AXIS Q19 Series

AXIS Q1941-E Thermal Network Camera

AXIS Q1942-E Thermal Network Camera

User Manual
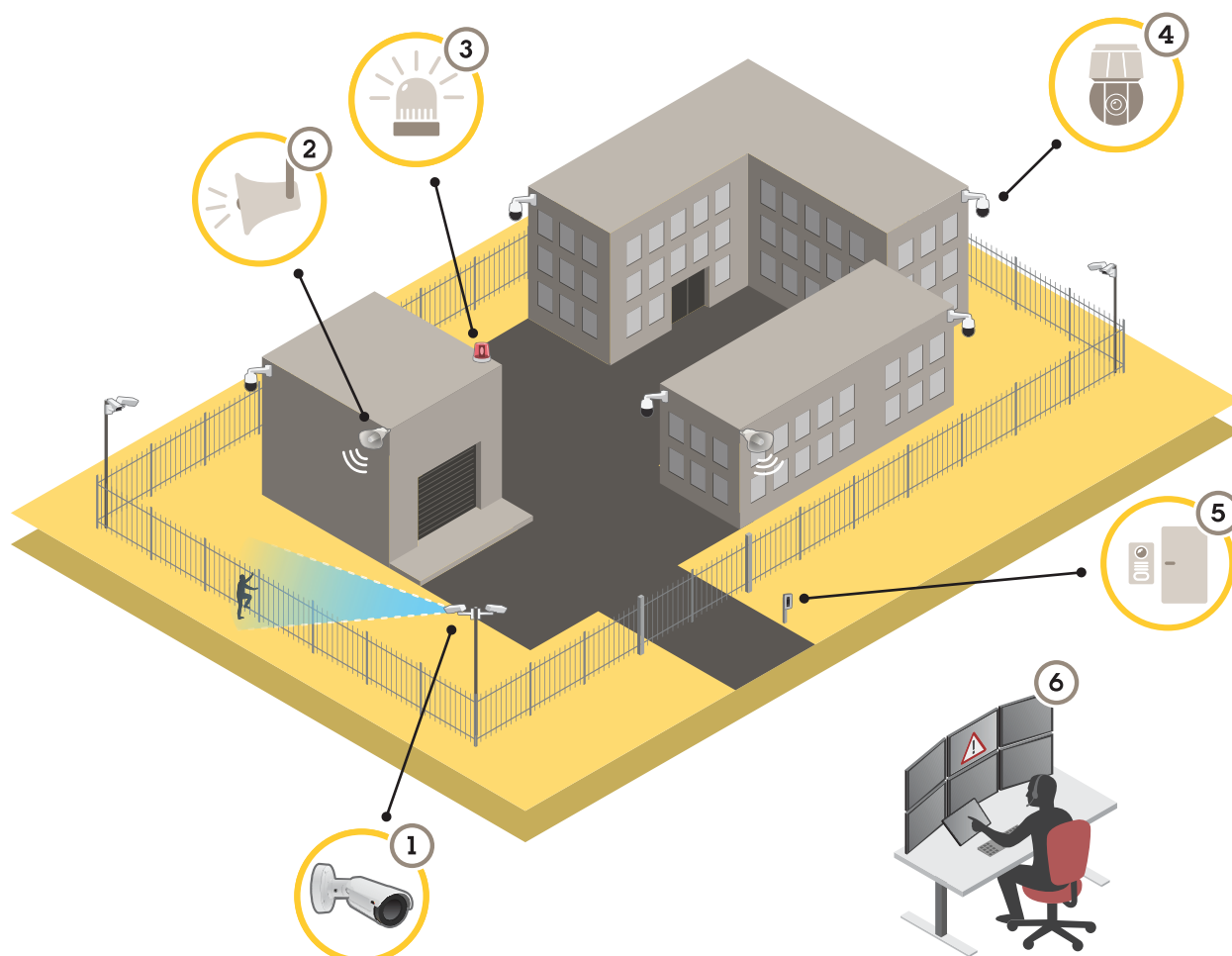
AXIS Q19 Series

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About perimeter protection

For areas in need of intrusion detection, you can set up perimeter protection using thermal cameras with analytics. The main objective for perimeter protection is to detect a threat or an actual intrusion at the earliest possible stage.

