FLIR A40 Smart Sensor 51°

P/N: 89851-0601

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Website

http://www.flir.com

Customer support

http://support.flir.com

General
Key Features • Accurate and stable temperature measurement for 24/7 monitoring, when higher resolution is not required. • Narrow field of view option for system integrators. • Easy integration to existing IT systems with support for Industrial protocols, such as modbus TCP, EtherNet/IP, MQTT and REST API. • Small and rugged with various connections including: M12 Ethernet, Digital I/O, RS-232/485. • IP66 rated with diamond-like carbon coating on the lens for durability. **Main Applications** • On-camera analytics and alarm capabilities for condition monitoring and early fire detection. • Quickly access thermal characteristics to catch potential failures, and detect fires before signs of smoke or flames. • Simplify integration efforts with thermal smart sensors that communicate with standard industrial protocols and video management systems.

Imaging and optical data	
Infrared resolution	320 × 240 pixels
Thermal sensitivity (NETD)	35 mK
Field of view (FOV)	51° × 39°
Minimum focus distance	0.2 m (0.66 ft)
Focal length	8.2 mm (0.32 in)
Spatial resolution (IFOV)	3.0 mrad/pixel
f-number	1.4
Image frequency	30 Hz
Focus	Fixed, adjustable with included focus tool

Detector data	
Focal plane array/spectral range	Uncooled microbolometer/7.5–14 µm
Detector pitch	25 µm

Visual imaging and optical data	
Still image resolution	• Web UI: 640 × 480 pixels • Alarm and Scheduler: 640 × 480 pixels • REST API: 640 × 480 pixels, 1280 × 960 pixels
Focus	Fixed

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Visual imaging and optical data	
Field of view (FOV)	• 320 × 240 pixels; according to IR FOV • 1280 × 960 pixels; 67.2° (diagonal)
LED lamp	Built-in LED light

Measurement	
Camera temperature range	• –20 to 175°C (–4 to 347°F) • 175 to 1000°C (347 to 1832°F)
Object temperature range and accuracy (for ambient temperature 15–35°C (59–95°F))	• Range –20 to 175°C (–4 to 347°F): ◦ –20 to 100°C (–4 to 212°F), accuracy ±2°C (±3.6°F) ◦ 100 to 175°C (212 to 347°F), accuracy ±2% • Range 175 to 1000°C (347 to 1832°F): accuracy ±2%

Measurement analysis	
Standard functions	• 10 Spotmeters • 10 Boxes or Polygons • 3 Deltas (difference any value/reference/ external lock) • 2 Isotherm (above/below/interval) • 2 Iso-coverage • 2 Lines • 1 Polyline • 1 Reference temperature
Automatic hot/cold detection	Max./min. temperature value and position shown within Box
Schedule response	sftp (image), SMTP (image and/or measurement data/result)
Measurement presets	Yes
Atmospheric transmission correction	Based on inputs of distance, atmospheric temperature, and relative humidity
Lens transmission correction	Automatic, based on signals from internal sensors
Emissivity correction	Variable from 0.01 to 1.0
Reflected apparent temperature correction	Based on input of reflected temperature
External optics/windows correction	Based on input of optics/window transmission and temperature
Measurement corrections	• Global object parameters • Local parameters per analyze function
Measurement frequency	Up to 10 Hz
Measurement result read-out	• EtherNet/IP (pull) • Modbus TCP Server (pull) • MQTT (push) • Query over REST API (pull) Measurements and still image (radiometric JPEG, visual 640 × 480, visual 1280 × 960), read access only. • Web interface

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Alarm	
Alarm functions	• On any selected measurement function • Digital in • Internal camera temperature
Alarm output	• Digital out • E-mail (SMTP) (push) • EtherNet/IP (pull) • File transfer (FTP) (push) • Modbus TCP Server (pull) • MQTT (push) • Query over RESTful API (pull) • Store image or video

Video/Radiometric streaming RTSP	
Protocol	RTSP
Unicast	Yes
Multicast	Yes
Multiple image streams	Yes
Video streaming	
Image quality	Bit rate set through Camera web
Video streaming, Image source 0:	
Resolution (source 0)	640 × 480 pixels
Contrast enhancement	FSX / Histogram equalization (IR only)
Overlay (source 0)	With / Without
Image source (source 0)	Visual / IR / MSX
Pixel format (source 0)	YUV411
Encoding (source 0)	H.264 / MPEG4 / MJPEG
Video streaming, Image source 1:	
Resolution (source 1)	1280 × 960 pixels
Overlay (source 1)	No
Image source (source 1)	Visual
Pixel format (source 1)	YUV411
Encoding (source 1)	H.264 / MPEG4 / MJPEG
Radiometric streaming	
Resolution (radiometric)	N/A
Source	N/A
Pixel format (radiometric)	N/A
Encoding (radiometric)	N/A

