# AXIS Q4809-PVE Panoramic Camera

## Seamless 180° view, high-pixel, 26 MP

With 26 MP at 30 fps and seamless stitching of all four images, this AI-based camera delivers cohesive 180° panoramic overviews for complete situational awareness. Lossless zoom lets you zoom in without degrading image sharpness. Plus, remote pan/tilt/roll functionality ensures fast, cost-efficient installation. Built on a dual Axis system-on-chip, it includes a deep learning processing unit to run advanced features and powerful analytics on the edge. For instance, AXIS Object Analytics can detect, classify, track, and count humans and types of vehicles. Furthermore, Axis Edge Vault safeguards the device and offers FIPS 140-2 Level 2 certified key storage and operations.

- > 10K multisensor camera with one IP address
- > 180° horizontal, 45° vertical coverage
- > AI-powered with support for advanced analytics
- > Horizon straightening and lossless zoom
- > Built-in cybersecurity with Axis Edge Vault

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## Camera

**Image sensor**
4 x 12 MP 1/2.3" progressive scan RGB CMOS
Pixel size 1.55 µm

**Lens**
5.0 mm, F1.7
Horizontal field of view: 180°
Vertical field of view: 45°
Fixed iris

**Day and night**
Automatic IR-cut filter

**Minimum illumination**
**Color:** 0.1 lux at 50 IRE, F1.7
**B/W:** 0.03 lux at 50 IRE, F1.7

**Shutter speed**
1/100000 s to 1/2 s

**Camera adjustment**
Pan ±176°, tilt 20° to 88°, roll ±7°

## System on chip (SoC)

**Model**
ARTPEC-8 (x2)

**Memory**
4096 (x2) MB RAM, 8192 MB Flash

**Compute capabilities**
Deep learning processing unit (DLPU)

## Video

**Video compression**
H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles
H.265 (MPEG-H Part 2/HEVC) Main Profile
Motion JPEG

**Resolution**
10240x2560 to 512x256

**Frame rate**
Up to 25/30 fps (50/60 Hz) in all resolutions

**Video streaming**
Up to 20 unique and configurable video streams[1]
Axis Zipstream technology in H.264 and H.265
VBR/ABR/MBR H.264/H.265
Low latency mode
Video streaming indicator

**Signal-to-noise ratio**
>55 dB

**WDR**
Forensic WDR: Up to 120 dB depending on scene

**Multi-view streaming**
Up to 6 individually cropped out view areas. 2 statically pre-defined view areas for 10K split view.

**Noise reduction**
Spatial filter (2D noise reduction)
Temporal filter (3D noise reduction)

**Image settings**
Horizon straightening, saturation, contrast, brightness, sharpness, white balance, day/night threshold, local contrast, tone mapping, exposure mode, compression, dynamic text and image overlay, privacy masks, polygon privacy mask

**Image processing**
Axis Zipstream, Forensic WDR, Lightfinder 2.0

**Pan/Tilt/Zoom**
Digital PTZ
Control queue
Lossless zoom

## Audio

**Audio features**
Automatic gain control
Network speaker pairing

**Audio streaming**
Configurable duplex:
One-way (simplex, half duplex)

1. *We recommend a maximum of 3 unique video streams per camera or channel, for optimized user experience, network bandwidth, and storage utilization. A unique video stream can be served to many video clients in the network using multicast or unicast transport method via built-in stream reuse functionality.*

### Audio input
Input for external unbalanced microphone, optional 5 V microphone power
Digital input, optional 12 V ring power
Unbalanced line input

### Audio output
Output via network speaker pairing

### Audio encoding
24bit LPCM, AAC-LC 8/16/32/48 kHz, G.711 PCM 8 kHz, G.726 ADPCM 8 kHz, Opus 8/16/48 kHz, LPCM
Configurable bitrate

