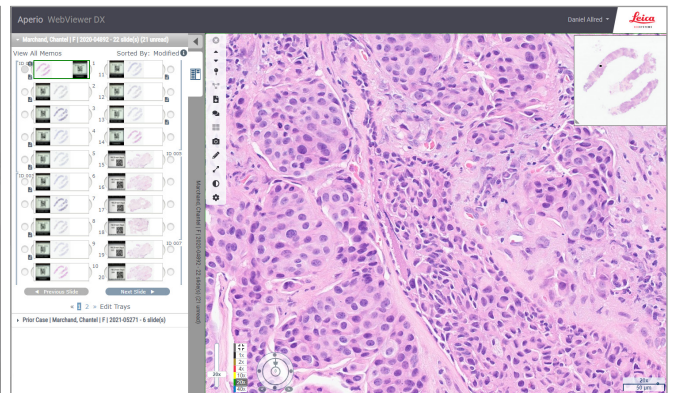


Aperio WebViewer DX

User's Guide



Aperio WebViewer DX User's Guide

This document applies to Aperio WebViewer DX 1.0 and later.




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- ▶ This product is protected by registered patents. For a list of patents, contact Leica Biosystems.


Customer Resources

- ▶ For the latest information on Leica Biosystems Aperio products and services, please visit www.LeicaBiosystems.com/Aperio.

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Contents

- Notices 6**
 - Revision Record 6
 - Intended Purpose 6
 - Limitations 6
 - Cautions and Notes 6
 - Symbols 9

- Customer Service Contacts 10**

- 1 Introduction 12**
 - Introducing Aperio WebViewer DX 12
 - Key Features for Pathologists 12
 - Quality Control for Pathologists and Histotechnicians 13
 - Pathologist Responsibility 13
 - Pathologist Quality Control Workflow 14
 - Digital Slide Scanning Quality Control 14
 - Supported Image Types 15
 - Non-Clinical Use Images 15
 - Installation 15
 - Environment 15
 - Supported Operating System and Browsers 15
 - Required Viewing Settings 15
 - Monitor Settings 16
 - Browser and Operating System Settings 16

- 2 Get Started 17**
 - Aperio WebViewer DX User Interface Overview 17
 - Training Workflows for Digital Slide Review 18
 - View Digital Slides 18
 - Open Digital Slides with Aperio eSlide Manager 18
 - Perform the Monitor Display Image Validation 19
 - Perform Quality Control for the Digital Case Review 19
 - Review a Single Slide 22
 - Review Multiple Slides 32
 - Ending a Viewing Session 34

3	Quick Reference	35
	Open Digital Slides	35
	Open Digital Slides from Aperio eSlide Manager	35
	Navigate Digital Slides.....	36
	Main Toolbar.....	37
	Navigation Tools	38
	Annotation Tools.....	39
	Icon Glossary.....	40
	Keyboard Shortcuts.....	41
	Close Aperio WebViewer DX.....	42
4	View and Navigate Digital Slides	43
	View and Organize Digital Slides in the Slide Tray.....	43
	Slide Tray Features.....	43
	Organize the Slide Tray.....	44
	Open Digital Slides	45
	View Digital Slide and Label Information	45
	View Case Data.....	46
	Viewer Window	47
	Thumbnail and Heat Map.....	47
	View Multiple Images	48
	Synchronize Navigation of Multiple Slides	49
	View Prior Cases for the Same Patient	50
5	Image Enhancements and Annotations	52
	Image Enhancements	52
	Adjust the Brightness, Contrast, and Gamma	53
	Reset an Image Enhancement.....	53
	Image Enhancement Presets	54
	Apply a Preset.....	55
	View the Applied Image Enhancement Preset	56
	Image Enhancement Preset Validation Workflow	57
	Set Image Enhancement Preferences	57
	Annotations	59
	Open the Annotation Window.....	59
	Quick Menu for Annotations	59
	Add Annotations	59
	Rectangle and Ellipse.....	60
	Freeform.....	60
	Polygon	60
	Arrow	61
	Pin Drops.....	61
	Add a Text Annotation	61
	Add a Linear Measurement	62

Define the Report Region	62
Use Pin Drops to Navigate Around Case Slides	63
Edit Freeform Annotations	64
Delete an Annotation	64
Copy an Annotation	64
Move an Annotation	66
Take a Snapshot of the Digital Slide	66
Take a Snapshot Using the Active Capture Mode	66
Snapshot Capture Modes	66
Full View	67
Fixed Size	67
User Drawn	68
6 Settings and Options	69
Aperio WebViewer DX Options	69
Global Settings	70
Slide Tray Sorting	70
Unit of Measure	70
7 Maintenance and Troubleshooting	71
Maintenance	71
Product Information	71
Automatic and Manual Monitor Display Image Validation Checks	72
Automatic Monitor Display Image Validation Checks	72
Manual Monitor Display Image Validation Checks	72
Troubleshooting	76
Monitor Display Image Validation Failure	76
Unsupported Zoom Level Notification	77
Digital Scan Quality	77
Slide Tray (DST) Error	77
Missing Image Metadata Error	77
A Performance Information	78
Analytical Performance Characteristics	78
Accuracy of Measurement	78
Clinical Performance Characteristics	78
Index	80

Notices

Revision Record

Rev.	Issued	Sections Affected	Detail
A	April 2022	All	New manual for Aperio WebViewer DX 1.0 and later.

Intended Purpose

Aperio WebViewer DX is a viewing software application intended to enable the pathologist with the qualitative review and interpretation of digital images of surgical pathology glass slides prepared from formalin-fixed paraffin-embedded (FFPE) tissue. Aperio WebViewer DX is intended for use with digital images from compatible scanners on local and remote networks.

Aperio WebViewer DX is not intended for use with a frozen section, cytology or non-FFPE specimens. It is the responsibility of a qualified pathologist to employ appropriate procedures and safeguards to assure the validity of the interpretation of images obtained using Aperio WebViewer DX.

Limitations

The following limitations apply to the Aperio WebViewer DX:

- ▶ The use of Aperio WebViewer DX from a virtual viewing station (VM) is not supported.
- ▶ The use of SVS images from an Aperio scanner other than the Aperio GT 450 DX is for non-clinical use only.
- ▶ The use of tablets and mobile devices is not supported.
- ▶ The use of touchscreens is not supported.
- ▶ The use of gaming mice (e.g., joysticks and 3-D mice) is not supported.
- ▶ The use of operating systems other than the Windows version specified in the Aperio WebViewer DX IT Administrator's Guide is not supported.
- ▶ Due to limitations of the operating system, Private Health Information data cannot be protected in transit. Leica recommends that the user protects data in transit by using SSL with strong security protocols such as Transport Layer Security (TLS) or network-level encryption such as IPSec or SSH tunnelling is utilized.

Cautions and Notes

- ▶ **Aperio WebViewer DX is for professional use only.**
- ▶ **Serious Incidents Reporting** - Any serious incident that has occurred in relation to the Aperio WebViewer DX shall be reported to the manufacturer and the competent authority of the member state in which the user and/or the patient is established.
- ▶ **Specifications and Performance** - For information on the requirements for monitors, refer to the document *Aperio WebViewer DX IT Administrator's Guide*.

- ▶ **Installation** - Aperio WebViewer DX must be installed by a trained Leica Biosystems Technical Services representative.
- ▶ **Accessories** - For information on using Aperio WebViewer DX with third-party accessories such as a Laboratory Information System (LIS) not provided by Leica Biosystems, contact your Leica Biosystems Technical Services representative.
- ▶ **Quality Control** - For information on quality control procedures for Pathologist and Histotechnicians, see, “*Quality Control for Pathologists and Histotechnicians*” on page 13.
- ▶ **Maintenance and Troubleshooting** - For information on maintenance, see “*Maintenance and Troubleshooting*” on page 71.
- ▶ **Cybersecurity** - Be aware that workstations are susceptible to malware, viruses, data corruption, and privacy breaches. Use caution when inserting USB drives and other removable devices. Consider disabling USB ports that are not in use. If you plug in a USB drive or other removable device, you should scan the devices with an anti-malware utility. Work with your IT administrators to protect your workstation by following your institution’s password and security policies.

IT staff: See the *Aperio eSlide Manager Administrator’s Guide* for further cybersecurity recommendations, including:

- ▶ Protecting workstations and servers
- ▶ Setting passwords
- ▶ Monitoring and restricting login attempts
- ▶ **Sensitive Data Protection** - This Leica Biosystems product is capable of input, storage, and handling of sensitive data, including personal identifier information (PII) and/or possibly protected health information (PHI). In addition to personal data such as name, address, and other obvious personal identifiers, sensitive data include barcodes, accession numbers, diagnostic information, and scan images, such as microscope slide labels and other labels or annotations embedded in image files. Please take appropriate precautions to protect from sensitive data exposure and theft. Handling of sensitive data is subject to local laws. Many countries have a data protection authority to ensure that data protection law is followed. For more information about your privacy rights, or if you are not able to resolve a problem directly with us and wish to make a complaint, contact your local authority.
- ▶ **Off-the-Shelf Software** - Potential impacts to cybersecurity in response to off-the-shelf (OTS) software are managed by Leica Biosystems, Inc. A list of all OTS software is maintained by Leica Biosystems, Inc. For more information on OTS, contact your Leica Biosystems Sales Representative and ask for a copy of the Aperio WebViewer DX Software Bill of Materials (SBOM). OTS failures can cause errors when viewing or loading images in the viewer, including inaccurate color representation or other visual anomalies. If you experience issues with loading or viewing images, contact Leica Biosystems Technical Services.
- ▶ **Training** - This manual is not a substitute for the detailed operator training provided by Leica Biosystems or for other advanced instruction. Leica Biosystems Technical Services should be contacted immediately for assistance in the event of any malfunction.












CAUTIONS: When viewing digital slides:

- ▶ Do not use the Image Enhancement tools to correct a suboptimal scanned image for diagnostic review. In this case, you should request a re-scan of the slide.
 - ▶ Your monitor must meet the specifications detailed in the *Aperio WebViewer DX IT Administrator's Guide*.
 - ▶ Your monitor's Display Mode must be set to sRGB.
 - ▶ Your viewing station must use the supported browser and operating system, as described in, "*Supported Operating System and Browsers*" on page 15.
-

Symbols

The following symbols appear in device labeling:

Symbol	Standard / Regulation	Description
	ISO 15223-1 – 5.1.1	Manufacturer
	ISO 15223-1 – 5.1.2	European Union Authorized Representative
	ISO 15223-1 – 5.7.10	Unique Device Identifier
	ISO 15223-1 – 5.1.6	Catalog number
	ISO 15223-1 – 5.5.1	In Vitro Diagnostic medical device
	EU 2017/746 Article 18	Device carries the CE (Conformité Européenne) Mark and fulfills the requirements of EU Regulation 2017/746.
	Medical Devices Regulations 2002	Device is in compliance with UK Conformity Assessment requirements.
	ISO 15223-1 – 5.1.8	Importer
	ISO 7010 – W001	The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions.

Customer Service Contacts

Please contact the office for your country for technical assistance.

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Tel: +1 844 534 2262 (toll free)
Direct International Tel: +1 760 539 1150
Email: TechServices@leicabiosystems.com

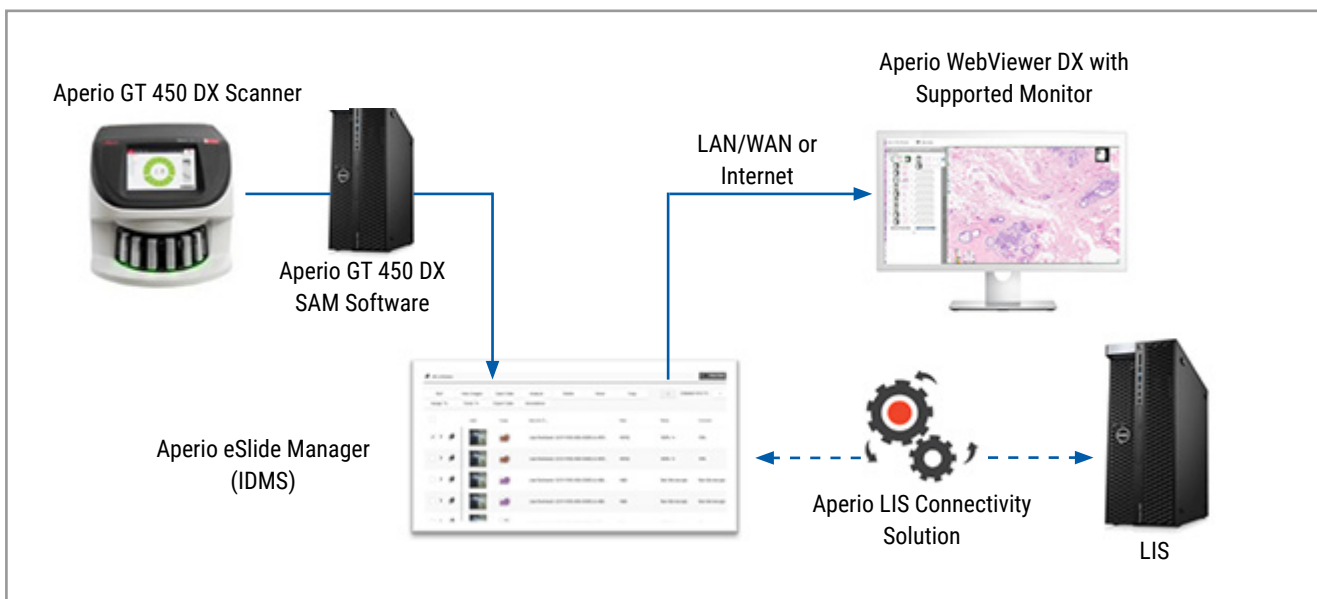
1

Introduction

Introducing Aperio WebViewer DX

Aperio WebViewer DX is a web-based digital slide viewing software product that enables you to navigate through whole slide images for a patient case in an organized manner for the purpose of on-screen primary diagnosis. You can open whole slide images in Aperio WebViewer DX from an image and data management system (IDMS), such as Aperio eSlide Manager, or from your Laboratory Information System (LIS).

The Aperio WebViewer DX is part of an overall clinical workflow solution, which also includes the Aperio GT 450 DX scanner, Aperio eSlide Manager, and an LIS connectivity solution.



Key Features for Pathologists

As a pathologist, Aperio WebViewer DX enables you to:

- ▶ Enhance images to optimize detection of important features such as chromatin, mitotic events, and intracellular bridges regardless of scanner source, stain, and/or tissue type.
- ▶ Annotate images for a variety of reasons, including delineating areas for special stain or a harvest zone for ancillary studies.
- ▶ Synchronize image magnification and rotation of multiple images within the same window.

- ▶ Compare a patient's current case with their past case(s) to provide needed context.

Quality Control for Pathologists and Histotechnicians

As a Histotechnician or Pathologist, Aperio WebViewer DX enables you to perform visual quality control checks to ensure:

- ▶ There are no missing slides for a case.
- ▶ There is no missing tissue on a slide by navigating the image and referring to the whole image view.
- ▶ The image is clear and the metadata is present and legible.

You should perform quality control on digital slides based on your organization's standard procedures.

Pathologist Responsibility

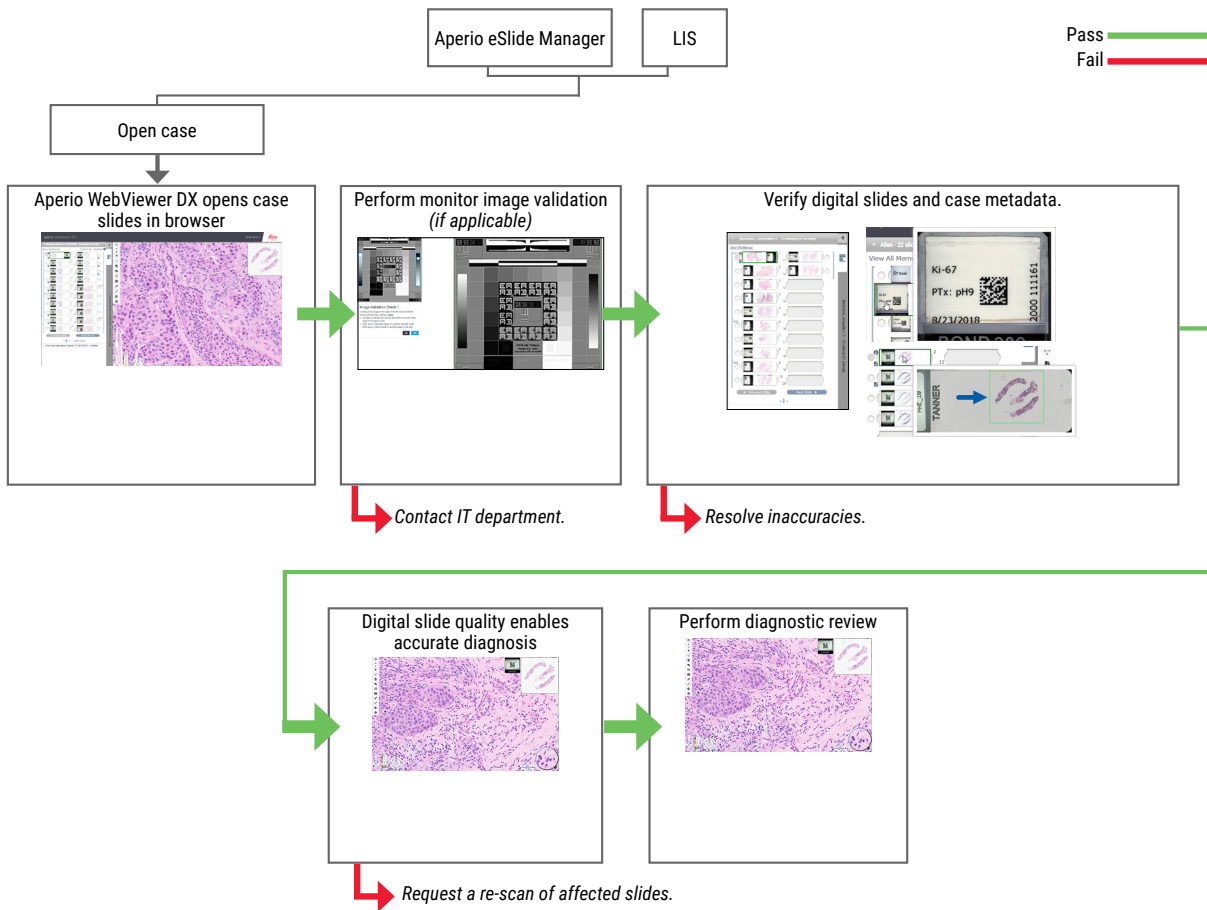
It is the responsibility of the pathologist to perform the quality checks described below.