To set up perimeter protection, you need to install an analytics application for perimeter surveillance and protection on your thermal camera. Axis provides the AXIS Perimeter Defender application for this purpose. You can read more about AXIS Perimeter Defender at *www.axis.com*.

- Use a flashing beacon (3) to let possible intruders know that your perimeter is protected (see *How to connect a flashing beacon on page 7*).

- To further warn and deter, connect a horn speaker (2) that plays a pre-recorded warning message (see *How to connect a network horn speaker on page 8*).

Setup

How to access the product

AXIS IP Utility and AXIS Camera Management are recommended methods for finding Axis products on the network and assigning them IP addresses in Windows®. Both applications are free and can be downloaded from *axis.com/support*

The product can be used with the following browsers:

- Chrome^{TM} (recommended), Firefox®, Edge®, or Opera® with Windows®

- Chrome^{TM} (recommended) or Safari® with OS X®

- Chrome^{TM} or Firefox® with other operating systems.

If you need more information about recommended browsers, go to *axis.com/browser-support*

How to access the product from a browser

1. Start a web browser.

2. Enter the IP address or host name of the Axis product in the browser's address field.

   To access the product from a Mac computer (OS X), go to Safari, click on Bonjour and select the product from the drop-down list. To add Bonjour as a browser bookmark, go to **Safari > Preferences**.

   If you do not know the IP address, use AXIS IP Utility to locate the product on the network. For information about how to discover and assign an IP address, see the document *Assign an IP Address and Access the Video Stream* on Axis Support web at *axis.com/support*

3. Enter your username and password. If this is the first time the product is accessed, the root password must first be configured.

4. The product's live view page opens in your browser.

About secure passwords

Important

> When setting the initial password, the password is sent in clear text over the network. If there is a risk of network sniffing, first set up a secure and encrypted HTTPS connection before resetting the passwords.

The device password is the primary protection for the data and services. Axis' devices do not impose a password policy as devices may be used in various types of installations, but to protect your data do the following:

- Don't use the default password that comes with the devices.

- Use a password with at least 8 characters, preferably using a password generator.

- Don't expose the password.

- Change password at a recurring interval, at least once a year.

Set a password for the root account

Important

> The default administrator user name **root** cannot be deleted. If the password for root is lost, the device must be reset to the factory default settings.

The default root account has full privileges and should be reserved for administrative tasks. Always create a user account with limited privileges for daily use. This reduces the exposure of the administrative account.

1. Make sure to follow the instructions about secure passwords, see *About secure passwords on page 5* .

2. Type a password and then retype it to confirm the spelling.

3. Click **Create login**. The password has now been configured.

About the product's built-in help

You can access the built-in help through your product's web page. The help provides more detailed information on the product's features and their settings.
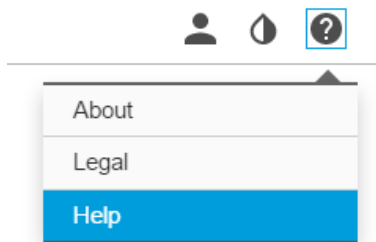
About applications

AXIS Camera Application Platform (ACAP) is an open platform that enables third parties to develop analytics and other applications for Axis products. To find out more about available applications, downloads, trials and licenses, go to *axis.com/applications*

To find the user manuals for Axis applications, go to *axis.com*

Note

- Several applications can run at the same time but some applications might not be compatible with each other. Certain combinations of applications might require too much processing power or memory resources when run in parallel. Verify that the applications work together before deployment.

About application licences

Some applications need a license to run. Licenses can be installed in two ways:

- Automatic installation — requires access to the Internet

- Manual installation — obtain the license key from the application vendor and upload the key to the Axis product

To request a license, the Axis product serial number (S/N) is required. The serial number can be found on the product label and under **About**.
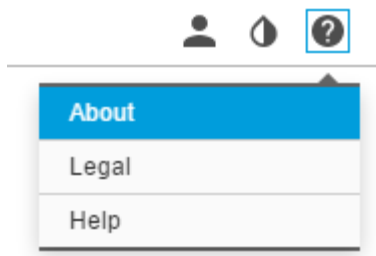
How to install the application on the camera

Note

The software license is only valid for one camera. You cannot activate the software on another camera without a new registration key.

1. For products with firmware 7.10 or later, go to **Settings > Apps** to install the application.

   For products with firmware 6.50 or previous, go to **Setup > Applications** to install the application.

