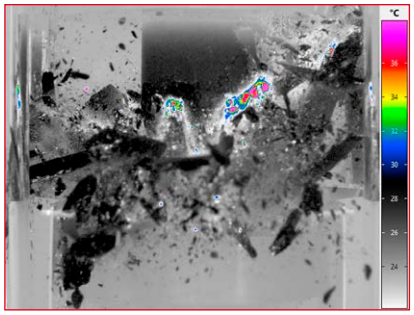
MADE IN GERMANY

InfraTec.
Infrarotsensorik und Messtechnik



Thermographic image of an exploding bottle

ImageIR® 9400 hs

High-speed Infrared Camera – in VGA Format

640 × 512 Detector

Detector Format
Efficient measurement of smallest structures on large-scale objects

640 × 512 622 Hz

IR-Frame Rate
Analysis of extreme temperature changes and gradients in full frame

±1 %

Measurement Accuracy
Highly accurate and repeatable measurements

≤ 20 mK

Thermal Resolution
Precise detection of smallest temperature differences

10 GigE

10 GigE Interface
High-speed, long-distance interference proof data transmission

20 µm Pitch

Pitch Dimension
Precise measurement of low temperatures and very fast integration times

Focus

Motor Focus
Precise, fast and remotely controllable; including multiple autofocus functions

With the ImageIR® 9400 hs from InfraTec, users get a high-speed infrared camera that is particularly suitable for non-contact temperature measurement of highly dynamic processes and fast moving objects. The cooled focal plane array photon detector belongs to the latest detector generation and guarantees outstanding performance data. In addition to the temporal resolution, the camera offers an excellent thermal resolution of 0.02 K. It can be used to measure the smallest temperature gradients. In full-frame format of (640 × 512) IR pixels, the camera achieves a frame rate of up to 622 Hz, in sub-frame format up to 3,343 Hz. The ImageIR® 9400 hs is therefore suitable for users who require both high thermal resolution and extremely short integration times of only a few microseconds to solve their tasks. The measurement system enables the creation and storage of thermographic sequences with very high frame rates.

Our ImageIR® 9400 camera series has an internal trigger interface that guarantees high-precision, repeatable triggering. There are two configurable digital inputs and outputs each for controlling the camera or for generating digital control signals for external devices. Additional information is also stored directly in the image data. Due to its modular design, the camera can be combined user-specifically with a motorised focusing unit which can be controlled via the camera software, ensuring even more comfort for the use.

Technical Specifications

Spectral range	(1.5 … 5.5) µm
Pitch	20 µm
Detector	InSb
Detector format (IR pixels)	(640 × 512)
Image acquisition	Snapshot
Readout mode	ITR / IWR
Aperture ratio	f/2.2 or f/3.0
Detector cooling	Stirling cooler
Temperature measuring range	(-40 … 1,500) °C, up to 3,000 °C*
Measurement accuracy	± 1 °C or ± 1 %
Temperature resolution @ 30 °C	Better than 0.02 K
Frame rate (full / half / quarter / sub frame)*	Up to 622 / 1,053 / 1,615 / 3,343 Hz
Window mode	Yes
Focus	Manual, motorised or automatic*
Dynamic range	Up to 16 bit*
Integration time	(1 … 20,000) µs
Rotating filter wheel*	Up to 6 positions
Rotating aperture wheel*	Up to 5 positions
Interfaces	10 GigE, HDMI*, GigE*, CamLink
Trigger	4 IN / 2 OUT, TTL
Analogue signals*, IRIG-B*	3 IN / 2 OUT, yes
Tripod adapter	1/4" and 3/8" photo thread, 2 × M5
Power supply	24 V DC, wide-range power supply (100 … 240) V AC
Storage and operation temperature	(-40 … 70) °C, (-20 … 50) °C
Protection degree	IP54, IEC 60529
Dimensions; weight	(241 × 123 × 160) mm*; 4.3 kg (without lens)
Further functions	Multi Integration Time, HighSense
Analysis and evaluation software	IRBIS® 3, IRBIS® 3 view, IRBIS® 3 plus*, IRBIS® 3 professional*, IRBIS® 3 control*, IRBIS® 3 online*, IRBIS® 3 process*, IRBIS® 3 active*, IRBIS® 3 mosaic*, IRBIS® 3 vision*

* Depending on model

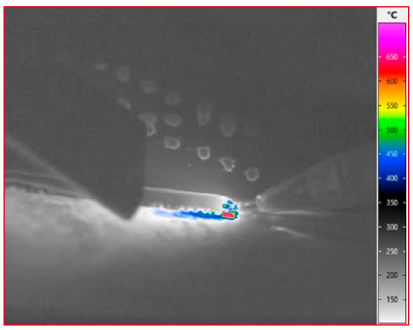
Lenses	Focal length (mm)	FOV (°)	IFOV (mrad)
Standard lens	25	(29 × 23)	0.8
Telephoto lens	50	(15 × 12)	0.4
Telephoto lens	100	(7.3 × 5.9)	0.2
Telephoto lens	200	(3.7 × 2.9)	0.1

Macro and microscopic lenses	Minimum object distance (mm)	Object size (mm)	Pixel size (µm)
Close-up for telephoto lens 50 mm	300	(77 × 61)	120
Close-up for telephoto lens 100 mm	500	(64 × 51)	100
Microscopic lens M=1.0×	40	(13 × 10)	20
Microscopic lens M=2.5×	14	(5.1 × 4.1)	8
Microscopic lens M=8.0×	14	(1.6 × 1.3)	2.6

Fields of application:

High-speed applications …

- In research and development
- For process monitoring
- In materials testing



Thermal analysis during laser soldering

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