ACETIAM Viewer Lite

User's Guide

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User License

IMPORTANT: Before using this software program, you should read the user license agreement. To access it, click in ACETIAM Viewer Lite **Help** menu on **View License Agreement**.

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Regulation

ACETIAM Viewer Lite MUST NOT be used for diagnostic purposes.

It is just a mean by which practioners save, handle, transfer, view and compare original data which have already been interpreted for making an appropriate diagnosis.

ACETIAM Viewer includes length, angle and density measurement tools.

The resulting measurements must be considered as for indication only.

Caution: Stored and viewed nuclear medicine images are viewed as DICOM standard images. Although ACETIAM warrants that images are stored and viewed in compliance with DICOM standard recommendations, the user should not consider that images viewed in ACETIAM Viewer Lite as reliable information as for the dispersion of pharmaceutical elements inside the patient's body.

Table of Contents

- **Introduction to ACETIAM Viewer Lite 1**
- **Starting and Stopping ACETIAM Viewer Lite 1**
- **Discovering ACETIAM Viewer Lite 2**
  - Viewing an Image Series 2
  - Displaying an Image Selection 4
- **ACETIAM Viewer Lite Main Features 5**
- **Tips 7**
- **Viewing Study Images 8**
  - Selecting a Display Layout 8
  - Browsing through a Study Series 9
  - Quick Browse Mode 10
  - Moving through a Series 10
  - Applying Presentation States to Images 10
    - Applying Presentation States to All the Images in a Series 11
    - Applying Presentation States to an Individual Image 11
- **Viewing Study Reports 12**
- **Manipulating Images 13**
  - Default Mouse Mode 13
  - Panning an Image 13
  - Magnify Mouse Mode 14
  - Inverting Colors in One or More Images 14
  - Flipping and Rotating One or More Images 14
  - Zooms 15
  - Adding Graphical Annotations on Images 15
    - Removing Annotations from Images 17
  - Displaying Information on Images 18
  - Windowing 18
    - Interactive Windowing 18
    - Region-of-Interest Windowing 19
    - Automatic Windowing 20
  - Displaying the Density on a CT Image 20
  - Multi-Series Mode 21
    - Multi-Series and Reference Lines 21
    - Multi-Series and Synchronization 22
- **Viewing Multiframe Images 23**
  - Playing a Frame Selection 24
  - Playing Multiframe Images in Back-and-Forth Mode 24
  - Adjusting the Playback Speed 24
- **Viewing an Image Series in Cine Mode 25**
  - Browsing a Series Images 25
  - Loading Images Included in a Selection 25

- **Applying Multiplanar Reconstructions (MPR) to Study Images 26**
  Configuring the Available Memory Usage for the Multiplanar Reconstruction Module 27
  Starting the Multiplanar Reconstruction Module.....27
  Changing Reference Views 28
  Applying a Translation 28
  Applying a Rotation 29
  Image Windowing 29
- **Printing Images 30**
  Printing Displayed Images 30
  Printing Images through the Film Composer 30
- **Copying Study Images to a Directory or Windows Clipboard 33**
  Copying Images to a Directory 33
  Copying an Image to Windows Clipboard 34
- **Exporting Still and Multiframe Images 35**
  Exporting a Still Image.....35
  Exporting Multiframe Images 35
- **Customizing ACETIAM Viewer Lite 37**
  Customizing Mouse Actions.....37
  Specifying the Drive to Browse for CDs/DVDs 37
  Customizing ACETIAM Viewer Lite Color Theme 37
  Setting a Maximum Size for Image Previews.....38
  Customizing Series Display Layout.....38
  Viewing MPEG Multiframe Images in VLC Media Player 39
  De-interlacing MPEG Multiframe Images.....39
  Customizing Text Overlays Displayed on Images 39
  Customizing Windowing 40
    Defining Custom Windowing Presets 40
  Configuring How to Use the Computer Memory when Loading Large Image Series.....41
  Defining Default Print Settings 43
- **Index 45**

Introduction to ACETIAM Viewer Lite

ACETIAM Viewer Lite is designed to view medical study images in DICOM (*Digital Imaging and Communications in Medicine*) format, the international standard used in medical imaging. ACETIAM Viewer Lite also enables to view reports and presentation states linked to study images. The viewer allows you to view images in various display modes, in various angles, to display distances, to apply various windowing settings to images... ACETIAM Viewer Lite also features a special module for image multiplanar reconstruction (MPR). You can also print images with the layout you want.

Starting and Stopping ACETIAM Viewer Lite

Just insert your study CD/DVD into the CD/DVD drive, and the ACETIAM Viewer Lite viewer will start automatically.

However, if ACETIAM Viewer Lite does not start after a few seconds, start it manually by doing the following:

1. Click Windows **Start** menu, point **Programs**, **Accessories**, and click **Windows Explorer**.
2. In Windows Explorer, click the letter for the CD drive, and double-click **Dcmltbox.exe** in the ACETIAM Viewer Lite CD directory.
3. To stop ACETIAM Viewer Lite, do one of the following:
   - In the **Application** menu, click **Exit**.

   -or-

   - In the control panel located on the right side or at the bottom of ACETIAM Viewer Lite screen, click the **Exit** button:

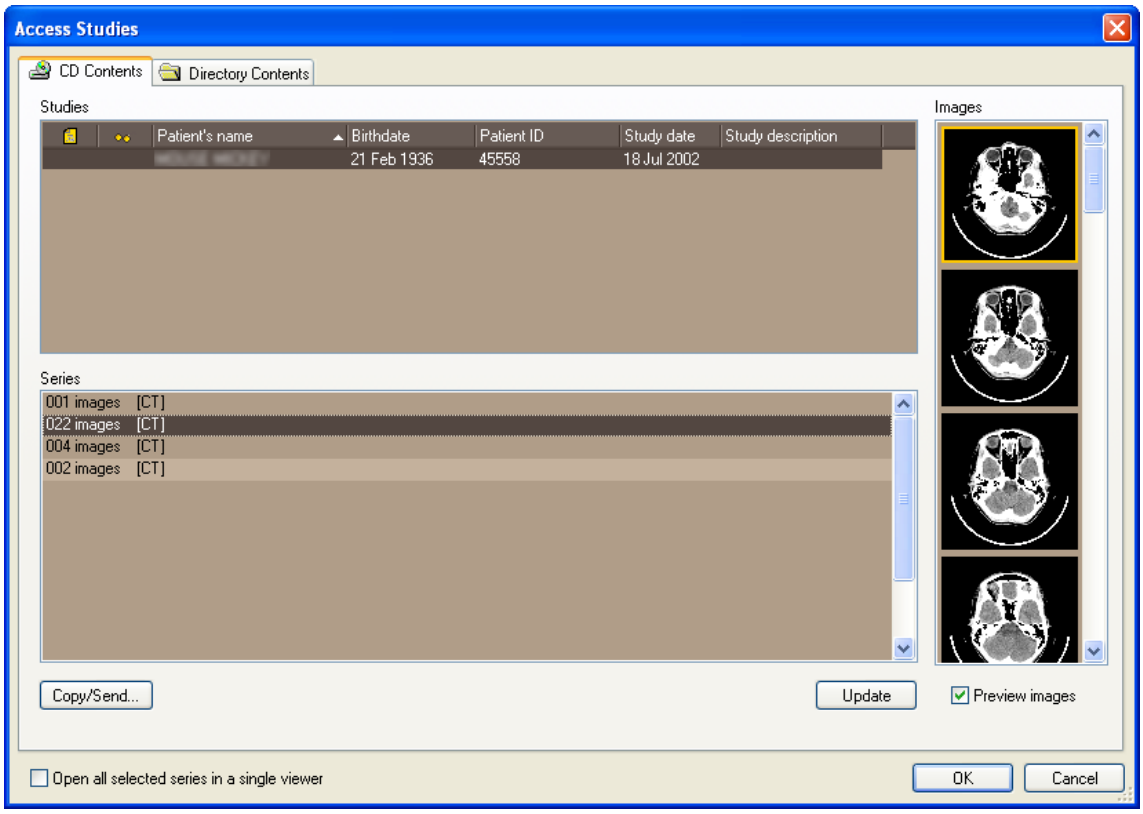
Discovering ACETIAM Viewer Lite

In this section, you will learn how to make your first steps in ACETIAM Viewer Lite.

First, it is important to remind that a study is made of one or more series, and each series contains one or more images.

Viewing an Image Series

When you insert a study CD into the CD/DVD drive, it brings you to the **Access Studies** dialog box shown below automatically:



In this example, the CD contains one study made up of four series that include 1, 22, 4 and 2 images respectively. In the **Images** section, the images included in the selected series are displayed as thumbnails. You can use the scroll box on the right side to browse the thumbnails. Thumbnails are displayed only if you select the **Preview images** checkbox.

Note: You can configure ACETIAM Viewer Lite so it does not display thumbnails for images larger than 1,024×1,024 pixels for example. This avoids slowing down your computer. To configure image previews, click **Settings** in the **Application** menu. In the **Miscellaneous** page of the **Settings** window, select the **Never preview images larger than** checkbox and the maximum size for images you want to preview, and then click **OK**.

- **To select an image series to view from a CD/DVD:**

  1. Insert an image CD/DVD into the ACETIAM Viewer Lite client CD/DVD drive.
  2. In the **Access Studies** dialog box, click the **CD Contents** tab.
  3. Select a study in the **Studies** section, and the image series you want to view in the **Series** section, and then click **OK**, or simply right-click the series you want, and click **Open Series**.

  Note: By default, ACETIAM Viewer Lite searches the first drive it founds for CDs/DVDs. You can specify another drive by selecting it on the **Miscellaneous** page in the **Settings** window.

- **To select an image series to view from a directory:**

  1. In the **Access Studies** dialog box, click the **Directory Contents** tab.
  2. To select the directory that stores the images you want to display, click the button, select the directory in the Select Directory dialog box, and then click OK.
  3. Select a study in the **Studies** section, and the image series you want in the **Series** section, and then click **OK**, or directly right-click the series you want, and click **Open Series**.

- **To open several image series simultaneously (multi-series mode):**

  You can open up to four series simultaneously.

  1. In the **Access Studies** dialog box, select the series you want while holding the **CTRL** or **SHIFT** keys down.
  2. If you want to display all the selected series in the same viewer, select the Open all selected series in a single viewer checkbox. This feature is very useful for some modalities (e.g. ophthalmology, conventional radiology), which produce series made up of one image only.

  Note: If you want to enable this feature by default at ACETIAM Viewer Lite startup, click **Settings** in the **Application** menu. In the **Miscellaneous** page of the **Settings** window, select the **Select the "Open all selected series in a single viewer" checkbox by default**, and then click **OK**.

  3. Click **OK**.

Note: From the image display area you can open additional series: To select a series to open in a separate viewer, click beside the **Access Studies** button.

