



IBM iConnect[®] Access

7.x

STUDY VIEWERS QUICK START GUIDE

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INDICATIONS FOR USE

The IBM iConnect Access application provides internet access to multi-modality softcopy medical images, reports, and other patient-related information to conduct diagnostic review, planning and reporting through the interactive display and manipulation of medical data. IBM iConnect Access provides healthcare professional tools to aid in interpreting medical images including:

- Displaying DICOM compliant medical images and non-DICOM content using XDS.
- Reformatting images, including creation of MPRs, MIPS, MinIPs, color/monochrome 3D volume rendered images.
- Manipulating displayed images via control of slice thickness, slice interval, obliquity, perspective, rotation, window/ level, crop, zoom, color/monochrome transformations, segmentation, sculpting, straightening the display of curved structures, and creating images perpendicular to a curvilinear path.
- Creating individually captured DICOM images that can be displayed and stored in a PACS.
- Measuring coronary calcium, which is intended for non-invasive identification and quantification of calcified atherosclerotic plaques in the coronary arteries using tomographic medical image data and clinically accepted calcium scoring algorithms.

The IBM iConnect Access application can be configured to provide either lossless or lossy compressed images for display. The medical professional user must determine the appropriate level of image data compression that is suitable for their purpose.

Lossy compressed mammographic images and digitized film screen images must not be reviewed for primary image interpretations. Mammographic images may only be interpreted using an FDA approved monitor that offers at least 5 MP resolution and meets other technical specifications reviewed and accepted by FDA.

Display monitors used for reading medical images for diagnostic purposes must comply with applicable regulatory approvals and with quality control requirements for their use and maintenance. Use of IBM iConnect Access application on mobile devices such as iPhones and iPads is not intended for diagnostic use.

The symbols glossary is provided electronically at <http://www.merge.com/Support/Statements-and-Patches.aspx>.

CAUTION: U.S. federal law restricts this device to sale by, or on the order of, a physician.

NOTE: The IBM iConnect Access software complies with the MDD Council Directive 93/42/EEC of 14 June 1993.

CANADIAN DEVICE IDENTIFIER: 100-00001-00



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For application support or to report issues with user documentation, contact Customer Support:

- In North America: call toll-free 1-877-741-5369
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- Email: MergeSupport@us.ibm.com

Part	Date	Revision	Description
ICA-19126	2019-05	1.0	Initial revision for IBM iConnect Access 7.x.

The latest revision of this document can be found in [Merge Communities](#).



Study Viewers

Quick Start Guide

The study viewers enable you to review studies in the following viewer types:

- **Enterprise** — legacy IBM iConnect Access study viewer including all the standard workflow and image viewing tools.
- **Universal** — universal user interface with similar functionality to the Enterprise viewer. Includes support for diagnostic quality collaboration and screen sharing.

NOTE: Some Enterprise features are not available on the Universal viewer (see the exception list in [Universal Study Viewer on page 23](#) for a list of features).

NOTE: The Universal viewer is only available for desktop browsers and not available on mobile devices.

Study Viewer functionality is described in the following:

- [Opening the Viewers on page 5](#)
- [Enterprise Study Viewer on page 5](#)
- [Universal Study Viewer on page 23](#)
- [Working with Studies on page 34](#)

The study viewers support the IBM iConnect Access 3D Viewer plugin, which is available under a separate license. IBM iConnect Access 3D provides clinical users the ability to perform and save advanced image processing of tissue volumes for MRI, CT, and PET. For more information on the IBM iConnect Access 3D Viewer, see the iConnect Access User's Guide.

NOTE: The following subsections are from the iConnect Access 7.1 User's Guide, Chapter 4, Study Viewers.

Opening the Viewers

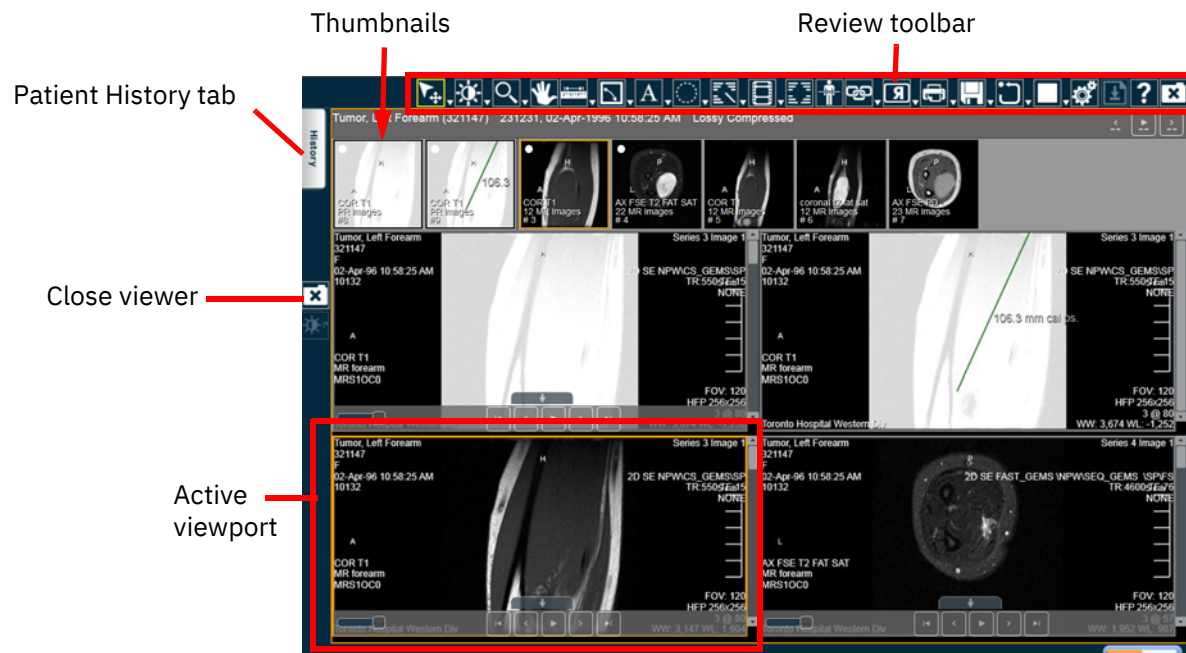
To open a study in a study viewer, do one of the following:

- Select a study in the study list search results and click a viewer type, **Enterprise** or **Universal**. The study opens in the selected viewer.
- Double-click a study in the study list search results. The study opens in the viewer set by the Default Viewer Setting in your User Preferences.

CAUTION: Closing a viewer does not save the presentation state applied to images.

Enterprise Study Viewer

The Enterprise study viewer window consists of the following components:



- [Patient History Tab on page 6](#)
- [Thumbnail Toolbar on page 34](#)
- [Viewer and Viewports on page 9](#)
- [Enterprise Viewer Review Toolbar on page 9](#)

NOTE: To help you differentiate between patients who have the same name, each viewport displays the patient name and a unique patient ID.

NOTE: When loading a shared study from a holding pen that has not been reconciled, a yellow caution icon appears at the top of the viewport and in the Status column for the study in the Patient History tab. The tool tip for the icon states “Foreign Exam. This study may not belong to the same patient.”.

Patient History Tab

The Patient History tab contains the following:

- Patient information section — displays the patient’s name, patient ID, date of birth, and if MPI is configured, Master Patient ID.

NOTE: If Master Patient ID is configured, IBM iConnect Access will query the Master Patient ID for other identifiers and use the result to find all related studies. Also, if “Add local query result” is enabled, IBM iConnect Access will query all local data sources belonging to the domain and use the query parameters configured in the domain or system (integrator) to query those data sources. If IBM iConnect Access finds any related studies, they will be identified with a “+” symbol.

- Related studies section — lists any DICOM or document studies that may be associated with the patient for comparison. When you load a study in the Enterprise viewer, IBM iConnect Access automatically searches for matches containing the same patient name, patient date of birth, and patient ID and displays them in the related studies section of the Patient History tab. See [Comparing Related Studies on page 7](#) for steps on comparing related studies.

NOTE: If a patient has XDS documents that do not have a study identifier (accession number or study instance UID), the documents will be grouped in an entry that displays “Other Patient Documents” in the “Study Description” column.

- Report area — lists any associated reports. Reports can include audio files (such as digital dictations) that you can play directly from the report area or the viewer (if you have selected Report View).
- A notes/comments section — displays any notes added to the study using the conference folders feature. These notes appear in the Patient History tab if the study was loaded from the Conference Folders tab. For more information, see iConnect Access User’s Guide.

Related topics:

- [Comparing Related Studies on page 7](#)
- [Viewing Order Requisitions on page 7](#)
- [Viewing a Study Report in the Enterprise viewer on page 8](#)

Comparing Related Studies

Related studies enable you to compare the original study with one or more additional studies. When opening a related study in the Enterprise viewer, each study is displayed in separate panel with its own thumbnails and demographic information. Up to three viewer panels can be open at one time in the Enterprise viewer. Each can be closed individually, except for the primary study (the one that was originally selected from the study list).

To select and load another study

From the Related Studies list, double-click a study. The application loads the study images into a new viewer panel.

Viewing Order Requisitions

If a study contains an order requisition, you can display it in the Enterprise viewer using the Requisition View. The Enterprise viewer supports the following types of documents:

- DICOM images
- Non-DICOM images (such as JPG and GIF files)
- Adobe Portable Document Format (PDF) documents
- Microsoft Office documents (for example, Microsoft Word, Microsoft PowerPoint, Microsoft Excel)
- Videos (such as AVI and MPG files)

NOTE: The Requisition View is an optional feature and may not be available at your site. This feature requires custom adaptation offered by the Professional Services team. Contact [Customer Support](#) for details.

When viewing the order requisition in the Enterprise viewer, the viewer provides basic tools that are native to the file format of the order requisition. For example, if the order requisition is an Adobe PDF file, the viewer provides the application's basic toolbar. Modified documents can only be saved locally.

