

# AXIS M4328-P Panoramic Camera

## 12 MP indoor fisheye with deep learning

AXIS M4328-P can deliver 360° or 180° panoramic views at up to 30 fps with no blind spots. The camera can stream up to four individual view areas simultaneously, with support for digital PTZ. Built on ARTPEC-8, it offers powerful artificial intelligence and deep learning analytics on the edge. Plus, thanks to AXIS Object Analytics, it can accurately detect and classify moving objects for more effective monitoring. The camera is delivered factory-focused and features digital roll functionality for easy installation. Furthermore, it's compact, discreet, and repaintable to blend in with any surroundings.

- > 180°/360° view up to 30 fps
- > 12 MP with stereographic lens
- > Support for digital PTZ views
- > Digital roll for easy installation
- > Support for advanced analytics



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<b>Camera</b>		
Image sensor	1/2.3" progressive scan RGB CMOS	
Lens	1.2 mm, F2.2 Horizontal field of view: 182° Vertical field of view: 182° Fixed iris, fixed focus, IR corrected	
Day and night	Automatic IR-cut filter	
Minimum illumination	Color: 0.19 lux at 50 IRE, F2.2 B/W: 0.04 lux at 50 IRE, F2.2	
Shutter speed	1/8100 s to 1/2 s	
Camera adjustment	Digital roll: ±180°	
<b>System on chip (SoC)</b>		
Model	ARTPEC-8	
Memory	2048 MB RAM, 8192 MB Flash	
Compute capabilities	Deep learning processing unit (DLPU)	
<b>Video</b>		
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	Overview: 2992x2992 to 160x160 (1:1) Panorama: 3840x2160 to 192x72 (8:3, 16:9 or 32:9) Double panorama: 3584x2688 to 384x288 (4:3 or 16:9) Quad view: 3584x2688 to 384x288 (4:3 or 16:9) View area 1-4: 2048x1536 to 256x144 (4:3 or 16:9) Corner left/right: 3200x1600 to 192x72 (2:1 or 8:3) Double corner: 2880x2880 to 384x288 (1:1 or 4:3) Corridor: 2560x1920 to 256x144 (4:3 or 16:9)	
Frame rate	360° overview only up to max resolution without WDR: 25/30 fps @ 50/60 Hz 360° overview and 4 dewarped views up to max resolution with WDR: up to 25/20 fps @ 50/60 Hz	
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 Video streaming indicator	
WDR	Forensic WDR: Up to 120 dB depending on scene	
Noise reduction	Spatial filter (2D noise reduction) Temporal filter (3D noise reduction)	
Image settings	Saturation, contrast, brightness, sharpness, local contrast, tone mapping, white balance, day/night threshold, exposure mode, exposure zones, compression, mirroring, dynamic text and image overlay, and polygon privacy mask	
Image processing	Axis Zipstream, Forensic WDR	
Pan/Tilt/Zoom	Digital PTZ of view areas, digital PT of panorama, corner, corridor and quad views, preset positions, guard tours	
<b>Audio</b>		
Audio features	Network speaker pairing	
Audio input/output	Audio features through portcast technology: two-way audio connectivity, voice enhancer	
<b>Network</b>		
Network protocols	IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS <sup>a</sup> , HTTP/2, TLS <sup>b</sup> , QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, mDNS (Bonjour), UPnP <sup>c</sup> , SNMP v1/v2c/v3 (MIB-II), DNS/DNSv6, DDNS, NTP, NTS, RTSP, RTP, SRTP, TCP, UDP, IGMPv1/v2/v3, RTCP, DHCPv4/v6, SSH, LLDP, CDP, MQTT v3.1.1, Syslog, Link-Local address (ZeroConf), IEEE 802.1X (EAP-TLS), IEEE 802.1AR	
<b>System integration</b>		
Application Programming Interface	Open API for software integration, including VAPIX <sup>®</sup> , metadata and AXIS Camera Application Platform (ACAP); specifications at <a href="https://axis.com/developer-community">axis.com/developer-community</a> . 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, specifications at <a href="https://onvif.org">onvif.org</a>	
		Support for Session Initiation Protocol (SIP) for integration with Voice over IP (VoIP) systems, peer to peer or integrated with SIP/PBX.
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 <a href="https://axis.com/vms">axis.com/vms</a> .
Onscreen controls		Privacy masks Media clip
Event conditions		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, live stream active Edge storage: recording ongoing, storage disruption, storage health issues detected I/O: manual trigger, virtual input MQTT: subscribe Scheduled and recurring: schedule Video: average bitrate degradation, day-night mode, tampering
Event actions		Day-night mode 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 Status LED Upload of images or video clips: FTP, SFTP, HTTP, HTTPS, network share and email WDR mode
Built-in installation aids		Pixel counter, digital roll, level grid
<b>Analytics</b>		
Applications		Included AXIS Object Analytics, AXIS Scene Metadata, AXIS Video Motion Detection, active tampering alarm Supported Support for AXIS Camera Application Platform enabling installation of third-party applications, see <a href="https://axis.com/acap">axis.com/acap</a>
AXIS Object Analytics		Object classes: humans, vehicles (types: cars, buses, trucks, bikes) Scenarios: line crossing, object in area, crossline counting, occupancy in area <sup>BETA</sup> Up to 10 scenarios Other features: triggered objects visualized with trajectories, color-coded bounding boxes and tables Polygon include/exclude areas ONVIF Motion Alarm event
AXIS Scene Metadata		Object classes: humans, faces, vehicles (types: cars, buses, trucks, bikes), license plates Object attributes: vehicle color, confidence, position
<b>Approvals</b>		
Product markings		CSA, UL/cUL, BIS, UKCA, CE, KC
Supply chain		TAA compliant
EMC		EN 55032 Class A, EN 55035, 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
Safety		IEC/EN/UL 62368-1 ed. 3, CAN/CSA C22.2 No. 62368-1 ed. 3, 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
Network		NIST SP500-267
Cybersecurity		ETSI EN 303 645, BSI IT Security Label
<b>Cybersecurity</b>		
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

