

Software Family IRBIS® 3

Special Software for Convenient Camera Control
and Analysis of Thermographic Images

INFRAtec.

Numerous analysis functions and tools

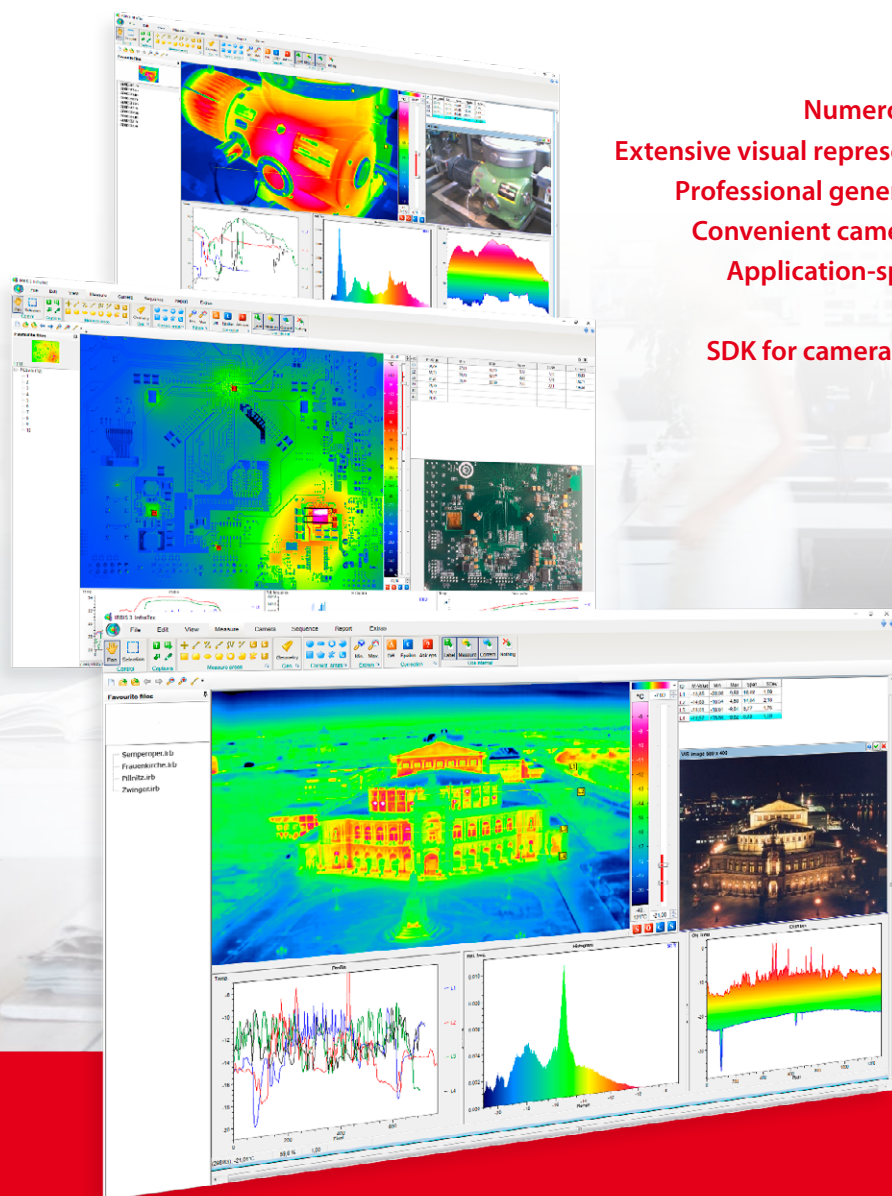
Extensive visual representations of measurement data