2. Upload the application file (.eap) to the camera.

3. Activate the license. If you're online, enter the license code. The application automatically activates the license.

   See the product's built-in help for further instructions.

4. To set up the application, go to *How to access the application settings*.

How to activate the license when you're offline

To activate the license you need a license key. If you don't have a license key on the computer, do the following:

1. Go to *www.axis.com*

2. To get a license key you need the license code and the Axis product serial number.

3. Save the license key file on the computer to be able to select it when the application asks for it.

How to access the application settings

1. To access the settings for a specific application, do one of the following:

   - For products with firmware 7.10 or later, go to **Settings > Apps**, select the application and click **Open** to open the application settings.

   - For products with firmware 6.50 or previous, click on the **Live view** button or go to **Setup > Applications > [Application name]** and click on the setup link to open the application settings.

How to connect a flashing beacon

Use a flashing beacon to let possible intruders know that your perimeter is protected.

This scenario explains how to connect a flashing beacon and set it up to flash whenever the thermal camera detects an intrusion. In this scenario the beacon can only be activated to flash due to alarms outside office hours, between 18.00 and 08.00 Monday–Friday, and it should flash for 30 seconds each time it is activated.

Required hardware

- Multicable, see *Multiconnector on page 15*

- Connecting wires (one blue and one red, min area: 0.25 mm^2, max area: 0.5 mm^2)

- Flashing beacon (12 V DC, max 50 mA)

Note

The maximum length of the connecting wires depends on the wire area and the power consumption of the beacon.

Physical connection

1. Connect the multicable to the camera.

2. Connect the red wire to pin 2 (DC output, +12 V DC) of the multicable I/O terminal connector.

3. Connect the other end of the red wire to the connector marked with **+** on the flashing beacon.

4. Connect the blue wire to pin 3 (I/O port) of the multicable I/O terminal connector.

5. Connect the other end of the blue wire to the connector marked with **–** on the flashing beacon.

Configure I/O ports

You need to connect the flashing beacon to the camera in the camera's webpage. The first part of this is to configure the I/O ports:

1. Go to **System > I/O ports**.
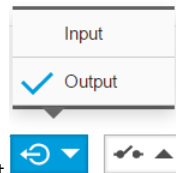
2. Select **Output** in the **Port 1** drop-down list.

3. Give the output module a descriptive name, for example "Flashing beacon".

4. To make the beacon start flashing whenever an event is triggered, select **Open circuit** in the drop-down list.
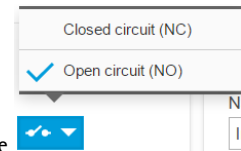
Create an action rule

For the camera to send a notification to the beacon to start flashing when something is detected, you need to create an action rule in the camera:

1. Go to **System > Events > Action rules**.

2. Click **Add**.

3. Select **Enable rule** and give the action rule a name, for example "Flashing beacon".

4. Select **Applications** from the **Trigger** drop-down list.

5. Select the perimeter protection application from the drop-down list.

6. Set the **Schedule** to **After hours**.

7. Select **Output port** from the **Type** drop-down list.

8. Select "Flashing beacon" from the **Port** drop-down list.

9. Set the duration to 30 seconds.

10. Click **Ok**.

How to connect a network horn speaker

Use a network horn speaker to warn and deter possible intruders.

This scenario explains how to connect an Axis network horn speaker to the camera and set it up to play an audio clip whenever the thermal camera detects an intrusion. In this scenario, the horn speaker can only be activated due to alarms coming outside office hours, between 18.00 and 08.00 Monday-Friday.

Set up recipient

Note

An audio clip must be available in the horn speaker and you need to know the number of the audio clip. To find out the number of the audio clip, type the following command: *http://[HornSpeakerIP]/axis-cgi/param.cgi?action=list*, where *[HornSpeakerIP]* is the IP address of the horn speaker. You find the number after the letter M in the list displayed.

Connect the camera to the horn speaker by setting it up as a recipient in the camera:

1. Go to **Settings > System** > **Events > Recipients**.

2. Click **Add**.

3. Give the recipient a name, for example "Horn speaker".

4. Select **HTTP** from the **Type** drop-down list.

5. Enter *http://[HornSpeakerIP]/axis-cgi/playclip.cgi?clip=[x]* in the url field, where *[HornSpeakerIP]* is the IP address of the horn speaker and *[x]* is the audio clip number.