- ▶ Pathologists should exercise professional judgment in each clinical situation and examine the glass slides by conventional microscopy if there is doubt about the ability to accurately render an interpretation using this device alone.
- ▶ Pathologists should confirm that all slides are present in the digital case, that the slides they are reviewing are for the correct patient, and that the slides match the gross description in their requisition.
- ▶ If a scanned image appears with a red tile, the image is corrupt or has missing data. In this case, do not use the image for diagnostic purposes. You should rescan the slide.

For a high-level workflow diagram of the quality control tasks, see the next section, *"Pathologist Quality Control Workflow"* on page 14.

Pathologist Quality Control Workflow

The following workflow diagram provides a high-level overview of the quality control tasks a pathologist should perform for each case.



Digital Slide Scanning Quality Control

Specimen collection and preparation is performed prior to use of the Aperio WebViewer DX using a formal procedure associated with the compatible device. Acceptable specimens are surgical pathology slides prepared from FFPE tissue, which are digital images once introduced to Aperio WebViewer DX.

Well prepared slides are crucial to a successful scan. It is the responsibility of the lab to verify the quality of the tissue preparation, the physical characteristics of the slide, and the staining quality. For more information on slide preparation techniques, refer to the user's guide for your scanner.

Supported Image Types

Aperio WebViewer DX supports SVS images created from the Aperio GT 450 DX for use in your clinical workflow.

Non-Clinical Use Images

You can open and view SVS images from an Aperio scanner other than the Aperio GT 450 DX; however, they are for non-clinical use only. When you open such an image, a banner appears at the bottom of the viewer indicating the image is for non-clinical use only.

Installation

Installation and setup of Aperio WebViewer DX and Aperio eSlide Manager should only be performed by a trained Leica Biosystems Service representative.



WARNING: Ensure Aperio WebViewer DX is installed only by a trained Leica Biosystems Service Representative. Incorrect installation can enable the use of incorrect color profiles.

Environment

Aperio WebViewer DX is intended for use in Histology and Pathology labs as well as within a pathologist's office for quality control tasks, routine diagnosis, and digital slide reviews. The pathologist's office may be at their home or place of work.

Supported Operating System and Browsers

Component	Supported Versions
Viewing Workstation Operating System	<ul style="list-style-type: none"> • Microsoft Windows 10 Professional / Enterprise
Viewing Workstation Server	<ul style="list-style-type: none"> • Microsoft Windows Server 2019 • Microsoft Windows Server 2016
Web Browser	<ul style="list-style-type: none"> • Mozilla Firefox: 88.0 or later • Google Chrome: 90.0 or later • Microsoft Edge: 90.0 or later

For a complete list of requirements, refer to the *Aperio WebViewer DX IT Administrator's Guide*.

Required Viewing Settings



WARNING: Your viewing workstation must meet the specifications provided in the *Aperio WebViewer DX IT Administrator's Guide* to ensure proper image rendering and display. Using a monitor that does not meet the required specifications can enable the use of incorrect color profiles.


Monitor Settings

Ensure your monitor's Display Mode is set to **sRGB**.

Browser and Operating System Settings

To display your digital slides with optimal image quality, you must use the following browser and operating system settings:

Component	Setting
Web Browser	Zoom level is set to a multiple of 100% (100%, 200%, etc.).
Operating System	Display settings "scale" value is a multiple of 100% (100%, 200%, etc.).

If your settings are outside of the specified range, the  icon appears on the image to alert you that the image quality is reduced.

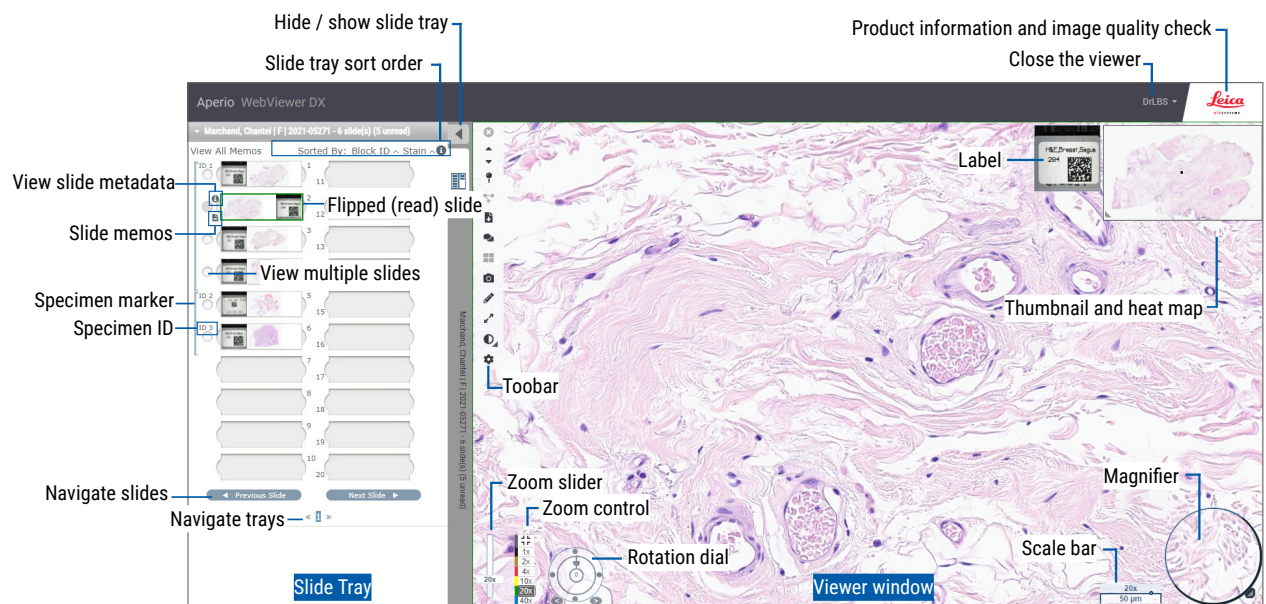
2

Get Started

This chapter provides information to help you get started using the Aperio WebViewer DX viewer. It contains a high-level overview to familiarize yourself with the user interface, and example training workflows to help you learn how to navigate through several specific workflows.

Aperio WebViewer DX User Interface Overview

The following example shows the Aperio WebViewer DX with a case of slides open. The example shows the primary areas of the interface and the tools you can use to view and navigate your digital slides.



The two main areas are the Slide Tray and the Viewer window:

- ▶ **Slide Tray** – The Slide Tray provides a simulation of the tray pathologists use to organize their glass slides. Slides are grouped in the tray by specimen. If configured in Aperio eSlide Manager, the slides may also be sorted by stain, block ID, and so on, within the specimen. For more details about using the Slide Tray, see *“View and Organize Digital Slides in the Slide Tray” on page 43.*
- ▶ **Viewer Window** – The Viewer window is where you review and work with your digital slides. For more details, see *“Viewer Window” on page 47.*

Training Workflows for Digital Slide Review

This section contains example digital slide review workflows that include typical tasks performed and tools you can use during your review, such as navigation and annotation tools. Note that these are examples only, and the workflows used at your institution may differ.

View Digital Slides

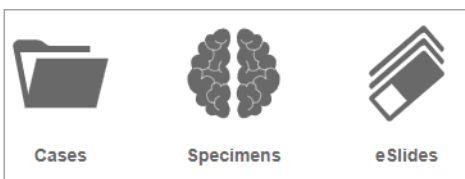
This section contains sample workflows in which you will:


- ▶ Log in to Aperio eSlide Manager.
- ▶ Open a case.
- ▶ Check image quality.
- ▶ Examine a digital slide for quality control.
- ▶ Examine the digital slide using Aperio WebViewer DX tools.
- ▶ Make the necessary annotations.
- ▶ Close Aperio WebViewer DX.
- ▶ Log out of all applications.

Open Digital Slides with Aperio eSlide Manager

From Aperio eSlide Manager, you can open one or more specific digital slides, or all of the digital slides for a case. Aperio WebViewer DX opens in a separate browser tab, with the selected digital slides loaded in the Slide Tray. For more details about using Aperio eSlide Manager, see the *Aperio eSlide Manager User's Guide*.

1. Log in to Aperio eSlide Manager.
 - a. From your Internet browser, go to the URL of the Aperio eSlide Manager website.
 - b. When the Aperio eSlide Manager website opens, click **Login to eSlide Manager**.
 - c. Type your username and password, and then click **Login**.
2. Click **Cases**.



3. From the Case list, locate the case you want to review.
4. Click  from the case list to open the digital slides in Aperio WebViewer DX.



The order the slides appear in the slide tray has already been set by the administrator. It can be changed to a multiple level sort within Specimen per your site's needs. For example, for each specimen, you can sort by the type of stain.

Perform the Monitor Display Image Validation



WARNING: When viewing digital slides with Aperio WebViewer DX, ensure your monitor meets the specifications detailed in *Aperio WebViewer DX Administrator's Guide*.

When you open the viewer for the first time and anytime your browser is updated, the system performs an automatic monitor display image validation to ensure your monitor displays digital slide images correctly. Following the automatic check, the system prompts you to do a manual monitor display image validation.

Follow the instructions on the screen to complete the check. If any part of the manual monitor display image validation fails, contact your IT Department.

Image Validation Check 1

Looking at the image on the right, verify the areas inside the vertical gradient bars outlined in blue

- Changes in intensity are smooth and uniform over the entire range from bright to dark.
- There are no noticeable bands of constant intensity (solid white, gray, or black) inside or near the edges of the bars

No Yes

You should perform the manual monitor display image validation once per month. To do this, click the Leica logo in the upper-right area of the viewer, and then select **Perform Image Quality Check**.

For more information and instructions, see *“Automatic and Manual Monitor Display Image Validation Checks”* on page 72.

Perform Quality Control for the Digital Case Review

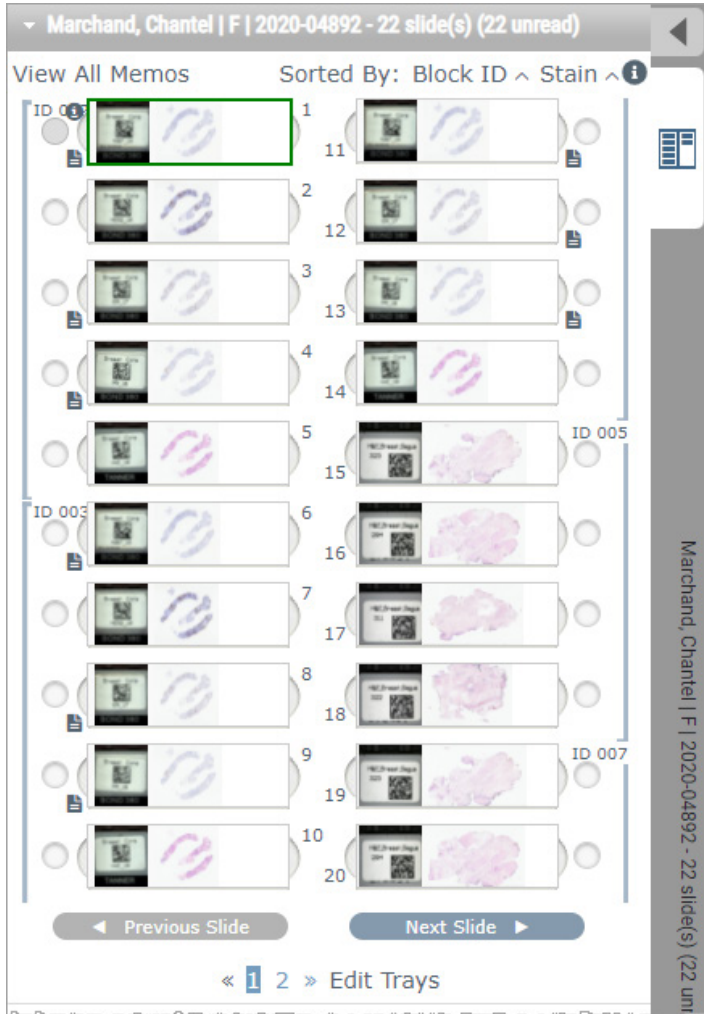
The purpose of quality control is to ensure the following:

- ▶ All the digital slides from the case or project are presented in Aperio WebViewer DX.

- ▶ All the tissue on the physical slide is included in the digital image.

High-quality, complete digital slides ensure the most accurate diagnosis for the patient. Depending on your organization's processes, quality control may be performed as slides are scanned into Aperio eSlide Manager or after cases are assembled.

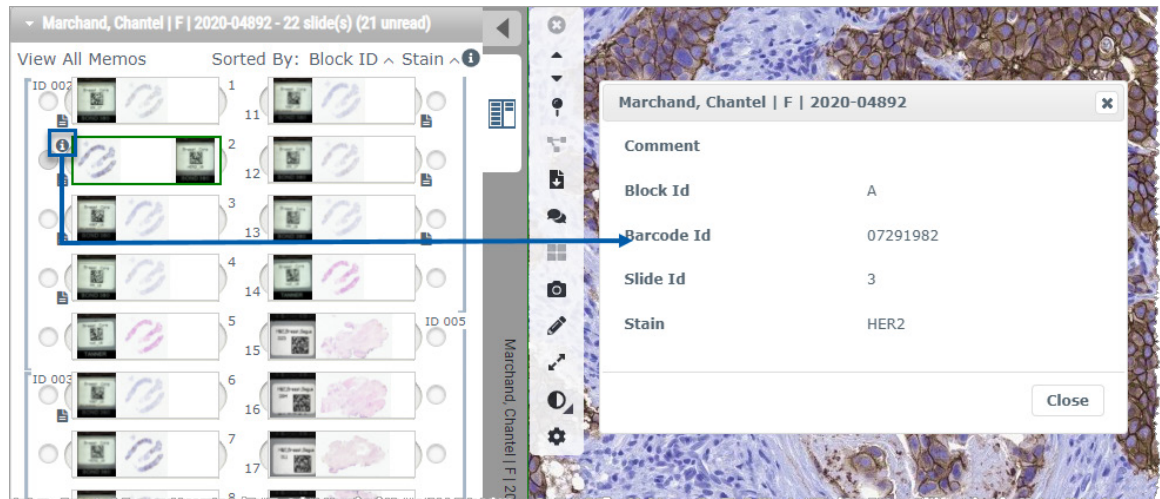
1. Verify all the case slides are scanned and included in the digital case file.



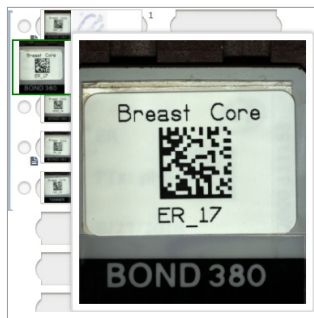
2. Review the digital slides and relevant case metadata, per your standard operating procedures. Metadata may include:
 - ▶ Accession number and part number on the slide label match other artifacts.
 - ▶ Data on the physical slide matches the data on the digital slide, if applicable.

If there is missing tissue or metadata, or if the image is blurry or metadata is blurry, rescan.

- a. Click the **i** that appears next to the slide in the Slide Tray to view and verify detail data from Aperio eSlide Manager.



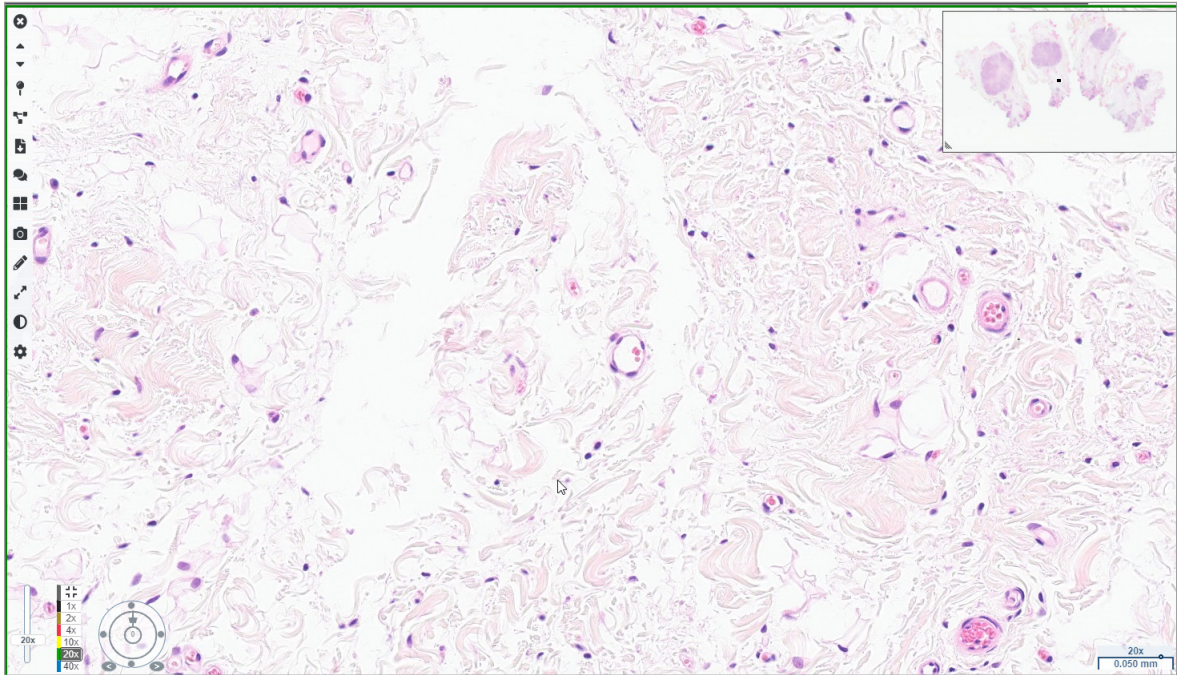
- b. Hover over the slide label to enlarge the view.



- c. Hover over the slide to see the macro overview to confirm tissue coverage. The green box defines the scanned area. If there is tissue outside the green box, it should be rescanned or prepared again.



- d. Review the digital image for quality, using the required magnification. For example, ensure the digital slide shows the necessary level of detail.



