

# 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



# AXIS M4328-P Panoramic Camera

## Camera

### 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:  $\pm 180^\circ$

## 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

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

## Audio

### Audio features

Network speaker pairing

## Audio input/output

Audio features through portcast technology: two-way audio connectivity, voice enhancer

## Network

### Network protocols

IPv4, IPv6, USGv6, ICMPv4/ICMPv6, HTTP, HTTPS<sup>1</sup>, HTTP/2, TLS<sup>1</sup>, QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, mDNS (Bonjour), UPnP®, SNMP v1/v2c/v3 (MIB-II), DNS/DNSv6, DDNS, NTP, PTP, 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

## 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](https://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](https://onvif.org)

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 [axis.com/vms](https://axis.com/vms).

### Onscreen controls

Privacy masks

Media clip

### Edge-to-edge

Siren and light pairing

## 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

## Analytics

### Applications

#### Included

AXIS Object Analytics, AXIS Image Health 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 [axis.com/acap](https://axis.com/acap)

### 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

1. 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 ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

## **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, confidence, position

## **Approvals**

### **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, FIPS-140

## **Cybersecurity**

### **Edge security**

**Software:** Signed OS, brute force delay protection, digest authentication and OAuth 2.0 RFC6749 Client Credential Flow/OpenID Authorization Code Flow for centralized ADFS account management, password protection, Axis Cryptographic Module (FIPS 140-2 level 1), 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)

### **Network security**

IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2)<sup>2</sup>, IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS<sup>2</sup>, TLS v1.2/v1.3<sup>2</sup>, Network Time Security (NTS), X.509 Certificate PKI, host-based firewall

### **Documentation**

*AXIS OS Hardening Guide*

*Axis Vulnerability Management Policy*

*Axis Security Development Model*

To download documents, go to [axis.com/support/cybersecurity/resources](https://axis.com/support/cybersecurity/resources)

To read more about Axis cybersecurity support, go to [axis.com/cybersecurity](https://axis.com/cybersecurity)

## **General**

### **Casing**

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.

### **Mounting**

Mounting bracket with junction box holes (double-gang, single-gang, and 4" octagon)

### **Power**

Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 1 Class 3

Typical 3.5 W, max 5.1 W

### **Connectors**

Network: Shielded RJ45 10BASE-T/100BASE-TX PoE

Audio: Audio and I/O connectivity via portcast technology

2. 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 ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

## Storage

Support for microSD/microSDHC/microSDXC card  
Recording to network-attached storage (NAS)  
For SD card and NAS recommendations, see [axis.com](https://axis.com)

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## Operating conditions

0 °C to 40 °C (32 °F to 104 °F)  
Humidity 10–85% RH (non-condensing)

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## Storage conditions

–40 °C to 65 °C (–40 °F to 149 °F)  
Humidity 5–95% RH (non-condensing)

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## Dimensions

Height: 51 mm (2.0 in)  
ø 101 mm (4.0 in)

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## Weight

300 g (0.66 lb)

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## Box content

Camera, installation guide, owner authentication key

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## Optional accessories

AXIS TM3820 Vandal Casing (IK08, IP42 with cover hatch, IP41 without cover hatch)  
AXIS TM3210 Recessed Mount  
AXIS TM3211 Recessed Mount  
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)

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## System tools

AXIS Site Designer, AXIS Device Manager, product selector, accessory selector, lens calculator  
Available at [axis.com](https://axis.com)

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## Languages

English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Polish, Traditional Chinese, Dutch, Czech, Swedish, Finnish, Turkish, Thai, Vietnamese

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## Warranty

5-year warranty, see [axis.com/warranty](https://axis.com/warranty)

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## Part numbers

Available at [axis.com/products/axis-m4328-p#part-numbers](https://axis.com/products/axis-m4328-p#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](https://axis.com/partner).

