Thermal Focus

Sterk in Temperatuur

Fixed cameras

Thermal and vision solutions for professionals

www.thermalfocus.eu

TELEDYNE FLIR

Everywhereyoulook™

PLATINUM PARTNER

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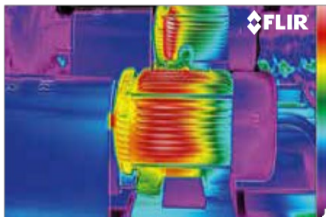
FLIR Ax8

Imaging & Optical Data	
IR resolution	80 × 60 pixels
Thermal sensitivity/NETD	< 0.10°C @ +30°C (+86°F) / 100 mK
Field of view (FOV)	48° × 37°
Focus	Fixed
Detector data	
Detector type	Focal Plane Array (FPA), uncooled microbolometer
Spectral range	7.5–13 µm
Visual camera	
Built-in digital camera	640 × 480
Digital camera, FOV	Adapts to the IR lens
Sensitivity	Minimum 10 Lux without illuminator
Measurement	
Object temperature range	–10°C to +150°C (14°F to 302°F)
Accuracy	±2°C (±3.6°F) or ±2% of reading (+10 to +100C@+10 to +35 amb)
Measurement analysis	
Spotmeter	6
Area	6 boxes with max./min./average
Automatic hot/ cold detection	Max/Min temp. value and position shown within box
Measurement presets	Yes
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 object parameters
Alarm	
Alarm functions	Automatic alarms on any selected measurement function. A maximum of 5 alarms can be set
Alarm output	Digital Out, 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
Web interface	Yes
Storage of images	
Storage media	Built-in memory for image storage
Image storage mode	IR, visual, MSX
File formats	JPEG+FFF



Ethernet	
Ethernet	Control, result and image
Ethernet, type	100 Mbps
Ethernet, standard	IEEE 802.3
Ethernet, connector type	M12 8-pin X-coded
Ethernet, video streaming	Yes
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, sftp, SMTP, SMB (CIFS), DHCP, MDNS (Bonjour)
Image streaming	
Image streaming formats	Motion JPEG, MPEG, H.264
Image streaming resolution	640 × 480
Image modes	Thermal, Visual, MSX (IR-image with enhanced detail presentation)
Automatic image adjustment	Continuous
Power system	
External power operation	12/24VDC, 2 W continuously/ 3.1 W absolute max
External power, connector	M12 8-pin A-coded (Shared with digital I/O)
Voltage Allowed range	10.8–30VDC
Environmental data	
Operating temp. range	0°C to +50°C (32°F to +122°F)
Storage temp. range	–40°C to +70°C (–40°F to +158°F) IEC 68-2-1 and IEC 68-2-2
Humidity (operating and storage)	IEC 60068-2-30/24 h 95% relative humidity +25°C to +40°C (+77°F to +104°F)/ 2 cycles
EMC	EN 61000-6-2:2001 (Immunity) EN 61000-6-3:2001 (Emission) FCC 47 CFR Part 15 Class B (Emission)
Encapsulation	IP67 (IEC 60529)
Bump	25 g (IEC 60068-2-29)
Vibration	2 g (IEC 60068-2-6)
Physical data	
Camera size (L × W × H)	54 × 25 × 79 mm (2.1 x 1 x 3.1 in.) w/o connectors 54 × 25 × 95 mm (2.1 x 1 x 3.7 in.) w/ connectors
Shipping information	
Packaging	Infrared camera with lens, printed documentation, user documentation CD-ROM

FLIR A35 & FLIR A65

EXTREMELY AFFORDABLE AND COMPACT

Imaging & Optical Data	FLIR A65	FLIR A35
IR resolution	640 x 512 pixels	320 x 256 pixels
Spatial resolution (IFOV)	45° (H) x 37° (V) with 13 mm lens 25° (H) x 20° (V) with 25 mm lens lenses are not interchangeable and need to be specified at time of order	48° (H) x 39° (V) with 9 mm lens 25° (H) x 19° (V) with 19 mm lens lenses are not interchangeable and need to be specified at time of order
Image frequency	7.5 Hz / 30Hz	60 Hz
Detector pitch	17 µm	25 µm
Object temperature range	-25°C to +135°C (-13 to 275°F)	-25°C to +135°C (-13 to 275°F) / –40°C to +550°C (-40 to 1022°F)

Quality control of food production line

Detecting liquid level in visually opaque bottles

CHOICE OF IMAGE QUALITY

GigE VISION™ STANDARD COMPATIBILITY

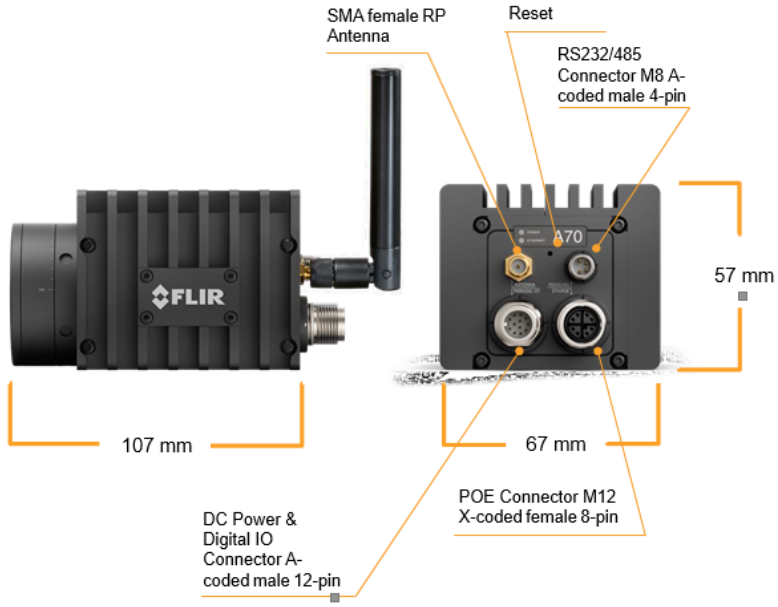
GenICam™ PROTOCOL SUPPORT

14-BIT TEMPERATURE LINEAR OUTPUT

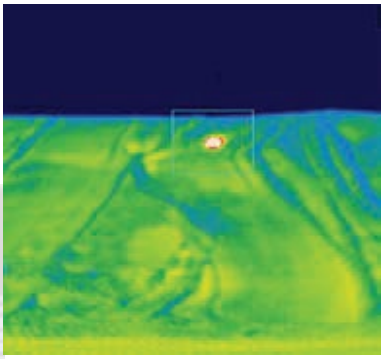
SYNCHRONIZATION

Imaging & Optical Data	
Thermal sensitivity/NETD	< 0.05°C @ +30°C (+86°F) / 50 mK
Accuracy	Accuracy ±5°C (±9°F) or ±5% of reading
F-number	1.25
Focus Fixed	Fixed
Detector data	
Focal Plane Array (FPA) / Spectral range	Uncooled VOX microbolometer / 7.5–13 µm
Detector time constant	Typical 12 ms
Ethernet	
Ethernet	Control and image
Ethernet, type	Gigabit Ethernet
Ethernet, standard	IEEE 802.3 / RJ-45
Ethernet, communication	GigE Vision ver. 1.2 Client API GenICam compliant
Ethernet, image streaming	8-bit monochrome @ 7.5 / 30 / 60 Hz (variant dependant) Signal linear/ DDE, Automatic/ Manual, Flip H&V 14-bit @ 7.5 / 30 / 60 Hz (variant dependent) according to IR camera resolution Signal linear/ DDE, GigE Vision and GenICam compatible
Ethernet, power	Power over Ethernet, PoE IEEE 802.3af class 0 Power
Ethernet, protocols	TCP, UDP, ICMP, IGMP, DHCP, GigEVision

FLIR Automation thermal cameras – A50/A70



FLIR A50 & FLIR A70



Smart Sensor

- Modbus TCP Server
- Modbus TCP Client*
- Ethernet IP (Rockwell AOP)
- MQTT
- REST API (write/read)
- FTP, SMTP
- ONVIF S*
- FLIR ATLAS SDK*
- FLIR Thermal Studio*
- FLIR Research Studio*

Image Streamer

- GigE Vision® – temperature linear
- GenIcam™
- ONVIF S*
- 3rd Party MV Software
- FLIR Spinaker SDK
- FLIR ATLAS SDK*
- FLIR Thermal Studio*
- FLIR Research Studio*

* Requires Advanced Configuration

SMART SENSOR

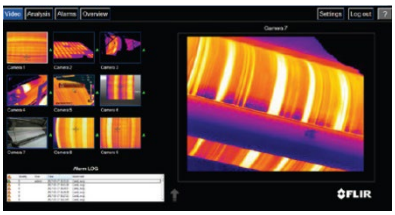
- ❑ PRIMARY APPLICATIONS ARE CONDITION MONITORING OR EARLY FIRE DTECTION.
- ❑ THE NEED TO JUST HAVING SOME KEY DATA POINTS FROM SEVERAL REGIONS OF INTEREST
- ❑ 10 Hz FRAME RATE IN PROCESSING IS FAST ENOUGH
- ❑ THE NEED TO USE INDUSTRIAL PROTOCOL COMMUNICATION

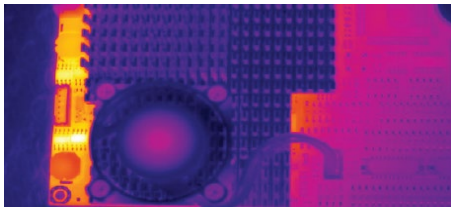
IMAGE STREAMER

- ❑ PRIMARY APPLICATIONS ARE PROCESS & QUALTIY CONTROL
- ❑ THE NEED TO PERFORM COMPLEX IMAGE ANALYSIS ON A COMPUTER
- ❑ THE NEED FOR FASTEST POSSIBLE ANALYSIS
- ❑ THE NEEC TO USE MACHINE VISON SOFTWARE TO CREATE SOLUTIONS

