

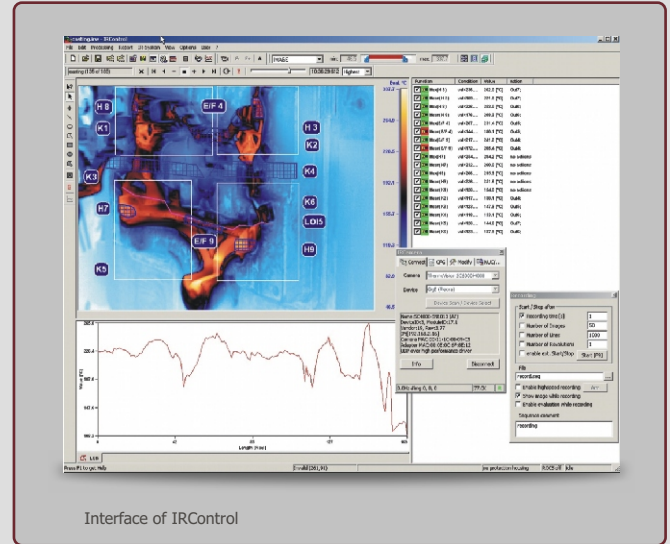
IRControl -

The Software Solution for Infrared Image Processing

- Analysis of thermal images for industrial automation, process and quality control
- Optimized for real-time applications
- Graphical user interface for easy generation of application-specific solutions
- COM / DCOM automation interface for remote control and data transfer

Infrared image processing with IRControl

IRControl is a software solution for infrared image processing in real-time. Therefore an infrared camera records thermal images of workflows. The software analyses the IR images using pre-defined workspaces, which are applicable for measurement, analysis and control tasks. With its different versions and several extension options, IRControl is easily adaptable to most customer requirements. This means IRControl is the ideal solution for all industrial automation, R&D and other challenging applications, where precise temperature control is of high importance.



Interface of IRControl

Graphical User Interface

Image View

- Live-stream of IR images
- Configuration of AOIs
- Adjustment of contrast and choice of color palettes
- Display of differential images
- Display of masks for template-matching

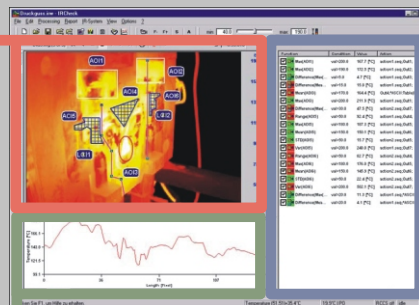


Diagram View

- Display of temperature profiles
- Choice of AOIs








Work Space

- Definition of measuring, analysis and control functions
- Display of functions, measurements and thresholds
- Signalization of complied conditions

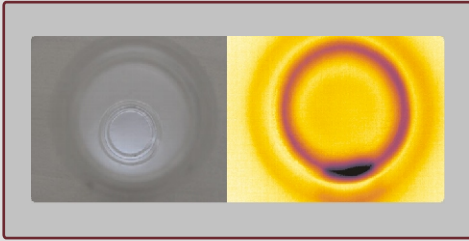
Versions & Features

	IRControl Basic	IRControl Standard	IRControl Professional
Offline analysis of infrared image data	supported	supported	supported
Support of uncooled infrared cameras	-	supported	supported
Support of High-End-infrared cameras	-	-	supported
IRCalib - calibration tool for high-end infrared cameras	-	-	optional
Online superframing	-	-	optional
OPC server	-	optional	optional
Multi-instance	-	optional	optional
IRDomeControl (pan tilt support)	-	optional	optional

Main Features of IrControl

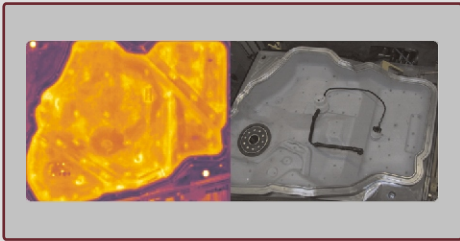
-  Graphical user interface for easy creation of application-specific workspaces
-  Very flexible measuring and analysis functions, inclusive emissivity adjustment and image subtraction
-  Integrated script-engine for the creation of Macros for solving complex inspection processes
-  OPC server support for visualization of process data by OPC standard V1 & V2
-  High-speed recording of image sequences and measuring values
-  Remote control and data transfer via COM / DCOM automation interface
-  Field of view enlargement by operation of the IR camera on a pan-tilt system

Customer-specific solutions with IRControl



Packaging control

A long shelf-life for food and medical products can only be guaranteed by a proper insulated packaging. Damaged packaging very often shows an abnormal thermal behavior around the area with a defect. These faults can be localized with the help of an infrared camera together with IRControl. If discrepancies are detected, the system can be setup to send automatic control commands to readjust its parameters.



Mould monitoring

Thermoforming or pressure casting are techniques often used for the manufacturing of plastic parts. IRControl can help, together with an infrared camera, to measure the complete surface temperature and compared the obtained values with pre-defined set-points. If deviations are found, the system can send automatic control commands to regulate its heating elements.



