

Infrared Line Cameras **PYROLINE**

High-Speed Non-Contact Measurement Of Temperature Profiles

0 °C to 3000 °C





PYROLINE

High-Speed Uncooled Infrared Line Camera

The infrared line cameras **PYROLINE** allow you high-speed non-contact measurement of temperature profiles.

The cameras are specially designed for long-term use in fixed-mounted applications. For general purpose use the spectral ranges from 8 μm to 14 μm and 3 μm to 5 μm are available. The spectral ranges from 4.8 μm to 5.2 μm (which is particularly suitable for the measurement of temperature profiles in glass) and 0.8 μm to 1.1 μm (for metal) are for special applications.

With an uncooled infrared linear array (128, 256 or 512 pixels) you can realize non-contact measurement with 256 lines per second (512 lines per second optional) in temperature ranges from 0 °C to 3000 °C. The high-speed version PYROLINE HS 512N even provides 2000 lines per second. The camera has an aluminium compact-housing (IP54) or in a stainless steel industry protection housing IP65. More housing variants are available.

Different lenses with a field of view up to 90° are available. Measurement results can be transferred to your computer with real-time data transmission via fast ethernet with up to 2000 lines per second. Stand-alone operation without computer is possible too. Alarm and thresholding monitoring as well as triggered measurements are practicable.

We grant you 2 years warranty and customized system solutions with modified hardware and software.

Advantages of line cameras compared to line scanners:

- no opto mechanical Scanner
- high measurement speed up to 2000 lines/second
- use of uncooled infrared sensor arrays
- simultaneous measurement of all measurement points



Selected technical features

Measurement uncertainty	2 K (object temperature < 100 °C) or 1 K + 1 % of measured value in °C ¹
Interfaces	Fast Ethernet, galvanically isolated digital inputs (trigger) and digital outputs (alarm)
Power supply	12 V to 36 V DC, approx. 7 VA
Camera housings	• Standard compact housing IP54 "compact": aluminium, 85 mm (L) × 175 mm (W) × 107 mm (H), without optics and connections, weight approx. 1.6 kg • Standard compact housing IP54 "compact+": aluminium, 65 mm (L) × 160 mm (W) × 79 mm (H), without optics and connections, weight approx. 1.1 kg • Industry protection housing IP65 "protection": stainless steel, with air purge unit, water cooling and protection window, diameter 110 mm, length 280 mm, without mechanical mounting and connections, weight approx. 4.2 kg • Explosion proof and weather proof housing
Operating temperature of the camera	-10 °C to 50 °C (without water-cooling), -25 °C to 150 °C (with water-cooling)



explosion proof housing (ATEX)



weather proof housing

PYROLINE "protection"
with industry protection housing IP65

¹ 512N/256 Hz and HS 512N/2 kHz: measuring temperature range 1: 1 % of measured value in °C, measuring temperature range 2: 2 % of measured value in °C. ² 512N, HS 512N

