DICOM LiteBox

User's Guide

www.sorna.com

DICOM LiteBox

User's Guide

Product Version: **3.40**
Documentation Update: **March 2008**

Regulation

Caution: DICOM LiteBox enables to make measurements in pixels on an image. When calibration information is available in the image (pixel size in vertical and horizontal directions), the measurement is shown in millimeters after a conversion from pixels to millimeters. This measurement is shown for information purposes only; it does not take the image thickness nor the calibration accuracy into account. It cannot be considered as a real anatomical measurement.

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

Table of Contents

- **Introduction to DICOM LiteBox 1**
- **Starting DICOM LiteBox 1**
- **Discovering DICOM LiteBox 2**

Viewing an Image Series 2
Study Display 4
Image Display Order 4
Displaying an Image Selection 4
Viewing Several Image Series (Multi-Series Mode) 5
Stopping DICOM LiteBox 6

- **DICOM LiteBox Main Features 7**
- **Tips 10**
- **Viewing Study Reports 10**
- **Viewing Study Images 12**

Display Layout 12
Displaying the Previous or Next Series 12
Displaying the Previous or Next Images 13
Default Mouse Mode 13
Quick Browse Mode 13
Moving through a Series 14
Displaying Information on Images 14
Adding Information on Images 14
Zooms 15
Windowing 15
Automatic Windowing 16
Interactive Windowing 17
Region-of-Interest Windowing 18
Applying Presentation States to Images 18
Applying Presentation States to All the Images in a Series 19
Applying Presentation States to an Individual Image 19
Resetting the Display of the Images in the Current Series 20

- **Manipulating Images 21**

Panning an Image 21
Magnify Mode 21
Inverting Colors in One or More Images 22
Flipping and Rotating One or More Images 22
Displaying a Position on an Image 22
Displaying a Distance on an Image 23

Displaying an Angle on an Image 23
Displaying an Ellipse on an Image 24
Displaying a Rectangle on an Image 24
Displaying a Region of Interest on an Image 25
Displaying the Density on a CT Image 26
Multi-Series Mode 26
Multi-Series and Reference Lines 27
Multi-Series and Synchronization 28
Automatic Synchronization 28
Manual Synchronization 28

Viewing Multiframe Images 29
Playing Multiframe Images 29
Playing a Frame Selection 30
Playing Multiframe Images in Back-and-Forth Mode 30
Adjusting the Play Speed 30

Viewing an Image Series in Cine Mode 31
Browsing a Series Images 31
Browsing a Part of Images 32
Loading the Images Included in a Selection 32
Playing Images in Back-and-Forth Mode 32
Adjusting the Browse Speed 33

Applying Multiplanar Reconstructions (MPR) to Study Images 34
Configuring the Available Memory Usage for the Multiplanar Reconstruction Module 35
Starting the Multiplanar Reconstruction Module 35
Changing Reference Views 36
Applying a Translation 36
Applying a Rotation 37
Image Windowing 37

Printing Study Images 38
Printing Displayed Images 38
Printing an Image Selection 38
Selecting Images 38
Printing the Selection 39
Printing Images through the Film Composer 39

Copying Study Images to a Directory or Windows Clipboard 42
Copying Images to a Directory 42
Copying an Image to Windows Clipboard 43

- **Exporting Still and Multiframe Images 44**
  - Exporting a Still Image 44
  - Exporting Multiframe Images 44
- **Customizing DICOM LiteBox 46**
  - Configuring Memory Usage to Load Large Image Series 46
  - Customizing the Mouse Actions 48
  - Customizing the Display Layout 49
    - Configuring the Number of Series Displayed per Modality 49
    - Configuring the Display Layout per Modality 50
    - Fitting Image Sizes to the Display Area 50
    - De-interlacing MPEG Multiframe Images 50
  - Customizing Windowing 50
  - Defining Default Print Parameters 51
- **Index 52**

Introduction to DICOM LiteBox

The DICOM LiteBox viewer is designed to view medical study images in DICOM (*Digital Imaging and Communications in Medicine*) format, the international standard used in medical imaging. DICOM LiteBox 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... DICOM LiteBox also features a special module for image multiplanar reconstruction (MPR). You can also print images with the layout you want.

Starting DICOM LiteBox

Just insert your study CD/DVD into the CD/DVD drive, and the DICOM LiteBox viewer will start automatically.

However, if DICOM LiteBox 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 DICOM LiteBox CD directory.

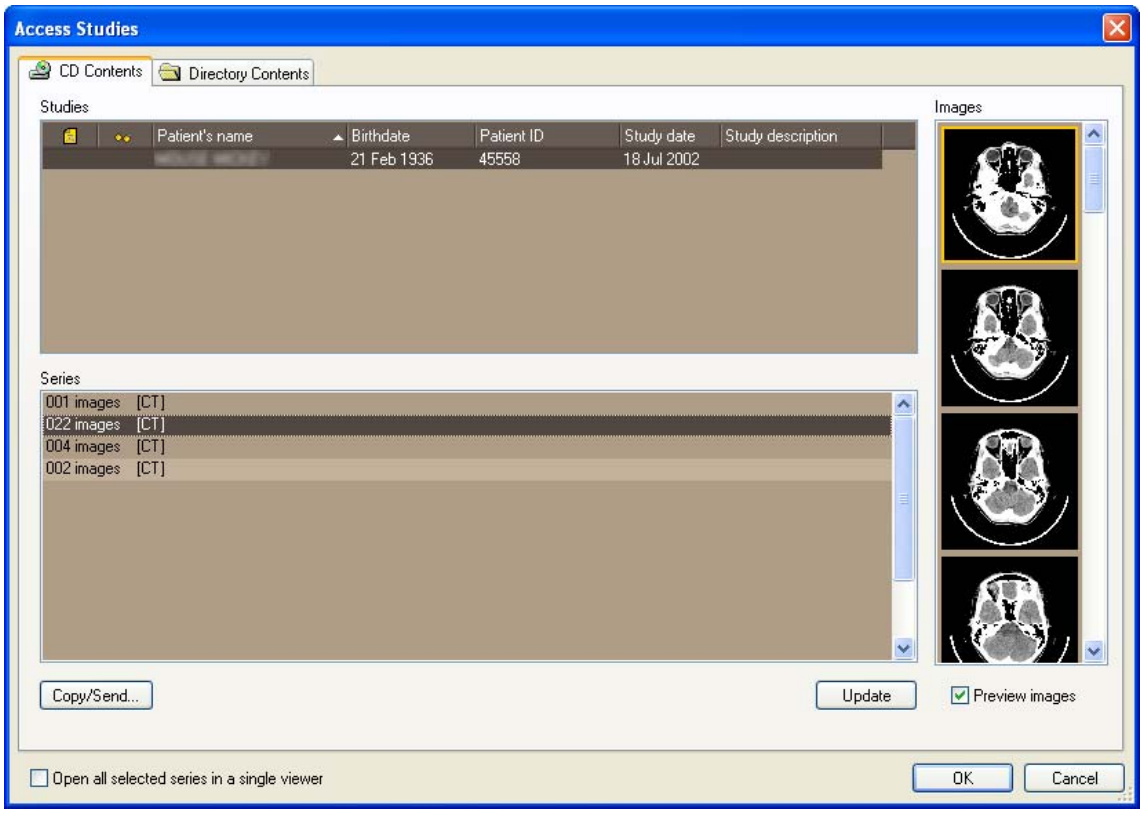
Discovering DICOM LiteBox

In this section, you will learn how to make your first steps with DICOM LiteBox.

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 DICOM LiteBox 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** dialog box, 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 DICOM LiteBox 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**.

- **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.

     Note: You can also enter the directory path in the **Directory** field manually.

  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:**

  You can open up to four series simultaneously.

  1. In the **Access Studies** dialog box, press and hold the **CTRL** key down while clicking the different series you want to open in the **Series** section.
  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 DICOM LiteBox startup, click **Settings** in the **Application** menu. In the **Miscellaneous** page of the **Settings** dialog box, select the **Select the "Open all selected series in a single viewer" checkbox by default**, and then click **OK**.

  3. Click **OK**.

  You can configure DICOM LiteBox so that it prompts you to open a new series automatically when you close the last one. To do this, click **Settings** in the **Application** menu. In the **Miscellaneous** page of the Settings dialog box, select the **Prompt for a new series when closing the last one** checkbox.

Study Display

Studies are displayed in the **Studies** section of the **Access Studies** dialog box. This section is organized in columns that you can add, remove, reduce or enlarge.

- **To add or remove a column:**

1. In the **Studies** section of the **Access Studies** dialog box, right-click one of the column headers.
2. In the context menu that displays click the column header for the column you want to add or remove.

- **To restore the default column display:**

1. In the **Studies** section of the **Access Studies** dialog box, right-click one of the column headers.
2. In the context menu that displays click **Default column set**.
3. To adjust the column width to the column headers and contents:
4. In the **Studies** section of the **Access Studies** dialog box, right-click one of the column headers.
5. In the context menu that displays click **Adjust columns width**.

Image Display Order

By default, DICOM LiteBox first displays (in the upper left corner if several images are displayed at the same time) the first image in the series you have selected in the **Access Studies** dialog box.

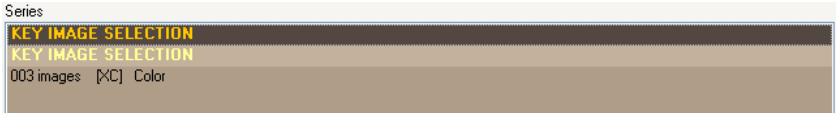
However, you can choose the image you want to display first by selecting it from the thumbnails displayed in the **Images** section before clicking **OK** in the **Access Studies** dialog box.

