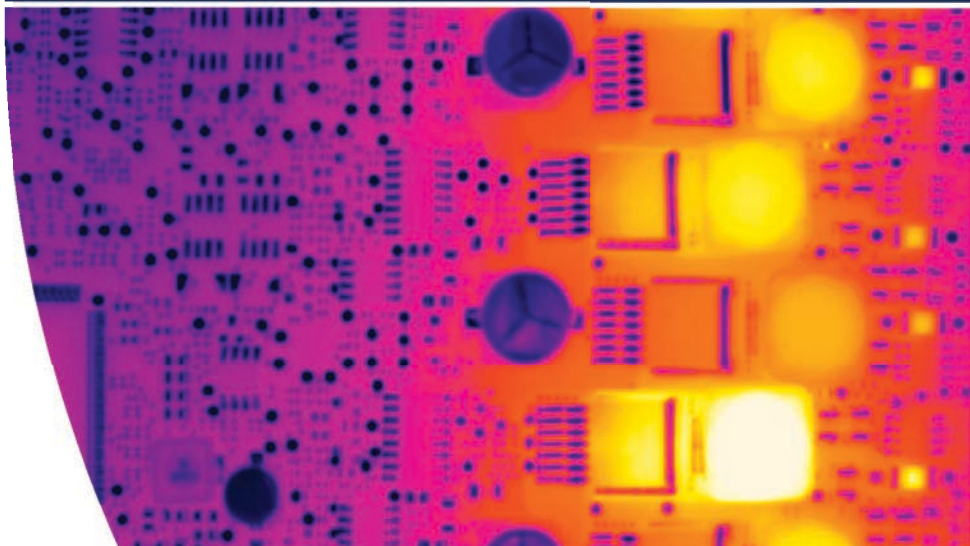




Ti-640

The smallest measuring
VGA infrared camera worldwide

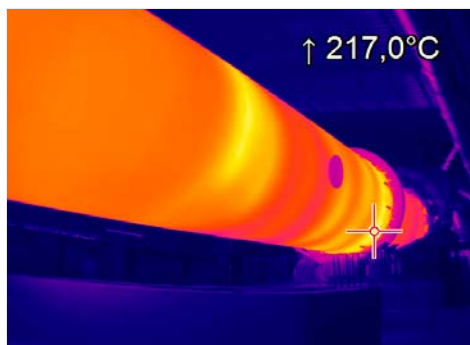
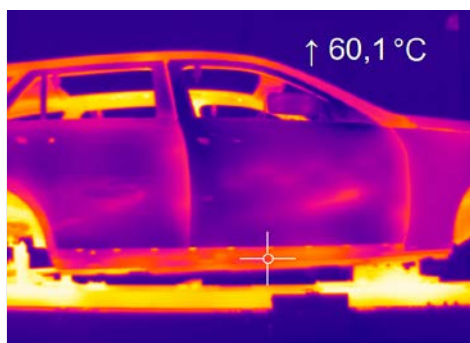
innovative infrared technology



Thermography in VGA resolution

Features:

- 640 x 480 pixel
- Radiometric video recording with 32 Hz
- Licence-free analysis software and complete SDK inclusive



Type	PI 640
Optical resolution	640 x 480 pixel
Detector	FPA, uncooled (17 µm x 17 µm)
Spectral range	7.5 – 13 µm
Temperature ranges	–20 ... 100 °C, 0 ... 250 °C, 150 ... 900 °C
Frame rate	32 Hz
Optics (FOV)	33° x 25° FOV / f = 18.4 mm or 15° x 11° FOV / f=41.5 mm or 60° x 45° FOV / f = 10.5 mm or 90° x 66° FOV / f = 7.3 mm
Thermal sensitivity (NETD)	75 mK
Accuracy	±2 °C or ±2 %, whichever is greater
PC interface	USB 2.0
Process interface (PIF), standard	0–10 V input, digital input (max. 24 V), 0–10 V output
Process interface (PIF), industrial	2x 0–10 V input, digital input (max. 24 V), 3x 0–10 V output, 3x relay (0–30 V/ 400 mA), fail-safe relay
Cable length (USB)	1 m (standard), 5 m, 10 m 5 m and 10 m also as HT cable (180 °C)
Ambient temperature	0 ... 50 °C
Storage temperature	–40 ... 70 °C
Relative humidity	20–80 %, non-condensing
Enclosure (size / rating)	46 mm x 56 mm x 90 mm / IP 67 (NEMA 4)
Weight	320 g, incl. lens
Shock ¹⁾	IEC 60068-2-27 (25 g and 50 g)
Vibration ¹⁾	• IEC 60068-2-6 (sinus-shaped) • IEC 60068-2-64 (broadband noise)
Tripod mount	¼ - 20 UNC
Power supply	USB powered
Scope of supply	• USB camera with 1 lens • USB cable (1 m) • Table tripod • Standard PIF with cable (1 m) and terminal block • Software package • Hard transport case

