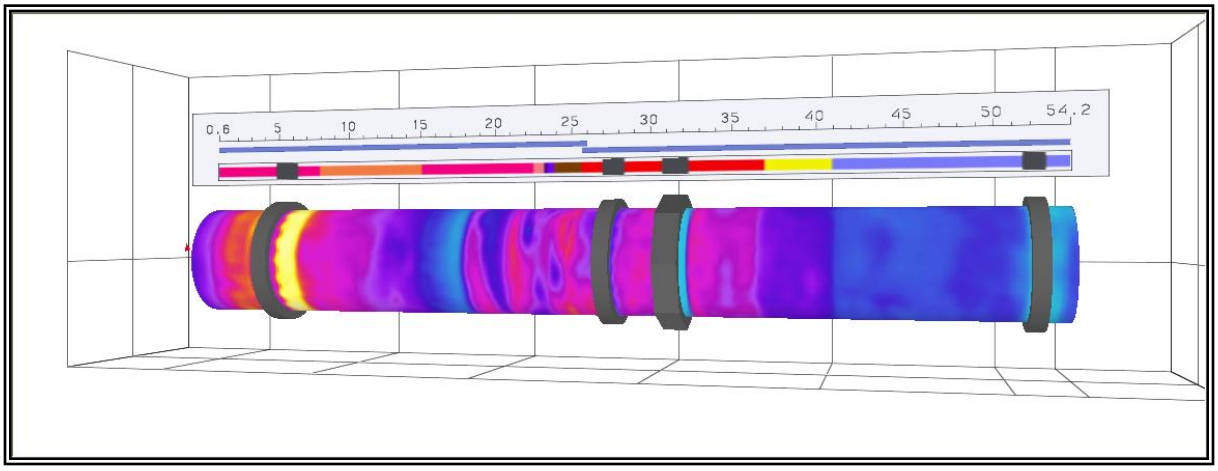
Infrared-Rotary Kiln-Temperature-Monitoring
IR-OMT

Infred-Monitoring for rotary kilns



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infrared customized engineering

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Thermal kiln-shell monitoring on rotary kilns

Problems:
Temperature-Hot-Spots on the kiln-shell give informations about defects of the kiln brick lining. Low-temperature zones within the brick lining range of the sinter zone permit conclusions on beginning of caking inside the rotary cement kiln.

Infrared-Camera with protective housing.

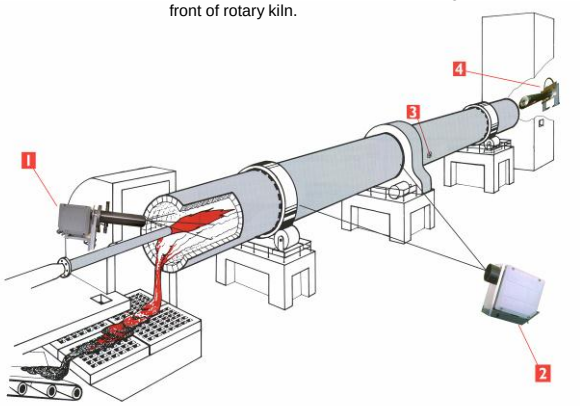
Infrared-Camera with Protective Housing installed in front of rotary kiln.

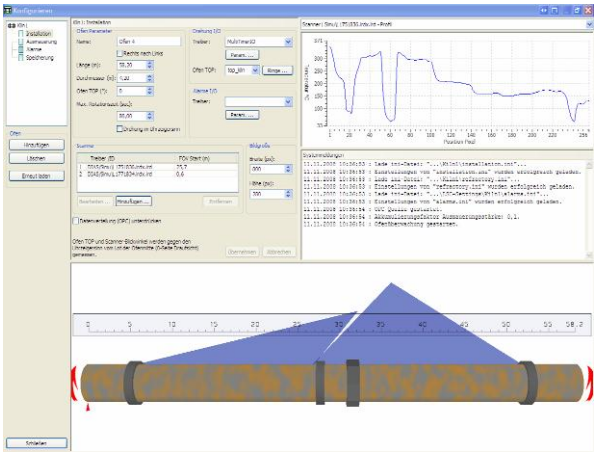
Task:
- Recognition and visualization of Hot spots and beginning caking-rings
- Integration of the measured values into a primary Control system

Solution:
Thermal kiln-shell monitoring on rotary kilns with infrared line camera

Components of the IR-OMT:

- High efficient infrared line cameras for rough industrial environment
- Robust housing with heating and cooling
- Industrial control cabinet for the camera supply
- PC system with integration into the customized control system
- Software „IRT KilnMonitor “for the monitoring, evaluation and analysis





Advantages:

