DJI Thermal Analysis Tool 3

User Guide

V1.4 2022.11

dji

Introduction

The DJI Thermal Analysis Tool 3 can be used to analyze and process thermal images. By identifying the temperature information of critical areas of the target, the software can be used to analyze objects across many industrial applications. Major incidents can be prevented or addressed quickly by using the software to detect and pinpoint temperature abnormalities in equipment in routine inspections.
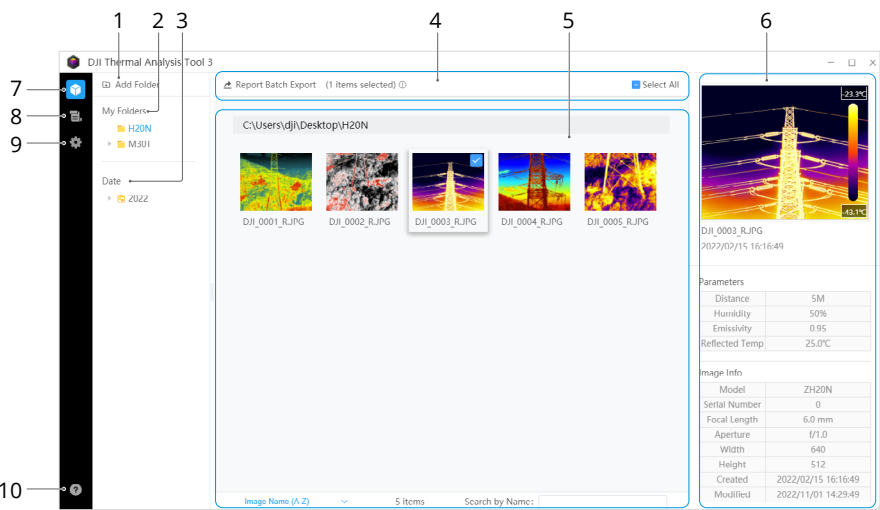
Operating System Requirements

DJI Thermal Analysis Tool 3 can only be run on 64-bit operating systems. Recommended operating systems include Windows 7, Windows 8, Windows 10, and later.

Supported Devices

DJI Mavic 3T, Matrice 30T, Zenmuse H20N, Zenmuse H20T, Zenmuse XT S, Mavic 2 Enterprise Advanced.

Usage

Home Screen

1. **Add Folder**
   Click Add Folder to import all the thermal images from the local directory to the software.

   ⚠ Only the R-JPEG thermal images taken by the supported devices mentioned above can be analyzed by this software.

2. **My Folders**
   Displays the added folders. Tree-structured display is supported.
   - Left-click a folder, and the Image Display Area will display all the JPG images in the folder.
   - Right-click a folder in the root directory to Delete, Refresh or Open Folder.

   ⚠ Select Delete to delete a folder from the software, which has no effect on the local folder.

3. **Date**
   Displays the imported images by date (year-month-day). Filter out the images taken on certain dates easily.

4. **Image Selection Area**
   - Click to select one or multiple images at the same time and export a report for all selected images.
   - Click Select All to select all images displayed in the Image Display Area.

5. **Image Display Area**
   Displays the imported images.
   - Left-click a thermal image to view its information in the Image Information Display Area on the right.
   - Double-click a thermal image to open and analyze it in the Thermal Analysis Screen.
   - Choose to organize images by date or name, search image by name, and view the total number of JPG images at the bottom of the screen.

6. **Image Information Display Area**
   Left-click a thermal image to view the information related with the image in this area. This contains the preview image, file name, shooting time, temperature range, parameters settings, image information, and remarks. Use the mouse wheel to scroll up and down to view all the information.
   In the home screen, the information is for view only. and cannot be edited.

7. **Library**
   Left-click to return to the home screen.

8. **Report**
   Export the measurement data and other related information of a thermal image into a PDF or DOC, or export the processed image with the chroma bar information only.

9. **Settings**
   Language
   Supported languages: Simplified Chinese and English.

   Unit
   Supported temperature units: Celsius (° C), Fahrenheit (° F), and Kelvin (K).

   Report
   Customize the logo and header for the report.

10. **About**
    Shows the current software version. Users can also find the user guide for the software here.

Thermal Analysis Screen

Double-click a thermal image in the Image Display Area to open and analyze the image in the Thermal Analysis Screen.