> **Note:** Thumbnails for the images in the selected series are displayed only if you select the **Preview images** checkbox.

Displaying an Image Selection

In DICOM LiteBox, you can also view images from studies and grouped into selections called "key image selections". You can even view the entire series where selected images come from.

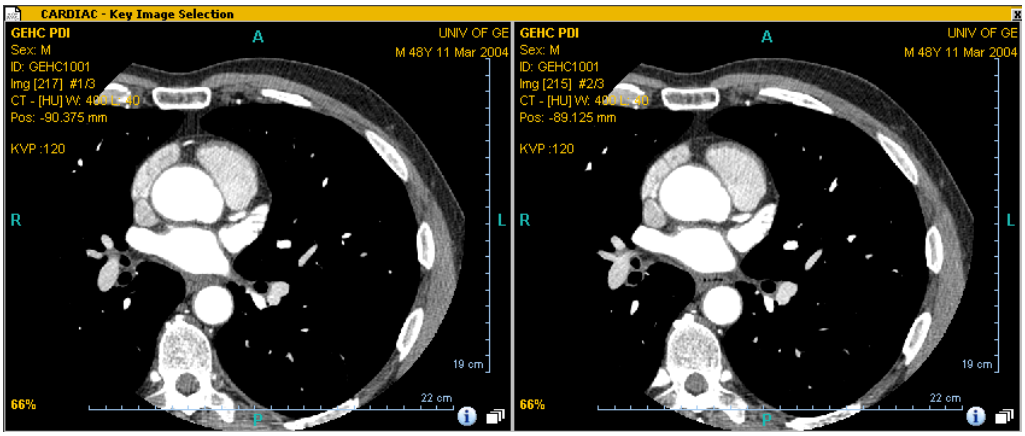
1. On one of the **Access Studies** dialog box tabs, click the study that contains the selection you want to view. The **Series** section looks as shown below:



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.

Viewing Several Image Series (Multi-Series Mode)

You can open up to four series at the same time in DICOM LiteBox. You can display for a single patient images on the CD and in a directory to compare different studies. Each series is then displayed in a separate image viewer.

- **To add the series after the current series:**

  Click the button beside the **Next Series** button.

- **To select the series you want to add:**

  Click the button beside the **Access Studies** button or do the following:

  1. In the **Series** menu, click **Open New Series Viewer**.
  2. In the **Access Studies** dialog box, select the series you want to add to the series already displayed, and click **OK**. Repeat this procedure if you want to display additional series.

  Note: In the **Access Studies** dialog box, you can also delete a study, a series or an image from your hard disk using the right click. To do this, right-click the item you want to delete, and click **Remove Study**. Of course, you can delete images in Windows Explorer, but image file names are not meaningful. So, it is very difficult to figure out which studies images belong to. Using the right click in DICOM LiteBox to delete images is more straightforward and quicker.

Stopping DICOM LiteBox

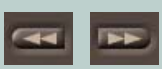
- In the **Application** menu, click **Exit**.

  -or-

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

DICOM LiteBox Main Features

You can access most of the features provided in DICOM LiteBox 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, pressing **CTRL+B** or simply by double-clicking the control panel. You can also hide the control panel to enlarge the display area. To do this, click **Show Control Panel** in the **Workspace** menu, or press the **ESC** key. To show the control panel again, do the same operation.

Click this Button	To
	Enable the default mouse mode.
	Pan an image.
	Zoom an image in or out interactively.
	Scroll through images in cine mode.
	Contrast various elements in an image (windowing).
	Magnify a portion of an image.
	Select the item to display on an image.
	Show a position.
	Show a distance.
	Show an angle.
	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.
	Display the previous or next image, or image page.

Click this Button	To *(continued)*
	Select the number of images you want to display per screen.
	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.
	Cancel image zooming.
	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 pixel density in an image.
	Synchronize several series on slice location.
	Show tips on using Open LiteBox.
	Close Open LiteBox.

Tips

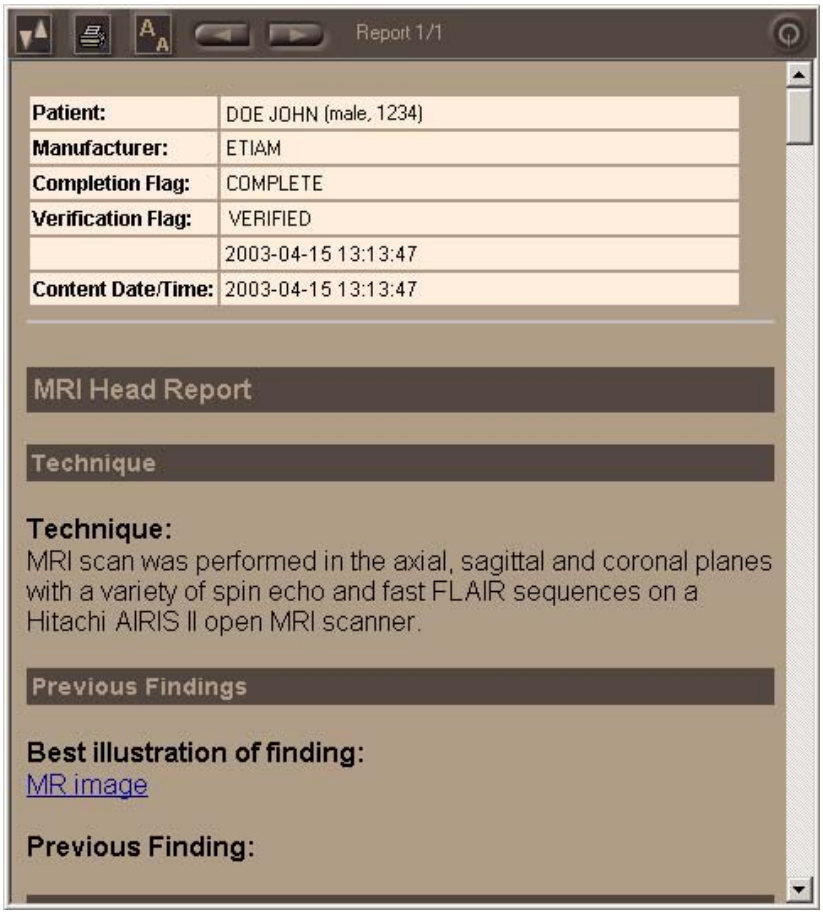
Tips created to help you use DICOM LiteBox in the best conditions unfold in the control panel under an icon depicting a rabbit. You can also go from one tip to the next manually by clicking the rabbit. If you want to hide the tips, click **Show LiteBox Tips** in the **Workspace** menu, or press **CTRL+T**.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

Viewing Study Reports

DICOM LiteBox enables you to display image series and also study reports linked to series. A study (made up of image series) can contain one or more text reports. Reports enable you to rely on study results to view images.

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 for the displayed study. To display the report(s) in the current study, click the icon or simply click the **Display Study Reports** button:

The report-viewing 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 DICOM LiteBox displays reports in their original layout.

The report-viewing window contains buttons that enable you to perform the following actions:

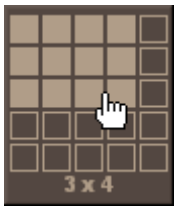
Click this Button	To
	Display/Hide the contents of the report viewing window.
	Print the displayed report to the printer you want.
	Increase/Decrease the size of the text in the displayed report.
	Display the previous or next report.
	Close the report-viewing window.

Viewing Study Images

In DICOM LiteBox, you display images contained in series, and series are contained in studies.

Display Layout

You can display from one to 25 images at the same time. To select the layout you want, click the **Select Display Layout** button, and drag the mouse pointer on the grid to select a layout. For example, if you select the **3 x 4** layout, DICOM LiteBox will display three rows of four images.



You can easily switch from multi-window display to 1x1 layout. To do this, double-click 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** dialog box.

Displaying the Previous or Next Series

You can switch from a series to another using the following buttons:

To switch to the beginning of the previous series, click the **Previous Series** button.

To switch to the beginning of the next series, click the **Next Series** button.

To display the previous or next series in a separate viewer, click the button beside the **Previous Series** or **Next Series** button.

Displaying the Previous or Next Images

You can switch from an image or an image page to another using the following buttons:

To display the previous image in 1x1 layout, or the previous image page in multi-window display, click the **Previous Image Page** button.

To display the next image in 1x1 layout, or the next image page in multi-window display, click the **Next Image Page** button.

Note: You can also use the keyboard arrow keys. If the displayed image series has been loaded partly, **(1/*N*)** is shown above these buttons. For example, if image number 1 is displayed and **(1/2)** is shown, when you click the **Next Image Page** button, you will go directly to image number 3.

Default Mouse Mode

To restore the default mouse mode, click the **Select** 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: In multi-window display, this command only applies to the current image (with an orange frame). However, when you release the right mouse button, inactive windows are refreshed automatically based on the current image.

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 31.

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.

For example, if you click the center of the bar, you will go to the middle of the series.

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.

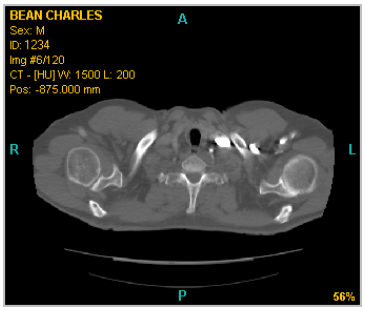
L Left side.

