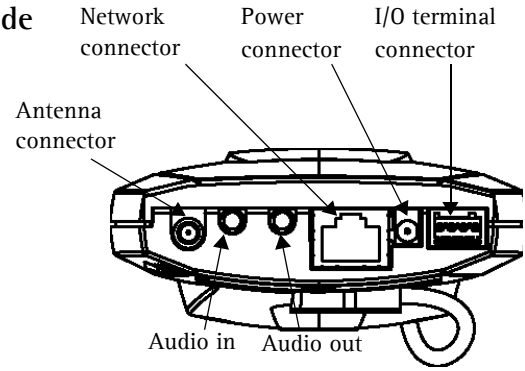
2 Hardware overview





Serial number
Control button
Power indicator LED
Network indicator LED
Wireless indicator LED

Rear panel



Dimensions

HxWxD = 38 x 88 x180mm (1.5" x 3.5" x 7")
Weight =260g (0.57 lb) (without antenna)

3 Install the hardware

IMPORTANT! - The AXIS 211W is designed for indoor and outdoor use. To use the camera outdoors, it must be installed in an approved outdoor housing. Please see www.axis.com for more information on outdoor housings.

Connect the cables and antenna

1. For indoor use, attach antenna by screwing it into place. For outdoor use see the outdoor housing instructions.
2. Connect the camera to the network using a shielded network cable.
   - For the wireless models, this connection is temporary and allows the camera's settings to be configured via the wired network before connecting to the wireless network.
3. Optionally connect external input/output devices, e.g. alarm devices. See page 14 for information on the terminal connector pins.
4. Optionally connect an active speaker and/or external microphone.
5. Connect power, using one of the methods listed below:
   - The supplied power connector.
   - PoE (Power over Ethernet). If available, this is automatically detected when the network cable is connected (see above).
   - Connect power via the terminal connector. See page 14 for information on the terminal connector pins.
6. Check that the indicator LEDs indicate the correct conditions. See the table on page 15 for further details. Note that some LEDs can be disabled and may be unlit.

4 Assign an IP address

To make it accessible on the network, the AXIS 211W must be assigned an IP address.

Depending on the number of cameras you wish to install, the recommended method for assigning IP addresses in Windows is either **AXIS IP Utility** or **AXIS Camera Management**. Use the method that best suits your purpose.

Both of these free applications are available on the Axis Network Video Product CD supplied with this product, or they can be downloaded from www.axis.com/techsup

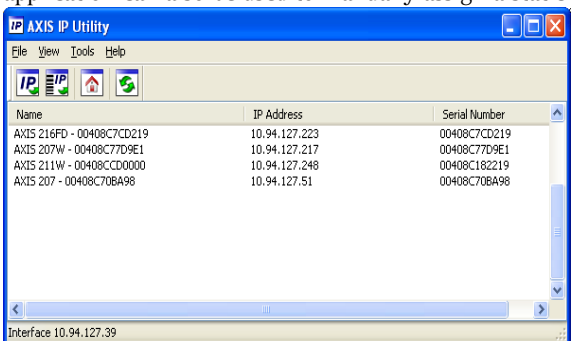
Method	Recommended for	Operating system
 AXIS IP Utility See page 7	Single camera Small installations	Windows
 AXIS Camera Management See page 8	Multiple cameras Large installations Installation on a different subnet	Windows 2000 Windows XP Pro Windows 2003 Server

Notes:

- A network DHCP server is optional.
- The AXIS 211W has the default IP address 192.168.0.90
- If assigning the IP address fails, check that there is no firewall blocking the operation.
- For other methods of assigning or discovering the IP address of the AXIS 211W, e.g. in other operating systems, see page 13.

AXIS IP Utility - single camera/small installation

AXIS IP Utility automatically discovers and displays Axis devices on your network. The application can also be used to manually assign a static IP address.



Note that the computer running AXIS IP Utility must be on the same network segment (physical subnet) as the AXIS 211W.

Automatic discovery

1. Check that the AXIS 211W is connected to the network and that power has been applied.
2. Start AXIS IP Utility.
3. When the camera appears in the window, double-click it to open its home page.
4. See page 9 for instructions on how to assign the password.

Assign the IP address manually

1. Acquire an unused IP address on the same network segment as your computer.
2. Click the button **Assign new IP address using serial number** and enter the serial number and IP address for the AXIS 211W. The serial number is located on the product label.
3. Click the **Assign** button and follow the instructions.
4. Click the **Home Page** button to access the camera's web pages.
5. See page 9 for instructions on how to set the password.

