AXIS Q2101-TE Thermal Camera

Large-scale remote temperature monitoring

Ideal for large-scale temperature monitoring, this dependable camera lets you remotely monitor temperatures from -40 °C to 350 °C (-40 °F to 660 °F). You'll know if your equipment is close to overheating and can act to avoid unwanted downtime. With the camera mounted on a positioning unit (sold separately) you can enable thermometric guard tour with up to 256 presets and 10 polygonal detection areas per preset. Robust and impact-resistant, it includes built-in cybersecurity features to help safeguard your system. Additionally, edge-to-edge technology lets you connect network speakers to enable audio alarms.

- > Thermometric guard tour capabilities
- > Early fire detection analytics
- > Spot temperature reading
- > Built-in cybersecurity features
- > Support for edge-to-edge technology

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Camera

Image sensor
Uncooled microbolometer 384x288 pixels, pixel size 17 µm.
Spectral range: 8-14 µm

Lens
Athermalized
7 mm
Horizontal field of view: 55°, F1.18
Vertical field of view: 40.7°
Minimum focus distance: 1.3 m (4.3 ft)
13 mm
Horizontal field of view: 28°, F1.0
Vertical field of view: 21°
Minimum focus distance: 4 m (13 ft)
19 mm
Horizontal field of view: 19.4°, F1.23
Vertical field of view: 14.7°
Minimum focus distance: 8.5 m (27.9 ft)

Sensitivity
NETD 40 mK @25C, F1.0

Pan/Tilt
Thermometric guard tour with up to 256 preset positions (positioning unit sold separately)

Thermometry

Object temperature range
-40 °C to 350 °C (-40 °F to 662 °F)

Temperature accuracy
Below 120 °C (248 °F): ±5 °C (±9 °F) accuracy
Above 120 °C (248 °F): ±15% accuracy

Detection range
We recommend the size of a monitored object to cover at least 10x10 pixels in 384x288.

General
Spot temperature meter
Up to 10 polygonal temperature detection areas per preset (positioning unit sold separately)

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
Sensor is 384x288. Image can be scaled up to 768x576.

Frame rate
Up to 8.3 fps or 30 fps depending on model

Video streaming
Up to 20 unique and configurable video streams[1]
Axis Zipstream technology in H.264 and H.265
Controllable frame rate and bandwidth
VBR/ABR/MBR H.264/H.265
Video streaming indicator

Image settings
Contrast, brightness, sharpness, local contrast, exposure zones, compression, rotation: 0°, 90°, 180°, 270° including corridor format, mirroring, text and image overlay, polygon privacy mask, electronic image stabilization, multiple color palettes

Image processing
Axis Zipstream

1. *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.*

Audio

Audio features
AGC automatic gain control
Network speaker pairing
Spectrum visualizer[2]

Audio streaming
Configurable 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
Line output

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[3], HTTP/2, TLS[3], 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, 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® and AXIS Camera Application Platform (ACAP); specifications at *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*

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
Electronic image stabilization
Video streaming indicator
Privacy masks
Media clip
Heater

Event conditions
Application: early fire detection
Audio: audio detection, audio clip playing
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, casing open
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, tampering, temperature detection

Event actions
Audio clips: play, stop
I/O: toggle I/O once, toggle I/O while the rule is active
MQTT: publish
Notification: HTTP, HTTPS, TCP, and email
Overlay text
Pre- and post-alarm video or image buffering for recording or upload
Recordings: SD card and network share
SNMP traps: send, send while the rule is active
Status LED: flash
Upload of images or video clips: FTP, SFTP, HTTP, HTTPS, network share, and email

Built-in installation aids
Pixel counter, level grid

2. *Feature available with ACAP*
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).*

Analytics

Applications
Included
AXIS Video Motion Detection, AXIS Motion Guard, AXIS Fence Guard, AXIS Loitering Guard, early fire detection, active tampering alarm, audio detection
Supported
AXIS Perimeter Defender
Support for AXIS Camera Application Platform enabling installation of third-party applications, see *axis.com/acap*

