

AXIS F9111-R Mk II Main Unit

AI-based, 1-channel unit for high-vibration environments

This one-channel main unit offers 4K at 30 fps or 720p at 180 fps. You can choose one of several different sensor units to suit your needs. A deep learning processing unit runs advanced features and powerful analytics at the edge. For instance, AXIS Object Analytics can detect, classify, track, and count humans and types of vehicles. AXIS Sensor Metrics Dashboard gathers information from connected sensors and devices. With a rugged design and FAKRA connector, it can withstand shock and vibrations. Furthermore, Axis Edge Vault, a hardware-based cybersecurity platform, safeguards the device and offers FIPS 140-2 Level 2 certified key storage and operations.

- > **4K at 30 fps or 720p at 180 fps**
- > **Flexible, rugged design and FAKRA connector**
- > **Support for powerful analytics**
- > **Ignition control with controlled shutdown**
- > **Built-in cybersecurity with Axis Edge Vault**



AXIS F9111-R Mk II Main Unit

System on chip (SoC)

Model
ARTPEC-8

Memory
4096 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
Up to 3840x2160 8Mp¹
Up to 2592x1944 5Mp¹
Up to 1920x1080 HDTV 2Mp¹

Frame rate
Up to 180/175 fps (60/50 Hz) in all resolutions²

Video streaming
Multiple, individually configurable streams in H.264, H.265 and Motion JPG
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

Image settings
Contrast, brightness, sharpness, white balance, tone mapping, exposure mode, exposure zones, compression, rotation: 0°, 90°, 180°, 270° including corridor format, mirroring, dynamic text and image overlay, privacy masks, polygon privacy mask

Audio

Audio streaming
Configurable duplex:
One-way (simplex)

Audio input
2x Input for external unbalanced microphone
Digital input, optional 12 V ring power
Unbalanced line input

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

Network

Network protocols
IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS³, HTTP/2, TLS³, 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)

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, 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
Privacy masks

1. Resolution varies depending on the sensor unit used.

2. For main units and sensor units capture mode specifications, see capture mode table.

3. 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 conditions

Application

Audio: audio detection

Device status: above/below/within operating temperature, IP address blocked, IP address removed, live stream active, network lost, new IP address, system ready, ring power overcurrent protection, shock detected

Digital audio: digital signal contains Axis metadata, digital signal has invalid sample rate, digital signal missing, digital signal okay

Edge storage: recording ongoing, storage disruption, storage health issues detected

I/O: digital input, manual trigger, virtual input

MQTT: MQTT Client connected, stateless

Scheduled and recurring: pulse, schedule

Video: average bitrate degradation, tampering, video source connected

Event actions

I/O: toggle I/O once, toggle I/O while the rule is active
LEDs: flash status LED, flash status LED while the rule is active

MQTT: publish

Notification: HTTP, HTTPS, TCP and email

Overlay text

Recordings: SD card and network share

Security: erase configuration

SNMP traps: send, send while the rule is active

Images or video clips: FTP, SFTP, HTTP, HTTPS, network share and email

WDR mode

Analytics

Applications

Included

AXIS Object Analytics, AXIS Scene Metadata, AXIS Audio Analytics, AXIS Video Motion Detection, AXIS Sensor Metrics Dashboard:

Modbus over serial: Protocol: Modbus RTU, Port mode: RS485 2-wire

Modbus over IP: Protocol: Modbus TCP, Port mode: Ethernet on switch

Supported

AXIS Perimeter Defender, AXIS People Counter
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)

Scenarios: line crossing, object in area, time in area, crossline counting, occupancy in area, tailgating detection, PPE monitoring^{BETA}, motion in area, motion line crossing

Single channel: up to 10 scenarios

Multi channel: up to 8 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 Audio Analytics

Features: adaptive audio detection, audio classification

Audio classes: scream, shout, glass break

Event metadata: audio detections, classifications

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

Product markings

FCC, UL/cUL, CE, KC, VCCI

EMC

CISPR 32 Class A, CISPR 35, EN 55035, EN 55032 Class A, EN 50130-4, EN 50121-4, EN 61000-6-1, EN 61000-6-2

Australia/New Zealand: RCM AS/NZS CISPR 32 Class A

Canada: ICES(A)/NMB(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, RCM AS/NZS 62368.1:2022, UN ECE R118

Environment

IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-64, IEC/EN 60529 IP3X, IEC 60721-3-5 Class 5M3, IEC/EN 61373 Category 1 Class B, NEMA TS 2 (2.2.7-2.2.9)