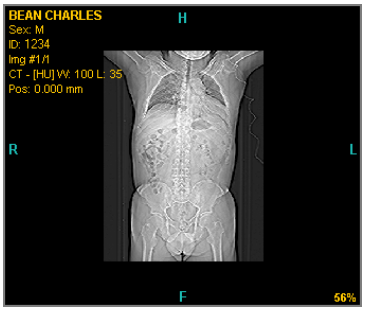
A Front (Anterior).

P Back (Posterior).

H Top (Head).

F Bottom (Feet).





Adding Information on Images

You can display additional information on images you view in DICOM LiteBox, such as the name of the institution that produced studies, the patients' weight, their birthdate... You can define various text overlays depending on the modalities used to produce images: scanner (CT), MRI (MR)... You can also set the location of each text overlay on images.

1. In the **Application** menu, click **Settings**, or press the **F9** key.
2. In the **Settings** dialog box click **Text Overlays**.
3. Read the dialog box contents, and then add annotations.
4. Click **OK**.

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

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 per modality. Please see the "Fitting Image Sizes to the Display Area" section on page 50.

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, and then drag the mouse.

Windowing

Windowing enables to bring out some elements in grayscale images.

By default, the windowing you apply to an image is replicated to all the images in the current series. If you want to window images individually, click **Settings** in the **Application** menu. In the **Windowing** page of the **Settings** dialog box, deselect the **Apply windowing to all the images in the current series by default**, and then click **OK**.

Automatic Windowing

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

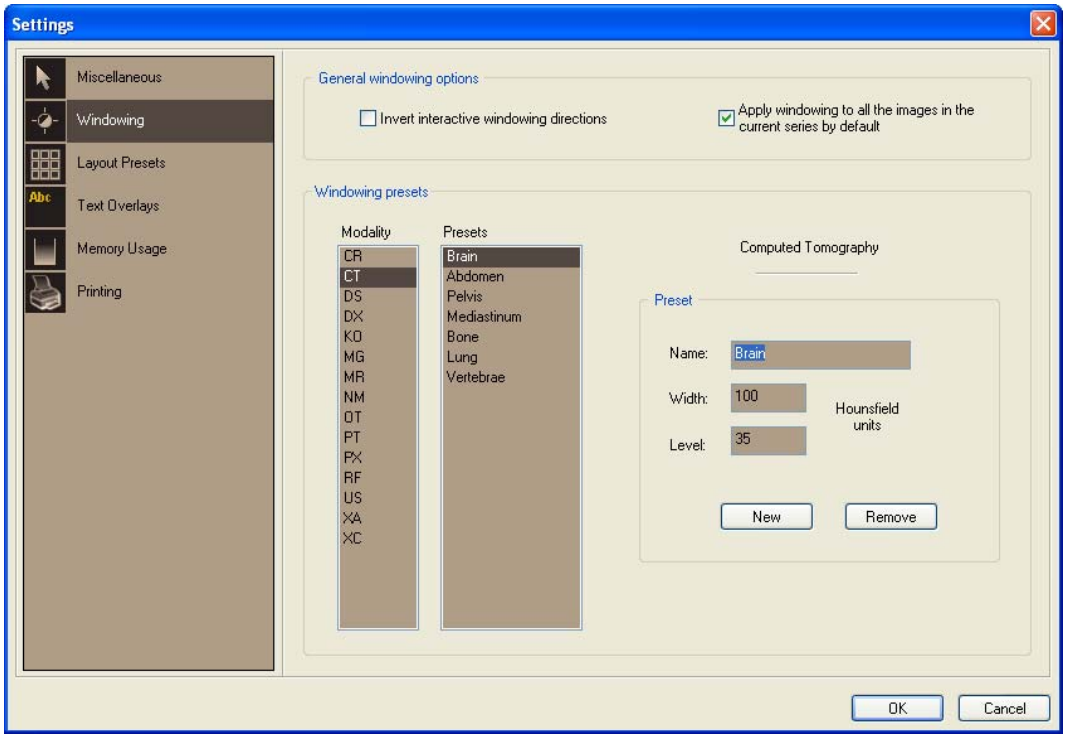
The following windowing settings are available:

Presets	Description
File Presets	To apply 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.

Adding Automatic Windowing Presets

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

1. In the **Application** menu, click **Settings**, or press the **F9** key.
2. In the **Settings** dialog box click **Windowing**. The **Windowing** dialog box contents changes to the following:



3. From the **Modality** list, select the modality you want to add a windowing preset for.
4. In the **Preset** section, fill in the fields, and click the **New** button.

   To add other windowing presets, repeat steps 3 and 4.
5. To save your changes, click **OK**.

Editing Automatic Windowing Presets

1. In the **Modality** list select the modality you want to edit a windowing preset for, and click the name of the preset you want.
2. In the **Preset** section, edit the fields as appropriate.
3. To edit other windowing presets, repeat steps 1 and 2.
4. To save your changes, click **OK**.

Deleting Automatic Windowing Presets

1. In the **Modality** list select the modality you want to delete a windowing preset for, and click the name of the preset you want.
2. Click the **Remove** button.
3. To delete other windowing presets, repeat steps 1 and 2.
4. To save your changes, click **OK**.

Interactive Windowing

You can also apply windowing manually.

1. Click the **Windowing** button:

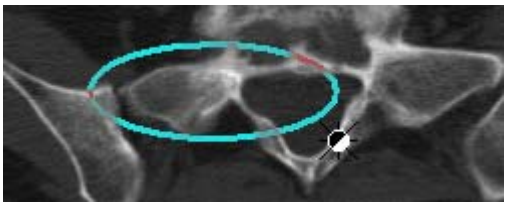
2. Click an image and hold the left mouse button down, and then drag the mouse as follows:
   - Vertically on the image to change the windowing central point.
   - Horizontally to change the windowing width.

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** dialog box deselect the **Apply windowing to all the images in the current series by default**.

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.



Note: The windowing applied to the current image is replicated to all the images in the current series when you release the mouse button.

Applying Presentation States to Images

Presentation states consist in 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 DICOM LiteBox, you can view studies including presentation states. One or more presentations can be associated to all the images in a study or only to some of them.

When you open a study including presentation states. DICOM LiteBox 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

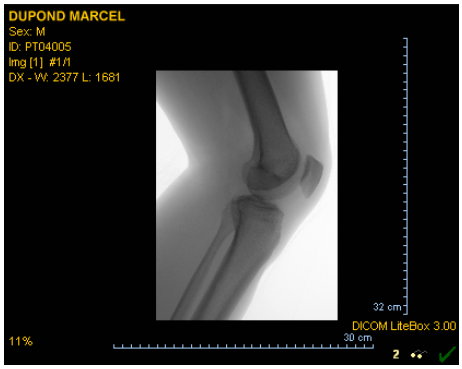


Image with presentation state 1
(image with video inversion and shutter)

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

Applying Presentation States to All the Images in a Series

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

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

Applying Presentation States to an Individual Image

To apply a presentation state associated to an image, click the icon in the lower 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 to 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 **Reset Image**.

Resetting the Display of the Images in the Current Series

To restore image original display parameters, click the **Reset Series Images to Original Display** button:

Manipulating Images

Panning an Image

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

Click the **Pan** button:

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

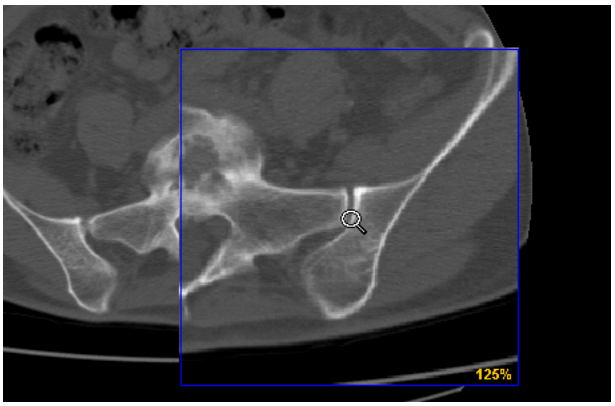
Note: You can also press the **SHIFT** key and the left mouse button simultaneously while dragging the mouse.

Magnify Mode

You can enlarge a portion of an image using the magnify 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.



Note: This magnify mode applies to the current image only.

To move the magnify effect from one image and/or a series to another, without holding the left mouse button down, do the following:

1. Click the **Magnify** button, and press **CTRL+M**.
2. In the "Press the left mouse button to start magnifying, and press the mouse button again to stop." message, click **OK**.
3. Click an image, and drag the mouse to move the magnify effect. You can also change the magnify factor using the mouse wheel.
4. To disable this magnify mode and switch back to the default magnify mode, press **CTRL+M**, and click **OK** in the "Press the left mouse button to switch back to the default magnify mode" message.

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**.

Flipping and Rotating One or More Images

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

Displaying a Position on an Image

To display a position on an image, do the following:

1. Click the Select an Annotation Tool button arrow:

   And click **Marker Annotation**:

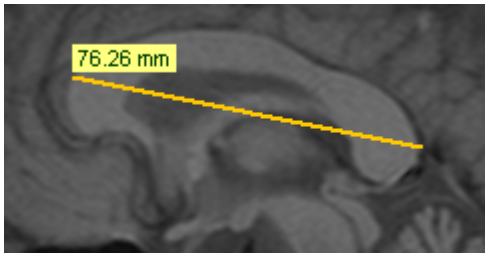
2. On an image, position the mouse pointer at the position you want to indicate, and press the left mouse button.
3. In the **Annotation Label** dialog box, the values are displayed in pixels or density according to the image type and the relevance. If you wish to customize the annotation, enter the text you want to add in the **Suggested text** field, and click **OK**.

