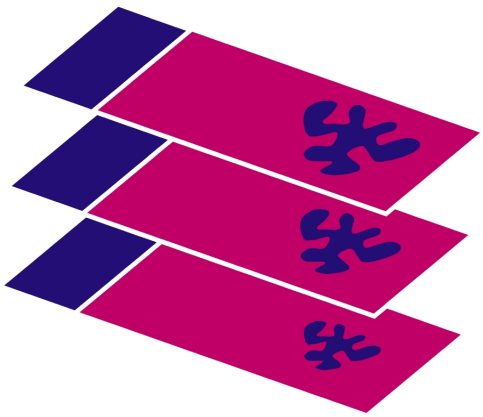

3DHISTECH

CaseViewer 2.3
User Guide

April 9, 2019
Rev. 1

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Character Formats and Symbols

Example	Words or characters that appear on the screen. These include field names, screen and window titles, push-button and menu names, paths or options. Keys on the keyboard. For example, function keys (such as **F11**) or the **Ctrl+M** key combination.
Example	Cross-references within this document or to other documents.
Warning!	It might cause irreversible damage or harm to the user of the product or the product itself if this instruction is not followed.
Important!	It might cause the product to not work properly if this instruction is not followed and alerts to a potentially critical situation.
Note:	Calls attention to some important information or feature.

1 Installation of CaseViewer

1.1 System Requirements

Minimum system requirements

Monitor resolution	1320 × 720
Operation system	Windows 7 SP1 or newer
Graphics Card	OpenGL 2.0 compatible *
CPU	Intel DualCore
RAM	2GB

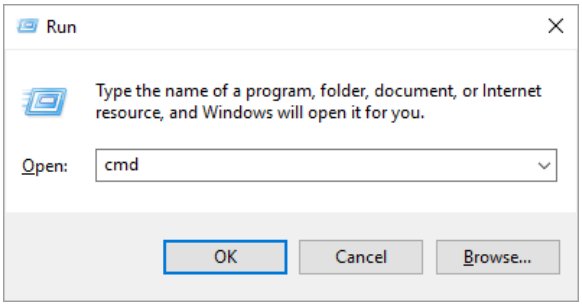
* Download and install driver for the specific card

1.2 Installation procedure

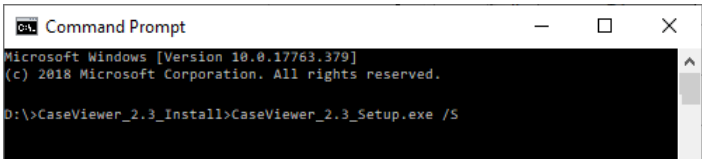
1. Launch the installation file (.exe) to install CaseViewer on your computer.

   An optional silent installation mode is available if you want to install the software based on the default settings:

   - Press **Win+R** to open Run window, then type *cmd* in the **Open:** field.

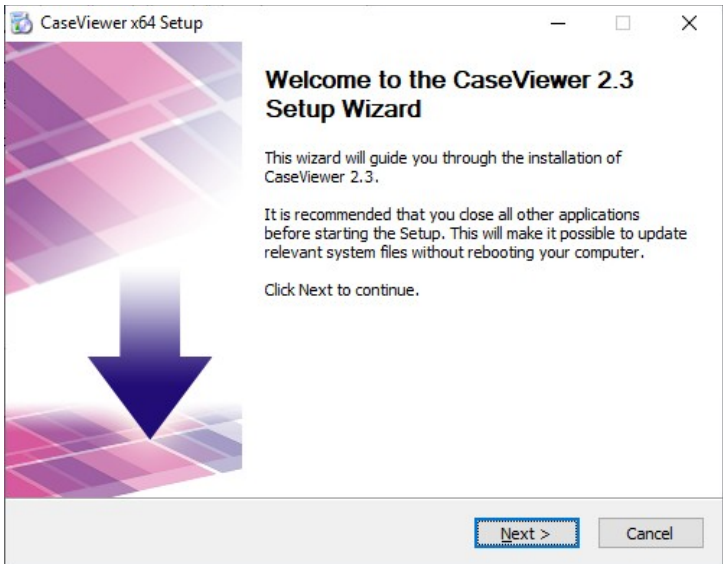


   - Click **OK**.
   - Type the name of the installation file (.exe) and add a */S* switch in the command line.

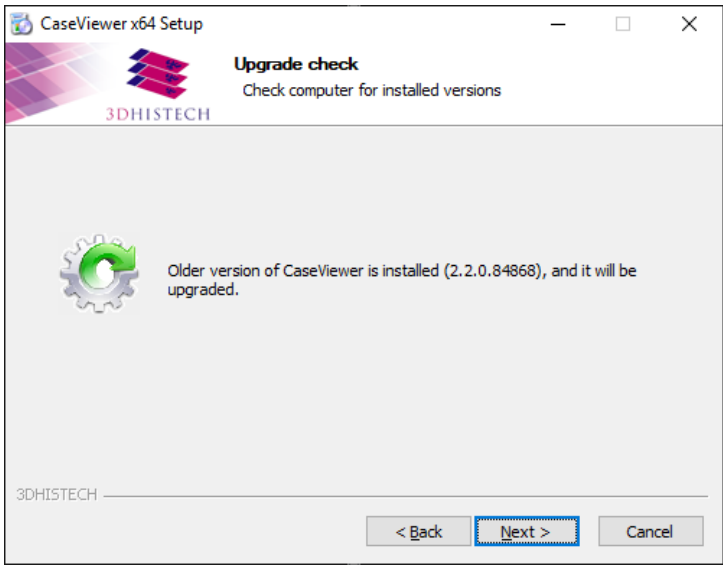


   - Hit **Enter** to run installer in silent mode – installation runs in the background.

2. If running the installer in normal mode (without adding switches), follow instructions of the installation wizard as detailed below:



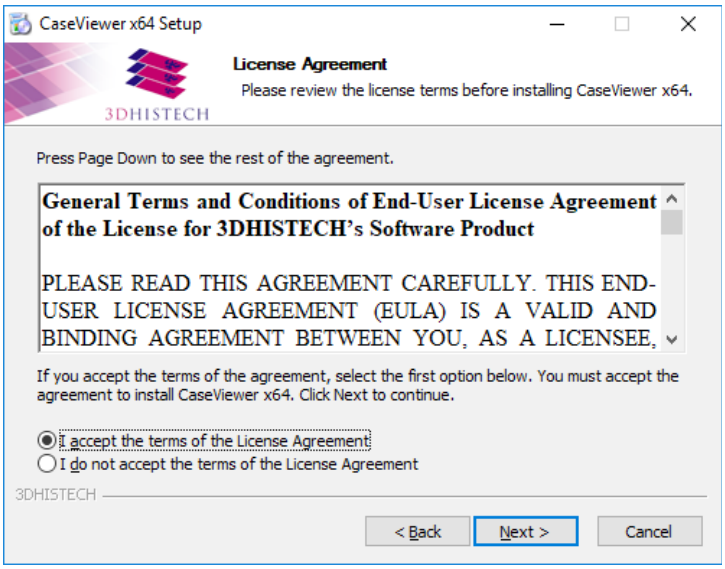
3. If a previous version of CaseViewer is installed on the computer, it will be upgraded. Click **Next** to continue.



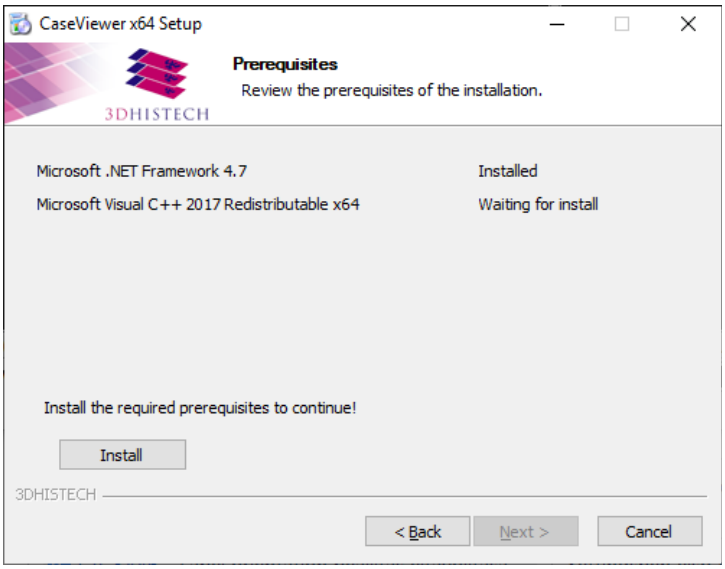
Note:

This window is displayed only when upgrading a previous version of CaseViewer. In the event of upgrading, make sure that SlideDriver Redistributable package is installed, and there is a license file for the functions.

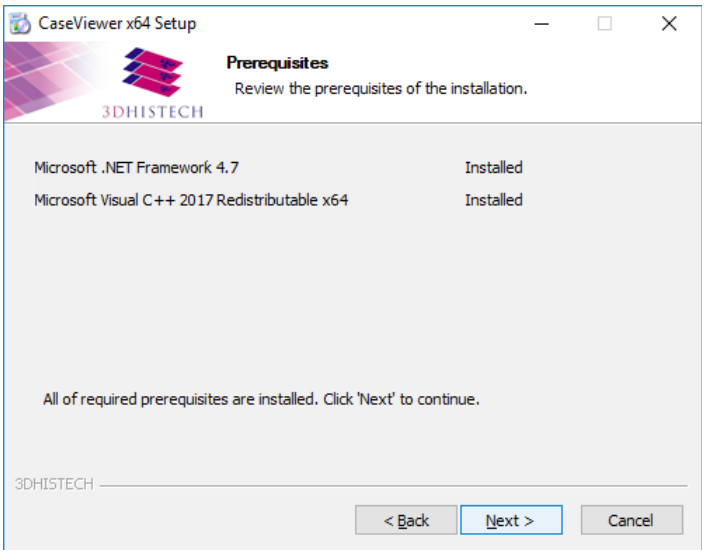
4. First, accept terms of the License Agreement, then click **Next**.



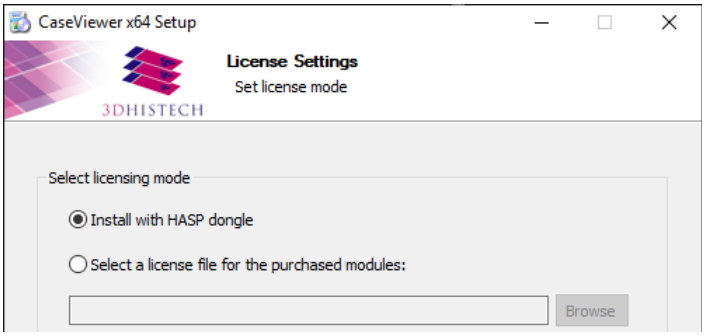
5. The installer checks the presence of prerequisite components. If any of the necessary prerequisites are not yet installed, click **Install** to perform this action.

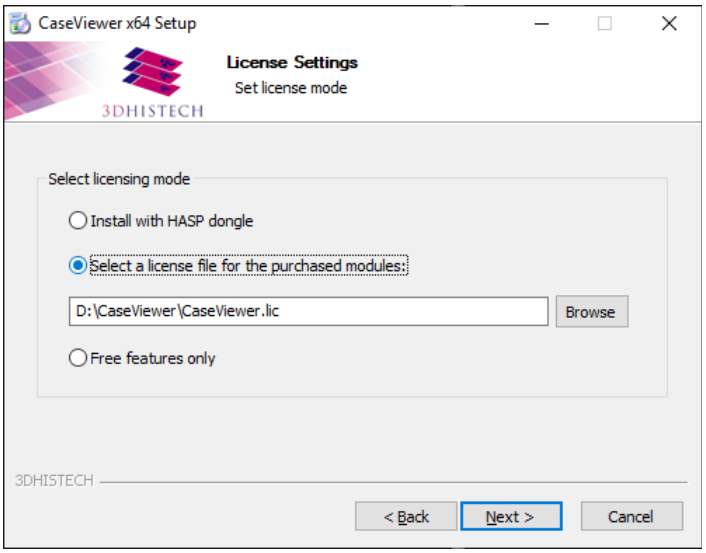


6. Once the necessary prerequisites are installed, click **Next** to continue with the installation.

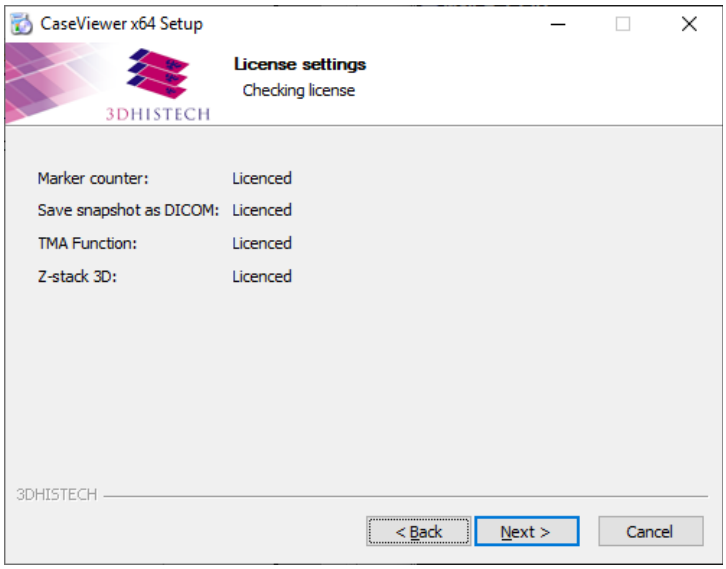


7. Select licensing mode, then click **Next**. Select **Free features only** to install CaseViewer with features only that are not bound to licensing – except DICOM snapshot, TMA Function, Marker Counter, and Z-Stack 3D-View.

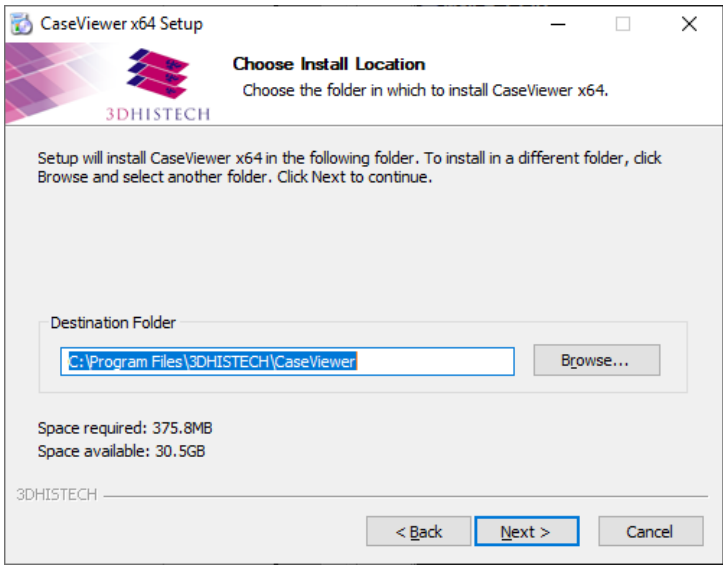




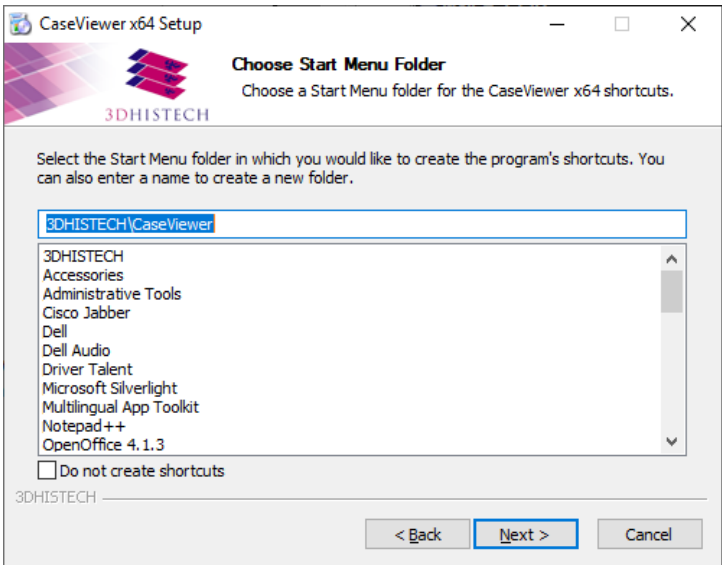
8. If the license is accepted, click **Install** to launch the installation of the selected component(s).



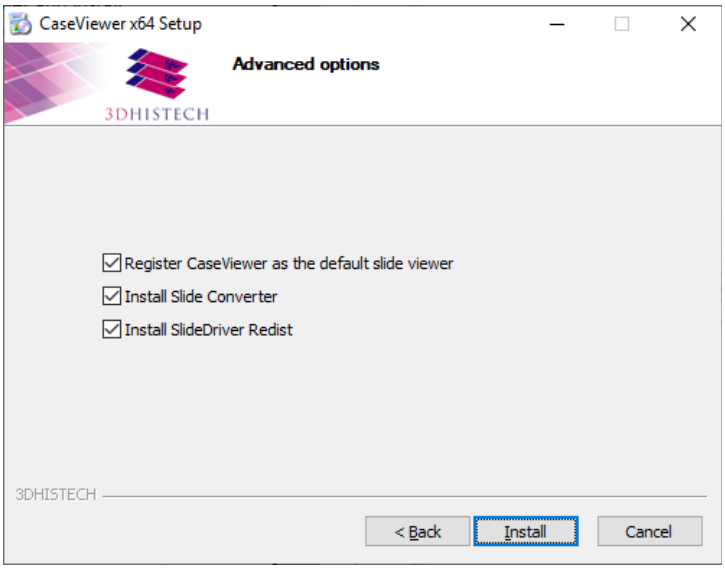
9. Set destination folder for the program files. Click **Browse** to locate a different folder than the default, then click **Next** if the location is defined.



