# ImageIR® 9400

## High-performance Thermography Camera


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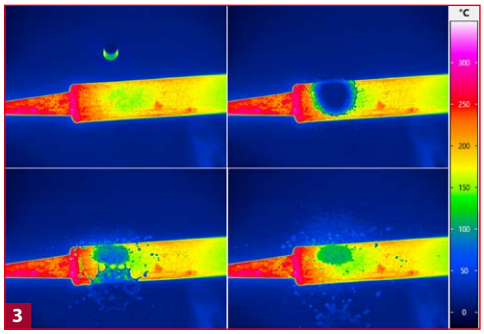

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1) ImageIR® 9400 with interchangeable lenses from InfraTec
2) Lock-in thermography of an electronic device with the thermographic software IRBIS® 3 active
3) Impact of a drop of water on a soldering iron, recorded with high-speed mode

InfraTec.

Europe's leading specialist for infrared sensors and measurement technology

- Cooled FPA photon detector with (1,280 × 1,024) IR pixels
- Available with high-speed mode thanks to binning technology
- Snapshot detector, internal trigger interface
- Thermal resolution up to 0.02 K
- Extremely short integration times in the microsecond range
- Pixel size with microscopic lens up to 1.3 µm
- Made in Germany


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**www.InfraTec.eu**

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Latest information on the internet.

| | |
|---|---|
| Spectral range | (2.0 … 5.5) µm or (3.6 … 4.9) µm |
| Pitch | 10 µm |
| Detector | InSb |
| Detector format (IR pixels) | (1,280 × 1,024) |
| 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 2,000 °C* |
| Measurement accuracy | ± 1 °C or ± 1 % |
| Temperature resolution @ 30 °C | Up to 0.03 K / Up to 0.02 K in high-speed mode |
| Frame rate (full frame mode / 640 × 512)* | Up to 180 Hz / 625 Hz, (identical FOV) |
| Window mode | Yes |
| Focus | Manually, motorised or automatically* |
| Dynamic range | Up to 16 bit* |
| Integration time | (1 … 20,000) µs |
| Rotating aperture and filter wheel* | Up to 5 positions |
| Interfaces | 10 GigE, HDMI* |
| Trigger | 3 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 | (235 × 120 × 160) mm, 4.0 kg (without lens) |
| Further functions | High-speed mode*, Multi Integration Time* |
| 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

To analyze the thermal behavior of objects and processes from a wide variety of perspectives InfraTec introduces ImageIR® 9400. The camera is equipped with a new generation **cooled focal-plane array photon detector** that provides a **format of (1,280 × 1,024) IR pixels.** Next to the standard mode users can choose a **high-speed** mode utilizing binning technology. Due to a reduced number of pixels but the same field of view (FOV) this enables **very high frame rates up to 625 Hz,** extremely short integration times and excellent thermal resolution at the same time.

ImageIR® 9400 was developed for demanding operations in research and development, **non-destructive testing and process monitoring.** Its **modular structure, which consists of optical, detector and interface modules,** makes it easily adaptable to the respective application.

An **integrated trigger interface** guarantees a repeatable high-precision triggering of quick procedures. Multiple configurable digital in- and outputs serve as control ports for the camera or as generator of control signals for external devices. The optical channel consists of exchangeable infrared lens systems as well as application-specific apertures, filters and optical elements. All **exchangeable radiometric precision lenses** of the ImageIR® 9400 can be equipped with a motorised focus unit, which is operated from the camera's application software. It allows quick, precise and remotely controllable motorised focusing.

| **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** | 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=8.0× | 14 | (1.6 × 1.3) | 1.3 |

Headquarters
**InfraTec GmbH**
**Infrarotsensorik und Messtechnik**
Gostritzer Str. 61 – 63
01217 Dresden / GERMANY
Phone +49 351 871-8630
Fax +49 351 871-8727
E-mail thermo@InfraTec.de

USA office
**InfraTec infrared LLC**
5048 Tennyson Pkwy.
Plano TX 75024 / USA
Phone +1 844-226-3722 (toll free)
E-mail thermo@InfraTec-infrared.com