Displaying a Distance on an Image

To display a distance between two points on an image, do the following:

1. Click the Select an Annotation Tool button arrow, and then Line Annotation:

2. On an image, position the mouse pointer at the starting point of the distance you want to display, and press and hold down the left mouse button. You can draw a distance with one or two arrows:
   - Press and hold down the **CTRL** key to add an arrow at one of the ends.
   - Press and hold down the **CTRL** and **SHIFT** keys to add an arrow at both ends.
3. Drag the mouse on the image (the distance displays as you move the mouse) to the end point of the distance. If you want to remove the arrow from an end and add it at the other end, press the **SHIFT** key and resume drawing the distance. Likewise if have started drawing a distance with two arrows and you want to remove one of them, press the **CTRL** or **SHIFT** key, and resume drawing the distance. When you have finished, release the left mouse button.
4. In the **Annotation Label** dialog box, the distance is displayed in millimeters if the information needed is available in the image. If you wish to customize the annotation, enter the text you want to add in the **Suggested text** field, and click **OK**.



Displaying an Angle on an Image

To display an angle on an image, do the following:

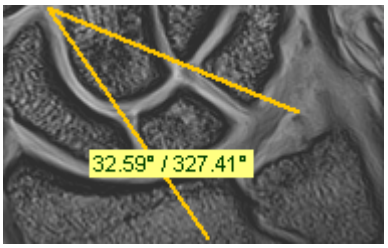
1. Click the Select an Annotation Tool button arrow, and then Angle Annotation:

2. On an image, position the mouse pointer at the top of the angle.
3. 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.

> **Note:** If you want to draw an angle made up of two separate lines hold the **CTRL** key down.

4. 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.

5. In the **Annotation Label** dialog box, both angles (acute and obtuse) are displayed in degrees. If you wish to customize the annotation, enter the text you want to add in the **Suggested text** field, and click **OK**.



Displaying an Ellipse on an Image

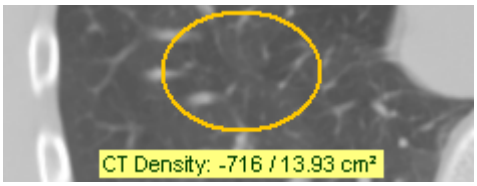
To display an ellipse or a circle on an image, do the following:

1. Click the Select an Annotation Tool button arrow, and then Ellipse Annotation:

2. On an image, position the mouse pointer at the top left of the ellipse you want to draw.
3. 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.

> **Note:** 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.

4. In the **Annotation Label** dialog box, the surface of the ellipse is displayed in cm^2, the density is also displayed if appropriate. If you wish to customize the annotation, enter the text you want to add in the **Suggested text** field, and click the **OK** button.



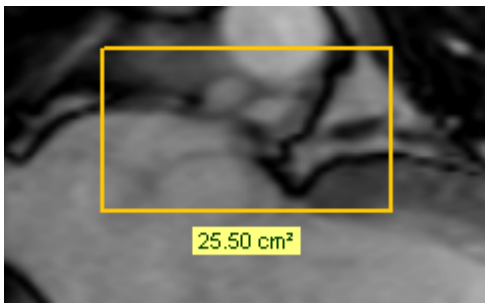
Displaying a Rectangle on an Image

To display a rectangle on an image, do the following:

1. Click the Select an Annotation Tool button arrow, and then Rectangle Annotation:

2. On an image, position the mouse pointer at the top left of the rectangle you want to draw.
3. 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.

4. In the **Annotation Label** dialog box, the surface of the rectangle is displayed in cm^2, the CT density is also displayed if appropriate. If you wish to customize the annotation, enter the text you want to add in the **Suggested text** field, and click **OK**.

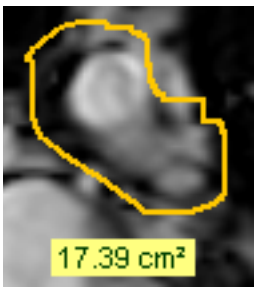


Displaying a Region of Interest on an Image

To draw a free-form region on an image, do the following:

1. Click the Select an Annotation Tool button arrow, and then Region Annotation:

2. On an image, position the pointer where you want to start drawing the region, and press and hold down the left mouse button.
3. Drag the mouse, and release the mouse button to end the first segment.
4. 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.
5. In the **Annotation Label** dialog box, the surface of the region is displayed in cm^2. If you wish to customize the annotation, enter the text you want to add in the **Suggested text** field, and click **OK**.



Note: You can create as many annotations as you want on a single image. To delete the last annotation, click **Remove Last Annotation** in the **Image** menu. To delete them all, click **All Annotations** in the **Image** menu. You can also access this feature using a right-click.

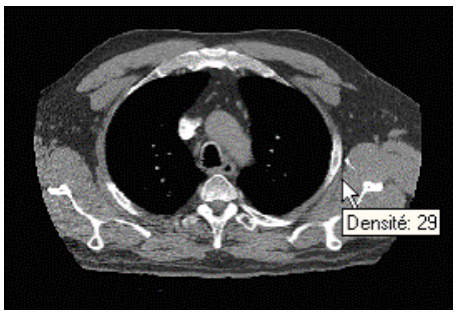
Displaying the Density on a CT Image

To display the density on a CT image, do the following:

1. In select or magnify 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 Mode

To learn how to display several series at the same time, please see the "Viewing Several Image Series (Multi-Series Mode)" section on page 5.

In multi-series mode, the display progress for the current series is shown as a bar on the upper border of the series viewer. When the Show/Hide Reference Lines and Synchronize Series on Slice Location commands are enabled, the progress bar is displayed in each series viewer.

Note: The commands you apply using the buttons available in the control panel apply to the current series only (with a blue frame), except the following commands: **Show/Hide Patient Information**, **Show/Hide Reference Lines**, **Show/Hide Density for CT Images**, and **Synchronize Series on Slice Location**.

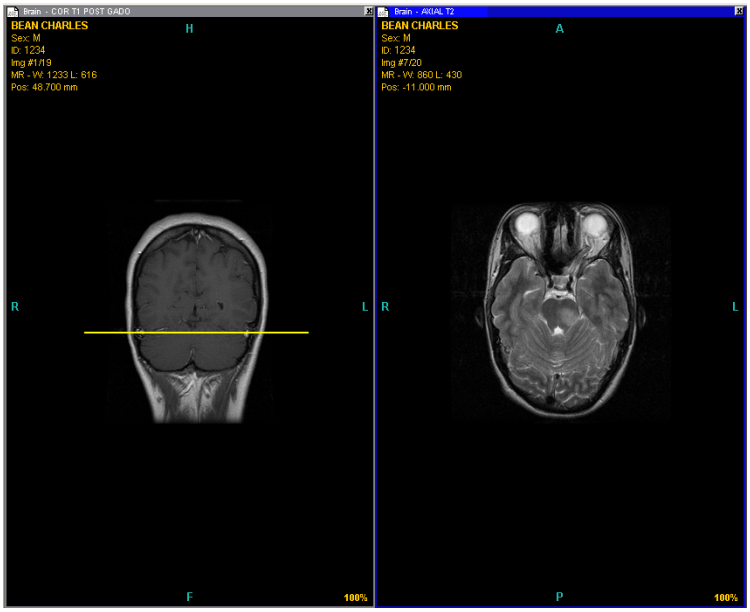
Multi-Series and Reference Lines

Reference lines are used to locate a slice in another slice. It means that you can locate an image in a series relative to another image in another series.

The **Show/Hide Reference Lines** command can be used only when at least two series from the same study are displayed, and DICOM LiteBox can find relative locations in images. To apply this command, do the following:

1. Open at least two series from the same study, if appropriate (please see the "Viewing Several Image Series [Multi-Series Mode]" section on page 5).
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 series with the same orientation, and that contain slice location information.

1. Open at least two series from the same study, if appropriate (please see the "Viewing Several Image Series [Multi-Series Mode]" section on page 5).
2. Click the **Synchronize Series on Slice Location** button:

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

Manual Synchronization

1. Open at least two series from the same study or different studies, if appropriate.
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.

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

Playing Multiframe Images

- To start playing the multiframe image, click the **Play/Pause** button:

- To stop playing the multiframe image, click the **Play/Pause** button again:

  Note: You can also browse the frames in the multiframe image manually by dragging the cursor on the scroll bar located on the right of the **Play/Pause** button.

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

  To play images backward.

  To play images forward.

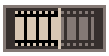
  To select an interval other than the default one (one frame) right-click one of these buttons.

Playing a Frame Selection

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

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. Click the **Selection only** button, and then click the **Play/Pause** button to play the selection only.

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

Playing Multiframe Images in Back-and-Forth Mode

To play a multiframe image in a direction, and then in the opposite direction, click the **Back and forth** button before clicking the **Play/Pause** button.

Adjusting the Play Speed

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

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

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

Note: The nominal speed can be used only if the computer is fast enough.

