Advanced Thermal Solutions

DL001U-M
ALTAIR User Manual

ALTAIR

User Manual

1. Contents

2. License Agreement

ALTAIR Version 5
Copyright (C) 1989, 2008 FLIR SYSTEMS
All rights reserved

ALTAIR LICENSE

The ALTAIR program is protected by copyright law and international treaties as well as by intellectual property laws and treaties. The ALTAIR program is licensed, it cannot be sold.

LICENSE AGREEMENT

You are allowed to install one (1) copy of ALTAIR on a computer.

THE MAIN RIGHTS AND LIMITATIONS

Limitations relating to reverse engineering, decompiling and disassembly.

You are not permitted to rebuild the program's logic, to decompile or disassemble it.

Component separation

The Altair program must be considered as an integrated product. Its components must not be separated for use on more than one computer.

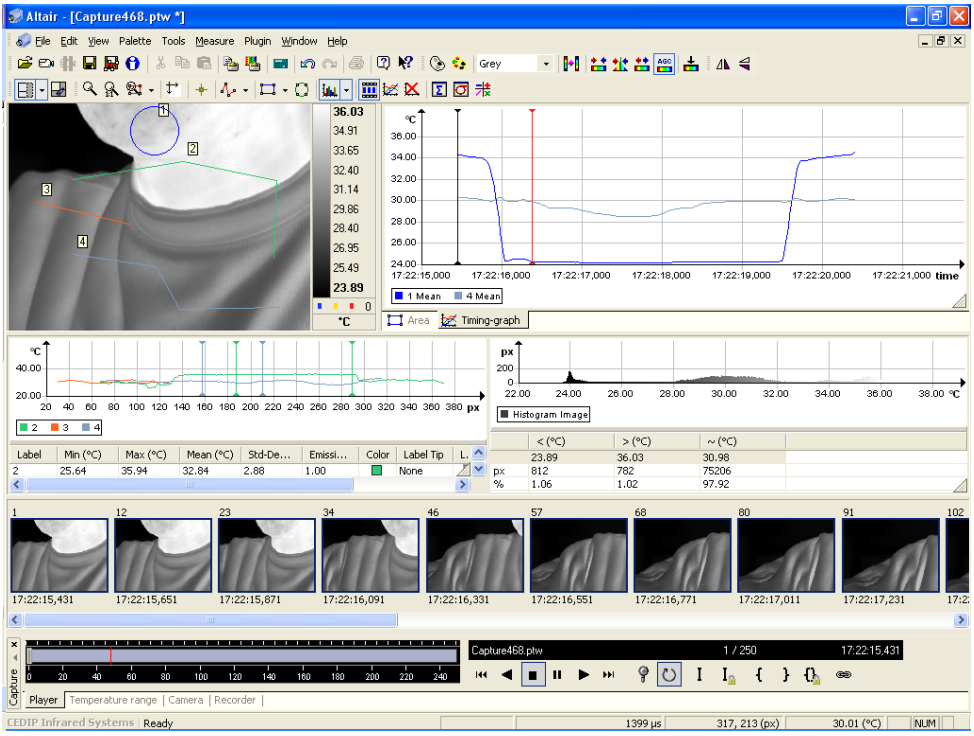
The Altair program is an integral part of the computer it is supplied with. It can only be used on this computer, except particular cases covered by agreement.

Rental

You are not allowed to rent or transfer the Altair program.

3. Altair General Presentation

Altair is a program dedicated to acquiring and processing images from FLIR SYSTEMS infrared cameras with 2D focal plane arrays. Thanks to its advanced technology, this program offers the ability to view films live and store them at a rate of 200 frames per second. In combination with other software components like Cirrus, this program can be used to manage picture taking specifications and image post-processing.



4. Using Help

Altair's help screens are provided to guide the user through the program's features. The help screens do not cover programs used in conjunction with Altair nor handling procedures. For information on these aspects, refer to FLIR SYSTEMS procedures for use.

There are two ways to access Altair:

- Using the **Help>Contents** command,
- By pressing the **<F1>** key.

You can call up the help items using one of the two methods described below:

- By clicking on  (the Help button), then on a screen element,
- By selecting the appropriate element and then pressing the **<F1>** key,
- By clicking on the Help button in a dialog box.

Balloon help

To display the name of a button or a toolbar, place the mouse pointer on the element. Balloon help will then be displayed.

5. Project Management

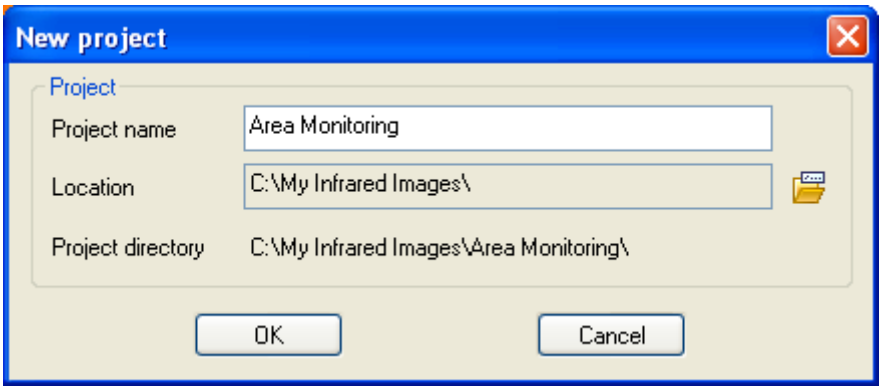
When it is first opened, Altair connects to the last project used.

When Altair is installed for the first time, it will move to the default folder created on installation.

Before acquiring any new images, you will have to create a new project directory. This operation will create the necessary folders for storing the data for your film and its related tools, thereby avoiding any mixing of files from different sources.

5.1. Creating a project

To create a project, select the **File>New project** menu. A dialog box prompts you to select the target folder and to choose a name for your project.



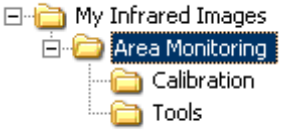
Use the  button to select or create the folder.

Enter the project name from the keyboard.

The new project's folder is created. It contains two other folders:

- "Calibration" intended to receive camera calibration files for this project, and
- "Tools" intended to receive the tools files for the project.

For example:



5.2. Opening a project

To open an existing project, select the **File>Open project** menu. A dialog box prompts you to choose the project to open.

6. Film Management

6.1. Viewing the scene as seen by the camera

To view the scene as seen by the camera, select the **File>Camera frame** menu or press [**Ctrl**] + [**L**] or click on the  button. The scene as seen by the camera will then be displayed live.

6.2. Opening a film or a image

To open a film or an image (an image is considered as a single frame film), then select the **File>Open frame** menu or press [**Ctrl**] + [**O**] or click on the  button.

6.3. Saving a film or a image

6.3.1. Saving the film with the current name

The **File>Save frame** menu (or [**CTRL**] + [**S**]) lets you update the film recording. If the film has not yet been saved, a window prompts you to specify where to save it and the name to be given to the film.

6.3.2. Saving the film under a new name

You can save your film under a new name, for example if you have made changes to it and do not wish to overwrite the original with it.

Choose the **File>Save frame as** menu (or press [**F12**]) and give your film a new name.

6.4. Playing a film

To play a film, you need to open it (refer to "Opening a film or an image ").

The play commands are available from the frame capture control panel. If the latter does not appear at the bottom of the screen, select the **View>Acquisition manager** menu.

Play the film forward. In "Pause" mode, displays the next frame. Play can also be started by pressing the [**Spacebar**] on the keyboard.

Play the film backward. In "Pause" mode, displays the previous frame.

Stop.

Pause. Click on this icon once again to resume play.

Back to the first an image in the film.

Go to the last an image in the film.

Opens a dialog box used to choose the frame to display.

Plays a film in a loop.

Marks the current a image as a "key frame".

Restricts play to "key frames".

Places a start of area of interest marker on the current frame.

Places an end of area of interest marker on the current frame.

Locks the player on the area of interest.

Creates a link so that the selected play criteria will be applied to all open films.

Play a sequence of images made by the best of each integration time.

7. Tool Management

7.1. Opening the tools file

The tools file can be opened by selecting the **File>Open tools** menu. The open function automatically moves to the project's "**Tools**" folder. From the tools files already saved, choose the one that you wish to apply to the frame. Tools files have a ***.tls** extensions.

7.2. Saving the tools file

7.2.1. Saving tools under the current name

You can save all of the tools created in your frame by calling up the **File>Save tools** menu. By default, the save is made to the project's "**Tools**" folder, under the same name as the current an image and with a **.tls** extension.

If you have already saved a set of tools with this an image, you will be prompted to choose a new name (refer to "**Saving the tools under a new name**").

7.2.2. Saving the tools under a new name

You should choose to save your tools set under a new name if you have already saved tools with the current an image or if you wish to choose a name other than that of the current an image for your tools. To do this, call up the **File> Save tools as** menu.

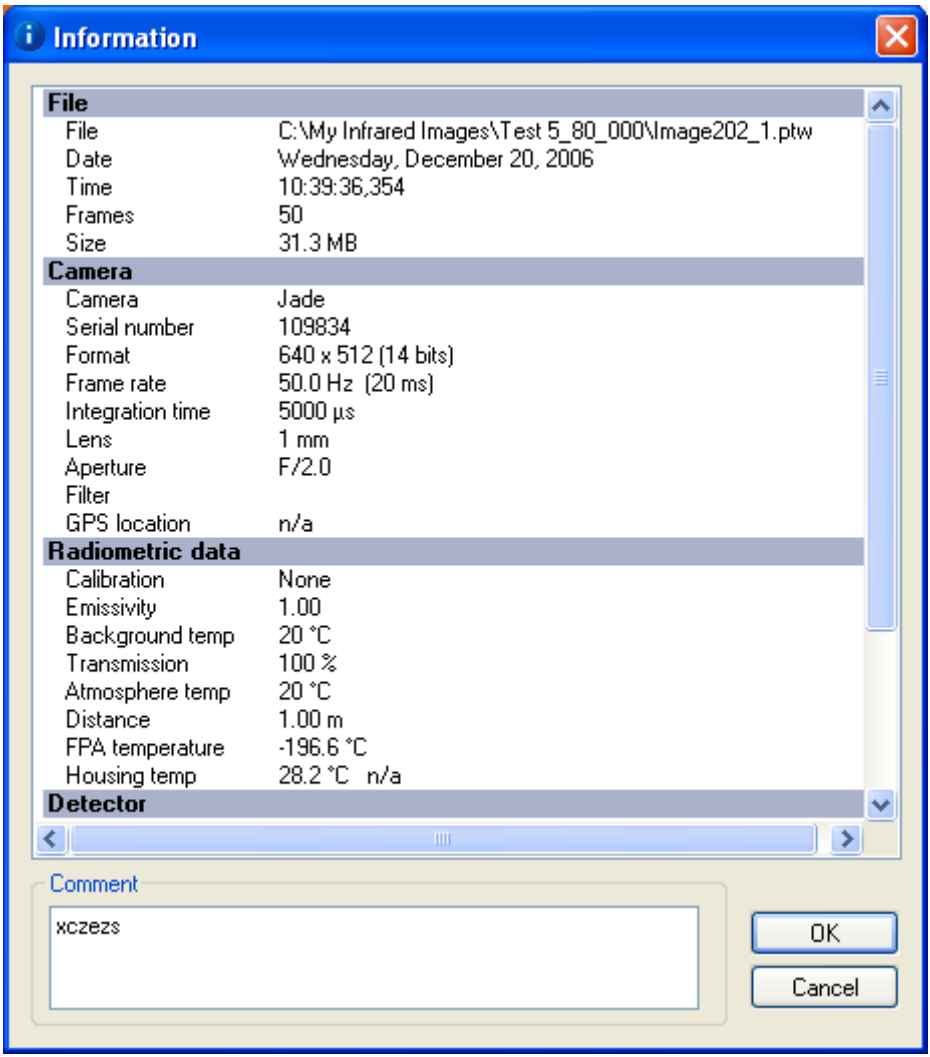
8. Viewing the General Properties of the Current Film

The properties of the current frame are stored as data that can be displayed at any time using the **File>Information** menu.

A window will then be displayed showing information on:

- Your film file (filename, date and time of acquisition, number of frames, file size)
- Your camera (camera name, serial number, frame format, frame rate, integration time, lens, aperture, filter, GPS location where applicable)
- The radiometric data (calibration file address and name, emissivity, background temperature, transmission, atmospheric temperature, frame taking distance, camera housing temperature)
- The detector (pixel size, active pixel width, cut on, cut off, NUC table number)
- Others (tool file address and name)

You can add free form comments in the data entry area at the bottom of the window.


Information
File
File C:\My Infrared Images\Test 5_80_000\Image202_1.ptw
Date Wednesday, December 20, 2006
Time 10:39:36,354
Frames 50
Size 31.3 MB
Camera
Camera Jade
Serial number 109834
Format 640 x 512 (14 bits)
Frame rate 50.0 Hz (20 ms)
Integration time 5000 µs
Lens 1 mm
Aperture F/2.0
Filter
GPS location n/a
Radiometric data
Calibration None
Emissivity 1.00
Background temp 20 °C
Transmission 100 %
Atmosphere temp 20 °C
Distance 1.00 m
FPA temperature -196.6 °C
Housing temp 28.2 °C n/a
Detector
Comment
xczezs
OK
Cancel

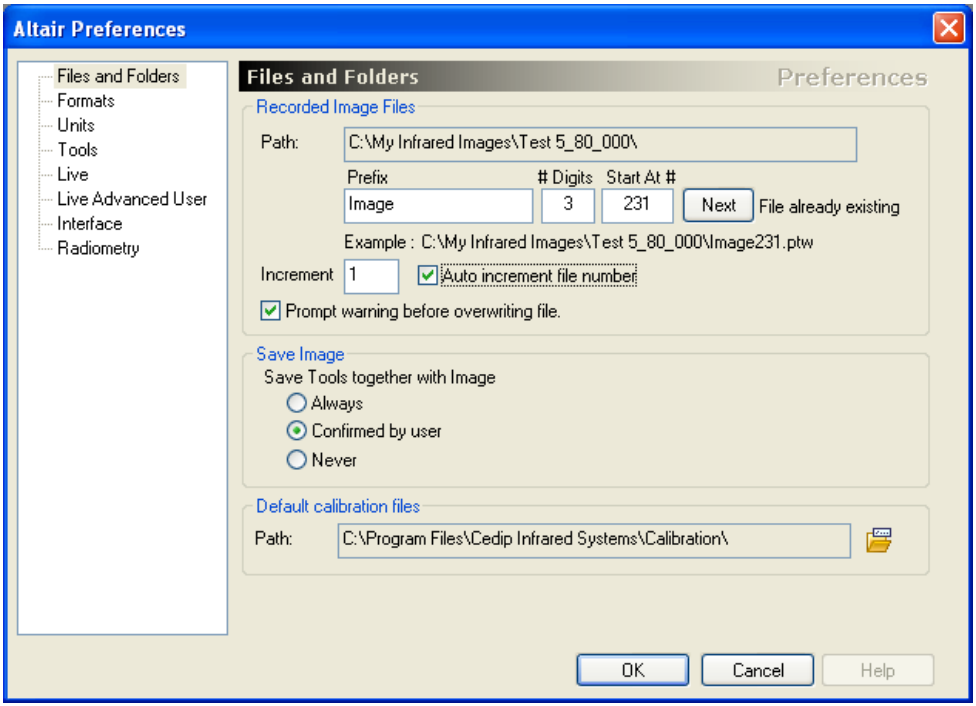
9. Displaying Altair Preferences

The **File>Preferences** menu lets you display the preferences for the current frame and change some of them.

Calling up preferences will display a window that shows data on the following items:

- Files and folders
- Formats
- Units
- Tools
- Live
- Live Advanced User
- Interface

9.1. "Files and Folders" preferences



The access path displayed is the one that you choose when you created the project. This cannot be changed from the **Preferences** menu.

