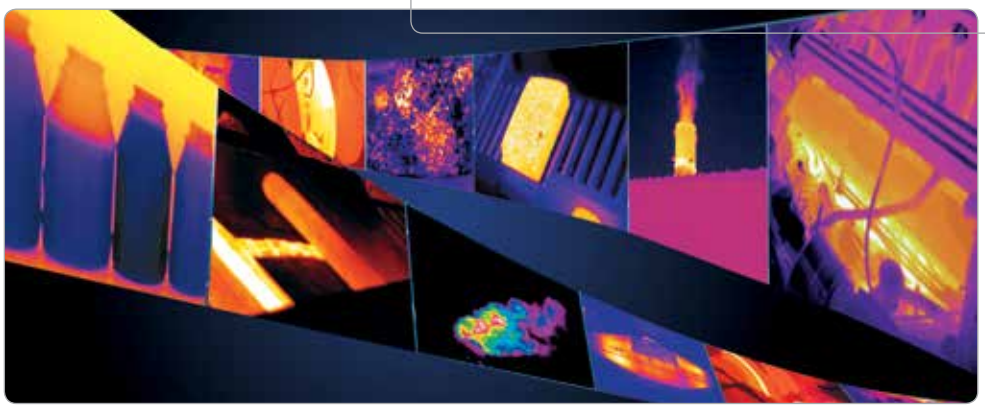
Compact thermal imaging cameras for automation and machine vision applications



Machine Vision

Process Monitoring

Quality Control

Hot Spot Detection

FLIR A65 / A35 / A15 / A5

FLIR A65 / A35 / A15 / A5

Compact thermal imaging cameras for machine vision applications

Thermal imaging cameras are used worldwide across a wide variety of industries to monitor continuous processes. Thermal imaging can easily collect information on product quality and/or production efficiency that is difficult or impossible to capture using conventional means such as thermocouples or visible light cameras.

The FLIR Axx-Series is the perfect solution for those applications that require the benefits of a thermal image but do not need exact temperature measurement. The FLIR Axx-Series camera has features and functions that make it the natural choice for anyone who uses PC software to solve problems.

Extremely affordable
The FLIR A5 comes at an extremely affordable price. It is the ideal tool for putting thermal imaging at work in an automation or machine vision environment.

Extremely compact
All models are extremely compact. They can easily be integrated in a machine vision environment.

Choice of image quality
The FLIR A65 produces crisp thermal images of 640 x 512 pixels. Users that do not need this high image quality for their application can choose for the FLIR A35 which produces thermal images of 320 x 256 pixels, for the FLIR A15 which produces thermal images of 160 x 128 pixels or for the FLIR A5 which produces thermal images of 80 x 64 pixels.

GigE Vision™ standard compatibility
GigE Vision is a new camera interface standard developed using the Gigabit Ethernet communication protocol. GigE Vision is the first standard to allow for fast image transfer using low cost standard cables even over long distances. With GigE Vision, hardware and software from different vendors can interoperate seamlessly over GigE connections.

GenICam™ protocol support
The goal of GenICam is to provide a generic programming interface for all types of cameras. Regardless of interface technology (GigE Vision, Camera Link, 1394 DCAM, etc.) or features implemented, the Application Programming Interface (API) will always be the same. The GenICam protocol also makes it possible to use third party software with the camera. GenICam makes the FLIR Axx plug-and-play when used with software packages such as IMAQ Vision and Halcon.

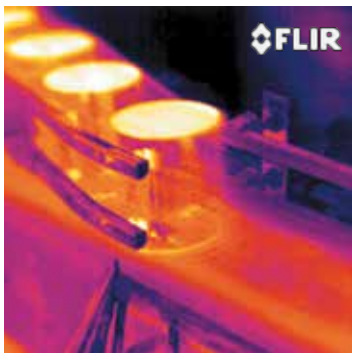
Power over Ethernet (PoE)
Communication and power supplied with only one cable.

Synchronization
Possible to configure one camera to be master and others to be slave(s) for applications that call for more than one camera to cover the object or for stereoscopic applications.

General Purpose Input/Output (GPIO)
One output that can be used to control other equipment and one input to read the status from the same equipment.