Displaying an Image Selection

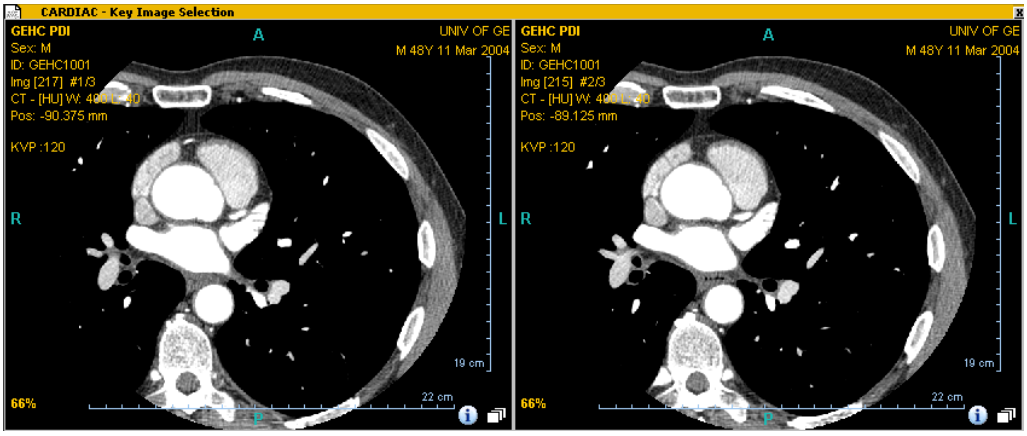
In ACETIAM Viewer Lite, you can also view images from studies and grouped into selections called "key image selections". You can view as well the entire series where selected images come from.

1. On one of the **Access Studies** dialog box tabs, click the study that contains the selection you want to view. The **Series** section looks as shown below:

An image selection is shown as a dedicated series in the **Series** section. All the series contained in the study are listed under **KEY IMAGE SELECTION**.

And the key image selections are shown as follows in the **Images** section:

2. To display the images in the selection, double-click **KEY IMAGE SELECTION** or the thumbnail for the selection in the **Images** section. The images in the selection look as shown below:



3. To determine the name of the person who created the selection, and view the selection description he might have typed, click the icon.

4. If you want to view the entire series where the current image comes from, click the icon. The series displays in a separate viewer beside the selection.

ACETIAM Viewer Lite Main Features

You can access most of the features provided in ACETIAM Viewer Lite through the control panel displayed on the right side of the application by default. You can toggle the control panel between the bottom part and the right side of the screen by clicking **Toggle Control Panel Location** in the **Workspace** menu, or pressing **CTRL+B**. You can also hide the control panel to enlarge the display area by clicking **Show Control Panel** in the **Workspace** menu, or pressing the **ESC** key.

Click this Button	To
	Enable the default mouse mode.
	Pan an image.
	Zoom an image in or out interactively.
	Scroll through images quickly.
	Adjust an image windowing or brightness/contrast.
	Magnify a portion of an image.
             	Access annotation tools. Show a position. Show a distance. Show an angle. Show an angle with disjoint lines. Show an ellipse or a circle. Show a rectangle. Show a free-form region of interest.
	Open, copy, send and receive studies.
	Display the previous or next image series.

Click this Button	To
	Display a series browser for selecting a series to display.
	Display the previous or next image, or image page.
	Select the number of images you want to display per viewer.
	Select a preset windowing setting.
	Display images in their original state.
	Apply to the current series images the associated presentation state (windowing, zoom, annotations…).
	Display the reports linked to the current study.
	Apply multiplanar reconstruction (MPR) to a series of tomography images.
	View an image series in cine mode or define an image selection in a series.
	Make an image fit the display area.
	Enlarge an image.
	Display the image in full resolution (one image pixel for one screen pixel).
	Shrink an image.
	Show or hide patient information on all displayed images.
	Show or hide a reference line to locate an image relative to other images.
	Show or hide Hounsfield pixel density in a scanner (CT) image.
	Synchronize several series on slice location.

Click this Button	To
	Print images to a Windows printer through the Film Composer.
	Show tips on using ACETIAM Viewer Lite.
	Exit ACETIAM Viewer Lite.

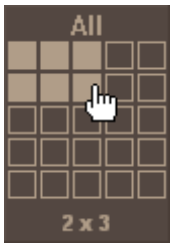
Tips

Tips created to help you use ACETIAM Viewer Lite in the best conditions unfold in the control panel under an icon depicting a rabbit. You can also go from one tip to the next manually by clicking the rabbit. If you want to hide the tips, click **Show ACETIAM Viewer Lite Tips** in the **Workspace** menu, or press **CTRL+T**. To show the tips again, do the same operation.

Viewing Study Images

Selecting a Display Layout

To select the layout you want, click the **Select Display Layout** button, and drag the mouse pointer on the grid to select a layout.



You can easily switch from multi-window display to 1x1 layout by double-clicking the image you want to display by itself. To switch back to the original multi-window display, double-click the image again. This feature is also available in multi-series mode, and applies to all the displayed series.

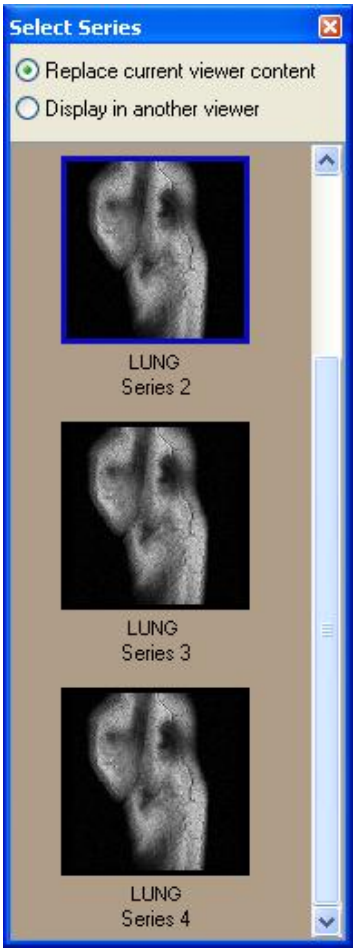
Note: In multi-series mode, you can use different layouts for each viewer. If you want to use the same layout for all the open viewers, click an image in the viewer with the layout you want, and then click **Apply Same Display Layout to All Series** in the **Series** menu. To return to an independent display mode for each viewer, repeat this procedure.

Note: A default display layout is defined for each modality (scanner [CT], MRI [MR]…). You can easily change it by setting the current layout as the default layout. To do this, click **Set Current Layout as Default for this Modality** in the **Series** menu. This is equivalent to modifying layout settings manually in the **Layout Presets** page of the **Settings** window.

Browsing through a Study Series

You can easily switch from one series to another by clicking the **Previous Series** or **Next Series** buttons:

ACETIAM Viewer Lite also features a series browser where each series is displayed as a thumbnail. This enables to quickly find the series you want without scrolling through series. To open the series browser, click the following button:



Quick Browse Mode

You can browse images quickly like in a stack.

Click the **Browse Images** button:

Then hold the left mouse button down and drag the mouse as follows:

- Upward on the image to browse images in descending order.
- Downward on the image to browse images in ascending order.

Note: You can also scroll through images in a series using the mouse wheel (to scroll five times more quickly, press and hold the **SHIFT** key down).

You can also browse images automatically in cine mode. For more information, please see the "Viewing an Image Series in Cine Mode" section on page 25.

Moving through a Series

On the top of each series viewer, there is a blue (or orange in an image selection) bar. You can move through a series rapidly by clicking this bar. For example, this can very useful in a series that is currently loading. You do not have to wait until the series is fully loaded to display images located at the end of the series.

Applying Presentation States to Images

The icon is shown in the **Access Studies** dialog box to identify the studies that contain presentation states.

Presentation states are visual modifications made to original images in order to highlight specific elements. Modifications include:

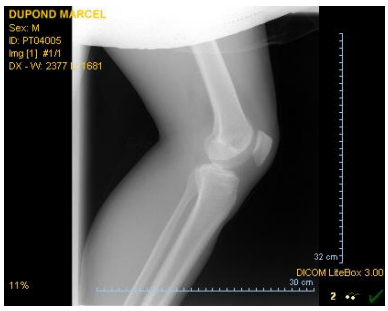
- Windowing
- Zoom in and out
- Image panning
- Annotations (text, circle, rectangle, angle…)
- Shutters to highlight elements

A single presentation state can include more than one of the listed elements.

In ACETIAM Viewer Lite, you can view studies including presentation states. One or more presentations can be associated with all the images in a study or only to some of them.

When you open a study including presentation states, ACETIAM Viewer Lite displays original images. You then choose to apply the associated presentation state(s).

The following example shows an image with and without its two associated presentation states:



Original image without a presentation state

Image with presentation state 1 (image with video inversion and shutter)

Image with presentation state 2 (image zoomed-in with video inversion)

Applying Presentation States to All the Images in a Series

Presentation states can be associated with one or more images in a series. To display available presentation states on appropriate images, click the **Apply Current Presentation to Images** button in the control panel:

Note: If several presentation states are associated with an image, the first presentation state is displayed.

Applying Presentation States to an Individual Image

To apply a presentation state associated with an image, click the icon in the bottom right corner of the image, and then click **Apply Presentation *X*** (where ***X*** is the number of the presentation state you want to apply).

Note: The number of presentation states associated with the image is shown on the left of the icon.

To cancel the presentation state applied to an image and restore the original image, click the icon, and then click in the control panel.

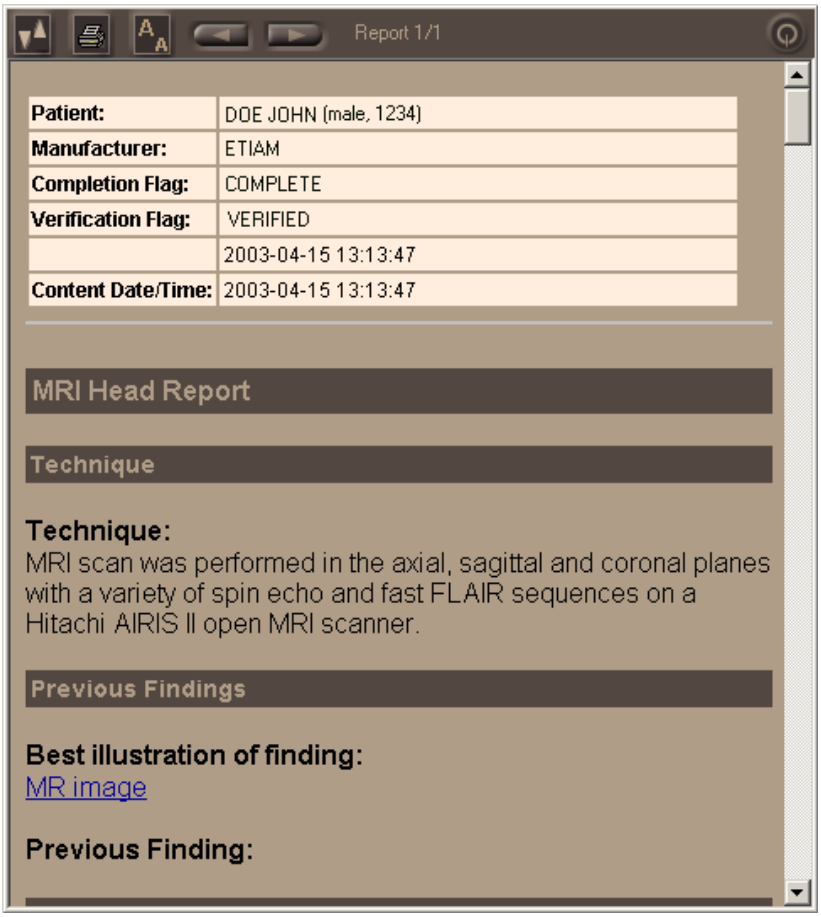
Viewing Study Reports

ACETIAM Viewer Lite enables you to display image series and also study reports linked to series.

