IRAnalyser®

User Manual

The Quality Management System of the manufacturer is approved to ISO9001:2000 for the design, manufacture, stockholding, in-house repair and site servicing of non-contact temperature measuring instrumentation.

Sierra Pacific Innovations Corp reserves the right to make changes and improvements for the product described in this manual without prior notice.

Content

Introduction

This publication provides the necessary information required to understand and use the analysis software **IrAnalyser**® to analyze static image files or real-time video taken by our cameras.

It is recommended that the User Manual is read thoroughly before using the software.

It is also advisable that all User Manuals and Instruction Leaflets supplied are kept readily available, for reference when the software is in general use.

Technical Support

Technical support for the software can be obtained by either contacting the address/telephone number on the cover of this User Manual, or by Email to the following address: overseas@guide-infrared.com

Feedback to Us

We have tested and verified the information in this manual to the best of our abilities. Yet as we are committed to continuous development and progress, you might find features of the product have been changed since the time of printing. Please let us know about any errors you find and your suggestions for modifications for future editions by either contacting the address/telephone number on the cover of this User Manual, or by Email to the following address: overseas@guide-infrared.com

Installing IrAnalyser®

System Requirements

Operating system: Window 2000 or higher (IE5.0 or higher), included:

Windows2000

WindowsXP

WindowsVista

Software: Microsoft® Office 2000 or higher, including:

Microsoft Office 2000

Microsoft Office XP

Microsoft Office 2003

Microsoft Office 2007

Minimum hardware requirement:

Processor	Pentium3 1G
RAM	256M (512M recommended)
Free available space on hard disk drive	100MB
Display	Super VGA (800 x 600) or higher; or higher resolution monitor with 16-bit colors

Install IrAnalyzer®

It is recommended that you close down all applications before installing the program.

- Insert the CD-ROM containing the program into the CD-ROM driver on your PC

- Follow the on-screen instructions

Note:

- Please double click the file "setup.exe" on the CD-ROM if the installation does not begin automatically

- Without changing the default directory to install the program, the installation procedure will allow the program to be installed under C: \Program files\Guide IrAnalyser

- The installation procedure will add a shortcut icon Launch Guide IrAnalyser to the desktop and Start (All programs\IrAnalyser\ Launch Guide IrAnalyser)

Uninstall IrAnalyzer®

It is recommended that you close down all applications before uninstalling the program.

- Insert the CD-ROM containing the program into the CD-ROM driver on your PC
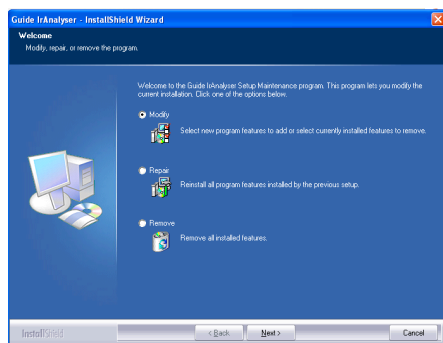
- Follow the on-screen instructions

- When the dialog box below is displayed, select Remove, click Next and then follow the on-screen instructions.
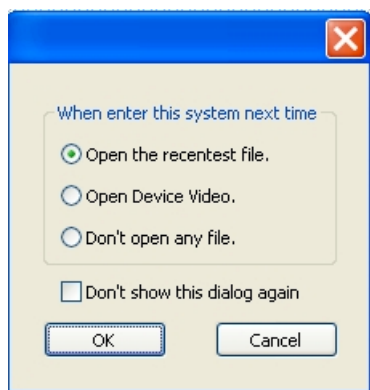
Using IrAnalyzer®

Choosing a language for IrAnalyzer®

After you install the program in your PC and run the program, the program will open with the default language. The default language is the one used by your Operating system.

To change the language, go to command Language under menu View and then choose a language you need for the program. A checkmark √ will appear in front of the selected language.

After changing the language, the program will prompt you restart it. Choose Yes to restart it immediately or No to go on using the original language.

Before IrAnalyzer closes, a dialog displays as follows

When enter this system next time
- ⦿ Open the recentest file.
- ◯ Open Device Video.
- ◯ Don't open any file.

☐ Don't show this dialog again

[OK]   [Cancel]

Open the latest image: open the latest image automatically when restarting the IrAnalyzer
Open the Device Video: open the latest infrared video automatically when restarting IrAnalyzer
Don't show any file: don't show any file when restarting IrAnalyzer
Don't show this dialog again: don't show this dialog in IrAnalyzer again

Get to know IrAnalyzer® interface

The program has only one Windows-based interface.

After starting the program, the program interface below will appear. It consists of eight parts: Tip of the day, Menu bar, Toolbar, Palette bar, Information bar, DataView bar, Gauge bar and Status bar. Below please find detailed introduction to each part.
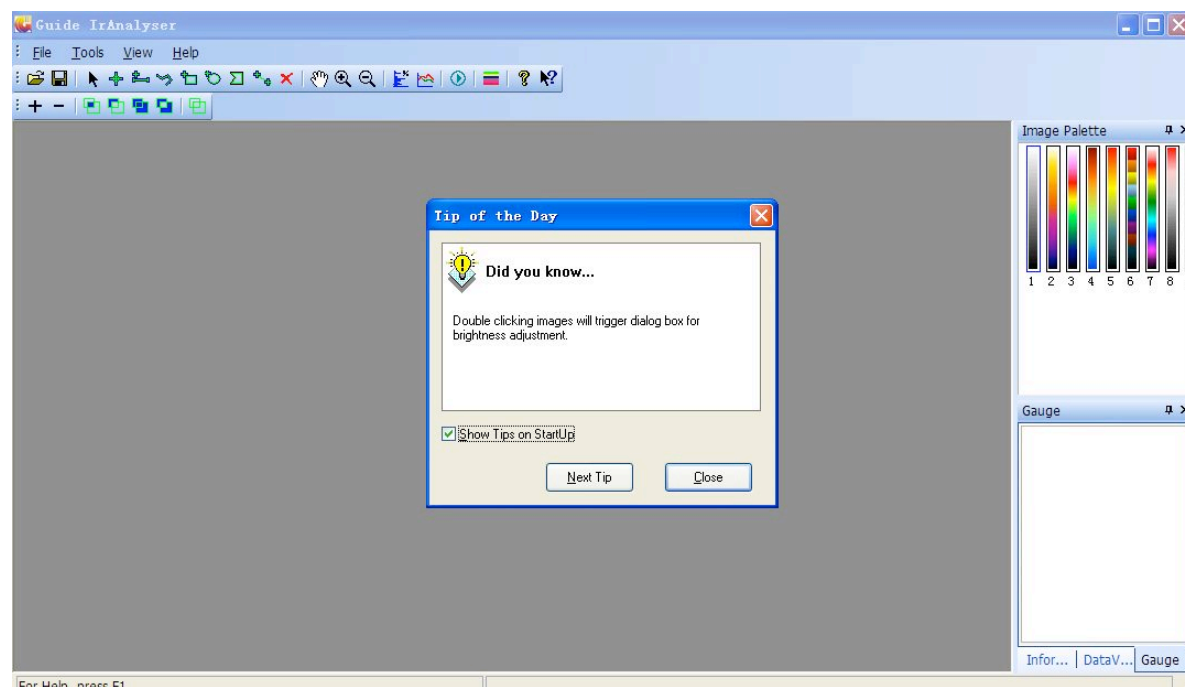
Tip of the Day

The dialog box displays several tips about the program features and how to use them. You can select Next Tip to go through the tips or Close to close down the dialog box. Or you can get cancel the selection of "Show Tips on StartUp" to modify the program to not open the dialog box next time you run the program.
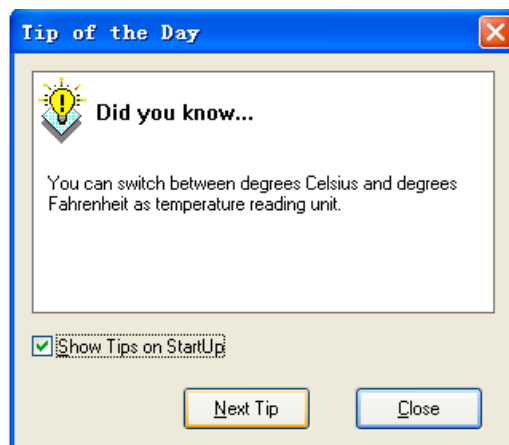
Menu Bar

Menu bar consists of eight sub-menu options, including File, Image, Filter, Measure, Tools, View, Window and Help.
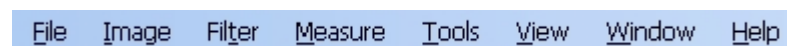
Keep the left button of the mouse depressed and by moving the mouse will allow you to move the menu bar to any desired place.

Toolbar

The toolbar is displayed across the top of the program window, below the menu bar. The toolbar provides quick mouse access to major functions in the program.
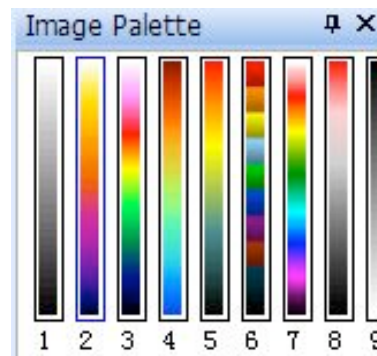

Keep the left button of mouse depressed and moving the mouse will allow you to move the toolbar.

Note:
- To hide or display the toolbar, click Toolbar in the View menu.

Palette Bar

There are nine palettes available. Moving the mouse across them will accordingly change the colors of the current image file and gauge color. Clicking a certain palette will confirm the selection. Move the mouse away without clicking a certain palette and the current open image file will still be in the original color.

Keep left button of the mouse depressed and moving the mouse will allow you to move the palette bar to any desired place.
Note:
- To hide or display the palette bar, click Palette Bar in the View menu or click the shortcut [icon] in the toolbar of View menu

Information Bar

Displays information of the current open image file, such as emissivity, humidity, date and time when it was created.

While moving the mouse within the image file, coordinates and temperature of the image pixel where the mouse lies will be displayed in the Information bar.

Note:

- To display or hide the information bar, click the Information Bar in the View menu.

- Clicking ✕ on the right top of the information bar can hide Information Bar as well.

DataView Bar

Display temperature measurement result of analysis objects (spots, lines, circles, rectangles, polygons, or delta-two spots) added to the current open image file if any.
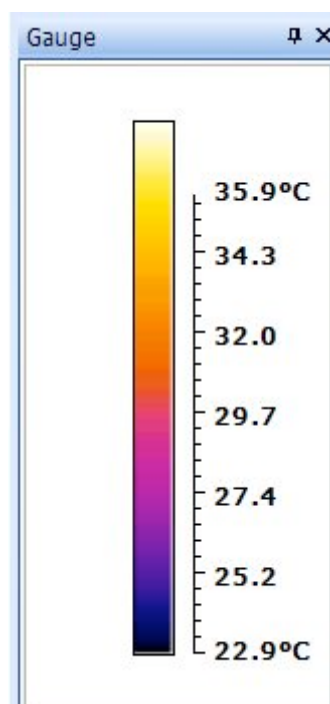
Keep left button of the mouse depressed and moving the mouse will allow you to move the DataView bar to any desired place.

Note:

- To display or hide the DataView bar, click DataView Bar in the View menu.

- Clicking ✕ on the right top of the DataView bar can hide the DataView bar as well.

Gauge Bar

It displays different colors according to the different temperatures.

Note:

- To hide or display the gauge bar, click Gauge Bar in the View menu.

Status Bar

The status bar is displayed at the bottom of the program window.

The left area of the status bar describes actions of menu items as you use the up and down arrow keys to navigate through menus. This area similarly shows messages that describe the actions of toolbar buttons as you press them, before releasing them. If after viewing the description of the toolbar button command you wish not to execute the command, then release the mouse button while the mouse pointer is off the toolbar button.

For Help, press F1

Note:
- To display or hide the status bar, use the Status Bar command in the View menu.

Use Commands under Menu Bar

File Menu

The File menu offers the following commands:

Open Image	Open an existing image file
Save Image	Save an opening image file
Save Image As	Save an open image file with palette or without palette in JPEG or BMP image file
Close	Close an open image file
Setup	Set the directory of thermal image and video and other relevant information
Report	Word: New: Create a Microsoft® Word report with the program and Microsoft® Word for the current opening image file; Open: Open an existing Microsoft® Word report Report Wizard: Create a Microsoft® Word report step-by-step for the current opening image file with pre-defined report templates Excel: New: Create a Microsoft® Excel report with the program and Microsoft® Excel for the current opening image file; Open: Open an existing Microsoft® Excel report Freport： Create a report with the program for the current open image file in other type file.
External Device Manager	Delete saved image files in MobIR® M series camera，TP8 camera,EasIR-4 camera or download them from MobIR® M series camera，TP8 camera，EasIR-4 camera to your PC
Exit	Exit the IrAnalyzer® program

Open Command

Use this command to open an existing image file in a new window. You can open multiple image files at one time. Use the Window menu to switch among the multiple opening files. For more details, please refer to **Window 1, 2, ... command**.

Note:
- Clicking shortcut ⬚ in the toolbar will open an existing image file as well.
- As many as 12 images may be opened at a time
- On the title bar of an open image file window, it shows the file name.

Save Command

Use this command to save an opening image file and the measurement analysis in its current name and directory.

Note:

- If the opening image file is of IMG format, a prompt whether to save it into IRI format will appear before saving it.
- You have to save the IMG file as IRI format, then the analysis result can be saved into the file together. The analysis information can't be saved in image files of IMG format
- If the opening image file is of JPG format, the analysis result and the JPG file will be saved together in JPG format.
- Clicking shortcut 💾 in the toolbar will save an opening image file as well.

Save Image As Command

Use this command to save an opening image file with pallet or without pallet in JPEG or BMP image file.

Note:

- You cannot measure temperature of pixels in the re-saved BMP or JPG image files
- To save the visual image of the current thermal image, please select the visual image firstly and then click the right bottom of mouse, a menu of "Copy, Save as, Close" will appear. Selecting " Copy" will copy the visual picture to other document, Selecting " Save as" will save the visual picture as another BMP or JPG file, Selecting " Close" will close the visual picture

Close Command

Use this command to close an opening image file.

Setup Command

Use this command to set a directory on the hard disks to store thermal images, reports, report templates and time format displayed in the information bar.
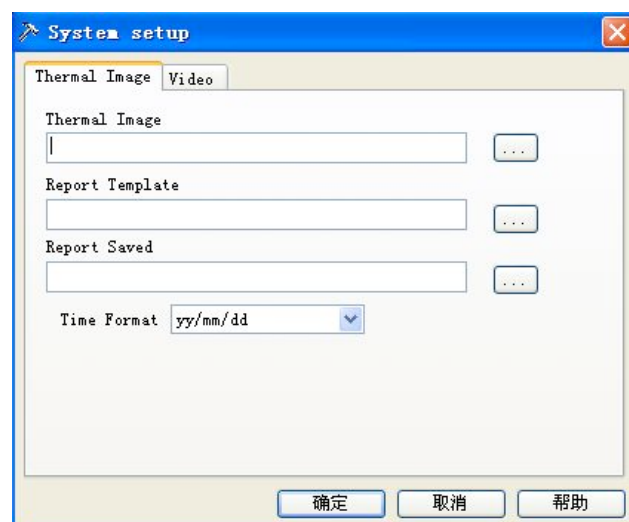
After saving the setup, the program will automatically go to the directory when opening

thermal images or reports and when creating reports using the Report Wizard.

Report Command

This command includes two sub-commands: Word and Excel.

Word includes three sub-commands as follows:

New: Use this command to create a Microsoft® Word report with the program and Microsoft® Word for the current opening image file;

Open: Use this command to open an existing Microsoft® Word report

Report Wizard: Use this command to create a Microsoft® Word report step-by-step for the current opening image file

Excel includes two sub-commands as follows:

New: Use this command to create a Microsoft® Excel report with the program and Microsoft® Excel for the current opening image file;

Open: Use this command to open an existing Microsoft® Excel report

Note:

• The command Report wizard is only available after opening an image file.

The program works together with Microsoft® Word& Excel to create reports.

External Device Manager

This command contains two sub-commands M Series Device, TP serious Device and EasIR serious. Using this command can delete image files saved in MobIR M series camera or TP serious Device and EasIR serious or download them from the camera to your PC.

◆ M series Device

After installing the USB driver and connecting MobIR® M series camera to your PC, choosing this command will open a dialog box below for you to download some files to PC or delete all the image files.
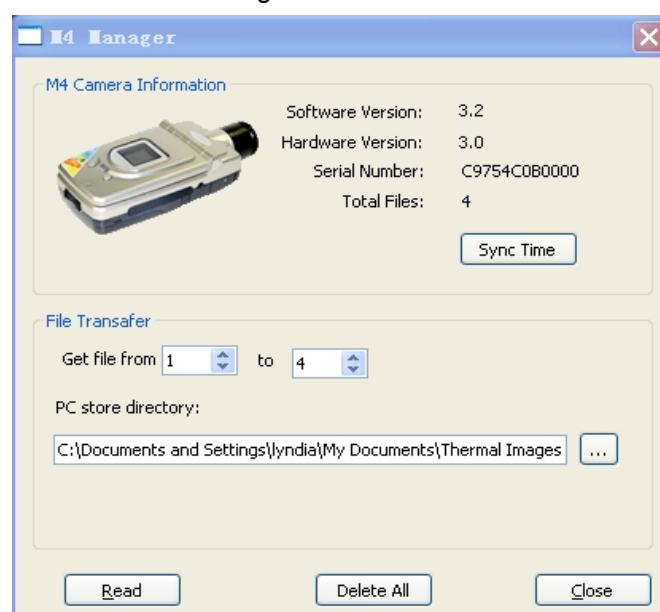
The dialog box contains three parts: MobIR M series Camera Information, Sync Time and File Transfer.

MobIR M series Camera Information

Software Version: Indicate software version of MobIR M series camera.

Hardware Version: Indicate hardware Version of MobIR M series camera.

Serial Number: Indicate serial number of MobIR M series camera

Total Files: Indicate total file number saved in MobIR M series camera.

Sync Time

Use this command to synchronize time shown on MobIR M series camera with PC.

File Transfer

Get file from……to: Appoint the file range as per file numbers which will be transferred to PC.

PC store directory: Appoint store directory for the files in PC.

Click button Read to transfer files to PC. Or Clicking button Delete ALL will eliminate all the image files from the built-in flash memory of MobIR$^®$ M series camera. Click button Close can exit the command.

Note:

- This command is unavailable unless a MobIR M series camera is powered on and connected to your PC and the USB driver is installed in your PC.
- You can connect MobIR M series camera to your PC through the USB extension cable supplied with MobIR M series camera.

◆ TP8 Device

After installing the USB driver and connecting TP8 camera to your PC, choosing this command will open a dialog box below for you to download some files to PC or delete all the image files.
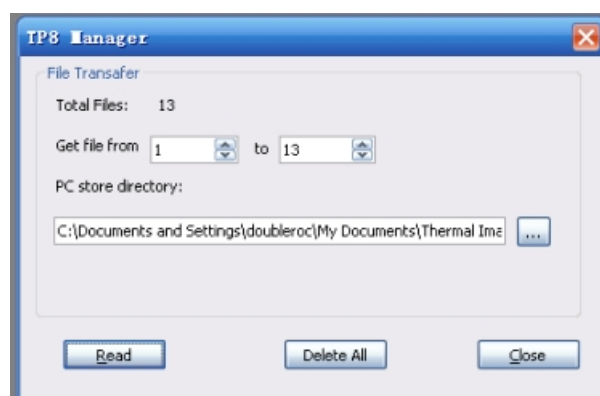
File Transfer

Get file from……to: Appoint the file range as per file numbers which will be transferred to PC.

PC store directory: Appoint store directory for the files in PC.

Click button Read to transfer files to PC. Or Clicking button Delete ALL will eliminate all the image files from the built-in flash memory of TP8 camera. Click button Close can exit the command.

Exit Command

Use this command to end your Guide IrAnalyser$^®$ session. After choosing this command,

the program will prompt you to save image files with unsaved changes.

Image Menu

The Image menu offers the following commands:

Palette	Choose palettes for an opening image file
Rotate	Rotate an opening image file clockwise or counterclockwise
Mirror	Display horizontal and vertical mirror images of an opening image file
Zoom	Zoom out an opening image by 50% or keep original size or zoom in an opening image by 150%, 200%, 300%, 400%, 500% or self-define zoom in multiple.
Zoom In	Zoom in an opening image
Zoom Out	Zoom out an opening image
Hand	Move the scroll bars around an opening image file to view the desired parts of the file
Actual Size	Resume the original size of an opening image file window
Gauge Setting	Change temperature range to adjust brightness of an opening image file by moving the two slides
Gauge Advance Setting	Change temperature range to adjust brightness of an opening image file by changing the max and min temperature
Image Fusion	Set the infrared image and visual image in fusion
Play Sound	Play voice annotation saved with an opening image file if any
Property	Display the property of an opening image file

Palette Command

Use this command to choose a palette from the nine available for the current opening image file.
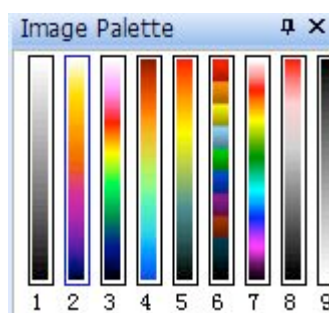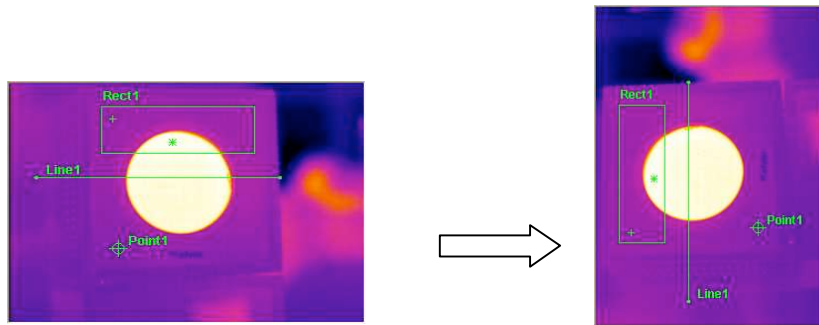

Note:

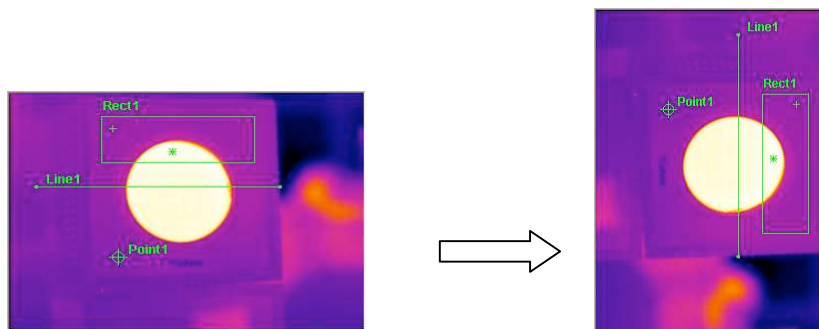- Using palette bar can activate this function as well. Please refer to **Palette Bar**.

