

AXIS Q641 1-LE Bispectral PTZ Camera

AI-powered, all-in-one thermal and visual camera

This all-in-one bispectral PTZ camera includes a thermal camera for reliable detection and verification 24/7 in all weather and light conditions, and a visual camera with an extremely light-sensitive 1/2" sensor. A deep learning processing unit (DLPU) runs advanced features and powerful analytics on the edge. For instance, AXIS Object Analytics is preinstalled to detect, classify, track, and count humans, vehicles, and types of vehicles. It's also compatible with AXIS Perimeter Defender for enhanced area detection using thermal technology. Furthermore, Axis Edge Vault, a hardware-based cybersecurity platform, safeguards the device and offers FIPS 140-3 Level 3 certified secure key storage and operations.

- > **7mm QVGA for reliable thermal detection**
- > **Outstanding visual identification**
- > **Excellent image quality in all light conditions**
- > **Next-generation AI-powered analytics**
- > **Built-in cybersecurity with Axis Edge Vault**



AXIS Q6411-LE Bispectral PTZ Camera

Camera

Variants

AXIS Q6411-LE 8.3 fps
AXIS Q6411-LE 30 fps

Visual sensor

Image sensor

1/2" progressive scan CMOS

Lens

Optical zoom: 31x
Focal length: 6.91 – 214.64 mm
Horizontal field of view: 59.6 – 1.0°
Vertical field of view: 36.3° – 0.5°
Autofocus, P-iris

Day and night

Automatically removable infrared-cut filter
Removable infrared-pass filter

Minimum illumination

Color: 0.06 lux at 30 IRE, F1.36
B/W: 0.001 lux at 30 IRE, F1.36, 0 lux with IR illumination on
Color: 0.09 lux at 50 IRE, F1.36
B/W: 0.008 lux at 50 IRE, F1.36, 0 lux with IR illumination on

Shutter speed

1/111000 s to 1/2 s

Pan/Tilt/Zoom

Pan: 360° endless, 0.05° – 150°/s
Tilt: +20 to -90°, 0.05° – 150°/s
Nadir flip, 300 preset positions, tour recording (max 10, max duration 16 minutes each), guard tour (max 100), control queue, on-screen directional indicator, set new pan 0°
Zoom: 31x optical, 12x digital, Total 372x zoom
Adjustable zoom speed

Resolution

1920x1080 (HDTV 1080p) to 640x360

Frame rate

Up to 50/60 fps (50/60 Hz) in all resolutions

Signal-to-noise ratio

>55 dB

Image settings

Compression, color, brightness, sharpness, white balance, exposure control, exposure zones, image freeze on PTZ, scene profiles, rotation, electronic image stabilization (EIS), defogging, barrel distortion correction
Contrast, local contrast, autofocus, Forensic WDR: Up to 120 dB depending on scene, 100 individual polygon privacy masks including mosaic and chameleon privacy masks

Thermal sensor

Image sensor

Uncooled microbolometer
384x288 pixels, pixels size: 17 µm
Spectral range: 8-14 µm

Lens

Athermalized
7 mm, F1.18
Horizontal field of view: 55°
Vertical field of view: 41°
Near focus distance: 1.2 m (3.9 ft)

Sensitivity

NETD <20 mK @25 °C, F1.0

Pan/Tilt/Zoom

Pan: 360° endless, 0.05° – 150°/s
Tilt: +20 to -90°, 0.05° – 150°/s
Nadir flip, 300 preset positions, tour recording (max 10, max duration 16 minutes each), guard tour (max 100), control queue, on-screen directional indicator, set new pan 0°

Resolution

Sensor is 384x288. Image can be scaled up to 768x576.

Frame rate

Up to 8.3 fps or 30 fps depending on model

Image settings

Barrel distortion correction, gain, electronic image stabilization, contrast, sharpness, brightness, exposure zones, compression, dynamic text and image overlay, polygon privacy mask, thermal palettes

System on chip (SoC)

Model

ARTPEC-9

Memory

4096 MB RAM, 8192 MB Flash

Compute capabilities

Deep learning processing unit (DLPU)

