AXIS Q6055-C PTZ Network Camera

User Manual

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About this document

About this document

This manual is intended for administrators and users of AXIS Q6055-C PTZ Network Camera, and is applicable to firmware 6.20 and later. It includes instructions for using and managing the product 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.

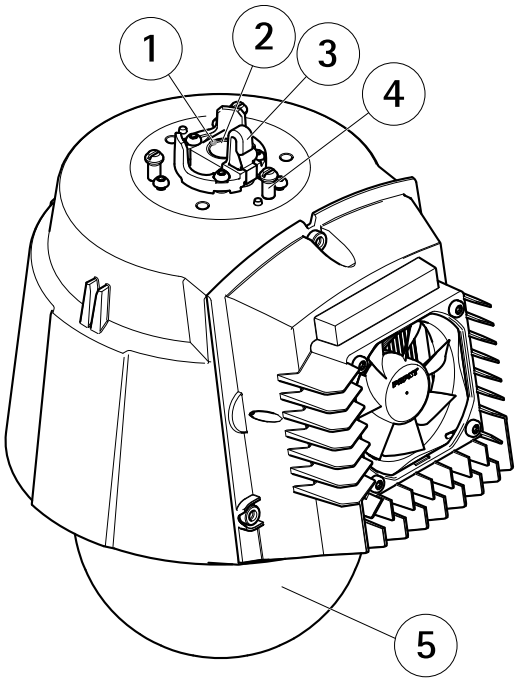
Product overview

Product overview

Product overview

NOTICE

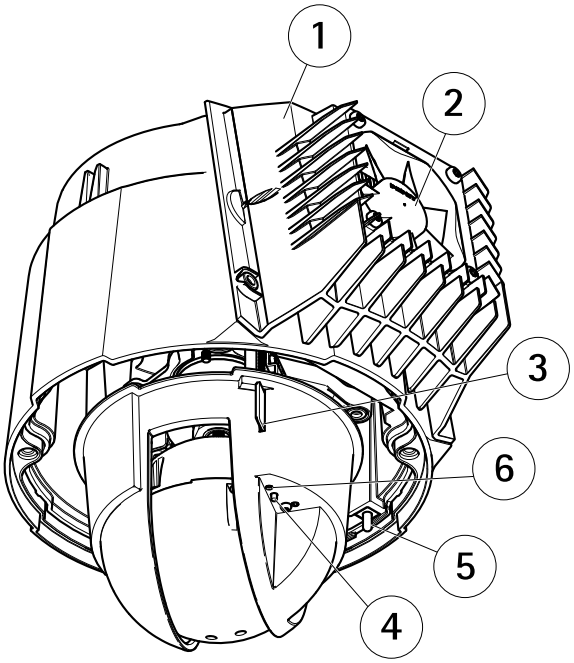
Make sure the dome is attached in operation mode, otherwise focus may be affected.



Top view

1 *Alignment indicator*
2 *Multiconnector*
3 *Hook for safety wire*
4 *Unit holder (3x)*
5 *Dome*