Rotate Command

This command contains two sub-commands as follows:

90 CCW: Use this command to rotate the current opening image file 90 degrees counterclockwise

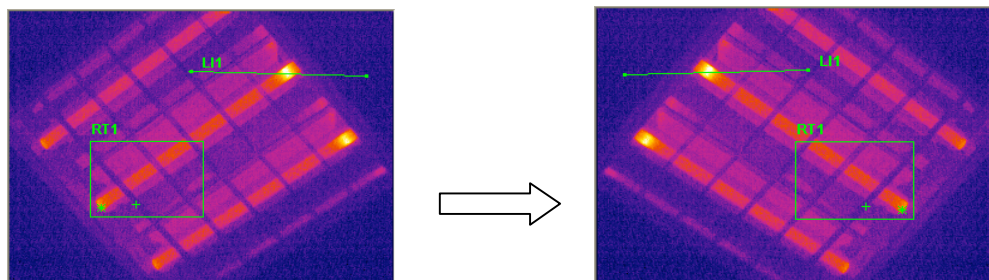**90 CW:** Use this command to rotate the current opening image file 90 degrees clockwise
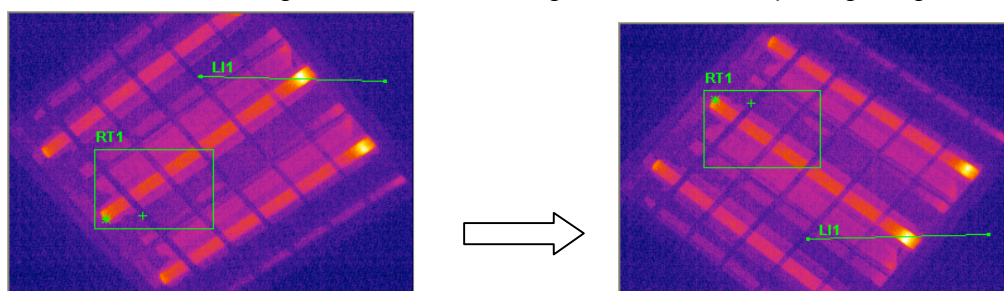

Mirror

Command

This command includes two sub-commands as follows:

Horizontal: Use this command to get horizontal mirror image of the current opening image file

Vertical:

Use this command to get vertical mirror image of the current opening image file

Zoom Command

For TP8: All images opened by analysis software have been zoomed in by 150% based on its original size captured by TP8 camera.

For M Series camera: All images opened by analysis software have been zoomed in by 200% based on its original size captured by MobIR M series camera.

For IR928 Series Camera: All images opened by analysis software is in the same size with that captured by IR928 series camera

This command contains eight sub-commands as follows:

50%: Use this command to zoom out an opening image by 50% based on original image size.

100%: Use this command to restore original size of an opening image

150%: Use this command to zoom in an opening image by 150% based on original image size.

200%: Use this command to zoom in an opening image by 200% based on original image size.

300%: Use this command to zoom in an opening image by 300% based on original image size.

400%: Use this command to zoom in an opening image by 400% based on original image size.

500%: Use this command to zoom in an opening image by 500% based on original image size.

Custom: User this command to self-define multiple based on original image size.
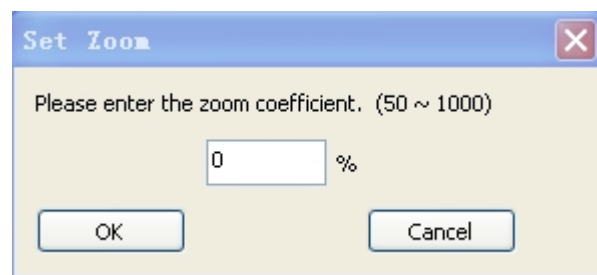
Zoom In Command

Zoom in an opening image by 100%→150%→200%→300%→400%→500%......→1000%

Click the shortcut of can activate this command as well

Zoom Out Command

Zoom out an opening image by 150%→100%→50% based on 150% zoomed in image.

Restore zoomed in image in opposite sequence when zooming in image: 1000%→900%→800%.......→50%.

Click the command of can activate this command as well

Hand

Move the scroll bars around an opening image file to view the desired parts of the file

Set Cursor

Change the mouse shape to be an arrow or a cross-line

Small: Choose this command to change the mouse to be an arrow

Large: Choosing this command will change the mouse to be a cross-line. The cross-line is originally as large as a pixel and will change as the image file size changes.

Actual Size Command

The mouse pointer becomes a two-headed arrow keys when you move it to the frames of an opening image file window. Move the two-headed arrow keys can zoom in or out the file window. Use this command will restore the original size of the file window.

Gauge Setting Command

The program establishes a mapping function for temperature and brightness of each image file. This command utilizes this mapping function to adjust brightness of the current opening image file. Dialog box of Temp Range will appear after choosing this command.
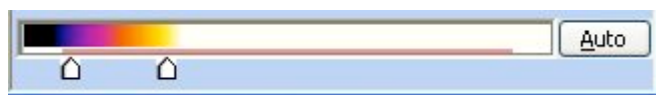
Moving the scale pointer to select a suitable temperature range and then double click the opening image will confirm the change. Or click button Auto to restore the original brightness. Click button Cancel to ignore the modification. If selecting Preview, the modification will display on image immediately.

Note:
  • Double clicking the opening image file will activate this command as well.
  • It could not change the pallet when you adjust the gauge scale

Gauge Advance Setting Command

The program establishes a mapping function for temperature and brightness of each image file. This command utilizes this mapping function to adjust brightness of the current opening image file. Dialog box of gauge advance setting will appear after choosing this command.
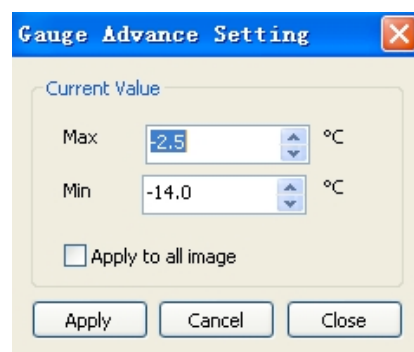
Type in the max and min temperature (any temperature in whole temperature range) and click Apply to change the mapping function and adjust brightness of current opening

image file.

If multi images are opened, Selecting Apply to all image will apply the temperature setting to all opening image file.

The command is useful if operator wants to compare similar thermal images. Operator just sets a temperature range and applies to all the images, then, the difference between each image is easily found.
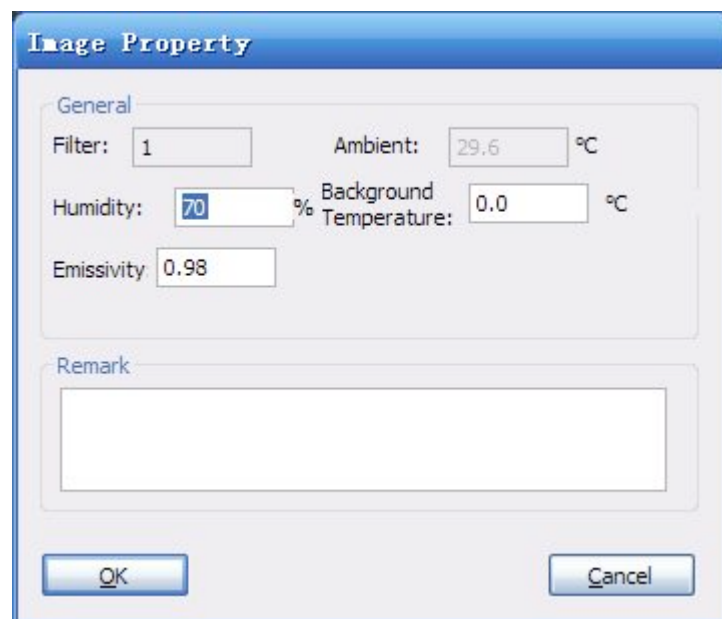
Play Sound Command

Use this command to play voice annotation saved with the current opening image file if any.

Note:

- This command is only available for files with voice annotation stored.
- Clicking shortcut ⏺ in the toolbar will activate this command as well. The shortcut is only available for files with voice annotation stored.

Property Command

Use this command to display property of the current opening image file. Click button OK will save the words which you write in the Remark


Note:

- Filter: It reflects the filter of the camera which you choose to take the infrared image. It also could reflect camera lens if it is used additional lense.
- Emissivity: It reflect the object emissivity which you set in the infrared camera. If you change it here, the image temperature would be also changed.

Filter Menu

The Filters menu offers the following commands:

|	
Blur	Get fuzzy effect of image
Emboss	Get emboss effect of image
Gaussian	Get smooth image
Soften	Get soft image
Sharpen	Get sharp image
Edge	Get image edge intensified
Median	Get the image median filtered, let it become soft
Add Noise	Add noise to image
Erode	Get erosive effect of image
Dilate	Get inflated effect of image
Contour	Display image contour
Jitter	Get agitating effect of image

Blur
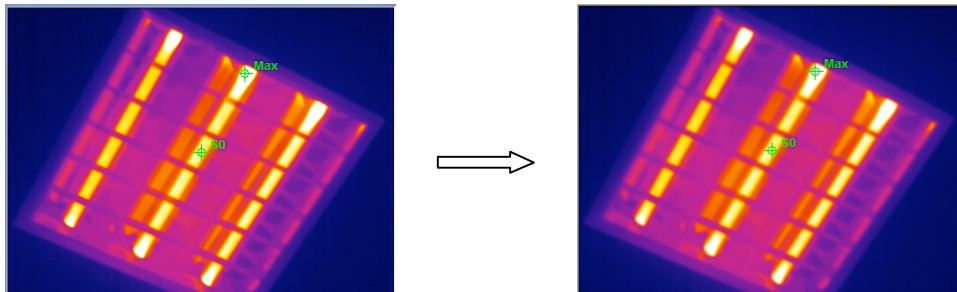
Emboss
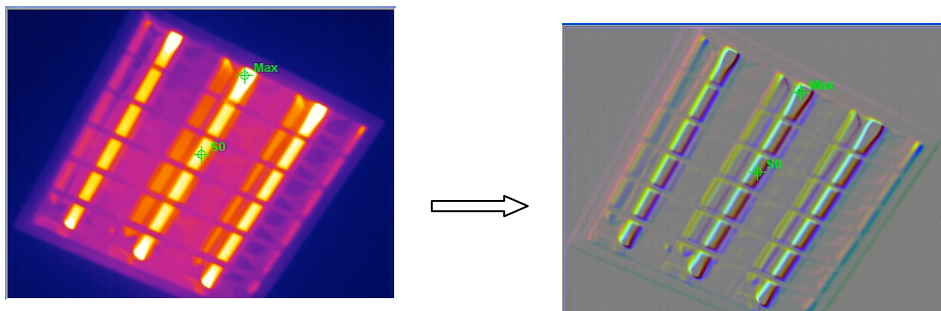
Gaussian
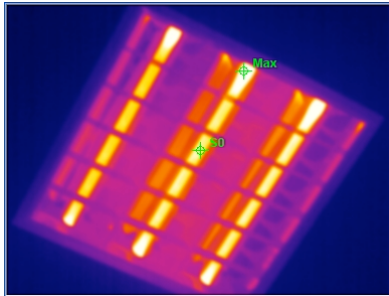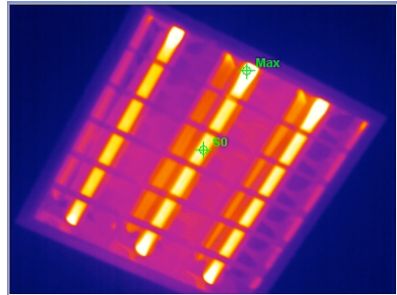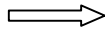
Soften
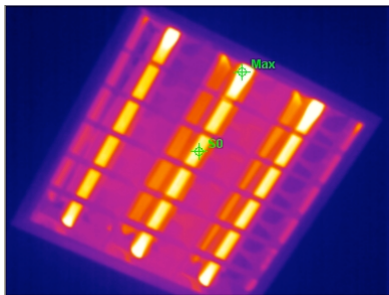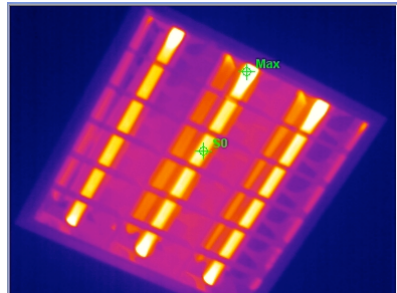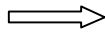
Sharpen
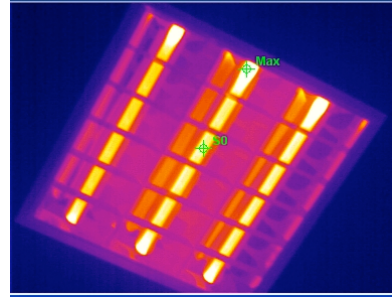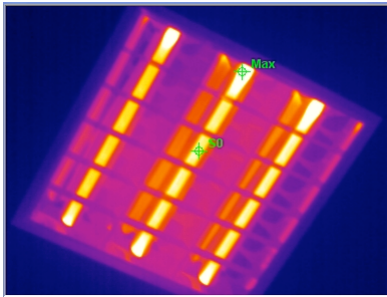
Edge
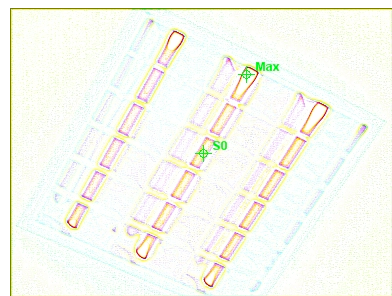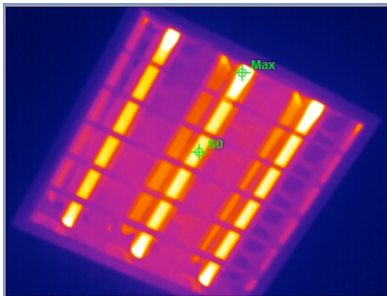
Median
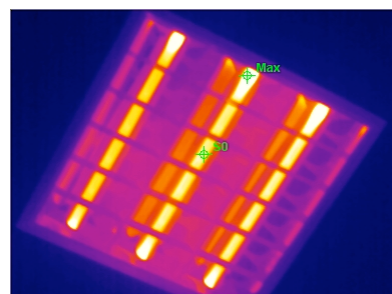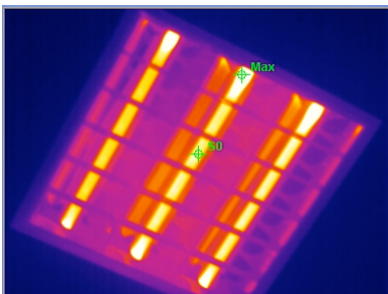
Add Noise
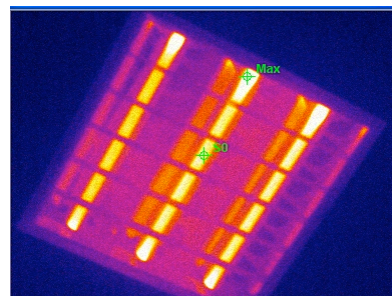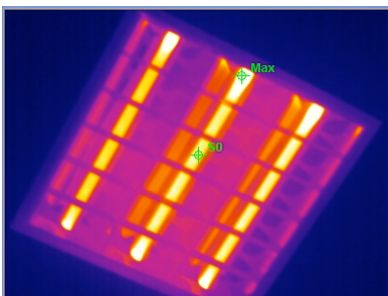
Erode
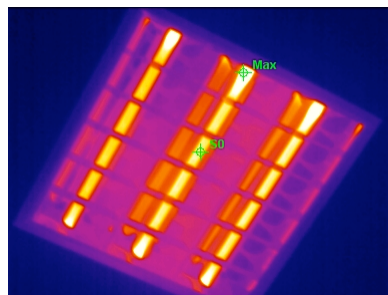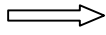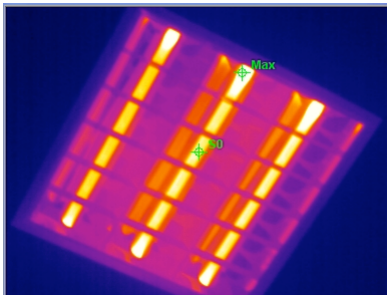
Dilate
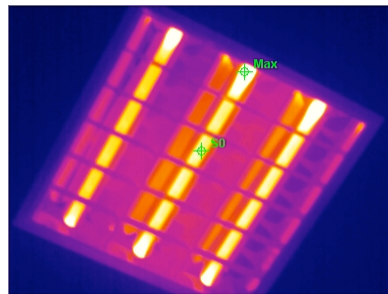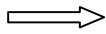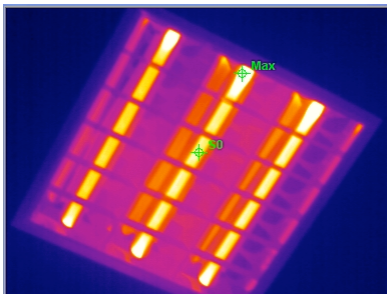
Contour
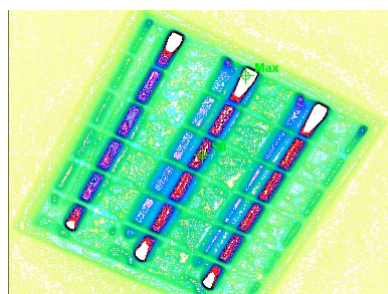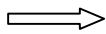
Jitter
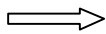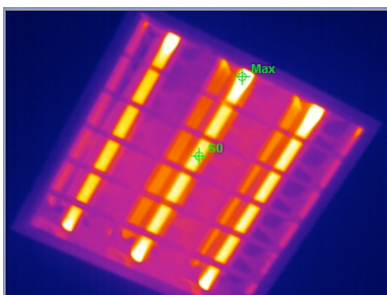
Measure Menu

The Measure menu offers the following commands:

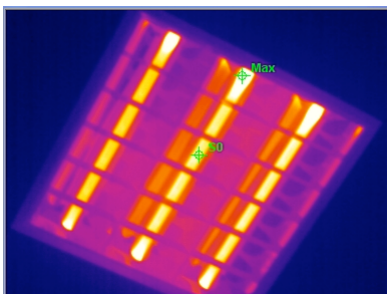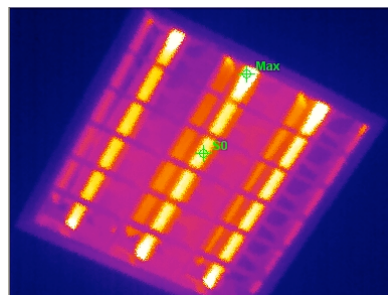|	
Temp Unit	Choose degrees Celsius or degrees Fahrenheit for temperature reading of an opening image file
Show MaxTemp Pos	Indicate where the pixel with the Max temperature lies in an opening image file
Show Min Temp Pos	Indicate where the pixel with the Min temperature lies in an opening image file
Show Profile	Display temperature profile of lines added to an opening image file (if any)
Isotherm	Add an isotherm to an opening image file for analysis
Histogram	Image Histogram: Display the temperature distribution histogram of an opening image file Other Histogram: Display the temperature distribution histogram of an object (a line, rectangle, circle or polygon) added to the opening image file (if any)
Add Spot	Add a spot to an opening image file for temperature measurement
Add Line	Add a line to an opening image file for temperature measurement
Add Polygon line	Add a polygon line to an opening image file for temperature measurement
Add Rectangle	Add a rectangle to an opening image file for temperature measurement
Add Circle	Add a circle to an opening image file for temperature measurement
Add Polygon	Add a polygon to an opening image file for temperature measurement
Add Delta Two	Add a pair of spots to an opening image file for temperature measurement
Combination	Create combined object based on existing area objects for temperature measurement
Delete Object	Delete an object (a spot, line, rectangle, circle, polygon or a pair of delta-two spots)added to an opening image file (if any)
Delete All Objects	Delete all the objects (spots, lines, rectangles, circles, polygons or delta-two spots) added to an opening image file (if any)

Temp Unit Command

Use this command to choose one from the two degrees Celsius and Fahrenheit for temperature reading of the current opening image file.

Note:

- You can switch between the two degrees as per requirements.
- All the temperature reading of the image file will change accordingly with your choice.