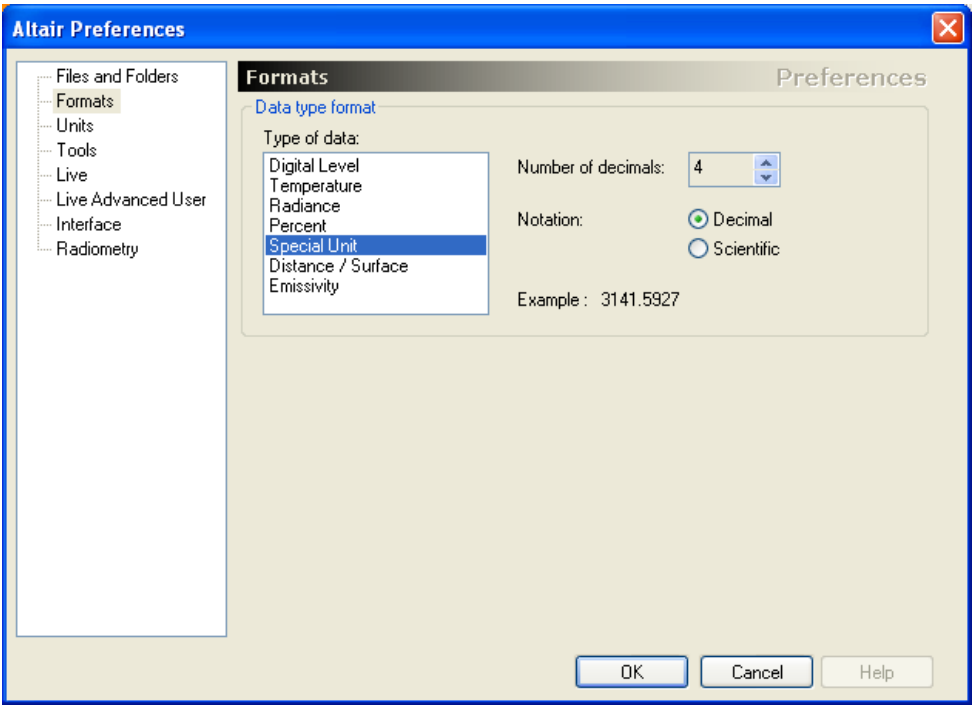
You can choose the name of your image files using three criteria:

- The prefix: chosen by the user
- The number of decimals (that will be assigned chronologically): from 1 to 6. If you choose "0", the value will be forced to "1". If you choose a number higher than "6", the value will be frozen on "6".
- Start (first frame number): from 1 to x. This choice can for example let you save your frames after files that were created during a previous session.

Tick the "Automatically increment file number" box to automatically save your frames with the next number.

If necessary, tick the "Warn before overwriting an existing file" box. This option is especially recommended if you do not choose to automatically increment the file number.

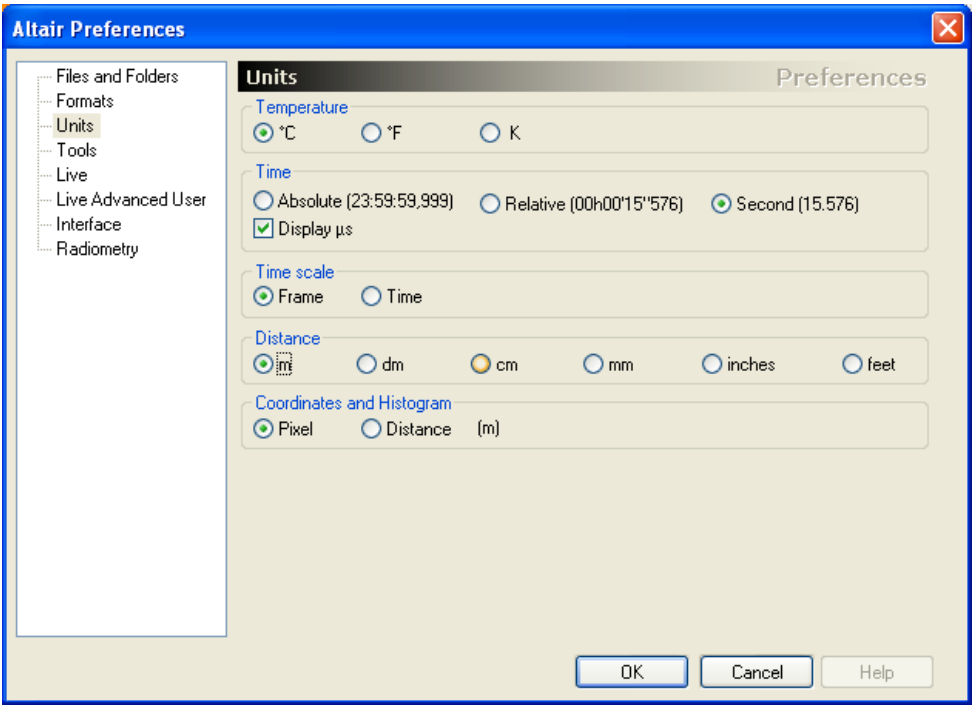
9.2. "Formats" preferences



This menu lets you choose data formats for the following units: Digital level, Temperature, Radiance, Percentage, Special unit, Distance/Surface and Emissivity

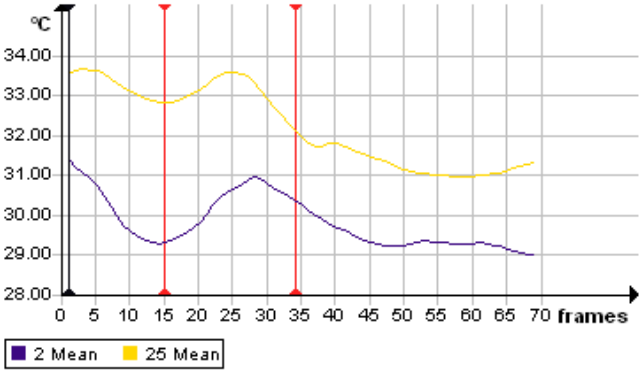
For each type of data, choose the number of decimals and the notation (decimal or scientific) to use. An example is displayed applying the chosen parameters.

9.3. "Units" preferences



This menu lets you choose the units to work with for the following data:

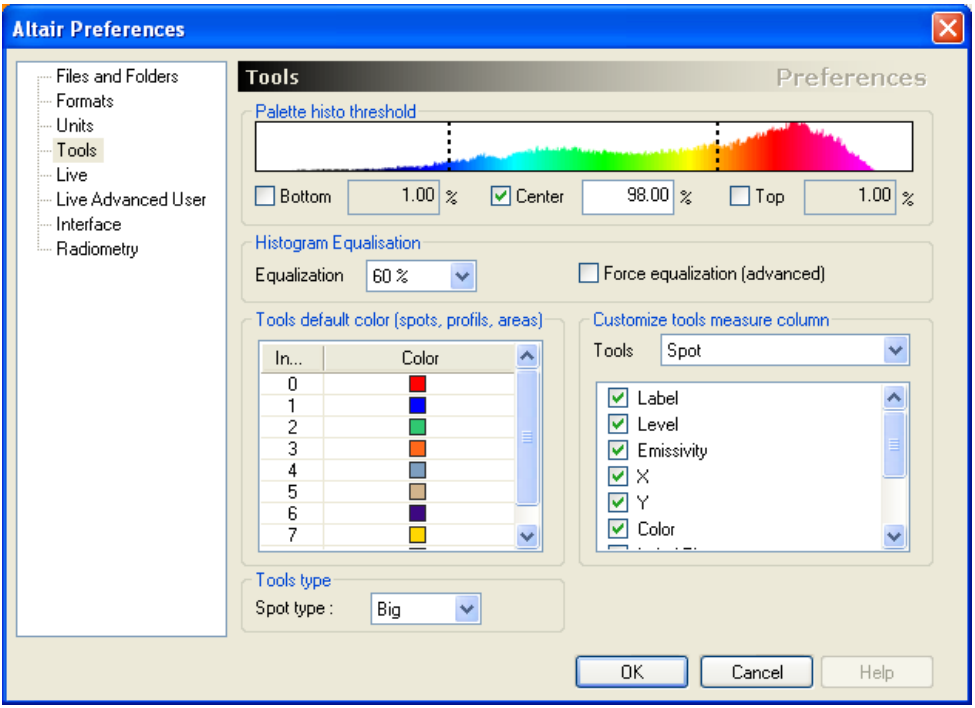
- Temperature: °C, °F, K.
- Time: Absolute. Time is measured from the start of the recording, in seconds.
  By default, the time is displayed in hundredths of a second. Tick the "Display µs" box to display three additional decimals.
- Time scale: Choose "Frame" to display the time graphs by reference to the frame number. Choose "Time" to display the time graphs by reference to elapsed time, as defined in the previous menu.



"Frame" reference

- Distance: Choose between m, dm, cm, mm, inches and feet. These units are used to display distances and surface areas if the "Coordinates and Histograms" option chosen is "Distance".
- Coordinates and Histograms: Choose "Pixel" to display distances and surface areas as a number of pixels. Choose "Distance" to display distances and surface areas in the unit chosen in the previous menu.

9.4. "Tools" preferences

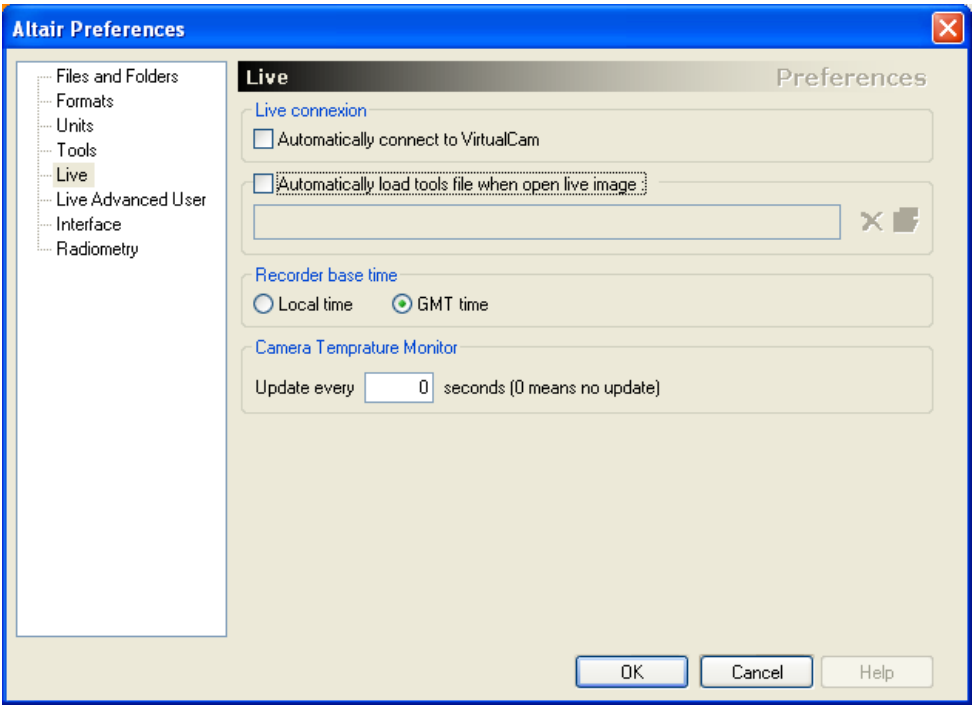


This menu lets you set:

- The palette histogram thresholds. By ticking one of the three boxes, choose whether to display pixels with a numerical value below the lower threshold, between the two thresholds or above the upper threshold. For each case, set a threshold.
  If you choose "center", the pixel value percentage retained will be centered on the entire temperature range.
- Tool colors. This menu lets you choose the colors assigned by default to the various tools and traces. Double-click on the color sample to open the palette, and then choose a color.

- Customizing the columns displayed for measurement values. For each of the tools (point, profile, area), tick the data you wish to see displayed in the measurement table.

9.5. "Live" preferences

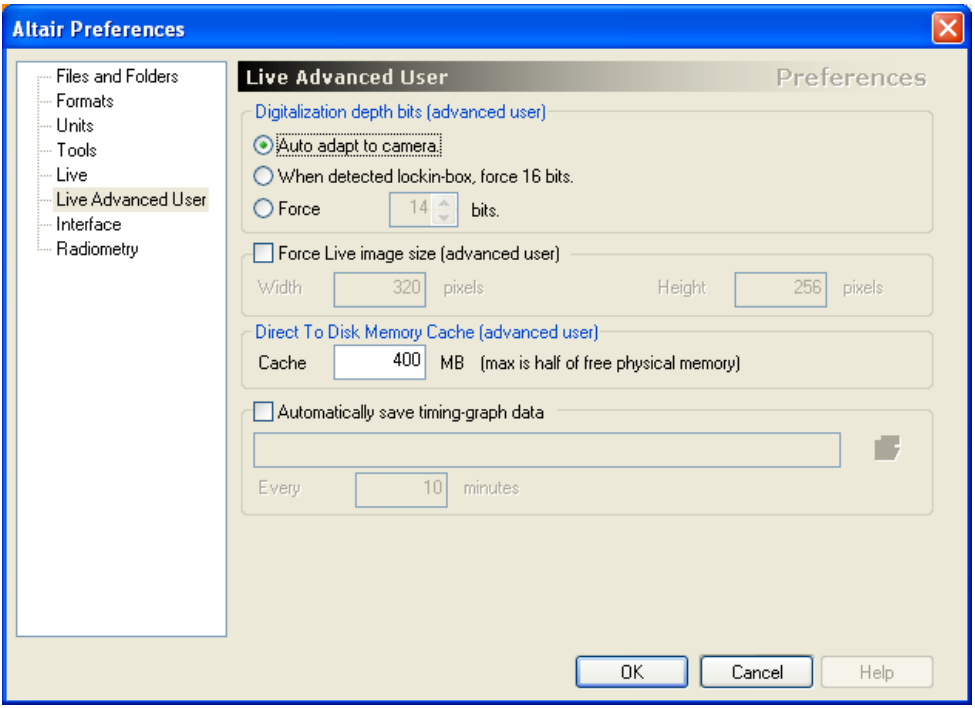


Tick the "Display the tools on the camera frame" to simultaneously open the image and the associated tools file. Then specify the access path and the name of the tools file.

Choose whether to use local time or Greenwich Mean Time (GMT).

You can choose the frequency for updating camera temperature.

9.6. "Live Advanced User" preferences



If necessary, choose whether to customize the encoding level (experienced users). By default, the "Automatic according to camera" option is ticked.

You can:

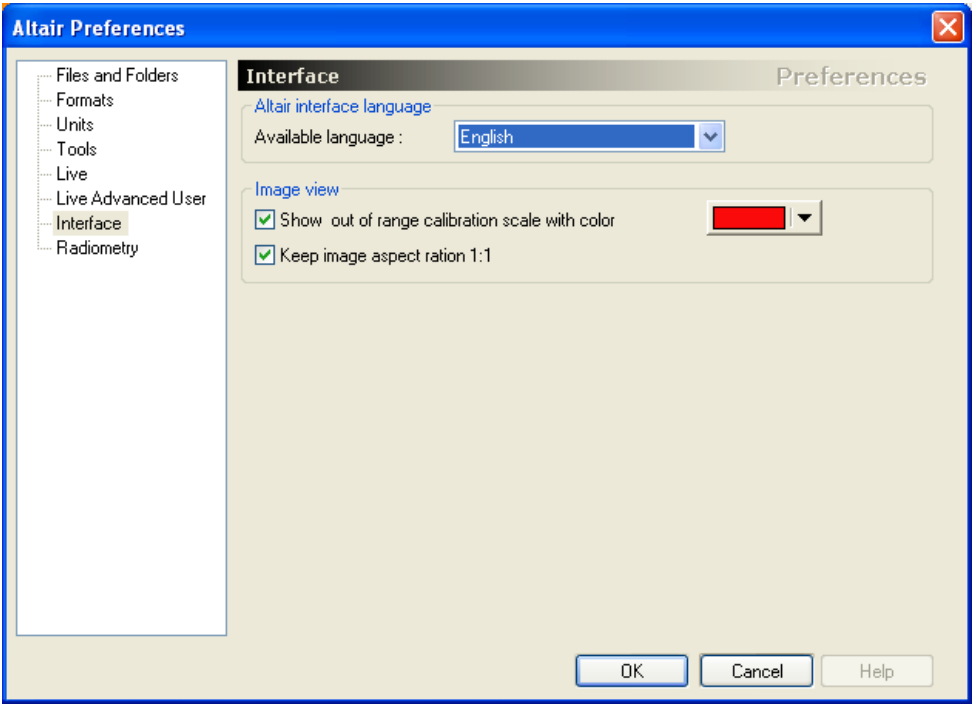
Force the image to be encoded in 16 bit format when using a demodulation box ("Lockin").