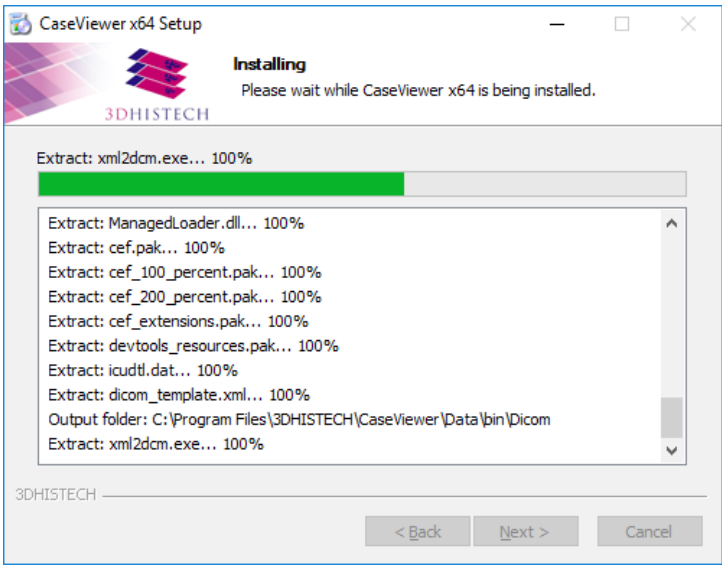
10. Leave the default or specify a different Start Menu folder to create the program's shortcuts, then click **Next**.



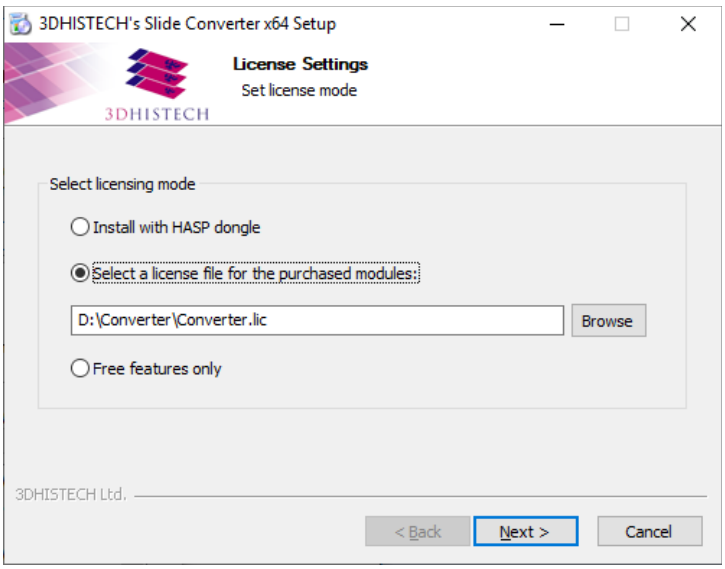
11. Tick the three options if you want to register CaseViewer as default slide viewer and install Slide Converter as an additional application for CaseViewer, and SlideDriver tool if you want to use your SlideDriver, then click **Install**.



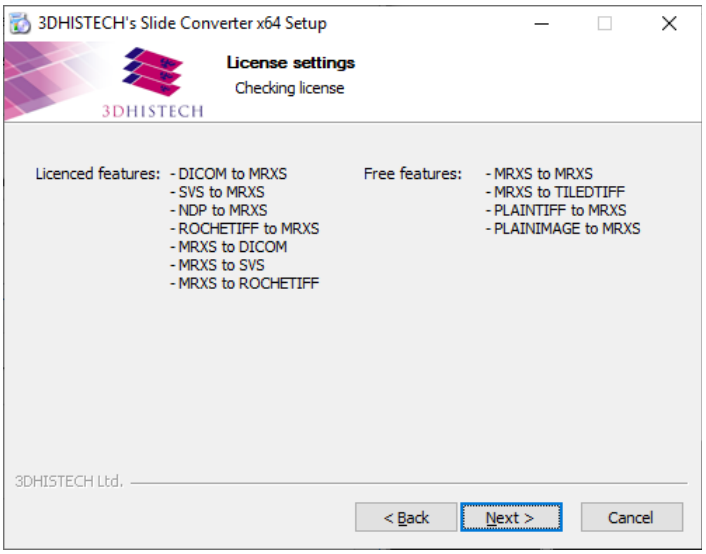
12. The progress of the installation is displayed.



13. Select the license mode for the installation of Slide Converter. Click **Next** to continue.

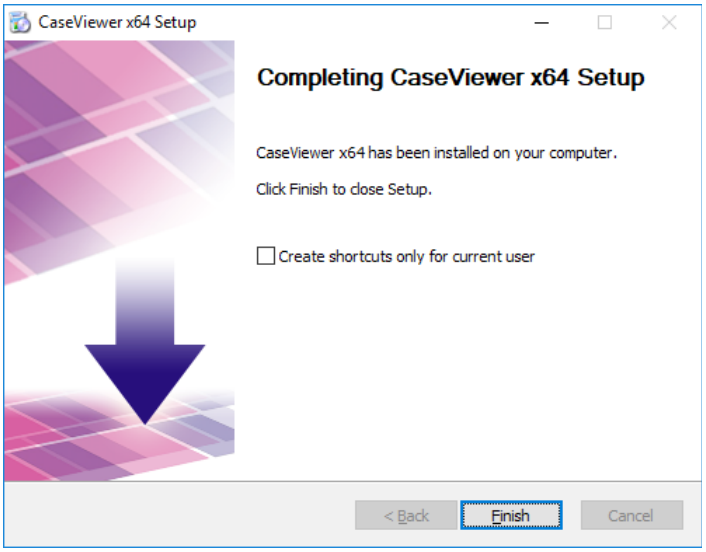


14. The licensed features of Slide Converter are listed in accordance with the license file. Click **Next** to continue.



For more information on how to activate license for the selected features, please, refer to ***Slide Converter 2.3 User's Guide***.

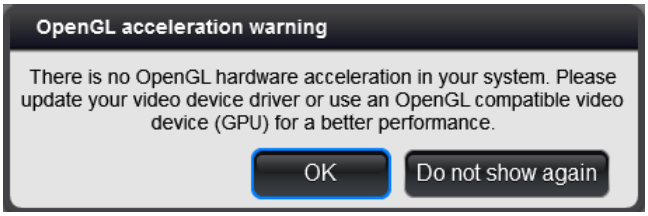
15. Click **Finish** to finalize the installation procedure of CaseViewer.



2 Using CaseViewer

1. Click the program shortcut icon on your desktop to display the startup window of the application.

If your system does not support OpenGL hardware acceleration (either not having a proper video card or driver installed), the below message is received.



Click **OK** or **Do not show again** to launch CaseViewer.

> **Note:**
>
> CaseViewer is operatable without OpenGL, but will work slower.

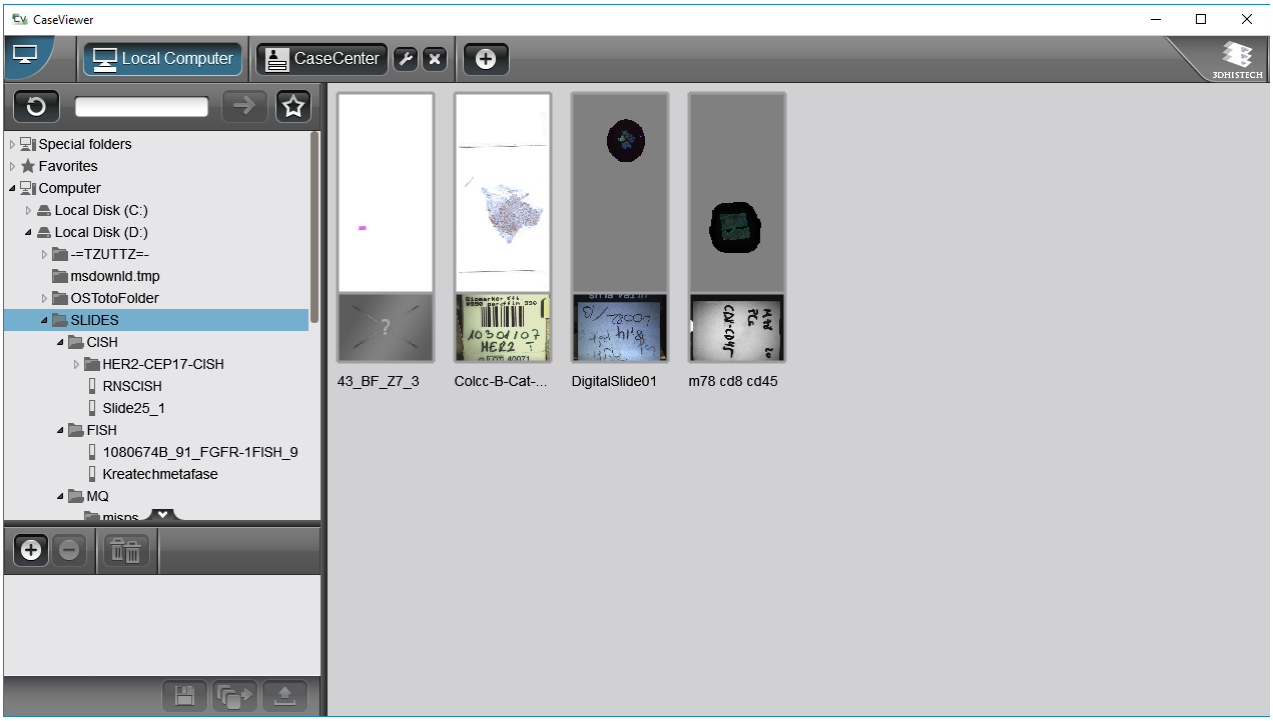
2. In the startup window of CaseViewer, select the desired storage you want to access:

   Local Computer

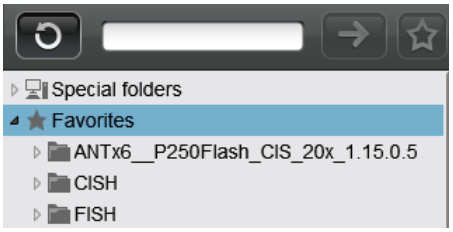
   In the left pane of the window, the tree structure of the selected drive can be expanded. If you click on a folder the thumbnails and label areas of the included slides are displayed in the right pane of the window. Click the slide thumbnail to open the slide in CaseViewer.

Note:

Aperio, DICOM, and Hamamatsu slides can be opened as well in CaseViewer, but with limited functionality (you cannot annotate areas or upload slides to CaseCenter server, etc.)



- – updates the tree view of the selected folder (it is advised to click this button after any modification is done in the folder structure).
- – field for search slides or folders in the tree, furthermore, adds UNC path to the tree.
- – click this button to add the selected folder to Favorites. The marked folders are listed under the Favorites folder at the top of the tree-view panel.

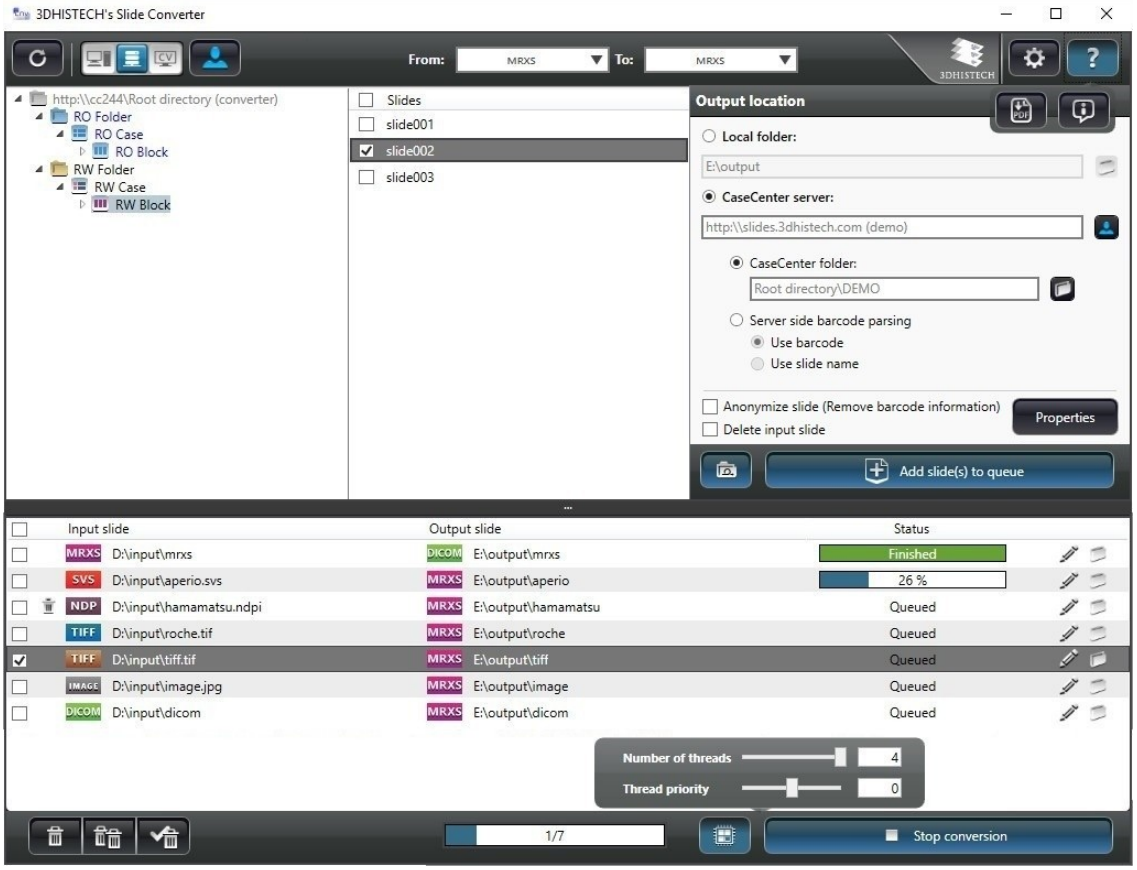


- – the **Upload/Processing** panel serves to collect slides for upload to CaseCenter or for batch processing.

First, select the slide or a single folder in the tree-view, then click to add it to the list. You can remove a slide from the list by clicking . If you want to delete all items, click .

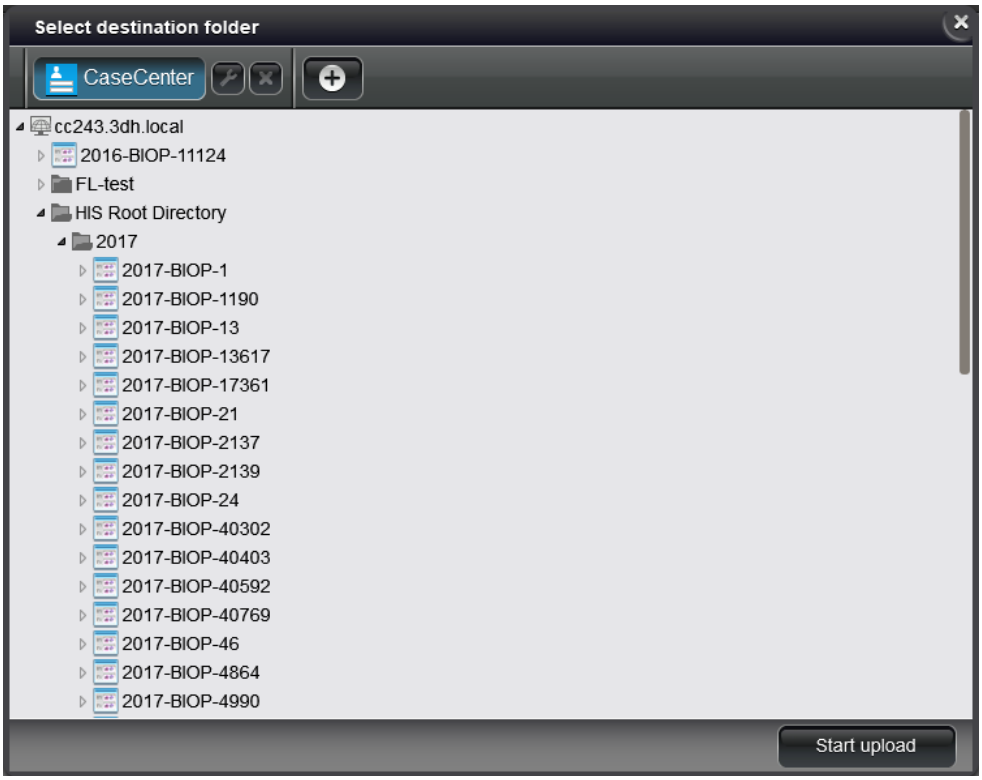
- – **Export Slide**

  Through this function the Slide Converter program is opened with which a slide (or slides) or its specific areas can be exported to different file formats (MRXS, Roche Tiff, Tiled Tiff, SVS). For more information on the use of Slide Converter, please refer to ***Slide Converter 2.3 User's Guide***.