- Pyroelectric sensor with drift stability
- Multi-camera solution also for in-house rotary kilns
- During multi-camera solution no shadowing, no additional pyrometers necessarily
- Line string with lens optics (maintenance-poor, high life span)
- Optimized measuring line by the use of objectives, optimum tuning on the rotary kiln
- Small absorption of H_2O (water vapour or fog) in the measuring wavelength 8 - 14 µm
- Network-able by fast ethernet interface

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Kiln-Monitoring-Software

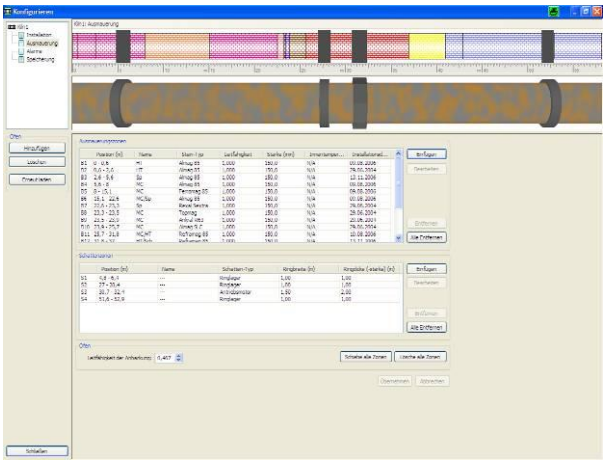
IRT KilnMonitor® is the full featured computer system that allows you to monitor, process and trace data from several kilns at once. It includes Scanners control, module for real-time temperature acquisition; Input/output control module; Kiln visualization module (2D and 3D); Thermographic analysis module and Historical storage module.
IRT KilnMonitor® is the industry-leading environment for real-time kiln data acquisition, analysis and control.

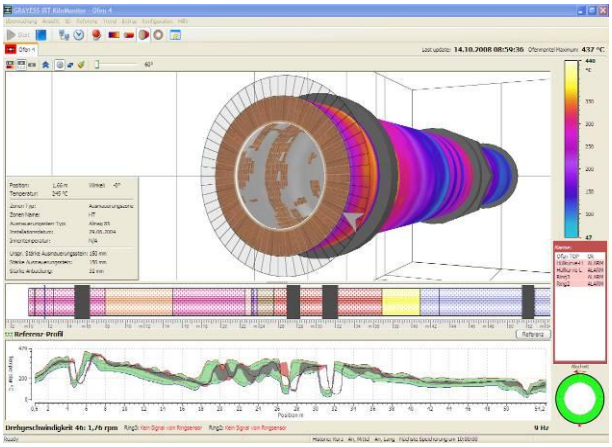
Features (choice):

Several kilns
Representation and processing up to 4 kilns per evaluation unit.

Bricks and coating thickness calculation
Bricks and coating thickness is estimated using the actual kiln shell temperatures and the kiln development history stored in the database.

Hot-Spot-Finder
If a Hotspot in the infrared image develops, this is put out in accordance with their coordinates at the kiln shell and as zoom shot picture. This Hotspot is then represented in a trend representation in dependence of the temperature rise. External blower fans could be place targeted and controled by the „IRT KilnMonitor-Software.





Worst case“ image
Image that shows maximum temperature at every kiln shell spot over some selectable period of time.

Alarms
On-screen display, beeper, external hardware alarms and OPC alarms;

History
Kiln state (scanned infrared image, bricks and coating thickness, alarm state) is continuously recorded in a database.

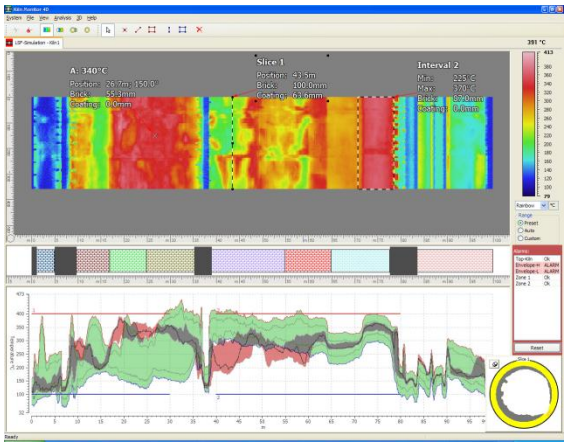
Client-server model
Server is the computer collecting data from the scanners. Client is any computer in the local network (or as an option – in the Internet).

Rotary-slip-monitoring

Analysis objects on the 2D image
All analysis objects are with labels containing selectable information.

