



AnalyzIR

User Manual

Thank you very much for your purchase of our products. If you have any questions or need please feel free to contact us.

This user manual is intended for FOTRIC thermal image analysis software, AnalyzIR.

This manual may contain information which is not technically accurate, doesn't match with the product's functions and operations, or typo from the printing. We will update the contents of this manual according to the enhancement of the product's function and regularly improve or update the products or procedures described in this manual. The updated content will be added to the new version of this manual without prior notice.

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1 Software Installation

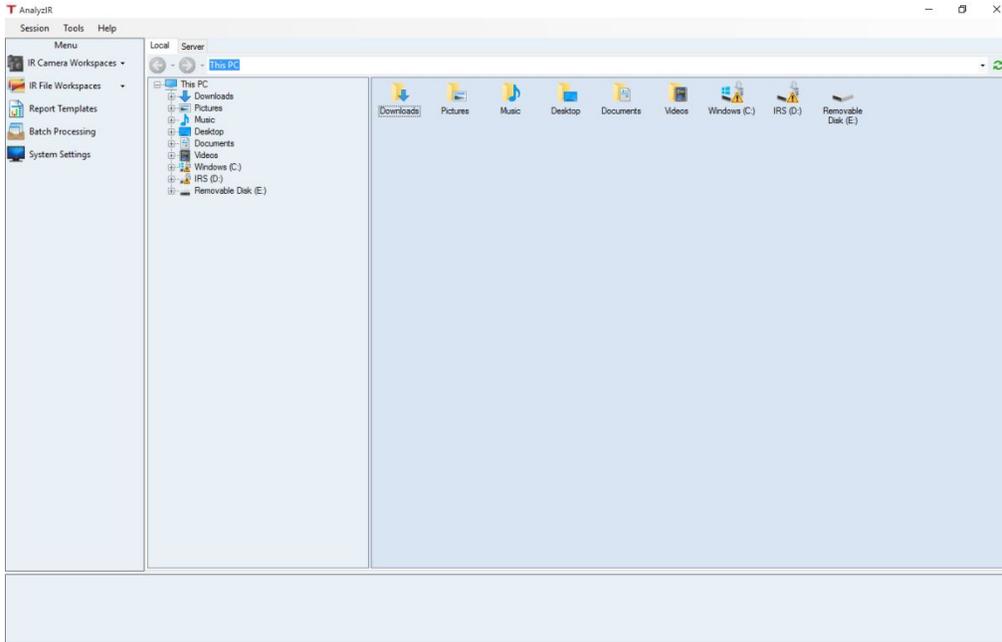
1.1 System Requirements

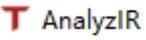
- ◆ Microsoft Windows XP (need to install .NET Framework 3.5, otherwise the program may not work properly)
- ◆ Microsoft Windows 7, 32-bit
- ◆ Microsoft Windows 7, 64-bit
- ◆ Microsoft Windows 10, 32-bit Professional Edition or higher version (need to enable .NET Framework 3.5 in windows)
- ◆ Microsoft Windows 10, 64-bit Professional Edition or higher version (need to enable .NET Framework 3.5 in windows)

1.2 Hardware Requirements

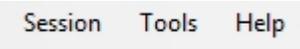
- ◆ CPU Intel Pentium IV 3.0 GHz or later
- ◆ Memory 4G or more
- ◆ Display 1024 × 768 or higher resolution

2 User Interface (UI)

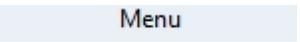


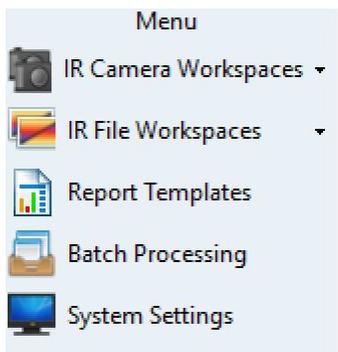
➤  Name of FOTRIC thermal image/video analysis software

➤  Software control key (minimize, restore, and closed down)

➤ 

- Session: Menu of IR Camera Workspaces, IR File Workspaces, System Settings, and Quit
- Tools: Show report templates, batch processing, and data interface
- Help: Displays user manuals, product registration and some information about the software

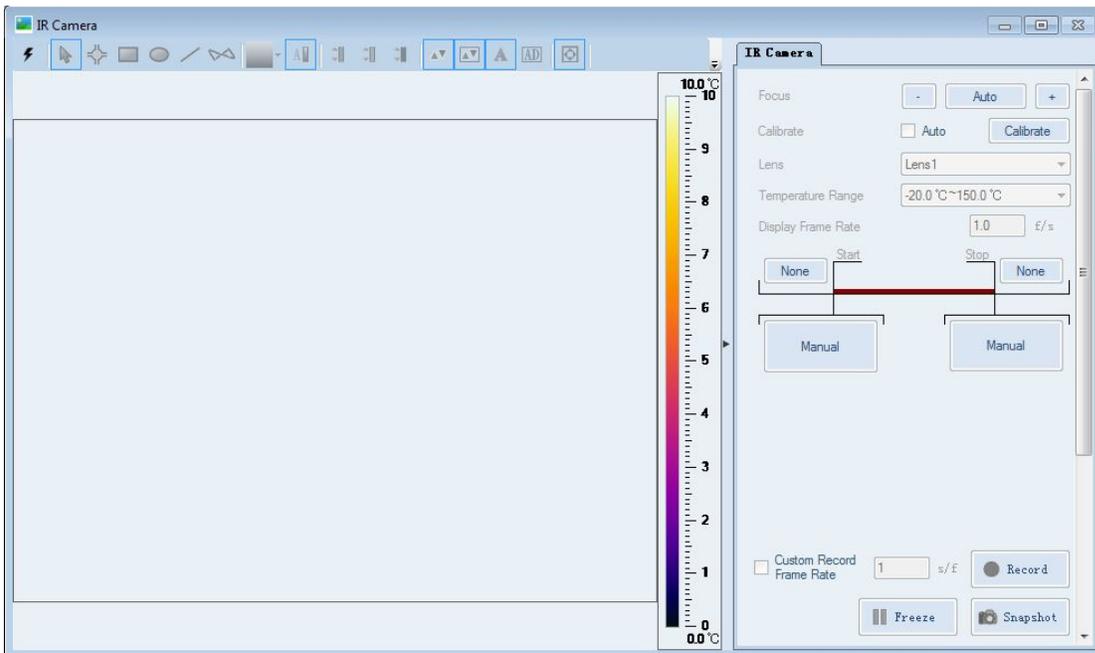
➤  Following menus are displayed under



- IR Camera Workspace: Connect with an external device of a thermal imager or load .IRS file for analysis
- IR File Workspaces: Load .IRS file or thermography images for analysis.
- Report Templates: Import, export, or edit report templates
- Batch Processing: Batch image conversion processing, video synthesis, and report generation
- System Settings: Set up and modify system configuration parameters

2.1 IR Camera Workspaces

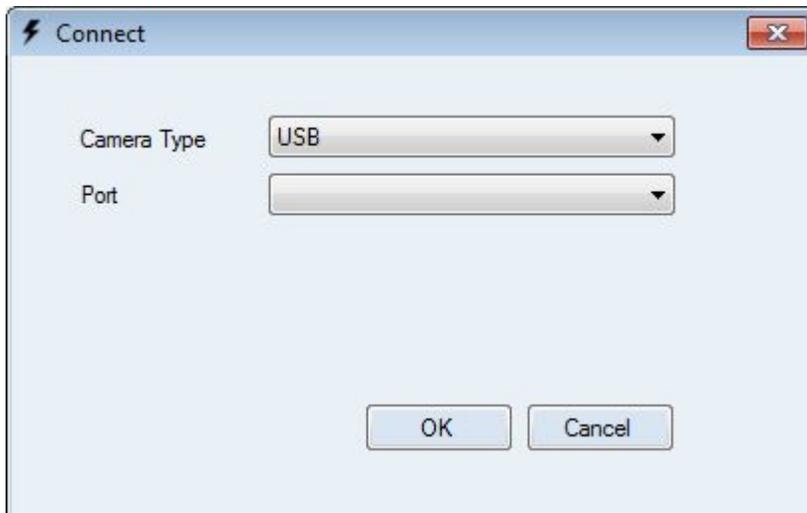
2.1.1 Main User Interface Window



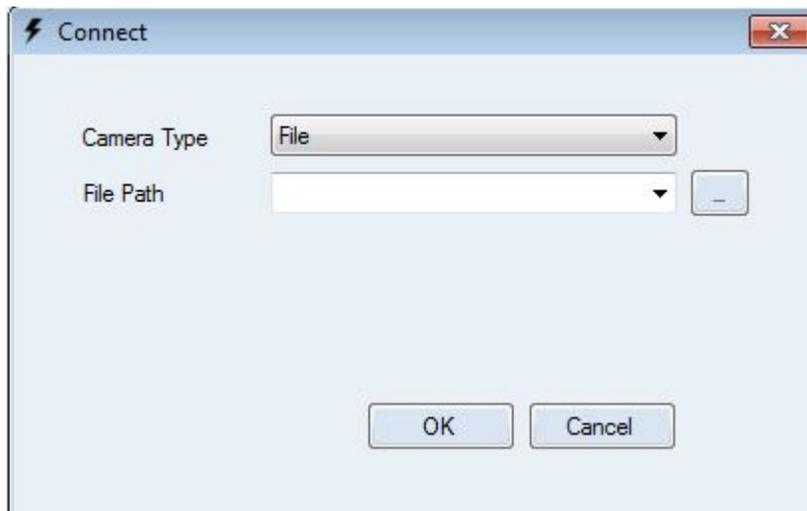
-  Open “Connect” window

Connection type

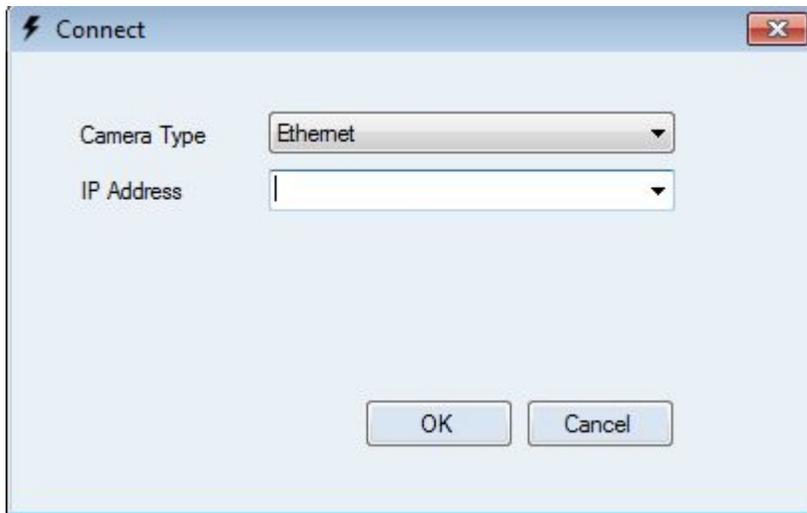
- Select USB for external device, the “Port” number is automatically recognized. Click OK to enter the workspace.