When a study contains at least one report, an icon is displayed in the column of the **Access Studies** dialog box. This icon is also visible in the title bar of the displayed study. To display the report(s) in the current study, click the icon or simply click the **Display Study Reports** button:

Note: You can also list reports in the **Series** section by selecting the **View hidden series** checkbox.

The report window appears:



Note: The report above is shown as an example only. All the reports you will view will not have the same layout and structure because ACETIAM Viewer Lite displays reports in their original layout.

Manipulating Images

You can perform basic manipulations on images using the buttons provided in the Left mouse button section of the control panel:

You can customize the default actions associated with the mouse buttons to address your specific needs. For more information, please see the "Customizing Mouse Actions" section on page 37.

Default Mouse Mode

The default mouse mode enables to select images, measure densities, drag and drop images onto the Film Composer for printing, etc.

To restore the default mouse mode, click the **Select** button:

Panning an Image

You can move an image inside the display area. This command is very useful for images too large to fit ACETIAM Viewer Lite display area.

1. Click the **Pan** button:

2. Click an image and hold down the left mouse button, and then drag the mouse to pan the image.

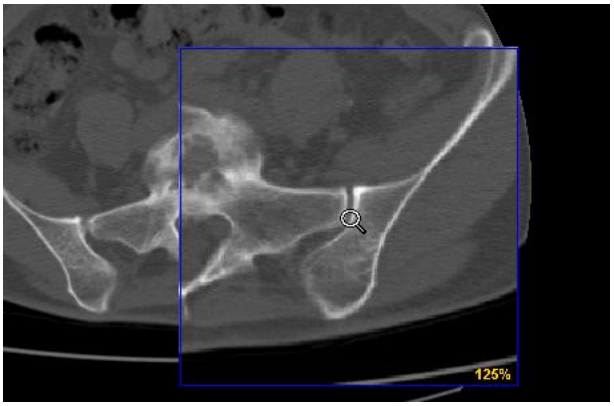
Note: You can also press the **SHIFT** key and the left mouse button simultaneously while dragging the mouse.

Magnify Mouse Mode

You can enlarge a portion of an image using the Magnify mouse mode.

1. Click the **Magnify** button:

2. On the image point the location you want to magnify, and press and hold the left mouse button down. You can move the magnify effect by dragging the mouse on the image. You can also change the default magnify factor (200%) using the mouse wheel.



Inverting Colors in One or More Images

You can invert image colors to bring out some elements by doing the following:

In the **Image** or **Series** menu, click **Invert Colors**.

Note: When inverting colors in an Enchanced scanner (CTe) and MRI (MRe) series, it applies to all the images in the series.

Flipping and Rotating One or More Images

You can access the flipping and rotating commands through the **Image** or **Series** menus.

Note: When flipping or rotating an image in an Enchanced scanner (CTe) and MRI (MRe) series, all the images in the series are flipped or rotated.

Zooms

You can apply various zooms to images. To do so, use the following buttons:

To enlarge the image to fit the display area size, click the **Fit to Window Size** button.

To display images entirely whatever the size of their display areas, double-click the **Fit to Window Size** button. A yellow lock appears on the button.
To cancel, click this button again.

> **Note:** You can customize this option on per-modality basis. Please see the "Customizing Series Display Layout" section on page 38.

To enlarge the image by increments, click the **Zoom In** button.

To restore the image original size, click the **No Zoom** button.

To shrink the image by increments, click the **Zoom Out** button.

You can also zoom images interactively. To do this, press and hold down the middle (or the wheel) mouse button or click the button, and then drag the mouse vertically.

Adding Graphical Annotations on Images

The annotation tools available in ACETIAM Viewer Lite are grouped in a window you can access by clicking the following button:

You can choose a pen size and a color for your annotations and also fill in with the selected color ellipse, rectangle and region annotations, for example, to hide the patient's demographics in order to anonymize the study. You can also specify a text size for labels and change them to bold face.

You can share an annotation with several images in the current series. To do this, select the annotation you want to replicate, click on the right of the button, select a command, and then click the button. If you edit (the shape, type, color, etc.) or move an annotation shared by several images, the changes will be replicated to all the instances of the annotation.

> **Note:** Before editing or moving an annotation, click it and ensure that the edit mode is enabled:

ACETIAM Viewer Lite suggests a default label for each annotation you draw. You can edit it by entering the text you want in the **Label** field. If you want to restore a default label you have modified,

select the annotation, and then click the button.

The following table explains how to add the different types of annotations:

Annotation	Button	Drawing	Label
Position		1. Select a type of marker from the **Type** list: 2. Position the mouse pointer at the position you want to indicate, and press the left mouse button.	Value displayed in pixels or density depending on the image type and the relevance.
Distance		1. Select a type of line from the **Type** list: 2. Position the mouse pointer at the starting point of the distance you want to display, and press and hold down the left mouse button. 3. Drag the mouse on the image (the distance displays as you move the mouse) to the end point of the distance.	Distance displayed in millimeters if the information needed is available in the image.
Angle		1. Position the mouse pointer at the top of the angle. 2. Press and hold down the left mouse button, and drag the mouse to the end of the first side of the angle, and then release the left mouse button. 3. Drag the mouse on the image (the angle displays as you move the mouse) to the end of the second side of the angle, and press the left mouse button.	Angles (acute and obtuse) displayed in degrees.
Angle with disjoint lines			
Ellipse		1. Position the mouse pointer at the top left of the ellipse you want to draw. (If you want to draw a circle, press and hold down the **CTRL** key, and then release the left mouse button before the **CTRL** key.) 2. Press and hold down the left mouse button, and drag the mouse to the bottom right of the ellipse, and then release the left mouse button.	Surface of the ellipse displayed in cm^2; the density is also displayed if appropriate.
Rectangle		1. Position the mouse pointer at the top left of the rectangle you want to draw. 2. Press and hold down the left mouse button, and drag the mouse to the bottom right of the rectangle, and then release the left mouse button.	Surface of the rectangle displayed in cm^2; the CT density is also displayed if appropriate.

Annotation	Button	Drawing	Label
Region of interest		1. Position the pointer where you want to start drawing the region, and press and hold down the left mouse button. 2. Drag the mouse, and release the mouse button to end the first segment. 3. Drag the mouse again to continue drawing the region. Click the left mouse button to end a segment. Repeat this step as needed, and then double-click to complete the region.	Surface of the region displayed in cm^2.

Note: When you add an ellipse, rectangle or region annotation on scanner images (CT), ACETIAM Viewer Lite also shows the standard deviation (SD) in the label.

Removing Annotations from Images

You can display an annotation on several images. You can also remove a single annotation from several images at once. To do this, select the annotation you want to remove, click on the right of the button, select the appropriate command, and then click the button.

To remove the selected annotation, simply press the **DEL** key.

To remove all the annotations from a series, click in the **Series** menu on **Remove All Series Annotations**.

Displaying Information on Images

By default, patient information and details on images are displayed in orange on each image. To hide this information and view images more clearly, especially if they are small in size, click the **Show/Hide Patient Information** button:

Letters are displayed on images to show the patient's orientation when the information is available in images.

These letters are the following:

R Right side.

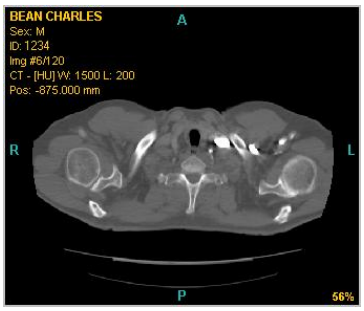
L Left side.

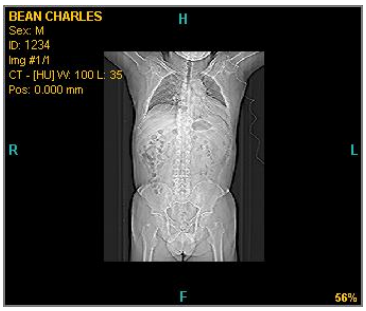
A Front (Anterior).

P Back (Posterior).

H Top (Head).

F Bottom (Feet).





Note: You can display additional information on images you view in ACETIAM Viewer Lite, such as the name of the institution that produced studies, the patients' weight, their birthdate... For more information, please see the "Customizing Text Overlays Displayed on ImagesViewing MPEG Multiframe Images in VLC Media Player" section on page 40.

Windowing

Windowing enables to bring out some elements in grayscale images.

Interactive Windowing

You can apply windowing manually.

Various windowing values are applied depending on the type of images:

- **Scanner:** Hounsfield units displayed in the following format: **[HU] W: *xxx* L: *yyy***.
- **Gray levels (other than scanner images):** Gray-level values displayed in the following format: **W: *xxx* L: *yyy***.
- **Color:** Brightness and contrast values displayed in the following format: **B: *xxx* / C: *yyy***.

1. Click the **Windowing** button:

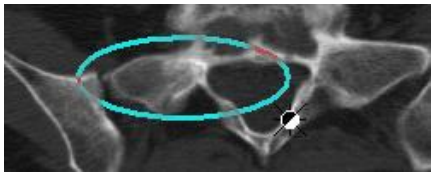
2. Click an image and hold the left mouse button down, and then drag the mouse as follows:
    - Vertically on the image to change the windowing central point.
    - Horizontally to change the windowing width.

Note: The changes you make to the current image are replicated to all the images in the current series when you release the mouse button. If you want to window images individually, in the **Windowing** page of the **Settings** window deselect the **Apply windowing to all images in current series by default** checkbox.

Region-of-Interest Windowing

You can delimit a region on an image and then get the appropriate windowing for that region automatically.

1. Click the **Windowing** button.
2. Press and hold the **CTRL** key down, press and hold down the left mouse button, and then drag the mouse to delimit the region you want. After delimiting the region, release the mouse button. The appropriate windowing is applied automatically based on the selected region.



Automatic Windowing

To apply windowing to displayed images, click the **Windowing Presets** button, and select a windowing setting from the list.