NOTE: Except for DICOM images, the viewer can only display documents whose application is already installed on your workstation. For example, to load and review a Microsoft Word document, the application must already exist on your local workstation. If the application is not already installed, the application asks if you want to save the document locally.

NOTE: Any changes to the requisition files performed in the viewer can only be saved to the local computer.

To view an order requisition for study

- 1 Select and load the desired study in the Enterprise viewer.
- 2 Open the Patient History tab.

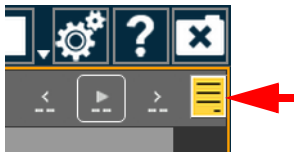
- 3 Click **Requisition** to display the requisition in the viewer.

Viewing a Study Report in the Enterprise viewer

You can view reports that are associated with a study. Reports can include items such as a DICOM Structured Report's, PDF, or audio file (digital dictation). Reports can be viewed directly from the Report Panel or the Enterprise viewer (if you have selected Report View). For audio files, the application displays audio controls then automatically plays the audio file once it has finished loading.

To access a study report

- 1 Select and load a study.
- 2 Do one of the following:
 - Open the Patient History tab, select a study, and click **Report** to display the report in the Report viewer.
 - Open the study in the viewer and click the Report button.



NOTE: The Report buttons are only enabled when a there is report available.

NOTE: To return to viewing the patient's images in the viewer, close the Patient History tab.

- 3 If a study has multiple reports, select the desired report from the top of the report list.

Study Transfer Dialog

The Transfer feature enables you to transfer a study from IBM iConnect Access to another data source.

NOTE: The Transfer Studies feature is also accessible from the study list. For details on using this feature, see the iConnect Access User's Guide.

Study Sharing Dialog

If configured, the Study Sharing dialog enables you to grant access to the study to another IBM iConnect Access user. This feature is also available from the Studies tab.

Viewer and Viewports

The viewer consists of a configurable number of viewports. You can configure the viewer by means of the following:

- [Series Viewer Options on page 18](#)
- [Image Layout Options on page 20](#)

Enterprise viewer Modality Toolbar

The Enterprise viewer modality toolbar contains tools that are specific to a given modality. Modality toolbars are configured by the System Administrator.



The tools contained in the modality toolbar are the same as those contained in the review toolbar. Refer to [Enterprise Viewer Review Toolbar on page 9](#) for details on the individual tools.

NOTE: The Enterprise viewer modality toolbar does not apply to document-only studies.

Enterprise Viewer Review Toolbar

The Review toolbar contains tools that you can use to investigate and manipulate images in the image viewer.



- NOTE:** The Review toolbar is configurable by the System Administrator. As a result, the contents of the toolbar and the order of buttons may differ.
- NOTE:** If the selected viewport contains an image document (such as JPG, PNG, GIF) or non-image document (such as PDF, HTML, text, audio, video), many of the Review toolbar tools are disabled.
- NOTE:** Do not drag the mouse outside of the browser when interacting with the viewport (in other words, when you release the mouse button, make sure the mouse pointer stays within the boundaries of the browser).

For more information, see:

- [All-In-One Tool on page 11](#)
- [Window Options on page 11](#)
- [Zoom on page 12](#)
- [Pan on page 12](#)
- [Measurement Tools on page 13](#)
- [Text and Annotations on page 14](#)
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- [Image Orientation on page 17](#)
- [Printing and Generating Reports on page 18](#)
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- [Series Viewer Options on page 18](#)
- [Series Scope Options on page 19](#)
- [Image Layout Options on page 20](#)
- [Series Navigation Options on page 20](#)
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- [Nominate Study for Archiving on page 21](#)
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All-In-One Tool



	Enables the All-In-One tool. See Using the All-In-One Tool on page 37 .
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Window Options


	<p>Enables you to manually adjust the window width and level. Width can be wide (many grays, less contrast) or narrow (fewer grays, more contrast). Level can be high (dark) or low (bright). See Changing Window Settings on page 38.</p> <p>NOTE: If the image or presentation state has VOI LUT (value of interest lookup table), the application displays “LUT” in the viewport instead of W/L values. If you perform any W/L operation, IBM iConnect Access uses W/L instead of LUT. Performing a reset restores the LUT until you perform another W/L operation. Contact your System Administrator to configure the default behavior for this tool in the Enterprise viewer.</p>
	Applies optimum window width and level values based on a histogram analysis of the active image. See Changing Window Settings on page 38 .
	<p>Inverts the image grayscale to provide a negative image display. Click again to return to the original setting.</p> <p>For MG images, this feature only inverts the breast tissue; the background remains black.</p>

	<p>Resets the image display parameters (such as window settings, zoom, pan, orientation and grayscale inversion) to the last saved settings or, if you have not saved the settings during the current session, resets the parameters to the settings applied when the study was first loaded.</p> <p>When you reset the image display parameters, depending on the scope set for the viewer, the application resets the current image or all the images in the series.</p>
	<p>Full screen mode offers more screen real estate by hiding the menu bar and toolbar from the viewer. See Using Full Screen Mode on page 37.</p>
	<p>Closes the viewer and returns to the study list.</p>

Zoom

	<p>Zooms the selected image. In the viewport, click and hold the left mouse button, and move the pointer up/down to zoom in/out on the center of the image.</p>
	<p>Magnifies an area of an image. You can move the magnification window to different locations within the viewport.</p> <p>Move the magnifier window to magnify areas of interest. Left-click within the magnification window to dismiss the window.</p> <p>To change the magnification level, you can either disable the tool and select a different magnification factor, or scroll the mouse wheel while in the magnifier.</p>

Pan





	<p>Pan. Repositions the image within the viewport.</p>
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Measurement Tools

NOTE: The application does not allow measurement tools on an ultrasound study that contains multiple measurement regions or when there is a single measurement region in which the measurement is other than distance.

Note that measurement tools are disabled for US studies in the following cases:

- there is a single measurement region, but the metric is other than distance.
- there are multiple measurement regions





	<p>Line Measurement. The application displays the distance between the starting point and ending point in millimeters when the image is calibrated. When not calibrated, it displays in pixels (px). The behavior of this tool can be configured in three ways in the IBM iConnect Access Service Tool. To change the behavior, contact your System Administrator.</p> <ul style="list-style-type: none"> • By default, the line measurement tool requires you to click on the image to identify the start of the line, and click again to identify the end of the line. • If the Use Alternate Drawing option is enabled in the Service Tool, after the line is drawn, you can select and move the line and each of its endpoints. • The third behavior enables you to use the option Rubberbanding Behavior When Drawing Line Measurement. With Rubberbanding, click and hold the left mouse button to start the line. Drag the pointer to the desired location and release the button to identify the endpoint. The line appears as you move the endpoint.
	<p>Calibration. Click two points on the image to create a line. The application displays the distance and an input field where you can enter the newly calibrated distance, in millimeters. See Working with Calibration Lines on page 44.</p>
	<p>Plumb Lines; Horizontal and Vertical. Select the desired plumb line orientation—vertical or horizontal—and click anywhere on an image to draw a plumb line across the entire image intersecting at the location of the mouse pointer. See Working with Plumb Lines on page 46.</p>
	<p>Joint Line. Measure angles for metatarsal osteotomies with the assistance of a line perpendicular to the base of the angle. Click two points on the image to create a reference line. Click a third point on the image to complete an angle. The application displays the angle measurement at the intersection. Adjustments can be made to joint lines after they have been created. See Working with Joint Lines on page 46.</p>



	Transischial Line. Used to measure leg length discrepancies for pre-operative planning of orthopedic surgeries. Click two points on the image to create a reference line. Click two more points on either side of the reference line to measure the distance between those points and the reference line. The application displays the distance between the two points and the reference line and calculates the discrepancy between the two distances.
	Angle. Click three points on the image. The application displays the angle's measurement.
	Cobb Angle. Click two points on the image to create a line. Click two more points to create the second line. The application extrapolates the point where the two lines intersect and displays the Cobb Angle.
	Free Draw. Click and hold the left mouse button to begin drawing nonlinear annotations on an image by moving the pointer. Release the left mouse button to end the annotation.
	Localizer Lines. These lines enable you compare images of different planes. The application takes one reference image, compares it with the images in the other viewers, then displays a line (if applicable) that shows where the reference image intersects with the other images. See Working with Localizer Lines on page 43 .

Measurements made in the Enterprise study viewer can be modified as follows:

- Click and drag a handle of a measurement to move the handle's location. Calculated values, such as distance measurements, are updated dynamically.
- Click and drag a measurement or text box to move it.
- Right-click a measurement to delete it.

Text and Annotations

	Add text. Click the image where you want the text to appear. The application places a text insertion point on the image. Type the text you want to place on the image. Click outside of the text box or press Enter to complete the function.
	Edit text. Click the text and edit as desired. Click outside of the text box or press Enter to complete the action.
	Toggles the text. Click once to hide the text and again to restore the text.
	Annotation rectangle. Click and drag the mouse pointer to draw a rectangle over the desired region. When you release the mouse button, the application displays the region of interest (ROI) measurements. *

	<p>Annotation Ellipse. Click and drag the mouse pointer to draw an ellipse over the desired region. When you release the mouse button, the application displays the ROI measurements. *</p>
	<p>Annotation ROI. Click and drag the mouse pointer to draw a freehand ROI. When you release the mouse button, the application completes the ROI with a straight line between the start and end points. The application displays the ROI measurements. *</p>




* For each annotation drawn, the following measurements are displayed: Max (maximum pixel value), Min (minimum pixel value), and Mean (average pixel value). For the Annotation Rectangle and Annotation Ellipse, Area (pixel area in sq. mm) is also displayed. For CT images, the pixel measurements are automatically converted to Hounsfield units.

Annotation Options


Annotation options enable you to manage the following annotations:

- Measurement annotations (such as line, rectangle, ellipse, ROI, angle, and Cobb angle). All measurements are displayed in metric units.
- Text annotations (such as labels and notes).


