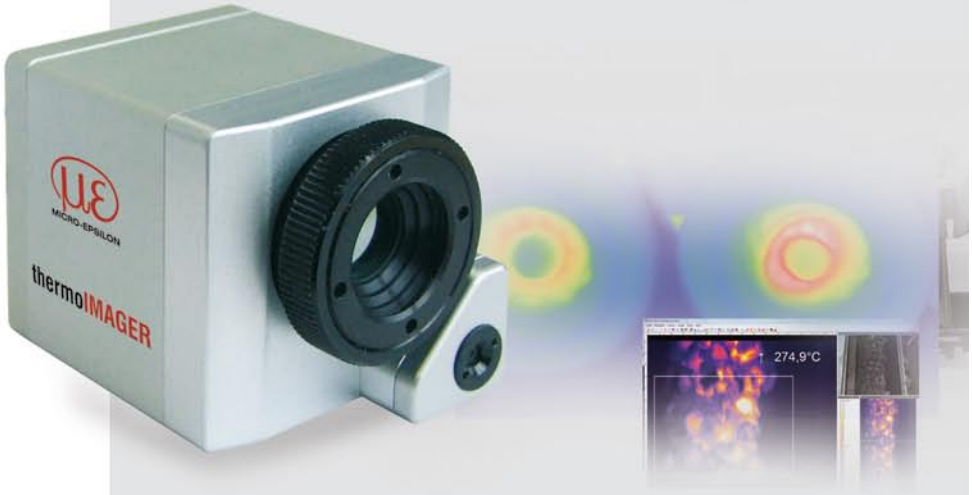
MICRO-EPSILON

More Precision.

thermoIMAGER TIM 200



thermoIMAGER TIM 200

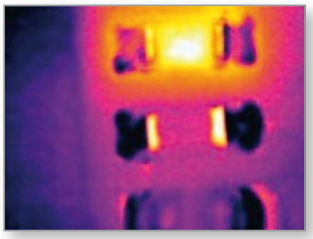
Themal imager with BI-SPECTRAL technology

- **NEW:** BI-SPECTRAL technology
- Measuring range from -20°C to 900°C (special edition 1500°C)
- Excellent thermal sensitivity of 0.08K (NEDT)
- Exchangeable lenses with 6°FOV, 23°FOV, 48°FOV and 80°FOV
- Thermal images in real time with 128Hz via USB 2.0 interface
- Time synchronic visual image recording (VIS) with 32Hz (640 x 480 pixel)
- Power supply and operation via USB 2.0 interface
- Extremely lightweight (215g) and rugged (IP67)
- Very compact 45x45x62mm
- Analogue input and output, trigger interface
- Software developer kit and Labview driver are included as standard

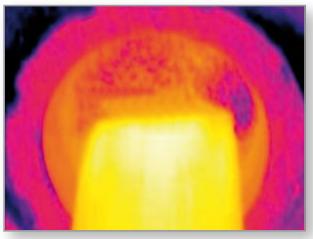
Software

- Display of the thermal image (128Hz) and the real time image (32 Hz) in real time with recording function (video, snap shot)
- Complete set up of parameters and remote control of the camera
- Detailed analysis of fast thermodynamic processes
- Output of analogue temperature or alert values via the process interface
- Digital communication via RS232 or DLL for software integration