6. Enter the user name and password of the horn speaker under **Login Credentials**.

7. Click **OK**.

Create an action rule

For the camera to send a notification to the horn speaker to play the audio clip when something is detected, create an action rule in the camera:

1. Go to **Settings > System** > **Events > Action rules**.

2. Click **Add**.

3. Give the action rule a name, for example "Horn speaker".

4. From the list of triggers, select **Applications** and then select the perimeter protection application.

5. Set the **Schedule** to **After hours**.

6. From the list of actions, select **Send notification** and then select **Horn speaker**.

7. Click **OK**.

How to reduce bandwidth and storage

Important

If you reduce the bandwidth it can result in loss of details in the picture.

1. Go to live view and select **H.264**.

2. Go to **Settings > Stream**.

3. Do one or more of the following:

    - Turn on the Zipstream functionality and select the desired level.

    - Turn on dynamic GOP and set a high GOP length value.

    - Increase the compression.

    - Turn on dynamic FPS.

About color palettes

Color palettes applied to thermal images help the human eye distinguish image details. The colors in the palette are artificially created pseudocolors that emphasize temperature differences.

Color palette recommendation

The product has several color palettes to choose from. If an operator watches the video stream, choose any of the palettes. If the video stream is only used by applications, select the white-hot palette.

How to stabilize a shaky image with Electronic Image Stabilization (EIS)

Troubleshooting

How to reset to factory default settings

Important

> Reset to factory default should be used with caution. A reset to factory default resets all settings, including the IP address, to the factory default values.

To reset the product to the factory default settings:

1. Disconnect power from the product.

2. Press and hold the control button while reconnecting power. See *Product overview*.

3. Keep the control button pressed for 15–30 seconds until the status LED indicator flashes amber.

4. Release the control button. The process is complete when the status LED indicator turns green. The product has been reset to the factory default settings. If no DHCP server is available on the network, the default IP address is 192.168.0.90

5. Use the installation and management software tools to assign an IP address, set the password, and access the video stream.

   The installation and management software tools are available from the support pages on *axis.com/support*

It is also possible to reset parameters to factory default via the web interface. Go to **Settings > System > Maintenance** and click **Default**.

How to check the current firmware

Firmware is the software that determines the functionality of network devices. One of your first actions when troubleshooting a problem should be to check the current firmware version. The latest version may contain a correction that fixes your particular problem.

To check the current firmware:

1. Go to the product's webpage.

2. Click on the help menu.

3. Click **About**.

How to upgrade the firmware

Important

> Preconfigured and customized settings are saved when the firmware is upgraded (provided that the features are available in the new firmware) although this is not guaranteed by Axis Communications AB.

Important

> Make sure the product remains connected to the power source throughout the upgrade process.

Note

> When you upgrade the product with the latest firmware, the product receives the latest functionality available. Always read the upgrade instructions and release notes available with each new release before upgrading the firmware. To find the latest firmware and the release notes, go to *axis.com/support/firmware*

1. Download the latest firmware file to your computer, available free of charge at *axis.com/support/firmware*

2. Log in to the product as an administrator.

3. Go to **Settings > System > Maintenance** in the product's webpage and follow the instructions. When the upgrade has finished, the product restarts automatically.

AXIS Camera Management can be used for multiple upgrades. Find out more at *axis.com/products/axis-camera-management*

Technical issues, clues and solutions

If you can't find what you're looking for here, try the troubleshooting section at *axis.com/support*

Problems upgrading the firmware

Firmware upgrade failure	If the firmware upgrade fails, the product reloads the previous firmware. The most common reason is that the wrong firmware file has been uploaded. Check that the name of the firmware file corresponds to your product and try again.

Problems setting the IP address

The product is located on a different subnet	If the IP address intended for the product and the IP address of the computer used to access the product are located on different subnets, you cannot set the IP address. Contact your network administrator to obtain an IP address.
The IP address is being used by another device	Disconnect the Axis product from the network. Run the ping command (in a Command/DOS window, type `ping` and the IP address of the product): • If you receive: `Reply from <IP address>: bytes=32; time=10...` this means that the IP address may already be in use by another device on the network. Obtain a new IP address from the network administrator and reinstall the product. • If you receive: `Request timed out`, this means that the IP address is available for use with the Axis product. Check all cabling and reinstall the product.
Possible IP address conflict with another device on the same subnet	The static IP address in the Axis product is used before the DHCP server sets a dynamic address. This means that if the same default static IP address is also used by another device, there may be problems accessing the product.