Professional generation of thermography reports

Convenient camera control and data acquisition

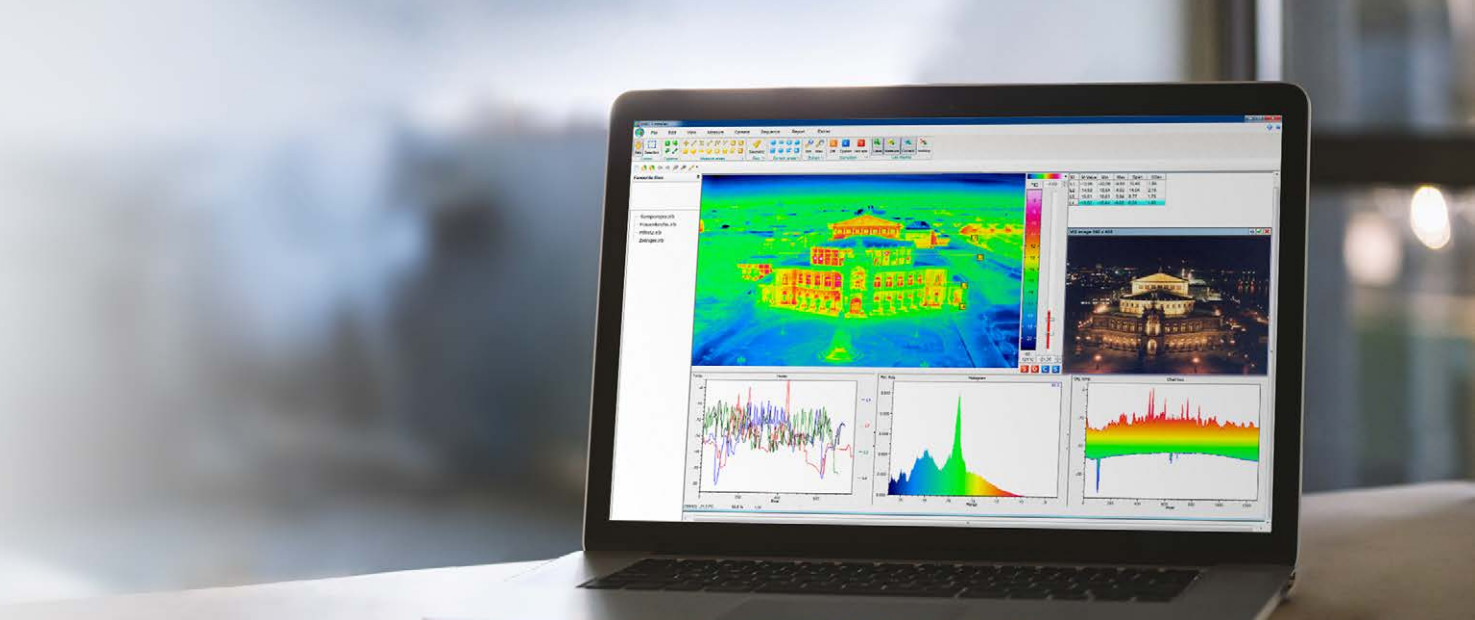
Application-specific configurations by means
of modular concept

SDK for camera integration to existing systems



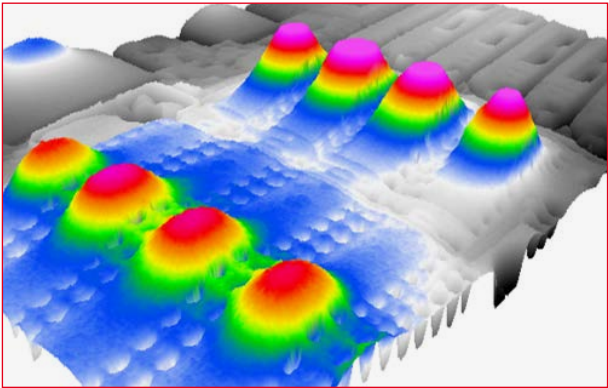
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Guarantees Working Efficiency



IRBIS® 3 – The New Dimension of Thermographic Analysis

The state-of-the art IRBIS® 3 software family designed by InfraTec represents the ideal tool for fast analysis of thermographic image data and convenient drafting of thermographic reports. Packages of different performance levels are available with application-specific expansion modules. The modular software concept allows for customised configuration and thereby facilitates its application in any field such as automotive industry, aerospace, electronics and electrical engineering, medicine and environmental studies, metallurgy, chemical and plastics industry, science and development.



3D view of the thermal image – provides a different view of things

The Extensive Software Family

IRBIS® 3 Analysis Software

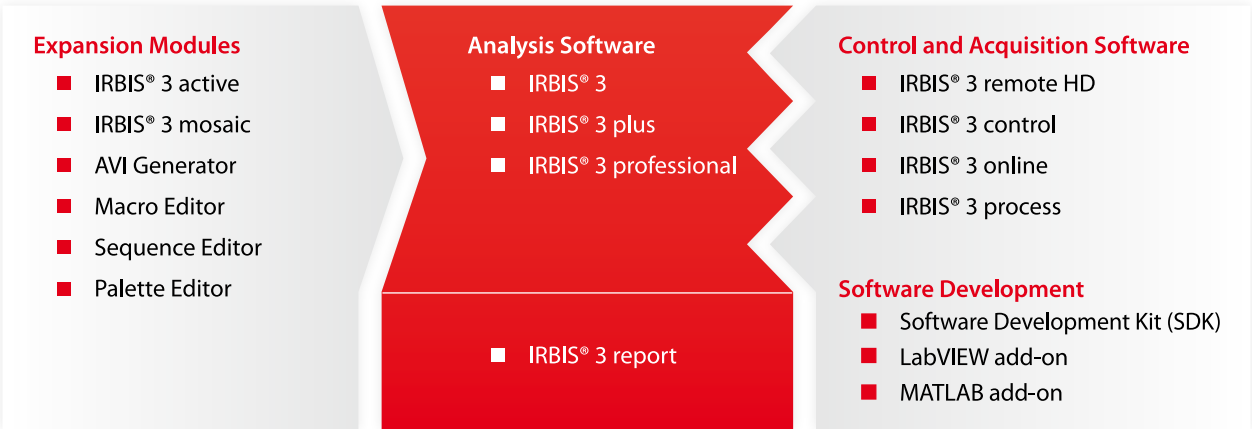
IRBIS® 3 is a complete and convenient tool for the analysis of your thermographic data, which is available in the packages IRBIS® 3, IRBIS® 3 plus and IRBIS® 3 professional. With a variety of automated, customisable features, it helps you to efficiently analyse measurement data and create comprehensive and meaningful thermography reports.

