

AXIS Q1656-DLE Radar-Video Fusion Camera

Next-level detection and visualization

This unique device fuses two powerful technologies to deliver next-level detection and visualization for reliable wide-area intrusion protection 24/7. Video and radar analytics come together in AXIS Object Analytics to provide precise localization and object classification powered by deep learning and distance and speed measurements based on an object's radar signature and movement characteristics. By default, our intelligent fusion system handles notifications in the most advantageous way depending on what best suits the circumstances. Or, if you prefer, you can choose between minimizing false notifications or never missing a thing.

- > **Two powerful technologies in one device**
- > **Increased scene intelligence**
- > **Accurate detection 24/7**
- > **Built-in cybersecurity features**
- > **Premium Axis Q-line camera functionality**



AXIS Q1656-DLE Radar-Video Fusion Camera

Camera

Image sensor

1/1.8" progressive scan RGB CMOS

Lens

Varifocal, 3.9–10 mm, F1.5
Horizontal field of view: 96°–44°
Vertical field of view: 63°–26°
Autofocus, i-CS lens, IR corrected, remote zoom and focus, P-Iris control
Minimum focus distance: 0.5 m (1.6 ft)

Day and night

Automatically removable infrared-cut filter

Minimum illumination

4 MP 25/30 fps with Forensic WDR and Lightfinder 2.0
Color: 0.05 lux at 50 IRE, F1.5
B/W: 0.01 lux at 50 IRE, F1.5
4 MP 50/60 fps with Lightfinder 2.0
Color: 0.1 lux at 50 IRE, F1.5
B/W: 0.02 lux at 50 IRE, F1.5
0 lux with IR illumination on

Shutter speed

1/47500 s to 1 s

Radar

Profiles

One-directional road monitoring
Two-directional road monitoring
Area monitoring

Sensor

FMCW (Frequency Modulated Continuous Wave)

Object data

Object type (classes: humans, vehicles, unknown),
range, direction, velocity

Frequency

61.0–61.5 GHz⁽¹⁾

RF transmit power

<100 mW (EIRP)
License-free. Unharmful radio-waves.

Recommended mounting height

3.5–12 m (11–39 ft)⁽²⁾

Recommended mounting tilt

15–45°⁽²⁾

Detection range

Road monitoring profiles: Up to 150 m (492 ft) when detecting a vehicle⁽³⁾

Area monitoring profile: 5–60 m (16–200 ft) when detecting a person⁽⁴⁾

5–90 m (16–300 ft) when detecting a vehicle⁽⁵⁾

Speed

One-directional road monitoring profile: Up to 360 km/h (224 mph) for oncoming vehicles. Up to 280 km/h (174 mph) for departing vehicles.

Two-directional road monitoring profile: Up to 200 km/h (125 mph)

Area monitoring profile: Up to 55 km/h (34 mph)

Field of detection

Horizontal: 95°

Speed accuracy

+/- 2 km/h (1.25 mph)

Distance accuracy

Road monitoring profiles: 0.8 m (2.6 ft)

Area monitoring profile: 0.5 m (1.6 ft)

Angle accuracy

95% percentile is <1.2°⁽⁶⁾

Spatial differentiation

3 m⁽⁷⁾

1. For road monitoring, center frequency is 61.340 GHz for channel 1 and 61.140 GHz for channel 2.
2. The mounting height and tilt affects the detection range. See user manual at axis.com for more information.
3. Measured at 7 m mounting height, with 15° tilt. The mounting height, tilt and placement of the radar-video fusion camera affects the detection range. See the user manual at axis.com for more information.
4. Measured at 5 m mounting height, with 25° tilt. See the user manual at axis.com for more information.
5. Measured at 5 m mounting height, with 25° tilt. See user manual at axis.com for more information.
6. Max error 1.3°
7. Minimum distance between moving objects.

