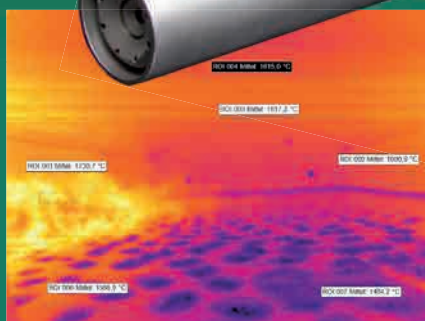
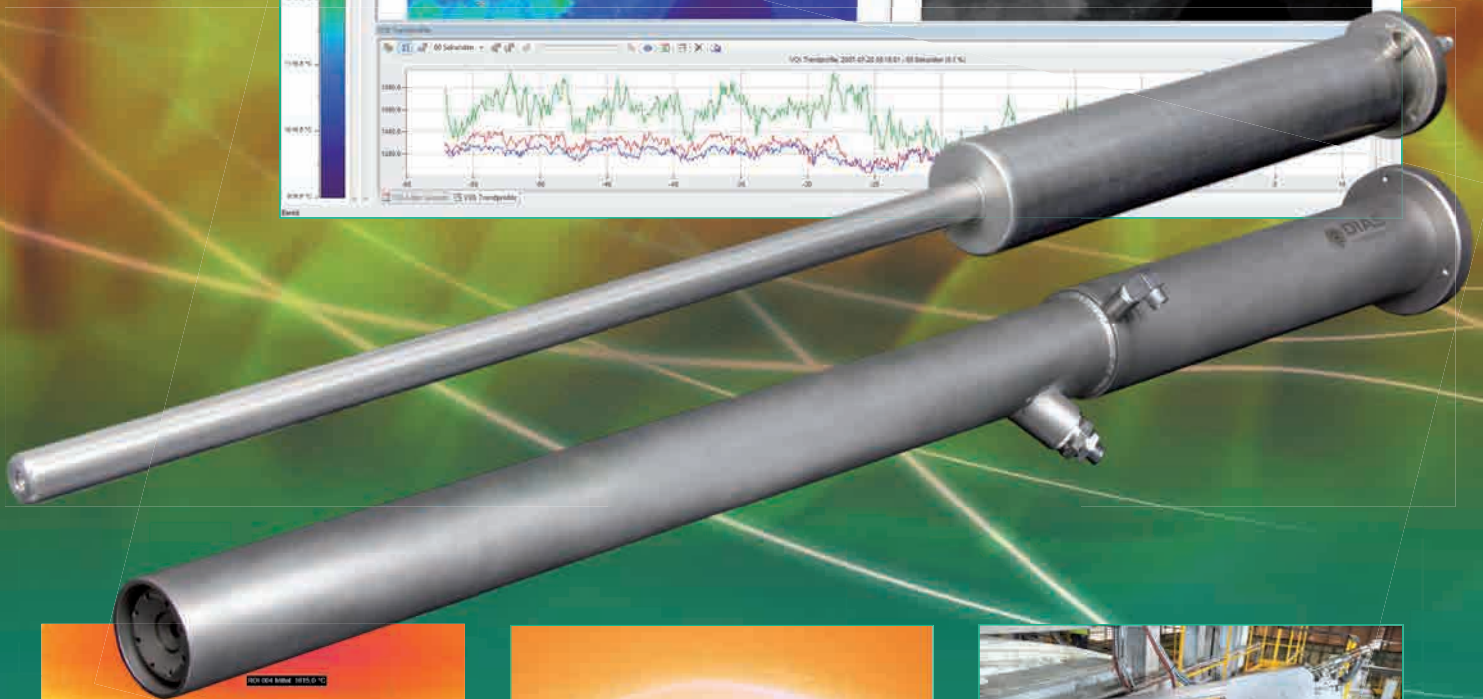
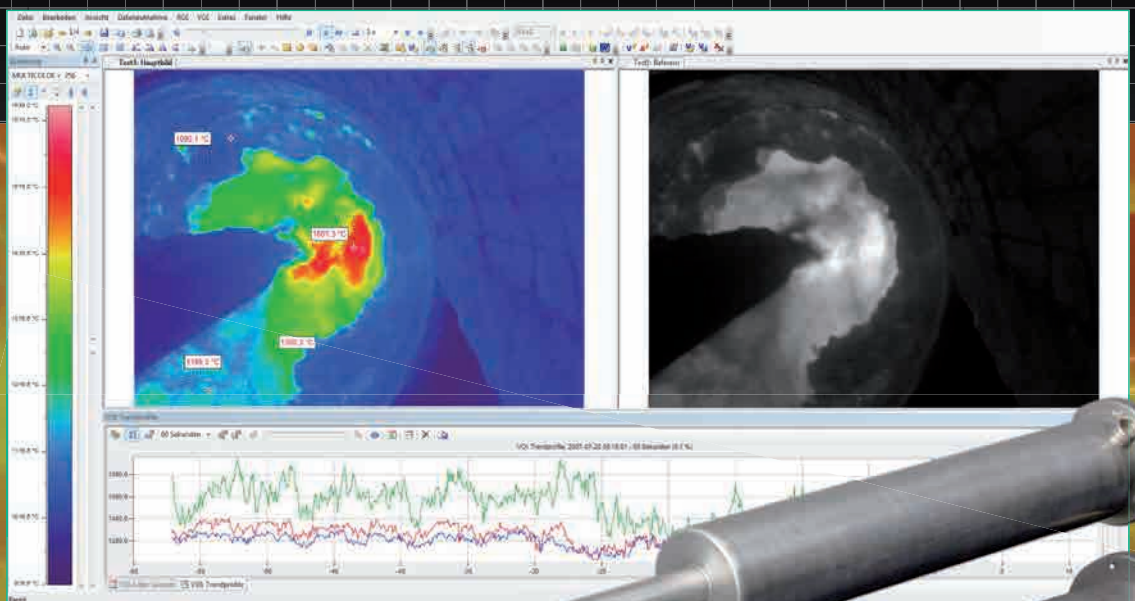