- Select File and click  to import .IRS file for analysis.

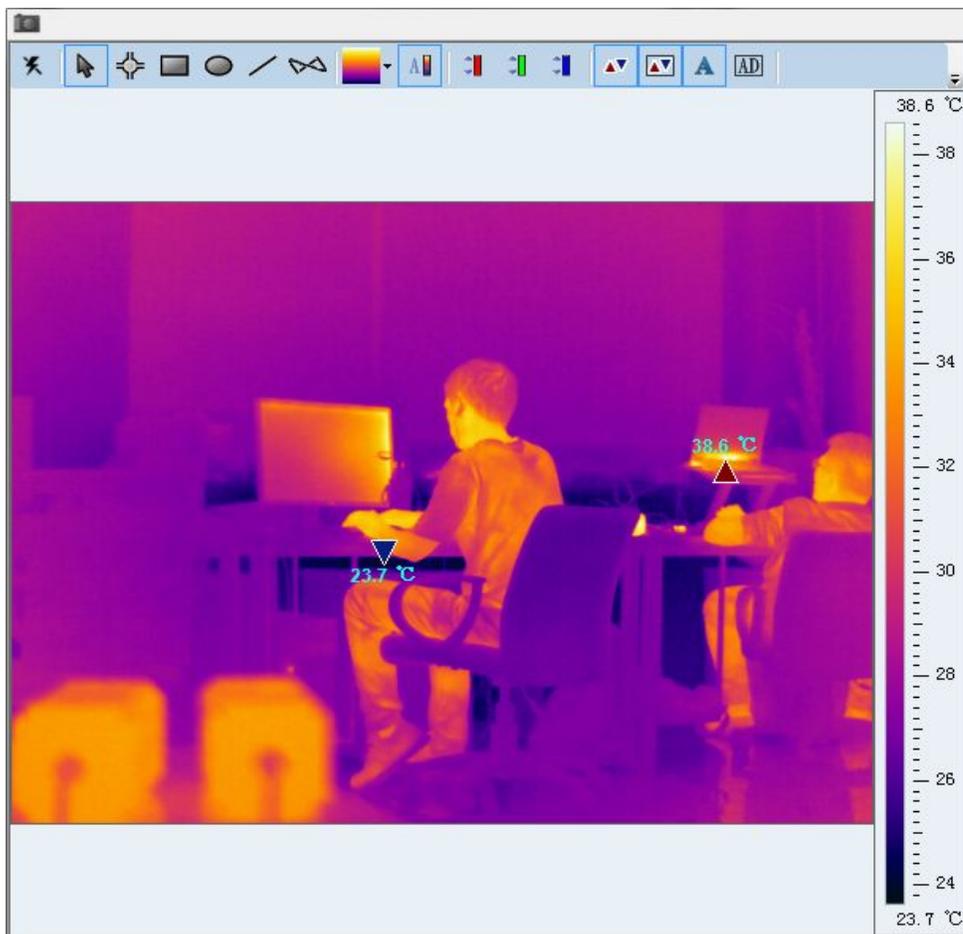


- Select Ethernet and enter the IP Address to connect with online equipment.



Note: Only registered users can connect to online equipment through Ethernet.

2.1.2 IR Camera Workspace Analysis Interface



-  Restore, move, size, minimize and maximize the analysis window



Toolbar with different analysis tools

-  Disconnect

-  Arrow

-  Set spot and display the corresponding temperature value

-  Set rectangle and display the max, min, and average temperature values of this area (average temperature is the sum of temperature data of all points within the selected area divided by the number of points). It will track the location of max and min temperature automatically.

-  Set ellipse and display the max, min, and average temperature values of this area (average temperature is the sum of temperature data of all points within the selected area divided by the number of points). It will track the location of max and min temperature automatically.

-  Set polyline and display the max, min, and average temperature values of this area (average temperature is the sum of temperature data of all points along the polyline divided by the number of points). It will track the location of max and min temperature automatically. You can draw a plot of the temperature distribution along the polyline.

-  Set polygon and display the max, min, and average temperature values of this area (average temperature is the sum of temperature data of all points within the selected area divided by the number of points). It will track the location of max and min temperature automatically.

Below is an example thermal image with various defined test areas.



Note: You can move each spot or area to obtain the temperature information of the desired area.

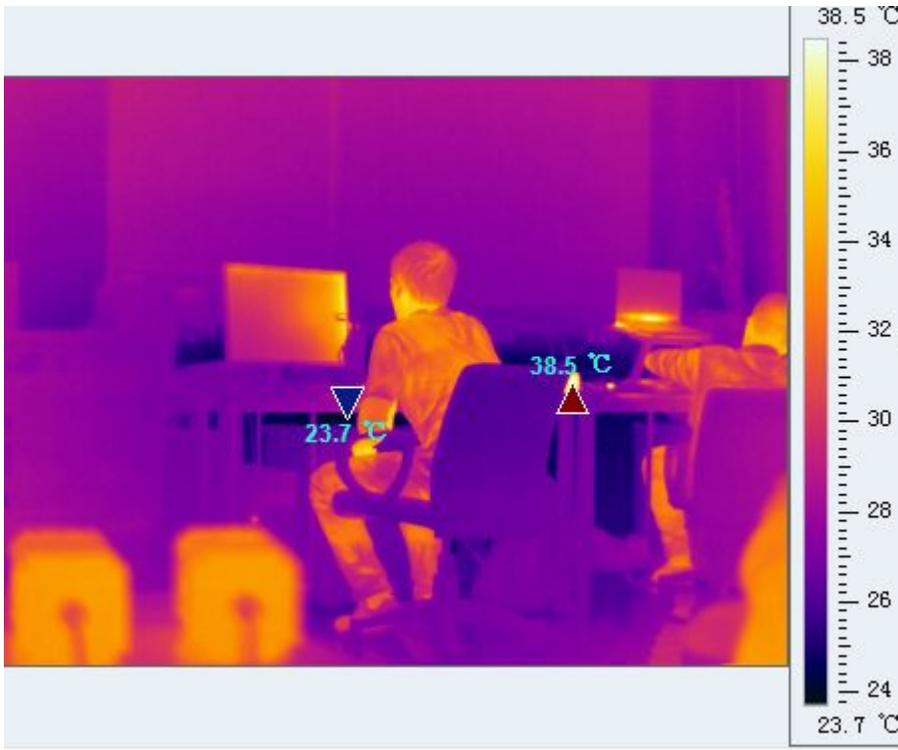
-  Choose color palette, including Grey, Iron, Rainbow etc.
-  Temperature scale (temperature bar range). Three (3) options are available
 -  Automatically temperature scale, the upper and lower limits are the maximum and minimum temperatures of the image. It requires minimum 8°C difference between the upper and lower limits in the scale.
 -  Smart temperature scale, removes 5% non-obvious temperature point, improves the image contrast.
 -  Fixed temperature scale click the triangle ▼ to set up the upper and lower limit of the scale with minimum 8°C difference.
-  Isotherm 1, click the triangle ▼ to set up the upper and lower limit to highlight the areas in red with the desired temperature range.

-  Isotherm 2 and 3 with different colors.
-  Display max. and min. temperature of the selected measurement areas. Click the triangle mark to turn off or turn on the display.
-  Display max. and min. temperature of the whole thermal image. Click the triangle mark to turn off or turn on the display.
-  Turn on or off the display of temperature values
-  Turn on or off the display of AD values.
-  Click to display the hidden tool when window is smaller

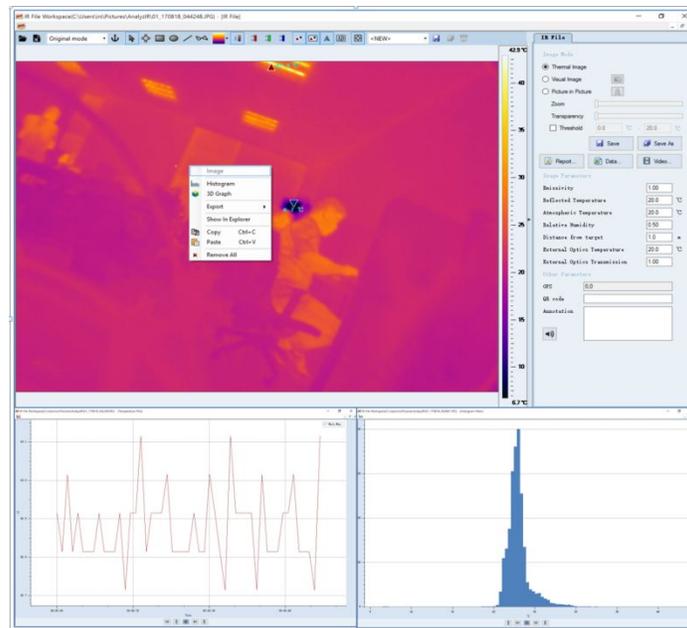


-  Name of the saved template
-  Save current screen settings as a template
-  Save current template as another template
-  Delete the selected template

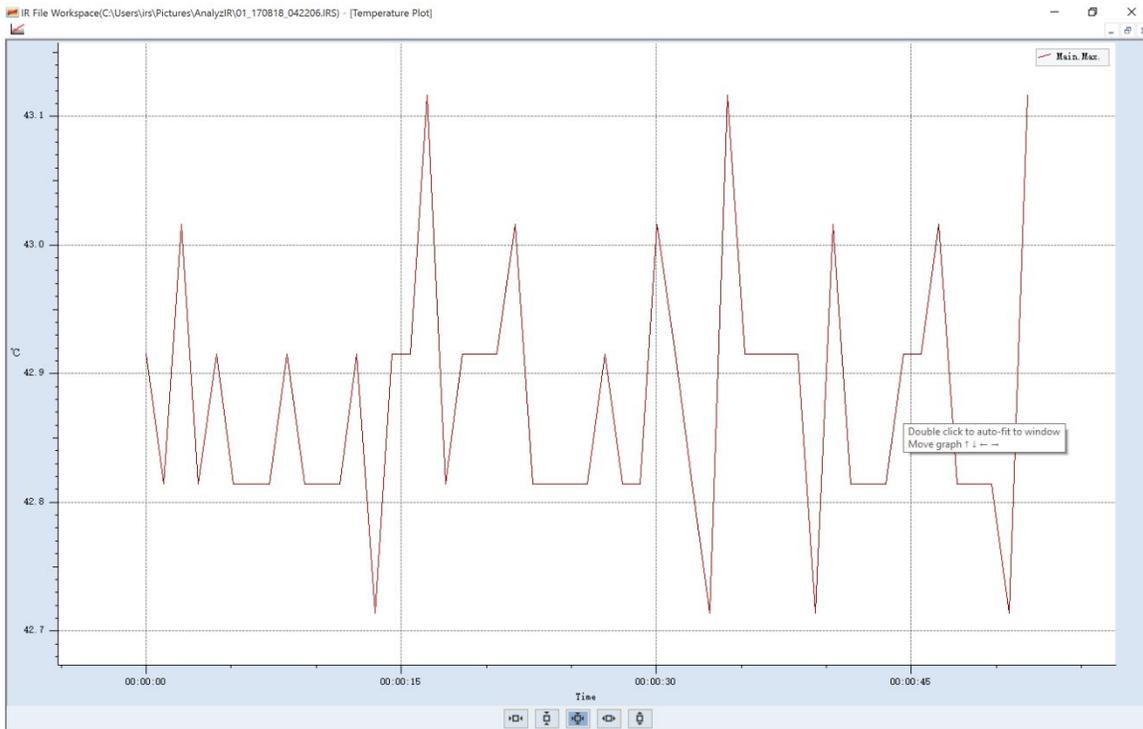
➤ Thermal Image Display Area



- Temperature scale (temperature bar) is on the right side of the thermal image. When double clicked, it's automatically switched to fixed temperature scale, you can change the upper and lower limit by dragging the mouse.
- Right click the image, you can generate the profile of temperature vs. time (temperature may vary with the time), and display the histogram graph (intuitive temperature distribution).



