**MICRO-EPSILON**

More Precision

thermo**IMAGER** TIM 40/41 // Compact OEM thermal imaging cameras

- *Industrial thermal imaging cameras for OEMs with excellent optical resolution for exact temperature measurements from -20 ˚C to 900 ˚C*

- *Robust and compact imager with motorized focus*

- *Comprehensive ready-to-use package including versatile software with SDK*

- *TIM41 for autonomous operation without external PC*
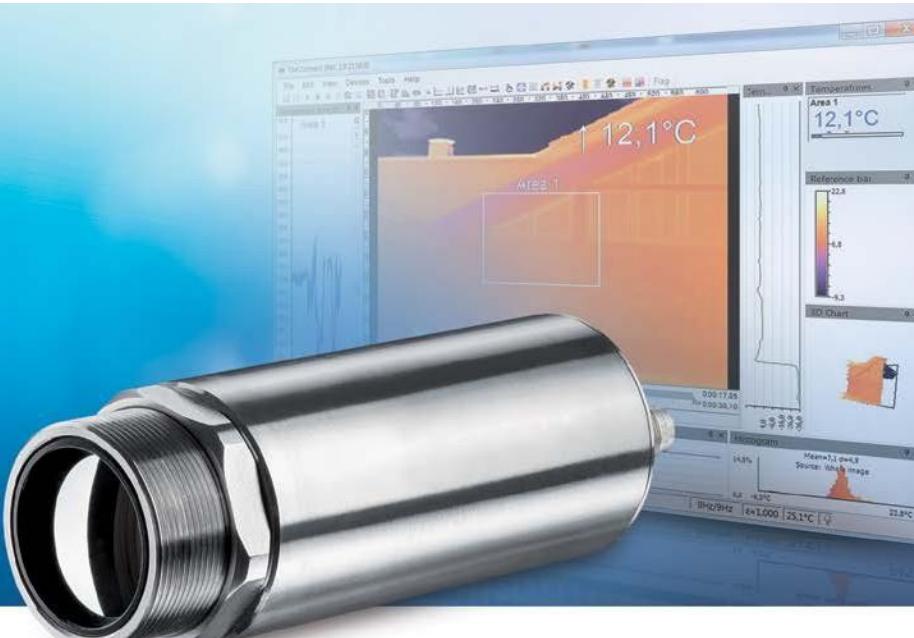
Industrial thermal imaging camera for serial applications
The TIM 40/41 models are robust and compact thermal imaging cameras that are particularly suitable for OEM use. The integrated motorized focus enables convenient remote focusing. The cameras are both space-saving and robust, and can be easily integrated into any industrial environment.

Precise temperature measurements from -20 °C to 900 °C
The cameras have a high resolution and a wide temperature measuring range. A standard USB interface and the TIMConnect software included in the scope of delivery simplify commissioning. In addition, the optional PIF connection outputs analog measurement values and alarms.

Other advantages of the thermoIMAGER TIM 41 thermal imaging cameras

Integration via Ethernet
Via the integrated Ethernet interface, the camera provides data that can be easily processed in other programs. Therefore, you can create, e.g., video streams with a frame rate of up to 25 Hz. The camera can be supplied via PoE.

Autonomous operation
The camera can also be operated without an additional PC via the spotfinder function. Simultaneous monitoring of up to 3 measuring fields is possible. This allows you to shut down machines preventively if, e.g., overheating is detected. Fire monitoring in machinery and equipment or electronic units is one of the main fields of application.