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)

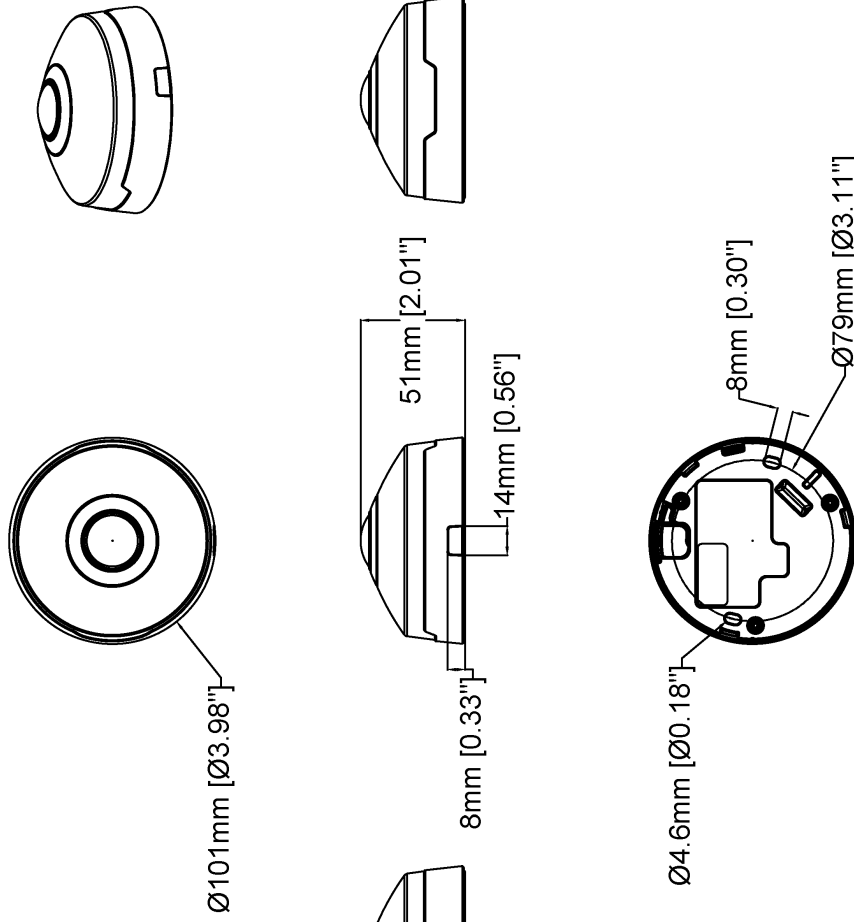
AXIS T94 mounting accessories  
AXIS T91 mounting accessories  
AXIS Surveillance Cards  
For more accessories, go to [axis.com/products/axis-m4328-p#accessories](https://axis.com/products/axis-m4328-p#accessories)

