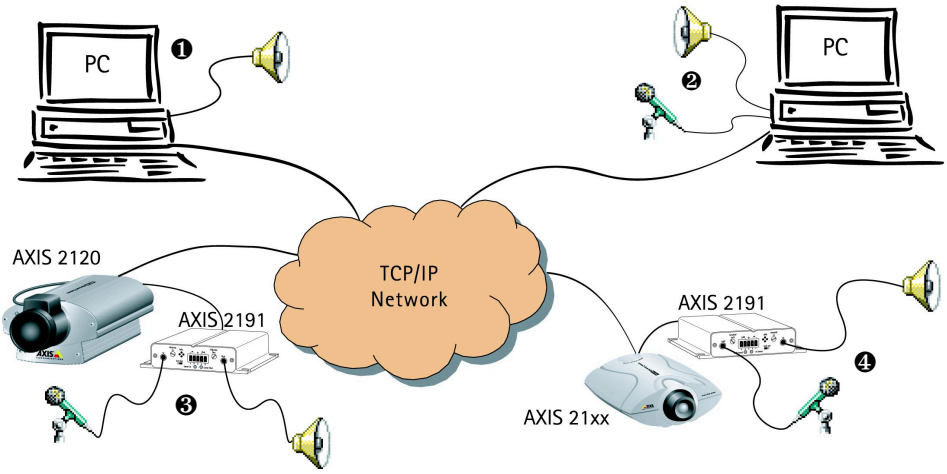
The AXIS 2191 Audio Module

The AXIS 2191 Audio Module is an add-on device that provides audio capability to Axis network camera products. The module connects quickly and easily to the serial port of the camera and is configured and controlled via the camera's user interface.



❸ or ❹ to ❶ and ❷ - An Axis Network Camera with an AXIS 2191 Audio Module connected provides live audio and video to browser clients on the network.

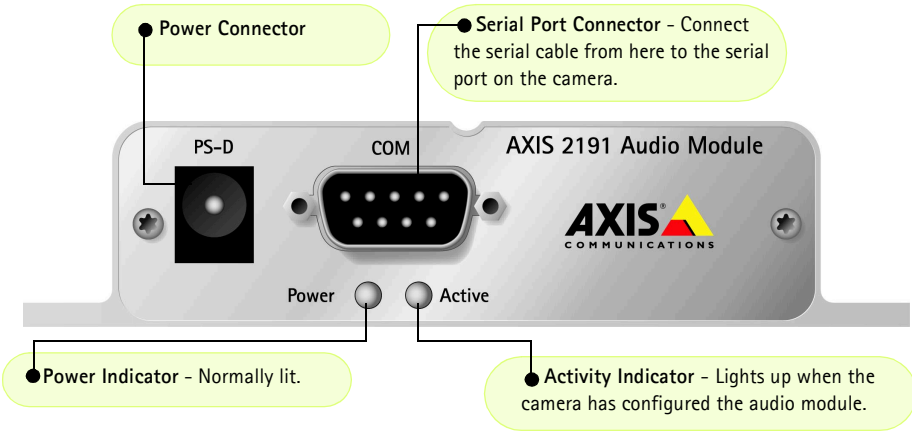
Features and Functions

- Easy to install and use
- Runs on Ethernet LANs and/or the Internet
- Built-in multi-directional microphone
- Compatible with most microphones and speakers (not included)
- External microphone via 3,5mm socket or Line-In via the terminal block
- Simple configuration and management via the network camera's administration pages
- Push-to-talk button in client user interface in Half Duplex or Simplex - Talk mode
- Can be used in Full Duplex, Half Duplex or Simplex mode (see below)
- Fully adjustable input and output levels
- Mute function

