

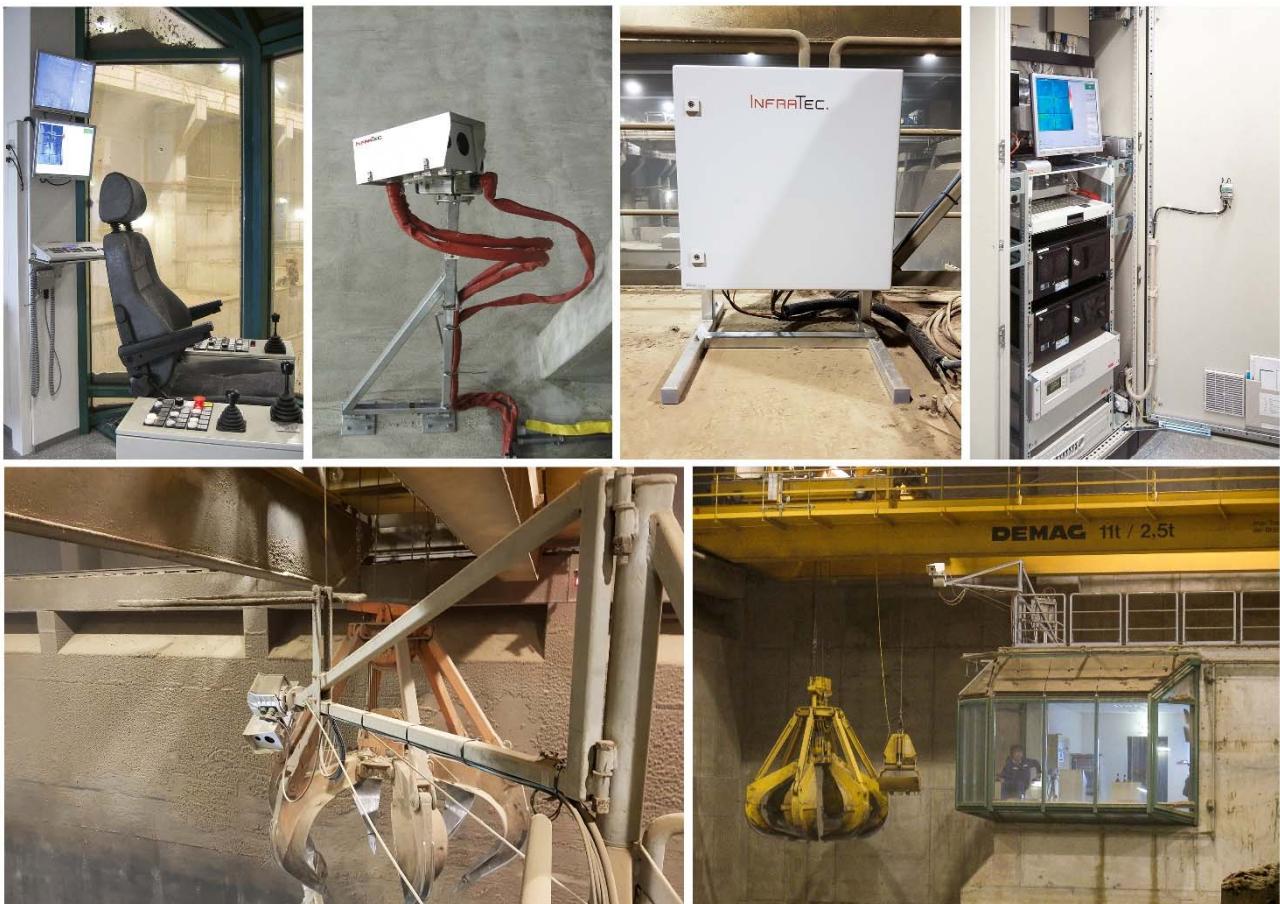
## WASTE-SCAN 4.0

### Thermographic Measurement and Monitoring in Plant Operation

#### Multi-spot Analyses with High-resolution Thermography Heads Enable a Safe Power Plant Process – The System Concept of WASTE-SCAN 4.0

In the age of Industry 4.0, the demands on system suppliers are growing, not just with regard to the primary measurement and monitoring tasks, but also with regard to data networking and structure. To meet these demands, InfraTec has developed a platform-independent internal data structure, which represents both the measurement and alarm data as well as the measurement sequences. Interfaces to control systems of leading suppliers, e.g. via TCP/IP in the PROFINET, Modbus, CC-Link and many other versions, can be achieved flexibly and economically. The proprietary Gigabit Ethernet data interfaces of fast infrared thermography camera heads permit real-time data analysis and evaluation.

**High-performance thermal imaging camera heads** with up to (1,024 x 768) infrared measurement pixels and also powerful video cameras with HD resolution are supported in a new measurement-technology dimension.