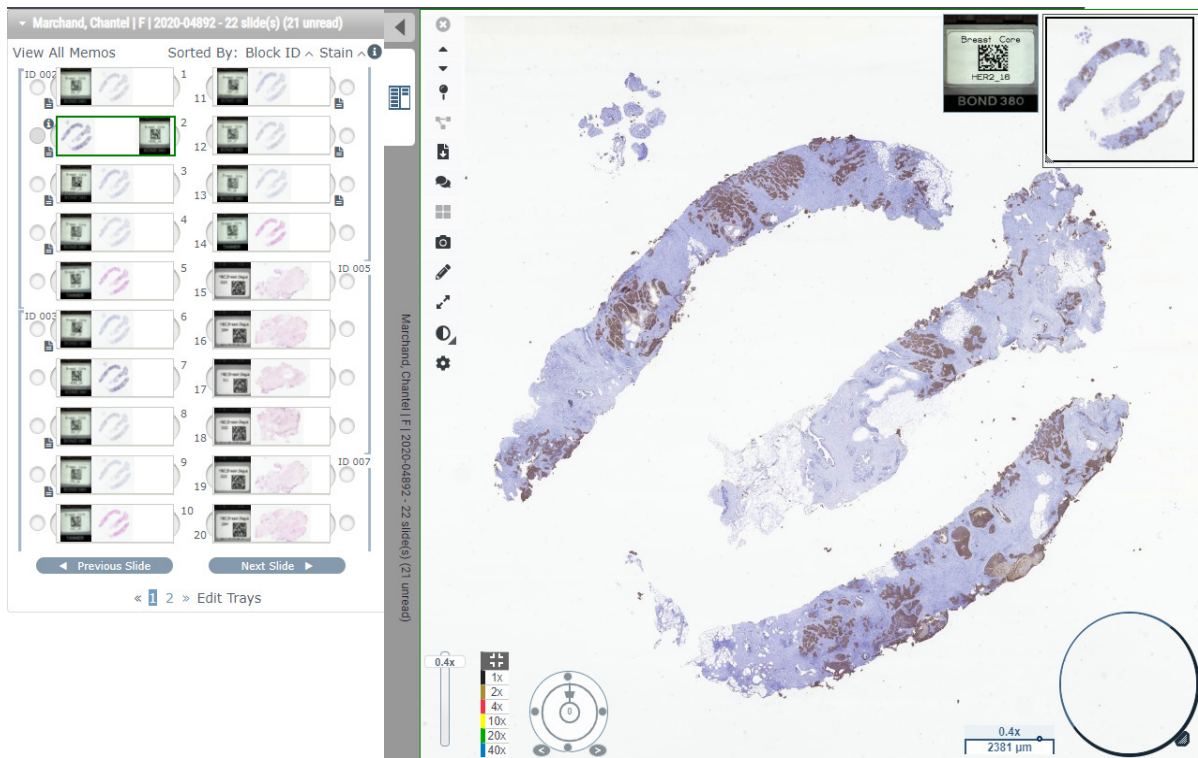
3. Repeat Step 2 on page 20 for each of the digital slides you need to review. Click the **Next Slide** button or forward arrows to navigate to the next set of digital slides.




Review a Single Slide

1. Confirm the slide you are reviewing is for the correct patient, and that it matches the gross description in your requisition.
2. If the slides are not in the order you want, click a slide and drag it to the correct location.

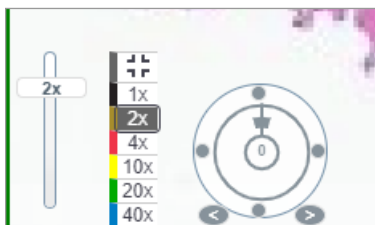
3. Select a digital slide to review. The slide displays in the Viewer Window.



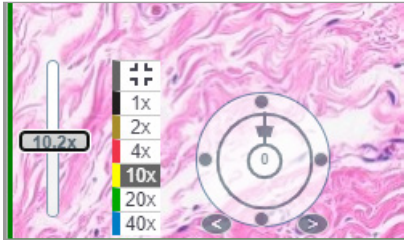
4. Turn on the Heat Map to document the areas of the digital slide you have visited. To turn it on:
 - a. Click the **Settings**  button on the WebViewer toolbar.
 - b. Select the **Heat Map** checkbox.
 - c. Click the **X** to close the Visibility box. The Heat Map is now turned on.



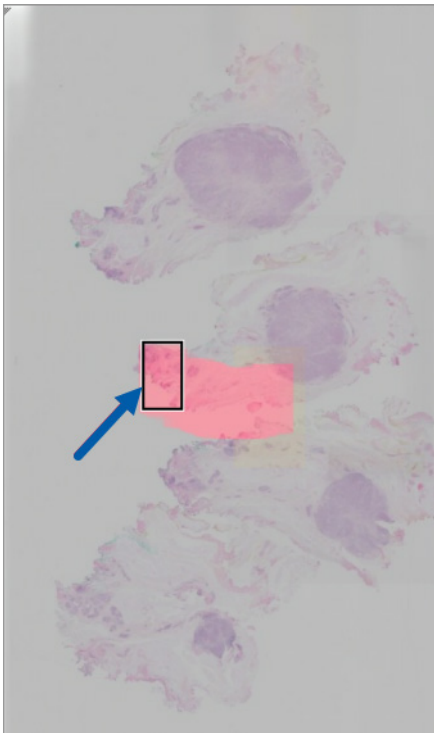
5. Click **2x** and visually review the digital slide for regions of interest at low magnification.



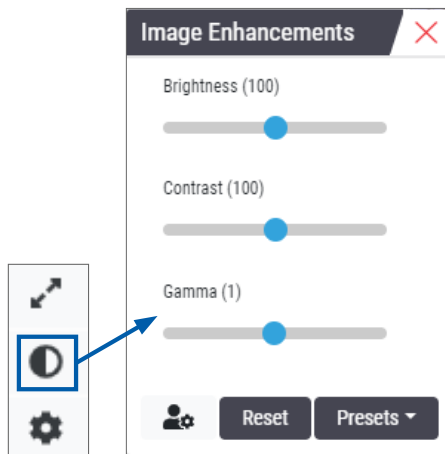
6. Identify a region of interest and click **10x**, **20x**, or **40x** or click and drag the zoom slider to the zoom level you desire.



7. The thumbnail box shows you where you are on the digital slide. The Heat Map shows what you have previously viewed. Click within the thumbnail to move to another location of interest.



8. Apply image enhancements to make slide areas stand out. Click the **Image Enhancement Toolbox** to open the options.

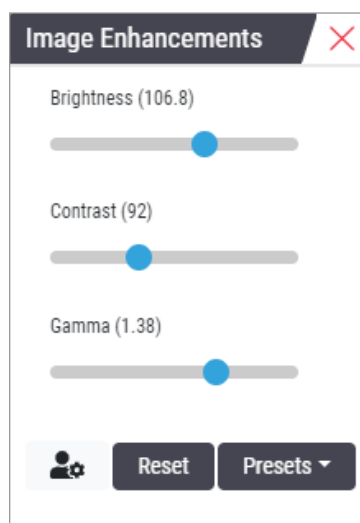


9. Click and drag the Gamma slider to the left to make the image darker.
10. Adjust the Brightness and Contrast, as needed.

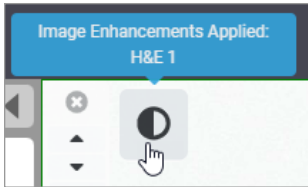
The Image Enhancements notification icon appears at the top of the Viewer window to notify you that the image has been enhanced.




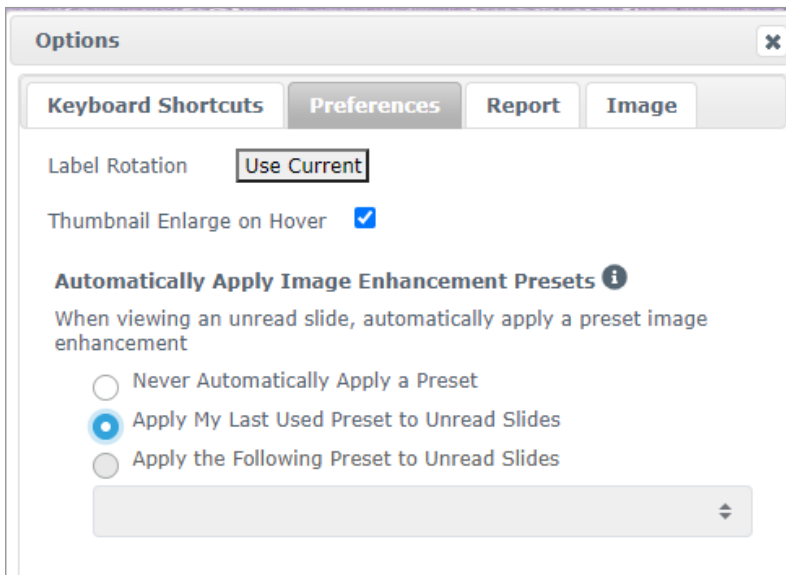
11. When you are satisfied with the image enhancements, save the setting. This allows you to use the new image enhancement settings for the next set of slides.
 - a. Click **Presets > Save as preset**




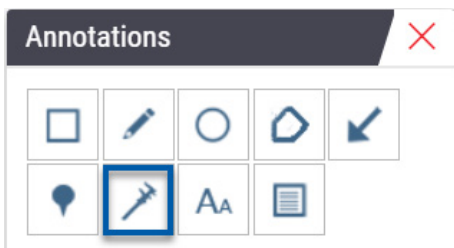
- b. Type in a name for the setting.
- c. Click **Enter**.
- d. Hover over the **Image Enhancements** notification icon at the top of the viewer to see the preset applied.



To automatically apply an image enhancement preset, click the **User Preferences**  icon in the Image Enhancements toolbox and select the option you want from the Preferences tab.



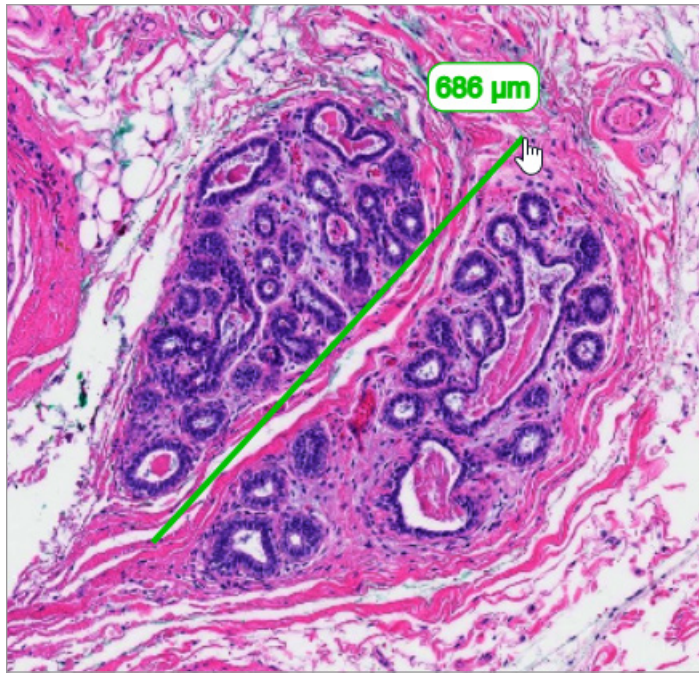
12. Use the Auto-Pan tool (see the "Semi-Automated" row in the table on page 37), or click and drag to pan around the digital slide to identify a region of interest (ROI) to annotate.
13. Click the **Annotation** tool  to open the Annotations window.
14. Measure the ROI for further examination. Click the **Measurement** annotation tool. Measure the ROI.



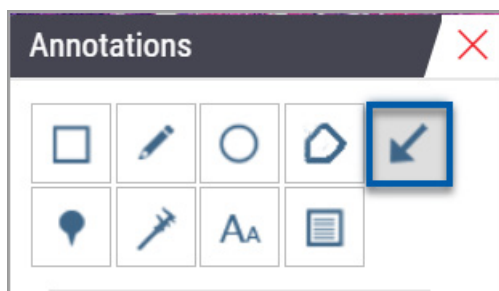
- a. On the digital slide click the beginning of the area to measure.

- b. Move the mouse along the ROI and double-click to end the measurement.

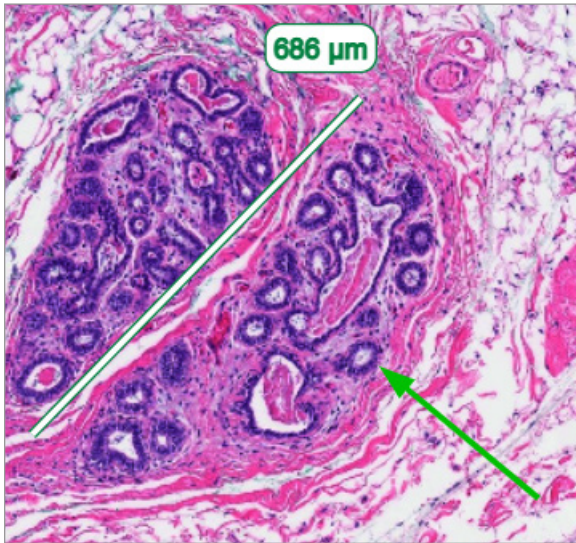
A line is drawn along the area you measured with a total length in microns (μm) or millimeters (mm), depending on how the measurement units are configured in the system.



15. Draw a green arrow pointing to the measured area.
 - a. In the Annotations window, click the color icon and select green.
 - b. Select the **Arrow** tool.



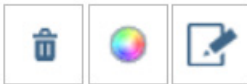
- c. Click and drag to create an arrow, leading with the arrowhead.



- d. Release the mouse to finish.

16. Change the color of the arrow.

- a. Select the arrow.
- b. Click the **Color** icon.



- c. Select a different color. The arrow changes color.



You may need to select different colors until you find one that stands out against the tissue.

17. Move the arrow to a different location.

- a. Right-click and select the **Move** tool.

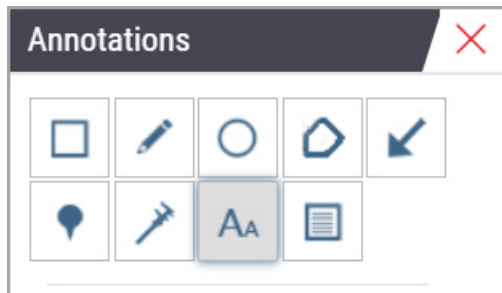


The arrow is now moving with your mouse pointer.

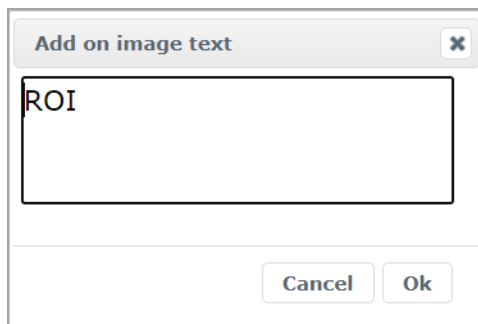
- b. Right-click on the new location to release the arrow.

18. Add text to the measured area.

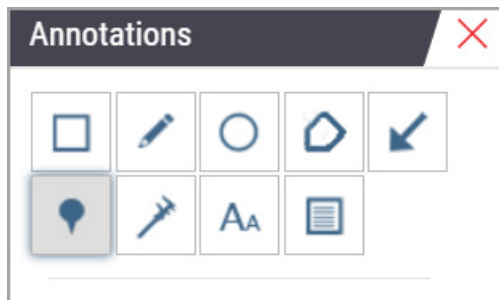
- a. In the Annotations window, click the **Aa** tool.



- b. Click near the annotation to add the note box.
c. Type your note (for example, "ROI") and click **OK**.




- d. The note should show in the color that was previously chosen. To change the color, select the note and click on the color icon. Select a new color.

19. Click the **Pin Drop** tool and click near the annotated area to add the pin.**20.** Magnify the image to 20x and add another pin.**21.** Close the Annotation toolbox.

- 22. Take a snapshot of the region of interest you annotated.
 - a. Click the snapshot tool to save the region of interest as an image.



- b. The image is automatically saved to the browser's Downloads folder.

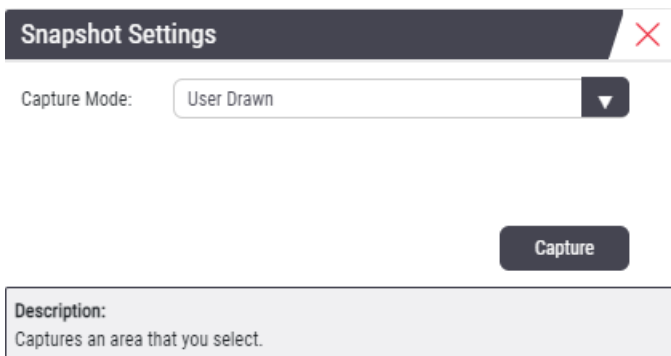


WARNING: The snapshot image (JPEG file) is not for use in diagnostic procedures.

- 23. Change the settings of the Snapshot tool and capture a user drawn section of the region of interest.
 - a. Hover over the **Snapshot** tool to show the Snapshot Settings tool. Click the **Snapshot Settings** tool to change the settings and capture a user drawn section of the region of interest.

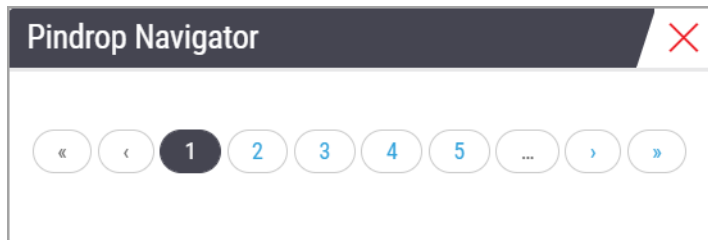


- b. Select **Image Settings**.
 - c. In the Capture Mode field, select **User Drawn** from the list.




- d. Click **Capture**.
 - e. Click and drag to select the region of interest to capture.
 - f. The image is saved in the Downloads folder.
 - g. Close the Snapshot Settings window.
- 24. Click on the next digital slide in the tray.
- 25. Click **20x** magnification.
- 26. Open the Annotation toolbox and add a pin.