Approvals

Product markings
CSA, UL/cUL, UKCA, CE, KC, VCCI, RCM

Supply chain
TAA compliant

EMC
CISPR 35, CISPR 32 Class A, EN 50121-4, EN 55032 Class A, EN 55035, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, IEC 62236-4
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, 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, IEC/EN 60529 IP66/IP67, IEC/EN 62262 IK10[4], ISO 21207 Method B , MIL-STD-810H (Method 501.7, 502.7, 505.7, 506.6, 507.6, 509.7, 510.7, 512.6, 514.8, 516.8, 521.4), NEMA 250 Type 4X, NEMA TS 2 (2.2.7-2.2.9)

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: Secure boot, Axis Edge Vault with Axis device ID, signed video, secure keystore (CC EAL4+, FIPS 140-2 level 2 certified hardware protection of cryptographic operations and keys)

Network security
IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2)[5], IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR, HTTPS/HSTS[5], TLS v1.2/v1.3[5], 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
IP66/IP67-, NEMA 4X-, and IK10-rated[4]
Aluminum
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 *axis.com/warranty-implication-when-repainting*.

Power
Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 2 Class 4
Typical 4.6 W, max 25.5 W
8–28 V DC, typical 4.1 W, max 25.5 W

4. *Excluding front window*
5. *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).*

Connectors
Network: RJ45 10BASE-T/100BASE-TX/1000BASE-T PoE
I/O: Terminal block for two supervised and two unsupervised configurable inputs / digital outputs (12 V DC output, max. load 50 mA)
Audio: 3.5 mm mic/line in, 3.5 mm line out
Serial communication: RS485/RS422, 2 pcs, 2 pos, full duplex, terminal block
Power: DC input, terminal block

Storage
Support for microSD/microSDHC/microSDXC card
Recording to network-attached storage (NAS)
For SD card and NAS recommendations see *axis.com*

Operating conditions
Temperature monitoring -40 °C to 50 °C (-40 °F to 122 °F)
Maximum temperature according to NEMA TS 2 (2.2.7): 74 °C (165 °F)
Humidity 10–100% RH (condensing)

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

Dimensions
404 x 159 x 150 mm (15.9 x 6.3 x 5.9 in)
Effective Projected Area (EPA): 0.05 m^2 (0.48 ft^2)

Weight
3.3 kg (7.3 lb)

Box content
Camera, installation guide, TORX® T30 bit, TORX® T20 screwdriver, terminal block connectors, connector guard, cable gaskets, owner authentication key

Optional accessories
AXIS T99A12 Positioning Unit, AXIS TQ1003-E Wall Mount
For more accessories, go to *axis.com/products/axis-q2101-te#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, Polish, Traditional Chinese

Warranty
5-year warranty, see *axis.com/warranty*

Export control
This product is subject to export control regulations, and you should always comply with all applicable national and international export or re-export control regulations.

