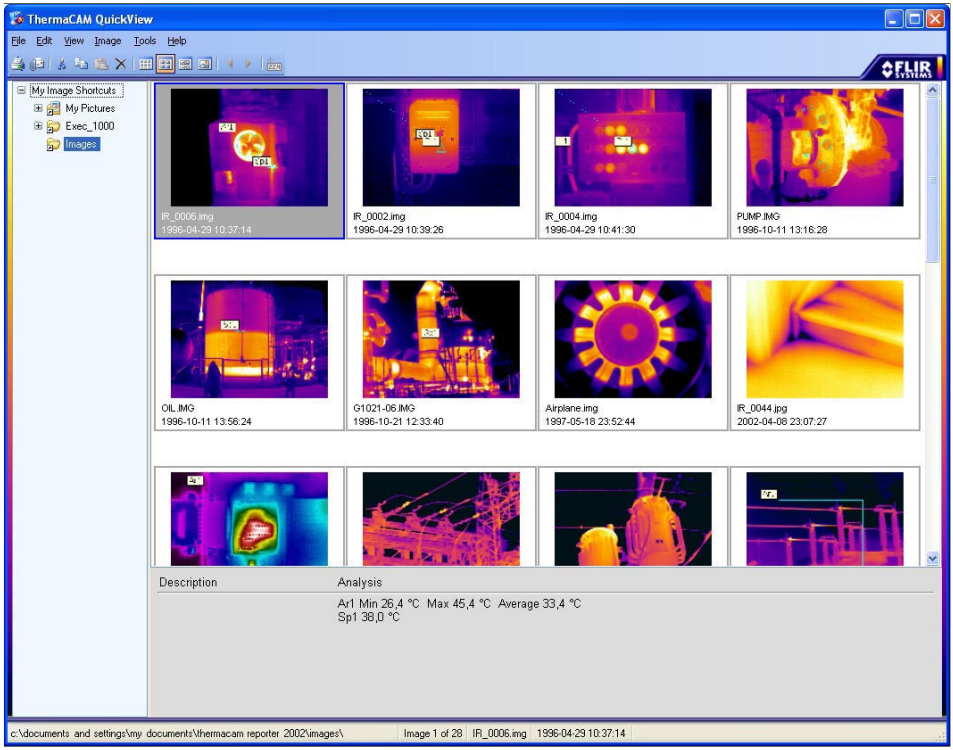
ThermaCAM™ QuickView

User's manual



FLIR SYSTEMS™

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➲ For contact details for regional offices, see the back cover of this manual.

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1 Welcome!

Thank you for choosing ThermaCAM™ QuickView!

ThermaCAM™ QuickView is a powerful, yet easy-to-use software for downloading images from an infrared camera to a laptop or desktop PC, and to remotely capturing images in the infrared camera. ThermaCAM™ QuickView can be regarded as a simple report generator in an infrared inspection workflow that starts with capturing the infrared images. It can also be regarded as a junction point between *infrared images* and *advanced infrared reports*, such as reports generated from ThermaCAM Reporter 7.0.

ThermaCAM™ QuickView provides the necessary tools and features to:

- Move images between camera and computer
- Copy images between camera and computer
- View any image folder in the camera or on the computer
- Create default image shortcuts to any folder
- Read out temperature information from any infrared image supporting *.img or radiometric *.jpg files
- Read out file names, creation dates, camera serial number, camera type from infrared images
- Change level and span and then save the images again (radiometric *.jpg files only)
- Change palette to one or several images (radiometric *.jpg files only)
- Read out internal palettes from an image
- Distribute images from within the software by using easy-to-use *mailto*: commands
- Create reports in Adobe® Acrobat's platform-independent PDF file format

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Figure 1.1 ThermaCAM™ QuickView works in conjunction with several different camera models from FLIR Systems – such as ThermaCAM E2, P40, and S60 shown above.

2 About this manual

2.1 Purpose of the manual

This manual is provided to customers using FLIR Systems infrared cameras, and describes the features and functionality of ThermaCAM™ QuickView. The manual is intended to give the customer a general idea of infrared inspection workflows, how to connect the camera to the PC, how to carry out common tasks in ThermaCAM™ QuickView, and how to create simple reports.

The manual also includes a complete reference section, describing all menus, commands and dialog boxes.

2.2 Typographical conventions

This document uses the following typographical conventions:

- Menu names, menu commands and labels and buttons in dialog boxes are typeset in **semibold**
- Emphasized information is typeset in *italic*

2.3 Comments & questions

FLIR Systems is committed to a policy of continuous development, and although we have tested and verified the information in this manual to the best of our ability, you may find that features and specifications have changed since the time of printing. Please let us know about any errors you find, as well as your suggestions for future editions, by sending an e-mail to:

documentation@flir.se

2.4 Technical support

Technical support is handled by FLIR Systems local sales offices. You can find the addresses and telephone numbers on the back cover of this manual.

Before contacting a local sales office about technical support, please write down the following information and keep it at hand:

- The camera model name
- The camera serial number
- The communication protocol you are using – RS-232, USB, or FireWire
- Operating system on your PC
- Full name and revision of the manual, and references to sections which you feel may be in error

3 Installation

3.1 Software requirements

3.1.1 Camera

ThermaCAM™ QuickView will only work with these camera configurations:

- E series cameras: boot2 version 2.7.2.1 or higher)
- E series cameras: appl version 1.7.18.1 (or higher)
- P/S series cameras: boot2 version 2.4.2.1 (or higher)
- P/S series cameras: appl version 2.4.4.1 (or higher)

To check the version of boot2/appl, start your camera and then click **Camera info** on the **Settings** or **Setup** menu (depending on camera).

3.1.2 PC

Serial communication (RS-232) between PC and camera is supported on the following operating systems:

- Windows 98 Second Edition
- Windows Me
- Windows NT4, Service Pack 6
- Windows 2000
- Windows XP

USB and FireWire connections between PC and camera is supported on the following operating systems:

- Windows 98 Second Edition
- Windows Me
- Windows 2000
- Windows XP

3.2 Installing ThermaCAM™ QuickView

➲ Before you install the program, please close all other programs on the computer. Make sure ThermaCAM™ QuickView is installed before connecting the camera to the USB, FireWire or RS-232 port.

Step	Action
1	Insert the ThermaCAM™ QuickView installation CD into the CD-ROM drive.
2	Select the preferred language.
3	Follow the on screen instructions.

If the installation program doesn't start when you insert the installation CD, please start the program manually by following the steps below.

Step	Action
1	Double-click **My Computer** on **Desktop**.
2	Right-click on your CD-ROM drive and click **Explore**.
3	Double-click SETUP.EXE
4	Select the preferred language.
5	Follow the on screen instructions.

3.3 Installing USB & FireWire drivers

When the ThermaCAM™ QuickView installation is finished, you need to install the drivers depending on how you connect the infrared camera to your computer.

Step	Action
1	Insert the ThermaCAM™ QuickView installation CD into your CD-ROM drive.
2	Connect the camera to the computer.
3	Switch on the camera.
4	Follow one of the installation procedures on the following pages.

3.3.1 USB Driver installation procedure for Microsoft Windows XP

Step	Action
1	When the system has detected the ThermaCAM, the **Welcome to the Found New Hardware Wizard** window appears. The wizard asks: **What do you want the wizard to do?** Select **Install from a list or specific location**.
2	Click **Next**.
3	The next wizard window is displayed: **Please choose your search and installation options.** ▪ Select **Search for the best driver in these locations**. ▪ Clear **Search removable media** ▪ Select **Include this location in the search** ▪ Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" ▪ Click **Ok**
4	Click **Next**.
5	The next wizard window is displayed: **The driver has not passed Windows Logo testing to verify its compatibility with Windows XP**. Click **Continue Anyway**
6	The wizard copies the necessary driver files to your system.
7	The driver installation procedure is completed. Click **Finish**.
8	Reboot your computer if prompted to do so.

3.3.2 USB Driver installation procedure for Microsoft Windows 2000

Step	Action
1	When the system has detected the ThermaCAM, the **Welcome to the Found New Hardware Wizard window appears**. Click **Next**.
2	The next wizard window is displayed: **This wizard will complete the installation for this device: FLIR USB Network Adapter**. The wizard asks: **What do you want the wizard to do?** Select **Search for a suitable driver for my device**.
3	Click **Next**.
4	The wizard asks: **Where do you want Windows to search for driver files?** Select **Specify a location**, clear all other options.
5	Click **Next**.
6	Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" Click **Ok**.
7	The wizard has now found a driver for the device. Click **Next**.
8	The next wizard window is displayed: **Microsoft has not digitally signed the driver**. Click **Yes** to continue.
9	The wizard copies the necessary driver files to your system.
10	The driver installation procedure is completed. Click **Finish**.
11	Reboot your computer if prompted to do so.

3.3.3 USB Driver installation procedure for Microsoft Windows ME

Step	Action
1	When the system has detected the ThermaCAM, the **Windows has found the following new hardware: FLIR ThermaCAM. What would you like to do?** window appears. Select **Specify the location of the driver**.
2	Click **Next**.
3	▪ Select **Search for the best driver for your device** ▪ Clear **Removable media** ▪ Select **Specify a location** ▪ Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" ▪ Click **Ok**
4	Click **Next**.
5	Click **Next**.
6	If you get version conflict questions, click **Yes**.
7	Click **Finish**.
8	Reboot your computer if prompted to do so.

3.3.4 USB Driver installation procedure for Microsoft Windows 98

Step	Action
1	When the system has detected the ThermaCAM, the **This wizard searches for new drivers for: FLIR USB Network Adapter** window appears. Click **Next**.
2	The wizard asks: **What do you want Windows to do?** Select **Search for the best driver for your device**.
3	Click **Next**.
4	▪ Clear **Floppy disk drives** ▪ Clear **CD-ROM drive** ▪ Select **Specify a location** ▪ Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" ▪ Click **Ok**
5	Click **Next**.
6	Click **Next**.
7	Insert Windows 98 CD-ROM if prompted to do so.
8	Click **Finish**.
9	Reboot your computer if prompted to do so.

3.3.5 FireWire/1394 Driver installation procedure for Microsoft Windows XP

Step	Action
1	When the system has detected the ThermaCAM, the **Welcome to the Found New Hardware Wizard** window appears. The wizard asks: **What do you want the wizard to do?** Select **Install from a list or specific location**.
2	Click **Next**.
3	The next wizard window is displayed: **Please choose your search and installation options**. ▪ Select **Search for the best driver in these locations** ▪ Clear **Search removable media** ▪ Select **Include this location** in the search ▪ Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" ▪ Click **Ok**
4	Click **Next**.
5	The next wizard window is displayed: **The driver has not passed Windows Logo testing to verify its compatibility with Windows XP**. Click **Continue Anyway**.
6	The wizard copies the necessary driver files to your system.
7	The first driver installation procedure is completed. Click **Finish**.
8	**Welcome to the Found New Hardware Wizard** window appears again. Repeat step 1 to 7. After that the driver installation is complete.
9	Reboot your computer if prompted to do so.

3.3.6 FireWire/1394 Driver installation procedure for Microsoft Windows 2000

Step	Action
1	When the system has detected the ThermaCAM, the **Welcome to the Found New Hardware Wizard window appears**. Click **Next**.
2	The next wizard window is displayed: **This wizard will complete the installation for this device: FLIR 1394 Network Adapter**. The wizard asks: **What do you want the wizard to do?** Select **Search for a suitable driver for my device**.
3	Click **Next**.
4	The wizard asks: **Where do you want Windows to search for driver files?** Select **Specify a location**, clear all other options.
5	Click **Next**.
6	▪ Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" ▪ Click **Ok**.
7	The wizard has now found a driver for the device. Click **Next**.
8	The next wizard window is displayed; Microsoft has not digitally signed the driver. Click **Yes** to continue
9	The wizard copies the necessary driver files to your system.
10	The first driver installation procedure is completed. Click **Finish**.
11	**Welcome to the Found New Hardware Wizard** window appears again. Repeat step 1 to 10. After that the driver installation is complete.

3.3.7 FireWire/1394 Driver installation procedure for Microsoft Windows ME

Step	Action
1	When the system has detected the ThermaCAM, the **Windows has found the following new hardware: FLIR ThermaCAM_R3. What would you like to do?** window appears. Select **Specify the location of the driver**.
2	Click **Next**.
3	▪ Select **Search for the best driver for your device** ▪ Clear **Removable media** ▪ Select **Specify a location** ▪ Click **Browse** and locate folder "C:\Program Files\FLIR Systems\Device drivers" ▪ Click **Ok**
4	Click **Next**
5	Click **Next**
6	If you get version conflict questions, click **Yes**.
7	Click **Finish**.
8	**Windows has found the following new hardware: FLIR ThermaNET_R2** window appears.
9	Repeat Step 1–4, 6–7
10	Reboot your computer if prompted to do so.