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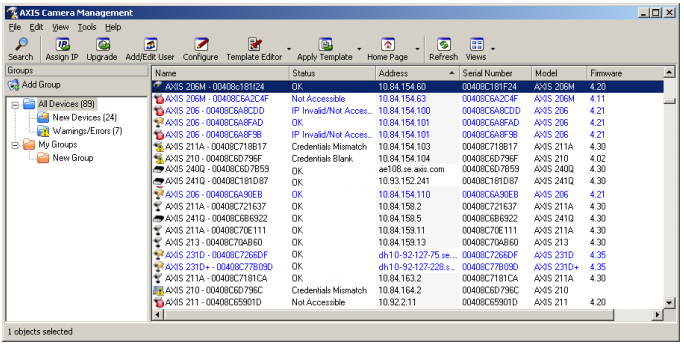
AXIS Camera Management - multiple cameras/large installations

AXIS Camera Management can automatically find and set IP addresses, show connection status, and manage firmware upgrades for multiple Axis video products.



Automatic discovery

1. Check that the camera is connected to the network and that power has been applied.
2. Start AXIS Camera Management. When the AXIS 211W appears in the window, double-click it to open the camera's home page.
3. See page 9 for instructions on how to set the password.

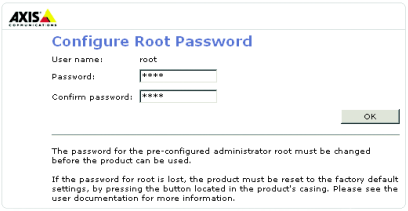
Set the IP address in multiple devices

AXIS Camera Management speeds up the process of assigning IP addresses to multiple devices, by suggesting IP addresses from a specified range.

1. Select the devices you wish to configure (different models can be selected) and click the **Assign IP** button.
2. Select **Obtain IP addresses automatically (DHCP)**, click the **Update** button and the program will search in the specified range and suggest an IP address for each device.
   -or-
   Enter the range of IP addresses, the subnet mask and default router that devices can use and click the **Update** button.

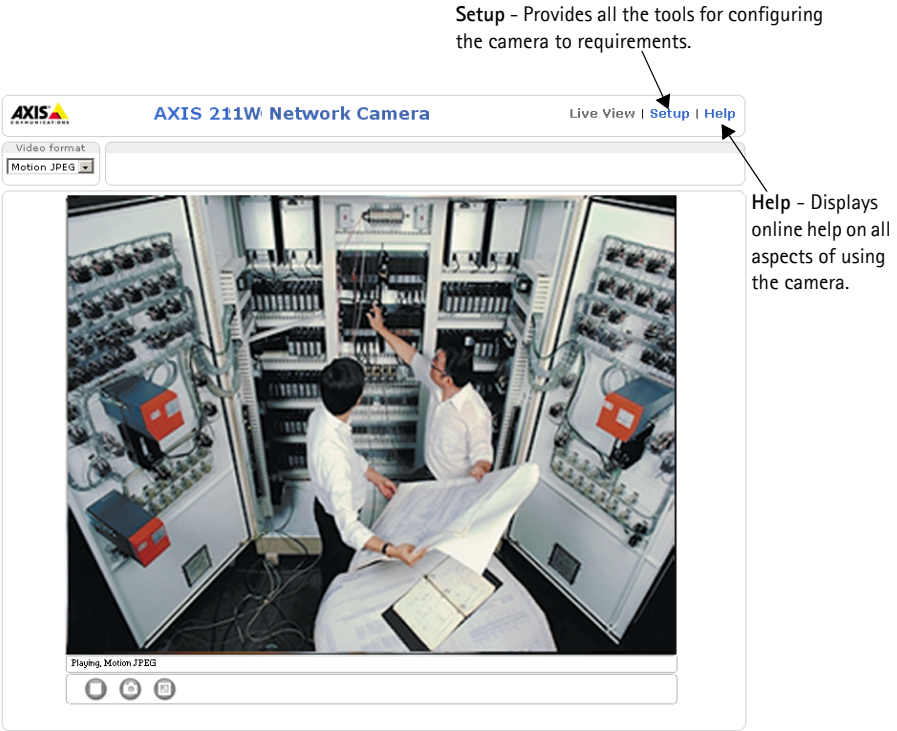
5 Set the password

When accessing the AXIS 211W for the first time, the '**Configure Root Password**' dialog will be displayed.



