FLUKE®

InsideIR

Thermal Image Analysis Software

Users Manual

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Chapter 1
Installing InsideIR

Introduction

This chapter describes how to install InsideIR on your computer.

System Requirements

- Microsoft Windows 2000 or Windows XP
- Version of Internet Explorer 5.01 or greater required to use Microsoft .Net Framework. You can download the latest version of Internet Explorer from the Microsoft web site.
- Microsoft .NET Framework 1.1 and Microsoft Visual runtime components 1.1 (included on the InsideIR 3.0 CD-ROM)

Note

To install the software on Windows 2000 or Windows XP, you must log in with Administrator privileges.

Hardware Requirements

- PC with a 1 GHz processor (faster recommended)
- 512 MB of RAM (or more depending on the number of thermal images stored on your computer)
- 500 MB of free hard disk space
- Super VGA monitor with the screen resolution set at 1024 x 768 or greater; small fonts setting; and true color (32 bits)
- CD-ROM drive
- USB port (USB 2.0 High-Speed recommended)
- Mouse or pointing device

Installing the Software

Before installing the software, make sure you have the Internet Explorer version 5.01 or later appropriate to the language/culture settings of the operating system installed on your computer.

Note

Do NOT remove the CD until after you have successfully installed the software, rebooted the machine, and opened the application.

1. Insert the CD into your CD-ROM drive.
2. A window appears that lists options on the CD. If the window does not automatically appear:
   a. On the Windows taskbar, select Start, then Run.
   b. Type d:\launch.exe (where d: is your CD drive letter).
3. Click the Launch Software button to start the installation program.
4. Follow the installation instructions that appear. After software installation is complete, the InsideIR () icon appears on your desktop.

After the installation is complete, please take a few minutes to complete your product registration. You can register quickly online at http://register.fluke.com (preferred) or you can print the form and fax it to the number provided on the form. Product registration is very important since it allows you to get free software updates and helps us provide you with the fastest and most efficient technical support.

Installing the USB Drivers

The correct USB drivers must be installed before InsideIR can communicate with the Imager. The appropriate drivers were copied into the windows\system32\drivers folder during InsideIR installation, but won't be installed until you connect the Imager to your PC for the first time.

Note

You are only required to install the USB drivers on the first installation of InsideIR. It is NOT when you are installing an InsideIR update.

1. Launch InsideIR with or without having the Imager connected.
2. Insert the USB connector in the USB port on your Imager and PC.
3. After the connection is made, a new driver will be installed on the Imager. You will need to indicate the path to the drivers folder.

You are now ready to launch the InsideIR application. Go to your computer desktop and double-click on the InsideIR program icon () to launch the application. Figure 1-1 shows the InsideIR splash screen.

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Figure 1-1. InsideIR Splash Screen

The splash screen appears momentarily and then the InsideIR Home display appears as shown in Figure 1-2:

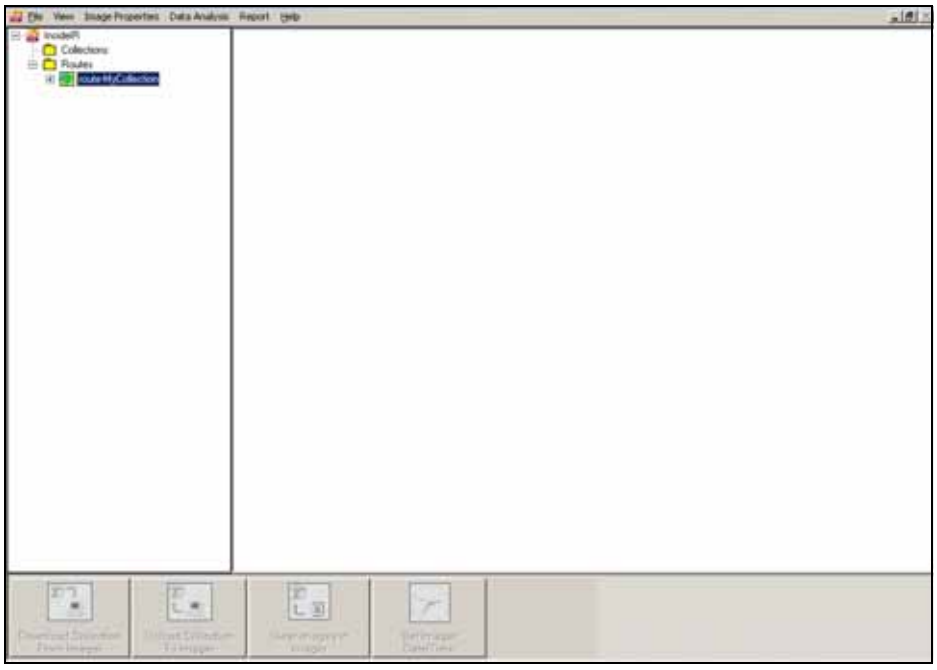

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Figure 1-2. InsideIR Home Display

Setting the Imager Clock

It is very important to set the Imager clock in your Imager because it records a time / date stamp with each stored image. This is important for meaningful reports and trending. The Imager's internal clock can only be set or changed from the computer. You cannot set or adjust it on the Imager. It is very important to have the internal clock set to your local time and date, since your inspections will be tracked based on the time and date you set.

1. Press the Set Date and Time in Imager button  on the lower portion of the Main menu.
2. Enter a Date and Time or check the Get Date Time box to use the date and time set on your computer.

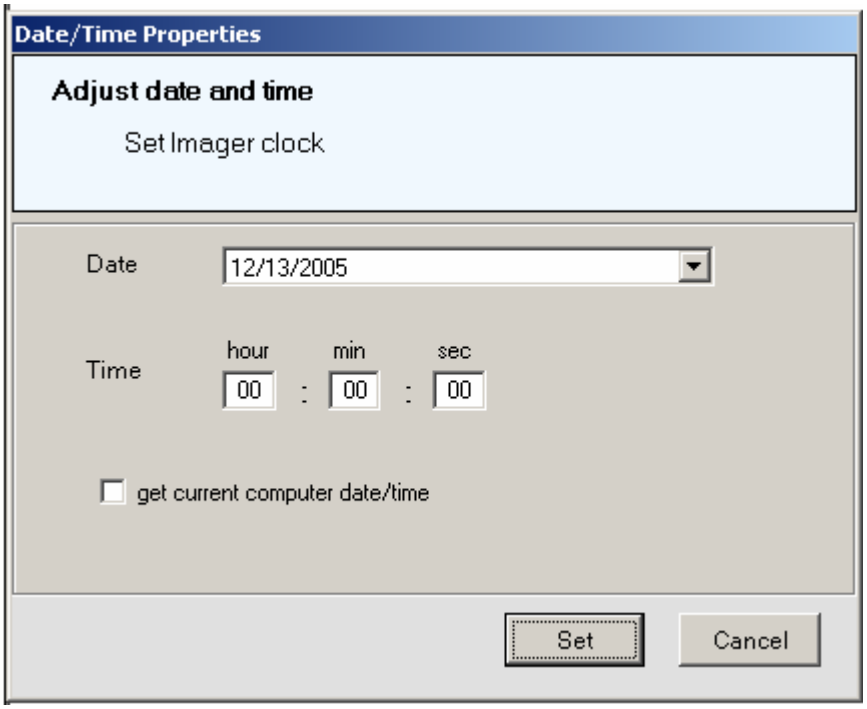

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Figure 1-3. Date and Time Adjustment Screen

3. Click the Set button to upload the information to the Imager.

Selecting a Language

With InsideIR, you have the ability to display a localized version of the software on your computer. The default language is English but you can chose to display information in German, French, Spanish, Portuguese, Japanese, Chinese (simplified), Russian, Italian, or Swedish. To select a language, click on the Help menu and select Language and choose a language. The screen will refresh and the selected language will now appear on the toolbar and buttons labels.

