AXIS P1465-LE Bullet Camera

Fully featured, all-around 2 MP surveillance

Based on ARTPEC-8, AXIS P1465-LE delivers excellent image quality in 2 MP. It includes a deep learning processing unit enabling advanced features and powerful analytics based on deep learning on the edge. With AXIS Object Analytics, it can detect and classify humans, vehicles, and types of vehicles. Available with a wide or tele lens, this IP66/IP67, NEMA 4X, and IK10-rated camera can withstand winds up to 50 m/s. Lightfinder 2.0, Forensic WDR, and OptimizedIR ensure sharp, detailed images under any light conditions. Furthermore, Axis Edge Vault protects your Axis device ID and simplifies authorization of Axis products on your network.

> Lightfinder 2.0, Forensic WDR, OptimizedIR

> Analytics with deep learning

> Audio and I/O connectivity

> Built-in cybersecurity features

> Two lens alternatives

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Camera

Models	AXIS P1465-LE 9 mm AXIS P1465-LE 29 mm
Image sensor	1/2.8" progressive scan RGB CMOS Pixel size 2.9 µm
Lens	Varifocal, remote focus and zoom, P-Iris control, IR corrected **AXIS P1465-LE 9 mm:** Varifocal, 3-9 mm, F1.6-3.3 Horizontal field of view 117°-37° Vertical field of view 59°-20° Minimum focus distance: 0.5 m (1.6 ft) **AXIS P1465-LE 29 mm:** Varifocal, 10.9-29 mm, F1.7-1.7 Horizontal field of view 29°-11° Vertical field of view 16°-6° Minimum focus distance: 2.5 m (8.2 ft)
Day and night	Automatic IR-cut filter Hybrid IR filter
Minimum illumination	0 lux with IR illumination on **AXIS P1465-LE 9 mm:** **Color:** 0.06 lux, at 50 IRE F1.6 **B/W:** 0.01 lux, at 50 IRE F1.6 **AXIS P1465-LE 29 mm:** **Color:** 0.06 lux, at 50 IRE F1.7 **B/W:** 0.01 lux, at 50 IRE F1.7
Shutter speed	**With Forensic WDR:** 1/37000 s to 2 s **No WDR:** 1/71500 s to 2 s

System on chip (SoC)

Model	ARTPEC-8
Memory	1024 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:** 1920x1080 to 160x90 **16:10:** 1280x800 to 160x100 **4:3:** 1280x960 to 160x120
Frame rate	**With Forensic WDR:** Up to 25/30 fps (50/60 Hz) in all resolutions **No WDR:** Up to 50/60 fps (50/60 Hz) in all resolutions
Video streaming	Up to 20 unique and configurable video streams[a] Axis Zipstream technology in H.264 and H.265 Controllable frame rate and bandwidth VBR/ABR/MBR H.264/H.265 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, exposure mode, exposure zones, defogging, compression, orientation: auto, 0°, 90°, 180°, 270° including corridor format, mirroring of images, dynamic text and image overlay, polygon privacy masks, barrel distortion correction Scene profiles: forensic, vivid, traffic overview **AXIS P1465-LE 29 mm:** Electronic image stabilization
Image processing	Axis Zipstream, Forensic WDR, Lightfinder 2.0, OptimizedIR
Pan/Tilt/Zoom	Digital PTZ, digital zoom

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 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 8/16/32/44.1/48 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[b], HTTP/2, TLS[b], 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, TCP, UDP, IGMPv1/v2/v3, RTCP, ICMP, DHCPv4/v6, ARP, SSH, LLDP, CDP, MQTT v3.1.1, Syslog, Link-Local address (ZeroConf)

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*. ACAP includes Native SDK and Computer Vision SDK. One-click cloud connection ONVIF® Profile G, ONVIF® Profile M, ONVIF® Profile S and ONVIF® Profile T, specification at *onvif.org*
Video management systems	Compatible with AXIS Companion, AXIS Camera Station, video management software from Axis' Application Development Partners available at *axis.com/vms*
Onscreen controls	Autofocus Day/night shift Defogging Video streaming indicator Wide dynamic range IR illumination Privacy masks Media clip **AXIS P1465-LE 29 mm:** Electronic image stabilization
Event conditions	Application Device status: above operating temperature, above or below operating temperature, below operating temperature, within operating temperature, IP address removed, new IP address, network lost, system ready, ring power overcurrent protection, live stream active Digital audio input status Edge storage: recording ongoing, storage disruption, storage health issues detected I/O: digital input, manual trigger, virtual input MQTT: subscribe Scheduled and recurring: schedule Video: average bitrate degradation, day-night mode, tampering
Event actions	Audio clips: play, stop Day-night mode 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 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 WDR mode
Built-in installation aids	Pixel counter, remote zoom (3x optical), remote focus, auto rotation

Analytics

AXIS Object Analytics	**Object classes**: humans, vehicles (types: cars, buses, trucks, bikes) **Trigger conditions**: line crossing, object in area, time in area[BETA] Up to 10 scenarios Metadata visualized with trajectories and color-coded bounding boxes Polygon include/exclude areas Perspective configuration ONVIF Motion Alarm event

