



## 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](#)



# AXIS P1465-LE Bullet Camera

<b>Camera</b>		<b>Audio streaming</b>	Configurable duplex: One-way (simplex, half duplex) Two-way (half duplex, full duplex)
<b>Models</b>	AXIS P1465-LE 9 mm AXIS P1465-LE 29 mm	<b>Audio input</b>	10-band graphic equalizer Input for external unbalanced microphone, optional 5 V microphone power Digital input, optional 12 V ring power Unbalanced line input
<b>Image sensor</b>	1/2.8" progressive scan RGB CMOS Pixel size 2.9 µm	<b>Audio output</b>	Output via network speaker pairing
<b>Lens</b>	Varifocal, remote focus and zoom, P-Iris control, IR corrected <b>AXIS P1465-LE 9 mm:</b> 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) <b>AXIS P1465-LE 29 mm:</b> 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)	<b>Audio encoding</b>	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
<b>Day and night</b>	Automatic IR-cut filter Hybrid IR filter	<b>Network</b>	
<b>Minimum illumination</b>	0 lux with IR illumination on <b>AXIS P1465-LE 9 mm:</b> Color: 0.06 lux, at 50 IRE F1.6 B/W: 0.01 lux, at 50 IRE F1.6 <b>AXIS P1465-LE 29 mm:</b> Color: 0.06 lux, at 50 IRE F1.7 B/W: 0.01 lux, at 50 IRE F1.7	<b>Network protocols</b>	IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS <sup>b</sup> , HTTP/2, TLS <sup>b</sup> , QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, mDNS (Bonjour), UPnP <sup>®</sup> , 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)
<b>Shutter speed</b>	With Forensic WDR: 1/37000 s to 2 s No WDR: 1/71500 s to 2 s	<b>System integration</b>	
<b>System on chip (SoC)</b>		<b>Application Programming Interface</b>	Open API for software integration, including VAPIX <sup>®</sup> , metadata and AXIS Camera Application Platform (ACAP); specifications at <a href="http://axis.com/developer-community">axis.com/developer-community</a> . ACAP includes Native SDK and Computer Vision SDK. One-click cloud connection ONVIF <sup>®</sup> Profile G, ONVIF <sup>®</sup> Profile M, ONVIF <sup>®</sup> Profile S and ONVIF <sup>®</sup> Profile T, specification at <a href="http://onvif.org">onvif.org</a>
<b>Model</b>	ARTPEC-8	<b>Video management systems</b>	Compatible with AXIS Companion, AXIS Camera Station, video management software from Axis' Application Development Partners available at <a href="http://axis.com/vms">axis.com/vms</a>
<b>Memory</b>	1024 MB RAM, 8192 MB Flash	<b>Onscreen controls</b>	Autofocus Day/night shift Defogging Video streaming indicator Wide dynamic range IR illumination Privacy masks Media clip <b>AXIS P1465-LE 29 mm:</b> Electronic image stabilization
<b>Compute capabilities</b>	Deep learning processing unit (DLPU)	<b>Event conditions</b>	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
<b>Video</b>		<b>Event actions</b>	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
<b>Video compression</b>	H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles H.265 (MPEG-H Part 2/HEVC) Main Profile Motion JPEG	<b>Built-in installation aids</b>	Pixel counter, remote zoom (3x optical), remote focus, auto rotation
<b>Resolution</b>	16:9: 1920x1080 to 160x90 16:10: 1280x800 to 160x100 4:3: 1280x960 to 160x120	<b>Analytics</b>	
<b>Frame rate</b>	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	<b>AXIS Object Analytics</b>	Object classes: humans, vehicles (types: cars, buses, trucks, bikes) Scenarios: line crossing, object in area, occupancy in area, time in area Up to 10 scenarios
<b>Video streaming</b>	Up to 20 unique and configurable video streams <sup>a</sup> 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		
<b>Signal-to-noise ratio</b>	>55 dB		
<b>WDR</b>	Forensic WDR: Up to 120 dB depending on scene		
<b>Multi-view streaming</b>	Up to 8 individually cropped out view areas		
<b>Noise reduction</b>	Spatial filter (2D noise reduction) Temporal filter (3D noise reduction)		
<b>Image settings</b>	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 <b>AXIS P1465-LE 29 mm:</b> Electronic image stabilization		
<b>Image processing</b>	Axis Zipstream, Forensic WDR, Lightfinder 2.0, OptimizedIR		
<b>Pan/Tilt/Zoom</b>	Digital PTZ, digital zoom		
<b>Audio</b>			
<b>Audio features</b>	AGC automatic gain control Network speaker pairing		