¹⁾ for more details see operator's manual

USB Server Gigabit

SIMPLE CABLE EXTENSION

Simple cable extension for the optris® PI series

- Fully compatible with USB 2.0, Data transfer rate 1.5 / 12 / 480 mbps, USB transfer modes: control, bulk, interrupt, isochronous
- Network connection via Gigabit Ethernet
- For all models in the optris® PI series
- Full TCP/IP support incl. routing and DNS
- Two independent USB connections
- Power via PoE or external voltage supply at 24 – 48 V DC
- Galvanic isolation 500 V_{RMS} (network connection)
- Remote configuration via web-based management
- Certified technology from Wiesemann & Theis



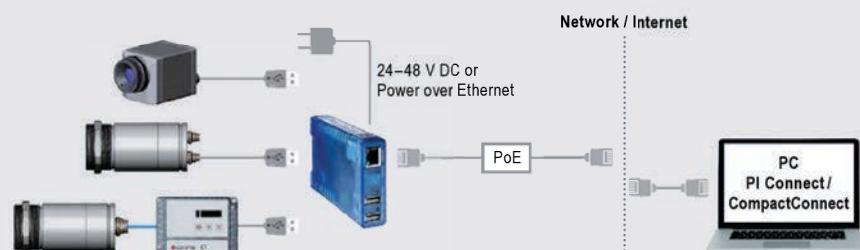
Technical data

USB connections	2 x USB A Port
USB speed	480 Mbit/s
Network	10/100/1000 BaseT (max. 1000 Mbit/s)
Power supply	Power over Ethernet (PoE) class 3 (6.49 – 12.95 W) or via screw terminal DC 24 V ... 48 V (+/-10 %)
Power consumption	External power supply (24 V DC) without USB devices: typ. 120 m A External power supply (24 V DC) with 2 USB devices each 2.5 W : typ. 420 mA
Ambient temperature	Storage: – 40 ... 85 °C In operation, individually assembled: 0 ... 50 °C
Permissible relative humidity	0–95 % (non-condensing)
Casing	Compact plastic casing for DIN rail mount, 105 x 75 x 22 mm
Weight	200 g
Contents	<ul style="list-style-type: none"> • 1 x USB-Server Gigabit • 24 V DC wall plug transformer • Quick guide* <p>* included on PI Connect CD or Compact Connect CD: – USB-Redirector – WuTility Management Tool – Operating instructions (DE / EN)</p>

Protocols

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

Connection options



Industrial Process Interface

WITH FAIL-SAFE MONITORING

Camera and process control for use in an industrial environment

- Industrial Process Interface with 3 analog / alarm outputs, 2 analog inputs, 1 digital input, 3 alarm relays
- 500 V AC_{RMS} isolation voltage between camera and process
- Separate fail-safe relay output
- The PI hardware with all cable connections and the PI Connect software are permanently monitored during operation



General specifications

Protective rating	IP65 (NEMA-4)
Ambient temperature	−30 °C ... 85 °C
Storage temperature	−30 °C ... 85 °C
Humidity	10–95 %
Vibrational stability	IEC 60068-2-6 (non condensing)/ IEC 60068-2-64 (broadband noise)
Shock stability	IEC 60068-2-27 (25 g and 50 g)
Weight	610 g (with 5 m cable)
Cable lengths	5 m HT cable (standard), optional 10 m and 20 m