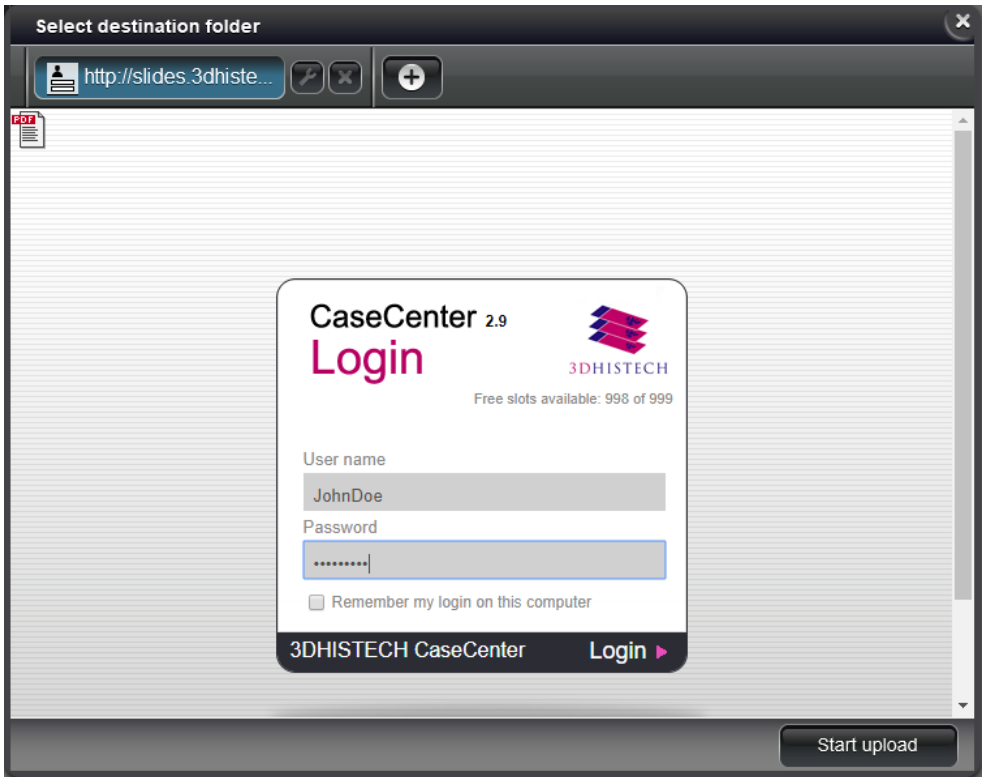


- – processes selected slide(s) with **Image Analysis Modules**.
- Batch upload of slides to CaseCenter server can be initiated by clicking .

a) If you already are logged in to the server, the tree-view of the server is displayed. First select a folder as destination, then click **Start upload**. To connect to another server as destination, click at the header bar.

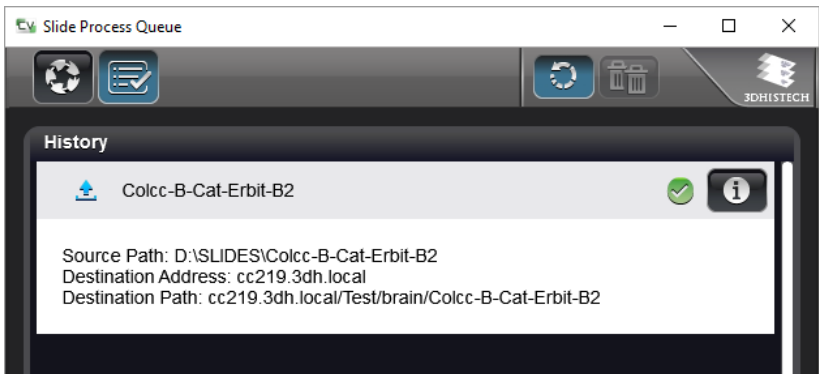


b) If you are not yet connected to any servers, click the button of the predefined server to which you can connect to, or create a new connection. After logging in to a server, the tree-view is displayed.



- After clicking **Start Upload**, the Slide Process Queue window is displayed in which the upload progress of slides is visible.

- Click to display the panel including the list of slides successfully uploaded in the History panel.



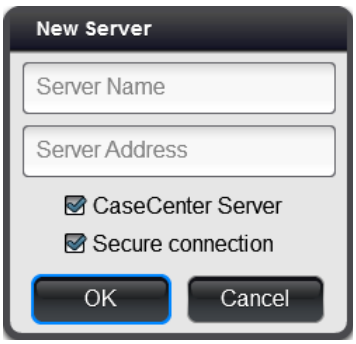
- Click to display slide information on the source and destination. By clicking all items can removed from the queue. Note, that an item that is being processed cannot be deleted this way. Click to delete the specific item from the queue.
- If the upload process is interrupted or could not be performed, the slide name is visible in red, and gets to the bottom of the list. Click to retry upload. In the info panel the cause of the error is displayed.

CaseCenter server

- Click the menu bar button of the CaseCenter server connection to open the login window to connect to the dedicated server, then the login window of the selected server is displayed if you are not already connected.

- Enter user name and password, then click **Login** to connect, locate the slide on the CaseCenter server, then click its thumbnail to open in CaseViewer.
- If the server you want to upload slides to is not listed, click to define the connection to another CaseCenter server.

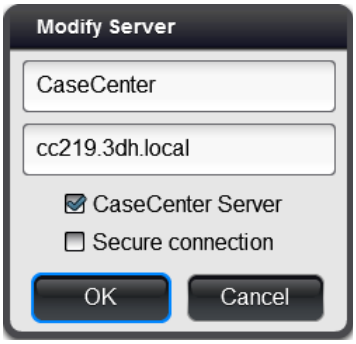
  Enter **Server Name** and **Server Address**, and activate **Secure connection** if the CaseCenter server you want to connect to uses an HTTPS protocol. If **CaseCenter server** option is disabled, any website can be opened. Click **OK** when finished.



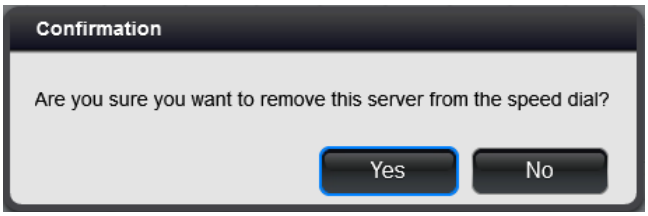
Note:

The maximum number of definable servers is 8.

Click to modify server name, address, and/or connection type.



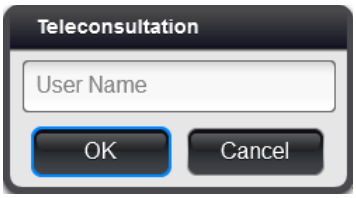
Click to the right of the CaseCenter server connection button, then click **Yes** in the message window to delete the server.



To open a slide that is included in a Teleconsultation session, and attend teleconsultation via CaseViewer, do the following:

1. Click the CaseCenter server connection button in the startup window.
2. Login to CaseCenter.
3. Go to **Teleconsultation** window, **TC requests** panel
4. Select the TC session you are invited to.
5. Click

to join the session.
6. Enter **User Name** in the TELECONSULTATION window (can be different than the CaseCenter user name), then click **OK**.



7. The first slide selected for the Teleconsultation session is displayed in the CaseViewer window. A button panel with additional buttons related to teleconsultation functions are displayed at the top left corner.

- If you are the host of the session, the button is active (as seen above), otherwise you can request for slide control by clicking the button. To turn slide movement on/off, thus making it visible or hidden for guests, click the button.

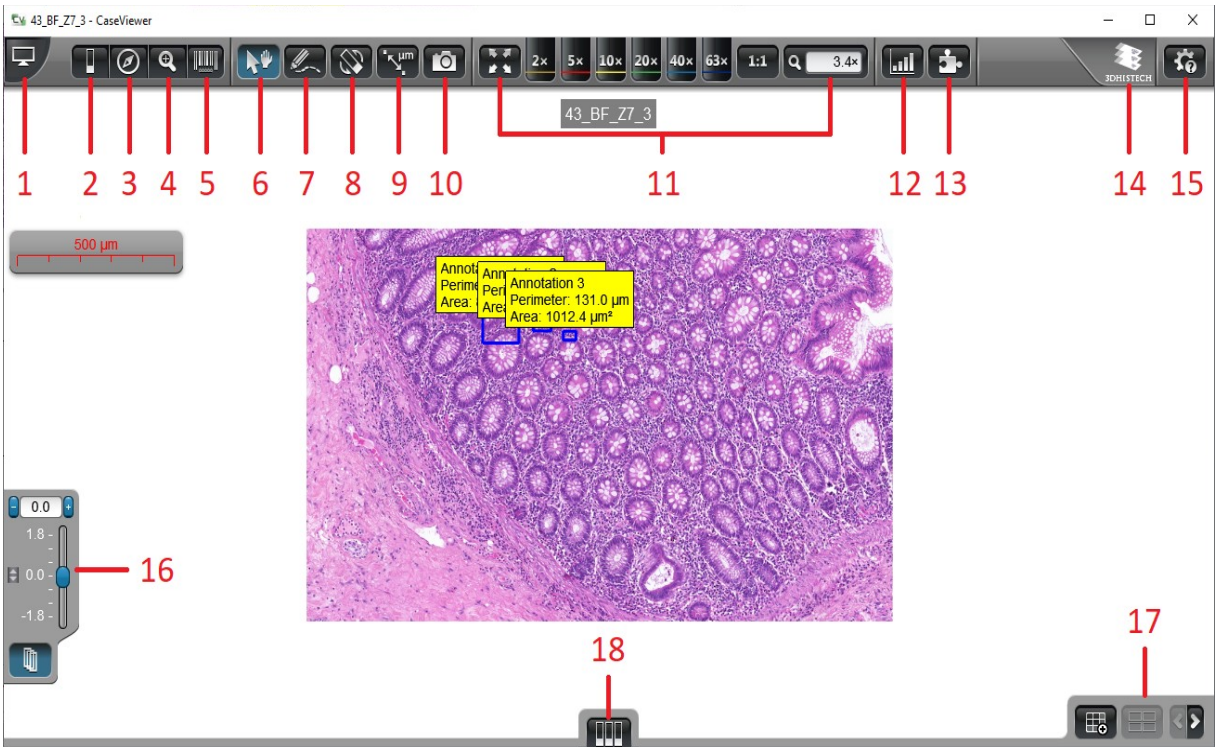
> **Note:**
>
> The host must approve the request, and the control can be taken back any time the host wants to.

- To quit session, click . The CaseCenter server window turns active again.
- To open a chat window, click . Type your message (visible to all the participants of the TC session) into the field at the bottom, then click .

2.1 Toolbar of Main Window

After selecting the slide to open, it will be automatically displayed in CaseViewer. CaseViewer offers various functions on a well-arranged user interface.

The functions accessible by clicking the highlighted toolbar buttons are described in detail in ***section 2.2***.



Note:

If you press ***F11*** to activate full screen, the normal window can be restored by clicking .

2.2 Functions

1. Open/Close Slide browser

Switch to local tree-view or select another folder within the server you are connected to or in another server.

2. Slide operations

Upon selecting this function, five options are available for you to select:

- – Download slide to local folder (if the slide is opened from CaseCenter) **OR**

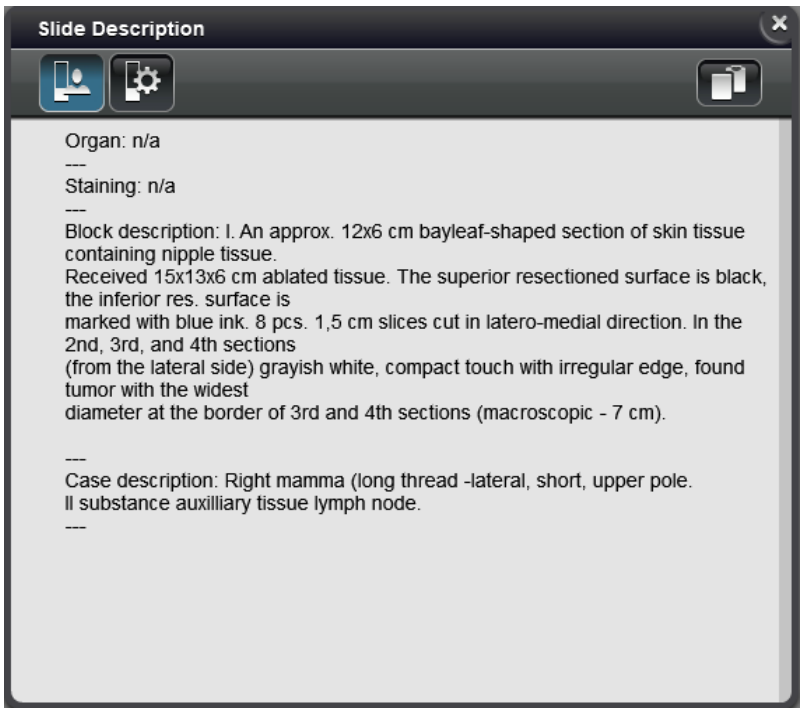
  – Upload slide to CaseCenter (if a local slide is opened)

  See ***section 2*** for further information on upload to CaseCenter.

- – **Slide information**

  Slide Description and/or *Slide Information* windows are displayed containing slide-related information.

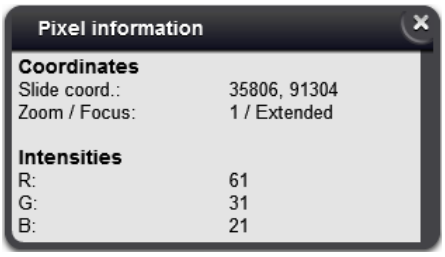
> **Note:**
>
> Slide description is available only for slides opened from CaseCenter.



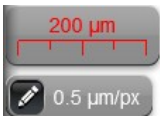
Click to copy information to clipboard.

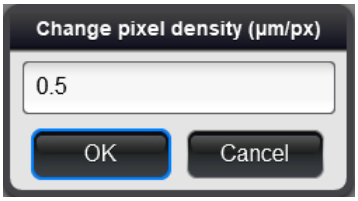
- – **Pixel information**

  Slide coordinates and color intensity values per channel are displayed in this panel. Pixel interpolation is turned off when this panel is open, therefore pixel boundaries are clearly visible. Turn off **Zoom Limit** function to inspect pixels at the highest magnification if necessary.



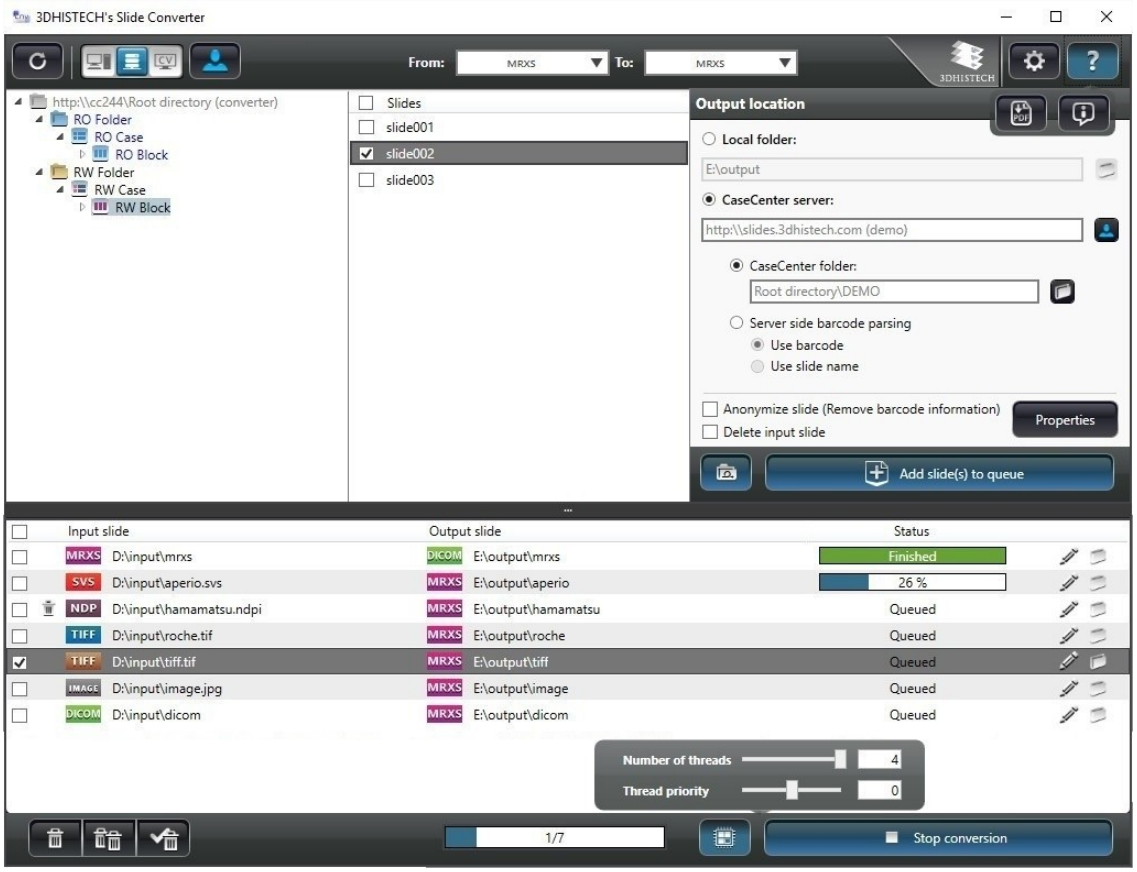
When opening image files, the pixel density value can be modified after clicking the button below the scale bar. Set a new value in the **Change pixel density (µm/px)** window, and click **OK**. If the resolution of an .mrxs slide is higher than 2 µm/px, the color of the scale bar turns to red and the value can be modified manually. After any modification was made to the µm/px area, the text will be displayed with blue.