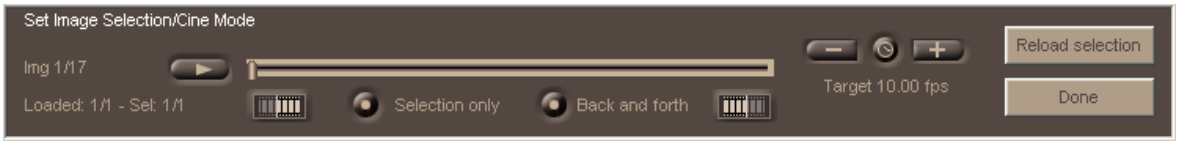
Viewing an Image Series in Cine Mode

The cine mode is similar to the quick browse mode in that it allows for 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

1. 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:

   Note: When you first run DICOM LiteBox, the control panel is displayed in the middle of the display area. You can click it and drag it to another location to clear the display area. This new location will be saved for the current and next DICOM LiteBox sessions.

2. To start browsing images, click the **Play/Pause** button:

3. To stop browsing images, click the **Play/Pause** button again:

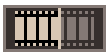
Note: You can also browse the images manually by dragging the cursor on the scroll bar located on the right of the **Play/Pause** button.

Browsing a Part of Images

You can browse an entire image series or only some of the images in the series. Do the following:

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. Click the **Selection only** button, and click the **Play/Pause** button to browse the image selection only.

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

Loading the 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 **Display Series Selection/Cine Mode** button, and the **Play/Pause** button again.

Playing Images in Back-and-Forth Mode

To play images in a direction, and then in the opposite direction, click the **Back and forth** button before clicking the **Play/Pause** button.

Adjusting the Browse Speed

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

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

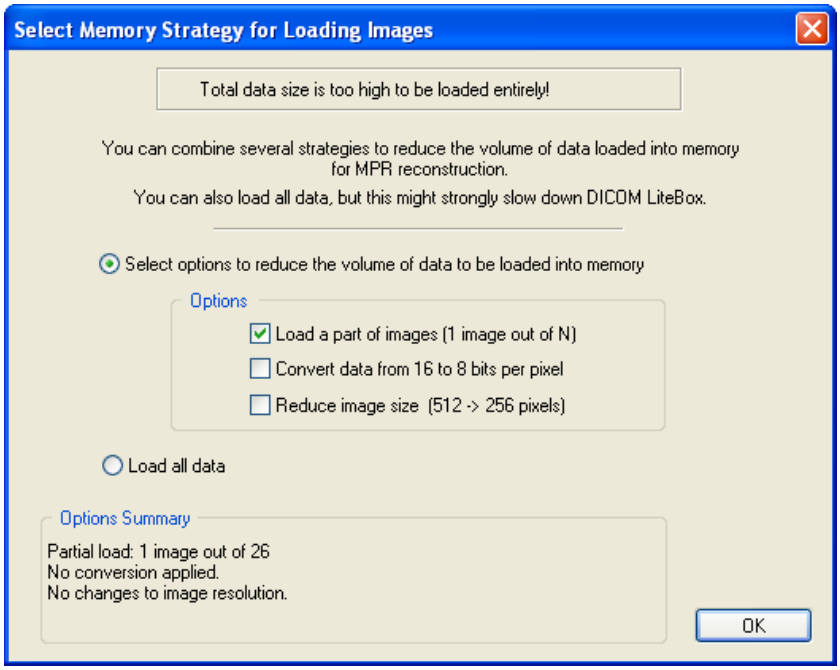
- To revert to the nominal play speed, that is the speed specified in the DICOM images, click the watch:

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 DICOM LiteBox. 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:

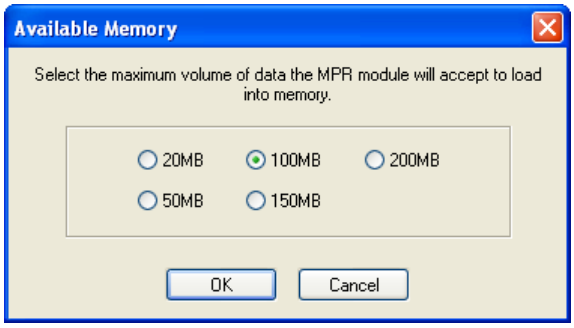


1. To set a strategy to limit the available memory usage, select the **Select options to reduce the volume of data to be loaded into memory**, and select one or more options:
   - **Load a part of images (1 image out of N):** Speeds up the loading of images while saving memory. The information loss is 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.
2. To load all images, which might result in lower performances, select the **Load all data** option.
3. To save your changes for the current Multiplanar Reconstruction module session, click **OK**.

Configuring the Available Memory Usage for the Multiplanar Reconstruction Module

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

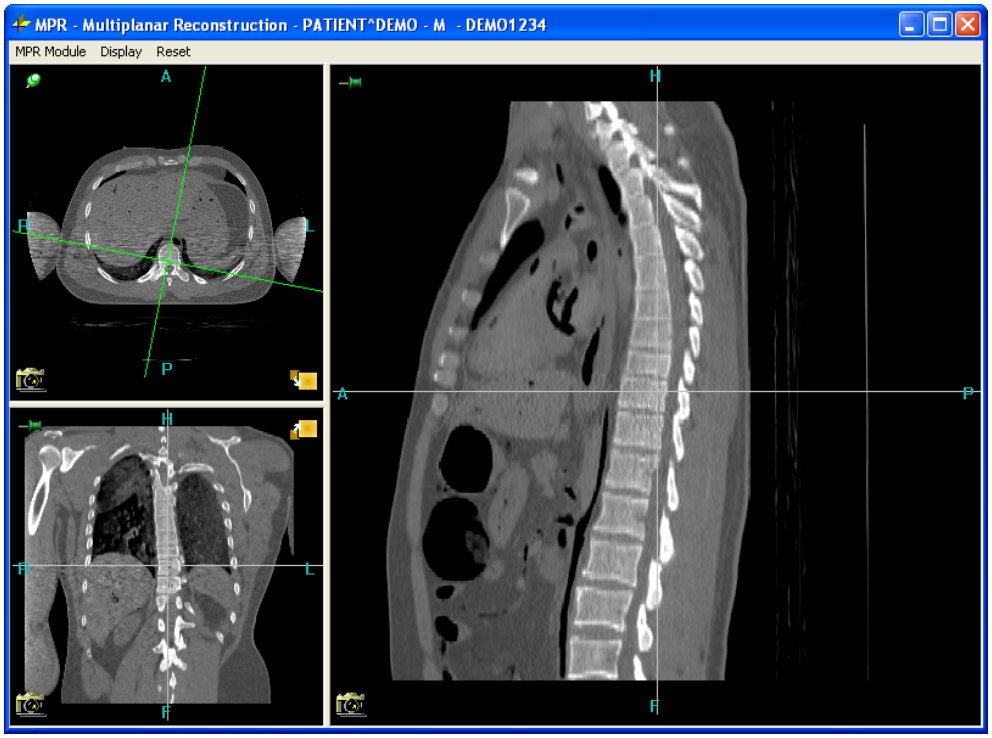
1. In the **MPR Module** menu, click **Memory Management**. The **Available Memory** dialog box appears:



2. Select the appropriate option, and click **OK** to save your change.

Starting the Multiplanar Reconstruction Module

Click the **Multiplanar Reconstruction (MPR)** button. The Multiplanar Reconstruction module appears:



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.

To go back to the DICOM LiteBox main interface, close the **MPR - Multiplanar Reconstruction** window.

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 Study Images

You can print displayed images or the images contained in a selection. They are printed to the default printer defined on the computer.

You can also print images with the layout you want.

Printing Displayed Images

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

Printing an Image Selection

Selecting Images

You can define one or more selections in a single study, and include in each image selection images from different series.

To select images, you can either:

- Directly select the images your are interested in.
- Select images you are NOT interested in, and then invert the selection.

1. Open a series from the study where you want to select images.
2. To select an image, do one of the following:
   - Click the image, and click **Toggle Image Selection** in the **Selection** menu.
   - Click the image, and press the **SPACE** key.
   - Click the dark green check mark in the lower right corner of the image.

   The check mark on the image then changes to bright green:

   Repeat this step for each image you want to select in the current series.

   Note: To select images quickly, display several images at once in the display area. This will reduce image scrolling. To select an image display layout, click the **Select Display Layout** button.
3. To select images in another series of the study, open the series you want, and repeat the previous step.
4. If you want to include in the selection *only* the images you have not selected, click **Invert Series Selection** in the **Selection** menu.

Printing the Selection

1. In the study where you have selected images, click **Actions on Selection** in the **Selection** menu, or press **CTRL+S**.
2. In the **Actions on Selection** dialog box click the **Print selection** button.

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 parameters in the **Settings** dialog box. 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 Parameters" on page 51.

