AXIS XFQ1656 Explosion-Protected Camera

Class/Division- and Zone-certified camera with deep learning

AXIS XFQ1656 is certified worldwide for use in hazardous locations (Class I/II/III Div 1, Zone 1,21, IIC, IIIC, and Ex I Mb certified). Ideal for health and safety applications, preinstalled smoke-alert analytics monitor for signs of smoke or fire in combustible environments. Plus, AXIS Object Analytics can detect people in restricted areas and supports safety compliance with hardhat detection. In addition, AXIS XFQ1656 can easily be integrated with production monitoring and industrial control systems to provide valuable image-based data, analyzed by deep learning algorithms. This can help improve scene understanding and offers valuable information about processes.

> **Worldwide hazardous area certifications**
> **Excellent light sensitivity**
> **Advanced analytics preinstalled**
> **Suitable for installation worldwide**
> **Axis Edge Vault safeguards device**

AXIS XFQ1656 Explosion-Protected Camera

Camera

Image sensor
1/1.8" progressive scan RGB CMOS

Lens
Varifocal, 3.9–10 mm, F1.5
Horizontal field of view: 81°–47°
Vertical field of view: 45°–27°
Autofocus, IR corrected, remote zoom and focus, i-CS lens, P-Iris control
Minimum focus distance: 0.5 m (1.6 ft)

Day and night
Automatic IR-cut filter
Hybrid IR 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
4 MP 25/30 fps with Forensic WDR and Lightfinder 2.0
With optional F0.9 lens
Color: 0.02 lux at 50 IRE, F0.9
B/W: 0.004 lux at 50 IRE, F0.9

Shutter speed
1/47500 s to 1 s

System on chip (SoC)

Model
ARTPEC-8

Memory
2048 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
16:9 2688x1512 Quad HD to 160x90
4:3 2016x1512 to 160x120

Frame rate
No WDR: Up to 50/60 fps (50/60 Hz) in all resolutions
WDR: Up to 25/30 fps (50/60 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

Signal-to-noise ratio
>55 dB

WDR
Forensic WDR: Up to 120 dB depending on scene

Multi-view streaming
Up to 8 individually cropped out view areas

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

Image settings
Saturation, contrast, brightness, sharpness, white balance, day/night threshold, local contrast, tone mapping, exposure mode, exposure zones, defogging, barrel distortion correction, electronic image stabilization, compression, rotation: 0°, 90°, 180°, 270° including Corridor Format, mirroring, dynamic text and image overlay, polygon and mosaic privacy mask
Scene profiles: Forensic, Vivid, Traffic overview

Image processing
Forensic WDR, Lightfinder 2.0

Pan/Tilt/Zoom

Digital PTZ, optical zoom, preset positions
Preset position tour

Audio

Audio features

AGC automatic gain control
Network speaker pairing

Audio streaming

Configurable duplex:
One-way (simplex, half duplex)
Two-way (half duplex, full duplex)

Audio input

10-band graphic equalizer
Input for external microphone, optional 5 V microphone
power
Digital input, optional 12 V ring power
Line input
Internal microphone

Audio output

Output via network speaker pairing or portcast
technology

Audio encoding

24bit LPCM, AAC-LC 8/16/32/44.1/48 kHz, G.711 PCM
8 kHz, G.726 ADPCM 8 kHz, Opus 8/16/48 kHz
Configurable bit rate

Network

Network protocols

IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS[1], HTTP/
2, TLS[1], 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

Autofocus
Electronic image stabilization
Day/night shift
Defogging
Wide dynamic range
Video streaming indicator
Privacy masks
Media clip
Timed wiper

Event conditions

Application
Audio: audio clip playing
Device status: above/below/within operating
temperature, 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
Scheduled and recurring: schedule
Video: average bitrate degradation, day-night mode,
tampering

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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 (eay@cryptsoft.com).*

Event actions
Audio clips: play, play while the rule is active, stop
Day-night mode
Defog: set defog mode, set defog mode while the rule is active
I/O: toggle I/O once, toggle I/O while the rule is active
MQTT: publish
Notification: HTTP, HTTPS, TCP and email
Overlay text
Pre- and post-alarm video or image buffering for recording or upload
Recordings: record, record while the rule is active
SNMP traps: send, send while the rule is active
Status LED
Upload of images or video clips: FTP, SFTP, HTTP, HTTPS, network share and email
WDR mode
Wiper

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, smoke alert
Supported
AXIS Perimeter Defender, 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: humans, vehicles (types: cars, buses, trucks, bikes, other)
Trigger conditions: line crossing, object in area, time in area, PPE monitoring
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 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

