Non-contact thermometry best done with thermal imagers

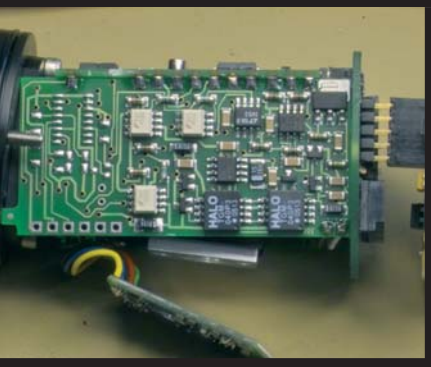
impac®
Mikron Group

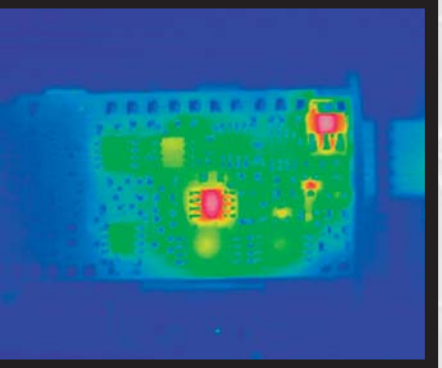
HS-Vision Series

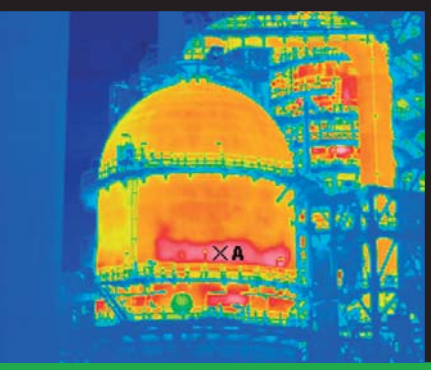
certified ISO 9001:2000 IMPAC Infrared

Automatic HotSpot Detection using on-line thermal imaging cameras

-40°C  1600°C







Typical applications

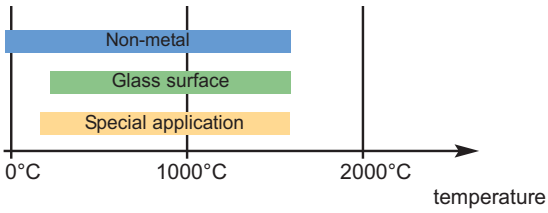
- Visualisation of temperature distribution
- System integration for HotSpot detection
- Process optimisation and control
- Research & Development

IMPAC – Competence in Infrared

HS-Vision Series

The fixed installation HS-Vision Series' thermal imagers have been specifically designed for automatic location of thermal anomalies (hot or cold spots) at temperature between -40°C and 1600°C. Depending, e.g. on the material or the temperature range of application, the imagers operate in specific spectral ranges. To help you, different colour bars are used in the product overview.

	8...14 µm	General applications on non-metal surfaces
	4.8...5.2 µm	Glass surface measurement
	3...5 µm	Special applications in the range of 3...5 µm



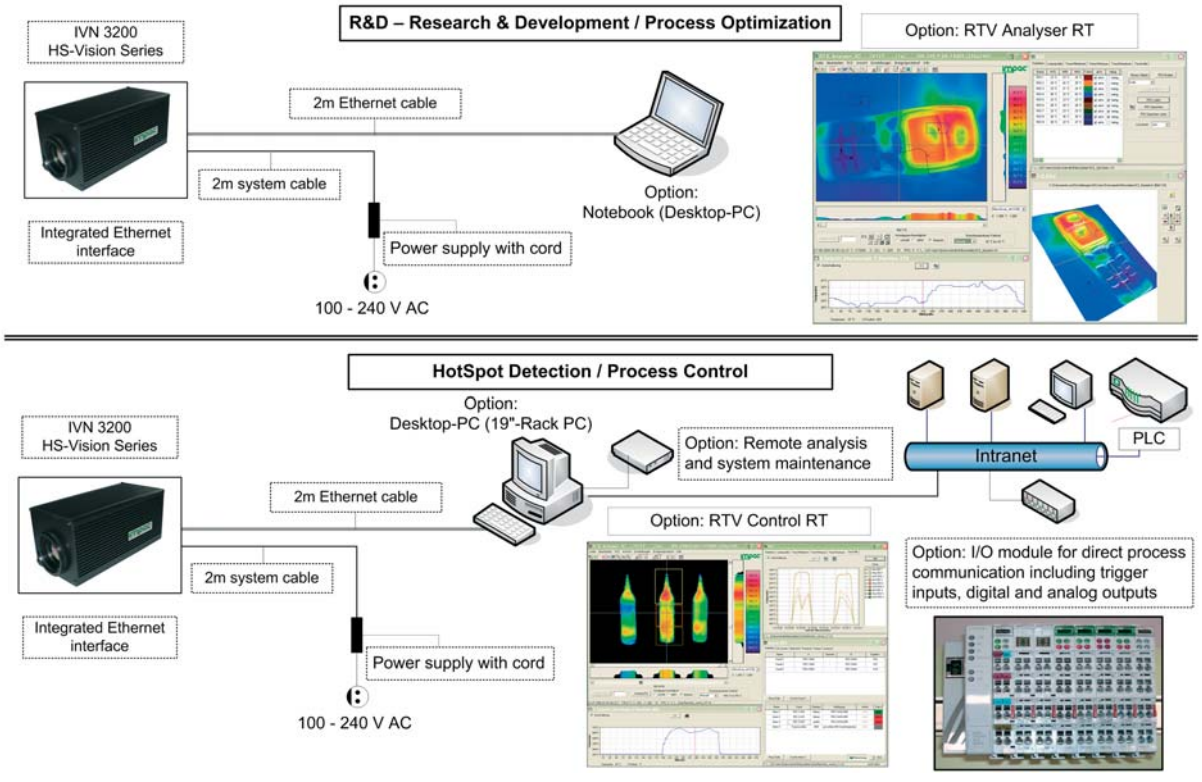
Different measurement ranges of thermal imagers of HS-Vision series