- **– Export Slide**

  Through this function the Slide Converter program is opened with which a slide (or slides) or its specific areas can be exported to different file formats (MRXS, Roche Tiff, Tiled Tiff, SVS). For more information the use of Slide Converter, please refer to ***Slide Converter 2.3 User's Guide***.

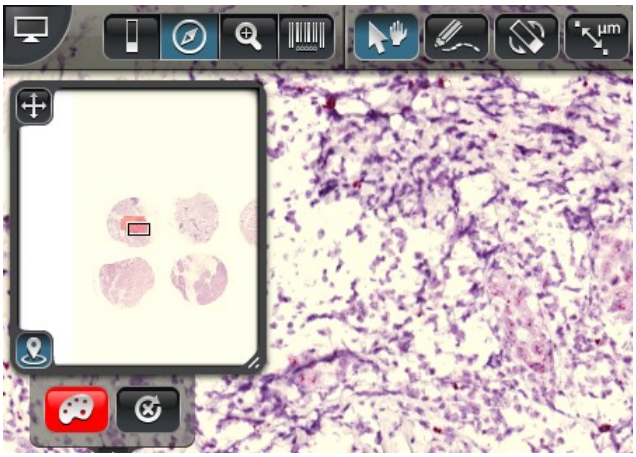


3. Slide overview

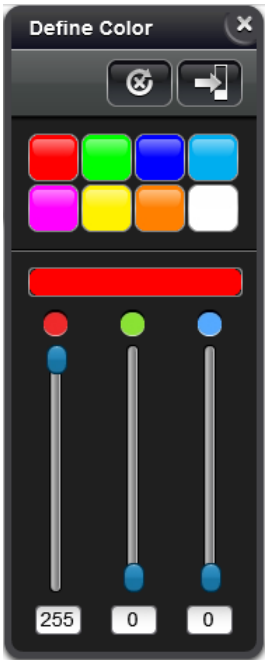
Shows a low resolution overview from the whole slide to help navigation. The screened area is marked with a rectangle with a border or with a cross depending on the current zoom level. It allows fast navigation through the slide by clicking onto a certain point in the overview or panning with the rectangle.

Move window by dragging it by the button at the top left corner. Drag to enlarge window.

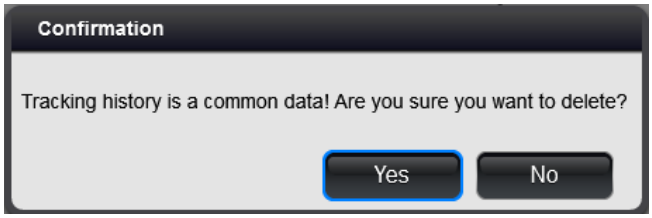
To turn on *Tracking History* function, click at the bottom left corner of the window. This enables for you to record the track of slide areas you have inspected.



Tracking map color can be changed by clicking . Select or edit a color for the map.



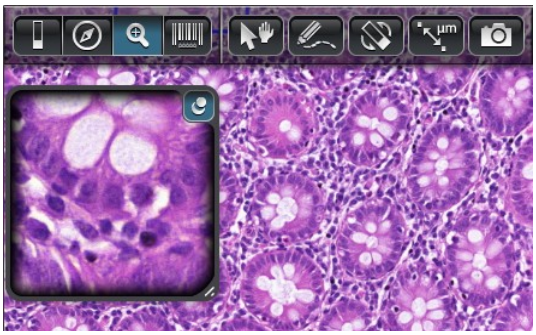
The recorded history can be deleted by clicking on the Tracking History panel. Click **Yes** in the appearing window to confirm deletion, otherwise click **No**.



4. Magnifier

Magnifies a certain area of the slide. The magnifier window can be dragged and dropped on the slide. The area beneath the magnifier window is magnified and displayed in this window. By clicking the button the area around the cursor pointer is displayed in the magnifier window. Click to restore default view in which either the slide or the magnifier window can be dragged to display magnified area of the slide.

Detached Magnifier



Pinned Magnifier

Magnifier window size can be changed by dragging at its right bottom corner. Magnification rate within the magnifier window can be modified by scrolling with the mouse wheel. The limits of this magnification can be set in the ***settings*** window.

5. Label area

Shows the label area of the slide. With the rotation icon the label image can be flipped by 180°. Label area window can be re-sized by dragging the icon at the bottom left corner. Click at the bottom of the label area window to open the preview image of the slide. *Slide Description* and/or *Slide Information* windows can be displayed by clicking the icon. See function ***2. Slide operations*** in this section for more information.

During slide conversion the slide can be anonymized, thus making label area unreadable and identifying information removed from the slide. Anonymized label of the slide is displayed in the window as shown below:

6. Pan mode

Use this mode to navigate on the slide.

7. Annotation mode

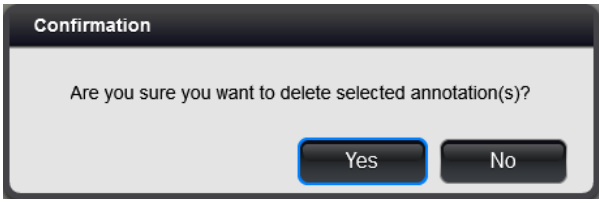
This mode allows placement of several different kind of annotations on the slide, such as:

- Free size rectangle (press and hold ***SHIFT*** key while resizing to maintain aspect ratio)
- Free circle (press and hold ***SHIFT*** key while resizing to maintain aspect ratio)
- Measurement annotation
- Free hand linear
- Free hand area
- Arrow-type annotation: draws an arrow to a point of interest on the slide.
- Screened: annotates the area visible on the monitor. This function is a built in function of SlideDriver as well.
- Fix size rectangle: draws a fixed size rectangle annotation on the slide. The annotation size can be set up in the **settings** window.
- Fix size circular: draws a fixed size circular annotation on the slide. The annotation size can be set up in the **settings** window.
- 20 × FOV: puts a standard 20 × field of view sized annotation on the slide. The annotation size can be modified in the **settings** window.
- 40 × FOV: puts a standard 40 × field of view sized annotation on the slide. The annotation size can be modified in the **settings** window.

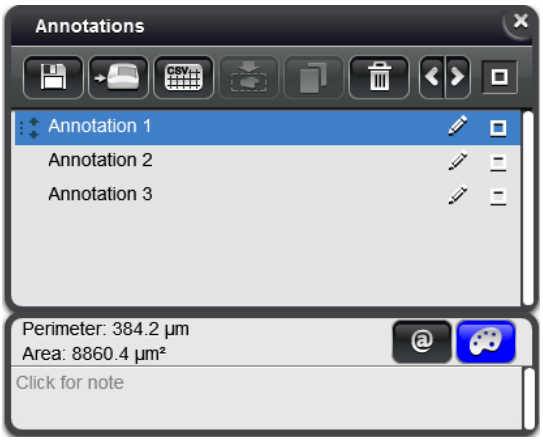
- Places TMA markers on the slide: select the marker button of the desired diameter from the panel, then place markers on the slide. Click to modify default colors of the selected marker.

After you have selected the diameter, keep the left mouse button pressed so that the emplacement of marker is easier as it is dragged along with the movement of the mouse. Release left mouse button to place the marker. If misplaced, right-click the belt area of the marker, then drag it by the arrows at its center point by keeping the left mouse button pressed.

If you want to delete a marker, right-click its belt area, then hit the **Delete** key. Confirm deletion by clicking **Yes** in the appearing message box.



- Displays *Annotations* panel in which the created annotations and their related information are listed. Move **Annotations** panel by dragging it (clicking on the panel header).

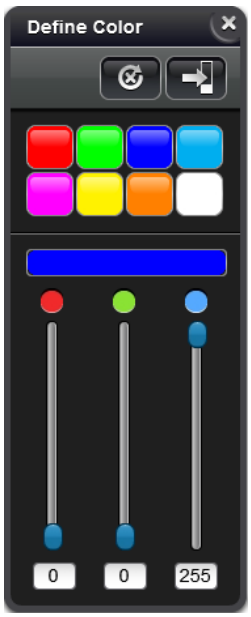


Note:

Annotations panel is displayed automatically and all the annotations will be selected both on the slide and the panel whenever you press ***CTRL+A***.

The following functions are available on this panel:

- Drag annotations to reorder them by grabbing at the left side of annotation name.
- *Edit annotation*: click this button to change the annotation name.
- *Change annotation color*: click this button to select or edit a color for the annotation from the Define Color panel.



- If the slide is opened from CaseCenter, by clicking this button a link for the specific annotation on the slide is copied to the clipboard.

  When inserting this link as hyperlink in a text editor, the slide will be opened and the annotation is zoomed in after clicking the link.
- **Click for note** – Field for annotation description. Entry of multiple data and copy/cut/paste function is supported.
- *Export selected annotations* – see ***section 2.2 – 2. Slide operations*** for more information.

- *Define area for re-scan*: a bitmap image is created that can be used by the control software of scanners – re-scanning of selected areas based on the scanmap is available if necessary.
- *Export data to CSV*: exports annotation properties, e.g. name, area, and perimeter of the selected annotation into a CSV file.
- *Create Virtual Tray or Replicated Slide*: If only one annotation is selected, then Virtual Slide or Virtual Tray can be created. If more annotations are selected, only Virtual Tray can be created.

Note:

This function is available only if the slide is opened from CaseCenter.

- *Clone selected annotation*: this function allows the duplication of the selected annotation from one slide to the other in MultiView mode.
- *Delete*: deletes the selected annotation(s).
- By clicking left or right arrows the previous or the next annotation can be displayed on the center of the window.
- *View /* *Hide all annotations*
- *View /* *Hide selected annotation*

Note:

Annotation sizes after being drawn may slightly differ from the sizes of the same annotations after reopening the slide(s) or CaseViewer. The main cause of this phenomenon is that the software saves annotations to slides with rounded values according to slide coordinates. This is also available for rectangular annotations as well, in a degree depending on slide resolution.

The *Annotations* panel is not displayed automatically after creating an annotation, allowing you to put annotations continuously on the slide.

After clicking the pinned mode is switched on, displayed as , so the *Annotations* panel is opened right after you annotate an area, enabling you to set or modify the annotation you created.

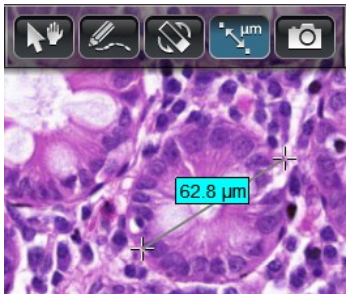
8. Flip or rotate slide

Switching to flip-or-rotate mode, the slide can be flipped either horizontally or vertically and also can be rotated using the slider, 0-180° either clockwise or counter-clockwise.

The (reset rotation) function rotates the slide back to its original position (as it was on the glass slide). The (pin) function fixes the panel, meaning that the panel remains open during operations. If the panel is not pinned, it will be closed after clicking any of the panel buttons.

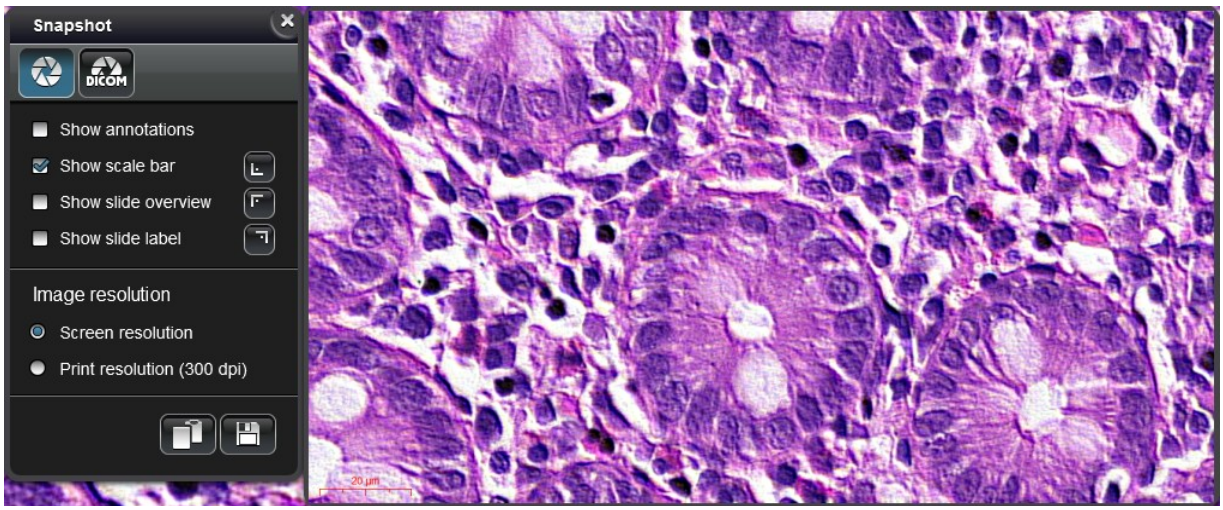
9. Measure length

Create simple length measurement by defining a starting and an end point of measurement on the slide by clicking with the mouse. The length is displayed on the connecting line.



10. Create snapshot

This feature allows the saving or copying of a screen-shot made from the current visible area.



Show annotations – annotated areas are shown in the Snapshot image

Show scale bar – a scale bar is displayed in the Snapshot image

Show slide overview – a preview image of the slide is displayed in the Snapshot image

> **Note:**
>
> To enable this option, the **Slide Overview** function must be activated first.

Show slide label – slide label is displayed

- The buttons represent the locations of the above three elements (**Show scale bar**, **Show slide overview**, and **Show slide label**) in the window, that can be modified by clicking the buttons.

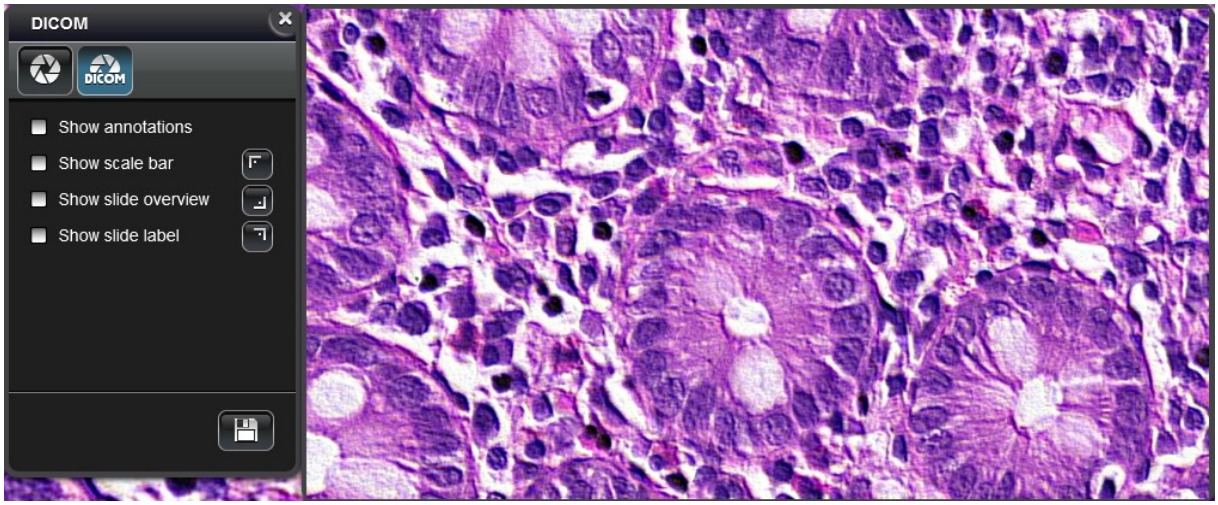
Image resolution – select one of the following:

- **Screen resolution** option sets image resolution identical with the applied resolution of the monitor
- **Print resolution (300 dpi)** sets image resolution to 300 dpi

Click to copy image to clipboard.

Click to save image as JPG, BMP, PNG, or TIFF file.

If you want to set snapshot image properties and create a DICOM image, click .



Show annotations – annotated areas are highlighted on the Snapshot image

Show scale bar – a scale bar is displayed in the Snapshot image

Show slide overview – a preview image of the slide is displayed in the Snapshot image

Show slide label – slide label is displayed in the Snapshot image

- The buttons represent the locations of the above three elements (**Show scale bar**, **Show slide overview**, and **Show slide label**) in the window, that can be modified by clicking the buttons.