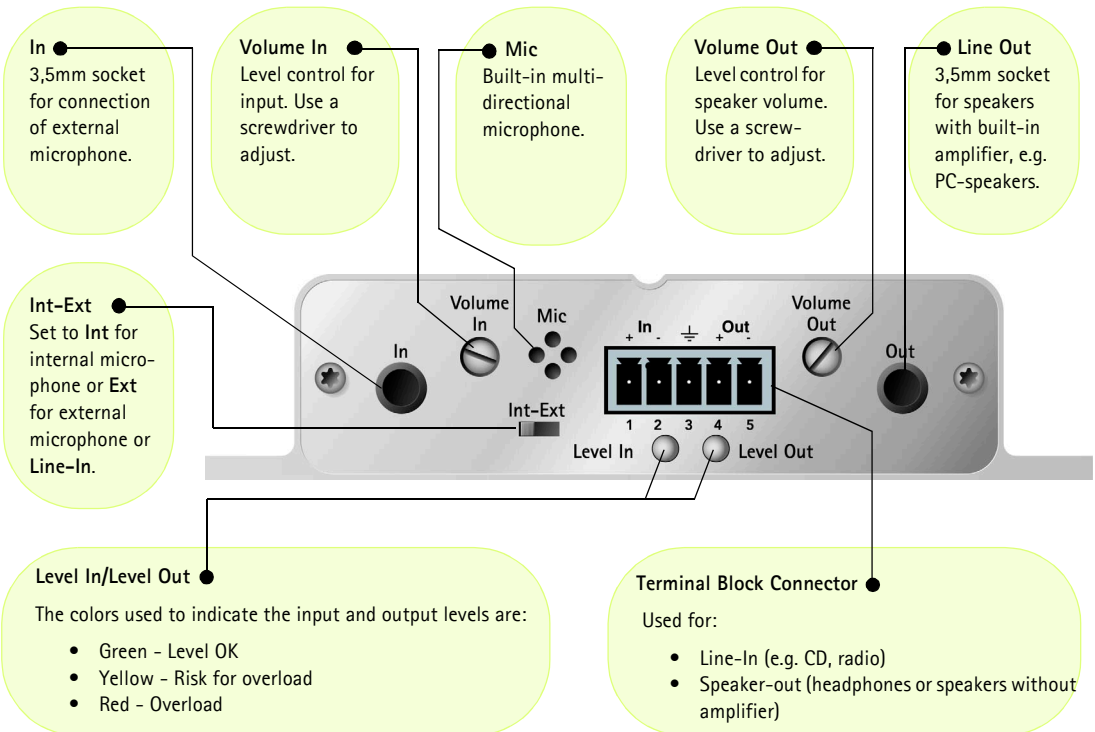
Audio Modes

- **Full Duplex** - Bi-directional communication that allows simultaneous transmission in both directions, as used in telephone systems. This type of communication requires a full-duplex sound card installed on your computer. The full-duplex mode can be used for e.g. virtual meetings.
  Note: This type of communication can only be used if your sound card supports full-duplex.
- **Half Duplex** - Bi-directional communication that transmits in one direction at a time. The one end of the connection must be silent to receive audio from the other end. A walkie-talkie is a good example of this type of communication.
- **Simplex - Talk** - Audio communication is one-way only. Use this to, for example, provide spoken instructions to a person waiting at a door that is monitored by the camera.
- **Simplex - Listen** - Also one-way only. This can be used, for example, for remote monitoring.

The Front Panel



The Rear Panel



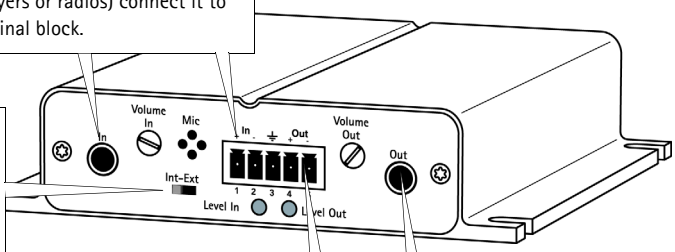
Installing the Audio Module

Follow the guide below to quickly get your AXIS 2191 up and running. Refer to the illustrations on the previous page for connector details.