Electrical specifications

Voltage supply	5–24 V DC
LED indicators	2 green LEDs for voltage and fail safe / 3 red LEDs for alarm relay status
Isolation	500 V AC _{RMS} between PI camera und process
Outputs	3 analog / alarm outputs 3 alarm relays ¹⁾
Inputs	2 analog inputs 1 digital input
Ranges	0–10 V (for AO 1–3) ²⁾ 0–30 V / 400 mA (for alarm relays DO1–3) 0–10 V (for AI 1–2) 24 V (for DI)

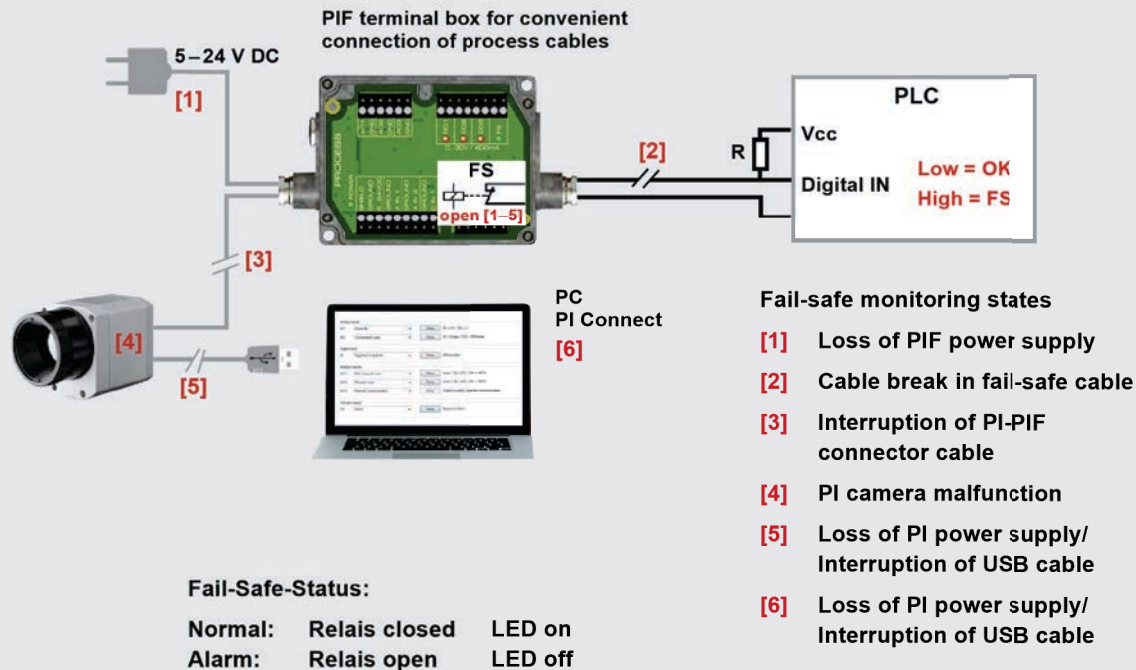
Programmable functions

Analog inputs	<ul style="list-style-type: none"> • Emissivity setting • Ambient temperature compensation • Reference temperature • Uncommitted value • Flag control • Triggered snapshots, triggered recordings, triggered line scan camera
Digital input	<ul style="list-style-type: none"> • Flag control • Triggered snapshots, triggered recordings, triggered line scan camera
Analog outputs	<ul style="list-style-type: none"> • Main measurement range • Measurement range • Internal temperature • Flag status • Alarm • Frame sync. • Fail-Safe • External communication