Network

IPv6 USGv6, NIST SP500-267

Cybersecurity

ETSI EN 303 645, BSI IT Security Label,
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)

Hardware: Axis Edge Vault cybersecurity platform
Secure keystore: TPM 2.0 (CC EAL4+, FIPS 140-2 Level 2), secure element (CC EAL 6+), system-on-chip security (TEE)

Axis device ID, signed video, secure boot, encrypted filesystem (AES-XTS-Plain64 256bit)

Network security

IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2)⁴,
IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR,
HTTPS/HSTS⁴, TLS v1.2/v1.3⁴, 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

IP3X-rated

Aluminum casing

Color: black NCS S 9000-N

Power

Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 2 Class 4

10–48 VDC, typical 8.6 W, max 25.5 W

Connectors

Network: RJ45 10BASE-T/100BASE-TX/1000BASE-T PoE

FAKRA: 1x for sensor unit

I/O: 6-pin terminal block for 4x configurable I/Os (12 V DC output), max load 50 mA

Audio: 2x 3.5 mm mic/line in

Serial communication: 2-pin terminal block RS485

Power: 3-pin terminal block for 10–48 V DC input

Data transfer: 1x USB 2.0 Type A, max load 500 mA, supported USB class: Vendor specific

Storage

Support for microSD/microSDHC/microSDXC card

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

Temperature: -40° C to 60 °C (-40 °F to 140 °F)

Maximum temperature according to NEMA TS 2 (2.2.7):
74 °C (165 °F)

Humidity: 10–95% RH (non-condensing)

Storage conditions

Temperature: -40 °C to 65 °C (-40 °F to 149 °F)

Humidity: 5–95% RH (non-condensing)

Dimensions

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

Weight

675 g (1.5 lb)

Required hardware

AXIS TU6007-E Cable, AXIS TU6004-E Cable,

AXIS TU6005 Plenum Cable, AXIS F21 Sensor Unit,

AXIS F41 Sensor Unit, AXIS F7225-RE Pinhole Sensor

Box content

Main unit, installation guide

Optional accessories

TU6001 Connector 3-pin, Connector A 2-pin,

TU6009 Connector 6-PIN, TF9902 Surface Mount

AXIS Surveillance Cards

For more accessories, go to axis.com/products/axis-f9111-r-mk-ii-main-unit#accessories

4. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (openssl.org), and cryptographic software written by Eric Young (ey@cryptsoft.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-f9111-r-mk-ii-main-unit#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 2015/863, and standard EN IEC 63000:2018
REACH in accordance with (EC) No 1907/2006. For SCIP UUID, see echa.europa.eu

Materials

Renewable carbon-based plastic content: 18% (recycled)
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