The following table describes all of the available annotation tools:

	<p>Edit Annotation. When selected, enables you to modify a selected annotation in the image viewer.</p>
	<p>Delete Annotation. When selected, deletes a selected annotation in the image viewer.</p>
	<p>Delete All Annotations. When selected, deletes all annotations in the image viewer.</p>





User Preferences

	<p>Opens the User Preferences dialog, where preferences for the viewer are set by the user. When these preferences are set by an Administrator for a role, all members of the role inherit the same preferences unless overridden at the user level. For more information, see the iConnect Access User’s Guide.</p>
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Pixel Value

	<p>Pixel Value. Identifies the pixel coordinates and the pixel value of a pixel when you click on an image. The pixel value is expressed as an RGB value for color images or a grayscale value (representing brightness) for monochrome images.</p> <p>For CT images, the pixel measurements are identified by the abbreviation “HU” if the pixel values are stored in Hounsfield units. An abbreviation of “US” indicates an unspecified unit of measure.</p>
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Cine and Stack

	<p>Cine. You can animate any active series using the Cine feature. Cine controls provide standard navigation commands that enable you to stop, pause, and move forward or backward through the cine. You can also adjust the speed of the cine and use the zoom, pan, and window settings while in cine mode.</p> <p>Cine starts automatically for modalities in which auto-play is configured.</p> <p>See Using the Cine Feature on page 47.</p>
	<p>Stack. Produces a stack of all images in the study within a single viewport. Use the scroll bars to scroll through the images that constitute the stack. An indicator displays in the viewport to identify that the images are stacked.</p> <div>  </div> <p>Global Stack does not apply when Exam Mode is enabled for modalities.</p>
	<p>Scroll Tool. Enables you to scroll through the images in a series within a viewport by moving the mouse pointer up or down while the left mouse button is pressed.</p>

Link Options










	Link All. See Link All / Link All Offset on page 39 .
	Link All Offset. See Link All / Link All Offset on page 39 .
	Link Cancel. See Cancel on page 40 .
	Link Selected. See Link Selected / Link Selected Offset on page 39 .
	Link Selected Offset. See Link Selected / Link Selected Offset on page 39 .



Image Orientation

	Flips the image on the horizontal axis.
	Flips the image on the vertical axis.
	Rotates the image clockwise or counter-clockwise in 90 degree increments.



Edge Enhancement

	<p>The Edge Enhancement feature enables you to enhance the edge of an image. Edge enhancement is an image processing filter that enhances the edge contrast of an image to improve its apparent sharpness.</p> <p>NOTE: The edge enhancement filter is intended for use on images with high spatial resolution and low signal-to-noise ratios. The edge enhancement filter is intended for use on X-ray images only.</p> <p>For more information, see Applying Edge Enhancement on page 52.</p>
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Printing and Generating Reports


	<p>Prints the selected patient image to a printer connected to your local workstation. If you are connected to a network, you can print to a network printer.</p> <p>The application's print function is dependent on the Web browser that you are using. Hardcopy printouts can vary between different Web browsers. See Printing Patient Images and Documents on page 53.</p>
	<p>Generate PDF Report. Generates a report of the study with embedded key images (if applicable) in PDF format. This option is only available when the study being viewed contains a report in text, HTML, or XML format. The first page of the report includes information that describes the exam and can optionally include logos and the institution's name and other information. Patient information appears in the header of every page. See Generating PDF Reports on page 54.</p>

Save

	<p>Saves the presentation state (PR series) for the currently active series.</p>
	<p>Saves annotated images to the currently selected series.</p>

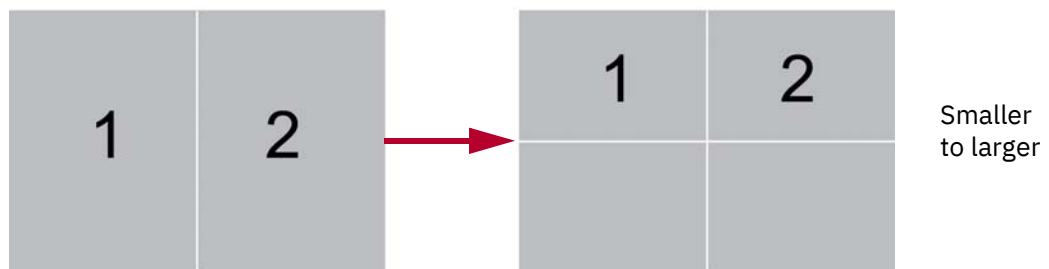
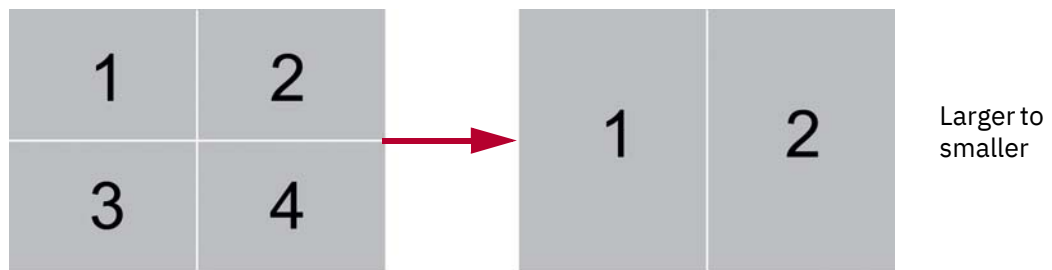
Series Viewer Options

For modalities other than PR and KO, series scope is set by default.

	<p>The Series Viewer in the Enterprise viewer enables you to display one, two, four, or six viewports within a viewer panel. Each viewer panel displays a series which you load from the Series Thumbnails panel or Patient History tab. When you use multiple viewports, you can perform side-by-side comparison of the same or different series, from the same or different studies for the same patient.</p>
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NOTE: When you first load a study, the application displays the number of viewers defined in the modality presets. For information on defining the modality presets, refer to the IBM iConnect Access Administrator's Guide.

When you change the number of viewports from a larger to a smaller number, the application preserves the first n images (where n is the smaller number). When you change the number of viewports from a smaller to a larger number the application preserves the images.



The application saves the last viewer settings and displays the same number of viewers the next time you load a study into the viewer window.

Series Scope Options

Scope is the range of displayed images to which the application applies your changes (such as window settings, zoom, pan, orientation and grayscale inversion). There are two scope settings: Image and Series. When you apply a scope, the setting applies to all viewer panels during a review session.

NOTE: For PR and KO modalities or if global stack is enabled, the default scope is set to Image. Otherwise, the scope is set to Series. If both scope options are configured, the system highlights the option that is applied. To keep series scope, ensure the scope setting is set to Series.

NOTE: If you change your scope setting from Image to Series during a review session, the application applies any review parameters on any image to all the images in the series.

Your scope setting applies to all the series that belong to the same study, including the studies in the Related Studies List.

	Applies review parameters to all images in a series.
--	--



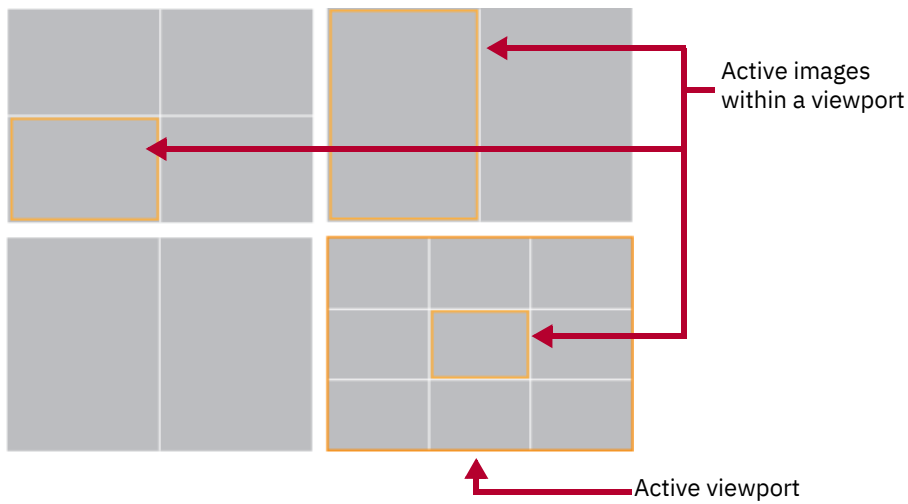
	<p>Applies review parameters to the current image.</p>
---	--


Image Layout Options

	<p>The image layout specifies the number of rows and columns in which images are displayed within a viewport. For example, if you select a 2x2 layout, there are four images in the viewport.</p>
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The following example shows four viewports, each with a different layout. The application applies a border to active viewports and images.




Series Navigation Options

	<p>Navigate to the next or previous series.</p>
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Email/Share Study

	Send a study to non-registered users via email.
	Opens the Grant Access dialog. For more information, see the iConnect Access User's Guide.


