

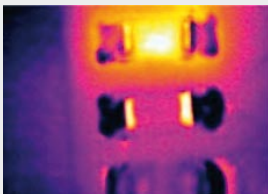


thermoIMAGER TIM160

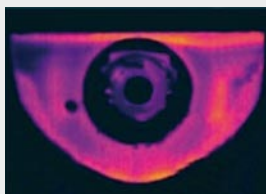
Miniature real time thermal imager with USB interface

- Measuring range from -20°C to 900°C
- Excellent thermal sensitivity of 0.1K (NEDT)
- Exchangeable lenses with 9°FOV, 31°FOV and 64°FOV,
- Real time video recording at 100Hz frame rate with slow motion playback capability
- Power supply and operation via USB 2.0 interface
- Extremely lightweight (250g) and rugged (IP67)
- Very compact 45x45x62mm
- Analog input and output, trigger interface
- Complex image analysis and process monitoring software with custom configuration and SDK

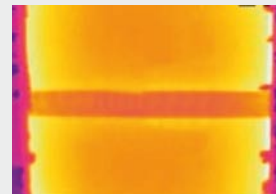
Applications



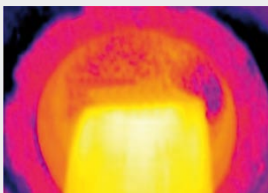
R&D electronic



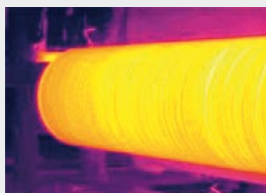
R&D mechanical components



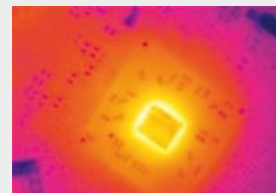
Production of solar panels



Process control extrusion



Process control calendaring

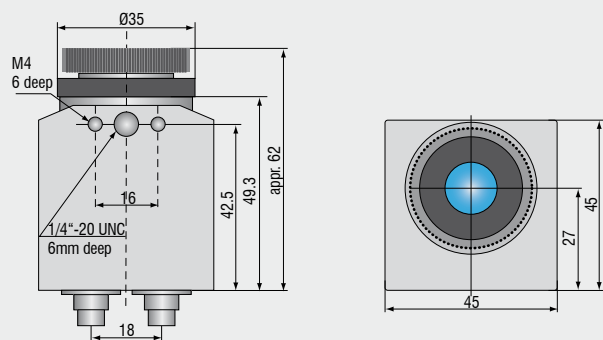


R&D electronic devices

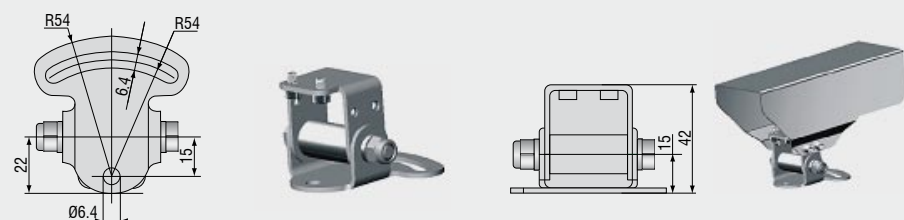
Model	thermoIMAGER TIM160
Optical resolution	160x120 pixel
Temperature ranges	-20°C to 100°C / 0°C to 250°C / 250°C to 900°C
Spectral range	7.5 to 13 μ m
Frame rate	100Hz
System accuracy	<2% or <2°C
Resolution (Display)	<0.1°C
Lenses	64° / f = 5.7 mm (min. distance 20mm); 31° / f = 10mm (min. distance 20mm); 9° / f = 36mm (min. distance 300mm);
Emissivity	0.10 to 1.00 adjustable
Thermal Sensitivity	0.1K with 64° FOV / 0.1K with 31° FOV / 0.3K with 9° FOV
Detector	Focal Plane Array (FPA) - uncooled micro bolometer 35x35 μ m ²
Measurement modes	Flexible spot with crosshair marking, fixed measurement field with automatic display of maximum-, minimum- or average value
Color palettes	Iron, rainbow, black-white, black-white inverted
Set up controls (via menu)	Mesurement modes, full automatic, manual, color palettes, emissivity, file management, date/time, °C/ °F, language
Outputs/digital	USB 2.0
Process interface (electrically isolated)	0-10 V output, 0-10 V input, trigger input
Cable length	1m (standard), 5m, 20m
Power supply	USB powered
Tripod mount	1/4-20 UNC
Environmental rating	IP 67
Ambient temperature	0°C to 50°C (up to 200°C with cooling jacket)
Storage temperature	-40°C to 70°C
Relative humidity	20 to 80%, non-condensing
Vibration	2G, IEC 68-2-6
Shock	25G, IEC 68-2-29
Weight	250g; incl. lens