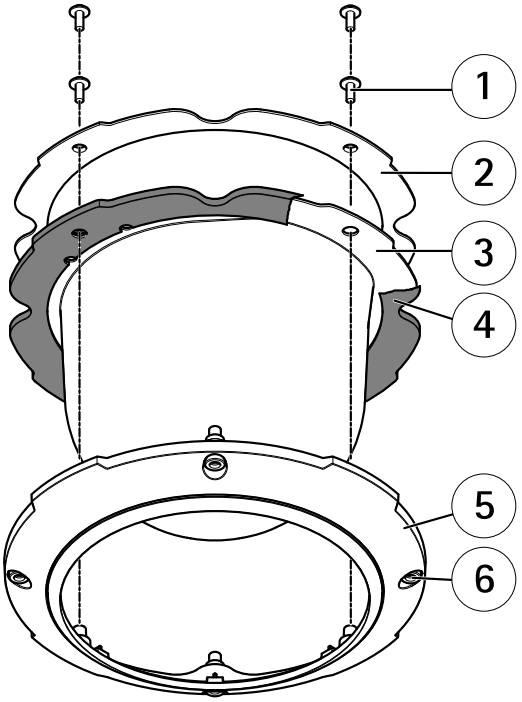
Product overview



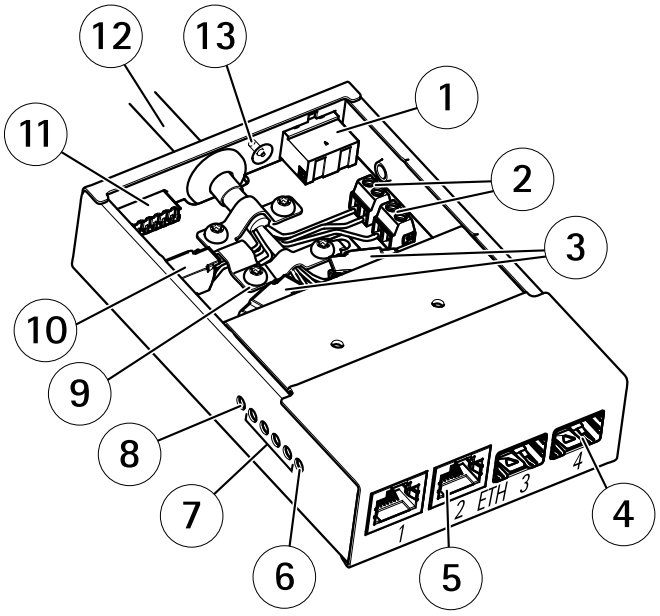
Bottom view

1 *Cooling system*
2 *Fan*
3 *SD card slot (SDHC)*
4 *Control button*
5 *Power button (for Factory Default only)*
6 *Status LED indicator*

Product overview



1 *Dome bracket screw PH2 (4x)*
2 *Dome bracket*
3 *Dome cover*
4 *Rubber gasket*
5 *Dome ring*
6 *Dome ring screw T30 (4x)*



1 *Power connector (DC input)*
2 *Power connector (DC output)*
3 *Network connector (internal)*

Product overview

4 *Network connector SFP (external) (2x)*
5 *Network connector RJ45 (external) (2x)*
6 *Camera network LED indicator*
7 *Network LED indicator (4x)*
8 *Power LED indicator*
9 *Ground clip*
10 *I/O connector (internal)*
11 *I/O connector (external)*
12 *Multicable*
13 *Ground screw*

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™ (recommended), Firefox®, Edge®, or Opera® with Windows®
- Chrome™ (recommended) or Safari® with OS X®
- Chrome™ or Firefox® with other operating systems.

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.

   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*

Note

To show Bonjour as a browser bookmark, go to **Safari > Preferences**.

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' products do not impose a password policy as products 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 products.
- 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** is permanent and cannot be deleted. If the password for root is lost, the product must be reset to the factory default settings.

How to access the product

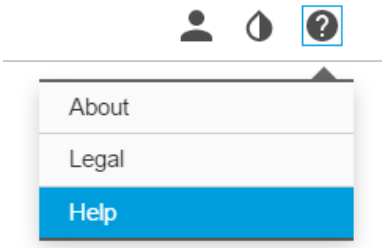
The default root account has full privileges and should be reserved for administrative tasks. Always create a user account with limited privileges for daily use. This reduces the exposure of the administrative account.

1. Make sure to follow the instructions about secure passwords, see *About secure passwords on page 8*.
2. Type a password and then retype it to confirm the spelling.
3. Click **Create login**. The password has now been configured.

Setup

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 long-distance connections

This product supports fiber-optic cable installations through a media converter. Fiber-optic cable installations offer a number of benefits such as:

- Long-distance connection
- High speed
- Long lifetime
- Large capacity of data transmission
- Electromagnetic interference immunity

Find out more about fiber-optic cable installations on *www.axis.com/technologies/fiber-optics*. For information about how to install the media converter see the Installation Guide for this product.

