

CA Series Scientific-Research Grade Thermal Analyzer

Specification

English Version (V3.0)

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Contents

| | | |
|-----|---|----|
| 1 | Introduction | 2 |
| 2 | Features..... | 3 |
| 3 | Powerful Featured Functions of Software | 7 |
| 3.1 | A variety of graphical measurement modes for analyzing temperature changes..... | 7 |
| 3.2 | Emissivity Setting by Area..... | 7 |
| 3.3 | Isotherm Analysis..... | 7 |
| 3.4 | Data Analysis | 8 |
| 3.5 | Curve Analysis | 8 |
| 3.6 | Modular Windows | 8 |
| 3.7 | Emergency Response Plans..... | 9 |
| 3.8 | Multidimensional Data Analysis..... | 9 |
| 4 | Application Scenarions..... | 11 |
| 5 | Specifications: | 14 |
| 6 | Accessories..... | 16 |

1 Introduction

DytSpectrumOwl CA Series Scientific-Research Grade Thermal Analyzer (“CA”) uses the infrared thermal imaging principle to display the surface temperature changes of objects, and can conduct data storage and reliability analysis of measurement results without time limit. The Thermal Analyzer integrates imaging, temperature measurement, analysis and data collection, providing effective test data for education, scientific research and factory inspection.



2 Features

- Adopting a high quality thermal imaging detector; wide temperature measurement range: $-20^{\circ}\text{C}\sim 550^{\circ}\text{C}$



- Angle adjustment frame, with the adjustment mode designed according to experimenters' custom



- Large angle wide-angle and dual micro-lens can be quickly changed



- Target objects under test of different sizes are considered; the base plate can be disassembled or spliced



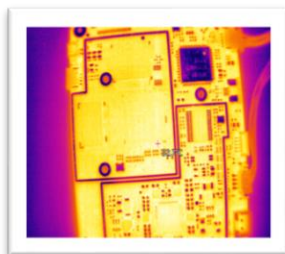
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- Direct connection via USB; image transmission without delay; simple connection and ease of used



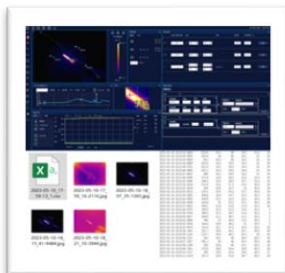
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- Can be connected to power analyzers and temperature sensors for multi-dimensional analysis of ambient temperature, voltage, current and temperature data



- High resolution image; unique DDE algorithm; observation of very small objects



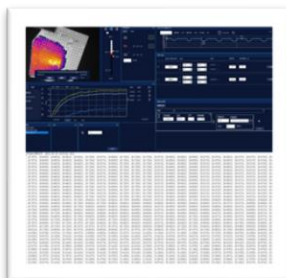
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- With the professional analysis software, smaller details and richer contents can be observed, recorded and detected



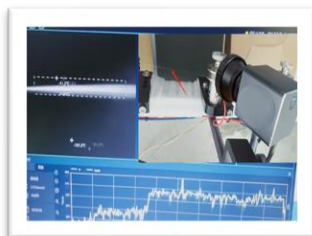
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- Automatic upgrade of software: the new version of software can be received at any time



- Full radiometric thermal video can be observed in real time, or full radiometric thermal video can be recorded for offline analysis



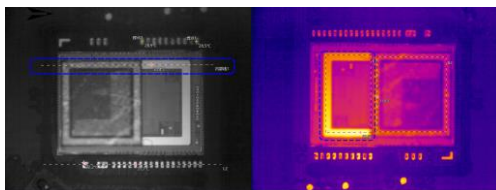
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- With a micro-lens, temperature changes of $\varphi=25\mu\text{m}$ small objects can be observed



3 Powerful Featured Functions of Software

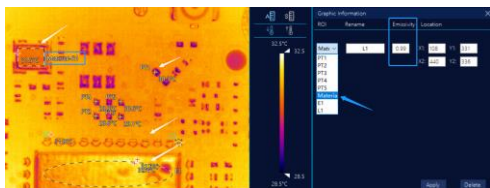
3.1 A variety of graphical measurement modes for analyzing temperature changes

Drawing of a variety of graphics on the video image (point, line, polygon, ellipse, point by point temperature on the line, uniform screen segmentation of a variety of measurement graphics) is supported to refine the object being observed.