## Network

### Network protocols
IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS[2], HTTP/2, TLS[2], QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, mDNS (Bonjour), UPnP®, SNMP v1/v2c/v3 (MIB-II), DNS/DNSv6, DDNS, NTP, NTS, RTSP, RTP, SRTP/RTSPS, TCP, UDP, IGMPv1/v2/v3, RTCP, ICMP, DHCPv4/v6, ARP, SSH, LLDP, CDP, MQTT v3.1.1, Secure syslog (RFC 3164/5424, UDP/TCP/TLS), Link-Local address (ZeroConf), IEEE 802.1X (EAP-TLS), IEEE 802.1AR

## System integration

### Application Programming Interface
Open API for software integration, including VAPIX®, metadata and AXIS Camera Application Platform (ACAP); specifications at *axis.com/developer-community*.
One-click cloud connection
ONVIF® Profile G, ONVIF® Profile M, ONVIF® Profile S, and ONVIF® Profile T, specifications at *onvif.org*

### Video management systems
Compatible with AXIS Camera Station Edge, AXIS Camera Station Pro, AXIS Camera Station 5, and video management software from Axis' partners available at *axis.com/vms*.

### Onscreen controls
Privacy masks
Media clip
Heater
Fan

### Edge-to-edge
Speaker pairing

### Event conditions
Device status: above/below/within operating temperature, casing open, fan failure, IP address blocked, IP address removed, live stream active, network lost, new IP address, ring power overcurrent protection, system ready
Digital audio input status
Edge storage: recording ongoing, storage disruption, storage health issues detected
I/O: digital input, manual trigger, virtual input
MQTT: stateless
Scheduled and recurring: schedule
Video: average bitrate degradation, day-night mode, tampering

### Event actions
Day-night mode
I/O: toggle I/O once, toggle I/O while the rule is active
MQTT: publish
Notification: HTTP, HTTPS, TCP and email
Overlay text
Recordings: SD card and network share
SNMP traps: send, send while the rule is active
Upload of images or video clips: FTP, SFTP, HTTP, HTTPS, network share and email
LEDs: flash status LED, flash status LED while the rule is active

### Built-in installation aids
Remote Pan/tilt/roll: designed to withstand at least 200 full cycles, autoroll, pixel counter, level grid.

## Analytics

### Applications
**Included**
AXIS Object Analytics, AXIS Scene Metadata, AXIS Video Motion Detection, active tampering alarm, audio detection
**Supported**
Support for AXIS Camera Application Platform enabling installation of third-party applications, see *axis.com/acap*

2. *This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (openssl.org), and cryptographic software written by Eric Young (eay@cryptsoft.com).*

### AXIS Object Analytics
**Object classes:** humans, vehicles (types: cars, buses, trucks, bikes, other)
**Scenarios:** line crossing, object in area, time in area, crossline counting, occupancy in area, tailgating detection, PPE monitoring[BETA], motion in area, motion line crossing
Up to 10 scenarios
**Other features:** triggered objects visualized with trajectories, color-coded bounding boxes and tables
Polygon include/exclude areas
Perspective configuration
ONVIF Motion Alarm event

### AXIS Scene Metadata
**Object classes:** humans, faces, vehicles (types: cars, buses, trucks, bikes), license plates
**Object attributes:** vehicle color, upper/lower clothing color, confidence, position

## Approvals

### Product markings
CSA, UL/cUL, BIS, CE, KC, VCCI, RCM

### Supply chain
TAA compliant

### EMC
CISPR 32 Class A, EN 55035, EN 55032 Class A, EN 61000-6-1, EN 61000-6-2
**Australia/New Zealand:** RCM AS/NZS CISPR 32 Class A
**Canada:** ICES(A)/NMB(A)
**Japan:** VCCI Class A, VCCI Class B
**Korea:** KS C 9835, KS C 9832 Class A
**USA:** FCC Part 15 Subpart B Class A

### Safety
CAN/CSA C22.2 No. 62368-1 ed. 3, IEC/EN/UL 62368-1 ed. 3, IS 13252

### Environment
IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-78, IEC/EN 60529 IP66/IP67, IEC/EN 62262 IK10, NEMA 250 Type 4X