Temperature vs. time curve (max. temperature of the entire image as an example)



Zoom out the horizontal axis



Zoom out the vertical axis



Restore to the default axis setting

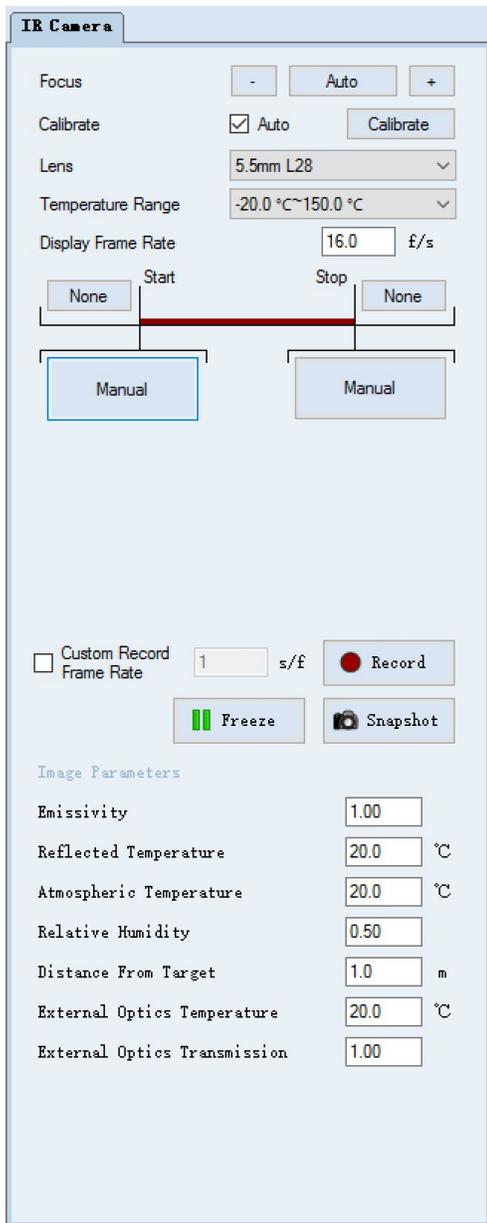


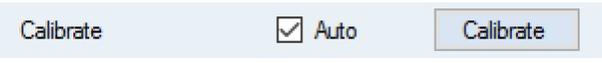
Zoom in the horizontal axis



Zoom in the vertical axis

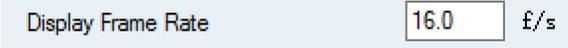
Same layout for both temperature curve and histogram plot. Name of the plot is displayed on the upper right corner.

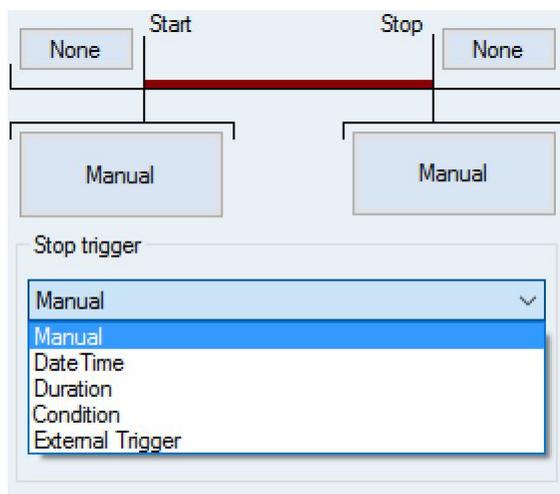


-  Auto focus, no need to set.
-  After the thermal camera connected, click calibration to automatically start NUC.
-  Select the lens. The default is the standard lens
-  Select the temperature range

according to the connected thermal camera, low-temperature range (-20°C - 120°C),

middle-temperature range (0°C - 350°C) and high-temperature range (200°C - 650°C).

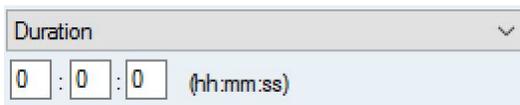
➤  Set up frames per second (1-60).



-
- Set up start and stop triggers to control the start and end of the thermal video recording.
 - Manual: Manually trigger the device to start or stop thermal video recording, the default setting is manual.
 - Date and time: Set up date and time to trigger the device to start or stop thermal video recording. You can fill the date and time manually.

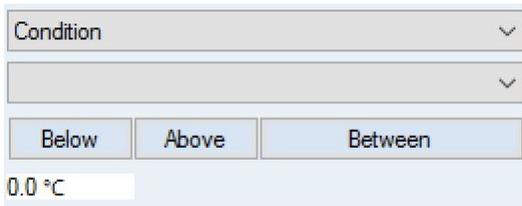


- Duration (Delay): Set up the delay time to start the recording after triggered.

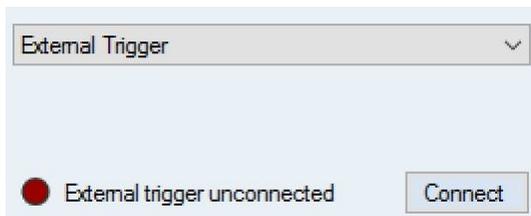


- Conditional trigger: Set up conditional trigger. Once a condition is met, trigger the

start or stop of recording.

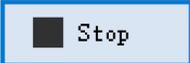
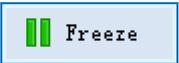
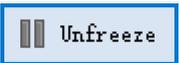
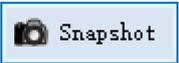


- External trigger: Connect to I/O module to trigger the start or stop of recording.



➤ Record Thermal Video Stream



- Custom Record Frame Rate 1 s/f User defined recording interval between frames
-  Click to start recording. After clicked, it switches to
-  Click to stop recording.
-  Click to freeze the current thermal image. After clicked, it switches to
-  Click to un-freeze and display live stream of the thermal image.
-  Click to shoot a thermal image and saved to the pre-defined folder.

- Object Parameters Setting. Real-time updates in thermal image/video with modified

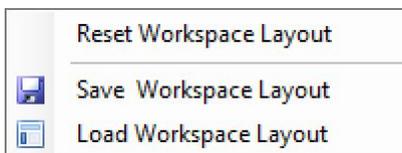
parameters.

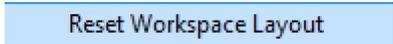
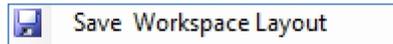
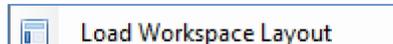
Image Parameters		
Emissivity	<input type="text" value="1.00"/>	
Reflected Temperature	<input type="text" value="20.0"/>	°C
Atmospheric Temperature	<input type="text" value="20.0"/>	°C
Relative Humidity	<input type="text" value="0.50"/>	
Distance From Target	<input type="text" value="1.0"/>	m
External Optics Temperature	<input type="text" value="20.0"/>	°C
External Optics Transmission	<input type="text" value="1.00"/>	

- Emissivity
- Reflected temperature
- Atmospheric temperature
- Relative humidity
- Distance to object
- External optics temperature (when IR window or external optics placed between thermal camera and object)
- External optics transmittance (when IR window or external optics placed between thermal camera and object)

2.1.4 Page Layout

- Right click on the blank area of the toolbar to set up the page

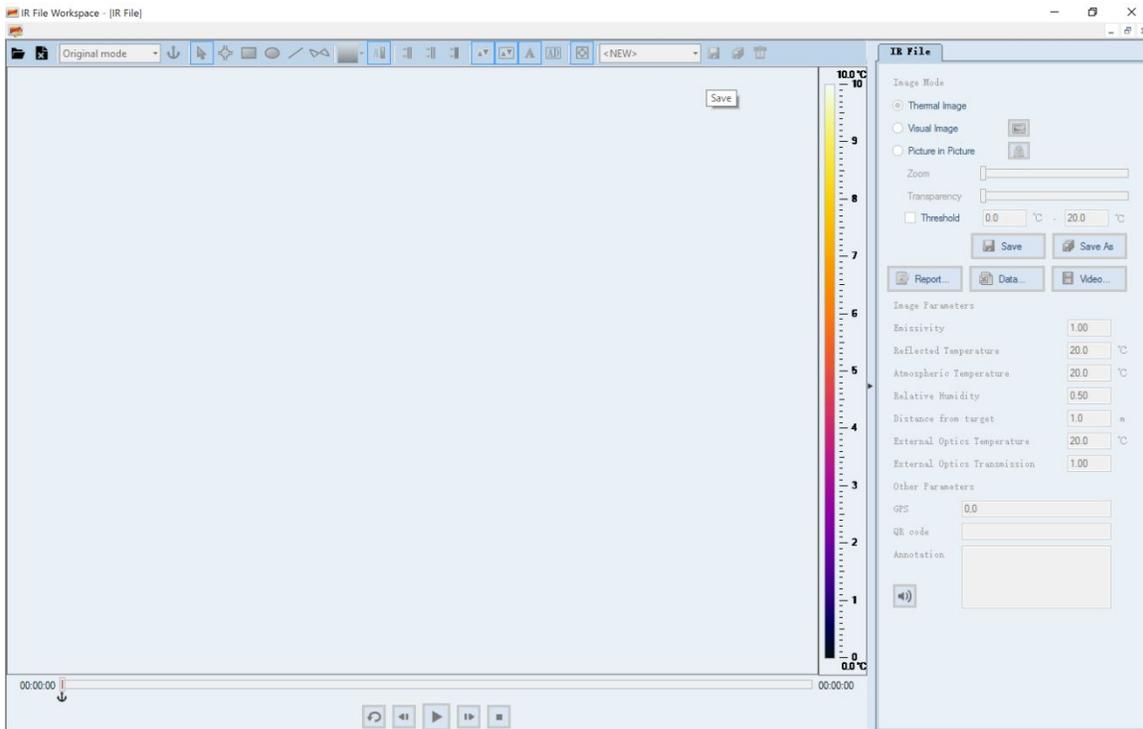


-  Fill all pages within the workspace.
-  Save current page layout. The workspace will be opened and displayed with the saved page layout.
-  Load saved page layout.