The following windowing settings are available:

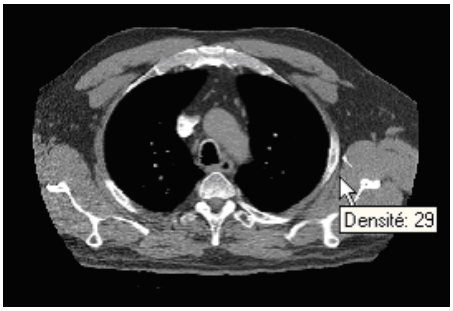
Presets	Description
File Presets	Applies the windowing information contained in images.
Default	Windowing setting calculated from the minimum and maximum grayscale values of the image.
Brain Abdomen Pelvis Mediastinum Bone Lung Vertebrae	Available for computed tomography (CT) images only.

You can also define your own windowing presets on a per-modality basis. They will then be available in the **Windowing Presets** button menu. For more information, please see the "Defining Custom Windowing Presets" section on page 40.

Displaying the Density on a CT Image

1. In Select mouse mode, click the **Show/Hide Density for CT Images** button:

2. Drag the mouse on the image to display the pointed pixel density value. The values are shown in Hounsfield units.



Note: The displayed density value is smoothed with close values (left-right, top-bottom).

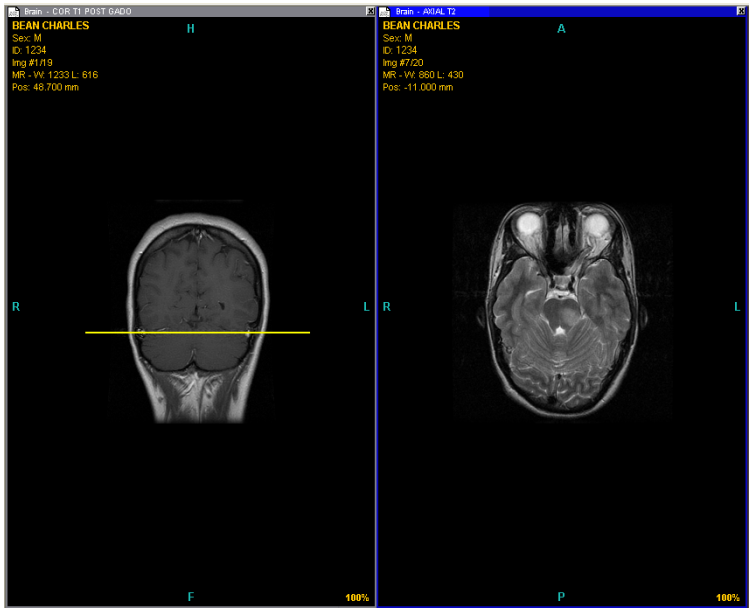
Multi-Series and Reference Lines

Reference lines are used to locate a slice in another slice.

The **Show/Hide Reference Lines** command can be used only when at least two series from the same study are displayed, and ACETIAM Viewer Lite can find relative locations in images.

1. Open at least two series from the same study.
2. Click the **Show/Hide Reference Lines** button:

3. Click an image to see its location in another image.



Note: Reference lines are slice projections. This is why they can appear as rectangles or parallelepipeds on images.

Multi-Series and Synchronization

You can use synchronization for example to compare two series with and without injected contrast product, or to compare a single series with two different windowing settings.

Automatic Synchronization

Automatic synchronization using slice location can be used only in a study series with the same orientation, and that contain slice location information.

1. Open at least two series from the same study.
2. Click the **Synchronize Series on Slice Location** button:

3. Browse the images in a series in quick browse mode by clicking the and buttons, or using the keyboard arrow keys.

Manual Synchronization

Manual synchronization enables to browse synchronously image series that do not have the same frame of reference.

1. Open at least two series from the same study or different studies.
2. In the **Workspace** menu click the **Synchronize Series on Slice Location** command to disable it, or press the **F6** key. A hand appears on the **Synchronize Series on Slice Location** button:

3. If the button is enabled, click it to disable it. It will then be dimmed.
4. In each series viewer click the image where you want to start manual synchronization.
5. Click the **Synchronize Series on Slice Location** button, and browse the images in one of the series.

Viewing Multiframe Images

Multiframe (animated) images are mainly used in ultrasound and cardiovascular studies. When a series that contains at least one multiframe image is displayed, an additional control panel appears at the bottom of the display area:

This control panel enables to read all or a part of a multiframe image, and to adjust the read speed.

The following icon might be displayed so you can view MPEG multiframe images in VLC Media Player and thus hear audio:

To enable this option, please see the "Viewing MPEG Multiframe Images in VLC Media Player" section on page 39.

Note: You can determine the duration of a multiframe image by clicking the number of frames shown on the left of the button.

Playing Multiframe Images

To play images on an interval basis (number of frames or duration), click the following buttons:

To play images backward.

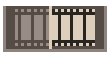
To play images forward.

To select an interval other than the default one (one frame) right-click one of these buttons.

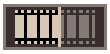
Playing a Frame Selection

You can play an entire multiframe image or only some of the frames in the image.

1. On the scroll bar position the cursor where you want to start the selection, and click the **Set Start of Selection** button:



2. On the scroll bar position the cursor where you want on the right of the location set as the beginning of the selection, and click the **Set End of Selection** button:



> **Note:** The selection is shown as a brown line on the scroll bar.

3. Select the **Selection only** option, and then click the button to play the selection only.

> **Note:** When you have defined a selection, you can still play the entire multiframe image by disabling **Selection only**.

Playing Multiframe Images in Back-and-Forth Mode

To play a multiframe image in a direction, and then in the opposite direction, select the **Back and forth** option before clicking the button.

Adjusting the Playback Speed

- To slow down the playback speed (reduce the number of frames displayed per second) by 25% increments, click the Slow Down (-25%) button:

- To speed up the playback speed (increase the number of frames displayed per second) by 25% increments, click the Speed Up (+25%) button:

- To revert to the nominal playback speed, i.e. the speed specified in DICOM images, click the watch:

> **Note:** The nominal playback speed is shown below the clock. This speed is used only if the computer processor is powerful enough. The actual playback speed is shown on the right of the clock.

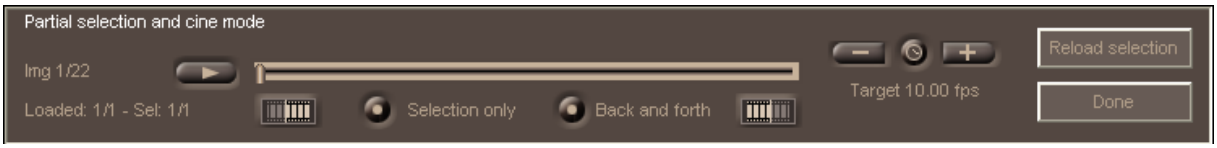
Viewing an Image Series in Cine Mode

The cine mode is similar to the quick browse mode in that it allows browsing the images in a series. This mode provides the same benefits as playing multiframe images: image browsing is automatic and consistent, and you can browse images in back-and-forth mode and adjust the browse speed.

Browsing a Series Images

To enable the cine mode for the current series, click the **Display Series Selection/Cine Mode** button:

The **Partial selection and cine mode** control panel appears:



Loading Images Included in a Selection

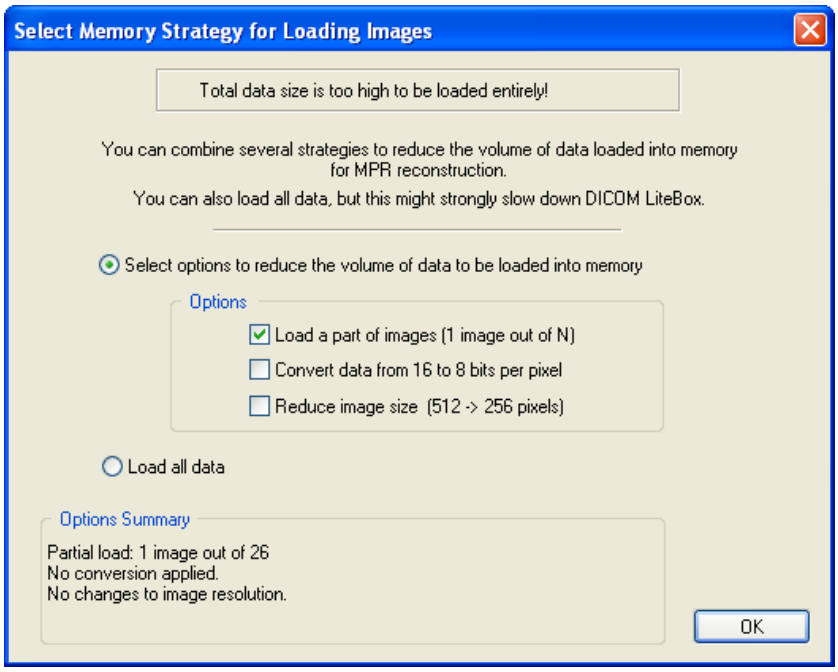
Depending on the size of the selection and the limitation set for the computer available memory usage, the proportion of images loaded in the selection might be higher than in the whole series. Let's take the example of a series made up of 500 images. When you opened the series, one image out of five was loaded. You have defined a selection with a size that allows loading one image out of two. To view all these images in cine mode, first load them by clicking the **Reload selection** button. Then, you will just need to click the button in the control panel, and the button again.

Applying Multiplanar Reconstructions (MPR) to Study Images

For tomographic image (slice images) acquisitions, it can be very useful to view organs in plans other than original slice plans. This is the function of multiplanar reconstruction. It involves calculating images in any orientations and positions inside the volume made up of original slices.

MPR reconstruction only applies to tomographic image series.

MPR reconstruction is performed using the images loaded in ACETIAM Viewer Lite. For example, if you have set and loaded a selection, only the images in that selection will be used for MPR reconstruction. This can be useful for image series including a large number of images. When you open the Multiplanar Reconstruction module, images are loaded again. If the image size is over the default memory usage limitation (100MB), the following dialog box appears:

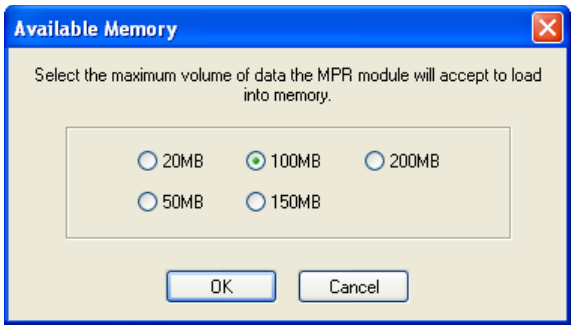


- To set a strategy to limit the available memory usage, select the **Select options to reduce the volume of data to be loaded into memory**, and select one or more options:
  - **Load a part of images (1 image out of N):** Speeds up the loading of images while saving memory. The information loss is partly compensated by the fact that the images not loaded can be interpoled using loaded images.
  - **Convert data from 16 to 8 bits per pixel:** Codes pixels on eight bits (original scanner or MRI images are coded on 12 or 16 bits). The loading process takes more time.
    A part of information is lost, but if windowing information is relevant, the information loss is not a problem.
  - **Reduce image size (512 -> 256 pixels):** Slows down the loading process, and a part of information is lost. However, images will take four times less space in memory.
- To load all images, which might result in lower performances, select the **Load all data** option.