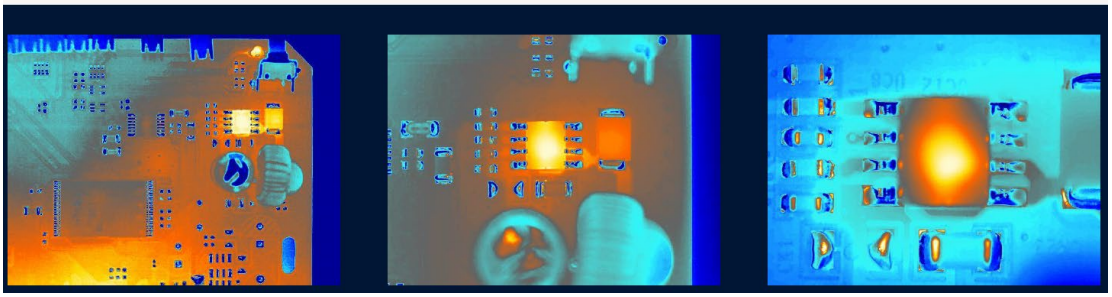
FLIR A400/A500/A700

Detector Data	Standard Configuration	Advanced Configuration
IR resolution	320 × 240 (A400), 464 × 348 (A500), or 640 × 480 (A700)	
Visual resolution	1280 × 960	
Focal plane array/spectral range	<30 mK to <50 mK, lens dependent	
Lenses	2x Macro, DFOV (24°/14°), 6°, 14°, 24°, 42°, and 80°	
IR camera focus	One-shot contrast, motorized, manual	





24° Lens – Min Focus | 24° Lens – Macro Mode | 2X Close-up Lens



STANDARD 24° LENS

STANDARD 24° LENS @ MIN FOCUS

Working Distance = 150mm
Overall FOV = 68mm x 51mm
Spatial Resolution = 106µm/pixel

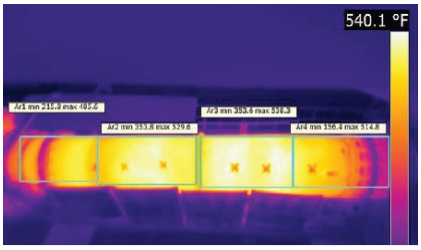
W/ MACRO MODE @ MIN FOCUS

Working Distance = 60mm
Overall FOV = 32mm x 24mm
Spatial Resolution = 50µm/pixel

2X CLOSE-UP LENS @ MIN FOCUS

Working Distance = 18mm
Overall FOV = 15.36mm x 11.52mm
Spatial Resolution = 24µm/pixel

FLIR Automation thermal cameras A400/A500/A700



SPECIFICATIONS

Image and Optical Data	Standard Config.	Advanced Config.
IR resolution	320 × 240 (A400) or 640 × 480 (A700)	
Visual resolution*	1280 × 960	
Thermal resolution	<30 mK to <50 mK, lens dependent	
Lenses	14°, 24°, and 42°	
IR Camera Focus	One-shot contrast, motorized, manual	
Measurement		
Object temperatures	-20°C to 2000°C (-4°F to 3632°F), 3 ranges	
Accuracy	±2°C (±3.6°F) or ±2% of reading	
Video streaming, RTSP protocol		
Unicast	-	Yes
Multicast	-	Yes
Multiple image streams	-	Yes
Video stream 0		
Source	-	Visual, IR, MSX®
Contrast enhancement	-	FSX®, histogram equalization (IR only)
Overlay	-	With, without
Pixel format	-	YUV411
Encoding	-	H.264/MPEG4/MJPEG
Video stream 1		
Source	-	Visual, IR, MSX®
Overlay	-	No
Pixel format	-	YUV411
Encoding	-	H.264/MPEG4/MJPEG
Radiometric streaming, RSTP		
Source	-	IR
Pixel format	-	MONO 16
Encoding	-	Compressed JPEG-LS; FLIR radiometric
Video/radiometric streaming, GVSP (GigE Vision) protocol		
Unicast	Yes	
Multicast	Yes	
Multiple image streams	No	

Video stream 0	Standard Config.	Advanced Config.
Resolution	Visual, IR, MSX®, 640 × 480 pixels	
Contrast enhancement	FSX® (optional), histogram equalization (IR only)	
Overlay	With, without	
Pixel format	YUV411 or MONO 8	
Encoding	Uncompressed	
Radiometric streaming, GVSP		
Resolution	320 × 240 (A400) or 640 × 480 (A700)	
Source	IR	
Pixel format	MONO 16	
Encoding	FLIR radiometric; temperature linear	Compressed JPEG-LS; FLIR radiometric; temperature linear
Ethernet		
Interface	Wired; Wi-Fi*	
Connector types	M12 8-pin X-coded, female; RP-SMA, female	
Ethernet type & standard	1000 Mbps, IEEE 802.3	
Ethernet power	Power over Ethernet, PoE IEEE 802.3af class 3	
Ethernet protocols	Include EtherNet/IP, Modbus TCP, and MQTT	
Digital input/output		
Connector type	M12 Male 12-pin A-coded (shared with ext. power)	
Digital input	2× opto-isolated, Vin (low) = 0-1.5 V, Vin (high) = 3-25 V	
Digital output	3× opto-isolated, 0-48 VDC, max. 350 mA (derated to 200 mA at 60°C). Solid-state opto relay, 1× dedicated as fault output (NC)	
Power system		
Connector type	M12 Male 12-pin A-coded (shared with Digital I/O)	
Power consumption	7.5 W at 24 V DC typical; 7.8 W at 48 V DC typical; 8.1 W at 48 V PoE typical	
Wi-Fi*		
Connector type	Female RP-SMA	

The FLIR A-Series cameras are designed for configuration to your specific needs. To learn more about the Image Streaming Configuration options, please visit: www.flir.com/a400-a700-series

FLIR Automation thermal cameras Matrix Smart cameras

	FLIR Ax8	FC-R Series	FLIR A310	FLIR A50 / A70 Smart Sensor Cameras	FLIR A50 / A70 Advanced Smart Sensor Cameras	FLIR A400/A500/A700 Smart Sensor Camera	FLIR A400/A500/A700 Advanced Smart Sensor Camera
Resolution	80 x 60	320x256 / 640x512	320x240	464x348 / 640x480	464x348 / 640x480	320x240 / 464x348 / 640x480	320x240 / 464x348 / 640x480
Dimensions	54 × 25 × 95 mm	234 x 117 x 104 mm	170 × 70 × 70 mm	107 × 67 × 57 mm	107 × 67 × 57 mm	123 × 77 × 77 mm	123 × 77 × 77 mm
Upper Measurement Limit C	150	110	2000	1000	1000	2000	2000
Lower Operating Temperature C	-10	-50	-15	-20	-20	-20	-20
Digital I/O	●		●	●	●	●	●
Power over Ethernet (PoE)	●	●	●	●	●	●	●
Athermalized Lenses		●		●	●	●	●
Motorized focus			●			●	●
Complex object shape analysis			●		●		●
Relay (350 mA) Fault Output				●	●	●	●
Built-in web interface	●			●	●	●	●
IP66 Water & Dust protection rating	●	●		●	●	●*	●*
Wi-Fi Connectivity*				●	●	●	●
Visual Camera with MSX® *	●			●	●	●	●
RTSP			●	●	●	●	●
Built-in spot analytics function	6		10	10	10	10	10
Built-in area analytics function	6	4	10	10	10	10	10
Built-in Delta function	1		1	3	3	3	3
Built-in alarms	●		●	●	●	●	●
Isotherms	●		●	●	●	●	●
Iso-coverage			●	●	●	●	●
Ethernet IP & Modbus TCP Server	●		●	●	●	●	●
Built-in fault diagnostics				●	●	●	●
REST-API				●	●	●	●
MQTT				●	●	●	●
Close up Lens			●	●	●	●	●
Macro Mode *						●	●
Telephoto Lenses			●			●	●
Very Wide-Angle Lens (>80 degree)			●	●	●		
Modbus TCP Client					●		●
Built-in line analytics function					●		●
Built-in polyline analytics function					●		●
Built-in polygon analytics function					●		●
Pan & Tilt support					●		●
Multi image streaming					●		●
Compressed 16-bit image streaming					●		●
ONVIF S Video and Alarms		●			●		●
External Black-body correction					●		●

Feature	FLIR Ax5	FLIR A315	FLIR A615	FLIR A50 / A70 Image Streaming Camera	FLIR A50 / A70 Advanced Image Streaming Camera	FLIR A400 / A500 / A700 Image Streaming Camera	FLIR A400 / A500 / A700 Advanced Image Streaming Camera
Resolution	320x256 / 640x512	320x240	640x480	464x348 / 640x480	464x348 / 640x480	320x240 / 464x348 / 640x480	320x240 / 464x348 / 640x480
Typical Size	104 × 50 × 47 mm	170 × 70 × 70 mm	360 × 180 × 550 mm	107 × 67 × 57 mm	107 × 67 × 57 mm	123 × 77 × 77 mm	123 × 77 × 77 mm
Approx. Response Time	12 ms	12 ms	8 ms	12 or 10 ms	12 or 10 ms	10 or 12 ms	10 or 12 ms
2% Accuracy		•	•	•	•	•	•
GigE Vision®	•	•	•	•	•	•	•
GenICam™	•	•	•	•	•	•	•
Digital I/O	•	•	•	•	•	•	•
Power over Ethernet (PoE)	•			•	•	•	•
Motorized focus		•	•			•	•
Built-in web interface				•	•	•	•
IP66 *				•	•	•	•
Wi-Fi *				•	•	•	•
Visual Camera with MSX® *				•	•	•	•
Macro Mode *				•	•	•	•
Temp. Meas. > 550 C		•	•	•	•	•	•
Temp. Meas. > 1000 C		•	•			•	•
Telephoto Lenses	•	•	•			•	•
Very Wide-Angle Lens (> 80deg)		•	•	•	•		
RTSP					•		•
Pan & Tilt support					•		•
Multi image streaming					•		•
Compressed 16-bit image streaming					•		•

FLIR A6301

Advanced Thermal Camera for 24/7 Process Monitoring and Quality Control

Key Features:

- A highly sensitive, cooled MWIR sensor improves defect detection and increases product quality.
- Industry-leading long-life micro cooler with 27,000-hour mean time to failure, maximizes camera uptime for consistent production uptime.
- Fast integration times ensure accurate temperature measurements on moving products and production lines.
- Low-latency, deterministic synchronization to external sources means thermal images are captured precisely when needed for decision support.
- Standard GigE Vision protocols, REST API and a built-in web interfaces shorten implementation timelines

Main Applications:

- Inline inspection and validation of package heat sealing
- Process control and monitoring for adhesives
- Quality assurance during paper and plastics production
- Remote monitoring of electrical/mechanical systems

The FLIR A6301 enhances product quality and drives production line efficiency and output for manufacturers.

