FLIR A310

P/N: 48201-1101

General description

The FLIR A310 camera offers an affordable and accurate temperature measurement solution for anyone who needs to solve problems that need built in "smartness" such as analysis, alarm functionality and autonomous communication using standard protocols. The FLIR A310 camera also has all the necessary features and functions to build distributed single- or multi-camera solutions utilizing standard Ethernet hardware and software protocols.
The FLIR A310 camera also has built in support to connect to industrial control equipment such as PLCs, and allows for sharing of analysis and alarm results and simple control using the Ethernet/IP and Modbus TCP field bus protocol.

Key features:

- Support for EthernetIP field bus protocol (analyse, alarm, and simple camera control)
- Support for Modbus TCP field bus protocol (analyse, alarm, and simple camera control)
- Built-in extensive analysis functionality
- Extensive alarm functionality, as a function of analysis and more
- On schedule: file sending (FTP) or email (SMTP) of analysis results or images
- On alarms: file sending (FTP) or email (SMTP) of analysis results or images
- MPEG-4 streaming
- PoE (Power over Ethernet)
- Built-in web server
- General purpose I/O
- 100 Mbps Ethernet (100 m cable, wireless, fiber, etc.)
- Synchronization through SNTP
- Composite video output
- Multi-camera utility software: FLIR IP Config and FLIR IR Monitor included
- Open and well-described TCP/IP protocol for control and set-up
- 16-bit 320 × 240 images @ 7–8 Hz, radiometric
- Lenses: 25° included, 15° and 45° optional

Typical applications:

- Safety with temperature alarms (multi-camera applications), fire prevention, critical vessel monitoring, and power utility asset management
- Volume-oriented industrial control (multi-camera installation is possible)

Imaging and optical data	
Field of view (FOV)	25° × 18.8°
Minimum focus distance	0.4 m (1.31 ft.)
Focal length	18 mm (0.7 in.)
Spatial resolution (IFOV)	1.36 mrad
Lens identification	Automatic
F-number	1.3
Thermal sensitivity/NETD	< 0.05°C @ +30°C (+86°F) / 50 mK
Image frequency	30 Hz
Focus	Automatic or manual (built in motor)
Zoom	1–8× continuous, digital, interpolating zooming on images
Detector data	
Detector type	Focal Plane Array (FPA), uncooled microbolometer
Spectral range	7.5–13 µm
IR resolution	320 × 240 pixels
Detector pitch	25 µm
Detector time constant	Typical 12 ms
Measurement	
Object temperature range	–20 to +120°C (–4 to +248°F) 0 to +350°C (+32 to +662°F)
Accuracy	±2°C (±3.6°F) or ±2% of reading
Measurement analysis	
Spotmeter	10
Area	10 boxes with max./min./average/position
Isotherm	1 with above/below/interval
Measurement option	Measurement Mask Filter Schedule response: File sending (ftp), email (SMTP)
Difference temperature	Delta temperature between measurement functions or reference temperature
Reference temperature	Manually set or captured from any measurement function
Atmospheric transmission correction	Automatic, based on inputs for distance, atmospheric temperature and relative humidity
Optics transmission correction	Automatic, based on signals from internal sensors
Emissivity correction	Variable from 0.01 to 1.0
Reflected apparent temperature correction	Automatic, based on input of reflected temperature
External optics/windows correction	Automatic, based on input of optics/window transmission and temperature
Measurement corrections	Global and individual object parameters
Alarm	
Alarm functions	6 automatic alarms on any selected measurement function, Digital In, Camera temperature, timer
Alarm output	Digital Out, log, store image, file sending (ftp), email (SMTP), notification
Set-up	
Color palettes	Color palettes (BW, BW inv, Iron, Rain)
Set-up commands	Date/time, Temperature°C/°F
Storage of images	
Image storage type	Built-in memory for image storage
File formats	Standard JPEG, 16-bit measurement data included
Ethernet	
Ethernet	Control, result and image
Ethernet, type	100 Mbps
Ethernet, standard	IEEE 802.3
Ethernet, connector type	RJ-45
Ethernet, communication	TCP/IP socket-based FLIR proprietary
Ethernet, video streaming	MPEG-4, ISO/IEC 14496-1 MPEG-4 ASP@L5
Ethernet, image streaming	16-bit 320 × 240 pixels @ 7-8 Hz - Radiometric
Ethernet, power	Power over Ethernet, PoE IEEE 802.3af class 0
Ethernet, protocols	Ethernet/IP, Modbus TCP, TCP, UDP, SNTP, RTSP, RTP, HTTP, ICMP, IGMP, ftp, SMTP, SMB (CIFS), DHCP, MDNS (Bonjour), uPnP
Digital input/output	
Digital input, purpose	Image tag (start/stop/general), Input ext. device (programmatically read)
Digital input	2 opto-isolated, 10–30 VDC
Digital output, purpose	As function of ALARM, Output to ext. device (programmatically set)
Digital output	2 opto-isolated, 10–30 VDC, max 100 mA
Digital I/O, isolation voltage	500 VRMS
Digital I/O, supply voltage	12/24 VDC, max 200 mA
Digital I/O, connector type	6-pole jackable screw terminal
Composite video	
Video out	Composite video output, PAL and NTSC compatible
Video, standard	CVBS (ITU-R-BT.470 PAL/SMPTE 170M NTSC)
Video, connector type	Standard BNC connector
Power system	
External power operation	12/24 VDC, 24 W absolute max
External power, connector type	2-pole jackable screw terminal
Voltage	Allowed range 10–30 VDC
Environmental data	
Operating temperature range	–15°C to +50°C (+5°F to +122°F)
Storage temperature range	–40°C to +70°C (–40°F to +158°F)
Humidity (operating and storage)	IEC 60068-2-30/24 h 95% relative humidity +25°C to +40°C (+77°F to +104°F)