3.3.8 FireWire/1394 Driver installation procedure for Microsoft Windows 98

Windows 98 does not support Plug and Play for FireWire. After you have connected the camera follow the instructions below.

Step	Action
1	Click **Start** → **Settings** → **Control Panel** in order to display the Control Panel
2	Double-click **Add New Hardware**.
3	Click **Next**.
4	Click **Next**.
5	Select **Yes, the device is in the list** and select the FLIR ThermaCAM_R3 device. Click **Next**.
6	Click **Finish**.
7	Click **Reinstall Driver**.
8	Click **Next**.
9	Select **Search for a better drive than the one your device is using now**. Click **Next**.
10	Select **Specify a location**. Clear all other options.
11	Click **Browse** and select folder C:\Program Files\FLIR Systems\Device drivers. Click **Ok**.
12	Click **Next**.
13	Click **Next**.
14	Insert Windows 98 CD-ROM if prompted to do so.
15	If you get version conflict questions, click **Yes**.
16	Click **Finish**.
17	Click **Close**.
18	Repeat Step 1–17 for the FLIR ThermaNET_R2 device.
19	Reboot your computer if prompted to do so.

4 A few words about file formats

4.1 General information

ThermaCAM™ QuickView supports a variety of different radiometric and non-radiometric file formats. These include not only FLIR Systems propriety file formats, but also a number of third-party file formats.

4.2 Supported radiometric file formats

ThermaCAM™ QuickView supports the following radiometric file formats:

- ThermaCAM radiometric *.jpg
- ThermaCAM radiometric *.img
- ThermaCAM radiometric 8-bit *.tif
- ThermaCAM radiometric 8/12-bit *.tif
- ThermaCAM radiometric 12-bit *.tif
- ThermoTeknix *.tgw
- ThermoTeknix *.tmw
- ThermoTeknix *.tlw

4.3 Supported non-radiometric file formats

ThermaCAM™ QuickView supports the following non-radiometric file formats:

- *.jpg – as defined by *Joint Photographic Experts Group*. A widely used image format that is compatible with the majority of all image software on the market. It takes advantage of a powerful compression algorithm named after the committee that defined it.
- *.bmp – as defined by Microsoft®. This is one of the most wide-spread file formats for images and is supported by the majority of image browsers and word-processing programs. However, the *.bmp file format creates considerably larger files than the *.jpg file format.

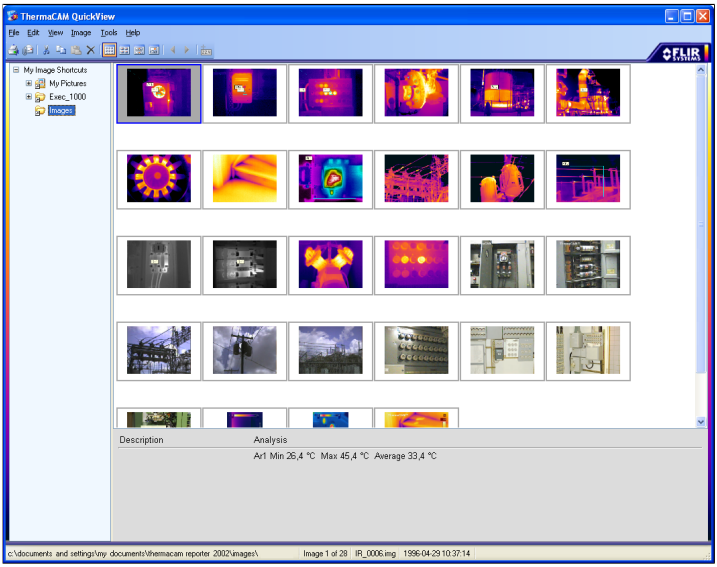
5 Getting started

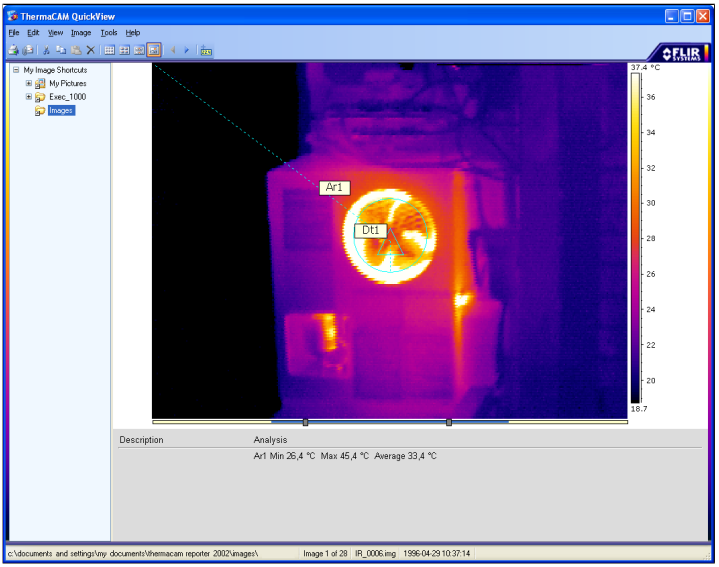
To get started on ThermaCAM™ QuickView right away, follow this procedure.

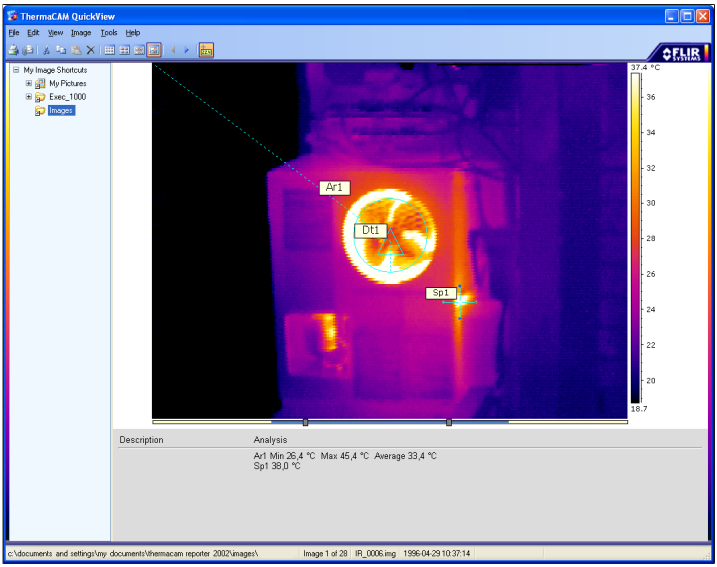
The procedure assumes that you have connected your camera to the PC, that ThermaCAM™ QuickView is running, and that you have moved the images from the camera to the PC.

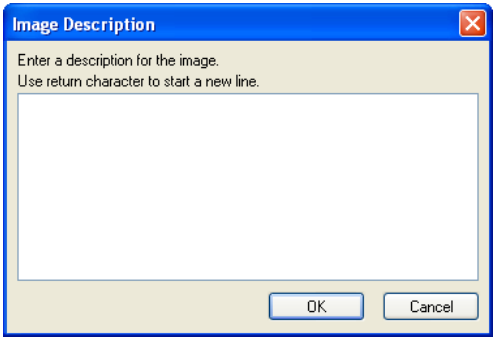
For information, see also:

- Section 8 – Connecting the camera on page 23
- Section 11 – About moving images on page 41

Step	Action
1	To get a good overview of the images, do one of the following ■ Click **Small Thumbnails** on the **Image** menu ■ Click the **Small Thumbnails** button on the toolbar. 10557303;3  **Figure 5.1 Small Thumbnails** image view

Step	Action
2	Select the image (or images) you want to work with by clicking the image. A gray frame will indicate that the image is selected. 10549803;2  **Figure 5.2** A selected image
3	Do one of the following: ▪ Click **Single Image** on the **View** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image 10557403;3  **Figure 5.3 Single Image** image view

Step	Action
4	Read out the temperature from the image by clicking **Flying Spot** on the **Image** menu, or by clicking the **Flying Spot** button on the toolbar. Now move the cursor to any position on the image. The internal temperature information in the image will be read out and displayed in two different ways: ▪ In a small result field at the same location as the cursor (Windows® XP only) ▪ At the status bar of the window 10557503;3  **Figure 5.4** Reading out the temperature using **Flying Spot**

Step	Action
5	Add an image description to the image by clicking **Image Description** on the **Image** menu. This will display an editing window in which you can type your comments about this particular image. 10557603;2  **Figure 5.5 Image Description** editing window
6	Do one of the following: ▪ Create a simple report by selecting this image as well as any other images and then clicking **Save as PDF** on the **File** menu ▪ Print the report to a local or network printer ▪ Mail one or several images to a mail recipient by clicking **Send To** on the **File** menu ▪ Save one or several images as in *.bmp file format by clicking **Save As** on the **Image** menu

6 Typical workflow

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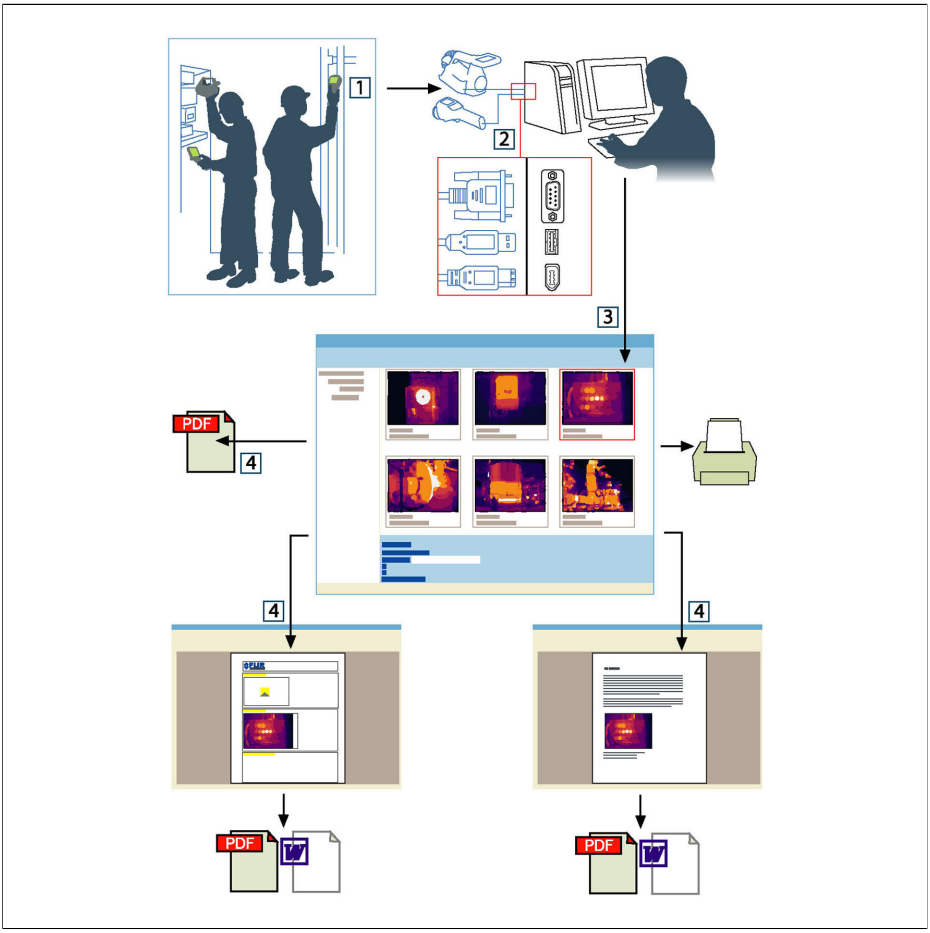


Figure 6.1 Typical workflow overview

An infrared inspection is usually carried out following a typical workflow. ThermaCAM™ QuickView is a vital part in this workflow, and will make it easy for you to move the infrared images from your camera to your PC, create simple reports, or save images to your hard disk drive for future use in ThermaCAM Reporter – the *de facto* industry standard for creating advanced and good-looking infrared inspection reports.

Figure 6.2 Explanations of callouts

Callout	Description of step in the workflow
1	During your infrared inspection, use your camera to capture the infrared and/or visual images of your interest.
2	Connect your camera to your PC, using RS-232 serial communication, USB (Universal Serial Bus), or FireWire For more information, see section 8 – Connecting the camera on page 23.
3	Work with the images of your choice, using the built-in features in ThermaCAM™ QuickView. You can select and deselect images, move images to different locations on your PC, or delete the images you don't want to keep. You can also add image descriptions, read out temperatures, and change level and span. For more information, see section 10 – About viewing images on page 36, section 11 – About moving images on page 41, and section 12 – About analyzing images on page 44.
4	Create reports one of the following ways: ▪ Create simple Adobe® Acrobat PDF reports using the report generator on the **File** menu (**Save as PDF**) ▪ Create reports using Microsoft® Word by dragging images into Microsoft® Word and then adding your own comments and descriptions ▪ Create reports using FLIR Systems ThermaCAM Reporter by dragging images into ThermaCAM Reporter For more information, see section 14 – About creating simple reports on page 56.

