MICRO-EPSILON

More Precision

thermoIMAGER TIM // Compact thermal imaging cameras

thermoIMAGER TIM M-1-N1064

Special model with laser blocking filter at a wavelength of 1064 nm (only 16 mm or 25 mm focal length)

- Measurement during active laser (neodymium-YAG laser)
- High measurement speeds up to 1 kHz

thermoIMAGER TIM M-08

Special narrow-band spectral sensitivity with 800 nm

- Ideal for almost all NIR and CO_2 laser processing applications

Model	TIM M-1-N1064	TIM M-08
Optical resolution	764 x 480 pixels @ 32 Hz 382 x 288 pixels @ 80 Hz (switchable to 27 Hz) 72 x 56 pixels @ 1 kHz [5] 764 x 8 pixels @ 1 kHz (fast line-scan mode) [5]	
Temperature ranges	450 [2] ... 1800 °C (27 Hz mode) 500 [2] ... 1800 °C (32 Hz mode) 500 [2] ... 1800 °C (80 Hz mode) 700 [2] ... 1800 °C (1 kHz mode)	575 °C ... 1900 °C (27 Hz mode) 625 °C ... 1900 °C (32 Hz mode) 625 °C ... 1900 °C (80 Hz mode) 750 °C ... 1900 °C (1 kHz mode)
Spectral range	0.92 - 1.1 µm with blocking filter at 1064 nm / FWHM = 44 nm	780 - 820 nm
Frame rate	up to 1 kHz / 1 ms real-time analog output (0 - 10 V) from 8 x 8 pixels (freely selectable)	
System accuracy	±1 % of reading (object temperature < 1400 °C)	±1 % of reading (object temperature < 1500 °C) ±1.5 % of reading (object temperature > 1500 °C) [3]
Lenses	**FOV @ 764 x 480 px:** 26° x 16° (f = 25 mm) [1] **FOV @ 382 x 288 px:** 13° x 10° (f = 25 mm) [1]	
Thermal sensitivity (NETD)	< 1 K (700 °C) | < 2 K (1000 °C)	< 2 K (< 1000 °C / 27 Hz to 1 kHz) [4]
Detector	CMOS (15 µm x 15 µm)	
Outputs/digital	USB 2.0 / optional GigE	
Standard process interface (PIF)	0 - 10 V input, digital input (max. 24 V), 0 - 10 V output	
Industry process interface (PIF)	2x 0 - 10 V inputs, digital input (max. 24 V), 3x 0(4) - 20 mA outputs, 3x relays (0 - 30 V / 400 mA), fail-safe relay	
Cable length (USB)	1 m (standard), 5 m, 10 m 5 m and 10 m also available as high temperature USB cable (180 °C or 250 °C)	
Power supply	USB powered	
Tripod mount	¼-20 UNC	
Protection class	IP67 [6]	
Ambient temperature	0 ... 50 °C	5 ... 50 °C
Storage temperature	-40 ... 70 °C	
Relative humidity	20 to 80 %, non-condensing	
Vibration	IEC 60068-2-6 (sinus-shaped) / IEC 60068-2-64 (broadband noise)	
Shock	IEC 60068-2-27 (25 g and 50 g)	
Housing (size)	46 mm x 56 mm x 88 - 129 mm (depending on lens and focus position)	
Weight	245 - 311 g, incl. lens	

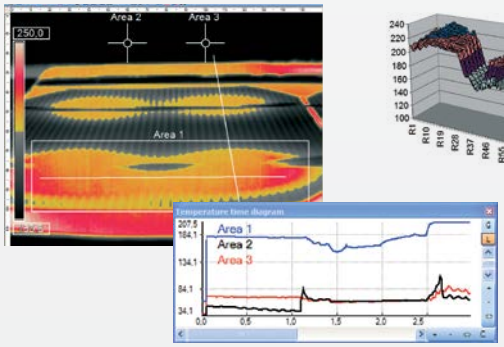
[1] Please note: measurement accuracy can be out of specification with distances below 500 mm
[2] +75 °C higher initial temperature with lenses providing a focal length of f=50 mm and f=75 mm
[3] For 1 kHz mode: ±1.5 % of reading (object temperature < 1500 °C) / ±2 % of reading (object temperature > 1500 °C)
[4] < 4 K (> 1000 °C / 27 Hz to 1 kHz)
[5] Can be placed anywhere within the FOV
[6] Only applies when lens protection tube is used

Scope of supply

TIM M-1/M-08

- TIM process camera incl. a selectable lens
- Lens cap incl. protective window
- Operating instructions
- USB cable 1 m
- Software for real-time processing and analyzing thermal images
- Tripod mount
- PIF cable incl. terminal block (1 m)
- Transport case
- Optional: Cooling Jacket Advanced, high temperature cable