Invite to Upload

	Invite non-registered users to upload studies as guest using the Web Uploader. For more information, see the iConnect Access User's Guide..
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Transfer Study

	Opens the Transfer dialog. For more information, see the iConnect Access User's Guide.
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Nominate Study for Archiving

	Opens the Confirm Study Archive Nomination dialog. See For more information, see the iConnect Access User's Guide.
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Reconcile Exam

	Opens the Reconcile Exam dialog. For more information, see the iConnect Access User's Guide.
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Change Destination

	Opens the Change Destination dialog. For more information, see the iConnect Access User's Guide.
---	---


Add Receiver

	Opens the Add Additional Details dialog. For more information, see the iConnect Access User's Guide.
---	---


Conference Folders

	Opens the Add to Conference Folder dialog. For more information, see the iConnect Access User's Guide.
---	--


Report Error

	Opens the Report Problem dialog. For more information, see the iConnect Access User's Guide.
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External Application Launch

	Launches an external third-party application with the selected study displayed in application's native interface. Position the pointer over the External Application Launch icon and select the third-party application.
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3D View - Enterprise viewer

	<p>Opens the currently selected MRI, CT, and PET series containing 15 or more images in the Enterprise IBM iConnect Access 3D viewer.</p> <p>NOTE: 3D View option in the Enterprise viewer is only available on mobile (iPAD) devices.</p>
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Download Document

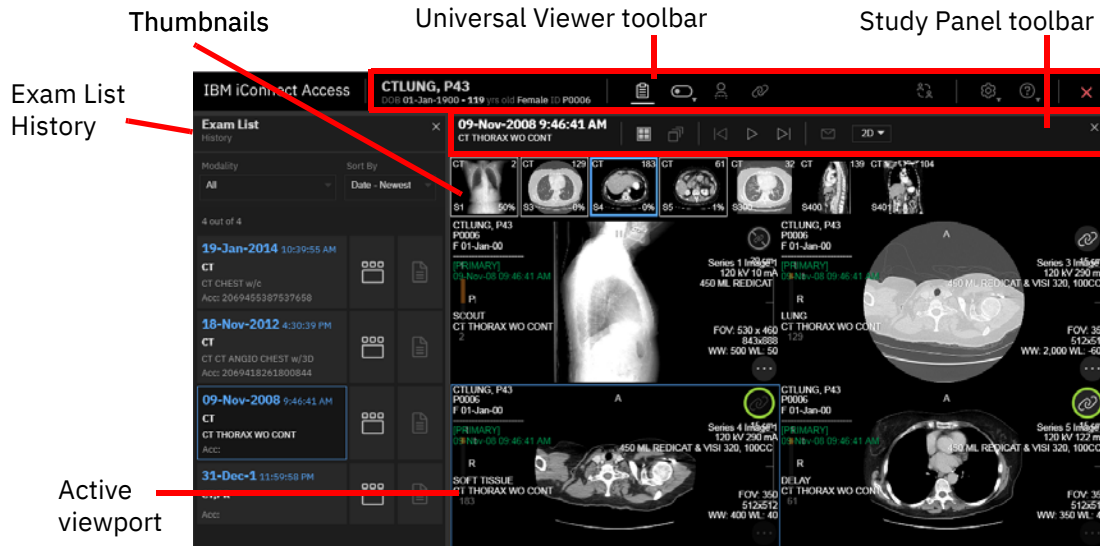
	<p>Downloads the document in the currently selected viewport. The icon is enabled if the currently selected viewport contains an XDS document.</p> <p>There are cases in the viewer where the plugin detection cannot accurately determine if a file will display properly. For example, some video files may fail to load with certain plugins. Click the Download Document icon to download and view the document. The document opens in the default program for the document type.</p>
---	---

Online Help

	Opens the IBM iConnect Access online help system in another browser window.
---	---

Universal Study Viewer

The Universal study viewer window consists of the following components:



- [Exam List History on page 25](#)
- [Thumbnail Toolbar on page 34](#)
- [Universal Viewer Toolbar on page 24](#)
- [Study Panel Toolbar on page 26](#)
- [Viewer and Viewports on page 28](#)
- [Toolbox on page 28](#)

NOTE: When loading a shared study from a holding pen that has not been reconciled, a warning icon appears at the top right corner of the exam card in the Exam List History.









The Universal viewer has similar functionality to the Enterprise viewer with the exception of the following features which are Enterprise viewer only:

- All-in-one tool
- Edge Enhancement tool
- Master Patient Index Customizable Patient Banner (NHS number)
- XDS/ XDS-I documents
- Split Color Channel

- DICOM Video
- Image Sharing Tools
- Print
- RDM support

Universal Viewer Toolbar

The Universal viewer toolbar contains the following:

- The patient's name, date of birth (DOB), and ID.
- Exams  icon — click to toggle the Exam List History display on or off.
- Show/Hide  icon — click to expand and toggle the following options on or off:
 - Image text
 - DICOM 6000 overlays
 - Thumbnails
 - Stack slider
 - 3D controls (if enabled) (includes MPR crosshairs and 3D rotation controls)
- Linked Scrolling  icon — click to enable scrolling of multiple series in several viewports at the same time. See [Linked Scrolling on page 39](#) for more information.
- Localizer Lines  icon — click to toggle localizer lines on or off. See [Working with Localizer Lines on page 43](#) for more information on using Localizer Lines.
- Collaboration  icon — click to see a list of users currently viewing the same study and initiate a diagnostic quality collaboration session. For more information, see the iConnect Access User's Guide.
- Help  icon — click to open the IBM iConnect Access online help in another browser window.
- User Settings  icon — click to expand. Includes options to toggle the user interface (UI) font and overlay size, toggle the UI skin brightness, and open the User Preferences dialog.
- Exit  icon — click to close the Universal viewer.

Exam List History

The Exam List History displays any DICOM or document studies that may be associated with the patient for comparison. When you load a study in the Universal viewer, IBM iConnect Access automatically searches for matches containing the same patient name, patient date of birth, and patient ID and displays them in the Exam List History. From the Exam List History, you can:

- open related studies for comparison.
- filter the Exam List History by modality and sort by date or modality.
- view a thumbnail preview window for related studies.
- view reports.

Related topics:

- [Comparing Related Studies on page 25](#)
- [Viewing Thumbnail Previews on page 25](#)
- [Viewing a Study Report in the Universal Viewer on page 26](#)

Comparing Related Studies

The Exam List History enables you to compare the original study with one or more additional studies. When opening a related study in the Universal viewer, each study is displayed in separate panel with its own thumbnails and demographic information. Up to five viewer panels can be open at one time in the Universal viewer. Each can be closed individually, including the primary study (the one that was originally selected from the study list).


To select and load another study

From the Exam List History, click a study. The application loads the study images into a new viewer panel.

Viewing Thumbnail Previews

The Exam History list allows you to view a thumbnail preview window of a related study series. From the thumbnail preview window, you can load different series from the same study, or another study for the same patient, into the Universal viewer.

To view thumbnail previews


- 1 Load a study in the Universal viewer.
- 2 From the Exam List History, click **Thumbnail Previews**  for a related study. The thumbnail preview window opens displaying the thumbnails.

- 3 To open a thumbnail preview, do one of the following:
 - Select a viewport from an open study panel and double-click the thumbnail.
 - Drag and drop the thumbnail into the desired viewport of an open study panel.
- 4 Click **Thumbnail Previews** to close the preview window.

Viewing a Study Report in the Universal Viewer

You can view reports that are associated with a study. Reports can include items such as a DICOM Structured Reports or PDF. Reports can be viewed directly from the Exam List History.

To access a study report

- 1 Load a study in the Universal viewer.
- 2 Open the Exam List History and locate the study containing the report.
- 3 Click **Reports** . The Report viewer opens.

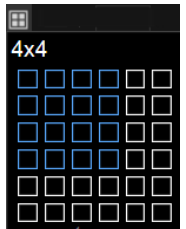
NOTE: The Reports icon is disabled if the study does not contain any reports.

- 4 Each report is displayed in its own tab. Click a tab to display the corresponding report.
- 5 Click Reports again or the close button to close the Report viewer.


Study Panel Toolbar

The Study Panel toolbar displays the study date and time, and includes the following tools for viewing and emailing studies.

Layout Options

	<p>The layout option specifies the number viewports displayed within a viewer panel. Each image area within a viewer panel is referred to as a viewport. For example, if you select a 4x4 layout, there are sixteen viewports in the viewer panel.</p>
---	--


Global Stack

	<p>Produces a stack of all images in the study within a single viewport. Use the mouse scroll wheel to scroll through the images that constitute the stack.</p> <p>Note: Global Stack does not apply when Exam Mode is enabled for modalities.</p> <p>Note: PR and KO modalities are excluded and will not display in the viewport where Global Stack is applied.</p>
---	---


Cine Group Play

	<p>Play a cine group. See Using Cine for Cardiology Studies on page 49.</p>
---	---


Email Study

	<p>Send a study to non-registered users via email. For more information, see the iConnect Access User's Guide.</p>
---	--

3D View - Universal viewer

	<p>Opens the currently selected MRI, CT, and PET series containing 15 or more images in the Universal IBM iConnect Access 3D viewer using one of the following selected modes:</p> <ul style="list-style-type: none"> • MPR • 3D 4:1 Layout • 3D 6:1 Layout • Curved MPR • Calcium Scoring <p>See the iConnect Access User's Guide for information on viewing 3D images in the available modes.</p> <p>NOTE: The Universal viewer 3D view is only available on desktop devices.</p>
---	---

External Application Launch

	<p>Launches an external third-party application with the selected study displayed in application's native interface. Position the pointer over the External Application Launch icon and select the third-party application.</p>
---	---

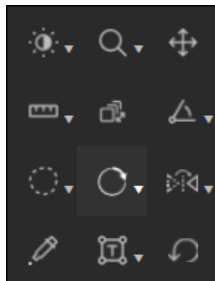
Viewer and Viewports

The viewer consists of a configurable number of viewer panels and viewports. You can configure the Universal viewer by means of the following:

- [Series Viewer Options on page 18](#)
- [Layout Options on page 26](#)

Toolbox

The Toolbox contains tools that you can use to investigate and manipulate images in the image viewer. To access the toolbox, right-click on a viewport containing an image or series.






- NOTE:** The Toolbox is configurable by the System Administrator. As a result, the contents of the Toolbox and the order of the tools may differ.
- NOTE:** If the selected viewport contains an image document (such as JPG, PNG, GIF) or non-image document (such as PDF, HTML, text, audio, video), many of the tools are disabled.
- NOTE:** Do not drag the mouse outside of the browser when interacting with the viewport (in other words, when you release the mouse button, make sure the mouse pointer stays within the boundaries of the browser).