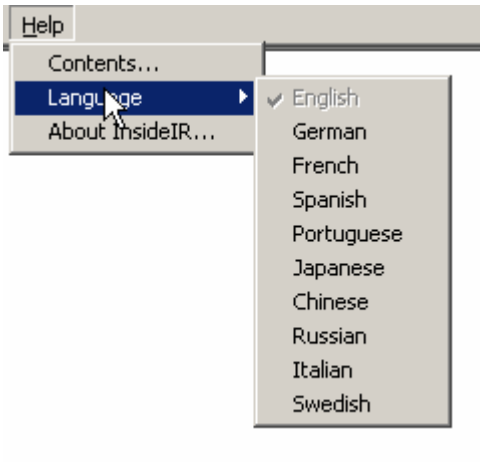

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Figure 1-4. Selecting a Language

Chapter 2
Storing and Organizing Thermal Images and Data

Introduction

The Imager when used together with the InsideIR software provides a powerful way to organize and track maintenance data. Different groups of equipment can be inspected and data specific to different plant areas or departments can be individually named, saved, stored and retrieved in a straightforward fashion. Because all the records are electronic, they can be backed up and stored without fear of loss or fading of records.

Using the Menu Bar

This section describes how to use the options that are available on the menu bar.

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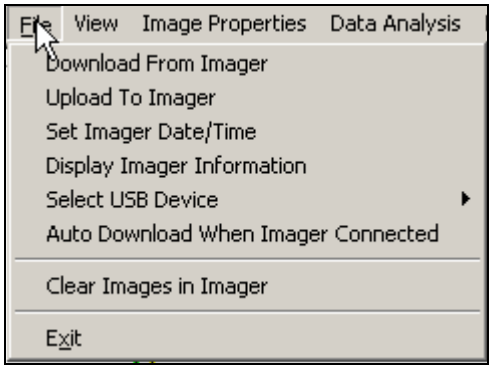
File Options



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Note

You will not see the new folder unless you are in Collection View, with the tree structure appearing on the left side of the screen.

Download from Imager

Downloads images from the Imager to your computer for storage, analysis and report creation. Images are downloaded using a USB connection between the Imager and your computer. The Download a Collection from Imager button on the bottom of the InsideIR display also performs this operation.

Upload to Imager

Creates a new folder, naming it according to the date and time. The name is highlighted and editable, so you can rename the folder according to your own naming conventions. The Upload a Collection to Imager button on the bottom of the InsideIR display also performs this operation.

Set Date and Time in Imager

Sets the Imager date and time. The Imager's date and time can only be set or changed from your computer. You cannot set or adjust it on the Imager. It is important to have the internal clock set to your local date and time since your inspections will be tracked based on this date and time information.

Display Imager Information

Product-specific information about each Imager you have used with a specific computer. This is useful when contacting the factory for service information. It is also useful to use the name of the individual units at the highest level in your directory structure, keeping all images stored by a single unit in the same folder.

Select USB Device

Select the model of the Imager you are using (Ti20 is the default).

Auto Download when Imager is Connected

Used to save registry settings such as language, location of window, auto download, and temperature type. A check mark indicates this option is selected.

Clear Images in Imager

Removes all images stored on the Imager and restores all 50 storage locations with the factory default parameters. Default parameters are:

- Location name: blank
- Emissivity: 1.00
- RTC: OFF
- Low alarm: 0 °C (32 °F)
- High alarm: 250 °C (482 °F)
- Comments: blank

The Clear Images in Imager button on the bottom of the InsideIR display also performs this operation.

Exit

Closes the InsideIR application.

View Options

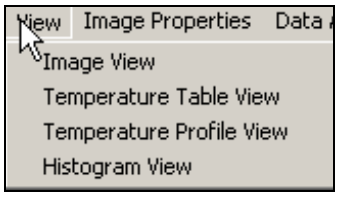

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Image view

Takes you to the image view screen for the selected image.

Temperature table view

Takes you to the temperature table for the selected image.

Temperature profile view

Takes you to the temperature profile screen for the selected image.

Histogram view

Takes you to the histogram for the selected image.

Image Properties Options

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Temperature Scale

Toggle the temperature scale between Fahrenheit or Celsius.

Palette

Original
Restores the palette used when the image was originally captured.

Gray
Displays the selected image in grayscale.

Rainbow
Displays selected image in the Rainbow palette. Rainbow is the default palette selection.

Ironbow
Displays selected image in the Ironbow palette

Gray Reverse
Reverses a grayscale image.

Data Analysis Options

The Data Analysis options are only active when you are in Image View mode (either Image, Temperature Table, Temperature Profiles, or Histogram mode). These functions are used to export images and tables. See Chapter 3 for more information about the data analysis options.

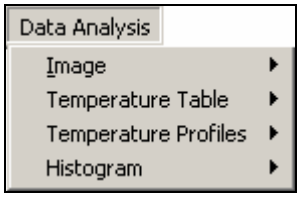

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Image

Allows you to save an image for use with another application. You can save the image in .bmp, .jpg, .gif, .png, .tif, .wmf, .exif, and .emf formats.

Note

When using this option, only the image is saved, the data is not.

Temperature Table

Allows you to export the underlying pixel data from a thermal scene to a .txt file for import into a spreadsheet program, allowing you to do your own in-depth analysis.

Temperature Profiles

Saves the temperature profile data to a .txt file for import into a spreadsheet program, allowing you to do additional analysis of the data.

The file that is saved can also be pasted into a program such as Paint (as well as Word and Excel).

Histogram

- Copy Chart
  Saves the chart to your Windows clipboard, and can then be pasted into Word or Excel, using either the Paste or Paste Special command.
- Pixel Data
  Displays temperature values as number of representative pixels in the thermal scene.
- Percentage Data
  Displays temperature values as a percentage of the all temperature values captured in a given thermal scene.

Report Options

Create Report

Generates a report form, pre-populating data fields with captured data from the given location. See Chapter 3 for detailed information on creating a report.