3.2 Emissivity Setting by Area

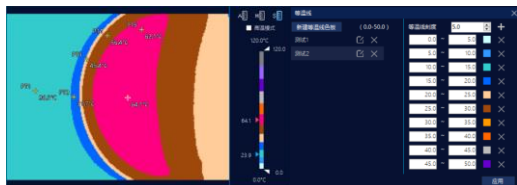
Emission rates can be set for different areas at the same time to ensure the accuracy of temperature measurement of different materials.



3.3 Isotherm Analysis

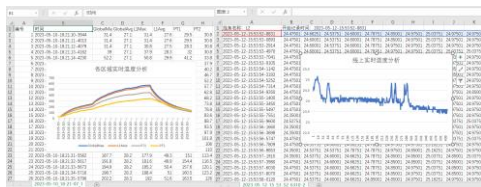
The isotherm can cure colors of different temperatures, and can display the set temperature range with a fixed color, which is

convenient for comparison between different experiments.



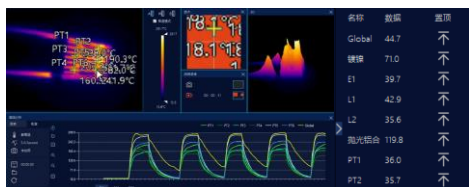
3.4 Data Analysis

Real-time data of various areas and online real-time temperature data can be recorded for unlimited time, and saved as EXCEL tables for chart making.



3.5 Curve Analysis

Curve analysis shows the temperature state of the product over time, and realizes real-time analysis of the temperature rise/temperature reduction state of the product.



3.6 Modular Windows

The software adopts the modular window design, with which

you can open and run functions through the window menu.



3.7 Emergency Response Plans

Different emergency response plans can be set. In case of an incident, the software automatically handles it. For example, when the temperature alarm occurs, you can set automatic video recording, automatic EXCEL data generation, automatic text marking and so on.



3.8 Multidimensional Data Analysis

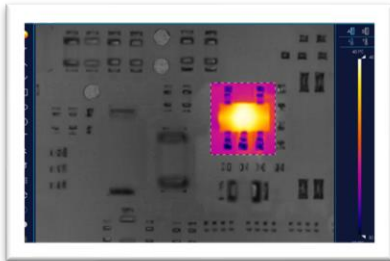
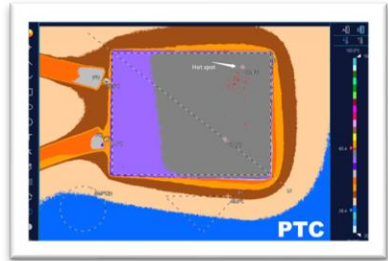
With the external ambient temperature sensor and power timing, the software can simultaneously collect and record the ambient temperature, voltage, current, and image and temperature and other multi-dimensional data of thermal imaging measurement equipment.



4 Application Scenarios

- Test and analysis of thermally conductive materials

Different temperature measurement ranges are set and the background is removed to observe the process of thermal conduction of materials.

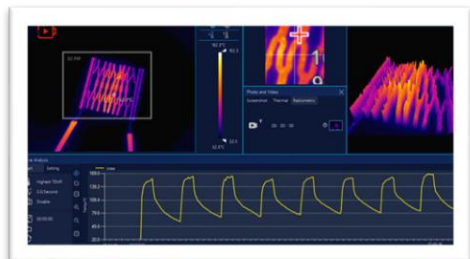


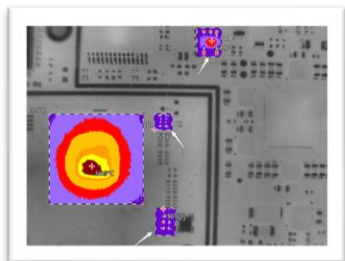
- Analysis of thermal fibers, integrated chips and other fine materials

The size of the real object observed in picture-in-picture mode is (1.5*3)mm, and 25um gold wires or smaller target objects in the chip can be observed with the micro-lens.

- Temperature control analysis of E-cigarette

Quickly tracking the heating rate and temperature of the atomizer



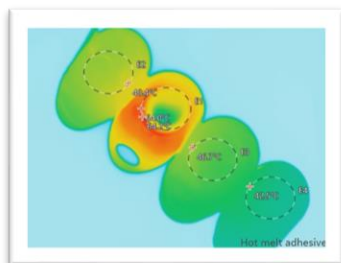
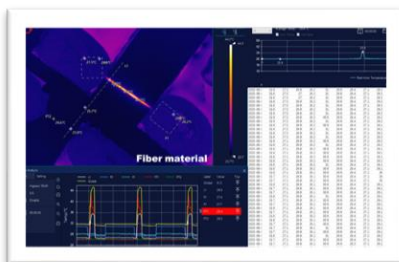


- **Thermal design analysis of circuit board**

When the circuit board chip heats up, users can check the components affected by the heat to adjust the layout.