| Model	TIM40	TIM41
Optical resolution	382 x 288 pixels	384 x 240 pixels
Measuring range	-20 ... 100 °C, 0 ... 250 °C, (20) 150 ... 900 °C [1]	
Spectral range	8 to 14 μm	
Frame rate	switchable 80 Hz or 27 Hz	Ethernet: 25 Hz USB: 4 Hz autonomous operation: 1.5 Hz
System accuracy	±2 °C or ±2 %, whichever is greater	
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	18° x 12° FOV / f =20 mm or 29° x 18° FOV / f =13 mm or 53° x 31° FOV / f =8 mm or 80° x 44° FOV / f = 6 mm
Focus	manual motorized focus	
Thermal sensitivity (NETD) [2]	80 mK	
Detector	FPA, uncooled (17 μm x 17 μm)	
Supply voltage	USB powered	5 ... 30 VDC / PoE / USB
Digital interface	USB 2.0 / optional interface USB to GigE (PoE)	Ethernet / USB 2.0 / RS485
Standard process interface (PIF)	0-10 V input, digital input (max. 24 V), 0-10 V output	0-10 V input, digital input (max. 24 V), 0/4-20 mA output
Industry process interface (PIF)	2x analog inputs (0-10 V); digital input (max. 24 V), 3x analog outputs (0/4-20 mA) or 3x relays (0-30 V / 400 mA), fail-safe relay	3x analog outputs (0/4 - 20 mA or 0 - 10 V); 3x alarm outputs (relay) 3x inputs (analog or digital); fail-safe (LED and relay); electrically isolated
Connection	1 m (standard), 3 m, 5 m, 10 m, 20 m	USB: 1 m (standard), 3 m, 5 m Ethernet: 1 m (standard), 5 m, 10 m, 20 m (up to 100 m)
Mounting	1/4-20 UNC	
Temperature range — Storage	-40 ... +70 °C	
Temperature range — Operation	0 ... +50 °C	
Humidity	20 ... 80 % r.H. (non-condensing)	
Shock (DIN EN 60068-2-27)	25 g / 11 ms in 3 axes, 2 directions and 100 shocks each 50 g / 11 ms in 3 axes, 2 directions and 3 shocks each	
Vibration (DIN EN 60068-2-6)	3 g / 10 - 500 Hz in 3 axes, 30 minutes each; IEC 60068-2-64 (broadband noise)	
Protection class (DIN EN 60529)	IP67	
Weight	approx. 216 - 220 g (depending on lens)	
Features	Compact OEM thermal imaging camera	Compact OEM thermal imaging camera with Ethernet interface and autonomous operation

[1] For the range (20)150 up to 900 °C, the specified accuracy applies from 150 °C

[2] Values apply with 40 Hz and 25 °C room temperature

thermoIMAGER TIM 40
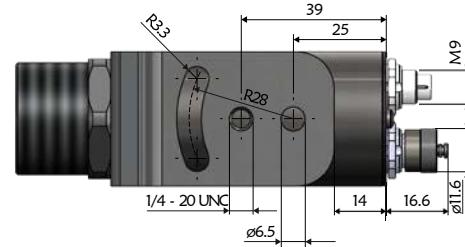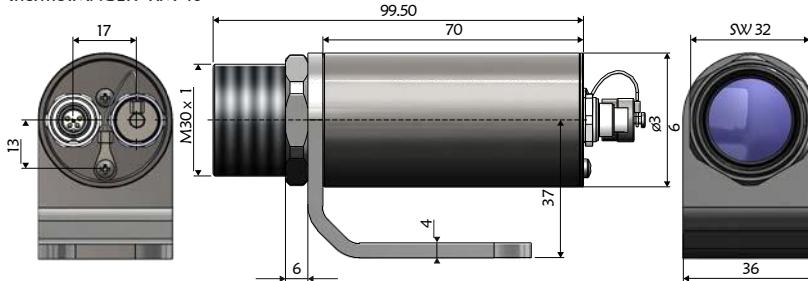
thermoIMAGER TIM 41
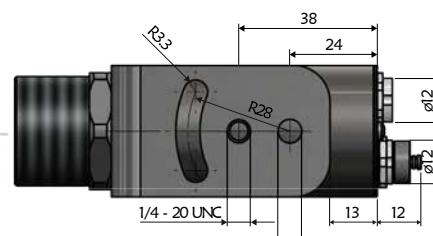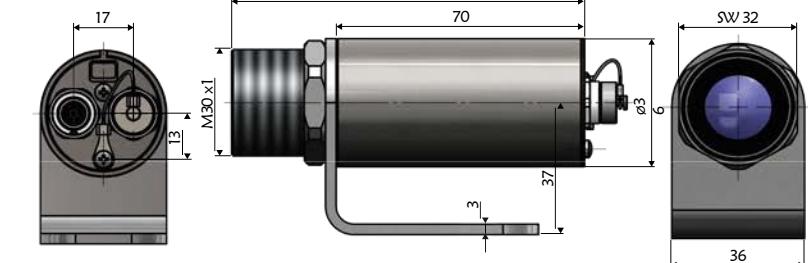
Dimensions in mm, not to scale.

