

## thermoIMAGER Microscope lens

High resolution thermal imagers with microscope lens



### Precise temperature measurement of very small parts

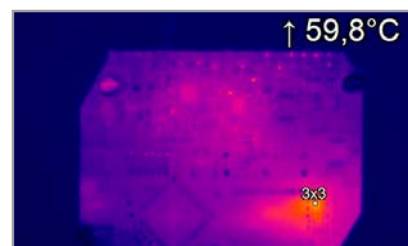
In order to recognize the slightest of temperature differences, the TIM 450 and TIM 640 thermal imaging cameras are available with a microscope lens. In addition to overall images and videos, even detailed macro shooting of individual components is possible. The scope of supply includes a thermal imaging camera (TIM 450 or TIM 640), a suitable microscope lens, PIF and USB connection cables and a high quality tripod. Comprehensive evaluation software is also provided, offering numerous features such as analysis and display of rapidly changing temperatures and recording of radiometric images and videos (up to 125Hz). The data can be exported and evaluated with other programs.

### High resolution

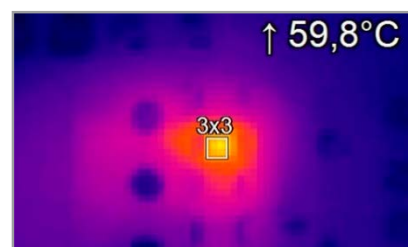
The microscope lens enables macro shooting of individual components based on a spatial resolution of up to  $28\mu\text{m}$ . The distance between the camera and the object to be measured can be up to 100mm. Within this range, flexible camera positioning is possible. Due to the large working distance, electrical function tests can be carried out whilst measuring the temperature. The synchronous measurement procedure for electrical parameters is therefore not influenced by the camera position.

### Upgrade your thermoIMAGER camera

Thermal imaging cameras from Micro-Epsilon are equipped with exchangeable lenses. Therefore, the TIM 450 and TIM 640 thermal imaging camera can be upgraded with a microscope lens.



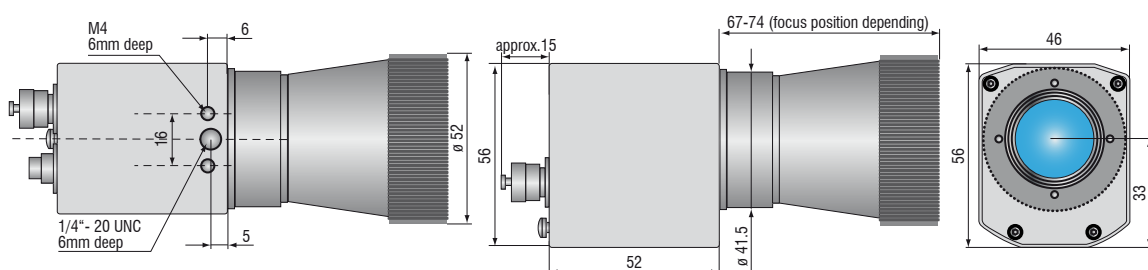
Overall record of a PCB with TIM 640 - standard lens



Individual components, magnified without microscope lens



Individual components, magnified with microscope lens



# thermoIMAGER Microscope lens

Model	TIM 450	TIM 640
Optical resolution	382 x 288 pixels @ 80Hz	640 x 480 pixels @ 32Hz 640 x 120 pixels @ 125Hz
Temperature ranges (scalable)	-20°C to 100°C, 0°C to 250°C, (20)150°C to 900°C <sup>1)</sup>	
Spectral range	7.5 to 13µm	
Frame rate	80Hz (switchable to 27Hz)	125Hz (switchable to 32Hz)
System accuracy	±2°C or ±2%, whichever is greater	
Field of view (FOV)	10° x 8° (F=1.1) / f= 44mm	12° x 9° (F=1.1) / f= 44mm
Smallest spot size (IFOV)	42µm	28µm
Min. field of view (MFOV)	85µm <sup>2)</sup>	
Focus adjustment	80 to 100mm	
Thermal sensitivity (NETD)	90mK	120mK
Detector	FPA - uncooled micro bolometer	
Outputs/digital	USB 2.0	
Standard process interface (PIF)	0-10V input, digital input (max. 24V), 0-10V output	
Industry process interface (option)	2x 0-10V inputs, digit. Input (max. 24V), 3 x 0-10V outputs, 3 x relays (0-30V / 400mA), fail-safe relay	
Cable length (USB)	1m (standard), 3m, 5m, 10m, 20m	
Power supply	USB powered	
Tripod mount	¼-20 UNC	
Protection class	IP67	
Ambient temperature range	0°C to 70°C	0°C to 50°C
Storage temperature	-40°C to 70°C	
Relative humidity	20 to 80%, non-condensing	
Shock / Vibration <sup>3)</sup>	IEC 60068-2	
Dimensions <sup>3)</sup>	TIM camera	46mm x 56mm x 90mm
	Microscope lens	52mm x 74mm
Emissivity	0.100 ... 1.100	

<sup>1)</sup> For the range (20)150 up to 900°C, the accuracy specification applies from 150°C

<sup>2)</sup> MFOV on TIM 450 is 2 x 2 pixels; on TIM 640 3 x 3 pixels

<sup>3)</sup> For more information see operating instructions

## Scope of supply

### Standard

- TIM (450 or 640) with microscope lens (TIM 450: 10° x 8°, TIM 640: 12° x 9°)
- Tripod mount for fine adjustment of camera focus
- PIF cable incl. terminal block (1m)
- USB cable 1m
- TIMConnect Software
- Hard-shell case for camera and accessories

For TIM 450 or TIM 640 cameras, an upgrade kit without cameras is available.