- **Heat dissipation analysis of materials**

Video files with temperature data can be recorded for unlimited time, which can be used to repeatedly analyze the heat dissipation performance of materials and record reliability

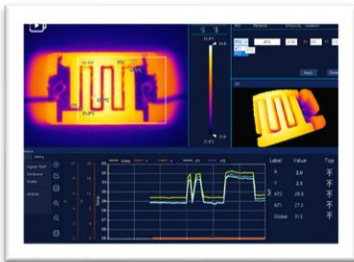
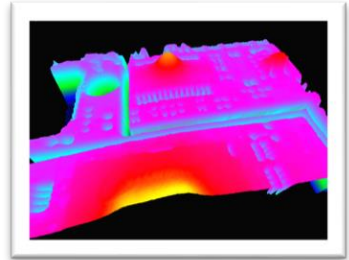


- **Quality analysis of products and parts**

Detecting temperature changes on a real-time basis, tracking the maximum temperature, minimum temperature and average temperature, and giving overtemperature alarms during automatic product processing.

- Circuit board pulse heating analysis

The thermal analyzer can quickly capture the occasional pulse heat emitted by some components on the circuit board due to failure.



- Analysis of temperature change process of heating materials under different voltages and currents

The heating rate, heating efficiency and heating temperature of heating wires, heating films and other materials under different voltages and currents can be quantitatively

5 Specifications:

| Parameter | CA-30 | CA-60 |
|----------------------------------|---|---|
| IR Resolution | 384*288 | 640*512 |
| NETD | <50mK@25°C, f#1.0 | <50mK@25°C, f#1.0 |
| Spectral Range | 8~14um | 8~14um |
| FOV | 29.2°X21.7° | 48.7°X38.6° |
| IFOV | 1.3mrad | 1.3mrad |
| Image Frequency | 25Hz | 25Hz |
| Focus mode | Manual focus | Manual focus |
| Working temperature | -10°C~+55°C | -10°C~+55°C |
| Macro-lens | Support | Support |
| Measurement and Analysis | | |
| Object Temperature Range | -20°C~550°C | -20°C~550°C |
| Temperature measurement method | Highest Temp.,Lowest Temp. and Avg Temp. | Highest Temp.,Lowest Temp. and Avg Temp. |
| Temperature measurement accuracy | ±2 or ±2% for -20°C ~120°C, and ±3% for 120°C~550°C | ±2 or ±2% for -20°C ~120°C, and ±3% for 120°C~550°C |
| Measuring distance | (4 ~ 200) cm | (4 ~ 200) cm |
| Temperature correction | Automatic | Automatic |
| Separate emissivity set | Adjustable within 0.1-1.0 | Adjustable within 0.1-1.0 |
| Image file | Full-temperature JPG thermogram | Full-temperature JPG thermogram |

| | | |
|-------------------------------------|---|---|
| | (Radiometric-JPG) | (Radiometric-JPG) |
| Video file | MP4 | MP4 |
| Full Radiometric Thermal Video file | dvt format, (opened with CA's software) | dvt format, (opened with CA's software) |

6 Accessories

Standard Components

| No. | Item | Quantity | Remarks |
|-----|--|----------|---|
| 1 | Baseboard | 1 | |
| 2 | Main support frame | 1 | |
| 3 | Cross-bar and main machine of thermal imaging camera | 1 | |
| 4 | Standard lens | 1 | When the device leaves factory, the standard lens is already assembled onto the main machine of the thermal imager. |
| 5 | Macro-lens | 1 | Interchangeable with the standard lens. |
| 6 | USB type C power and data cable | 1 | |
| 7 | Screws for the baseboard | 8 | In which, 2 screws are spare ones. |
| 8 | Extension support rod | 1 | |
| 9 | USB cable bracket buckle | 1 | |
| 10 | High pressure fan | 1 | Dust and other impurities can be removed from the surfaces of the main machine of the thermal imager and lens. |
| 11 | USB flash disk | 1 | Including the thermal analyzer installation software, assembly video, etc. |

Optional Accessories

| | | |
|---|--------------------|---|
| 1 | Temperature sensor | 1 |
|---|--------------------|---|

| | | |
|---|-------------|---|
| 2 | Power meter | 1 |
|---|-------------|---|