1. Enter a password and then re-enter it, to confirm the spelling. Click **OK**.
2. Enter the user name root in the '**Enter Network Password**' dialog.
   Note: The default administrator user name root cannot be deleted.
3. Enter the password as set above, and click **OK**. If the password is lost, the AXIS 211W must be reset to the factory default settings. See page 16.
4. If required, click **Yes** to install AMC (AXIS Media Control), which allows viewing of the video stream in Internet Explorer. You will need administrator rights on the computer to do this.

The Live View page of the AXIS 211W is displayed, with links to the Setup tools, which allow you to customize the camera.



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6 Configure the wireless connection

Once the AXIS 211W has been installed on your network, the wireless settings can be configured. These settings should always (i.e. both during installation and at all other times) be configured or changed in the camera first and in the wireless access point secondly. This ensures that the camera is always accessible when making changes.

The AXIS 211W automatically senses the available network connections, and allows only one of these to be active at a time. Connecting a network cable disables the wireless connection.

Using a wired connection ensures greater secrecy while making these settings.

Note: For even greater security use HTTPS. Go to Setup > System Options > Security > HTTPS and refer to the camera's online help.

Open the wireless settings from **Setup > System Options > Network > Wireless**. These settings can also be reached from the **Basic Configuration** menu.

Status of Wireless Networks

This list is the result of a network scan. Access points with a disabled SSID Broadcast will not appear unless the camera is associated with it. The network currently associated to is shown in blue. A network using unsupported security is shown in grey. The following information is provided:

- SSID - The name of a wireless network (or ad-hoc device). If the same name occurs several times this means that several access points for that network were found. The AXIS 211W cannot be configured to only associate with one particular access point.
- Network Type - An Access Point (Master) or Ad-Hoc device.
- Security - Shows which type of security the network uses. See below for the supported security types.
- Channel - Shows the wireless channel currently in use.
- Signal strength - Shows the signal strength.
- Bit rate - Shows the bit rate in Mbit/s. This can only be shown for the access point currently in use. Note that the bit rate shown is the current rate, and that this value may vary over time.

Wireless Settings

These settings control how the AXIS 211W interacts with the wireless network. Apart from identifying the wireless network, it is also possible to enable wireless encryption.

SSID - This is the name of the wireless network the camera is configured for. The field accepts up to 32 alphanumeric characters. The name must be exactly the same as that used in the wireless access point, or the connection will not be established.

Leaving this field blank means the camera will attempt to access the nearest unsecured network.

Note: SSID is sometimes written as ESSID.

Network type - Setting this to **Master** means the camera will attempt to access the network via an access point. The **Ad-hoc** option allows the camera to connect to other wireless devices, e.g. a laptop with a wireless connection.

Security - The AXIS 211W supports two security methods:

- **WPA-PSK/WPA2-PSK** (recommended method)
- **WEP**

WPA-PSK/WPA2-PSK (Wi-Fi Protected Access - Pre-Shared Key)

The AXIS 211W uses a pre-shared key (PSK) for key management. The pre-shared key can be entered either as Manual hex, as 64 hexadecimal (0-9, A-F) characters, or as a Passphrase, using 8 to 63 ASCII characters.

WEP (Wired Equivalent Protection)

WEP - Authentication - Select Open or Shared Key System Authentication, depending on the method used by your access point. Not all access points have this option, in which case they probably use Open System, which is sometimes known as SSID Authentication.

WEP - Key length - This sets the length of the key used for the wireless encryption, 64 or 128 bit. The encryption key length can sometimes be shown as 40/64 and 104/128.

WEP - Key Type - The key types available depend on the access point being used. The following options are available:

- Manual - Allows you to manually enter the hex key.
- ASCII - In this method the string must be exactly 5 characters for 64-bit WEP and 13 characters for 128-bit WEP.
- Passphrase - The passphrase can contain up to 31 characters. In 64-bit WEP, the Passphrase generates 4 different keys. For 128-bit WEP, only 1 key is generated, which is then replicated for all 4 keys. Key generation is not standardized and can differ from brand to brand. Check that the generated keys are identical to those in your access point - if not, they must be entered manually.

WEP - Active Transmit Key - When using WEP encryption, this selects which of the 4 keys the Productname 3/Productname 2 uses when transmitting.