Wide temperature range
The FLIR Axx-Series visualizes temperatures between –40°C and +550°C.

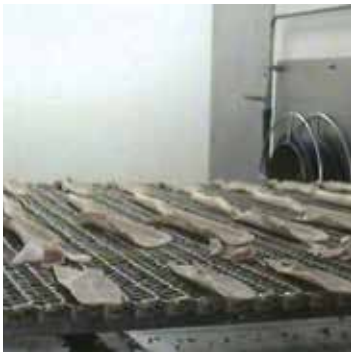
High sensitivity < 50 mK
< 50 mK thermal sensitivity captures the finest image details and temperature difference information.

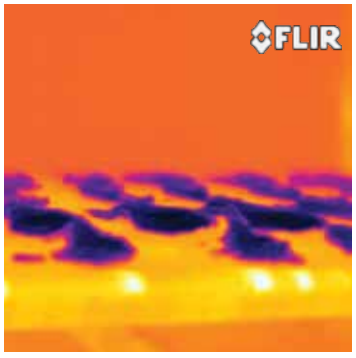


Process monitoring of production line

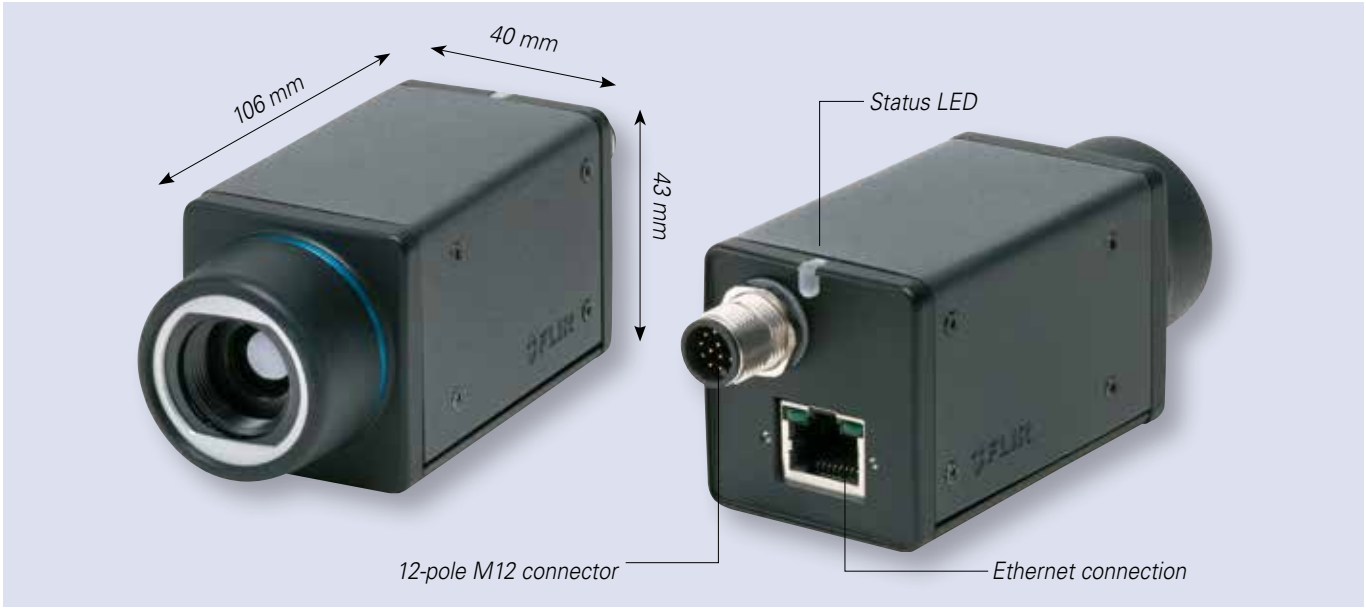
Software included

The FLIR Axx thermal imaging cameras work seamlessly together with FLIR Tools. It allows for viewing and analyzing thermal images and includes functions such as time versus temperature plots. Users that need more functionality and also want to be able to record images can optionally choose for FLIR Tools+.