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EMC	• EN 61000-6-2:2001 (Immunity) • EN 61000-6-3:2001 (Emission) • FCC 47 CFR Part 15 Class B (Emission)
Encapsulation	IP 40 (IEC 60529)
Bump	25 g (IEC 60068-2-29)
Vibration	2 g (IEC 60068-2-6)
Physical data	
Weight	0.7 kg (1.54 lb.)
Camera size (L × W × H)	170 × 70 × 70 mm (6.7 × 2.8 × 2.8 in.)
Tripod mounting	UNC ¼"-20 (on three sides)
Base mounting	2 × M4 thread mounting holes (on three sides)
Housing material	Aluminium

Scope of delivery

- Hard transport case or cardboard box
- Infrared camera with lens
- Calibration certificate
- Ethernet™ cable
- Mains cable
- Power cable, pig-tailed
- Power supply
- Printed Getting Started Guide
- Printed Important Information Guide
- User documentation CD-ROM
- Utility CD-ROM
- Warranty extension card or Registration card

Optional Accessories

- 1196961 IR lens f = 30 mm, 15° incl. case
- 1196960 IR lens f = 10 mm, 45° incl. case
- T197215 Close-up 4× (100 µm) incl. case
- T197214 Close-up 2× (50 µm) incl. case
- T197407 Lens 76 mm (6°) with case and mounting support for A/SC3XX
- T197411 Lens 4 mm (90°) with case and mounting support for A/SC3XX
- T197415 Close-up 1× (25 µm) incl. case and mounting support for A/SC3XX
- T197000 High temp. option +1200°C/+2192°F for FLIR T/B2XX to T/B4XX and A/SC3XX Series
- 1910585 Power supply for A/SC3XX and A/SC6XX
- 1910400 Power cord EU
- 1910401 Power cord US
- 1910402 Power cord UK
- 908929 Video cable, 3.0 m/9.8 ft.
- T951004 Ethernet cable CAT-6, 2m/6.6 ft.
- 1910586 Power cable, pigtailed
- 1196940 Hard transport case for A/SC3XX and A/SC6XX series
- 1196962 Delivery Box for A/SC3XX