Speed

Fast integration times ensure accurate temperature measurements on moving products and production.

Sensitivity

The highly sensitive MWIR sensor picks up the smallest of defects, driving improved product quality.

Synchronicity

Thermal images are clear, consistent, and precise, thereby improving quality control.

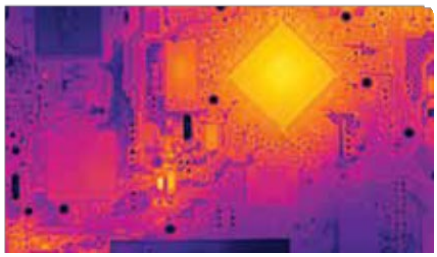
Specifications

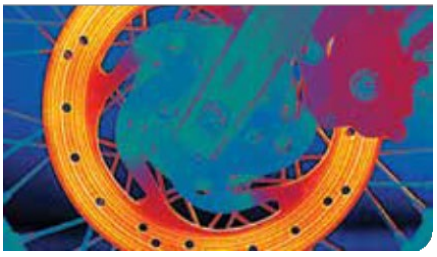
Imaging and optical	
IR resolution	640 × 512
Field of view (FOV)	50 mm lens – 11.0° × 8.8° 25 mm lens – 21.7° × 17.5° 17 mm lens – 31.5° × 25.5°
Minimum focus distance	50 mm lens – 500 mm 25 mm lens – 200 mm 17 mm lens – 60 mm
Focus	Manual
Zoom	Digital zoom, 1x, 2x, 4x, 8x
Digital image enhancement	High sensitivity mode (HSM)
Detector type	High Operating Temperature (HOT) MWIR T2SLS
Spectral range	3.0–5.0 µm
Detector pitch	15 µm
F/#	f/2.5
Frame rate	30 Hz
Sensor cooling	FLIR FL100 Linear cooler
Image modes	IR image, high sensitivity mode (HSM)
Automatic image adjustment	Linear, PE
Color palettes	Selectable 8-bit
Overlay	RTSP Only
Measurement & Analysis	
Thermal sensitivity (NETD)	≤15 mK at 25°C
Temperature measurement range	-20°C to 200°C
Ambient drift compensation (with factory calibration)	Yes
Accuracy	≤100°C ±2°C, >100°C ±2% of reading
Communication & Data Storage	
Synchronization modes	Sync In
Radiometric IR video recording	None
Non-radiometric IR recording	None
Radiometric IR video streaming	GigE Vision
Non-radiometric IR video streaming	H.264 or MJPEG over RTSP
Command & control	GEV: Genicam RTSP: Web Interface, REST API
Storage media	None
Digital I/O connector type	M12 12-pin A-coded, Male (shared with external power)
Digital inputs	2x opto-isolated, Vin(low)= 0–1.5 V, Vin(high)= 3–25 V
Digital outputs	3x opto-isolated, 0–48 V DC, max. 350 mA Solid-state opto relay 1x dedicated as Fault output (NC)
Communication interfaces	Ethernet

Power	
Primary power source	PoE+ Type 2 (30 W min)
Optional DC power connection	M12 12-pin A-coded, male (shared with Digital I/O)
Power consumption	25 W (cool down)
DC voltage range	18 V-56 V
Environmental & Certifications	
Operating temperature range	-20°C to 50°C
Directives	EMC: 2014/30/EU, WEEE: 2012/19/EU
EMC	EN55032:2015/A11:2020 EN55035:2017/A11:2020 FCC Part 15, Subpart B ClassA KC C 9832 and KS C 9835
Encapsulation	IP50
Vibration	10-58 Hz, 0.15 mm; 58-500 Hz, 2 g; 5 cycles, 1 oct/min; X,Y&Z (IAW MIL-STD-810H)
Shock	25 g, 6 ms; Half sine; ± 500 shocks; X,Y&Z (IAW MIL-STD-810H)
General	
Camera size w/o lens	200 × 76 × 92 mm (7.9 × 3.0 × 3.6 in)
Camera size w/lens	50 mm lens: 241 × 76 × 92 mm (9.5 × 3.0 × 3.6 in) 25 mm lens: 260 × 76 × 92 mm (10.3 × 3.0 in × 3.6 in) 17 mm lens: 267 × 76 × 92 mm (10.5 in × 3.0 in × 3.6 in)
Camera weight w/o lens	1.32 kg (2.9 lbs)
Camera weight w/lens	50 mm lens: 1.63 kg (3.6 lbs) 25 mm lens: 1.72 kg (3.8 lbs) 17 mm lens: 1.77 kg (3.9 lbs)
Mounting	w/Mounting plate - 2 × 1/4"-20 tapped holes, 1 × 3/8"-16 tapped hole, 4 × #10-24 tapped holes w/o Mounting plate - 6 × #6-32
Box Contents	Camera w/lens, M12 to RJ45F Cable (0.3 m), quick start guide, certificate of calibration

FLIR A675x

GiGE VISION GENICAM MathWorks





HIGH SENSITIVITY, CRISP THERMAL IMAGES

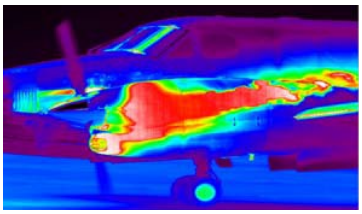
FLIR A6750sc incorporates a cooled FLIR Indium Antimonide (InSb) detector that operates in the 3- to 5-micron waveband. Optionally, a broadband version that operates in the 1-5 micron waveband is available. Both versions produce crisp thermal images of 640 x 512. Achieving a high thermal sensitivity of <20 mK, FLIR A6700sc is able to capture the finest image details.

FAST INTEGRATION TIMES

Working in snapshot mode, the FLIR A6750sc is able to capture all pixels from a scene simultaneously in under 190µs for room temperature scenes. This is particularly important when monitoring fast moving objects where an uncooled thermal imaging camera would suffer from image blur. The camera supports image frame rates up to 4.1k frames per second when operating in windowing mode.

STANDARD VIDEO INTERFACES

Using a standard GigE Vision® interface to transmit full dynamic range digital video, and GenICam for camera control, the FLIR A6750sc is a true "plug and play" thermal imaging camera. Additional interfaces include a BNC analog video output. The Gigabit Ethernet and analog video are simultaneously active yet independently controlled allowing greater flexibility for recording and display purposes.



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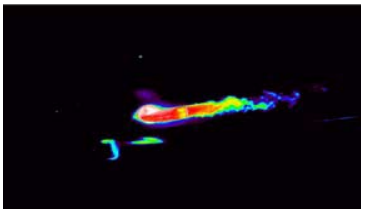
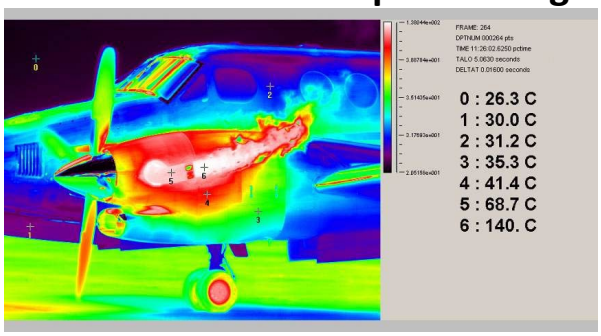


= **Superframing**



CUSTOM COLD FILTERS AVAILABLE

Custom cold filtering options for specific spectral detection and measurement are available. Perfect for imaging through glass, measuring temperature of thin film plastics, laser profiling and detection, or optical gas imaging

SOFTWARE

FLIR A6750sc camera works seamlessly with FLIR ResearchIR Max software enabling intuitive viewing, recording and advanced processing of the thermal data provided by the camera. A Software Developers Kit (SDK) is optionally available.

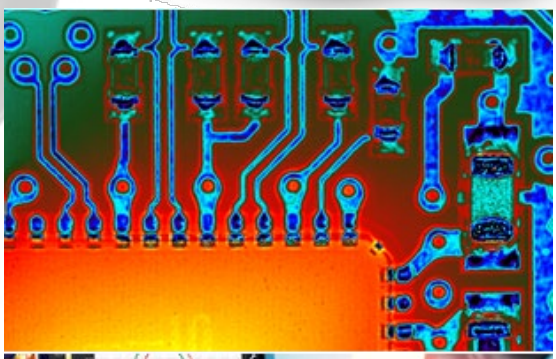
COMPATIBLE WITH 3RD PARTY SOFTWARE

Control the A6750sc and capture data directly into MathWorks® MATLAB software for custom image analysis and enhancement.