Help Options

Contents

Displays complete contents of this users manual.

Language

Allows you to select your language preference from English, German, French, Spanish, Portuguese, Japanese, Simplified Chinese, Russian, Italian or Swedish.

About InsideIR

Displays copyright information and software version number.

Downloading a Collection of Images and Data

Images are automatically organized into directories as they are downloaded to InsideIR. To download a Collection of images:

1. Double-click the InsideIR icon () on your desktop. A flash screen momentarily displays and then the main program screen appears.
2. From the InsideIR main screen (Figure 2-1) you can work with any saved images shown in the menu tree on the left side of the screen or you can connect an Imager to your computer and download a new collection of images.

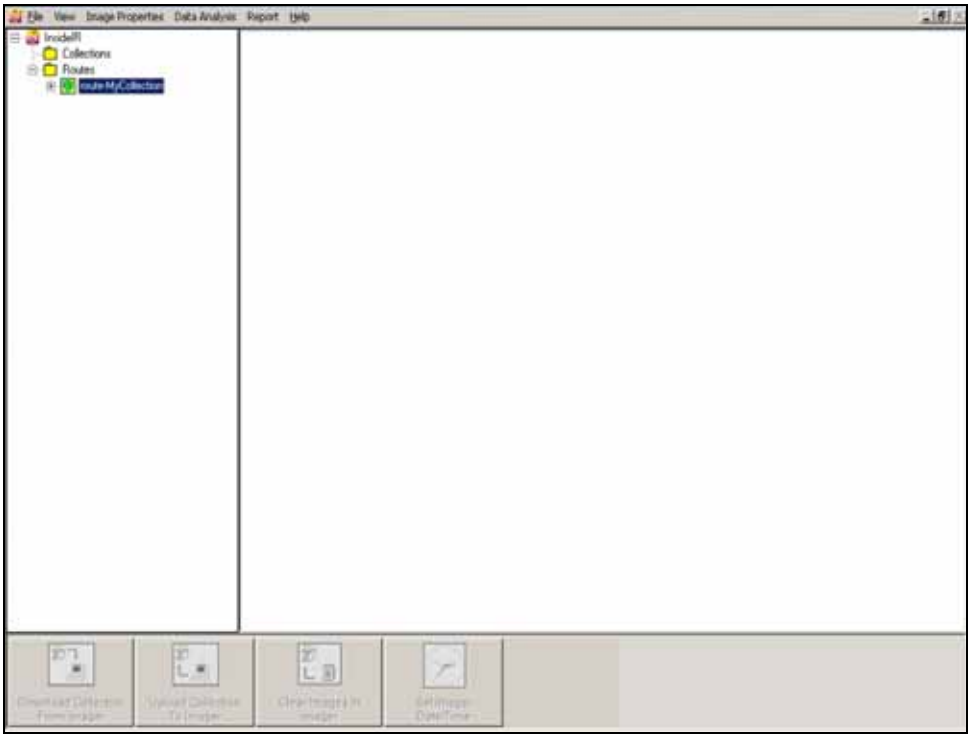

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Figure 2-1. InsideIR Main Screen

3. Connect the Imager to your computer using the provided USB cable. A USB (⇆) symbol appears on the Imager display as soon as a hardware connection is made. The buttons along the bottom of the InsideIR screen are activated (turn from gray to white) when communication with the Imager is established.
4. Click the Download from Imager button ()on the bottom of the Main program screen.

5. Download progress is indicated by a status bar on the Communication Progress display on your computer and by the live video icon ( )in the Header zone of the Imager display. Click the close button when the transfer is complete.

6. The images from your latest download appear in a window on the right side of the Main display (Figure 2-2). Each set of images is in a fixed order starting at image 1 and going to 50 (or however many images you have saved). Use the two scroll bars to view the image thumbnails.

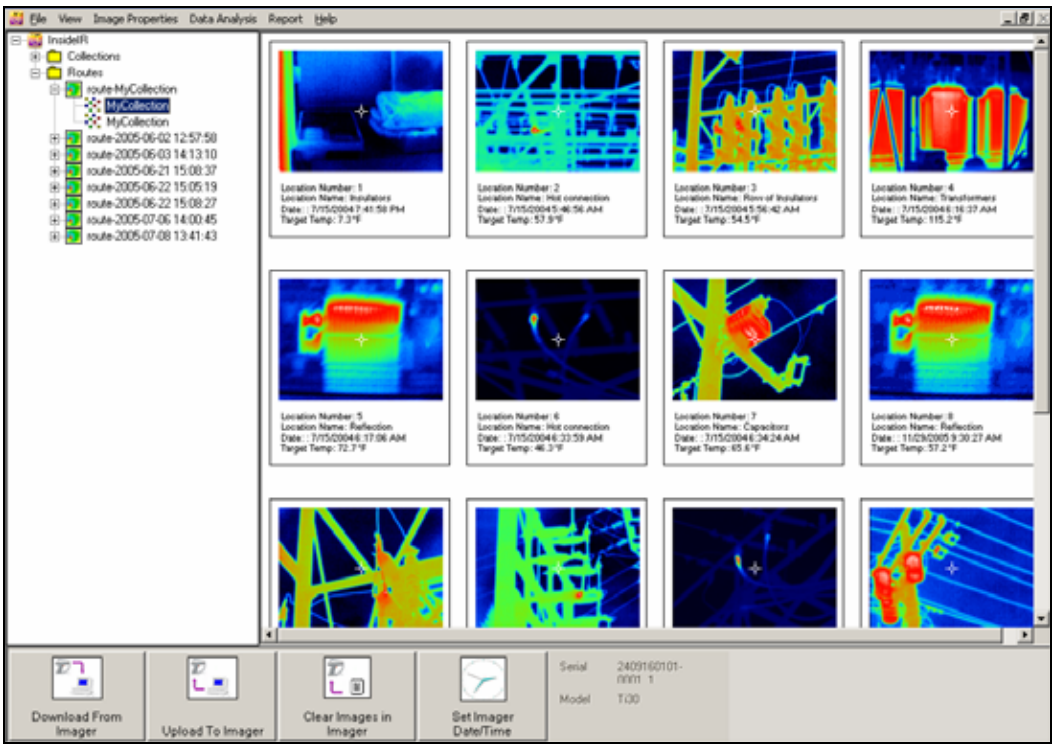

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Figure 2-2. Thumbnail View Screen

7. Double-click on a thumbnail to view a larger version of a single image. Use of the Image, Temperature Table, Profile, and Histogram tabs is described in Chapter 3.

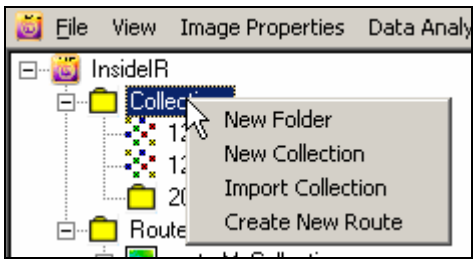
Organizing Collections and Images

Following data storage, InsideIR automatically opens the Collections folder. The Collections folder is the default folder location for all new collections downloaded from the Imager. You can later move collections to alternate folders by simply a selecting and dragging images from one folder to another folder. A collection is a collection of images, not a single image.