About image quality

How to reduce noise in low-light conditions

To reduce noise in low-light conditions, you can adjust one or more of the following settings:

- Make sure that the exposure mode is automatic.

Note

Increasing the max shutter value can result in motion blur.

- The shutter speed should be as slow as possible, which means you should set max shutter to the highest possible value.
- Reduce sharpness in the image.
- Try lowering the max gain value.

Setup

How to benefit from IR light in low-light conditions using night mode

Your camera delivers color images during the day. As light diminishes, you can set the camera to automatically shift to night mode. This enables delivering black-and-white images with the help of IR light.

1. Go to **Settings > Image > Day and night**, and make sure that the **IR cut filter** is set to **Auto**.
2. To determine at what light level you want the camera to shift to night mode, move the **Threshold** slider toward **Bright** or **Dark**.

Note

If you set the shift to night mode occur when it's brighter, the image remains sharper as there will be less low-light noise. If you set the shift to occur when it's darker, the image colors are maintained longer but there will be more blurring in the image due to low-light noise.

How to select exposure mode

There are several exposure mode options in the camera that adjusts aperture, shutter speed, and gain to improve image quality for specific surveillance scenes. In the **Image** tab, select between the following options:

How to maximize details in an image

Important

If you maximize details in an image, bitrate increases and might lead to reduced frame rate.

- Make sure to select capture mode that has the highest resolution.
- Set compression as low as possible.
- Select MJPEG streaming.
- Turn off the Zipstream functionality.

How to handle scenes with strong backlight

Use WDR to make both dark and bright areas of the image visible.

1. Go to **Settings > Image**.
2. Turn on WDR under **Wide dynamic range**.

Image without WDR.

Image with WDR.

Note

If you use WDR, you may experience some WDR artifacts in the image.

Find out more about WDR and how to use it at *axis.com/web-articles/wdr*

How to see above the horizon

In some cases, you might want to look above the default upper tilt limit to see above the horizon.

1. Go to **Settings > PTZ > Advanced > Limits**
2. Set the upper limit to the maximum value and click **Save**

About streaming and storage

How to choose video compression format

Deciding which compression method to choose depends on your viewing requirements, and on the properties of your network. The available options are:

Motion JPEG

Motion JPEG or MJPEG is a digital video sequence that is made up of a series of individual JPEG images. These images are then displayed and updated at a rate sufficient to create a stream that shows constantly updated motion. For the viewer to perceive motion video the rate must be at least 16 image frames per second. Full motion video is perceived at 30 (NTSC) or 25 (PAL) frames per second.

The Motion JPEG stream uses considerable amounts of bandwidth, but provides excellent image quality and access to every image contained in the stream.

H.264 or MPEG-4 Part 10/AVC

Note

H.264 is a licensed technology. The Axis product includes one H.264 viewing client license. Installing additional unlicensed copies of the client is prohibited. To purchase additional licenses, contact your Axis reseller.

H.264 can, without compromising image quality, reduce the size of a digital video file by more than 80% compared to the Motion JPEG format and by as much as 50% compared to the MPEG-4 standard. This means that less network bandwidth and storage space are required for a video file. Or seen another way, higher video quality can be achieved for a given bitrate.

Find out more at *axis.com/compression-formats*

How to reduce bandwidth and storage

Important

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

1. Go to live view and select H.264.
2. Go to the **Stream** tab.
3. Do one or more of the following:
   - Turn on the Zipstream functionality.
   - Turn on the GOP and set a high GOP length value.
   - Increase the compression.
   - Turn on the dynamic FPS.

How to set up network storage

To store recordings on the network, you need to set up network storage:

1. Go to **Settings > System** > **Storage**.
2. Click **Setup** under **Network storage**.
3. Enter the IP address of the host server.
4. Enter the name of the shared location on the host server.
5. Move the switch if the share requires a login, and enter username and password.
6. Click **Connect**.

