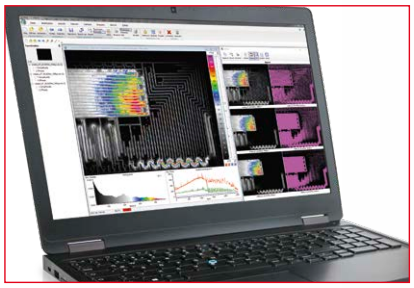
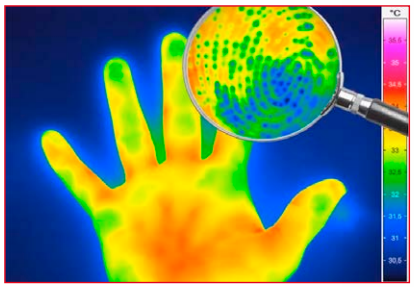
MADE
IN
GERMANY

INFRATEC.
INFRAROTSENSORIK UND MESSTECHNIK



Analysis of an electronic component by lock-in thermography with IRBIS® 3 active software



Thermography with significantly better image quality

ImageIR® 9400

High-end Infrared Camera with HD Image Quality

1,280 × 1,024 Detector
Detector Format
Efficient measurement of smallest structures on large-scale objects

5.2 MegaPixel
MicroScan
(2.560 × 2.048) IR pixels by genuine camera hardware

1,280 × 1,024 180 Hz
IR-Frame Rate
Analysis of extreme temperature changes and gradients in full frame

±1 %
Measurement Accuracy
Highly accurate and repeatable measurements

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

Calibration
HighSense
Flexible setting of temperature measurement ranges / integration times beyond calibration ranges

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

This camera model is the ideal measurement system for users whose measurement task requires a particularly high geometric resolution. The cooled focal plane array photon detector has (1,280 × 1,024) IR pixels and can increase the image format up to (2,560 × 2,048) IR pixels with the optional opto-mechanical MicroScan. Each single one of these 5.2 Megapixels in the image represents a real temperature measurement value. This allows the finest structures to be recorded and analysed without gaps and simultaneously on large or distant measurement objects.

The ImageIR® 9400 has a very small pitch of 10 µm, making it ideal for microthermography in electronics. In combination with an 8× microscope lens, the finest structures can be precisely resolved down to 1.3 µm. Its modular design enables individual configuration and optimal adaptation to the task at hand. The camera is equipped with numerous innovative functions, such as the HighSense function for the use of additional individual temperature measurement ranges. The integrated trigger interface ensures high-precision, repeatable triggering for fast processes. Multiple configurable digital inputs and outputs allow for camera control and the generation of control signals for external devices. Equipped with a separate filter and aperture wheel each with up to six free positions (30 combinations), the camera enables universal use in measurement tasks with high object temperatures and in the field of spectral thermography. All precision optics of the ImageIR® 9400 can be combined with a motorised focus unit.

Technical Specifications

Spectral range	(1.5 … 5.5) µm
Pitch	10 µm
Detector	InSb
Detector format (IR pixels)	(1,280 × 1,024)
Detector format with opto mechanical MicroScan (IR pixels)	(2,560 × 2,048)
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 0.03 K
Frame rate (full / half / quarter / sub frame)*	Up to 180 / 342 / 622 / 2,601 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)	0.4
Telephoto lens	50	(15 × 12)	0.2
Telephoto lens	100	(7.3 × 5.9)	0.1
Telephoto lens	200	(3.7 × 2.9)	0.05

Macro and microscopic lenses	Minimum object distance (mm)	Object size (mm)	Pixel size (µm)
Close-up for telephoto lens 50 mm	300	(77 × 61)	60
Close-up for telephoto lens 100 mm	500	(64 × 51)	50
Microscopic lens M=1.0×	40	(13 × 10)	10
Microscopic lens M=2.5×	14	(5.1 × 4.1)	4
Microscopic lens M=8.0×	14	(1.6 × 1.3)	1.3

Fields of application:

- Safety engineering
- Stationary microthermography
- Materials testing
- Research and development

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