KEY FEATURES

- FLIR built cryo cooler and insb detector
- Excellent image quality: 640 x 512 pixels
- High sensitivity: <20 mK
- High speed image acquisition: up to 4,1 kHz in windowing mode
- Synchronization with other instruments and events
- Wide choice of optics & extender rings

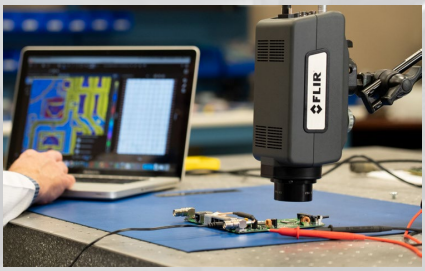
FLIR A678x



Model Number	A6780	A6781	A6782	A6783
Detector Type	FLIR indium antimonide (InSb)			
Spectral Range	1.0 – 5.0 µm	3.0 – 5.0 µm	1.0 – 5.0 µm	3.0 – 5.0 µm
Resolution	640 × 512			
Pixel Size	15 µm			
Thermal Sensitivity / NETD	≤25 mK typical	≤20 mK typical	≤25 mK typical	≤20 mK typical
Operability	≥99.8% (≥99.95% typical)			
Sensor Cooling	Closed-cycle rotary			
Readout Electronics				
Readout	Snapshot			
Readout Modes	Asynchronous integrate while read, asynchronous integrate then read			
Image Time Stamp	Yes			
Integration Time	480 ns to –full frame			
Pixel Clock	50 MHz			
Frame Rate (Full Window)	Programmable; 0.0015 Hz to 125 Hz			
Subwindow Mode	Flexible windowing down to 16 × 4 (steps of 16 columns, 4 rows)			
Camera Electronics				
Synchronization Modes	Internal, external, video			
Sync In/Sync Out Connection	Sync In (via Rear Panel), Sync Out (via Aux Cable)			
Trigger Input	Yes (via AUX breakout cable)			
Superframing/DRX	Yes			
Max Frame Rate (Min Window)	4,130 Hz (16 x 4 sub-window)			
Dynamic Range	14-bit			
On-Camera Image Storage	None			
Radiometric Data Streaming	Gigabit Ethernet (GigE Vision)			
Standard Video	SDI			
Command and Control	GenICam (GigE), RS-232			
Integration Active Output	Yes (via AUX breakout cable)			
Lock-in Signals Input	Optional (via AUX breakout cable)			
Record Start Input	Yes (via AUX breakout cable)			
Measurement				
Standard Temperature Range [with band-matched optics]	-20°C to 300°C (-4°F to 572°F)	-20°C to 350°C (-4°F to 662°F), Microscope Lenses: -10°C to 350°C (14°F to 662°F)	-20°C to 350°C (-4°F to 662°F)	-20°C to 350°C (-4°F to 662°F), Microscope Lenses: -10°C to 350°C (14°F to 662°F)
Optional Temperature Range [with band-matched optics]	45°C to 600°C/113°F to 1112°F (ND1); 250°C to 2000°C/482°F to 3632°F (ND2); 500°C to 3000°C/932°F to 5432°F (ND3)			
Accuracy	≤100°C (≤212°F), ±2°C (±3.6°F) accuracy (±1°C/1.8°F typical); >100°C ±2% of reading (±1% typical)			
Ambient Drift Compensation [with factory calibration]	Yes			
Image / Video Presentation				
Palettes	Selectable 8-bit			
Automatic Gain Control	Manual, linear, plateau equalization, DDE			
Overlay	Fixed configuration, can be turned off			
Video Modes	SDI: 720p at 50/59.9 Hz, 1080p at 25/29.9 Hz			
Standard Video Zoom	Automatic, best fit			

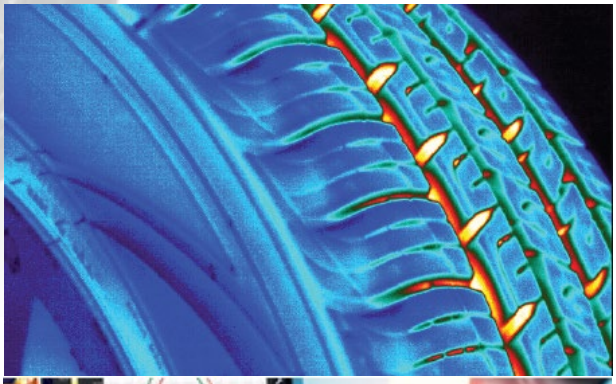
Optics				
Camera f/#	f/2.5		f/4.0	
Available Lenses	Manual (broadband): 25 mm, 50 mm, 100 mm	Manual (3-5 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm Motorized (3-5 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm	Manual (broadband): 25 mm, 50 mm, 100 mm	Manual (3-5 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm Motorized (3-5 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm
Close-up Lenses / Microscopes	No microscopes available	1X, 3X	No microscopes available	1X, 3X
Lens Interface	FLIR FPO-M (4-tab bayonet, motorized)			
Focus	Motorized (compatible w/ manual)			
Filter Holder [Warm]	3-position motorized filter wheel (1-inch diameter filters), factory installed only			
General				
Operating Temperature Range	-20°C to 50°C (-4°F to 122°F)			
Power	24 VDC (< 24 W steady state)			
Weight w/o Lens	2.3 kg (5 lbs)			
Size [L × W × H] w/o Lens	226 × 102 × 109 mm (8.9 × 4.0 × 4.3 in)			
Mounting	2 × ¼"-20 tapped holes, 1 × 3/8"-16 tapped hole, 4 × 10-24 tapped holes			

FLIR A678x SLS



SPECIFICATIONS

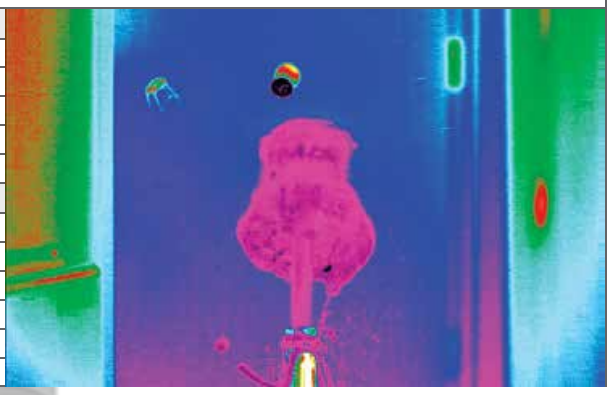
Model Number	A6781 SLS	A6783 SLS
Detector Type	Strained-Layer Superlattice	
Spectral Range	7.5 µm (lower), 10-11 µm (upper)	
Resolution	640 × 512	
Pixel Size [Square]	15 µm	
Thermal Sensitivity / NETD	≤40 mK typical	
Operability	≥98% (≥99% typical)	
Sensor Cooling	Closed-cycle rotary	
Readout Electronics		
Readout	Snapshot	
Readout Modes	Asynchronous integrate while read, asynchronous integrate then read	
Image Time Stamp	Yes	
Integration Time	480 ns to –full frame	
Pixel Clock	50 MHz	
Frame Rate (Full Window)	Programmable; 0.0015 Hz to 125 Hz	
Subwindow Mode	Flexible windowing down to 16 × 4 (steps of 16 columns, 4 rows)	
Camera Electronics		
Synchronization Modes	Internal, external, video	
Sync In/Sync Out Connection	Sync In (via Rear Panel), Sync Out (via Aux Cable)	
Trigger Input	Yes (via AUX breakout cable)	
Superframing/DRX	Yes	
Dynamic Range	14-bit	
On-Camera Image Storage	None	
Radiometric Data Streaming	Gigabit Ethernet (GigE Vision)	
Standard Video	SDI	
Command and Control	GenICam (GigE), RS-232	
Integration Active Output	Yes (via AUX breakout cable)	
Lock-in Signals Input	Optional (via AUX breakout cable)	
Record Start Input	Yes (via AUX breakout cable)	
Measurement		
Standard Temperature Range [with band-matched optics]	-20°C to 650°C (-4°F to 1202°F)	
Optional Temperature Range [with band-matched optics]	250°C to 2000°C/482°F to 3632°F (ND1) 500°C to 3000°C/932°F to 5432°F (ND2)	
Accuracy	≤100°C (≤212°F) ±2°C (±3.6°F) accuracy (±1°C/1.8°F typical) >100°C ±2% of reading (±1% typical)	
Ambient Drift Compensation [with factory calibration]	Yes	



Optics		
Camera f/#	f/2.5	f/4.0
Available Lenses	Manual (7.5-12 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm Motorized (7.5-12 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm	
Close-up Lenses / Microscopes	1X	
Lens Interface	FLIR FPO-M (4-tab bayonet, motorized)	
Focus	Motorized (compatible w/ manual)	
Filter Holder [Warm]	3-position motorized filter wheel (1-inch diameter filters), factory installed only	
Image/Video Presentation		
Palettes	Selectable 8-bit	
Automatic Gain Control	Manual, Linear, Plateau equalization, DDE	
Overlay	Fixed configuration, can be turned off	
Video Modes	SDI: 720p@50 / 59.9, 1080p@25 / 29.9	
Standard Video Zoom	Automatic, best fit	
General		
Operating Temperature Range	-20°C to 50°C (-4°F to 122°F)	
Power	24 VDC (< 24 W steady state)	
Weight w/o Lens	2.3 kg (5 lb)	
Size [L × W × H] w/o Lens	226 × 102 × 109 mm (8.9 × 4.0 × 4.3 in)	
Mounting	2 × ¼"-20 tapped holes 1 × 3/8"-16 tapped hole 4 × 10-24 tapped holes	