The collection of images and their associated data is automatically saved, using the computer's date and time settings.

Top Level Collection Menu

You can right-click on the top level collection menu to perform a variety of functions. The pop-up menu is shown in Figure 2-3.



dag332s.bmp

Figure 2-3. Top-Level Collection Menu

- New Folder
  Creates a new folder. The new folder will show the date and time it was created.
- New Collection
  Creates a new collection in the top-level collection folder. The new folder will show the date and time it was created.
- Import Collection
  Imports a collection of images in .xml format including collection and Imager details. The file can also be a zipped .xml file.
- Create New Route
  Creates a new route in the top-level route folder. The route name is not specified, InsideIR will prompt you for a name until one is provided.

Individual Collection Menu

You can change a collection name by right-clicking on the current name. It is recommended you keep the date and time information in the file name so you can keep track of your periodic inspections.

You can rename or delete files or folders from a collection by right-clicking a folder and choosing the appropriate command from the pop-up menu. The pop-up menu is shown in Figure 2-4.

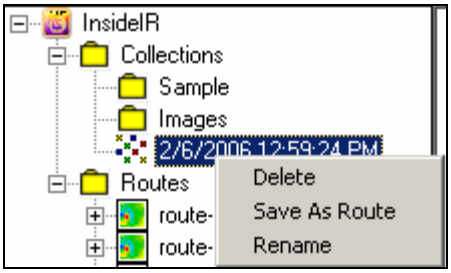


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Figure 2-4. Tree-View Menu

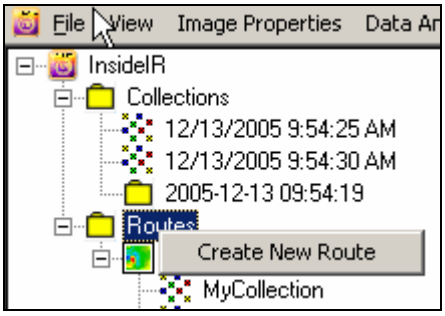
- Delete
  Deletes a collection. You will be asked to confirm the deletion.
- Save As Route
  Saves the collection of images in the Routes folder.
- Rename
  Rename the collection of images.

Working with Routes

Routes are a group of images that you create in order to perform your inspections. Chapter 4 provides information for planning and creating routes as well as guidelines for tracking changes you encounter. After you have saved a collection of images as a route, you can use InsideIR to work with your routes.

Top-Level Route View

You can right-click on the top level route menu to perform a variety of functions. The pop-up menu is shown in Figure 2-5 and described below.

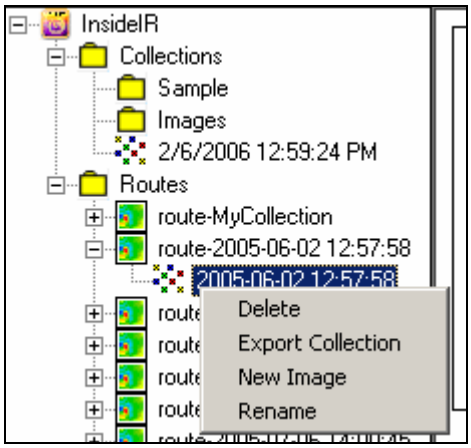


dag333s.bmp

Figure 2-5. Top Level Route View

- Create New Route
  Creates a new route in the top-level routes folder. A route name is not specified, the new folder will show the date and time it was created. If you right-click on a route, you are able to Delete or Copy that route.

Individual Route Menu



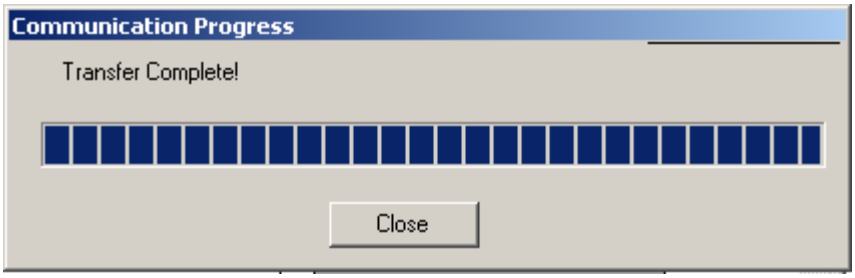
dag334s.bmp

Figure 2-6. Individual Route Menu

- Delete
  Deletes the collection within the route.
- Export Collection
  Exports the route as a collection to another folder on your computer.
- New Image
  Creates a blank image as a place holder for a route location. You can then edit the attributes of the image to be taken.
- Rename
  Renames the route.

Uploading a Route to the Imager

1. Select the route you want to upload and click the Upload to Imager button ()on the InsideIR main screen. Status messages in the Communication Progress dialog inform you about progress of the upload.
2. The Transfer Complete message appears when the upload is complete.



dag520s.bmp

Figure 2-7. Transfer Data Screen

Chapter 3
Analyzing Thermal Images and Data

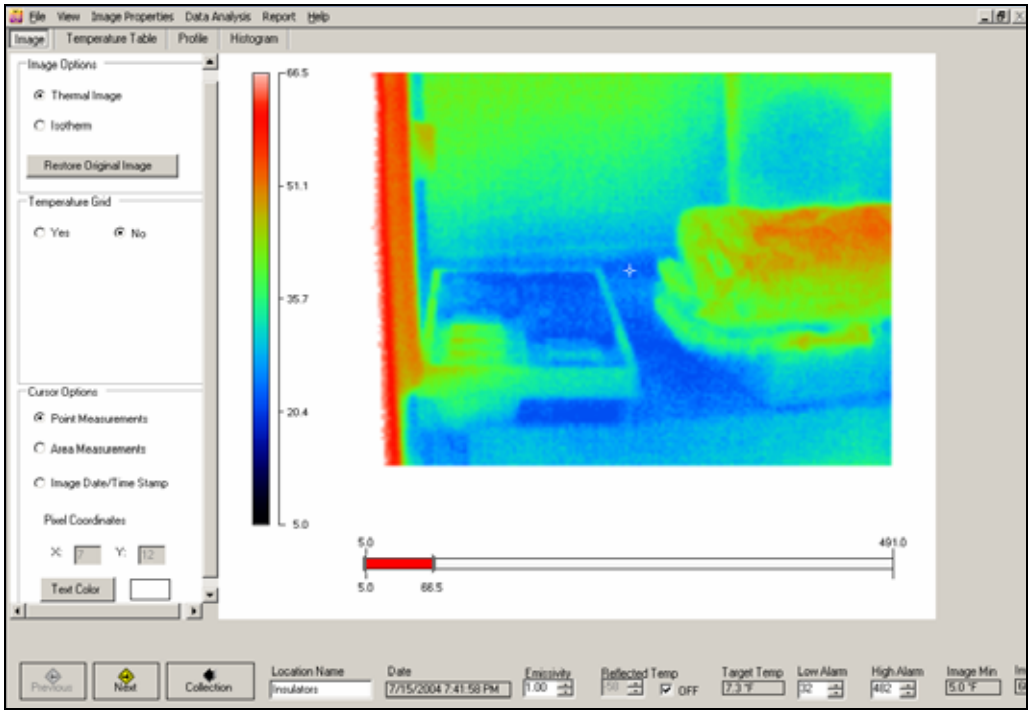
Introduction

There are many ways to analyze your thermal data now that you have it downloaded and organized. After clicking on a thumbnail in the Main InsideIR screen, the data for that specific thermal image is displayed in one of four tabs: Image, Temperature Table, Profile, and Histogram.