Metadata	**Object data**: Classes: humans, faces, vehicles (types: cars, buses, trucks, bikes), license plates Confidence, position **Event data**: Producer reference, scenarios, trigger conditions
Applications	**Included** AXIS Object Analytics AXIS Live Privacy Shield, AXIS Video Motion Detection, active tampering, shock detection **Supported** AXIS Perimeter Defender, AXIS Speed Monitor[c] Support for AXIS Camera Application Platform enabling installation of third-party applications, see *axis.com/acap*

Approvals

Product markings	CSA, UL/cUL, BIS, UKCA, CE, KC, EAC
Supply chain	NDAA compliant, TAA compliant
EMC	CISPR 35, CISPR 32 Class A, EN 55035, EN 55032 Class A, EN 50121-4, 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) **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	CAN/CSA C22.2 No. 62368-1 ed. 3, IEC/EN/UL 62368-1 ed. 3, IEC/EN 62471 risk group exempt
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, NEMA TS 2 (2.2.7-2.2.9)
Network	NIST SP500-267

Cybersecurity

Edge security	**Software:** Signed firmware, brute force delay protection, digest authentication, password protection, AES-XTS-Plain64 256bit SD card encryption **Hardware:** Secure boot, Axis Edge Vault with Axis device ID, signed video, secure keystore (CC EAL4 certified hardware protection of cryptographic operations, certificates and keys)
Network security	IEEE 802.1X (EAP-TLS)[b], IEEE 802.1AR, HTTPS/HSTS[b], TLS v1.2/v1.3[b], Network Time Security (NTS), X.509 Certificate PKI, IP address filtering
Documentation	AXIS Hardening Guide AXIS Vulnerability Management Policy AXIS Security Development Model To download documents, go to *axis.com/support/product-security* To read more about Axis cybersecurity support, go to *axis.com/cybersecurity*

General

Casing	IP66/IP67-, NEMA 4X-, and IK10-rated casing Polycarbonate blend and aluminium Color: white NCS S 1002-B
Power	Power over Ethernet IEEE 802.3af/802.3at Type 1 Class 3 Typical: 7.9 W, max 12.95 W 10–28 V DC, typical 7.2 W, max 12.95 W
Connectors	Network: Shielded RJ45 10BASE-T/100BASE-TX/1000BASE-T Audio: 3.5 mm mic/line in I/O: Terminal block for 1 alarm input and 1 output (12 V DC output, max. load 25 mA) Power: DC input
IR illumination	OptimizedIR with power-efficient, long-life 850 nm IR LEDs **AXIS P1465-LE 9 mm:** Range of reach 40 m (131 ft) or more depending on the scene **AXIS P1465-LE 29 mm:** Range of reach 80 m (262 ft) or more depending on the scene
Storage	Support for microSD/microSDHC/microSDXC card 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) Maximum temperature according to NEMA TS2 (2.2.7): 74 °C (165 °F) Start-up temperature: -40 °C Humidity 10–100% RH (condensing)
Storage conditions	-40 °C to 65 °C (-40 °F to 149 °F) Humidity 5-95% RH (non-condensing)
Dimensions	Ø132 x 132 x 280 mm (Ø5.2 x 5.2 x 11.0 in) Effective Projected Area (EPA): 0.022 m^2 (0.24 ft^2)
Weight	With weather shield: 1.2 kg (2.65 lb)
Box content	Camera, installation guide, TORX® L-keys, terminal block connector, connector guard, cable gaskets, AXIS Weather Shield L, owner authentication key
Optional accessories	AXIS T94F01M J-Box/Gang Box Plate, AXIS T91A47 Pole Mount, AXIS T94P01B Corner Bracket, AXIS T94F01P Conduit Back Box, AXIS Weather Shield K, Axis PoE Midspans For more accessories, go to *axis.com/products/axis-p1465-le#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, Traditional Chinese
Warranty	5-year warranty, see *axis.com/warranty*
Part numbers	Available at *axis.com/products/axis-p1465-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 EN 63000:2018 REACH in accordance with (EC) No 1907/2006. For SCIP UUID, see *axis.com/partner.*
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*