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### Materials

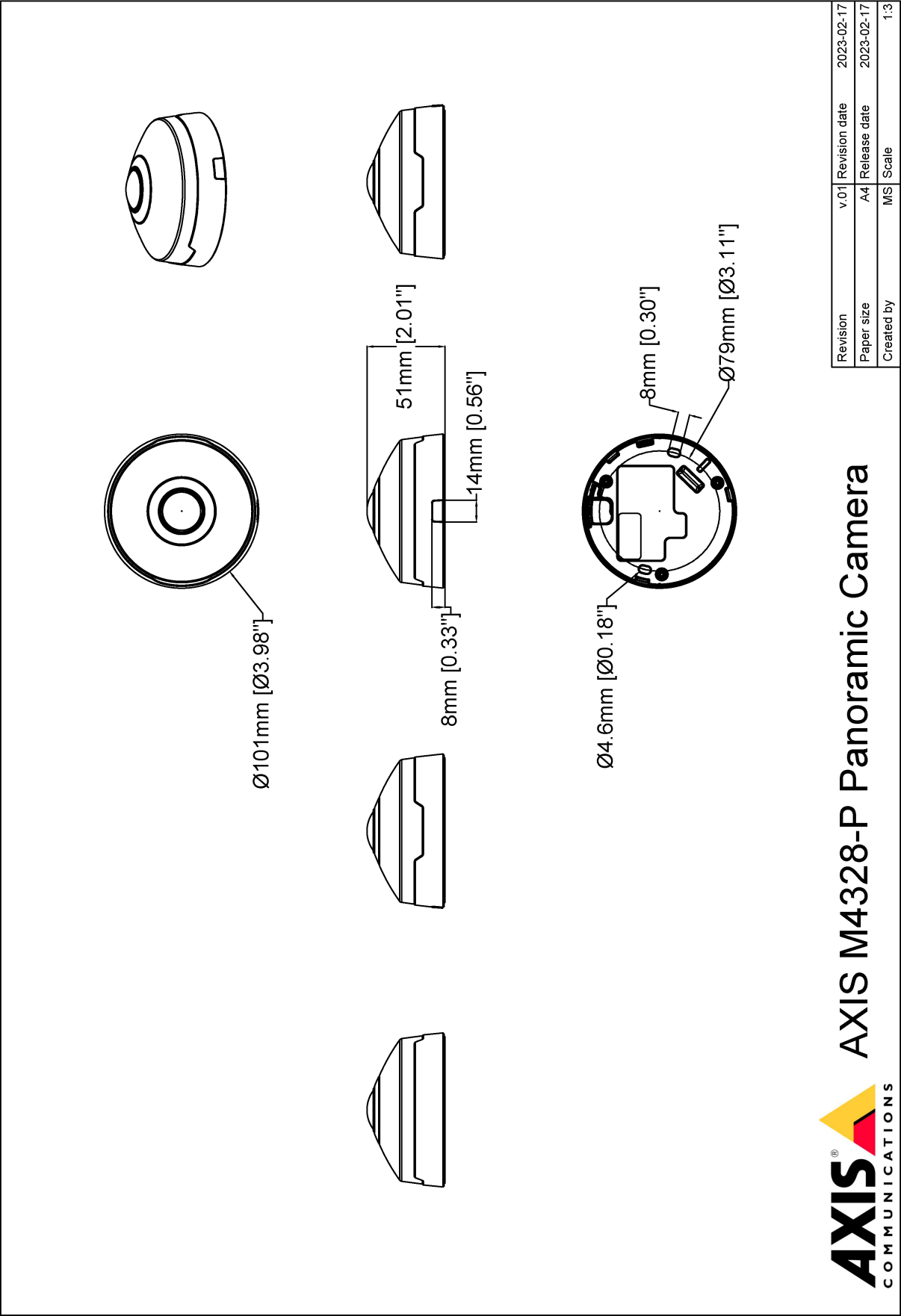
Renewable carbon-based plastic content: 73% (recycled)  
Screened for conflict minerals in accordance with OECD guidelines  
To read more about sustainability at Axis, go to [axis.com/about-axis/sustainability](https://axis.com/about-axis/sustainability)

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### Environmental responsibility

[axis.com/environmental-responsibility](https://axis.com/environmental-responsibility)  
Axis Communications is a signatory of the UN Global Compact, read more at [unglobalcompact.org](https://unglobalcompact.org)

Dimension drawing



## 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.

information is identified, recorded, and sent in full resolution and frame rate.

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

### 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