About events

The event pages allow you to configure your product to perform actions when different events occur. For example, the product can start a recording or send an email notification when motion is detected. The set of conditions that defines how and when the action is triggered is called an action rule.

How to trigger an action

1. Go to **Settings > System > Events** to set up an action rule. The action rule defines when the product will perform certain actions. Action rules can be setup as scheduled, recurring, or for example, triggered by motion detection.
2. Select what **Trigger** must be met to trigger the action. If you specify more than one trigger for the action rule, all of them must be met to trigger the action.
3. Select which **Action** the camera should perform when the conditions are met.

Note

If you make changes to an active action rule, the action rule needs to be restarted for the changes to take effect.

How to record video when the camera detects motion

This example explains how to set up the camera to start recording to the SD card five seconds before it detects motion and to stop one minute after.

Make sure the AXIS Video Motion Detection application is running:

1. Go to **Settings > Apps** > **AXIS Video Motion Detection**.

2. Start the application if it is not already running.
3. Make sure you have set up the application according to your needs.

Create an action rule:

4. Go to **Settings > System > Events** and add an action rule.
5. Type a name for the action rule.
6. From the list of triggers, select **Applications** and then select **AXIS Video Motion Detection (VMD)**.
7. From the list of actions, select **Record video**.
8. Select an existing stream profile or create a new one.
9. Set the pre-trigger time to 5 seconds.
10. Set the post-trigger time to 60 seconds.
11. Select **SD card** from the list of storage options.
12. Click **Ok**.

How to automatically zoom in on a specific area with gatekeeper

This example explains how to use the gatekeeper functionality to make the camera zoom in automatically on the license plate of a car that passes through a gate. When the car has passed, the camera zooms out to the home position.

Create the preset positions:

1. Go to **Settings > PTZ > Preset positions**.
2. Create the home position that includes the entrance of the gate.
3. Create the zoomed-in preset position so that it covers the area in the image where you assume that the license plate will appear.

Create a motion detection profile:

4. Go to **Settings > Apps** and open AXIS Video Motion Detection.
5. Create a profile that covers the entrance of the gate and then save the profile.

Create an action rule:

6. Go to **Settings > System > Events** and add an action rule.
7. Name the action rule `Gatekeeper`.
8. From the trigger list, select **Applications** and then select the previously created motion detection profile.
9. From the action list, select the previously created preset position.
10. Click **OK**.

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*

Setup

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.

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. Press and hold the control button and the power button for 15–30 seconds until the status LED indicator flashes amber. See *Product overview*.
2. Release the control button but continue to hold down the power button until the status LED indicator turns green.
3. Release the power button and assemble the product.
4. The process is now complete. 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. Using the installation and management software tools to assign an IP address, set the password and access the video stream.

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.

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.
4. The upgrade takes a while, don't break the power to the product. When the upgrade is finished, the product restarts automatically.

Troubleshooting

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.

Troubleshooting

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.
Color saturation is different in H.264 and Motion JPEG	Modify the settings for your graphics adapter. Go to the adapter's documentation for more information.
Lower frame rate than expected	• See *Performance considerations on page 18*. • 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. • In the product's webpage, set a capture mode that prioritizes frame rate. Changing the capture mode to prioritize frame rate might lower the maximum resolution depending on the product used and capture modes available. • 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.

Specifications

To find the latest version of the product's datasheet, go to axis.com > [product] > Support & Documentation.

LED Indicators

Status LED	Indication
Unlit	Connection and normal operation.
Green	Shows steady green for 10 seconds for normal operation after startup completed.
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.

Media converter switch LED indicators

LED	Color	Indication
Power	Unlit	DC power unconnected or current protection engaged (power overload)
	Green	DC power connected.
Network (4x)	Amber	10 Mbit connection. Flashes during activity.
	Green	100/1000 Mbit connection. Flashes during activity.
Camera network (only available on AXIS T8607)	Green	100 Mbit connection. Flashes during activity.

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 SD/SDHC/SDXC cards (not included).

