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 Minimum focus distance: 1.3 m (4.3 ft) **13 mm** Horizontal field of view: 28°, F1.0 Minimum focus distance: 4 m (13 ft) **19 mm** Horizontal field of view: 19.4°, F1.23 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[a] 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

Audio

Audio features	AGC automatic gain control Network speaker pairing Spectrum visualizer[b]
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[c], HTTP/2, TLS[c], 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, Syslog, 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*. 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 Companion, AXIS Camera Station, video management software from Axis' Application Development 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

Analytics

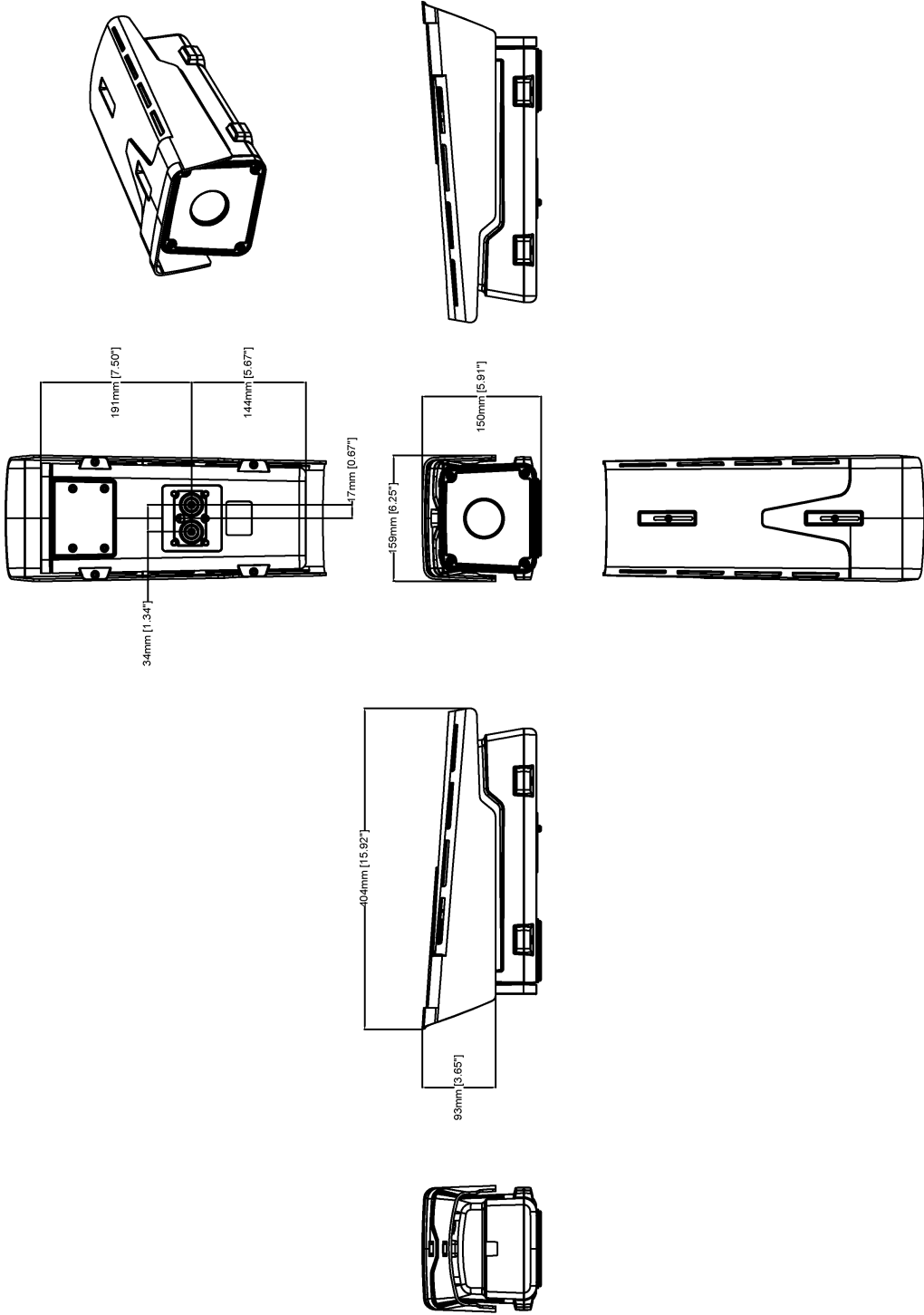|	
Applications	Included AXIS Video Motion Detection, AXIS Motion Guard, AXIS Fence Guard, AXIS Loitering Guard, early fire detection, active tampering alarm, audio detection Supported AXIS Perimeter Defender Support for AXIS Camera Application Platform enabling installation of third-party applications, 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
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[d], 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

Edge security	**Software:** Signed firmware, brute force delay protection, digest authentication, password protection, 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)[c], IEEE 802.1AR, HTTPS/HSTS[c], TLS v1.2/v1.3[c], Network Time Security (NTS), X.509 Certificate PKI, IP address filtering
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[d] 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
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	
	Temperature monitoring -40 °C to 50 °C (-40 °F to 122 °F)
conditions	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: 18% (recycled: 5%, bio-based: 13%) 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*

a. *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.*
b. *Feature available with ACAP*
c. *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).*
d. *Excluding front window*

Dimension drawing

AXIS Q2101-TE Thermal Camera

191mm [7.50"]
144mm [5.67"]
17mm [0.67"]
34mm [1.34"]
150mm [5.91"]
159mm [6.25"]
404mm [15.92"]
93mm [3.65"]

Revision	v.01	Revision date	2023-03-08
Paper size	A4	Release date	2023-03-08
Created by	MS	Scale	1:7

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Key features and technologies

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.

Built-in cybersecurity

Axis Edge Vault is a secure cryptographic compute module (secure module or secure element) in which the Axis device ID is securely and permanently installed and stored.

Signed firmware is implemented by the software vendor signing the firmware image with a private key, which is secret. When firmware has this signature attached to it, a device will validate the firmware before accepting and installing it. If the device detects that the firmware integrity is compromised, it will reject the firmware upgrade. Axis signed firmware is based on the industry-accepted RSA public-key encryption method.

Secure boot is a boot process that consists of an unbroken chain of cryptographically validated software, starting in immutable memory (boot ROM). Being based on signed firmware, secure boot ensures that a device can boot only with authorized firmware. Secure boot guarantees that the Axis device is completely clean from possible malware after resetting to factory default.

TPM is short for Trusted Platform Module. A TPM is a component that provides a set of cryptographic features suitable for protecting information from unauthorized access. The private key is stored in the TPM and never leaves the TPM. All cryptographic operations requiring the use of the private key are sent to the TPM to be processed. This ensures that the secret part of the certificate remains safe even in the event of a security breach.

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*

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