Part numbers
Available at *axis.com/products/axis-q2101-te#part-numbers*

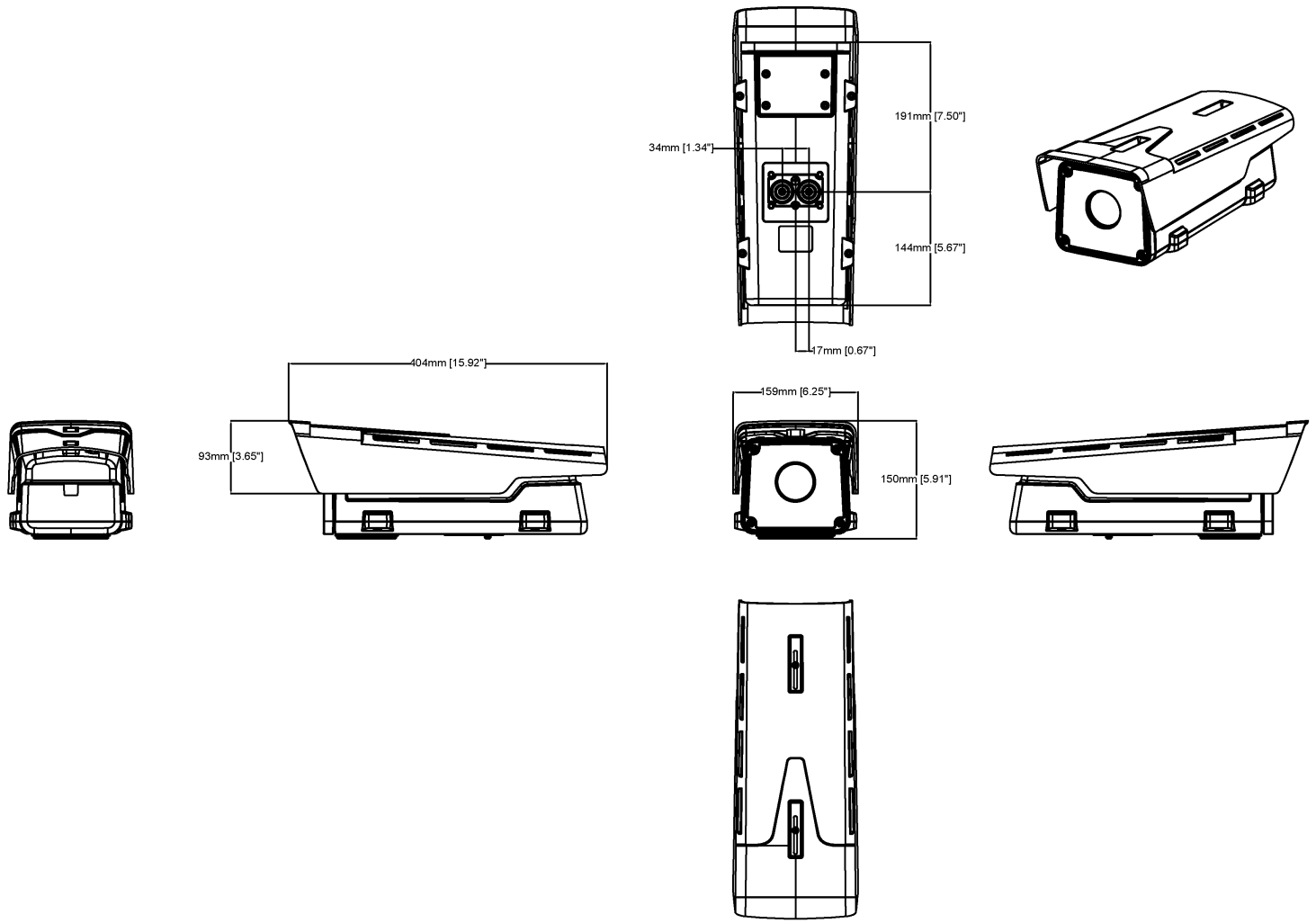
Sustainability

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.

Materials
Renewable carbon-based plastic content: 7% (recycled: 2%, bio-based: 5%)
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*

Dimension drawing



AXIS COMMUNICATIONS

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Created by	MS	Scale	1:7

Highlighted capabilities

Thermometry

Thermal cameras detect objects using the infrared radiation (heat) emitted by all objects. Temperature-calibrated thermal cameras, called thermometric cameras, can measure absolute temperatures, while surveillance-optimized thermal cameras show relative temperatures. All types of thermal cameras have excellent object detection capabilities regardless of light conditions – even in total darkness.

Isothermal palette

A mode that allows the user to select a color range to represent different temperatures in a scene. Each color in an isotherm palette corresponds to a specific temperature value. The user can choose between black-and-white ranges, color ranges, or a mix between the two. The same input (measured thermal radiation) can result in different visual appearance depending on how each pixel value is mapped to a color range.

Thermometric guard tour

When using thermometric guard tour the camera needs to be installed on a positioning unit to be able to move between preset positions. It then measures temperatures in predefined polygonal detection areas. It's possible to add up to 256 presets with 10 detection areas per preset for large-scale temperature monitoring.

With thermometric guard tour, you also don't have to control the camera manually every time you want to do a video tour of the premises. Instead, you can play the guard tour. You can play the guard tour on command and at scheduled times.

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*.

Electronic image stabilization

Electronic image stabilization (EIS) provides smooth video in situations where a camera is subject to vibrations. Built-in gyroscopic sensors continuously detect the camera's movements and vibrations, and they automatically adjust the frame to ensure you always capture the details you need. Electronic image stabilization relies on different algorithms for modeling camera motion, which are used to correct the images.

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