7.5 Hz, Export licence free				
Type	**IVN 3200-HS** **IVN 3200-HS/HT**	**IVN 3200/5-HS** **IVN 3200/5-HS/HT**	**IVN 3200/3-5-HS**	**IVN 3200/39-HS** **IVN 3200/39-HS/HT**
Feature	Detection of HotSpots on non-metal surfaces	Detection of HotSpots on glass surfaces	Detection of HotSpots e.g. on metal and ceramics from 150°C	Detection of HotSpots in flame heated furnaces (through flames and hot gases)
Meas. range*	-40...500°C 200...1600°C	200...800°C 400...1600°C	150...800°C	200...800°C 400...1600°C
Spectral range	8...14 µm	4.8...5.2 µm	3...5 µm	at 3.9 µm
Data points	320 x 240	320 x 240	320 x 240	320 x 240
Field of view	21° x 16° (additional lenses)	21° x 16° (additional lenses)	21° x 16° (additional lenses)	21° x 16° (additional lenses)
Focusing	Motor focus	Motor focus	Motor focus	Motor focus
Frame rate	7.5 Hz	7.5 Hz	7.5 Hz	7.5 Hz
Housing (IP54)	82 x 83 x 199 mm	82 x 83 x 199 mm	82 x 83 x 199 mm	82 x 83 x 199 mm
Reference no.	3 824 110 / 3 824 130	3 824 530 / 3 824 520	3 824 210	3 824 430 / 3 824 420

System configuration

The HS-Vision Series is a complete, easy-to-install system. The setup of parameter thresholds (e.g. maximum temperature) enables the user to configure visual and/or audible alarms, or both, for permanent monitoring of processes and equipment. Special software versions are available for comprehensive analyses and checking tasks. IMPAC systems integrates and adapts customer specific systems to individual measuring applications. Below are examples of what a system configuration could look like.

Scope of delivery: camera in IP54 housing, PC connection cables, power supply unit, basic software *RTV Basic RT*, carrying case

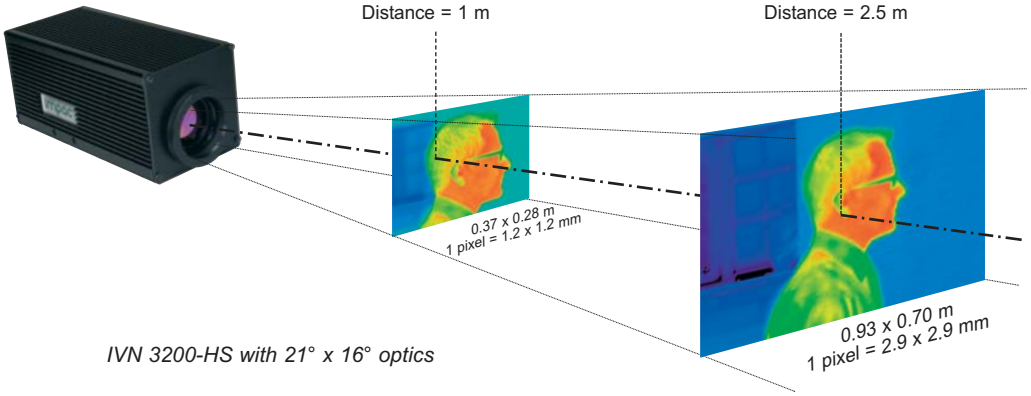


Measurement field and pixel resolution

The thermal imagers are supplied with a vario optics which is suitable for most applications. For specific applications, different lenses are available (tele, wide angle and macro). The compensation for the lenses (transmission) can be adjusted in the software.