PYROINC endoscope

High-resolution IR camera for combustion chambers with
endoscope lens for temperature measurements from
800 °C to 1800 °C



PYROINC 320F, 640F and 768N endoscope

Infrared cameras for the use in combustions chambers under high temperatures



Description and application

The PYROINC endoscope is a special and very robust thermal imager series for combustion chambers that measures temperatures in real-time between 800 °C and 1800 °C. A sapphire window protects the motor focus borescope lens. The slim and robust stainless steel probe-cooling jacket can be cooled additionally with air or water.

By using an opening in the combustion chamber walls the probe lens can be inserted. Together with the automatic retraction system it is guaranteed that the system withstands the high temperatures and special requirements of the location. The front part of the probe cooling jacket is able to resist temperatures about 1800 °C with a service life between 2 and 10 years (depending on the operating conditions).

The in-camera web server allows remote access at any time. In this way, remote maintenance can be carried out or thermography data and current operating status can be called up.

The variant PYROINC 768N endoscope provides temperature measurements between 800 °C and 1800 °C in the near infrared range (NIR) from 0.8 µm to 1.1 µm. A very small diameter of the endoscope lens of only 36 mm characterizes this device variant. In this way, the camera can be inserted in already existing openings of the chamber walls for visual cameras. Both camera systems (IR and visual) can be changed easily.

Temperatures within the range from 800 °C to 1600 °C are measured with the devices PYROINC 320F and 640F endoscope. For example, these temperatures are important in rotary kilns for cement production. The cameras are sensitive around 3.9 µm.

Application examples:

- ✓ In glass melting furnaces the PYROINC 768N endoscope camera for combustion chambers is used for the temperature measurement of the glass melt and for the monitoring of the brickwork.
- ✓ In cement rotary kilns the ir camera PYROINC endoscope is used for the online temperature monitoring in the sintering area to derive control variables for the burner control.
- ✓ The PYROINC 320F/640F endoscope camera monitors recovery boiler in paper and chemical pulp factories.