FLIR A858x MWIR

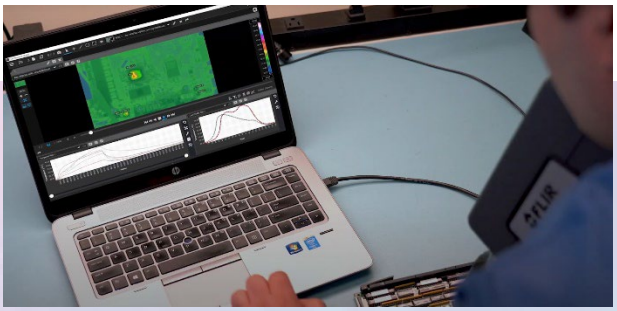
MWIR Model names	A8580	A8581	A8582	A8583
Detector Type	FLIR Indium antimonide (InSb)			
Spectral range	1.5–5.0 µm	3.0–5.0 µm	1.5–5.0 µm	3.0–5.0 µm
Resolution	1280 × 1024			
Pixel size	12 µm			
Thermal sensitivity/NEDT	≤40 mK (≤30 mK typical)	≤30 mK (≤25 mK typical)	≤40 mK (≤30 mK typical)	≤30 mK (≤25 mK typical)
Well capacity	Gain 0: 3.0 Me-, Gain 1: 11.5 Me-			
Operability	≥99.5% (≥99.9% typical)			
Sensor cooling	Linear Sterling cooler			
Electronics				
Readout	Snapshot			
Readout modes	Asynchronous integrate while read, Asynchronous integrate then read			
Synchronization modes	Sync In, Sync Out			
Image time stamp	Yes			
Integration time	480 ns to ~full frame			
Pixel clock	100 MHz			
Frame rate (full window)	Programmable; Up to ~45 Hz (GigE), 60 Hz (CXP)			
Subwindow mode	Flexible windowing down to 32 × 4 (steps of 32 columns, 4 rows)			
Dynamic range	14-bit			
On-camera image storage	None			
Radiometric data streaming	Gigabit Ethernet (GigE Vision), CoaXPress			
Standard video	HD-SDI			
Command and control	GenICam (GigE, CXP), RS-232			
Measurement				
Standard temperature range	-20°C to 300°C (-4°F to 572°F)	-20°C to 350°C (-4°F to 662°F), -10°C to 350°C (14°F to 662°F) for microscopes	20°C to 350°C (-4°F to 662°F)	-20°C to 350°C (-4°F to 662°F), -10°C to 350°C (14°F to 662°F) for microscopes
Optional temperature range (with band-matched optics)	45°C to 600°C (ND1); 250°C to 2000°C (ND2); 500°C to 3000°C (ND3)			
Accuracy	±2°C (±1°C typical) below 100°C, ±2% of reading (±1% typical) above 100°C			
Ambient drift compensation (with factory calibration)	Yes			
Optics				
Camera f/#	f/2.5	f/2.5	f/4	f/4
Available lenses	Manual (broadband): 25 mm, 50 mm, 100 mm. Motorized: TBA	Manual or Motorized: 17 mm, 25 mm, 50 mm, 100 mm, 200 mm	Manual (broadband): 25 mm, 50 mm, 100 mm. Motorized: TBA	Manual or Motorized: 17 mm, 25 mm, 50 mm, 100 mm, 200 mm
Close-up lenses / micro-scopes	—	1× (12 µm/pixel) or 3× (4 µm/pixel)	—	1× (12 µm/pixel) or 3× (4 µm/pixel)
Lens interface	FLIR FPO-M (4-tab bayonet, motorized)			
Focus	Motorized (compatible w/manual lenses)			
Filter holder (warm)	Internal 4-position motorized filter wheel; factory installed filters			
Image/video presentation				
Palettes	Selectable 8-bit			
Automatic gain control	Manual, linear, plateau equalization, DDE			
Overlay	Fixed configuration, can be turned off			
Video modes	SDI: 720p at 50/59.9/60 Hz, 1080p at 25/29.9/30 Hz			
Standard video zoom	Automatic, variable			
General				
Operating temperature range	-20°C to 50°C (-4°F to 122°F)			
Shock / vibration	40 g, 11 msec ½ sine pulse/4.3 g RMS random vibration, all 3 axes			
Power	24 VDC (< 24 W steady state)			
Weight w/o lens	2.3 kg (5 lbs)			
Size (L × W × H) w/o lens	226 × 102 × 109 mm (8.9 × 4.0 × 4.3 in.)			
Mounting	2x ¼" -20 tapped holes, 1x 3/8"-16 tapped hole, 4x 10-24 tapped holes			



FLIR A858x SLS

Model number	A8581 SLS
Detector Type	Strained Layer Superlattice (SLS)
Spectral range	7.5 µm (lower) 11.5–12.5 µm (upper)
Resolution	1280 × 1024
Pixel size	12 µm
Thermal sensitivity/NEDT	≤45 mK (≤40 mK typical)
Well capacity	Gain 0: 3.0 Me-, Gain 1: 11.5 Me-
Operability	≥98% (≥99% typical)
Sensor cooling	Linear Sterling cooler
Electronics	
Readout	Snapshot
Readout modes	Asynchronous integrate while read, Asynchronous integrate then read
Synchronization modes	Sync In, Sync Out
Image time stamp	Yes
Integration time	480 ns to ~full frame
Pixel clock	100 MHz
Frame rate (full window)	Programmable; Up to ~45 Hz (GigE), 60 Hz (CXP)
Subwindow mode	Flexible windowing down to 32 × 4 (steps of 32 columns, 4 rows)
Dynamic range	14-bit
On-camera image storage	None
Radiometric data streaming	Gigabit Ethernet (GigE Vision), CoaXPress
Standard video	HD-SDI
Command and control	GenICam (GigE, CXP), RS-232
Measurement	
Standard temperature range	-20°C to 650°C (-4°F to 1202°F)
Optional temperature range (with band-matched optics)	250°C to 2000°C (ND1); 500°C to 3000°C (ND2)
Accuracy	±2°C (±1°C typical) below 100°C, ±2% of reading (±1% typical) above 100°C
Ambient drift compensation (with factory calibration)	Yes
Optics	
Camera f/#	f/2.5
Available lenses	Manual or Motorized (7.5–12.5 µm): 17 mm, 25 mm, 50 mm, 100 mm, 200 mm
Close-up lenses / microscopes	1× (12 µm/pixel)
Lens interface	FLIR FPO-M (4-tab bayonet, motorized)
Focus	Motorized (compatible w/manual lenses)
Filter holder (warm)	Internal 4-position motorized filter wheel; factory installed filters

Image/video presentation	
Palettes	Selectable 8-bit
Automatic gain control	Manual, linear, plateau equalization, DDE
Overlay	Fixed configuration, can be turned off
Video modes	SDI: 720p at 50/59.9/60 Hz, 1080p at 25/29.9/30 Hz
Standard video zoom	Automatic, variable
General	
Operating temperature range	-20°C to 50°C (-4°F to 122°F)
Shock / vibration	40 g, 11 msec ½ sine pulse/4.3 g RMS random vibration, all 3 axes
Power	24 VDC (< 24 W steady state)
Weight w/o lens	2.3 kg (5 lbs)
Size (L × W × H) w/o lens	226 × 102 × 109 mm (8.9 × 4.0 × 4.3 in.)
Mounting	2 x ¼" -20 tapped holes, 1 x 3/8"-16 tapped hole 4 x 10-24 tapped holes



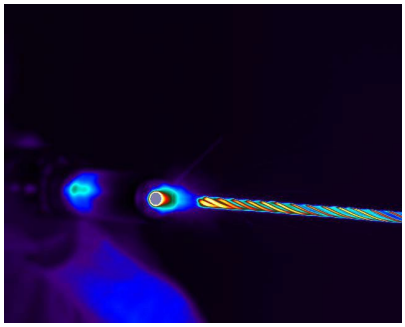
FLIR X698x

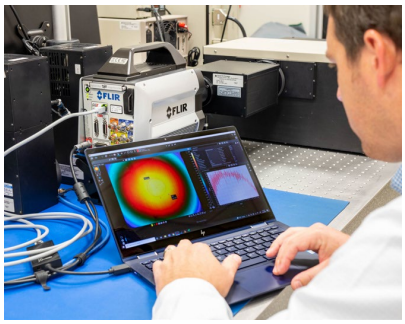
High-Speed MWIR Science-Grade Camera

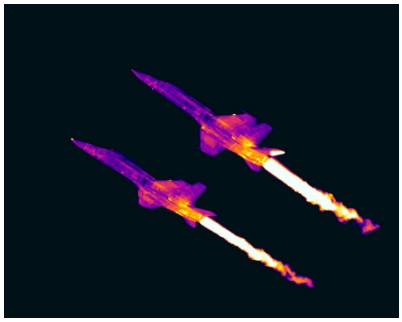
The FLIR X6980 is an extraordinarily fast, highly sensitive, 640 × 512 resolution midwave IR camera designed for scientists and engineers. It enables users to capture detailed imagery of fast events for accurate thermal analysis, perform custom radiometric measurements, or detect points of failure in composites, solar cells, and electronics. It is also a great tool for thermal mapping of stress in hypervelocity impact testing or other materials research.

KEY APPLICATIONS

HIGH-SPEED THERMAL IMAGING
MUNITIONS RANGE TESTING
TARGET SIGNATURE
RADIOMETRY
NON-DESTRUCTIVE TESTING
STRESS MAPPING







As with the entire line of FLIR X-Series cameras, the X6980 offers advanced recording, triggering, and synchronization capabilities, making it easy to configure and integrate for successful acquisitions in the most demanding applications. This camera features a four-position motorized filter wheel and support for FLIR motorized focus lenses, providing higher quality recordings while saving time and mitigating frustration in dynamic acquisition environments. Plus, by combining a highly sensitive detector with the fastest high-speed frame rates, the X6980 allows researchers to capture and stop motion on the entire high-speed event—whether in the lab or on the test range.

