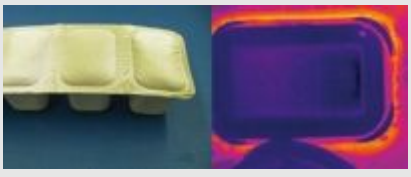
Application Examples

Packaging Control

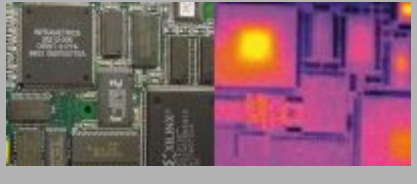


A long shelf-life for food and medical products can only be guaranteed by a proper insulated packaging. Damaged packaging very often shows an abnormal thermal behavior around the area with a defect. These faults can be localized with the help of an infrared camera together with IRControl. If discrepancies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

Thermoforming

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.

Elektronic 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 exited with a pulsed current while an IR camera controlled by IRControl records their thermal response. IRControl helps to detect hotpots (or cold-spots) due to wire defects, etc. and provides feedback to help correct manufacturing errors and optimize the production process.

Highspeed-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

Together with a suitable infrared camera, IRControl 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.

Inspection of Heating Elements

IRControl can be used for the inspection of electrical 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.

Technical Specifications

Infrared Cameras	
Supported Cameras	Cooled and Uncooled IR Cameras of Various Manufacturers
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 8, Windows 7, Windows XP
Image Processing	
Image Formats	All Image Formats of the Supported Cameras with Full Frame Rate and Dynamic Range
Image Pre-Processing	- Emissivity Correction performed separatly for each Image Pixel - Image Subtraction - Adjustable Temperature Range for the Implementation of Evaluations - Template-Matching
Operating States	- Online: Evaluation of the Camera's Live Image - Offline: Analysis of Recorded Images and Image Sequences
Display of Thermal Images	- Auto-Adjust or Manual Scaling of the Displayed Temperature Range - 35 Color Palettes
Display	Thermal Image with Overlay, Temperature Profile and 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	- Control of Digital Ports - Storage of Inividual 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	
- COM / DCOM Automation Interface for Remote Control and Data Transfer, e.g. as Part of Process Control - Macro-Engine for Fully-Automatic Processing of Complex Analytical Sequences	
Report Functions	
- Automatic Report Generation with Display in Microsoft Excel - Export of Thermal Images with and without Overlay - Automatic Logging of Readings in a File	
Options	
- Use as OPC Server According to OPC Specifications OPC DA V1 & V2 (OPC-Data Access) - Retrace of Camera Positions with a Pan-Tilt System, incl. Measuring Plan Call-Up	
Function for Additional Hardware	
Monitoring and Control Functions for Camera Enclosures of AT - Automation Technology's IRCamSafe-Series	