IRBIS® 3 Expansion Modules

The software packages can optionally be upgraded with useful additional functions.

IRBIS® 3 Control and Acquisition Software

The four modules of the IRBIS® 3 control and acquisition software allow the infrared camera to be controlled directly from the computer or tablet PC. The acquisition of the data is action-driven or time-controlled.



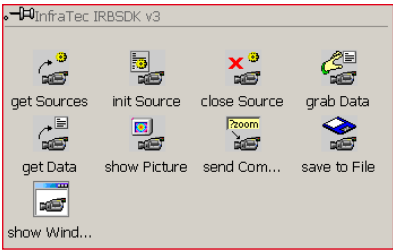
SDK Integration in MATLAB and LabVIEW (MS Windows-based)

Two SDK versions – Perfectly adapted for online and offline data analysis

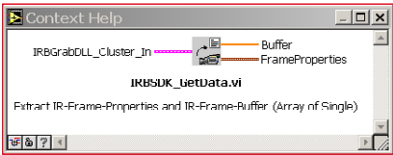
- **irbgrab-SDK:** Integration of radiometric temperature data based on the live data of the camera (via MS Visual Studio C++ VS 2017, C#, Free Pascal, Python)
- **irbacs-SDK:** Analysis of IRB data (via MS Visual C++ 2017, Free Pascal)
- Usable as add-on in MATLAB and LabVIEW (irbgrab-SDK)

MATLAB – High performance with native integration

- All functions of SDK are available in MATLAB
- Comprehensive access to thermographic camera functions (acquisition of calibrated temperature data, full control of all specific camera features)
- Maximum performance by use of native integration
- Better performance and additional benefits by saving data in IRB files (compatible to IRBIS® 3, compressed storage of radiometric data, etc.)



LabVIEW add-on provide new additional functions for SDK access



Data access with the function „get Data” in LabVIEW

Software User Interface

1 Navigation

The holistic concept and familiar symbols ensure intuitive handling. The user interface can be customized and saved as part of the settings. This allows users to keep an overview of the operating functions at any time.

2 Favourite Files

The list of favourites clearly arranges all opened thermograms and sequences. In combination with a preview image this allows easy and direct access to each thermal image or sequence.

3 Thermogram

Powerful integrated measuring and editing functions facilitate a comprehensive and fast analysis of digital thermograms. Numerous automatic functions for image correction and optimisation support the user in clearly recognising and visualising thermal details of measured objects.

4 Diagrams

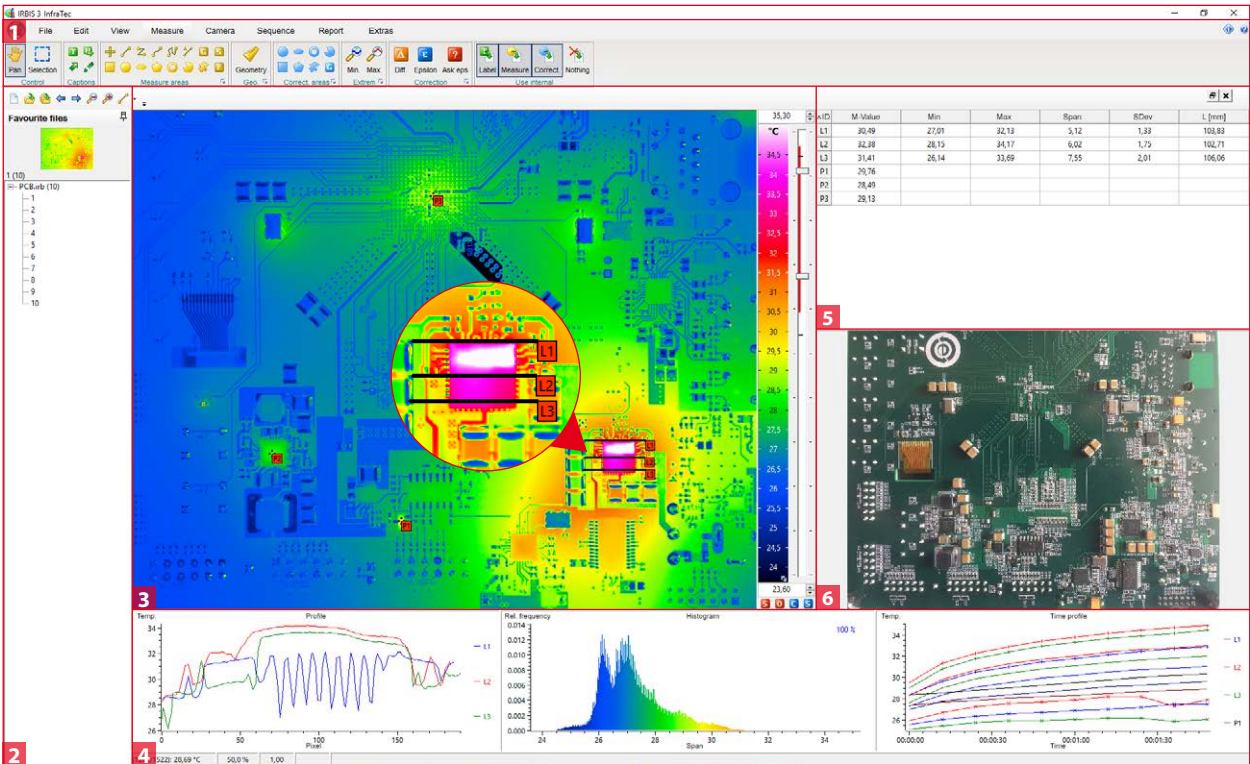
Numerous two and three-dimensional diagrams help to visualise and export temperature data of defined measured areas from individual images or image sequences.