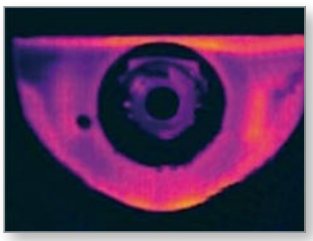
Applications - Examples



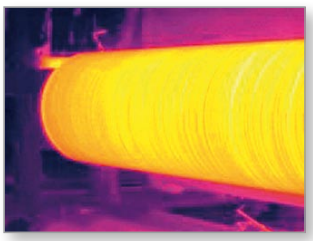
R&D electronic



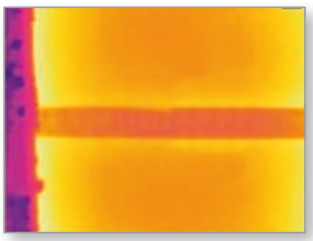
Process control extrusion



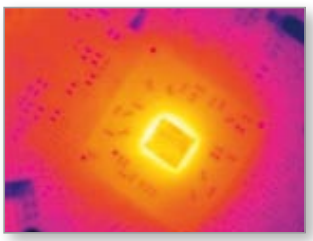
R&D mechanical components



Process control calendering



Production of solar panels



R&D electronic devices

Technical data

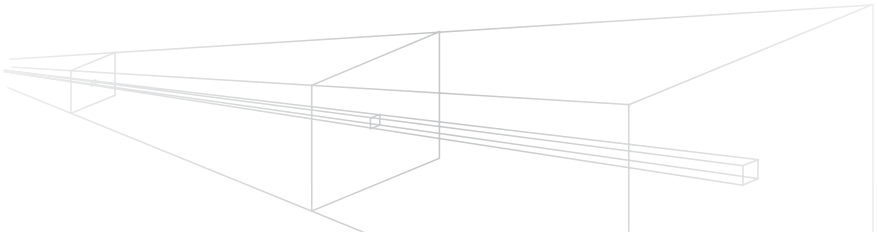
thermoIMAGER TIM 200

Optical resolution	160x120 pixel
Temperature ranges	-20°C to 100°C / 0°C to 250°C / 150°C to 900°C
Spectral range	7.5 to 13μm
Frame rate	128Hz
System accuracy	±2% or ±2°C
Resolution (Display)	±0.1°C
Lenses	80° / f = 3.1mm (min. distance 20mm); 48° / f = 4.5mm (min. distance 20mm); 23° / f = 10mm (min. distance 20mm); 6° / f = 35.5mm (min. distance 500mm)
Emissivity	0.10 to 1.00 adjustable
Thermal Sensitivity	0.1K with 48° FOV and 80° FOV [1] / 0.08K with 23° FOV [1] / 0.3K with 6° FOV [2]
Detector	Focal Plane Array (FPA) - uncooled micro bolometer 25x25μm^2
Measurement modes	Flexible spot with crosshair marking, fixed measurement field with automatic display of maximum-, minimum- or average value
Colour palettes	Iron, rainbow, black-white, black-white inverted
Set up controls (via menu)	Mesurement modes, full automatic, manual, colour palettes, emissivity, file management, date/time, °C/ °F, language
Data of visual camera	Optical resolution: 640 x 480 Pixel Frame rate: 32Hz Lenses (FOV): 54° x 40°

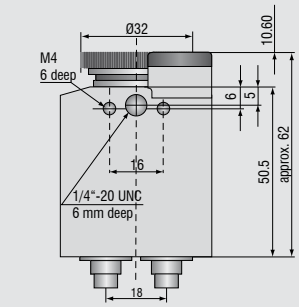
Outputs/digital	USB 2.0
Process interface (electrically isolated)	0-10 V output, 0-10 V input, trigger input
Digital communication	via RS232 of PC / DLL interface
Cable length	1m (standard), 5m, 10 m, 20m
Power supply	USB powered
Tripod mount	1/4-20 UNC

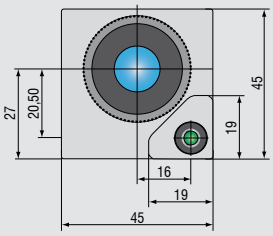
Environmental rating	IP 67
Ambient temperature	0°C to 50°C (up to 240°C with cooling jacket)
Storage temperature	-40°C to 70°C
Relative humidity	20 to 80%, non-condensing
Vibration	2G, IEC 68-2-6 11-200Hz each axis
Shock	25G, IEC 68-2-29 11ms each axis
Weight	215g; incl. lens

PC requirements: minimum 1.5GHz, 1GB RAM, Windows XP SP2, Windows 7
[1] Caution: at distances below 200mm measurement accuracy can be out of specification
[2] Caution: at distances below 500mm measurement accuracy can be out of specification