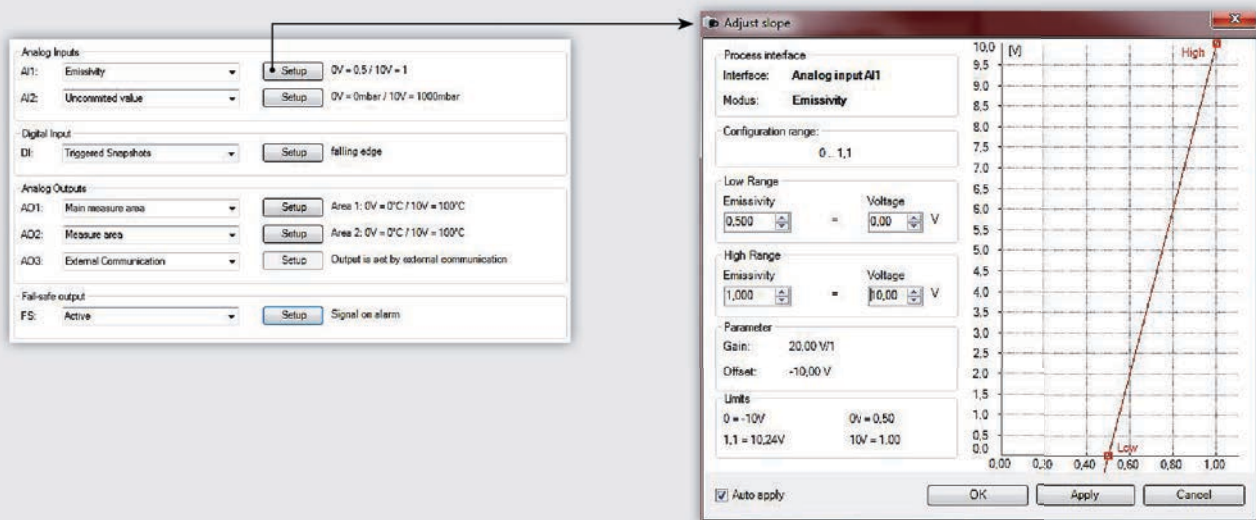
¹⁾ active when AO1, 2 or 3 is / are programmed as alarm output

²⁾ dependent on supply voltage

Example of fail-safe monitoring of the PI camera with connected PLC



Overview of programmable functions



PI Connect

LINE SCAN CAMERA SOFTWARE MODE

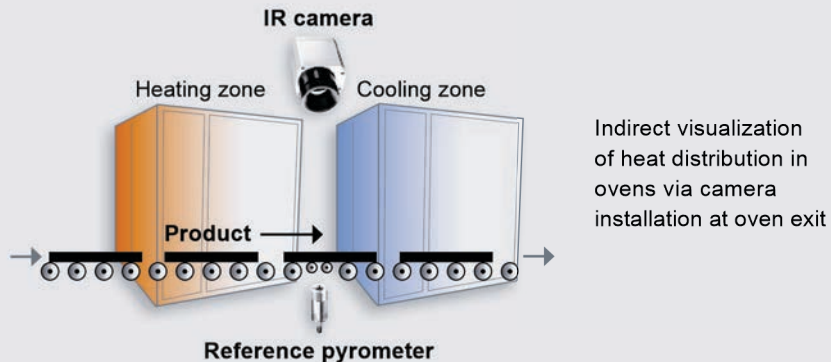
For the measurement of moving objects

The optris® PI Connect software is equipped with a line scan camera function. The line scanner is primarily used for processes involving moving measurement objects, like rotary kiln measurements or large quantities on conveyor belts (batch process).



The advantages

Simple monitoring of processes with limited visual access



Only 3 steps to initialize the function

Step 1

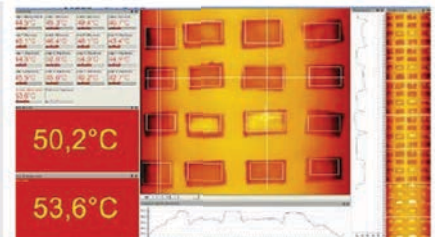
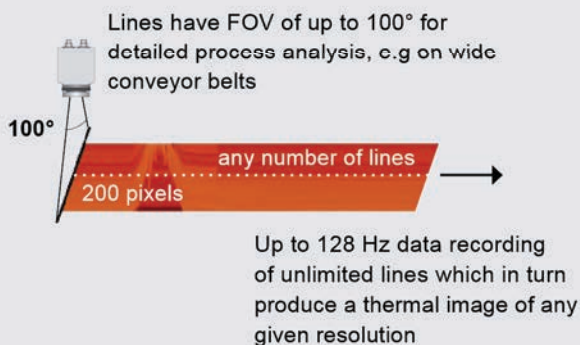
Activation of the line scan camera function and definition of the position of the lines in the thermal image. For this the camera itself serves as an orientation aid.