PC requirements: minimum 1.5GHz, 1GB RAM, Windows XP SP2, Vista, Windows 7

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 180°C)

Plug&Play thermal imager

Powered from just one USB cable, the system is truly plug and play. Data is streaming from the camera to the software via USB 2.0. in real time. This process and analysis tool, provided with every camera, enables the user to capture, record and monitor real time thermal process images at 100Hz. The software will store the data to a file, which allows playback at user defined speeds, e.g. in slow motion, frame by frame if required. The image can be viewed and monitored either online with the camera connected, or off line at a later time without the camera being connected. A perfect tool for R&D applications, failure diagnostics or process monitoring.

Additionally the software can be used as a runtime application where the user is able to program and configure a custom envi-

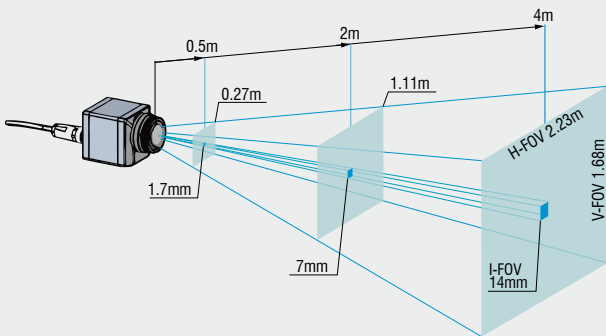
ronment. (multiple monitoring windows, alarms, hot spot localization, line profiles etc.) A programmable process Interface, hard wired input and output, (PIF in) enables external control and communication for the emissivity of the target material, trigger functions, shutter control or alarm outputs and other useful features.

The right optics for many applications

- 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



Dependence between field of view (FOV) and distance (lens 31° x 23°)

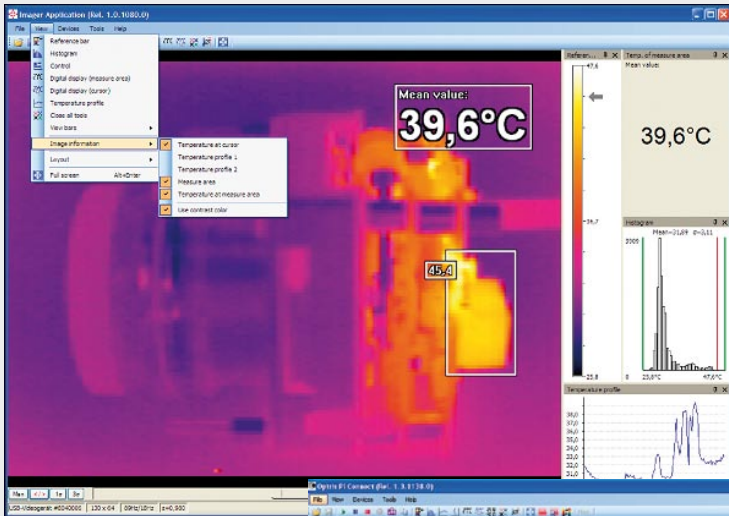


Objective 64° x 50° wide angle; focal distance 5.7 mm; min distance 0.02m												
HFOV	m	0.019	0.119	0.369	0.619	1.494	2.49	4.5	7.5	12.5	37.5	125
VFOV	m	0.015	0.09	0.277	0.464	1.121	1.87	3.7	5.6	9.4	28.1	94
IFOV	mm	0.121	0.746	2.308	3.871	9.338	15.6	31.2	46.8	78	234.3	781
Distance in m		0.02	0.1	0.3	0.5	1.2	2	4	6	10	30	100

Objective 31° x 23° wide angle; focal distance 10 mm; min distance 0.02m												
HFOV	m	0.006	0.05	0.16	0.27	0.67	1.11	2.3	3.4	5.6	16.8	56
VFOV	m	0.004	0.04	0.12	0.21	0.50	0.84	1.7	2.5	4.2	12.6	42
IFOV	mm	0.03	0.30	1.00	1.70	4.20	7	14	21	35	105	350
Distance in m		0.02	0.1	0.3	0.5	1.2	2	4	6	10	30	100