The product cannot be accessed from a browser

Cannot log in	When HTTPS is enabled, ensure that the correct protocol (HTTP or HTTPS) is used when attempting to log in. You may need to manually type `http` or `https` in the browser's address field. If the password for the user root is lost, the product must be reset to the factory default settings. See *How to reset to factory default settings*.
The IP address has been changed by DHCP	IP addresses obtained from a DHCP server are dynamic and may change. If the IP address has been changed, use AXIS IP Utility or AXIS Camera Management to locate the product on the network. Identify the product using its model or serial number, or by the DNS name (if the name has been configured). If required, a static IP address can be assigned manually. For instructions, go to *axis.com/support*.
Certificate error when using IEEE 802.1X	For authentication to work properly, the date and time settings in the Axis product must be synchronized with an NTP server. Go to **Settings > System > Date and time**

The product is accessible locally but not externally

Router configuration	Check that your router allows incoming data traffic to the Axis product. The router must support UPnP®.
Firewall protection	Check the Internet firewall with your network administrator.

Problems with streaming	
Multicast H.264 only accessible by local clients	Check if your router supports multicasting, or if the router settings between the client and the product need to be configured. The TTL (Time To Live) value may need to be increased.
No multicast H.264 displayed in the client	Check with your network administrator that the multicast addresses used by the Axis product are valid for your network.
	Check with your network administrator to see if there is a firewall preventing viewing.
Poor rendering of H.264 images	Ensure that your graphics card is using the latest driver. The latest drivers can usually be downloaded from the manufacturer's website.
Lower frame rate than expected	• See *Performance considerations on page 13*. • Reduce the number of applications running on the client computer. • Limit the number of simultaneous viewers. • Check with the network administrator that there is enough bandwidth available. • Lower the image resolution. • The maximum frames per second is dependent on the utility frequency (60/50 Hz) of the Axis product.

Performance considerations

When setting up your system, it is important to consider how various settings and situations affect the performance. Some factors affect the amount of bandwidth (the bitrate) required, others can affect the frame rate, and some affect both. If the load on the CPU reaches its maximum, this also affects the frame rate.

The following factors are the most important to consider:

- High image resolution or lower compression levels result in images containing more data which in turn affects the bandwidth.

- Access by large numbers of Motion JPEG or unicast H.264 clients affects the bandwidth.

- Simultaneous viewing of different streams (resolution, compression) by different clients affects both frame rate and bandwidth.

  Use identical streams wherever possible to maintain a high frame rate. Stream profiles can be used to ensure that streams are identical.

- Accessing Motion JPEG and H.264 video streams simultaneously affects both frame rate and bandwidth.

- Heavy usage of event settings affects the product's CPU load which in turn affects the frame rate.

- Using HTTPS may reduce frame rate, in particular if streaming Motion JPEG.

- Heavy network utilization due to poor infrastructure affects the bandwidth.

- Viewing on poorly performing client computers lowers perceived performance and affects frame rate.

- Running multiple AXIS Camera Application Platform (ACAP) applications simultaneously may affect the frame rate and the general performance.