7 A view of the working area

7.1 Screen area

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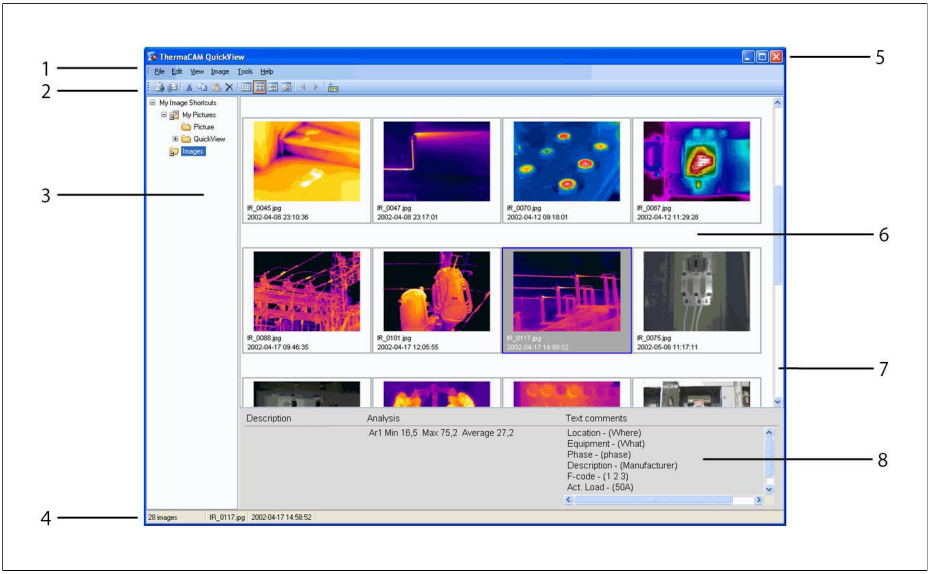


Figure 7.1 Screen area

Figure 7.2 Explanations of callouts

Callout	Description
1	Menu bar
2	Toolbar
3	Folder pane
4	Status bar
5	Minimize, Maximize, and Close buttons
6	Image pane
7	Scroll bar
8	Pane for image attributes

7.2 Toolbar

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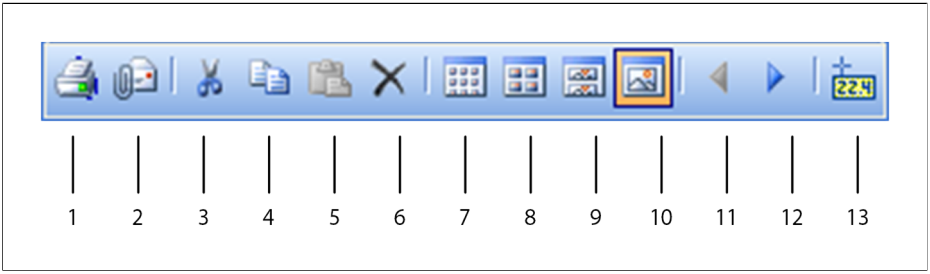


Figure 7.3 ThermaCAM™ QuickView toolbar

Figure 7.4 Explanations of callouts

Callout	Function	Explanation
1	**Print**	Click this button to print the currently selected image, using a local or network printer.
2	**Mail Recipient**	Click this button to e-mail the currently selected image (or images) to a mail recipient, using your default mail client.
3	**Cut**	Click this button to cut an image from a folder.
4	**Copy**	Click this button to copy an image to Clipboard.
5	**Paste**	Click this button to paste an image to a folder.
6	**Delete**	Click this button to delete an image from a folder.
7	**Small Thumbnails**	Click this button to display the images as small thumbnails.
8	**Medium Thumbnails**	Click this button to display the images as large thumbnails.
9	**Large Thumbnails**	Click this button to display the images as large thumbnails.
10	**Single Image**	Click this button to display one single image at a time.
11	**Previous**	Click this button to display the previous image in the image catalog.
12	**Next**	Click this button to display the next image in the image catalog.

Callout	Function	Explanation
13	**Flying Spot**	When in single image mode and you want to read out temperatures from a radiometric image, click this button and move the cursor over the image. The temperature will be displayed in two different ways: ▪ In a small result field at the same location as the cursor (Windows® XP only) ▪ At the status bar of the window ➲ This feature is only supported for images containing radiometric information.

8 Connecting the camera

8.1 *Cameras & connections*

10550103;4

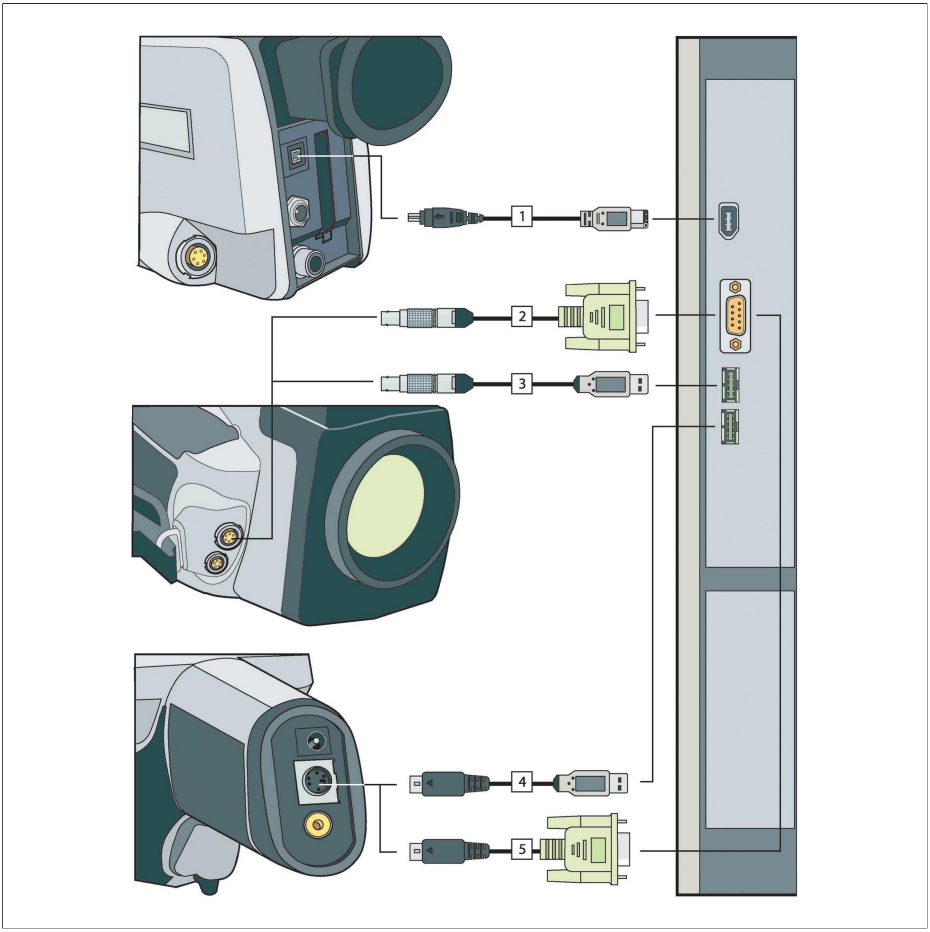


Figure 8.1 Connecting the camera

You can connect your infrared camera to your laptop or desktop computer using one of the following three communication protocols:

- RS-232 serial communication protocol
- USB Universal Serial Bus communication protocol
- FireWire communication protocol

➲ Different camera support different communication protocols. For example, a ThermaCAM S60 will support both USB and FireWire, while a ThermaCAM E2 will support USB and RS-232.

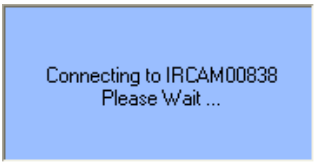
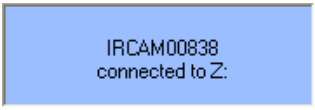
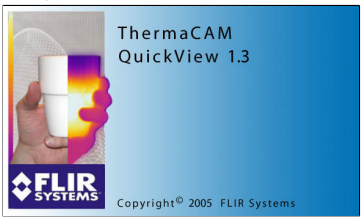
Figure 8.2 Explanations of callouts

Callout	Description of part
1	FireWire communication cable. This cable is connected to the FireWire connector on the rear connector panel of a ThermaCAM P/S series cameras featuring FireWire communication.
2	RS-232 communication cable. This cable is connected to the RS-232/USB connector on the right front side of a ThermaCAM P/S/B series camera.
3	USB communication cable. This cable is connected to the RS-232/USB connector on right front side of a ThermaCAM P/S/B series camera.
4	USB communication cable. This cable is connected to the RS-232/USB connector on the rear connector panel of a ThermaCAM E/B/SCOUT series camera.
5	RS-232 communication cable. This cable is connected to the RS-232/USB connector on the rear connector panel of a ThermaCAM E/B/SCOUT series camera.

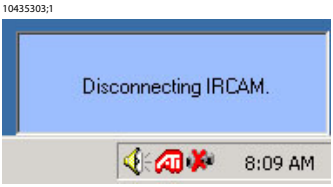
8.2 Auto detect

When a camera is plugged in to the computer it is automatically detected by ThermaCAM™ QuickView. Auto detect does *not* work when using serial communications (RS-232) – *only* for USB or FireWire.

8.2.1 Connecting

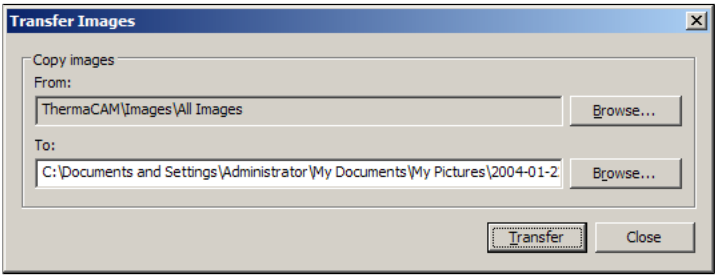
Step	Action
1	When a connection is in the process of being established between the camera and the computer, four notifications windows will be displayed, one after another: 10558203;1  10558303;1  10558403;1  10558503;2 
2	Next, the ThermaCAM™ QuickView welcome image appears. 10557203;4 

8.2.2 Disconnecting

Step	Action
1	When the camera is being disconnected from the computer, a notification window will be displayed: 10435303;1 

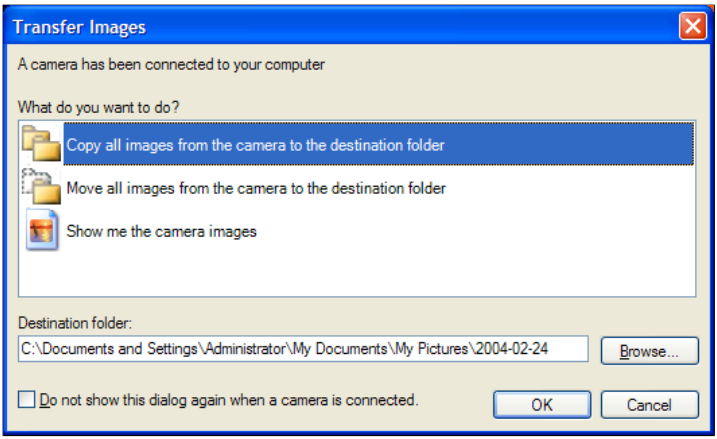
8.3 Moving images from the camera (RS-232)

Follow this procedure to move images from the camera to the PC using RS-232 communication protocol:

Step	Action
1	Connect the camera using the appropriate RS-232 cables according to the overview above.
2	Click **Transfer Images** on the **File** menu. This will display the **Transfer** dialog box for RS-232 communications: 10550703;1  **Figure 8.3 Transfer** dialog box (RS-232)
3	If you want to select another file source (**From**) or file destination (**To**), click **Browse**.
4	Click **Transfer** to begin moving the images. The complete transfer may take some time, depending on the number of images and their file sizes.

8.4 Moving images from the camera (USB/FireWire)

Follow this procedure to move images from the camera to the PC using USB/FireWire communication protocol:

Step	Action
1	Connect the camera using the appropriate USB/FireWire cables according to the overview above. This will display the following dialog box: 10558803;1  **Figure 8.4 Transfer** dialog box (USB/FireWire)
2	Click one of the following options: ▪ **Copy all images from the camera to the destination folder** ▪ **Move all images from the camera to the destination folder** ▪ **Show me the camera images**
3	If you want to select another file destination, click **Browse**.
4	Click **OK** to begin moving the images. The complete transfer may take some time, depending on the number of images and their file sizes.