Configuring the Available Memory Usage for the Multiplanar Reconstruction Module

To preserve ACETIAM Viewer Lite performances based on your computer capacity, you can change the default maximum size of series loaded for MPR reconstruction by doing the following:

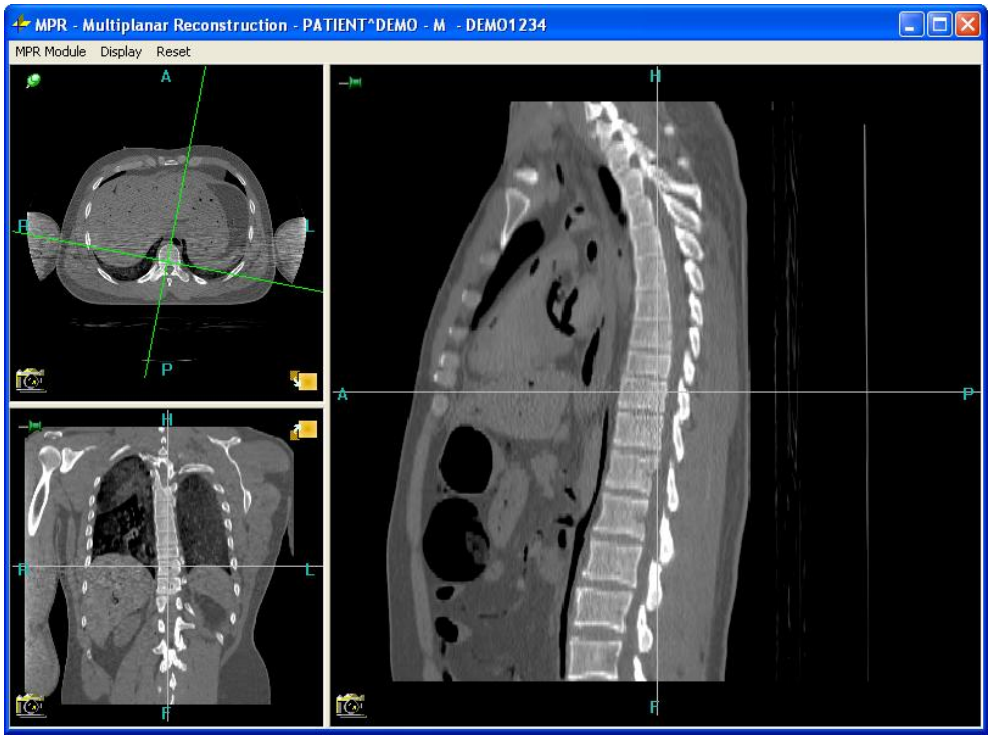
1. In the **MPR Module** menu click **Memory Management**. The **Available Memory** dialog box appears:



2. Select the appropriate option, and click **OK**.

Starting the Multiplanar Reconstruction Module

Click the **Multiplanar Reconstruction (MPR)** button:



The displayed plans are the following:

- **SAGITTAL:** Right view. It is represented by the A, H, P and F markers.
- **AXIAL:** Top Left view. It is represented by the R, A, L and P markers.
- **CORONAL:** Bottom Left view. It is represented by the R, H, L and P markers.

Note: You can hide orientation markers by clicking in the **Display** menu the **Orientation** command to disable it.

By default, the Multiplanar Reconstruction module runs in reference view mode. In this mode, you can perform translations and rotation in the reference view only. They are applied to both views whereas the reference view remains steady. You can disable this mode by clicking in the **MPR Module** menu the **Reference View Mode** command to disable it. The color of pins on the images changes to red. You can then perform translations and rotations in any of the views, and they will be applied to all the views. This mode is very useful for neurological images.

Two axes are displayed in each view to allow for translations and rotations. In reference view mode, when you point an image with the mouse, the axis for that image in the reference view changes colors for a few seconds.

Note: You can hide the axes by clicking in the **Display** menu the **Axes** command to disable it.

You can resize images by dragging their borders. To revert to image original sizes, click **Image Sizes** in the **Reset** menu.

Changing Reference Views

By default, the Top Left view is the reference view. It shows a green pushed-in pin. To change reference views, click the pin in the view you want.

Applying a Translation

1. In reference view mode, point the axis intersection with the mouse in the reference view. The following cursor appears:

2. Click the cursor, hold down the left mouse button while dragging the mouse to move the rotation center to the location you want, and then release the mouse button.

If the reference view mode is disabled, run this procedure in the view you want.

Applying a Rotation

1. In reference view mode, point one of the axes with the mouse in the reference view. The following cursor appears:

2. Click the cursor to grab the axis, hold the left mouse button down while rotating the axis, and then release the mouse button.

If the reference view mode is disabled, run this procedure in the view you want.

Note: You can cancel translations and rotations by clicking **Image Orientations** in the **Reset** menu.

Image Windowing

Right-click an image, hold the right mouse button down and move the mouse to change the contrast in the three views.

Note: You can revert to the original windowing by clicking **Windowing** in the **Reset** menu.

Printing Images

You can print displayed images directly to the default printer defined on the computer or through the Film Composer tool.

Printing Displayed Images

- Select the appropriate image display layout because all the displayed images will be printed.
- In the **Workspace** menu, click **Print Displayed Images** to print to the default printer.

Printing Images through the Film Composer

The Film Composer enables you to print images from different series to the printer you select from lists of available printers. You can also easily arrange images on films to suit your needs.

If you generally print images using the same layout, you can set default settings in the **Settings** window. Then you will not have to configure the layout each time you will use the Film Composer. For more information, please see the "Defining Default Print Settings" on page 37.

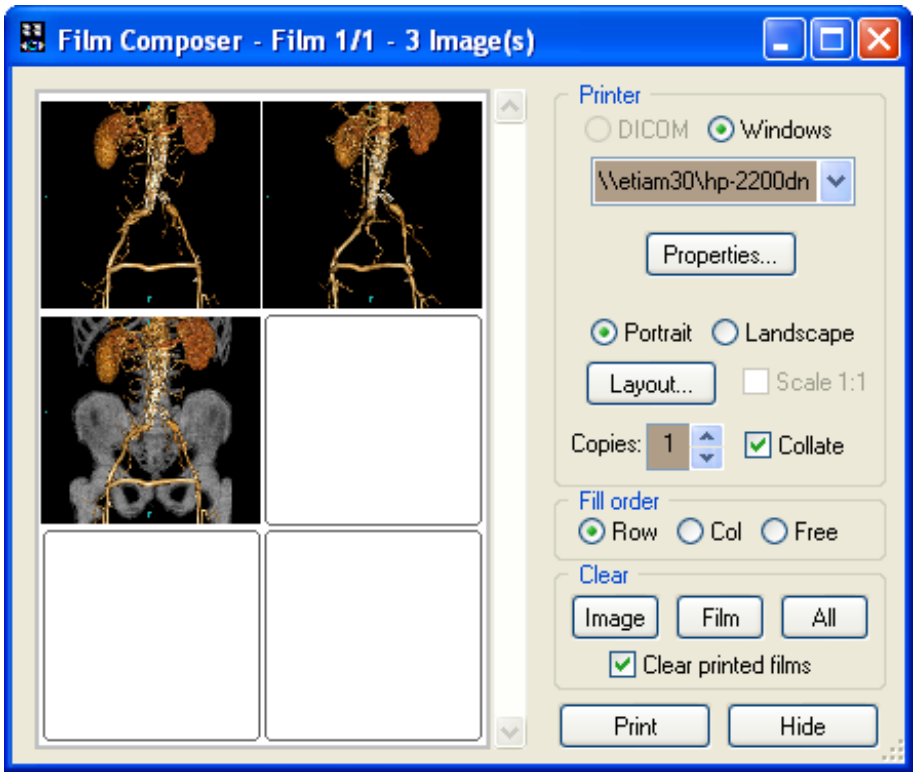
1. If the Select mouse mode is not enabled, click the **Select** button.
2. Point the image you want to print, press and hold down the left mouse button, and drag the mouse to the **Film Composer** icon, and then release the mouse button:

Note: You can also use the **CTRL+TAB** shortcut.

If you want to add more than one image at once to the Film Composer, select them, and then click the button on the right of the **Film Composer** icon. You can also configure this button to add a whole series to the Film Composer. To do this, right-click the button, and click **Add Series to Film Composer**. In this configuration when you click the button you access the **Film Composer** dialog box directly.

Note: If all the images cannot fit on a single film the Film Composer creates as many films as needed automatically. To scroll through films, use the scroll bar on the right of the Film Composer display area or use the mouse wheel. The number shown in the lower right corner of the Film Composer icon identifies the number of films created.

3. To open the Film Composer, click the **Film Composer** icon:



> **Note:** At any time you can add other images directly to the Film Composer by dragging them from ACETIAM Viewer Lite display area. Also, you can hide the Film Composer to proceed with your work: the images added to the Film composer are kept until they are printed or you exit ACETIAM Viewer Lite.

4. In the **Printer** section, select the printer you want from the list. If you want to edit the printer default settings, click the **Properties** button.
5. Select the **Portrait** or **Landscape** option based the film orientation you want.
6. To select the number of images you want to print per film, click the **Layout** button, drag the mouse pointer on the grid, and then click when you have selected the appropriate number of lines and columns.

> **Note:** If you want to change the order of the images on the film, drag the images you want to move using the mouse to the appropriate locations.

7. From the **Copies** list, select the number of copies you want to print. The **Collated** checkbox must be selected if you want to print film copies in the order they will be assembled.

> **Note:** Some printer drivers collate copies systematically.

8. In the **Fill order** section, select one of the following options:
    - **Row:** Select this option to fill films horizontally.
    - **Col:** Select this option to fill films vertically.
    - **Free:** Select this option to be able to position images in the locations you want in the Film Composer. This option allows for gaps between images unlike the other two options.
9. If you want to remove images from the Film Composer, click the **Image**, **Film** or **All** buttons. The **Clear printed films** checkbox enables to empty films automatically after they have been printed.
10. When you are ready to print, click the **Print** button.

Copying Study Images to a Directory or Windows Clipboard

Copying Images to a Directory

You can copy images from a CD to a directory to compare various studies located on separate CDs for a single patient for example.

