IIIRcam

Infrared Camera

VELOX 81k SM

with Indium Antimonide (InSb) Image Sensor

320 x 256 Pixels
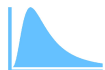**1.5 µm – 5.5 µm**
384 Hz

State-of-the-art IR image sensor

Numerous optional features

Several data interface options

Radiometric calibration
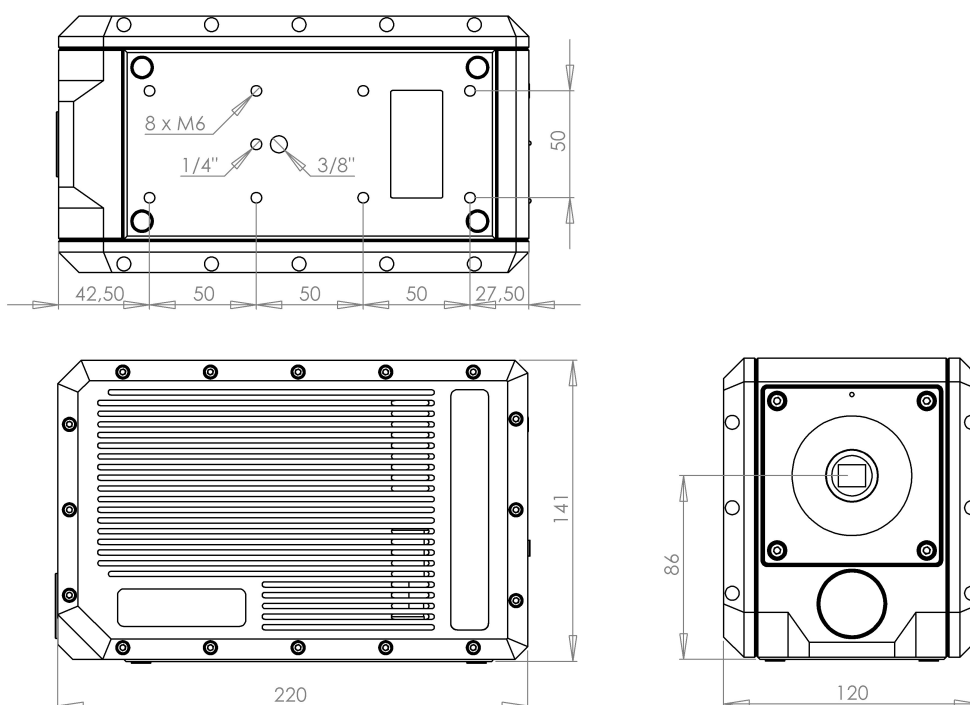
Scientific, industrial and OEM software solutions

Broad selection of lenses

Customization of hardware and software

IRcam

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Spectral range	1.5 µm – 5.5 µm
Detector technology	Indium Antimonide (InSb)
Format	81 920 (320 x 256) Pixels
Sensor size	9.60 mm x 7.68 mm
Pixel pitch	30 µm
Aperture	F/3
NETD	< 20 mK
Fullframe rate	384 Hz
Integration time	Adjustable
Operating mode	Snapshot (integrate-while-read)
A/D Resolution	14 bit
Dimensions (mm)	L=220, W=120, H=141
Weight	4 kg
Data interface	Camera Link (additional/alternative interfaces optional)
Input voltage	24 V
Power	< 40 W
Cooler	Stirling (Rotary)
Working temperature	-15 °C to 50 °C
Storage temperature	-40 °C to 70 °C