Note: User can import and play .IRS file in the IR Camera Workspace window. The UI is same as when an external thermal camera is connected.

2.2 IR File Workspace

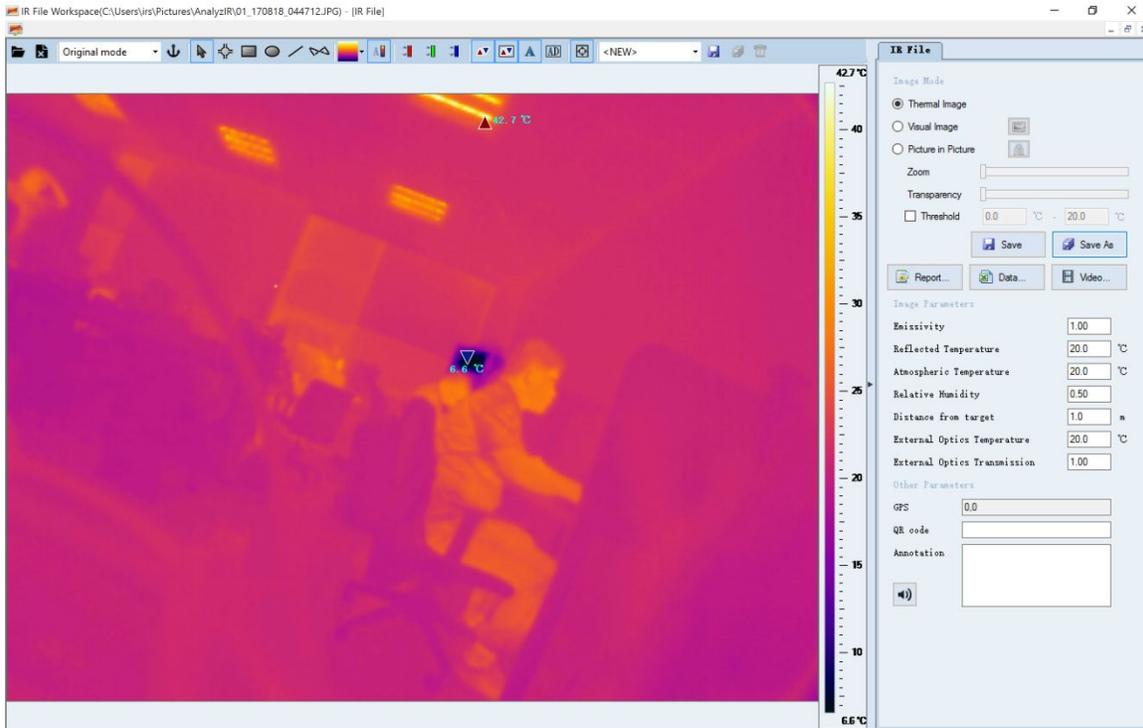
2.2.1 Main User Interface Window



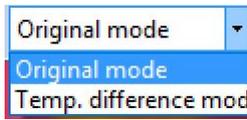
-  Restore, move, size, minimize and maximize the workspace
-  Import .IRS file or FOTRIC thermal image
-  Close the opened .IRS file or FOTRIC thermal image

2.2.2 IR File Workspace Analysis Interface

An example of importing .IRS file



Toolbar with different analysis tools



■ Analysis Type

- Original Mode: Default mode. Display temperature of imported thermal image.
- Temperature difference mode: Display the temperature difference between the current frames to the defined base frame.

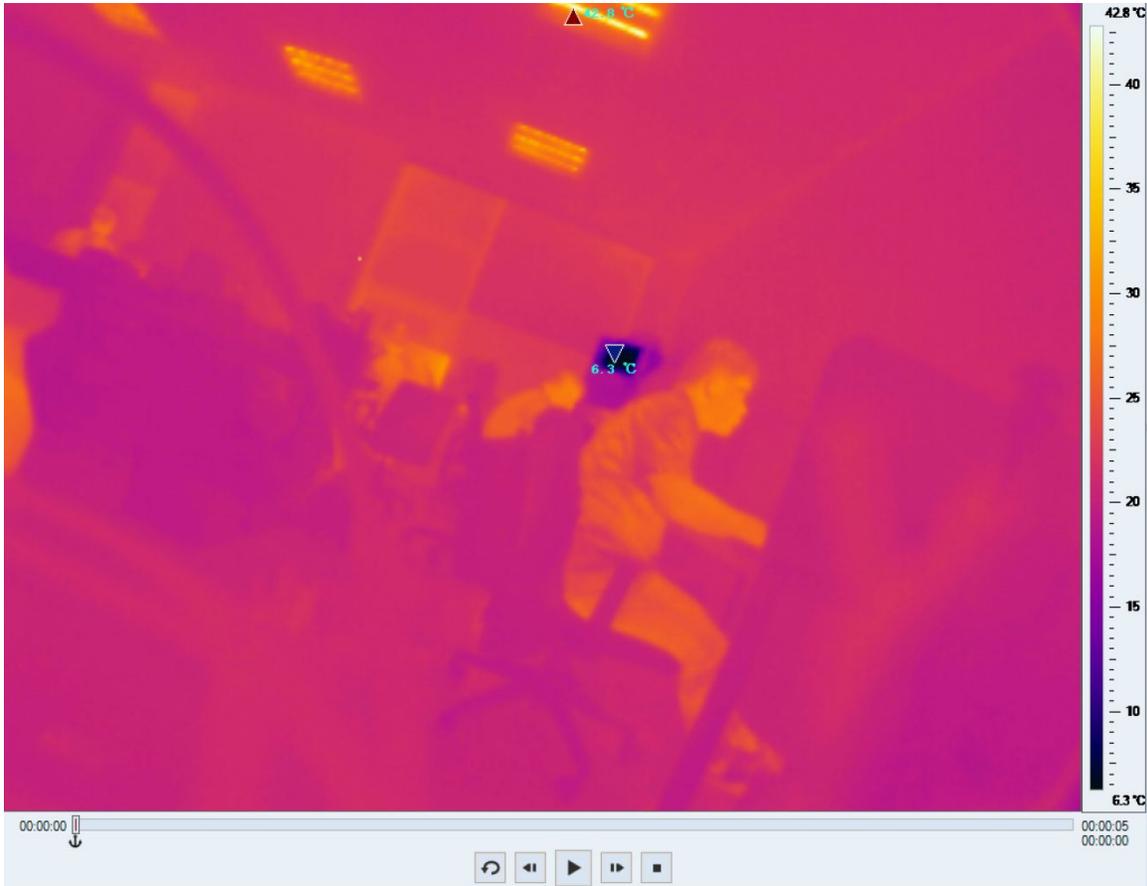


■ Set up the current frame as the base frame under temperature.

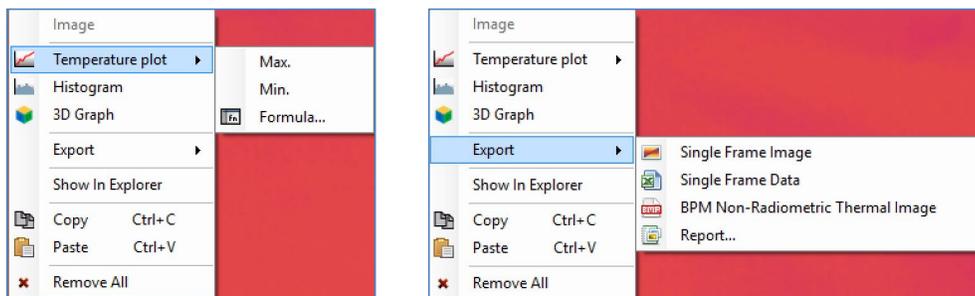


■ Toolbar with different analysis tools. Same functions as IR Camera Workspace. Refer to section 2.1.2 for more information.

➤ Thermal Video Display Window



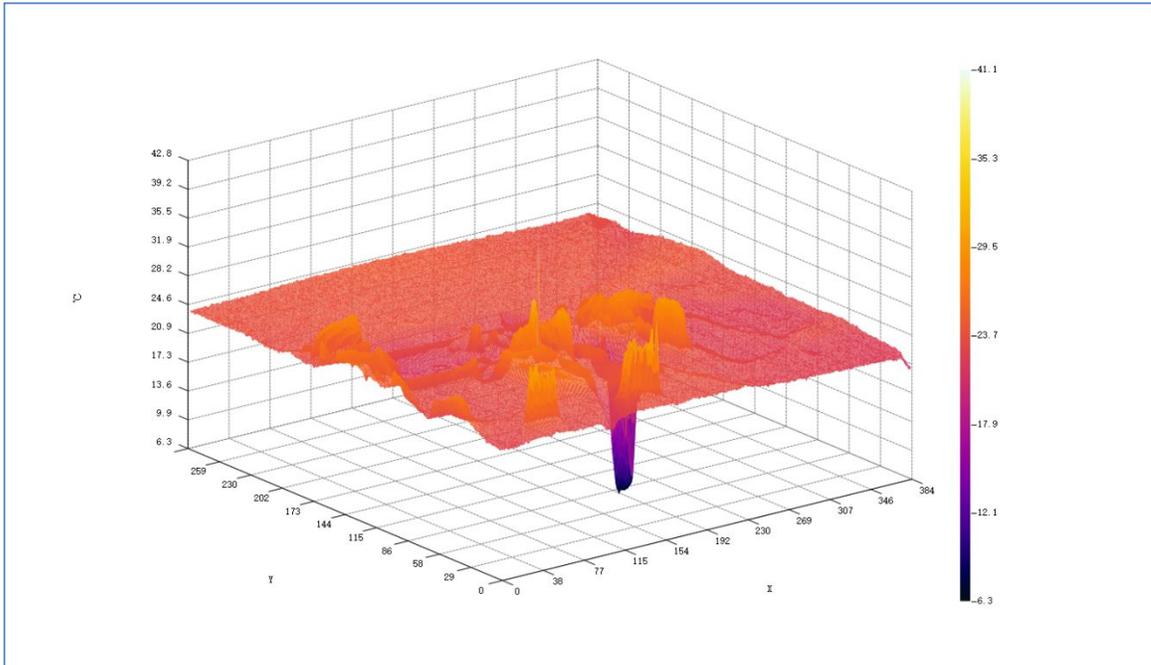
- Temperature scale (temperature bar) is on the right side of the thermal image. When double clicked, it's automatically switched to fixed temperature scale, you can change the upper and lower limit by dragging the mouse.