Click to save image as a DICOM file.

11. Zoom levels

These controls change the magnification from fit-to-screen to 63×, 1:1, and arbitrary levels. The current zoom level is displayed and can be modified in the far right field. Zooming in/out can be also achieved by pressing the **-**/**+** keys, and fast zooming is enabled when holding ***SHIFT*** at the same time.

> **Note:**
>
> Visualization of structures can be different depending on the applied zoom level. The halt in zooming at 1:1 magnification is intentionally designed as an indicator.

12. Color channel adjustments

Color adjustment might be necessary for the best visualization results for your display. Both panels of color histogram (8-bit and 16-bit) for Brightfield and Fluorescent slides include adjustable brightness, contrast (both on X and Y axes), and gamma levels. This menu icon has two states, is displayed if default color setting values are loaded or restored after modification, and is visible if values have been modified.

Bottom end-sliders are set to the darkest (Black) and lightest (White) tones that occur in the image. The goal for faded images is to move the black and white point sliders in to or near the darkest and lightest tones that actually occur in the image. The middle slider adjusts the mid-tones (Gamma) in the image without changing the black and white values.

Histogram range can be zoomed/narrowed down by dragging and at the end-points. By right-clicking or double-clicking on arrows set values can be restored to default and vice versa. The histogram of 16-bit slides can be zoomed in with the mouse by holding the left mouse button pressed during selection.

Brightfield slides

Brightness, contrast, and gamma values can be modified on the *Color Adjust* panel. Changes take effect immediately. A color histogram of the slide is available in this panel to support precise adjustment.

- Current area histogram displays the histogram of the currently visible area of the slide. Activated automatically if the slide does not contain a previously saved histogram.

- Best fit

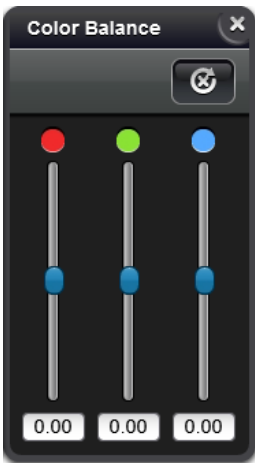
- Sets optimal contrast

- Saves settings to slide

- Restores settings from slide (if saved)

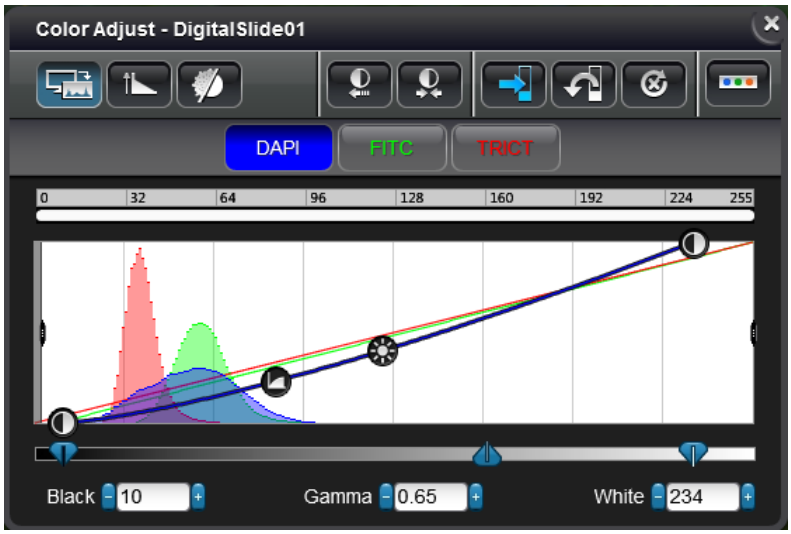
- Resets default values

RGB channels can be adjusted individually on the *Color Balance* panel after clicking . Click to reset values.



Fluorescent slides

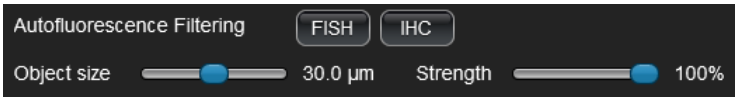
Fluorescent slides contain individual channels for each fluorescent signal. This panel represents the available fluorescent channels of the slide. Color adjustment of a fluorescent slide is available channel by channel. Click a channel to select and modify its curve, brightness, contrast, and gamma values on the histogram.



- Current area histogram displays the histogram of the currently visible area of the slide

- Linear/Logarithmic scale on Y-axis

- Auto-fluorescence filtering method can be applied on FL slides by clicking this button



- Best fit

- Sets optimal contrast

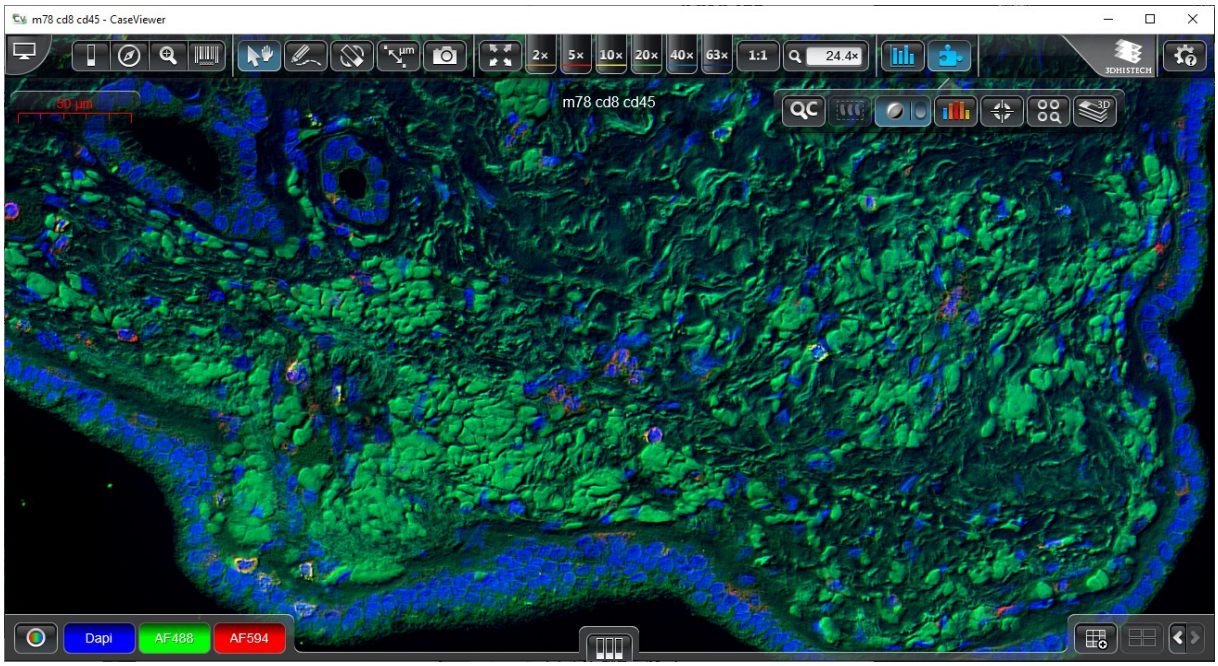
- Saves settings to slide

- Restores settings from slide (if saved)

- Resets default values

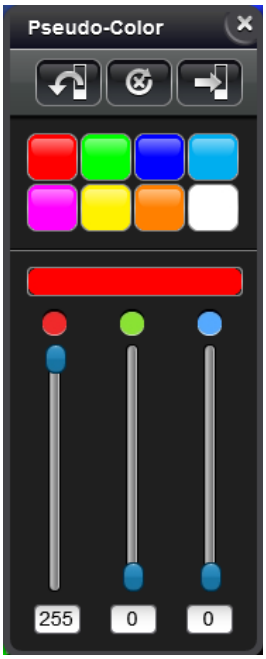
Single channel display mode can be activated upon clicking . If gray-scale mode is activated, only one selected channel is visible and modifiable at a time.

For fluorescent slides, the toolbar for color channel adjustments is located at the bottom left corner of the main window representing the available fluorescent channels of the slide.



- Click a label to turn a channel on or off. Channels can be displayed in grayscale mode upon clicking , and also you can switch between single channel and multi channel modes. If grayscale mode is activated, only one selected channel is visible at a time.

- Color adjustment of a fluorescent slide is available channel by channel. Right click an active channel to modify its representative color on the *Pseudo-Color* panel, where you can select a predefined color, adjust RGB channels to create a unique color, and perform the following actions:



- Saves settings to slide

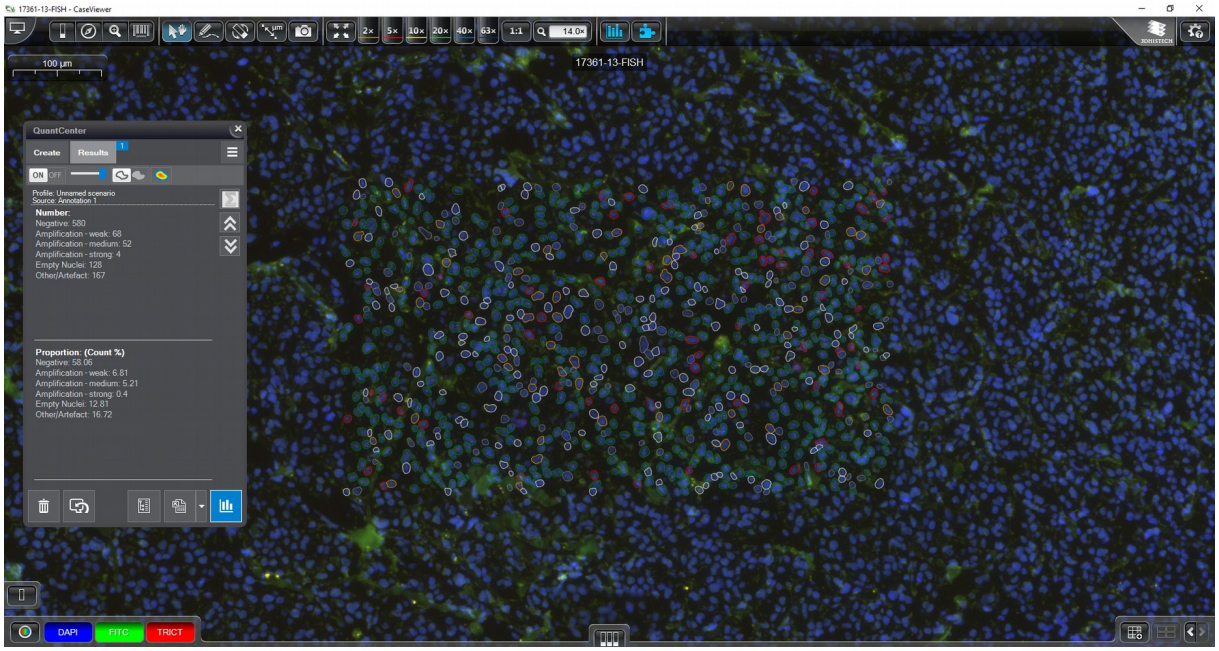
- Restores settings from slide (if saved)

- Resets default values

13. Plugins

– Manage quantifications with QuantCenter

The slide will be opened in QuantCenter upon clicking this button. For more information on in the Snapshot imagequantification-related functions and features, please, read ***QuantCenter User's Guide***.



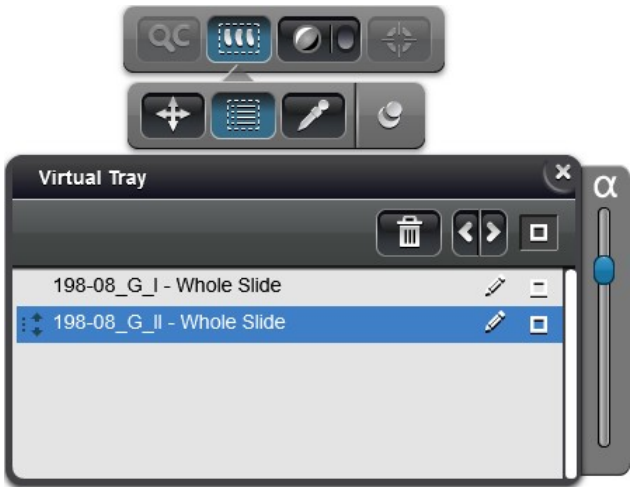
– Virtual Tray management panel

This button is active only if a Virtual Tray is opened. Compartment Virtual Slides integrated into the same Virtual Tray can be managed on this panel.

The list shows compartment slides of a Virtual Tray. Compartments can be managed as layers – drag and drop the selected compartment to view in the front or send it to back, or click to hide them.

The opacity of the compartment also can be set with the **alpha** slider located at the right side of the Virtual Tray panel. It is also available for you to delete a slide from the list, or rename a slide.

- Move a virtual slide by dragging it.
- Manage Virtual Tray items:

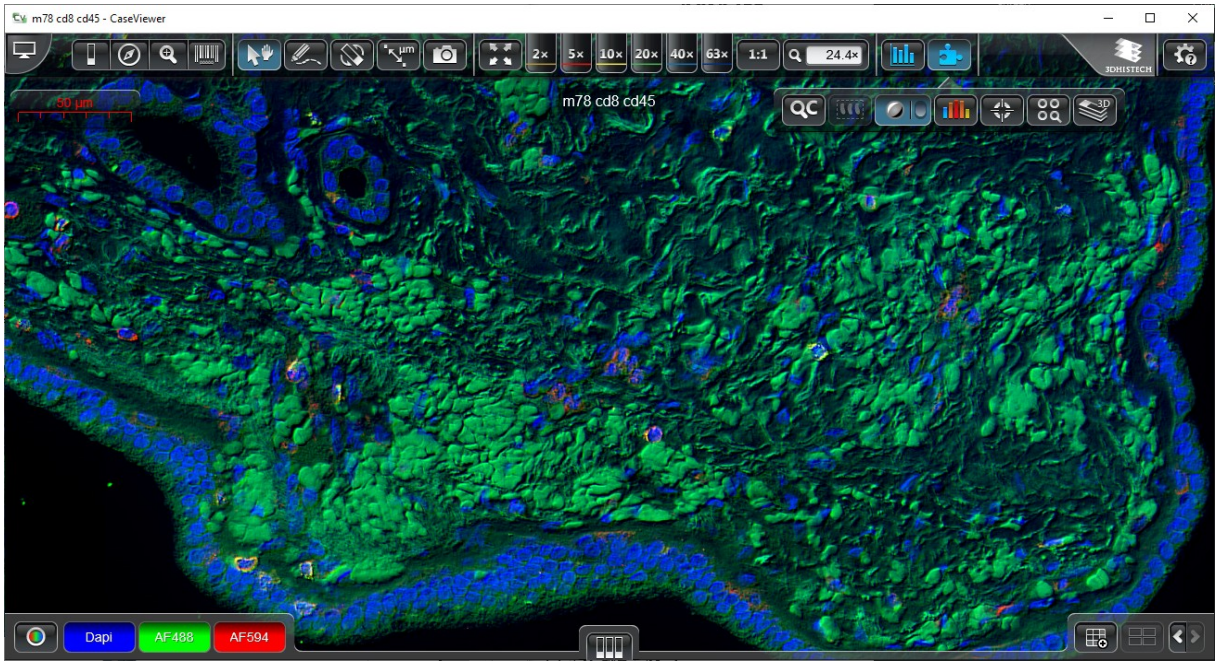


  Click the slide to select, then it can be deleted - , hidden - , or its name can be edited - if necessary. Move between slides by clicking the buttons.

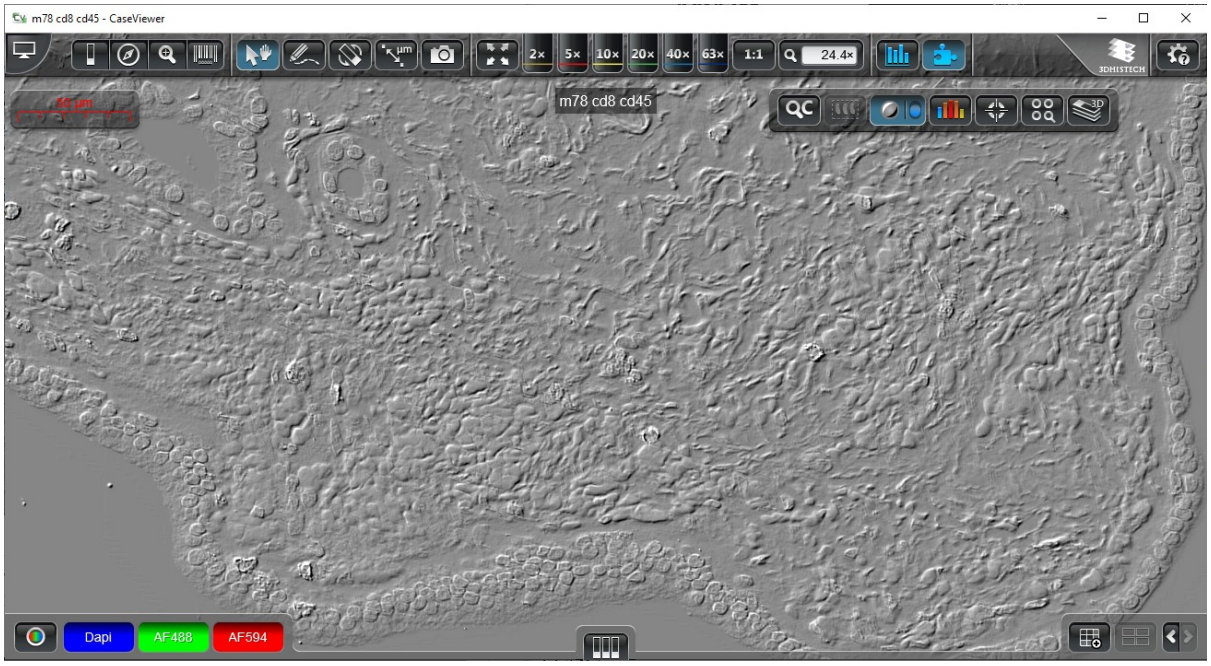
- Opens the panel containing background tools. The following functions are available:
  - Selects background color and make it transparent.
  - Shows/Hides background.
  - Resets background.
  - Undo-Redo

– Digital Differential Interference Contrast (DDIC)

This function is useful to enhance the contrast in almost transparent or faded samples. DDIC works on the principle of interferometry to gain information about the optical path length of the sample, to see otherwise hardly visible tissue structure features. The image has the appearance of a three-dimensional object under very oblique illumination, causing strong light and dark shadows on the corresponding faces.