Video

Video compression

AV1

H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles

H.265 (MPEG-H Part 2/HEVC) Main Profile

Motion JPEG

Video streaming

Multiple, individually configurable streams in AV1, H.264, H.265 and Motion JPEG

Axis Zipstream technology in AV1, H.264 and H.265

Controllable frame rate and bandwidth

VBR/ABR/MBR AV1/H.264/H.265

Low latency mode

Video streaming indicator

Audio

Input

Input through portcast technology

Output

Output through portcast technology

Network

Security

Multi-level user, IP address filtering, HTTPS¹ encryption, IEEE 802.1x (EAP-TLS)¹, network access control, user access log, centralized certificate management, secure keystore (CC EAL4 certified), TPM-equivalent secure element (CC EAL 6+, FIPS 140-3 Level 3)

Network protocols

IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS¹, HTTP/2, TLS¹, QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, mDNS (Bonjour), UPnP[®], SNMP v1/v2c/v3 (MIB-II), DNS/DNSv6, DDNS, NTP, PTP, NTS, RTSP, RTCP, RTP, SRTP/RTSPS, TCP, UDP, IGMPv1/v2/v3, DHCPv4/v6, ARP, SSH, NTCIP, LLDP, CDP, MQTT v3.1.1, Secure syslog (RFC 3164/5424, UDP/TCP/TLS), Link-Local address (ZeroConf)

System integration

Application Programming Interface

Open API for software integration, including VAPIX[®] and AXIS Camera Application Platform; specifications at axis.com

One-Click Cloud Connection

ONVIF[®] Profile G, ONVIF[®] Profile M, ONVIF[®] Profile S, and ONVIF[®] Profile T, specification at onvif.org

Onscreen controls

IR illumination

Edge-to-edge

Speaker pairing

Radar pairing

Event conditions

Audio: audio clip playing

Device status: above operating temperature, above or below operating temperature, below operating temperature, fan failure, IP address removed, IP address blocked, live stream active, network lost, new IP address, PTZ power failure, shock detected, system ready, within operating temperature

Edge storage: recording ongoing, storage disruption, storage health issues detected

I/O: digital input is active, manual trigger, virtual input is active

MQTT: MQTT client connected

PTZ: PTZ control queue, PTZ malfunctioning, PTZ movement, PTZ preset position reached, PTZ ready

Scheduled and recurring: schedule

Video: average bitrate degradation, day-night mode

1. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (openssl.org), and cryptographic software written by Eric Young (ey@cryptosoft.com).

Event actions

Audio clips: play, stop
Day-night mode
Defog: set defog mode, set defog mode while the rule is active
Guard tour, guard tour (recorded)
I/O: toggle I/O once, toggle I/O while the rule is active
Illumination: use lights, use lights while the rule is active
Images: FTP, SFTP, HTTP, HTTPS, network share and email
MQTT: MQTT publish message
Notification: HTTP, HTTPS, TCP and email
Overlay text
Preset positions
Recordings: record video, record video while the rule is active
Security: erase configuration
SNMP: trap messages, trap messages while the rule is active
Tracking: start temporary detection, toggle autotracking, toggle autotracking profile, toggle autotracking profile while the rule is active, toggle autotracking while the rule is active
Video clips: FTP, HTTP, HTTPS, SFTP, email, network share

Analytics

Applications

Included

Visual: AXIS Object Analytics, AXIS Scene Metadata, AXIS Video Motion Detection, AXIS OSDI Zone, Orientation Aid PTZ, advanced gatekeeper, autotracking 2, AXIS Image Health Analytics, AXIS Live Privacy Shield

Supported

Support for AXIS Camera Application Platform enabling installation of third-party applications, see axis.com/acap

AXIS Object Analytics

Visual:

Object classes: humans, vehicles (types: cars, buses, trucks, bikes, other)

Scenarios: line crossing, object in area, time in area, crossline counting, 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

Image health analytics

Visual

Detection settings:

Tampering: blocked image, redirected image

Image degradation: blurred image, underexposed image

Other features: sensitivity, validation period

AXIS Scene Metadata

Visual:

Object classes: humans, faces, vehicles (types: cars, buses, trucks, bikes), license plates

Object attributes: confidence, position

Approvals

EMC

EN 55032 Class A, EN 55035, EN 61000-6-1,

EN 61000-6-2, CISPR 35, EAC, EN 50121-4

Australia/New Zealand: RCM AS/NZS CISPR 32 Class A

Canada: ICES-3(A)/NMB-3(A)