HIGH SPEED, HIGH SENSITIVITY

Acquire crisp thermal images, even at high speeds

- Capture full 640 × 512 pixel resolution data at up to 1004 Hz or up to 29,134 Hz in subwindow mode
- Detect minute temperature differences with very low noise
- Ensure crisp images by remotely focusing the camera using FLIR motorized lenses
- Stream high-speed 14-bit data simultaneously over Gigabit Ethernet, Camera Link, and CoaXPress®

ON-CAMERA RAM/SSD RECORDING

Record critical thermal data directly to on-camera memory

- Save up 26,000 frames of full-resolution data at 1 kHz to on-camera RAM with zero dropped frames
- Record up to 15 minutes of 640 × 512 resolution data at 800 Hz directly to the included 512 GB SSD
- Remotely playback and transfer recorded data directly from the SSD over GigE, Camera Link, or CXP
- Rapidly remove sensitive data from the camera with hot-swappable SSD

SYNCHRONIZATION AND TRIGGERING

Capture essential imagery by synchronizing with external events or instrumentation

- Initialize on-camera data recordings using an external record trigger or specific IRIG-B time
- Control precisely when an image frame is generated or synchronize it to other equipment
- Align image capture times with other data using TSPI-accurate IRIG-B time stamping

MULTIPLE SOFTWARE INTERFACES

View, record, analyze and share important thermal data

- Stream thermal data directly to a computer running Windows®, MacOS®, or Linux®
- Make critical decisions quickly using FLIR Research Studio's advanced analysis capabilities
- Integrate camera functionality and recording in third-party software via the FLIR Science Camera SDK
- Collaborate with colleagues by enabling local analysis of shared data with FLIR's free Research Studio Player

ADVANCED FILTERING OPTIONS

Maximize camera imagery to meet specific requirements

- Quickly switch between different filters using the easy access, four-position motorized filter wheel
- Easily install/remove spectral or neutral density filters in the field for optimal camera flexibility
- Ensure the correct filters and calibration association with automatic filter recognition
- Optimize the camera system for unique applications with custom cold filter options

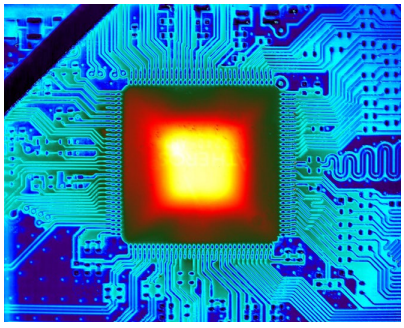
FLIR X858x

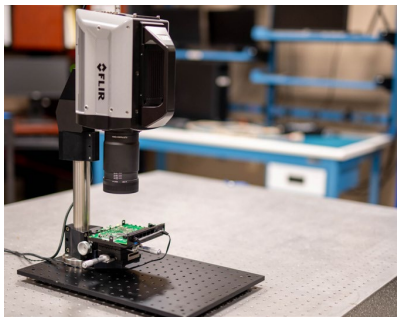
High Definition MWIR Science-Grade Camera

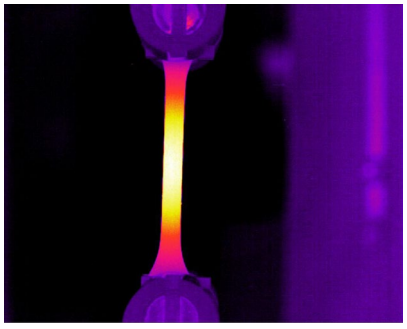
The FLIR X8580 is a high-speed, high definition 1280 × 1024 resolution midwave IR camera designed for scientists and engineers. It enables users to capture detailed imagery of fast events for accurate thermal analysis, perform custom radiometric measurements, or detect points of failure in composites, solar cells, and electronics. It is also a great tool for thermal mapping of stress in hypervelocity impact testing or other materials research.

KEY APPLICATIONS

HIGH RESOLUTION THERMAL IMAGING
PCB TESTING
NON-DESTRUCTIVE TESTING
TARGET SIGNATURE
RADIOMETRY
STRESS MAPPING







As with the entire line of FLIR X-Series cameras, the X8580 offers advanced recording, triggering, and synchronization capabilities, making it easy to configure and integrate for successful acquisitions in the most demanding applications. With a four-position motorized filter wheel and support for FLIR motorized focus lenses, the X8580 will provide higher quality recordings, save time, and mitigate frustration in dynamic acquisition environments. Plus, by combining HD resolution with high-speed frame rates, this camera allows researchers to capture detailed imagery of the scene and stop motion high-speed events—whether in the lab or on the test range.

HIGH RESOLUTION, HIGH SENSITIVITY

Acquire crisp thermal images, even at high speeds

- Detect minute temperature differences with very low noise
- Capture full 1280 × 1024 pixel resolution data at up to 181 Hz or up to 6,000 Hz in subwindow mode
- Ensure crisp images by remotely focusing the camera using FLIR motorized lenses
- Stream high-speed 14-bit data simultaneously over Gigabit Ethernet, Camera Link, and CoaXPress®

ON-CAMERA RAM/SSD RECORDING

Record critical thermal data directly to on-camera memory

- Save up to 34 seconds of full HD resolution data to on-camera RAM with zero dropped frames
- Record up to 15 minutes of 1280 × 1024 resolution data at 181 Hz direct to the included 512 GB SSD
- Remotely playback and transfer recorded data directly from the SSD over GigE, Camera Link, or CXP
- Rapidly remove sensitive data from the camera with hot-swappable SSD

SYNCHRONIZATION AND TRIGGERING

Capture essential imagery by synchronizing with external events or instrumentation

- Initialize on-camera data recordings using an external record trigger or specific IRIG-B time
- Control precisely when an image frame is generated or synchronize it to other equipment
- Align image capture times with other data using TSPI-accurate IRIG-B time stamping

MULTIPLE SOFTWARE INTERFACES

View, record, analyze and share important thermal data

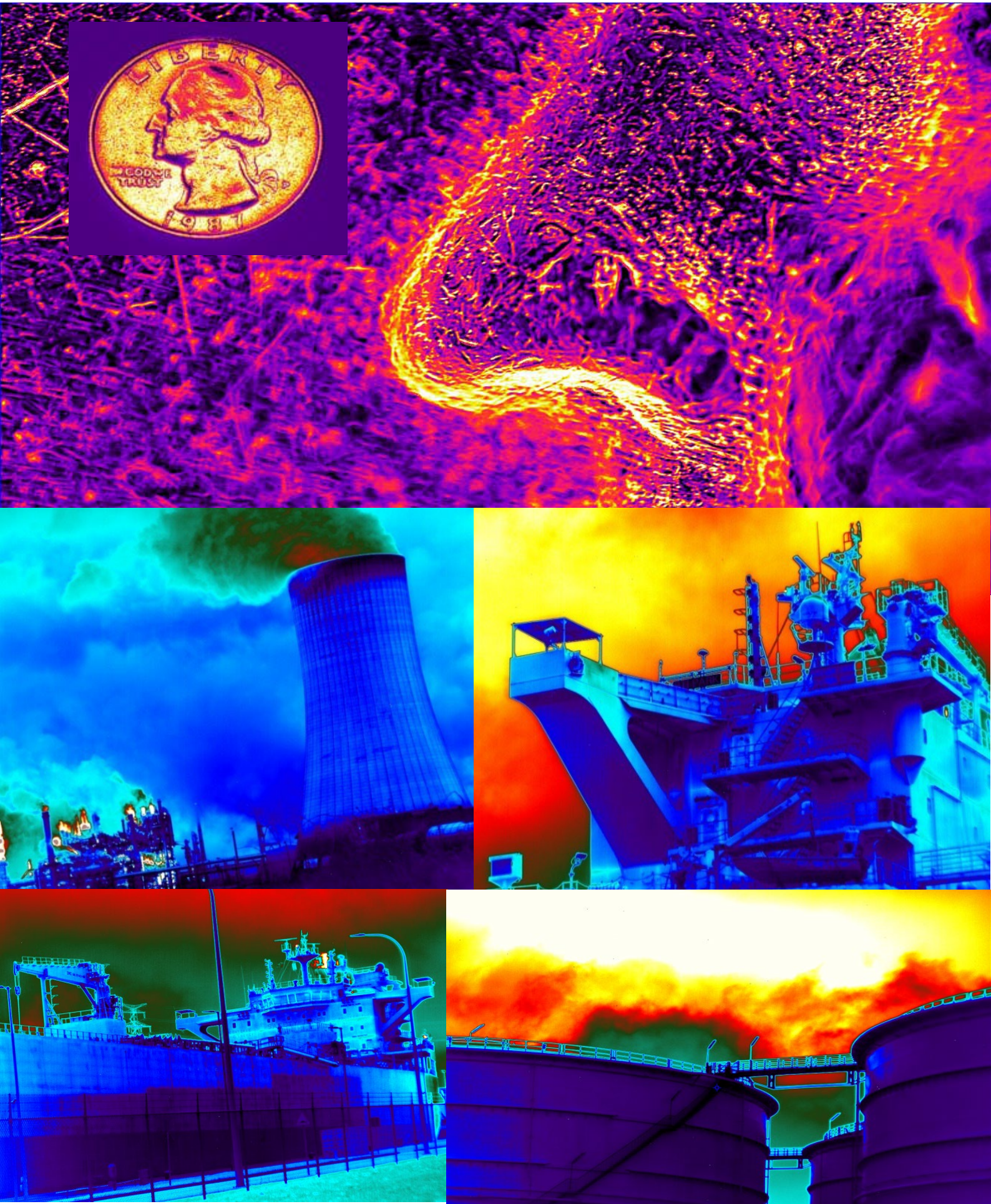
- Stream thermal data directly to a computer running Windows®, MacOS®, or Linux®
- Make critical decisions quickly using FLIR Research Studio's advanced analysis capabilities
- Integrate camera functionality and recording in third-party software via the FLIR Science Camera SDK
- Collaborate with colleagues by enabling local analysis of shared data with FLIR's free Research Studio Player

ADVANCED FILTERING OPTIONS

Maximize camera imagery to meet specific requirements

- Quickly switch between different filters using the easy access, four-position motorized filter wheel
- Easily install/remove spectral or neutral density filters in the field for optimal camera flexibility
- Ensure the correct filters and calibration association with automatic filter recognition
- Optimize the camera system for unique applications with custom cold filter options

FLIR Research & Science – No compromises on image quality




FLIR
FLIR
RESEARCH
STUDIO
Thermal Analysis Software for
Research and Science Applications
CONNECT – VIEW – RECORD – ANALYZE

FLIR Teledyne Vision solutions

FLIR Firefly DL

On-Camera Deep Learning
Deep learning is a powerful tool for system designers to quickly automate complex and subjective decision making and deliver higher quality products and improved productivity. Deploy your trained neural network to the FLIR Firefly DL with Neuro technology and reduce system cost and complexity by making decisions on-camera without host PC. With its very small size, low weight and power consumption, the Firefly DL camera is ideal for embedding into mobile, desktop, and handheld systems.