### Network
IPv6 USGv6, NIST SP500-267

### Cybersecurity
ETSI EN 303 645, BSI IT Security Label, FIPS 140

## Cybersecurity

### Edge security
**Software:** Signed OS, brute force delay protection, digest authentication and OAuth 2.0 RFC6749 Client Credential Flow/OpenID Authorization Code Flow for centralized ADFS account management, password protection, Axis Cryptographic Module (FIPS 140-2 level 1)
**Hardware:** Axis Edge Vault cybersecurity platform
Secure keystore: TPM 2.0 (CC EAL4+, FIPS 140-2 Level 2), secure element (CC EAL 6+), system-on-chip security (TEE)
Axis device ID, signed video, secure boot, encrypted filesystem (AES-XTS-Plain64 256bit)

### Network security
IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2)[3], IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS[3], TLS v1.2/v1.3[3], Network Time Security (NTS), X.509 Certificate PKI, host-based firewall

### Documentation
Lossless zoom whitepaper, available at *axis.com/learning/white-papers*
*AXIS OS Hardening Guide*
*Axis Vulnerability Management Policy*
*Axis Security Development Model*
AXIS OS Software Bill of Material (SBOM)
To download documents, go to *axis.com/support/cybersecurity/resources*
To read more about Axis cybersecurity support, go to *axis.com/cybersecurity*

## General

### Casing
IP66-/IP67-, NEMA 4X- and IK10-rated
Aluminum casing, polycarbonate (PC) dome, sunshield (PC/ASA)
Color: white NCS S 1002-B
For repainting instructions, go to the product's support page. For information about the impact on warranty, go to *axis.com/warranty-implication-when-repainting.*

### Mounting
Mounting bracket with junction box holes (double-gang, single-gang, 4" square, and 4" octagon)
¾" (M25) conduit side entries

3. *This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (openssl.org), and cryptographic software written by Eric Young (eay@cryptsoft.com).*

### Power
Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 2 Class 4
Typical 9.74 W, max 19.1 W
Feature: power meter

### Connectors
Network: Shielded RJ45 1000BASE-T PoE
Audio: 3.5 mm mic/line in
I/O: Terminal block for two configurable supervised inputs / digital outputs (12 V DC output, max load 50 mA)

### Storage
Support for microSD/microSDHC/microSDXC card
Support for SD card encryption (AES-XTS-Plain64 256bit)
Recording to network-attached storage (NAS)
For SD card and NAS recommendations see *axis.com*

### Operating conditions
-40 °C to 50 °C (-40 °F to 122 °F)
Maximum temperature according to NEMA TS 2 (2.2.7): 74 °C (165 °F)
Installation temperature: -20 °C (-4 °F)[4]
Start-up temperature: -40 °C (-40 °F)[5]
Humidity 10–100% RH (condensing)

### Storage conditions
-40 °C to 65 °C (-40 °F to 149 °F)
Humidity 5–95% RH (non-condensing)

### Dimensions
For the overall product dimensions, see the dimension drawing in this datasheet.
Effective Projected Area (EPA): 0.038 $m^2$ (0.12 $ft^2$)

### Weight
3320 g (7.3 lb)

### Box content
Camera, weathershield, installation guide, drill template, connector guard, cable gaskets, conduit adaptor, IO connector, owner authentication key

### Optional accessories
AXIS T8415 Wireless Installation Tool
AXIS Surveillance Cards
For more accessories, go to *axis.com/products/axis-q4809-pve#accessories*

### System tools
AXIS Site Designer, AXIS Device Manager, product selector, accessory selector, lens calculator
Available at *axis.com*

### Languages
English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Polish, Traditional Chinese, Dutch, Czech, Swedish, Finnish, Turkish, Thai, Vietnamese