For more information, see:


- [Window Options on page 29](#)
- [Zoom on page 29](#)
- [Pan on page 30](#)
- [Measurement Tools on page 30](#)
- [Text and Annotations on page 32](#)
- [User Settings on page 32](#)
- [Pixel Value on page 33](#)
- [Scroll on page 33](#)

- [Image Orientation on page 33](#)
- [Save on page 33](#)
- [Series Scope Options on page 33](#)
- [Layout Options on page 26](#)
- [Email Study on page 27](#)
- [3D View - Universal viewer on page 27](#)
- [External Application Launch on page 27](#)

Window Options

	<p>Enables you to manually adjust the window width and level. Width can be wide (many grays, less contrast) or narrow (fewer grays, more contrast). Level can be high (dark) or low (bright). See Changing Window Settings on page 38.</p> <p>NOTE: If the image or presentation state has VOI LUT (value of interest lookup table), the application displays “LUT” in the viewport instead of W/L values.</p>
	<p>Applies optimum window width and level values based on a histogram analysis of the active image. See Changing Window Settings on page 38.</p>
	<p>Inverts the image grayscale to provide a negative image display. Click the button again to return to the original setting.</p> <p>For MG images, this feature only inverts the breast tissue; the background remains black.</p>

Zoom

	<p>Zooms the selected image. In the viewport, click and hold the left mouse button, and move the pointer up/down to zoom in/out on the click point.</p> <p>CAUTION: If you click outside of the anatomical area in the image, the image will be re-centered around the selected point and the anatomical data may become located outside the viewer.</p> <p>CAUTION: When zooming in the Universal viewer, a minor change of $\leq 5\%$ in zoom factor may not trigger an update to the viewport resolution to match the modified zoom factor.</p>
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	<p>Magnifies an area of an image. You can move the magnification window to different locations within the viewport.</p> <p>Hold the left mouse button to display and move the magnifier window to magnify areas of interest. Release to dismiss the window.</p> <p>You can use mouse wheel while holding the left mouse button to change the magnification factor between 2x, 3x, and 4x.</p>
--	---

Pan

	Pan. Repositions the image within the viewport.
--	---




Measurement Tools

NOTE: The application does not allow measurement tools on an ultrasound study that contains multiple measurement regions or when there is a single measurement region in which the measurement is other than distance.

Note that measurement tools are disabled for US studies in the following cases:

- there is a single measurement region, but the metric is other than distance.
- there are multiple measurement regions







	<p>Line Measurement. The application displays the distance between the starting point and ending point in millimeters when the image is calibrated. When not calibrated, it displays in pixels (px). Click two points on the image to create a line. After the line is drawn, you can select and move the line and each of its endpoints.</p>
	<p>Calibration. Click two points on the image to create a line. The application displays the distance and an input field where you can enter the newly calibrated distance, in millimeters. After the line is drawn, you can select and move the line and each of its endpoints. See Working with Calibration Lines on page 44.</p>
	<p>Transischial Line. Used to measure leg length discrepancies for pre-operative planning of orthopedic surgeries. Click two points on the image to create a reference line. Click two more points on either side of the reference line to measure the distance between those points and the reference line. The application displays the distance between the two points and the reference line and calculates the discrepancy between the two distances.</p>
	<p>Angle. Click three points on the image. The application displays the angle's measurement.</p> <p>You can also modify any existing angle measurements. Click and hold an endpoint, drag to the desired location, and release.</p>

	<p>Cobb Angle. Click two points on the image to create a line. Click two more points to create the second line. The application extrapolates the point where the two lines intersect and displays the Cobb Angle.</p> <p>You can also modify any existing Cobb angle measurements. Click and hold an endpoint, drag to the desired location, and release.</p>
	<p>Plumb Lines; Horizontal and Vertical. Select the desired plumb line orientation—vertical or horizontal—and click anywhere on an image to draw a plumb line across the entire image intersecting at the location of the mouse pointer. See Working with Plumb Lines on page 46.</p>
	<p>Joint Line. Measure angles for metatarsal osteotomies with the assistance of a line perpendicular to the base of the angle. Click two points on the image to create a reference line. Click a third point on the image to complete an angle. The application displays the angle measurement at the intersection. Adjustments can be made to joint lines after they have been created. See Working with Joint Lines on page 46.</p>

Measurements made in the Universal study viewer can be modified as follows:

- Click and drag a handle of a measurement to move the handle's location. Calculated values, such as distance measurements, are updated dynamically.
- Click and drag a measurement or text box to move it.
- Right-click a measurement to delete it.

Text and Annotations


	Add Text. Click the image where you want the text to appear. The application places a text insertion point on the image. Type the text you want to place on the image. Click outside of the text box or press Enter to complete the function.
	Free Draw. Click and hold the left mouse button to begin drawing nonlinear annotations on an image by moving the pointer. Release the left mouse button to end the annotation.
	Annotation Rectangle. Click and drag the mouse pointer to draw a rectangle over the desired region. When you release the mouse button, the application displays the region of interest (ROI) measurements. *
	Annotation Ellipse. Click and drag the mouse pointer to draw an ellipse over the desired region. When you release the mouse button, the application displays the ROI measurements. *
	Annotation ROI. Click and drag the mouse pointer to draw a freehand ROI. When you release the mouse button, the application completes the ROI with a straight line between the start and end points. The application displays the ROI measurements. *
	Delete All Annotations. When selected, deletes all annotations in the image viewer.

* For each annotation drawn, the following measurements are displayed: Max (maximum pixel value), Min (minimum pixel value), and Mean (average pixel value). For the Annotation Rectangle and Annotation Ellipse, Area (pixel area in sq. mm) is also displayed. For CT images, the pixel measurements are automatically converted to Hounsfield units.


Annotations made in the Universal study viewer can be modified as follows:

- Click and drag a handle of a measurement to move the handle's location. Calculated values, such as area, are updated dynamically.
- Click and drag an annotation to move it.
- Right-click an annotation to delete it.

User Settings

	<p>Opens settings panel with options for the following:</p> <ul style="list-style-type: none"> • Toggle the user interface (UI) scale size; Large, Medium, or Small. • Toggle the UI skin brightness; Dark or Gray (light). • Settings link to User Preferences. For more information, see the iConnect Access User's Guide.
---	---

Pixel Value

	<p>Pixel Value. Identifies the pixel coordinates and the pixel value of a pixel when you click on an image and hold the button. The pixel value is expressed as an RGB value for color images or a grayscale value (representing brightness) for monochrome images.</p> <p>For CT images, the pixel measurements are identified by the abbreviation “HU” if the pixel values are stored in Hounsfield units. An abbreviation of “US” indicates an unspecified unit of measure.</p>
---	--

Scroll







	<p>Scroll Tool. Enables you to scroll through the images in a series within a viewport by moving the mouse pointer up or down while the left mouse button is pressed.</p>
---	---

Image Orientation

	Flips the image on the horizontal axis.
	Flips the image on the vertical axis.
	Rotates the image clockwise or counter-clockwise in 90 degree increments.

Save



	Saves the presentation state (PR series) for the currently active series.
	Saves annotated images to the currently selected series.

Series Scope Options


Scope is the range of displayed images to which the application applies your changes (such as window settings, zoom, pan, orientation and grayscale inversion). There are two scope settings: Image and Series. When you apply a scope, the setting applies to all viewers during a review session.

NOTE: If you change your scope setting from Image to Series during a review session, the application applies any review parameters on any image to all the images in the series.

Your scope setting applies to all the series that belong to the same study.

	Applies review parameters to all images in a series.
	Applies review parameters to the current image.

Reset

	Resets your presentation to the initial state.
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Working with Studies

The following sections describe how to work with studies when using the study viewers:

- [Thumbnail Toolbar on page 34](#)
- [Using the All-In-One Tool on page 37](#)
- [Using Full Screen Mode on page 37](#)
- [Changing Window Settings on page 38](#)
- [Linked Scrolling on page 39](#)
- [Working with Localizer Lines on page 43](#)
- [Working with Calibration Lines on page 44](#)
- [Working with Plumb Lines on page 46](#)
- [Working with Joint Lines on page 46](#)
- [Using the Cine Feature on page 47](#)
- [Applying Edge Enhancement on page 52](#)
- [Printing Patient Images and Documents on page 53](#)
- [Generating PDF Reports on page 54](#)

Thumbnail Toolbar

Thumbnails enable you to quickly navigate studies for review. The thumbnail toolbar can display the following:

- Enterprise viewer — a single DICOM image (such as a CR, DR, or ultrasound), DICOM series (in the case of a slice stack of MR or CT images), DICOM video, audio file (such as WAV or MP3), video file (such as AVI or MP4), PDF document, HTML report, CDA document, Microsoft Office document (such as Word, Excel, PowerPoint), text document, or KOS document (reference to DICOM images; KOS documents display with the thumbnail title “KOS”).
- Universal viewer — a single DICOM image (such as a CR, DR, or ultrasound) or DICOM series (in the case of a slice stack of MR or CT images).

NOTE: Some files and documents require a plugin to view in the browser. If a plugin is available, you may be requested to activate and allow the plugin in the browser. If a plugin is not available, you will be notified in the browser that the document cannot be displayed and provided the option to download the document in order to view it (see [Download Document on page 22](#) for more information on downloading documents).

Thumbnail behavior can be configured per modality using the System Configuration tool, in Domain Settings and in User Preferences. For example, you can choose to have a CR series of three images represented by a single thumbnail (**Series**), by three thumbnails (**Image**), or, if available, both multiframe and non-multiframe images (**Auto**). If **Image** is selected, each viewport that corresponds to a thumbnail displays a single image. If **Auto** is selected and the series contains both multiframe and non-multiframe images, each multiframe image will have one thumbnail and all non-multiframe images will be grouped together and represented by a single thumbnail.

NOTE: Some studies, such as dual echo MR, appear as a single study in the Studies tab but are interpreted by the application as two separate series (one series for each TE value). In these cases, the application displays two thumbnails instead of one.

NOTE: The Series Thumbnail panel displays the image series for the study currently selected study in the Enterprise viewer Patient History or Universal Viewer Exam History List. See [Comparing Related Studies on page 7](#).