Complete the wireless installation

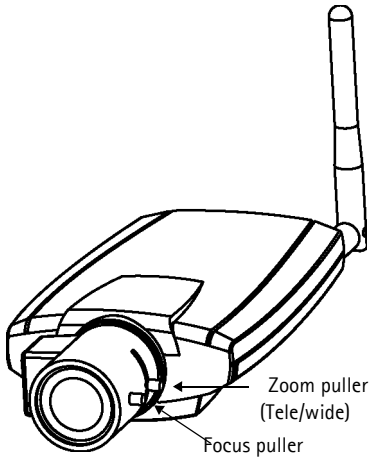
1. Check that the wireless settings in the camera correspond to the settings in the access point.
2. Disconnect the network cable from the camera.

Refresh the web page after 20-30 seconds to confirm the wireless connection. If the camera cannot be accessed, run AXIS IP Utility to discover the new IP address and try again.

6 Adjust the image and focus

To focus the AXIS 211W follow the instructions below.

1. From the **Basic Configuration** page in the setup tools, open the **Focus adjustment** page.
2. Set the DC-Iris to *Disabled* and click **Save**.
3. Unscrew the zoom puller on the lens by turning it anti-clockwise. Adjust the zoom setting as required. Re-tighten the zoom puller.
4. Unscrew the focus puller on the lens. Adjust the focus as required. Re-tighten the focus puller.
5. From the Focus adjustment page, set the DC-Iris to *Enabled* and click **Save**.



Note: The DC-Iris should always be disabled while focusing the camera. This opens the iris to its maximum, which gives the smallest depth of field and thus the best conditions for correct focusing. When the focus is set with this method it will then be maintained in any light conditions.

Accessing the AXIS 211W from the Internet

Once installed, your AXIS 211W is accessible on your local network (LAN). To access the camera from the Internet, network routers must be configured to allow incoming traffic, which is usually done on a specific port. Please refer to the documentation for your router for further instructions. For more information on this and other topics, visit the Axis Support Web at www.axis.com/techsup

Other methods of setting the IP address

The table below shows the other methods available for setting or discovering the IP address. All methods are enabled by default, and all can be disabled.

	Use in operating system	Notes
UPnP™	Windows (ME or XP)	When enabled on your computer, the camera is automatically detected and added to "My Network Places."
Bonjour	MAC OSX (10.4 or later)	Applicable to browsers with support for Bonjour. Navigate to the Bonjour bookmark in your browser (e.g. Safari) and click on the link to access the camera's web pages.
AXIS Dynamic DNS Service	All	A free service from Axis that allows you to quickly and simply install your camera. Requires an Internet connection with no HTTP proxy. See www.axiscam.net for more information.
ARP/Ping	All	See below. The command must be issued within 2 minutes of connecting power to the camera.
View DHCP server admin pages	All	To view the admin pages for the network DHCP server, see the server's own documentation.

Set the IP address with ARP/Ping

1. Acquire an IP address on the same network segment your computer is connected to.
2. Locate the serial number (S/N) on the AXIS 211W label.
3. Open a command prompt on your computer and enter the following commands:

Windows syntax	**Windows example**
`arp -s <IP Address> <Serial Number>` `ping -l 408 -t <IP Address>`	`arp -s 192.168.0.125 00-40-8c-18-10-00` `ping -l 408 -t 192.168.0.125`
UNIX/Linux/Mac syntax	**UNIX/Linux/Mac example**
`arp -s <IP Address> <Serial Number> temp` `ping -s 408 <IP Address>`	`arp -s 192.168.0.125 00:40:8c:18:10:00 temp` `ping -s 408 192.168.0.125`

4. Check that the network cable is connected to the camera and then start/restart the camera, by disconnecting and reconnecting power.
5. Close the command prompt when you see 'Reply from 192.168.0.125: ...' or similar.
6. In your browser, type in http://<IP address> in the Location/Address field and press Enter on your keyboard.

Notes:

- To open a command prompt in Windows: from the Start menu, select Run... and type cmd. Click OK.
- To use the ARP command on a Mac OS X, use the Terminal utility in Application > Utilities.

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Unit connectors

Antenna connector - Reverse SMA connector for antenna.

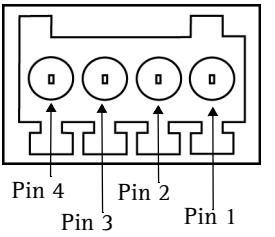
Network connector - RJ-45 Ethernet connector. Supports Power over Ethernet. Using shielded cables is recommended.