Force encoding with another value (to be chosen).

Tick the "Force camera size" box if necessary. Then enter the required size.

You can specify a cache file size when saving the frame directly to the hard disk drive. The cache size value cannot exceed half of the physical memory available.

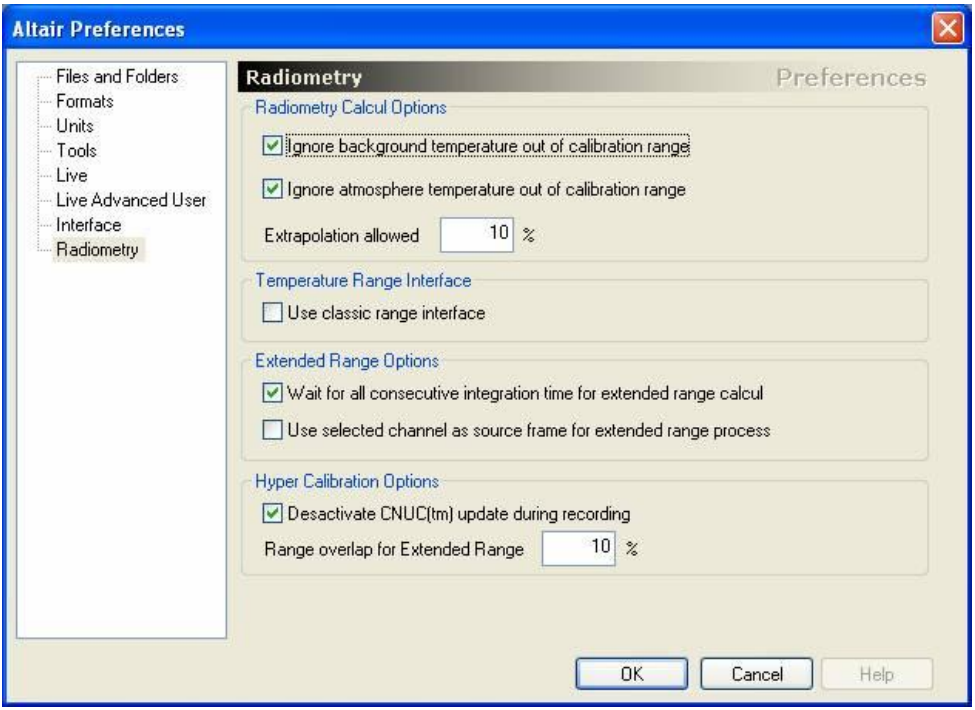
9.7. "Interface" preferences



This section let you:

- Change Altair language with an available one.
- Choose if you want to see when the scale is out of calibration range and with which color it is showed.
- Choose if you want to keep the image ratio.

9.8. "Radiometry" preferences



This section let you select radiometry calculation option:

In case of the ambient or the atmosphere temperatures are under the range, you could disregard the flux depending of these 2 types of temperature. You could adjust the threshold of extrapolation of the range of temperature.

This section let you select the temperature range interface: the new interface adapted to the hyper calibration feature or the previous interface.

This section let you select the extended range options:

It is recommended to **wait for all consecutive integration time** for the merge of images. In case of you uncross this option; the first image grabbed will be the references. This option is recommended.

The option which **use selected channel as a source frame** could allow having a priority of one range; and this range of temperature will be the range selected in the live image. This option is not recommended.

This section also let you select the hyper calibration options:

One could stop the automatic updating of the CNUC during a sequence acquisition to ensure not to drop frames. This option is recommended

The percentage of overlap is to ensure the continuity of the global range in extended range feature. 10% is recommended

10. Menus and Toolbars

Altair popup menus allow access to all of the functions available. The main functions are also accessible from the toolbars.

10.1. File menu

This menu is partially linked to the **Main** toolbar.

	New project	Creates the folders needed to save all of the project data (frames, tools, etc.)
	Open project	Opens a previously saved project
	**Camera**	Displays the scene seen by the camera (the camera must be running)
	**Freeze camera**	One click on this button freezes the image from the camera
	**Open frame**	Opens a film or a image
	**Save frame**	Saves the current image
	Save frame as	Saves the current image under a new name
	**Save all**	Saves all of the open images
	Open tools	Opens a previously saved tools file and applies it to the selected image

	Save tools	Saves the tools applied to the selected image
	Save tools as	Saves the tools applied to the selected image under a new name
	Information	Displays all of the image parameters
	Preferences	Displays Altair parameters
	Quit	Closes Altair. If changes have been made to the open files, a window prompts you to save these files.

This menu also displays the last four files opened.

10.2. Edit menu

Like the **File** menu, this menu is partially linked to the **Main** toolbar.

	Cut	Cuts the selected element and places it in the clipboard.
	Copy	Copies the selected element and places it in the clipboard.
	Paste	Pastes the contents of the clipboard.
	Undo	Undoes the last action done. If nothing was done, the button is shaded.

Redo

Redoes the last action undone. If nothing was undone, the button is shaded.

Copy digital frame

Copies the digital data for the selected object into the clipboard. The data is stored in ASCII format for reuse in other applications. The following objects can be copied:

Frame

The entire frame is copied to the clipboard.

Cursors

Copies the data for all of the cursors created in the frame.

Profiles

Copies the data for all of the profiles created.

Areas

Copies the data for all of the areas created.

Histogram

Copies the data for all of the histograms created.

Graph

Copies the data from the time graph.

Selected tools

Copies only the data on the selected tools. The tools may be of different types.

Copy the graphic frame

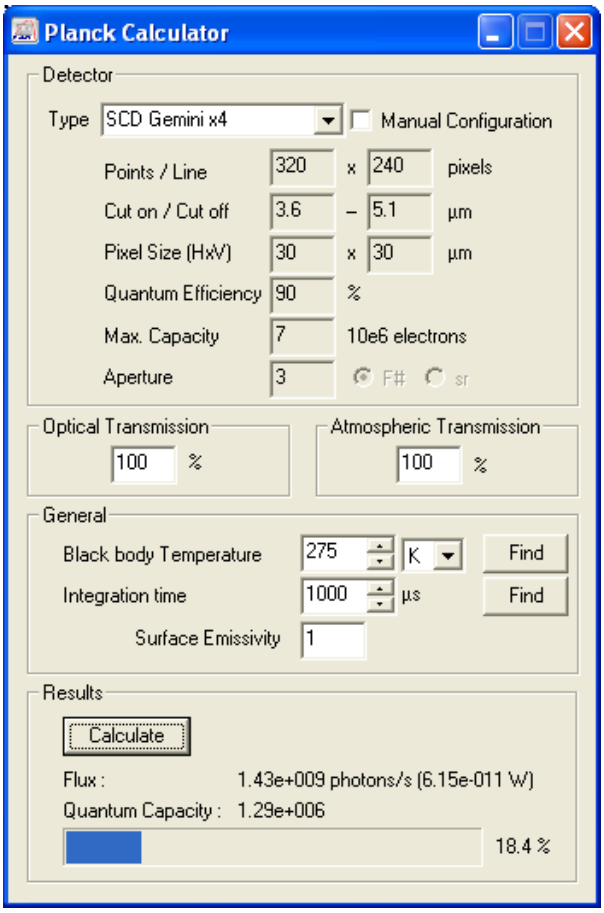
Copies the selected objects in bitmap format into the clipboard. The objects are copied as they appear on-screen. Consequently, before they can be copied, they must be displayed on-screen using the following tabs:

The various options are available from the submenus:

Copy graphic frame / Frame

Copies the infrared frame with no tools or palette.

Copy graphic frame / Frame & Palette	Copies the infrared frame with the palette display.
Copy graphic frame / Frame & Tools	Copies the infrared frame with the tools (cursors, areas, etc.).
Copy graphic frame / Frame & Palette & Tools	Copies the infrared frame with the tools and the palette display.
Copy graphic frame / Cursors	Copies the data for all of the measurement cursors.
Copy graphic frame / Profiles	Copies the data for all of the profiles.
Copy graphic frame / Areas	Copies the data for the drawn areas.
Copy graphic frame / Histogram	Copies the histogram.
Copy graphic frame / Graph	Copies the time graph.
Copy graphic frame / Multiple views	Copies the multiple views strip as displayed on-screen.
Copy graphic frame / Zoom area	Copies the selected zoom area.
Copy graphic frame / All views	Copies the entire work area.
 **Planck calculator**	One click on this button calls up a Planck's law radiometric calculation module.



10.3. View menu

This menu's options are used to display or mask the different elements shown in the work area.

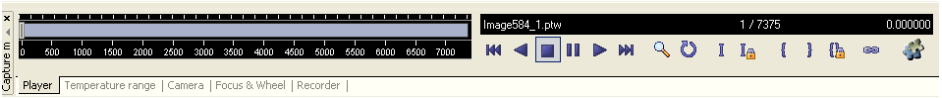
Main toolbar Displays or hides the Main toolbar

Palette toolbar Displays or hides the Palette toolbar

Tools toolbar Displays or hides the Tools toolbar

Layout toolbar Displays or hides the Layout toolbar

Capture manager Displays or hides the Capture manager



Status bar Displays or hides the Status bar

10.4. Palette menu

This menu is used to choose the data display mode based on the preset models. It is linked to the **Palette** toolbar.

Palette BW

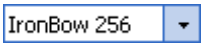
Displays frames in grayscale.

Change palette

Replaces the current palette with the next one in the list:

- Threshold
- Grey
- Rainbow
- Steel
- Lockin
- Grey 16
- Rainbow 16
- Lockin 16
- Hot Metal
- Cycle

Shortcut: [**F4**] key.



Palette

Offers a choice of palette from the above list.

Swap palette

Swaps the entire palette.

Shortcut: [**Shift**] + [**F4**].

Min-Max palette

Adjusts the palette to the only useful amplitude. The lowest level is thereby assigned to the lowest data value in the frame and the highest level to the highest data value in the frame.

Shortcut: [**Alt**] + [**X**].

Histo palette

Adjusts the palette to match a percentage of the population in the

		histogram in the image. This percentage can be configured from the "Preferences" menu. Shortcut: [**Alt**] + [**Y**].
	**"Full scale range" palette**	Rescales the palette to cover the full scale range. Shortcut: [**Backspace**].
	**Auto Gain Palette**	Applies a Histogram palette to every image displayed. Shortcut: [**Alt**] + [**A**].
	**Histogram Equalization**	Applies a histogram equalization.

10.5. Tools menu

This menu is linked to the **Tools** toolbar.

Frame zoom	This menu lets you adjust the frame size. It offers the following choices:
 **Zoom**	Activates the "zoom" function. The mouse pointer takes the shape of a magnifying glass when you move it around the frame. Click on that part of the frame you would like to see enlarged. A x2 zoom factor is applied with each mouse click.

Zoom 1:1

Restores the normal image size.

Zoom in

Enlarges the image size (x 2) from its center.

Seven successive enlargements are possible.

Zoom out

Reduces the image size (x 2) from its center.

Adjust zoom to window

Adjusts the frame size to match that of the display area.

Zoom area

This function is only accessible if you have defined areas of interest. Submenus corresponding to each of the areas created let you choose the area you wish to enlarge.

The zoomed image of the selected area is displayed in the tab view. Each pixel is shown in line with the palette selected and with its value expressed in the selected units.

cm	3.54	3.57	3.60	3.63	3.66	3.69	3.72	3.75
0.42	34.76	34.85	34.89	35.08	35.15	35.14	34.98	34.76
0.45	34.44	34.67	34.85	35.00	35.15	35.08	35.02	34.92
0.48	33.91	34.46	34.69	34.86	34.99	35.09	35.09	35.07
0.51	32.34	33.94	34.39	34.74	34.87	35.05	35.11	35.04
0.54	29.75	32.34	33.92	34.50	34.69	34.91	35.05	35.05
0.57	26.52	29.65	32.24	33.84	34.43	34.66	34.96	35.05
0.60	25.20	26.41	29.27	32.01	33.67	34.43	34.73	34.95
0.63	24.78	25.11	26.21	29.01	31.58	33.45	34.43	34.76
	24.84	24.82	25.01	25.93	28.21	31.12	33.19	34.20

Timing-graph | Area | Spot | Area zoom

	**Cursor**	Places a measurement point in the image
	**Single profile**	Draws a measurement segment in the image
	**Multiple profile**	Draws a multiple measurement segment in the image
	**Rectangle**	Traces a rectangular area of interest in the image
	**Polygon**	Traces an area of interest of any shape in the image
	**Circle**	Traces a circular area of interest in the image
	Histogram	Displays the histogram for the selected area. Note: Additional submenus are displayed for each of the areas of interest that are drawn. The area label is shown for each item.
	**Graph**	Displays the dialog box for building a timing-graph.
	**Stop graph updating**	Click on this button to inhibit timing-graph updating when you change the position of a tool in the image. This function avoids any wasted time when adjusting tools on a long film.

Multiple views	Displays a shortened film sequence.
Average	Produces and saves the average over time for a film: every pixel in the average frame takes as its value the average of all of the values of the same pixel in the film image. By default the filename proposed is that of the image with a **.ptm** extension.
RMS noise	Produces and saves a image where every pixel takes the noise value of a same pixel in the film frames. By default the filename proposed is that of the frame with a **.ptb** extension.
Arithmetical module	Displays the arithmetical module window.
Erase all tools	Erases all of the tools placed in the frame and their analysis window.

10.6. Measurement menu

Units

Digital level	Displays the data in logical levels (default parameter).
Temperature	Displays the data as a temperature. This menu is accessible if a calibration file has been linked to the frame.
Brightness	Displays the data as brightness ($W/m^2/sr$). This menu is accessible if a calibration file has been linked to the frame.

Percent	Displays the data as a percentage.
Special unit	Displays the data using the scale included in the files.
Calibration special unit	Displays the data using the units defined by the user in a specific calibration file. This menu is accessible if a calibration file has been linked to the frame.
Radiometry	Opens the radiometry parameter window.

10.7. Additions menu

Altair can host additional functions by adding tools libraries. This menu groups all of the added functions, for example:

Frame mirroring

Vertical mirror image	Reverses the frame along the vertical axis
Horizontal mirror image	Reverses the frame along the horizontal axis

10.8. Window menu

Cascade	Displays the windows in cascade
Tile	Tiles the windows over the entire working area
Arrange icons	Reorganizes the minimized frame windows

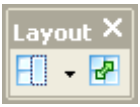
Close	Closes the selected window. If changes have been made to the film, a message prompts you to save the changes.
Close all	Closes all of the open windows. If changes have been made to the films, a message prompts you to save the changes.
More windows...	Used to list all of the open files, even when there are more than just the nine listed in the Windows menu.

The Windows menu can display up to nine open files.

10.9. Help menu

Help	Opens the Help window. The Help cursor will position itself on the "Contents" tab.
Index	Opens the Help window. The Help cursor will position itself on the "Index" tab.
Find	Opens the Help window. The Help cursor will position itself on the "Find" tab.
About Altair	Opens a window showing the Altair version information and when it entered service.
Update serial number	When Altair is used for the first time, you are prompted to enter the program's serial number. This information is recorded and can be updated.

10.10. Layout toolbar



	**Multiple report view**	This view presents all of the tool analyses on the same page. The analyses are added to this view by double-clicking on the triangle in the lower right hand corner of each analysis window.
	**Toggle view**	Toggles between the tabs view and the multiple report view.

11. Tools

Altair offers advanced frame analysis tools. These tools share the common features described below:

11.1. Positioning a tool on the frame

Select the tool from the <**Tools**> menu or click on its icon it the "Tools" toolbar.

Move the mouse over the frame. The cursor takes a cross shape. Click on the desired position to start a tool trace. For tools other than points and segments, successively click on each point. To finish the trace, you can:

- Click on the starting point (closed shape),
- Click anywhere with the right mouse button,
- Double-click (open shape).