For Non-Contact Measurement Of Temperature Profiles

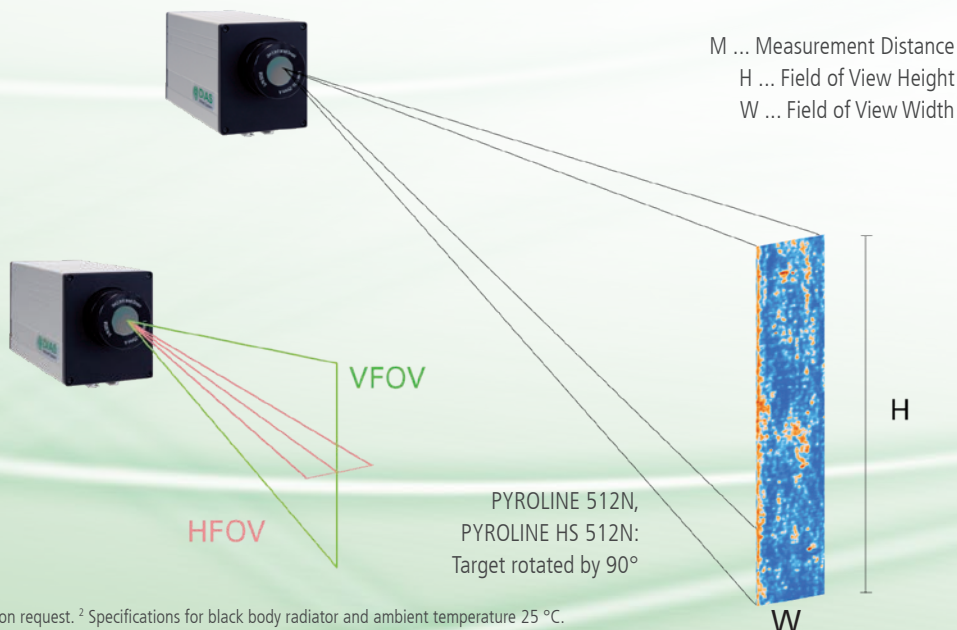


Camera type	Pixel	Temperature range ^{1,2}	NETD ³	Spectral range
128LS/256 Hz	128 × 1	0 °C to 80 °C	0.2 K/0.5 K	8 μm to 14 μm Wood, paper, plastics, gum, bulk materials, building material, textiles, food
128L/256 Hz	128 × 1	50 °C to 550 °C	0.5 K/1.5 K	
256L/256 Hz	256 × 1	50 °C to 550 °C	0.5 K/1.5 K	
128LS/512 Hz	128 × 1	50 °C to 550 °C	0.5 K/2 K	
256L/512 Hz	256 × 1	150 °C to 800 °C	0.5 K/2 K	
Optics with motor focus: 40°, 60°, 90°				

Camera type	Pixel	Temperature range ^{1,2}	NETD ³	Spectral range
128G/256 Hz	128 × 1	450 °C to 1250 °C	1 K/3 K	4.8 μm to 5.2 μm Glasses: float glass, container glass, glass bottles, glass melts
256G/256 Hz	256 × 1	450 °C to 1250 °C	1 K/3 K	
128GS/256 Hz	128 × 1	250 °C to 800 °C	1 K/3 K	
Optics with motor focus: 40°, 60°, 90°				

Camera type	Pixel	Temperature range ^{1,2}	NETD ³	Spectral range
128M/256 Hz	128 × 1	450 °C to 1250 °C	0.5 K/1.5 K	3 μm to 5 μm Building materials (clay, brick), metals (non-ferrous metals, rolled steel)
256M/256 Hz	256 × 1	450 °C to 1250 °C	0.5 K/1.5 K	
128MS/256 Hz	128 × 1	200 °C to 800 °C	0.5 K/1.5 K	
Optics with motor focus: 40°, 60°, 90°				

Camera type	Pixel	Temperature range ^{1,2}	NETD	Spectral range
512N/256 Hz	512 × 1	600 °C to 1500 °C, 1400 °C to 3000 °C ⁴	< 1 K (600 °C) ⁴ ≈ 2 K (1400 °C) ⁴	0.8 μm to 1.1 μm Metals in high temperature range (steel, stainless steel, steel melts)
HS 512N/2 kHz	512 × 1	650 °C to 1500 °C, 1400 °C to 3000 °C ⁴	< 1 K (600 °C) ⁴ ≈ 2 K (1400 °C) ⁴	
Optics with motor focus: 9°, 13°, 19°, 36°, 51°, 90° ⁴ ... or 0.15 % of measured value in °C at 256 Hz respectively 2 kHz.				

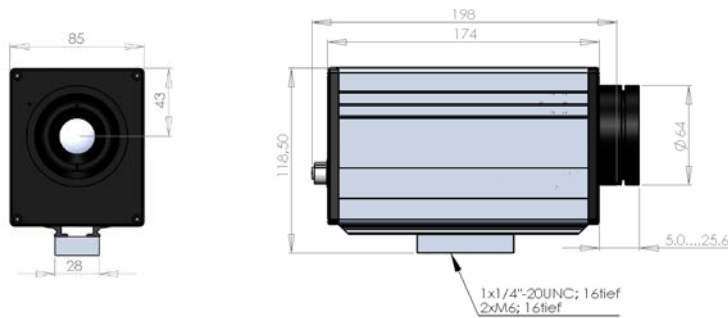


Optics variants			
VFOV × HFOV	M [m]	H [mm]	W [mm]
19° × 0.2°	1	352	3
	3	1060	8
	10	3530	28
40° × 0.3°	1	728	6
	3	2180	17
	10	7280	57
51° × 0.2°	1	960	3,8
	3	2880	11,3
	10	9600	37,5
60° × 0.5°	1	1160	9
	3	3460	27
	10	11500	90
90° × 0.9°	1	2000	16
	3	6000	47
	10	20000	156