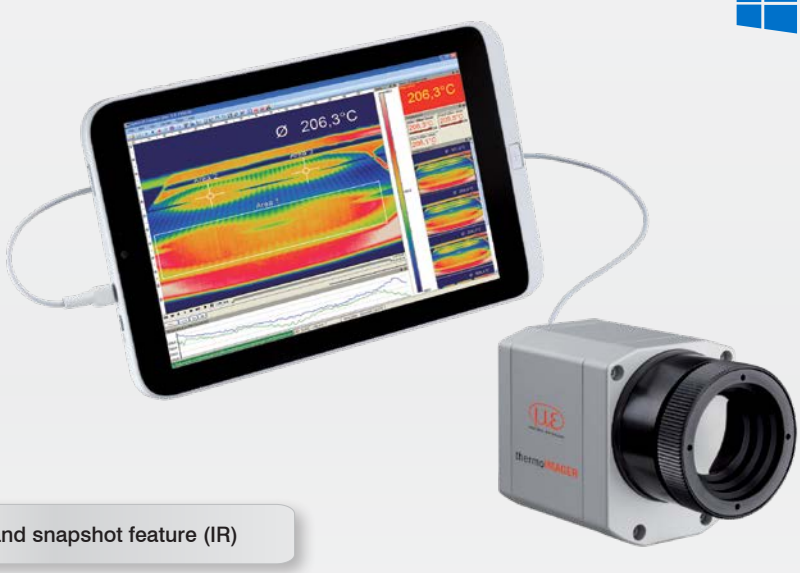
TIMConnect SOFTWARE FEATURES



Comprehensive IR camera software

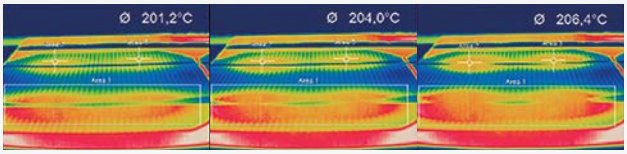
- License-free analysis software and complete SDK included
- Intuitive user interface
- Camera remote control via software
- Displays several camera images in different windows
- Compatible with Windows 7, 8 and 10
- Data output via PIF hardware interface using up to 3 analog channels

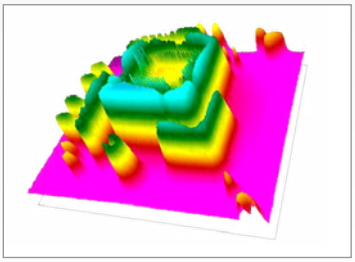
Windows 10



Video recording and snapshot feature (IR)

- Recording of video sequences and individual images for later analysis or documentation
- Adjustable frame rate to reduce data volume
- Display of snapshot process for direct analysis





Online and offline data analysis

- Real-time temperature information (°C or °F) in main window, as digital display or graphic display
- Detailed analysis using measuring fields, automatic hotspot/coldspot search
- Logical linking of temperature information
- Slow-motion replay without connected camera
- Various layout functions and color palettes to highlight thermal contrasts

Temperature data analysis and documentation

- Triggered data collection
- Radiometric video sequences (*.ravi) and snapshots (*.tiff)
- Thermal images as *.tiff or *.csv, *.dat text files incl. complete temperature information
- Data transfer in real time to other software programs via DLL or COM port interfaces

Lenses thermoIMAGER TIM M-1 / TIM M-08 / TIM M-05

TIM M-1 / TIM M-08 [1] / TIM M-05 [1] 382 x 288 px	Focal length [mm]	Angle	Minimum measurement distance*	Distance to measurement object [m]											
					0.1	0.2	0.3	0.5	1	2	4	6	10	30	100
f=16 mm Wide angle lens	16	20° 15° 25° 0.94 mrad	0.2 m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]		0.07 0.05 0.09 0.2	0.11 0.08 0.13 0.3	0.18 0.14 0.22 0.5	0.36 0.27 0.45 0.9	0.72 0.54 0.90 1.9	1.43 1.08 1.79 3.8	2.15 1.62 2.69 5.6	3.6 2.7 4.5 9.4	10.7 8.1 13.5 28.1	35.8 27.0 44.9 93.8
f=25 mm Standard lens	25	13° 10° 16° 0.60 mrad	0.5 m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]	0.023 0.017 0.029 0.1	0.05 0.03 0.06 0.1	0.07 0.05 0.09 0.2	0.11 0.09 0.14 0.3	0.23 0.17 0.29 0.6	0.46 0.35 0.57 1.2	0.92 0.69 1.15 2.4	1.38 1.04 1.72 3.6	2.3 1.7 2.9 6.0	6.9 5.2 8.6 18.0	22.9 17.3 28.7 60.0
f=50 mm Telephoto lens	50	7° 5° 8° 0.30 mrad	1.5 m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]				0.06 0.04 0.07 0.2	0.11 0.09 0.14 0.3	0.23 0.17 0.29 0.6	0.46 0.35 0.57 1.2	0.69 0.52 0.86 1.8	1.1 0.9 1.4 3.0	3.4 2.6 4.3 9.0	11.5 8.6 14.4 30.0
f=75 mm Super telephoto lens	75	4° 3° 5° 0.20 mrad	2.0 m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]					0.08 0.06 0.10 0.2	0.15 0.12 0.19 0.4	0.31 0.23 0.38 0.8	0.46 0.35 0.57 1.2	0.8 0.6 1.0 2.0	2.3 1.7 2.9 6.0	7.6 5.8 9.6 20.0

[1] TIM M-05 and TIM M-08 only available with OF25 lens | Please note: the camera provides 382 x 288 px in the 80 Hz mode

* Please note: The measurement accuracy of the camera may lie outside of the specifications for distances below the defined minimum measurement distance.

Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

Sensors and measurement devices for non-contact temperature measurement

Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers

3D measurement technology for dimensional testing and surface inspection

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