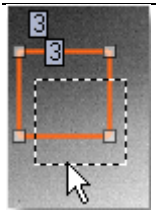
A right mouse click on the frame selects the last type of trace tool used. This makes it possible to quickly add a number of traces using different tools of the same shape.

11.2. Selecting a tool

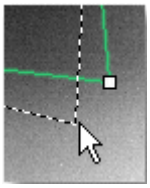
You can select a tool by clicking on its trace. Then the tool will be displayed in bold face and its label will be assigned a pale blue background.

11.3. Moving a tool

It is possible to change the dimension or the position of a tool.



To move a tool, click on a point along its contour, hold the click and move the mouse until the new location is reached. Release the mouse button.



To change the size of a tool, grab one of its handles and drag it towards the desired position (the handles appear when you pass over the tool with the mouse).

11.4. Parameters that are common to all tools

Each tool has its own parameters displayed at the top of the corresponding measurement table. The parameters below are common to all tools:

Label Each tool is numbered individually. By default, Altair assigns them a chronological number. It is however possible to change a tool's identification by double-clicking on its number in the data table (any alphanumeric sequence is valid).

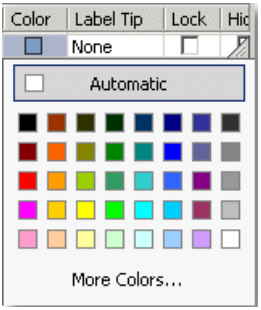
Warning: you may in this case obtain two tools with the same number.

Emissivity Specific emissivity level to be used in the calculations.

Warning, this value then replaces the value set in the radiometric data.

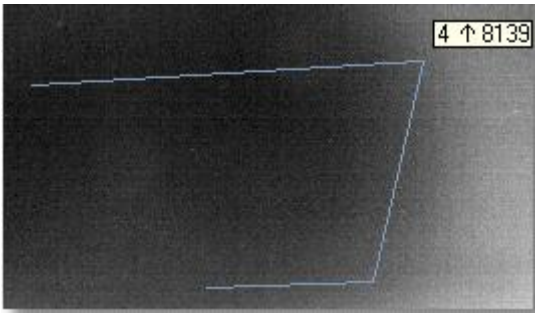
Color Double-click on the color sample to change it. A color selection window will then be displayed.

The tool color is updated in each of the views.



Label Tip To add or change any markings that appear in the tool representation, double-click on the marking in the data table and choose from the list displayed.

The figure below illustrates a tool where the selected marking shows the maximum value achieved on the profile.



Lock Ticking this box will disable the tool selection, thereby inhibiting changing and deleting it.

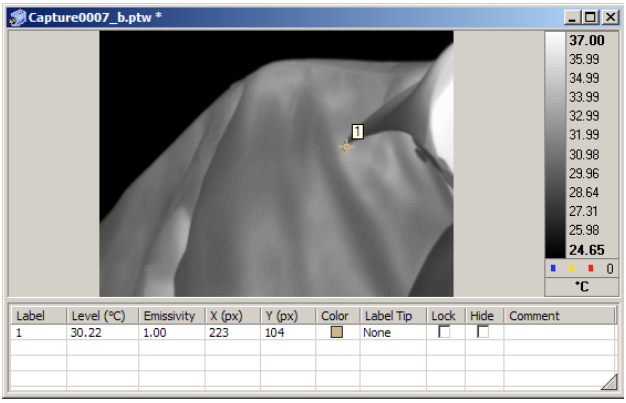
Hide Ticking this box will hide the tool on the frame. Use this function to reduce the calculation duration or to lighten up frame presentation.

Comment Double-click on this column to add a freeform text comment.

11.5. Cursor

Positions a measurement cursor on the frame. You can position up to 30 measurement cursors on the same frame.

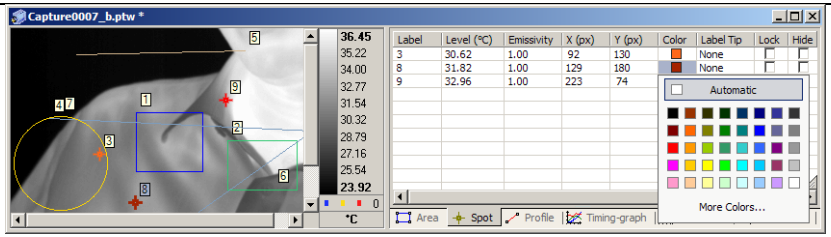
When this function is selected, the mouse pointer takes the shape of a thick cross as soon as it is located over the frame. To place a measurement point, click on the desired location in the frame.



You can at any time move the cursor using the mouse click/move method.

The cursor's X and Y coordinates are displayed in the additional data window. They can be displayed in pixels or in physical dimensions (m, dm, cm or mm). To choose this option, refer to the "Preferences" menu. The value of the measurement made using the cursor is displayed in the current measurement unit (temperature scale, isothermal value, brightness unit or digital level).

Different colors are assigned successively to each newly created element. You can change these colors by double-clicking on the corresponding color sample. Then choose a new color from the proposed palette.



11.6. Single profile

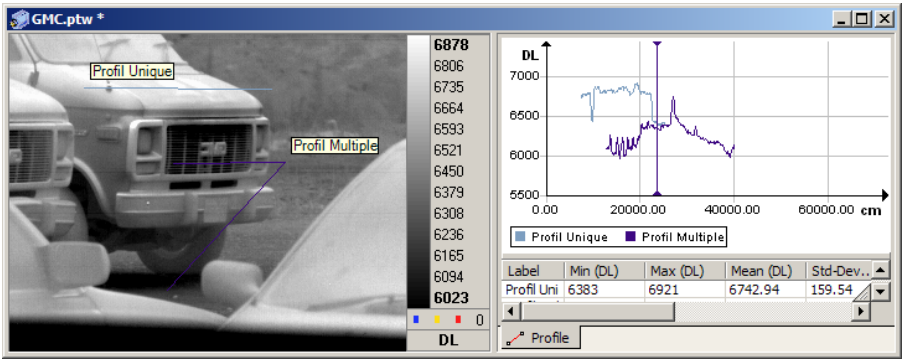
This function is used to position up to 30 profiles in the frame. A measurement will be made along each one.

To draw a profile in the frame, click to position the first end, move the cursor (a dotted line follows your motion), then click on the location of the other end. The dotted line is replaced by a colored line.

The data and the graph that correspond to the trace profile are displayed in the additional data window under the "profile" tab.

11.7. Multiple profile

To draw a multiple profile, click on the first end, then on each "break" in the multiple profile. Double-click on the last point to end the trace.



11.8. Area of interest

An area of interest is a surface, whether regular in shape or not, on which you would like to perform specific measurements.

These areas may be regular in shape (rectangle, circle) or irregular (polygons). Please note that for rectangle, all pixels within the rectangle are processed while, for polygons, only the upper and left edges' pixels are included into the region. The lower and right edges' pixels are not processed

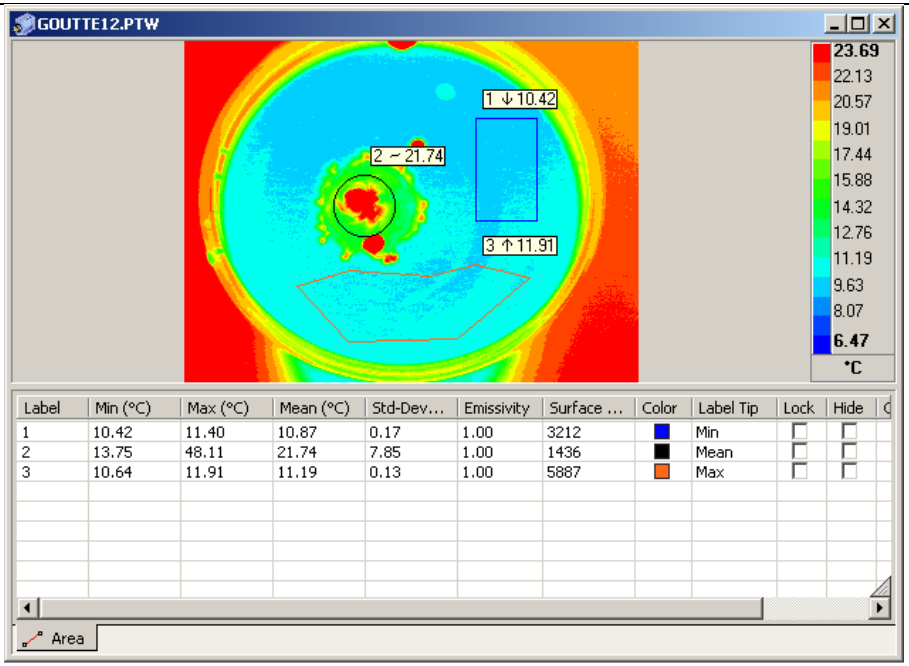
You can trace up to 30 areas in the same frame.

Each area can be made up of up to 100 sides.

A specific emissivity level can be defined for each of these areas.

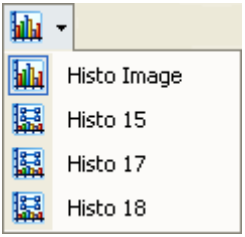
The results of the measurements made in each area are displayed in a table linked to the frame. These measurement cover the:

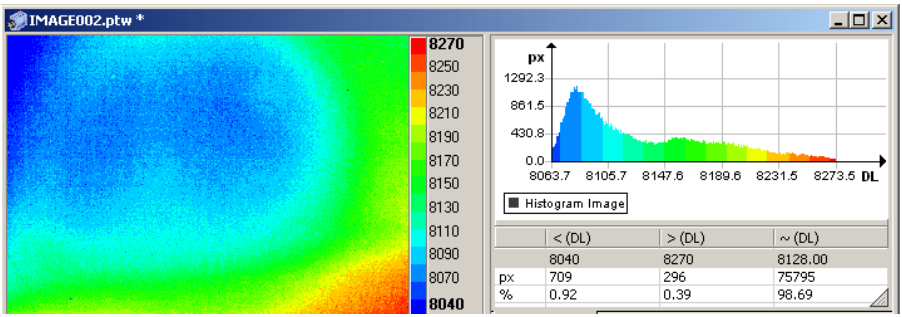
- Minimum value measured
- Maximum value measured
- Average value
- Standard deviation
- Surface area



11.9. Histogram

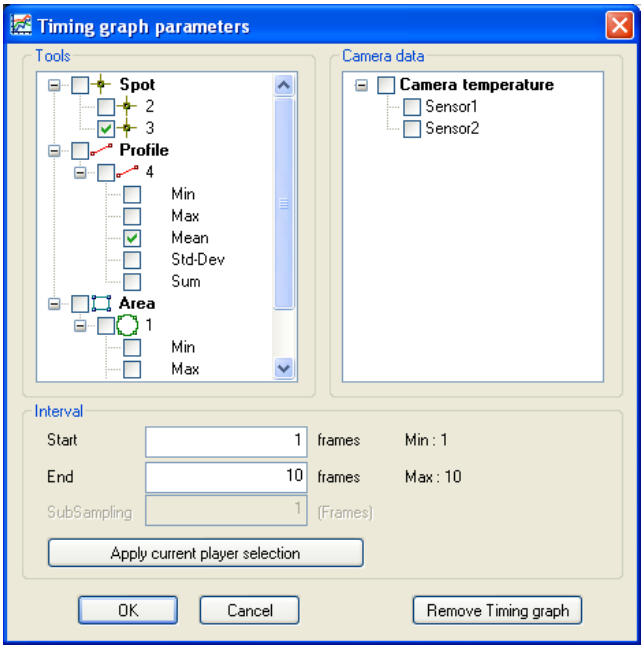
This function is used to calculate and to display a histogram image of frame data. A submenu offers you a choice of all of the existing areas of interest. The resulting graph is displayed in the "Histogram" view.





11.10. Timing-graph

This tool lets you trace a number of timing graphs. When this function is called up, the window below is displayed so that you can define graph parameters:



For each of the elements required, choose which parameters to use. You could identify the tool by the label name of the tool.

Choose the reference time interval (expressed in frames) for the trace. Click on "Apply current player selection" to use the same interval as that of the player.

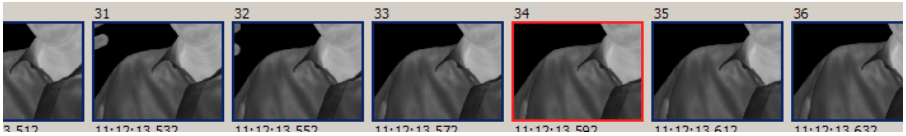
The “SubSampling” option allow to reduce the density of sampling displayed

The button “Remove timing graph” allow to remove all selections.

Click on "**OK"**. The graph will be generated.

11.11. Multiple views

This mode displays the film in contact form. The number of frames is linked to the size of the display on-screen and the frames are spread out at regular intervals along the length of the film.

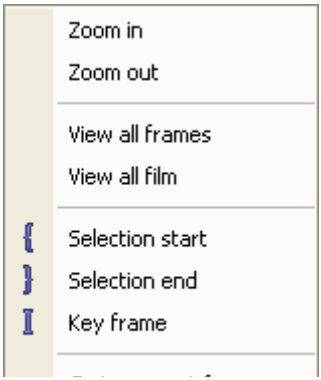


Every frame has its frame number as shown on the film.

Key frame are outlined in red.

Double-click on a frame to display it in the main view.

Click on a frame with the right mouse button to choose a display option:



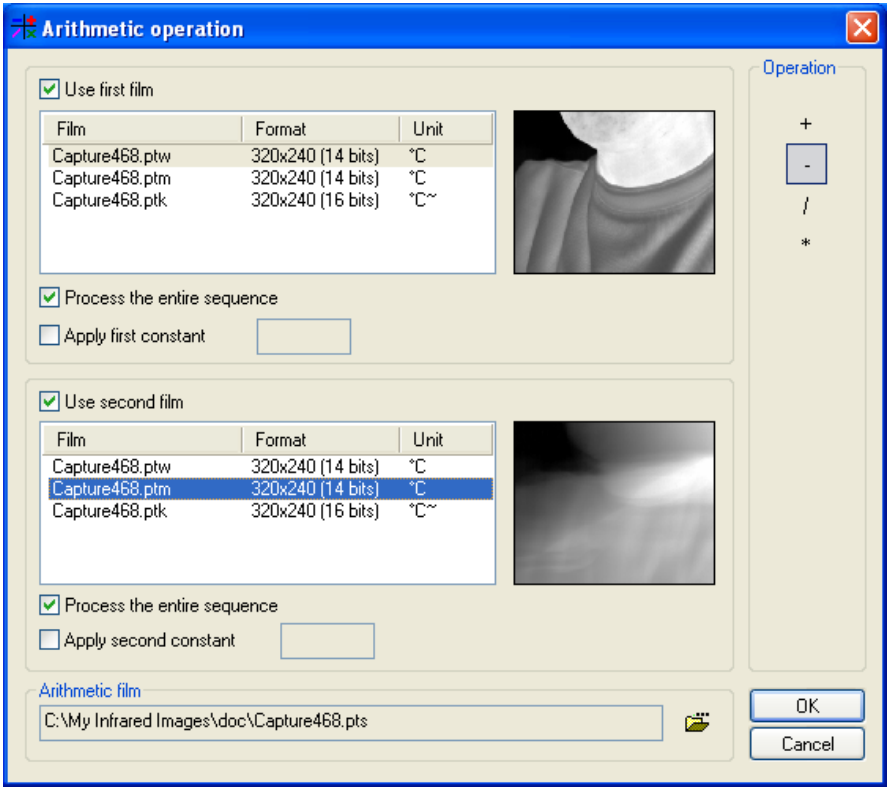
Zoom in	Reduces frame sampling. The frames displayed are separated by a wider interval. The function stops working when all of the frames fit the display area.
Zoom out	Increases frame sampling. The frames displayed are separated by a narrower interval. The function reaches its limit when all of the frames in the film are displayed.
Show all frames	Shows all of the frames in a film (a horizontal scroll bar is added at the bottom of the multiple view window).
Show entire film	The entire film is shown on-screen: the first and the last frame are displayed. Intermediate frames spread equally along the length of the film are displayed depending on the amount of space available on-screen.
Start	Moves the start of the film to the selected frame.
End	Moves the end of the film to the selected frame.
Frame	Designates the selected frame as the key frame.
Go to	Lets you select the current frame using its number.

