



# More Precision

thermo**IMAGER** TIM // Compact thermal imaging cameras





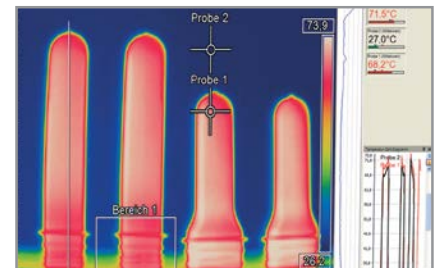
### thermoIMAGER TIM QVGA

Thermal imaging camera with high resolution and sensitivity

- Detector with 382 x 288 pixels
- Measuring range from -20 °C to 900 °C (special model up to 1500 °C)
- Fast, real-time thermal imager with up to 80 Hz
- Very high thermal sensitivity with 75 mK (TIM QVGA) and 40 mK (TIM QVGA-HD)
- Compact design (46 mm x 56 mm x 68 - 77 mm)
- Lightweight (237 - 251 g, incl. lens)
- Exchangeable lenses & industrial accessories
- TIMConnect software delivered with Software Developer Kit

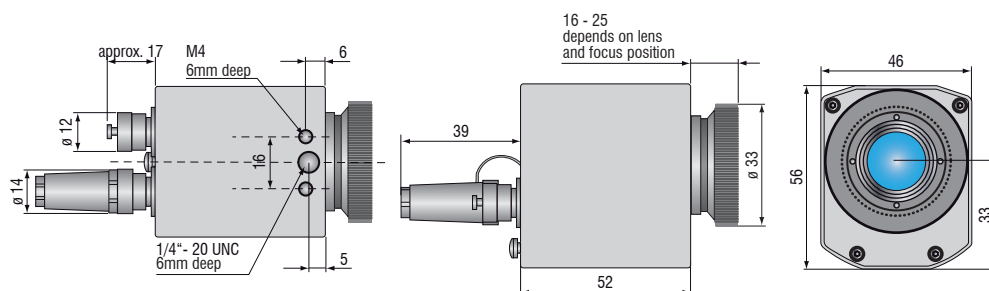
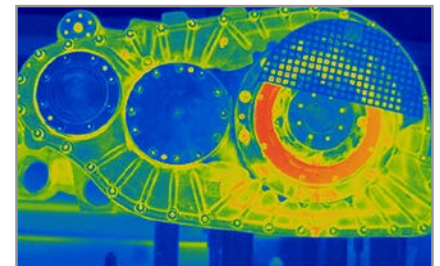
### Software

- Display of the thermal image in real time (80 Hz) with recording function (video, snapshot)
- Complete set up of parameters and remote control of the camera
- Detailed analysis of fast, thermodynamic processes
- Output of analog temperature or alarm values via the process interface
- Digital communication via RS232 or DLL for software integration



### 80 Hz imaging with full pixel resolution

Thermal image shots of preforms in PET bottle production



Model	TIM QVGA	TIM QVGA-HD
Optical resolution	382 x 288 pixels	
Temperature ranges	-20 ... 100 °C, 0 ... 250 °C, (20) 150 ... 900 °C <sup>1)</sup> additional temperature range: 200 ... 1500 °C (optional)	
Spectral range	8 to 14 μm	
Frame rate	switchable 80 Hz or 27 Hz	
System accuracy	±2 °C or ±2 %, whichever is greater TIM QVGA-HD-T100: ±0.5 °C with ambient reference radiator TM-BR20AR-TIM	
Lenses	18° x 14° FOV / f = 20 mm or 29° x 22° FOV / f = 12.7 mm or 53° x 38° FOV / f = 7.7 mm or 80° x 54° FOV / f = 5.7 mm	
Thermal sensitivity (NETD) <sup>2)</sup>	75 mK with 29° x 22° FOV / F = 0.9 75 mK with 53° x 38° FOV / F = 0.9 75 mK with 80° x 54° FOV / F = 0.9 100 mK with 18° x 14° FOV / F = 1.1	40 mK with 29° x 22° FOV / F = 0.9 40 mK with 53° x 38° FOV / F = 0.9 40 mK with 80° x 54° FOV / F = 0.9 60 mK with 18° x 14° FOV / F = 1.1
Detector	FPA, uncooled (17 μm x 17 μm)	
Outputs/digital	USB 2.0 / optional interface USB to GigE (PoE)	
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, 20 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	
Ambient temperature	0 ... 50 °C	0 ... 70 °C
Storage temperature	-40 ... 70 °C	-40 ... 85 °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 68 - 77 mm (depending on lens and focus position)	
Weight	237 - 251 g	