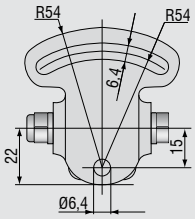


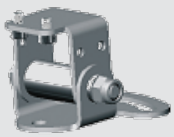
Dimensions



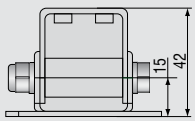


Accessories





TM-MB-TIM Mounting base, adjustable



TM-PH-TIM Protective housing incl. mounting base

TM-J-TIM Cooling jacket
(length 228mm, ø89mm) with adjustable mounting bracket TM-JAB-TIM;
recommended high temperature cable TM-USBC5H-TIM (up to 240°C)

The right optics for many applications

thermoIMAGER TIM 160/200

Objective 80° x 60° wide angle; focal distance 3.1mm; min distance 0.1m												
HFOV	m	0.13	0.26	0.39	0.65	1.55	2.58	5.16	7.7	12.9	38.7	129.0
VFOV	m	0.09	0.19	0.29	0.48	1.16	1.94	3.87	5.8	9.7	29.0	96.8
IFOV	mm	0.81	1.61	2.42	4.03	9.68	16.13	32.26	48.4	80.7	241.9	806.5
Distanz in m		*0.1*	*0.2*	*0.3*	*0.5*	*1.2*	*2*	*4*	*6*	*10*	*30*	*100*

Objective 48° x 37° wide angle; focal distance 4.5mm; min distance 0.02m												
HFOV	m	0.09	0.18	0.27	0.44	1.07	1.78	3.56	5.3	8.9	26.7	88.9
VFOV	m	0.07	0.13	0.20	0.33	0.80	1.33	2.67	4.0	6.7	20.0	66.7
IFOV	mm	0.56	1.11	1.67	2.78	6.67	11.11	22.22	33.3	55.6	166.7	555.6
Distance in m		*0.1*	*0.2*	*0.3*	*0.5*	*1.2*	*2*	*4*	*6*	*10*	*30*	*100*

Objective 23° x 17° wide angle; focal distance 10mm; min distance 0.02m												
HFOV	m	0.04	0.08	0.12	0.20	0.48	0.80	1.60	2.40	4.00	12.00	40.00
VFOV	m	0.03	0.06	0.09	0.15	0.36	0.60	1.20	1.80	3.00	9.00	30.00
IFOV	mm	0.25	0.50	0.75	1.25	3.00	5.00	10.00	15.00	25.00	75.00	250.00
Distance in m		*0.1*	*0.2*	*0.3*	*0.5*	*1.2*	*2*	*4*	*6*	*10*	*30*	*100*

Objective 6° x 5° wide angle; focal distance 35.5mm; min distance 0.5m												
HFOV	m	-	-	-	0.06	0.14	0.23	0.45	0.7	1.1	3.4	11.3
VFOV	m	-	-	-	0.04	0.10	0.17	0.34	0.5	0.8	2.5	8.5
IFOV	mm	-	-	-	0.35	0.85	1.41	2.82	4.2	7.0	21.1	70.4
Distance in m		*0.1*	*0.2*	*0.3*	*0.5*	*1.2*	*2*	*4*	*6*	*10*	*30*	*100*

FOV = Field of view; HFOV = Horizontal field of view; VFOV = Vertical field of view; IFOV = Indicated field of view

- ➔ Standard-, tele- and wide angle lens for different applications
- ➔ High quality germanium lenses and a special antireflective coating
- ➔ Factory calibrated lenses allowing the easy exchange of optics without recalibration

thermoIMAGER TIM 400/450

Objective 30° x 23°; focal distance 17mm; min distance 0.2m											
HFOV	m	0.11	0.17	0.28	0.67	1.12	1.60	3.4	5.6	16.9	56.2
VFOV	m	0.08	0.13	0.21	0.51	0.84	1.20	2.5	4.2	12.7	42.4
IFOV	mm	0.29	0.44	0.74	1.76	2.94	5.88	8.8	14.7	44.1	147.1
Distance in m		*0.2*	*0.3*	*0.5*	*1.2*	*2*	*4*	*6*	*10*	*30*	*100*

