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

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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	Area monitoring Road monitoring
Sensor	FMCW (Frequency Modulated Continuous Wave)
Object data	Object type (classes: humans, vehicles, unknown), range, direction, velocity
Frequency	**Channel 1:** 61.00–61.25 GHz **Channel 2:** 61.25–61.50 GHz
RF transmit power	<100 mW (EIRP) License free. Unharmful radio-waves.
Recommended mounting height	3.5–12 m (11–39 ft)[a]
Recommended mounting tilt	15–45°[a]
Detection range	**Area monitoring profile:** 5–60 m (16–200 ft) when detecting a person[b] 5–90 m (16–300 ft) when detecting a vehicle[b] **Road monitoring profile:** Up to 150 m when detecting a vehicle[c]
Radial speed	**Area monitoring profile:** Up to 55 km/h (34 mph) **Road monitoring profile:** up to 200 km/h (125 mph)
Field of detection	Horizontal: 95°
Speed accuracy	+/- 2 km/h (1.25 mph)
Distance accuracy	**Area monitoring profile:** 0.5 m (1.6 ft) **Road monitoring profile:** 0.8 m (2.6 ft)
Angle accuracy	1°
Spatial differentiation	3 m[d]
Data refresh rate	10 Hz
Coverage	**Area monitoring profile:** 2700 m^2 (29000 sq ft) for persons 6100 m^2 (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

Audio streaming	Two-way, full duplex Noise reduction
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 Configurable bit rate
Audio 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[e], HTTP/2, TLS[e], QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, Bonjour, UPnP®, SNMP v1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, 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* One-click cloud connection ONVIF® Profile G, ONVIF® Profile M, ONVIF® Profile S, and ONVIF® Profile T, specification at *onvif.org*
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 position[f], 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[g] **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

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, 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 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)[e], IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS[e], TLS v1.2/v1.3[e], 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	OptimizedIR with power-efficient, long-life 850 nm IR LEDs Range of reach 38 m (125 ft) or more depending on the scene
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 T94Q01A 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*

a. *The mounting height and tilt affects the detection range. See user manual at axis.com for more information.*
b. *Measured at 5 m mounting height, with 25° tilt. See user manual at axis.com for more information.*
c. *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.*
d. *Minimum distance between moving objects.*
e. *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).*
f. *Enter the camera's GPS position manually to get the objects' GPS position in the data stream.*
g. *Available for download*