Supply chain
TAA compliant

EMC
EN 55035, EN 55032 Class A, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2
Australia/New Zealand: RCM AS/NZS CISPR 32 Class A
Canada: ICES-3(A)/NMB-3(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. 3IS 13252

Environment
IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-64, IEC 60068-2-78, UL 50E

Network
IPv6 USGv6, NIST SP500-267

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

Explosion
IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-31, UL 1203, UL 60079-1, UL 60079-31, CSA C22.2 No. 30, CSA C22.2 No. 25, CSA C22.2 No. 60079-0, CSA C22.2 No. 60079-1, CSA C22.2 No. 60079-31, UL121201

Certifications

Type F31111
ATEX:
I M2 Ex db I Mb
II 2 G Ex db IIC T5 Gb
II 2 D Ex tb IIIC T100°C Db
Certificate: ExVeritas 20ATEX0651X
IECEx:
Ex db I Mb
Ex db IIC T5 Gb
Ex tb IIIC T100°C Db
Certificate: EXV 20.0017X
cMETus:
Class I Div 1 Groups B,C,D T5
Class II Div 1 Groups E,F,G T5
Class I Zone 1 AEx db IIC Gb
Zone 21 AEx tb IIIC
Certificate: MET E115198

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, Axis Cryptographic Module (FIPS 140-2 level 1)
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)[2], IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS[2], TLS v1.2/v1.3[2], 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-, IP67- and IP68-rated, electropolished SUS316L (EN 1.4404) stainless steel casing for maximum corrosion protection
IK08-rated front glass, IK10-rated housing
Wiper included

Power
Power over Ethernet (PoE) IEEE 802.3bt Type 3 Class 6
Typical 11.5 W, max 51W
100–240 V AC, typical 13.3 V A, max 56 V A

Connectors
Network: RJ45 10BASE-T/100BASE-TX/1000BASE-T PoE
Network: SFP connector
I/O: Terminal block for two supervised and two unsupervised configurable inputs / digital outputs (12 V DC output, max load 50 mA)
Serial communication: RS485, 2 pos, terminal block
Power: AC input, terminal block
Audio: 3.5 mm mic/line in, 3.5 mm line out
Auxiliary output: 48 V DC 14.4 W, 0.3 A
Two M25x1.5 cable entries
Two M20x1.5 cable entries

Storage
256 GB microSD/microSDHC/microSDXC card included
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
With PoE: -40 °C to 60 °C (-40 °F to 140 °F)
With AC/SFP: -40 °C to 55°C (-40 °F to 131 °F)
Humidity 10–100% RH (condensing)

Storage conditions
-40 °C to 60 °C (-40 °F to 140 °F)
Humidity 5-95% RH (non-condensing)

Dimensions
For the overall product dimensions, see the dimension drawing in this datasheet.

Weight
9 kg (19.8 lb)

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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).*

Box content

Camera, installation guide, installation manual IM001,
AXIS TQ1903-E Swivel Joint,
AXIS TQ1924–E Washer Nozzle,
AXIS TQ1917 Adapter M25x1.5-3/4 NPT, connector kit,
H4 bit, owner authentication key, Declaration of
Conformity

Optional accessories

AXIS TQ1001-E Wall Mount,
AXIS TQ1301-E Pole Mount 50-150 mm[3],
TQ1303-E Corner Mount[4]
For more accessories, see *axis.com*