Show Max/Min Temp Pos Command

Use this command to indicate location of the point that has the max/min temperature of an opening image file by using the symbol and Max/Min

After choosing this command, the symbol and Max/Min will appear immediately in the image file to indicate where the point is.
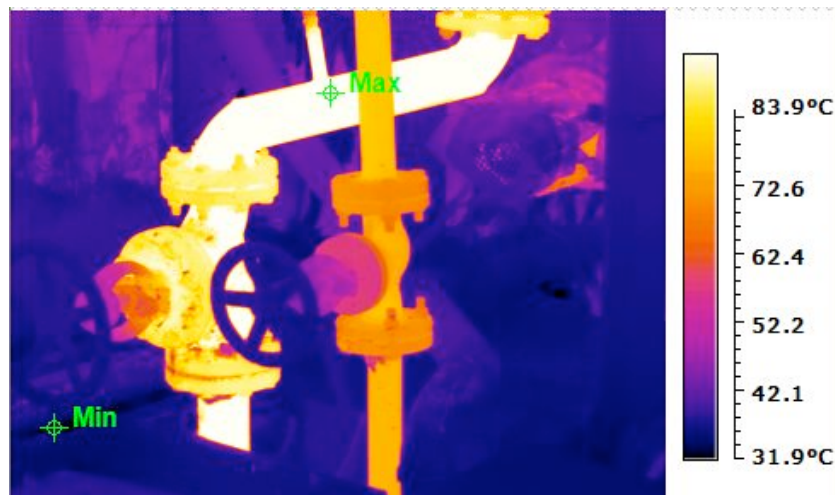
Note:

Max/Min Temp point along with temperature value will be on the image automatically when you open the image. Choose this command again to delete the Max/Min Temp point on the image.

Show Profile Command

Use this command to display temperature profiles of lines added to an opening image file. Click this command will display the Profile View window. Line profiles are displayed in the rectangular coordinates. When moving the mouse along the profiles, a vertical line will appear and move together with the mouse, showing temperature of the point where the vertical line intersects the profiles. Icon + will show corresponding point on the line.
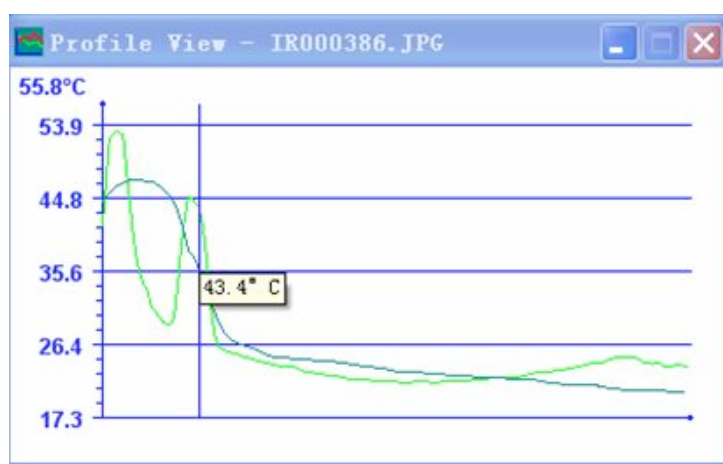
Clicking the right button of mouse on the line profile view window will bring up four commands for it, Copy, Setting, Save as, and Close

Choosing command Copy allows you to copy the rectangular coordinates and lines

profiles to other applications.

Choosing command Setting enables you to bring up the setup dialog box and change colors and the background of the rectangular coordinates if you wish. Click Button OK to save changes and Button Cancel to cancel.
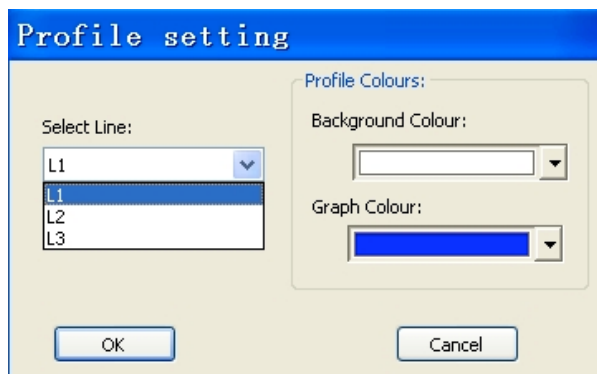
Choosing command Save As will allow you to save the rectangular coordinates and lines profiles to be BMP or JPG image file.

Clicking button Close will close the profile view window.

Note:

- Temperature reading and unit of the coordinates will change with your choice of temperature degrees.

- Clicking short button [icon] in the toolbar can activate this command as well.

Isotherm Command

Use this command to add an isotherm to an opening image file for analysis.

The dialog box Isotherm setting will appear after choosing this command.

Clicking Button [icon] brings up the default isotherm, with its name, color and location in the temperature range displayed as well. Click on its name, its upper and lower limits will be displayed with both numbers and pointers on temperature scales. You can change its color, and limits by moving the scale pointers.

Clicking Button [icon] again and repeating the above will add new isotherms and make changes to them as per requirements.

Then pixels of the image file within the isotherm ranges are displayed in the isotherm colors.

Choosing an isotherm name and clicking button [icon] will delete the isotherm.
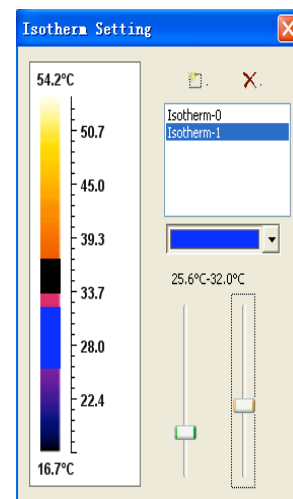
Histogram Command

This command includes two sub-commands as follows:

Image Histogram: Use this command to display the temperature distribution histogram of

an opening image file.
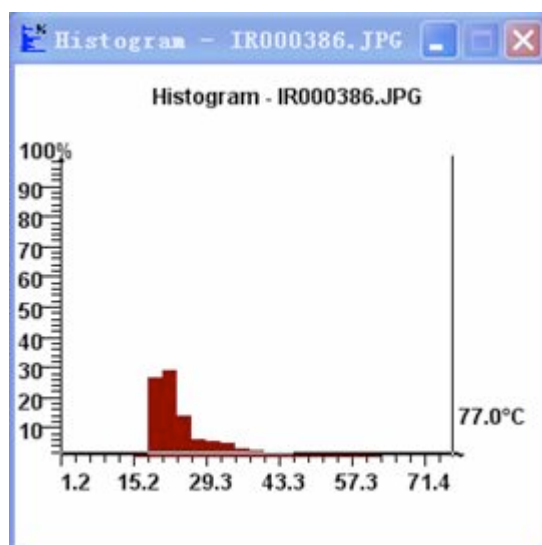
Other Histogram: Use this command to display the temperature distribution histogram of an analysis object (a line, polygon line, rectangle, circle or polygon) added to the opening image file (if any)

♦ *Image Histogram*
  • After choosing this command, a dialog box showing the histogram in the rectangular coordinates appears.
  • While moving the mouse within in the rectangular coordinates, temperature range and percent of the bar (histogram consists of multiple bars) where the mouse points at appears.
 • Clicking the right button of mouse on the dialog box will bring up four commands for it, Copy, Setting, Save as, and Close.
  • Choosing command Copy allows you to copy the rectangular coordinates and the histogram to other applications.

  • Choosing command Setting enables you to bring up the setup dialog box and change colors and background of the rectangular coordinates if you wish. Click Button OK to save and Button Cancel to cancel changes.
  • Choosing command Save As will allow you to save the rectangular coordinates and histogram to be BMP or JPG image file.
  • Clicking button Close will close the dialog box.
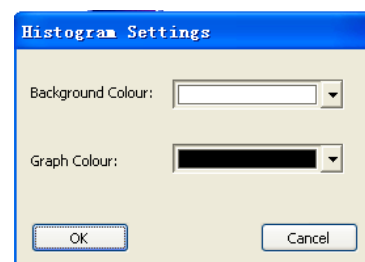
♦ *Other Histogram*
  • After adding an object (a line, rectangle, circle or polygon) to the opening image file, choosing this command will open a dialog box showing the object name and type.
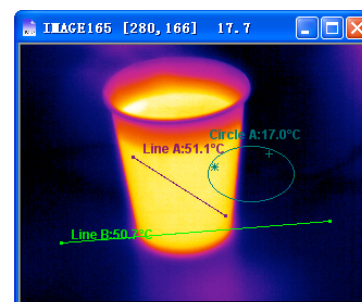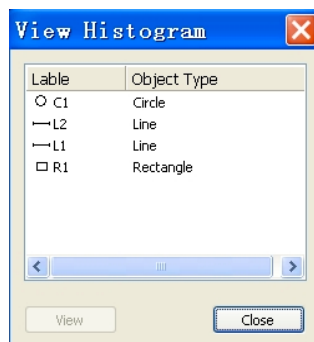
- Click on the object, and then click button View, the histogram of the object will be displayed.
- While moving the mouse within the rectangular coordinates, temperature range and percent of the bar where the mouse points at appears.
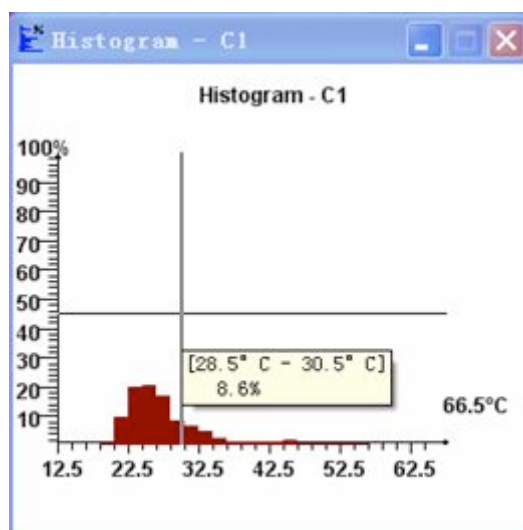
- Clicking the right button of mouse on the dialog box will bring up four commands for it, Copy, Setting, Save as, and Close.
- Choosing command Copy allows you to copy the rectangular coordinates and the histogram to other applications.
- Choosing command Setting enables you to bring up the setup dialog box, change colors and background of the rectangular coordinates if you wish. Click Button OK to save and Button Cancel to cancel changes.
- Choosing command Save As will allow you to save the rectangular coordinates and histogram to be BMP or JPG image file.
- Clicking button Close will close the dialog box.

Note:

- Clicking short button in the toolbar can activate command Image Histogram.
- Viewing histograms of spots and delta-two spots added to an opening file (if any) is not available.

Add Spot Command

Use this command to add a spot to an opening image file for temperature measurement.

After choosing this command, clicking left button of the mouse within an opening image file will add a spot to it, with temperature of the spot and its number shown beside it and also in DataView Bar.
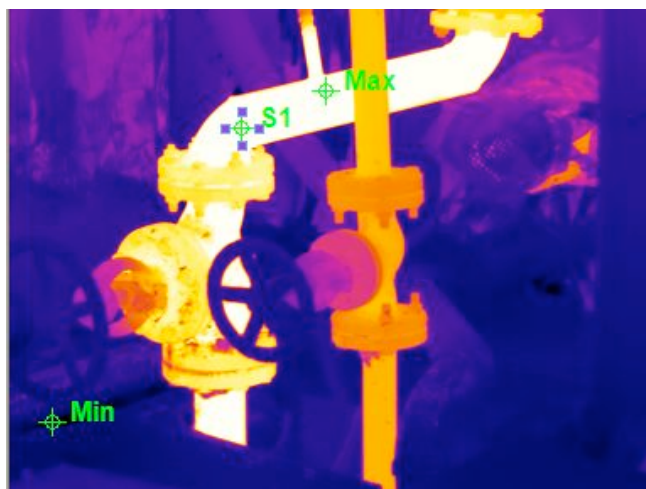
You can change position and property of a spot added to the opening image file as follows:

♦ *Move the spot:*

• Move the mouse to the spot (more accurately to the symbol), the mouse pointer will change to be a four-headed arrow with a symbol +. Clicking the left button of the mouse to select it, there will be four small squares around the spot , indicating the spot is moveable at present. To move the spot, keep left button of the mouse depressed and drag the mouse to any desired place, then release the left button to confirm the place.

♦ *Modify the spot property:*

• Move the mouse to the spot (more accurately to the symbol), the mouse pointer will change to be a four-headed arrow with a symbol +, indicating you can select the spot and modify its property at present. Double click the spot to open dialog box Spot Property. Then you can modify the items within to modify the spot property.

• Moving the pointer on transparency scale will allow the spot symbol to change

from being completely transparent to being completely solid. Selecting Show Temperature will display temperature of the spot within the image file window. Choosing Custom and changing emissivity value will make the program to recalculate and display temperature of the spot accordingly.

• After such modification, clicking button OK will save or clicking button Cancel will give up the modification.

Note:

• Clicking shortcut ⊕ in the toolbar will activate this command as well.

Add Line Command

Use this command to add a line to an opening image file for temperature measurement.

After choosing this command, keeping left button of the mouse depressed and dragging the mouse within an opening image file will add a line to it, with Average, Max and Min temperature of the line shown in DataView Bar. Number and average temperature will show beside the mouse when it moves along the line.

You can change position, size and property of a line added to the opening image file as follows:
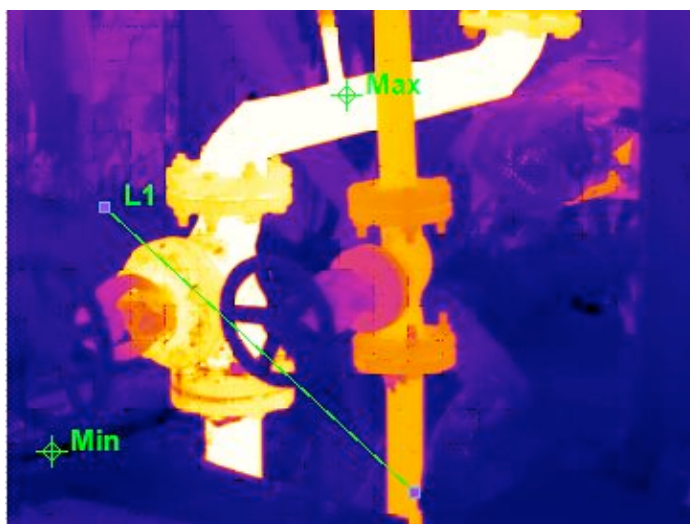
◆ *Move the line:*

• Move the mouse to the line (between its starting point and ending point), the mouse pointer will change to be a four-headed arrow with a symbol -. Clicking the left button of mouse to select it, there will be two small squares at its two ends, indicating the line can be moved now. To move the line, keep left button of the mouse depressed and drag the mouse to any desired place, then release the left button to confirm the place.

◆ *Change the line size:*

• Click left button of the mouse on the line to select it and move the mouse to either end of the line, the mouse pointer will change to be a two-headed arrow, indicating you can change the line size with the arrow keys. Place the mouse on one end of the line, keep left button of the mouse depressed and drag the mouse to a desired place, then

release the left button to confirm the new place of this end. Now the line size is changed. You can change the other end in the same way if needed.

♦ *Modify the line property:*
  • Place the mouse on the line and then double click left button of the mouse to get dialog box Line Property. Now you can modify the property by changing items in the dialog box, such as name, color, emissivity, and etc.
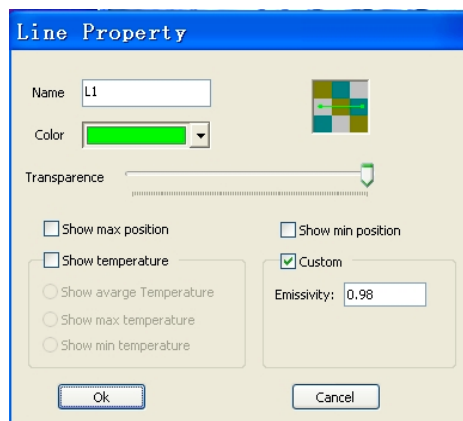
  • Moving the pointer on transparency scale allows the line to change from being completely transparent to being completely solid. Selecting Show min/ max position can indicate where the spot having min/ max temperature of the line lies, with symbol ×/* shown on the line. Choosing Custom and changing emissivity value makes the program to recalculate and display temperature of the line accordingly. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature of the line.
  • After such modification, click button OK to save or click button Cancel to cancel the modification.

Note:

  • Clicking shortcut in the toolbar will activate this command as well.

Add Polygon Line Command
Use this command to add a polygon line to an opening image file for temperature measurement.
After choosing this command, drag the mouse and click the left button of the mouse continuously to confirm the turning points, connect the spots and double click the left bottom of the mouse, a Polygon Line will be added to the image, with Average, Max and Min temperature of the polygon line shown in DataView Bar. Number and average temperature will show beside the mouse when it moves along the polygon line.
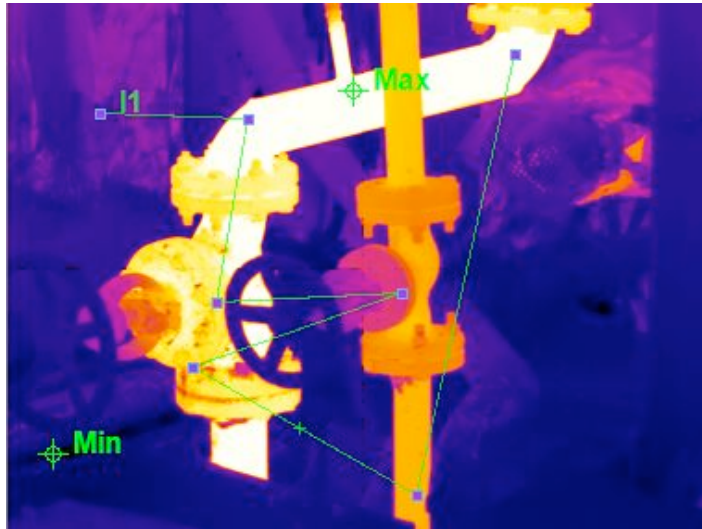
You can change position, size and property of a Polygon line added to the opening image file as follows:

♦ *Move the polygon line:*
- Move the mouse to the polygon line (between its starting point and ending point), the mouse pointer will change to be a four-headed arrow with a symbol -. Clicking the left button of mouse to select it, there will be small squares at its two ends and the turning points, indicating the polygon line can be moved now. To move the polygon line, keep left button of the mouse depressed and drag the mouse to any desired place, then release the left button to confirm the place.

♦ *Change the polygon line size:*
- Click left button of the mouse on the line to select it and move the mouse to either turning points of the polygon line, the mouse pointer will change to be a two-headed arrow, indicating you can change the polygon line size with the arrow keys. Place the mouse on one turning point of the line, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the new place of the turning point. Now the turning point position is changed. You can change either turning points including the beginning point and ending point in the same way if needed.

♦ *Modify the polygon line property:*
- Place the mouse on the polygon line and then double click left button of the mouse to get dialog box Line Property. Now you can modify the property by changing items in the dialog box, such as name, color, emissivity, and etc.
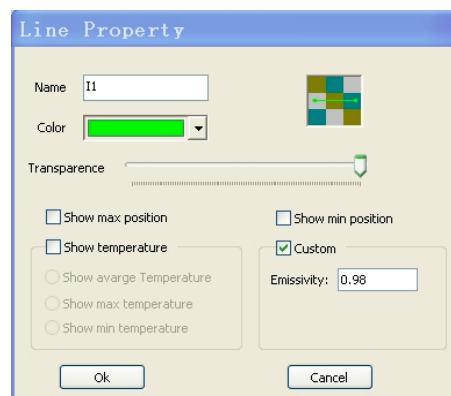
- Moving the pointer on transparency scale allows the polygon line to change from being completely transparent to being completely solid. Selecting Show min/ max position can indicate where the spot having min/ max temperature of the polygon line lies, with symbol ×/* shown on the polygon line. Choosing Custom and changing emissivity value makes the program to recalculate and display temperature of the polygon line accordingly. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature of the polygon line. Selecting color to set the color of polygon line to be displayed in
- After such modification, click button OK to save or click button Cancel to cancel the modification.

Note:

- Clicking shortcut in the toolbar will activate this command as well.

Add Rectangle Command

Use this command to add a rectangle to an opening image file for temperature measurement.

After choosing this command, keeping left button of the mouse depressed and dragging the mouse within an opening image file will draw a rectangle in it. Release the left button, the rectangle will be confirmed, with Average, Max and Min temperature within it shown in DataView Bar. Number and average temperature of the rectangle will show beside the mouse when it moves in the rectangle.
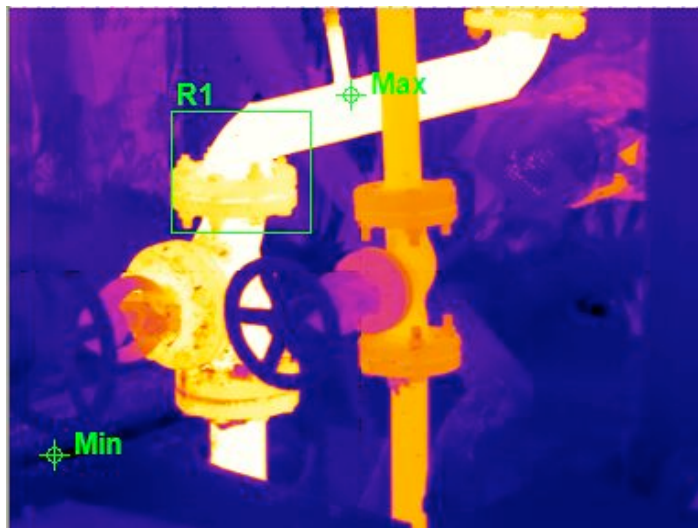
You can change position, size and property of a rectangle added to the opening image file as follows:

♦ *Move the rectangle:*

• Move the mouse into the rectangle, the mouse pointer will change to be a four-headed arrow with a symbol □. Clicking the left button of mouse to select it, there will be eight small squares on its sides and vertexes, the rectangle can be moved now. To move the rectangle, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Change the rectangle size:*

• Click left button of the mouse in the rectangle to select it first and move the mouse to any one side of the rectangle or any one of its vertexes, the mouse pointer will change to be a two-headed arrow, indicating you can change the rectangle size with the arrow keys. Place the mouse on one side of the rectangle or any one of its apexes, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the new place of this side. Now the rectangle size is changed. You can move other three sides in the same way if needed.