The table and the picture display the correlation between the measurement distance, different optics and the size of the measurement fields:

Distance of object [m]	Measurement field W x H [m] 21° x 16°	11° x 8°	53° x 40°
0.50	0.19 x 0.14	–	0.50 x 0.36
0.75	0.28 x 0.21	–	0.75 x 0.55
1.00	0.37 x 0.28	–	1.00 x 0.73
2.50	0.93 x 0.70	0.48 x 0.35	2.49 x 1.82
5.00	1.85 x 1.41	0.96 x 0.70	4.99 x 3.64
10.00	3.71 x 2.81	1.93 x 1.40	9.97 x 7.28

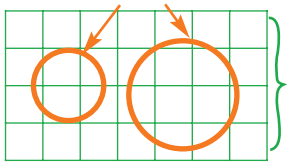


IVN 3200-HS with 21° x 16° optics

Please note:

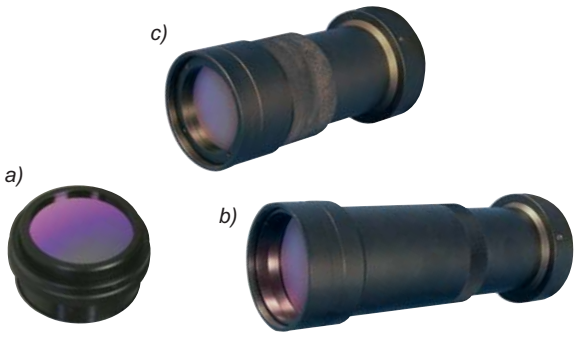
The size of the measurement object should be as big as 3 x 3 pixels. This guarantees the precise temperature determination, as at least one pixel of the detector is completely covered.

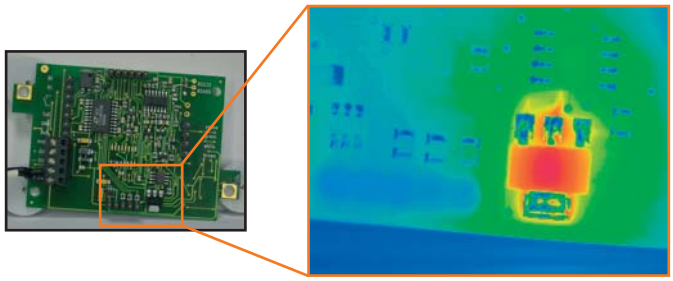
Meas. object with different diamaters (2 and 3 pixels)



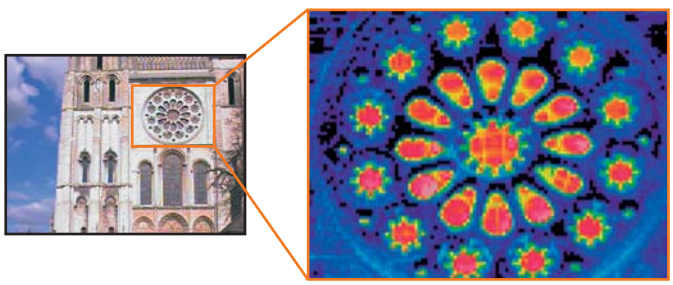
Optional lenses

	Standard vario optics	Telephoto lens	Wide angle lens	100 µm Macro close-up lens
Field of view W x H	21° x 16°	11° x 8°	53° x 40°	
Measurement distance	> 0.3 m	> 2 m	> 76 mm	60 mm +/– 1.5 mm
Measurement field	0.11 x 0.08 m	0.39 x 0.28 m	76 x 55 mm	32 x 24 mm (fix)
Min. size of object (3 x 3 pixels)	1.04 mm x 1.05 mm	3.61 mm x 3.50 mm	0.71 mm x 0.69 mm	0.3 x 0.3 mm
Ref. no. IVN 3200-HS und -HS/HT		3 824 260	3 824 270	3 824 280
Ref. no. IVN 3200/5-HS und /39-HS		3 824 550	3 824 560	

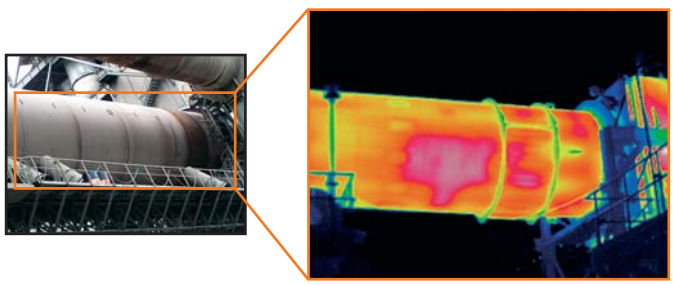




a) Macro close-up lens for measurement of very small objects, e.g. electrical component parts, PCBs