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Focal Plane Array (FPA) Sensor	The camera uses a cryogenically cooled FPA quantum detector which counts incoming photons during the integration time. By using a global shutter, all pixels are sensitive during the same period of time. The FPA is mounted in an evacuated Dewar and is located behind a cooled radiation shield ("cold stop").
Stirling Cooler	Coolers with different MTTF are available. In case of failure, IRCAM can replace the cooler in-house within a few working days.
Data Interface Camera Link	Camera Link is a well-established, stable and reliable interface between camera and computer (via framegrabber card). In "Medium" configuration, the interface uses two cables. Fiber-optic cables can be used to increase transmission length. Additional secondary data interfaces can be integrated (see "Options" next page).
Windowing Mode	In windowing mode, only a rectangular part of the image sensor is read out. Decreasing the vertical size results in a higher maximum frame rate.
Multiple Integration Time Mode	The camera can change the integration time from frame to frame. Up to 6 integration times can be pre-selected. The mode can be used to increase the camera´s dynamic range.
Image Meta Data	Every frame transmitted from the camera contains a lot of additional information which belongs to the image, like e.g. frame number, MIO signal status, operating hours, etc.
Custom Backpanel	Based on a modular concept, the camera backpanel is customized to support all available features and electrical interfaces of the camera.
Ventilation System	An active cooling system with integrated fans maintains the thermal drift on a low level, which is important for the measurement accuracy and permits to use the camera at elevated ambient temperatures.
Smart Lens Interface	Lenses are mounted with a square flange. The flange contains integrated electronics for storage of the lens ID and measure-ment of the lens temperature. Camera and software automati-cally recognize the lens and use the temperature information for thermal compensation. The lens is thermally isolated from the camera housing.

Options (Interfaces & Features) Selection

Data Interface GigE	Connects to any PC via network interface card. Note: max. frame rate limited by bandwidth to approx. 45 Hz
Data Interface USB 3.0	Connects to any PC via USB 3.0. Optional: fiber-optic extension for long-distance transmission.
Data Interface 10-GigE	Connects to any PC via 10-GigE (fiber-optic transmission) For laptops: with Thunderbolt 3 adapter.
Data Interface CoaXPress	Alternative to Camera Link. Requires CoaXPress framegrabber.
MIO Measurement Interface	MIO D: 2 digital inputs, 2 digital outputs, MIO DA: plus 2 analog inputs
IRIG-B Input	For time signal from external digital IRIG-B signal source Optional: Adapter with analog input
GNSS/GPS Input	Built-in GNSS receiver. Requires external antenna (via SMA connector).
Dual-Mode Filter Wheel	Switching and synchronized spinning mode. 6 positions for standard filters with 25 mm - 25.4 mm (1 inch) diameter.
Filter Holder	Accepts standard filters with 25 mm - 25.4 mm (1 inch) diameter.
Motor Focus	Integrated into camera housing. Universal for all lenses. Operation by software (e. g. IRCAM Works).
Shutter	Camera-integrated, motorized shutter. Versions: passive, heated, temperature-controlled, NIR
VIS Camera	Integrated camera for visible range. Different versions available. Connected to PC via USB 2.0. C-Mount lens interface.
IP65	Sealing of camera housing, including lens flange. Use of sealed connectors.
Longlife Stirling Cooler	Cooler with MTTF 28.000 h
Embedded PC	Runs IRCAM Works software. Video output via HDMI. USB 2.0 for keyboard, mouse, remote control, storage media
IRCAM Rail	Compatible to NATO Accessory Rail (STANAG 4694), on top of the camera for mounting of handle, monitor, etc.
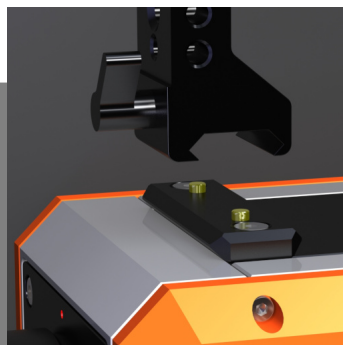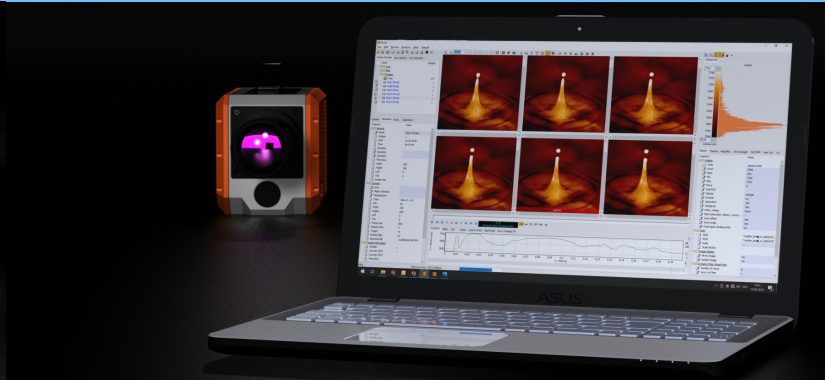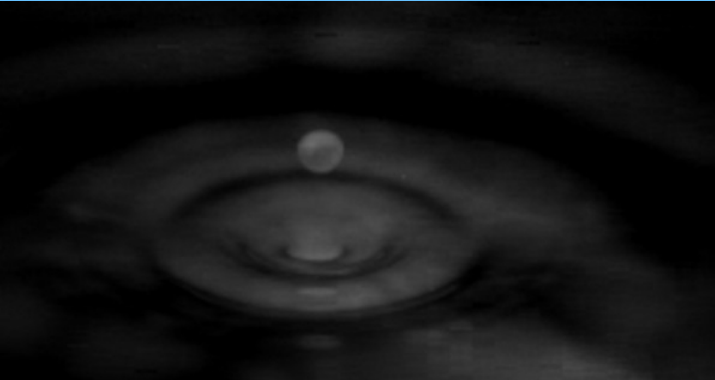
IRCAM Works