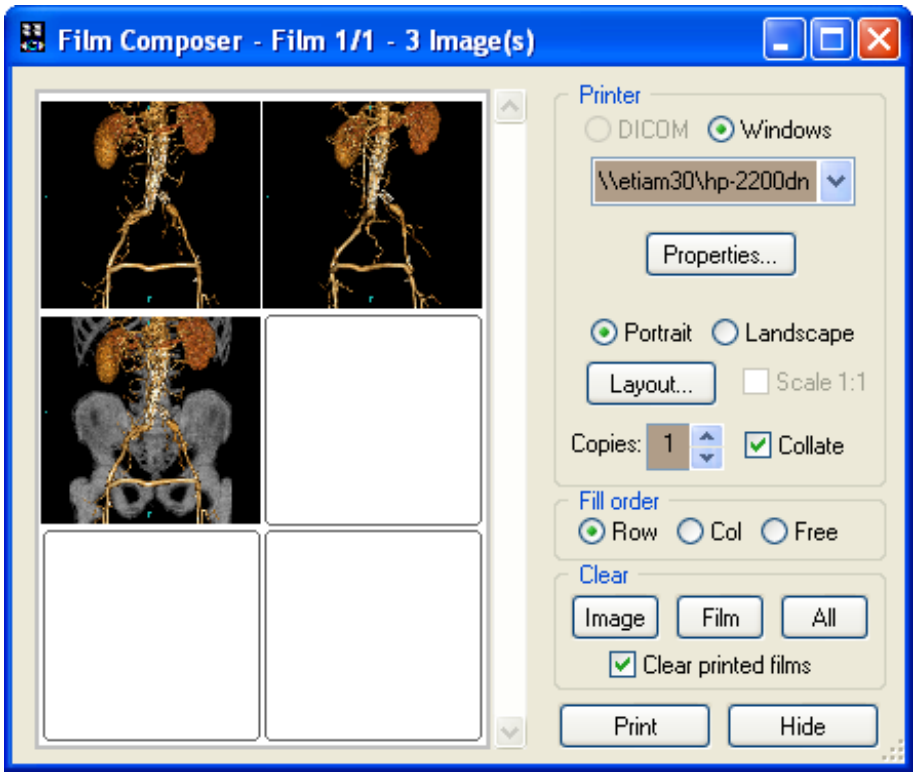
1. If the default mouse mode (Select mode) is not enabled, click the **Select** button.
2. Point the image you want to print, press and hold down the left mouse button, and drag the mouse to the **Film Composer** icon, and then release the mouse button:

To add an image with references lines, position the pointer on the image you want, and press **CTRL+TAB**.

Repeat this step for each image you want to add to the Film Composer.

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 DICOM LiteBox display area.

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 vertically.
    - **Col:** Select this option to fill films horizontally.
    - **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.

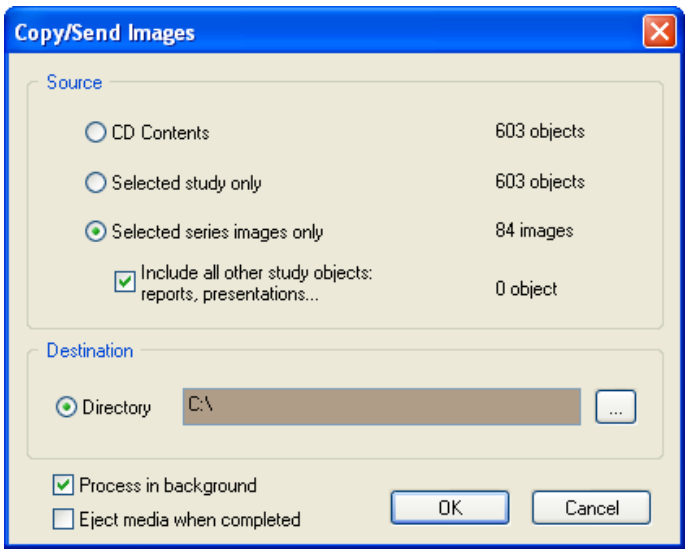
1. In the **Access Studies** dialog box, click the **CD Contents** tab.
2. Select the item (s) for the images you want to copy:
   - **Several studies:** Select the studies you want in the **Studies** section.
   - **All the images in a study:** Select the study you want in the **Studies** section.
   - **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** dialog box, 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 done** 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 annotations and patient information:**

  1. Select the image you want, and press **CTRL+C**.
  2. In the graphics application, paste the image by pressing **CTRL+V**.

     -or-

  1. Right-click the image you want.
  2. In the context menu, point **Copy to Clipboard**, and click **Image as Displayed (With Overlays)**.

  In the graphics application, paste the image by pressing **CTRL+V**.

- **To copy an image in real size without annotations and patient information:**

  1. Right-click the image you want.
  2. In the context menu, point **Copy to Clipboard**, and click **Full Size Image Only**.

  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 disk for future use or use in other applications.

Exporting a Still Image

- **To export an image as displayed including annotations and patient information:**

  1. If several images are displayed, click the image you want to export.
  2. In the **Image** menu, point **Export**, and click **Image as Displayed (With Overlays)**.

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

  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.

- **To export an image in real size without annotations and patient information:**

  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. 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.

Note: Text information displayed on the image in DICOM LiteBox 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 30.

2. In the **Image** menu, point **Export**, and click **Image as Displayed (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), DICOM LiteBox 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 DICOM LiteBox 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.

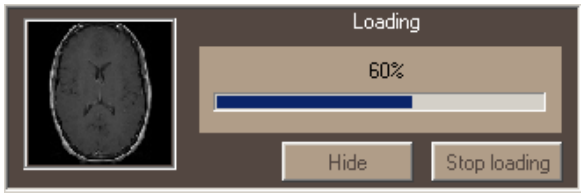
Customizing DICOM LiteBox

Configuring Memory Usage to Load Large Image Series

DICOM LiteBox is designed to adapt the loading of large image series to your computer performances and capacity. By default, this feature is disabled.

When the memory limitation is enabled, the following actions can take place:

- 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.

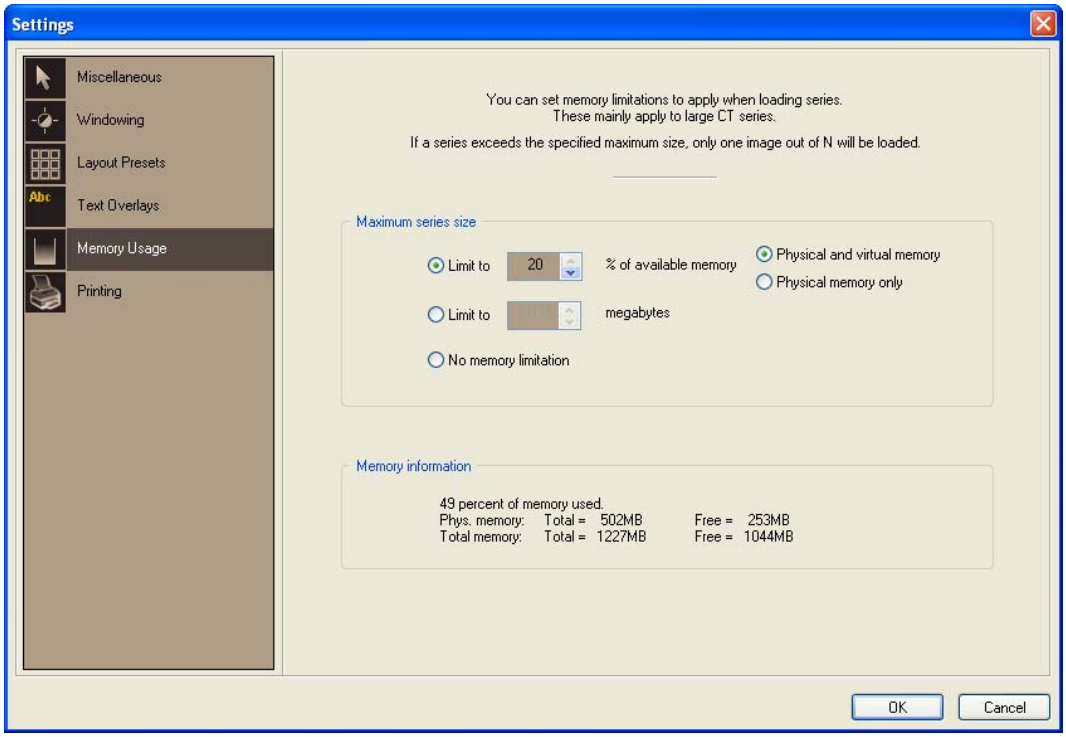


Note: To enable this loading panel, in the **Miscellaneous** page of the **Settings** dialog box, select the **Display loading progress window** checkbox.

- Load images in the background to continue working by clicking the **Hide** button.
- Stop the loading of 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 been loaded yet, will be loaded as and when you display them.

- **To enable memory limitation:**

1. In the **Application** menu, click **Settings**, or press the **F9** key.
2. In the **Settings** dialog box click **Memory Usage**. The **Settings** dialog box contents changes to the following:



3. 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 DICOM LiteBox. 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, DICOM LiteBox will load one image out of ten.