11.12. Arithmetic module

The arithmetic module is a tool for performing basic arithmetic operations (+, -, x, /) on one or two frames. This function is used, for example, to obtain a negative frame by inverting the pixel values (the "1/x" function) or to remove noise by subtracting two frames.

To activate the arithmetic module:

- Click on the  button in the Tools menu or in the corresponding toolbar. The following window opens:



It shows two areas (first film and second film) which contain the list of films opened.

11.12.1. **Apply an operation between two films**

- Select the premier film, the arithmetic operation to apply and the second film (the selected films are shaded and the operation framed).
- Tick the "Process all film frames" box if you wish to apply the operation frame by frame from one film to the other.
- If necessary, change the name and location where the resulting film is saved. By default, the result of the operation is saved under the original film name followed by a **.pts** extension in the current project folder.

Click on [OK] to confirm.

11.12.2. **Applying an operation on just one film**

- Depending on the operation to apply, select

– the first film, the operation and the second constant (e.g. "Capture0007_b.ptw", "+", "second constant: 25" to raise all values by 25°C), or

– the first constant, the operation and the second film (e.g. "first constant: 1", "/", "Capture0007_b.ptw" to obtain an inverted frame display).

Click on [OK] to confirm.

12. Tool Handling

12.1. Using the clipboard

Use the Cut, Copy and Paste commands to copy a tool from one frame to another. You can also duplicate a tool in the same frame.

12.2. Tools files

Tools can be saved in a file. This means that the same group of tools can be applied to a number of frames. To save the tools, use the **File>Save tools** menu or **File>Save tools as** menu. The filename is built from the original frame's filename followed by a **.tls** extension. It is placed in the project folder that the frame belongs to.

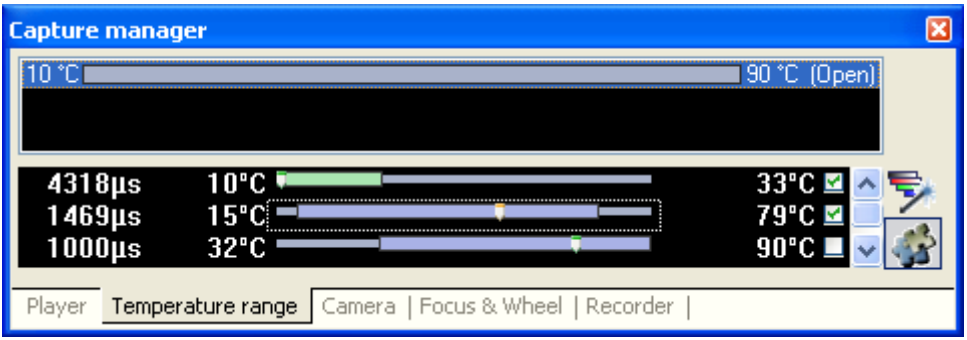
For example, a frame called **c:\project_1\frame.ptw** will have its tools saved in file **c:\project_1\tools\frame.tls**.

To apply a previously saved tool set to the current frame, use the **File>Open tools** menu.

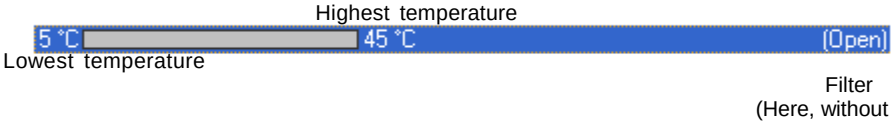
13. Acquiring a Film

13.1. Choosing the temperature ranges

To configure the temperature range, select the "Temperature range" tab from the Capture manager.



The upper part of the window displays the configurations available on your camera. Each configuration is shown with its lower and upper total limits, as well as the optical filter used.



Only one configuration is valid at one time.

To select a configuration, click on its display. It will be highlighted in blue. Once selected, the camera is automatically set to this configuration.

Warning: Make sure you choose a range that matches the temperatures of the scene to be filmed. If not, your measurements will be wrong for they will be outside the limits of the calibration function

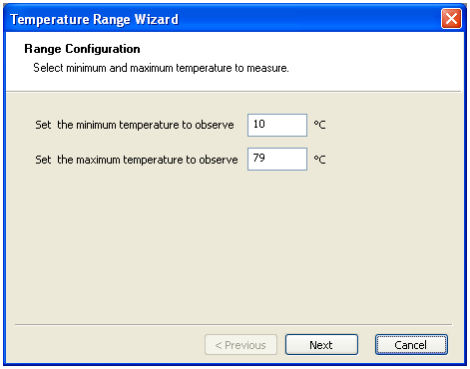
If the selected configuration is a Hypercal™ configuration, it is possible to adjust the different integration times inside this configuration.

Integration Time	Low temperature for this integration Time	Slide the button to adjust integration time	High temperature for this integration Time	Select this range for acquisition

Use the slider bar to adjust the integration time. The lower and higher temperature for the selected integration time is displayed.

Check the box to select this range for acquisition. If more than one range is selected, the camera will enter multiIT mode, playing alternatively, each range.

Another way to configure temperature range is to click on the  button to open the "Range Configuration Wizard" window and proceed:



For Hypercal™ Process:

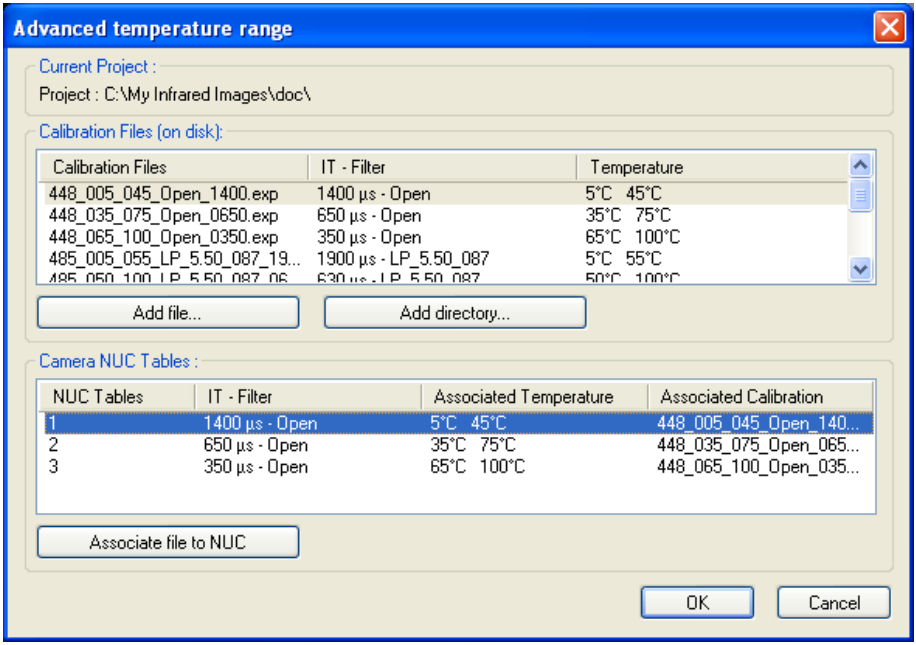
The calibration parameters are automatically saved on the image header. There is no external calibration file. These parameters are automatically loaded from the camera.

For standard NUC process:

Calibration files are automatically loaded from the "Calibration" folder in the project folder.

Warning: If a number of calibrations have been made (e.g. for using different lenses), Altair will load the first one available in the Windows file sequence. You will therefore need to select the calibration file to apply yourself. To do this:

- Click on the  button to open the "Advanced temperature" window:



- The "Project" area shows the address of the project folder. This address can be changed using the **File>Open project** menu.

- The disk's "Calibration File" list shows all of the calibration files available in the current project (filenames, IT and Filter, Temperature range).

Files from other projects can be added individually using the **[Add a file...]** button or all of the files contained in another calibration folder can be added using the **[Add a folder...]** button.

Warning: Files from other projects will not be saved with the project.

- The "Camera non-uniformity table" field lists the NUC tables contained in the camera as well as any associations with the calibration files.

To associate a calibration file to a NUC table:

- Select a calibration file by clicking on its name (the filename is shaded)
- Select a NUC table by clicking on its name (the table is shaded)
- Click on the **[Associate a Non-Uniformity file].** The calibration file name is updated in the NUC field.

Warning: Ensure that the elements you associate are compatible.

Click on the **[OK]** button to exit the advanced temperature window.

Extended range process:

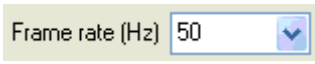
Click on the  button to activate the extended range mode. The extended range mode generates a sequence of images made from the best of each integration time. It can be used by both kind of calibration.

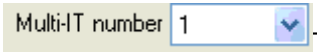
13.2. Camera configuration

To configure the camera, select the "Camera" tab in the "Capture manager" window.

This window offers the same functions as Cirrus. Using this window avoids the need to move back and forth between the windows of these two programs. The choices made from the "Camera" tab are sent directly to Cirrus to be applied.

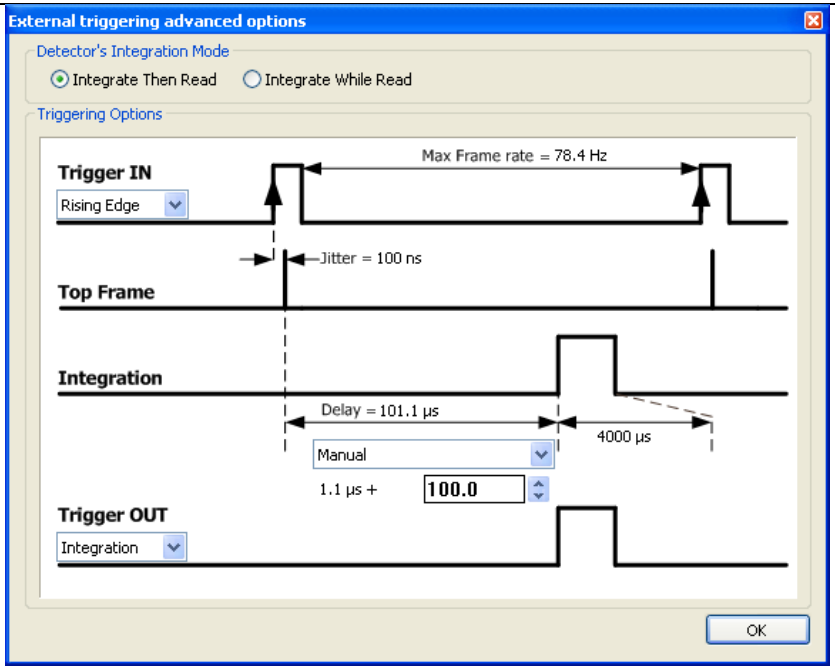
The adjustable parameters offered are:

- 

The camera frame rate (in Hz)
- 

The Multi-IT number (Choose "1" to work in mono-IT mode)
- 
External triggering
- 
External triggering advanced options

This button opens the advanced triggering options window, which allow user to manually define the triggering start edge and delay, and also to change the detector's integration mode.



The triggering options such as starting edge, delay and trigger out are modifiable only if the **external triggering** button is checked.

Select the **detector's integration mode** by clicking either on "ITR" (Integrate Then Read) or "IWR" (Integrate While Read) buttons.

Change the **triggering start edge** by selecting in the combo box either "Falling Edge" or "Rising Edge".

Triggering delay can be set either as a fixed value, an optimized value (for IWR mode only), or can be manually adjusted. To set the delay manually, user can select the "Manual" mode in the combo box, then either fills in the desired value (in µs) in the edit box, or use the spin control to increase/decrease the delay (by 0.1 µs steps).

Warning: Any change made to triggering start edge, delay or triggering out is directly applied to the camera.

-  Automatic Gain Control
-  Zoom (x2 factor, centered on the analog frame)
-  Reticule display (to simplify aiming)
-  Analog video palette inversion
-  Palette change (only works with an Emerald camera)
-  Starting a camera non-uniformity operation

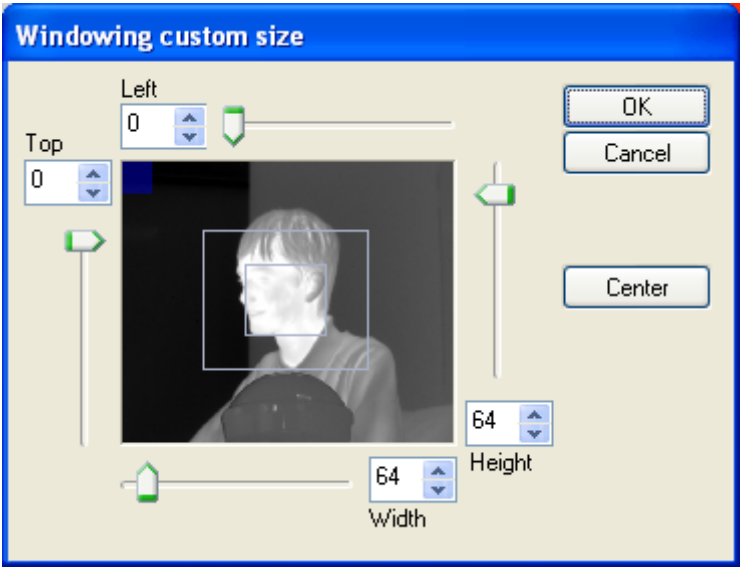
Warning: This button directly applies the last configuration set, without displaying the configuration window. Use this only if you are sure of the current configuration settings.

-  In Multi-IT mode, "Int. Video No." is used to choose the video to display by reference to the IT No.
- Handling detector sub-windowing.

The  information displays the status of the camera link.

The  buttons are used to choose the "full size", "½ size", "¼ size" and "random size" windowing modes.

When "random size" is selected, click on the  button to access a choice window for selecting the position and the size of the detector window:



Move the cursors to set the point of origin for the window (from the upper left hand corner) and the size of the window (height and width). Confirm with the **[OK]** button.

The "Camera" tab window display 

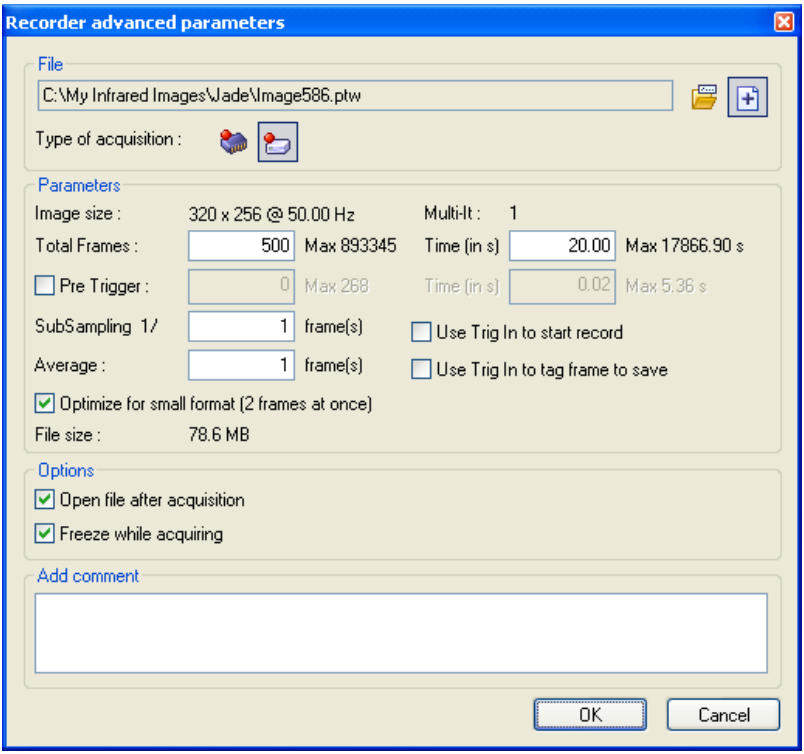
restates the position of the random windowing (positions of the upper left hand and lower right hand corners as well as the size of the window).

13.3. Acquisition configuration

The camera picture must be activated before recording a film. Click on the  button to activate it.

Click on the "Recorder" tab to call-up the capture panel.

The "Advanced…" button calls up the recorder's advanced settings window:



Advanced acquisition configuration parameters can be chosen directly from the control panel or from the advanced parameters window.

