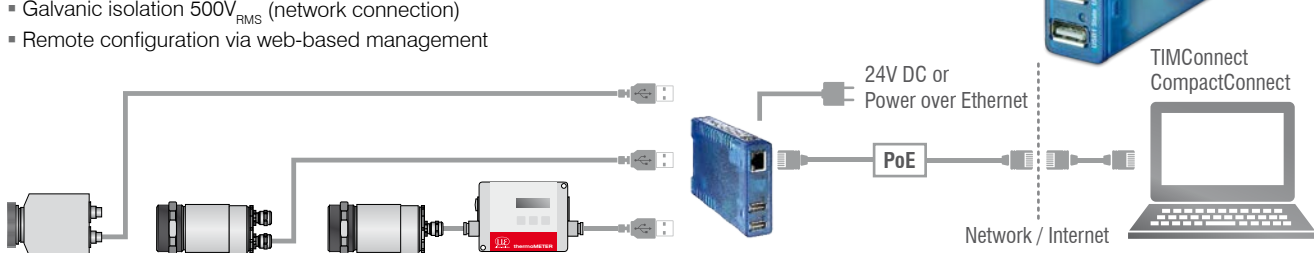# More Precision

thermoIMAGER TIM // Compact thermal imaging cameras

thermoIMAGER TIM USB Server Gigabit
Simple cable extension for the thermoIMAGER TIM series and pyrometers

- Fully compatible with USB 2.0, data transfer rate 1.5/ 12/ 480 mbps,
  USB transfer modes: Control, Bulk, Interrupt, Isochronous
- For all models in the thermoIMAGER TIM series 1x TIM640, 1x TIM4xx, 2x TIM160, 1x TIM200
- Full TCP/IP support incl. routing and DNS
- Galvanic isolation 500V_{RMS} (network connection)
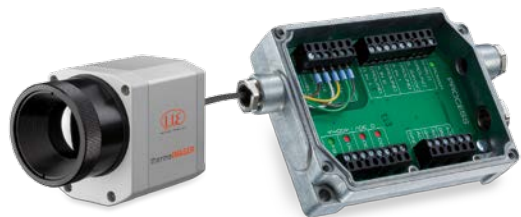- Remote configuration via web-based management

24V DC or
Power over Ethernet

TIMConnect
CompactConnect

PoE

Network / Internet

Model	TIM USB Server Gigabit
USB ports	Two independent USB ports
USB speed	480Mbit/s
Network	10/100/1000 BaseT (max. 1000Mbit/s)
Power supply	Power over Ethernet (PoE) class 3 (6.49 - 12.95W) or via screw terminal DC 24V ... 48V (±10%)
Power consumption	External power supply (24V DC) without USB devices: typ. 120mA External power supply (24V DC) with 2 USB devices each 2.5W: typ. 420mA
Ambient temperature	Storage: -40 ... 85°C | In operation, individually assembled: 0 ... 50°C
Permissible relative humidity	0 - 95% (non-condensing)
Housing	Compact plastic housing for DIN rail mount, 105 x 75 x 22mm
Weight	200g
Scope of supply	1 x USB Server Gigabit | 24 V DC wall plug transformer | Quick guide [1]
USB protocols	USB 1.0 / 1.1 / 2.0 Control / Bulk / Interrupt / Isochronous
Protocols for direct network connection	TCP/IP: Socket | Auxiliary protocols: ARP, DHCP, HTTP, PING Inventory keeping, group management

[1] TIMConnect CD or Compact Connect CD: USB redirector | WuTility Management Tool | Operating instructions (DE/EN)

Industrial process interface
Camera and process control for use in industrial environments

- Separate fail-safe relay output
- TIM hardware with all cable connections and the TIMConnect
  software are permanently monitored during operation

Model	Industrial process interface
Protection class	IP65 (NEMA-4)
Ambient temperature	-30°C to 85°C
Storage temperature	-30°C to 85°C
Relative humidity	10 to 95% (non-condensing)
Vibration resistance	IEC 60068-2-6 (non-condensing)/ IEC 60068-2-64 (broadband noise)
Shock	IEC 60068-2-27 (25g and 50g)
Weight	610g (with 5m cable)
Cable length	5m, optional 10m and 20m or HT cable (180° or 250°)
Power supply	5 – 24V DC
LED indicators	2 green LEDs for voltage and fail safe / 3 red LEDs for alarm relay status
Isolation	500V AC$_{RMS}$ between TIM camera und process
Outputs	3 analogue/ alarm outputs | 3 alarm relays [1]
Inputs	2 analogue inputs |1 digital input
Ranges	0 – 10V (for AO 1 – 3) [2] | 0 – 30V / 400mA (for alarm relays DO1 – 3) | 0 – 10V (for AI 1 – 2) | 24V (for DI)
Analogue inputs	Emissivity setting | Ambient temperature compensation | Reference temperature | Uncommitted value Flag control | Triggered snapshots, triggered recordings, triggered line scan camera
Digital input	Flag control | Triggered snapshots, triggered recordings, triggered line scan camera
Analogue outputs	Main measuring range | Measuring range | Internal temperature | Flag status

[1] active when AO1, 2 or 3 is / are programmed as alarm output [2] dependent on supply voltage

TIM M1 with VGA resolution 764 x 480 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=16mm Wide angle lens	16	39° 25° 46° 0.94 mrad	0.2m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]		0.14 0.09 0.17 0.2	0.21 0.14 0.25 0.3	0.36 0.23 0.42 0.5	0.72 0.45 0.85 0.9	1.43 0.90 1.69 1.9	2.87 1.80 3.38 3.8	4.30 2.70 5.08 5.6	7.2 4.5 8.5 9.4	21.5 13.5 25.4 28.1	71.6 45.0 84.6 93.8
f=25mm Standard lens	25	26° 16° 30° 0.60 mrad	0.5m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]	0.046 0.029 0.054 0.1	0.09 0.06 0.11 0.1	0.14 0.09 0.16 0.2	0.23 0.14 0.27 0.3	0.46 0.29 0.54 0.6	0.92 0.58 1.08 1.2	1.83 1.15 2.17 2.4	2.75 1.73 3.25 3.6	4.6 2.9 5.4 6.0	13.8 8.6 16.2 18.0	45.8 28.8 54.1 60.0
f=50mm Telephoto lens	50	13° 8° 15° 0.30 mrad	1.5m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]				0.11 0.07 0.14 0.2	0.23 0.14 0.27 0.3	0.46 0.29 0.54 0.6	0.92 0.58 1.08 1.2	1.38 0.86 1.62 1.8	2.3 1.4 2.7 3.0	6.9 4.3 8.1 9.0	22.9 14.4 27.1 30.0
f=75mm Super telephoto lens	75	9° 5° 10° 0.20 mrad	2.0m	HFOV [m] VFOV [m] DFOV [m] IFOV [mm]					0.15 0.10 0.18 0.2	0.31 0.19 0.36 0.4	0.61 0.38 0.72 0.8	0.92 0.58 1.08 1.2	1.5 1.0 1.8 2.0	4.6 2.9 5.4 6.0	15.3 9.6 18.0 20.0

Please note: the camera provides 764 x 480 px in the 32Hz mode

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MICRO-EPSILON