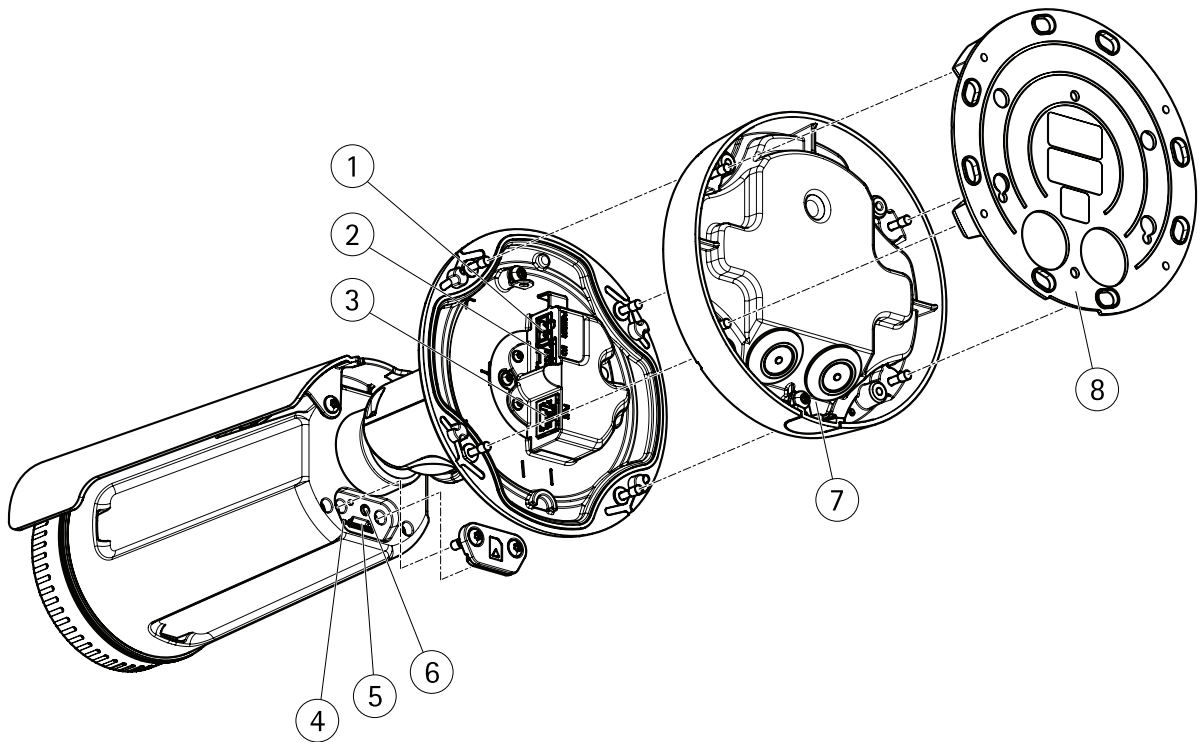- Using palettes affects the product's CPU load which in turn affects the frame rate.

Specifications

Specifications

To find the latest version of the product's datasheet, go to the product page on *axis.com* and locate **Support & Documentation**.

Product overview

1   Power connector
2   I/O and audio terminal connector (multi-connector)
3   Network connector
4   Status indicator LED
5   MicroSD memory card slot
6   Control button
7   Foot
8   Mounting bracket

LED Indicators

Status LED	Indication
Unlit	Connection and normal operation.
Green	Connection and normal operation.
Amber	Steady during startup. Flashes during firmware upgrade or reset to factory default.
Amber/Red	Flashes amber/red if network connection is unavailable or lost.
Red	Firmware upgrade failure.

Specifications

SD card slot

NOTICE

- Risk of damage to SD card. Do not use sharp tools, metal objects, or excessive force when inserting or removing the SD card. Use your fingers to insert and remove the card.
- Risk of data loss and corrupted recordings. Do not remove the SD card while the product is running. Unmount the SD card from the product's webpage before removal.

This product supports microSD/microSDHC/microSDXC cards (not included).

For SD card recommendations, see *axis.com*

Buttons

Control button

For location of the control button, see *Product overview on page 14*.

The control button is used for:

- Resetting the product to factory default settings. See *page 11*.

- Connecting to an AXIS Video Hosting System service. See . To connect, press and hold the button for about 3 seconds until the Status LED flashes green.

- Connecting to AXIS Internet Dynamic DNS Service. See . To connect, press and hold the button for about 3 seconds.

Connectors

Power connector

Terminal connector for connecting AC/DC power supply.

Network connector

RJ45 Ethernet connector with Power over Ethernet (PoE).