While each of these analytical tools possess unique qualities, they also share many features. For example, data from any of the tabs may be saved in other formats or cut and pasted into other applications for your own further analysis or communications needs.

Image Analysis

The Image tab allows you to manipulate and perform a detailed analysis of a thermal image. You can also export the image in various graphical formats for use in other programs. Click Data Analysis|Image|Export Image to export the image. An Image Analysis screen is shown in Figure 3-1.



dag314s.bmp

Figure 3-1. Image Analysis Screen

Image Options

Use the radio buttons to view the image as either a Thermal or Isothermal image.

Cursor Points

Click any part of the image to display the temperature reading at that spot (indicated by the crosshatch). You may click as many spots as you wish, each click adds a reading to the displayed image at that point. Move your cursor around the image to momentarily display the temperature reading on points along your path. The pixel coordinates display simultaneously as you move your cursor across the image.

Restore Original Image

This button restores the original image, removing any temperature or date/time information that has been manually added from the image (with the exception of the temperature grid which must be turned off to disappear).

Temperature Grid

By turning on the temperature grid, you will see 300 8 by 8 pixel squares superimposed over the image. A brightness level bar appears which allows you to control the brightness of the grid. Each grid displays a temperature, which is the average of the 64 pixels in that square.

Text Color

For each of the functions above, you can select various colors of text to improve the appearance of the data over the image. Multiple colors can be used on the same image to highlight different information.

Limit Bar

The limit bar is underneath the image and shows the temperature range the Imager is capable of measuring. The minimum (-10 ºC (14 ºF)) is represented at the far left of the bar, and the maximum (250 ºC (482 ºF)) is represented by the far right of the bar. When the Thermal Image radio button at the bottom of the Image screen is selected, the red area on the bar indicates the range of temperatures, within the minimum and maximum limits that are represented in the thermal scene.

In order to see more detail in narrow ranges of temperature, it is often useful to adjust the scale limits. In order to do this, make sure the Thermal Image radio button is selected. To adjust the upper or lower limits, click and drag the appropriate arrow at the edge of the red portion of the bar. To keep the same range span but change the limits, you can drag the whole red section of the bar left (colder) or right (warmer).

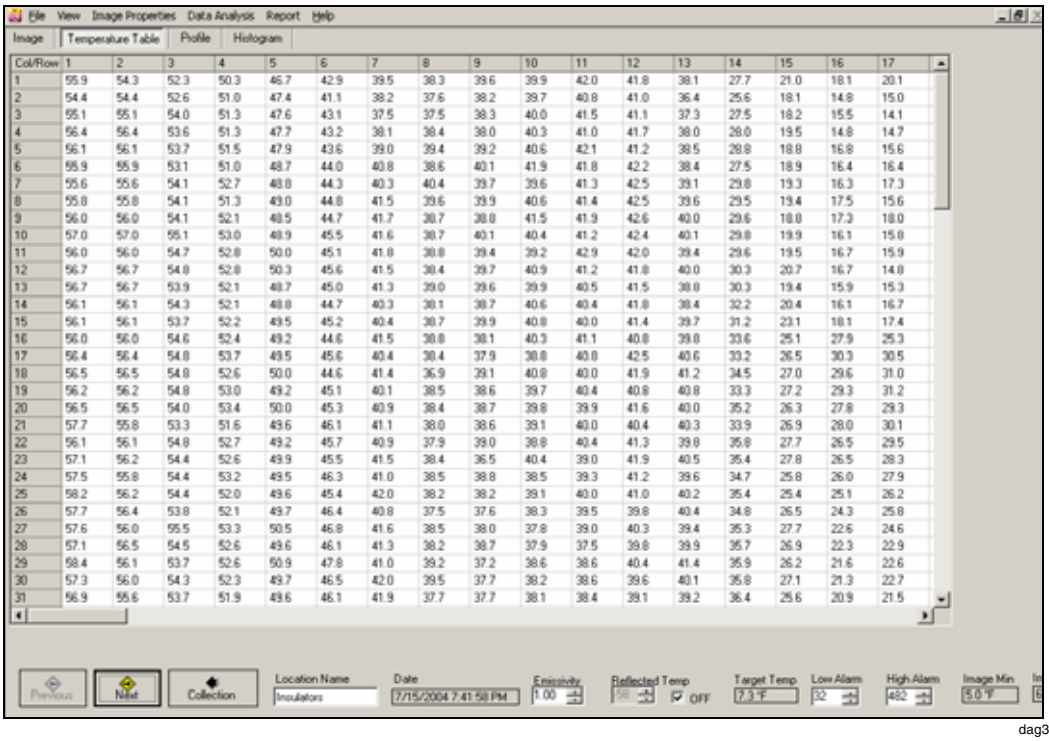
When the Isotherm radio button is selected, the red portion of the bar indicates the temperature range that will be “highlighted” in red in the thermal scene.

Changing of the limits and the interval is done the same way for isotherms as it is for scale limits—by moving the limit arrows or the red portion of the limit bar.

Temperature Table

Clicking on the **Temperature Table** tab reveals a pixel view of all the data in the image (120 rows x 160 columns or 19,200 pixels. An example is shown in Figure 3-2.