♦ *Modify the rectangle property:*

• Place the mouse within the rectangle and then double click left button of the mouse to get dialog box Rectangle Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.
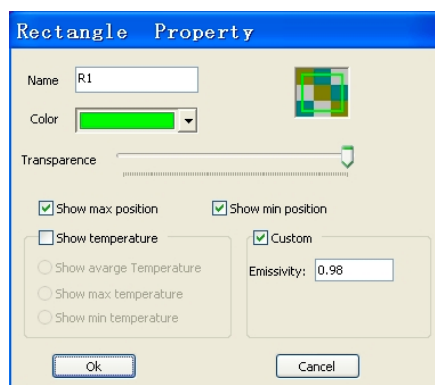
• Moving the pointer on transparency scale allows four sides of the rectangle to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the rectangle. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the rectangle. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature within the rectangle.

• After such modification, click button OK to save or button Cancel to give up the modification. Picture on the right shows the rectangle with property modified.

Note:

• Clicking shortcut ⬚ in the toolbar will activate this command as well.

Add Circle Command

Use this command to add a circle to an opening image file for temperature measurement. After choosing this command, keeping left button of the mouse depressed and dragging the mouse within an opening image file will draw a circle in it. Release the left button, the circle will be confirmed, with Average, Max and Min temperature within it shown in DataView Bar. Number and average temperature will show beside the mouse when it moves in the circle.

You can change position, size and property of a circle added to the opening image file as follows:
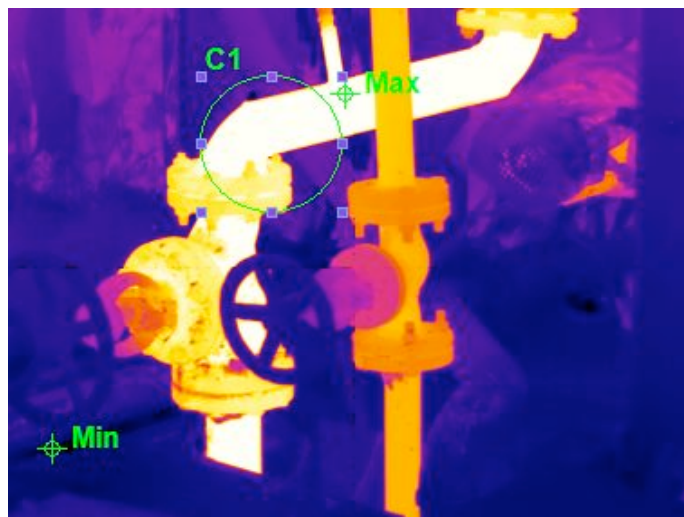
♦ *Move the circle:*

• Move the mouse into the circle, the mouse pointer will change to be a four-headed arrow with a symbol o. Clicking the left button of mouse to select it, there will be eight small squares on its frame, indicating the circle can be moved now. To move the circle, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Change the circle size:*

• Click left button of the mouse in the circle to select it and move the mouse to any one

of the eight small squares, the mouse pointer will change to be a two-headed arrow, indicating you can change the circle size with the arrow keys. Place the mouse on the circle frame, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the new place. Now the circle size is changed.

♦ *Modify the circle property:*

• Place the mouse within the circle and then double click left button of the mouse to get dialog box Circle Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.
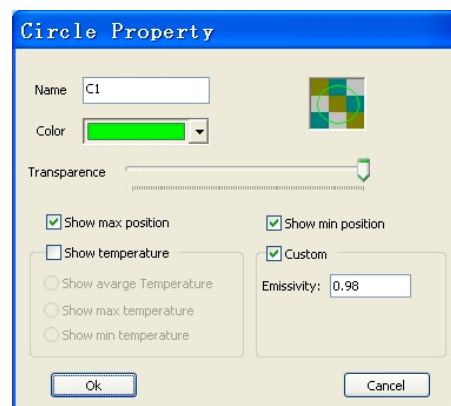
• Moving the pointer on transparency scale allows the circle frame to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the circle. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the circle. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature within the circle.

• After such modification, click button OK to save or button Cancel to give up the modification.

Note:

• Clicking shortcut in the toolbar will activate this command as well.

Add Polygon Command

Use this command to add a polygon to an opening image file for temperature measurement.

After choosing this command, keep left button of the mouse depressed, drag the mouse within an opening image file and then release the left button to draw the first side of a polygon. Then keep the left button depressed on the ending point of this side and drag the mouse again to draw the other two sides of the polygon. Repeat the above to draw some more sides of the polygon. Release the left button and double click on the last vertex of the polygon, the polygon will be confirmed, with Average, Max and Min temperature within it shown in DataView Bar. Number and average temperature will show beside the mouse when it moves in the polygon.
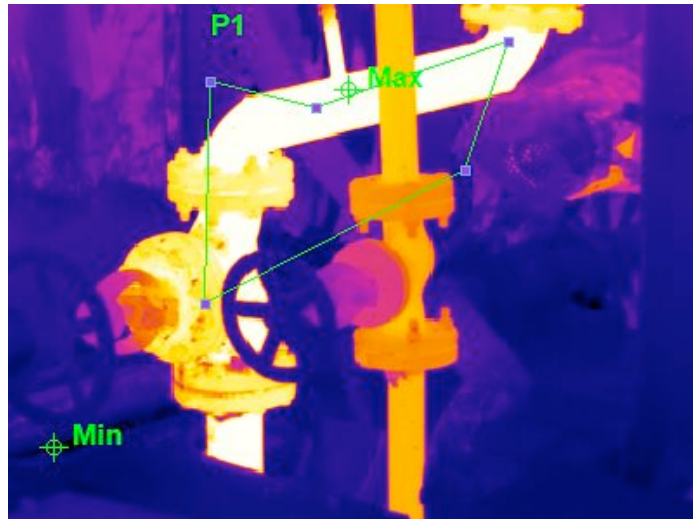
You can change position, size and property of a polygon added to the opening image file as follows:

♦   Move the polygon:

• Move the mouse into the polygon, the mouse pointer will change to be a four-headed arrow with a symbol [Σ]. Clicking the left button of mouse to select it, there will be a small square on every vertex, indicating the polygon can be moved now. To move the polygon, keep left button of the mouse depressed and drag the mouse to any desired place, then release the left button to confirm the place.

♦   Change the polygon size:

• Click left button of mouse in the polygon to select it and move the mouse to any one vertex of the polygon, the mouse pointer will change to be a two-headed arrow, indicating you can change the polygon size with the arrow keys. Place the mouse on the vertex, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the new place of the vertex. Repeat the above to move some more vertexes of the polygon if needed. Then the polygon size is changed.

♦   Modify the polygon property:

• Place the mouse within the polygon and then double click left button of the mouse to get dialog box Polygon Property. Now you can modify the property by changing items in the dialog box, such as name, color, emissivity, and etc.
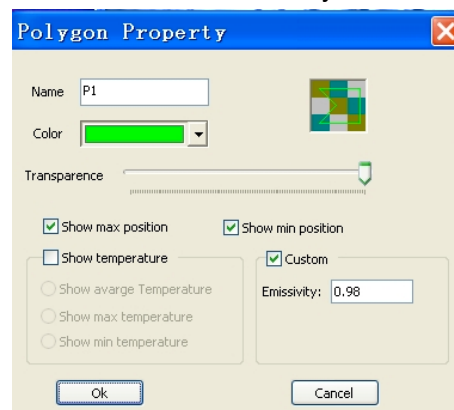
• Moving the pointer on transparency scale allows four sides of the polygon to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the polygon. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the polygon. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature within the polygon.

• After modification, click button OK to save or button Cancel to give up it.

Note:

• Clicking shortcut in the toolbar will activate this command as well.

Add Delta Two Command

Use this command to add a pair of spots to an opening image file for Delta Two temperature measurement.

After choosing this command, keep left button of the mouse depressed, drag the mouse within an opening image file and then release the left button, a pair of spots and the broken line between them will be confirmed. Two symbol x indicate the two spots. Temperature of the two spots, delta temperature and temperature ratio list in DataView Bar.
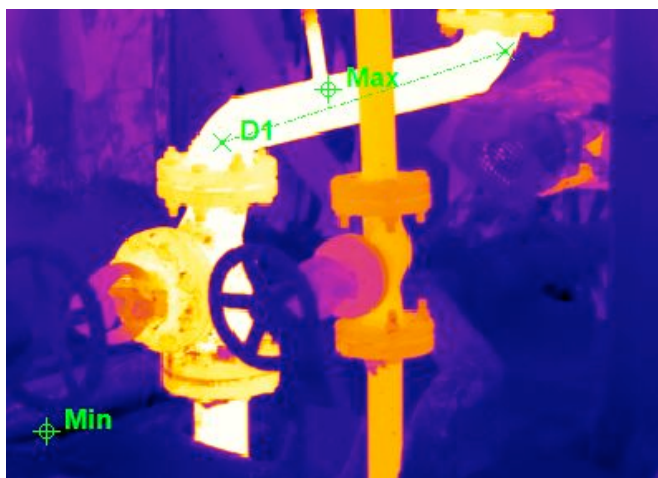
You can change position, size of the broken line and property of the pair of spots as follows:

♦ *Change location:*

• Move the mouse to either of the two spots (i.e. one end of the broken line between them), the mouse pointer will change to be a four-headed arrow. Click left button of the mouse on either of the two spots to select it and then move the mouse to either spot of the two, the mouse pointer will change to be a two-headed arrow, indicating the spot can be moved now. To move it, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Change size:*

• Move the mouse to either spot of the two (i.e. one end of the broken line between

them), the mouse pointer will change to be a four-headed arrow. Click left button of the mouse on either spot of the two to select it and move the mouse to either spot of the two, the mouse pointer will change to be a two-headed arrow, indicating you can change the broken line size with the arrow keys. Place the mouse on the spot, keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the new place of this spot. Now size of the broken line is changed. You can move the other spot in the same way if needed.

♦ *Modify property:*
  • Place the mouse on either spot of the two and then double click left button of the mouse to get dialog box DeltaTwo Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.
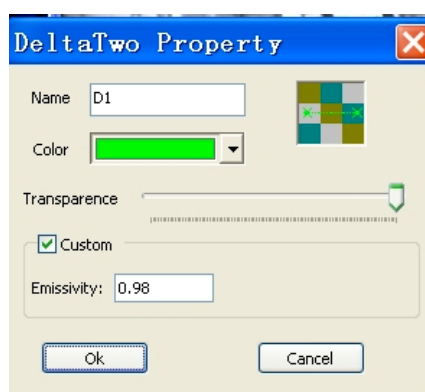
  • Moving the pointer on transparency scale allows the two spots and the broken line between them to change from being completely transparent to being completely solid. Choosing Custom and changing emissivity value makes the program to recalculate and display temperature of the two spots accordingly.
  • After modification, click button OK to save or button Cancel to cancel it.

Add Combination Command

Use this command to combine two areas to create a new object via set operation.

Combination command contains five sub-commands as following

Intersection Command

Add two areas(like rectangle, circle, polygon) in the thermal image file and confirm one of them by clicking the left bottom of mouse, select the command of Intersection under Combination and move the mouse to another area, click the left bottom of mouse again to bring out a intersection of two areas for temperature measurement.
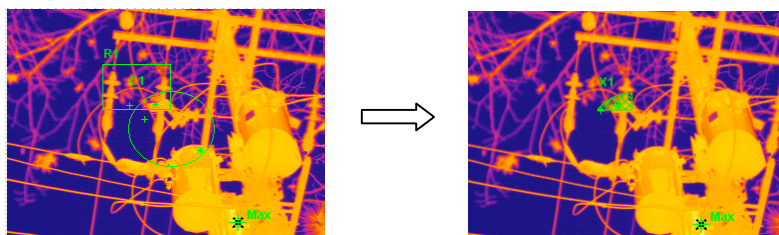
Average, Max and Min temperature of the intersection object will be shown in DataView Bar. Number and average temperature will be shown beside the mouse when it moves in

the intersection area.

You can change position, size and property of the intersection object added to the opening image file as follows:

♦ *Move the intersection object:*

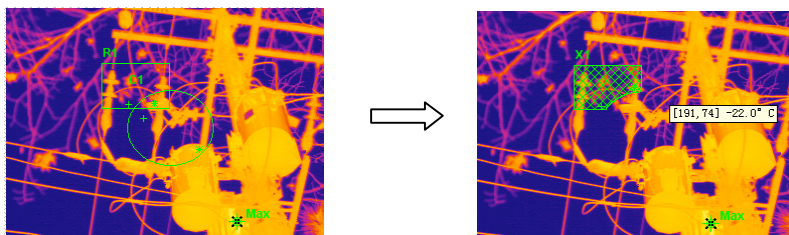• Move the mouse into the intersection area, the mouse pointer will change to be a four-headed arrow with a symbol o. Keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Modify the intersection object property:*

• Place the mouse within the intersection object and then double click left button of the mouse to get dialog box Polygon Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.
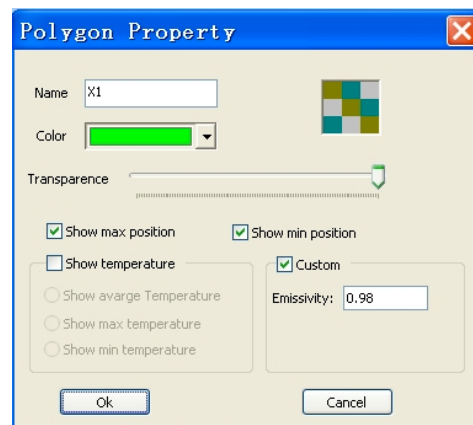
• Moving the pointer on transparency scale allows the intersection frame to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the intersection object. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the intersection. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature of the intersection object. Change color to set the color of the intersection object to be displayed in.

• After such modification, click button OK to save or button Cancel to give up the modification.

Subtract Command

Add two areas(like rectangle, circle, polygon) in the thermal image file and confirm one of them by clicking the left bottom of mouse, select the command of Subtract under Combination and move the mouse to another area, click the left bottom of mouse again to confirm the subtract of two areas for temperature measurement.

Average, Max and Min temperature of the intersection object will be shown in DataView Bar. Number and average temperature will be shown beside the mouse when it moves in the subtract area.

You can change position, size and property of the intersection object added to the opening image file as follows:

♦ *Move the subtract object:*
  • Move the mouse into the subtract area, the mouse pointer will change to be a four-headed arrow with a symbol o. Keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Modify the subtract object property:*
  • Place the mouse within the intersection area and then double click left button of the mouse to get dialog box Polygon Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.
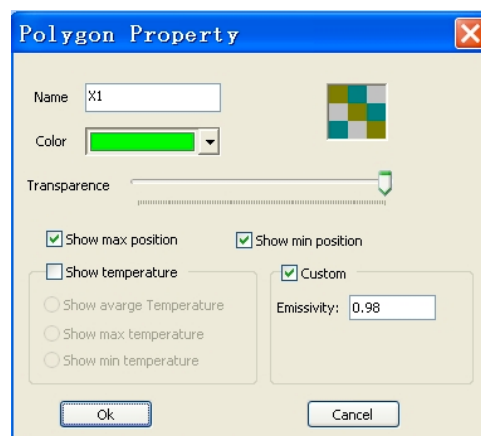

  • Moving the pointer on transparency scale allows the intersection frame to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the subtract area. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the subtract. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature of the subtract object. Change color to set the color of the subtract object to be displayed in.
  • After such modification, click button OK to save or button Cancel to give up the modification.

Merge Command

Add two areas(like rectangle, circle, polygon) in the thermal image file and confirm one of

them by clicking the left bottom of mouse, select the command of Merge under Combination and move the mouse to another area, click the left bottom of mouse again to confirm the merge of two areas for temperature measurement.
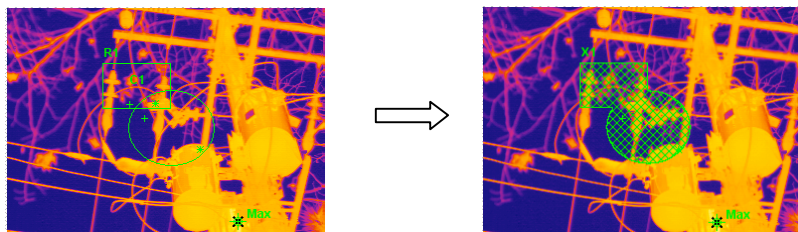
Average, Max and Min temperature of the Merge object will be shown in DataView Bar. Number and average temperature will be shown beside the mouse when it moves in the merge.

You can change position, size and property of the merge object added to the opening image file as follows:

♦ *Move the merge object:*

• Move the mouse into the merge area, the mouse pointer will change to be a four-headed arrow with a symbol o. Keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Modify the merge object property:*

• Place the mouse within the merge area and then double click left button of the mouse to get dialog box Polygon Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.
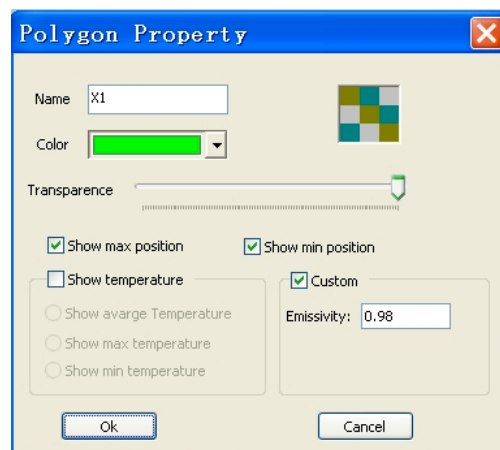
• Moving the pointer on transparency scale allows the merge frame to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the merge. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the merge area. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min temperature of the merge object. Change color to set the color of the merge to be displayed in.

• After such modification, click button OK to save or button Cancel to give up the modification.

Not Overlap Command

Add two areas(like rectangle, circle, polygon) in the thermal image file and confirm one of them by clicking the left bottom of mouse, select the command of Not Overlap under Combination and move the mouse to another area, click the left bottom of mouse again to confirm the not overlap part of two areas for temperature measurement.
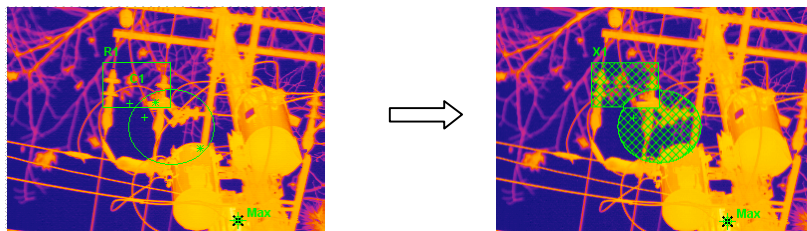
Average, Max and Min temperature within the not overlap area will be shown in DataView Bar. Number and average temperature will be shown beside the mouse when it moves in the not overlap area.
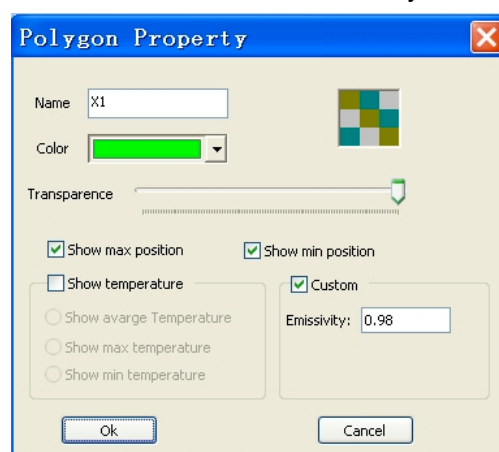
You can change position, size and property of the not overlap area added to the opening image file as follows:

♦ *Move the not overlap area:*

• Move the mouse into the overlap area, the mouse pointer will change to be a four-headed arrow with a symbol o. Keep left button of the mouse depressed and drag the mouse to a desired place, then release the left button to confirm the place.

♦ *Modify the not overlap area property:*

• Place the mouse within the not overlap area and then double click left button of the mouse to get dialog box Polygon Property. Now you can modify the property by changing items within, such as name, color, emissivity, and etc.

• Moving the pointer on transparency scale allows the merge frame to change from being completely transparent to being completely solid. Choosing Custom and then changing emissivity value makes the program to accordingly recalculate and display temperature within the not overlap area. Selecting Show min/ max position allows the program to use symbol ×/* to indicate position of the spot having min/ max temperature within the not overlap area. Selecting Show temperature on image and then choosing any sub-option will allow the program to display Average, Max or Min

temperature within the not overlap area. Change color to set the color of the not overlap area to be displayed in.

• After such modification, click button OK to save or button Cancel to give up the modification.
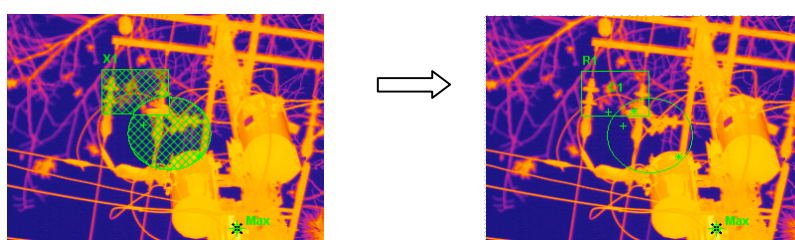
Decompose Command

Select the combination object and activate Decompose under Combination to decompose the combination

Example:

I After Decompose Command, R1 is decomposed into RT1 and A1.