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-xfq1656#part-numbers*

Sustainability

Substance control

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

Screened for conflict minerals in accordance with OECD
guidelines
To read more about sustainability at Axis, go to *axis.
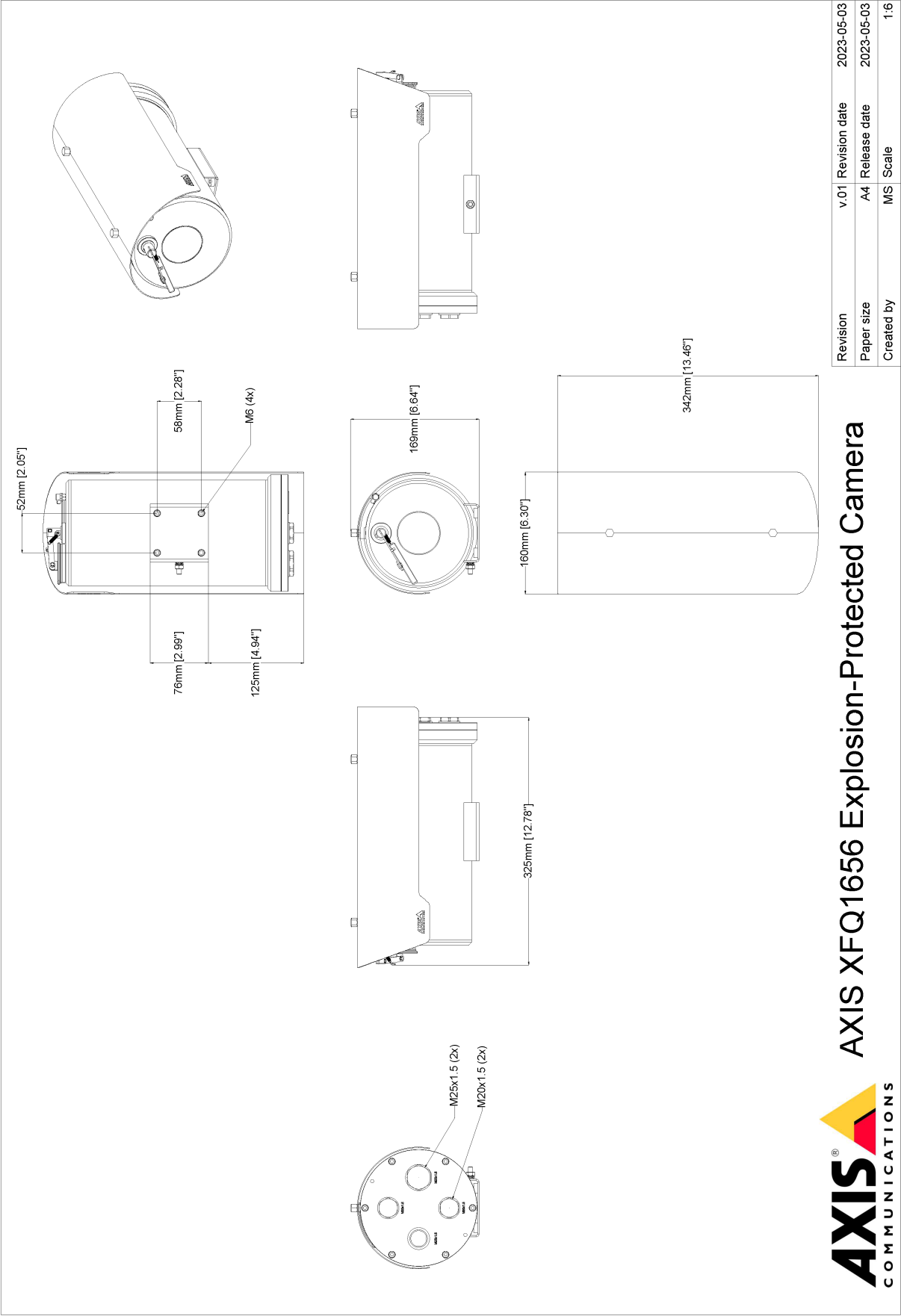com/about-axis/sustainability*

Environmental responsibility

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

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3. *AXIS TQ1301-E Pole Mount must be installed on AXIS TQ1001-E Wall Mount*
4. *AXIS TQ1303-E Corner Mount must be installed on AXIS TQ1001-E Wall Mount*

Dimension drawing

AXIS XFQ1656 Explosion-Protected Camera

58mm [2.28"]
M6 (4x)
52mm [2.05"]
76mm [2.99"]
125mm [4.94"]
169mm [6.64"]
342mm [13.46"]
160mm [6.30"]
325mm [12.78"]
M25x1.5 (2x)
M20x1.5 (2x)

Revision	v.01	Revision date	2023-05-03
Paper size	A4	Release date	2023-05-03
Created by	MS	Scale	1:6

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Highlighted capabilities

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.

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*.

Electronic image stabilization

Electronic image stabilization (EIS) provides smooth video in situations where a camera is subject to vibrations. Built-in gyroscopic sensors continuously detect the camera's movements and vibrations, and they automatically adjust the frame to ensure you always capture the details you need. Electronic image stabilization relies on different algorithms for modeling camera motion, which are used to correct the images.

Forensic WDR

Axis cameras with wide dynamic range (WDR) technology make the difference between seeing important forensic details clearly and seeing nothing but a blur in challenging light conditions. The difference between the darkest and the brightest spots can spell trouble for image usability and clarity. Forensic WDR effectively reduces visible noise and artifacts to deliver video tuned for maximal forensic usability.

Lightfinder

The Axis Lightfinder technology delivers high-resolution, full-color video with a minimum of motion blur even in near darkness. Because it strips away noise, Lightfinder makes dark areas in a scene visible and captures details in very low light. Cameras with Lightfinder discern color in low light better than the human eye. In surveillance, color may be the critical factor to identify a person, an object, or a vehicle.

For more information, see *axis.com/glossary*