FLIR Blackfly S USB3

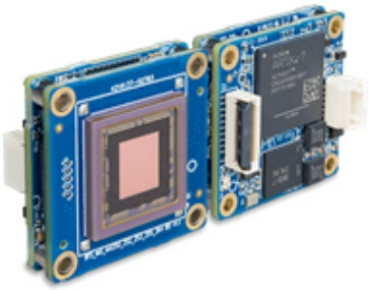
The Blackfly® S leverages the industry's most advanced sensors in an ice-cube form factor. It is packed with powerful features enabling you to easily produce the exact images you need and accelerate your application development. This includes both automatic and precise manual control over image capture and on-camera pre-processing. The Blackfly S is available in GigE, USB3, cased, and board-level versions.

FLIR Blackfly S GigE

The Blackfly® S leverages the industry's most advanced sensors in an ice-cube form factor. It is packed with powerful features enabling you to easily produce the exact images you need and accelerate your application development. This includes both automatic and precise manual control over image capture and on-camera pre-processing. On-camera features including IEEE1588 clock synchronization and full compatibility with popular third-party software supporting GigE Vision, gives system designers the tools to quickly develop innovative solutions. GigE models featuring Lossless Compression (LLC) are also available with higher maximum frame rates and lower bandwidth requirements, helping maximize output without compromising image quality. The Blackfly S is available in GigE, USB3, cased, and board-level versions.

FLIR Blackfly S Board level

The FLIR Blackfly Board Level variants are high performance, machine vision, area scan cameras designed for embedding into tight spaces. Unlike many board level cameras, it boasts a rich feature set applied to the latest CMOS sensors; the same feature set as the cased version. It is ready for integration with proven compatibility with popular SBCs and SOMs. The Blackfly S board level models enable OEMs to develop smaller, lighter, and lower cost solutions with embedded system connectivity and rich features.



FLIR Oryx 10GigE

The award-winning Oryx 10GigE camera family allows systems designers to take advantage of the latest sensors by supporting transfer speeds of up to 10 Gbit/s enabling capture of 4K resolution, 12-bit images at over 60 FPS. Oryx features include IEEE1588 clock synchronization and full compatibility with several popular third-party software supporting GigE Vision. Reliable image transfer at high bandwidth is further improved with Myricom bundles and packet resend feature. Oryx's 10GBASE-T interface is a proven and widely deployed standard that provides reliable image transfer at cable lengths over 50 meters on inexpensive CAT6A, and up to 30 meters on CAT5e.

FLIR Firefly S

The FLIR Firefly® S delivers the essential machine vision features you need in an ultra-compact body. Its small size, low power, and light weight make it ideal for embedding into portable devices. The Firefly S provides amazing value by combining powerful on-camera features with the latest CMOS sensors.

FLIR Spinnaker SDK

The Spinnaker SDK is FLIR's next generation GenICam3 API library built for machine vision developers. It features an intuitive GUI called SpinView, rich example code, and comprehensive documentation designed to help you build your application faster. The Spinnaker SDK supports FLIR USB3, 10GigE, and most GigE area scan cameras. Supported platforms: Windows / Linux Ubuntu / MacOS

FLIR Grasshopper3 USB3

The Grasshopper®3 camera line provides high-performance, high-quality imaging by combining FLIR expertise with the latest in CCD and CMOS technology.

FLIR Grasshopper3 GigE

The Grasshopper®3 GigE camera family utilizes primarily Sony CCD sensors and the Sony Pregius IMX174 sensor. For FLIR GigE cameras with the latest sensors and most advanced feature sets, please refer to our Blackfly S and Oryx camera families.

FLIR Chameleon USB3

The Chameleon®3 camera family combines the ease-of-use of USB3, small size, flexibility of board-level versions, and popular CCD and CMOS image sensors into an affordable package. For FLIR cameras with the latest sensors and most advanced feature sets, please refer to Blackfly S and Oryx camera families.

FLIR Blackfly USB3

The Blackfly® camera line combines Sony CCD, Aptina, e2v, and Sharp sensors with a host of unique features. For FLIR area scan cameras with the latest sensors and most advanced feature sets, please refer to our Blackfly S and Oryx camera families.

FLIR Blackfly GigE

The Blackfly® camera line combines Sony CCD, Aptina, e2v, and Sharp sensors with a host of unique features. For FLIR area scan cameras with the latest sensors and most advanced feature sets, please refer to our Blackfly S and Oryx camera families.

FLIR Flea3 USB3

The Flea®3 line of USB3 Vision, GigE Vision and FireWire cameras offers a variety of CMOS and CCD image sensors in a compact package. The Flea3 leverages a variety of Sony, ON Semi, and e2v sensors ranging from 0.3 MP to 5.0 MP and from 8 FPS to 120 FPS. For FLIR GigE and USB3 cameras with the latest sensors and most advanced feature sets, please refer to our Blackfly S and Oryx camera families.

FLIR Forge 5GigE

The FLIR Forge 5GigE camera delivers high-resolution images at a 5GigE speed. This camera is ideal for industrial imaging applications that need to capture and transfer data at high speeds. Examples of these applications include inspection of: Power Supply, beverages, batteries, and electronics. The latest model of the Forge 5GigE camera is based on the Sony Pregius S Backside Illuminated (BSI) sensors that allow detection of microscopic scratches on all kinds of materials due to its higher sensitivity in the UV spectrum. In addition, this camera is designed to support a range of functions and sensors that allow robust and powerful systems to be built faster.

FLIR Dragonfly S USB3

The Dragonfly S USB3 camera is a practical option for industries ranging from life science to factory automation. Configurations of this camera include board-level to fully enclosed systems. This camera is modular and compact making it ideal for production at scale, volume applications and multi-camera systems.

FLIR FlyCapture SDK

The FlyCapture® Software Development Kit (SDK) provides a common software interface to control and acquire images for FLIR area scan USB 3.1, GigE, FireWire, and USB 2.0 cameras using the same API under 32- or 64-bit Windows or Linux. Note: Blackfly S cameras use our latest SDK: Spinnaker. Spinnaker also supports all USB 3.1 and GigE area scan cameras.

HOW TO READ OUR MODEL NUMBERS

What do your model numbers mean?

Here is one example of our model numbers and what each section means. Understanding this will give you a quick explanation of the model's specifications and help you when comparing models.

BFS-U3-50S5M-C-BD2-DL

Camera Family
BFS = Blackfly S
BFLY = Blackfly
ORX = Oryx
FFY = Firefly S or DL
CM3 = Chameleon3
GS3: Grassopper3
LD5P = Ladybug5+

Interface
U3=USB 3.0
GE=GigE
PGE=PoE GigE
10G/10GS=
10GigE

Megapixels
04 = 0.4 MP
13 = 1.3 MP
50 = 5.0 MP
310 = 31.0 MP
etc

Sensor Brand
S=Sony
A=Aptina
C=CMOSIS
Y=ON Semi
E=E2V
H=Sharp

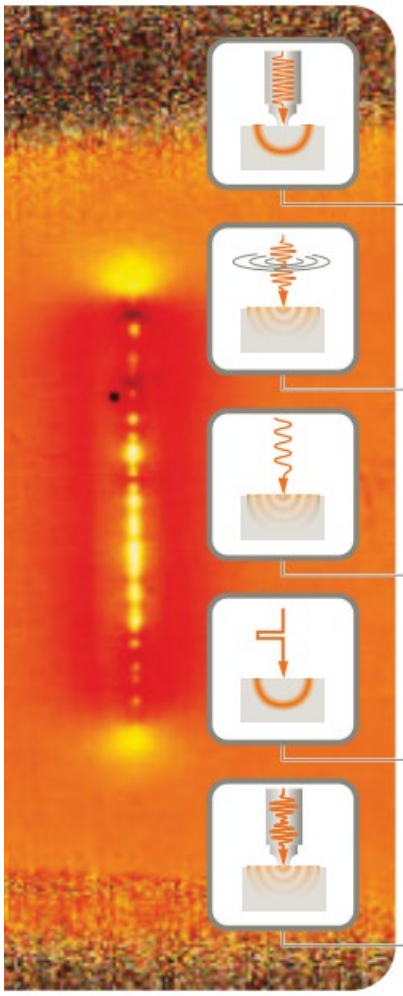
Sensor Size
5=2/3"
0=Unassigned
1=1/4"
2=1/3",
1/2.8",
1/2.5"
3=1/2"
4=1/1.8"
5 = 2/3"
6=1"
7=1.1"

Color/Mono
M=Mono
C=Color
P=Polarized
NIR=Near
Infrared

Lens Mount
C=C-Mount
CS=CS-Mount
S=S-Mount
BD2=Board-level
w/FPC

Board-level

Deep Learning Inference



Laser thermography
LTvis

Induction thermography
ITvis

Optical Lockin Thermography
OTvis

Pulse Thermography
PTvis

Ultrasound Thermography
UTvis

edevis®

Active Thermography

Automated Inspection Systems
Laboratory Testing Systems
Non Destructive Testing Services

←Laser thermography for weld seam inspection, battery testing, non-contact crack detection.