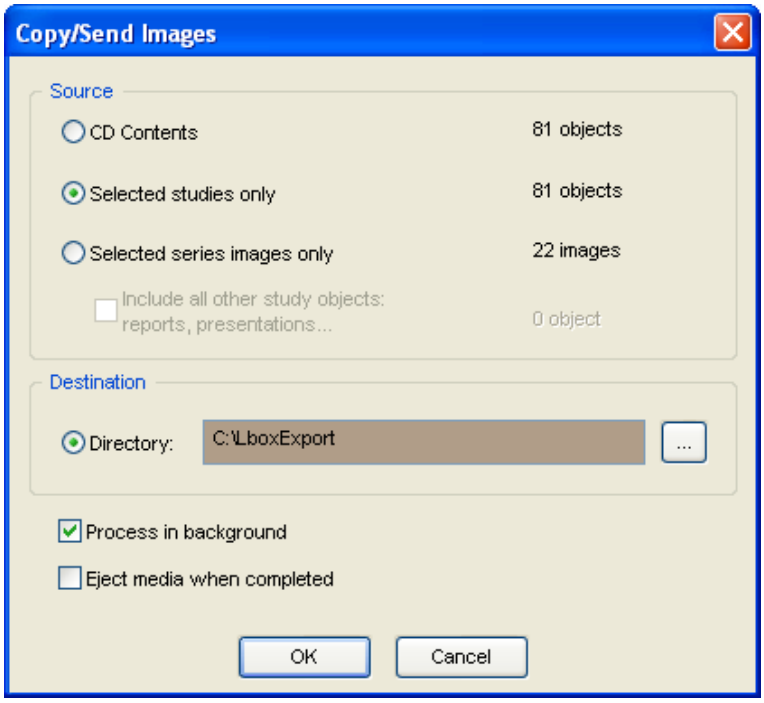
1. In the **Access Studies** dialog box, click the **CD Contents** tab.
2. Select the item (s) for the images you want to copy:
   - **Several studies:** Select the studies you want in the **Studies** section.
   - **All the images in a study:** Select the study you want in the **Studies** section.
   - **Images in one or more series:** Select the series you want in the **Series** section.

Note: If you want to copy all the tab contents, skip to the next step.

3. Click the **Copy/Send** button.

Note: If you want to access the **Copy/Send Images** dialog box directly when you press the **ENTER** key after performing step 2, click **Settings** in the **Application** menu. In the **Miscellaneous** page of the **Settings** window, select **Copy/Send Study** from the **Default ENTER key action when displaying study list** list, and then click **OK**.

The **Copy/Send Images** dialog box appears:



4. In the **Source** section, select the option for the contents you want to copy.
5. If you do not want to copy reports or presentations with images, deselect the **Include all other objects** checkbox.

6. To select the destination directory, click the button, select the directory you want and click **OK** in the **Select Directory** dialog box.
7. To copy images in the background so you can continue viewing studies without waiting until the copy process is complete, select the **Process in background** checkbox.
8. If you want to eject the CD containing the images when the copy process is complete, select the **Eject media when completed** checkbox.
9. To start copying images, click **OK**.

Copying an Image to Windows Clipboard

You can copy images into a graphics application and manipulate them.

- **To copy an image as is including text overlays and patient demographics:**
  1. Select the image you want, and press **CTRL+C**.
  2. In the graphics application, paste the image by pressing **CTRL+V**.
- **To copy an image in real size without text overlays and patient demographics:**
  1. Right-click the image you want.
  2. In the context menu, point **Copy to Clipboard**, and click **Full Size Image Only**.
  3. In the graphics application, paste the image by pressing **CTRL+V**.

Exporting Still and Multiframe Images

You can export images to common formats (BMP, JPEG...) and multiframe images to AVI to save them on your hard drive for future use or use in other applications.

Exporting a Still Image

- **To export an image as displayed including text overlays and patient demographics:**
  1. If several images are displayed, click the image you want to export.
  2. In the Image menu, point Export, and click Displayed Image (With Overlays).

     Note: You can also access this command by right-clicking the image and then pointing **Export**.

  3. Fill in the fields in the **Save As** dialog box, and then click the **Save** button.
- **To export an image in real size without text overlays and patient demographics:**
  1. If several images are displayed, click the image you want to export.
  2. In the **Image** menu, point **Export**, and click **Full Size Image Only**.
  3. Fill in the fields in the **Save in** field, and then click the **Save** button.

Note: Text information displayed on the image in ACETIAM Viewer Lite might also be exported depending on the modality used to produce the image. This applies to ultrasound images for example.

Exporting Multiframe Images

You can export all or a part of a multiframe image, or even a single frame.

1. If several multiframe images are displayed, click the multiframe image you want to export.

   Note: If necessary, select in the multiframe image the frames to export. To do this, run steps 1 and 2 in the "Playing a Frame Selection" section on page 24.

2. In the Image menu, point Export, and click Displayed Image (With Overlays) or Full Size Image Only.
3. In the **Save As** dialog box, select a directory from the **Save in** field, and a format from the **Save as type** list, enter a name for the image in the **File name** field, and then click the **Save** button.

Exporting multiframe images is specific in the following aspects:

- If you export several frames and you select a fixed image format (BMP, JPEG or TIFF), ACETIAM Viewer Lite will create one image per frame. For example, if you enter **Lung** in the **File name** field and you export three frames, image files will be named as follows: Lung001, Lung002, and Lung003.
- If you select the AVI format, you should select one of the compression programs installed on your computer (Microsoft Video® 1, Indeo® or DivX® for example) because ACETIAM Viewer Lite does not install any compression programs on your computer. However, you should keep in mind that AVI files created with a compression program will be readable only on computers featuring the same compression program.

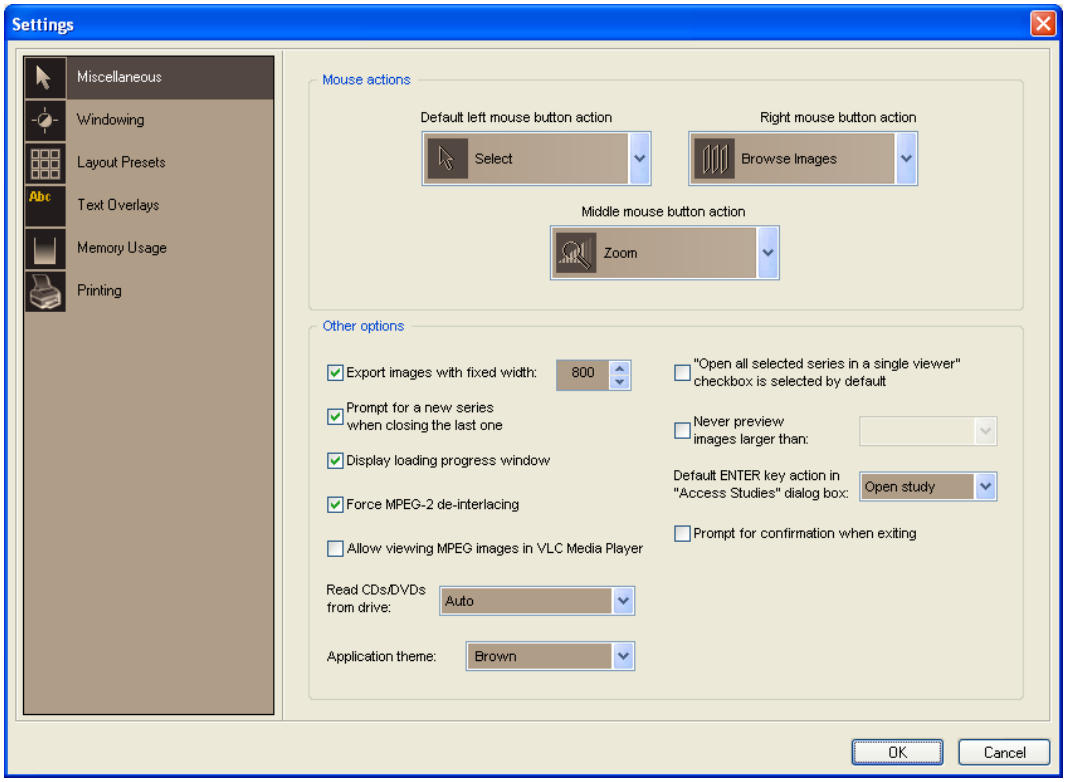
Customizing ACETIAM Viewer Lite

To customize ACETIAM Viewer Lite, click **Settings** in the **Application** menu.

Customizing Mouse Actions

If the default mouse button actions do not suit you, you can customize them.

1. Click **Miscellaneous**.



2. In the **Mouse actions** section select the actions you want.

Specifying the Drive to Browse for CDs/DVDs

By default, ACETIAM Viewer Lite searches for CDs/DVDs in the first drive that it finds.

To specify a different drive, on the **Miscellaneous** page select the drive or folder you want from the **Read CDs/DVDs from drive** list.

Customizing ACETIAM Viewer Lite Color Theme

By default, ACETIAM Viewer Lite control panels are gray. If you want you can choose a different color, on the **Miscellaneous** page select the color you want from the **Application theme** list.

Setting a Maximum Size for Image Previews

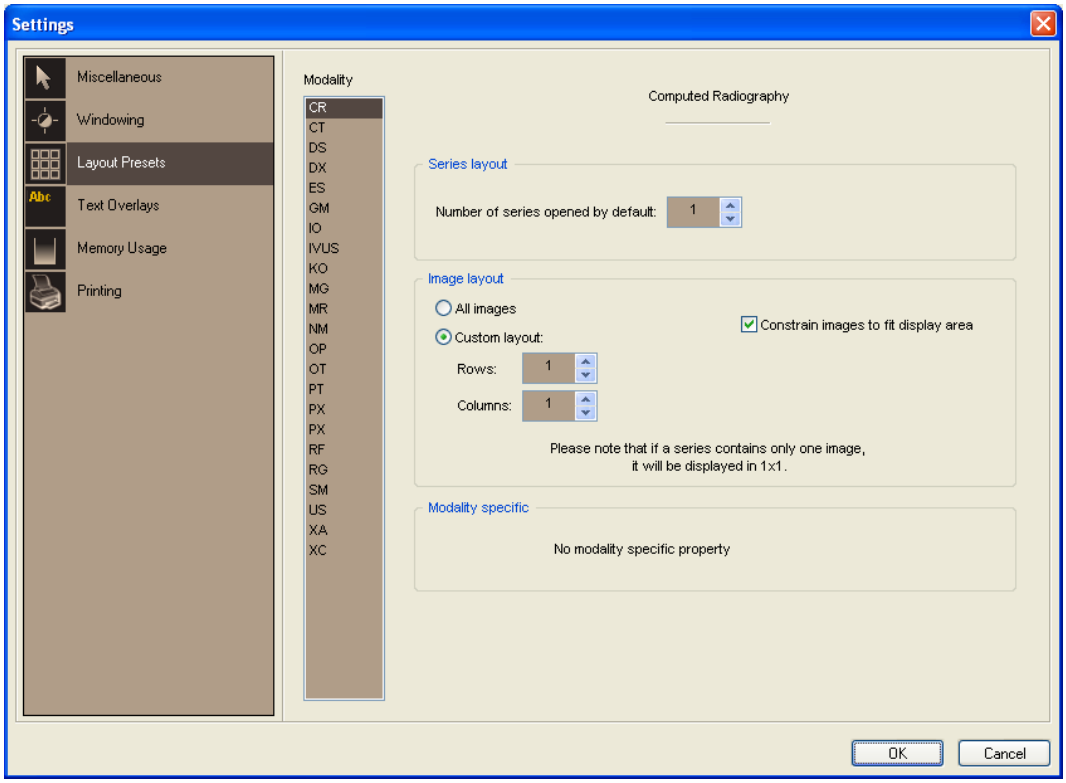
By default, ACETIAM Viewer Lite shows all images as thumbnails in the **Access Studies** dialog box for quick selection. You can configure ACETIAM Viewer Lite so it does not display thumbnails for images larger than 1,024×1,024 pixels for example. This avoids slowing down the computer.