❶ Firstly, your network camera must have the correct software version installed. This can be checked by opening the camera's home page in your browser and checking the version number displayed in the browser's title bar. Please refer to the CD supplied with your AXIS 2191 for instructions on updating the software. If you purchased your AXIS 2191 as part of a package, together with a network camera, then the correct software should already be installed in the camera.

❷ If using an external microphone, connect it to the socket provided. To use an alternative input device, (e.g. CD-players or radios) connect it to Line-In on the terminal block.

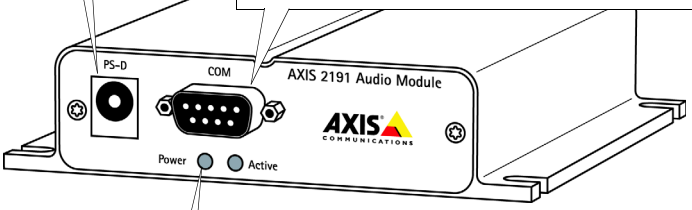
❸ Set the selector switch to **Ext** to use an external microphone or device. Otherwise set to **Int** to use the internal microphone.



❹ Connect a loudspeaker to the 3.5mm socket (amplified speakers only), or to Out on the terminal block (speakers with no amplification). Other devices (including headphones) are connected to the terminal block.

❺ Connect power to the audio module.

❻ Using the supplied cable, connect the audio module's serial port to the network camera's serial port.



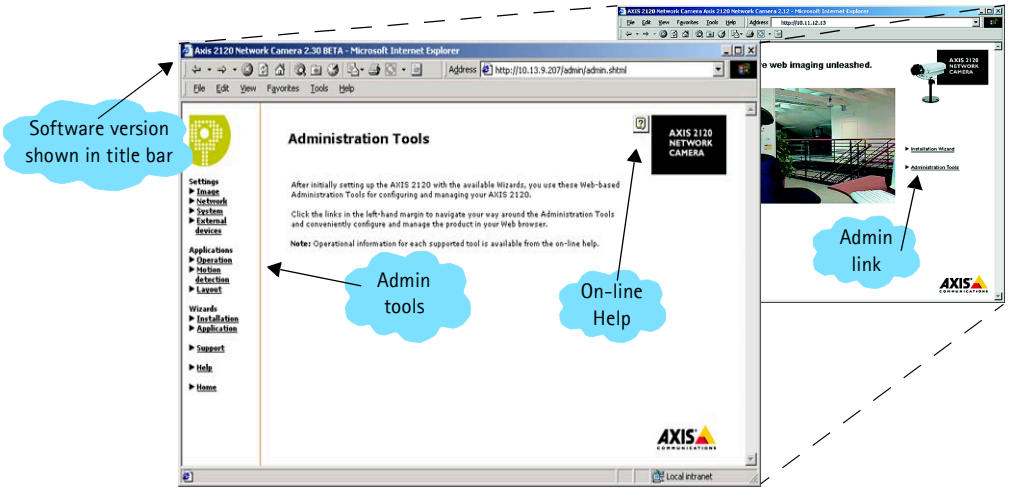
❼ Check that the power indicators on both the audio module and the camera are lit. Note that the power LED will blink during power-up.

❽ Verify the connection to the AXIS 2191 by starting your browser and entering the IP address of the network camera in the location/address field, e.g. 171.21.1.200. Configure the audio module from the camera's administration pages, as described below.

Note: If you are in doubt about which software version is required, or if you wish to download the latest version, please see the AXIS 2191 product pages at www.axis.com. Full instructions on how to update the camera software are provided with each software release.

Configuring the Audio Module

The network camera's administration pages provide all the tools required for successfully configuring the AXIS 2191. From the camera's home page, click on the **Admin** link. A new page containing the administration tools will open.