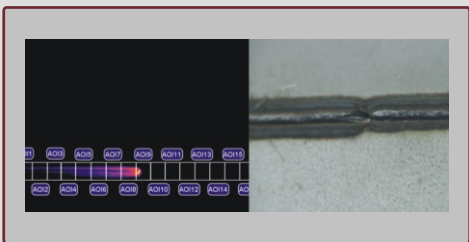
Inspection of heating elements

IRControl, together with an Infrared camera, is a suitable package for the inspection of electronic heat elements. Typical applications are the analysis of the heat propagation or the localization of defects. For example, a partially damaged element can cause a local increase in temperature due to a higher current density. On the contrary, a heavy damaged element can interrupt the current circuit leading to a total breakdown of the heating.



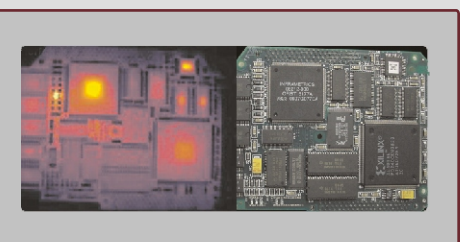
High-Speed Recording

IRControl, in combination with a high-speed infrared camera, supports the recording of infrared images at high-speed. The recording can be carried out with an image rate of up to 1000 images per second. IRControl assures the proper recording of all thermal images, even over larger periods of time.



Control of welding processes

IRControl, together with a suitable infrared camera, can control the quality of welding processes, even while the welding is being carried out. The system can detect defects based on the analysis of the temperature distribution and can generate control commands or alarm signals automatically. These capabilities, among others, make IRControl an ideal solution for the online monitoring and control of welding processes.

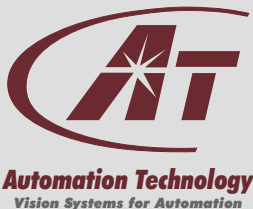


Electronic component inspection

The efficiency and functionality of PCBs and semi-conductors can be checked by their emitted thermal radiation. To do this, the components are excited with a pulsed current while an infrared camera controlled by IRControl records their thermal response. IRControl helps detect hotspots (or cold-spots) due to wire defects, etc. and provides important feedback to help correct manufacturing errors and optimize the production process.

Technical Specifications

Infrared cameras	
Supported Infrared cameras	<ul style="list-style-type: none"> → FLIR Systems A-Series (A615, A315, A310, A300) → FLIR Systems SC-Series (SC8400, SC7000, SC6550, SC5000, SC4000, SC3000, SC2000, SC325, SC305, SC660, SC620, SC325, SC305) → IRSmartEye640, IRSmartEye320, IRSmartEye 320 GEV → Omega, Phoenix, Merlin, Agema900, CEDIP, etc.
Camera interfaces	Gigabit Ethernet, Firewire (IEEE1394), IRFlashLink, parallel interface (FLIR Systems) and digital framegrabber ITI IC2-DIG16D
Camera control	IRControl integrates all control functions and parameters of the relevant cameras (e.g. focus, measuring range, recalibration)
Hardware requirements	Standard PC with high operating speed for real-time processing
Supported operating systems	Windows 7, XP, 2000, NT4
Image processing	
Image formats	All image formats of the supported cameras with full frame rate and dynamic range
Image pre-processing	<ul style="list-style-type: none"> → Emissivity correction performed separately for each image pixel → Image subtraction → Adjustable temperature range for the implementation of evaluations → Template-matching
Operating states	<ul style="list-style-type: none"> → Online: evaluation of the camera's live image → Offline: for analyses of recorded images and image sequences
Display of thermal images	Autoadjust or manual scaling of the displayed temperature range; 35-colour palette
Display	Thermal image with overlay, temperature profile, measuring program
Measuring program	
Input	Via graphical user interface
Areas of interest	Point, line, polyline, contour, rectangle, polygon, ellipse, circle, temperature cursor; number unlimited
Measuring functions	Minimum value, maximum value, range, mean, variance, standard deviation
Combination of readings	Total, difference, amount, minimum value, maximum value
Comparison with target values	Less than, more than, equal to, within a defined range, outside of a defined range
Definable actions	<ul style="list-style-type: none"> → Control of digital ports → Storage of individual images or sequences → Storage of readings in a file
Measuring-program management	Storage of all settings as a workspace file
Remote control facility/ data transfer / automated program execution	
<ul style="list-style-type: none"> → COM / DCOM automation interface for remote control and data transfer, e.g. as part of process control → Makro-engine for fully automatic processing of complex analytical sequences 	
Report functions	
<ul style="list-style-type: none"> → Automatic report generation with display in Microsoft Excel → Export of thermal images with and without overlay → Automatic logging of readings in a file 	
Options	
<ul style="list-style-type: none"> → Use as OPC server according to OPC specifications OPC DA V1 & V2 (OPC-DataAccess) → Retrace of camera positions with a pan-tilt-system, incl. Measuring plan call up 	
Functions for additional hardware	
Monitoring and control functions for camera enclosures of the IRCamSafe-Series of Automation Technology	



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