Software for scientific and industrial R&D infrared imaging applications

- Camera control & image acquisition
- Processing and display of images
- Recording and playback of images and videos
- Data export
- Evaluation of data
- Measurement of temperature and radiation

Script for Works   Extension for IRCAM Works

Script-based automization & customization of measurements and processing of data

- Script language with over 200 commands (camera control, image acquisition, …)
- Script editor
- Script examples
- Support & custom development

Lock-in for Works   Extension for IRCAM Works

**Lock-in thermography for non-destructive testing and other applications**

- Real-time data processing and display of results
- Calculation of amplitude image, phase image, 0° image, -90° image
- Control of excitation sources

IRCAM SDK

Software library for using IRCAM cameras with several programming environments

- IRCAM API (C++, C#, Delphi), 32-bit & 64-bit, LabVIEW Toolkit, MATLAB Interface
- IR camera control, image acquisition and processing, temperature measurement
- Documentation & code examples

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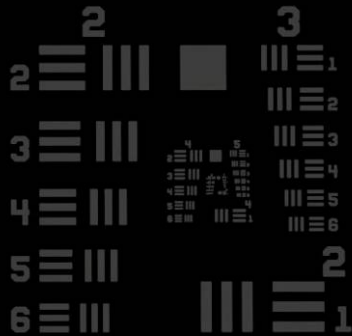
Standard Lenses

- Optimized for the camera´s image sensor and cold shield
- Chromatic correction for specified spectral range
- High "speed" due to large aperture (F/2 or better)
- Wide working distance range (optional: extension rings & close-up lenses)

Model	Focal length	Spectral range	F#	WD
IR M 10	10 mm	3.0 µm – 5.5 µm	2.0	0.1 m – infinity
IR M 15 MP	15 mm	3.0 µm – 5.5 µm	1.5	0.1 m – infinity
IR M 25	25 mm	3.0 µm – 5.5 µm	2.0	0.1 m – infinity
IR M 50	50 mm	3.0 µm – 5.5 µm	2.0	0.3 m – infinity
IR M 100	100 mm	3.0 µm – 5.5 µm	2.0	2 m – infinity
IR M 200 MP	200 mm	3.0 µm – 5.5 µm	2.0	10 m – infinity
IR SM 29 MP	29 mm	1.5 µm – 5.5 µm	1.5	0.1 m – infinity
IR SM 50 MP	50 mm	1.5 µm – 5.5 µm	2.0	1 m – infinity
IR SM 100 MP	100 mm	1.5 µm – 5.5 µm	2.0	3 m – infinity
IR SM 300	300 mm	1.5 µm – 5.5 µm	2.0	10 m – infinity
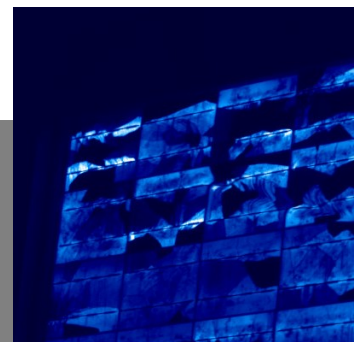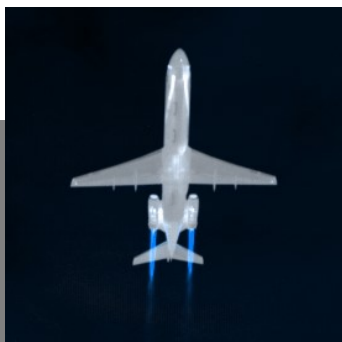
Close-up Lenses