You can export temperature data as a .txt file and then import the data into a spreadsheet program (tab delimited format for MS Excel) for your own in-depth analysis. Click Data Analysis|Temperature Table|Export Temperature Table to export the file.



dag323s.bmp

Figure 3-2. Temperature Table

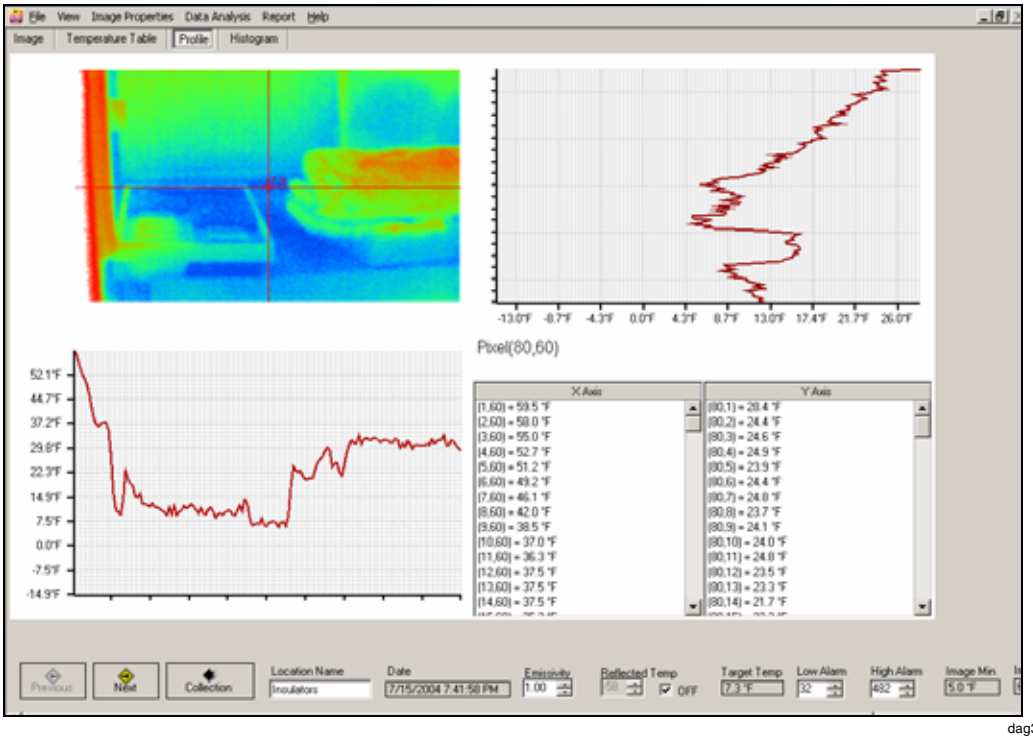
Profile Analysis

There are four quadrants on the profile tab view:

- an interactive radiometric thermal image in the upper left-hand corner
- a vertical temperature profile the upper right-hand corner
- a horizontal temperature profile in the lower left-hand corner
- a table of temperature values for horizontal and vertical profiles in the lower right-hand corner

Click on any portion of the thermal image on the top for the exact temperature reading at that spot. As you do this, you will see that the graph below changes, reflecting the new x and y axes as you move around the image. An example of this is shown in Figure 3-3.

You can export the temperature profile as a .txt file for import into a spreadsheet program (tab delimited format for MS Excel) for your own in-depth analysis or as a .bmp image file for insertion into another program. Click Data Analysis|Temperature Profiles|Export Temperature Data (text file) or Copy to Clipboard Image and Charts (bitmap file) to perform the export.



dag324s.bmp

Figure 3-3. Profile Analysis Screen

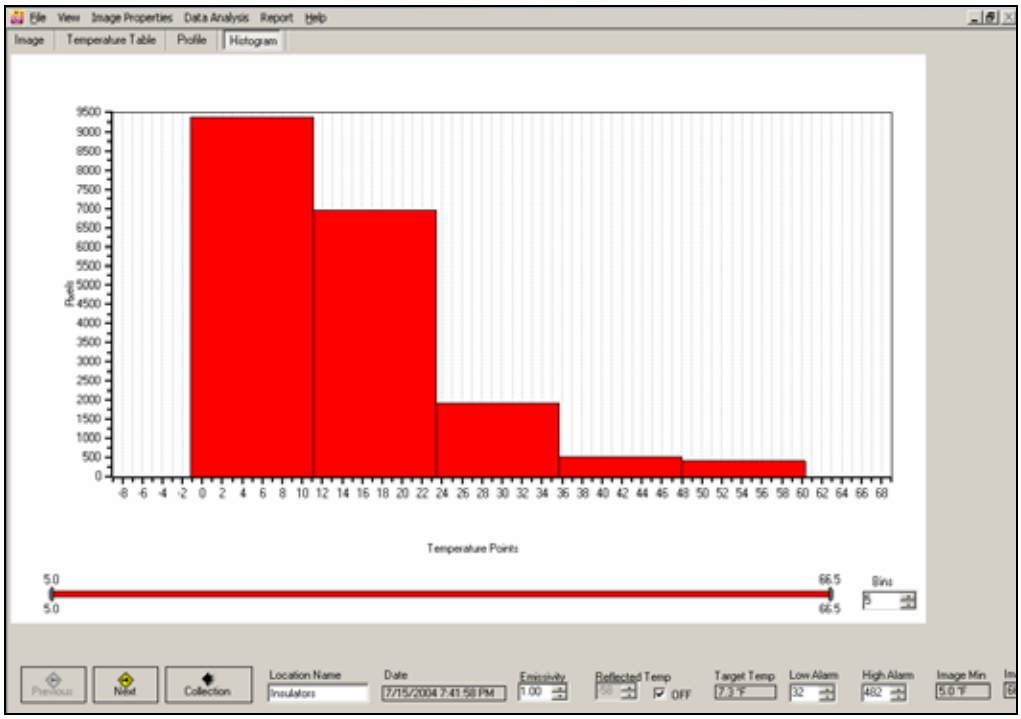
Histogram Analysis

The Histogram tab provides a summary of the pixel data presented on the previous screens.

The histogram displays temperature values as either a percentage of the all temperature values captured in a given thermal scene, or by number of representative pixels in the thermal scene.

You can also select the Data Analysis|Histogram|Limits menu and enter the maximum and minimum temperatures for the data you are interested in graphing.

To export the chart or chart data in another program, select Data Analysis|Histogram|Copy Chart to save the information on the Windows clipboard. You can then paste the data into Microsoft Word, Excel, or other compatible program, using the Paste or Paste Special command. An example is shown in Figure 3-4.