Image below shows a combined object created by RT1 and A1 via Not overlap operation.

Delete Object Command

Use this command to delete an object (a spot, line, rectangle, circle, polygon or a pair of delta-two spots) added to an opening image file if any.

After choosing this command, move the mouse into the opening image file, then the mouse pointer will change to be a ×, indicating you can delete any object you want to delete.

To delete a spot, line, rectangle, circle or polygon, move the mouse to it and click left button of the mouse, then you will delete it.

To delete a pair of delta-two spots, move the mouse to either of the spots (i.e. either end of the broken line) and click left button of the mouse, then you can delete them.

Note:

• Clicking shortcut ![X] in the toolbar will activate this command as well.

• The shape of mouse pointer varies from different objects to be deleted.

• This is no available to the Max Temp point created automatically with the open image.
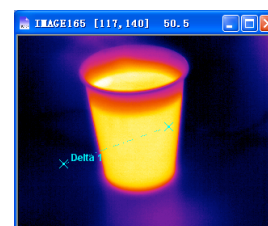
Delete All Objects Command

Use this command to delete all the objects (spots, lines, polygon lines, rectangles, circles, polygons and delta-two spots) added to an opening image file if any.

After choosing this command, all the objects will be erased from the opening image file.

Note:

• This is no available to the Max Temp point created automatically with the open image.

Multi-isotherm.

It contains two sub-commands: Setting and Apply. Using this command can divide the temperature range within an opening image into some small temperature ranges. Difference temperature range can be differently colorized. It is easy to see temperature distribution as per color.

Setting: To divide temperature ranges within the whole thermal image. It can be done both manually and automatically. After carrying out this command, the window below will come out:
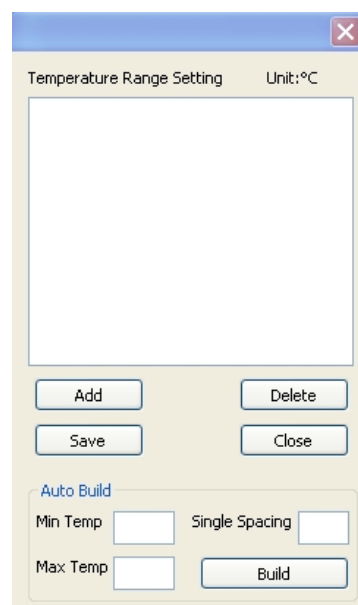

Add: to add a temperature range. After carrying out this command, a line will be added, you can select color and set min temperature and max temperature as follows:

Delete: Delete one temperature range.

Auto Build: Type in min and max temperature, set number of temperature range in Single Spacing and click Build will averagely divide whole temperature range and build certain numbers of temperature ranges.
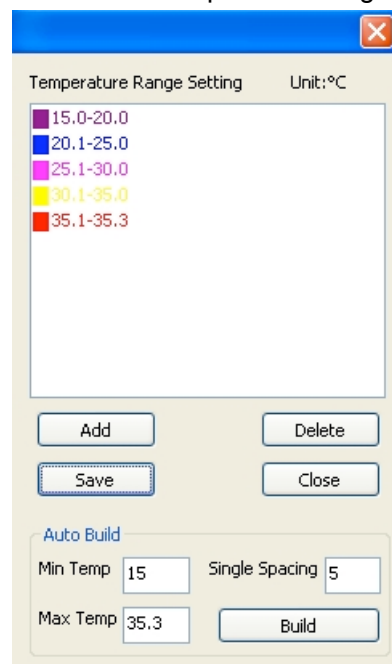

Save: Save divided the temperature ranges for future use. Click Save, the setting will be applied. The infrared image will be displayed as per the setting.

Apply: Apply or cancel self-define colorization for the opening image.

Image chart

This function is used to analyze the trend of highest and lowest temperature in multi images. It could not only analyze the highest and lowest temperature of each whole image, but also could analyze the highest and lowest temperature of the analysis target. There are two ways of displaying trend: 1,diagram; 2, data.

When you open multiple images, click the Tool->Image chart, you will see the below dialog box
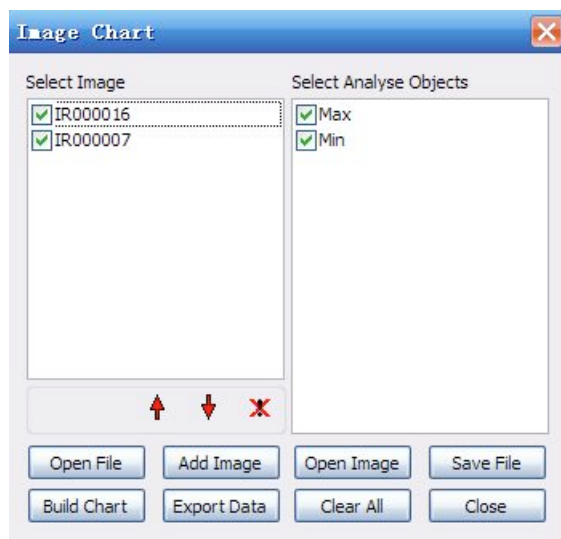
The check box below the "Select Image" means to choose open selected images. The check box below "Select Analyse Objects" means to choose analysis target, such as the Maximum spot, Minimum spot or others.
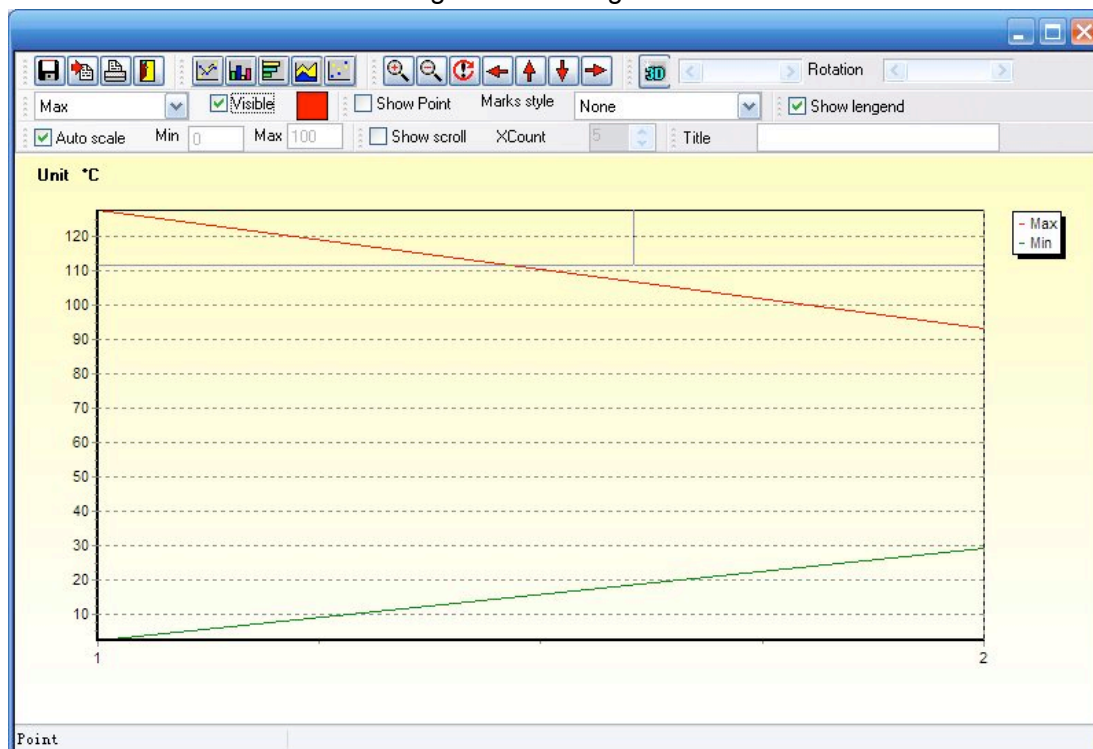
Open File: It is used to open "*.ird" file which you would save after you do multiple images analysis.

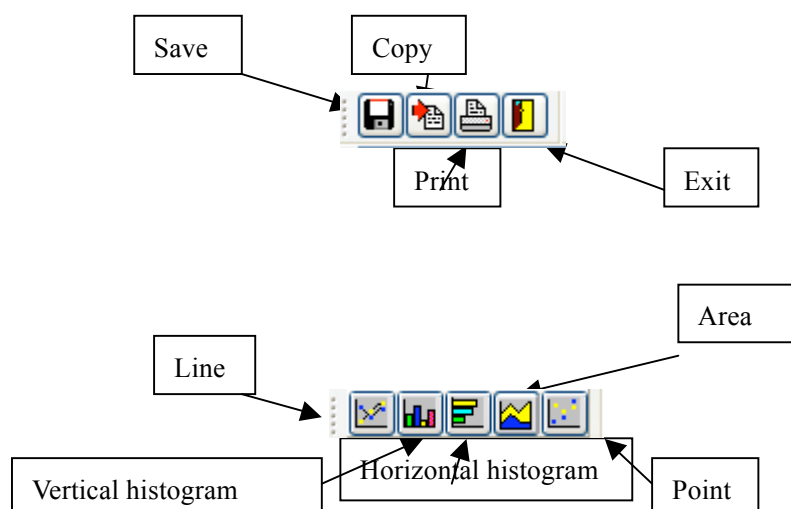Add Image: It is used to add images into the "Select Image" below.

Open Image: It is used to set the chosen image as current window

Save Image: It is used to save multiple images analysis into "*.ird" file.

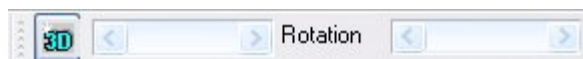Built Chart: Click it and then it will generate dialog box as follows:

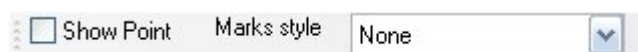Here is the instruction of the tools bar

The meaning of above icons are as they showed: zoom in, zoom out, reset zoom, left shift, up shift, down shift, right shift.

When you click the icon of 3D, the chart is displayed in three dimensional and it is also could rotate.

The above tool bar is to choose analysis target and color.

The above tool bar is to display data point and mark style.

Auto scale: It is showed the range of Axis Y. If click the check box it will run auto range, if not click the check box you could set the Max and Min manually.

Show scroll: It is displayed point number of the curve, if choose it you could set the length of X Axis

Title: you could type the title name on the blanket

View Menu

The View menu offers the following commands:

Show visual Image	Show or hide the visual image
Toolbar	Show or hide the Toolbar.
Gauge Bar	Show or hide the gauge bar
Status Bar	Show or hide the Status Bar.
Palette Bar	Show or hide the Palette Bar.
DataView Bar	Show or hide the DataView Bar.
Information Bar	Show or hide the Information Bar.
Language	Select one language from Default, English and Simplified Chinese to be the language the program uses

Show visual image

Use this command to display and hide the visual image, you could see the thermal image only if you set hiding the visual image.

Toolbar Command

Use this command to display and hide the toolbar, which provides shortcuts to major functions in the program. A checkmark appears next to the sub-menu Toolbar when the toolbar is displayed.

Shortcut	Description
	Open Image Button
	Save Image Button
	Select Button
	Add Spot Button
	Add Line Button
	Add Polygon Line Button
	Add Rectangle Button
	Add Circle Button
	Add Polygon Button
	Add Delta-two Spots Button
	Delete Object Button
	Hand Button
	Zoom In Button
	Zoom Out Button
	Show Histogram Button
	Show Profile Button
	Play Sound Button
	Palette Bar Button
	About IrAnalyser Button
	Specific Help Button

Note:
- You can refer to commands under menu bar to find detailed information of the shortcuts.
- Specific Help Button means you can use this shortcut to get help for a specific menu item or toolbar button within the program. Choosing this shortcut and clicking a menu item or toolbar button you want to know more about will make the program to display the help content relevant to the object.

Gauge Bar Command

Use this command to display and hide gauge bar. A checkmark appears next to the sub-menu Gauge Bar when the gauge bar is displayed.

Status Bar Command

Use this command to display and hide the status bar, which describes the action to be executed by the selected menu item or pressed toolbar button. A checkmark appears next to the sub-menu Status Bar when the status bar is displayed.

Palette Bar Command

Use this command to display and hide the palette bar. A checkmark appears next to the sub-menu Palette Bar when the palette bar is displayed.

DataView Bar Command

Use this command to display and hide the DataView bar. A checkmark appears next to the sub-menu DataView Bar when the dataview bar is displayed.

Information Bar Command

Use this command to display and hide the information bar. A checkmark appears next to the sub-menu Information Bar when the information bar is displayed.

Language Command

Use this command to choose one language from Default, Several languages such as English ,Simplified Chinese, Traditional Chinese, France and so on is selectable for the program uses. A checkmark appears next to the sub-option whichever is chosen.

Note:
- Default is the default language of the operating system in your PC. If the program cannot recognize the language, the program will choose English to be the default.
- After you change the language, a dialog box will prompt you to restart the program so as to effect the change. Clicking button Yes will close down, restart the program and change its language to be the one you chose. Clicking button No will remain the language before choice. Then language change will not be effected until you restart the program next time.

Window Menu

The Window menu offers the following commands:

Cascade	Arrange opening file windows in layers
Tile	Arrange opening file windows in vertical direction
Window 1, 2……	Go to a specific file window

Cascade Command

Use this command to arrange current opening file windows in layers in the program window

Tile Command

Use this command to arrange current opening file windows in vertical direction in the program window

Window 1, 2,… Command

The program displays a list of current opening file windows at the bottom of the Window menu. A checkmark appears in front of the file name of the active window. Choosing a file from this list will make its window active.

Help Menu

The Help menu offers the following commands:

Help Topics	Display help contents
What is New	Display new features and functions of the program
Tip of the Day	Display tips for using the program
Bug Report	Send us reports of the program problems
Feedback	Send us feedback as to the program
About IrAnalyser	Display edition information of the program

Help Topics Command

Use this command to get help details for the program. You can go through all the contents by clicking words with hyperlink.

What is New Command

Use this command to know about new features and functions of the program.
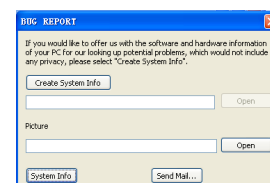
Tip of the Day Command

Use this command to open the dialog box Tip of the Day.

Bug Report Command

Use this command to create and send reports of the program bugs or problems to us. Choosing this command will open the dialog box Bug Report.

Note:

- Clicking button Send Mail will allow you to write and send an email to us to report the program bugs or problems.

- Clicking button Create System Info will allow the program to create a document Back Info under the directory where you install the program, showing information of your computer configuration. After the document is generated, the program will automatically attach it to the email you will send to us. Clicking button Open will open this document.
- Clicking button Open under Picture will allow you to choose an IR, JPG, IRI or IMG image and attach it to the email you will send to us.
- Clicking button System Info will make the program to open document System Information, displaying detailed information of your computer. You can edit and save the document as per requirements.

Feedback Command

Use this command to send your feedback about the program to us through email.

About IrAnalyser Command

Use this command to get information of the program edition, copyright, your computer information and our website.

Infrared Video

General Information

The infrared video with temperature information taken by TP8 can be transferred to PC through USB2.0 for further analysis by Guide software. Before the communication please install the USB drive into your computer

Also the other cameras of Guide such as IR236, IR810,IR220 can be connected with PC and controlled by the software too.

PC System Requirements

Operating system: Window 2000 or higher (IE5.0 or higher)

Software: Microsoft® Office 2000 or higher

Hardware:

Processor	Pentium 4 2.4G or Above
RAM	At least 512M
Others	Independent Graphic Card

Commands in Main Menu

Setup Command

Use this command to set a directory on the hard disks to store the infrared video, capture image and set other relevant information.
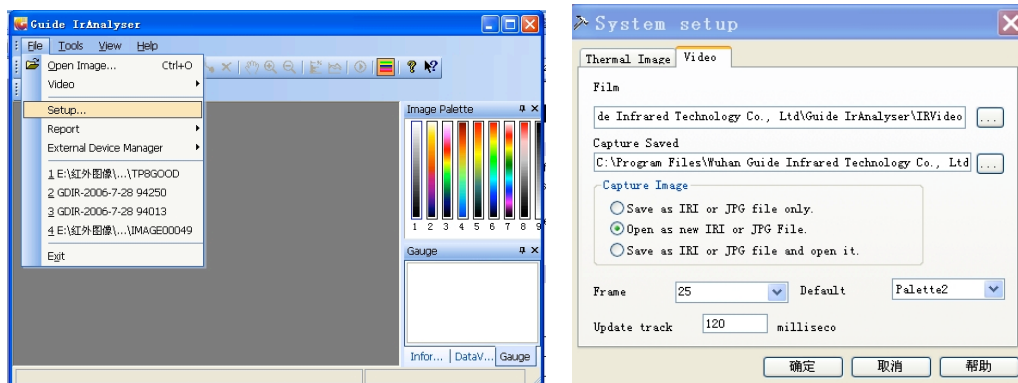
Film: set the directory path to save the video recording

Capture Saved: set the directory path to save the captured image

Frame: set the frame of thermal image per second. The default value is 25/ second

Palette: set the palette to be used for the infrared video

Update track: update the interval between track circles

After saving the setup, the program will automatically go to the directory when opening infrared video and perform the relative commands.
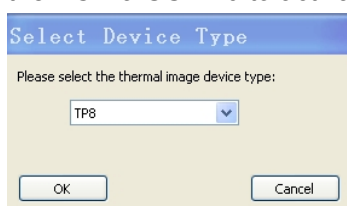
Video Command

Use this command to get infrared video from the camera such as TP8 directly or from the directory path of the PC where the films are saved
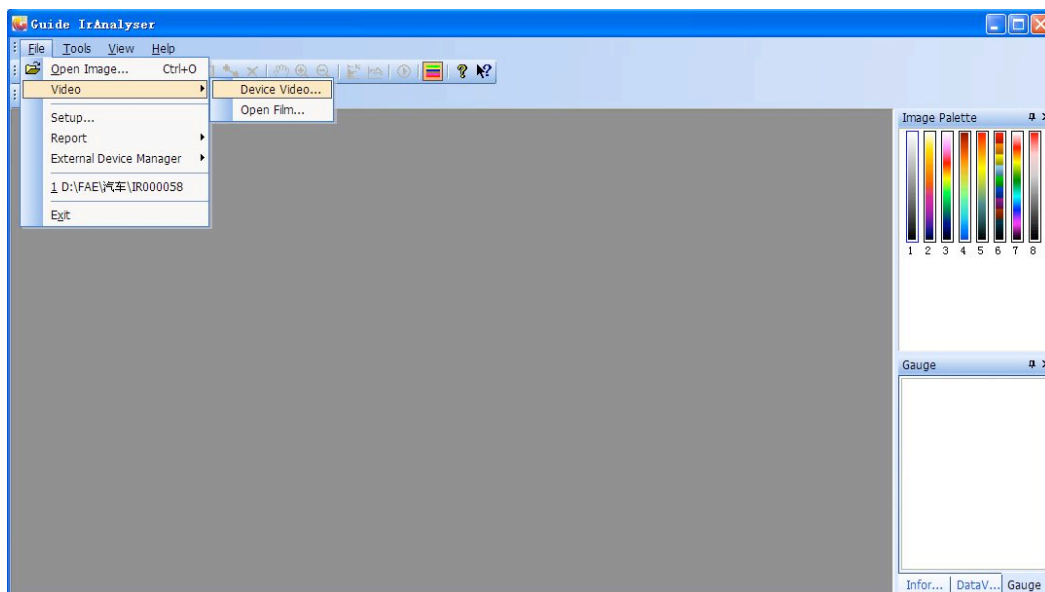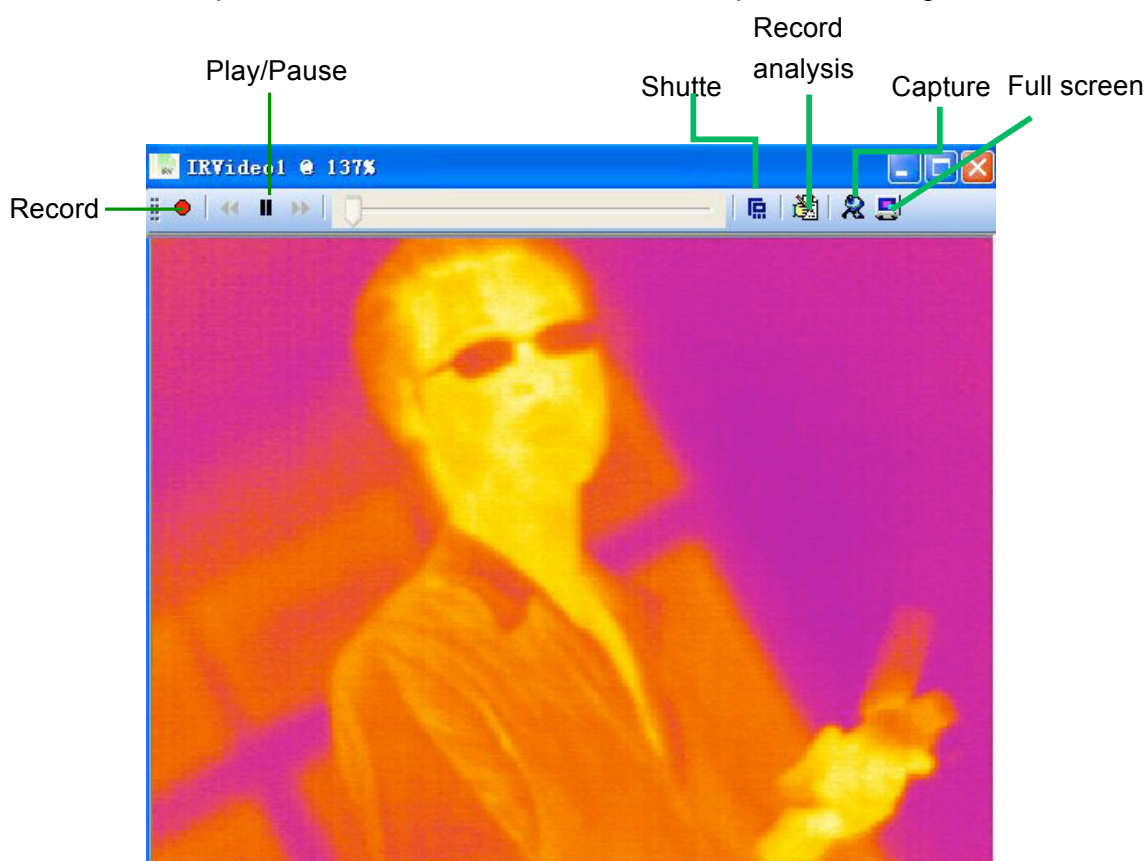

◆ Device Video

Make sure the camera of TP8 is under normal working status and connect the TP8 with the PC via USB2.0 to activate this command; it will bring a dialog box as following

Select TP8 and press ok to confirm, the infrared video is open as following

You may pause video, or make recording, operate shutter or control the camera in the above real-time status.