9 About organizing images

9.1 General information

In some respects, ThermaCAM™ QuickView can be regarded as 'Windows® Explorer for infrared images'. In the left pane you can navigate through the file structure of your PC and in the right pane the infrared images of each folder will displayed as small, medium or large thumbnails, or as single images.

The similarity between ThermaCAM™ QuickView and Windows® Explorer means that you can organize your infrared images in the same way as you organize any other types of files on your PC.

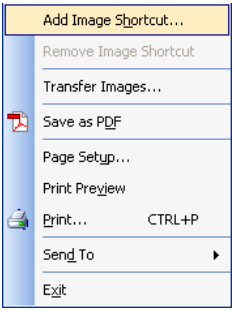
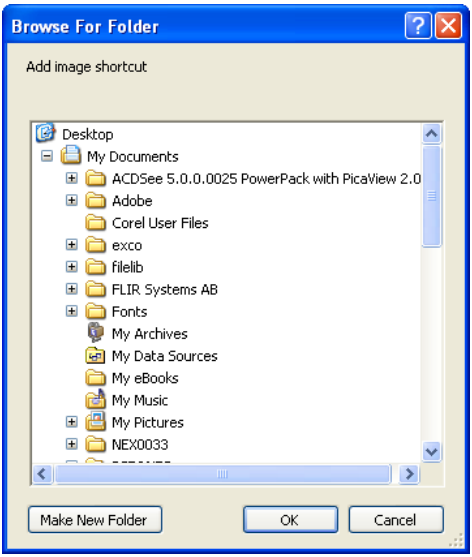
You can, for example:

- Add shortcuts to image folders
- Remove shortcuts to image folders
- Expand folders by clicking the 'plus' sign
- Compress folders by clicking the 'minus' sign
- Create new folders

9.2 How to add or remove image shortcuts

9.2.1 How to add an image shortcut

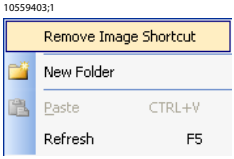
Follow this procedure to add an image shortcut:

Step	Action
1	Click **Add image shortcut** on the **File** menu. 10559203;1  **Figure 9.1 Add image shortcut** menu command You can also right-click **My image shortcuts** in the left pane.
2	Click the folder you want to add to the left pane of ThermaCAM™ QuickView. 10559303;1  **Figure 9.2 Add image shortcut** dialog box

Step	Action
3	Your new image shortcut as now been added.

9.2.2 How to remove an image shortcut

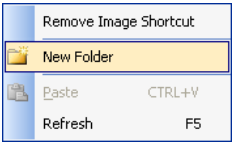
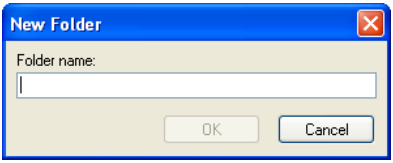
Follow this procedure to remove an image shortcut:

Step	Action
1	In the left pane, right-click the image shortcut you want to remove.  **Figure 9.3** Context menu when right-clicking image shortcuts
2	Click **Remove Image Shortcut**.
3	The image shortcut has now been removed.

9.3 How to create, delete and rename folders

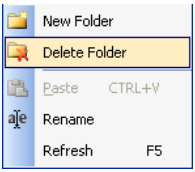
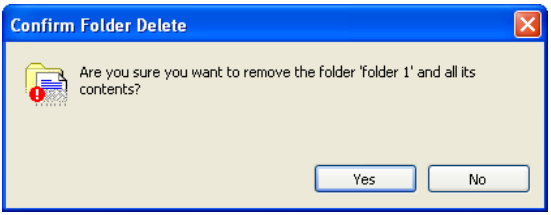
9.3.1 How to create a folder

Follow this procedure to create a new folder:

Step	Action
1	Right-click the image shortcut in which you want to create a new folder. 10559703;1  **Figure 9.4** Context menu when right-clicking image shortcuts
2	Click **New folder**.
3	Enter the name of the new folder in the **New folder** dialog box. 10561203;1  **Figure 9.5 New folder** dialog box
4	Click **OK**. A new folder has now been created.

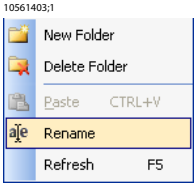
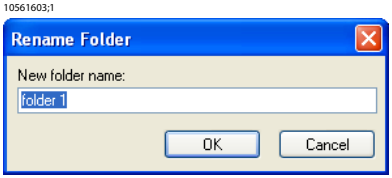
9.3.2 How to delete a folder

Follow this procedure to delete a folder:

Step	Action
1	Right-click the folder you want to delete. 10561303;1  **Figure 9.6** Context menu when right-clicking a folder
2	Click **Delete folder**.
3	Click **Yes** to confirm the deletion. 10561503;1  **Figure 9.7 Confirm Folder Delete** dialog box
4	The folder has now been deleted.

9.3.3 How to rename a folder

Follow this procedure to rename a folder:

Step	Action
1	Right-click the folder you want to rename  **Figure 9.8** Context menu when right-clicking a folder
2	Click **Rename**.
3	Enter the new name of the folder in the **Rename Folder** dialog box.  **Figure 9.9 Rename Folder** dialog box
4	The folder has now been renamed.

10 About viewing images

10.1 General information

In ThermaCAM™ QuickView you can view infrared or visual images using different *image views*. For example, if you have downloaded several hundred images from your camera you may want to begin with getting a general idea of the image batch – where certain images are in the image flow, the ratio between infrared and visual images and so on. For this purpose it would be a good idea to use the **Small Thumbnails** image view.

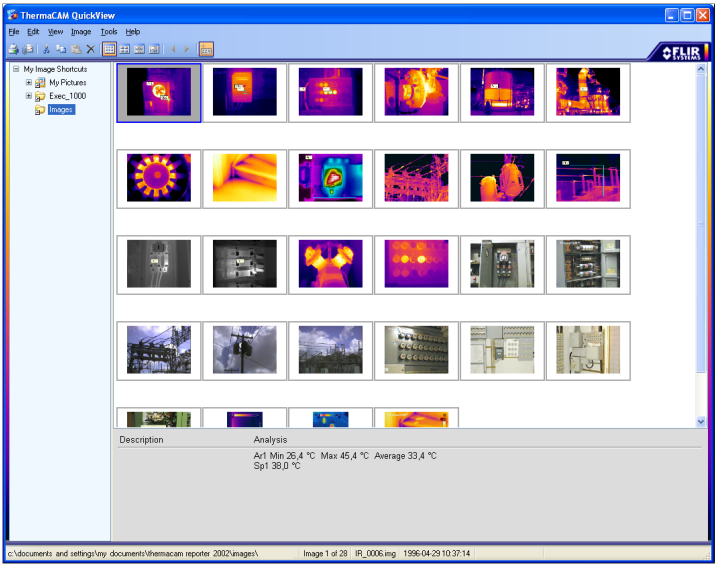
After getting a general idea of the images you have downloaded, the next step would be to take a closer look at some images. At this point you may want to see the image file names and the recording date. Using the **Medium Thumbnails** image view would give you just that. Using this image view, all file names and recording dates are read out from the images, yet you still have a good overview of the images.

The **Large Thumbnails** image view gets you even closer. Using this view, you can identify any measurement markers in your images, easily compare two or more images side by side, or one on top of another.

When you want to look at the images one by one, the **Single Image** image view provides the means to do that. Only one image is displayed full screen, and a temperature scale is displayed on the right side of your image.

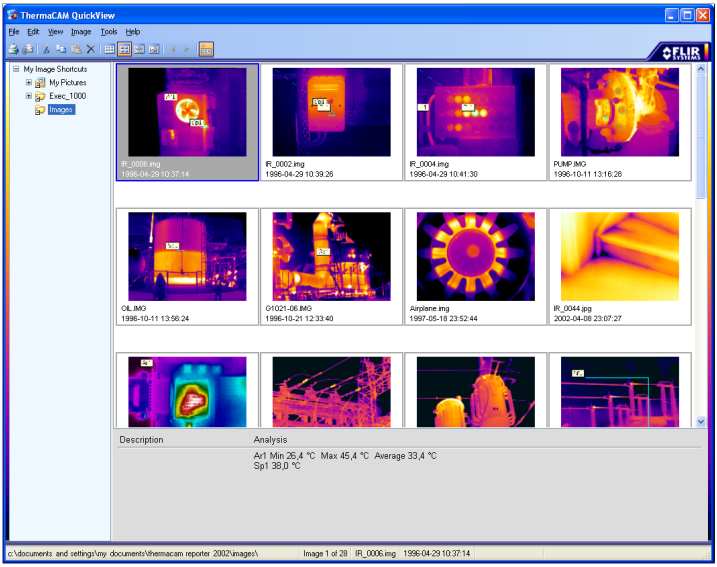
10.2 *Setting* **Small Thumbnails** *image view*

Follow this procedure to set **Small Thumbnails** image view:

Step	Action
1	Do one of the following: ▪ Click **Small Thumbnails** on the **View** menu ▪ Click the **Small Thumbnails** button on the toolbar
2	The image view has now changed and images will be displayed according to the figure below: 10549403;4  **Figure 10.1 Small Thumbnails** image view

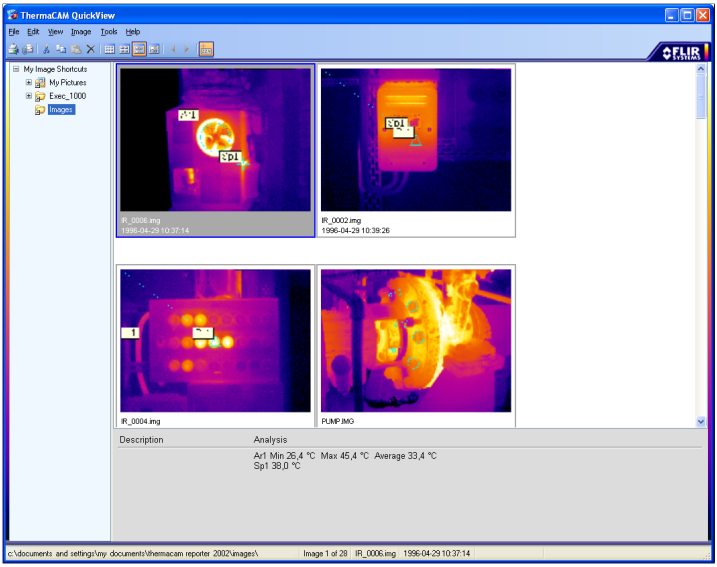
10.3 *Setting* **Medium Thumbnails** *image view*

Follow this procedure to set **Medium Thumbnails** image view:

Step	Action
1	Do one of the following: ▪ Click **Medium Thumbnails** on the **View** menu ▪ Click the **Medium Thumbnails** button on the toolbar
2	The image view has now changed and images will be displayed according to the figure below: 10549503;4  **Figure 10.2 Medium Thumbnails** image view

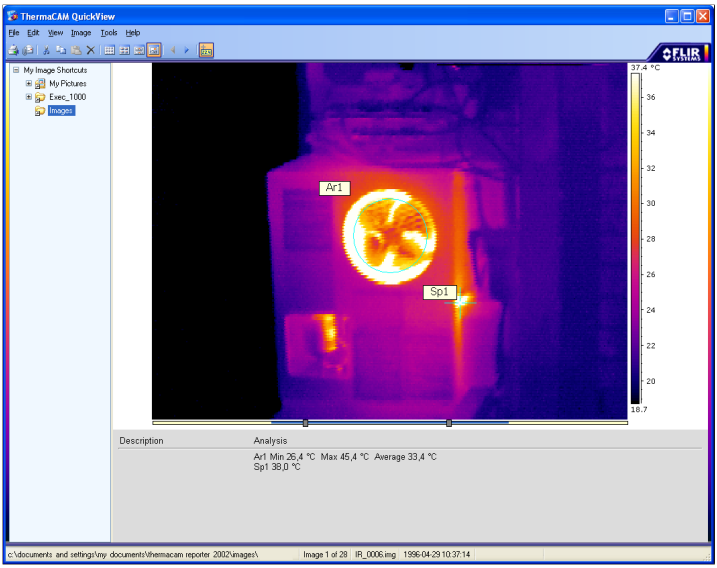
10.4 *Setting* **Large Thumbnails** *image view*

Follow this procedure to set **Large Thumbnails** image view:

Step	Action
1	Do one of the following: ▪ Click **Large Thumbnails** on the **View** menu ▪ Click the **Large Thumbnails** button on the toolbar
2	The image view has now changed and images will be displayed according to the figure below: 10549603;4  **Figure 10.3 Large Thumbnails** image view

10.5 *Setting* **Single Image** *view*

Follow this procedure to set **Single Image** view:

Step	Action
1	Do one of the following: ▪ Click **Single Image** on the **View** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
2	The image view has now changed and images will be displayed according to the figure below: 10549703;4  **Figure 10.4 Single Image** view

11 About moving images

11.1 General information

Moving images is very easy in ThermaCAM™ QuickView, and works much the same way as when you move images or any other files in Windows® Explorer – by using a drag-and-drop operation. You can also move images by using shortcut menus, or by using menu commands. Before moving an image you need to *select* the image, which is done by clicking *once* on the image. A gray frame indicates that the image is currently selected.