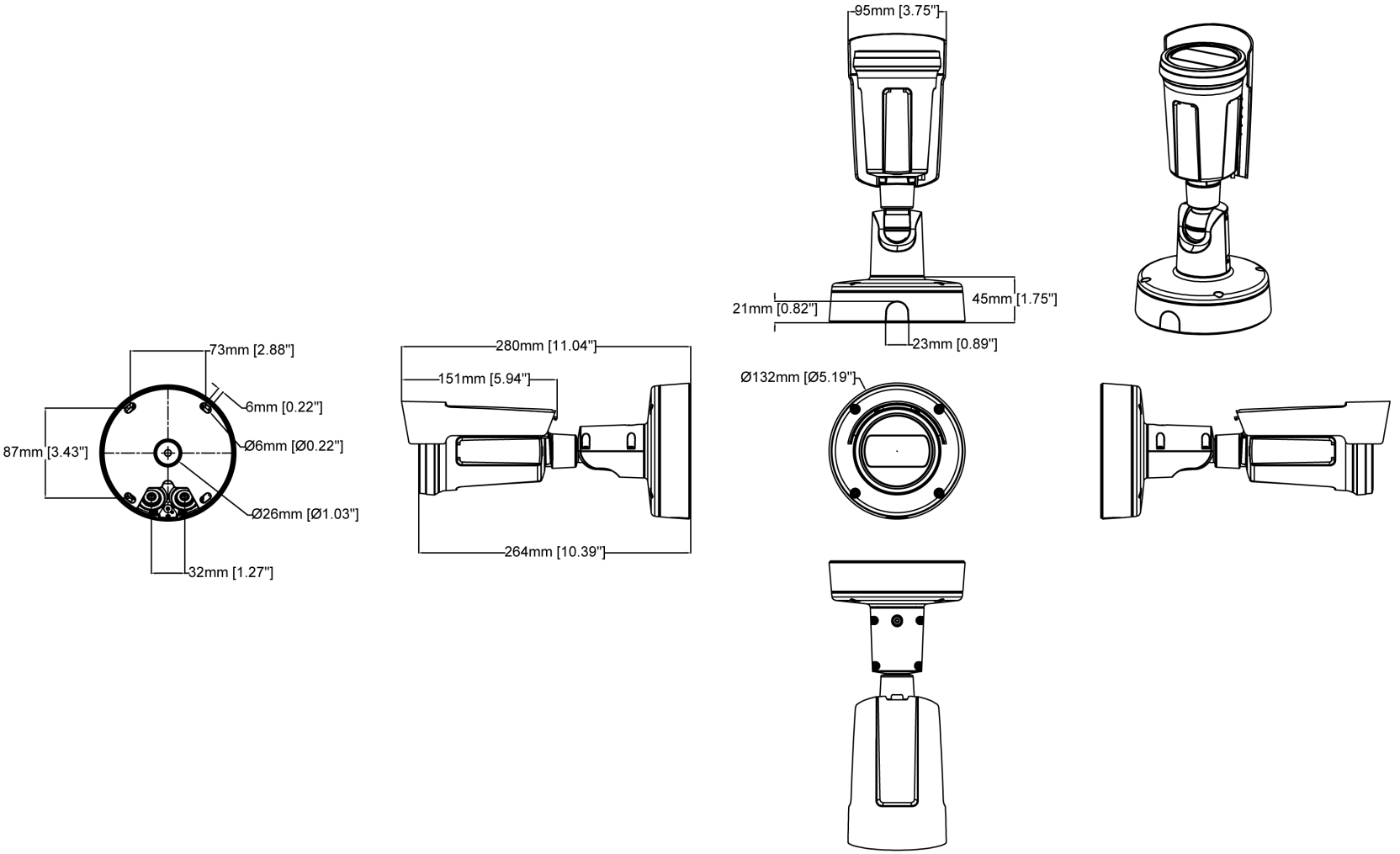
a. *We recommend a maximum of 3 unique video streams per camera or channel, for optimized user experience, network bandwidth, and storage utilization. A unique video stream can be served to many video clients in the network using multicast or unicast transport method via built-in stream reuse functionality.*

b. *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).*

c. *It also requires AXIS D2110-VE Security Radar with firmware 10.12 or later.*

Environmental responsibility:

axis.com/environmental-responsibility



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Revision	v.01	Revision date	2022-09-23
Paper size	A4	Release date	2022-09-23
Created by	MS	Scale	1:5

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Key features and technologies

Built-in cybersecurity

Axis Edge Vault is a secure cryptographic compute module (secure module or secure element) in which the Axis device ID is securely and permanently installed and stored.

Secure boot is a boot process that consists of an unbroken chain of cryptographically validated software, starting in immutable memory (boot ROM). Being based on signed firmware, secure boot ensures that a device can boot only with authorized firmware. Secure boot guarantees that the Axis device is completely clean from possible malware after resetting to factory default.

Signed firmware is implemented by the software vendor signing the firmware image with a private key, which is secret. When firmware has this signature attached to it, a device will validate the firmware before accepting and installing it. If the device detects that the firmware integrity is compromised, it will reject the firmware upgrade. Axis signed firmware is based on the industry-accepted RSA public-key encryption method.

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.

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.

AXIS Object Analytics

AXIS Object Analytics is an intelligent video analytics that adds value to your camera by detecting and classifying humans and vehicles tailored to your surveillance needs. It's ideal for various applications including public buildings, warehouses, parking lots, industrial sites, and other unattended areas in non-critical applications.

Two lens alternatives

The camera is available in two variants with a choice of lenses: a wide 3.9-9 mm lens for wide area surveillance and a tele 10-29 mm lens for surveillance from a distance.

OptimizedIR

Axis OptimizedIR provides a unique and powerful combination of camera intelligence and sophisticated LED technology, resulting in our most advanced camera-integrated IR solutions for complete darkness. In our pan-tilt-zoom (PTZ) cameras with OptimizedIR, the IR beam automatically adapts and becomes wider or narrower as the camera zooms in and out to make sure that the entire field of view is always evenly illuminated.

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

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