	Metadata visualized with trajectories, color-coded bounding boxes and tables Polygon include/exclude areas Perspective configuration ONVIF Motion Alarm event
<b>Metadata</b>	<b>Object data:</b> Classes: humans, faces, vehicles (types: cars, buses, trucks, bikes), license plates <b>Attributes:</b> Vehicle color, upper/lower clothing color, confidence, position <b>Event data:</b> Producer reference, scenarios, trigger conditions
<b>Applications</b>	<b>Included</b> AXIS Object Analytics AXIS Live Privacy Shield, AXIS Video Motion Detection, active tampering, shock detection <b>Supported</b> AXIS Perimeter Defender, AXIS Speed Monitor <sup>c</sup> Support for AXIS Camera Application Platform enabling installation of third-party applications, see <a href="http://axis.com/acap">axis.com/acap</a>
<b>Approvals</b>	
<b>Product markings</b>	CSA, UL/cUL, BIS, UKCA, CE, KC, EAC
<b>Supply chain</b>	TAA compliant
<b>EMC</b>	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 <b>Australia/New Zealand:</b> RCM AS/NZS CISPR 32 Class A <b>Canada:</b> ICES-3(A)/NMB-3(A) <b>Japan:</b> VCCI Class A <b>Korea:</b> KS C 9835, KS C 9832 Class A <b>USA:</b> FCC Part 15 Subpart B Class A <b>Railway:</b> IEC 62236-4
<b>Safety</b>	CAN/CSA C22.2 No. 62368-1 ed. 3, IEC/EN/UL 62368-1 ed. 3, IEC/EN 62471 risk group exempt, IS 13252
<b>Environment</b>	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)
<b>Network</b>	NIST SP500-267
<b>Cybersecurity</b>	ETSI EN 303 645
<b>Cybersecurity</b>	
<b>Edge security</b>	<b>Software:</b> Signed firmware, 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 <b>Hardware:</b> Axis Edge Vault cybersecurity platform 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)
<b>Network security</b>	IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2) <sup>b</sup> , IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS <sup>b</sup> , TLS v1.2/v1.3 <sup>a</sup> , Network Time Security (NTS), X.509 Certificate PKI, host-based firewall
<b>Documentation</b>	<i>AXIS OS Hardening Guide</i> <i>Axis Vulnerability Management Policy</i> <i>Axis Security Development Model</i> AXIS OS Software Bill of Material (SBOM) To download documents, go to <a href="http://axis.com/support/cybersecurity/resources">axis.com/support/cybersecurity/resources</a> To read more about Axis cybersecurity support, go to <a href="http://axis.com/cybersecurity">axis.com/cybersecurity</a>
<b>General</b>	
<b>Casing</b>	IP66/IP67-, NEMA 4X-, and IK10-rated casing Polycarbonate blend and aluminium 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 <a href="http://axis.com/warranty-implication-when-repainting">axis.com/warranty-implication-when-repainting</a> .
<b>Power</b>	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
<b>Connectors</b>	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
<b>IR illumination</b>	Optimized IR with power-efficient, long-life 850 nm IR LEDs <b>AXIS P1465-LE 9 mm:</b> Range of reach 40 m (131 ft) or more depending on the scene <b>AXIS P1465-LE 29 mm:</b> Range of reach 80 m (262 ft) or more depending on the scene
<b>Storage</b>	Support for microSD/microSDHC/microSDXC card Recording to network-attached storage (NAS) For SD card and NAS recommendations see <a href="http://axis.com">axis.com</a>
<b>Operating conditions</b>	-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)
<b>Storage conditions</b>	-40 °C to 65 °C (-40 °F to 149 °F) Humidity 5–95% RH (non-condensing)
<b>Dimensions</b>	Ø132 x 132 x 280 mm (Ø5.2 x 5.2 x 11.0 in) Effective Projected Area (EPA): 0.022 m <sup>2</sup> (0.24 ft <sup>2</sup> )
<b>Weight</b>	With weather shield: 1.2 kg (2.65 lb)
<b>Box content</b>	Camera, installation guide, TORX® L-keys, terminal block connector, connector guard, cable gaskets, AXIS Weather Shield L, owner authentication key
<b>Optional accessories</b>	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 <a href="http://axis.com/products/axis-p1465-le#accessories">axis.com/products/axis-p1465-le#accessories</a>
<b>System tools</b>	AXIS Site Designer, AXIS Device Manager, product selector, accessory selector, lens calculator Available at <a href="http://axis.com">axis.com</a>
<b>Languages</b>	English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Traditional Chinese, Dutch, Czech, Swedish, Finnish, Turkish, Thai, Vietnamese
<b>Warranty</b>	5-year warranty, see <a href="http://axis.com/warranty">axis.com/warranty</a>
<b>Part numbers</b>	Available at <a href="http://axis.com/products/axis-p1465-le#part-numbers">axis.com/products/axis-p1465-le#part-numbers</a>
<b>Sustainability</b>	
<b>Substance control</b>	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 <a href="http://axis.com/partner">axis.com/partner</a> .
<b>Materials</b>	Screened for conflict minerals in accordance with OECD guidelines To read more about sustainability at Axis, go to <a href="http://axis.com/about-axis/sustainability">axis.com/about-axis/sustainability</a>
<b>Environmental responsibility</b>	<a href="http://axis.com/environmental-responsibility">axis.com/environmental-responsibility</a> Axis Communications is a signatory of the UN Global Compact, read more at <a href="http://unglobalcompact.org">unglobalcompact.org</a>
	<ol style="list-style-type: none"> <li>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.</li> <li>This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<a href="http://openssl.org">openssl.org</a>), and cryptographic software written by Eric Young (<a href="mailto:eyay@cryptsoft.com">eyay@cryptsoft.com</a>).</li> <li>It also requires AXIS D2110-VE Security Radar with firmware 10.12 or later.</li> </ol>