For SD card recommendations, see *axis.com*

Buttons

Control button

For location of the control button, see *Product overview on page 4* .

The control button is used for:

- Resetting the product to factory default settings. See *page 16*.
- 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.

Power button

Press and hold the power button to temporarily power the product when the dome cover is removed. The power button is also used with the control button to reset the camera to factory default settings. See *page 16*.

Connectors

Multiconnector

Terminal connector for connecting the supplied media converter switch, which provides the following signals:

- DC Power
- Network (Ethernet 10/100Base-T)
- Input/Output (I/O)

Multicable connectors

Note

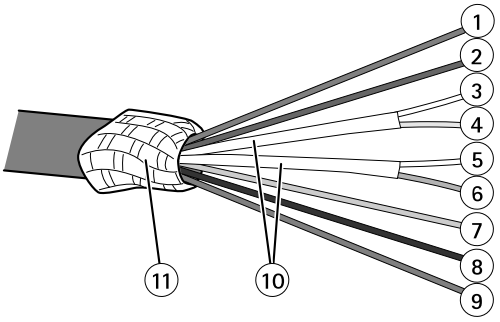
The supplied multicable is required in order to maintain the camera's NEMA/IP rating.

The multicable is connected to the camera's multiconnector, see .

The wires are connected to the supplied media converter switch, see *AXIS T8607 Media Converter Switch on page 6* .

The cable provides the following signals:

- DC power to camera
- Network (Ethernet 10/100Base-T)
- Input/Output (I/O)



Multicable overview

1 *Power wire (red)*
2 *Digital I/O wire (blue)*
3 *Ethernet wire (green/white)*
4 *Ethernet wire (green)*
5 *Ethernet wire (orange/white)*
6 *Ethernet wire (orange)*
7 *Digital I/O wire (yellow)*
8 *Ground wire (black)*
9 *Power wire (red)*
10 *Ethernet wire foil shield (2x)*

11 Braided shield coil

Function	Wire	Connect to	Specifications
Configurable (Input or Output)	2 – blue 7 – yellow	Digital input – I/O terminal connector	0 to max 30 V DC
		Digital output – I/O terminal connector	0 to max 30 V DC, open drain, 100 mA
RX+	3 – green/white	Ethernet – receiving	
RX-	4 – green	Ethernet – receiving	
TX+	5 – orange/white	Ethernet – transmitting	
TX-	6 – orange	Ethernet – transmitting	
0 V DC (-)	8 – black		0 V DC
DC output (24 V)	1, 9 – red	Power connector	24 V DC

Media converter switch connectors

NOTICE

The product shall be connected using a shielded network cable (STP) or an optical fiber cable. All cables connecting the product to the network shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see .

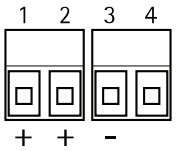
Important

The media converter switch does not support hotswapping. Disconnect power from the switch before swapping cameras. An attempt to hotswap could cause the switch to freeze, in which case it must be restarted.

Camera connectors

Power connector

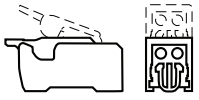
Two 2-pin terminal blocks for power output (pin 4 is not used).



Function		Pin	Notes
DC output	24 V DC	1, 2	Power out to camera
	0 V DC (-)	3	
	N/A	4	N/A

Network connector

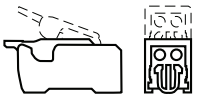
Two 2-pin Ethernet terminal blocks.



Specifications

I/O terminal connector

2-pin terminal block.



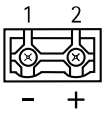
External connectors

Ground screw

Ground screw for connecting the media converter switch to earth ground. Make sure that both ends of the grounding wire are in contact with their respective grounding surfaces.

Power connector

2-pin terminal block for power input.



Function		Pin	Notes
DC input	0 V DC (-)	1	
	24 V DC	2	Power in from power supply (sold separately)

Network connector RJ45

Two RJ45 connectors (10/100Base-T) for network.