27. Click the **Pindrop** tool  to open the Pindrop Navigator.



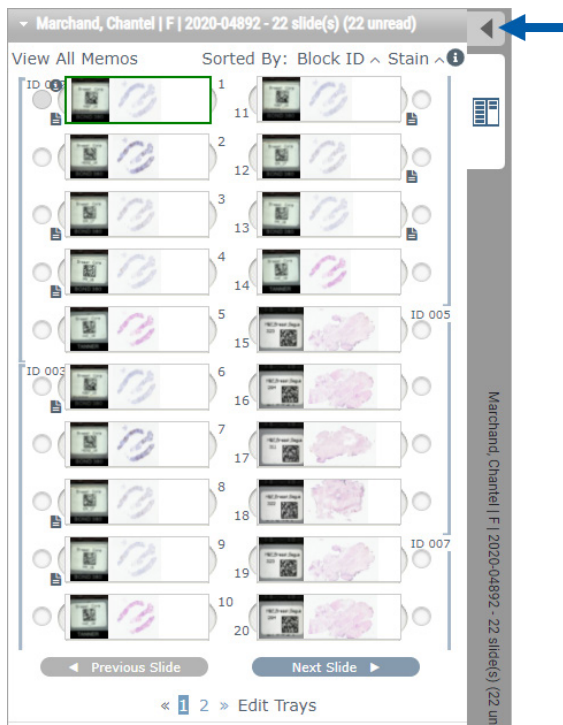
28. Navigate to all the areas that contain pin drops. Click each number or the forward/back arrows to navigate.

 *The region of interest shows in the magnification that was set when the pin drop was added.*


29. Close the Pindrop Navigator window.
30. Continue reviewing the digital slides by clicking the navigation arrows at the bottom of the Slide Tray.



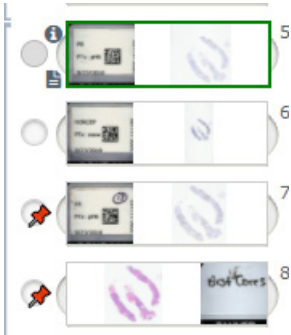
31. Click the **Hide Workflow Tools** arrow to close the slide tray to create more room to view the digital slide in the Viewer Window.



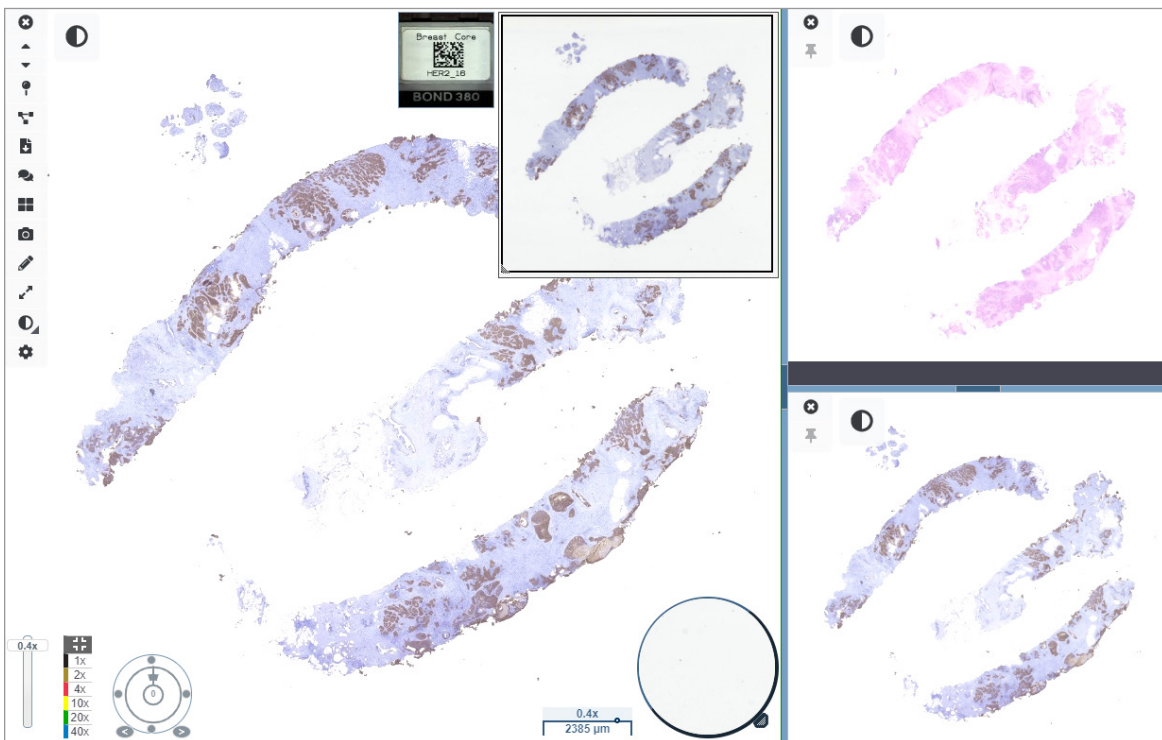
Review Multiple Slides

To perform the steps below, verify you can view all the slides in the Slide Tray. If the Slide Tray is hidden, click the **Show Workflow Tools**  icon to unhide it.

1. In the Slide Tray, click the circle to the left of two digital slides to show three digital slides in the viewing window. A pin appears in each slot. Choose three of the same images.



2. Confirm that each digital slide under review shows the whole tissue present on the glass slide. If tissue is off the screen, click and drag the digital image until it shows the whole tissue.

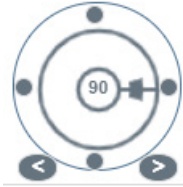




3. All images should show tissue orientation in the same direction. If the orientation needs adjusting, do the following:
 - a. Click the slide.

- b. Click within the **Rotation Dial** tool and select your choice of adjustment.



- The dots change orientation by 90-degree increments.



- The Rotation Dial allows manual adjustments.
 - The arrows adjust by one degree in either direction.
4. As needed, synchronize the digital slides to be able to simultaneously look at the same region of interest on the different slides. Prior to synchronization, verify all the slides you want to show in the viewer have the same zoom level.
- Click the **Synchronize** tool  to pan and zoom all the images at the same time.
 - Click the **Change Image Tiling Pattern** tool  to show the tiles horizontally.



5. Zoom in on specific regions of interest on the tissue on one slide (for example, H&E).
6. Pan around and change zoom magnification to examine the whole tissue. Aperio WebViewer DX shows the same region on all displayed digital images.
7. Use the Rotation Dial to adjust the rotation, as desired. Aperio WebViewer rotates all the open digital images in the same manner.
8. Close all of the digital slides when you are satisfied with your review.
9. Close the browser tab when you have completed reviewing all the digital slides.
10. Return to the Aperio eSlide Manager browser tab. From this tab, you can share the images and regions of interest with other pathologists in your network with the conferencing capabilities available in Aperio eSlide Manager. Refer to the *Aperio eSlide Manager User Guide* for details.
11. Click the **Log out** icon and close the browser tab.



Ending a Viewing Session

To close a case and end your viewing session, do one of the following:

- ▶ Close your browser tab.
- ▶ Click the down arrow beside your user name in the upper-right corner of the Aperio WebViewer DX window, and click **Close WebViewer**.

Also, if you exit Aperio eSlide Manager or if the system times out, the viewer will close automatically. In this case, you need to log in to Aperio eSlide Manager again.

3

Quick Reference

Open Digital Slides


You can open digital slides in Aperio WebViewer DX from Aperio eSlide Manager, from your image and data management system (IDMS), or your Laboratory Information System (LIS). This section describes how to open digital images from Aperio eSlide Manager. Contact your site administrator for instructions on using your IDMS or LIS.

Open Digital Slides from Aperio eSlide Manager

From Aperio eSlide Manager, you can open one or more specific digital slides, or all of the digital slides for a case. Aperio WebViewer DX opens in a separate browser tab, with the selected digital slides loaded in the Slide Tray. For more details about using Aperio eSlide Manager, see the *Aperio eSlide Manager User's Guide*.

1. Log in to Aperio eSlide Manager:
 - a. From your Internet browser, go to the URL of the Aperio eSlide Manager website.
 - b. When Aperio eSlide Manager opens, click **Login to eSlide Manager**.
 - c. Type your user name and password, and click **Login**.
2. From the Aperio eSlide Manager Home page, use one of these methods to open your digital slides for review:

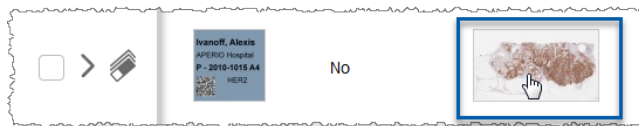
Open all digital slides for a case

- Go to the Case list, and locate the case you want to review.
- Click  from the case list (shown below) or case detail page to open all digital slides for the specified case.



Open a single digital slide

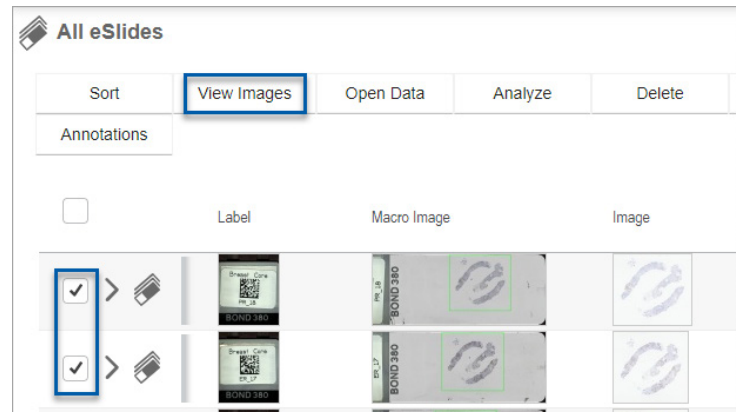
- Go to the eSlide list, and locate the digital slide you want to review.
- Click the thumbnail image of the digital slide. (Press and hold the W key if Aperio WebViewer DX is not set as the default viewer in Aperio eSlide Manager.)



Open multiple digital slides from the Aperio eSlide Manager eSlides list.

Go to the eSlide list, and locate the digital slides you want to review.



Select the check box next to each digital slide image you want to open, and click **View Images**.





3. Aperio WebViewer DX opens in a separate browser tab with the specified digital slides shown. See the following section for an example and overview of the Aperio WebViewer DX interface.

Navigate Digital Slides

There are several ways to move around the digital slide.












Navigation Type	Tool	Instructions
Manual		<p>Click and drag</p> <ul style="list-style-type: none"> Click and hold the left mouse button to drag the digital slide within the Viewer window.
		<p>Keyboard Navigation</p> <ul style="list-style-type: none"> Use the arrow keys for incremental vertical and horizontal movements. For larger vertical and horizontal movements, press Shift and an arrow key.

Navigation Type	Tool	Instructions
Semi-Automated		<p>Auto-Pan</p> <ul style="list-style-type: none"> Click the boundary of the Viewer window to start auto pan. The Auto-pan symbol  appears in the center of the window, and the digital slide scrolls from the center towards your mouse pointer. The greater the distance between the mouse pointer and center, the faster the scroll speed. The higher the zoom level, the faster the scroll speed. Click anywhere in the Viewer window to stop the auto-pan.

Tools Quick Reference

This section provides quick reference information for the tools on the main toolbar.

Main Toolbar

-  Close the current digital slide, if there is more than one digital slide open.
-  View the previous digital slide in the tray.
-  View the next digital slide in the tray.
-  Open the Pin drop navigation tool. See *"Use Pin Drops to Navigate Around Case Slides"* on page 63.
-  Use synchronized navigation to pan, zoom, and rotate multiple digital slides together. See *"Synchronize Navigation of Multiple Slides"* on page 49.
-  Download the .sis file (ScanScope Image Set file) to open the active digital slide in the Aperio ImageScope viewing software.
-  Host a conference to share digital slides with colleagues working in your Aperio eSlide Manager location. See the *Aperio eSlide Manager User's Guide* for details.
-  Change the image tiling pattern when you have multiple digital slide images open. See *"View Multiple Images"* on page 48.
-  Take a snapshot of the digital slide, and save it as a JPEG image file. See *"Take a Snapshot of the Digital Slide"* on page 66.
-  Add or edit annotations. See *"Annotations"* on page 59.
-  Enables you to resize the Viewer window.




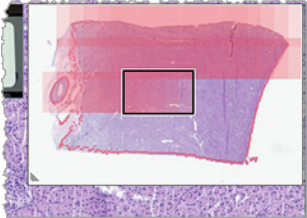

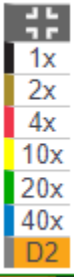
Opens the Image Enhancement settings, which allow you to apply gamma, brightness, and contrast settings to the image.


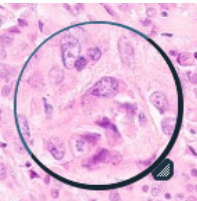





Open the Aperio WebViewer DX Visibility panel and Options window. See “Aperio WebViewer DX Options” on page 69.

Navigation Tools


The following table describes the tools available from the Aperio WebViewer DX.

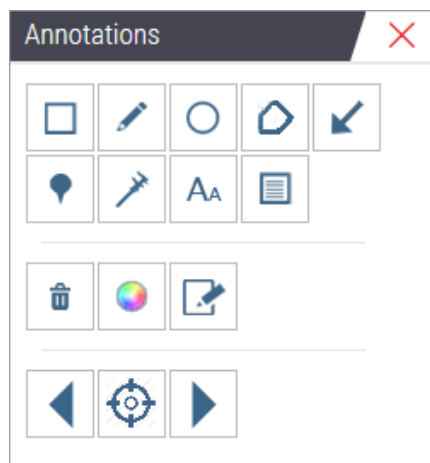
Use this tool:	To do this:	
Label *	View and rotate the digital slide label. Click the digital slide label to rotate it 90 degrees to the right.	
Thumbnail and heat map *	<p>Navigate in the main Viewer window using a small version of the entire digital slide.</p> <ul style="list-style-type: none"> • The Thumbnail shows you where you are in the digital slide. • The heat map shows the areas of the digital slide you have viewed and the magnification level used. • You can resize the thumbnail by dragging the bottom-left corner. 	
Zoom slider *	Zoom in and out of the digital slide.	
Zoom control with digital zoom*	<p>Select a specific magnification level (Fit, 1x, 20x, etc).</p> <p>If you are using a high-resolution monitor (for example, a 4K monitor), digital zoom levels are available on the zoom control. This enables you to zoom to a viewing magnification that is higher than the scanned magnification.</p> <p>Digital zoom enlarges the image in increments of 100% (D2 = 200%, D3 = 300%, etc.).</p>	

Use this tool:	To do this:	
Rotation dial *	Rotate the digital slide from 0° to 360° by clicking and dragging the rotation bar.	 A circular rotation dial with a central '0' and a vertical arrow pointing to the top. It is overlaid on a histology image. Navigation arrows are visible at the bottom.
Magnifier glass *	Drag the magnifier glass to view areas of the digital slide at twice the current magnification. Click and drag the handle to resize the magnifier.	 A magnifying glass icon overlaid on a histology image. The lens is positioned over a specific area of the slide.
Scale bar *	View a measurement scale that adjusts with the magnification level. You can resize the scale bar by dragging the left or right edge. You can also drag it to a different area of the digital slide.  <i>The unit of measure is set in the Aperio eSlide Manager System Settings. Your Aperio eSlide Manager administrator can set the unit of measure to millimeters or microns.</i>	 A horizontal scale bar with a white background and black border. It is labeled '40x' and '0.025 mm'. It is overlaid on a histology image.


















* Click  on the bottom of the vertical toolbar to show or hide these tools.

Annotation Tools

Use annotations to mark the image, measure an area of interest, add a comment, etc. Click  to open the Annotations window.



In the Annotations window, click to use the following annotation tools:

	Draw a rectangle annotation.
	Draw a free-form shape annotation.
	Draw an elliptical annotation.
	Draw a polygon annotation.
	Click to set points, and then double-click to complete the polygon.
	Draw an arrow annotation.
	Place a pin drop annotation.
	Perform a linear measurement.
	Click to set points, and then double-click to complete the measurement.
	Place a text label.
	Define the report image.
	Delete the selected annotation.
	Change the color of the selected annotation.
	Add or edit notes for selected annotation.
	Go to previous annotation.
	Place the selected annotation in the center of the Viewer window at the magnification the annotation was created.
	Go to next annotation.

Icon Glossary

In addition to the icons described previously in this chapter, the following icons also appear on the Aperio WebViewer interface.





	Unsupported zoom level - Appears in the upper-left of the Viewer window when the system detects an unsupported zoom level. For optimal viewing quality, ensure your browser and operating system zoom levels are set to a multiple of 100%. See <i>"Unsupported Zoom Level Notification"</i> on page 77.
	Monitor Display Image Validation Failure - Appears in the upper-left of the Viewer window when your automatic or manual monitor quality check failed. If this occurs, repeat the manual check again. See <i>"Automatic and Manual Monitor Display Image Validation Checks"</i> on page 72. If it still fails, contact your IT representative.
	Memo - Appears next to the selected slide in the Slide Tray. Click the Memo icon to add a note to the specified slide.
	Image Enhancement applied - Appears in the upper-left area of the Viewer window when you have applied an image enhancement to the digital slide. If you are using an image enhancement preset, you can hover over the image enhancement icon to view the name of the applied preset. See <i>"Image Enhancements"</i> on page 52 for more details.




Image Enhancement Presets defined - The small triangle in the lower-right of the Image Enhancement tool appears if you have Image Enhancement presets defined. See *“Reset an Image Enhancement”* on page 53 for more details.



Image Enhancement User Preferences - Appears on the Image Enhancement toolbox. Click to set Preferences for using Image Enhancement presets for all viewing sessions. See *“Image Enhancement Preset Validation Workflow”* on page 57.



Information - Appears on the user interface to provide additional information. Click the  to view information.



Show/Hide Workflow - Appears on the upper-right area of the Slide Tray. Click to show or hide the Slide Tray. When the Slide Tray is hidden, the arrow is reversed: 




Product Information - The Leica Biosystems logo appears in the upper-right of the Viewer window. Click the logo to access product information and the manual monitor display image validation. See *“Product Information”* on page 71.

Keyboard Shortcuts

The Aperio WebViewer DX provides a number of keyboard shortcuts for frequently used actions.



A list of keyboard shortcuts is also available in the Options window, which you can access by clicking the Settings tool  on the main toolbar. For details, see *“Aperio WebViewer DX Options”* on page 69.