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

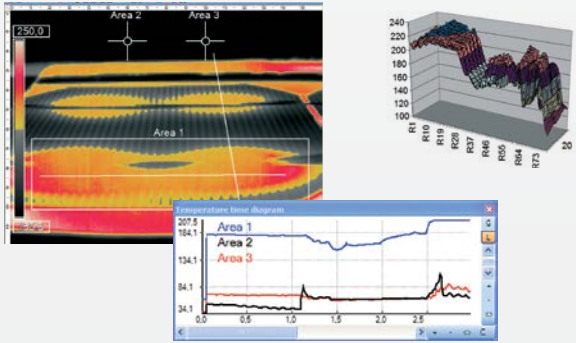
<sup>2)</sup> Values apply with 40 Hz and 25 °C room temperature

## Scope of supply

### TIM QVGA

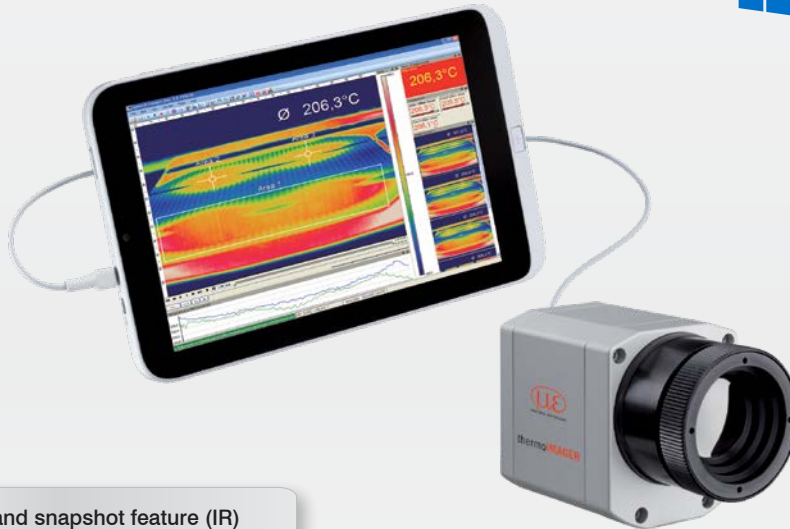
- TIM process camera  
incl. a selectable lens
- Operating instructions
- USB cable 1 m
- Software for real-time processing  
and analyzing thermal images
- Tripod mount
- PIF cable 1 m
- Transport case
- Test certificate

## TIMConnect SOFTWARE FEATURES



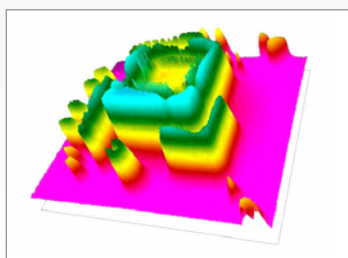
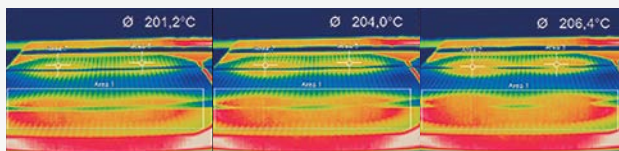
### Comprehensive IR camera software

- 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



### 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

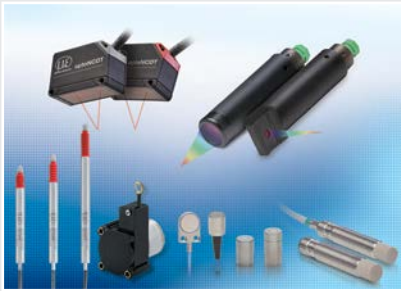
## Lenses thermoIMAGER TIM QVGA / TIM QVGA-HD / TIM QVGA-G7