Ethernet	
Interface	• Wired
Connector type	• M12 8-pin X-coded, Female • RP-SMA, Female (not used)
Ethernet, purpose	Control, result, image, and power
Ethernet, type	1000 Mbps
Ethernet, standard	IEEE 802.3
Ethernet, communication	TCP/IP socket-based FLIR proprietary

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Ethernet	
Ethernet, power	Power over Ethernet, PoE IEEE 802.3af class 3
Ethernet, protocols	• EtherNet/IP • IEEE 1588 • Modbus TCP Server • MQTT • SNMP • TCP, UDP, SNTP, RTSP, RTP, HTTP, HTTPS, ICMP, IGMP, sftp (server), FTP (client), SMTP, DHCP, MDNS (Bonjour), uPnP

Digital Input/output	
Connector type	M12 12-pin A-coded, Male (shared with external power)
Digital input	2x opto-isolated Vin(low)= 0–1.5 V, Vin(high)= 3–25 V
Digital input, purpose	• NUC • NUC disable • Alarm
Digital output	• 3x opto-isolated, 0–30 V DC, max. 300 mA (derated to 200 mA at 60C) • Solid state opto relay • 1x dedicated as Fault output (NC)
Digital output, purpose	• As function of alarm, output to external device • Fault (NC)
Digital I/O, isolation voltage	500 VRMS

Power system	
External power	18 VDC – 56 VDC, Max 8 W
Power over Ethernet (PoE)	44 VDC – 56 VDC, Max 8.1 W
Connector type	External power: • M12 12-pin A-coded, Max 450 mA (shared with Digital I/O) PoE: • M12 8-pin X-coded, Max 350 mA

Environmental data	
Operating temperature range	• With cooling plates on at least three sides: –20 to 50°C (–4 to 122°F) • No cooling plates: –20 to 35°C (–4 to 95°F)
Storage temperature range	IEC 68-2-1 and IEC 68-2-2, –40 to 70°C (–40 to 158°F) for 16 hours
Humidity (operating and storage)	IEC 60068-2-30/24 hours, 95% relative humidity, 25–40°C (77–104°F)/2 cycles EN60068-2-38
EMC	• ETSI EN 301 489-1 (radio) • ETSI EN 301 489-17 (radio) • EN 61000-4-8 (magnetic field) • FCC 47 CFR Part 15 Class B (emission US) • ISO 13766-1 (EMC - Earth-moving and building construction machinery) • EN ISO 14982 (EMC - Agricultural and forestry machinery)
Encapsulation	IEC 60529, IP66
Shock	IEC 60068-2-27, 25 g

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Environmental data	
Vibration	• IEC 60068-2-6, 0.15 mm at 10–58 Hz and 2 g at 58–500 Hz, sinusoidal • IEC 61373 Cat 1 (Railway)
Safety	IEC 62368-1 (IT equipment audio-visual products)
Corrosion	• ISO 12944 C4 G or H • EN60068-2-11
Declaration of conformity	See: https://support.flir.com/resources/DoC

Physical data	
Weight (including lens)	0.52 kg (1.1 lb)
Size (L × W × H)	107 × 67 × 57 mm (4.21 × 2.64 × 2.24 in)
Base mount	4 × M2.5 directly onto camera or 4 × 10-32 UNF onto bottom cooling plate
Tripod mounting	UNC ¼″-20 on 2 sides
Housing material	Aluminium
Color	Black

Warranty and service	
Warranty	http://www.flir.com/warranty/

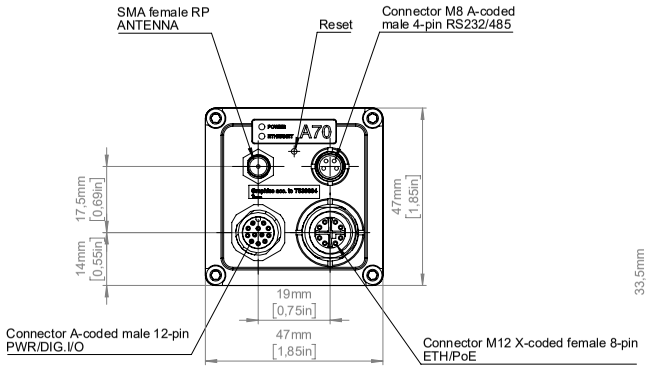
Shipping information	
Packaging, type	Cardboard box
Packaging, contents	• Infrared camera • Cooling plate • Focus adjustment tool • Ethernet cable M12 to RJ45F (0.3 m), P/N T911869ACC • Printed documentation including the username and password for log in to the web interface of the camera
Packaging, weight	0.92 kg (2.0 lb)
Packaging, size	182 × 128 × 109 mm (7.16 × 5.04 × 4.29 in)
EAN-13	7332558034217
UPC-12	845188031756
Country of origin	Sweden

Supplies & accessories:

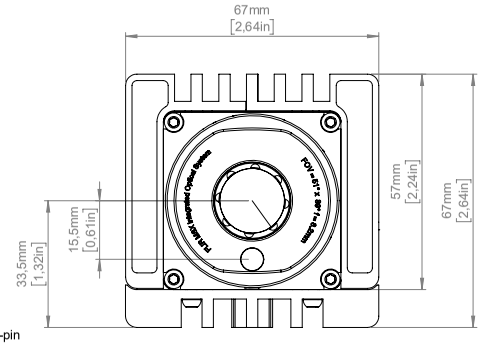
- T951004ACC; Ethernet cable CAT6, 2 m/6.6 ft.
- T300202; Connector cap kit
- T300268ACC; A-series connection board
- T300321ACC; Two-ball mounting bracket kit
- T911852ACC; Cable M12 to pigtail, 2 m
- T911853ACC; Cable M12 to pigtail, 10 m
- T911854ACC; Ethernet cable M12 to RJ45, 2 m
- T911855ACC; Ethernet cable M12 to RJ45, 10 m
- T911869ACC; Ethernet cable M12 to RJ45F, 0.3 m
- T911183; Gigabit PoE injector 16 W, with multi-plugs
- T911997; Tripod
- T199507; Gigabit PoE injector 15 W

Generic dimensions for all FOV

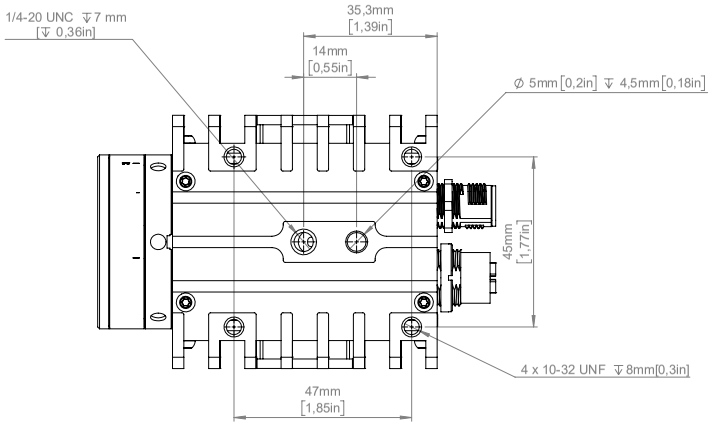
Back View

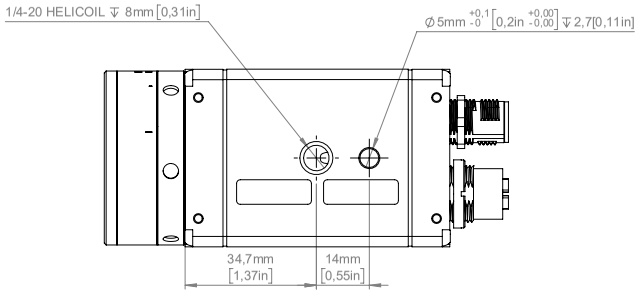


Front View

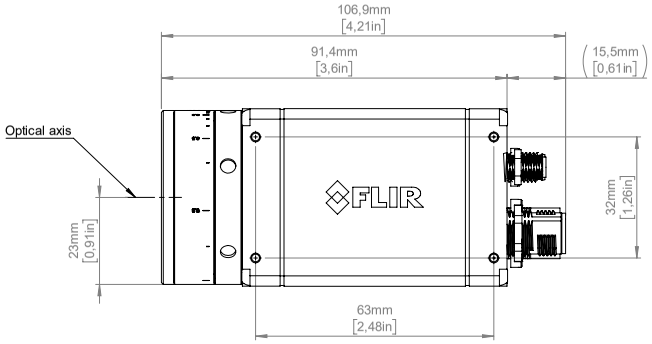


Bottom View

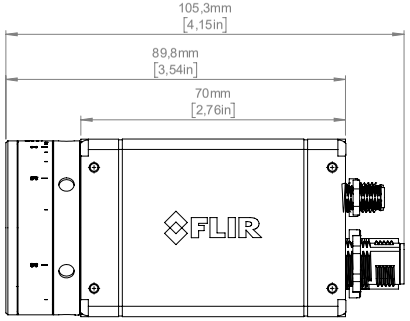




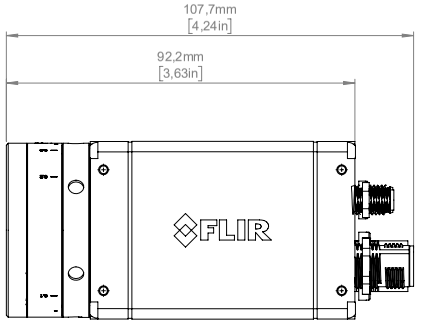
IR Lens 29 deg



IR Lens 51 deg



IR Lens 95 deg



Modified	Check	Drawn by
2021-04-15	JOHE	R&D

Denomination

Basic dimension Ax0

FLIR

Size	Sheet
A2	1(1)
Scale	
1:1	
Drawing No.	Rev
T131228	A