View Next or Previous Digital Slide

q, Q	Step to the previous slide in the Slide Tray
e, E	Step to the next slide in the Slide Tray

Digital Slide Navigation

Arrow Keys	Move the view one-fourth of the view width or height
Shift + Arrow Keys	Move the view three-fourths of the view width or height

Magnification

Ctrl + Minus Sign	Zoom Out
Ctrl + Plus Sign	Zoom In
Double-click	Toggle between the last two magnifications

Rotation

r	Rotate clockwise 15°
Shift + R	Rotate clockwise 1°

Ctrl + r	Rotate counter-clockwise 15°
Ctrl + Shift + R	Rotate counter-clockwise 1°
0 (Zero)	Set rotation to 0°

Annotations

Ctrl + m	Move the selected pin. Press Ctrl+m, drag the pin to its new location, and press Ctrl+m again to place the pin.
Ctrl + c	Copy selected annotation
Ctrl + v	Paste copied or selected annotation
Delete	Delete the selected annotation

Close Aperio WebViewer DX

To close the viewer, click the small x in the upper-right corner of the viewer’s browser tab. You can also click the down-arrow beside your user name in the upper-right corner of the viewer’s window, and click **Close WebViewer**.

4

View and Navigate Digital Slides

View and Organize Digital Slides in the Slide Tray

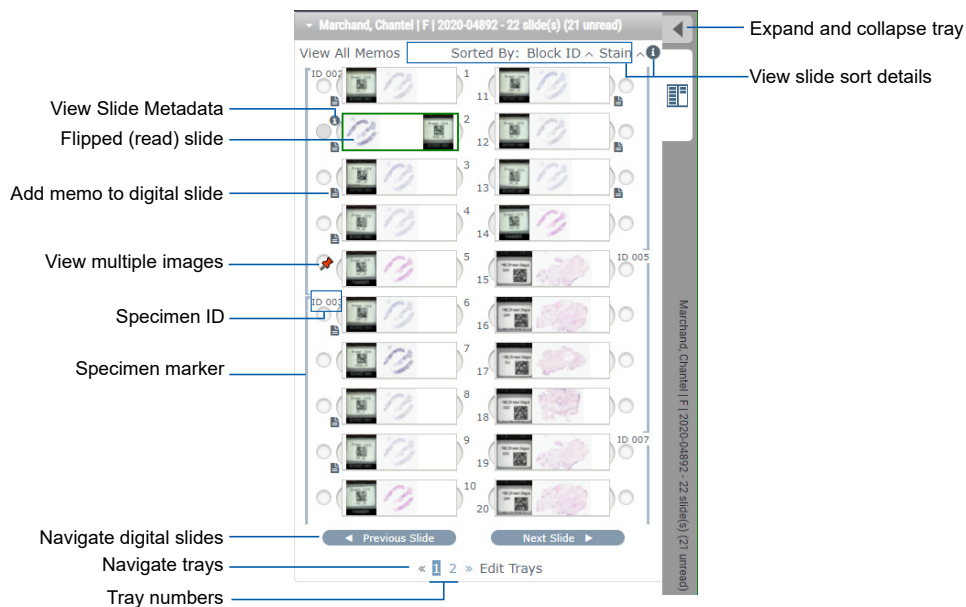
This section describes the various Slide Tray tools you can use while reviewing digital slides.

Depending on whether you opened digital slides from a case details page or the eSlide list in Aperio eSlide Manager, the Slide Tray can contain the following:

- ▶ All digital slides from a single case.
- ▶ All selected digital slides.

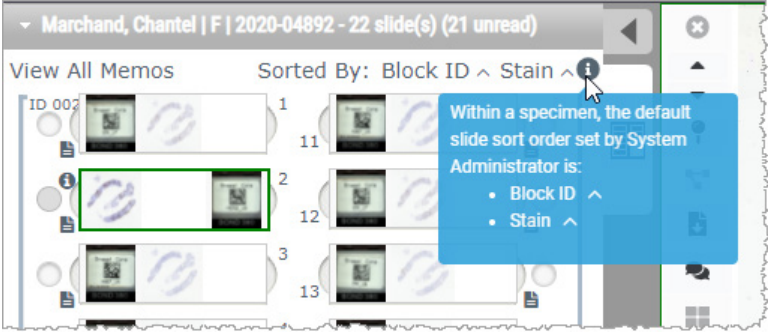
Slide Tray Features

The following example shows the different parts of the Slide Tray, and introduces how you can view, open, and organize slides.



You can perform the following actions from the Slide Tray.

Organize the Slide Tray

To do this:	Do this:
Define the digital slide sort order	<p>Slides are always grouped by specimen in the Slide Tray. Optionally, your Aperio eSlide Manager administrator can further define how your slides are sorted under each specimen. For example, under each specimen, you can sort the slides by stain, block ID, and so on.</p> <p>The sort order is indicated in the upper portion of the slide tray. You can click i to view further details about the sort order, as shown below. (The ^ and v symbols indicate ascending or descending order.)</p> 
Flip a digital slide horizontally to mark it as read or unread	<p>By default, after you view and interact with a digital slide in the Viewer window, it is flipped in the tray to indicate it was read.</p> <p>If you have turned this feature off, you can flip the digital slides manually. Right-click the digital slide in the Slide Tray, and select Toggle Read/Unread. Use your keyboard Ctrl key to select multiple digital slides.</p> <p>To change the automatic slide flipping behavior in your personal settings, click ⚙ in the upper-right corner of the Aperio eSlide Manager window to go to My Settings, and select or clear the Disable Auto-Slide Flipping check box.</p>
Move a digital slide to a different slot in the tray	<p>Drag the digital slide to a different position within the same specimen. Depending on where you want to position a slide in the tray, you may choose to insert blank slots (see below) before moving a slide.</p> <p>If your site uses a custom slide sort for the Slide Tray and you manually change the slide order, the “Sorted By” section will say “Modified” to indicate the sort order has changed. In this case, the slide order remains changed for the current viewing session.</p>
Insert a blank slot in the Slide Tray	<p>Right-click the digital slide located below the space where you want an extra slot and select Insert Blank Slot. To remove a blank slot, right-click the slot and select Remove Selected Blank(s).</p>
Remove a digital slide from the Slide Tray	<p>With one or more digital slides selected, right-click one of the selected digital slides and select Remove Selected Slide(s). This removes the slide from the tray, but does not remove the slide from the associated case.</p>

Open Digital Slides

To do this:	Do this:
View a digital slide	Click a digital slide to open it in the Aperio WebViewer DX window.
Select multiple images to view	Select the circle next to the digital slide to open the digital slide image in the Viewer window. See <i>"View Multiple Images"</i> on page 48 for details.

View Digital Slide and Label Information

To do this:	Do this:
-------------	----------

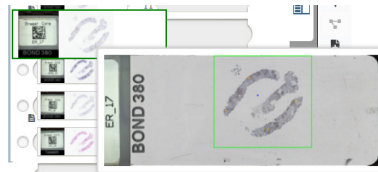
View an enlarged version of the digital slide label or macro image

In the Slide Tray:

- Hover over the slide label you want to view.




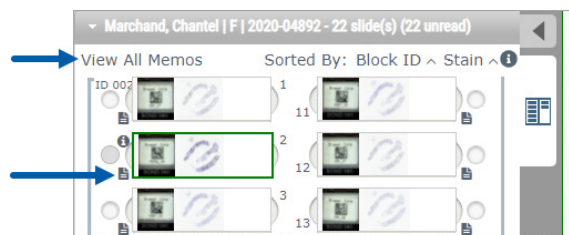
- Hover over the digital slide to view an enlarged macro image.




(In Aperio eSlide Manager, you must have the **Display Hover Popups for Images** check box selected in My Settings.)






View one or more digital slide memos

To view a memo for a specific slide, click  next to the digital slide in the tray. To view existing memos for all slides in the tray, click the **View All Memos** link.



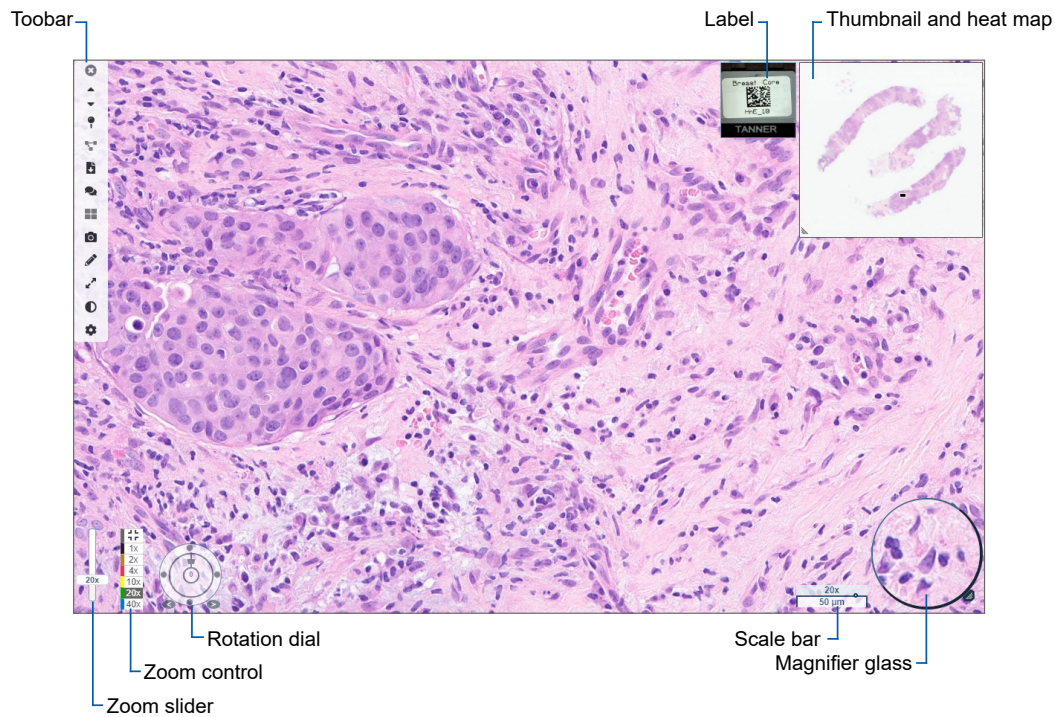
To do this:	Do this:
View metadata for the digital slide	To view metadata for the active digital slide, click the  that appears to the left of the digital slide in the Slide Tray. The data includes information such as Stain, Block ID, and Barcode ID.

View Case Data


To do this:	Do this:
Navigate through the digital slides in the Slide Tray	Click Previous Slide and Next Slide , or use the Previous  and Next  buttons from the Web Viewer toolbar.
Navigate through all open Slide Trays	If there are more than 20 digital slides in the open case, click the Previous or Next buttons or click the number of the tray you want to view    .
View prior cases for the patient	If you see a “Prior Case” link at the bottom of the Slide Tray, you can click the link to view digital slides for the referenced case. The Prior Case link only appears if the active case and associated prior cases were created using the Aperio eSlide Manager Network case workflows. See <i>“View Prior Cases for the Same Patient” on page 50</i> .

Viewer Window

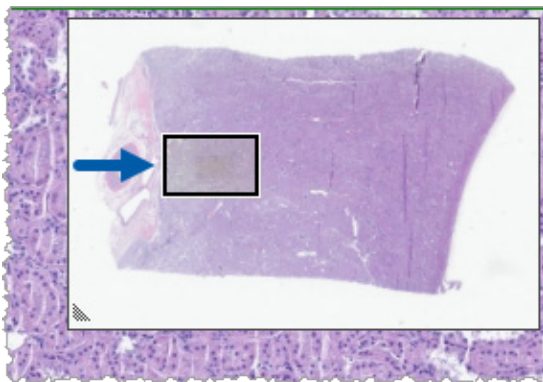
The Viewer window is where you view and annotate digital slides.



Thumbnail and Heat Map

The Thumbnail enables you to navigate in the main Viewer window using a small version of the entire digital slide. You can resize the thumbnail by dragging the bottom-left corner. If you do not see the Thumbnail, click  in the main toolbar, and ensure Thumbnail is selected in the Visibility box.

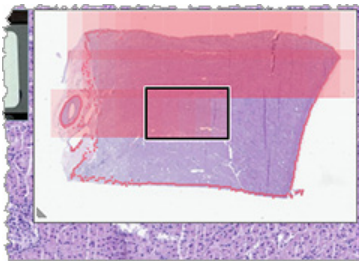
The navigation box within the Thumbnail shows you where you are in the digital slide. The size of the box varies depending on the current zoom level.





Using the Thumbnail, you can:

- ▶ See where you are in the digital slide.
- ▶ Click an area in the Thumbnail to move to the corresponding area in the digital slide.
- ▶ Drag the small Thumbnail navigation box around to navigate the digital slide.

If enabled, the heat map appears in the thumbnail window, and highlights the areas of the digital slide you have viewed and the magnification level used.



To use the heat map:

1. To enable the heat map, click the **Settings** button  on the Viewer's toolbar, and select the **Heat Map** check box.
2. As you navigate through different areas of the slide, the heat map highlights the viewed area. The color of the heat map corresponds to the color on the zoom control that represents the current zoom level.
3. To clear the heat map, click the **Settings** button  on the Viewer's toolbar, and click **Clear**.

View Multiple Images

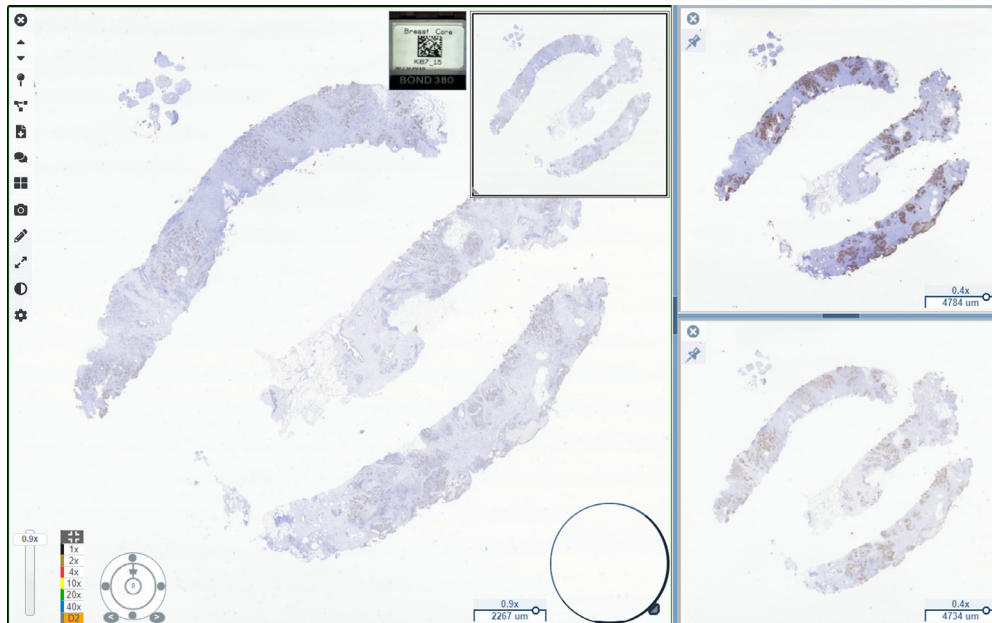
From the Slide Tray, you can open up to four images in the Viewer window at a time.

Follow these steps to open and view multiple images in the Aperio WebViewer DX window:

1. Click the circle next to each digital slide to select the images to open. Selected images appear with a push pin inside the circle, as shown below.





- The selected images appear in the Viewer window.



The newly opened digital slides are “pinned” in the Viewer window.

i When you have multiple digital slides open in the Viewer window, the tools selected in the Visibility box are available for the selected digital slide. If the tools do not appear as expected in the selected digital slide image, you might need to click inside the image.


See “Introducing Aperio WebViewer DX” on page 12 for details about setting Visibility options.


- When multiple digital slide images are open, you can do the following:
 - ▶ Use the Synchronize tool  to pan and zoom multiple digital slides at the same time. (See the next section.)
 - ▶ Click  to change how the images appear in the Viewer window. For example, the images can appear horizontally, vertically, or in a tiled pattern.
 - ▶ Select a pinned image, and use any of the available navigation or annotation tools on that image.
 - ▶ View a different primary digital slide image by selecting a different digital slide from the tray, keeping the pinned images in place.

Synchronize Navigation of Multiple Slides

The Synchronize tool enables you to pan, zoom, and rotate all open digital slides together. For example, if you rotate the active digital slide, the other open digital slides rotate too. This is useful for reviewing the same region of interest on multiple slides that are stained differently.

To view multiple digital slides using synchronized navigation:

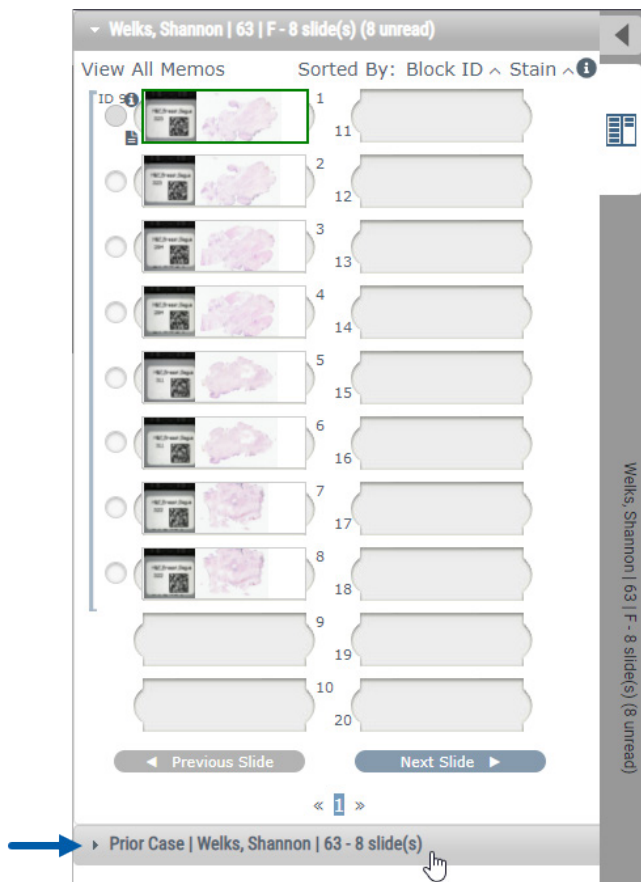
- Open the digital slides you want to view. You can open up to four images at one time.
- Manually align the open digital slides so that they are at the same zoom level and show the same viewable area.
- Go to the Aperio WebViewer DX toolbar, and click the **Synchronization** tool .

4. In the active digital slide, pan, zoom, and rotate to view the digital slide. All open digital slides follow the same navigation.
5. To stop synchronized navigation, click  .