Right click on the thermal video image, you can access other functions.

- Temperature plot: Generate the profile of temperature vs. time. Besides the Max. and Min. temperatures, you can define your own temperature by creating the Formula.
- Histogram: Display the histogram graph (intuitive temperature distribution).

- 3D Graph: Display the current thermal image in 3D. You can change the view angle and azimuth angle to change the viewing angle of the 3D picture.



- Export
 - Single Frame Image: Export current frame as a thermal picture file (with temperature data and can be analyzed later).
 - Single Frame Data: Export temperature data of current frame as a .csv file.
 - BPM Non-Radiometric Thermal Image: Export current frame as a .bpm file (without temperature data and cannot be analyzed later).
 - Report: Export to report template. You can fill other information to make a complete report.
- Show In Explorer: Open the folder where current thermal video/image is from.
- Copy: Copy the position information of spot or area selections in current thermal image which can be copied to other files.
- Paste: Paste the copied information.
- Remove all: Remove all spot and area selections.

Report Number: **1. Basic Information**

Company	<input type="text"/>	Department	<input type="text"/>
Contact	<input type="text"/>	Phone	<input type="text"/>
Address	<input type="text"/>		

2. Inspection Information**a. Inspection Images**

Infrared thermal image



Visible light reference photo

**b. Test Environment**

Test instruments	<input type="text" value="Fotric 612#L28"/>	Lens configurations	<input type="text"/>
Weather	<input type="text"/>	Ambient temperature (°C)	<input type="text" value="20.0 °C"/>
Distance (m)	<input type="text" value="1.0 m"/>	Relative humidity (%)	<input type="text" value="0.5"/>
Emissivity	<input type="text" value="1.0"/>	Shooting Time	<input type="text" value="0001-01-01 00:00:00"/>

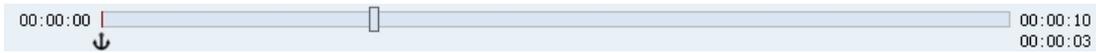
c. Test Data

Thermal video file playback control options



Click to switch the display of duration

- Time difference starting with 0



- Recording time



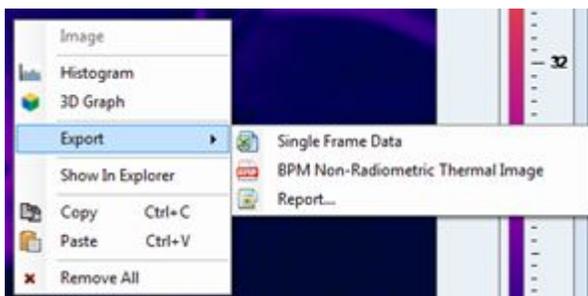
- Number of frames of recording file.



-  Loop playback.
-  Last frame.
-  Next frame.
-  Play and pause.
-  Stop and revert back to the beginning.

➤ Thermal Image Display Window

Note: Same operations as Thermal Video Display Window above. Right click on the thermal image and you can access other functions.



2.2.3 Thermal Image Parameter Setting Panel

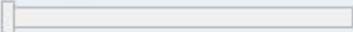
IR File

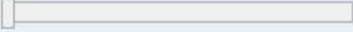
Image Mode

Thermal Image

Visual Image 

Picture in Picture 

Zoom 

Transparency 

Threshold °C - °C

 Save  Save As

 Report...  Data...  Video...

Image Parameters

Emissivity

Reflected Temperature °C

Atmospheric Temperature °C

Relative Humidity

Distance from target m

External Optics Temperature °C

External Optics Transmission

Other Parameters

GPS

QR code

Annotation



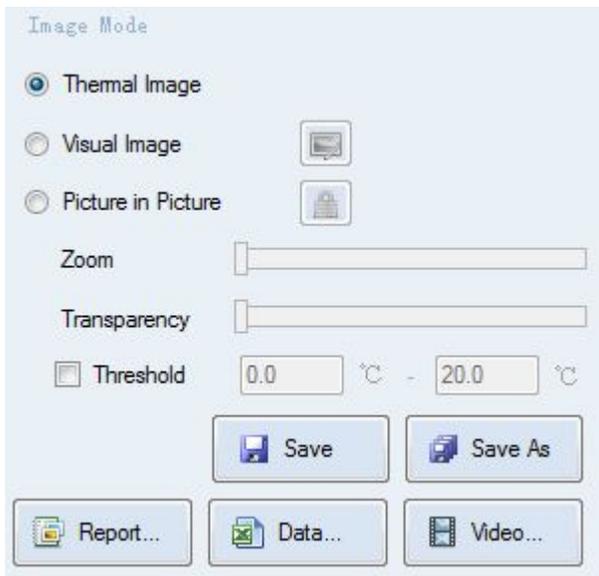


Image Mode,

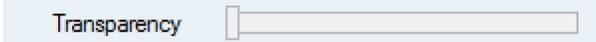
- Thermal Image: Display thermal image in the workspace window.

-  Visual Image: Display visible image in the workspace window.

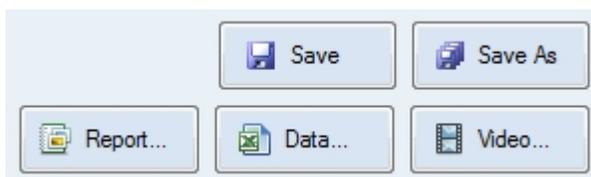
-  Picture in Picture: Display the thermal image inside the visible image.

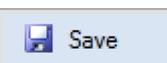
- Click the  Lock flag to change the size of the thermal image by dragging the thermal image.



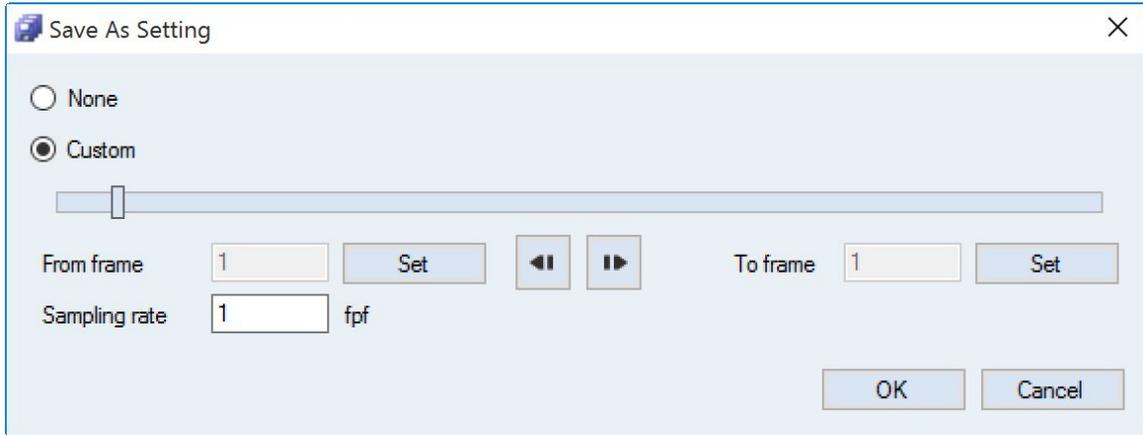
-  Zoom in and out the image.
-  Change the transparency of the image.
- Threshold °C - °C Check to display the thermal image areas with the temperature between the defined thresholds mixed with the visible image.

➤ Save, Save As, Report, Data Export, Video Export



-  Save Save current thermal image with all operations to the original file.

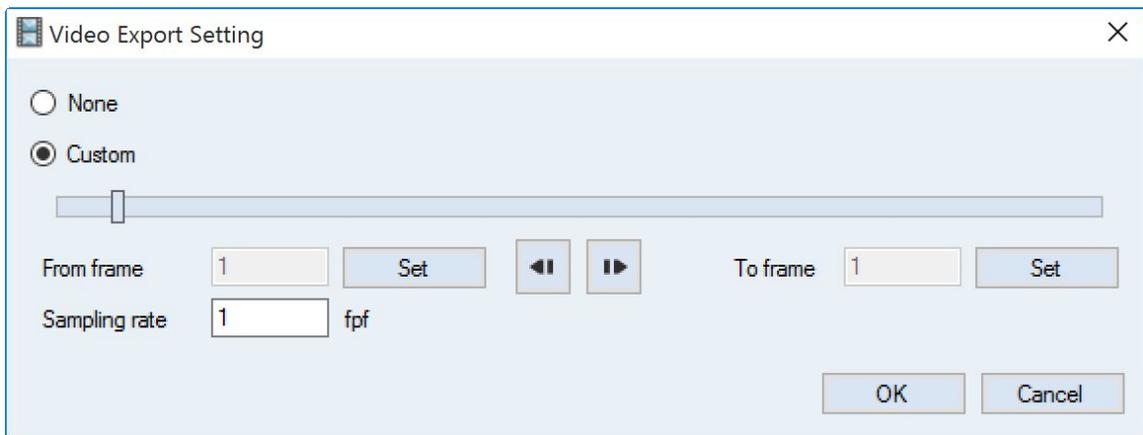
-  Save As Save current thermal image with all operations as a new file. A window pops out to configure the settings of Save As.



You can drag the progress bar shown, click "settings" to set the start and end frames. If the progress bar keeps rolling, please close the settings screen, pause the video play and then open. Or, manually input the start and end frames.

Sampling frequency: Define the interval between frames to be recorded.

-  Report... Export current image into a report template.
-  Video... Export current file as a video file. A window pops out to configure the settings.



You can drag the progress bar shown, click "settings" to set the start and end frames. If the progress bar keeps rolling, please close the settings screen, pause the video play and then open. Or, manually input the start and end frames.

- Object Parameters Setting. Real-time updates in thermal image/video with modified parameters.