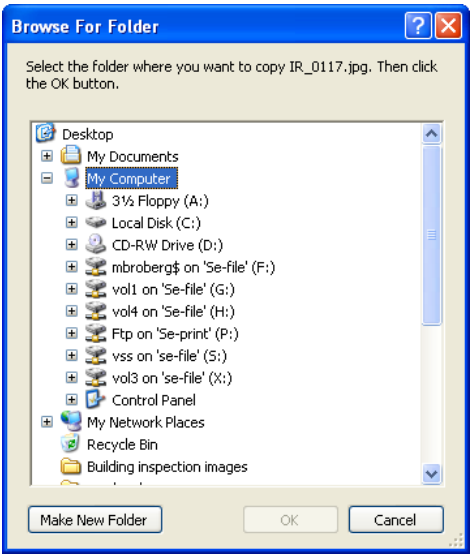
11.2 Moving images by using a drag-and-drop operation

Follow this procedure to move images using a drag-and-drop operation:

Step	Action
1	▪ To select one image to be moved, click the image once ▪ To select several images to be moved, click one image and then SHIFT + click or CRTL + click the other images A gray frame will indicate that the image is selected.  **Figure 11.1** A selected image
2	Click the image, but *keep down* the mouse button.
3	Now move the mouse in any direction until the folder where you want to put the images is selected. Both folders in the folder window and folders outside ThermaCAM™ QuickView work as destination folders.
4	Release the mouse button. You have now moved the image or images to the destination folder.

11.3 Moving images by using menu commands

Follow this procedure to move images using menu commands:

Step	Action
1	▪ To select one image to be moved, click the image once ▪ To select several images to be moved, click one image and then SHIFT + click or CRTL + click the other images A gray frame will indicate that the image is selected. 10549803;2  **Figure 11.2** A selected image
2	Do one of the following: ▪ To *copy* the image to a folder, click **Copy To Folder** on the **Edit** menu ▪ To *move* the image to a folder, click **Move To Folder** on the **Edit** menu
3	Select a destination folder and click **Copy** or **Move**, respectively. 10549903;1  **Figure 11.3 Browse For Folder** dialog box

Step	Action
4	You have now moved the images to the destination folder.

12 About analyzing images

12.1 General information

In ThermaCAM™ QuickView you can analyze your images using one of the three following methods:

- Reading out any internal temperature information from the image using the **Flying Spot**
- Moving any exisiting measurement markers in an image
- Laying out a spot
- Changing level & span
- Changing object parameters

The methods methods descfibed are supported for supported for radiometric *.jpg files only.

12.2 *Reading out a temperature using* **Flying Spot**

Follow this procedure to read out temperatures from the image using the **Flying Spot**:

Step	Action
1	Select an image by clicking it once. A gray frame will indicate that the image is selected.  **Figure 12.1** A selected image
2	To set **Single Image** view, do one of the following: ▪ Click **Single Image** on the **Image** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
3	To display the **Flying Spot**, do one of the following: ▪ Click **Flying Spot** on the **Image** menu ▪ Click the **Flying Spot** button on the toolbar
4	Now move the cursor to any position on the image. The internal temperature information in the image will be read out and displayed in two different ways: ▪ In a small result field at the same location as the cursor (Windows® XP only) ▪ At the status bar of the window

12.3 Moving existing measurement markers

Follow this procedure to read out temperatures from the image using the **Flying Spot**:

Step	Action
1	Select an image by clicking it once. A gray frame will indicate that the image is selected.  **Figure 12.2** A selected image
2	To set **Single Image** view, do one of the following: ▪ Click **Single Image** on the **Image** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
3	To move an existing measurement marker, move the cursor to the marker, press and hold down the mouse key, then move the marker in any direction.

12.4 Laying out a spot

Follow this procedure to read out temperatures from the image using the **Flying Spot**:

Step	Action
1	Select an image by clicking it once. A gray frame will indicate that the image is selected.  **Figure 12.3** A selected image
2	To set **Single Image** view, do one of the following: ▪ Click **Single Image** on the **Image** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
3	To display the **Flying Spot**, do one of the following: ▪ Click **Flying Spot** on the **Image** menu ▪ Click the **Flying Spot** button on the toolbar
4	To lay out a spot, move the cursor to any position on the image and then click once. A spot has now been laid out on the image. A spot can only be laid out if the image does not contain any spots before.

12.5 Changing level & span

At the bottom of the image you will see two sliders. By dragging these sliders you can change the *level* and *span* of the image. Using a similar concept from video technology, level can be regarded as *brightness*, while span can be regarded as *contrast*, according to the following:

- High level = low brightness
- High span = low contrast

Follow this procedure to change the image level:

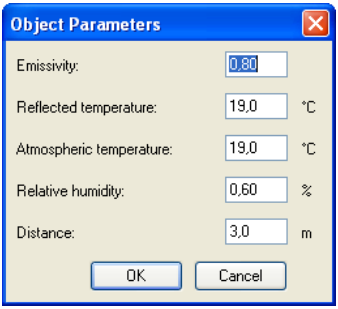
Step	Action
1	Select an image by clicking it once. A gray frame will indicate that the image is selected.  **Figure 12.4** A selected image
2	To set **Single Image** view, do one of the following: ▪ Click **Single Image** on the **Image** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
3	To change the level, drag the right slider in any direction, thus increasing or decreasing the image brightness. ➲ Changing level will autosave the image.

Follow this procedure to change the image span:

Step	Action
1	Select an image by clicking it once. A gray frame will indicate that the image is selected.  **Figure 12.5** A selected image
2	To set **Single Image** view, do one of the following: ▪ Click **Single Image** on the **Image** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
3	To change the span, drag the left slider in any direction, thus increasing or decreasing the image contrasts. ➲ Changing span will autosave the image.

12.6 Changing object parameters

Follow this procedure to change one or several object parameters for the image:

Step	Action
1	Select an image by clicking it once. A gray frame will indicate that the image is selected. 10549803;2  **Figure 12.6** A selected image
2	To set **Single Image** view, do one of the following: ▪ Click **Single Image** on the **Image** menu ▪ Click the **Single Image** button on the toolbar ▪ Doubleclick the image
3	Click **Object Parameters** on the **Image** menu to display the **Object Parameters** dialog box. 10562903;1  **Figure 12.7 Object Parameters** dialog box
4	Change one or several object parameters by typing a new value in the corresponding text box.
5	Click **OK**.

For more information about object parameters, see section 17 – Thermographic measurement techniques on page 81.

13 About adding image descriptions

13.1 General information

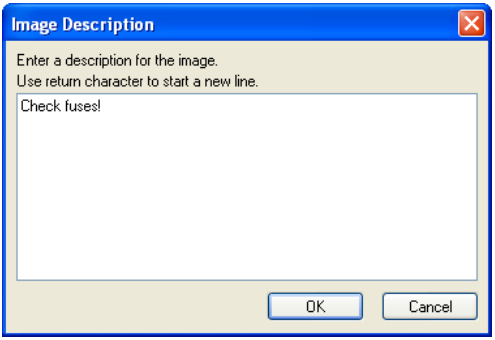
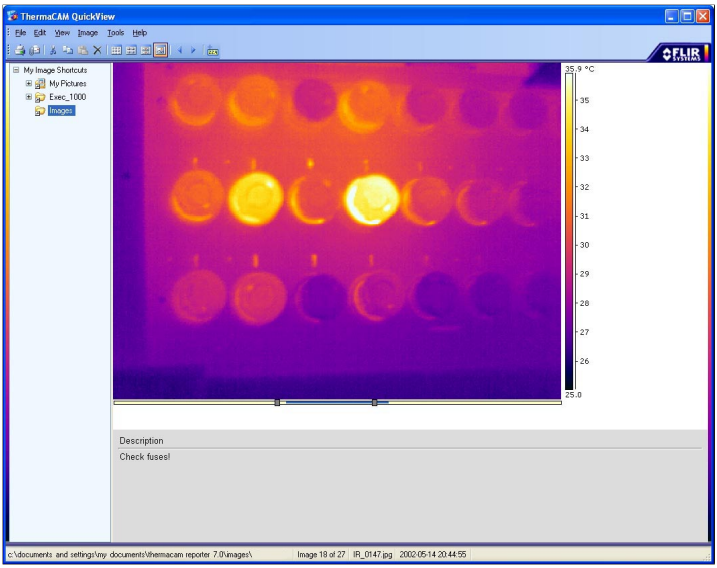
For radiometric and non-radiometric *.jpg images you can add *image descriptions*.

An image description is a short text that says something about the image – for example, where it was taken, what it depicts, what you recommendation is for follow-up etc. You can add any text you want, as long as the length does not exceed 255 characters. The image description will be stored inside the image file and can be read out by other programs from FLIR Systems, as well as by programs from other vendors.

13.2 Adding image descriptions

Follow this procedure to add an image description to an image:

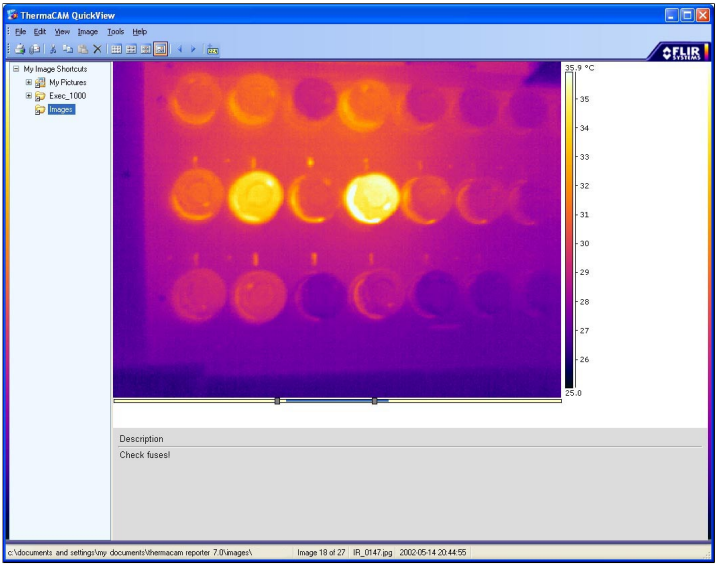
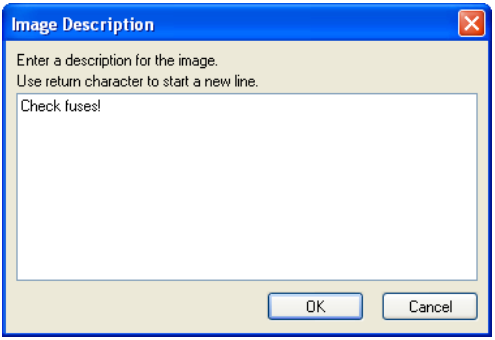
Step	Action
1	Select the image you want to work with by clicking the image. A gray frame will indicate that the image is selected.  **Figure 13.1** A selected image

Step	Action
2	Click **Image Description** on the **Image** menu. This will display an **Image Description** editing window. 10561003;1  **Figure 13.2 Image Description** editing window
3	Type the text you want as image description. Please note the following: ▪ Do not exceed 255 characters ▪ Press ENTER on the keyboard to start a new line
4	Click **OK** to save the image description. 10561103;3  **Figure 13.3** Image description

Step	Action
5	The changed image description has now been added. You can see it under **Description** in the bottom left-hand corner.

13.3 Editing image descriptions

Follow this procedure to edit an image description:

Step	Action
1	Click the text below **Description** in the bottom left-hand corner – in this case the text *Check fuses*. 10561103;3  **Figure 13.4** Image description
2	This will display the **Image Description** editing window. 10561003;1  **Figure 13.5 Image Description** editing window
3	Make the necessary changes and then click **OK**.

Step	Action
4	The image description has now been changed.