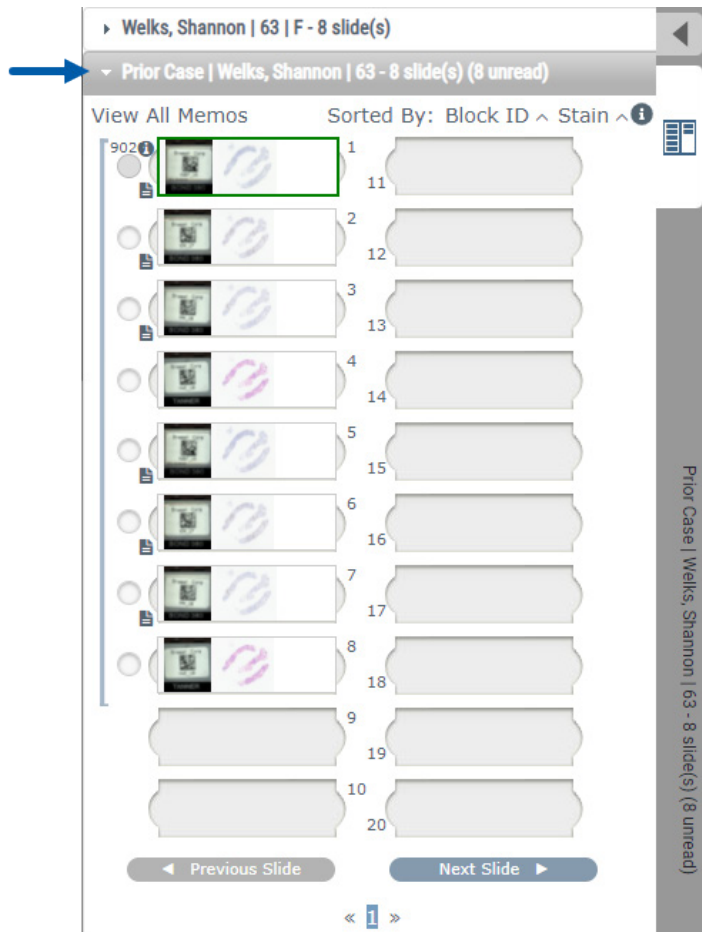
View Prior Cases for the Same Patient

If more than one case using the same MRN number was created in the Aperio eSlide Manager Network case workflows, you can view the linked cases together in the viewer. (The cases do not need to be assigned to the same pathologist in order to be linked.) This enables you to compare a current case with past linked cases to provide needed context. When linked cases exist, the Slide Tray includes a “prior case” link.

1. To view slides for the prior case, click the Prior Case link at the bottom of the Slide Tray.



The prior case expands into the Slide Tray, as indicated by the Prior Case information bar near the top of the Slide Tray.



2. View the prior case slides as needed.
3. To return to the original case opened, click the case bar at the top of the Slide Tray.

For information about using the Apero eSlide Manager Network case workflows, see the *Apero eSlide Manager User's Guide*.

5

Image Enhancements and Annotations

Image Enhancements

The Image Enhancements feature enables you to adjust the brightness, contrast, and gamma levels on your digital slides. The enhancements are for viewing purposes only and do not change the original scanned image.




WARNING: Do not use the Image Enhancement tools to correct a suboptimal scanned image for diagnostic review. In this case, you should request a re-scan of the slide.


Image Enhancements include:

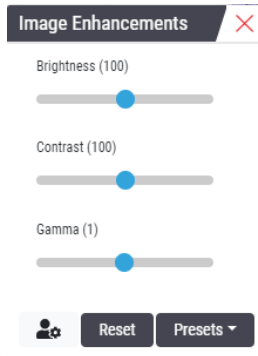
- ▶ **Gamma** - allows contrast adjustment to vary as a function of brightness. If the image appears too light and washed-out, reduce gamma and the image will become darker with more contrast. If the image appears too dark, increase gamma and the image will become lighter with less contrast.
- ▶ **Brightness** - use to make the overall image brighter or darker.
- ▶ **Contrast** - use to adjust the bright and dark areas of an image in relation to each other.

After making adjustments, you can save them as a preset to use in future viewing sessions. You can also specify which (if any) image enhancements you wish to use during each viewing session.


 *Image Enhancements are not saved with your digital slide image or case. They are applied for your active viewing session only. To ensure you can use the same image enhancement settings in a future viewing session, you should save them as a preset, as described in "Reset an Image Enhancement" on page 53. This way, you can reapply them as needed. If you want to start every viewing session with a particular image enhancement setting, you can save a default preset, as described in "Image Enhancement Preset Validation Workflow" on page 57.*

Adjust the Brightness, Contrast, and Gamma

1. Click  on the main toolbar to open the Image Enhancements tool box:



2. Click and drag the **Gamma** slider to left to increase the gamma levels, or right to decrease the gamma levels.
3. Click and drag the **Contrast** slider left for less contrast, and right for greater contrast.
4. Click and drag the **Brightness** slider left to make the image darker, and right to make the image brighter.

 You can use the Up Arrow and Down Arrow keyboard keys to fine-tune the adjustments in increments of 0.01 for Gamma, and 0.1 for Brightness and Contrast.

When you adjust one of the Image Enhancements sliders, the Image Enhancement notification icon appears in the upper-left of the viewer window. This is to inform you that the digital slide has an image enhancement applied.



To save your adjustments for future use, create a preset as described in, “*Image Enhancement Presets*” on page 54. To remove the image enhancements, click **Reset**.

Reset an Image Enhancement

To reset the brightness, contrast, and gamma to their original levels after applying an Image Enhancement:

- ▶ Click **Reset** in the Image Enhancements tool box.

The image enhancements are removed from the digital slide, and the Image Enhancement notification icon no longer appears in the viewer window.

Image Enhancement Presets

If you use the same Image Enhancement settings often, you can save them as a preset. For example, you may find that a certain combination of brightness, contrast, and gamma settings work well for a particular stain type. Image enhancement presets enable you to apply a particular set of image enhancements without adjusting the settings each time.

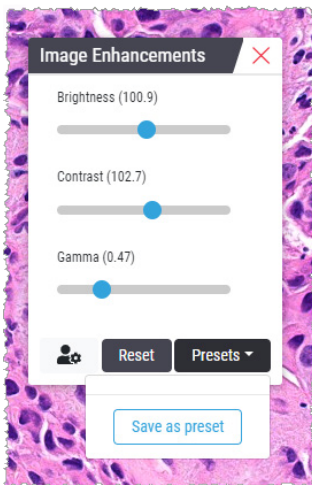
Before you use the same image enhancement preset on a group of slides, ensure the image enhancement enables accurate evaluation of the slides, as described in *"Image Enhancement Preset Validation Workflow"* on page 57.



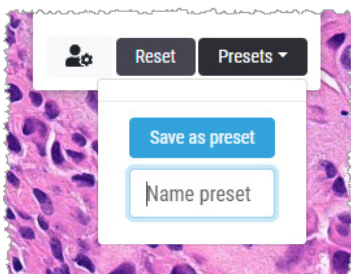
WARNING: Misapplied image enhancements can lead to an incorrect interpretation of the digital slide image. Before using an image enhancement preset for a diagnostic review, the pathologist must first validate the accuracy of the preset (gamma, brightness, and contrast settings) on a representative group of digital slides. For more information on validating a group of slides, see *"Image Enhancement Preset Validation Workflow"* on page 57.

To save an image enhancement preset:


1. Use the Image Enhancement toolbox to make the desired adjustments to Gamma, Brightness, and Contrast.
2. Click **Presets**, and then click **Save as Preset**.



3. Type a name for the new preset.




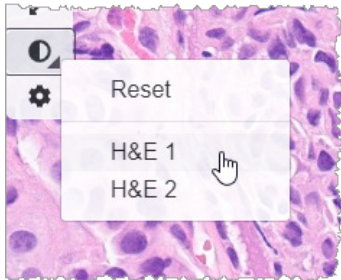
4. Click **Save as Preset** to finish.
5. To close the Image Enhancements Toolbox, click **X**.

i After you save an Image Enhancement preset, the Image Enhancement tool on the main toolbar appears with a small triangle . This is to let you know Image Enhancement presets are available.

Apply a Preset

To apply a preset to the active digital slide:

1. Hover your mouse over the Image Enhancements tool .



i The small triangle in the lower-right of the tool indicates that presets are available. If the triangle does not appear, this means you have not defined any presets yet.

2. Select the preset you want to apply.

The image is adjusted according to the preset you selected, and a green check mark appears next to the applied preset.



i You can also apply a preset from the Image Enhancement toolbox. Click **Presets**, and then select the preset you want to apply.

View the Applied Image Enhancement Preset

The viewer shows you which preset is applied in the following ways:

- ▶ Hover-over the Image Enhancement tool. The applied preset has a green check mark next to it:
- ▶ Hover-over the Image Enhancement Notification icon in the upper-left of the viewer window:
- ▶ Click Presets from the Image Enhancement toolbox:

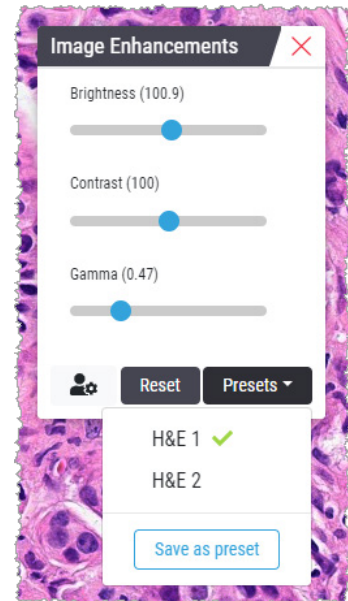
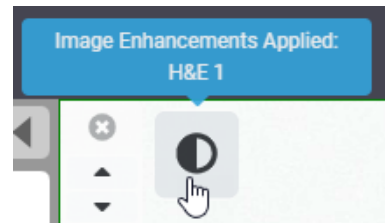
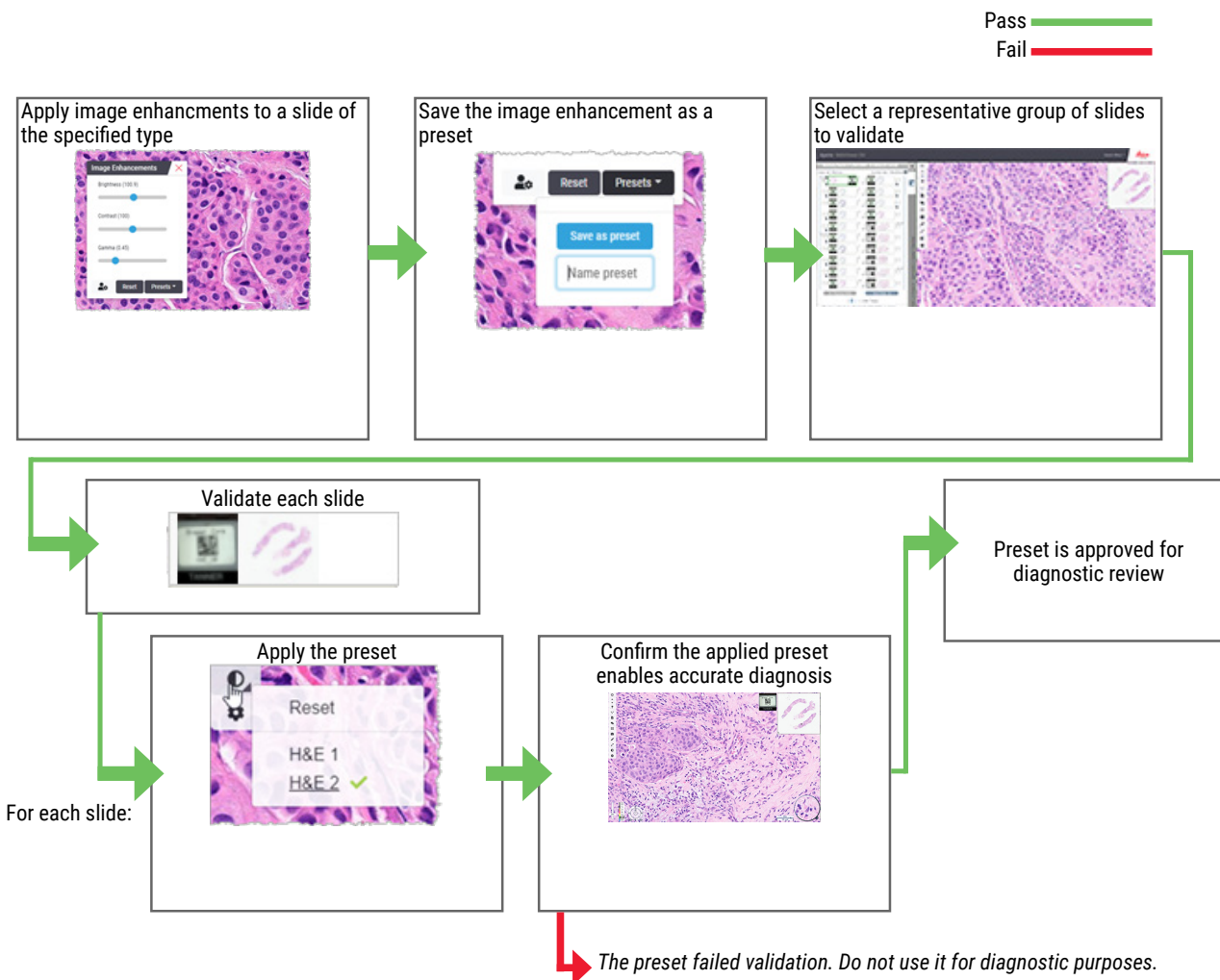


Image Enhancement Preset Validation Workflow

Before applying an image enhancement preset for the purpose of performing a diagnostic review on multiple slides, ensure the applied preset enables accurate diagnosis on the type of slides you are reviewing. The following workflow diagram describes the process of validating a preset for use on a particular slide type.




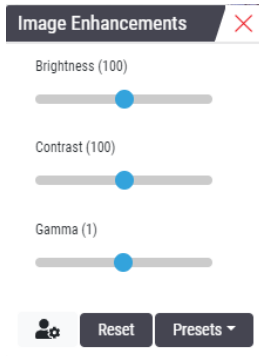
Set Image Enhancement Preferences


If you have defined Image Enhancement presets, you have the option of starting each viewing session with a specified preset. Automatically applied presets affect unread slides only. During your viewing session, the system doesn't overwrite an image enhancement adjustment or a preset you have already applied to a slide.

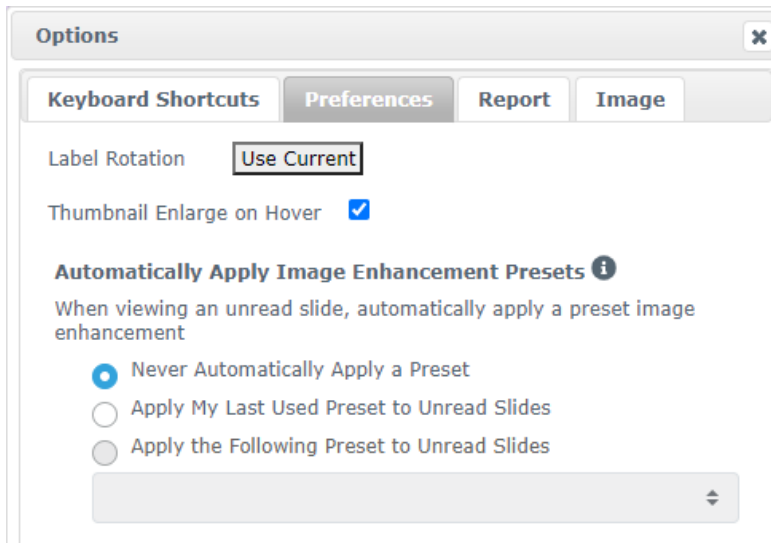
i To use the Image Enhancement Preset Preferences, ensure "Image Enhancements" is selected in the Visibility window. For details on using the Visibility window, see "Aperio WebViewer DX Options" on page 69.

To set Image Enhancement preferences:

1. Click  on the toolbar to open the Image Enhancements tool box.



2. Click  to open the Preferences tab in the Options window.



3. Select one of the following:

- ▶ **Never Automatically Apply a Preset** - this is the default setting. Select if you do not want the system to automatically apply presets.
- ▶ **Apply My Last Used Preset to Unread Slides** - select if you want the system to automatically apply the last preset you used to all unread slides.

Example: Suppose you create a preset called "Preset 1," and apply that preset to the current active slide. The system then applies "Preset 1" to the remaining unread slides in your tray. If you then open a new case, the system remembers your setting, and applies "Preset 1" to all slides in your tray. If you then apply "Preset 2" to a slide, the system then remembers "Preset 2," and applies it to all remaining unread slides in your tray.

If you manually adjust the Image Enhancement values on a slide without using a preset, the system does not carry that value over to other slides.


- ▶ **Apply the Following Preset to Unread Slides** - select if you want the system to automatically apply the preset you select from the drop-down list. This option allows you to set a “default” preset to apply to all unread slides in your tray.

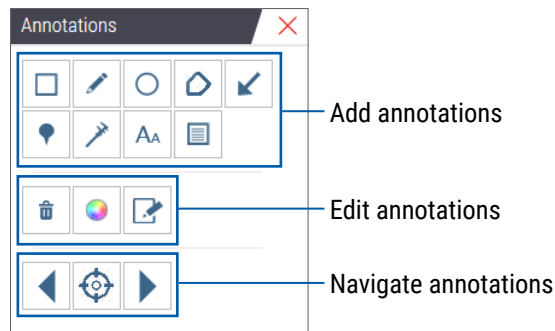
Example: If you frequently start your viewing sessions with “Preset 3,” you may wish to set “Preset 3” as your default preset. The system then always applies “Preset 3” to all unread slides in your tray. If you change the Image Enhancements settings or apply a different preset to a slide, only that slide is affected. All remaining unread slides in your tray still use the default preset you specify.

Annotations

Use annotations to mark or measure areas of interest on the digital slide image. The navigation tools enable you to easily move from one marked area of interest to another.

Open the Annotation Window

1. Click the Annotations tool  on the Aperio WebViewer DX toolbar:



2. Select an annotation tool, and then click on the digital slide image to place or draw the annotation. Annotations are saved automatically.

Quick Menu for Annotations



After you add an annotation, you can right-click the annotation to access the quick menu. From here, you can delete, copy, edit, and move the annotation. You can also change the color of annotations.