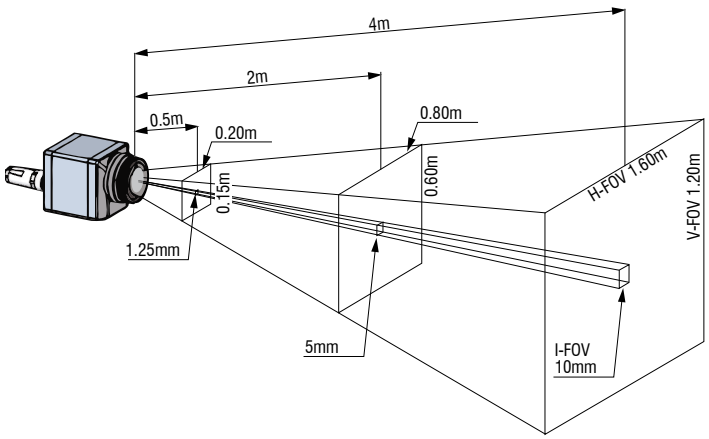
Objective 13° x 10° Tele; focal distance 40mm; min distance 0.5m											
HFOV	m			0.12	0.29	0.48	0.96	1.5	2.4	7.2	23.9
VFOV	m			0.09	0.22	0.36	0.72	1.1	1.8	5.4	18.0
IFOV	mm			0.31	0.75	1.25	2.50	3.8	6.3	18.8	62.5
Distance in m				*0.5*	*1.2*	*2*	*4*	*6*	*10*	*30*	*100*

FOV = Field of view; HFOV = Horizontal field of view; VFOV = Vertical field of view; IFOV = Indicated field of view

Note: The accuracy of measurement can be outside of the specifications for distances below 0.2m.

Precise measurement values can be calculated on
www.micro-epsilon.com/optikkalkulator

Dependence between field of view (FOV) and distance
Example: (lens 23° x 17°)



Scope of supply

TIM 160/200

- TIM process camera including one selected lens
- Operation manual
- USB cable 1m
- Processing and analysing software
- Tripod mount
- PIF cable 1m

TIM 160/200 /DK

- TIM process camera including 6°, 23°, 48° optics
- Certificate of calibration, matched with the optics
- Tripod mount 200 to 1000mm
- Rugged transport case
- Operation manual
- USB cable 1m and 10m
- Processing and analysing software
- PIF cable 1m

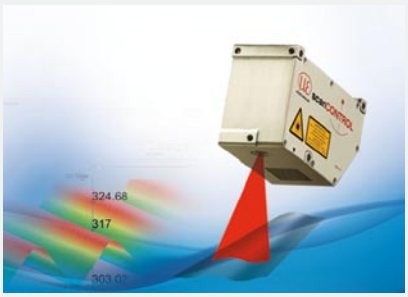
TIM 400/450

- TIM process camera including one selected lens
- USB cable 1m
- Processing and analysing software
- Tripod mount
- PIF cable 1m
- Aluminium case

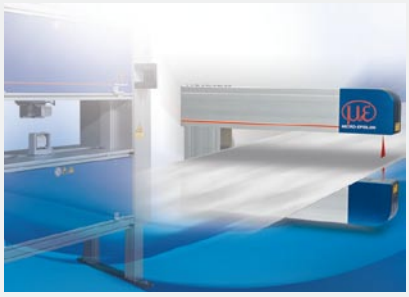
High performance sensors made by Micro-Epsilon

Sensors and systems for displacement and position

Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Measurement and inspection systems for quality assurance

Optical micrometers, fiber optic sensors and optical fibers

Color recognition sensors, LED analyzers and color online spectrometer

MICRO-EPSILON

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