There are several short-cuts in the window to active the commands to operate the camera and the infrared video.

▶ : Play infrared video. If it is play mode, perform this command to change it to pause mode.

❚❚ : Pause infrared video. If it is pause mode, perform this command to change it to play mode

▶▶ : Make the video go forward by one frame when playing video.

◀◀ : Make the video go backward by one frame when playing video.

F2: Operate shutter

F3: Near focus adjustment

F4: Far focus adjustment

F5: Camera Control

🔴 : Record the video capture by TP8 and save it in appointed directory. The default saving directory is in the sub-directory of capture under installation directory. Computer system will denominate the video file automatically.

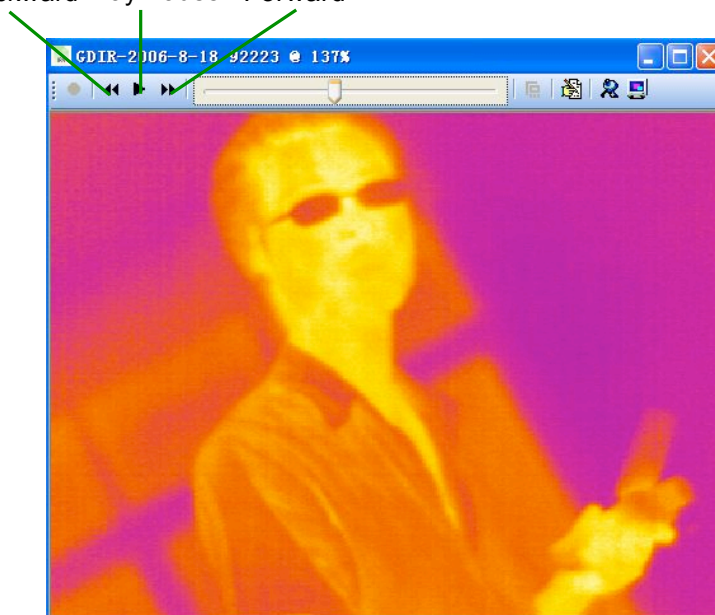Perform this command again after stopping record.

♦ Open Film

Use this command to open the saved Video file in the directory path of PC. The software

will play this file and further analysis can be done on it.
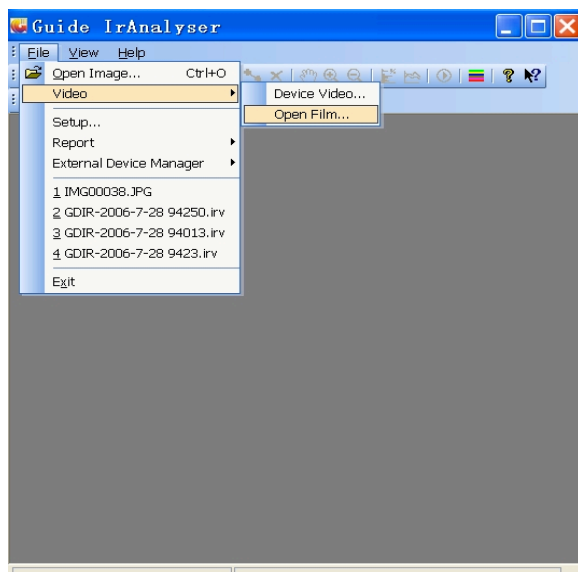
The infrared video will be open as following

Backward Play/Pause   Forward

There are several short-cuts in the window to active the commands to operate the infrared video.

▶ : Play infrared video. If it is play mode, perform this command to change it to pause mode.

II: Pause infrared video. If it is pause mode, perform this command to change it to play mode

▶▶: Make the video go forward by one frame when playing video.

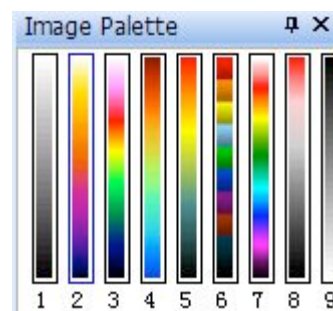: Make the video go backward by one frame when playing video.

Commands in Menu bar

Video Menu

The File menu offers the following commands:

Palette Command

Select a palette for the current infrared video. Nine palettes as follows are available.

Auto adjustment command

Use this command to choose adjust image color automatically or manually.

◆ Auto adjustment: the system mapped every image to the appointed pseudo color according to its temperature.

◆ Manual adjustment: mapped the temperature range to the appointed palette via appointing the maximum and minimum temperature, then the image will be displayed. User can observe the image of appointed temperature range via manual adjustment.

Note:

Manual adjustment is to adjust temperature range. The image will be under manual mode after adjusting the temperature. Execute this command to return to auto mode.

Gauge Setting Command

The program establishes a mapping function for temperature and brightness of each image file. This command utilizes this mapping function to adjust brightness of the current opening image file. Dialog box of Temp Range will appear after choosing this command.

TP8 control command

Through the software, the users could operate the camera as the following
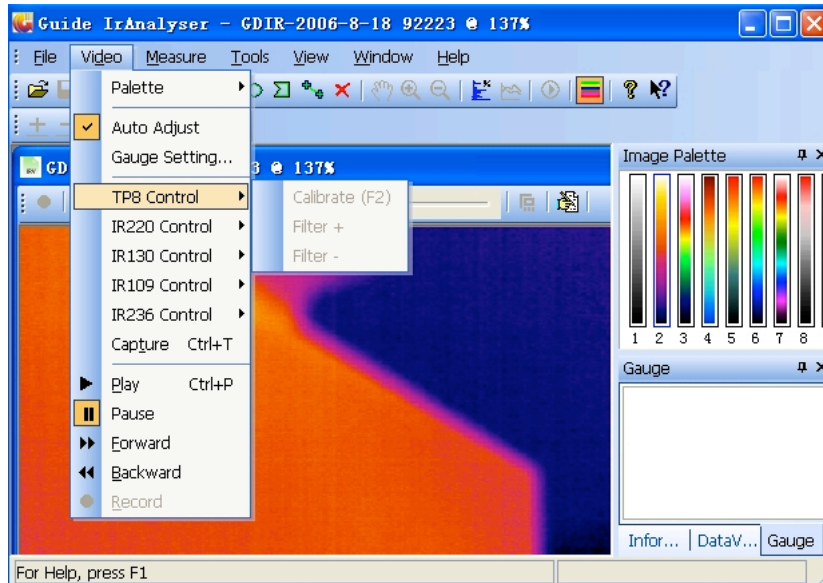
Calibration (F2)   Select this option or Press F2 to send calibration command to the camera

Filter 1   Switch to Filter 1

Filter 2   Switch to Filter 2

Near Focus (F3) Press F3 continuously to adjust near focus, stop adjusting by releasing the bottom

Far Focus (F4)   Press F4 continuously to adjust far focus, stop adjusting by releasing the bottom

IR236 control command

IR236 can be controlled when it is connected to PC in real-time status . IR236 is an on-line

thermal camera enabling long-time examination with high accuracy. The system includes

thermal and visual video output and can be used for human body examination and

industry purpose.

For detailed information, please refer to IR236 control command manual.

Video capture command

When playing infrared video, use this command under Video Menu or Press Ctrl + T to
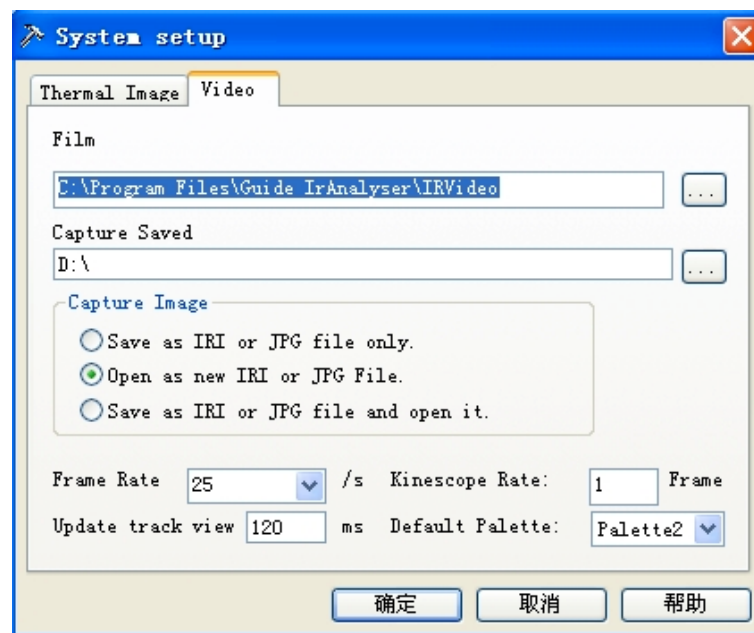capture the current image.
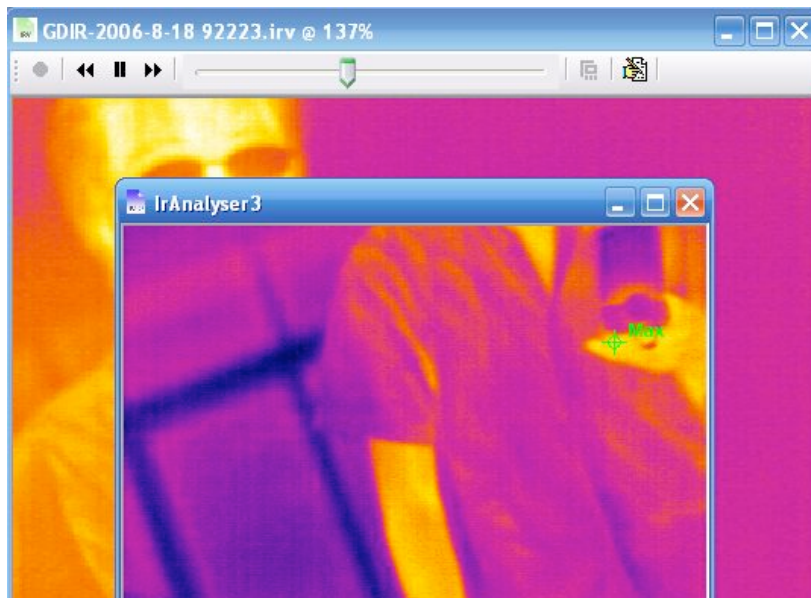
The capture image can be done as following

- Save as .IRI file or .JPG file to the appointed directory path
- Open as new .IRI or .JPG file
- Save as .IRI file or .JPG file and open it

Note: 1. For TP8, the file format is .JPG

2. The captured image is stored in the path re-set.

Play command

Use this command or press ▶ to play infrared video. If it is play mode, perform this command to change it to pause mode.

Pause Command

Use this command or press ▮▮ to pause infrared video. If it is **pause** mode, perform this command to change it to **play** mode.

Frame Forward command

Use this command or press ▶▶ to make the video go forward by one frame when playing video.

Frame Backward command

Use this command or press ◀◀ to make the video go backward by one frame when playing video.

Record command

Use this command or press 🔴 to record the video capture by TP8 and save it in appointed directory. The default saving directory is in the sub-directory of capture under installation directory. Computer system will denominate the video file automatically. Perform this command again after stopping record.

Note: Saved video can be opened with the software and do further analysis. Click command **open film** under sub-menu **video** in the **file** menu to open a saved video.
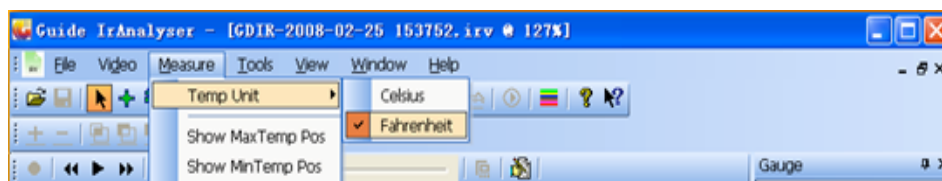
Measure Menu
Temp Unit command
There are two temperature units selectable
Choose degrees Celsius as temperature unit
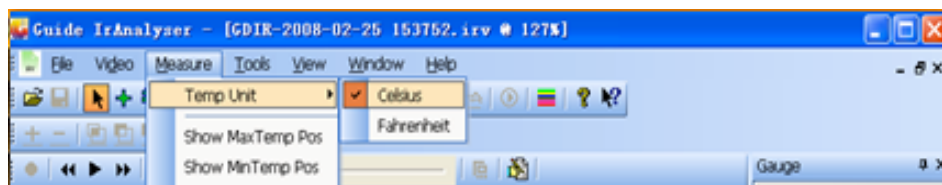
Choose degrees Fahrenheit as temperature unit

Show Max Temp Pos
Use this command to indicate location of the point that has the max temperature of infrared video by using symbol ×.
After choosing this command, the symbol × will appear immediately in the image file to indicate where the point is, and also the temperature value will be indicated beside too.
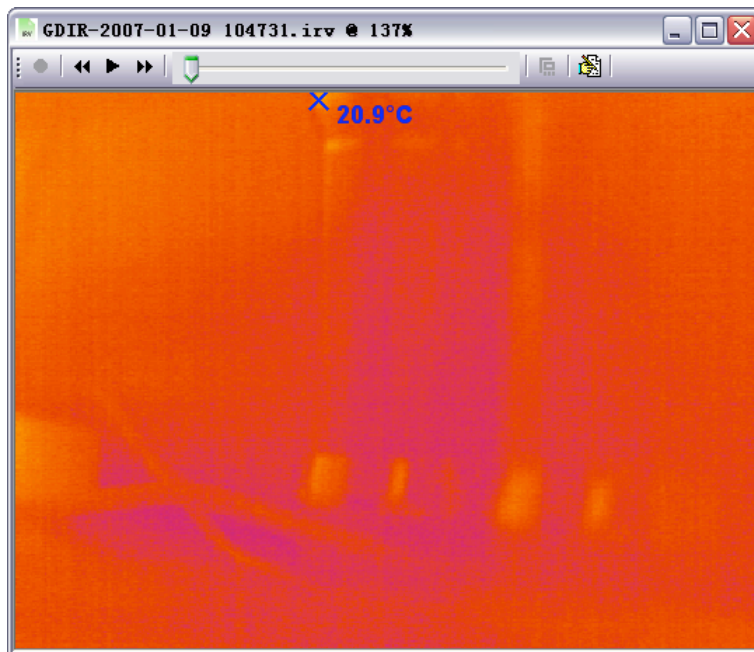
Show Min Temp Pos

Use this command to indicate location of the point that has the minimum temperature of infrared video by using symbol +.
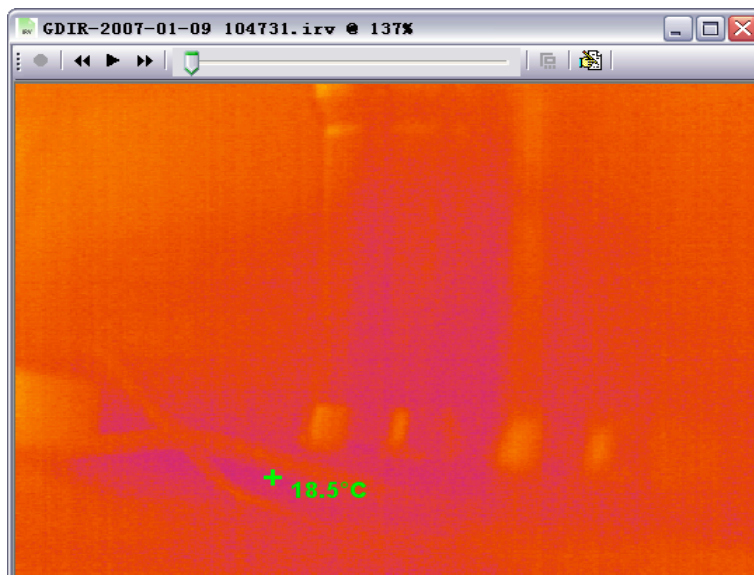
After choosing this command, the symbol × will appear immediately in the image file to indicate where the point is, and also the temperature value will be indicated beside too.
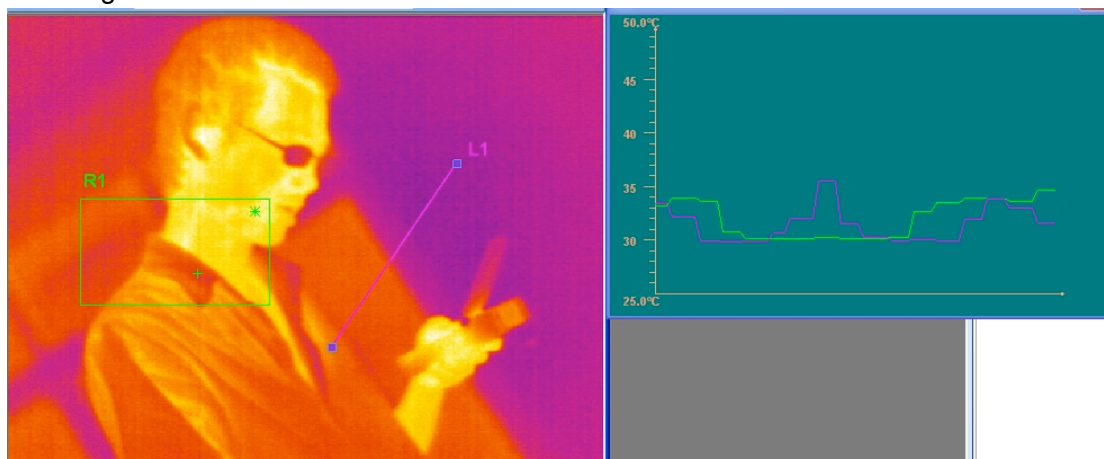

Show Track View

Use this command to display temperature TrackView of spot, lines or areas added to the infrared video

For spot, it will display the temperature TrackView of the spot.

For lines or areas, it will display the TrackView of the average temperature of the selected lines or areas.

Click this command after adding the spots, lines or areas, the TrackView will display as

following.

You can change the TrackView Lines Color by changing the property of the selected object. The TrackView Line color is the same as that of the selected object.
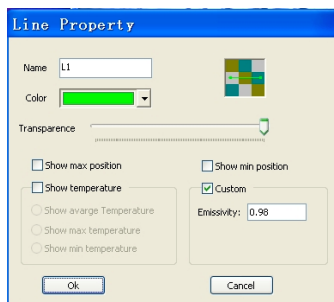
Selecting the Track View and double click the left bottom of the mouse, a dialog box of TrackView settings will be brought as following. You can change colors and the background of the rectangular coordinates if you wish. Click Button OK to save changes and Button Cancel to cancel.
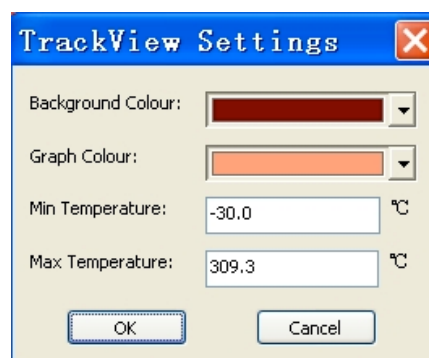
You can also change the Min Temperature and Max Temperature of the Y-axis so that the TrackView could be displayed more suitably to the different application
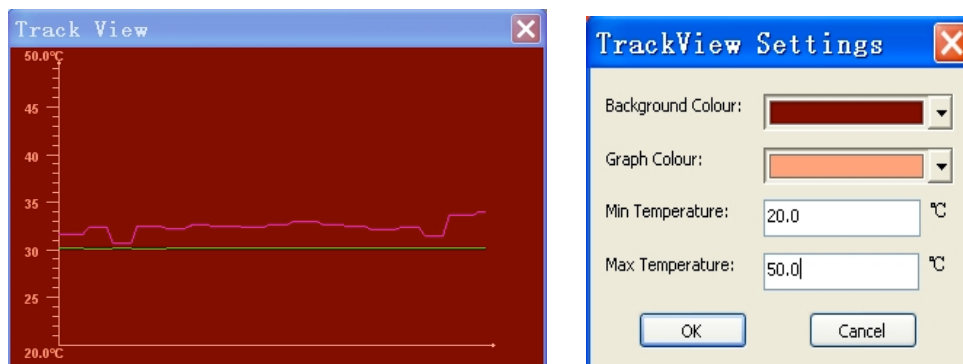
Pressing F11 can save the current TrackView as JPG file in the directory path of captured picture of the infrared video. The suggestive information is written in the Status Bar at the bottom of Program Window

After pressing F11, the TrackView will be saved in the capture saved directory

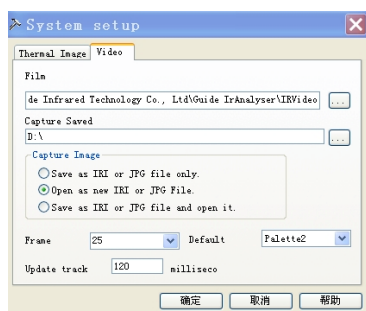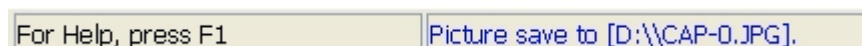

Other Commands

The other commands such as Isotherm Command, Histogram Command are the same as the measurement commands for the thermal image.