Japan: VCCI Class A

Korea: KS C 9835, KS C 9832 Class A

USA: FCC Part 15 Subpart B Class A

Railway: IEC 62236-4

Safety

IEC/EN/UL 62368-1, CAN/CSA C22.2 No. 62368-1,

IEC/EN 62471 risk group 1

Environment

IEC/EN 62262 IK10, IEC/EN 60529 IP66, NEMA 250,

Type 4X, NEMA TS 2 (2.2.7-2.2.9), IEC 60068-2-1,

IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14,

IEC 60068-2-27, IEC 60068-2-78,

ISO 21207 (Method B), ISO 12944-6 C5,

MIL-STD-810H (Method 501.7, 502.7, 505.7, 506.6,

507.6, 509.7, 510.7, 521.4)

Network

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 OpenID Authorization Code Flow for centralized ADFS account management, password protection, AES-XTS-Plain64 256bit SD card encryption

Hardware: Axis Edge Vault cybersecurity platform
Secure keystore: secure element (CC EAL6+, FIPS 140-3 Level 3), 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)², IEEE 802.1AE (MACsec PSK/EAP-TLS), HTTPS/HSTS², TLS v1.2/v1.3², Network Time Security (NTS), X.509 Certificate PKI, host-based firewall

Documentation

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-, NEMA 4X- and IK10-rated³

Color: white NCS S 1002-B

Repaintable metal casing (aluminum), hard coated Polycarbonate (PC)

Power

PoE, IEEE802.3bt Class 6

Typical 13 W (no IR), max 51 W

Features: power profiles, power meter

Connectors

RJ45 10BASE-T/100BASE-TX/1000BASE-T

RJ45 Push-pull Connector (IP66)

Audio: Audio and I/O connectivity via portcast technology

IR illumination

Optimized IR with power-efficient, long-life 850 nm IR LEDs

Range of reach 150 m (492 ft) or more depending on the scene

Storage

Support for SD/SDHC/SDXC card

Support for SD card encryption (AES-XTS-Plain64 256bit)

Support for recording to network-attached storage (NAS)

For SD card and NAS recommendations see axis.com

Operating conditions

Full power with 60 W midspan: -40 °C to 55 °C (-40 °F to 131 °F)

Maximum temperature according to NEMA TS 2 (2.2.7): 74 °C (165 °F)

Arctic temperature control: Start-up as low as -40 °C (-40 °F)

Humidity 10–100% RH (condensing)

Storage conditions

-40 °C to 65 °C (-40 °F to 149 °F)

Humidity 5–95% RH (non-condensing)

Dimensions

Height: 304 mm (12.0 in)

With: ø 239 mm (9.4 in)

Weight

6 200 g (13.7 lb)

Included accessories

Installation guide, Windows® decoder 1-user license, IP66-rated network connector, repaint template, paint paper

Optional accessories

AXIS TU8003 90 W Connectivity Midspan

AXIS T91/T94 Mounting Accessories

AXIS Surveillance Cards

For more accessories, see axis.com

Video management software

AXIS Companion, AXIS Camera Station, video management software from Axis Application

Development Partners available at axis.com/vms

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 (ey@cryptsoft.com).

3. Excluding front windows

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

Export control

This product is subject to export control regulations, and you should always comply with all applicable national and international export or re-export control regulations.

Part numbers

Available at axis.com/products/axis-q6411-le#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 2015/863, and standard EN IEC 63000:2018
REACH in accordance with (EC) No 1907/2006. For SCIP UUID, see echa.europa.eu

Materials

Renewable carbon-based plastic content: 13%
(recycled: 10%, bio-based: 3%, carbon capture based: 0%)
Screened for conflict minerals in accordance with OECD guidelines
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

Power-optimized performance

Power

PoE, IEEE802.3bt Class 6
Low power profile: typical 13 W (no IR), max 25 W.
With IR: 36 W
PoE, IEEE 802.3at Class 4
Full power profile: typical 13 W (no IR), max 25 W (with IR: 25 W)
Low power profile: typical 13 W (no IR), max 21 W (with IR: 25 W)