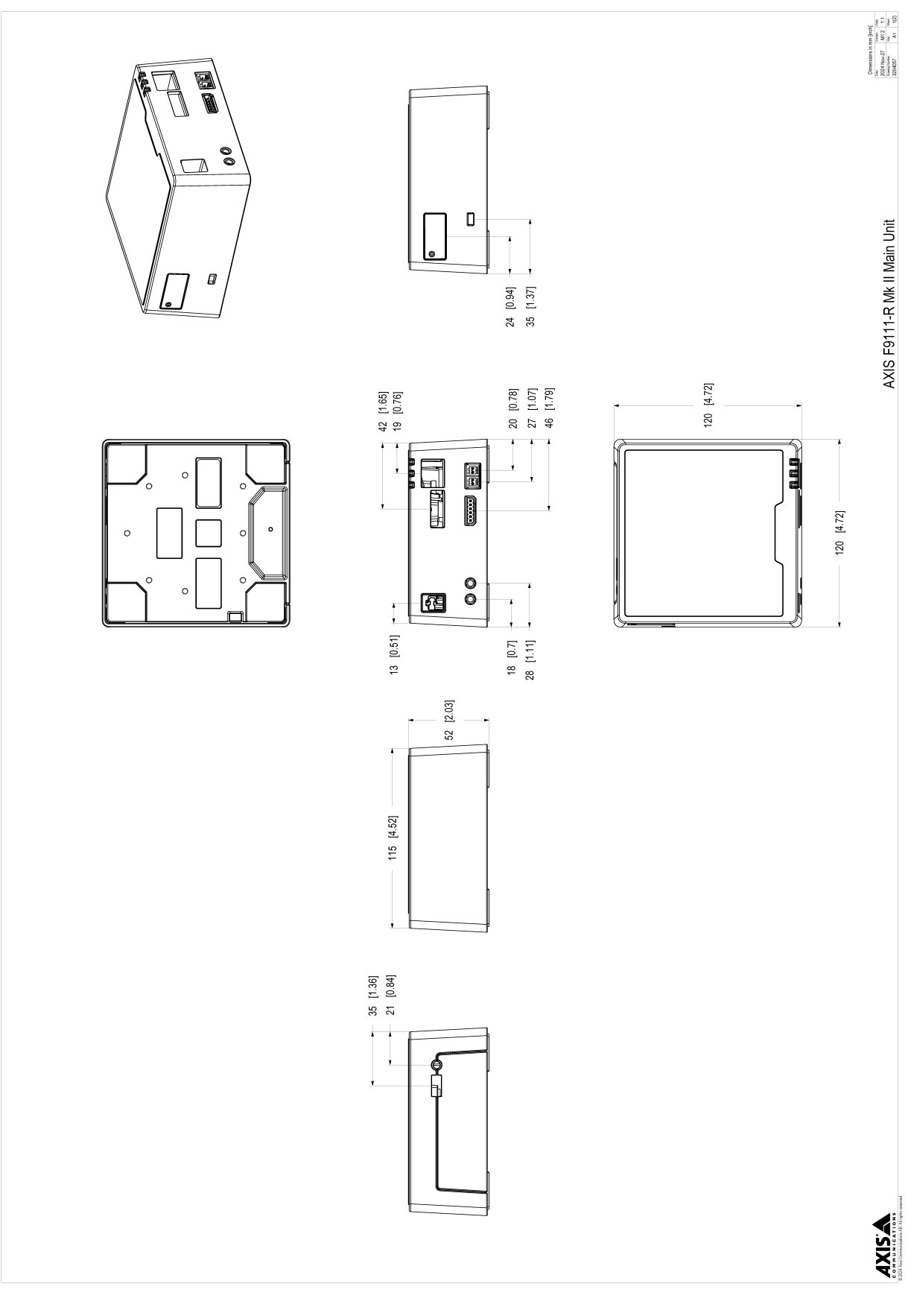
Capture mode

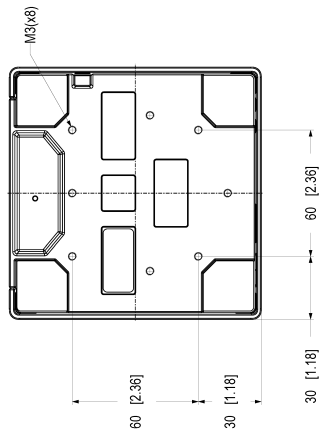
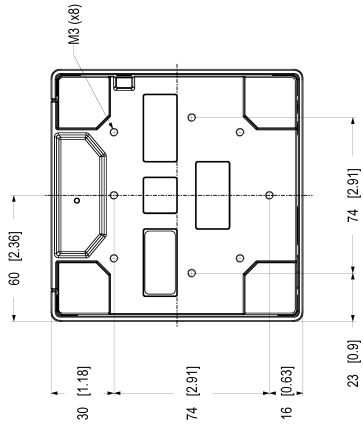
Capture mode includes resolution, frame rate, and shutter speed for the main unit in combination with different sensor units.

Sensor unit	Resolutions	Exposure	Frame rate (fps) (60/50Hz)	Shutter speed (seconds)
2 MP sensor units	1080p: 1920x1080	Without WDR	60/50	1/43500 to 1 s
		WDR	30/25	1/20000 to 1.5 s
	720p: 1280x720	Without WDR	180/175	1/32500 to 1/2 s
5 MP sensor units	5 MP: 2592x1944	Without WDR	30/25	1/16000 s to 1 s
		WDR	20/20	1/18000 s to 1 s
	Quad HD: 2560x1440	Without WDR	60/50	1/27000 s to 1/2 s
		WDR	30/25	1/18000 s to 1 s
8 MP sensor units (not yet released)	8 MP: 3840x2160	Without WDR	30/25	
		WDR	15/12.5	

No WDR support for 720p: 1280x720. To get WDR, use 1080p: 1920x1080 and scale down.

Dimension drawing





Dimensions in mm [inch]			
Item	Unit	Value	Value
Overall Width	mm	60	2.36
Overall Height	mm	74	2.91
Mounting Hole Diameter	mm	3.2	0.126
Mounting Hole Spacing	mm	30	1.18

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Highlighted capabilities

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.

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.

Rugged

Rugged is a term that for Axis modular and onboard products describes a device's endurance and stability in high vibration environments – over time. High vibration environments could be inside or close to machinery or inside vehicles. Rugged products from Axis are constructed to keep operating in these challenging conditions for the entire lifetime of the product.