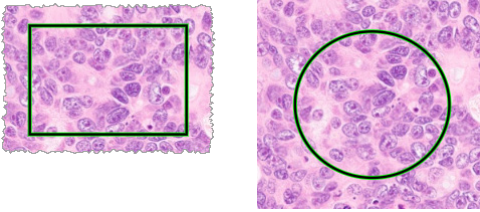


Add Annotations

This section provides instructions for using the different types of annotations to outline and identify regions of interest.

Rectangle and Ellipse

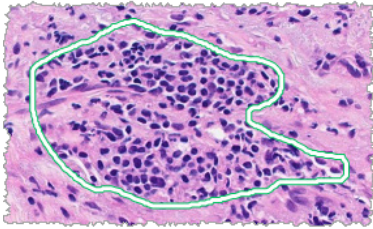
1. From the Annotations window, click the Rectangle  or Ellipse  tool.
2. In the digital slide image, click and drag to outline the region of interest with a rectangle or ellipse.



3. Release the mouse button to complete the annotation.


Freeform

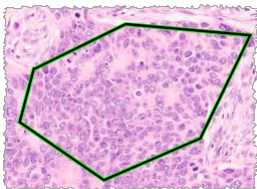
1. From the Annotations window, click the Freeform  tool.
2. In the digital slide image, click and drag to highlight a region of interest using a freeform annotation.




3. Release the mouse button to complete the annotation.

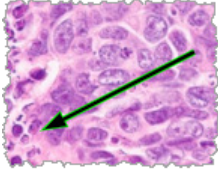
Polygon

1. From the Annotations window, click the Polygon  tool.
2. In the digital slide image, click to set each point, and then double-click to close the polygon.



Arrow

1. From the Annotations window, click the Arrow  tool.
2. In the digital slide image, click where you want the arrowhead to appear, and drag to extend the arrow to the desired angle and length.





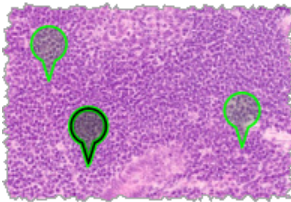
3. Release the mouse button to complete the annotation.

Pin Drops


Use the Pin Drop tool to mark multiple regions of interest on one or more slides. You can then use the Pin Drop Navigator to quickly navigate from one pin drop to the next. For more details, see *"Use Pin Drops to Navigate Around Case Slides"* on page 63.

To add pin drops to your digital slide image:

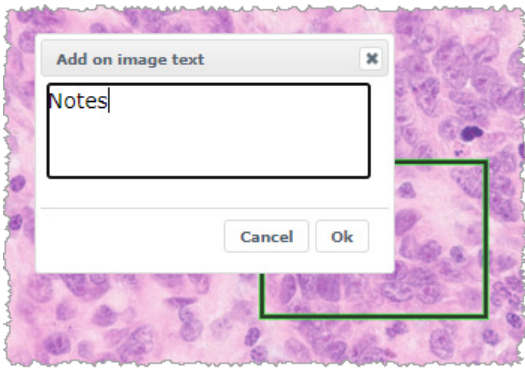
1. From the Annotations window, click the Pin Drop  tool.
2. Click anywhere in the digital slide image to set the pin drop. When adding multiple pin drops, you need to click the  each time.



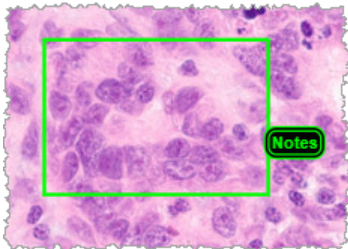
Add a Text Annotation

1. From the Annotations window, click the Text  tool.
2. In the digital slide image, click where you want to add a note.

3. When the text box appears, type your note, and click **OK**.




4. The note appears in the specific location.



Add a Linear Measurement

The linear measurement tool enables you to set two or more points to measure a region of interest. The unit of measure is set by your administrator in Aperio eSlide Manager. For more details, see the *Aperio eSlide Manager Administrator's Guide*.

Follow the steps below to measure a region of interest. Ensure you are using the measurement tool correctly to avoid missing critical information.

1. From the Annotations window, click the Measurement  tool.
2. In the digital slide image, click to set each measurement point, and then double-click to end the measurement.




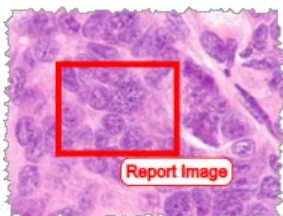
Define the Report Region

Use the Report Annotation to create the image that appears in Aperio eSlide Manager reports. You can create one report image per report. The Aperio eSlide Manager report template you are using determines whether images are included in reports.

Depending on your settings, you either draw a rectangle for the report annotation or click to add a fixed-size rectangle. For information on the report region settings, see *"Aperio WebViewer DX Options"* on page 69.


To create the report region:

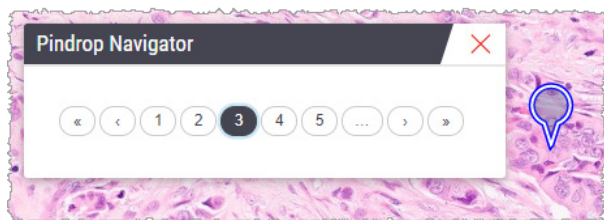
1. From the Annotations window, click the Report  tool.
2. Do one of the following to add the report region:
 - ▶ Click in the region of interest to add a fixed-size rectangle around the report region.
 - ▶ Click and drag to outline the report region with a rectangle.
3. The report region appears in a different annotation style:



Use Pin Drops to Navigate Around Case Slides

After you mark your digital slides with pin drops, you can navigate from pin to pin on one or more digital slides in your tray when you are reviewing a case.

1. Click the pin drop navigation icon  on the toolbar to access the Pindrop Navigator.




2. From the Pindrop Navigator, you can:
 - ▶ Click < or > to move between the pin drops on this or other digital slides in the slide tray.
 - ▶ Click << or >> to move to the first or last pin drop.
 - ▶ Click a number to go to a specific pin drop.

Edit Freeform Annotations

Follow these steps to redraw a freeform annotation.

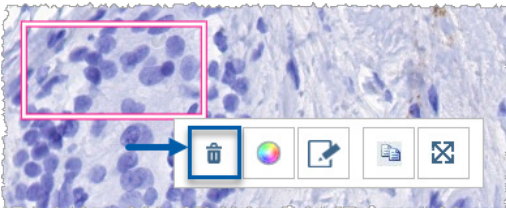
1. On the digital slide image, select the annotation you want to redraw.
2. Right-click the annotation to display the annotation toolbar.



3. Select the Redraw tool .
4. Click and hold the left mouse button, and drag the pointer in the direction you want to redraw the annotation.
5. Release the mouse button when you are finished drawing.
6. When asked to save, click **Yes** to save the revised annotation. If you want to return to the original annotation, click **No**.

Delete an Annotation

1. Right-click on the annotation to select the annotation and display the quick menu.

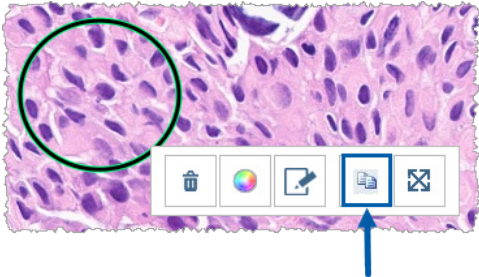


2. Click the **Delete** tool to delete the annotation.

Copy an Annotation

1. Right-click on the annotation to select the annotation and display the quick menu.

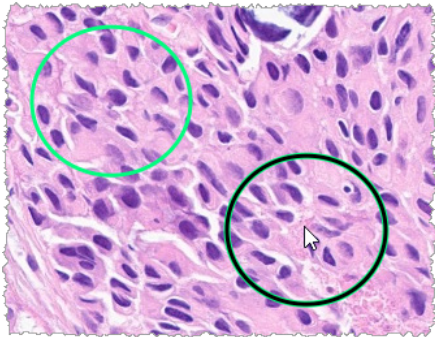
2. Click the **Copy** tool.



A copy of the annotation appears with your pointer.

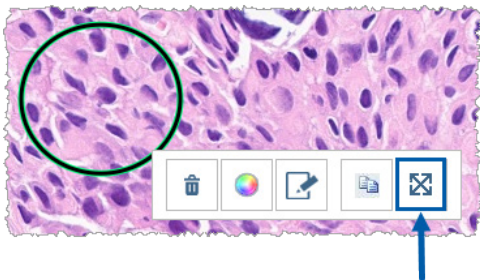


3. Position the pointer where you want to copy the annotation, and then right-click to place the annotation.



Move an Annotation

1. Right-click on the annotation to select the annotation and display the quick menu.
2. Click the **Move** tool.




The annotation appears with your pointer.



3. Position the pointer where you want to move the annotation, and then right-click to place the annotation.


Take a Snapshot of the Digital Slide

The Snapshot feature enables you to capture an image of the digital slide. The snapshot image (JPEG file) is saved to the **Downloads** folder on your local computer. The viewer's tools (zoom slider, rotation dial, image enhancements, etc.) are not included in the snapshot image.



WARNING: The snapshot image (JPEG file) is not for use in diagnostic procedures.

Take a Snapshot Using the Active Capture Mode

To take a snapshot using the last capture mode you selected, click the **Snapshot** tool  on the Aperio WebViewer DX toolbar.

Snapshot Capture Modes

The following capture modes are available:

- ▶ **Full View** – captures an image of the digital slide as it currently appears in the Viewer window.
- ▶ **Fixed Sized** – captures an image of the selected area, at the size you specify. This setting is useful for reports or presentations that require a specific size for images.

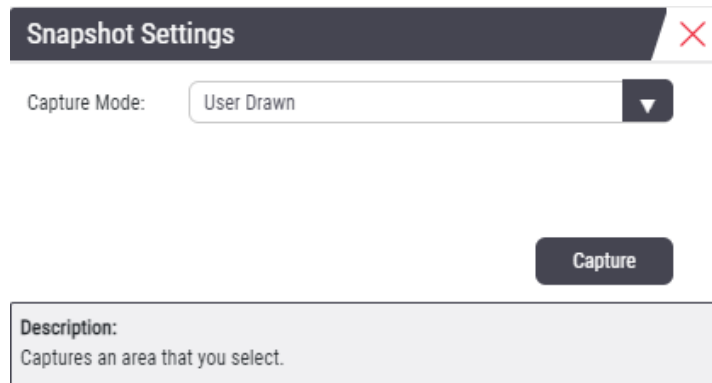
- ▶ **User Drawn** – captures an image that contains only the area you select.

To select a new capture mode and take a snapshot:

1. Point to the **Snapshot** tool  on the Aperio WebViewer DX toolbar. The Snapshot Settings tool  appears to the right of the Snapshot tool.



2. Click the **Snapshot Settings** tool  to open the Snapshot Settings.



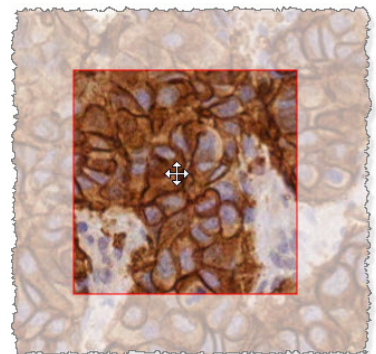
3. From the Capture Mode list, select one of the three capture modes described in the next sections.

Full View

Select **Full View** from the Capture Mode list, and click **Capture**.

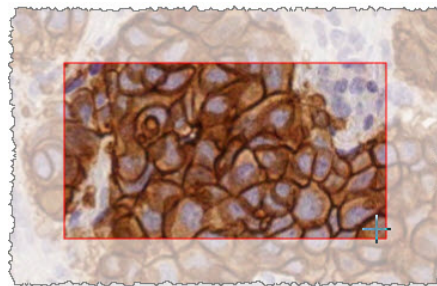
Fixed Size


1. Select **Fixed Sized** from the Capture Mode list.
2. Set the Width and Height (in pixels) for your snapshot image.
3. Click **Capture**.
4. When the rectangle appears, drag it to the area you want to capture and then click to take the snapshot.



User Drawn

1. Select **User Drawn** from the Capture Mode list.
2. Click **Capture**.
3. When the cross-hairs appear, drag the mouse pointer to select your area and then release the mouse button to take the snapshot..



i *To take more snapshots using the same mode and settings, you do not need to open the Snapshot Settings again. Just click the Snapshot tool  on the Aperio WebViewer DX toolbar.*

6


Settings and Options

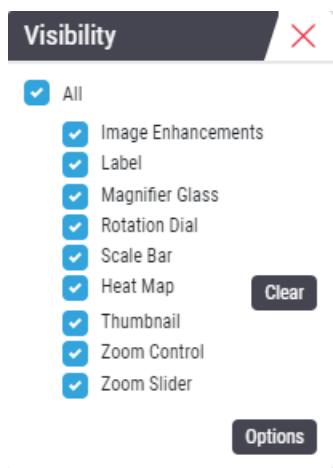
This chapter provides instructions and information regarding the settings and options used with Aperio WebViewer DX.

Aperio WebViewer DX Options

You can select which features to display in the Aperio WebViewer DX window. You can also view information and change other options.

Follow these steps to view or change Aperio WebViewer DX settings.

1. Click the **Settings** button  on the Aperio WebViewer DX toolbar.



2. From the Visibility box, select or clear the check boxes to set the visibility of the different Aperio WebViewer DX tools.
3. To view or change other Aperio WebViewer DX options, click the **Options** button to open the Options window.

4. The following table describes the tabs available from the Options window.

Options tab	Description
Keyboard Shortcuts	Provides a list of keyboard shortcuts that you can use in the Aperio WebViewer DX. See also <i>“Keyboard Shortcuts”</i> on page 41.
Preferences	<p>Enables you to set the following preferences:</p> <ul style="list-style-type: none"> • Label rotation – Sets the default rotation of the digital slide label. With the label rotated as desired, click the Use Current button. This setting applies to your login only. • Thumbnail Enlarge on Hover – When selected, you can hover your mouse pointer over the thumbnail window to enlarge it. • Automatically Apply Image Enhancement Presets – If you have defined Image Enhancement presets, you have the option of starting each viewing session with a specified preset. For more details, see <i>“Image Enhancement Preset Validation Workflow”</i> on page 57. You must have Image Enhancements selected in the Visibility window to use these settings. <p>Clicking Default resets the default preferences.</p>
Report	<p>For the report image, specifies:</p> <ul style="list-style-type: none"> • If it is a fixed size or if it can be drawn to any size. • If the image uses the maximum resolution (magnification) of the digital slide or its current resolution in the Viewer window. <p>You can click the Default button to return to the default report settings.</p>
Image	Provides details on the digital slide image, including dimensions, resolution, and compression type.

Global Settings

Your site administrator sets the global settings for Aperio eSlide Manager and Aperio WebViewer DX. These settings apply to all users in your site. For any questions on these global setting configurations, consult your site administrator. For more information on how to configure these settings, see the *Aperio eSlide Manager Administrator’s Guide*.

Slide Tray Sorting

When viewing a case in Aperio WebViewer DX, the Slide Tray groups the slides by specimen. The WebViewer Sort Order global setting in the Aperio eSlide Manager System Settings enables your administrator to further define the sort order of the slides within each specimen group, including multi-level sort order.

Unit of Measure

The WebViewer Length Unit setting in the Aperio eSlide Manager System Settings determines whether Aperio WebViewer DX uses microns or millimeters when displaying measurements. The default value is Microns.

7

Maintenance and Troubleshooting

This chapter provides maintenance and troubleshooting information for your viewer. Troubleshooting information starts on page 76.

Maintenance

This section provides maintenance and troubleshooting information.

Product Information

To view product information, including the Unique Device Identifier (UDI), service contact information, and Quality Check status:

1. Click the Leica Biosystems logo that appears in the upper-right corner of the viewer.



2. The Product Information pane appears, which includes the Unique Device Identifier (UDI), service contact information, monitor display image validation (Quality Check) status, as well as a Check Image Quality button for initiating a manual monitor display image validation.

Product Information


Product Name	Aperio WebViewer DX
REF	23WVROWIVD
UDI	0815477020280(8012) 1.0
Updated	2/14/22, 4:34:59 PM
Quality Check	Passed 2/16/2022

[Check Image Quality](#)

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The Netherlands

CE

IVD

3. To close the Product Information pane, click the Leica Biosystems logo again.

Automatic and Manual Monitor Display Image Validation Checks

To ensure your digital slide images are displayed on your monitor as intended and that browser updates have not inadvertently affected the image display quality, Aperio WebViewer DX incorporates monitor quality checks.

Automatic Monitor Display Image Validation Checks

The system performs this quality check the first time you open the viewer and anytime your browser is updated. The check happens automatically. If the test fails, a message displays to alert you. You should then perform the manual validation, as described in the next section.

Manual Monitor Display Image Validation Checks

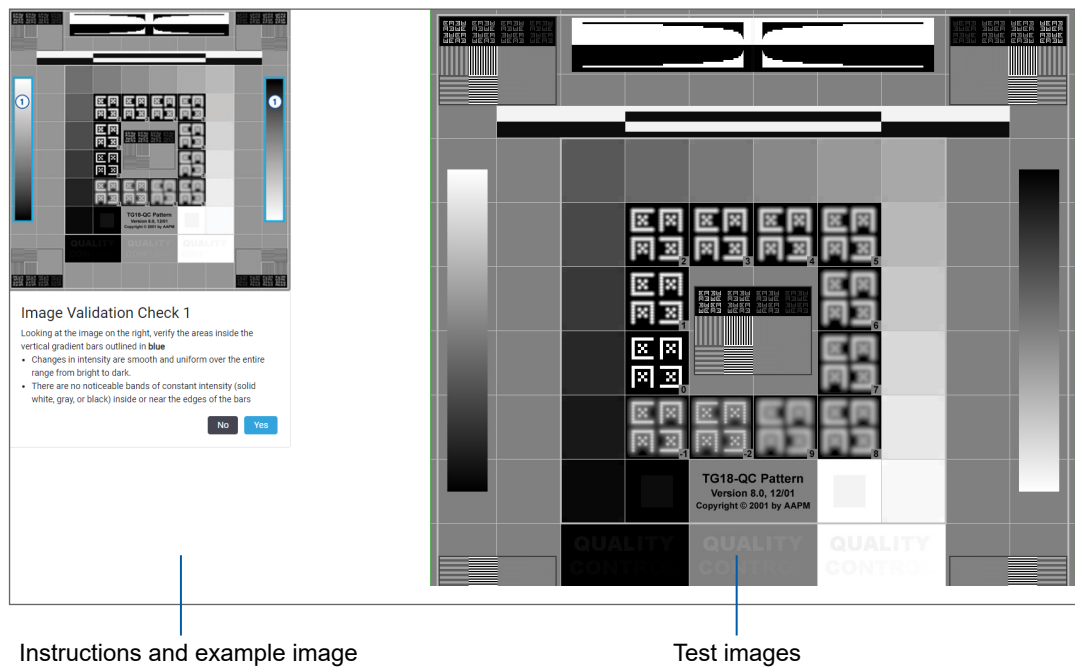
After the system performs the automatic image quality check described previously, it prompts you to perform a manual monitor display image validation check by visually evaluating test images. You should perform the manual validation once per month, and any time you suspect an issue with the quality of the image display.