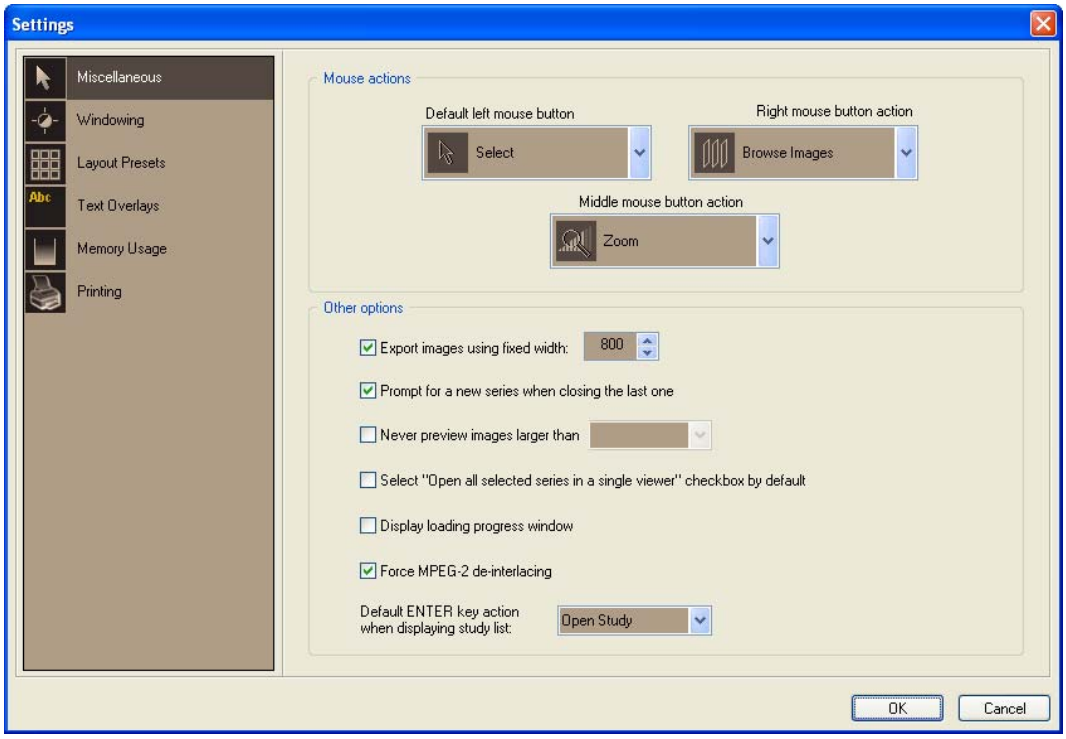
> **Note:** Information on the memory is displayed in the lower part of the dialog box to help you determine the appropriate memory limitation in order to fit your needs regarding DICOM LiteBox performance.

   - **No memory limitation:** Select this option if you want to load all the series entirely whatever their sizes. However, this might reduce DICOM LiteBox performance.
4. To save your changes, click **OK**.

Customizing the Mouse Actions

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

1. In the **Settings** dialog box click **Miscellaneous**. The **Settings** dialog box contents changes to the following:



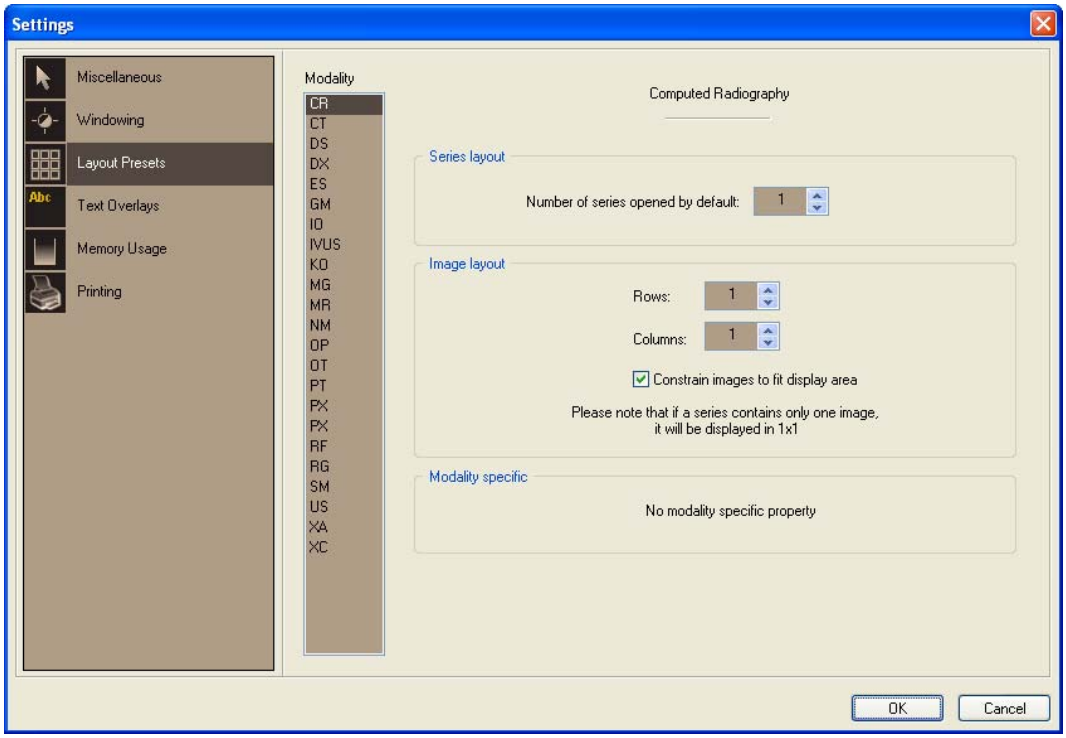
2. In the **Mouse actions** section, select the actions you want, and click **OK** to save your changes.

Customizing the Display Layout

Configuring the Number of Series Displayed per Modality

For each modality you can decide how many series will be selected by default for opening when starting DICOM LiteBox.

1. In the **Settings** dialog box click **Layout Presets**. The **Settings** dialog box contents changes to the following:



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 DICOM LiteBox for the selected modality.

> **Note:** If you select **3** and two series are available, only these two series will be selected in the **Access Studies** dialog box. Then you will simply need to press the **ENTER** key to open them.

4. In the **Image layout** section, select 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 **Fit to Window Size** button.

6. To save your changes, click **OK**.

Configuring the Display Layout per Modality

You can configure a specific display layout for each modality:

1. In the **Settings** dialog box click **Layout Presets**.
2. In the **Modality** section, select the modality for which you want to configure a display layout.
3. In the **Image layout** section lists, select the numbers of lines and columns you want to display for the selected modality.
4. To save your changes, click **OK**.

Fitting Image Sizes to the Display Area

When loading images, DICOM LiteBox can fit them to the display area size. Images can also be loaded in their original size without being adjusted. To fit images to the display area depending on their modality, do the following:

1. In the **Settings** dialog box click **Layout Presets**.
2. In the **Modality** section, select the modality for which you want to configure the image layout.
3. In the **Image layout** section, select the **Constrain images to fit display area** checkbox.
4. To save your change, click **OK**.

De-interlacing MPEG Multiframe Images

DICOM LiteBox can de-interlace DICOM/MPEG multiframe images automatically for a better display quality. In interlaced images only one image on two is displayed which results in a lower display quality.

1. In the **Settings** dialog box click **Miscellaneous**.
2. Select the **Force MPEG-2 de-interlacing** if applicable.
3. To save your change, click **OK**.

Customizing Windowing

1. In the **Settings** dialog box 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 the images in the 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.

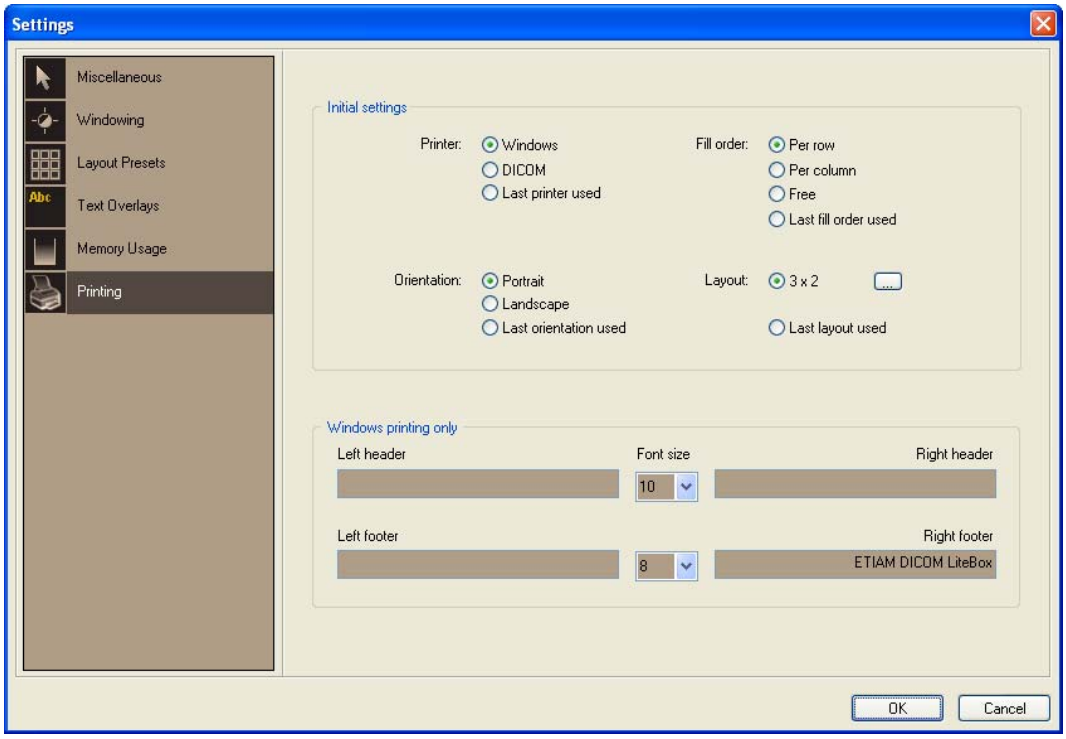
   Note: You can also enable or disable this feature by clicking **Apply Windowing to All Images in Series** in the **Series** menu.

4. To save your changes, click **OK**.

Defining Default Print Parameters

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

1. In the **Settings** dialog box click **Printing**. The **Settings** dialog box changes to the following:



2. In the **Print parameters** section, select the options you want.
3. In the **Windows printing only** section, you can enter the information you want to show on each printed film and the text sizes.
4. To save your changes, click **OK**.