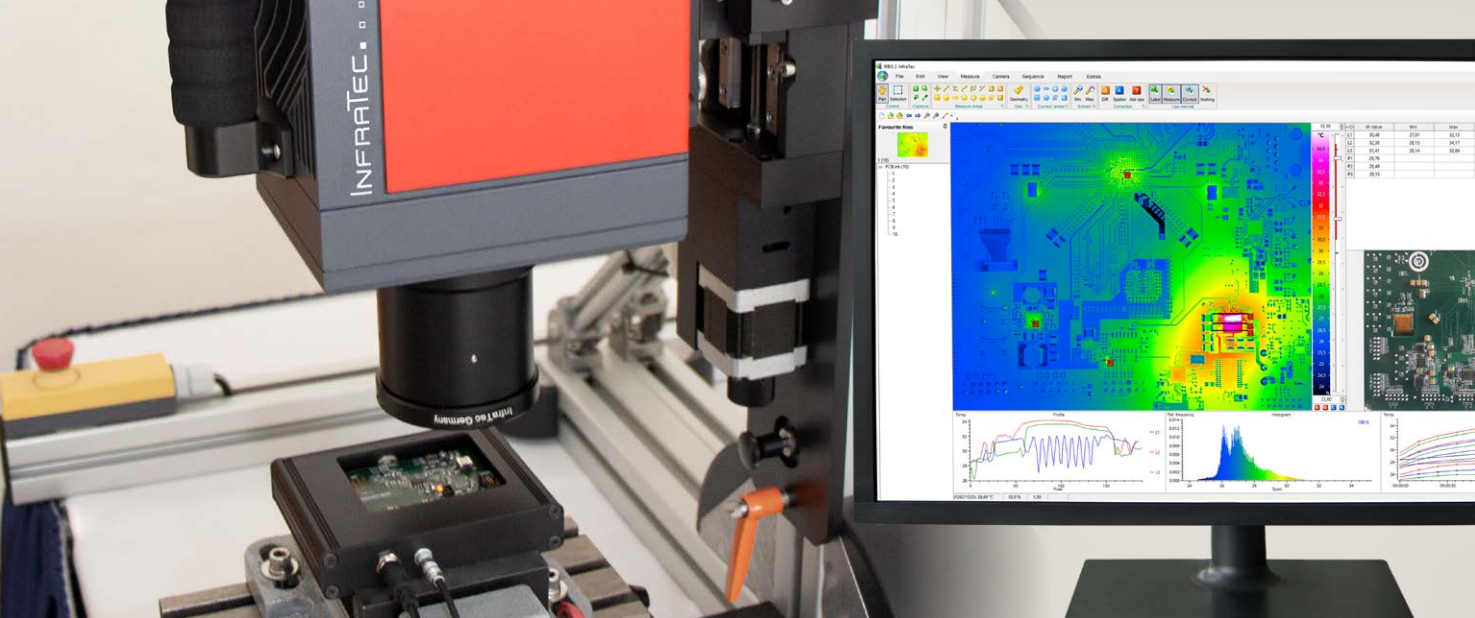
5 Table of Measured Data

User-defined measured data and statistical parameters of thermograms or their partial areas can be presented very clearly in tabular form, which can be customised by the user.

6 Visual Image

Visual images recorded in parallel either by an external camera or digital camera integrated in a thermographic camera are optionally added to the respective thermogram automatically or at the touch of a button. Both images can be merged, too. This serves to clearly allocate measuring scenarios or problem spots.



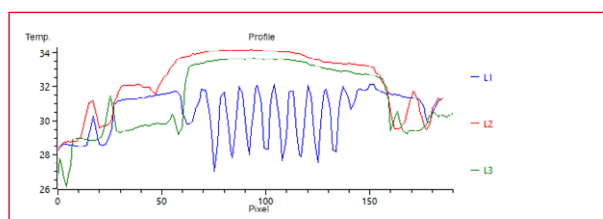


Range of Functions of the Software Packages

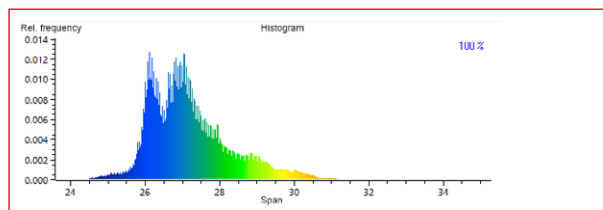
The IRBIS® 3 software offers three performance levels. IRBIS® 3 plus and IRBIS® 3 professional contain the functions of the previous level and additional ones that are based on it. This is a selection of them.