To complete the configuration of your audio module, follow these instructions:

1. From the Admin tools, click **External Devices**. Select the AXIS 2191 Audio Module as the device to use. Click **Save**.
2. Under External Devices, click **Audio**. This opens the configuration page for the audio module.
3. Select the audio mode. This can be:
   - Full Duplex (Talk and Listen Simultaneously)
   - Half Duplex (Talk and Listen)
   - Simplex - Talk
   - Simplex - Listen

   This selection will depend on your application. See pages 1 and 5 for more information.
4. Enter the number of clients that will be able to access the application at any one time. Use this setting to limit access if you have only limited bandwidth available.
5. If you are using Half Duplex mode, select whether or not to **Send Audio to other clients on receive**. This can be used to allow the audio signal from one client to be sent to all other clients, and not just to the server end.
6. When using Half Duplex, the **Push-To-Talk** button will be visible. Select the mode to use for this button. Selecting **Toggle** means that when the button is pushed it will remain so until pushed a second time. **Instant** means that the button will remain pushed for as long as the user holds it pushed, i.e. until the mouse button is released.
7. Adjust the Volume In control so that the LED occasionally shows yellow, but not red.
8. Adjust the Volume Out control until a satisfactory level is heard. The Level Out LED can be used to check that there is audio being received by the Audio Module.

Using the Audio Module with Your Camera

Your Audio Module is now configured and ready for use with your network camera. Enter your camera's IP-address in your browser, or click **Home** on the Admin page. You should then see the control panel for the AXIS 2191 below the camera image.

NB. Exactly which controls will be visible below the image depends on the audio mode you are using. For example, the Push-to-Talk button will not be visible in Full Duplex mode. Similarly, when using Simplex-Listen mode, only the Volume Slider and the Speaker mute button will be shown.

Using the Different Audio Modes

Full Duplex

Full Duplex mode means that you can transmit and receive audio (talk and listen) at the same time, without having to use any of the controls. This is just like having a telephone conversation. The only controls you may wish to use are the mute checkboxes and the volume sliders, to kill the sound or to adjust the input/output levels. This mode requires a full duplex sound card on your computer.

Half Duplex

Half Duplex mode also sends and receives audio in both directions, but only in one direction at a time. This means that you must actively transmit with the help of the **Push-to-Talk** button. To speak, press the button (check that the microphone is not muted). When finished speaking, release the button. You will now be receiving audio from the other end of the connection. Note that the Push-to-Talk button can be configured for use in two different ways - **Toggle** or **Instant**. This is set in the camera's administration tools.

Simplex - Talk

Simplex - Talk mode means that only the web-client end of the connection can transmit audio (i.e. *to* the AXIS 2191). This could be used to e.g. provide spoken instructions to a person seen in the network camera. This mode also requires you to use the Push-to-Talk button.

Simplex - Listen

Simplex - Listen mode can only receive audio *from* the AXIS 2191 to the web-client. This can be used in remote monitoring, web attractions etc., to provide live audio, as well as video, of a monitored situation.