Thumbnail overlays display information on the Enterprise viewer in the bottom left corner of the thumbnail. On the Universal viewer, thumbnail overlays are displayed in the four corners of the thumbnail. The overlays are configurable and by default show the following:

- Enterprise viewer — description, number of images, modality, and series (and optionally image) number.
- Universal viewer — clockwise in each corner from top left: modality, number of slices, percentage of slices viewed in the stack, and series (and optionally image) number.

NOTE: Place the pointer on a thumbnail to view additional image information.

NOTE: If the percentage of slices viewed is not visible or disabled, the feature is not enabled. Contact your System Administrator.

If the number of thumbnails exceeds the width of the screen, do the following:

- Enterprise viewer — click and drag the thumbnail toolbar scrollbar to navigate left and right through the available thumbnails.
- Universal viewer — click the navigation arrows at the ends of the thumbnail toolbar to navigate left and right.

To open a thumbnail

You can open a thumbnail into a viewport in the following ways:

- Select a viewport and double-click the thumbnail.
- Drag and drop the thumbnail into the desired viewport.

NOTE: In the Universal viewer, thumbnails can be opened in any viewport in any open study panel. In the Enterprise viewer, thumbnails can only be opened in a viewport within the active study panel.

To open a DICOM video in a viewport

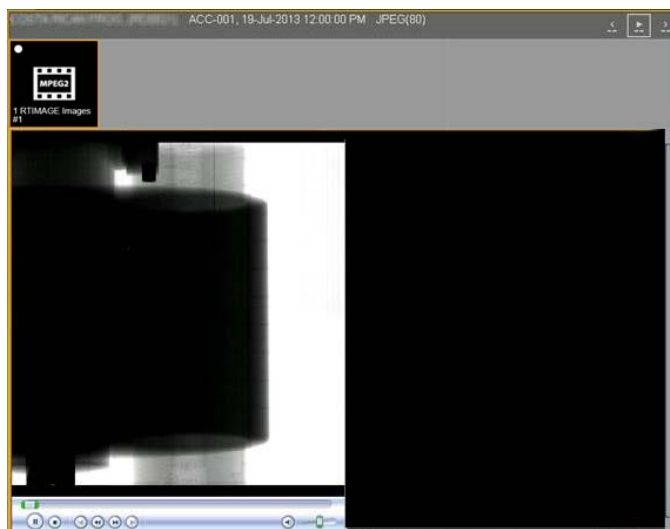
NOTE: DICOM video is not supported in the Universal viewer.

You can open a DICOM video (MPEG-2 or MPEG-4) in a viewport in the following ways:

- Select the viewport in which you want to open the video and then double-click the thumbnail.
- Click and drag the thumbnail to the desired viewport.

The native IBM iConnect Access video viewer provides a play/pause button. You can click the progress bar to navigate to a specific location in the video.

For MPEG-2 videos, you must use a video player plugin, such as Windows Media Player or QuickTime and Internet Explorer 11 as the browser. In this case, the video controls are native to the plugin. The following sample screen shows the Windows Media Player interface.



WARNING: If the MPEG-2 DVD codec that is used to play MPEG videos is not installed, you must obtain and install it on your client system to use Windows Media Player or QuickTime.

Using the All-In-One Tool

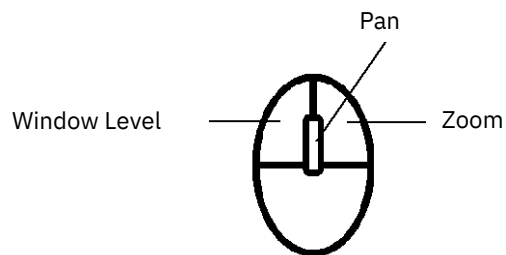
The All-In-One tool enables you to assign specific functions to the right and left mouse buttons and to the mouse wheel. The functions are available when the cursor is positioned over images displayed in the image viewer.

NOTE: The All-in-one tool is not available in the Universal viewer.

The All-In-One tool is enabled by default. The tool can be disabled by clicking any other button in the Review toolbar. If the tool has been disabled, it can be enabled by clicking the following button in the Review toolbar:



The following illustrates the functions that may be assigned to mouse buttons.



You can assign functions to the right and left mouse buttons and to the mouse wheel in the **User Preferences** dialog. For more information, see the iConnect Access User's Guide.

Using Full Screen Mode

You can create more space on the monitor for viewing images using Full Screen mode. Full Screen mode hides the menu bar and toolbar from the viewer.

NOTE: This is different from your browser's full screen (F11) mode.

NOTE: Full Screen mode is not available in the Universal viewer.

To use Full Screen Mode

- 1 In the viewer window, click the **Full Screen** button.



The application hides the menu bar and toolbar and maximizes the viewer(s).

- 2 To exit from Full Screen mode, click **Menus** on left side of the screen and then click the **Full Screen** button again.

Changing Window Settings

The window settings (such as window width and level) on digital images are similar to the contrast and brightness, respectively, on your computer screen. The window width can be wide (many grays, less contrast) or narrow (fewer grays, more contrast). The window level can be high (dark) or low (bright). You can apply the window width and window level functionality across different modalities, including 2D color studies (such as Doppler U/S, PET, NM, cardio).

You can change the window settings manually, automatically, or by using presets. Presets are set in User Preferences. For more information, see the iConnect Access User's Guide.

NOTE: Additional presets can also be created by an Administrator.

Manually changing the window settings is sensitive to the speed in which you move the mouse. If you move the mouse slowly, the window level changes are relatively small. If you move the mouse more quickly, the changes are more pronounced. As well, the changes are more pronounced for higher resolution data.

NOTE: If the image or presentation state has VOI LUT, the application displays "LUT" in viewport instead of W/L values.

To change the window settings using the mouse

- 1 From the Enterprise viewer Review toolbar or Universal viewer Toolbox, click **Window Level**.



- 2 Adjust the window width and/or level as follows:

- Click and drag the mouse vertically over the selected image to adjust the window level.
- Click and drag the mouse horizontally over the image to adjust the window width.

To change the window settings automatically

- 1 Do one of the following:

- From the Enterprise viewer Review toolbar, click the **Auto Window Level** tool.



- From the Universal viewer Toolbox, click the **Auto Window Level** tool.



- 2 The application applies optimum window width and level values based on a histogram analysis of the active image.

Linked Scrolling

Linked scrolling automates the scrolling of multiple series in several viewports at the same time. When one viewport is scrolled, the other linked series scroll in increments based on their physical location. If images cannot be matched spatially, the other selected viewports scroll in increments based on their numbering (numerically).

CAUTION: When using linked scrolling, issues such as poor network connection could cause a delay or out of sync between the linked viewports.

The Linked Scrolling tool behavior differs slightly depending on the study viewer type. Refer to the following sections for information on linked scrolling for each type.

- [Linked Scrolling – Enterprise Viewer on page 39](#)
- [Linked Scrolling – Universal Viewer on page 41](#)

Linked Scrolling – Enterprise Viewer

The Enterprise viewer provides the following link options:

- [Link All / Link All Offset on page 39](#)
- [Link Selected / Link Selected Offset on page 39](#)
- [Cancel on page 40](#)

Link All / Link All Offset

The **Link All** option links all displayed series. The system attempts to automatically align the slices based on their DICOM position and orientation attributes.

The **Link All Offset** option links all displayed series but assumes the current scroll positions represent spatially aligned images. The system maintains the same offsets as the images are scrolled.

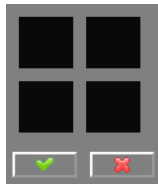
NOTE: The availability of the Link All features is configurable. Contact your System Administrator.

Link Selected / Link Selected Offset

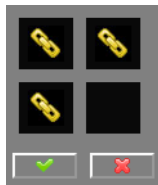
The **Link Selected** option links only the selected series. The system attempts to automatically align the slices based on their DICOM position and orientation attributes.

The **Link Selected Offset** option links only the selected series. The system assumes the current scroll positions represent spatially aligned images. The system maintains the same offsets as the images are scrolled.

When you select either of these options, the system displays a representation of the viewers currently displayed; for example:



When you click within the boxes to identify the viewers (and series) that you want to link, the system identifies the linked boxes as follows:



Click the check mark to complete the link.

Cancel

The **Cancel** option unlinks images.

Linking a Series

Perform the following to link a series.

To link a series


- 1 Select the number of viewports to compare the series (see [Series Viewer Options on page 18](#)).
- 2 Load and display the series.
- 3 From the **Linked Scrolling** drop-down, select the appropriate link option. For more information on individual options, see [Link Options on page 17](#).

NOTE: If a series is linked numerically, the images display the linked icon with the number sign beside it. If a series is linked spatially, the number sign does not appear.

To manipulate a linked series

Use the scroll bars to scroll through the stacks. The linked series scroll simultaneously according to how they are linked.

The example below displays secondary capture images using the Linked Scrolling feature (Linked All).

Linked scrolling on active viewport  Numerical linking icon 



NOTE: In the Enterprise viewer, if the images are determined to be too far from each other (in other words, beyond the configured slice distance or angle tolerance), an X appears beside the linked icon. The tolerances are only configurable at the system level by a System Administrator. For details on configuring the tolerance levels, refer to the IBM iConnect Access Installation Guide.









Linked Scrolling – Universal Viewer

The Universal viewer provides the following link options:

- Auto – automatically link all eligible series viewports within the currently selected viewer panel.
- Manual – link two or more series manually.


The following icons are displayed in the top right corner of each viewport and indicate the viewports linking scrolling status.

Status	Description
 Progress indicator	Application is determining whether series can link to other viewports.
 Active	Currently selected series.
 Linkable	Series is linkable.
 Linked	Series is linked to the active series.
 Not linkable	Series is not linkable to the active series.
 Series does not match	Series cannot find a precise matching slice to scroll. Series scrolling may be out of sync.

Linking Series

Perform the following to link all series or to manually link series.