IRBIS® 3

- Merging visual and infrared images
- Manual and automatic temperature range selection
- Temperature profiles along / across any lines / measured areas
- Autom. indication of max. and min. temperature / mean value
- Global and selective correction of emissivity
- Basic image editing and measuring functions
- Integrated MS Word-based report function
- Image enhancement by digital filtering
- Comprehensive isotherm editor



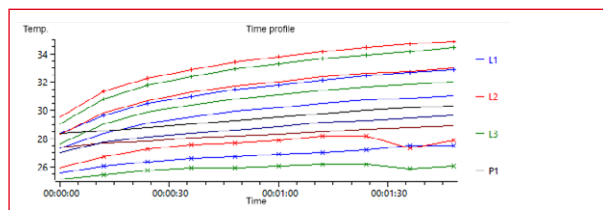
Temperature profiles of defined lines (L1 – L3)



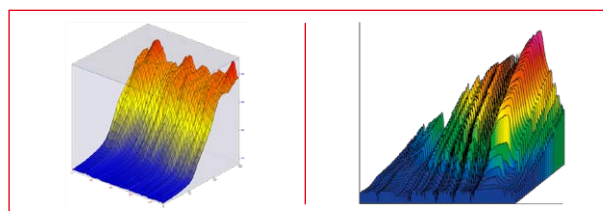
Histogram of the temperature distribution in the complete thermogram

IRBIS® 3 plus

- Editing and analysing of thermographic image sequences
- 3D temperature profile display
- Pre-defined models for emissivity correction
- Temperature-time-diagram / profile-time-diagram
- Differential image display and differential spot display
- Numerous statistical, image editing and measuring functions
- AVI Generator – conversion of thermographic video sequences
- Accumulation of recorded thermographic images
- Export of measuring data (csv, ASCII, etc.)



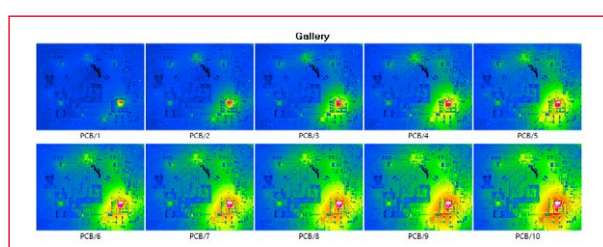
Temperature-time sequence of the defined measurement objects



3D profile of the thermogram and temperature profile

IRBIS® 3 professional

- Extended and specific models for correcting emissivity, incl. automatic correction of emissivity for each pixel
- Geometric measurement within the thermogram
- 3D thermographic images and sequences display
- Expandable for specific experimental setups / SDK
- Parallel analysis of several thermograms and sequences
- IRBIS® 3 mosaic, Macro, Sequence and Palette Editor
- Data export into shareable .exe-file
- Multiple temperature scales per image



Gallery view of the recorded sequence

Report Software – IRBIS® 3 report

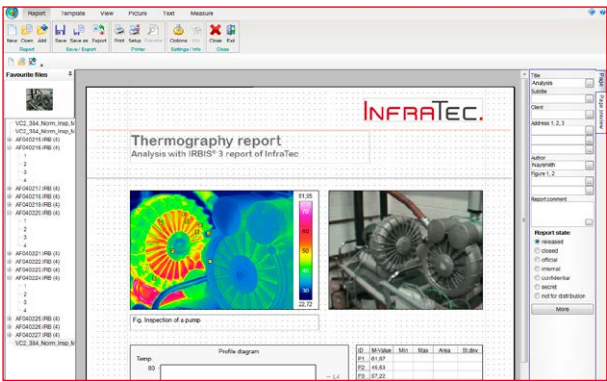
The stand-alone thermography software IRBIS® 3 report is part of the software family IRBIS® 3 and enables time-efficient report generation by using variable templates. Even the largest amounts of data, which are frequently generated by professional thermographers, can be easily and quickly documented as a report in PDF format.

A comprehensive set of analysis tools allows measuring scenarios to be processed, analysed and documented conveniently and effortlessly. Apart from routine analyses of thermographic images, IRBIS® 3 report also meets complex demands for automation.

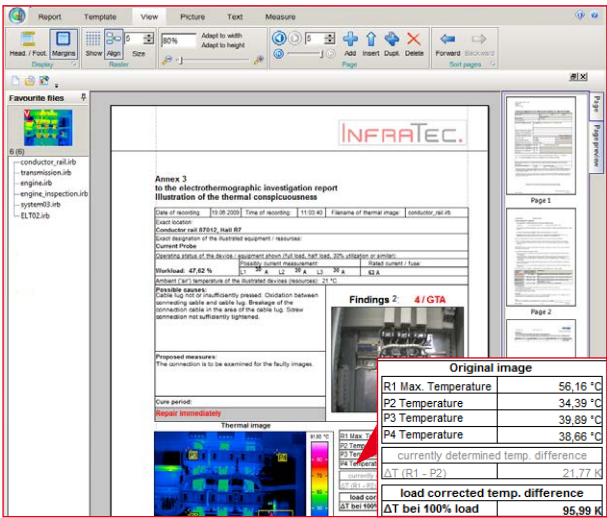
Features of IRBIS® 3 report

- Automated analysis and correction of thermographic images
- Powerful features and easy handling
- Wide range of prepared report templates
- Easy setup of customized report templates
- Storage of report properties in the style sheet
- Subsequent alteration and extension of completed reports
- Deposit of calculation rules using the formula editor
- Automated and manual transfer of camera parameters

Thus IRBIS® 3 report will assist you in solving everyday thermographic jobs professionally with a minimum in time and effort. The professional thermography software IRBIS® 3 report is available for thermography systems offered by InfraTec.