14 About creating simple reports

14.1 General information

You can create simple reports which includes one or many infrared or visual images, as well as any internal information in the images – such as text comments, file names, dates etc. The reports are saved in the platform-independent Adobe® Acrobat PDF format, which makes the reports readable on printable from any PC, using a free downloadable PDF reader from the Adobe website.

To download the reader, point your browser to the following web page:

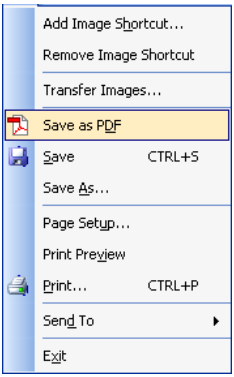
http://www.adobe.com/products/acrobat/readermain.html

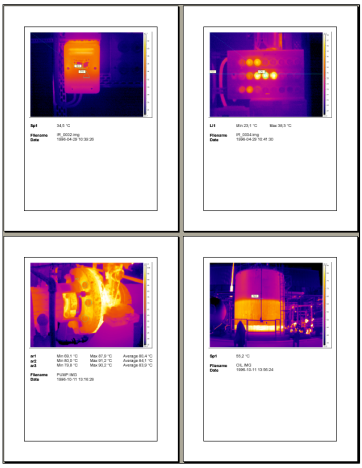
When creating a report, each page will be created according to the following structure (from top to bottom):

- Image
- Image description
- Analysis
- Text comments
- Filename
- Date

14.2 How to create a simple report

Follow this procedure to create a simple report:

Step	Action
1	▪ To select one image for the report, click the image once ▪ To select several images for the report, click one image and then SHIFT + click or CRTL + click the other images A gray frame will indicate that the image is selected. 10549803;2  **Figure 14.1** A selected image
2	Click **Save as PDF** on the **File** menu. 10550303;1  **Figure 14.2 Save as PDF** command
3	In the **Save As** dialog box, specify a file name and location for the report.

Step	Action
4	Your report has now been created and saved as a PDF file. To open the report, do one of the following: ▪ Double-click the PDF file ▪ Start Adobe® Acrobat PDF Reader, click **Open** on the **File** menu and select the PDF file 10550403;1  **Figure 14.3** A simple report

15 Troubleshooting

15.1 General information

Before you start troubleshooting, please note the following:

- Make sure you have the latest drivers. If not, download them from the website
- Make sure that the problem is possible to repeat by restarting the camera and the PC

To restart the camera and the PC, follow this procedure:

Step	Action
1	Disconnect the camera from the PC by unplugging the cable.
2	Restart the camera.
3	Restart the PC.
4	Connect the camera to the PC by plugging in the cable.

If the problem persists, check if any of the procedures below or at the website resolves your problem.

15.2 Problems when trying to communicate with the camera

If ThermaCAM™ QuickView is not successfully communicating with the camera using RS-232, USB or FireWire communication, the following things may happen:

- The transfer application displays the error message **Cannot connect to camera**. Make sure the camera is connected to your computer. If you are using RS-232 serial communication make sure the COM port is available.
- The different notification windows will not be displayed

If the software in the camera does not meet the software requirements stated in section 3.1.1 – Camera on page 3, the problems above will be experienced. Resolve the problem by upgrading the camera.

15.3 Problems when connecting the IR camera using USB (Universal Serial Bus) or FireWire

On Windows 2000/XP, only administrators and users with appropriate rights may load/unload device drivers. To enable users to connect to the camera, you should either give them *Local Administrator Rights* or change the *Local Security Policy*.

15.3.1 Giving a user local administrator rights

You need to be logged in as Administrator (or as user with administrator rights)

Step	Action
1	Open the Control Panel by selecting **Start Menu** → **Settings** → **Control Panel**.
2	Double click **Administrative Tools**.
3	Double click **Computer Management**.
4	Open **Local Users And Groups** by double-clicking it.
5	Select **Groups** and double-click **Administrators**.
6	Add the relevant users, or the name of a group containing the right users.

15.3.2 Giving a user rights to load/unload device drivers

You need to be logged in as administrator (or as user with administrator rights)

Step	Action
1	Open the Control Panel by selecting **Start Menu** → **Settings** → **Control Panel**.
2	Double click **Administrative Tools**.
3	Double-click **Local Security Policy**.
4	Open **Local Policies** by double-clicking it.
5	Select **User Rights Assignment**.
6	Find **Load and Unload Device Drivers** and double-click it.
7	Add the relevant users, or the name of a group containing the right users.

15.4 Problems when connecting the IR camera using serial communication

If there are one or more applications using the same serial communication port (COM 1–9) as the camera which is connected to the PC, ThermaCAM™ QuickView fails to set up a successful connection.

If the transfer application fails to setup a serial connection it will display the error message: **Cannot connect to camera**. Make sure the camera is connected to your computer. If you are using serial communication make sure the COM port is available. If this error message is encountered, you have to find the application that uses the COM port and disable it.

ActiveSync, used for synchronizing data between a PDA (Personal Digital Assistant) and Windows, is an example of such an application that may cause the problem mentioned above.

15.5 Camera icon not visible on system tray

When resuming from a password protected screensaver, or if you switch user on your Windows XP / 2000 computer, it could happen that the camera icon on the system tray will not be visible. Disconnecting and connecting the USB / FireWire cable will make the icon visible again.

16 System reference section

16.1 **File** *menu*

10550503;2

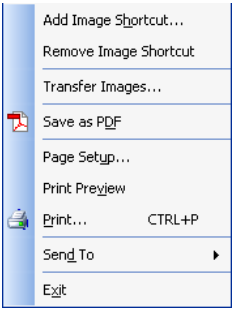
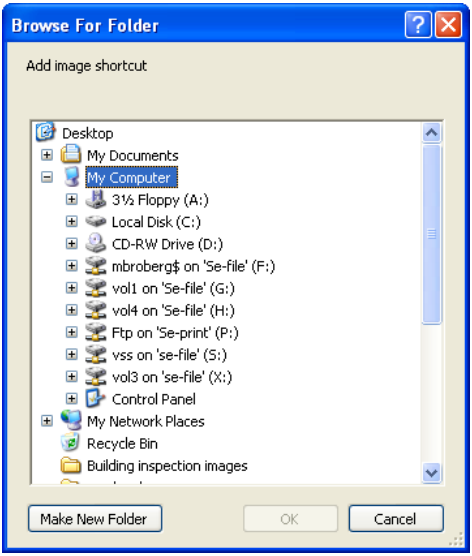
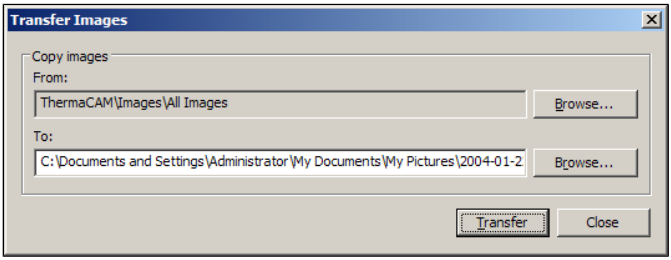
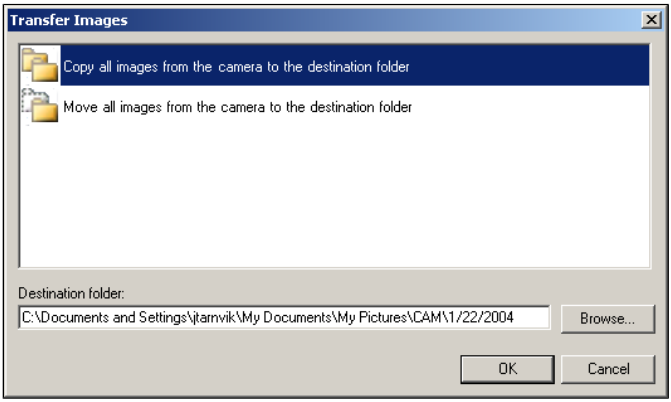
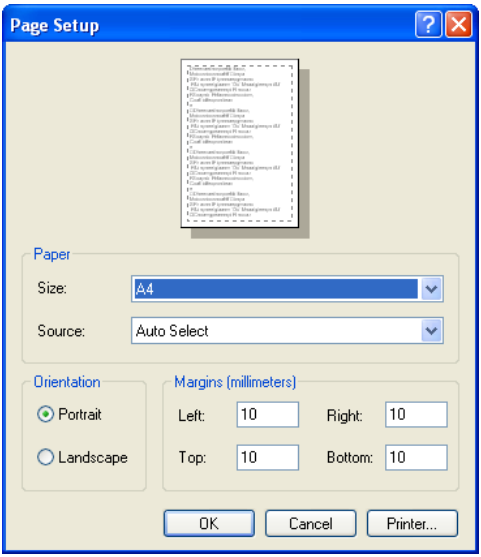


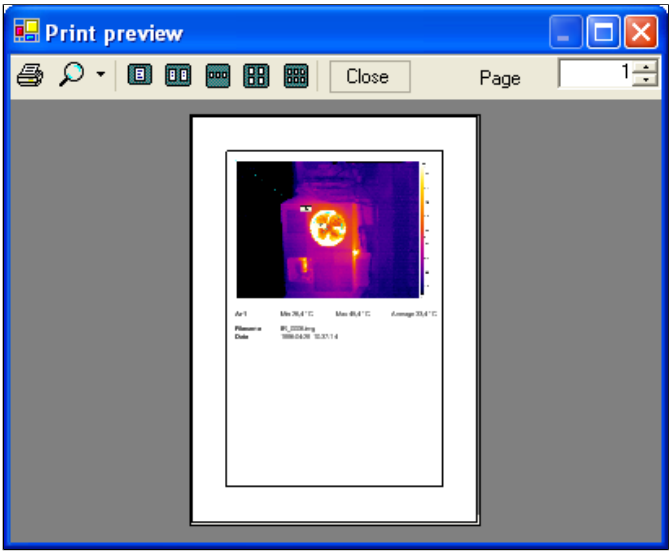
Figure 16.1 File menu

Figure 16.2 Explanations of menu commands on the **File** menu

Menu command	Description or explanation
Add image shortcut	Click **Add image shortcut** to display a **Browse For Folder** dialog box where you can select a folder of your choice. This folder will then appear in the folder pane. 10547703;1  **Figure 16.3 Browse For Folder** dialog box

Menu command	Description or explanation
Remove Image Shortcut	Click **Remove Image Shortcut** to delete a previously added shortcut from the folder pane. You will need to have selected this folder before using this command.
Transfer Images	Click **Transfer Images** to display a **Transfer** dialog box where you can select a folder to which the images in the camera will be moved. The dialog box differs depending on whether the communication protocol is RS-232 or USB/FireWire according to the figures below: 10550703;1  **Figure 16.4** **Transfer** dialog box (RS-232) 10550803;1  **Figure 16.5** **Transfer** dialog box (USB/FireWire)
Save as PDF	Click **Save as PDF** to generate a simple report in Adobe® Acrobat's platform-independent PDF format.

Menu command	Description or explanation
Page Setup	Click **Page Setup** to display a dialog box where you can define page sizes, page orientation and margins for the PDF reports. This dialog box differs depending on the brand of your local or network printer. A typical **Page Setup** dialog box is displayed below. 10548403;1  **Figure 16.6 Page Setup** dialog box

Menu command	Description or explanation
Print Preview	Click **Print Preview** to preview the report before sending it to the printer or creating the PDF report. Use the **Zoom** box to the left to zoom the page, and the **Page** box to the right to go to another page. 10548303;1  **Figure 16.7 Print Preview** dialog box
Print	Click **Print** to display a dialog box where you define printer settings before sending the report to your local or network printer. This dialog box differs depending on the brand of your printer.
Send To	Click **Send To** to do one of the following: ▪ E-mail the currently selected image or images to a mail recipient, using your default e-mail client ▪ Send the currently selected image or images to ThermaCAM Reporter
Exit	Click **Exit** to quit ThermaCAM™ QuickView.