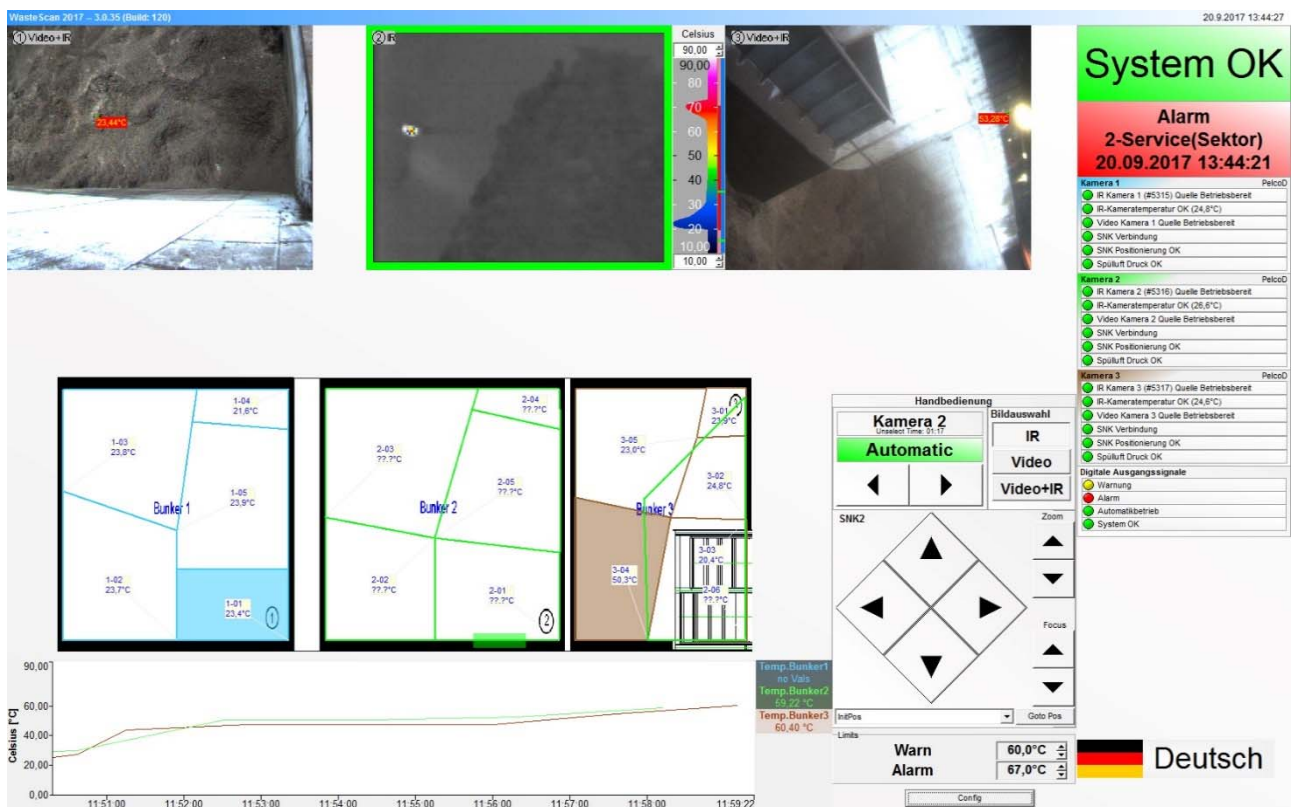
This measurement-technology basis permits an outstanding **simultaneous multi-spot analysis**. Regardless of whether the camera heads are moveable with robust pan-tilt systems or fixed installations, individual camera images can be divided into several measurement areas (ROI – region of interest) with recipe-based parameters. Here, free-form contours are used to enable unhindered recording of application-specific geometries in the measurement scene (spot). In each spot, the classic functions with threshold values, such as **warning and alarm**, are supported just as simultaneously as algorithmically determined parameters. That means, in addition to the proven **WASTE-SCAN**

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functions, process-specific factors (e.g. load situation, environmental conditions, throughput, storage quantity) can be taken into account. Here, procedures of experience-based and past-based characterisation up to KI-algorithms are used. As monitoring redundancies play an increasing role, several switchable recipes (day-night operation, redundancy operation, partial operation) are provided.

The customer- and task-adapted installations are implemented with the software kit **WASTE-SCAN** or **FIRE-SCAN**.