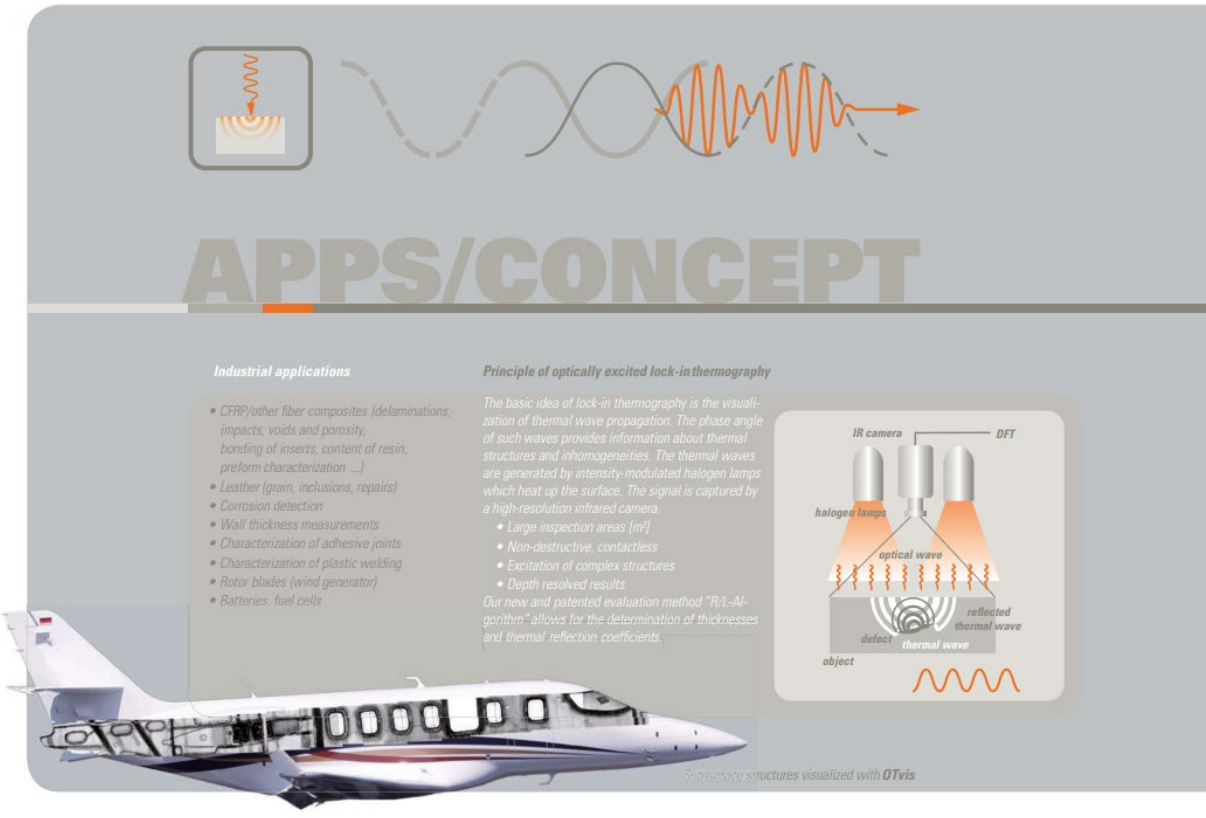
←Induction thermography for fast crack detection, weld and solder seam inspection on metallic components.

←Optical lockin thermography for non-destructive testing of fiber composites and adhesive layers.

←Pulse thermography testig for coating thickness and fiber composites.

←Ultrasound thermography for detection of hidden cracks.

Edevis – OTvis / optical excited Lockin Thermography



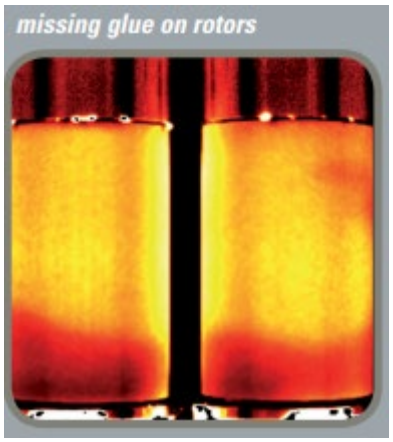
edevis

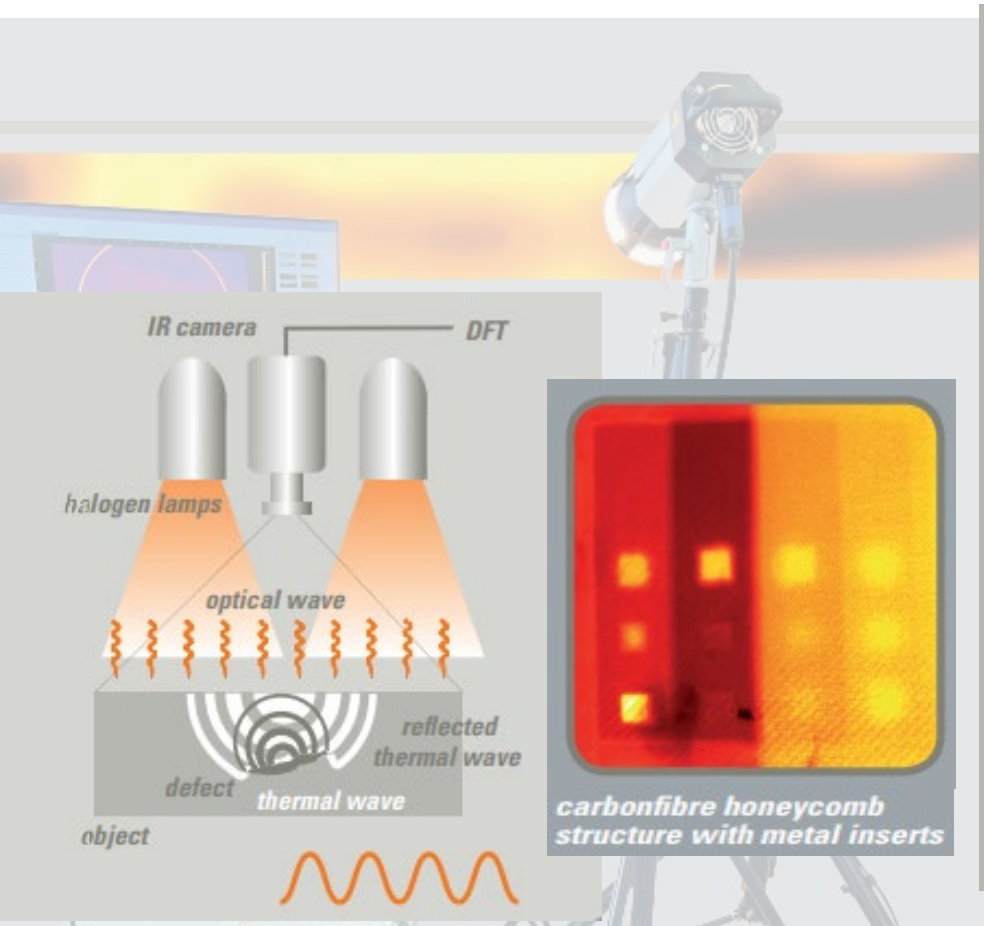
SPECIFICATIONS

OTvis *is available as 2000 / 4000 / 6000 version*

Lamp control				**Excitation**	
Output power	2 / 4 / 6 kW			1 / 2 / 3 halogen lamps each with 2,5 kW	
Circuit points	1 / 2 / 3 lamps each with max. 2 kW			Temperature controlled fan	
Power supply	230 / 400 / 400 V, 16A, 50Hz			Changeable reflector with bayonet connector	
Fan	Temperature controlled			Changeable filter	
Fuse protection	16A			Changeable illuminants	
Overload protection	√			Robust tripod incl. gear set	
Software				**Camera (options)**	
Real-time-lockin	√	Sequence measuring	P	Detector material	InSb or MCT
Arbitrary signals	P	Parameter files (xml)	√	Detector arrays	640x512 or 320x256 Pixel
Offline storage	P	Remote control (DDE)	P	Spectral response	3-5 µm or 8-9 µm
Phase images	√			Frame rate	180Hz @ 1280 x 1024
Amplitude images	√			Interface	Ethernet
Live image overlay	P			Lens	12mm, 25mm, 50mm, 100mm, G1- G5

P= in PRO version available; √= in Standard version available





Advantages
- Large inspection areas [m²]
- Imaging method
- Non-destructive, contactless
- Excitation of complex structures
- Depth resolved results

Applications in industry
- CFRP/GFRP (delamination, impact, voids and porosity ...)
- Leather (grain, inclusions)
- Characterisation of preforms

Aerospace applications
- CFRP/GFRP (delamination, impact, voids, porosity, content of resin, bonding of inserts ...)
- Characterisation of riveted structures
- Characterisation of adhesive joints
- Corrosion
- Wall thickness

Energy sector
- Rotor blades (windmill)
- Batteries
- Fuel cells

Other applications
- Characterisation of adhesive joints
- Characterisation of plastic welding
- Characterisation of ceramic coatings

Edevis – LTvis / Laser excited Lockin Thermography

LABIR <100°C Resistant

Thermographic spray paint for standard applications

HERP-LT-MWIR-BK-11

Paints with high mechanical resistance suitable for routine measurements up to 100 °C, for uncooled infrared cameras and for applications on electrical equipment. The best value offer.

LABIR <100°C Washable

Thermographic spray paint for high-temperature applications

HERP-HT-MWIR-BK-11

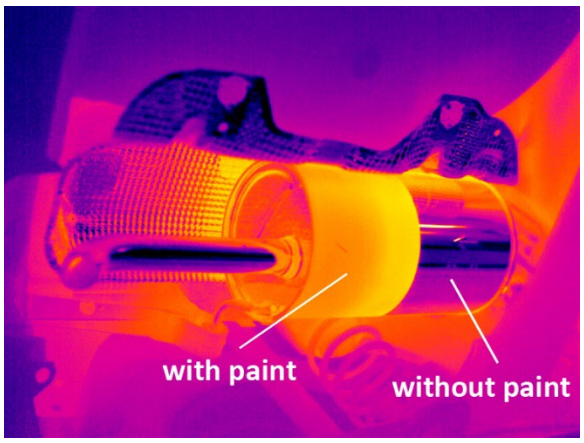
Durable paint with high emissivity, resistance and stability at high temperatures.

LABIR <1000°C Resistant

Washable spray paint for thermography applications

HEWP-LT-MWIR-BK-11

Paint with high emissivity is easily washable by water without using chemicals or coarse mechanical methods. Suitable for measurement locations where permanent paint application is unsuitable. Paint is applicable at room temperature.



Notes

Notes

Building Thermography

Research & Science

Active thermography

Predictive maintenance

Automation

Optical Gas Imaging

Vision cameras

Camera accessories and measurement solutions

Thermal Focus

Sterk in Temperatuur

Thermal Focus BV

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SCAN ME