File Select the location for saving new files using the find button  . If you do not specify your choice, the save location will be that of the current project. The filename prefix and numerical index number must be defined in the preferences window.

Auto increment Click on the  button to select the auto increment function. The numerical part of the filename of each newly acquired file will be incremented by "1" compared with the previous one.

Type of acquisition

Two types of acquisition are available:

- **Acquire in memory**: Click on the button  . The frames are temporarily stored in the computer memory then transferred to the hard disk drive after acquisition. This option favors the acquisition speed and the integrity of the resulting picture. It does however imply that additional time is required to transfer the frame to the hard disk drive and the film duration is restricted by the amount of memory space available.
- **Acquire directly to hard disk**: Click on the  button. Pictures are stored directly on the PC's hard disk drive. This option makes it possible to acquire large size files, but the recording quality is directly related to the speed of the hard disk drive (the best results are obtained with SCSI disks).

Nbr. frames

Indicates the number of frames (pictures) to acquire. The acquisition duration is calculated according to the choice made for the number of frames.

The maximum is mainly a function of memory size and the amount of space available on your hard disk drive.

Duration (of film)

This parameter specifies the film duration (in seconds). Based on your choice, the number of frames that will be recorded is calculated taking into account the camera frame rate. The maximum duration is calculated taking into account the memory size and the amount of space available on your hard disk drive.

Pre Trigger

The number of frames to be recorded before the start recording event. The maximum quantity is the maximum quantity of film to be used. If you choose the max. value, then the entire film will be recorded before the start event.

Duration (of Pre Trigger)	This parameter specifies the duration (in seconds) of the recording prior to the start event. You can set a number of frames or duration.
Sampling	Shows the sampling ratio **N**. If this ratio is not "1", then one frame out of every N frames will be recorded. This option effectively slows the frame rate (or accelerates play compared with the true duration).
Averaging	Specifies the number of frames over which the average will be calculated during acquisition. A "1" choice means that no average is calculated. Note that the total acquisition time will be multiplied by the number of frames used to calculate the average.
Optimize for small format	This option, when ticked, will optimize the acquisition of small size frames. This feature is especially useful for small size, high frame rate combinations.
Use Trig In to start record	This option when ticked start record on first front of Trigger In signals.
Use Trig In to tag frame to save	This option when ticked only allow to record frames marked by Trigger In signals.
File size	Specifies the forecast file size (in Mbytes) given the parameters already set.
Open the file after acquisition	Automatically opens the film file after acquisition.
Freeze the frame during acquisition	Tick this box to freeze the camera frame during acquisition. This releases system resources to enhance the quality of acquisition.

Comments Freeform entry. These comments are saved with the film.

13.4. Acquisition commands

Prepare Prepares film acquisition by checking the amount of disk space available and assigns buffer memory space.

Acquisition starts from the first frame that follows pressing the Record button.

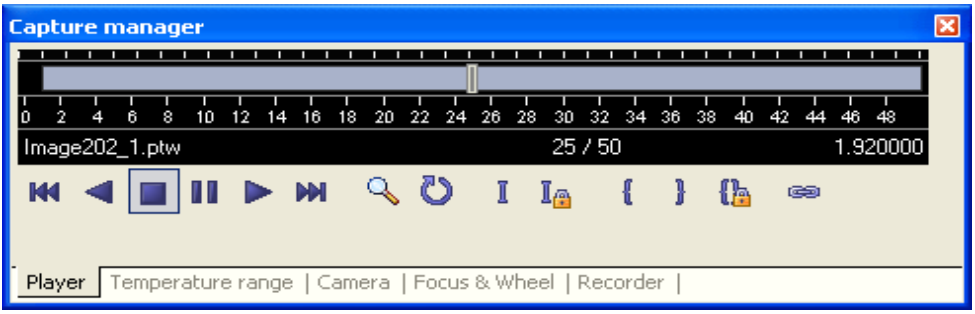
Record Click on the record button  to start acquisition. If no preparation was done, it will be performed when the Record button is pressed, delaying the actual start of acquisition by the preparation time.

Pause Click on the  button to pause during recording. While this button is pressed, no frames are recorded.

Stop Recording stops automatically when the set number of frames has been reached. It is however possible to (definitively) stop recording during acquisition by pressing the  button. If you choose the acquire to memory mode, the file is then transferred to the hard disk drive.

14. Playing a Film

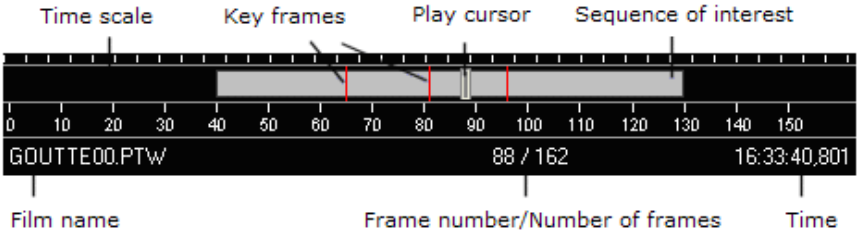
When you open the film to play, the "Player" tab in the control panel is automatically selected.



The control panel lets you play the film using standard VCR commands It also lets you select key frames and sequences of interest. It comprises two parts:

- A time view
- The toolbars

Note: Depending on the control panel position on-screen, these two parts can be superimposed or juxtaposed.



Refer to the Play commands

15. Film Display Parameters

The digital frame is made up of pixels whose value is linked to the digital value filmed by the camera, affected by the calibration trend and by the palette settings. It is therefore interesting to be able to use the palette adjustments to refine the display of significant frame components.

After first choosing the type of palette, you can change the scale using these three parameters:

- Low value
- High value
- Offset compared with the measurement scale

Adjust palette manually

You can shift the palette range opposite the value (numerical and temperature) scale: click and hold the left mouse button on the palette, then drag it vertically. This function is used to refine frame contrast over a given measurement range.

Choose low palette value

To choose the low palette value, two options are available:

- Using the left mouse button, enter the low limit for the graphic part of the palette, hold the button down and move the mouse vertically over the palette until the display shows the required value.
- Click on the low value displayed and enter the desired value from the keyboard.

Choose high palette value

To choose the high palette value, two options are available:

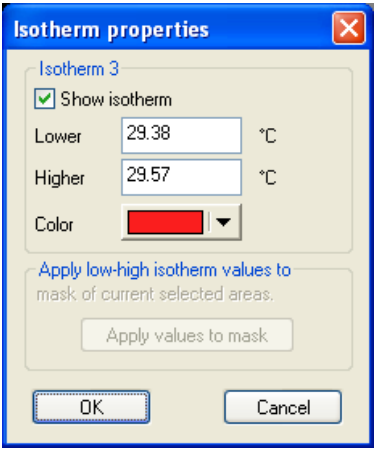
- Using the left mouse button, enter the high limit for the graphic part of the palette, hold the button down and move the mouse vertically over the palette until the display shows the required value.
- Click on the high value displayed and enter the

desired value from the keyboard.

Isotherms

You can display isotherms directly in the frame by proceeding in one of the ways described below:

- Click on an isotherm marker  located at the bottom of the palette. A marker appears in the palette. Enter the marker high and low limits to adjust it for the required temperature range. If necessary, move the marker along the palette.
- Click on an isotherm marker with the right mouse button and select "Properties". A dialog box opens so that you can directly choose the low and high limits as well as the color. Tick the "Show isotherm" box and click on **[OK]**.



Multiple report view layout

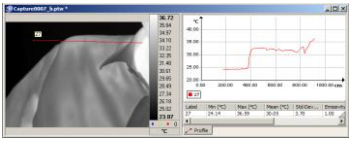
Click on the  button in the "Layout" toolbar to choose the way the elements appear in the multiple report view. The following menu is displayed:

Then choose the layout for the views by clicking on the options shown.

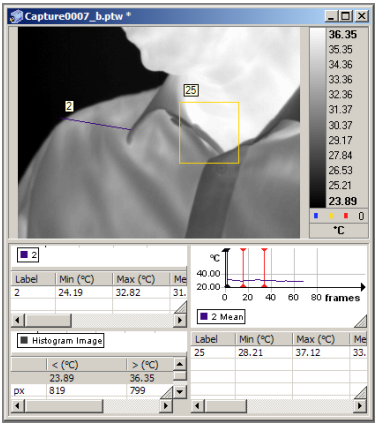
Note: the popup menu varies depending on the number of views displayed.

Toggle layout

Click on the  button to display the analysis window in multiple view or tab view format.



Tab view



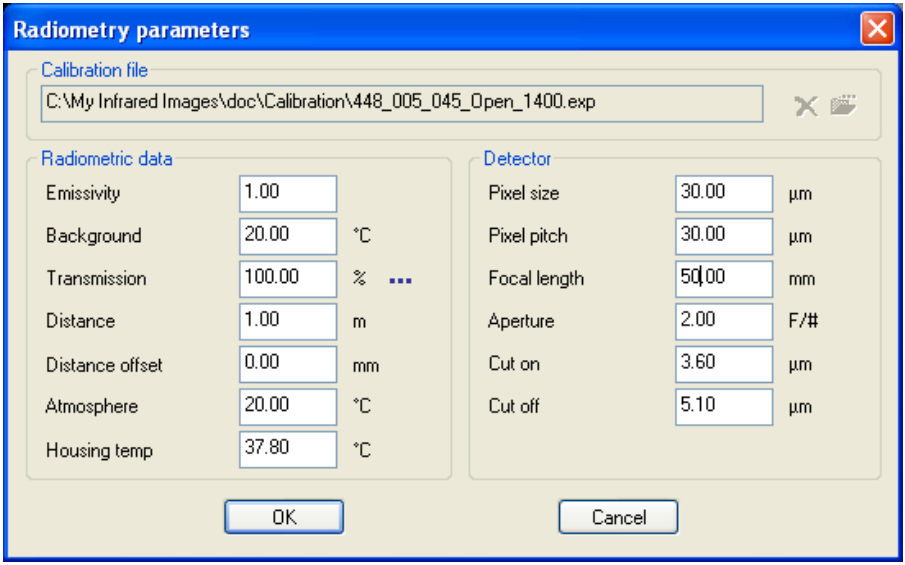
Multiple report view

For every element, you can toggle from the tab view to the multiple report view and back by double-clicking on the lower right hand corner of the element.

16. Radiometric Data

16.1. Adjusting radiometric parameters

Call up the Radiometric parameters dialog box by selecting the **Measurement>Radiometry** dialog box (or by pressing [**Ctrl**] + [**Shift**] + [**R**]).



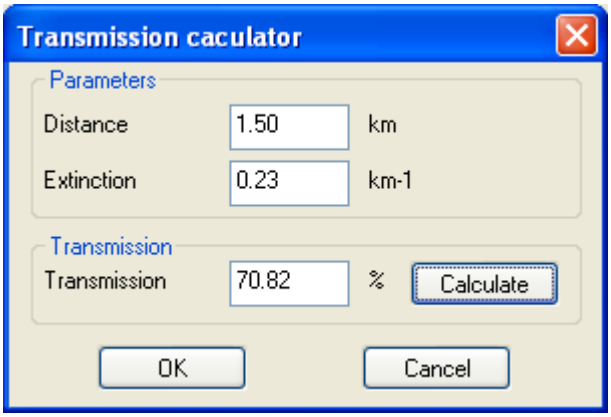
Calibration file Use the find button  to help you when specifying the access path to the calibration file linked to the recorded frame or the camera frame.

16.2. Radiometric data

Emissivity The object's emissivity value is used to calculate the temperature and the brightness. This value is applied by default to all of the frame's tools. It is however possible to assign each tool its own factor.

T. Environment Specify the ambient temperature level of the object's location. This is used for temperature and brightness calculations.

Transmission Object transmission factor (as a %). This parameter is used to calculate the temperature. You can directly enter the value or use the ▪▪▪ button to display the calculation box.



The calculation is based on object distance and extinction factor (Km^{-1}). The formula is:

$$\tau_{atm} = e^{(-d \times a)}$$

With

τ_{atm} the transmission factor (%)

d the object distance (Km)

a the extinction factor (Km-1).

Distance The distance is that which separates the object from the camera.

T. Atmospheric	The atmospheric temperature is used to calculate the object's temperature and brightness.
T. Camera	The camera's internal temperature is used to correct the effect of the camera's internal temperature on the sensor.

16.3. Detector related data

Pixel size	The basic pixel size (in µm), used for radiometry calculations.
Pixel gap	The gap between two adjacent pixels (in µm), used for distance and surface calculations.
Focal	The lens focal length (mm) used for the lens horizontal and vertical field and for distance and surface calculations.
Aperture	Lens aperture (F#) of the system.
Low cutoff	Low cutoff at 50% of transmission on the system wave length (µm), used to calculate the brightness.
High cutoff	High cutoff at 50% of transmission on the system wave length (µm), used to calculate the brightness.

16.4. Radiometric temperature equation

The radiometric temperature is calculated using the following formula:

$$Q = \tau_{atm} \cdot [\varepsilon \cdot f(T_{obj}) + (1-\varepsilon) \cdot f(T_{bkg})] + (1-\tau_{atm}) \cdot f(T_{atm})$$

With:

- Q the amount of radiation (DL)
- ε the emissivity [0 … 1]

- T_{obj} the object temperature (K)
- T_{bkg} the surrounding temperature (K)
- T_{atm} the ambient temperature (K)
- τ_{atm} the transmission factor [0 … 1]
- $f(x)$ the reverse calibration function (DL)

16.5. Radiometric brightness equation

The radiometric brightness level is calculated with the following formula

$$L = \int_{\lambda cuton}^{\lambda cutoff} Planck(\lambda,T)$$

With:

L the brightness

λ the wavelength

T the object temperature

$Planck(\lambda,T)$ Planck's law

16.6. Saving radiometric data

Radiometric data is saved at the same time as the frame.

It is however possible to change the radiometric parameters saved with the frame *afterwards*:

1- Open the frame file,

2- Open the radiometric parameters dialog box (**Measurements>Radiometry**) menu

3- Change the parameters

Click on the **OK** button.

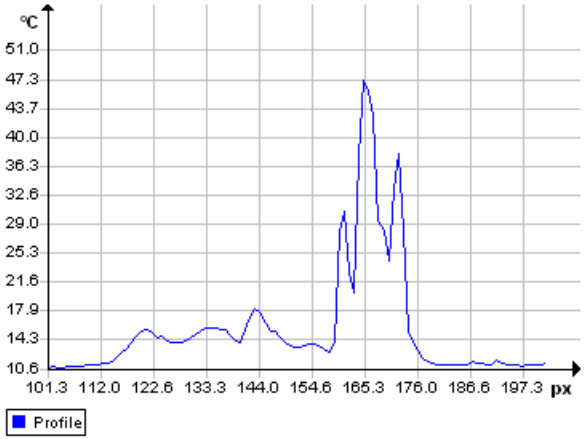
Save the frame (**File>Save frame** menu) to replace the radiometric parameters with your new choice.

17. Graphic Representation Configuration

This section describes the graphic representations linked to frame tools. To clarify this text, these graphic representations will be called "Graphs".

A graph can be displayed as soon as a tool is applied to the frame.