On the **Miscellaneous** page select the **Never preview images larger than** checkbox and enter the maximum size of images to show as previews.

Customizing Series Display Layout

For each modality you can decide how many series will be selected by default for opening when starting ACETIAM Viewer Lite. Also, when loading images, ACETIAM Viewer Lite can fit them to the display area size. Images can also be loaded in their original sizes without being adjusted.

1. Click **Layout Presets**.



2. In the **Modality** section, select the modality for which you want to configure the layout.
3. In the **Series layout** section, select the number of series you want to open when starting ACETIAM Viewer Lite for the selected modality.
4. In the **Image layout** section, select either **All images** or **Custom layout** and then the numbers of images you want to display per line and column.
5. When changing the display layout if you want to resize images accordingly to always display them entirely, select the **Constrain images to fit display area** checkbox.

Note: You can also enable this feature manually by double-clicking the button in the control panel.

Viewing MPEG Multiframe Images in VLC Media Player

If you will view MPEG video sequences you can play them in VLC Media Player, provided that it is installed on the computer. This viewer offers smoother video sequence playback and enables to hear audio.

On the **Miscellaneous** page, select the **Allow viewing MPEG images in VLC Media Player** checkbox.

When this option is enabled and VLC Media Player is available on the computer, an icon is shown in the video playback control panel so that you can open MPEG video sequences in that player:

De-interlacing MPEG Multiframe Images

ACETIAM Viewer Lite can de-interlace DICOM/MPEG multiframe images automatically for better display quality. In interlaced images only one image out of two is displayed which results in lower display quality.

On the **Miscellaneous** page, select the **Force MPEG-2 de-interlacing** checkbox if applicable.

Customizing Text Overlays Displayed on Images

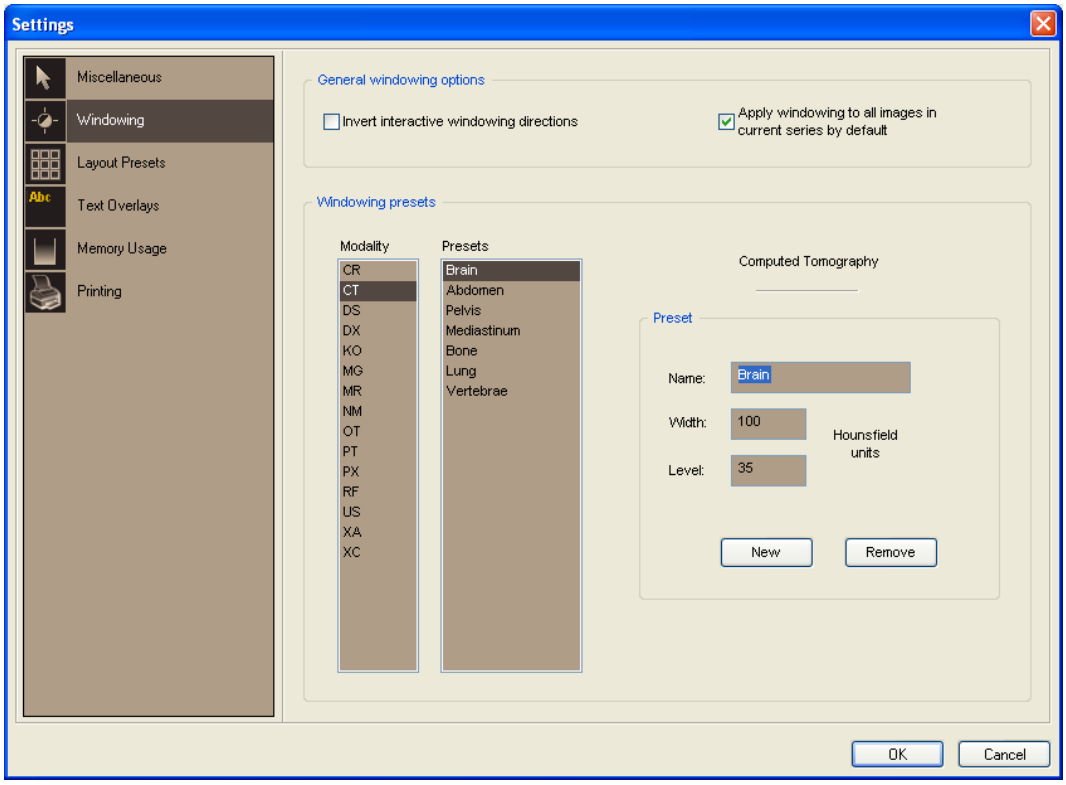
You can define various text overlays (or "annotations") depending on the modalities used to produce images: scanner (CT), MRI (MR)… You can also define the location of each text overlay on images, and the size and color of the text.

Read the content of the **Text Overlays** page, and then follow the guidelines to add or customize the information you want.

When you display images, the DICOM attributes you specified will be replaced with the matching values found in images.

Customizing Windowing

1. Click **Windowing**.



2. In the **General windowing options** section, select the **Invert interactive windowing directions** checkbox if you want to change the windowing central point when moving the mouse horizontally.

3. Deselect the **Apply windowing to all images in current series by default** checkbox if you do not want to replicate the windowing applied to a particular image in a series to all the images in this series in the same viewer.

> **Note:** You can also enable or disable this feature by clicking **Apply Windowing to All Images in Series** in the **Series** menu.

Defining Custom Windowing Presets

You can also define your own windowing presets on a per-modality basis. They will then be available in the button menu.

> **Note:** You can only define windowing presets for scanner images (in Hounsfield units) and other gray-level images (in gray-level values).

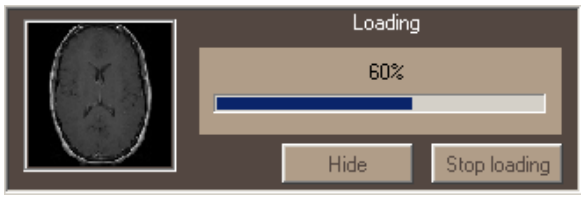
In the **Modality** list select the modality you want to add a windowing preset for. Click the **New** button, and fill in the fields.

Configuring How to Use the Computer Memory when Loading Large Image Series

ACETIAM Viewer Lite is designed to adjust large series loading to the computer performance and capacity. By default, this feature is enabled.

When the memory limitation is enabled, the following can be done:

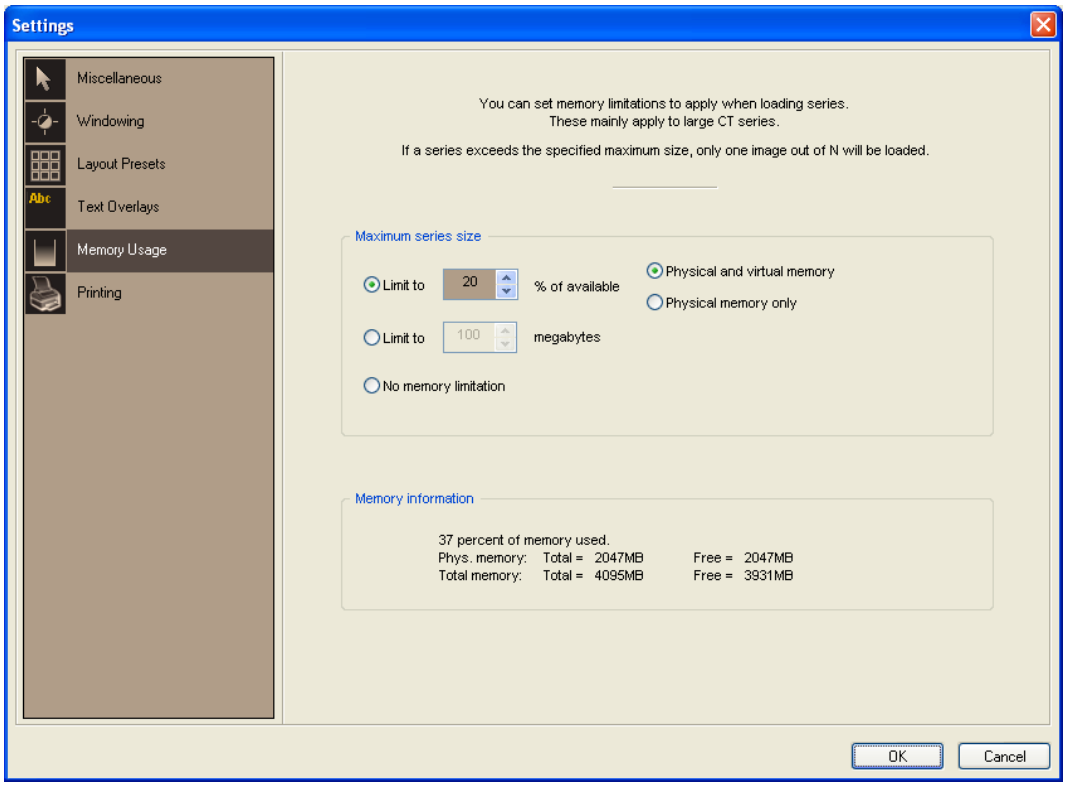
- Load image series partly, i.e. load one image out of N to conform to the limitation set for the computer available memory usage.
- Scroll images as and when they are loaded. As they are loaded, images scroll as thumbnails in the loading panel. You can make images scroll in a bigger size in the display area by simply clicking the thumbnail.



Note: To enable this loading panel, in the **Miscellaneous** page of the **Settings** window, select the **Display loading progress window** checkbox.

- Load images in the background to continue working by clicking the **Hide** button.
- Stop loading an image series. This can be very useful if the series contains a very large number of images, or if you do not need to view the entire series. This also saves computer memory. Even if a series is loaded partly, you can still view the remaining images in the series. The images that have not yet been loaded will be loaded as and when you display them.

1. Click **Memory Usage**.



2. Fill in one of the following fields:

   - **Limit to *N*% of available memory (physical and virtual):** When loading an image series, the amount of available memory depends on the number of running applications and on the number of image series already loaded in ACETIAM Viewer Lite. Select one of the following options:
   - **Physical and virtual memory:** Select this option if the limitation applies to both available physical and virtual memories.
   - **Physical memory only:** Select this option if the limitation applies to available physical memory only.
   - **Limit to *N* megabytes:** For example, if you enter **50** in this field and then you open a 500MB series including 1,000 images, ACETIAM Viewer Lite will load one image out of ten.