Operating conditions

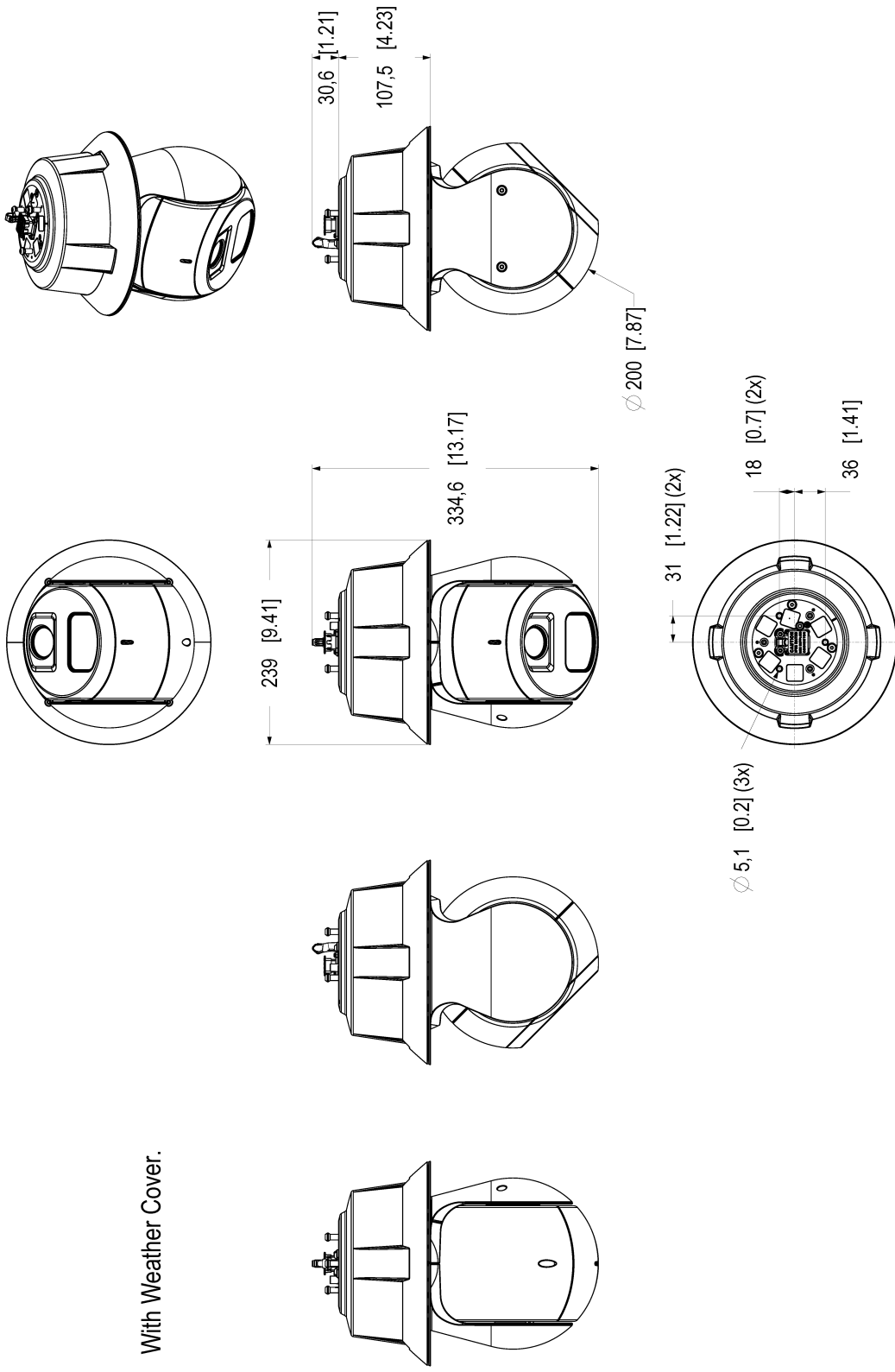
Full power profile with 30 W midspan: -40 °C to 55 °C (-40 °F to 131 °F)
Low power profile with 60 W or 30 W midspan: -10 °C to 55 °C (-4 °F to 131 °F)

Detect, Observe, Recognize, Identify (DORI)

	DORI definition	Distance (wide)	Distance (tele)
Detect	25 px/m (8 px/ft)	65.8 m (216 ft)	1749.3 m (5737.7 ft)
Observe	63 px/m (19 px/ft)	26.1 m (85.6 ft)	693.7 m (2275 ft)
Recognize	125 px/m (38 px/ft)	13.2 m (43.3 ft)	349.2 m (1145 ft)
Identify	250 px/m (76 px/ft)	6.6 m (21.6 ft)	174.2 m (571.4 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.

With Weather Cover.



Dimensions in mm [inch]	
Code	Rev
Q6411-LE-23	1.0
Created	2013
Drawn by	MLP
3370673	A2
	(1/2)

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