Tools Menu

Temperature Alarm Command

This command is set for the temperature Alarm

- Alarm Setting: Set the temperature to alarm, if you select Max and set the relative value, the PC will give an alarm when the temperature exceeds the set value. If you select Min and set the relative value, the PC will give an alarm when the temperature is lower than the set value
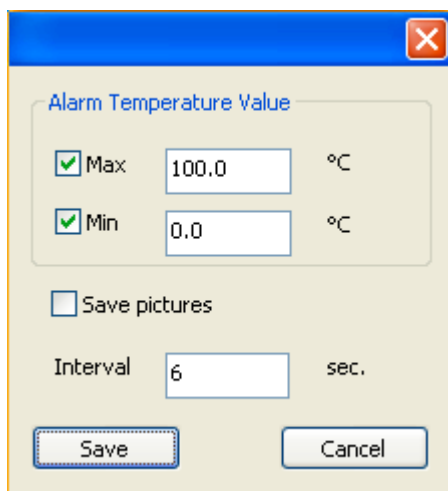
For recording purpose, the user could capture the picture of alarm and save them under the same path as normal captured picture. The picture will be saved automatically according to the set interval.

- Enables Alarm(Ctrl+A): Choose this command to active the alarm function. Only when you select by √, the function is available.

NOTE: The sound alarm is named as [Alarm.wav] in the installation directory. Users could change the sound freely in condition that remaining the same file name as Alarm.wav.

Auto Capture Command

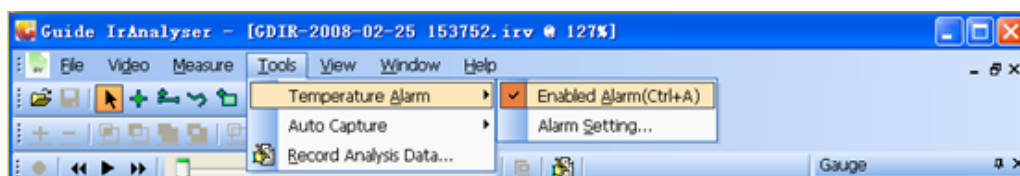This command is set for the picture capture automatically

- Auto Capture setting: Set atuo capture interval, you can set according to time and also the frame frequency. For example if you set 1 second, the software will capture one picture every one second. If you select 30 frame, then every 30 frame a picture will be saved automatically.
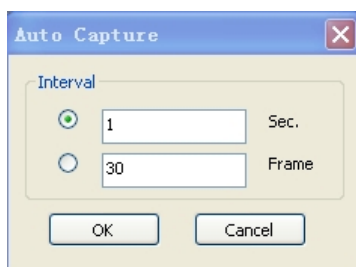
- Enables Auto Capture (Ctrl+A): Choose this command to active the auto capture function Only when you select by √, the function is available.
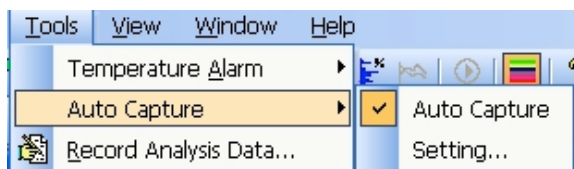
Record Analysis Data Command

Use this command to export real-time temperature data analysis result of the analysis objects in infrared Video in .txt file or charts. It can display the real-time spot temperature, line or area Max, Min and Avg Temperature according to different intervals.

click in the bar of or select Menu "Tools" and then "Record Analysis Data" to run this command. A dialog box will display as follows:
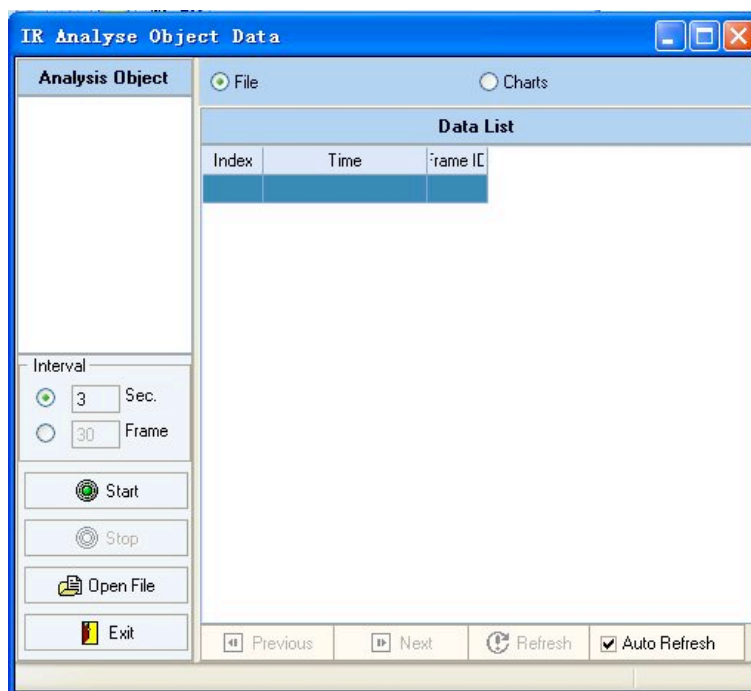
There are two analysis modes, one is in File, the other is in Charts

● First select the objects to be analysed such as R1 and S1, then set the interval of temperature analysis information by time or frame. Select "File" and click button "Start" when infrared video is playing, the temperature information of analysis objects will appear in Data List.
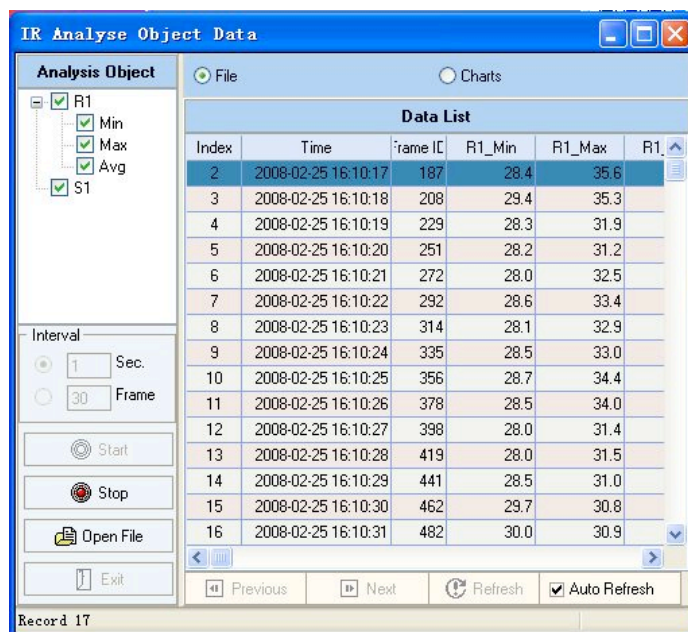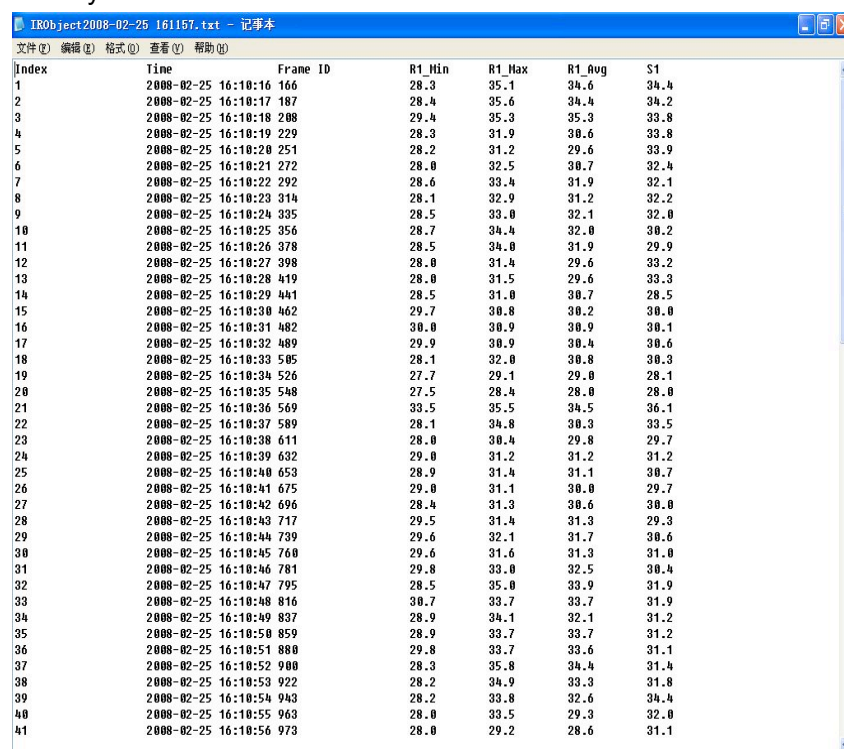
When "Auto Refresh" is selected, the data list will display the newest information. When "Auto Refresh" isn't selected, click "Previous" will go to the previous page of recording, click "Next" will go the next page of recording, click "Refresh" will update the recording.

Click "Stop" to stop the data recording.
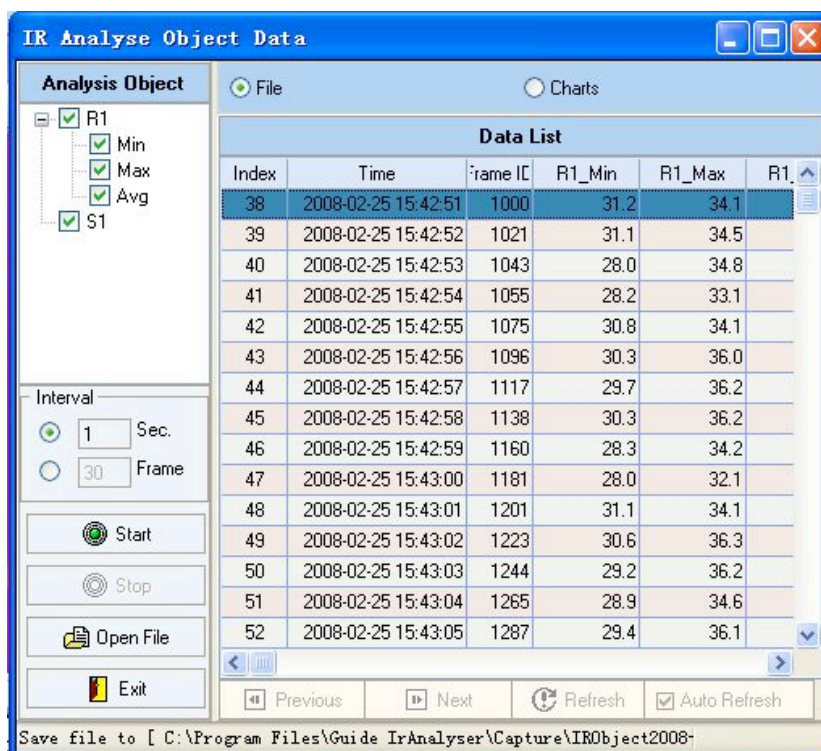
The temperature data will be saved as .txt file in the directory of the captured picture is in. The default directory is C:\Program Files\Guide IrAnalyser\Capture\IRObject2008-02-25161157.txt. Click "Open File" to open the txt. file directly as follows

Click "Exit" to exit this command

● When the analysis mode is charts, the data list will show in charts.

First select the objects to be analyzed such as R1 and S1, and then set the interval of temperature analysis information by time or frame. Select "Charts" and click button "Start" when infrared video is playing, the temperature information of analysis objects will appear in Charts
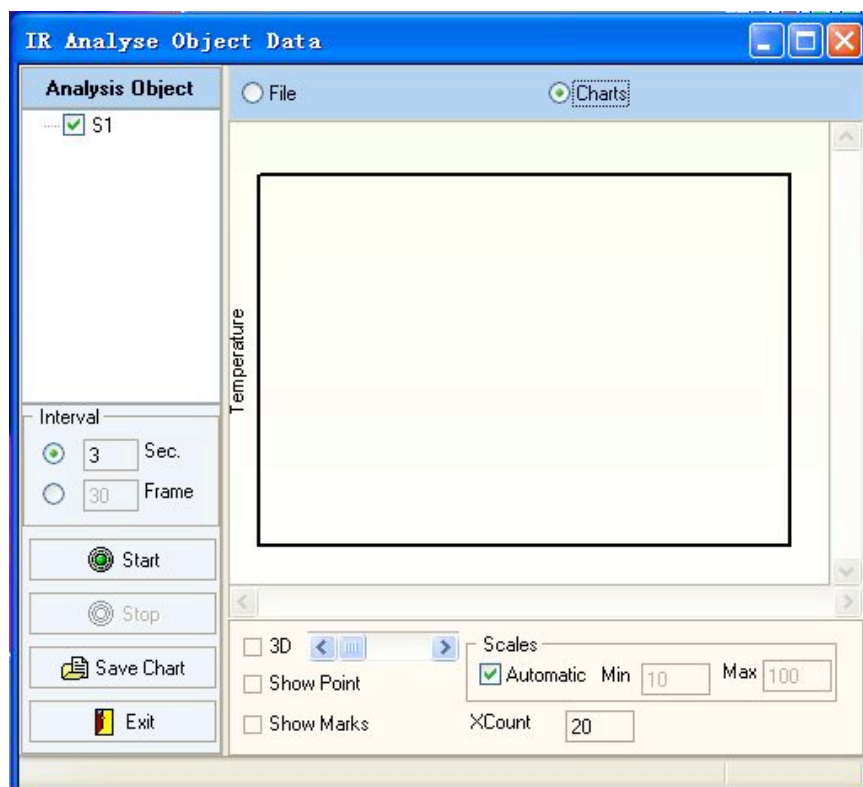
The following settings are for different types of chart may be needed:

3D: display the chart in 3D mode. The sliding bar is used to adjust the depth of 3D effect.

Show Point: display the point position in the chart according to interval.

Show Marks: display the temperature of the point

Scales: select "Automatic", the temperature scale of Y-axis will be displayed automatically.

If not selected, the Min value of Max Value of Y-axis can be set.

Xcount: change the scale of X-axis.
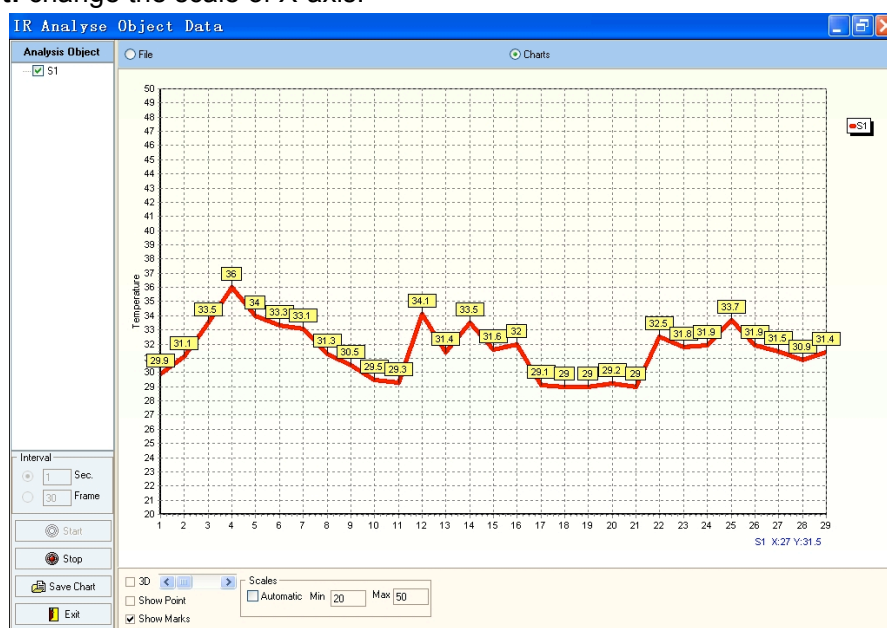
The following chart is in 3D mode.
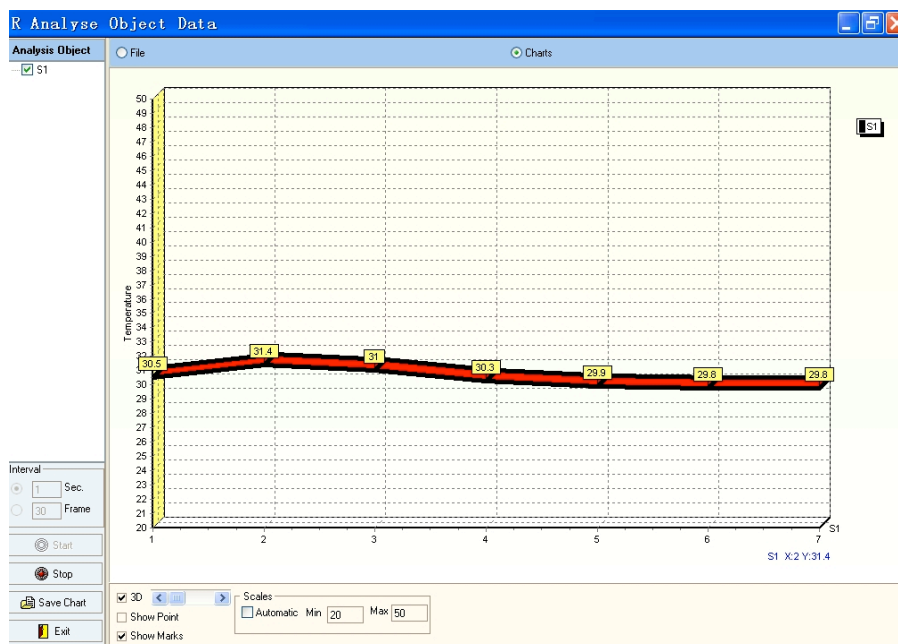
Note: The temperature data of different analysis objects such as spot, line, and area will be displayed in different colors as follows.

View Menu, Window Menu, Help Menu

Refer to View Menu, Window Menu, Help Menu for image analysis

Creating an Inspection Report with Microsoft[R] Word

General Information

The program works together with Microsoft® Word to create inspection reports.

When creating a report, the program adds four menus to the Microsoft® Word menus.

Basic commands regarding creating a report are included in these four menus. You can use them to insert all the information of the image file for which a report will be created into the report, and then edit the report with other Microsoft® Word menus.

Using the Menu

Choose sub-command report>word>new under command Report of menu File. A report as shown below will open in the program window.
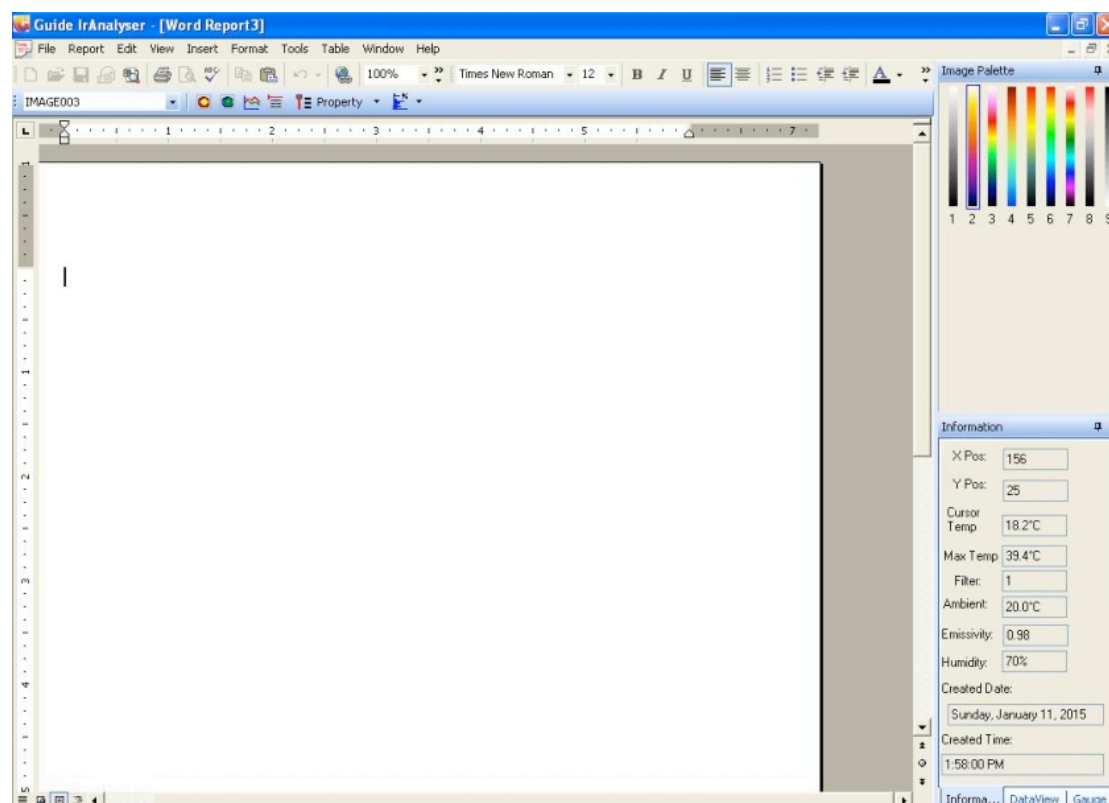
Four menus of the program appear in the Microsoft® Word menus: File, Report, Windows and Help.