17.1. General presentation

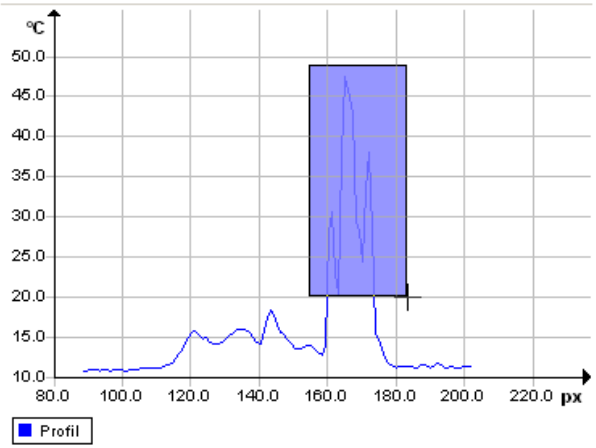


The graph uses the standard representation conventions: axes, grid, curves and keys. Every element in the graph has its own specific properties as described below:

17.2. Contextual menu

Use the right mouse button to display a contextual menu

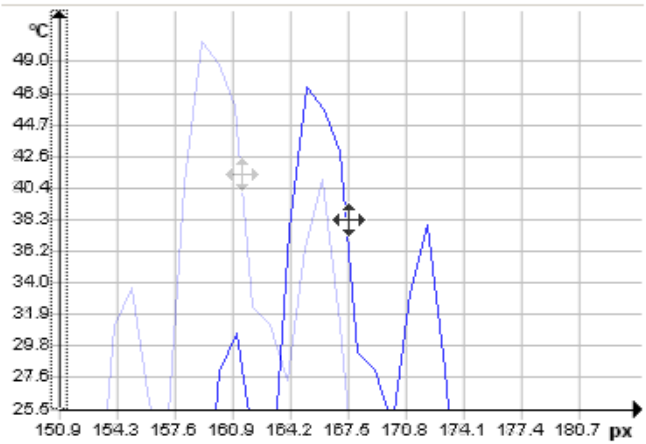
Zoom window Lets you zoom in on the graph. When this function is activated, the mouse cursor takes a crosshair shape. Click on the graph, hold the mouse button down and drag the mouse to define the zoom window. Release the mouse button to apply the zoom to the selection.



Zoom auto Resizes the contents of the graph so as to present all of the data (cancels the Zoom window and Panoramic functions).

Panoramic Use this function to move the graph window in relation to the curve. When this function is activated, the mouse cursor pointer changes to a crosshair pattern. Click and drag to move the window.

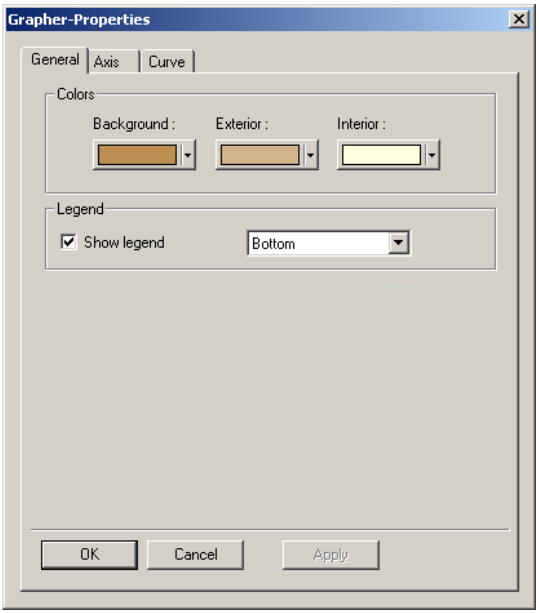
Use the Zoom auto function to return to the initial view.

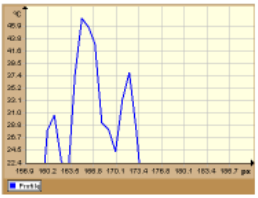


Properties Displays the properties for the selected part of the graph.

17.3. General properties

Double-click on the graph to open the "Grapher-Properties" dialog box and select the "General" tab. You can also use the right mouse button and select "Properties".





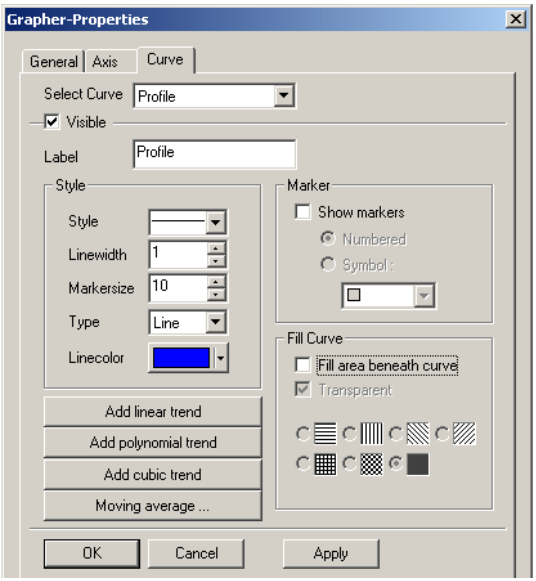
Colors Choose the colors to assign to the different graph areas (Background, Exterior and Interior of the graph).

Legend Tick box to show the legend and choose its location in the graph.

Use the **[Apply]** button for your choice to take effect.

17.4. Curve properties

Double-click on a curve to open the "Grapher-Properties" dialog box, "Curve" tab. You can also use the right mouse button and select "Properties".



Select Curve — Choose the curve that you want to change the properties of.

Visible — Untick this box to mask the curve. By default, all newly created curves are visible.

Label — You can change the label assigned to the curve. All alphanumeric characters are valid.

Style — You can choose the line style, its width, the marker size, the type of curve and its color.

Marker — Tick box to display the Markers. You can then define whether they are numbered or use a symbol.

Fill curve — Tick box to color the area beneath the curve.

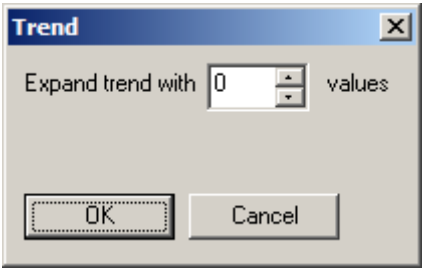
Choose the fill curve style and if necessary, tick

the "Transparent" box to allow the other graph elements to be displayed by transparency.

17.5. Specific curve handling

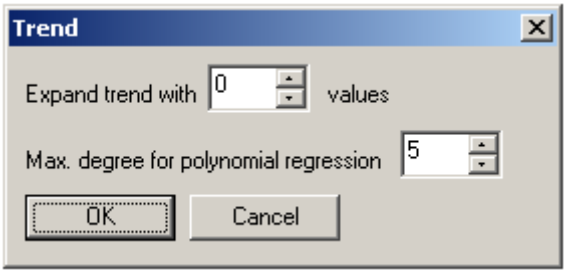
This function is used to assign specific handling to the curve.

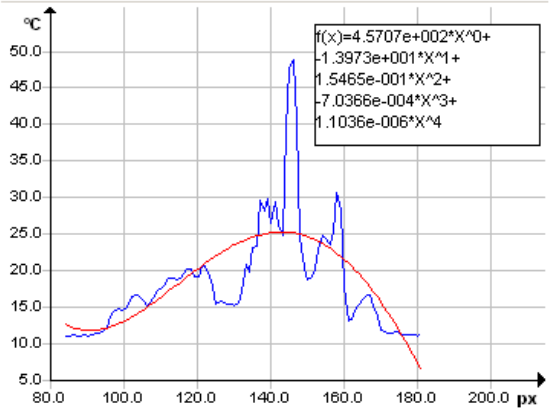
Linear trend Adds a linear trend curve to the graph.



Choose the number of values that the trend must be calculated on.

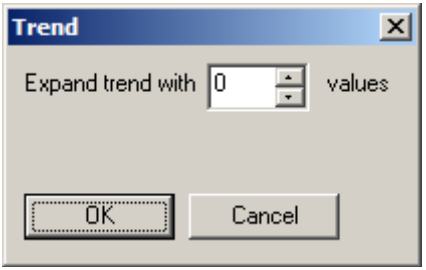
Polynomial trend Adds a polynomial trend to the curve. Select the polynomial trend curve using the button and click on **[OK]** to confirm.





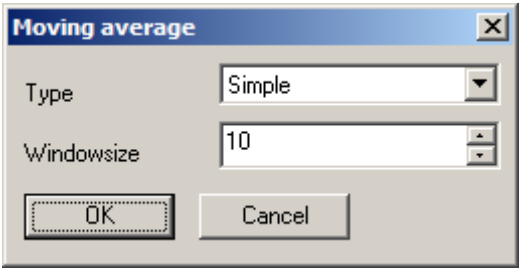
Cubic trend

Choose the number of values that the trend must be calculated on.



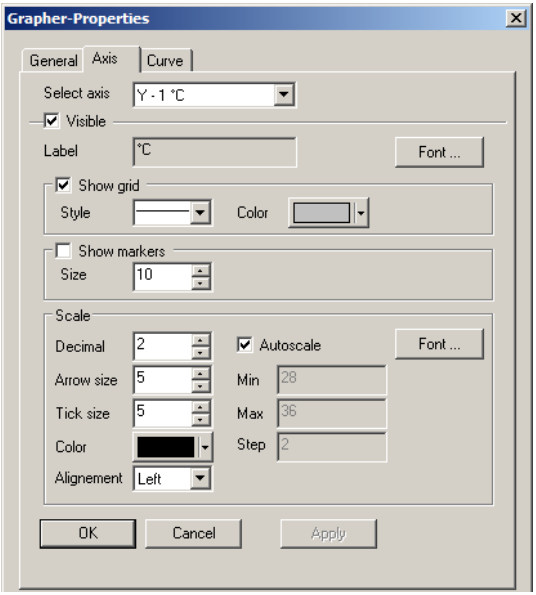
Moving average

You can calculate a moving average by clicking on the corresponding button. Choose the type of moving average (Simple, Linear, Exponential, Triangular, sinusoidal) and the number of samples.



17.6. Axis properties

Double-click on an axis to open its properties window or use the right mouse button and select "Properties". The following dialog box is displayed:



Select Axis Choose the axis that you want to change the properties of.

Visible Untick this box to mask the axis.

Font This button opens a new window for choosing the font and its attributes.

Show grid Untick this box to mask the axis grid.

Style Choose the axis grid style from the list.

Color Choose the axis grid color from the palette offered.

Show markers Tick this box to display the axis markers.

Size Choose the size of the axis markers.

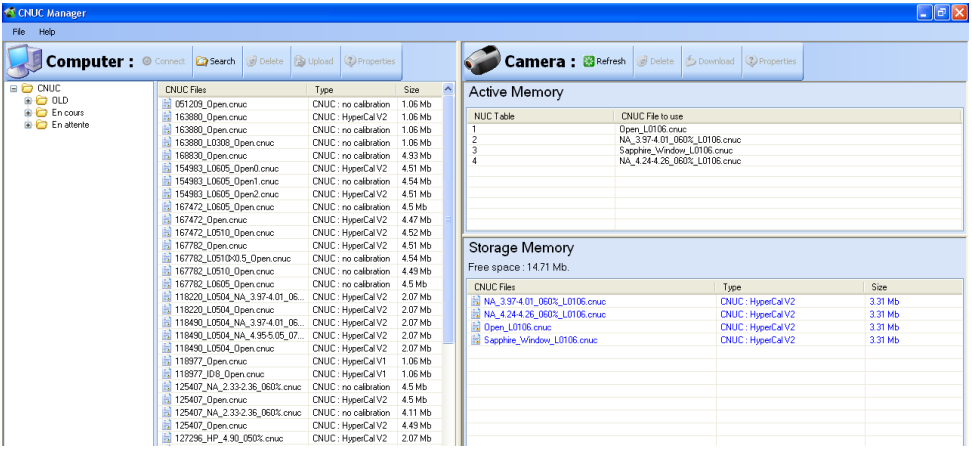
Scale	Choose the axis scale parameters (number of decimals, font, arrow size, tick size, color, alignment).
Autoscale	Tick this box to automatically scale the axis. Else, choose the min. and max. values to display as well as the scale step increment.

18. CNUC Manager

18.1. General Presentation

CNUC Manager is dedicated to manage and transfer CNUCs files from and to a camera. It can be accessed from Altair by clicking the  icon. CNUC manager can also be launched thru the Windows' Program Menu All Programs>Cedip Infrared Systems>Utilities>CNUC Manager.

The following interface is displayed.

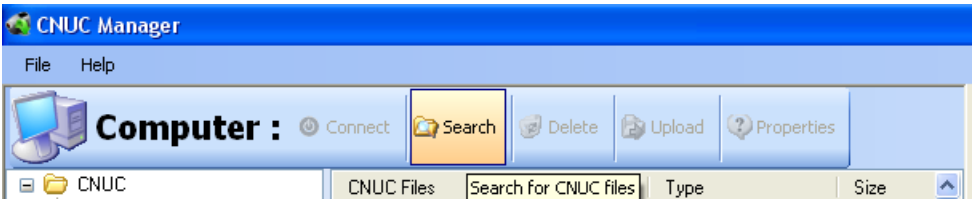


18.2. CNUC Management in computer

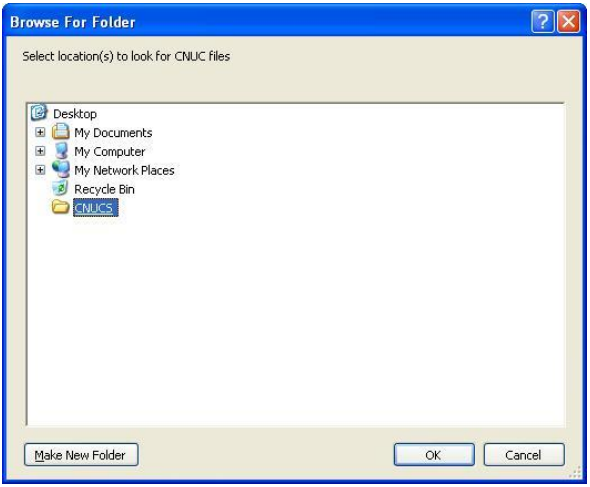
When it is first opened, CNUC Manager shows a file browser that will allow you to find CNUC files in your computer.

18.2.1. **Search for CNUC files**

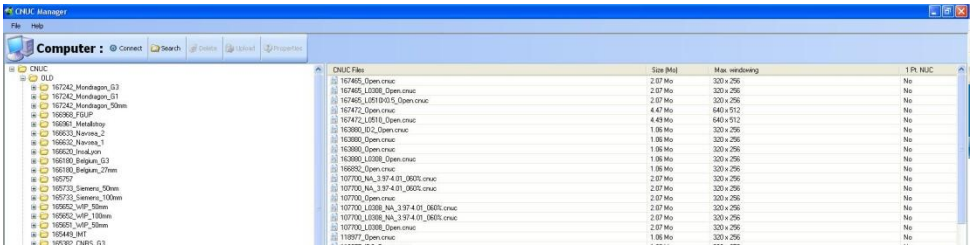
To browse one or more folders or drives for CNUC files, click on the **Search** button of the tool bar.



A dialog box prompts you to select the target folder.



The CNUC Manager will search this folder (and sub-folders) for CNUC files, with extension "**.cnuc**". When finished, the browser displays every CNUC file found.



The left panel below the tool bar is a tree view of the scanned folder and sub-folders (if any).

The right panel is a list in which a line represents a single CNUC file. The first column gives the name of the file, the second one the size (in Mo), the third shows the largest windowing of the CNUC and the last column tells if a one point NUC has been calculated.

Each CNUC file can be viewed in details, renamed, deleted and uploaded to the camera.

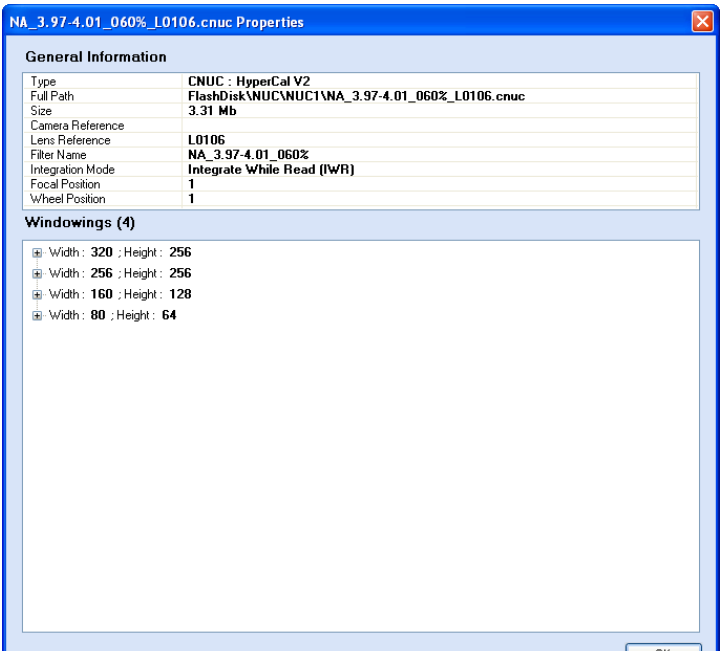
18.2.2. **View the details of a CNUC File**

You can view the details of each file such as windowing, calibrations, filter name or wheel position.