- **Spots:** temperature, position, brick thickness, coating thickness, averaging. Unlimited number of spot objects.
- **Slices** (kiln sections): min, max, average temperature, brick thickness, coating thickness, averaging. Unlimited number of slice objects.
- **Intervals:** min, max, average temperature, brick thickness, coating thickness, averaging. Unlimited number of interval objects.
- **Lines:** min, max, average temperature, averaging. Unlimited number of line objects.
- **Areas:** min, max, average temperature, averaging. Unlimited number of area objects.

History reference
Possibility to recall any kiln state from the history and display it on the screen for reference: as kiln shell image, as envelope profile or as a difference map between the current and the history image.



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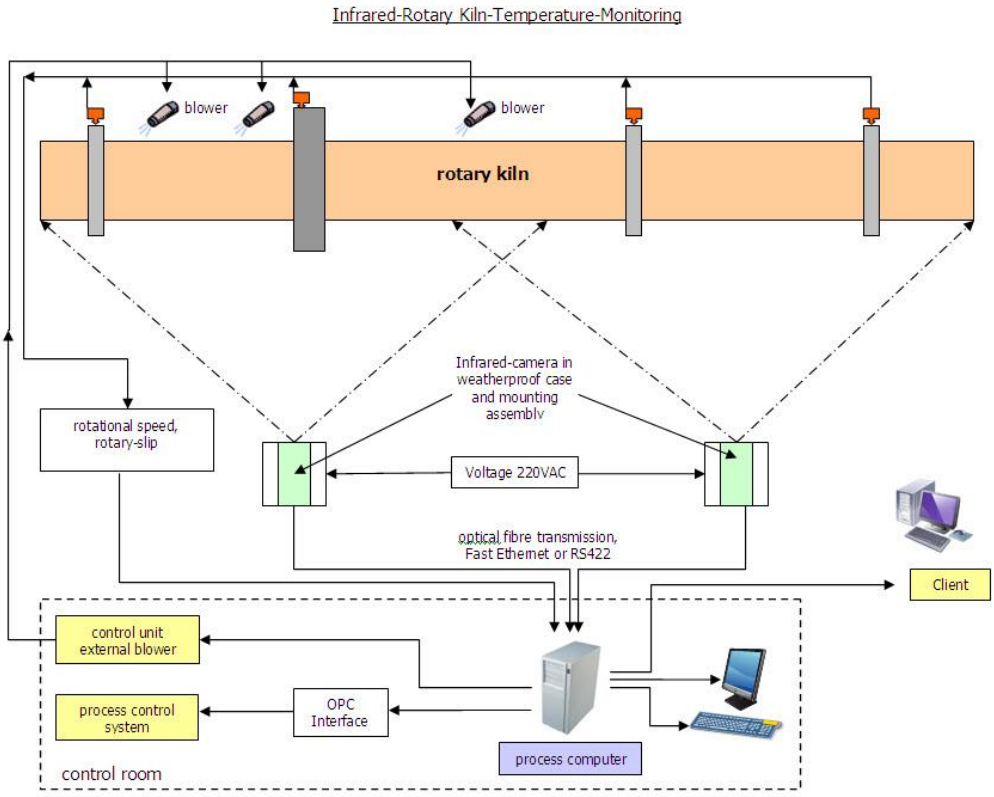
Installation



System-Specification

Range of measurement:	50°C - 850°C	Supply voltage:	11...36V DC
Temperature resolution:	< 0,5K (32 Hz), < 1,5 K (256 Hz)	Interfaces:	Fast Ethernet (optional optical fibre)
Measurement uncertainty:	2 K or 1 K + 1% from Value	Camera housing:	Protection to IP 65 standard camera-weatherproof case
Spectral range:	8...14 µm		
Field of view:	90° x 0,7° or 56° x 0,5° or 40° x 0,3°	Transfersize:	2000 m with optical fibre
Measurement frequency:	50 Hz or 256 Hz	Number of monitored kilns:	2 kilns per evaluation unit
Sensor:	Uncooled infrared linear array with 256 pixels or 2D-Array	Client-connection:	unlimited
		Internet-connection:	optional
Admissible ambient temperature:	-10°C - 50°C, -20°C - 80°C (with weatherproof case)		

Infrared-systems for industrial process-diagnostic and process-automation

- IR-consulting, system analyses,feasibility studies, system-concepts
- Installation, training and maintenance service
- Everything from one hand !

Distributor:

CMV systems GmbH & Co. KG
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CMV Systems GmbH & Co.KG
Wolfsittard 10
D- 41179 Mönchengladbach

Telefon: +49/ (0)2161 / 5954-0
Telefax: +49/ (0)2161 / 5954-30
E-mail: info@cmv-systems.de
Internet: www.cmv-systems.de