Model	Magnification	Spectral range	F#	WD
IR M CU 35/50 *	2 x	3.0 µm – 5.5 µm	N/A	35 mm
IR M CU 100/50 *	0.5 x – 0.7 x	3.0 µm – 5.5 µm	N/A	75 mm – 100 mm
IR M CU 250/50 *	0.2 x – 0.4 x	3.0 µm – 5.5 µm	N/A	135 mm – 250 mm
IR M CU 500/50 *	0.1 x – 0.3 x	3.0 µm – 5.5 µm	N/A	185 mm – 500 mm
IR M CU 500/100 **	0.2 x – 0.4 x	3.0 µm – 5.5 µm	N/A	250 mm – 500 mm

* attaches to IR M 50   ** attaches to IR M 100   WD: Working distance

Microscope Lenses

Model	Magnification	Spectral range	F#	WD
IR M Micro 1x	1 x	3.0 µm – 5.5 µm	2.0	14 mm
IR M Micro 2x	2 x	3.0 µm – 5.5 µm	2.0	14 mm
IR M Micro 5x	5 x	3.0 µm – 5.5 µm	4.0	14 mm
IR M Micro 5x WD35	5 x	3.0 µm – 5.5 µm	4.0	35 mm
IR M Micro 10x Mirror	10 x	1.0 µm – 11.0 µm		30 mm
IR M Micro SIL	4 x	3.0 µm – 5.5 µm	N/A	0 mm

Custom Lens Design

You have not found the perfect IR lens for your application? Contact us.

IRCAM offers custom optical and mechanical design and manufacturing, from prototype to production.
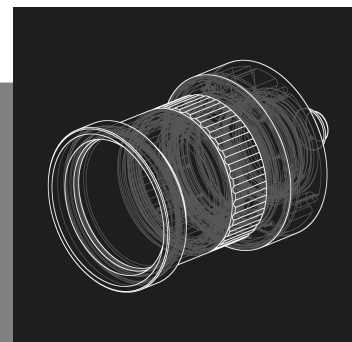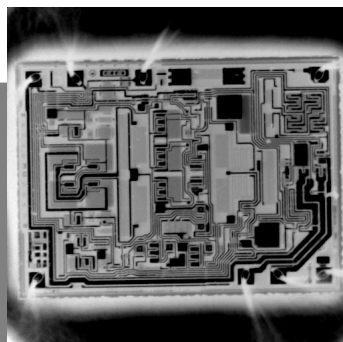
Dual-band IR panorama image of the city of Erlangen

The IR Camera Specialists

IRCAM – established in 2005 – specializes in the design and manufacturing of standard and customized scientific-grade cameras for the infrared spectrum. Our technical team of developers, engineers, scientists and assemblers is passionate about IR imaging technology and implementing state-of-the-art IR quantum detectors. IRCAM cameras are used worldwide for scientific and industrial applications.

Capabilities & Services

- IR image sensor integration
- Mechanical design and manufacturing
- Electronic design and manufacturing
- Optics design and manufacturing
- Software development
- Radiometric calibration
- Custom development and manufacturing of IR cameras, components and systems
- Application support by scientists
- Technical support by developers
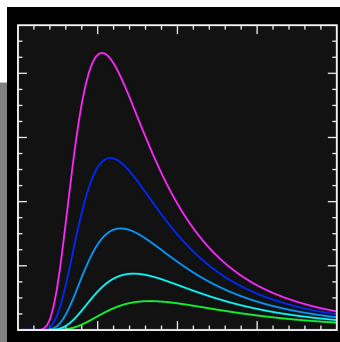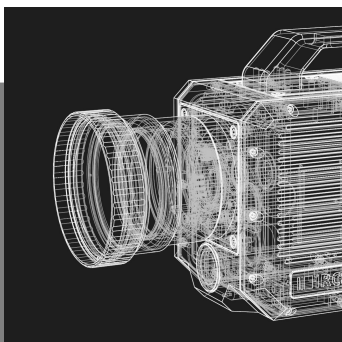
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