Follow these steps to manually validate the test image:

1. There are two ways to start the monitor display image validation:
 - ▶ If you are performing the monthly monitor display image validation, continue with step 2.
 - ▶ If the monitor display image validation appears automatically when you open the viewer, continue with step 4.
2. To open the monitor display image validation, click the Leica Biosystems logo in the upper right corner.
3. From the Product Information pane, click **Check Image Quality**.

Product Information	
Product Name	Aperio WebViewer DX
REF	23WVROWIVD
UDI	0815477020280(8012) 1.0
Updated	2/14/22, 4:34:59 PM
Quality Check	Passed 2/16/2022

4. The test image and validation instructions appear:



Instructions and example image

Test images

5. Follow the on-screen instructions that appear on the left to validate the test image on the right. If the image passes your evaluation, click **Yes** to proceed to the next validation check.

The following table describes the four validations:

Image Validation Check 1:

Use the example image in the left pane of the viewer to validate the test image in the right pane of the viewer.

For the areas outlined in blue in the example, verify the following:

- ▶ Changes in intensity are smooth and uniform over the entire range from bright to dark.
- ▶ There are no noticeable bands of constant intensity (solid white, gray, or black) inside or near the edges of the bars.

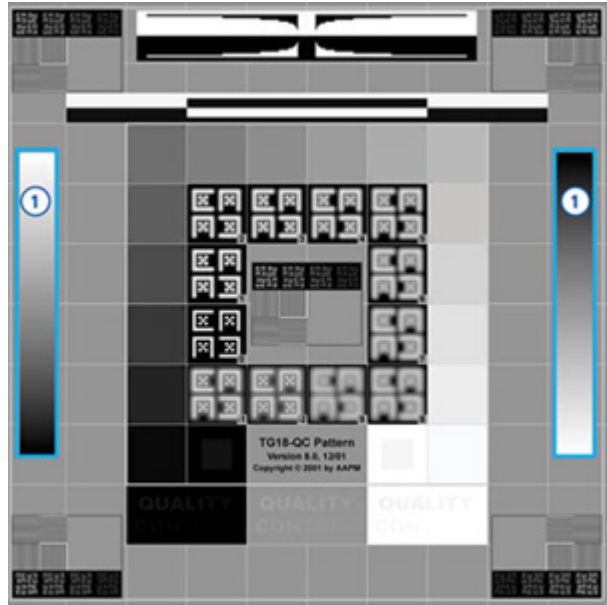


Image Validation Check 2:

Use the example image in the left pane of the viewer to validate the test image in the right pane of the viewer.

Following the direction of yellow arrows shown in the example (from white to black), the change in intensity from one square patch to the next increases by the same relative amount.

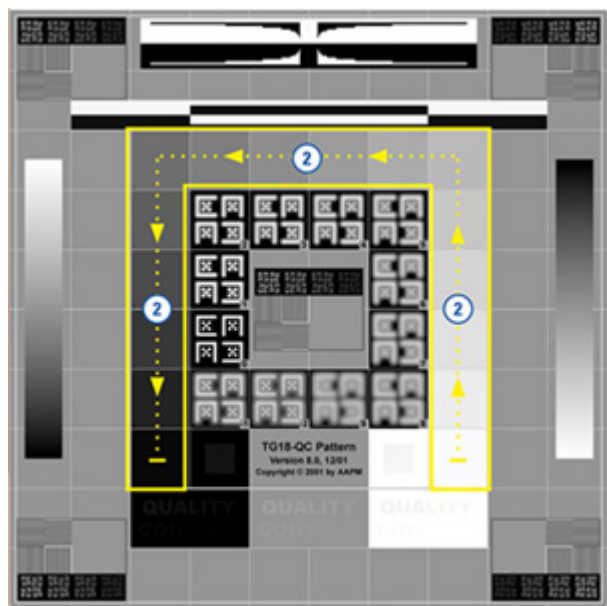
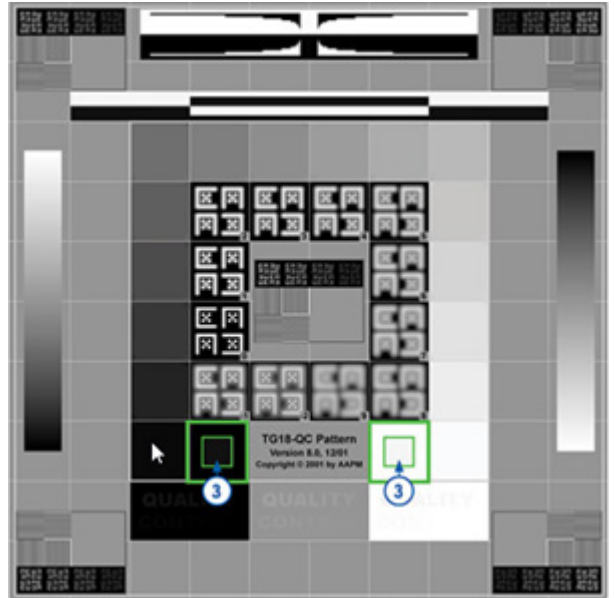


Image Validation Check 3:

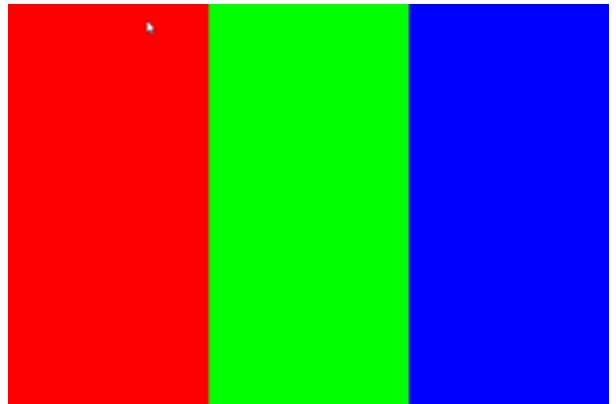
Use the example image in the left pane of the viewer to validate the test image in the right pane of the viewer.

For the areas outlined in green in the example, verify the following:

- ▶ The small 95% grayscale square patch inside the black square is clearly visible at normal viewing distance (30 - 60 cm).
- ▶ The small 5% grayscale square patch inside the white square is clearly visible at normal viewing distance (30 - 60 cm).

**Image Validation Check 4:**

Looking at the image in the right pane of the viewer, verify colors are present.



7. When you have answered Yes to every question, your specified case appears in the viewer. You can continue with your typical case review workflow.
8. If you answered No during the image check, see *"Monitor Display Image Validation Failure"* on page 76.

Troubleshooting

This section provides troubleshooting information for viewing digital slides.




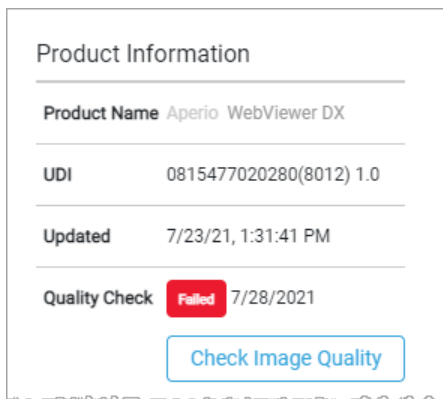
CAUTIONS: When viewing digital slides:

- ▶ Do not use the Image Enhancement tools to correct a suboptimal scanned image for diagnostic review. In this case, you should request a re-scan of the slide.
- ▶ Your monitor must meet the specifications detailed in the *Aperio WebViewer DX IT Administrator's Guide*.
- ▶ Your monitor's Display Mode must be set to sRGB.
- ▶ Your viewing workstation must use the supported browser and operating system, as described in "Supported Operating System and Browsers" on page 15.
- ▶ Tablets and mobile devices are not supported.


Monitor Display Image Validation Failure

As described in "Automatic and Manual Monitor Display Image Validation Checks" on page 72, the web-based viewer incorporates automatic and manual monitor display image validation checks. If the automatic or manual check fails, the system alerts you in the following ways:



- ▶ The  icon appears in the upper-left corner of the Viewer window to indicate a potential issue with how your images appear on the monitor.
- ▶ The Quality Check status in the Product Information pane indicates the test failed:



If your monitor display image validation check fails:

1. Click the  icon to perform the manual image quality check again.
2. If you answer No to any of the questions and the validation fails again, contact your site administrator to revert your browser to the last verified version.

Unsupported Zoom Level Notification

If the  icon appears in the upper-left portion of the Viewer window, it means the viewer is not displaying the digital slide with optimal image quality because the viewing settings are not set to a multiple of 100%. The  icon also appears if your viewing workstation is using an unsupported operating system.

If the  icon appears:

1. Ensure your viewing settings are correct:
 - ▶ **Browser** - ensure the zoom level is set to a multiple of 100% (100%, 200%, etc.).
 - ▶ **Operating system** - ensure the Display settings "scale" value is a multiple of 100% (100%, 200%, etc.).
2. Ensure your viewing workstation is using the correct operating system. See the *Aperio WebViewer IT Administrator's Guide* for specifications and requirements.

Digital Scan Quality

If your digital slides require re-scanning, ensure your lab uses the best practices for slide preparation. It is the responsibility of the lab to verify the quality of the tissue preparation, the physical characteristics of the slide, and the staining quality. For more information on slide preparation techniques, refer to the user guide for your scanner.

Slide Tray (DST) Error

If you attempt to open a case with a large number of slides, the viewer may time out. If the viewer displays the message, "Error getting DST: error Internal Server Error," this means the viewer is unable to open the slide tray. If this happens, try reducing the number of slides you are attempting to open. If you continue receiving this error, contact Leica Biosystems Technical Services.

Missing Image Metadata Error

In rare cases, you can encounter an image that is missing the MPP (microns per pixel) data. If this happens, the viewer alerts you by displaying the message, "Image metadata is missing. Measurements displayed in the application may be inaccurate." If you encounter this message, be aware that any annotation measurements that appear on the image may not be accurate.

A

Performance Information

This appendix contains Analytical Performance and Clinical Performance information for Aperio WebViewer DX.

Analytical Performance Characteristics

This section gives a summary of the Aperio WebViewer DX analytical performance studies.

Accuracy of Measurement

Test	Acceptance Criteria	Test Purpose
Measurements	<ul style="list-style-type: none">• The scalebar tool supports measuring distances in millimeters or microns using the MPP value stored in the image metadata and “measurement units” site setting.• The caliper tool displays distances in millimeters and micrometers using the MPP value stored in the image metadata and “measurement units” site setting.• The Aperio WebViewer DX warns the user that measurement information may not be accurate if an image’s MPP value is not present.• Verification testing was performed utilizing slides that have defined measurements.	Demonstrates that Aperio WebViewer DX accurately measures distances on an image, and can display measurements in millimeters and micrometers.

Clinical Performance Characteristics

Clinical performance of the Aperio WebViewer DX is based on available scientific literature. At this time, no clinical performance studies, data from routine diagnostic testing or other clinical performance data is available for the Aperio WebViewer DX. A systematic literature search was performed to identify relevant literature which supports the clinical performance of the Aperio WebViewer DX.

The clinical performance of the Aperio WebViewer DX has been demonstrated by Hacking et al. 2020 and Henricksen et al. 2020^{1,2}. Hacking et al. 2020 demonstrated that users found, when using the Aperio WebViewer DX to review digital slides, greater interobserver reliability³. Henricksen et al. 2020 demonstrated that 100% concordance was achieved for both reader groups when the Aperio WebViewer DX was used to view digital slides⁴.

Overall, based on the clinical performance evidence available, the Aperio WebViewer DX able to perform as per its intended purpose in a clinical setting.

The performance of the Aperio WebViewer DX showed an improved interobserver reliability when using WSI than with light microscopy, and it has also been demonstrated that 100% concordance can be obtained between individual study groups. Results from the clinical performance studies reported in the literature are show below.

Performance Outcome	Comparator	Results	Reference
Interobserver reliability	Conventional light microscopy (CLM)	Improved interobserver reliability with WSI	Hacking et al. 2020
Concordance	N/A	100% of diagnostic concordance in both reader groups without any minor or major discrepancies either in Nsx or in NM sets	Henrickson et al. 2020

1 Hacking S, Nasim R, Lee L, Vitkovski T, Thomas R, Shaffer E, et al.: *Whole slide imaging and colorectal carcinoma: A validation study for tumor budding and stromal differentiation*. Pathology - Research and Practice, 216: 153233, 2020 <https://doi.org/10.1016/j.prp.2020.153233>

2 Henriksen J, Kolognizak T, Houghton T, Cherne S, Zhen D, Cimino PJ, et al.: *Rapid Validation of Telepathology by an Academic Neuropathology Practice During the COVID-19 Pandemic*. Arch Pathol Lab Med, 144: 1311-1320, 2020 10.5858/arpa.2020-0372-SA

3 Bauer TW, Behling C, Miller DV, Chang BS, Viktorova E, Magari R, et al.: *Precise Identification of Cell and Tissue Features Important for Histopathologic Diagnosis by a Whole Slide Imaging System*. J Pathol Inform, 11: 3, 2020 10.4103/jpi.jpi_47_19

4 Kim D, Pantanowitz L, Schüffler P, Yarlagadda DVK, Ardon O, Reuter VE, et al.: *(Re) Defining the High-Power Field for Digital Pathology*. J Pathol Inform, 11: 33, 2020 10.4103/jpi.jpi_48_20

Index

A

adjustments, images. See image enhancements

analytical performance 78
measurement accuracy 78

annotations 59
add 59
arrow 61
copy 64
delete 64
ellipse 60
freeform 60
measurement 62
move 66
pin drops 61
polygon 60
quick menu 59
rectangle 60
report region 62
text 61
window, open 59

annotations toolbar button 37

Aperio eSlide Manager
global settings 70
open digital slides from 18, 35

arrow annotation 61

B

blank slot in tray, insert 44

brightness, adjust 53

browsers 15

browser settings 16

C

case data, view 46

clinical performance 78

clinical workflow 12

close viewer 42

connectivity 12

contrast, adjust 53

copy an annotation 64

cybersecurity 15

D

delete an annotation 64

digital scan quality 77

digital slides
image details 70

E

ellipse annotation 60

end viewing session 34

environment 15

F

fixed size snapshot 67

freeform annotation 60
edit 64

full view snapshot 67

G

gamma, adjust 53

global settings for viewer 70

H

heat map
turning on or off 48, 69
using 48

I

icon glossary 40
 IDMS 12
 image
 details 70
 report settings 70
 image details, view 70
 image enhancements 52
 apply a preset 55
 notification icon 53
 preset preferences 57
 preset validation 57
 reset 53
 save preset 54
 set defaults 57
 view applied preset 56
 image information, viewing 70
 images, supported 15
 image validation, monitor display 19
 installation 15
 intended purpose 6
 interface overview 17
 IQ icon 16

K

keyboard shortcuts 41
 keyboard shortcuts, view list of 70

L

label
 eSlide 47
 rotation 70
 learning. *See* training workflows
 LIS 12
 logging in 35
 log out. *See* end viewing session

M

maintenance 71
 mark slide as read 44
 measurement accuracy performance 78

measurement annotation 62
 measurement units. *See* unit of measure, global setting for
 metadata, view 46
 metadata, view slide 21
 modified slide sort 44
 monitor display image validation
 automatic 72
 failure 76
 manual test 72
 visual check 19
 monitor settings 16
 move an annotation 66
 multiple images, synchronize navigation 49
 multiple images, view 48

N

navigate digital slides 43
 navigate slides 36
 Auto-Pan 37
 keyboard 36
 mouse 36
 navigation
 pin drop 63
 navigation, synchronize multiple slide 49

O

open digital slides 18, 35, 45
 operating system 16
 operating system settings 16
 Options button, eSlide Viewer 69
 options, viewer settings 69
 overview 17

P

pan and zoom 36
 pathologist features 12
 pathologist responsibilities 13
 pin drop annotation 61
 navigate 63
 pin drop navigator 63

- polygon annotation 60
- preferences
 - image enhancement defaults 57
- preferences, label rotation 70
- preferences, set 70
- preset, image enhancements. *See* image enhancements
- prior case link, eSlide Tray 46
- prior cases, view 50
- product information pane 71

Q

- quality control
 - digital slide scanning 14
 - pathologist responsibility 14
 - workflow 14
- quick reference 35
 - annotation tools 39
 - navigate 36
 - navigation tools 38
 - tools 37

R

- rectangle annotation 60
- remove a digital slide 44
- report annotation setting 70
- report options 70
- report region annotation 62
- report region, set size for 70
- reset image enhancement 53
- rotate digital slide image 39

S

- screen shot tool. *See* snapshot, digital slide
- Settings button
 - eSlide Viewer 48, 69
- settings, required for viewing
 - browser 16
 - monitor 15
 - operating system 16
- slides. *See* digital slides
- slide sort order 44

- Slide Tray 17
 - features 43
 - flip eSlide 43
 - insert a blank slot 44
 - navigating in 46
 - organize 43
 - prior case link 46
 - remove an eSlide 44
 - slide sort 44
 - view different trays 46
- slide tray sorting, global setting for 70
- snapshot, digital slide 66
 - capture mode 66
- sort order, digital slide tray 44
- supported images 15

T

- text annotation 61
- thumbnail 47
- Thumbnail options 70
- tools quick reference 37
- training workflows 18
 - monitor display image validation 19
 - open digital slides 18
 - quality control 19
 - review a single slide 22
 - review multiple slides 32
 - view digital slides 18
- troubleshooting 76
- tutorials. *See* training workflows

U

- unit of measure, global setting for 70
- user drawn snapshot 68

V

- view digital slides 43
- Viewer Window 47
- viewing workstation, monitor quality check 73
- Visibility box, settings 69

W

WebView

pin drops 63

window 17

Z

zoom level unsupported notification 77

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