# Key features and technologies

## 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 offers features to protect the device's identity, safeguard its integrity from factory and protect sensitive information from unauthorized access.

Establishing the root of trust starts at the device's boot process. In Axis devices, the hardware-based mechanism **secure boot** verifies the operating system (AXIS OS) that the device is booting from. AXIS OS, in turn, is cryptographically signed (**signed firmware**) during the build process. Secure boot and signed firmware tie into each other and ensure that the firmware has not been tampered with during the lifecycle of the device and that the device only boots from authorized firmware. This creates an unbroken chain of cryptographically validated software for the chain of trust that all secure operations depend on.

From a security aspect, 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 is provided through a Common Criteria and/or FIPS 140 certified hardware-based cryptographic computing module. Depending on security requirements, an Axis device can have either one or multiple such modules, like a TPM 2.0 (Trusted Platform Module) or a secure element, and/or a system-on-chip (SoC) embedded Trusted Execution Environment (TEE).

**Signed video** ensures that video evidence can be verified as untampered without proving the chain of custody of the video file. Each camera uses its unique video signing key, which is securely stored in the secure keystore, to add a signature into the video stream. This allows video to be traced back to the Axis camera from where it originated, so it's possible to verify that the footage has not been tampered with after it left the camera.

To read more about Axis Edge Vault, go to [axis.com/solutions/edge-vault](http://axis.com/solutions/edge-vault).

## 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 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.

## 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](http://axis.com/glossary)