Thermography report, for example pump



Integrated template with automated alarm indication

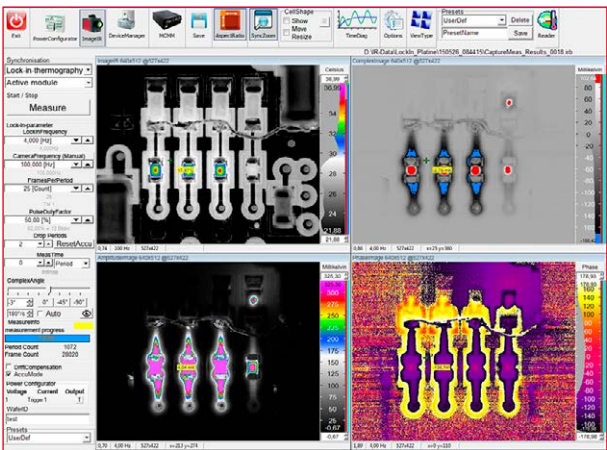
Active Thermography – IRBIS® 3 active

The thermography software IRBIS® 3 active by InfraTec is a modern and universally usable tool for non-destructive material testing (NDT) by infrared thermography.

- Convenient data analysis of image sequences – online and offline
- Algorithms independent of emissivity
- Analysis with different active thermography methods: **Quotient method, pulse phase thermography, Lock-in Thermography**
- Storage of input parameters for different test objects
- Online and offline analysis

Analysis Methods of IRBIS® 3 active

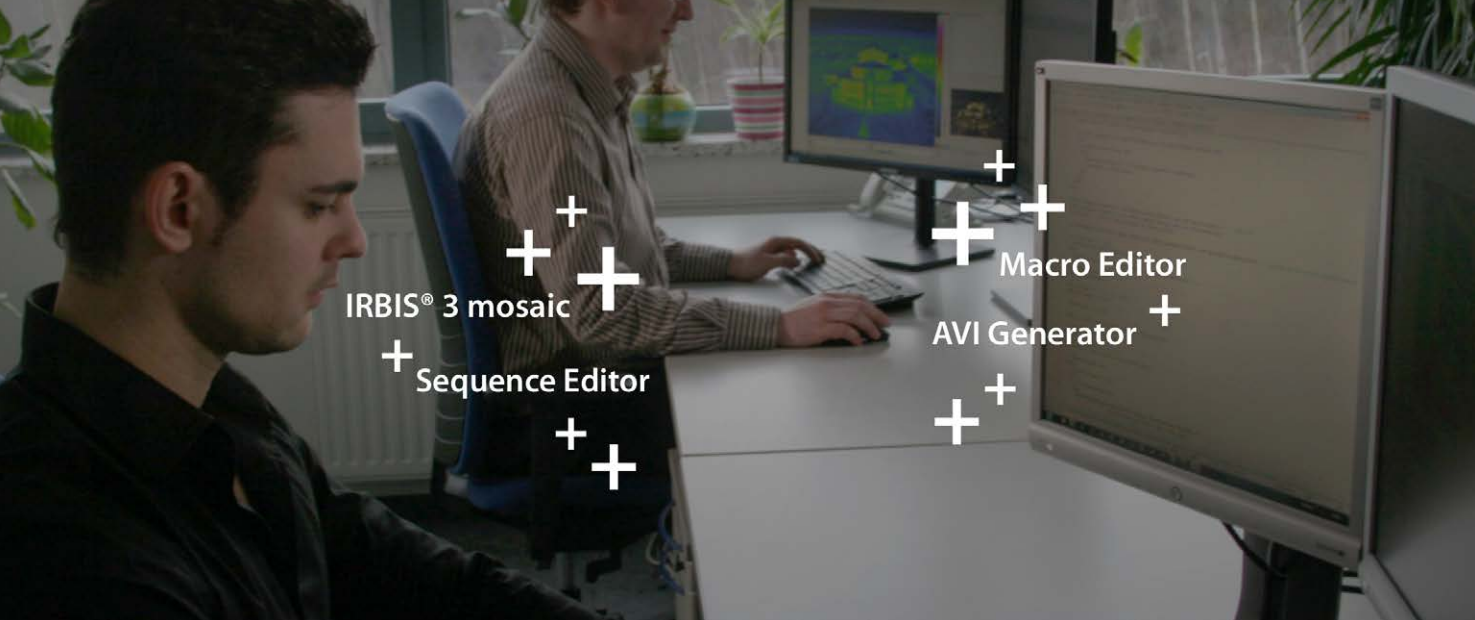
- **Quotient method:** The heat flow is analysed in the test object by means of the increase or decrease in the surface temperature
- **Pulse phase thermography (PPT):** The temperature curve is analysed depending on different frequencies ($n = 1, 2, 3, \dots$). One amplitude image and one phase image is established for each frequency
- **Lock-in Thermography (LIT):** The sequences of periodical excitation of the test object is analysed



Choose different views such as layout, time with domain, amplitude and phase image



How does IRBIS® 3 active work?
Please scan this QR code and watch the video of a test measurement with Active Thermography.