TIM40 — 382 x 288 px

Lens	Focal length [mm]	Angle	Min. meas. distance*		0.05	0.1	0.2	0.3	0.5	1	2	4	6	10	30	100
29° Standard lens	13	29° 22° 37° 1.3 mrad	0.35 m	HFOV [m]		0.059	0.111	0.16	0.27	0.53	1.06	2.1	3.2	5.3	15.8	52.5
				VFOV [m]		0.043	0.082	0.12	0.20	0.39	0.78	1.5	2.3	3.9	11.6	38.5
				DFOV [m]		0.073	0.138	0.20	0.34	0.66	1.31	2.6	3.9	6.5	19.5	65.1
				IFOV [mm]		0.2	0.3	0.4	0.7	1.4	2.8	5.5	8.3	13.8	41.2	137.4
18° Telephoto lens	20	18° 14° 23° 0.9 mrad	0.35 m	HFOV [m]			0.069	0.102	0.17	0.33	0.66	1.30	1.9	3.2	9.7	32.4
				VFOV [m]			0.051	0.076	0.12	0.25	0.49	0.98	1.5	2.5	7.4	24.6
				DFOV [m]			0.086	0.127	0.21	0.41	0.82	1.63	2.4	4.1	12.2	40.7
				IFOV [mm]			0.2	0.3	0.4	0.9	1.7	3.4	5.1	8.5	25.4	84.8
53° Wide angle lens	8	53° 38° 66° 2.2 mrad	0.25 m	HFOV [m]		0.099	0.20	0.30	0.49	0.99	2.0	4.0	5.9	9.9	29.6	98.6
				VFOV [m]		0.071	0.14	0.21	0.34	0.68	1.4	2.7	4.1	6.8	20.4	68.1
				DFOV [m]		0.122	0.25	0.36	0.60	1.20	2.4	4.8	7.2	12.0	36.0	119.9
				IFOV [mm]		0.26	0.53	0.78	1.3	2.6	5.2	10.4	15.5	25.9	77.5	258.2
80° Super wide angle lens	6	80° 54° 96° 3.0 mrad	0.2 m	HFOV [m]	0.084	0.16	0.32	0.48	0.81	1.6	3.3	6.5	9.8	16.6	49.9	166.4
				VFOV [m]	0.056	0.11	0.21	0.331	0.51	1.0	2.0	4.1	6.1	10.2	30.6	101.9
				DFOV [m]	0.101	0.19	0.38	0.57	0.96	1.9	3.8	7.7	11.6	19.5	58.5	195.1
				IFOV [mm]	0.2	0.4	0.8	1.3	2.1	4.2	8.5	17.0	25.7	43.6	130.7	435.5

TIM41 — 384 x 240 px

Lens	Focal length [mm]	Angle	Min. meas. distance*		0.05	0.1	0.2	0.3	0.5	1	2	4	6	10	30	100
29° Standard lens	13	29° 18° 35° 1.4 mrad	0.35 m	HFOV [m]		0.059	0.112	0.17	0.27	0.53	1.07	2.1	3.2	5.3	15.9	52.9
				VFOV [m]		0.036	0.068	0.10	0.16	0.32	0.64	1.3	1.9	3.2	9.5	31.7
				DFOV [m]		0.069	0.131	0.19	0.32	0.62	1.24	2.5	3.7	6.2	18.5	61.6
				IFOV [mm]		0.2	0.3	0.4	0.7	1.4	2.8	5.5	8.3	13.8	41.3	137.7
18° Telephoto lens	20	18° 12° 21° 0.9 mrad	0.35 m	HFOV [m]			0.069	0.102	0.17	0.33	0.66	1.31	2.0	3.3	9.8	32.6
				VFOV [m]			0.043	0.064	0.10	0.21	0.41	0.82	1.2	2.1	6.1	20.5
				DFOV [m]			0.081	0.120	0.20	0.39	0.78	1.55	2.3	3.9	11.5	38.5
				IFOV [mm]			0.2	0.3	0.4	0.9	1.7	3.4	5.1	8.5	25.5	84.8
53° Wide angle lens	8	53° 31° 61° 2.6 mrad	0.25 m	HFOV [m]		0.100	0.20	0.30	0.49	0.99	2.0	4.0	5.9	9.9	29.7	98.9
				VFOV [m]		0.057	0.11	0.17	0.28	0.55	1.1	2.2	3.3	5.5	16.5	54.9
				DFOV [m]		0.115	0.23	0.34	0.57	1.13	2.3	4.5	6.8	11.3	33.9	113.1
				IFOV [mm]		0.3	0.5	0.8	1.3	2.6	5.1	10.3	15.5	25.8	77.2	257.4
80° Super wide angle lens	6	80° 44° 91° 4.3 mrad	0.2 m	HFOV [m]	0.084	0.16	0.32	0.48	0.81	1.6	3.3	6.5	9.8	16.6	49.9	166.4
				VFOV [m]	0.044	0.08	0.17	0.25	0.41	0.8	1.6	3.2	4.8	8.0	24.1	80.4
				DFOV [m]	0.095	0.18	0.36	0.54	0.91	1.8	3.6	7.3	10.9	18.5	55.4	184.8
				IFOV [mm]	0.2	0.4	0.8	1.3	2.1	4.2	8.5	16.9	25.5	43.4	130.0	433.2

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; IFOV: 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.

Scope of supply

- TIM 40 / 41
- USB cable 1 m
- Ethernet PoE cable 1 m (only TIM 41)
- PIF cable incl. terminal block (1 m)
- Mounting bracket with tripod socket and mounting nut
- TIMConnect Software
- Assembly instructions