Network slot SFP

Two SFP slots (100Base-FX/1000Base-X) for network.

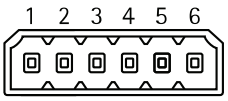
Each RJ45 and SFP port has its own dip switch. The dip switches control how the port forwards data. For more information, see *page 23*.

I/O terminal connector
6-pin configurable I/O terminal block, which is connected to the camera through the multicable. Use with external devices in combination with, for example, tampering alarms, motion detection, event triggering, time lapse recording 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, output buttons on the Live View page or by an Action Rule. The output will show as active (shown under **System Options > Port & Devices > Port Status**) if the alarm device is activated.
- **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 **System Options > Port & Devices > Port Status**).

6-pin terminal blocks for:

- Digital Input/Output
- Power (DC output)
- 0 V DC (-)



Function	Pin	Notes	Specifications
0 V DC (-)	1, 4, 6		0 V DC

Specifications

DC output	2	Power out	12 V DC, 50 mA
Configurable I/O 1 (Input or Output)	3	Digital input	0 to max 30 V DC
		Digital output (transistor – open collector)	0 to max 30 V DC, open drain, 100 mA
Configurable I/O 2 (Input or Output)	5	Digital input	0 to max 30 V DC
		Digital output (transistor – open collector)	0 to max 30 V DC, open drain, 100 mA

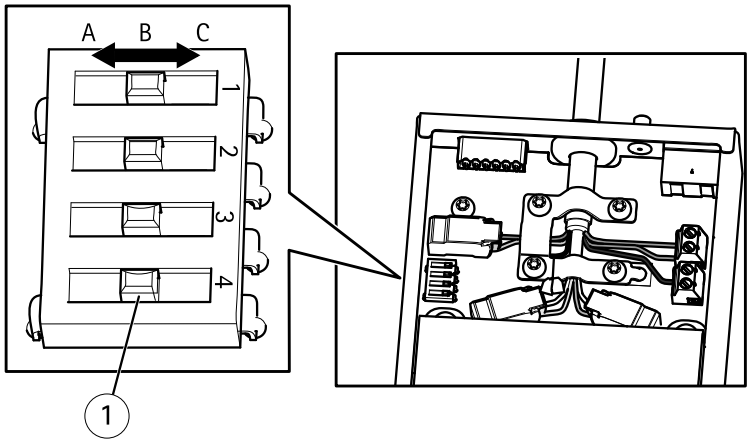
Network connector dip switches

Important

Always use the default dip switch setting (position B) if the relationship between devices in the system is not defined.

The camera attaches a particular VLAN tag to all its forwarded multicast packages. The media converter switch manages how these multicast packages are forwarded between cameras, media converter switches and other network devices. This is especially useful when connecting the camera and media converter switch to the network in a daisy chain.

By changing the position of the dip switches, each network connector port in the media converter switch can be configured to manage multicasts in three different ways.



Dip switch position		Description
Default (middle)	B	Remove VLAN tags from forwarded multicast packages. Use this setting when connecting to the network, directly or through a router or network switch.
Left	A	Block multicast packages that have a VLAN tag. Use this setting when connecting to a device that is not intended for multicast viewing.
Right	C	Forward multicast packages with a VLAN tag. Use this setting when connecting to another media converter switch.

VLAN tags are used to create independent logical networks, virtual local area networks (VLANs), within a physical network. Multiple media converter switches that are connected to each other in a daisy chain are members of the same VLAN. The media converter switches tag the multicast packages moving between them so that the next media converter switch in line knows the destination of the packages. In other words, the VLAN tag serves as a VLAN identifier. VLAN tagging should only be used when using multiple cameras and media converter switches because forwarding multicast packages with a VLAN tag only serves a purpose when the port is connected to another media converter switch, which might be connected to potential viewers.

Specifications

Note

When connecting an outgoing media converter switch network connector to another type of network device, set the dip switch to position A to protect the device from multicast traffic.

User Manual
AXIS Q6055-C PTZ Network Camera

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