To automatically link all eligible series

- 1 Set the desired number of viewports in a viewer panel for comparing the series (see [Layout Options on page 26](#)).
- 2 Set the viewports to the desired slice offsets to be linked.
- 3 From the Universal viewer toolbar, click **Auto Linked Scrolling** . All eligible series viewports are linked. The link status icon is displayed in the top right of each viewport within the viewer panel indicates the link status.

NOTE: When Auto Linked Scrolling is enabled, the More menu is not available.

- 4 To disable linking, click **Auto Linked Scrolling**. All automatic links are removed from each linked series in the viewer panel.

To manually link series

- 1 Set the desired number of viewer panels and viewports for comparing the series (see [Layout Options on page 26](#)).
- 2 Select an initial viewport to link and scroll to the desired slice.

- For each linkable series you want to link, scroll to the correct slice offset in the corresponding viewport and click the **Linkable** icon in the top right corner of the viewport.

NOTE: Manual linking overrides auto-linking. If a series viewport has been linked or unlinked through manual linking, it will not be included in auto linking again until its host study panel is re-opened.

- To remove a linked series, click the **Linked** icon for each series you to unlink.

To manipulate linked series

Place the cursor on a linked series and use the mouse scroll wheel to scroll through the stacks. The linked series will scroll simultaneously according to how they are linked.

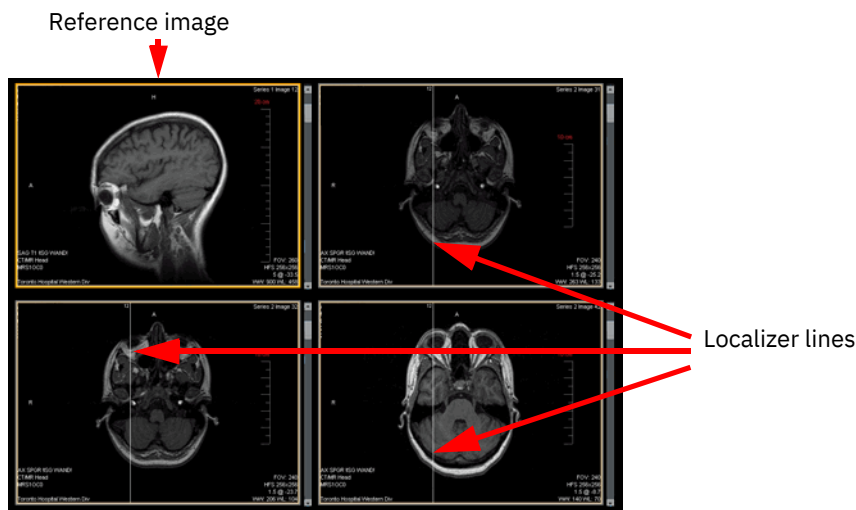
Working with Localizer Lines

The application can display localizer lines when you compare images of different planes. The application takes one reference image, compares it with the images in the other viewports, then displays a line (if applicable) that shows where the reference image intersects with the other images.



NOTE: This feature is only available when you display multiple viewports (see [Series Viewer Options on page 18](#)).

NOTE: After you enable the Localizer Line feature, it remains active until you disable it or when you switch from multiple viewers to a single viewer (see [Series Viewer Options on page 18](#)).

The following example shows a viewport selected as the reference and the images in the other viewports displaying the localizer lines.



To display localizer lines

- 1 Select your viewport setting (see [Series Viewer Options on page 18](#)). You must have a minimum of two viewports.
- 2 Select and load the desired images into the viewports.
- 3 If desired, select the image layout for each viewport.
- 4 Click the viewport that contains the images you want to use as a reference.
- 5 Do one of the following:
 - From the Enterprise viewer Review toolbar, click the **Localizer Lines**  tool.
 - From the Universal viewer toolbar, click the **Localizer Lines**  tool.

The images in the other viewports update to show the localizer lines indicating where the images intersect.

NOTE: If the reference image is on the same plane as the images in the other viewers, the application displays a white box around the image.

- 6 To change the reference image, click a different viewport. The images in the other viewports update to show where the images intersect.

NOTE: When you click another viewport, the series in that viewport immediately becomes the reference image even if you are only scrolling that series or applying a tool on that image/series (for example, pan, zoom, window settings).

- 7 Click **Localizer Lines** again to toggle the feature off.

Working with Calibration Lines

In the image viewport, the Calibration tool enables you to draw a calibration line and input its length in millimeters. After calibration, all existing annotations in the image are recalculated and any new annotations are calculated using the newly calibrated value. The calibration line appears as a normal line measurement afterwards.

The Calibration tool only affects the image level; therefore, it only affects one image from the image viewport. Other images in the same series are not calibrated.

NOTE: The Calibration tool is disabled on PR/KO/MR/CT/PET/NM series images.

You cannot perform calibration by editing an existing calibration line. The calibration process must be repeated to re-calibrate.

When you apply the Calibration tool to input the actual length, the new pixel spacing is recalculated according to the current pixel aspect ratio value. If neither the pixel spacing nor pixel aspect ratio exist, square pixels are assumed for calculating the new pixel spacing.



The following units of measure apply to measurement values:

- px – The measurement is displayed in pixels.
- mm cal – The pixel spacing for the measurement was calibrated by the application, either by using the provided Estimated Radiographic Magnification Factor (ERMF) or by using other correction factors provided by the modality.
- mm det – The pixel spacing for the measurement came directly from the detector/modality and was not calibrated by the application.
- mm cal ps – The pixel spacing for the measurement was manually calibrated using the Manual Calibration Tool.
- mm unknown – The measurement value is unknown.

Depending on the type of calibration performed, one of the following indicators may also be displayed:

- FIDUCIAL – The pixel spacing values have been calibrated by the operator or image processing software by the measurement of an object (fiducial) that is visible in the pixel data and is of known size and is located close to the central ray (e.g. a catheter).
- GEOMETRY – The pixel spacing values account for assumed or known geometric magnification effects and correspond to some unspecified depth within the patient.

To display calibration lines

- 1 Click the viewport with the image you want to calibrate.
- 2 Do one of the following:
 - From the Enterprise viewer Review toolbar, click the **Calibration**  tool.
 - From the Universal viewer Toolbox, click the **Calibration**  tool.
- 3 Draw a line in the image by clicking the image to set the start point and clicking again to set the end point. A text box opens for the input value.
- 4 Change the default value by typing a new value in the text box. The unit of measure is millimeters (minimum 0, maximum 1000). Click **Enter**.

All annotations in this image are recalculated and updated according to the new value. The calibration line remains but is no longer highlighted.

NOTE: The Calibration results are stored in the current image presentation. They are not automatically saved. To preserve the calibration result so it can be accessed later, you will need to save the series as described in the iConnect Access User's Guide.).

NOTE: At any time, you can abort the calibration by pressing the Escape (Esc) key. The calibration line is removed.

NOTE: When reloading a study, saved PR objects from previous calibrations will have the correct calibration result. However, if loading the image series instead of the saved PR, pixel spacing will be incorrect.

- 5 To modify the line, click on the line or an endpoint and drag to the desired location.

Working with Plumb Lines

You can add a vertical or horizontal plumb line to an image by selecting the desired Plumb Line tool and clicking on an image. A horizontal or vertical plumb line is placed across the image intersecting the location of the mouse pointer.

To add a plumb line

- 1 Do one of the following:

- From the Enterprise viewer Review toolbar, click the desired Plumb Line tool.

Horizontal  or Vertical 

- From the Universal viewer Toolbox, click the desired Plumb Line tool.


Horizontal  or Vertical 

- 2 Click anywhere on an image to draw the plumb line horizontally or vertically across the entire image intersecting the location of the mouse pointer.

Working with Joint Lines

You can measure angles for metatarsal osteotomies with the assistance of a line perpendicular to the base of the angle using the Joint Line tool.

To measure an angle

- 1 From the Enterprise viewer Review toolbar or the Universal viewer Toolbox, click the **Joint Line**  tool.
- 2 Click on an image once with the left mouse button where you want to begin drawing the first line.
- 3 Click a second time with the left mouse button where you want to define the end position of the first line.

- Click a third time with the left mouse button where you want to complete the angle. The angle will be placed and the angle measurement will appear at the intersection point.



- With the Joint Line tool cursor, you can make the following adjustments to the annotation once you have created it:
 - To move the entire annotation, click on the first line drawn and drag the entire annotation to a new location.
 - To move the location of the perpendicular line, click on the line's endpoint and drag it to a new location.
 - To move the accompanying text, click on the text and drag it to a new location.
 - To change the angle, click on any line's endpoint and drag it to a new location.

Using the Cine Feature

The Cine feature enables you to animate any active series. Cine controls provide standard navigation commands that enable you to stop, pause, and move forward or backward through the cine. You can also adjust the speed of the cine and use the zoom, pan, and window settings while in cine mode, as well as apply flip, rotate, and reset operations.

CAUTION: A monitor with at minimum 30Hz refresh rate is recommended to play cine at the displayed speed.

For information on cardiology-specific Cine, refer to [Using Cine for Cardiology Studies on page 49](#).

Exam Mode

Exam Mode sets cine to play through the entire study (all clips) and repeats, instead of just playing through the current clip. Exam Mode can be enabled or disabled in your user preferences. For more information, see the iConnect Access User's Guide.


When Exam Mode is enabled, the Exam mode button is available in the study viewers, which you can use to toggle Exam Mode on/off.

Enterprise  Universal 

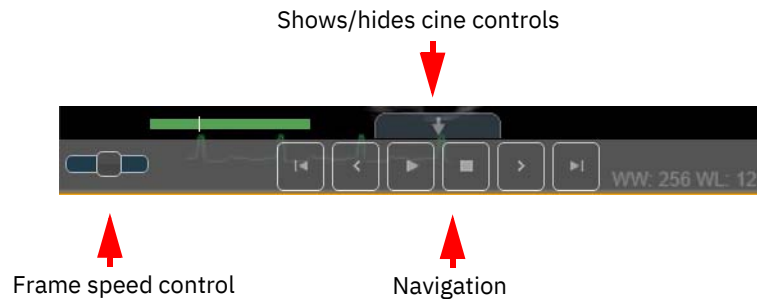
Using Cine

To use cine

- 1 Click the viewport of the series you want to animate.
- 2 Do one of the following:

- In the Enterprise viewer Review toolbar, click **Cine** .