The Thermal Analysis Screen contains the Toolbar, Image Display Area, Topbar, Chroma Bar, Information Display Area and Action Bar.
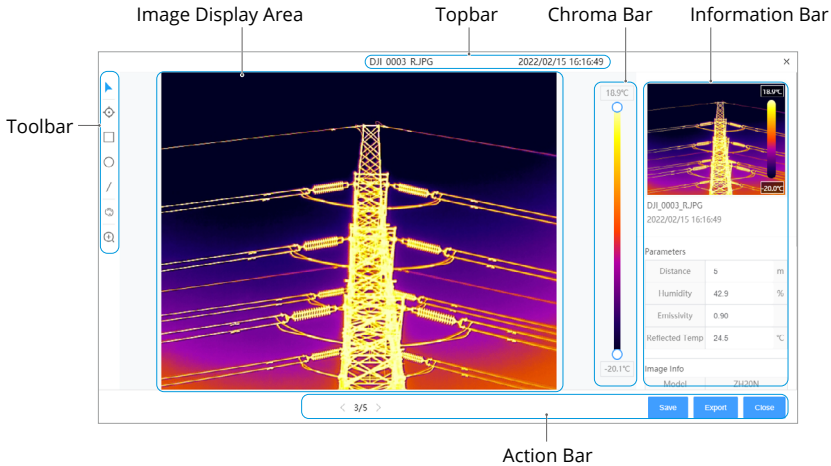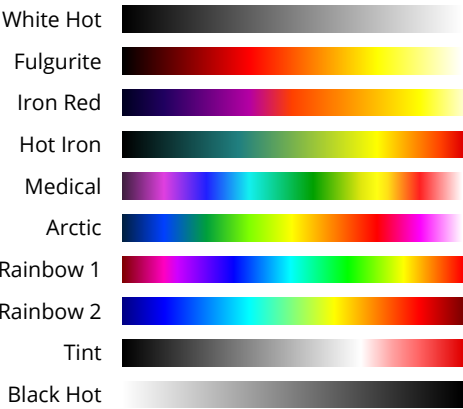

Toolbar

The toolbar on the left contains the following tools:

▶ Select: Once in the Thermal Analysis Screen, the Select tool is enabled by default. After switching to a different tool, click the icon again or press the shortcut key (Esc key/ number key 1) to switch back to the Select tool.

⊕ Spot Temperature: Click the icon or press the shortcut key (number key 2) to select the tool, and then left-click the point that needs to be measured in the image and the temperature of that point will be shown. Drag the point to change the location of the measurement. Right-click the point to delete the point, select the font size, or where to show the annotations.

☐ Rectangle Temperature: Click the icon or press the shortcut key (number key 3) to select the tool, and then left-click and drag to create a rectangular measurement area. The highest, lowest, and average temperatures of the rectangular area will be shown on the screen. Left-click the rectangle to change its size and location. Right-click the rectangle to delete the rectangle, select the font size, or where to show the annotations.

◯ Circle Temperature: Click the icon or press the shortcut key (number key 4) to select the tool, and then left-click and drag to create a circular measurement area. The highest, lowest, and average temperatures of the circular area will be shown on the screen. Left-click the circle to change the size and location of the circle. Right-click the circle to delete the circle, select the font size, or select where to show the annotations.

╱ Line Temperature: Click the icon or press the shortcut key (number key 5) to select the tool, and then left-click and drag to create a measurement line. The highest, lowest, and average temperatures of the line will be shown on the screen. Left-click the line to change its length and location. Right-click the line to delete the line, select the font size, or where to show the annotations.

◔ Palette: Click the icon to select palette to show the thermal image by different pseudo colors.

⊕ Resize: Click the icon to show the thermal image in original size or to fit the window.

Palette Color Description

The supported devices offer a variety of palette options. Distinct colors are used to show temperature differences in the thermal image, which are related to grayscale intensity. The temperature range of the image is mapped to 256 colors and displayed in an 8-bit JPEG image. The following table shows all palette options.

White Hot	▬▬▬▬▬▬▬▬
Fulgurite	▬▬▬▬▬▬▬▬
Iron Red	▬▬▬▬▬▬▬▬
Hot Iron	▬▬▬▬▬▬▬▬
Medical	▬▬▬▬▬▬▬▬
Arctic	▬▬▬▬▬▬▬▬
Rainbow 1	▬▬▬▬▬▬▬▬
Rainbow 2	▬▬▬▬▬▬▬▬
Tint	▬▬▬▬▬▬▬▬
Black Hot	▬▬▬▬▬▬▬▬

Palette	Description
White Hot	The most commonly used pseudo color, using white for high temperatures and black for low temperatures, which is a natural association for people.
Fulgurite	Dark red represents low temperatures and white represents high temperatures. The warm tone of this palette aligns with people's association with hot temperatures.
Iron Red	This palette displays nuanced differences in heat signatures, quickly displaying anomalies and human bodies. Hotter objects appear as light warm colors and colder objects appear as dark cool colors.
Hot Iron	Red represents high temperatures, and cool colors represent low temperatures. It is able to identify hot targets quickly, while showing the details of cool targets.