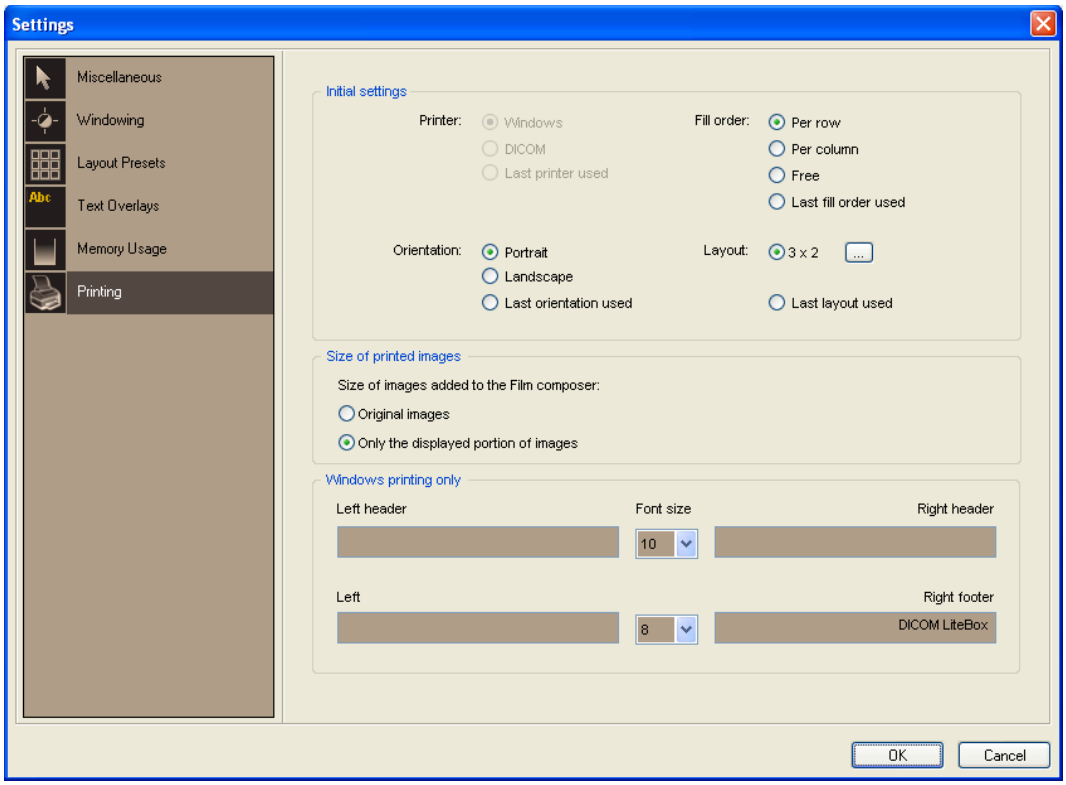
Note: Information on the memory is displayed in the lower part of the dialog box to help you determine the appropriate memory limitation in order to fit your needs regarding ACETIAM Viewer Lite performance.

   - **No memory limitation:** This option loads all the series entirely whatever their sizes. However, this might reduce ACETIAM Viewer Lite performance when the RAM becomes overloaded.

Defining Default Print Settings

You can define the print settings you want to enable by default in the Film Composer. Preferably define the parameters you will use most often. Then you can edit these settings when needed directly in the Film Composer.

1. In the **Settings** window click **Printing**.



2. In the **Initial settings** section, select the options you want.
3. In the **Size of printed images** section, select one of the following options:
   - **Original images:** Select this option if you want to print images entirely.
   - **Only the displayed portion of images:** Select this option to print images according to their current zoom ratio. Only the visible portion of images will be printed.
4. In the **Windows printing only** section, you can enter the information you want to show on each printed film and the text sizes.

Index

Access Studies dialog box
  display images, 2
Annotations
  add to images, 15
  angles, 16
  angles with disjoint lines, 16
  display on images, 15, 16
  ellipses, 16
  export with images, 35
  lines, 16
  markers, 15, 16
  rectangles, 16
  regions of interest, 17
AVI format to export multiframe images, 36
BMP format to export images, 36
CD/DVD
  display, 1
  open, 1
CD/DVD, open, 2
Cine mode
  adjust play speed, 25
  browse a portion of images in a series, 25
  browse series images, 25
  define an image selection, 25
Close LiteBox, 1
Configuration of LiteBox, customize, 37
Control panel
  display, 5
  hide, 5
Copy images
  to a directory, 33
  to Windows Clipboard, 34
Customize LiteBox
  appearance, 37
  color, 37
  display, 38
  display settings, 38
  mouse, 37
Densities
  display on scanner images (CT), 20
  hide on scanner images (CT), 20
DICOM, 1
DICOM printer, print to, 31
Directories
  copy images to, 33
  select images to display, 3
Display
  adjust image play speed, 25
  angles on images, 16
  angles with disjoint lines on images, 16
  CD/DVD, 2
  customize, 38
  densities on scanner images, 20
  display layouts, 8
  distances on images, 16
  ellipses on images, 16
  image selections, 4
  images, 2, 8
  images in cine mode, 25
  images in cine mode, partly, 25
  number of images displayed simultaneously, 8
  patient information on images, 39
  positions on images, 15, 16
  rectangles on images, 16
  regions of interest on images, 17
  select images to display, 3
  several image series, 4, 8
  text annotations, 39
Display layouts
  define, 8
  define default, 8, 38
  define per modality, 8
  multi-window display, 8
  select, 8
Enlarge images, 14, 15
Exit LiteBox, 1
Export images
  fixed, 35
  in real size, 35
  multiframe, 35
  still, 35
  with annotations, 35
  with patient information, 35
  without annotations, 35
  without patient information, 35
Film Composer
  add images, 30
  clear images, 32
  open, 31
  print images, 30
  remove images, 32
Fixed images *See* Still images
Frames *See* Multiframe images
Image colors, invert, 14
Image display layouts *See* Display layouts
Image pages *See* Images
Image previews, set a maximum size to display, 38
Image selections
  display, 4
  display creator's name, 4
  display description of, 4
Image series
  adjust image browse speed, 25
  adjust image play speed, 25
  apply presentation states to, 11
  browse images quickly, 25
  browse images quickly, partly, 25
  display, 2
  display reference lines, 21
  flip, 14
  image selections, 4
  MPR module, 26
  MPR reconstructions, 26
  multiplanar reconstructions, 26
  open, 2
  print, 30
  rotate, 14
  rotations, 14
  scroll through images quickly, 25
  scroll through images quickly, partly, 25
  synchronize automatically, 22
  synchronize manually, 22
  synchronize on slice location, 22
  tomographic, multiplanar reconstructions, 26
Image viewers
  apply the same layout to all, 8

different layouts depending on viewers, 8
display layouts, 8
display reference lines, 21
number of images displayed per viewer, 8
select a layout per viewer, 8
synchronize series, 22
Images
adjust play speed, 25
apply presentation states to an image, 11
browse quickly, 25
browse quickly, partly, 25
de-interlace MPEG images, 39
display, 2, 8
display angles on, 16
display angles with disjoint lines on, 16
display distances on, 16
display ellipses on, 16
display in cine mode, 25
display in cine mode, partly, 25
display information on, 18
display layouts, 8
display positions on, 15, 16
display rectangles on, 16
display reference lines on, 21
display regions of interest on, 17
display selections, 4
enlarge a portion of an image, 14
export in real size, 35
export with annotations, 35
export with patient information, 35
Film Composer, 30
flip, 14
invert colors, 14
Magnify mouse mode, 14
manipulate, 13
MPR module, 26
MPR reconstructions, 26
multiplanar reconstructions, 26
multi-window display, 8
number of images displayed simultaneously, 8
pan, 13
print, 30
print displayed images, 30
rotate, 14
rotations, 14
scanner (CT), display densities on, 20
scanner (CT), hide densities on, 20
series, 2
studies, 2
tomographic, multiplanar reconstructions, 26
window, 18
Images, define page layouts for printing, 30
Imaging modalities
add windowing presets, 20, 40
change default display layouts, 8, 38
define a default display layout per modality, 8, 38
edit windowing presets, 40
Import images into graphics applications, 34
Information on images
add, 39
display, 39
hide, 39
Introduction to LiteBox, 1
Invert image colors, 14
JPEG format to export images, 36
Key images *See* Image selections
LiteBox
close, 1
control panel, show and hide, 5
customize, 37
exit, 1
main features, 5
overview, 1
start, 1
stop, 1
tips, show and hide, 7
LiteBox appearance, customize, 37
LiteBox color, customize, 37
Magnify mouse Mode *See* Images, enlarge a portion of an image
Mouse mode, default, 13
Mouse, customize button actions, 37
MPEG format
de-interlace images, 39
play with audio, 39
view in VLC Media Player, 39
MPR *See* Multiplanar reconstructions
Multiframe images
define a frame selection to play, 24
display, 23
export, 35
export frames, 35
MPEG, de-interlace, 39
MPEG, improve display quality, 39
MPEG, view in VLC Media Player, 39
play, 23
play back and forth, 24
play entirely, 23
play in back-and-forth mode, 24
play partly, 24
Multiplanar reconstructions, 26
apply rotations, 28
apply translations, 28
cancel rotations, 29
cancel translations, 29
cancel windowing settings, 29
change reference views, 28
image rotations, 29
image translations, 28
reference views, change, 28
reset images, 29
rotate images, 29
start the module, 27
window images, 29
Multi-series mode
display reference lines, 21
synchronize series, 22
Multi-window display, 8
Open
CD/DVD, 1, 2
studies, 1, 2
Page layouts for printing, define, 30
Pan images, 13
Patient information
display on images, 18
export with images, 35
hide on images, 18
Play multiframe images
back and forth, 24
back-and-forth mode, 24
define a frame selection, 24
entirely, 23

partly, 24
Presentation states
apply to a series, 11
apply to an image, 11
Print
customize, 43
define default parameters, 43
define page layouts, 30
displayed images, 30
through the Film Composer, 30
to DICOM printers, 31
Printing
define size of images to print, 43
images in original size, 43
print only displayed portion, 43
Reference lines
display on images, 21
hide on images, 21
Regions of interest
apply windowing, 19
display on images, 17
Rotate
all the images in a series, 14
an image in a series, 14
Rotations
apply to all the images in a series, 14
apply to an image in a series, 14
cancel, 29
multiplanar reconstructions, 29
Select images to display
from a CD/DVD, 3
from a directory, 3
Show *See* Display
Slice location, synchronize on, 22
Start
LiteBox, 1
MPR module, 27
Multiplanar Reconstruction module, 27
Steady images *See* Still images
Still images *See also* Images
export, 35
Stop LiteBox, 1
Studies
display, 2
image series, 2
open, 2
Synchronize series
automatically, 22
manually, 22
TIFF format to export images, 36
Tips
display, 7
hide, 7
Translations
apply, 28
cancel, 29
multiplanar reconstructions, 28
View *See* Display
VLC Media Player, view MPEG images, 39
Window
an image in a series, 19
automatic windowing, 20
customize, 40
manual windowing, 18
region-of-interest windowing, 19
Windowing presets
apply, 20
customize, 40
edit, 40
Windowing settings *See also* Window
automatic, 20
customize, 40
manual, 18
region of interest, 19
Windows Clipboard, copy images to, 34
Zooms
display images entirely, 15
interactive, 15
reset image original size, 15

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