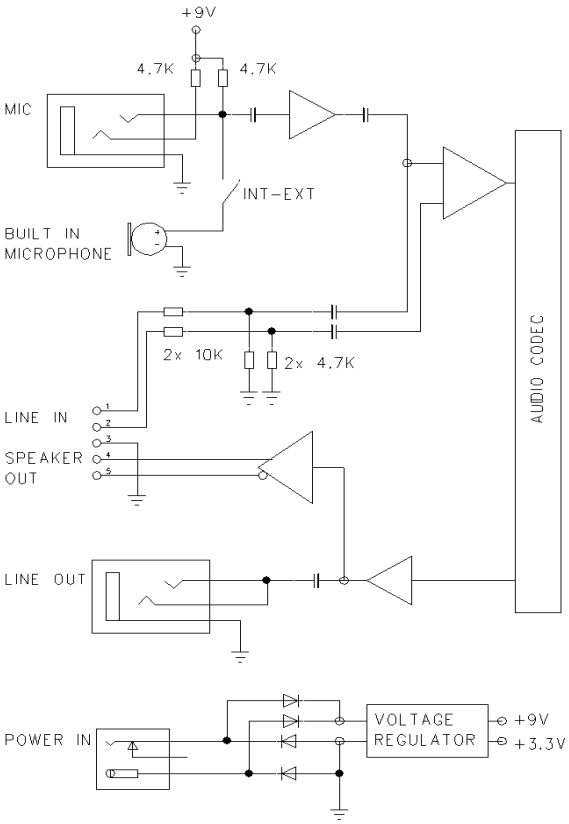
Troubleshooting

Symptoms	Possible causes	Remedial actions
The network camera cannot be accessed from a browser.	Incorrect camera configuration.	Please refer to the camera's documentation for help on resolving the problem.
	Networking problems.	Check all cables, including the network cable from the camera to the network. See the camera's documentation.
No audio controls below camera image.	AXIS 2191 not selected as external device.	In the camera's administration tools, click on **External Devices** and select AXIS 2191 Audio Module.
	Wrong camera firmware.	Check the firmware in the camera by clicking **About** in the camera's Administration Tools. See www.axis.com for more information.
No sound from the AXIS 2191 or from a PC trying to access a web page containing audio content.	Incorrect settings.	Check that: • the Mute button is not pressed • the Int/Ext switch for the input is in the correct position • the input and output levels are correct • all cabling is connected and all power switches are ON
No full-duplex function.	Incorrect configuration.	Check the setting in the camera administration tools. See also page 4.
	Sound card does not support full-duplex.	For information on how to check if your sound card supports full-duplex, please see the support section for Axis Camera products at www.axis.com.
Whining or screeching sound from speakers (feedback).	Poor positioning of speakers and/or microphone.	Relocate the speakers or microphone until the feedback disappears.
Poor sound on headphones.	Incorrect connection.	Headphones can only be used by connecting them to Speaker-Out on the terminal connector.
The Power indicator LED is not constantly lit.	Faulty power supply.	Verify that you are using an AXIS PS-D power supply.
Your AXIS 2191 works 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.

Note: If you still have a problem after reading this information, please contact your reseller, or check the support section for Axis cameras products at www.axis.com.

Technical Specifications

- **Operating temperature**: 40-105°F (5-40°C).
- **Humidity** - 8-80% relative humidity.
- **EMC - CE**: EN55024, EN55022, Class B and EN61000-3-3.
- **EMC - FCC** Class A of FCC Rules and Regulations part 15, subpart B.
- **EMC -**
- **Full-duplex audio**: Audio data encoded in ADPCM format at 32kbps, 8 kHz sampling (G.721). RTP header is added (RFC 1889). Data is sent using HTTP.
- **9-pin D-SUB serial connector**: RS-232.
- **Microphone Input**: 1-50mVpp. PC type.
- **Line Input**: Balanced 0.05-1Vpp. Connect source ground to pin 2 and source signal to pin 1 if the source is unbalanced.
- **Speaker Output**: Balanced, 0.5W. Impedance 8-32 Ohms. Connect directly to speaker without capacitors.
- **Line Out**: Unbalanced, 0.05-1.0Vpp
- **Power Input**: Axis PS-D power supply.
- **Alternative Power**: 12-15VAC, min 10VA, or 15-20VDC, min 7W.
- **Metrics**: Height: 1.1" (27mm), Width: 4.4" (112mm), Length: 4.3" (110mm), Weight: 0.7lb (0.32kg).



The Audio Module to Camera Serial Cable

The serial cable supplied with your AXIS 2191 is wired as shown in the table below:

Pinouts for the RS-232 Port

Audio	Pin	Pin	Camera
IN	1	1	IN
IN	2	2	IN
OUT	3	3	OUT
OUT	4	4	OUT
GND	5	5	GND
IN	6	6	IN
OUT	7	7	OUT
IN	8	8	IN
Unused	9	9	IN