WASTE-SCAN 4.0 software interface for camera monitoring of several sections

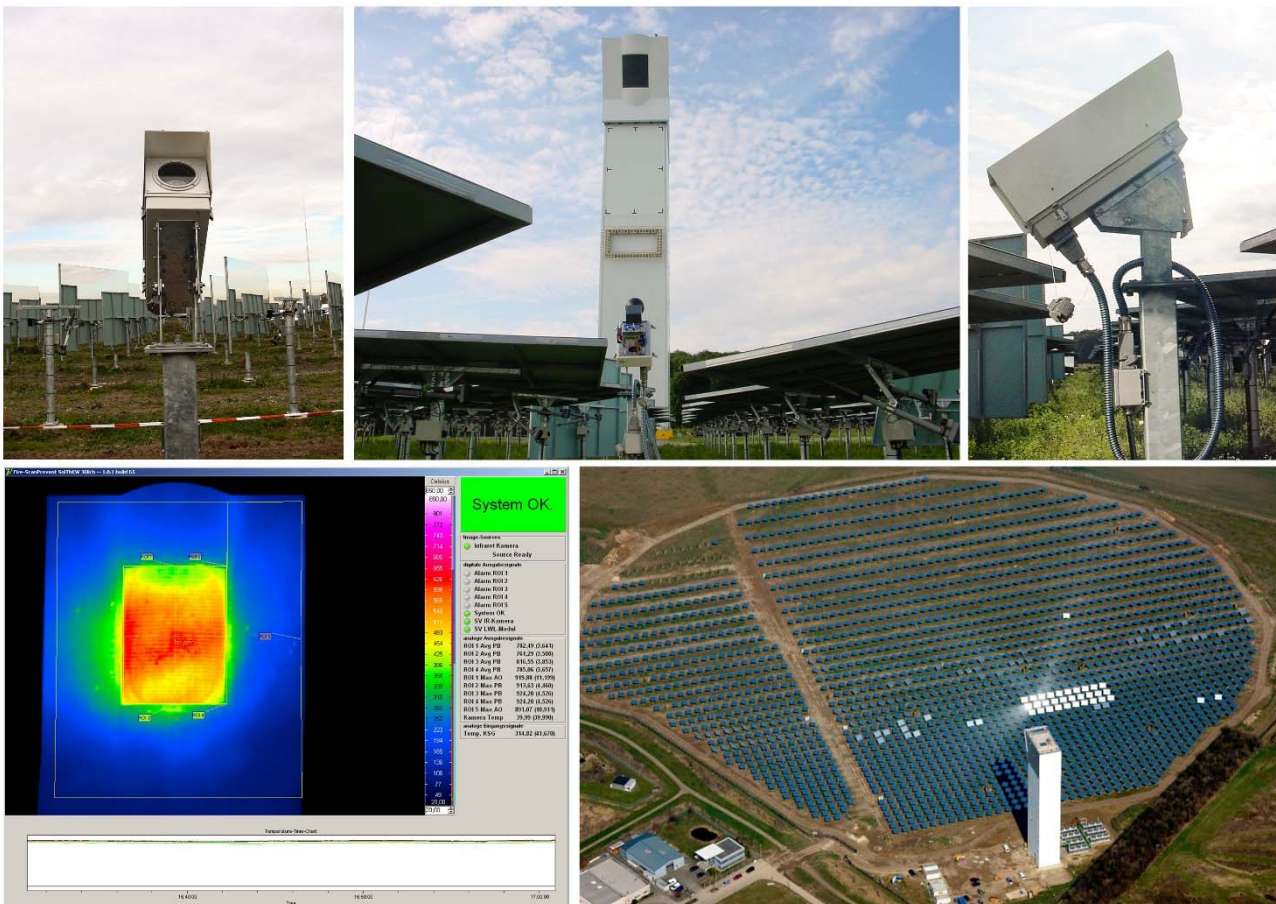


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Besides the safety aspect, process guidance and control are increasingly gaining importance (chemistry, biomass, solar towers). Here, the evaluation of high-resolution, non-linear, thermal signatures by means of **multi-spot analyses** is used directly for monitoring, control and regulation of industrial processes. In large waste incineration plants, more than ten camera heads can be used asynchronously and simultaneously (**multi-head systems**). In the biomass and chemical area, application options include thermal treatment and drying processes. To achieve immediate orientation and manual evaluation of hazard and process conditions, the camera heads are typically operated as twin systems (infrared and visual camera) in the **visual overlay mode**, practiced successfully by InfraTec for years.

In the application spectrum of modern solar tower power plants with different operating principles, real-time spot measurement data are also used for energy-related working-point management of the power plant.



Monitoring of solar towers using InfraTec's innovative technology

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Besides the design of the thermography camera heads, selection and quality of the lenses play a decisive role. Here, a spectrum is covered from radiometric, temperature-measuring wide-angle lenses to **super-zoom lenses** (e.g. 25 to 150 mm) to high-temperature special telephoto lenses (265 mm).



The new VarioCAM® HD Z in the stainless steel protective housing

Reliable 24/7/365 operation of the systems requires great care in the design and instrumentation of data transmission routes. These range from industry-capable CAT-cabling to redundant, self-healing fibre-optic ring systems with corresponding industry signal converters. The overall system is designed accordingly with main systems and sub-distributors in CAD and EPLAN as well as CE tested.

Regarding the Human Machine Interface (HMI), **WASTE-SCAN 4.0** uses proven control system components. They allow to control several computers via KVM switch which is connected to the system. Remote diagnosis, support and service have always been a top priority at **InfraTec**. Here, the systems have suitable interfaces for remote diagnosis, which can include smartphone solutions for factory managers.



Use of InfraTec solutions in diverse power plants