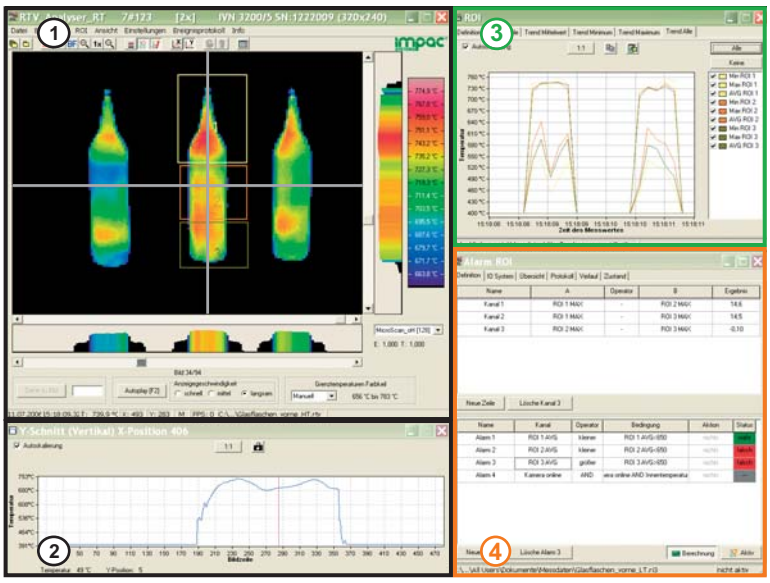
b) Telephoto lens for precise measurement of objects at long distances, e.g. transformer substations, people



c) Wide-angle lens for monitoring of large areas at short distance, e.g. equipment (rotary kilns, vessels, lumberyards)

Software

IMPAC systems develops software, based on standardised software elements, which is then customised to suit specific applications. The basic software ***RTV Basic RT*** comprises features for online visualisation and logging of processes. For more detailed analysis tasks IMPAC offers the software ***RTV Analyser RT*** and for advanced process control the software ***RTV Control RT***. Therefore, the measuring system can easily be integrated into your systems – for example to control and monitor production processes. Additionally, it is possible to analyse the temperature data of images and sequences in an offline mode. To achieve this, IMPAC provides the software versions *RTV Analyser* und *RTV Control*. For demonstration purposes, the freeware *RTV Basic* can be ordered from IMPAC.



Software specification	RTV Basic RT	RTV Analyser RT	RTV Control RT
Data recording and visualisation	X	X	X
Shorten sequences	X	X	X
.JPG, .BMP, .AVI export	X	X	X
X- / Y-cuts (horizontal / vertical)	X	X	X
Zoom +/-	X	X	X
Filter	X	X	X
Isotherms	X	X	X
HD memory manager	X	X	X
3D profile		X	X
Report generator		X	X
ROI definition		X	X
Line profile		X	X
ROI trend windows (4x)		X	X
Online/offline data export (DDE)		X	X
Emissivity correction (ROI)		X	X
Access protection (password)			X
Alarm ROI window			X
Overview measurement channels			X
Operation channels (ROIs)			X
Alarm: protocol, trend, current state			X
Export of screen			X
Reference number online version	3 831 670	3 831 680	3 831 690

1 *Main window*

Online monitoring and recording of sequences; thermal images can be loaded and saved

- Temperature display (°C, °F, K)
- Replay of sequences at 3 different rates
- Shorten sequences
- Export to standard picture formats (.JPG, .BMP) and digital video sequences (.AVI)
- Multiple isotherms with grey colour wedge
- Diverse colour palettes for high-contrast visualisation
- Language version: German, English, French

2 *Line Profile*

Graphical and coloured display of temperatures over time with horizontal X-cuts and vertical Y-cuts

3 *Image processing tools (ROIs)*

Analysis of temperature data in multiple Regions of Interests (ROIs) during or after data recording

- Diverse tools (e.g. point, line, rectangle, hot spot, polygon, polyline, circle, ellipse)
- Display of characteristic temperature data within ROIs (minimum, maximum, average)
- Display of line profiles
- Trends for all defined ROIs values
- Export of temperature and ROI data as text file or over Windows DDE Interface (offline/online)

4 *Process control and network integration*

Fast data transfer to PLCs (process control) and optional I/O-module

- Mathematical operation with single ROIs (operation channels)
- Trigger- and alarm functions using external contacts (I/O-module or software trigger)
- Documentation of events (information, warning, error) with time stamp
- Option: scaleable I/O-module with relay and analogue outputs

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