Quality control of food production line



Available models

	FLIR A65	FLIR A35	FLIR A15	FLIR A5
Resolution	640 x 512 pixels	320 x 256 pixels	160 x 128 pixels	80 x 64 pixels
Available lenses	Focal length 13 mm Focal length 25 mm	Focal length 9 mm Focal length 19 mm	Focal length 9 mm Focal length 19 mm	Focal length 5 mm Focal length 9 mm

FLIR A65 / A35 / A15 / A5

Technical specifications

Imaging and optical data	FLIR A65	FLIR A35	FLIR A15	FLIR A5
IR resolution	640 x 512 pixels	320 x 256 pixels	160 x 128 pixels	80 x 64 pixels
FOV (Field of view) / Focal length	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	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	44° (H) x 36° (V) with 5 mm lens 25° (H) x 20° (V) with 9 mm lens lenses are not interchangeable and need to be specified at time of order
Spatial resolution (IFOV)	1.31 mrad for 13 mm lens 0.68 mrad for 25 mm lens	2.78 mrad for 9 mm lens 1.32 mrad for 19 mm lens	5.56 mrad for 9 mm lens 2.63 mrad for 19 mm lens	10.0 mrad for 5 mm lens 5.56 mrad for 9 mm lens
Image frequency	9 Hz	60 Hz	60 Hz	60 Hz
Detector data				
Detector pitch	17 µm	25 µm	50 µm	50 µm
Measurement				
Object temperature range	–40°C to +160°C (–40 to 320°F)	–40°C to +160°C (–40 to 320°F) / –40°C to +550°C (–40 to +1022°F)	–40°C to +160°C (–40 to 320°F) / –40°C to +550°C (–40 to +1022°F)	–40°C to +160°C (–40 to 320°F) / –40°C to +550°C (–40 to +1022°F)

General

Imaging and optical data	
Thermal sensitivity/NETD	< 0.05°C @ +30°C (+86°F) / 50 mK
Minimum focus distance	Fixed
F-number	1.25
Focus	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
Ethernet, connector type	RJ-45
Ethernet, communication	GigE Vision ver. 1.2 Client API GenICam compliant
Ethernet, image streaming	8-bit monochrome @ 60 Hz Signal linear/ DDE, Automatic/ Manual, Flip H&V 14-bit @ 60 Hz 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
Digital input/output	
Digital input, purpose	General purpose
Digital input	1× opto-isolated, "0" < 2, "1"=2–40 VDC
Digital output, purpose	General purpose Output to ext. device (programmatically set)
Digital output	1× opto-isolated, 2–40 VDC, max 185 mA
Digital I/O, isolation voltage	500 VRMS
Digital I/O, supply voltage	2–40 VDC, max 200 mA
Digital I/O, connector type	12-pole M12 connector (shared with Digital Synchronization and External power)
Synchronization In, purpose	Frame sync In to control camera
Synchronization In	1×, non-isolated
Synchronization In, type	LVC Buffer @3.3V, "0" <0.8 V, "1">2.0 V.
Synchronization Out, purpose	Frame sync Out to control another Ax5 camera
Synchronization Out	1×, non-isolated
Synchronization Out, type	LVC Buffer @ 3.3V, "0"=24 MA max, "1"= –24 mA max.
Digital Synchronization, connector type	12-pole M12 connector (shared with Digital I/O and External power)
Power system	
External power operation	12/24 VDC, < 2.5 W absolute max
External power, connector type	12-pole M12 connector (shared with Digital I/O and Digital Synchronization)
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)
EMC	EN 61000-6-2 (Immunity) EN 61000-6-3 (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	0.200 kg (0.44 lb.)
Camera size (L × W × H)	106 × 40 × 43 mm (4.2 × 1.6 × 1.7 in.)
Tripod mounting	Optional with Accessory T198349, Base support
Base mounting	4 × M3 thread mounting holes (bottom)
Housing material	Magnesium and aluminum
Scope of delivery	
Packaging, contents	Cardboard box , Thermal imaging camera with lens, Focus adjustment tool, Getting Started Guide, Important Information Guide, User documentation CD-ROM, Registration card

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