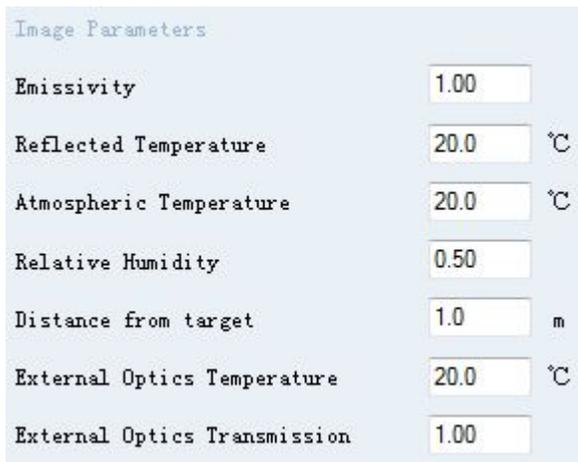
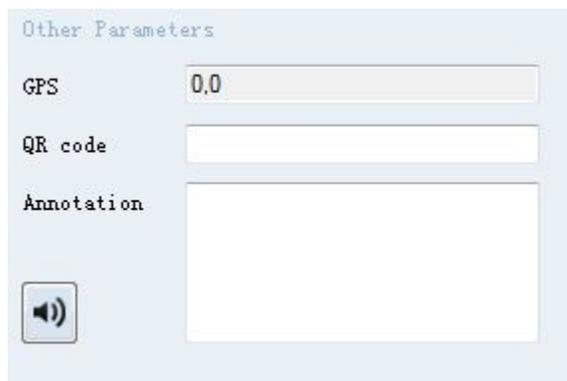


Image Parameters	
Emissivity	1.00
Reflected Temperature	20.0 °C
Atmospheric Temperature	20.0 °C
Relative Humidity	0.50
Distance from target	1.0 m
External Optics Temperature	20.0 °C
External Optics Transmission	1.00

- Emissivity
- Reflected temperature
- Atmospheric temperature
- Relative humidity
- Distance to object
- External optics temperature (when IR window or external optics placed between thermal camera and object)
- External optics transmittance (when IR window or external optics placed between thermal camera and object)

- Other Object Parameters Setting



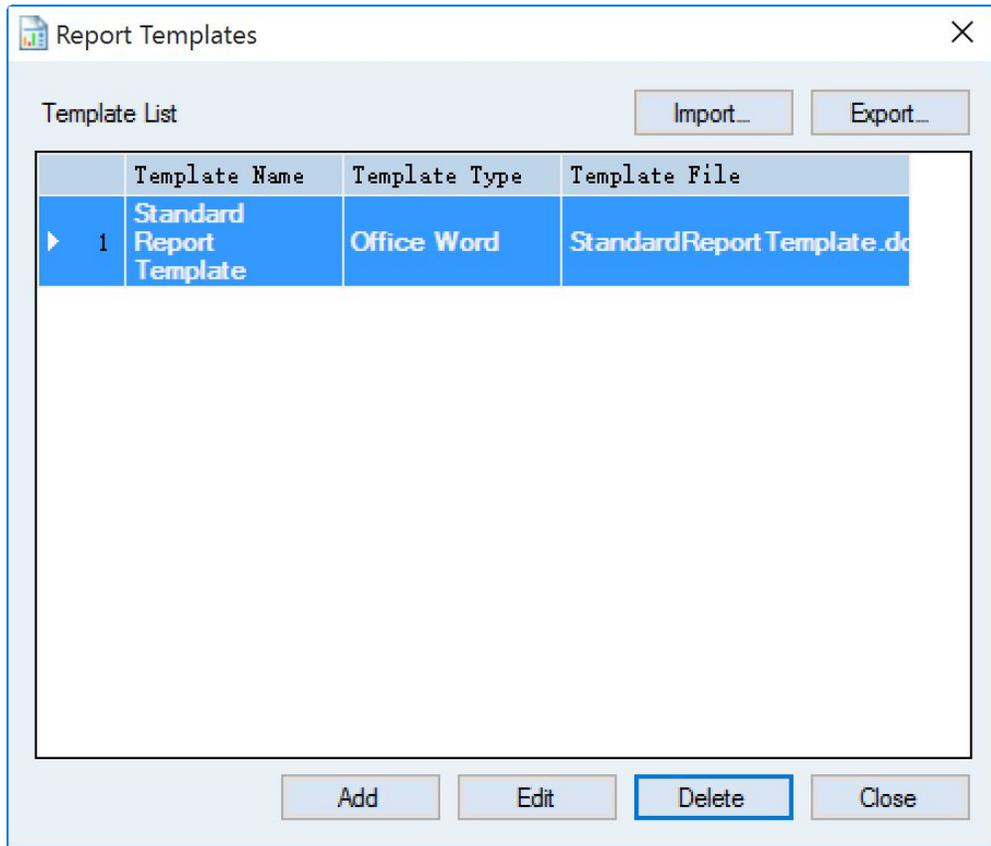
Other Parameters	
GPS	0,0
QR code	
Annotation	
	

- GPS: Automatically imported data, related to the device.
- QR code: Equipment QR code.
- Annotation: Add descriptions of equipment or test.

2.2.4 Page Layout

Refer to section 2.1.4.

2.3 Report Template



Provide report templates for user to generate an inspection report. Right click to “Set As Default”.

2.3.1 Import and Export the Report Template



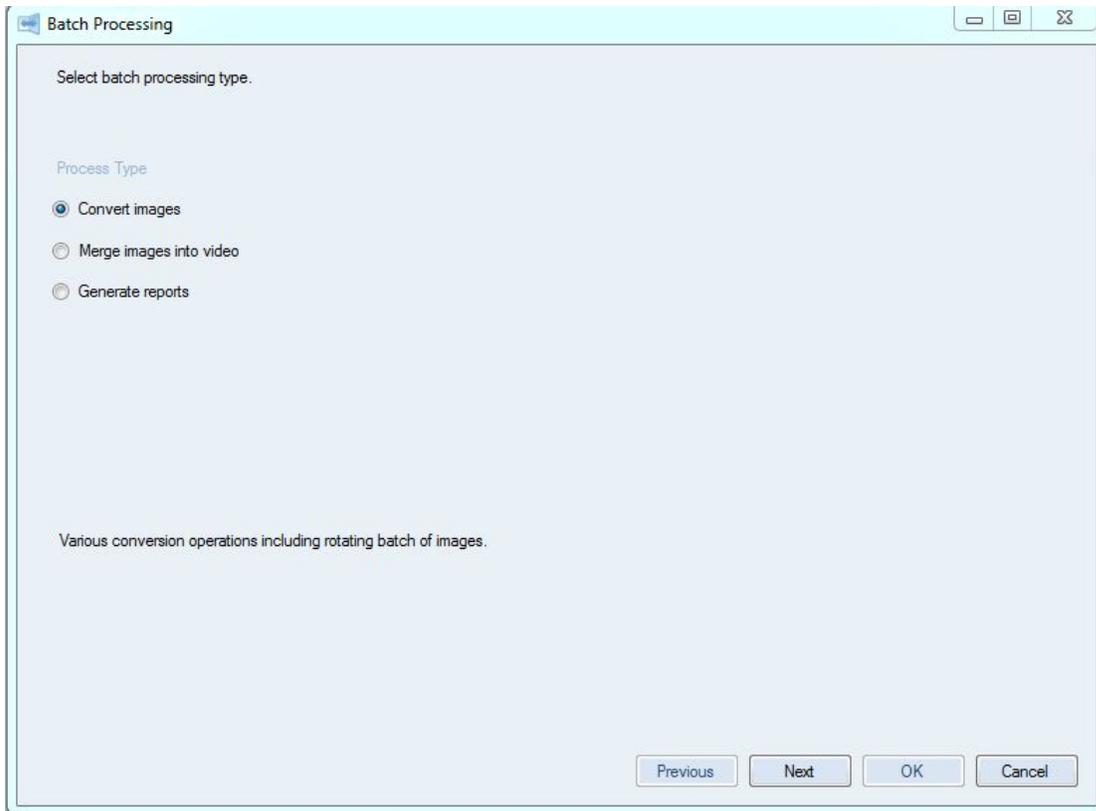
- Import external report template package into the software.
- Export selected report template as a report template package.

2.3.2 Add/Edit/Delete/Close report template

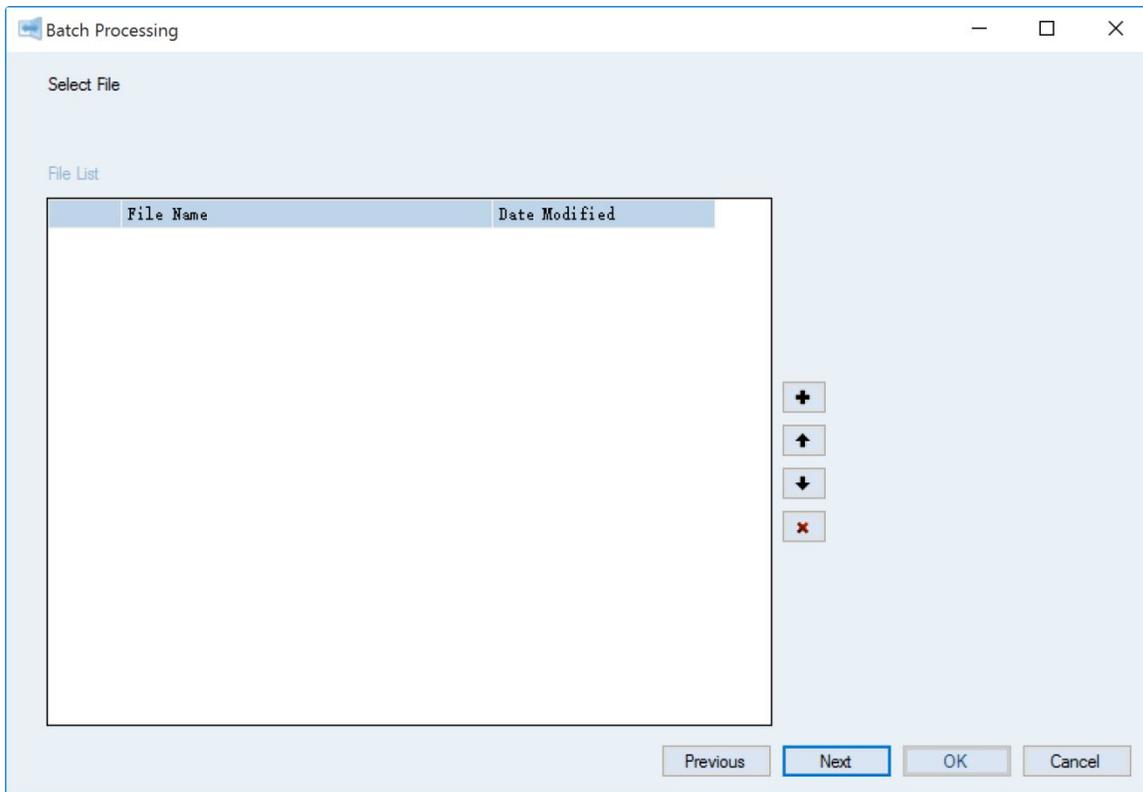


- Add report template (including name, type, and file). User can define a report template.
- Edit selected report template.
- Delete selected report template.
- Close "Report Template" window.