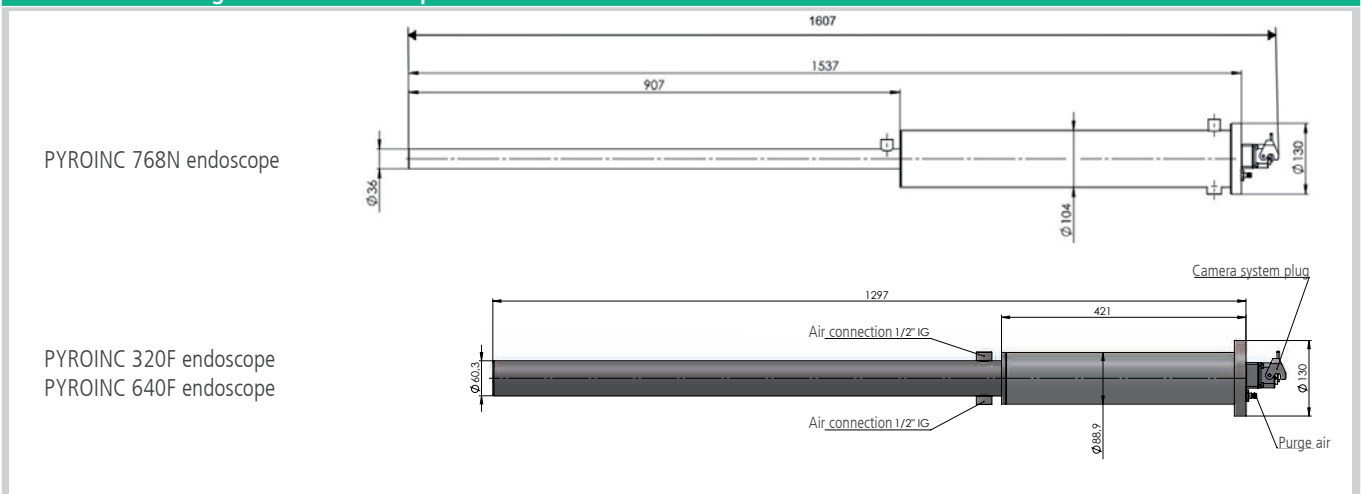
PYROINC 320F, 640F and 768N endoscope

Infrared cameras for the use in combustions chambers under high temperatures

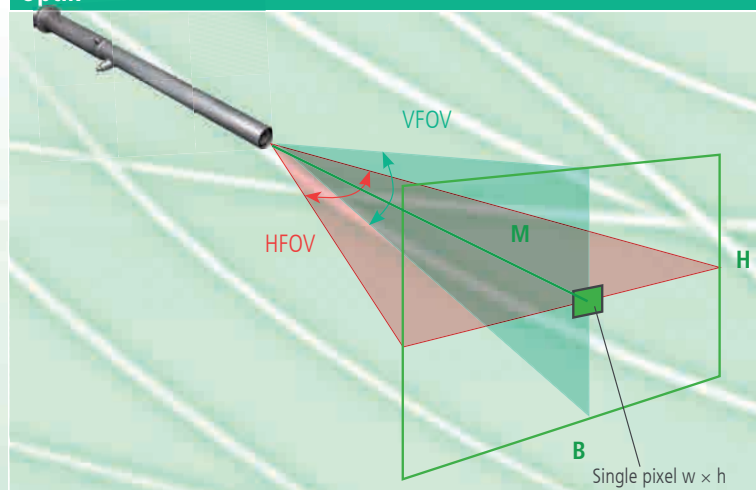
Technical data	PYROINC 768N endoscope	PYROINC 320F endoscope	PYROINC 640F endoscope	
Spectral range	0.8 μm to 1.1 μm	around 3.9 μm	around 3.9 μm	
Meas. temperature range ¹	800 °C to 1800 °C	800 °C to 1600 °C	800 °C to 1600 °C	
Sensor	uncooled 2D-Si-CMOS array (768 × 576 pixels)	microbolometer-2D array (320 × 240 pixels)	microbolometer-2D array (640 × 480 pixels)	
Optics ¹	Field of view	74° × 59°	75° × 54°	
	Measurement distance	from 1 m	from 1 m	from 1 m
	Motor focus	yes	yes	yes
Measurement uncertainty ²	2 % of measured value in °C ³			
NETD ⁴	< 1 K (800 °C, 50 Hz)	< 1.5 K (1000 °C, 25 Hz)	< 1.5 K (1000 °C, 25 Hz)	
Measurement frequency	internal 50 Hz, selectable: 50 Hz, 25 Hz, 12.5 Hz, ...			
Response time	internal 40 ms, selectable: 2/measurement frequency			
Interface	Ethernet (real-time, 50 Hz), two galvanically isolated digital inputs and two digital outputs			
Connections	HAN Modular (power supply, digital inputs and outputs, Ethernet)			
Weight	approx. 15 kg	approx. 10 kg	approx. 10 kg	
Power supply	12 V to 36 V DC, typical 7 ... 10 VA			
Housing	stainless steel housing, length 1607 mm, \varnothing 36 mm, air or water cooling	stainless steel housing, length 1297 mm, \varnothing 60.3 mm, air cooling	stainless steel housing, length 1297 mm, \varnothing 60.3 mm, air cooling	
Operating temperature of camera module	-10 °C to 55 °C (inner device temperature)			
Storage conditions	-20 °C to 70 °C, max. 95 % relative humidity			
Software	PC control and display program PYROSOFT for Windows®, customized version on request			

¹ Others on request. ² Specifications for black body radiators and ambience temperature 25 °C. ³ 3 % of measured value in °C (object temperatures > 1400 °C). ⁴ Noise equivalent temperature difference.