There is three ways to view the properties of a file:

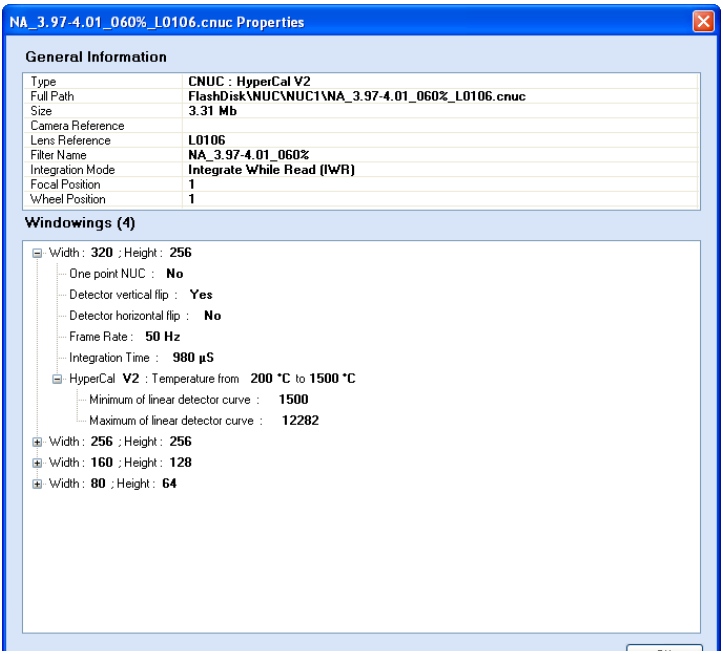
- Double-click on an item of the list;
- Select an item in the list then use the **Properties** button of the toolbar;
- Right-click on an item in the list then click on the **Properties** button of the contextual menu.

A popup window is displayed and shows the details of the CNUC:



18.2.3. **Windowing and calibration**

A tree view displays the windowing for this CNUC file. A click on the cross at the left of each windowing expands all information about it.



18.2.4. **Rename a CNUC File**

You can rename each CNUC files on your computer. To do it, either:

- Right click on the file to rename in the list, then click on the **Rename** button of the contextual menu;
- Or just left click on the file to rename while it is selected in the list, then type the new name for your file.

18.2.5. **Delete a CNUC File**

Select the file(s) to delete in the list, then either:

- Right click on the file to delete in the list, then click on the **Delete** button of the contextual menu;

- Or select the file to delete in the list then click on the **Delete** button of the tool bar.

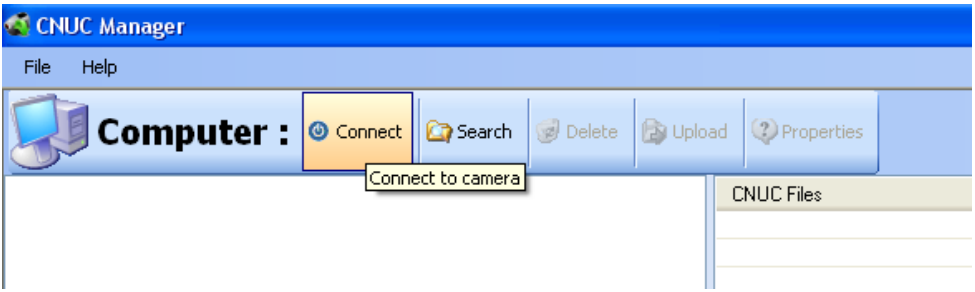
18.2.6. Upload a CNUC file in the camera

To upload a CNUC in the camera, you need to connect CNUC Manager to a camera (see §18.4.2)

18.3. Connect to a camera

18.3.1. Connection

To establish a connection with a camera, just click on the **Connect** button of the tool bar.



18.3.2. The camera panel

When connection is done, a new panel appears to the right side of the CNUC Manager window, which represents the camera.

This panel is split in two parts :

- The "active memory" : the CNUC files currently in use by the camera (see §18.6 Load a CNUC file in the Active Memory of the camera)
- The "storage memory" of the camera : The internal Flash disk where CNUC files are stored

18.4. Upload a CNUC file from PC to Camera

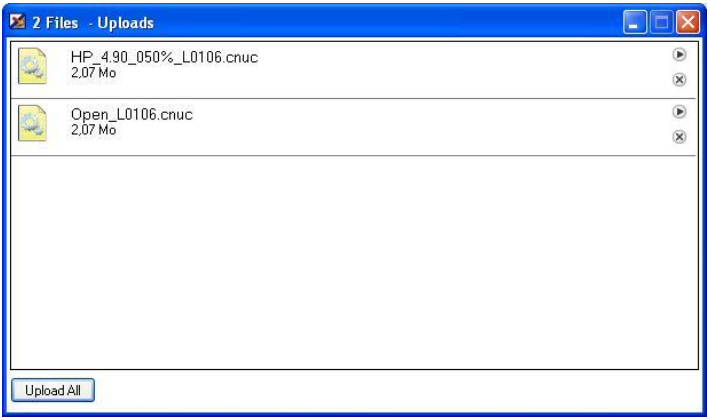
18.4.1. Select the CNUC file(s) to upload

Any file on your computer that has the ".cnuc" extension is visible with CNUC Manager. Just select in the list one or more files, then,

- Click on the **Upload** button in the tool bar ;
- Right-click on any selected item then click on the **Upload** button in the contextual menu.

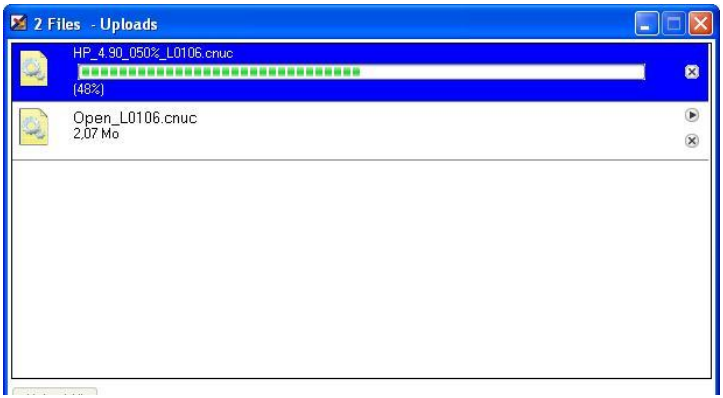
18.4.2. Upload CNUCs

Once the Upload button is clicked, the Upload manager opens as a modal window, which allows you to upload CNUC files one by one or as a batch.



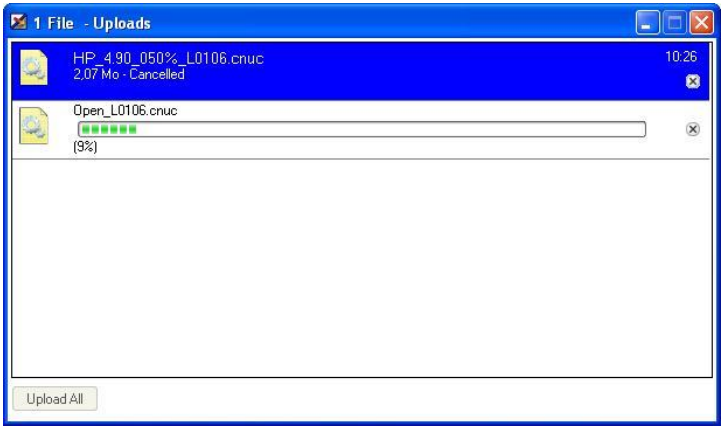
18.4.3. Upload a CNUC file

To upload a CNUC file, click on the **Start** button of the file to upload: . Upload will start **only if there's enough available memory** in the camera to store the CNUC. If not, every upload is cancelled.



18.4.4. **Cancel an upload**

To cancel an upload, click on the **Cancel** button of the uploading file: .



18.4.5. **Upload a batch of CNUC files**

To upload all the selected files in the upload manager, click on the **Upload All** button at the bottom left corner of the Upload manager.

18.5. Download a CNUC file from camera to PC

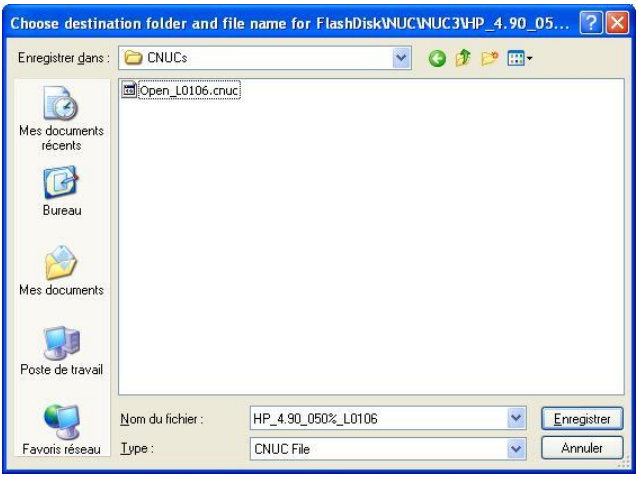
18.5.1. Select the CNUC file(s) to download

Select a CNUC in the storage memory of the camera, then,

- Click on the **Download** button in the tool bar:  ;
- Right-click and select the **Download** button in the contextual menu.

18.5.2. Choose a name and the destination folder

A folder browser opens and allows you to specify the file name and destination folder.

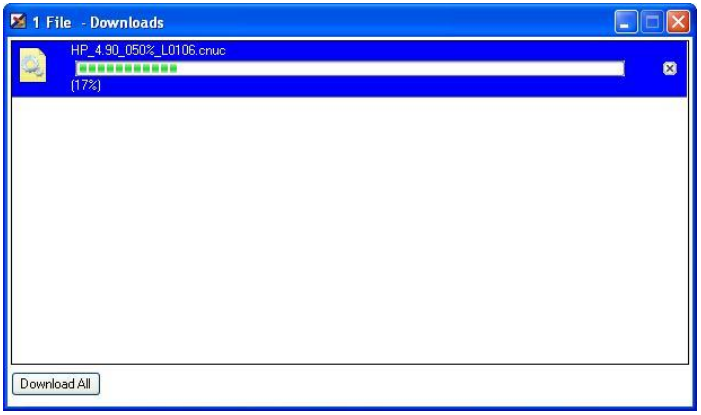


18.5.3. Start downloading the file

Once name and destination is chosen, the download manager pops up:

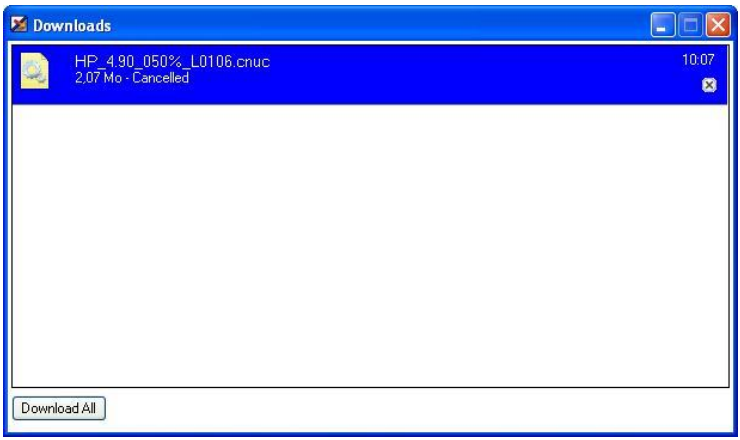
you can start downloading the file by clicking on the **Start** button of the download manager: .

While download is running, a progress bar shows the percentage of download's completion.



18.5.4. Cancel download

At any time, it's possible to cancel a download by clicking on the **Cancel** button of the Download manager: .

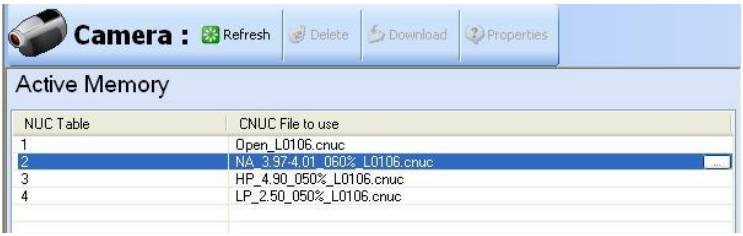


18.6. Load a CNUC file in the Active Memory of the camera

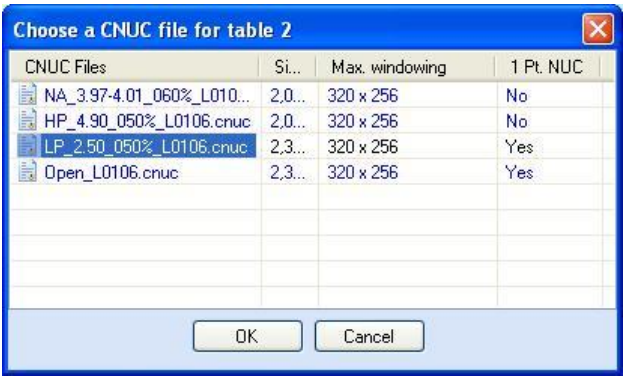
The active memory of the camera shows the NUC tables that can be applied on the image. The number of NUC tables depends on the camera configuration.

18.6.1. Link a CNUC file to a NUC table

Select a NUC table in the active memory view, then either double click an item, or click on the button at the right side of the selected item.

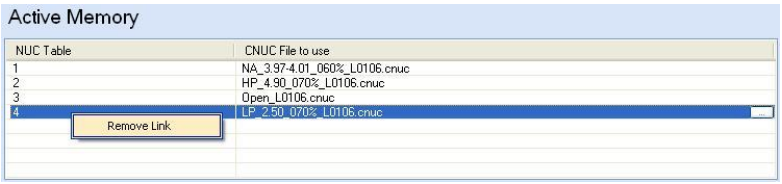


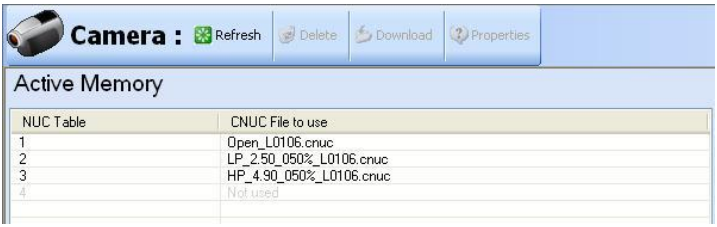
A new window pops up and displays all the CNUCs available in the storage memory of the camera. Select the desired CNUC and click **Ok**.



18.6.2. **Delete a link between a CNUC file and a NUC table**

Right click on a NUC table in the active memory view, then click on the **Remove Link** button of the contextual menu.





In the example above, the link with NUC table 4 has been removed.

18.7. Displaying CNUC Manager Preferences

The **File>Preferences** menu lets you display the preferences and change some of them.

18.7.1. Camera's auto connection

If this option is checked, CNUC Manager will try to establish a connection with a camera automatically at start-up.

If not, user will have to connect manually with a click on the **Connect** button of the tool bar. (see chap. 5)

18.7.2. Default PC's CNUC folder

If specified, the application will search for CNUC files in this folder at start-up.

18.8. Quitting CNUC Manager

To quit CNUC Manager, select the **File>Quit** menu.

19. Create A Custom Palette

To create your own palette you have to edit the "**Palette.ini**" file which can be found in Altair path.

Open it with a basic editor like notepad and implement your palette as describe just below:

A palette is defined by a name, color stages, and numbers of colors.

[Name]	Name of the palette between square brackets.
(Red, Green, Blue)	First stage color composed of the 3 primary colors between brackets.
(Red, Green, Blue)	Color stage 1
…	
(Red, Green, Blue)	Color stage n (You have a maximum of 20 color stages).
NBCOLORS=n	Number of color contained in the palette (256 is the maximum allowed).

Example:

[IronBow 256]

(0, 0, 0)

(0, 0, 255)

(255, 0, 0)

(255, 255, 0)

(255, 255, 255)

NBCOLORS=256

20. Quitting Altair

To quit Altair, call up the **File>Quit** menu. An alert window prompts you to save the modified files (frames, tools, averages, etc.).