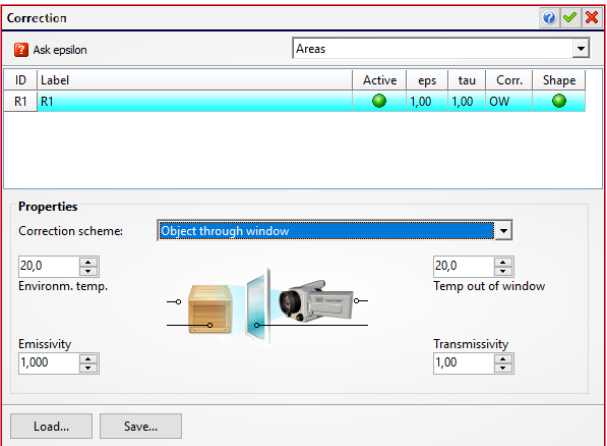


Modules and Functions – Tailored to Your Application

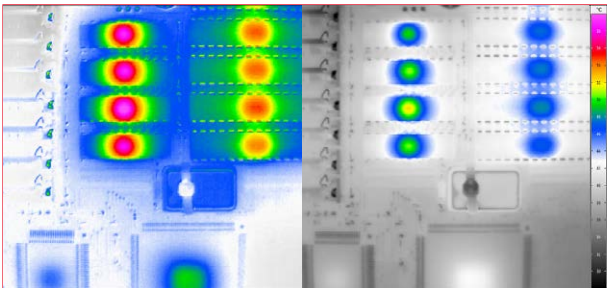
Correction Models

All practice-oriented correction models come with the software as descriptive diagrams. With the help of these diagrams, users can simulate the respective measurement situation and consider sources of error – such as interfering radiation from

the environment or damping properties of the measurement path – in the temperature calculation (in the calculation instructions). In this way, incorrect measurements can be avoided safely. Among other things, direct and indirect emissivity correction pixel-by-pixel is available. The IRBIS® 3 software family offers various models for the correction of emissivity, whereby thermograms can be corrected entirely for defined subregions or automatically pixel-by-pixel.



Emissivity correction model, example



With (left) and without (right) pixel-by-pixel emissivity correction

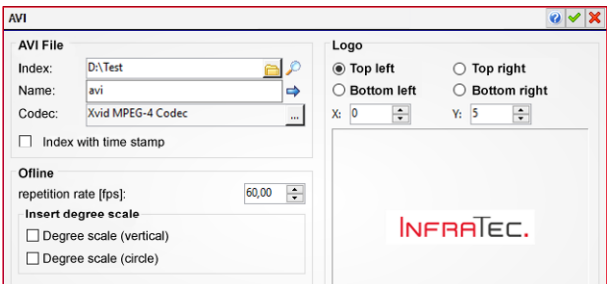
Macro Editor

Extensive sets of commands can be summarised by the user into a macro without any special programming skills. Complex and repetitive analysis processes can therefore be performed in a timesaving and automated way.



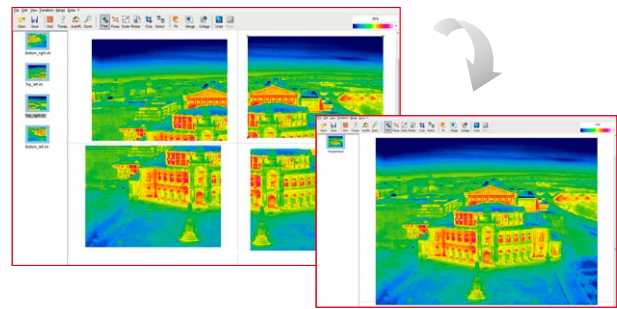
AVI Generator

This module enables the automatic export of thermal image sequences or several single images into descriptive AVI films. It is also possible to define a user-defined partial area of the thermogram for AVI export. The resulting film sequences can be played in any conventional media player.



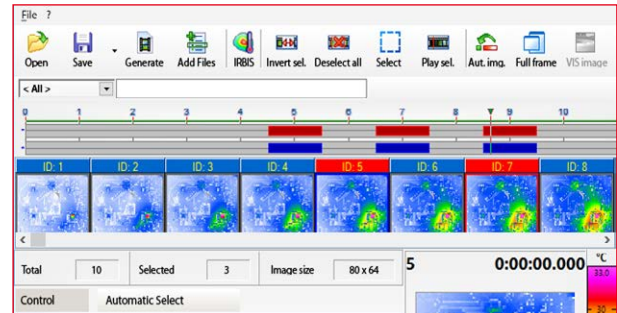
IRBIS® 3 mosaic

If a measuring scenario consists of several individual images, IRBIS® 3 mosaic will help you to produce quickly and easily a combined image. The software will automatically look for places of geometric overlapping and will put them together. The resulting thermogram can be further analysed with all its measured data.