### Warranty
5-year warranty, see *axis.com/warranty*

### Part numbers
Available at *axis.com/products/axis-q4809-pve#part-numbers*

## Sustainability

### Substance control
PVC free, BFR/CFR free in accordance with JEDEC/ECA Standard JS709
RoHS in accordance with EU RoHS Directive 2011/65/EU/ and EN 63000:2018
REACH in accordance with (EC) No 1907/2006. For SCIP UUID, see *echa.europa.eu*

### Materials
Renewable carbon-based plastic content: 32.6% (recycled: 16%, bio-based: 14%, carbon capture based: 2.6%)
To read more about sustainability at Axis, go to *axis.com/about-axis/sustainability*

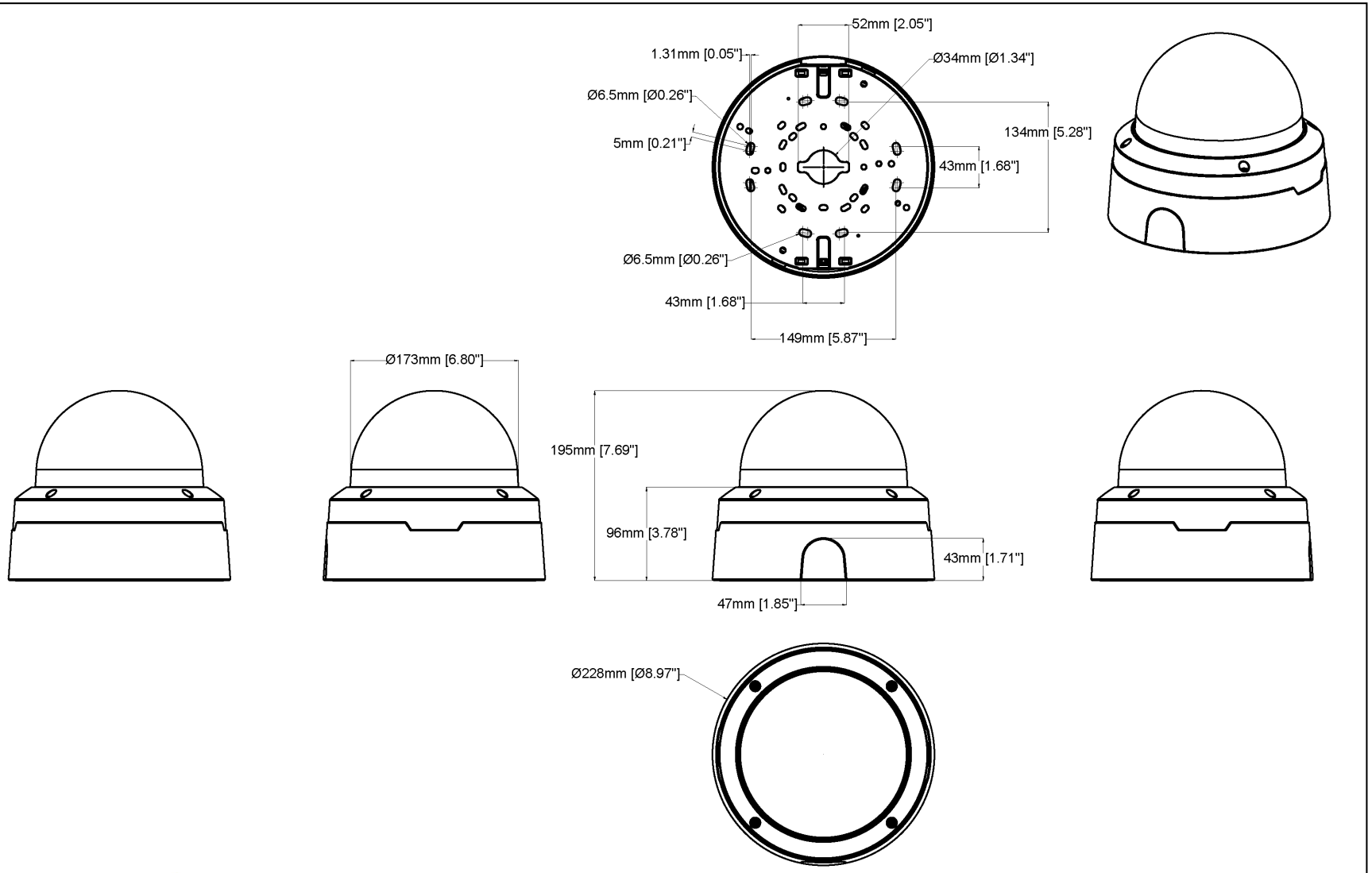
### Environmental responsibility
*axis.com/environmental-responsibility*
Axis Communications is a signatory of the UN Global Compact, read more at *unglobalcompact.org*