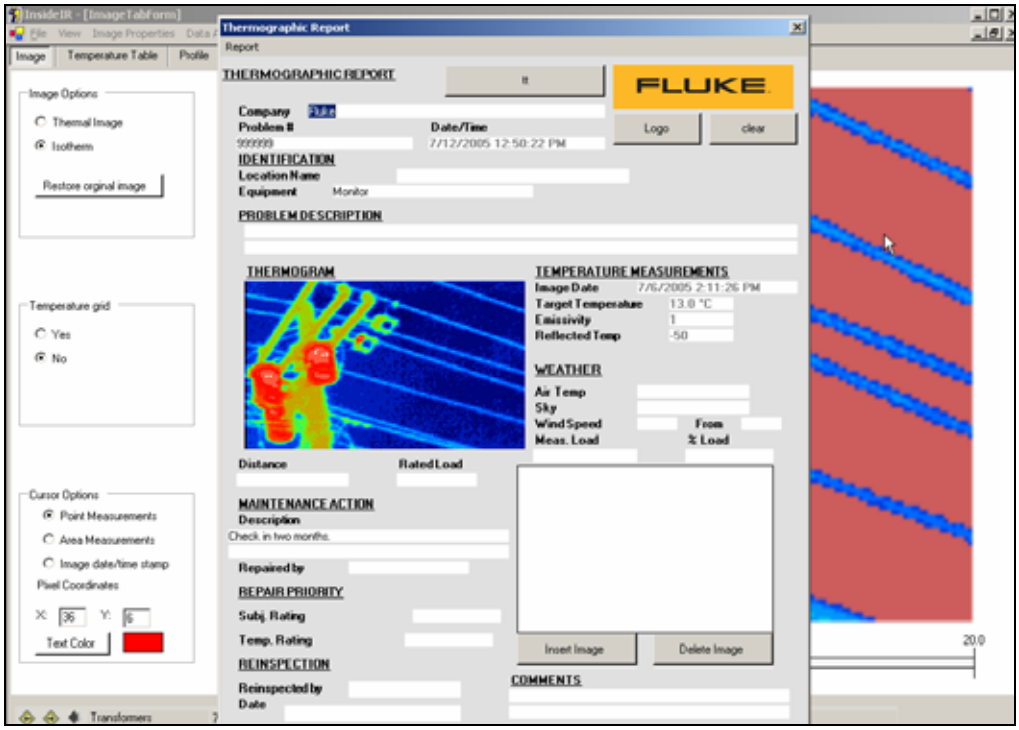


dag325s.bmp

Figure 3-4. Histogram Analysis

Creating a Report

InsideIR provides a report form for you to use in reporting the findings of your thermographic survey. To create a report select an image, next select Report from the Menu Bar and then choose "Create Report" from the drop-down list. An example is shown in Figure 3-5.



dag327s.bmp

Figure 3-5. Report Creation Screen

Some data is filled in for you with known data from the image file so you don't have to copy the information into the record. Other text fields are populated with the last information entered and saved from the previous report. In this way, if you are creating multiple, related reports, you don't have to keep entering the same information over and over again.

You can also use the following additional features when designing your report:

Clear Button

Click the "Clear" button at the top of the report if you would like to clear all text fields and start over.

Logo Button

By default, a Fluke logo appears in the logo field in the upper right hand corner of the report. If you would prefer your own logo on the report, simply click the Logo button and browse for the graphic file containing the logo you want to use. The graphic you select becomes the default logo in this field.

Image Button

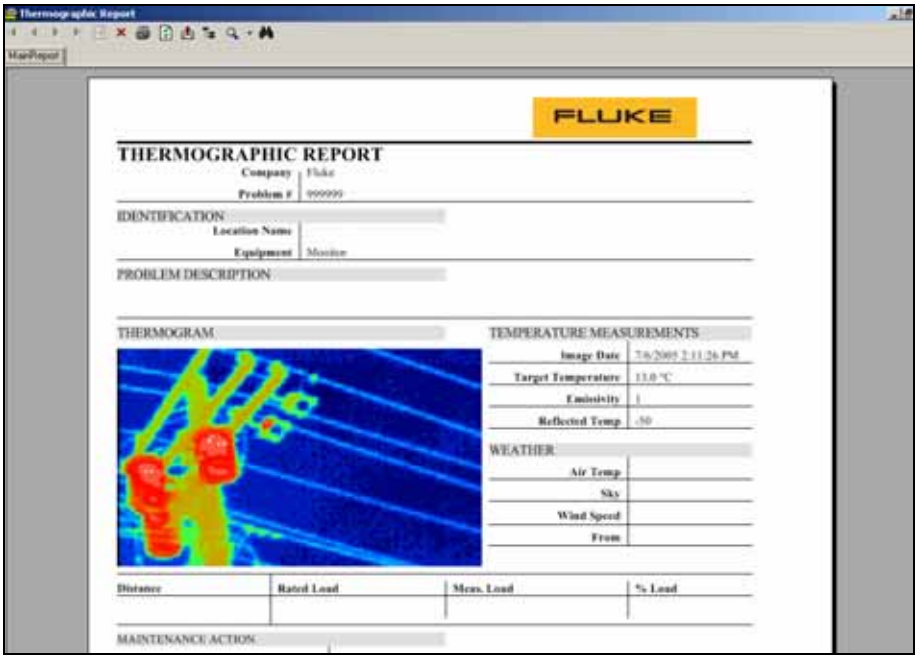
Click the "Insert Image" button to attach an additional visual image (such as a digital photograph) to the report. The Delete Image button removes the selected image.

Preview Report

When your changes are complete, select Report| Preview on the menu bar and. A new window appears displaying the report in Print Preview mode. An example is shown in Figure 3-6.

Use the icons at the top of the window to:

- Print the Report
- Refresh the Display
- Export the Report (.pdf, .xls, .doc, or .rtf)
- Toggle the Group Tree (Not Used)
- Zoom
- Search for Text



dag328s.bmp

Figure 3-6. Preview Report Screen

Chapter 4
Guidelines for Route-Based Inspections

Introduction

This Chapter provides some guidelines for planning and developing a predictive or preventative maintenance program for your facility.

Identifying Critical Equipment for Inspection

Begin by using existing lists of equipment from a Computerized Maintenance Management System (CMMS) or other inventory tool. Eliminate items that aren't well suited for infrared measurement and focus on equipment that creates production bottlenecks. If possible, determine where have failures have occurred in the past. Use a database or spreadsheet to group the remaining equipment together, either by area or function, into roughly 2-3 hour inspection blocks.

The lists may not be up to date, so you can expect the first inspection cycle to take more time as you locate equipment, update lists, deal with access issues, and so forth. During your first pass, also consider taking digital photos of each piece of equipment and storing the images in the equipment database for later reference as needed. If thermography is new in your plant, the first few inspection cycles may yield a large number of finds. Subsequent inspections should go more smoothly. After about three cycles, re-organize the routes so they are more efficient and add new routes and equipment into the inspection cycle as necessary. The optimum frequency of inspection will be determined by the needs of the equipment assets. As they age, are heavily loaded, or are poorly maintained, inspections may become more frequent.

Frequency of inspection is based on a number of factors. The key drivers are safety, the criticality of the equipment, the expense of a failure, and the frequency with which problems impact production and/or maintenance. This latter point is important enough that you should devote time to researching past failures, through discussions with co-workers and by reviewing plant records. See Table 4-1 for recommended inspection periods.

Table 4-1. Recommended Inspection Periods

Equipment Type	Inspection Frequency
High Voltage Substations	1 to 3 years
Transformers	Annual
440 V Air Conditioned Motor Control Centers	6 to 12 months
Older or Non-Air Conditioned Motor Control Centers	4 to 6 months
Electrical Distribution Equipment	4 to 6 months
Large Motors (Assumes vibration analysis, MCA, and lub analysis are also being used)	Annual
Smaller Motors	4 to 6 months

It's also vital to inspect all new equipment both as part of the acceptance process as well as, for larger equipment, to establish a baseline. If equipment is damaged on arrival, inspect it as soon as possible to determine its actual condition. Some plants send their thermographers off site to inspect new equipment before it's delivered, often finding deficiencies and problems before the equipment is accepted. When repairs or modifications are made to equipment, the CMMS must alert the thermographer to conduct a follow-up inspection; all too often a repair is not adequately made, for a variety of reasons, so don't assume everything is okay until the follow-up proves it.