Step 2

Configuration of line scan function, e.g. number of lines displayed or set trigger for automatic saving of images.

Step 3

Definition of individual layouts, e.g. display of saved images in the snapshot process.



Layout example for display of line scan camera function

Precise measuring at various distances

A choice of lenses makes it possible for you to precisely measure objects at various distances, from close and standard distances right up to large distances.

With infrared cameras there are various parameters which display the relationship between the distance from the measuring object and the size of the pixel on the object plane. In choosing the correct lens, the following should be taken into account:

HFOV

Horizontal expansion of the total measuring field on the object plane.

VFOV

Vertical expansion of the total measuring field on the object plane

IFOV

Size of individual pixels on the object plane

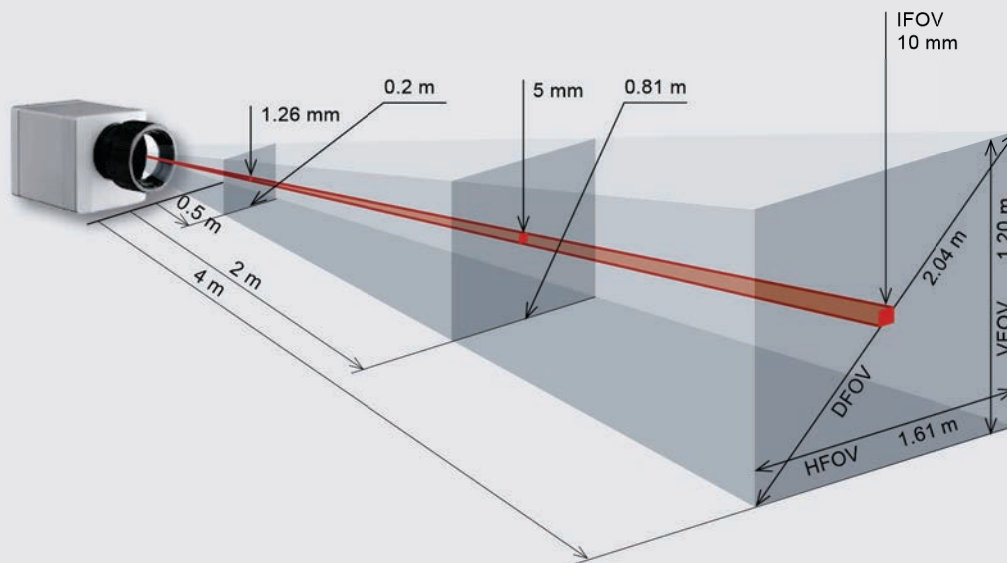
DFOV

Diagonal expansion of the total measuring field on the object plane

MFOV

Recommended, smallest measuring object size of 3 x 3 pixels

Measuring field of optris® PI infrared camera using a 23° x 17° lens





New

Outdoor protective housing

Universal protective housing for the
infrared cameras of the **STEK**® PI series

innovative infrared technology

Universal outdoor protection for infrared cameras of the **STeK** PI series

Features:

- Environmental rating IP 66
- Additional air purge collar allows for a continuous operation in dusty and humid conditions
- Heating element and built-in fan enable for a 24/7 operation from -40 °C
- Installation of USB Server Gigabit possible for integration into control systems over large outdoor distances



Specifications

Environmental rating	IP 66
Temperature range	-40 °C ... +50 °C
Heating	PTC heater (automatically starting at T<15 °C) / fan for homogeneous temperature distribution
Power supply	24 V DC
Power	70 W
Protective window	Germanium (Ge), zinc sulfide (ZnS), Borofloat or foil
Air purge collar	Integrated
Integrable additional components	USB-Server Gigabit Industrial Process interface (PIF)
Max. FOV	90° (HFOV)
Accessories	Optional wall mount bracket



Dimensions