4. *PTR functionality is only guaranteed from -20 °C*
5. *Video stream becomes available within 60 minutes.*

## Detect, Observe, Recognize, Identify (DORI)

| | DORI definition | Distance |
|---|---|---|
| Detect | 25 px/m (8 px/ft) | 130 m (426 ft) |
| Observe | 63 px/m (19 px/ft) | 51.6 m (169.2 ft) |
| Recognize | 125 px/m (38 px/ft) | 26 m (85 ft) |
| Identify | 250 px/m (76 px/ft) | 13 m (43 ft) |

The DORI values are calculated using pixel densities for different use cases as recommended by the EN-62676-4 standard. The calculations use the center of the image as the reference point and consider lens distortion. The possibility to recognize or identify a person or object depends on factors such as object motion, video compression, lighting conditions, and camera focus. Use margins when planning. The pixel density varies across the image, and the calculated values can differ from the distances in the real world.

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|---|---|---|---|
| Revision | v.01 | Revision date | 2024-03-12 |
| Paper size | A4 | Release date | 2024-03-12 |
| Created by | MS | Scale | 1:5 |

## Highlighted capabilities

### Axis Edge Vault

Axis Edge Vault is the hardware-based cybersecurity platform that safeguards the Axis device. It forms the foundation that all secure operations depend on and offer features to protect the device's identity, safeguard its integrity and protect sensitive information from unauthorized access. For instance, **secure boot** ensures that a device can boot only with **signed OS**, which prevents physical supply chain tampering. With signed OS, the device is also able to validate new device software before accepting to install it. And the **secure keystore** is the critical building-block for protecting cryptographic information used for secure communication (IEEE 802.1X, HTTPS, Axis device ID, access control keys etc.) against malicious extraction in the event of a security breach. The secure keystore and secure connections are provided through a Common Criteria or FIPS 140 certified hardware-based cryptographic computing module.

Furthermore, signed video ensures that video evidence can be verified as untampered. Each camera uses its unique video signing key, which is securely stored in the secure keystore, to add a signature into the video stream allowing video to be traced back to the Axis camera from where it originated.

To read more about Axis Edge Vault, go to *axis. com/ solutions/edge-vault*.

### AXIS Object Analytics

AXIS Object Analytics is a preinstalled, multifeatured video analytics that detects and classifies humans, vehicles, and types of vehicles. Thanks to AI-based algorithms and behavioral conditions, it analyzes the scene and their spatial behavior within – all tailored to your specific needs. Scalable and edge-based, it requires minimum effort to set up and supports various scenarios running simultaneously.

### Horizon straightening

Horizon straightening is a feature in panoramic multisensor cameras that compensates for any physical tilt of the camera, thereby removing distortion and enabling the horizon to be straight even though it is not in the middle of the image. All objects and lines that are vertical in real life stay vertical also in the image.

### Zipstream

The Axis Zipstream technology preserves all the important forensic in the video stream while lowering bandwidth and storage requirements by an average of 50%. Zipstream also includes three intelligent algorithms, which ensure that relevant forensic information is identified, recorded, and sent in full resolution and frame rate.