Optional Software

- T197038 ThermoVision™ System Developers Kit Ver. 2.6

Optional Accessories

1196961; IR lens f = 30 mm, 15° incl. case

General description	
The 15° lens is a popular lens accessory and provides 1.7× magnification compared to the standard lens. Ideal for small or distant targets such as overhead power lines.	
Technical data	
Field of view (FOV)	15° × 11.25°
Minimum focus distance	1.2 m (3.93 ft.)
Focal length	30.38 mm (1.2 in.)
Spatial resolution (IFOV)	1.31 mrad/0.82 mrad
F-number	1.3
Lens note	When two pieces of data are separated by "/" the first piece of data is for T/B200 and T/B250 and the second piece of data is for T/B360, T/B400 and A320/A325
Weight	0.092 kg (0.203 lb.), incl. two lens caps
Size (L × D)	24 × 58 mm (1.0 × 2.3 in.)
Scope of delivery	
• Lens • Lens case	

v1.02

1196960; IR lens f = 10 mm, 45° incl. case

General description	
This wide angle lens has a field of view almost double that of the standard lens. Perfect for wide or tall targets or when working in crowded spaces.	
Technical data	
Field of view (FOV)	45° × 33.8°
Minimum focus distance	0.20 m (0.66 ft.)
Focal length	9.66 mm (0.38 in.)
Spatial resolution (IFOV)	3.93 mrad/2.45 mrad
F-number	1.3
Lens note	When two pieces of data are separated by "/" the first piece of data is for T/B200 and T/B250 and the second piece of data is for T/B360, T/B400 and A320/A325
Weight	0.105 kg (0.231 lb.), incl. two lens caps
Size (L × D)	38 × 47 mm (1.5 × 1.9 in.)
Scope of delivery	
• Lens • Lens case	

v1.01

T197215; Close-up 4× (100 µm) incl. case

General description	
For R&D usage or development purposes. As an example looking at PCB's or small electronic components.	
Technical data	
Field of view (FOV)	32 × 24 mm
Magnifying factor	4×
Working distance	79 mm
Depth of field	±2.0 mm
Focal length	73 mm (2.9 in.)
Spatial resolution (IFOV)	160 µm/100 µm
F-number	1.3
Number of lenses	2 (2 asph)
MTF @ 70% of FOV	Normal requirements (52%)
Distortion	3%
Lens note	When two pieces of data are separated by "/" the first piece of data is for T/B200 and T/B250 and the second piece of data is for T/B360, T/B400 and A320/A325
Weight	0.11 kg (0.24 lb.)
Size (L × D)	35.2 × 55 mm
Scope of delivery	
• Lens • Lens case	

v1.02

T197214; Close-up 2× (50 µm) incl. case

General description	
For R&D usage or development purposes. As an example looking at PCB's or small electronic components.	
Technical data	
Field of view (FOV)	16 × 12 mm
Magnifying factor	2×
Working distance	33 mm
Depth of field	±0.4 mm
Focal length	37 mm (1.5 in.)
Spatial resolution (IFOV)	80 µm/50 µm
F-number	1.3
Number of lenses	2 (2 asph)
MTF @ 70% of FOV	Normal requirements (52%)
Distortion	3%
Lens note	When two pieces of data are separated by "/" the first piece of data is for T/B200 and T/B250 and the second piece of data is for T/B360, T/B400 and A320/A325
Weight	0.11 kg (0.24 lb.)
Size (L × D)	35.2 × 55 mm
Scope of delivery	
• Lens • Lens case	

v1.03

T197407; Lens 76 mm (6°) with case and mounting support for A/SC3XX

General description	
A narrow FOV is used in applications where the object that is going to be monitored is remote from the Camera or when the Camera needs to be far away from the object due to for an example high temperatures.	
Technical data	
Field of view (FOV)	6° × 4.5°
Minimum focus distance	4 m (13.11 ft.)
Focal length	76 mm (3.0 in.)
Spatial resolution (IFOV)	0.33 mrad
F-number	1.3
Number of lenses	3 (3 asph)
MTF @ 70% of FOV	Normal requirements (52%)
Distortion	3%
Weight	Lens: 0.328 kg (0.723 lb.) Support: 0.15 kg (0.331 lb.)
Size (L × D)	106 × 89 mm (4.17 × 3.48 in.)
Scope of delivery	

- Lens
- Lens case
- Mounting support

v1.03

T197411; Lens 4 mm (90°) with case and mounting support for A/SC3XX

General description	
A wide angle lens is used when working in confined areas or when a large object area needs to be covered. This lens is also designed for to look in to electrical cabinets down to 1/2" windows	
Technical data	
Field of view (FOV)	90° × 73°
Minimum focus distance	20 mm (0.79 in.)
Focal length	4 mm (0.157 in.)
Spatial resolution (IFOV)	4.9 mrad
F-number	1.3
Number of lenses	3 (3asph)
MTF @ 70% of FOV	Normal requirements (52%)
Distortion	5%
Weight	Lens: 0.262 kg (0.578 lb.) Support: 0.048 kg (0.106 lb.)
Size (L × D)	90 × 60 mm (3.54 × 2.36 in.), excluding support
Scope of delivery	