2.4 Batch Processing

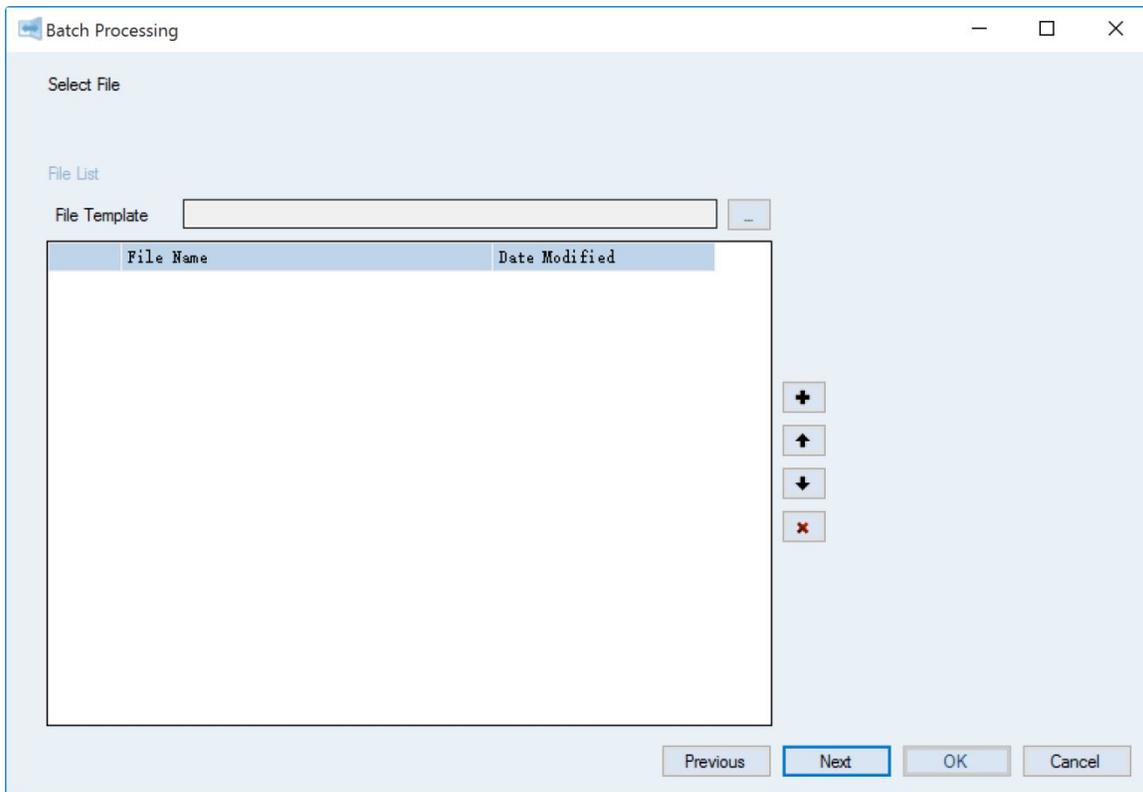


2. 4. 1 Convert Images



-  Add thermal image files (cannot add visible image).
-  Move up the image file location.
-  Move down the image file location.
-  Delete the selected thermal image file.

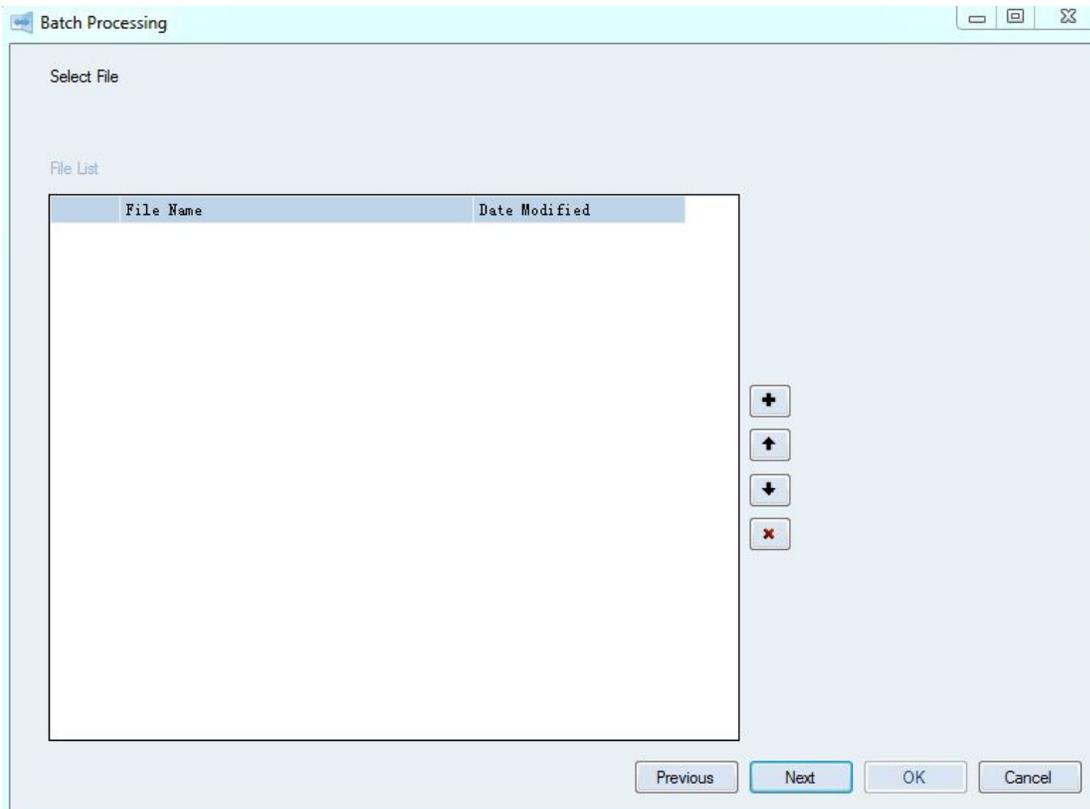
2.4.2 Merge Images into Video



- File template: Select the start image/video file (thermal image file or .IRS file). , Added files must be taken from the same thermal camera as the file template.
-  Add thermal image/video files (cannot add visible image). Added files must be taken from the same thermal camera as the file template.
-  Move up the image file location.
-  Move down the image file location.
-  Delete the selected thermal image file.

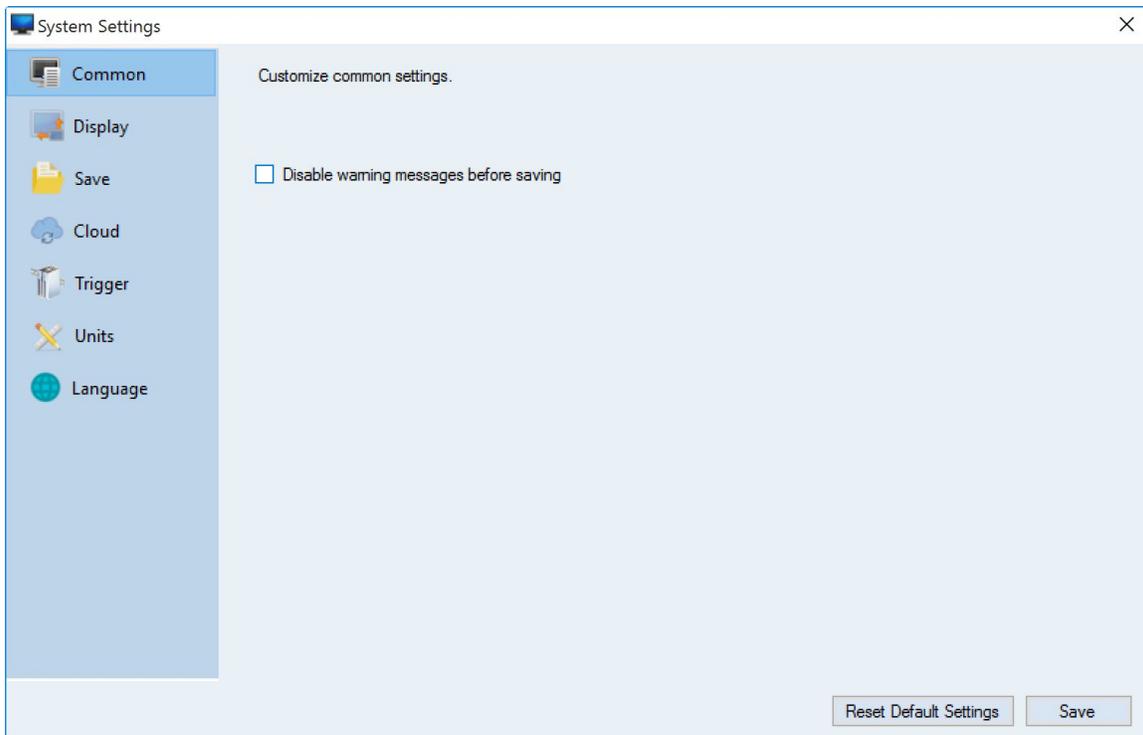
2.4.3 Generate Reports

Create reports in batch.



-  Add thermal image files (cannot add visible image).
-  Move up the image file location.
-  Move down the image file location.
-  Delete the selected thermal image file.

2.5 System Settings



2.5.1 Common

- Disable warning messages before saving After checked, no warning messages pop out before saving.

2.5.2 Display

Customize display settings.

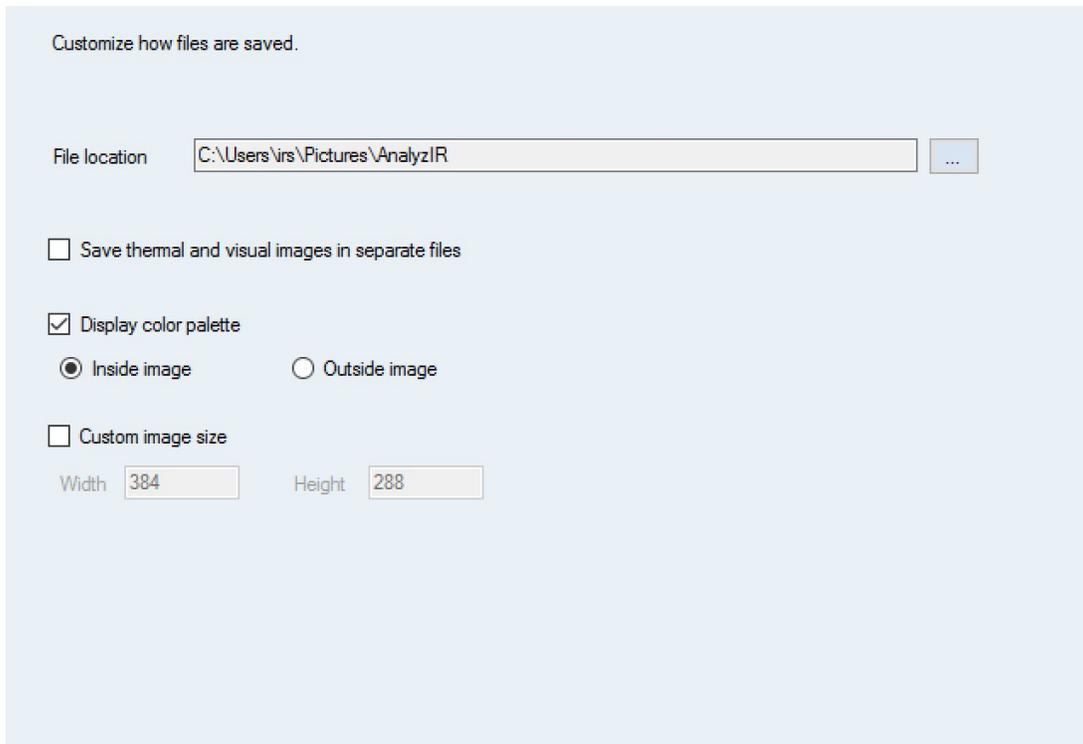
- Display max. temp. spot of entire image
- Display min. temp. spot of entire image
- Display max. temp. spot of measurement tools
- Display min. temp. spot of measurement tools
- Display max. temp. value of measurement tools
- Display min. temp. value of measurement tools
- Display average temp. value of measurement tools
- Display temp. difference of measurement tools
- Display max. and min. temp. value of flying spots
- Automatically adjust label position

Reset Default Settings

Save

Options to set up the data display in workspaces.