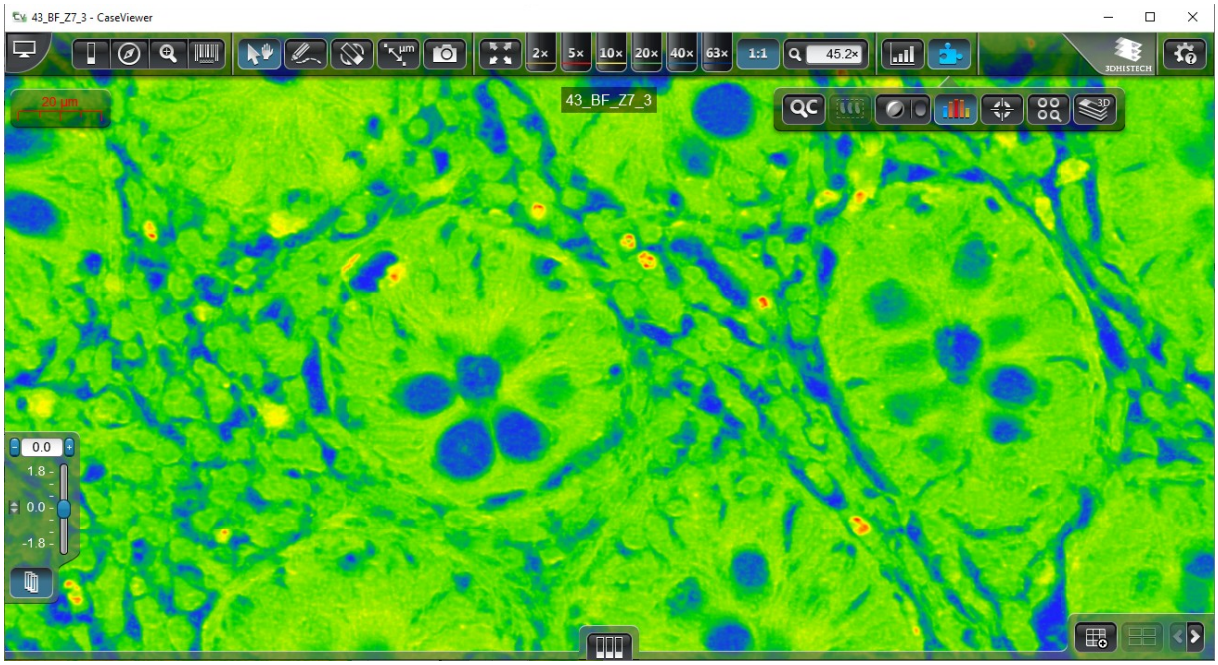
When clicking the right section of the button if DDIC is activated, the gray-scale image of the slide is visible. A relatively complex lighting scheme produces an image with the object appearing black to white on a gray background.



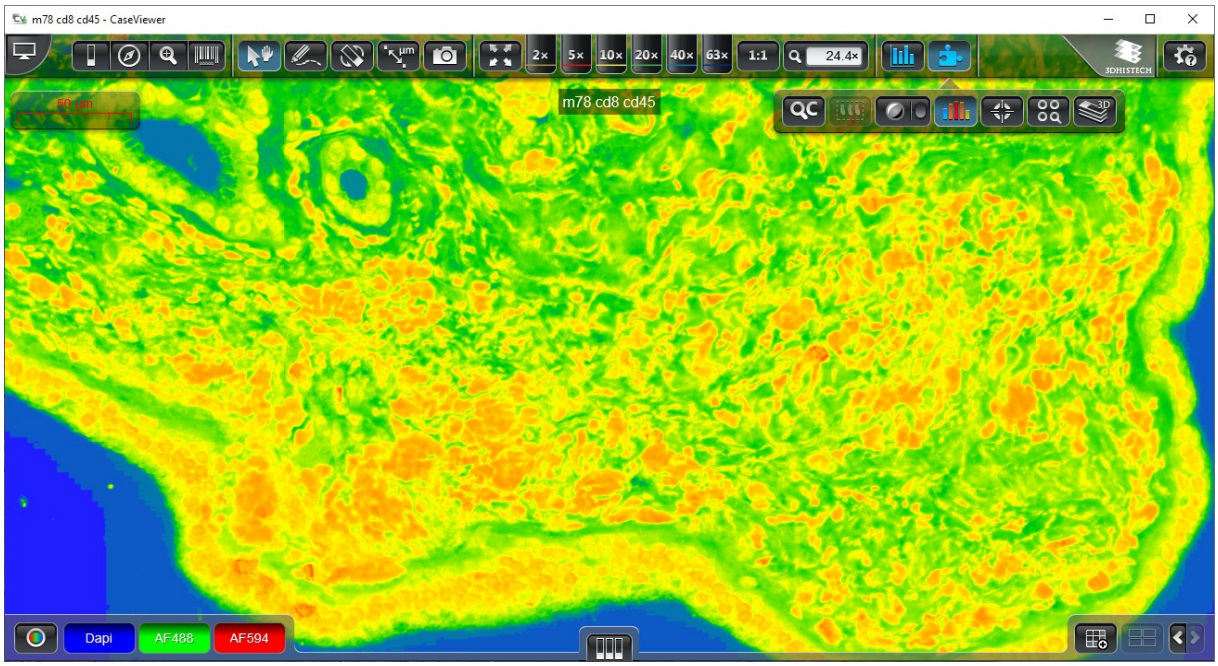
– Gradient map visualization

With this function the critical areas of the slide can be highlighted.

When you activate this function for Brightfield slides, the stain-based positivity is visualized:



For Fluorescent slides the intensity of the gray-scale image is highlighted:



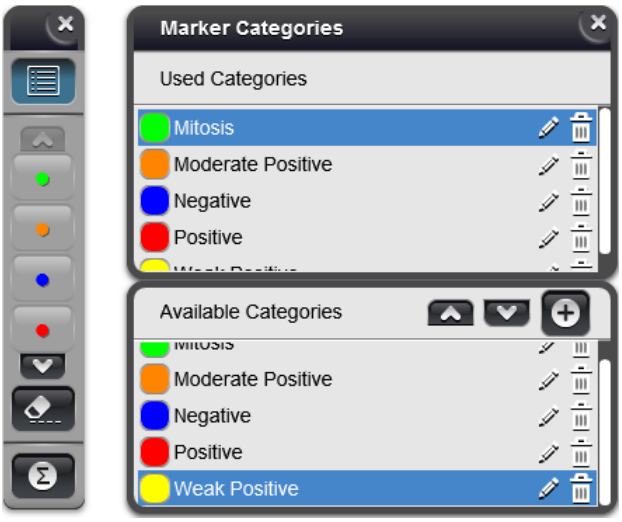
Based on a predefined criteria, the following colors are used for the image to visualize different areas of the slide:

- **Blue:** insignificant
- **Green:** somewhat significant
- **Yellow:** significant
- **Orange:** more significant
- **Red:** most significant

– Marker Counter

Upon clicking this button the following panel appears through which marker-related functions are available for you to select:

- – Shows a list of markers: saved markers are listed in the lower panel (**Available Categories**), used markers on the slide are listed in the upper panel (**Used Categories**).

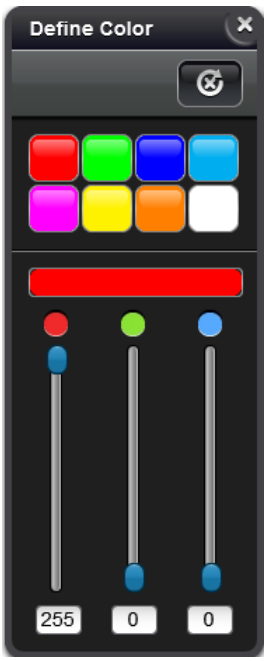


Select a marker from the list of **Available Categories**, then click to add the marker to the list of **Used Categories**.

The marker category added to the list is then presented by a button on the marker panel at the left side of the CaseViewer window. If you have more than four categories on the panel, you can scroll down to select a non-visible category you wish to use by clicking .

- A new category can be created by clicking the button.

- Type category name into the text field, set its color by clicking then selecting the desired color from the predefined palette or adjust RGB channels to give it a unique color.



- Set its type – **Filled** or **Outline**, its **Diameter (µm)** and **Line width (px)**. Activate **Add to Used** to add the newly created marker to the list of **Used Categories**.

Click to save the new marker category.

Important!

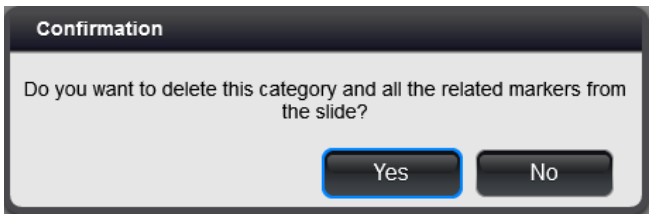
It is not possible to create more than one marker categories with identical names.

- Click to edit marker category settings such as name, color, type, diameter, and line width.

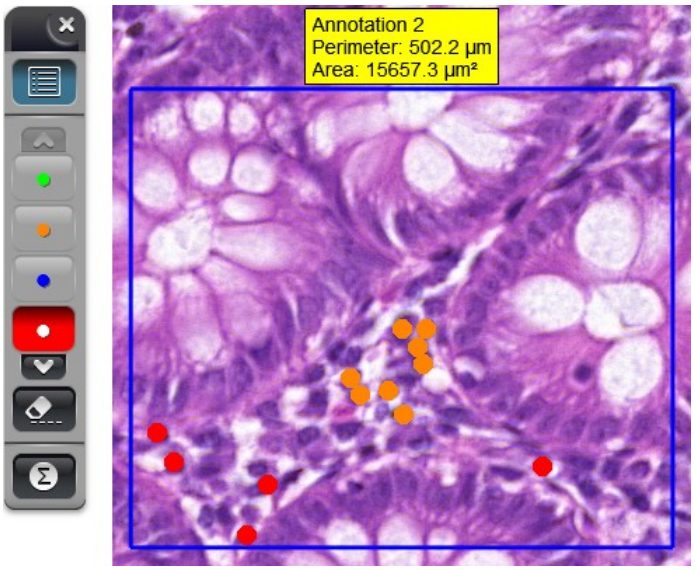
Note:

Any modification to the category will be applied to all of the markers of the same kind after clicking .

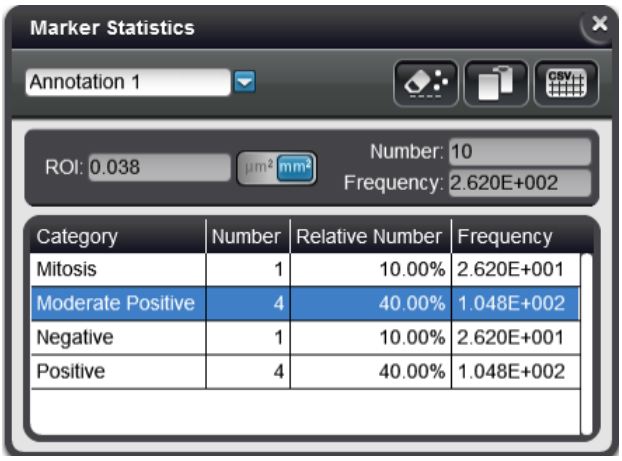
- To delete a marker category, first select it, then click . Click **Yes** in the message box to confirm deletion.



Add markers to the slide by selecting the marker category from the panel first, then mark category-related spots by clicking with the left mouse button.



- – Click this button to delete unnecessary markers by clicking either with the left- or right-mouse-button. If the deletion function is not activated, markers can be deleted by clicking with the right-mouse-button only.
- – Opens the **Marker Statistics** panel. First, select the annotation from the drop-down list, then the related statistical data will be shown. Switch between µm² and mm² ROI surface area measurement units with the µm² mm² button.

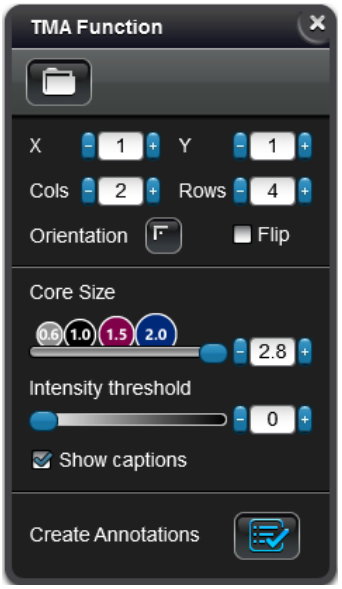


Category	Number	Relative Number	Frequency
Mitosis	1	10.00%	2.620E+001
Moderate Positive	4	40.00%	1.048E+002
Negative	1	10.00%	2.620E+001
Positive	4	40.00%	1.048E+002

- – Click this button to delete all of the markers of the selected category placed within the annotation.
- – Copies table to clipboard
- – Exports table to CSV file

– TMA Function

Upon clicking this button an automated TMA core detection is performed and the TMA Function window is displayed in which the function-related settings are displayed.



Results can be filtered by the following options:

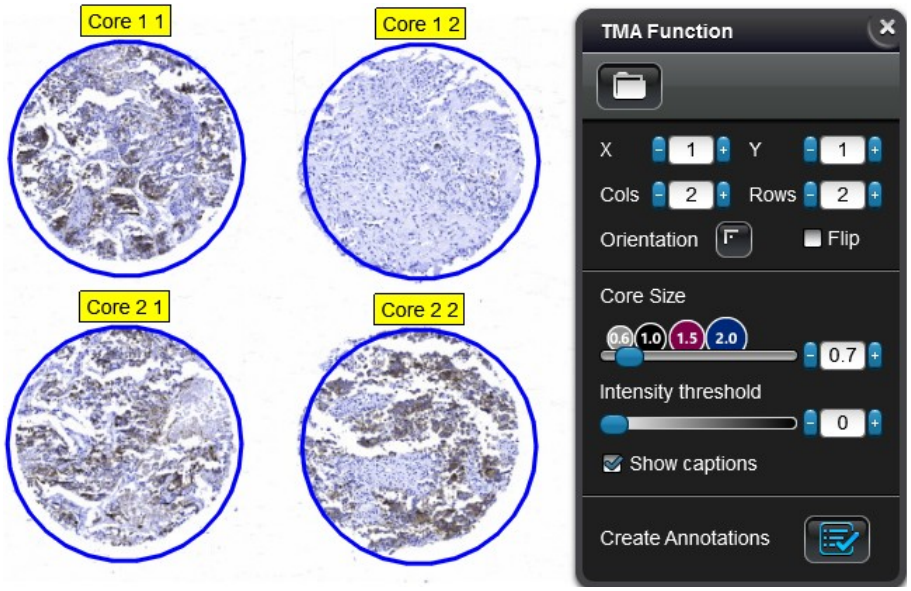
- – Open TMA database file generated by a TMA control software. After clicking this button, locate the TMA database file in the browser window (this is optional, the function can be used also without defining a database).

  The **Recipient Blocks** drop-down list is visible only if a database has been loaded. In this list the recipient block data from the XLS/XLSX or ODS file are displayed. Once you select a recipient block the block-related core data are listed.