TIM QVGA / QVGA-HD / QVGA-G7	Focal length [mm]	Angle	Minimum measurement distance*	Distance to measurement object [m]												
					0.05	0.1	0.2	0.3	0.5	1	2	4	6	10	30	100
382 x 288 px	13	29° 22° 37° 1.3 mrad	0.35 m	HFOV [m]		0.057	0.111	0.16	0.27	0.53	1.06	2.1	3.2	5.3	15.7	52.5
				VFOV [m]		0.042	0.081	0.12	0.20	0.40	0.80	1.6	2.4	4.0	11.9	39.6
				DFOV [m]		0.071	0.137	0.20	0.34	0.67	1.32	2.6	4.0	6.6	19.7	65.7
				IIFOV [mm]		0.1	0.3	0.4	0.7	1.3	2.7	5.4	8.0	13.4	40.2	133.9
18° Telephoto lens	20	18° 14° 23° 0.9 mrad	0.45 m	HFOV [m]			0.066	0.099	0.16	0.33	0.65	1.3	1.9	3.2	9.7	32.4
				VFOV [m]			0.050	0.075	0.12	0.25	0.49	1.0	1.5	2.5	7.4	24.6
				DFOV [m]			0.083	0.124	0.20	0.41	0.82	1.6	2.4	4.1	12.2	40.7
				IIFOV [mm]			0.2	0.3	0.4	0.9	1.7	3.5	5.2	8.6	25.9	86.3
53° Wide angle lens	8	53° 38° 66° 2.2 mrad	0.25 m	HFOV [m]		0.103	0.20	0.30	0.50	1.0	2.0	4.0	5.9	9.9	29.6	98.6
				VFOV [m]		0.073	0.14	0.21	0.35	0.70	1.4	2.8	4.1	6.9	20.7	68.9
				DFOV [m]		0.127	0.25	0.37	0.61	1.22	2.4	4.8	7.2	12.0	36.1	120.3
				IIFOV [mm]		0.2	0.4	0.7	1.1	2.2	4.4	8.8	13.2	21.9	65.8	219.4
80° Super wide angle lens	6	80° 54° 96° 3.0 mrad	0.2 m	HFOV [m]	0.087	0.17	0.33	0.49	0.82	1.7	3.3	6.7	10.0	16.6	49.9	166.4
				VFOV [m]	0.056	0.11	0.21	0.31	0.51	1.0	2.0	4.1	6.1	10.2	30.6	101.9
				DFOV [m]	0.103	0.20	0.39	0.58	0.97	2.0	3.9	7.8	11.7	19.5	58.5	195.1
				IIFOV [mm]	0.2	0.3	0.6	0.9	1.5	3.0	6.0	12.0	18.1	30.1	90.3	300.9

FOV: Horizontal expansion of the total measuring field at the object level; VFOV: Vertical expansion of the total measuring field at the object level;  
DFOV = Diagonal expansion of the total measuring field at the object level; IIFOV: Size of the individual pixels at the object level

\* 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



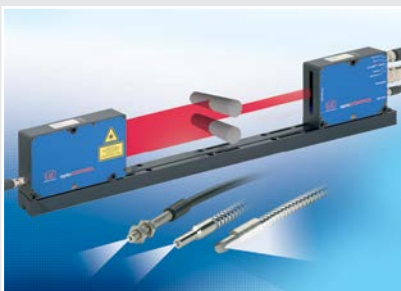
Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



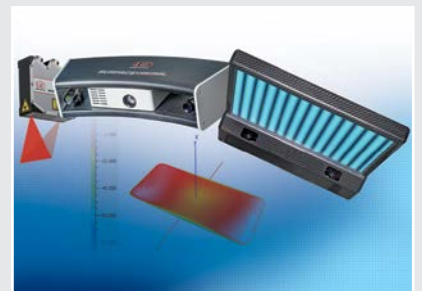
Measuring and inspection systems for metal strips, plastics and rubber



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