Medical	This palette shows nuanced differences in temperatures, and is therefore ideal for scenarios with small temperature changes. In environments with low contrast, it is still able to detect objects and slight temperature changes. It is mainly used in the medical field for human body temperatures.
Arctic	Uses the same palette as Medical, except switching the purple for a cool blue to better reflect temperature changes.
Rainbow 1	Similar to Medical, it reduces the warm color ratio and increases the cold color ratio for high temperature targets to better show the details of cool targets.
Rainbow 2	The color transition is reduced, the warm and cold colors are moderately proportioned, which can show the details of high and low temperature targets at the same time.
Tint	Uses black and white for low temperatures and bright red for high temperatures, it is able to detect high temperature targets quickly. Mainly used for high-contrast environments, ideal for quickly and accurately identifying high temperature targets at night.
Black Hot	The opposite to White Hot, using black for warmer objects and white for cooler objects. The heat distribution of high temperature targets can be better observed when outdoors.

Different palettes applied to the same example image are shown below.
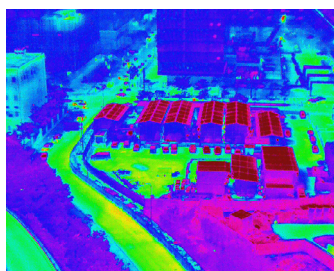
White Hot

Black Hot

Iron Red

Rainbow 1

Image Display Area

Displays the currently analyzed image and its temperature measurements.

Topbar

Displays the file name and the shooting time for the thermal image.

Chroma Bar

Displays the adaptive temperature range of the thermal image with the selected parameters settings. Drag the two ends of the chroma bar to adjust the color scale of the pseudo color to highlight objects in a specific temperature range.

Information Bar

The information bar contains the preview image, temperature measurements, parameters settings, image information, annotations and remarks.

- **Preview**
  Preview the image.

- **Measurements**
  Displays all the measurements made on the current image.

- **Parameters**
  Distance: The distance to the target. An infrared thermal imager generates thermal images by receiving infrared radiation from objects. The farther away the object, the more the radiation attenuates. The camera's default calibration distance is generally fixed during production. This is the distance at which temperature measurements are the most accurate. Being too close or too far will result in bigger measurement errors.

  Relative Humidity: the relative humidity of the environment. Please configure this parameter based on the actual environmental conditions. The default value 70 means that the relative humidity is 70%, and the value range is [20~100]. Humidity configurations could affect the measurement result, but the effect is limited.

  Emissivity: how strongly the target surface is emitting energy as thermal radiation. Refer to the Emissivity of Common Materials Table to configure, since the target surface may be corroded or oxidized, the actual emissivity value may differ from the reference value. Emissivity configurations could significantly impact the measurement result.

  Reflected Temperature: the surface of the target that is measured could reflect the energy radiated by the surrounding objects. This reflected energy could be picked up by the camera along with the radiation, which could cause an error in the temperature reading. If there are no objects with extreme high or low temperatures nearby, set this parameter as the ambient temperature. Reflected temperature configurations could affect the measurement result, and the bigger the difference between the reading and the ambient temperature, the bigger the impact.

  Press the Enter key or click anywhere outside the input field to finish setting the parameters.

  ⚠ If the input value is beyond the range, the software will input the threshold value instead.

- **Annotations**
  Input annotations in key-value pairs.

- **Remarks**
  Input remarks.

Action Bar

The action bar contains the image switch arrows, and the Cancel, Export and Save buttons.

- Image Switch: Displays the total number of the R-JPEG images in the selected folder and which one is being shown. Click the arrows to switch images.
- Cancel: Cancel all the operations for the selected image.
- Export: Click Export to go to the Report screen. Click Export PDF or Export DOC to

export a PDF or DOC report for the selected thermal image, which contains the measurements, parameters settings, image information, annotations, and remarks. Users can also customize the logo and header for the report. Click Export Image to export a JPG image which contains measurements and the chroma bar information.

• Save: Save data such as spots and areas of temperature measurement, or specific palette settings to the R-JPEG images. This information is only visible when using the DJI Thermal Analysis Tool 3. This data cannot be seen when viewing these images in another software.

⚠ Saving an image will overwrite the original image, please make a backup if needed.

WE ARE HERE FOR YOU

Contact
DJI SUPPORT

This content is subject to change.
Download the latest version from

 https://www.dji.com