16.2 **Edit** *menu*

10547203;2

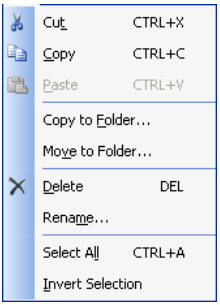
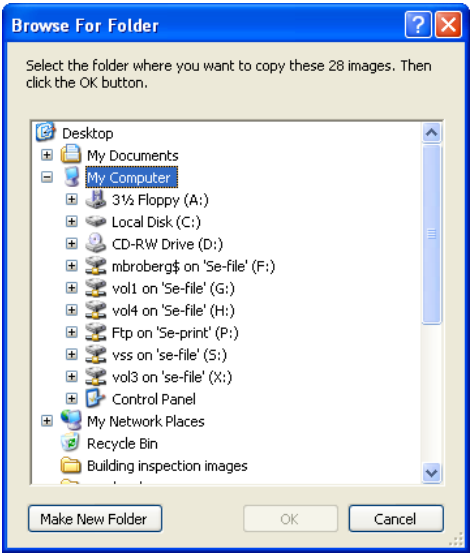
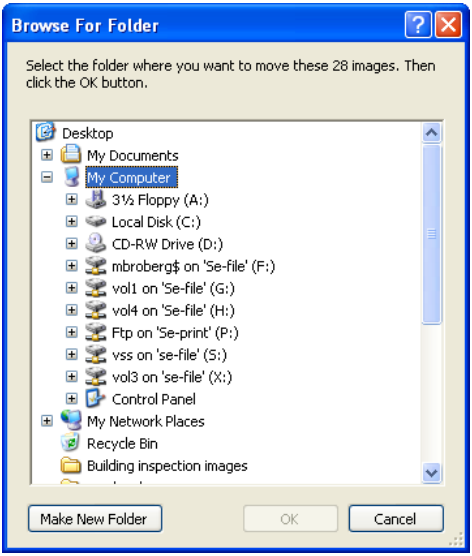
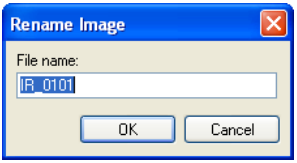


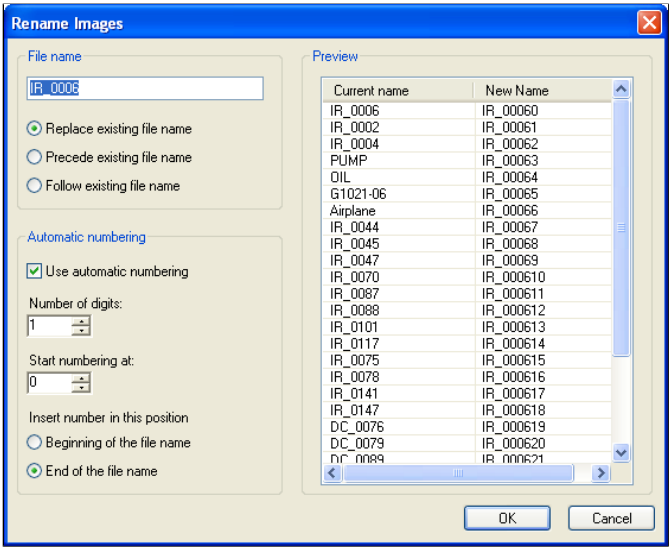
Figure 16.8 **Edit** menu

Figure 16.9 Explanations of menu commands on the **Edit** menu

Menu command	Description or explanation
Cut	Click **Cut** to cut one or more currently selected images and save them temporarily on the Clipboard. This will remove the image or images from the current location.
Copy	Click **Copy** to copy one or more currently selected images and save them temporarily on the Clipboard.
Paste	Click **Paste** to paste one or more images currently saved on the Clipboard to a location of your choice.

Menu command	Description or explanation
Copy To Folder	Click **Copy To Folder** to copy one or more currently selected images to a folder of your choice. The command will display a **Browse For Folder** dialog box where you can select the folder. 10548503;1  **Figure 16.10 Browse For Folder** dialog box

Menu command	Description or explanation
Move To Folder	Click **Move To Folder** to move one or more currently selected images to a folder of your choice. The command will display a **Browse For Folder** dialog box where you can select the folder. 10548603;1  **Figure 16.11 Browse For Folder** dialog box
Delete	Click **Delete** to delete one or more currently selected images.
Rename (when one image is selected)	Select the image you want to rename, click **Rename** to display a **Rename Image** dialog box, type the new name and then click **OK**. 10548703;1  **Figure 16.12 Rename Image** dialog box

Menu command	Description or explanation
Rename (when several images are selected)	To rename a batch of images, select the images, and click **Rename** to display a different **Rename Images** dialog box. Using this dialog box you can carry out advanced renaming sequences of your images – such as prefixing and suffixing existing file names, numbering the images starting from any number etc. 10548803;1  **Figure 16.13 Rename Images** dialog box
Select All	Click **Select All** to select all images in the image window.
Invert Selection	This command is useful when you want to select the majority of images in the image window except a few images here and there. Selecting these latter images and then clicking **Invert Selection** will select the images you want.

16.3 View menu

10547303;1

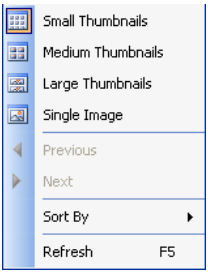
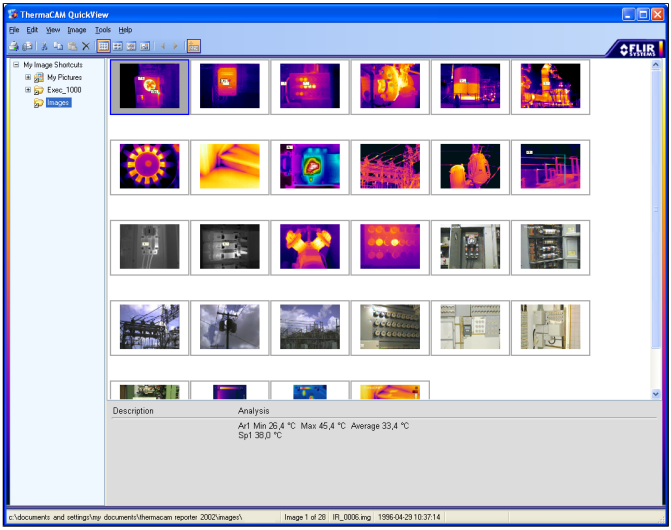
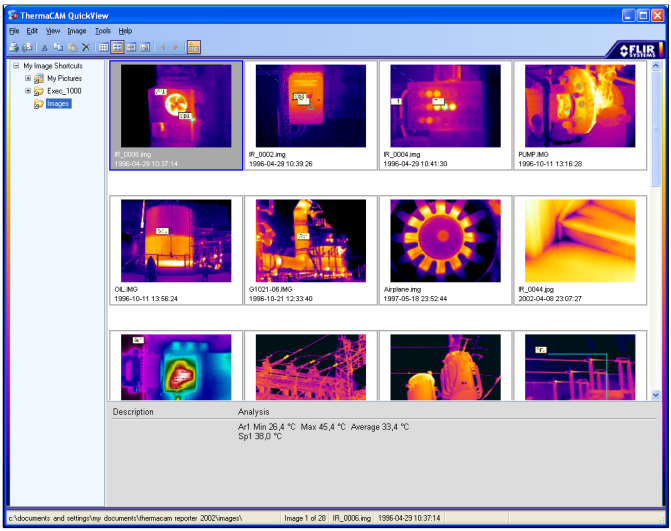
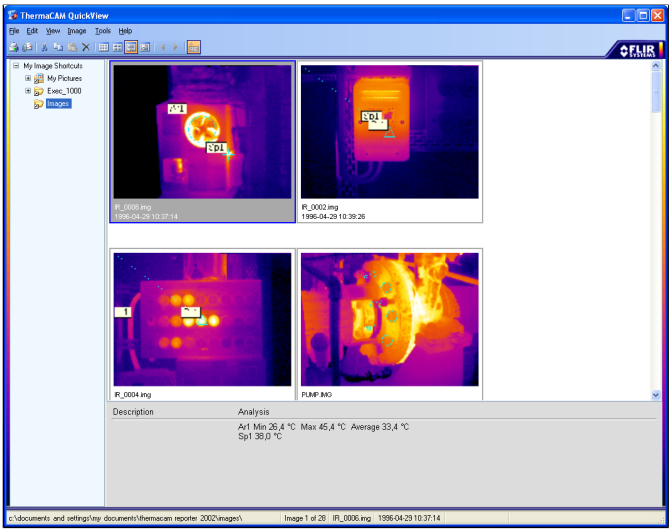


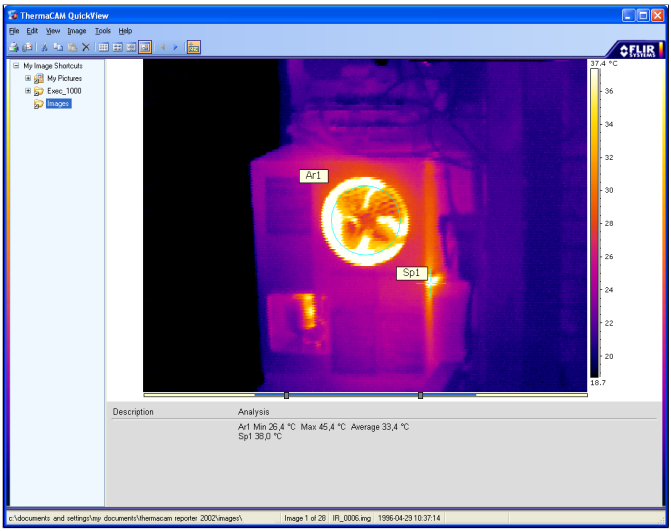
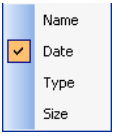
Figure 16.14 View menu

Figure 16.15 Explanations of menu commands on the **View** menu

Menu command	Description or explanation
Small Thumbnails	Click **Small Thumbnails** to display the images as small thumbnail images according to the figure below: 10549403;4  **Figure 16.16 Small Thumbnails** image view

Menu command	Description or explanation
Medium Thumbnails	Click **Medium Thumbnails** to display the images as medium thumbnail images according to the figure below: 10549503;4  **Figure 16.17 Medium Thumbnails** image view

Menu command	Description or explanation
Large Thumbnails	Click **Large Thumbnails** to display the images as large thumbnail images according to the figure below: 10549603;4  **Figure 16.18 Large Thumbnails** image view

Menu command	Description or explanation
Single Image	Click **Single Image** to display an image one by one according to the figure below: 10549703;4  **Figure 16.19 Single Image** image view
Previous	Click **Previous** to go to the previous image.
Next	Click **Next** to go to the next image.
Sort By	Click **Name**, **Date**, **Type**, or **Size** on the **Sort By** menu to sort the images according to these criteria. 10548903;1  **Figure 16.20 Sort By** menu
Refresh	Click **Refresh** to refresh the screen.

16.4 **Image** *menu*

10562703;3

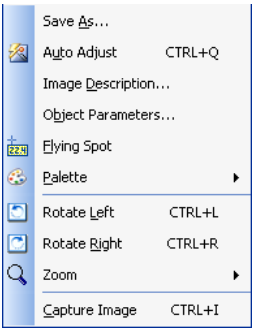
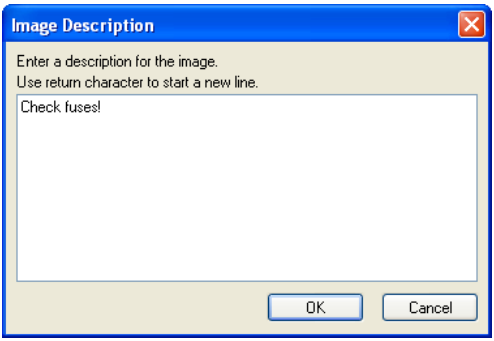
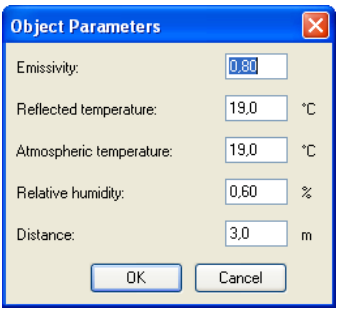


Figure 16.21 Image menu

Figure 16.22 Explanations of menu commands on the **Image** menu

Menu command	Description or explanation
Save As	Click **Save As** to save the currently selected image (or images) to a folder, using another file format or filename.
Auto Adjust	Click **Auto Adjust** to automatically adjust the currently selected image or images to best contrast and brightness.
Image Description	Click **Image Description** to display an **Image Description** editor where you can add comments about your image. 10561003;1  **Figure 16.23 Image Description** editing window

Menu command	Description or explanation
Object Parameters	Click **Object Parameters** to display an **Object Parameters** dialog box where you can change one of the following parameters: ▪ **Emissivity** ▪ **Reflected temperature** ▪ **Atmospheric temperature** ▪ **Relative humidity** ▪ **Distance** 10562903;1  **Figure 16.24 Object Parameters** dialog box For more information about object parameters, see section 17 – Thermographic measurement techniques on page 81
Flying Spot	Click **Flying Spot** to display a spotmeter at the location of the cursor. By moving the spotmeter you can read out any temperature stored inside images supporting temperature information. The internal temperature information in the image will be read out and displayed in two different ways: ▪ In a small result field at the same location as the cursor (Windows® XP only) ▪ At the status bar of the window To remove the flying spot, press ESC.