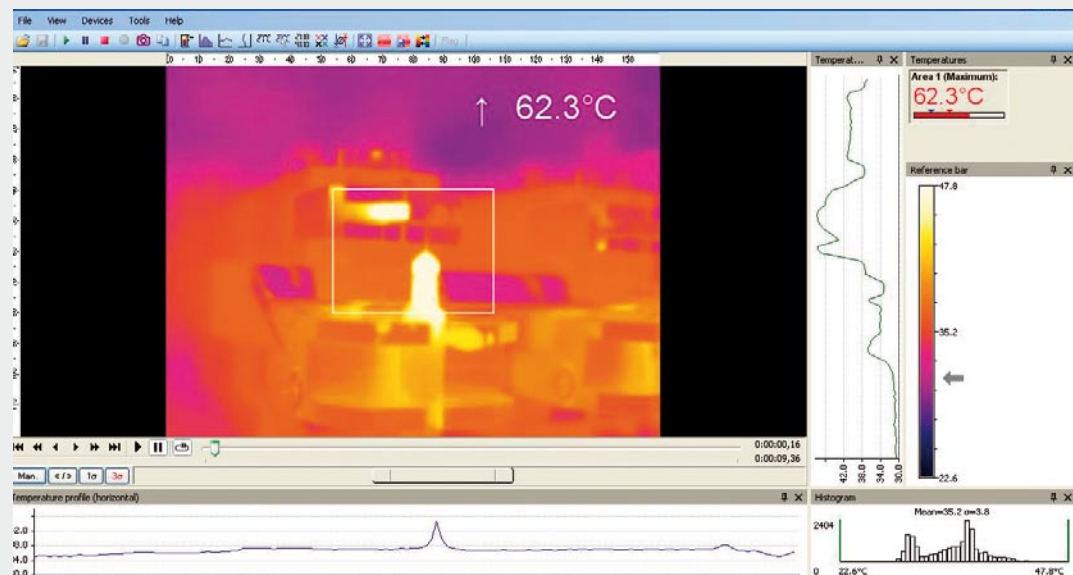
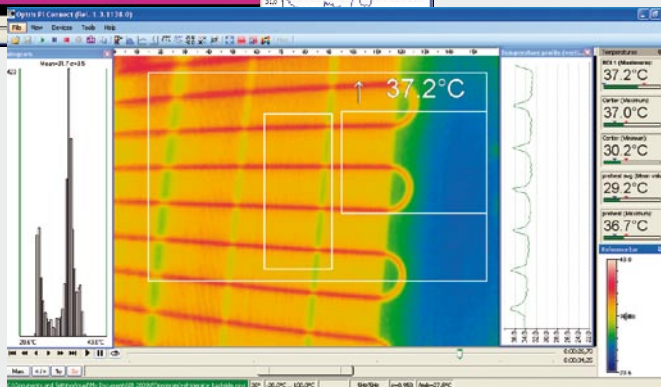
Objective 9° x 7° wide angle; focal distance 35.5 mm; min distance 0.3m												
HFOV	m	-	-	0.04	0.07	0.18	0.31	0.6	1	1.6	4.8	15.8
VFOV	m	-	-	0.03	0.05	0.14	0.23	0.5	0.7	1.2	3.6	11.9
IFOV	mm	-	-	0.30	0.50	1.20	2	4	6	10	30	99
Distance in m		0.02	0.1	0.3	0.5	1.2	2	4	6	10	30	100

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



Software

- Display of the thermal image in real time (100 Hz) with recording function (video, snap shot)
- Complete set up of parameters and remote control of the camera
- Detailed analysis of fast thermodynamic processes
- In-process and offline analysis
- Process interface supports analog and digital output
- Free software development kit for individual programming
- RS232 software interface for PLC connection



In-process monitoring, e.g. linecamera with hotspot detection

Scope of supply TIM160

- ▶ TIM process camera including one selected lens
- ▶ Tripod mount
- ▶ Operation manual
- ▶ USB cable 1m
- ▶ Image processing and analysis software

Scope of supply TIM160/DK

- ▶ TIM process camera including 9°, 31°, 64° optics
- ▶ Certificate of calibration, matched with the optics
- ▶ Tripod mount 200 to 1000 mm
- ▶ Rugged carrying case
- ▶ Operation manual
- ▶ USB cable 1m and 10 m
- ▶ Image processing and analysis software