2.5.3 Save



Set up the default folder to save files

- Save thermal and visual images in separate files
After checked, it will save thermal and visible images from the picture in picture window separately with different file names.
- Display color palette
 Inside image Outside image
Locations of temperature color bar display.
- Custom image size
Width Height
User defined image size (pixels).

Note: Width and Height must be even numbers.

Thermal cloud settings.

Local path

C:\AnalyzeIR



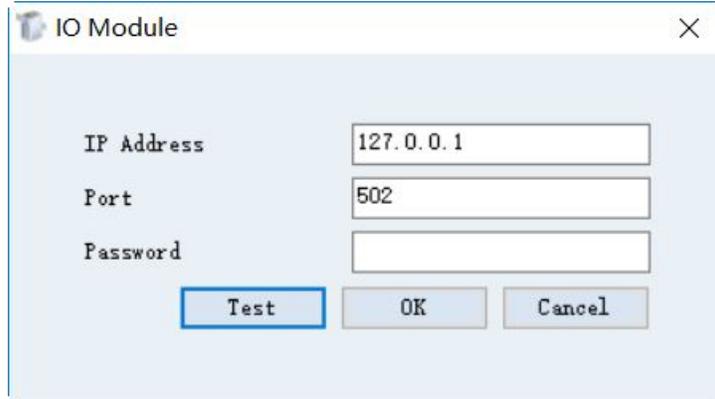
2.5.4 Trigger

Customize external trigger settings.

Trigger Type

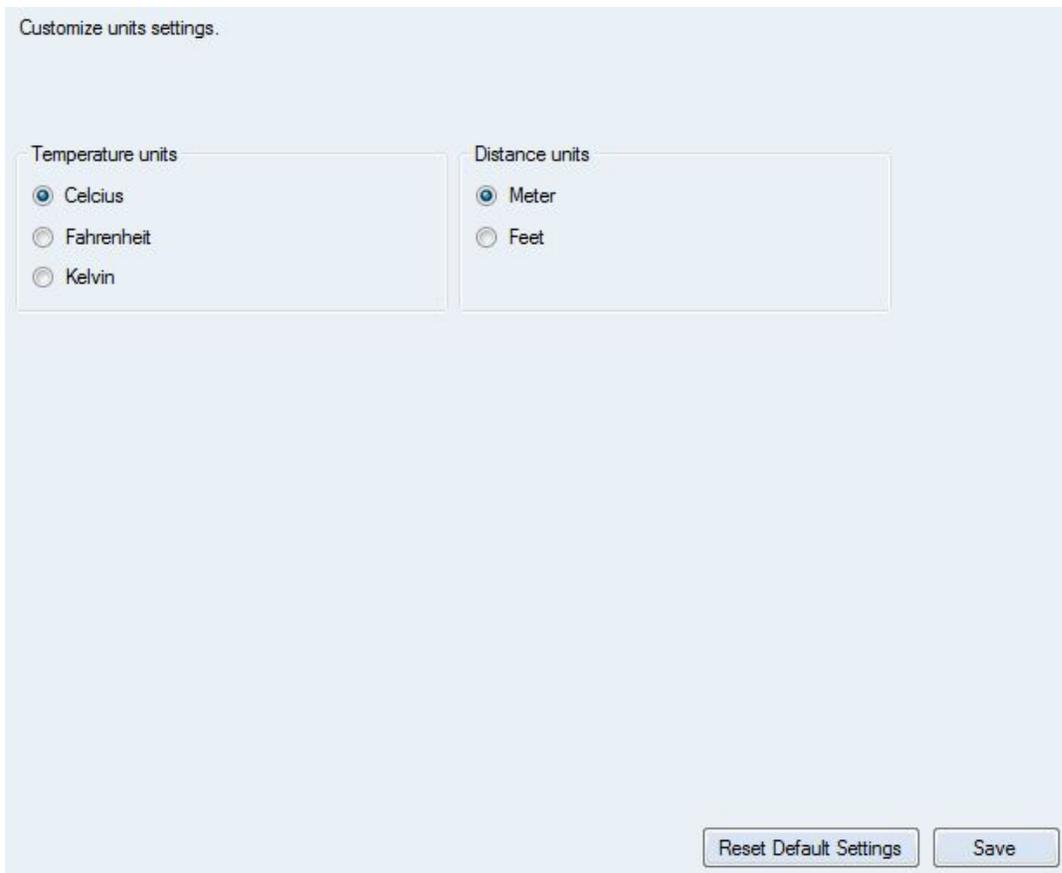
IO

Modbus



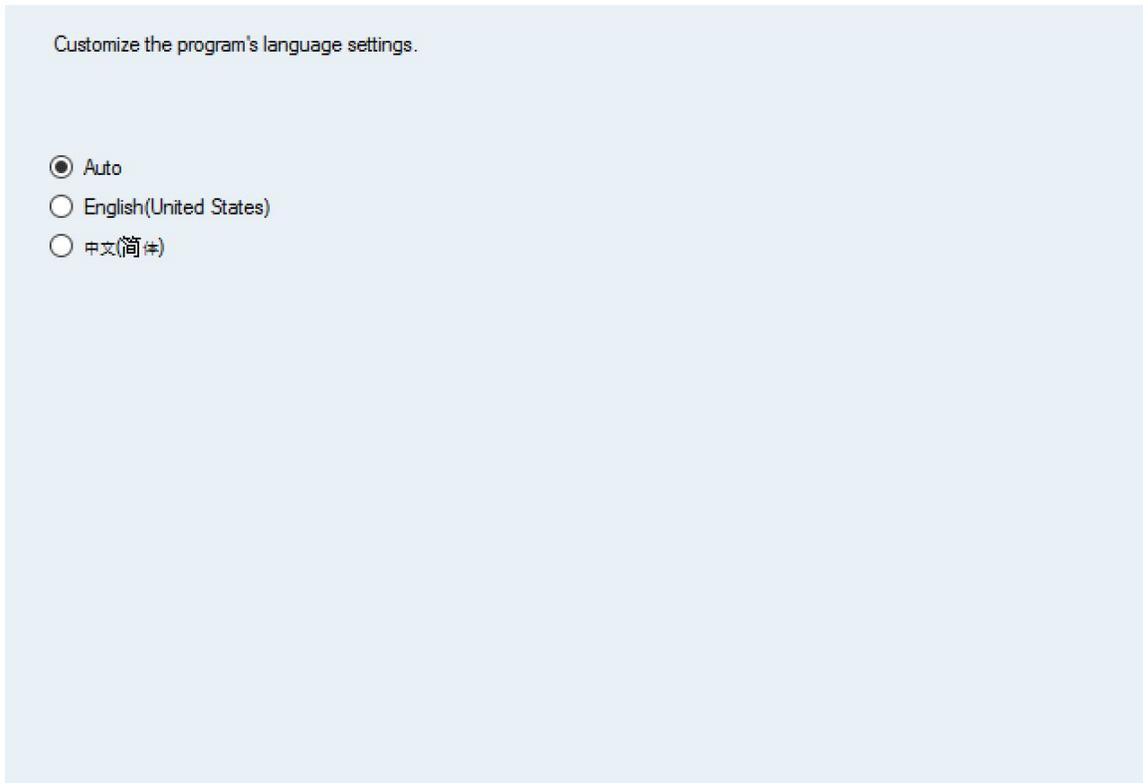
Connect to external modules. Control the start and stop of thermal video recording in IR Camera Workspace.

2.5.5 Units



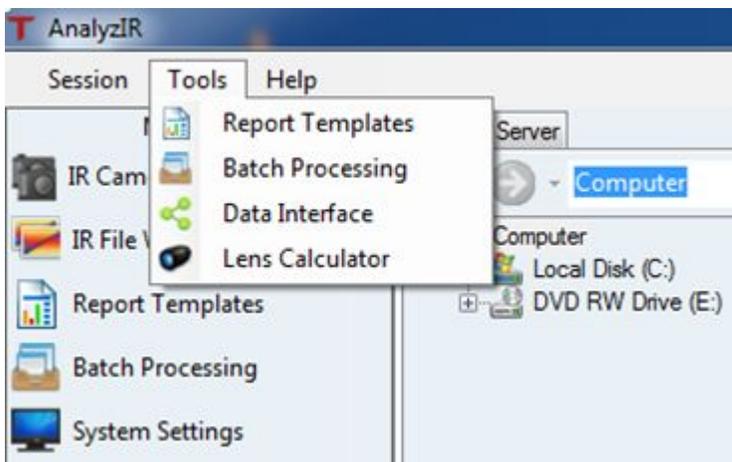
Set up temperature and distance units of workspaces. The default is “Celcius” for temperature and “Meter” for Distance.

2.5.6 Languages



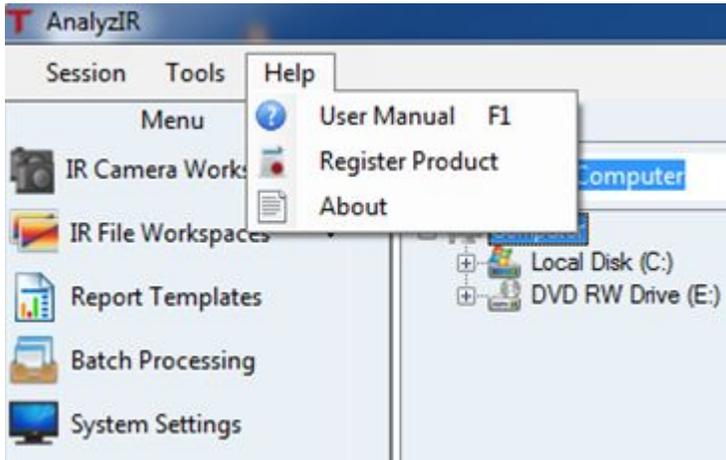
Configure the display language of the user interface (UI). The default is “Auto” which is same as display language of the operation system (OS).

2.6 Tools



Note: Manually input the “Marker Name” in the “Data Interface”, and the addresses cannot be same.

2.7 Help



- User Manual F1: Open user manual file.
- Register product: Register product with FOTRIC.
- About: Check the version of the software.

Note: When registering product, user needs Administrator authority of the computer, otherwise registration may fail.