Sequence Editor

The sequence editor allows you to manually or – according to user-defined criteria – automatically select thermographic data from complex thermal image series as well as to filter series of images. In this way, users reduce the original data to the level of information appropriate to the task at hand and save the individually created material with a new name.



Control and Acquisition Software

IRBIS® 3 remote HD

Linking Thermographic Cameras with PCs or Notebooks

- Remote control of the camera-operating functions via a graphic interface
- Real-time visualisation of digitally transferred thermal images
- Storage of real-time thermographic video sequences

IRBIS® 3 control

Data Acquisition from Digital Infrared Thermographic Images

- Time and temperature-controlled acquisition of digital thermographic data up to 10 Hz
- Extensive analysis and evaluation of the transferred thermal images
- Numerous online temperature-measuring functions: Identification of measuring spots and measuring areas, global correction of emissivity by area or spot within the online thermal image

IRBIS® 3 online

High-speed Data Collection of Digital Infrared Thermographic Images

- Digital data are collected at the camera's maximum frame rate
- Online differential image mode and temperature profile display
- External trigger option, retrigger, multiple signal sequence, pretrigger
- Freely definable temperature trigger
- Parameterization of measuring fields and threshold values, alarm function

IRBIS® 3 process

Extension Module for Convenient Process Control

- Permits intensity- or temperature-dependent control of processes via digital or analogue inputs and outputs
- Trigger and alarm function for freely definable signal thresholds
- Utilisation of different I/O cards for connecting to the processes
- Individual extendability by specific project solutions

IRBIS® 3 vision

Parallel Recordings of Data Streams

- Parallel recording of data streams from multiple infrared cameras and VIS cameras
- Synchronous data acquisition of up to eight cameras
- Additional storage of external data, e.g. GPS data

Each IRBIS® 3 module is based on the extent of functions of the previous level of software

Software functions	IRBIS® 3	IRBIS® 3 plus	IRBIS® 3 professional
Analysis software			
Multi-lingual interface	x	x	x
Change palette selection and temperature display range	x	x	x
Display editing windows simultaneously	1	1	4
Display/add/edit real image	x	x	x
Play/add/edit audio comment	x	x	x
Merging visual and infrared image	x	x	x
Integrated WORD-based report function	x	x	x
Image export/measured data export into MS WORD, PDF, TIFF, BMP, JPEG, ASCII	x	x	x
Image editing functions (interpolation, rotate, reverse, etc.)	x	x	x
Mirror/distort thermal image	–	–	x
Measured areas (spot, line, polygon, rectangle, circle, ellipse)	x	x	x
Display table of measured date, parameters and comments	x	x	x
Temperature-profile-diagram	x	x	x
Measured areas (curved line, freehand line, circular ring, segment, freehand)	–	–	x
Image accumulation	–	x	x
Differential image display and differential spot display	–	x	x
Various statistics functions, histogram	–	x	x
Display 3D thermogram	–	–	x
Display/define isotherms	5	10	20
Improve image by digital filtering	3	3	5
Determine emissivity	x	x	x
Correction of emissivity (global, laminar, selective)	x	x	x
Pre-defined models for correcting emissivity	–	x	x
Models for automatically correcting emissivity by pixel	–	–	x
Adoption of GPS coordinates	–	x	x
Geometric measurement within the thermogram	–	x	x
Play, thin out, store image sequences	–	x	x
Temperature-time-diagram/profile-time-diagram	–	x	x
3D temperature profile display	–	x	x
Data export in shareable .exe format	–	–	x
Multiple temperature scales per image	–	–	x
Expansion modules			
IRBIS® 3 active/active online	–	o	o
IRBIS® 3 mosaic – add-in of single thermal images	o	o	x
AVI Generator (add/edit/play)	o	x	x
Macro Editor (setup/edit/activate)	–	o	x
Sequence Editor	–	o	x
Palette Editor (freely defined colour palettes)	o	o	x
Control and acquisition software			
IRBIS® 3 remote HD	o	o	o
IRBIS® 3 online	–	o	o
IRBIS® 3 control	–	o	o
IRBIS® 3 process	–	o	o
IRBIS® 3 vision	o	o	o
Add-on software			
IRBIS® 3 report	o	o	o

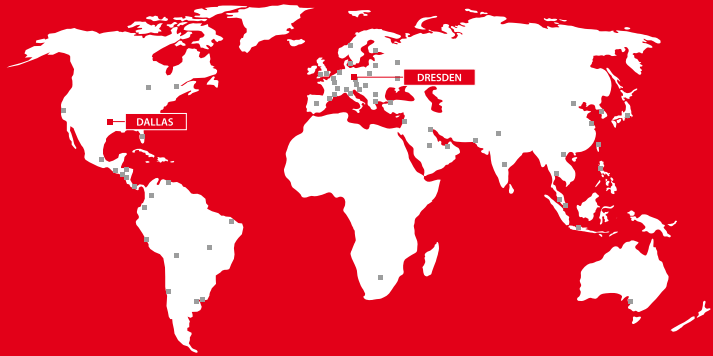
Caption: – = not included | o = optionally available | x = included

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