Multiconnector

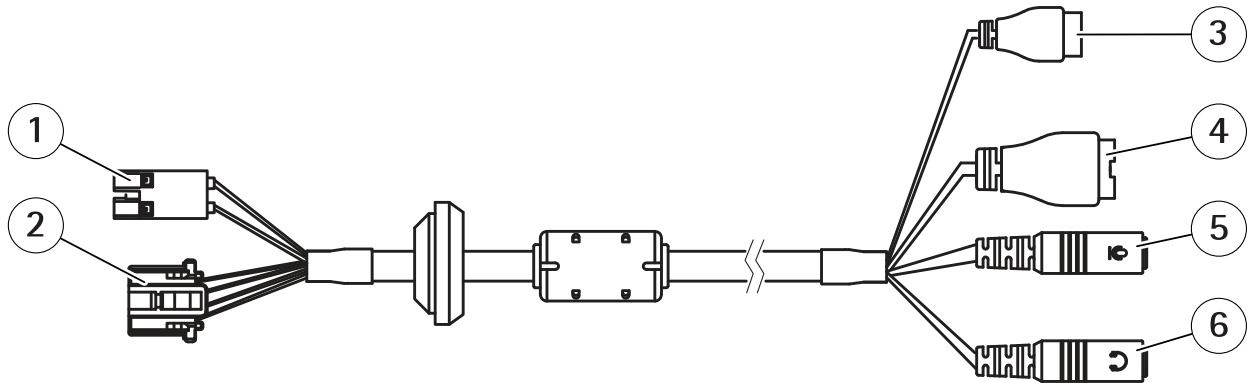Terminal connector for connecting external equipment:

- Audio equipment

- Input/Output (I/O) devices

- DC power supply

When connecting external equipment, a separately sold Axis multicable is required in order to maintain the product's IP rating. For more information, see *Multicable connectors on page 16*.

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Specifications

Multicable connectors

Multicable overview

1 *Camera power connector*
2 *Camera multiconnector*
3 *Power connector*
4 *I/O terminal connector*
5 *Audio in (pink)*
6 *Audio out (green)*

The multicable provides the following connectors:

Power connector – 2-pin terminal block used for power input. The polarity of the cables does not matter. Use a Safety Extra Low Voltage (SELV) compliant limited power source (LPS) with either a rated output power limited to ≤100 W or a rated output current limited to ≤5 A.
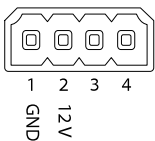

Audio in (pink) – 3.5 mm input for a mono microphone, or a line-in mono signal (left channel is used from a stereo signal).

Audio out (green) – 3.5 mm output for audio (line level) that can be connected to a public address (PA) system or an active speaker with a built-in amplifier. A stereo connector must be used for the audio out.

I/O terminal connector – Use with external devices in combination with, for example, tampering alarms, motion detection, event triggering, and alarm notifications. In addition to the 0 V DC reference point and power (DC output), the I/O connector provides the interface to:

- Digital output — For connecting external devices such as relays and LEDs. Connected devices can be activated by the VAPIX® Application Programming Interface or in the product's webpage.

- Digital input — For connecting external devices that can toggle between an open and closed circuit, for example PIR detectors, door/window contacts, and glass break detectors.

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Function	Pin	Notes	Specifications
0 V DC (-)	1		0 V DC
DC output	2	Can be used to power auxiliary equipment. Note: This pin can only be used as power out.	12 V DC Max load =50 mA
Configurable (Input or Output)	3–4	Digital input – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate.	0 to max 30 V DC
		Digital output – Connect to pin 1 to activate, or leave floating (unconnected) to deactivate. If used with an inductive load, e.g. a relay, a diode must be connected in parallel with the load, for protection against voltage transients.	0 to max 30 V DC, open drain, 100 mA
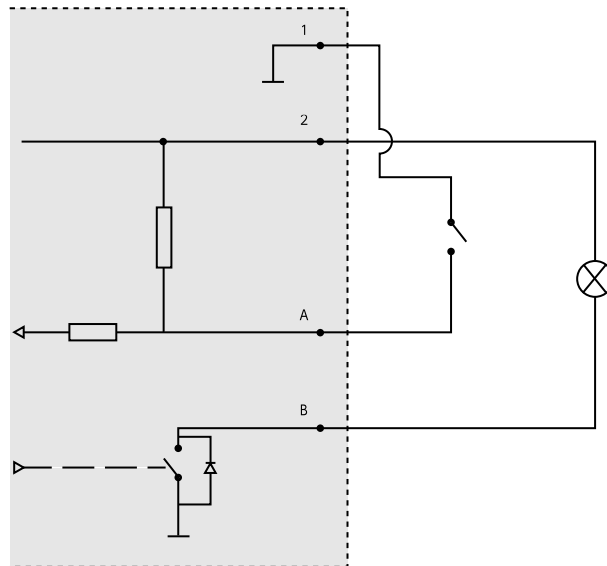
1   0 V DC (-)
2   DC output 12 V, max 50 mA
A   I/O configured as input
B   I/O configured as output