Conditions may not be right for an inspection when it comes due. This incomplete work must be rescheduled before the next cycle, so reserve time for makeup work. You will also develop a list of equipment that needs increased monitoring until it can be repaired; many thermographers add these pieces into a weekly route until the condition changes.

Working from a pre-inspection checklist is a good idea.

- Make sure the Imager is ready to go.
- Charge the batteries.
- Clear the memory of previously recorded data.
- If you will be following an inspection route that has been inspected previously, upload past results to the Imager so they can be compared to new findings.
- If additional equipment is required, such as a digital clamp meter for load reading, or a voice recorder, etc., assemble all of it and make sure it's in good working order.

Sit down with co-workers from the area where you will be conducting your day's work. Discuss concerns (for safety, equipment conditions, etc) and note any unusual conditions that might impact your work. Ask about any problems they have noted. Because routine inspections should generally be conducted by more than one person, this is also a good time to go over your needs with your escort. Typically the escort will locate the exact equipment to be inspected, remove panel covers, take load readings, and watch out for the safety of the thermographer while the Imager is being used. He or she should also be able to fill in any necessary information about equipment conditions or peculiarities. During the pre-job meeting, it's also important to identify the exact person who should be notified if an alarm or emergency condition is encountered.

Whenever you enter an inspection area, take a moment to get oriented, determine an emergency exit strategy, and note any potential hazards. Many thermographers begin an

electrical inspection by looking first at the panel covers while they are still closed; if any appear abnormally warm it may be appropriate to take further safety precautions before accessing the equipment inside. Airborne ultrasound detection equipment can provide a very useful supplemental signature and a level of assurance that things are safe.

Unless you are conducting a first-time baseline inspection, only record thermal images when problems or "exceptions" are located. Take time to look at the finding from several different angles and collect any other data that might be useful for your analysis, including additional visual images of the component. Don't worry about actually measuring temperatures until after you've found a problem. At that point, if it is appropriate, the correct emissivity and reflected temperature compensation (RTC) can be used. Additional analysis is often easier to do back in the office at the computer. This finding, an internal fault in a pole-mounted transformer feeding a critical load, was considered serious enough that it could not wait for a scheduled shutdown. Protocols should be established before the inspection to handle situations like these effectively.

For electrical enclosures, such as control panels, open only as many panels as is safe. If enclosure doors are left open for too long, any problem hot spots may cool off. Once you've completed inspecting an enclosure, the escort should close the cover to ensure the safety of anyone in the area. If necessary, post signs or barricades around an area during the inspection.

When the inspection is complete, meet briefly with the area manager(s) and review your findings. Prepare them for what you'll say in your report, let them know when the report will be coming, and discuss when your next inspection cycle will occur.

Download any data you've collected after each route as soon as possible to reduce the risk of accidental erasure. Delete any unnecessary images and process the rest individually, fine-tuning temperature measurements and making any adjustments to temperature level and span settings. Enter any supplemental data into the report page, along with the visual image of the equipment inspected.

When the inspection report is complete, add the area manager and/or operator(s) to your distribution list. As a final task, update the equipment list with any changes, additions or deletions.

Planning an Inspection Route

Listed below are several steps to take prior to conducting an inspection.

- Determine what critical assets you are going to inspect.
- Define how you want to organize your inspection.
- Define how many inspection points and locations you want for each asset you inspect.

Note

In order to compare like images, it is recommended that you are in the same relative position each time you capture a thermal image of an asset. The goal of the inspection is to compare images over time that are taken from the same position. If you are in a different position when you record an image, it will be difficult to make accurate comparisons of your results.

- Review safety standards and procedures.
- Set up alarms for image comparison and track key indicators over time.

Collecting Baseline Images and Creating an Inspection Route

Once you have planned your inspection route you can collect baseline images which you will then make into an inspection route. Follow the steps below to create a new route and capture thermal images of inspection points on the route.

1. Select the number of images (route locations) that will be inspected.
2. Check or change the defaults for each location as necessary (emissivity, RTC, Hi/Lo alarms).
3. Capture multiple images of each asset and examine them to determine which point of view provides an optimal thermal image.

Note

When you determine the optimal thermal image note your relative position to the asset when you recorded the image. If you know the exact relative position, you can capture the same image in subsequent inspections of the asset.

4. Inspect the image and if the result is satisfactory, press F1 (STORE) to store the image.
5. If the image in not satisfactory, squeeze the trigger or press F1 (YES) to return to live viewing.
6. When all images on your inspection route are captured you can download the saved images to InsideIR for additional analysis and annotation. Connect the provided USB cable to the Imager and download the baseline images to InsideIR.
7. Captured images are downloaded into a Route folder. When the images are in a Route folder you can:
   - Delete images that you don't want to include in your inspection route
   - Drag and drop collected images to create an image order for your route.

You can also create a route from an existing set of thermal images:

1. Drag or drop images from collections or routes to a route folder.
2. Check or change the defaults for each location as necessary (emissivity, RTC, Hi/Lo alarms).
3. Upload the route to the Imager.
4. Take multiple images of each asset and examine them to determine which point of view provides an optimal thermal image.

Note

When you determine the optimal thermal image note your relative position to the asset when you recorded the image. If you know the exact relative position, you can capture the same image in subsequent inspections of the asset.

5. Inspect the image and if the result is satisfactory, press F1 (STORE) to store the image. If an image is already stored in the memory location, a prompt will ask you to confirm saving the image at that location. Press F1 (YES), F2 (CANCEL), or F3 (COMPARE).

6. If the image is not satisfactory, squeeze the trigger or press F1 (YES) to return to live viewing.
7. When all images on your inspection route are captured you can download the saved images to InsideIR for additional analysis and annotation. Connect the provided USB cable to the Imager and download the baseline images to InsideIR.
8. Captured images are downloaded into a Route folder. When the images are in a Route folder you can:
   - Delete images that you don't want to include in your inspection route
   - Drag and drop collected images to create an image order for your route.

Tracking Your Inspection Results

Analysis of data over the long term is very important, so plan on accumulating it in forms that facilitate this process. The benefit is two fold. First, you will see trends that may not be obvious in a day-to-day analysis. For instance, you may discover that the motor shop is doing a poor job, or that a certain brand of fused disconnect consistently has problems.

Another benefit is that you will see what is working and what isn't working in your inspection program You can see where problems are continuing to occur, enabling you to justify dedicating resources in those areas or decreasing the frequency of inspection because few problems are being found.