File Menu

The File menu offers the following commands:

Open Image	Open an existing image file
Save	Save the current report
Print	Print the current report
External Device Manager	Delete saved image files in TP8 camera/ M-series camera or download them from TP8 camera/ M-series camera to your PC.
Close	Close the current report
Exit	Exit the Guide IrAnalyser® program

Open Command

Use this command to open an existing image file in a new window. You can open multiple image files at one time. Use the Window menu to switch among the multiple opening files. More details, please refer to **Window 1, 2, ... command**.

Save Command

Use this command to save the current editing report in its current or a different name and directory.

Print Command

Use this command to print the current editing report

External Device Manager Command

This command contains a sub-command Device Manager. Using this command can delete files saved in TP8 camera or download them from TP8 camera to your PC. After installing the USB driver and connecting TP8 camera to your PC, choosing this command will open a dialog box for you to download or delete all the image files. Clicking Button Copy All allows you to download all the images saved in TP8 camera to your PC, with the progress shown in status bar. When the status bar us fully filled, download is completed. Clicking Button Delete All will eliminate all the image files from the built-in flash memory of TP8 camera. Clicking Button Quit can exit the command.

Note:

● This command is unavailable unless TP8 camera is connected to your PC and the USB driver is installed in your PC.

● You can connect TP8 camera to your PC through USB extension cable supplied with TP8 camera.

Close Command

Use this command to close the current report

Exit Command

Use this command to end your Guide IrAnalyser® session. After choosing this command, the program will prompt you to save image files with unsaved changes.

Commands under the Report menu carry out most of the basic procedures to create a report.

Select Image	Choose one from current opening thermal images to create a report for
Insert Thermal Image	Insert the selected thermal image into the report
Insert Photo	insert the visual image saved together with the selected thermal image or other visual images stored in your computer (if any) into the report.
Insert Profile	Insert profiles of the lines added to the selected thermal image (if any) into the report
Insert VoiceComment	Insert the voice annotation of the selected thermal image into the report
Insert Property	Insert property of the selected thermal image into the report

Insert Histogram	Image Histogram: Insert histogram of the selected thermal image into the report Other Histogram: Insert histograms of analysis objects added to the selected thermal image (if any) into the report
Insert Analysis Result	Insert data of all the analysis objects added to the selected thermal image into the report
Insert Analysis	Select analysis objects added to the selected thermal image and insert their data into the report

Select Image Command

Use this command to choose one from the current opening thermal images to create a report

for it.

When there are several opening thermal images in the program window,

Choosing this command will open the dialog box to prompt you to select one. Click the image name to be chosen and click Button OK to select it. Then the report will be created for this image.

Note:

● When there is only one opening thermal image in the program window, the program will automatically choose it to create the report.

● When there are several opening thermal images in the program window, choosing one image name from the form Guide1 in the toolbar will do the same as using this command.

Insert Thermal Image Command

Use this command to insert the selected thermal image into the report.

When there are several opening thermal images in the program window, the command is unavailable unless you choose one image from them by using the command Select Image. When there is only one opening thermal image in the program window or after you choose one

image, clicking this command will insert the image to the report.

Note:

● Clicking shortcut icon in the toolbar can activate this command as well.

Insert Photo Command

Use this command to insert the visual image saved together with the selected thermal image or other visual images stored in your computer (if any) into the report.

It will bring a dialogue box as following

Choose 'Y' to insert other visual images(not the visual ones for the selected thermal image) in the computer into the report.

Choose "N" to insert the visual image of the selected thermal image into the report

Choose "Cancel" to exit Insert Photo Command

Note:

● Clicking short icon in the toolbar can activate this command as well.

Insert Profile Command

Use this command to insert profiles of lines added to the selected thermal image (if any) into the report.

Note:

● Clicking short icon in the toolbar can activate this command as well.

● This command is not available until a thermal image is selected.

Insert Property Command

Use this command to insert property of the selected thermal image into the report.

Choosing sub-command Property Table under this command will insert into the report all the

data when taking the selected thermal image. The data will be listed in the form of a table.

Choosing other sub-commands only inserts their respective value into the report.

Note:

● Clicking shortcut icon in the toolbar can activate this command as well.

You can choose whether to insert all the data or a specific item value to the report from the sub-options by clicking next to property.

● This command is not available until a thermal image is selected.

Insert Histogram Command

This command includes two sub-commands as follows:

Image Histogram: Use this command to insert histogram of the selected thermal image into the report

Other Histogram: Use this command to insert histogram of an analysis object (a line, rectangle, circle or polygon) added to the selected thermal image (if any) into the report. After choosing it, a dialog box View Histogram will appear to prompt you to choose the object whose histogram will be inserted into. Click on the object name and click Button View, then its histogram is added into the report.
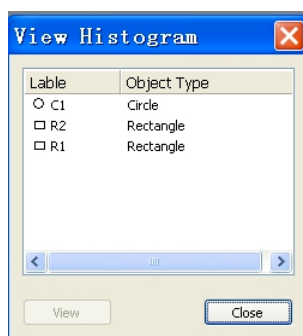
Note:

● Clicking short icon ![icon] in the toolbar can activate this command as well. You can choose whether to insert the image histogram or other histogram by clicking button ![icon] at the right hand.

● This command is not available until a thermal image is selected.

Insert Analysis Result Command

Use this command to insert data of all the analysis objects (a spot, line, rectangle, circle, polygon or a pair of delta-two spots) added to the selected thermal image (if any) into the report in the form of a table.

Note:

● Clicking short icon ![icon] in the toolbar can activate this command as well.

● This command is not available until a thermal image is selected.

Insert Analysis Command

Use this command to choose some analysis objects (spot, line, rectangle, circle, polygon or a pair of delta-two spots) added to the selected thermal image (if any) and then insert data of the selected objects into the report in the form of a table.

After choosing this command, a dialog box Insert Analysis Table will appear to prompt you to choose the object whose data will be inserted into. Choose the object and click button OK to add its data into the report.
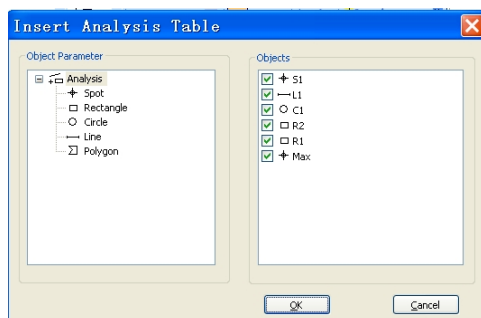
Note:

- This command is not available until a thermal image is selected.
- After using these commands above, all the information regarding the selected thermal image is included in the report. You can add more information to it and edit it with other Microsoft$^{®}$ Word commands if necessary.

- After editing, choose Save command under File menu to save the report.

Window Menu

The Window menu offers the following commands:

Cascade	Arrange opening file windows in layers
Tile	Arrange opening file windows in vertical direction
Window 1, 2……	Go to a specific file window

Cascade Command

Use this command to arrange current opening file windows in layers in the program window

Tile Command

Use this command to arrange current opening file windows in vertical direction in the program window

Window 1, 2,… Command

The program displays a list of current opening file windows at the bottom of the Window menu. A checkmark appears in front of the file name of the active window. Choosing a file from this list will make its window active.

Help Menu

The Help menu offers the following commands:

Guide IrAnalyser Help	Display help contents of Guide IrAnalyser$^{®}$ program
Microsoft$^{®}$ Office Word Help	Display help contents of Microsoft$^{®}$ Word

Guide IrAnalyser Help Command

Use this command to view help contents for the program. You can choose different sub-commands to go through their respective contents.

Microsoft Office Word Help Command

Use this command to get help contents of Microsoft® Word. You can choose different sub-commands to go through their respective contents.

Toolbar Description

The toolbar provides shortcuts to major functions in the report.

Shortcut	Description
Guide1	Select Image Button
	Insert Thermal Image Button
	Insert Photo Button
	Insert Profile Button
	Insert Analysis Result Button
Property	Insert Property Button
	Insert Histogram Button

For more information about the shortcut icons, please refer to the sections of their corresponding command under menu Report.

Creating a Report

● Choose sub-command Report>Word>New under command Report of menu File.

● A report window as shown below will open in the program window.
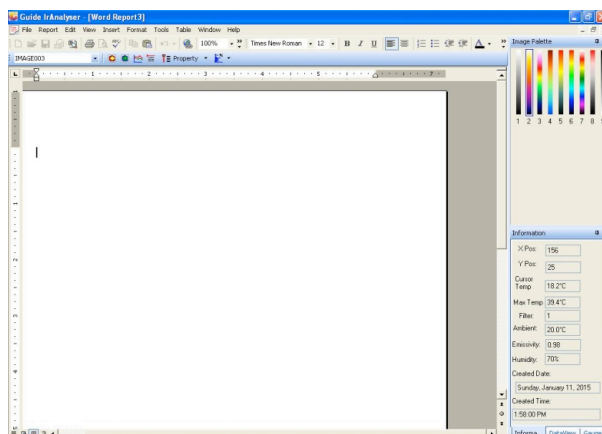
● Input the report title and other general information to the blank report.

● Choose command Open Image under menu File to open a thermal image.

● If you have opened several thermal images, choose command Select Image to select one from them.

● Choose command Insert Thermal Image under menu Report to insert the thermal image or the selected thermal image to the report.

● (If you have opened one thermal image before creating a blank report, the program

will automatically regard the report is to be created for the thermal image. In this case, you can directly choose command Insert Thermal Image to insert the image without re-opening it.)

● Choose command Insert Photo under menu Report to insert the visual image saved together with the selected thermal image or other visual images stored in your computer (if any) into the report.

● Choose other commands under menu Report to insert all the relevant information to the report.

● Edit the report with other Microsoft$^{®}$ Word menus and commands.

● Choose command Save under menu File to save the report.

Creating an Inspection Report with The Report Wizard

General Information

Before creating an inspection report using the report wizard, a report template (a *.dot file) must have been previously created and a thermal image has been chosen to create the report for.

Note:

● The program is supplied with 3 kinds of report templates (called ReportTemplate1.dot, ReportTemplate2.dot and ReportTemplate3.dot) for your basic use. Also you can create customized report templates. More details please refer to next section- Creating an inspection report based on a customized report template.

● ReportTemplate1, ReportTemplate2 and ReportTemplate3.dot are under the directory where you install the program to your PC. If you do not change the default directory during installation, you can find it under C:\Program Files\Guide IrAnalyser\Templates.

● Every time you run the program to create an inspection report, the program will choose ReportTemplate1 or ReportTemplate2 or ReportTemplate3 as the default report template. You can choose other templates (if any) to create a report as well.

Creating a Report

● Choose sub-command Report Wizard under command Report of menu File.

● A dialog box Open will appear to prompt you to select a report template before creating the report.

- Click a template name and button Open will apply the selected template to the report creation.
- Follow the report wizard (5 steps in total) to create the report.
- In Step 2 of the wizard, you can edit the document properties by selecting a specific item at a time, double clicking it and then editing its property in the dialog box.

- Step 3, select the thermal image(s) you want to input in to the report.

- Step 4, select a thermal image name, then its thumbnail image and visual image (if any) will be displayed in the two blanks at the bottom. If the visual image is not saved with the thermal image, select the image name and then click the blank under Photo to input its corresponding visual image to the report.
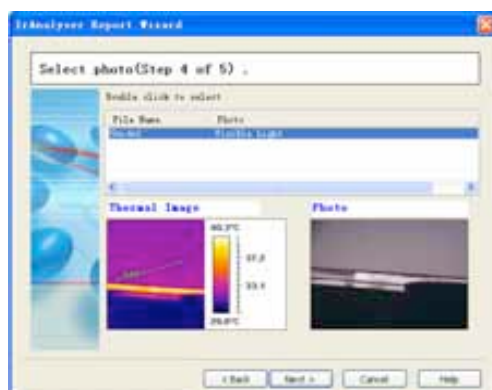
- Click button Next to go through all the five steps.
- After the report wizard dialog box disappears, the program will prompt you to save the report. Choose a directory to save it.

● Then a dialog box appears to prompt you to save, print or open the report. Choosing Save and Open it allows you to view it immediately.
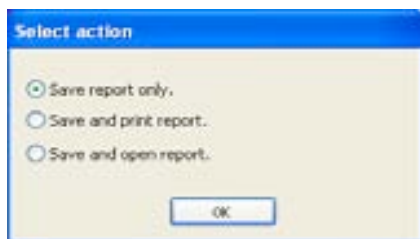
● After opening the report, you can edit it further as instructed in the above section-

Creating an inspection report with Microsoft$^®$ Word.

Note:
Create report in Excel format is also available. Detailed processes are exactly the same as creating report in Word format.

Creating an Inspection Report based on a Customized Report Template

General Information

As the report template supplied with the program may be too simple to use, you can create customized templates according to your specific requirements. Then you can create inspection reports based on these new templates.
Note:
● Creating a report template requires skill in creating document templates in Microsoft$^®$ Word. For more information about this, please refer to your Microsoft$^®$ Word documentation or the Microsoft$^®$ Word online help.
● Choosing a report template is only required when creating a report using the report wizard. The command Report wizard is unavailable unless a thermal image has been opened in the program window.

Creating a Report Template based on the Existing Template ReportTemplate.dot

Introduction

It is the easiest to modify an existing report template so as to create a customized report template. You can take use of the existing infrared objects already included in the template and save a lot of time compared to creating a template from scratch.

Note:

● You can change any information in the template ReportTemplate.dot, but it is advisable that you do not modify information included in <##> (e.g. <#PageStart#>), which is automatically input by the program.

● After you save change made to the template ReportTemplate.dot, the program will always utilize this new version to create reports. You cannot resume its original information unless you reinstall the program.

Creating a report template based on ReportTemplate.dot

● Find out where the template ReportTemplate.dot is. The default directory where ReportTemplate.dot lies is C:\Program Files\Guide IrAnalyser\Templates

● Open ReportTemplate.dot in this way: Select ReportTemplate.dot, click right button of the mouse and choose command Open to open it

● Modify the content of ReportTemplate.dot

● Save the modified ReportTemplate.dot and close it

Note:

● Please never try to double click ReportTemplate.dot to open it. In Microsoft® Word, double clicking a template file will open a new Word file (*.doc) rather than open the selected template file (*.dot).

● In ReportTemplate.dot , please do not modify information included in <##> (e.g. <#PageStart#>), which is automatically input by the program.

Creating a Report based on the Modified Template ReportTemplate.dot

Two ways are available to create a report based on the modified ReportTemplate.dot. One is creating it with Microsoft® Word. The other is creating it using the report wizard. More details please refer to the two sections above: Creating an inspection report with Microsoft® Word and Creating an inspection report using report wizard.

Creating a Customized Report Template

● A report template file is essentially a Microsoft® Word document template file.

● There are two ways to create a Microsoft® Word document template file.

◆ *Create a new Microsoft® Word document and then save it as a file of document template*

   ● Create a new Microsoft® Word file.
   ● Open and edit it as per your requirement.
   ● Choose command Save As to save it as a document template file. In the dialog box save as, enter the file name, choose Document Template as the file type and then choose a directory to save it.
   ● Please do remember where you save it so that you can find it when choosing templates to create reports. The default directory for Microsoft® Word Document Template files is the folder where Microsoft® lies in your

operating system.

◆ *Copy the template ReportTemplate.dot, modify the copied file and then save it.*
- Select ReportTemplate.dot, copy and paste it in a folder you want to store it. A template file named Copy of ReportTemplate.dot will exist.
- Rename it if you wish
- Select it, click right button of the mouse and choose command Open to open it
- Modify its content as per your requirement.
- Choose command Save to save it in the original name or Save As to save it as a new file in a new name. And save it in a specific directory.
- Please do remember where you save it so that you can find it when choosing templates to create report. The default directory for ReportTemplate.dot is C:\Program Files\Guide IrAnalyser\Templates. If you save it together with ReportTemplate.dot, you can directly go to the folder above to choose it.

Now, the new report template is available for creating a report based on it.
Note:
- You can save new templates in the same folder Templates as ReportTemplate.dot or in a different folder. If you save it in a different folder, you need to go to the folder to choose it when you creating reports.
- You can set up the directory where to save report templates using command Setup under menu File of the program. The program will automatically go to the directory to find a template when creating a report.

Creating a Report based on the New Report Template

Choosing a report templates is only required when creating a report using the report wizard.
- Open one or several thermal images.
- Choose sub-command Report Wizard under command Report of menu File.
- A dialog box open will appear to prompt you to select a report template before creating the report. Now go to the directory where you save the templates and choose one you want to use.
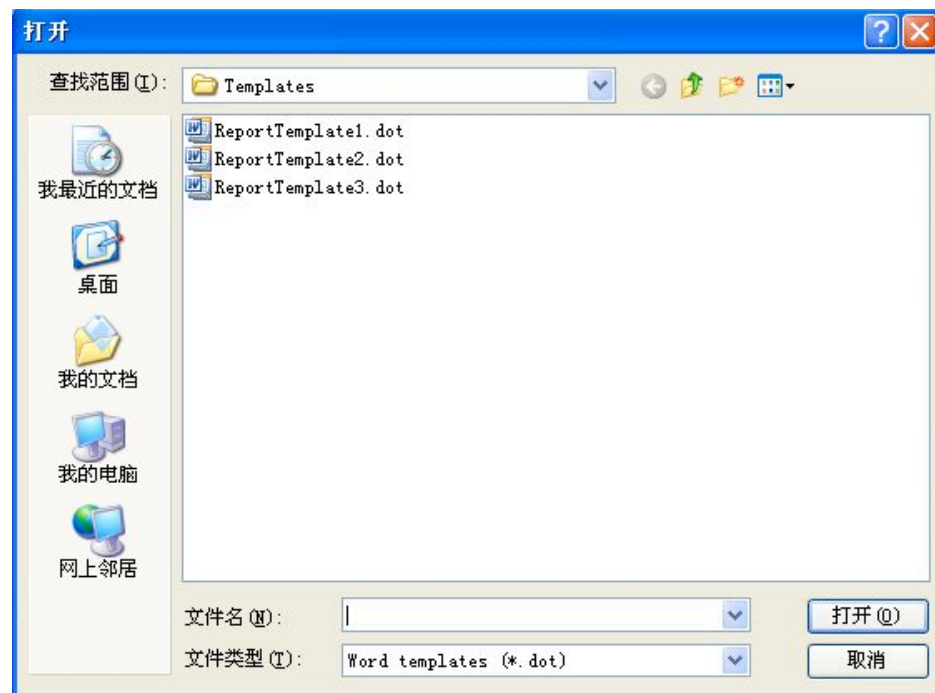
- Follow the steps of Report wizard to create a report.
- More details please refer to the section above: Creating an inspection report using report wizard.

Emissivity

What Is Emissivity?

The standard of radiation is "blackbody" radiation which exists in any enclosure whose walls are at a uniform temperature. The shape of the enclosure and the wall material have no effect on this radiation, it being a function of temperature alone.

A small hole in such an enclosure only affects this radiation level very slightly. The area of the hole should not exceed 5% of the area of the walls of the enclosure, when the radiation passing through the hole is within about one part in a thousand of the blackbody radiation level defined by the wall temperature. Such a device is fairly easy to build and forms the source on which all thermometers are calibrated.

A surface always emits less radiation than would a black body at the same temperature by a factor called the "emissivity" of the surface.

Emissivity = Radiation emitted by surface/ Radiation emitted by black body

How Do We Deal With Emissivity?

If we ignore the emissivity altogether and infer a temperature from the thermometer output, we shall get a temperature lower than the true temperature by an amount depending on the value of emissivity and the characteristics of the thermometer. This temperature is

known as the "apparent" or "brightness" temperature of the surface. If the emissivity is constant, this temperature rises and falls in exactly the same way as the true temperature and this may be sufficient for some purposes.

More often the true surface temperature is required. We have:

Actual output = E x output when viewing blackbody

To obtain the true surface temperature we must divide the actual output by the emissivity value E before we convert to temperature.

This is done by setting the emissivity control to the appropriate value.

It is therefore necessary to know the value of the emissivity. There is a vast amount of data available, unfortunately much of it is confusing because substantially different values are quoted. This is because emissivity depends upon:

a) The basic material
b) Surface condition - roughness and oxidation
c) Temperature
d) Angle of view
e) Wavelength

For materials with smooth, clean (unoxidised) surfaces, emissivities are usually in the range 0.05 to 0.50 and are usually very wavelength dependent, being higher at shorter wavelengths. The appropriate settings for the IR Thermal Cameras of Guide are given in the following tables. It must be remembered that these are only guideline figures. They can be substantially increased if the surface is rough or even slightly oxidised.

The values quoted for oxidised metals assume that the metal is heavily oxidised. Thin oxide layers will give an emissivity value between this and the value for an unoxidised surface.

If a more precise emissivity value is needed or more information is required on how to obtain the emissivity value of a specific material, please contact us.
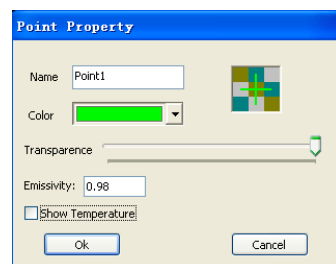
Typical Emissivity Values

Refractories			Miscellaneous	
Alumina	0.40		Asphalt	0.90
Red Brick	0.93		Carbon	>0.90
		Graphite		0.85
Alloys			Soot	0.95
Brass	0.10		Cement & Concrete	0.90
Oxidized	0.61		Cloth	0.85

Metals

Aluminium	0.05
Oxidized	0.30
Chromium	0.15
Cobalt	0.18
Gold	0.02
Iron & Steel	0.18
Oxidized	0.85
Lead	0.16
Oxidized	0.63
Magnesium	0.12
Nickel	0.15
Platinum	0.10
Silver	0.03
Tin	0.09
Titanium	0.30
Tungsten	0.13
Zinc	0.05
Oxidized	0.11