Data refresh rate

10 Hz

Coverage

Area monitoring profile: 2700 m² (29000 sq ft) for persons

6100 m² (65600 sq ft) for vehicles

Coexistence zone

Frequency band: 61 GHz

Radius: 350 m (1148 ft)

Recommend number of radars: up to 8

Radar controls

Multiple detection zones, line crossing detection with one or two lines, exclude zones with filters for short-lived objects, object speed, and object type, configurable trigger duration

Radar transmission on/off, grid opacity, zone opacity, color scheme, trail lifetime, detection sensitivity, swaying object filter, small object filter, frequency channel, reference map calibration with options to scale, pan, and zoom map

System on chip (SoC)

Model

ARTPEC-8

Memory

2048 MB RAM, 8194 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

16:9 2688x1512 Quad HD to 160x90

4:3 2016x1512 to 160x120

Frame rate

No WDR: Up to 60/50 fps (60/50 Hz) in all resolutions

WDR: Up to 30/25 fps (60/50 Hz) in all resolutions

Video streaming

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

Axis Zipstream technology in H.264 and H.265

Controllable frame rate and bandwidth

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

Low latency mode

Video streaming indicator

Image settings

Saturation, contrast, brightness, Forensic WDR: Up to 120 dB depending on scene, white balance, day/night threshold, tone mapping, exposure mode, exposure zones, defogging, electronic image stabilization, compression, dynamic text and image overlay, polygon privacy mask

Scene profiles: forensic, vivid, traffic overview

Audio

Streaming

Two-way, full duplex

Noise reduction

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

Configurable bit rate

Input/output

External microphone input or line input, line output, ring power, digital audio input, automatic gain control

Network

Network protocols

IPv4, IPv6 USGv6, HTTP, HTTPS⁽⁸⁾, HTTP/2, TLS⁽⁸⁾, QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, Bonjour, UPnP®, SNMP v1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, PTP, RTSP, RTP, SRTP/RTSPS, TCP, UDP, IGMPv1/v2/v3, RTCP, ICMP, DHCPv4/v6, ARP, SOCKS, SSH, LLDP, MQTT v3.1.1, Secure syslog (RFC 3164/5424, UDP/TCP/TLS)

System integration

Application Programming Interface

Open API for software integration, including VAPIX® and AXIS Camera Application Platform; specifications at axis.com/developer-community.

One-click cloud connection

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

8. 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).

Onscreen controls

Electronic image stabilization
Day/night shift
Defogging
Wide dynamic range
Video streaming indicator
IR illumination
Heater

Edge-to-edge

Speaker pairing
PTZ camera pairing

Event conditions

Application
Audio: audio detection, audio clip playing
Device status: above/below/within operating temperature, casing open, IP address blocked, IP address removed, live stream active, network lost, new IP address, ring power overcurrent protection, system ready, radar data failure; interference, no data, tampering
Digital audio: digital signal contains Axis metadata, digital signal has invalid sample rate, digital signal missing, digital signal okay
Edge storage: recording ongoing, storage disruption, storage health issues detected
I/O: digital input, manual trigger, virtual input
MQTT: stateless
Radar motion detection
Scheduled and recurring: schedule
Video: average bitrate degradation, day-night mode, tampering

Event actions

Overlay text, external output activation, play audio clip, zoom preset
I/O: toggle I/O once, toggle I/O while the rule is active
Illumination: use lights, use lights while the rule is active
MQTT: publish
Notification: HTTP, HTTPS, TCP, and email
Pre- and post-alarm video or image buffering for recording or upload
Radar: radar autotracking, radar detection
Record video: 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

Data streaming

Video, radar, and fusion metadata with relative position, GPS position⁹, velocity, direction, and object type

Built-in installation aids

Remote zoom and focus, remote back focus, leveling assistant, pixel counter

Analytics

Applications

Included

AXIS Object Analytics, AXIS Scene Metadata, AXIS Image Health Analytics
AXIS Video Motion Detection
AXIS Speed Monitor⁽¹⁰⁾