Dimensional drawings PYROINC endoscope



Optik



HFOV × VFOV	M [m]	W [m]	H [m]	ww [mm]	h [mm]
74° × 59°	1	1.5	1.1	2	2
	10	15	11	20	20
75° × 54°	1	1.5	1.1	5	5
	10	15	11	50	50

HFOV ... Horizontal Field Of View

VFOV ... Vertical Field Of View

M ... Measurement distance

B ... Image width

H ... Image height

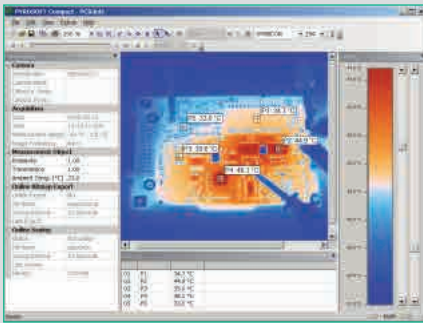
b ... Pixel width

h ... Pixel height

PYROSOFT

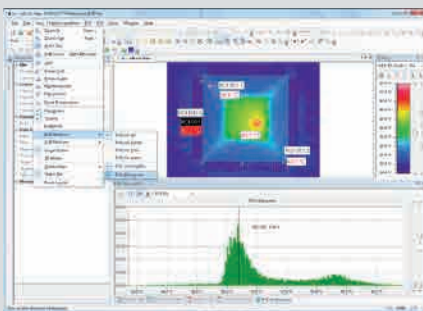
Powerful online and offline software for DIAS infrared cameras

PYROSOFT Compact



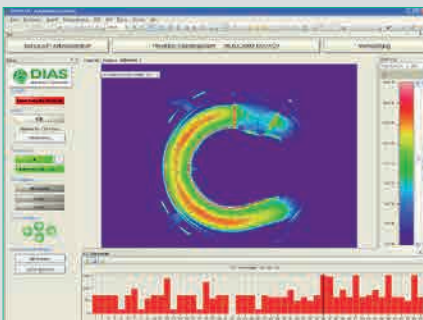
- Online data acquisition of one DIAS infrared camera
- Open and edit archived measured data and sequences
- Bitmap and video export
- Online data storage and online bitmap export
- Definition of regions of interests (ROI): points, lines and rectangle
- Generating of reports in Microsoft® Word format by integrated report function
- Context-sensitive help system (F1 key)
- Included in the scope of delivery of every PYROVIEW infrared camera

PYROSOFT Professional



- Online data acquisition – Analyze, store and export data in real-time
- Open and edit archived measured data and sequences
- Multi document structure for several documents
- Bitmap, video and text export
- Definition of regions of interests (ROI) and values of interests (VOI) with alarm calculation, histogram and trend chart
- Numerous interface possibilities for processes (PROFIBUS, PROFINET, WAGO, TCP-Socket, Text IO)
- Reporting function, context-sensitive help system (F1 key)
- PYROSOFT Professional IO offers optionally a bidirectional data interface via PROFIBUS, PROFINET, WAGO, MODBUS, OPC, TCP Socket to process control systems, controllers and other applications

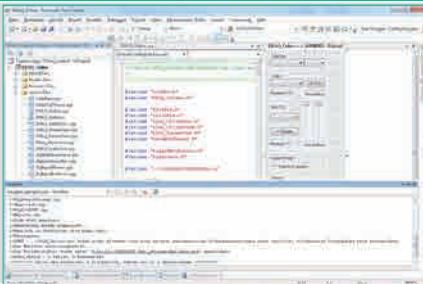
PYROSOFT Automation



DIAS has developed the software PYROSOFT Automation for the integration of infrared cameras in automation processes.

- Comfortable product management with free definable document templates
- Product choice and release control can be made manually or automatically
- Different user levels for operator, tool setter and administrator
- Functionality of PYROSOFT Professional for administrators
- Automatic logging of system messages, measured data and alarms
- Easy to use and configurable user interface for application in fabrication
- Learning functions for automatic adjustment of alarm threshold
- Offline viewer for belated data analysis
- Bidirectional data interface via PROFIBUS, PROFINET, WAGO, MODBUS, OPC, TCP Socket to process control systems, controllers and other applications

PYROSOFT DAQ



For users who want to make an integration into their software environment by themselves, we offer an own online and offline DLL interface for DIAS infrared cameras.

- API (DLL) for direct data access under Windows®
- Support for DIAS IRDX file format
- Setting of data acquisition parameters and object properties
- Query of temperature values and camera information
- Functions for displaying of images and palettes as bitmap
- Online and offline function

More software packages are available, for example:

PYROSOFT MultiCam (process software for monitoring up to 8 cameras), PYROSOFT CamZone (software for programming a stand-alone camera), application specific software like PYROSOFT FDS for DIAS fire detection systems.



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