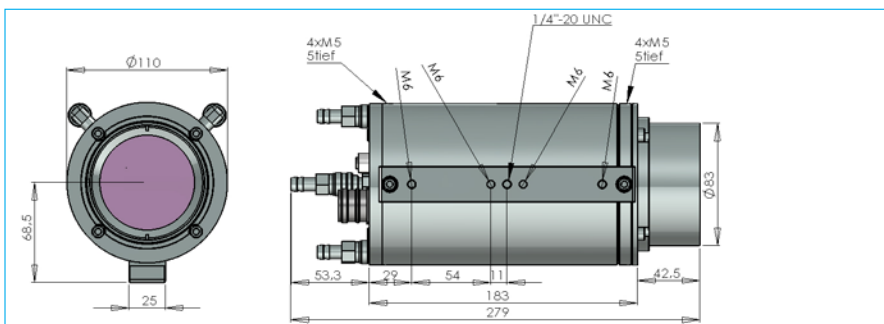
¹ Others on request. ² Specifications for black body radiator and ambient temperature 25 °C.
³ Noise equivalent temperature difference at 32 Hz and maximum measurement frequency.

PYROLINE

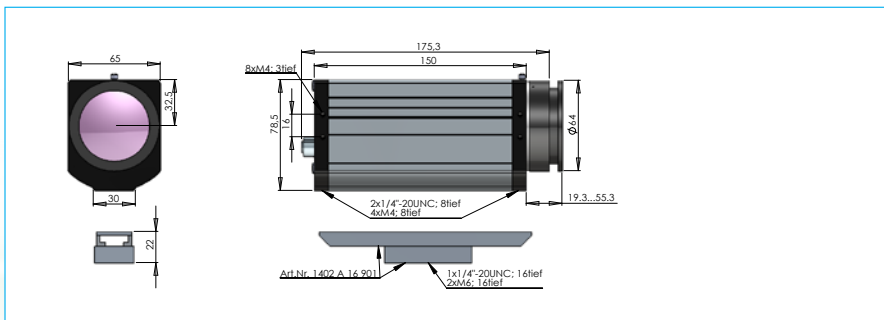
Dimensional drawing standard compact housing „compact“ (IP54)



Dimensional drawing industrial "protection" housing (IP65)



Dimensional drawing standard compact housing „compact+“ (IP54)



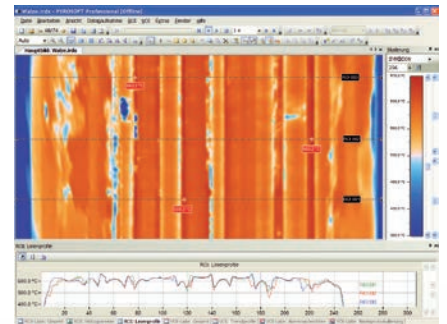
Software

The powerful online software **PYROSOFT** for Windows® allows you to control the infrared line camera **PYROLINE**. Recording, viewing, manipulation and storage of the measured data are possible as well.

Special features are:

- real-time data recording
- definition of zones and monitoring of alarm thresholds
- analysis of trends
- data export (text, bitmap, video)
- process control via PROFIBUS, analog and digital inputs, outputs and other interfaces

A programming interface (Windows® DLL) is available for system integration.



Connectors



Ethernet (LAN)

- Infrared data in real-time with up to 2000 lines per second (TCP/UDP)
- Web interface (status and image bar)
- PYROSOFT software
- Configuration for stand-alone operation

- ➔ Power supply
- ➔ Trigger 1
- ➔ Trigger 2

Inputs

- Error signal/
- Alarm 1 ➔
- Synch signal/
- Alarm 2 ➔

Outputs

Customized terminal box
(with power supply, alarm relay, controller, media converter, ...)