The application loads the images into the Enterprise viewer, displays the cine controls, and starts the cine.



- In the Universal viewer, click the **More**  icon at the bottom right of the viewport. The application displays the cine controls in the Universal viewer.



- 3 Operate the cine as follows:
 - To play the cine, click **Play**. The cine advances through the images in a loop until the animation is paused or stopped.
 - To advance the cine by one frame, click **Forward**. To move backward by one frame, click **Back**. In both cases, make sure the cine is paused first.
 - To pause the cine, click **Pause**. Click **Play** to resume.
 - To stop the cine, click **Stop**. On the Enterprise viewer, the **Cine** status bar closes.
 - On the Universal viewer, click **Play all in the study** to play all visible series.

To adjust the cine speed

- 1 Do one of the following:
 - From the Enterprise viewer cine controls, click and drag the frame speed control slider to achieve the desired frame rate. The frame speed control displays the adjusted cine speed; for example, 4/20 fps where 4 is the current frame rate and 20 is the adjusted frame rate.
 - From the Universal viewer cine controls, click the frame speed control and a drag the frame speed slider to achieve the desired frame rate. The frame speed control displays the current frame rate.
- 2 The application adjusts the speed dynamically as you move the sliders.

Using Cine for Cardiology Studies

For cardiology studies, you can play and navigate cine groups and cine clips.

A cine clip is a single series that can be viewed by stepping through images or by playing the entire set of images.

A cine group is a grouping of series. A series can consist of an image (in the case of multiframe images such as US, XA) or a series of non-multiframe images (such as CT or MR). KO and PR are also considered series. Cine groups are based on the number of viewports. For example, if there are 4 visible viewports, series 1 through 4 are be part of group 1, series 5 through 8 are part of group 2, and so forth. If there are 6 visible viewports, series 1 through 6 would be in group 1, series 7 through 12 would be in group 2 and so forth. Group assignments are based on the thumbnail order and include KO and PR.

WARNING: It is recommended that virtual desktop infrastructure not be used in conjunction with the Cine feature, as it is possible that frames may be dropped when playing at frame rates that are higher than they can transfer. If you notice that cine play is uneven, it is recommended that you launch URLs in a local browser.

If using a Citrix environment, the system can be configured to launch the IBM iConnect Access URL in a local browser. Contact Citrix for more information.

Cine controls for cardiology studies appear as follows:

Group Controls

Group controls (previous group, play/pause, next group)

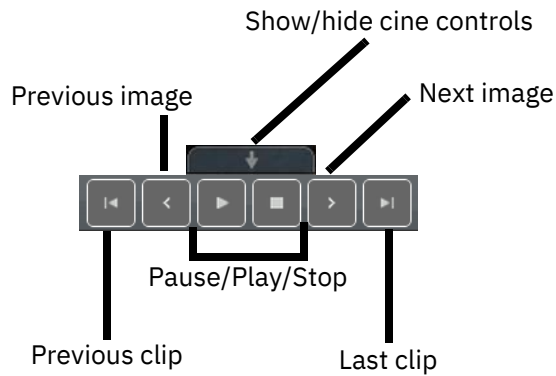
Enterprise




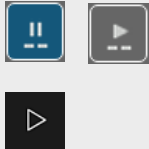
Universal







Image/Clip Controls



Group Controls

Control	Description
	Starts playing the previous or next series. For example, if the layout is 2x2 and cine group 2 was previously playing, clicking Next starts playing series 9 through 12. The initial cine frame rate used corresponds to each particular series.
	Click Play in the group control bar to start playing cine for all visible viewports containing multiframe images or a series with multiple non-multiframe images. If you select a viewport and click Play, then the cine starts playing from the first image in the series based on the specified frame rate. When the last image of the series is reached, cine proceeds to the first image of the next series. If the series consists of a single image, cine will delay for a configurable number of seconds before proceeding to the next series. Cine continues from series to series until cine is stopped or paused.

Clip Controls

Control	Description
	<p>The viewport switches to the previous or next series and displays the first image of that series. If the cine was previously playing, then the previous or next series starts playing.</p>
	<p>Enables you to play or pause the current series.</p>
	<p>Enables you to manually step through the images in the current series. If the cine is currently on the last image of the series, then:</p> <ul style="list-style-type: none"> the cine is returned to the first image of the series if Exam Mode is not enabled. the cine displays the first image of the next series if Exam Mode is enabled. <p>For information on enabling or disabling Exam Mode, see the iConnect Access User's Guide.</p> <p>Exam Mode can also be enabled or disabled at the domain or role level by the System Administrator.</p> <p>When enabled, Exam Mode causes cine to play through the entire study (plays through entire clip, proceeds to the next clip and plays it until it eventually cycles back to the first clip and repeats) instead of just playing through the current clip.</p>
	<p>Stops the cine.</p>

To use cine for cardiology exams

- 1 Load a cardiology exam (US, XA) into the Enterprise viewer.

If auto-play is enabled for applicable modalities, cine starts automatically.

NOTE: Auto-play is currently only available in the Enterprise viewer.

- 2 Use the controls to navigate through clips or groups.

The viewer quality (lossless PNG or lossy JPEG) is defined as a user preference. If you change this preference, the default viewer quality only takes effect when the viewer is reloaded.

- 3 You may optionally do the following:

- Apply edge enhancement to cath (XA) images during the cine (provided edge enhancement is enabled in the application). See [Applying Edge Enhancement on page 52](#).
- Apply window level, pan, and zoom during cine. Applying these tools affects all frames in that multiframe image. For non-multiframe images, the entire series is affected. See [Changing Window Settings on page 38](#).

Applying Edge Enhancement

The Edge Enhancement tool enables you to enhance the edge of an image. Edge enhancement is an image processing filter that enhances the edge contrast of an image to improve its apparent sharpness.

NOTE: The Edge Enhancement tool is not available in the Universal viewer.

This feature has the effect of creating subtle bright and dark highlights on either side of any edges in the image, leading the edge to look more defined. This enhancement enables you to more easily detect tube placements, hairline fractures, and so on.

NOTE: The edge enhancement filter is intended for use on images with high spatial resolution and low signal-to-noise ratios. The edge enhancement filter is intended for use on X-ray and cardio (XA) images only.

NOTE: Not all image archives support the Edge Enhancement feature. Enhanced images with this feature applied may not appear as expected.

To manually perform edge enhancement

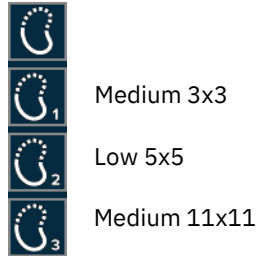
- 1 In the Enterprise viewer, click the image viewport of the image you want to enhance.
- 2 Click **Edge Enhancement**.



- 3 Place the mouse pointer over the image, click the left mouse button and perform any of the following actions:
 - Drag the mouse upward — Increases the size of edge for the image.
 - Drag the mouse downward — Decreases the size of edge for the image.
 - Drag the mouse right — Increases the contrast for the image.
 - Drag the mouse left — Decreases the contrast for the image.

To perform edge enhancement using presets

- 1 Click the image viewport of the image you want to enhance.
- 2 Click one of the predefined settings for edge enhancement.



The image is enhanced to the predetermined level.

- 3 If required, click another option to change the edge enhancement.

Printing Patient Images and Documents

The Print feature prints the following image and document types that are displayed in the viewer:

- Images — such as DICOM, JPG, PNG, GIF, TIFF, BMP
- Printable documents — such as PDF, XML, TXT, HTML, or video (MP4, WMV, AVI, etc.)


NOTE: The Print feature is not available in the Universal viewer.

Unprintable documents (such as XLS or audio (MP3, WAV, MIDI, etc.)) cannot be printed.

You can print to a printer connected to your local workstation or a network printer if you are connected to a network.

WARNING: The application's print function depends on the Web browser that you are using. Print output can vary between different Web browsers and are not recommended for diagnostic use.

To print patient images

- 1 Select and load the desired study in the Enterprise viewer.
- 2 If required, use the review tools to manipulate the image.
- 3 Select the viewport with the image to be printed and click **Print View** .

The composite image layout print dialog opens displaying all viewports in the active panel with Print Preferences options. If a viewport contains an image, the image is displayed. If a viewport contains a Printable Document, Unprintable Document, or is empty, a blank image is displayed.

NOTE: If the selected viewport is empty but there is at least one viewport that contains an image, the application proceeds to the composite image layout print dialog. If the selected viewport is empty and there are no viewports that contain an image, a message is displayed that the selected viewport is empty.

- 4 Select the page size and orientation that corresponds with the browser's print settings.
- 5 Click **Print**. The application displays a standard print dialog.
- 6 Set the printer options, click **Print**.

To print printable documents

- 1 Select and load the desired study.
- 2 Select the viewport with the document to be printed and click **Print View**. The application displays the document in a new browser window.
- 3 Click **Print**. The application displays a standard print dialog.
- 4 Set the printer options and click **Print**.

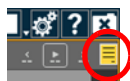
Generating PDF Reports

The following procedure describes how to generate and download PDF reports.

NOTE: The Generate PDF Report tool is not available in the Universal viewer.

To generate PDF reports

- 1 Open a study in the Enterprise viewer.
- 2 Click the **Report** button.



The report opens in the Enterprise viewer.

- 3 Click **Generate PDF Report**. The Opening Report dialog opens.

NOTE: **Generate PDF Report** is enabled only after you have displayed a report in the report viewer.

- 4 Do one of the following:
 - Select **Open with** and select the appropriate program to open and view the file.
 - Select **Save File** to download the file to the Downloads folder of your computer.
- 5 Click **OK**.