Supported

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

AXIS Object Analytics

Object classes (radar-video fusion): humans, vehicles

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

Scenarios (radar-video fusion): line crossing, object in area

Scenarios (video only): crossline counting, occupancy in area, time in area

Up to 10 scenarios

Key features: detection sensitivity, object speed

Other features: triggered objects visualized with color-coded bounding boxes

Polygon include/exclude areas

Perspective configuration

ONVIF Motion Alarm event

AXIS Image Health Analytics

Detection settings:

Tampering: blocked image, redirected image

Image degradation: blurred image, underexposed image

Other features: sensitivity, validation period

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

9. Enter the camera's GPS position manually to get the objects' GPS position in the data stream.

10. Available for download

Approvals

EMC

EN 55032 Class A, EN 55035, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 50121-4

Australia/New Zealand: CISPR 24, CISPR 35, RCM AS/NZS CISPR 32 Class A

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

Japan: VCCI Class A

Korea: KS C 9832 Class A, KS C 9815, KS C 9835, KS C 9547

USA: FCC Part 15 Subpart B Class B

Railway: IEC 62236-4

Safety

IEC/EN/UL 62368-1, IEC/EN/UL 60950-22, IEC 62471, 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, IEC/EN 62262 IK10, NEMA 250 Type 4X, NEMA TS 2 (2.2.7-2.2.9), ISO 21207 (Method B)

Wireless

EN 305550, EN 301489-1, EN 301489-3, EN 62311, FCC Part 15 Subpart C

Network

NIST SP500-267

Cybersecurity

ETSI EN 303 645, BSI IT Security Label, FIPS 140, EN 18031-1

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), AES-XTS-Plain64 256bit SD card encryption

Hardware: Axis Edge Vault cybersecurity platform TPM 2.0 (CC EAL4+, FIPS 140-2 Level 2), secure element (CC EAL 6+), system-on-chip security (TEE), Axis device ID, secure keystore, signed video, secure boot, encrypted filesystem (AES-XTS-Plain64 256bit)

Network security

IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2)⁽¹¹⁾, IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS⁽¹¹⁾, TLS v1.2/v1.3⁽¹¹⁾, 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-, and NEMA 4X-rated, IK10 impact-resistant aluminum enclosure with integrated dehumidifying membrane

weathershield with black anti-glare coating

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.

Sustainability

PVC free, BFR/CFR free, 2% recycled plastics, 6% bio-based plastics

Power

Power over Ethernet (PoE) IEEE 802.3at Type 2 Class 4 Typical 10 W, max 25.5 W

10–28 VDC, typical 9.5 W, max 25.5 W

Power redundancy

Connectors

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

Terminal block for two supervised and two unsupervised configurable inputs / digital outputs (12 VDC output, max load 50 mA)

RS485/RS422, 2 pcs, 2 pos, full duplex, terminal block

DC input, terminal block, 3.5 mm mic/line in, 3.5 mm line out

IR illumination

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

Range of reach 38 m (125 ft) or more depending on the scene

11. 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).

Illumination LED

Power-efficient, long-life white LED
Range of reach 18 m (60 ft) or more depending on the scene

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 60 °C (-40 °F to 140 °F)
Start-up at -30 °C (-22 °F)
Maximum temperature according to NEMA TS 2 (2.2.7):
74 °C (165 °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

404 x 159 x 234 mm (16 x 6.3 x 9.2 in)

Weight

5 kg (11 lb)

Included accessories

AXIS TQ1003-E Wall Mount, sunshield, connector kit, resistorx® T20 tool, installation guide, Windows® decoder 1-user license

Optional accessories

AXIS T8415 Wireless Installation Tool
AXIS Surveillance Cards
For more accessories, see axis.com

Supporting software

AXIS Radar Autotracking for PTZ (Slew to Cue)
For supported cameras, see axis.com/products/axis-radar-autotracking

Video management software

AXIS Camera Station and video management software from Axis Application Development Partners available at axis.com/vms

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