<b>Network security</b>	IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2) <sup>c</sup> , IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS <sup>d</sup> , TLS v1.2/v1.3 <sup>e</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> To download documents, go to <a href="https://axis.com/support/cybersecurity/resources">axis.com/support/cybersecurity/resources</a> To read more about Axis cybersecurity support, go to <a href="https://axis.com/cybersecurity">axis.com/cybersecurity</a>
<b>General</b>	
<b>Casing</b>	Plastic casing, encapsulated electronics Color: white NCS S 1002-B For repainting instructions of the casing and information about the impact on warranty, contact your Axis partner.
<b>Mounting</b>	Mounting bracket with junction box holes (double-gang, single-gang, and 4" octagon)
<b>Power</b>	Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 1 Class 3 Typical 3.5 W, max 5.1 W
<b>Connectors</b>	Network: Shielded RJ45 10BASE-T/100BASE-TX PoE Audio: Audio and I/O connectivity via portcast technology
<b>Storage</b>	Support for microSD/microSDHC/microSDXC card Recording to network-attached storage (NAS) For SD card and NAS recommendations, see <a href="https://axis.com">axis.com</a>
<b>Operating conditions</b>	0 °C to 40 °C (32 °F to 104 °F) Humidity 10–85% RH (non-condensing)
<b>Storage conditions</b>	–40 °C to 65 °C (–40 °F to 149 °F) Humidity 5–95% RH (non-condensing)
<b>Dimensions</b>	Height: 51 mm (2.0 in) ø 101 mm (4.0 in)
<b>Weight</b>	300 g (0.66 lb)
<b>Box content</b>	Camera, installation guide, owner authentication key
<b>Optional accessories</b>	AXIS TM3820 Vandal Casing (IK08, IP42 with cover hatch, IP41 without cover hatch) AXIS TM3210 Recessed Mount AXIS TM3211 Recessed Mount

<b>System tools</b>	AXIS Site Designer, AXIS Device Manager, product selector, accessory selector, lens calculator Available at <a href="https://axis.com">axis.com</a>
<b>Languages</b>	English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Polish, Traditional Chinese, Dutch, Czech, Swedish, Finnish, Turkish, Thai, Vietnamese
<b>Warranty</b>	5-year warranty, see <a href="https://axis.com/warranty">axis.com/warranty</a>
<b>Part numbers</b>	Available at <a href="https://axis.com/products/axis-m4328-p#part-numbers">axis.com/products/axis-m4328-p#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="https://axis.com/partner">axis.com/partner</a> .
<b>Materials</b>	Renewable carbon-based plastic content: 73% (recycled) Screened for conflict minerals in accordance with OECD guidelines To read more about sustainability at Axis, go to <a href="https://axis.com/about-axis/sustainability">axis.com/about-axis/sustainability</a>
<b>Environmental responsibility</b>	<a href="https://axis.com/environmental-responsibility">axis.com/environmental-responsibility</a> Axis Communications is a signatory of the UN Global Compact, read more at <a href="https://unglobalcompact.org">unglobalcompact.org</a>

- This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. ([openssl.org](https://openssl.org)), and cryptographic software written by Eric Young ([eyay@cryptsoft.com](mailto:eyay@cryptsoft.com)).
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# Dimension drawing



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www.axis.com

Revision	v.01	Revision date	2023-02-17
Paper size	A4	Release date	2023-02-17
Created by	MS	Scale	1:3

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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](https://axis.com/solutions/edge-vault).

### 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.

### 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.

For more information, see [axis.com/glossary](https://axis.com/glossary)