Index

Access Studies dialog box
- add columns 4
- adjust column width 4
- delete images 6
- display columns 4
- display images 2
- image previews 4
- image thumbnails 4
- remove columns 4

Annotations
- angles 22
- delete 24
- display on images 21
- ellipses 23
- export with images 43
- lines 22
- markers 21
- rectangles 23
- regions of interest 24
- text ..... *See* Information on images

AVI format to export multiframe images 44
BMP format to export images 44
CD/DVD
- display 1
- open 1

CD/DVD, open 2
Cine mode
- adjust play speed 32
- back-and-forth mode 31
- browse a portion of images in a series 31
- browse in back-and-forth mode 31
- browse series images 33
- define an image selection 31

Close DICOM LiteBox 6
Configuration of DICOM LiteBox, customize 45
Control panel
- display 7
- hide 7

Copy images
- to a directory 41
- to Windows Clipboard 42

Customize DICOM LiteBox
- display 48
- display settings 48
- loading of large series 45
- memory usage configuration 45

Customize DICOM LiteBox (*continued*)
- mouse 47

Densities
- display on scanner images (CT) 25
- hide on scanner images (CT) 25

DICOM 1
DICOM LiteBox
- close 6
- control panel, show and hide 7
- customize 45
- exit 6
- main features 9
- overview 1
- start 1
- stop 6
- tips, show and hide 9

DICOM printer, print to 39
Directories
- copy images to 41
- select images to display 3

Display
- adjust image play speed 32
- angles on images 22
- CD/DVD 2
- customize 48
- densities on scanner images 25
- display layouts 11
- distances on images 22
- ellipses on images 23
- image display order 4
- image selections 4
- images 2, 11
- images in cine mode 33
- images in cine mode, back and forth 31
- images in cine mode, partly 31
- images, original parameters 19
- next series in another viewer 11
- next series in the same viewer 11
- number of images displayed simultaneously 11
- patient information on images 13
- positions on images 21
- previous series in another viewer 11
- previous series in the same viewer 11
- rectangles on images 23
- regions of interest on images 24

Display (*continued*)
select images to display ... 3
several image series ... 5, 11, 25
text annotations ... 13
Display layouts
define ... 11
define default ... 11, 48
define per modality ... 11
multi-window display ... 11
select ... 11
Enlarge images ... 14, 20
Exit DICOM LiteBox ... 6
Export images
fixed ... 43
in real size ... 43
multiframe ... 43
still ... 43
with annotations ... 43
with patient information ... 43
without annotations ... 43
without patient information ... 43
Film Composer
add images ... 41
clear images ... 40
open ... 39
print images ... 41
remove images ... 40
Fixed images ... *See* Still images
Frames ... *See* Multiframe images
Image colors, invert ... 21
Image display layouts ... *See* Display layouts
Image pages ... *See* Images
Image selections
define ... 37
display ... 4
display creator's name ... 5
display description of ... 5
print ... 37, 38
Image series
adjust image browse speed ... 32
adjust image play speed ... 32
apply presentation states to ... 18
browse images in back-and-forth mode ... 31
browse images quickly ... 12, 33
browse images quickly, back and forth ... 31
browse images quickly, partly ... 31
delete ... 6
display ... 2
display in several viewers ... 6
Image series (*continued*)
display next in another viewer ... 11
display next in the same viewer ... 11
display previous in another viewer ... 11
display previous in the same viewer ... 11
display reference lines ... 26
display several ... 5
flip ... 21
image selections ... 4
move magnify effect between ... 21
MPR module ... 37
MPR reconstructions ... 37
multiplanar reconstructions ... 37
open ... 2
partly loaded, display ... 12
print ... 41
print image selections ... 38
reset display ... 19
rotate ... 21
rotations ... 21
scroll through images in back-and-forth mode ... 31
scroll through images quickly ... 12, 33
scroll through images quickly, back and forth ... 31
scroll through images quickly, partly ... 31
synchronize automatically ... 27
synchronize manually ... 27
synchronize on slice location ... 27
tomographic, multiplanar reconstructions ... 37
Image viewers
add ... 6
apply the same layout to all ... 11
different layouts depending on viewers ... 11
display layouts ... 11
display reference lines ... 26
display several ... 6
display several series ... 6
number of images displayed per viewer ... 11
select a layout per viewer ... 11
synchronize series ... 27
Images
adjust default size ... 49
adjust play speed ... 32
apply presentation states to ... 17
apply presentation states to an image ... 18
browse quickly ... 12, 33
browse quickly, back and forth ... 31
browse quickly, partly ... 31

Images (*continued*)
define default size 49
de-interlace MPEG images 49
delete 6
delete annotations 24
display 2, 11
display angles on 22
display distances on 22
display ellipses on 23
display in cine mode 33
display in cine mode, back and forth 31
display in cine mode, partly 31
display information on 13
display layouts 11
display next 12
display order 4
display positions on 21
display previous 12
display rectangles on 23
display reference lines on 26
display regions of interest on 24
display selections 4
enlarge a portion of an image 20
export in real size 43
export with annotations 43
export with patient information 43
Film Composer 38
flip 21
invert colors 21
magnify mode 20
manipulate 28
MPR module 37
MPR reconstructions 37
multiplanar reconstructions 37
multi-window display 11
number of images displayed simultaneously 11
pan 20
print 41
print displayed images 37
print selections 38
quick browse mode, view in 12
reset display 19
rotate 21
rotations 21
scanner (CT), display densities on 25
scanner (CT), hide densities on 25
select 37
series 2
studies 2
tomographic, multiplanar reconstructions 37
window 17
zooms 14
Images, define page layouts for printing 38
Imaging modalities
add windowing presets 15
change default display layouts 11, 48, 49
define a default display layout per modality 11, 48, 49
delete windowing presets 16
edit windowing presets 16
Import images into graphics applications 42
Information on images
add 13
display 13
hide 13
Introduction to DICOM LiteBox 1
Invert image colors 21
JPEG format to export images 44
Key images ..... *See* Image selections
Magnify mode ..... *See* Images, enlarge a portion of an image
Magnify mode, move between series 21
Mouse mode, default 12
Mouse, customize button actions 47
MPEG format, de-interlace images 49
MPR ..... *See* Multiplanar reconstructions
Multiframe images
adjust play speed 29
define a frame selection to play 29
display 30
export 43
export frames 43
MPEG, de-interlace 49
MPEG, improve display quality 49
play 30
play back and forth 29
play entirely 28
play in back-and-forth mode 29
play partly 29
Multiplanar reconstructions
apply rotations 35
apply translations 35
cancel rotations 36
cancel translations 36
cancel windowing settings 36
change reference views 35

Multiplanar reconstructions (*continued*)
image rotations 36
image translations 35
reference views, change 35
reset images 36
rotate images 36
start the module 34
window images 36
Multi-series mode
display reference lines 26
display several series 5
synchronize series 27
Multi-window display 11
Open
CD/DVD 1, 2
studies 2
Ouvrir
studies 1
Page layouts for printing, define 38
Pan images 20
Patient information
display on images 13
export with images 43
hide on images 13
Play multiframe images
adjust play speed 29
back and forth 29
back-and-forth mode 29
define a frame selection 29
entirely 28
partly 29
Presentation states
apply to a series 18
apply to an image 18
apply to images 17
Print
customize 50
define default parameters 50
define page layouts 38
displayed images 37
image selections 37, 38
study reports 10
through the Film Composer 38
to DICOM printers 39
Quick browse mode .. *See* Images, browse quickly
Reference lines
display on images 26
hide on images 26
Regions of interest
apply windowing 17
display on images 24
Reports ..... *See* Study reports
Reset image display 19
Rotate
all the images in a series 21
an image in a series 21
Rotations
apply to all the images in a series 21
apply to an image in a series 21
cancel 36
multiplanar reconstructions 36
Select images 37
Select images to display
from a CD/DVD 3
from a directory 3
Show ..... *See* Display
Slice location, synchronize on 27
Start
DICOM LiteBox 1
MPR module 34
Multiplanar Reconstruction module 34
Steady images ..... *See* Still images
Still images ..... *See also* Images
export 43
Stop DICOM LiteBox 6
Structured reports ..... *See* Study reports
Studies
delete 6
display 2
image series 2
including presentation states 17
open 2
select images 37
Study reports
display 9
print 10
Synchronize series
automatically 27
manually 27
TIFF format to export images 44
Tips
display 9
hide 9
Translations
apply 35
cancel 36
multiplanar reconstructions 35

View ..... *See* Display
Window
add windowing presets 15
all the images in a series 14
an image in a series 14, 16
automatic windowing 15
customize 49
interactive windowing 16
region-of-interest windowing 17
Windowing presets
add 15
apply 15
delete 16
edit 16
interactive 16
Windowing settings ..... *See also* Window
automatic 15
customize 49
interactive 16
region of interest 17
Windows Clipboard, copy images to 42
Zooms
cancel zoom 14
display images entirely 14
enlarge images 14
in 14
interactive 14
out 14
reset image original size 14
shrink images 14

ETIAM Technopole Atalante-Villejean

20, rue du Professeur Jean Pecker
35000 Rennes – France
Tel.: +33.(0)2.99.14.33.88
Fax: +33.(0)2.99.14.33.80

www.etiam.com
info@etiam.com

Sorna Corporation

2020 Silver Bell Road, Suite 17
Eagan, MN 55122 – USA
Tel.: +1-651-406-9900
Fax: +1-651-406-9904

www.sorna.com
info@sorna.com