- Lens
- Lens case
- Mounting support

v1.03

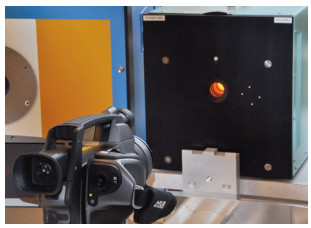
T197415; Close-up 1× (25 µm) incl. case and mounting support for A/SC3XX

General description	
For R&D usage or development purposes. As an example looking at PCB's or small electronic components.	
Technical data	
Field of view (FOV)	8 × 6 mm
Magnifying factor	1×
Working distance	20 mm
Depth of field	±0.15 mm
Focal length	18.2 mm (0.72 in.)
Spatial resolution (IFOV)	25 µm
F-number	1.3
Number of lenses	3 (3 asph)
MTF @ 70% of FOV	Normal requirements (52%)
Distortion	3%
Weight	0.38 kg (0.83 lb.)
Size (L × D)	167 × 60 mm
Scope of delivery	

- Lens
- Lens case
- Mounting support

v1.03

T197000; High temp. option +1200°C/+2192°F for FLIR T/B2XX to T/B4XX and A/SC3XX Series



General description	
For high temperature applications the camera can be calibrated for high temperature ranges.	
Technical data	
Optional object temperature range	Up to +1200°C (+2192°F)

v1.0

1910585; Power supply for A/SC3XX and A/SC6XX

General description	
Power supply for the A320-series	
Technical data	
AC operation	100–240 V, 50–60 Hz, 1.8 A output: 12 VDC 3.0 A
Power	36 W
Size (L × W × H)	120 x 60 x 35 mm (4.7 x 2.4 x 1.4 in.)

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Cable length	2.0 m (6.6 ft.)

v1.0

1910400; Power cord EU

General description	
Power cord (EU) for the power supply	
Technical data	
AC operation	250 V 16 A
Cable length	2.0 m (6.6 ft.)
Color	Black

v1.0

1910401; Power cord US

General description	
Power cord (US) for the power supply	
Technical data	
AC operation	125 V 15 A
Cable length	2.0 m (6.6 ft.)
Color	Black

v1.0

1910402; Power cord UK

General description	
Power cord (UK) for the power supply	
Technical data	
AC operation	250 V 13 A
Cable length	2.0 m (6.6 ft.)
Color	Black

v1.0

908929; Video cable, 3.0 m/9.8 ft.

General description	
This cable is used to transfer video signals from the infrared camera to an external monitor, or to a computer featuring an internal video card.	
Technical data	
Weight	163 g (5.7 oz.)
Cable length	3.0 m (9.8 ft.)
Connector	BNC

v1.01

T951004; Ethernet cable CAT-6, 2m/6.6 ft.

General description	
This cable is used to connect the infrared camera to Ethernet.	
Technical data	
Weight	80 g (2.8 oz.)
Cable length	2.0 m (6.6 ft.)
Connector	RJ-45 to RJ-45
Cable type	CAT-6

v1.01

1910586; Power cable, pigtailed

General description	
This cable is used, when a separate power supply is used (not the one supplied with the camera)	
Technical data	
Weight	75 g (2.6 oz.)
Cable length	2.0 m (6.6 ft.)
Connector	Pigtailed
Color	Black

v1.02

1196940; Hard transport case for A/SC3XX and A/SC6XX series

General description	
Hard transport case for FLIR A3XX series	

v1.0

1196962; Delivery Box for A/SC3XX

General description	
Cardboard delivery box with plastic handle for the A3XX series. Holds all items neatly.	
Technical data	
Weight	826 g (29.14 oz.)
Size (L × W × H)	455 × 300 × 165 mm (17.9 × 11.8 × 6.5 in.)
Material	Cardboard
	v1.0

Optional Software

T197038; ThermoVision™ System Developers Kit Ver. 2.6

General description	
ThermoVision™ System Developers Kit	
Release notes	
Version	2.6

v1.0

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