Menu command	Description or explanation
Palette	Click any palette name on the **Palette** menu to assign a new palette for the currently selected image or images. To read out the internal palette of an image, click **Palette From Image**. 10549003;1  **Figure 16.25 Palette** menu
Rotate Left	To rotate one or several images to the left, select the images and then click **Rotate Left**.
Rotate Right	To rotate one or several images to the right, select the images and then click **Rotate Right**.
Zoom	To zoom into, or out of, an image, click **Zoom**, and then select 1x, 2x, 4x or 8x. ➲ The **Zoom** command is only available in **Single Image** view.
Capture Image	When your infrared camera is connected to ThermaCAM™ QuickView, you can let it capture an infrared image. To do this, click **Capture Image**.

16.5 **Tools** *menu*

10562803;1

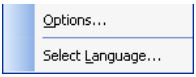
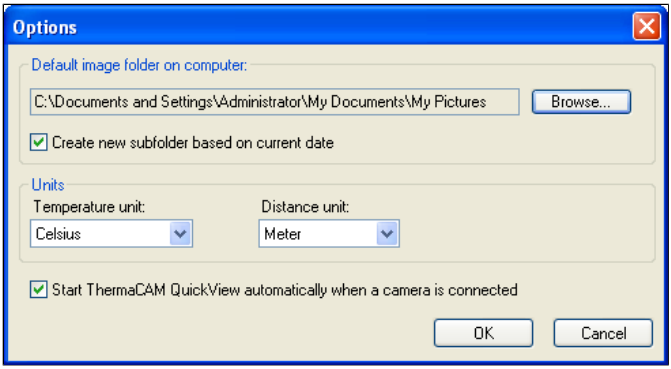


Figure 16.26 Tools menu

Figure 16.27 Explanations of menu commands on the **Tools** menu

Menu command	Description or explanation
Options	Click **Options** to display the **Options** dialog box. Use this dialog box when: ▪ Changing temperature unit ▪ Setting new default image folder ▪ Setting whether a new subfolder should be created ▪ Setting whether ThermaCAM™ QuickView should start automatically when a camera is connected to your PC. Clearing this box may be desirable if you are running other programs from FLIR Systems on your computer. 10565403;1  **Figure 16.28 Options** dialog box
Select Language	Click **Select Language** to display a submenu where you can change the program language.

16.6 **Help** *menu*

10547803;3

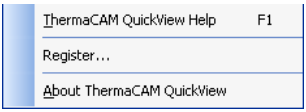


Figure 16.29 Help menu

Figure 16.30 Explanations of menu commands on the **Help** menu

Menu command	Description or explanation
ThermaCAM™ QuickView Help	Click **ThermaCAM™ QuickView Help** to display the user's manual for ThermaCAM™ QuickView as an Adobe® Acrobat PDF file.
Register	Click **Register** to sign up for warranty registration and to receive important updates and special offers on IR cameras and training.
About ThermaCAM™ QuickView	Click **About ThermaCAM™ QuickView** to display legal and copyright information about ThermaCAM™ QuickView, as well as information about the program version.

16.7 Context menu

10557803;2

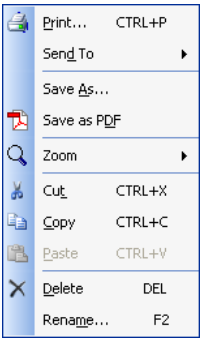
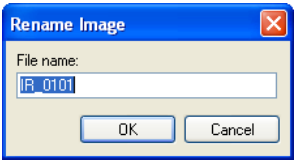
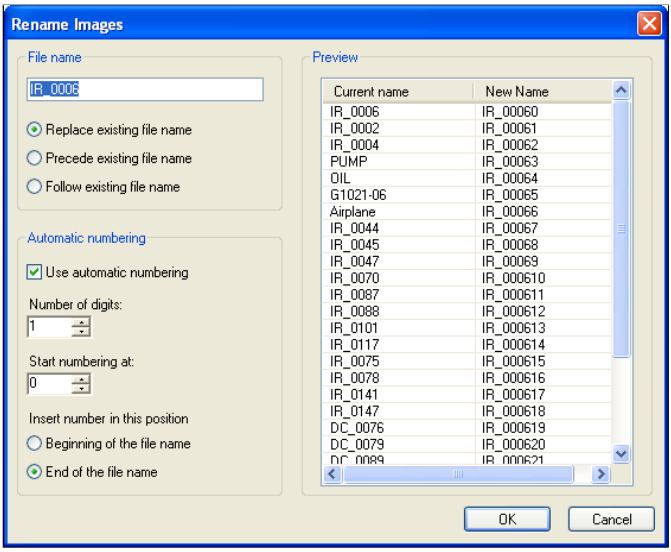


Figure 16.31 Context menu when right-clicking an image

Figure 16.32 Explanations of the context menu

Menu command	Description or explanation
Print	Click **Print** to display a dialog box where you define printer settings before sending the report to your local or network printer. This dialog box differs depending on the brand of your local or network printer.
Send To	Click **Send To** to do one of the following: ▪ E-mail the currently selected image or images to a mail recipient, using your default e-mail client ▪ Send the currently selected image or images to ThermaCAM Reporter
Save As	Click **Save As** to save the currently selected image (or images) to a folder, using another file format or filename.
Save as PDF	Click **Save as PDF** to generate a simple report in the platform-independent Adobe® Acrobat PDF format.
Zoom	Click **Zoom**, and then select 1x, 2x, 4x or 8x to zoom into, or out of, an image. ➲ The **Zoom** command is only available in **Single Image** view.
Cut	Click **Cut** to cut one or more currently selected images and save them temporarily on the Clipboard. This will remove the image or images from the current location.
Copy	Click **Copy** to copy one or more currently selected images and save them temporarily on the Clipboard.
Paste	Click **Paste** to paste one or more images currently saved on the Clipboard to a location of your choice.
Delete	Click **Delete** to delete one or more currently selected images.

Menu command	Description or explanation
Rename (when one image is selected)	Select the image you want to rename, click **Rename** to display a **Rename Image** dialog box, type the new name and then click **OK**. 10548703;1  **Figure 16.33 Rename Image** dialog box
Rename (when several images are selected)	To rename a batch of images, select the images, and click **Rename** to display a different **Rename Images** dialog box. Using this dialog box you can carry out advanced renaming sequences of your images – such as prefixing and suffixing existing file names, numbering the images starting from any number etc. 10548803;1  **Figure 16.34 Rename Images** dialog box

17 Thermographic measurement techniques

17.1 Introduction

An infrared camera measures and images the emitted infrared radiation from an object. The fact that radiation is a function of object surface temperature makes it possible for the camera to calculate and display this temperature.

However, the radiation measured by the camera does not only depend on the temperature of the object but is also a function of the emissivity. Radiation also originates from the surroundings and is reflected in the object. The radiation from the object and the reflected radiation will also be influenced by the absorption of the atmosphere.

To measure temperature accurately, it is therefore necessary to compensate for the effects of a number of different radiation sources. This is done on-line automatically by the camera. The following object parameters must, however, be supplied for the camera:

- The emissivity of the object
- The reflected temperature
- The distance between the object and the camera
- The relative humidity

17.2 Emissivity

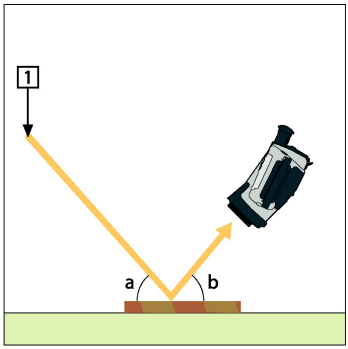
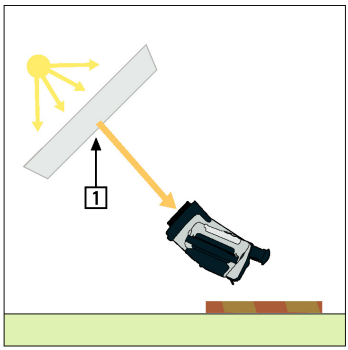
The most important object parameter to set correctly is the emissivity which, in short, is a measure of how much radiation is emitted from the object, compared to that from a perfect blackbody.

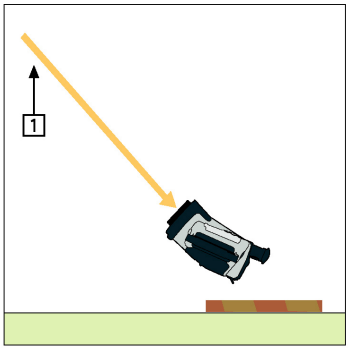
Normally, object materials and surface treatments exhibit emissivity ranging from approximately 0.1 to 0.95. A highly polished (mirror) surface falls below 0.1, while an oxidized or painted surface has much higher emissivity. Oil-based paint, regardless of color in the visible spectrum, has an emissivity over 0.9 in the infrared. Human skin exhibits an emissivity close to 1.

Non-oxidized metals represent an extreme case of almost perfect opacity and high spectral reflexivity, which does not vary greatly with wavelength. Consequently, the emissivity of metals is low – only increasing with temperature. For non-metals, emissivity tends to be high, and decreases with temperature.

17.2.1 Finding the emissivity of a sample

17.2.1.1 Step 1: Determining reflected apparent temperature

Step	Action
1	Aim the camera towards your sample to determine the source of reflection. Make sure the incident angle = reflection angle (a = b) 10588903;1  **Figure 17.1** 1 = Reflection source
2	If the reflection source is a spot source, modify the source by obstructing it using a piece if cardboard. 10589103;1  **Figure 17.2** 1 = Reflection source

Step	Action
3	Measure the radiation intensity from the reflecting source using the following settings: ▪ Emissivity: 1.0 ▪ D_{obj}: 0 10589003;1  **Figure 17.3** 1 = Reflection source

➲ Please note the following:

Using a thermocouple to measure reflecting temperature is not recommended for two important reasons:

- A thermocouple does not measure radiation intensity
- A thermocouple requires a very good thermal contact to the surface, usually by gluing and covering the sensor by a thermal isolator.

17.2.1.2 Step 2: Determining the emissivity

Step	Action
1	Select a place to put the sample
2	Determine and set reflected apparent temperature according to the previous procedure.
3	Put a piece of electrical tape with known high emissivity on the sample.
4	Heat the sample at least 20 K above room temperature. Heating must be reasonably even.
5	Focus and auto-adjust the camera, and freeze the image.
6	Adjust **Level** and **Span** for best image brightness and contrast.
7	Set emissivity to that of the tape (usually 0.97).

Step	Action
8	Measure the temperature of the tape using one of the following measurement functions: ▪ **Isotherm** (helps you to determine both the temperature and how evenly you have heated the sample) ▪ **Spot** (simpler) ▪ **Box Avg** (good for surfaces with varying emissivity)
9	Write down the temperature.
10	Move your measurement function to the sample surface.
11	Change the emissivity setting until you read the same temperature as your previous measurement.
12	Write down the emissivity.

➲ Please note the following:

- Avoid forced convection
- Look for a thermally stable surrounding that will not generate spot reflections
- Use high quality tape that you know is not transparent, and has a high emissivity you are certain of
- This method assumes that the temperature of your tape and the sample surface are the same. If they are not, your emissivity measurement will be wrong.

17.3 Reflected temperature

This parameter is used to compensate for the radiation reflected in the object and the radiation emitted from the atmosphere between the camera and the object.

If the emissivity is low, the distance very long and the object temperature relatively close to that of the reflected it will be important to set and compensate for the reflected temperature correctly.

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This manual was produced using XML – Extensible Markup Language. For more information about XML, point your browser to: http://www.w3.org/XML/

Customers interested in the history & theory of markup languages may also want to visit the following sites:

- http://www.gla.ac.uk/staff/strategy/information/socarcpj/
- http://www.renater.fr/Video/2002ATHENS/P/DC/History/plan.htm

The following software was used for the production of this manual:

Description	Software	Supplier	URL
Version control	ExcoConf	Excosoft	http://www.excosoft.se/eweb/site/excoconf_pd.html
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Preformatting	ExcoForm	Excosoft	http://www.excosoft.se/eweb/site/home.html
XML parser	Xerces	Apache	http://xml.apache.org/xerces-j
XSLT processor	Xalan	Apache	http://xml.apache.org/xalan-j
XSL-FO rendering engine	XEP	RenderX	http://www.renderx.net/Content/index.html

The following file identities and versions were used in this manual:

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(F0015)20252003.xml;5
(F0015)20252103.xml;1
(F0015)20252203.xml;2
(F0015)20252303.xml;2
(F0015)20252403.xml;1
(F0015)20252603.xml;1
(F0015)20252703.xml;2
(F0015)20254103.xml;2
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