Power connector - Mini DC connector. 7 - 20V DC, max 5W. See product label for ± connection.

Audio in - 3.5mm input for a mono microphone, or a line-in mono signal (left channel is used from a stereo signal).

Audio out - Audio output (line level) that can be connected to a public address (PA) system or an active speaker with a built-in amplifier. A pair of headphones can also be attached. A stereo connector must be used for the audio out.

I/O terminal connector - Used in applications for e.g. motion detection, event triggering, time lapse recording and alarm notifications. It provides the interface to:

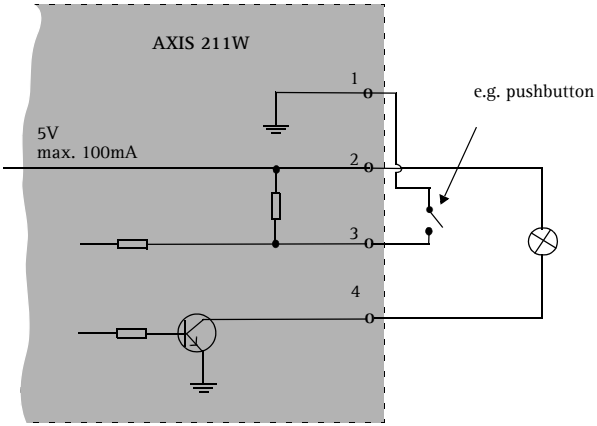


Terminal connector. Note that the pins are numbered 1-4, right to left.

- 1 transistor output - For connecting external devices such as relays and LEDs. Connected devices can be activated by AXIS VAPIX AP, output buttons on the **Live View** page or by an **Event Type**. The output will show as active (shown under **Event Configuration > Port Status**) if the alarm device is activated.
- 1 digital input - An alarm input for connecting devices that can toggle between an open and closed circuit, for example: PIRs, door/window contacts, glass break detectors, etc. When a signal is received the **state** changes and the input becomes active (shown under **Event Configuration > Port Status**).
- Auxiliary power and GND

Function	Pin number	Notes	Specifications
GND	1		
5VDC Power	2	Can be used to power auxiliary equipment (7-20VDC) or as a +5VDC (100mA) output.	Max load = 100mA
Digital Input	3	Connect to GND to activate, or leave floating (or unconnected) to deactivate.	Must not be exposed to voltages greater than 20VDC
Transistor Output	4	Uses an open-collector NPN transistor with the emitter connected to the GND pin. If used with an external relay, a diode must be connected in parallel with the load, for protection against voltage transients.	Max load = 100mA Max voltage = 24VDC (to the transistor)

Connection diagram



LED indicators

LED	Color	Indication
Wireless	Green	Steady for connection to a wireless network. Flashes for network activity.
	Red	Steady for no wireless network connection. Flashes when scanning for wireless networks.
	Unlit	Wired mode.
Network	Green	Steady for connection to a 100 Mbit/s network. Flashes for network activity.
	Amber	Steady for connection to 10 Mbit/s network. Flashes for network activity.
	Unlit	No network connection.
Status	Green	Steady green for normal operation. Note: The Status LED can be configured to be unlit during normal operation, or to flash only when the camera is accessed. To configure, go to **Setup > System Options > LED settings.** See the online help files for more information.
	Amber	Steady during startup, during reset to factory default or when restoring settings.
	Red	Slow flash for failed upgrade.
Power	Green	Normal operation.
	Amber	Flashes green/amber during firmware upgrade.

Resetting to the Factory Default Settings

This will reset all parameters, including the IP address, to the Factory Default settings:

1. Disconnect power from the camera.
2. Press and hold the Control button and reconnect power.
3. Keep the Control button pressed until the Status indicator displays amber (this may take up to 15 seconds), then release the button.
4. When the Status indicator displays green (which can take up to 1 minute) the process is complete and the camera has been reset.
5. Re-assign the IP address, using one of the methods described in this document.

It is also possible to reset parameters to the original factory default settings via the web interface. For more information, please see the online help or the user's manual.

Further information

The user's manual is available from the Axis Web site at www.axis.com or from the Axis Network Video Product CD supplied with this product.

Tip!
Visit www.axis.com/techsup to check if there is updated firmware available for your AXIS 211W. To see the currently installed firmware version, see the Basic Configuration web page in the product's Setup tools.

AXIS 211W Installation Guide v1.0 January 2007

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