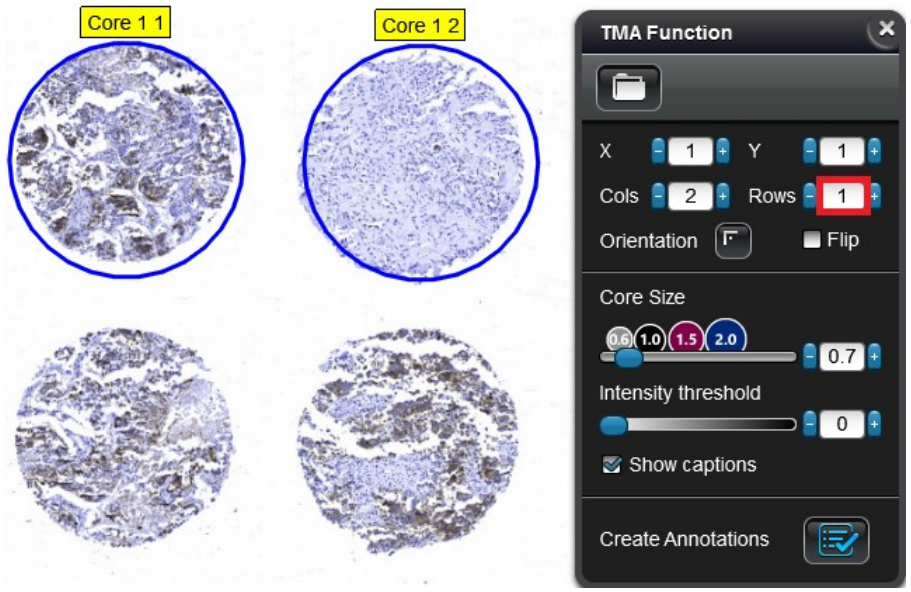
> **Important!**
>
> The handling of XLSX files exported from LibreOffice or OpenOffice are not supported.

- The following data are displayed once the spot recognition is performed:
  - Core names (displayed above the markers)
  - Core-related block/sector data
  - Core-related patient data (if database has been loaded)
  - Detected size (diameter) of cores
  - Core positions

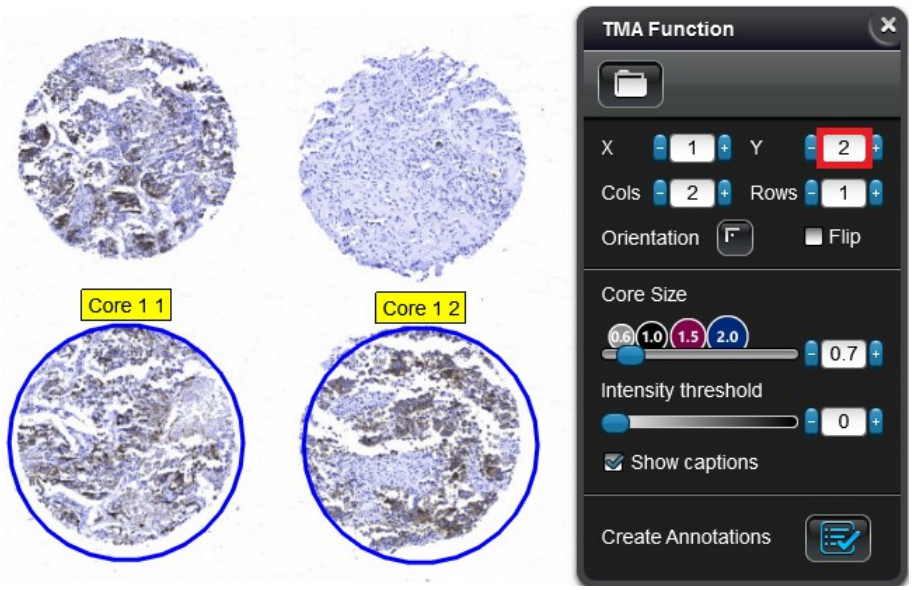
Cols and **Rows** represent number of rows/columns to be left out from the total grid, **X** and **Y** values define the positions from which the grid fragment is shown.



1. For example, first, decrease the **Row** or **Column** value.



2. Increase the **X** or **Y** value, and the following grid section according to the modified axis is shown in the slide image.



Cols, Rows: these fields display the number of rows/columns detected by the algorithm

Orientation: the top left corner is the default orientation of the grid.

Flip: tick this checkbox to flip the orientation of the grid.

Core Size: detected core-size

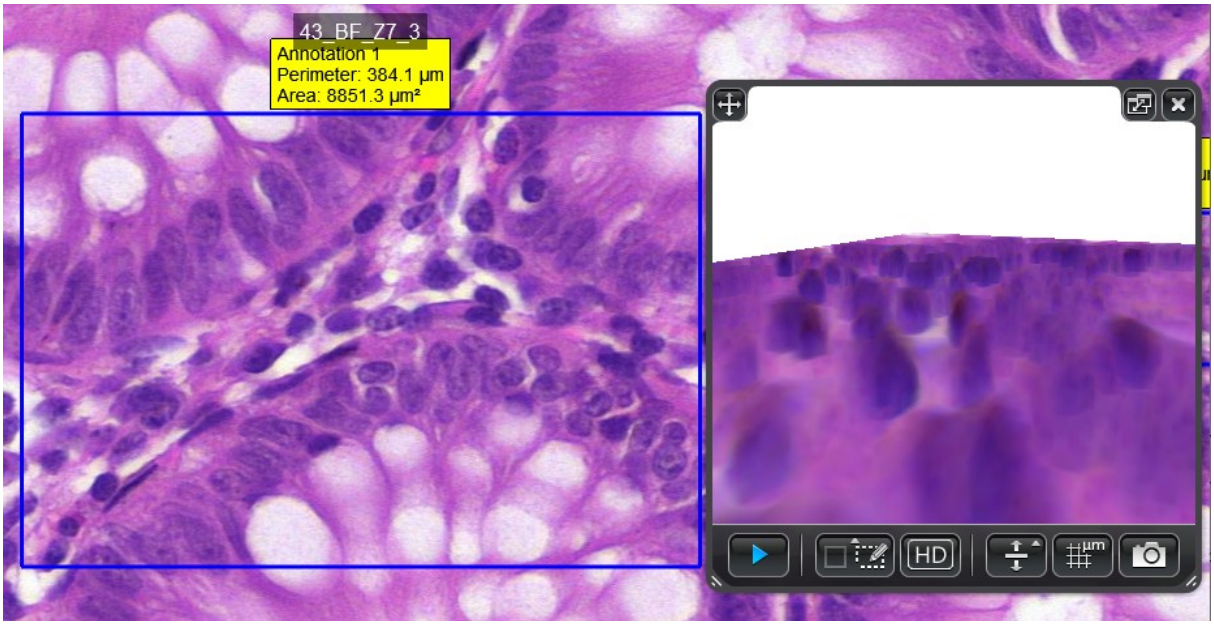
Intensity threshold: Core intensity value is 0 by default.

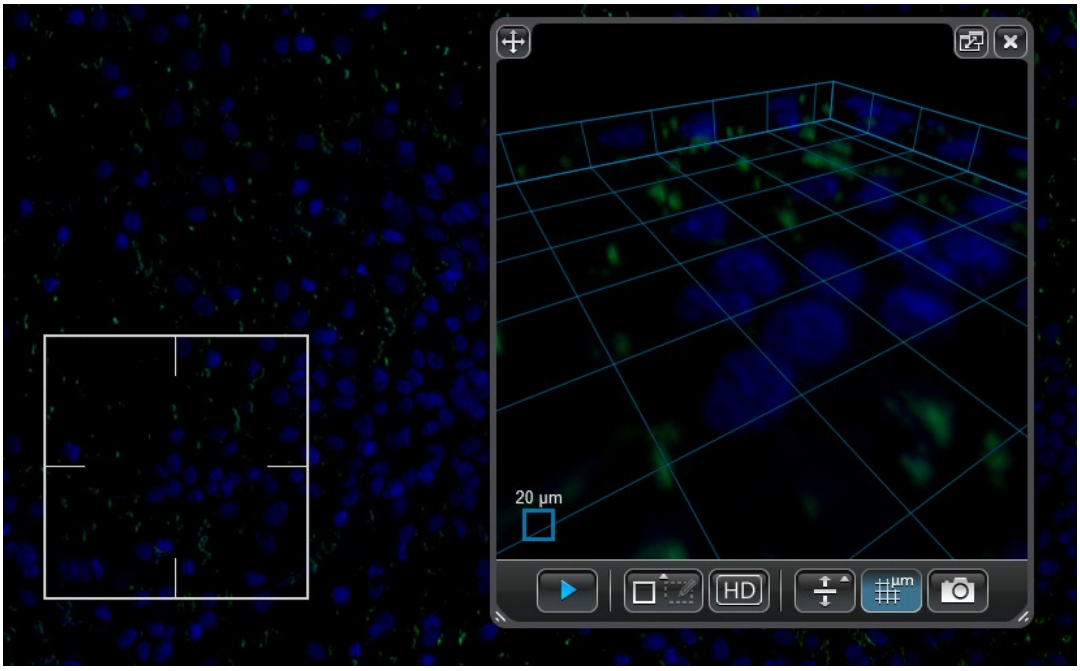
Show captions: Core captions are shown by default, but they can be turned off when this option is inactive.

Create annotations: if all the parameters are configured properly, click to apply annotations to the slide.

– Z-Stack 3D-View

This function is bound to the *Z-Stack 3D-Viewer* license, and is a new feature of CaseViewer, by which Z-Stack slides can be presented in 3D, thus providing a window into the investigation of tissue structures in 3D. This tool is optimal for the 3D visualization of brightfield and fluorescent slides as well.


43_BF_Z7_3
Annotation 1
Perimeter: 384.1 µm
Area: 8851.3 µm²
HD


20 µm
HD

– Start/Abort 3D reconstruction

– Select simple (ROI within the white marker rectangle) area or annotation as input

– High-Density visualization

– Stretch vertically

– Show grid

– Take snapshot

The visualization window can be reduced to small-view or restored to the previously set size by clicking . Move window by dragging it at the area of the window. Modify window size by dragging the areas at the bottom corners. Click to close the window.

14. Official website

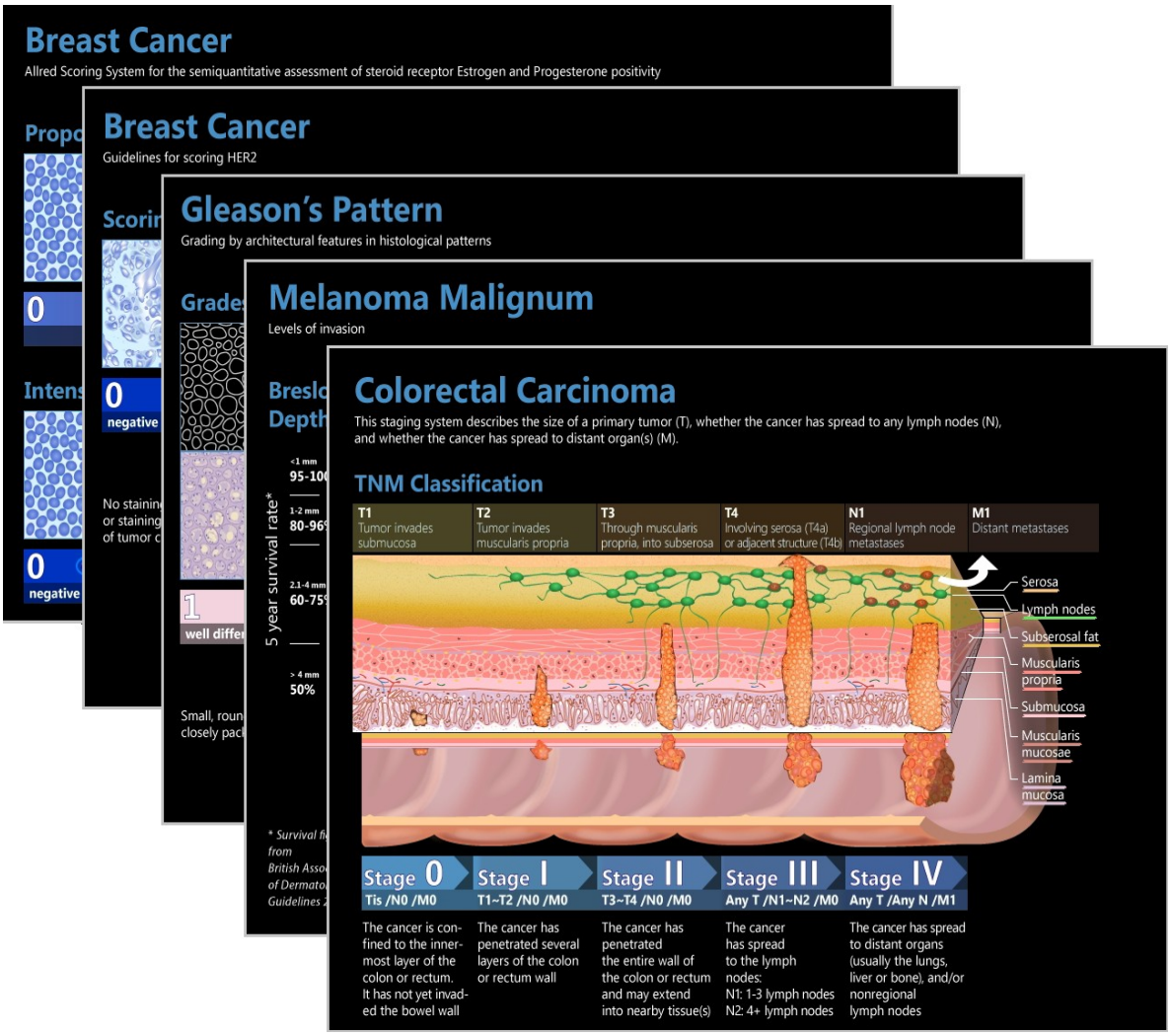
Upon clicking this area the website of 3DHISTECH Ltd. (http://www.3dhistech.com/) is opened in your browser.

15. Settings & Help

The first four sub-menus contain operation- and software-related guidance, help on how to use the touchscreen, hotkeys, and download the PDF format of this manual.

– Pathology guidelines

Upon clicking this button various pathology guidelines can be displayed as aids for scoring.

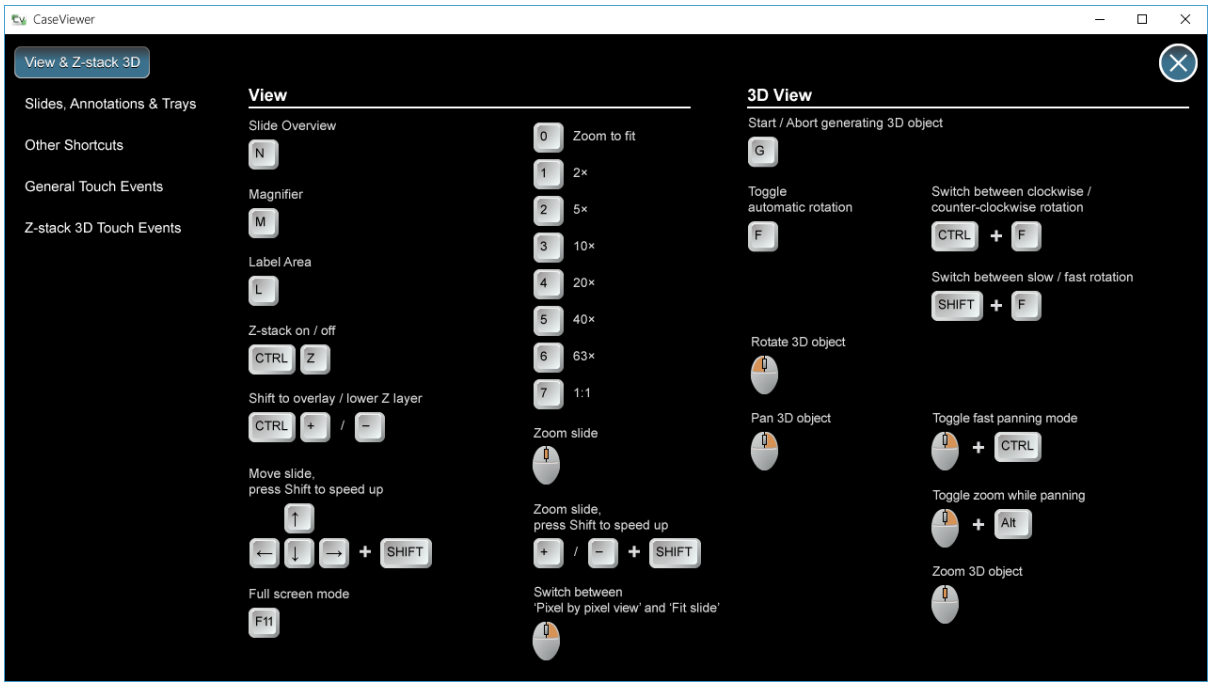


– Open Keyboard Shortcuts help

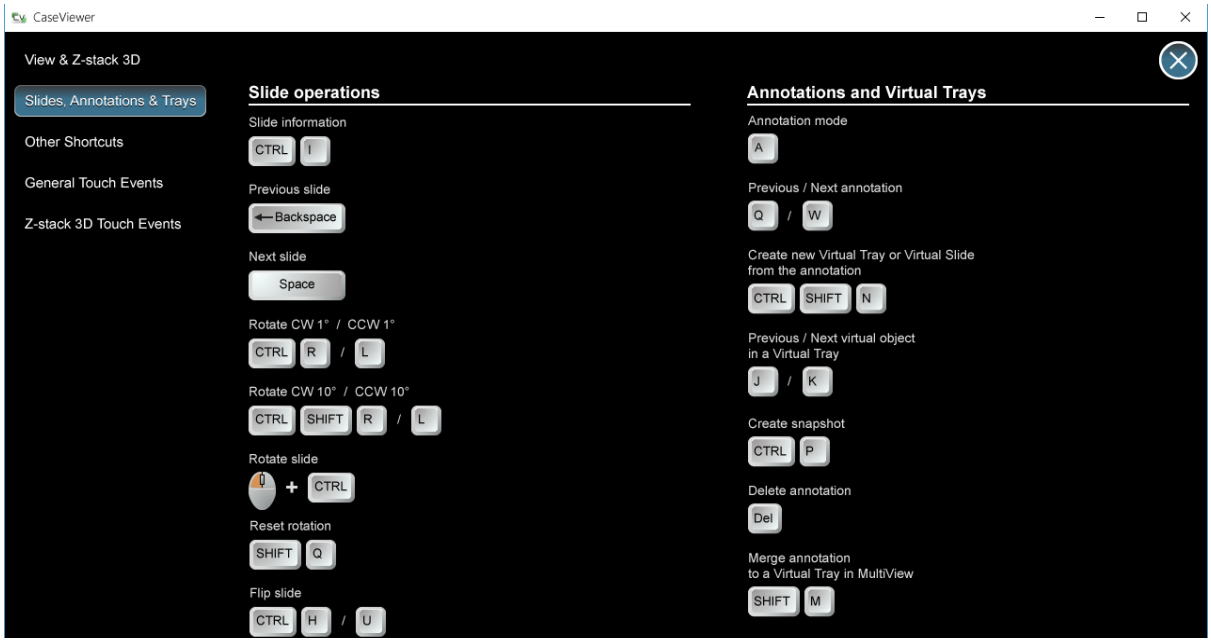
This window includes the following panels:

- **View & Z-Stack 3D**

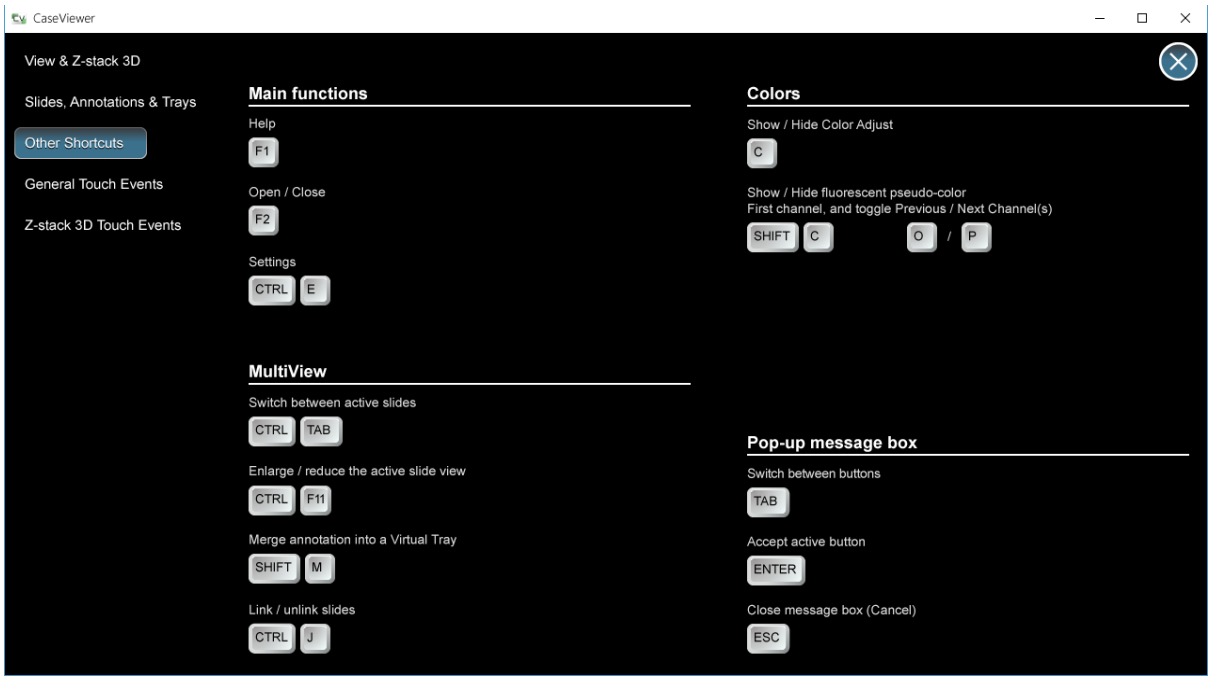
  This panel contains keyboard shortcuts you can use in CaseViewer to activate View and 3D-View functions.



- **Slides, Annotations & Trays**

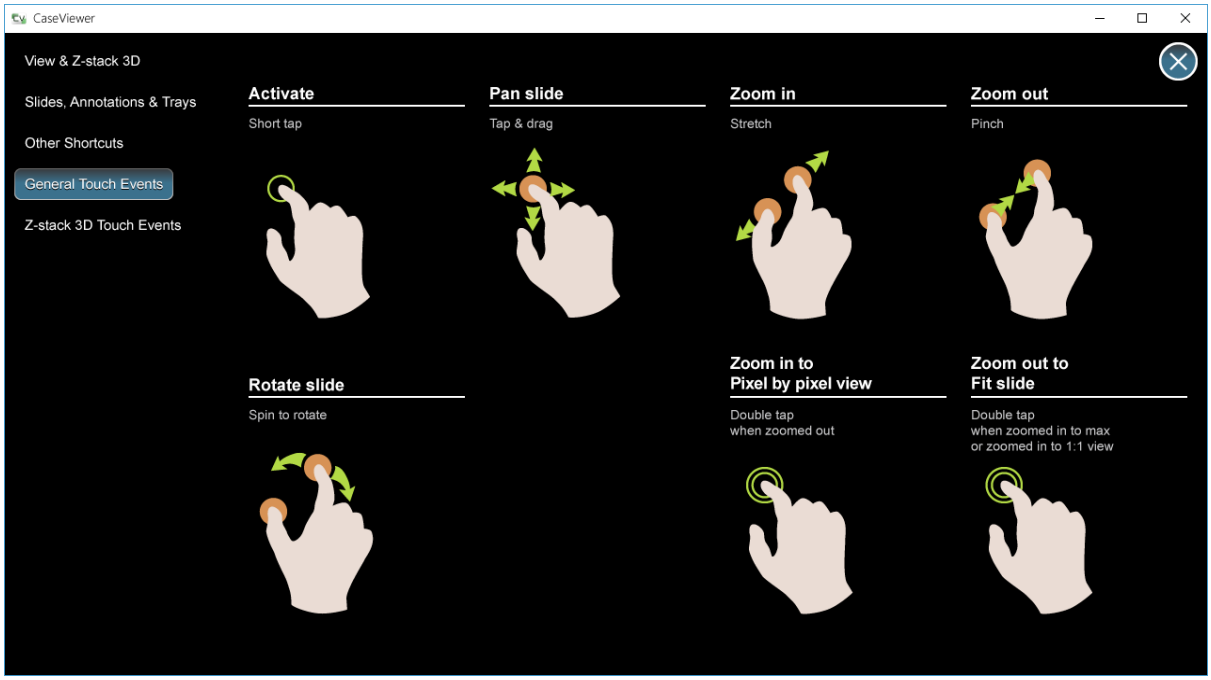


- **Other shortcuts**



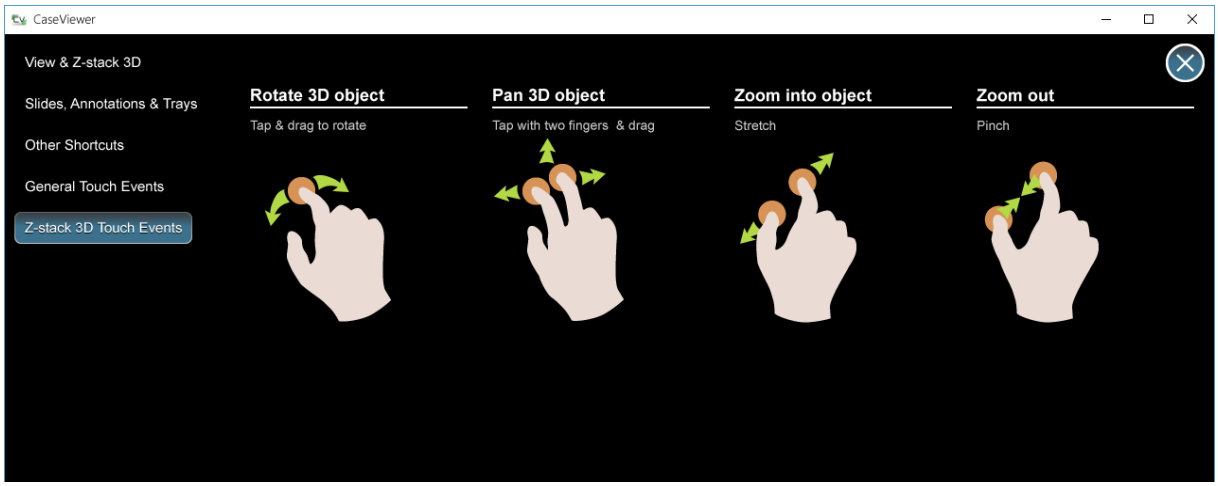
- **General Touch Events**

This window includes information regarding operating the software through the touchscreen of your device.



- **Z-Stack 3D Touch Events**

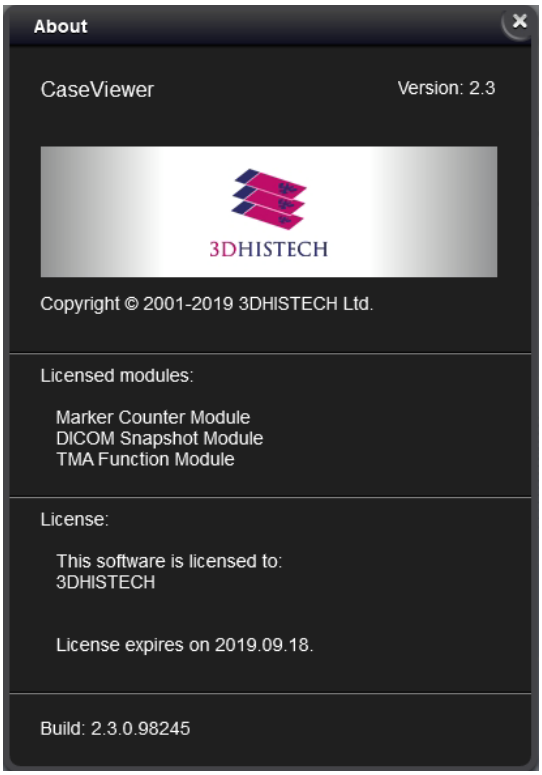
This window includes information regarding operating the software through the touchscreen of your device when viewing slides with the **Z-Stack 3D-View** tool.



– Open User Guide (PDF)

The CaseViewer User Guide in PDF format is opened upon clicking this button.

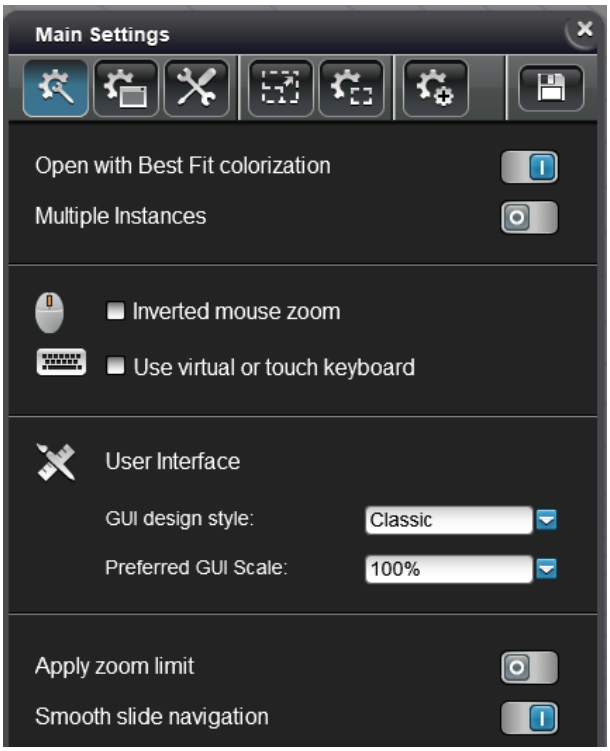
– About this program



- Settings

Operation-related settings of CaseViewer can be accessed through this window, and it includes the following panels:

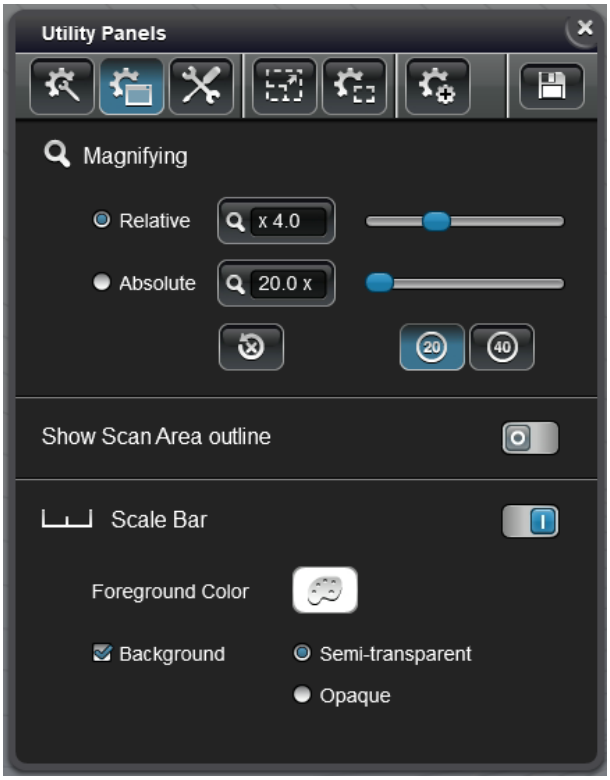
- **- Main settings**



  - **Open with Best Fit colorization**: Slide is opened with the Best Fit colorization function applied by default.
  - **Multiple Instances**: Enable/Disable running multiple instances
  - **Inverted mouse zoom**: activate this option to invert direction of zooming with the mouse wheel.
  - **Use virtual or touch keyboard**: upon clicking or touching a textbox in the GUI, the Windows On-Screen Keyboard (OSK) appears on the screen.
  - **User Interface**
    - **GUI design style:** it is available for you to select from two different styles – **Classic** and **Flat**.
    - **Preferred GUI Scale:** select the scale of the interface within the range of **50%** and **400%** if necessary. Scaling depends on the CaseViewer window size and the monitor resolution; so if for example 200% is set, the actual scaling can be less than that.

- The **Apply zoom limit** function restricts the applicable maximum magnification rate to 2x of 1:1; if not activated, it allows zooming at 16x of 1:1.
- **Smooth slide navigation**: When zooming in or out on the image, the transition between zoom levels and during navigation is performed without abruptness.

- **- Utility settings**

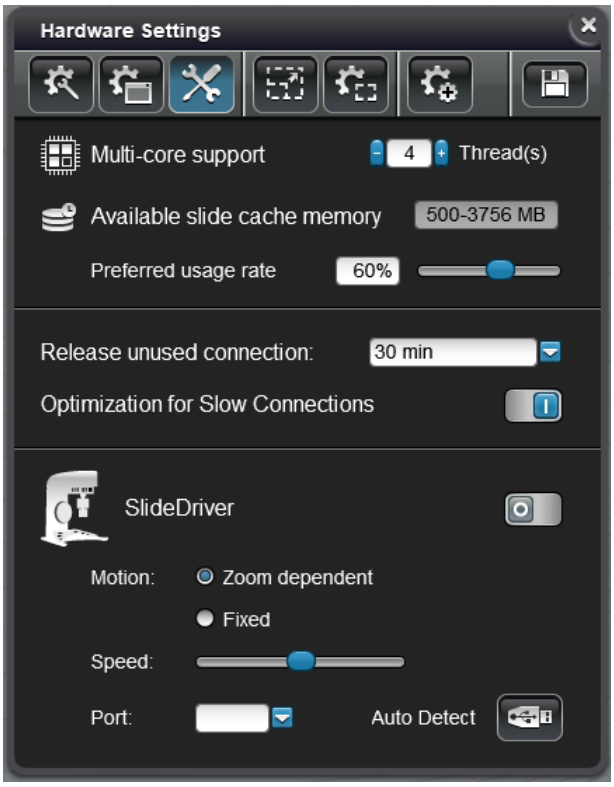


- **Magnifying**: sets magnifier window attributes. Select the option **Relative** to set magnifier window magnification to be dependent on the magnification of the slide. If selecting the option **Absolute**, the magnifier displays the set magnification. **Absolute** value can be set either to **20x** or **40x** magnification by clicking the corresponding button.

  Click to restore default settings.
- **Show Scan Area outline**: with this function the outer edge area of tissue is marked with an outline to show the exact area that has been scanned. This function is useful to mark the scanned area of the specimen.
- **Scale bar**: the scale bar displayed in the slide window can be switched on by clicking or off by clicking if necessary.

  The color of the scale bar can be modified after clicking . Note, that the color of the scale bar cannot be set to red, as it is used for presenting high-resolution of the slide. The color used actually is presented in the color box next to this button. To define the background color of the scale bar, activate the **Background** option, then select **Semi-transparent** or **Opaque**.

- **- Hardware settings**

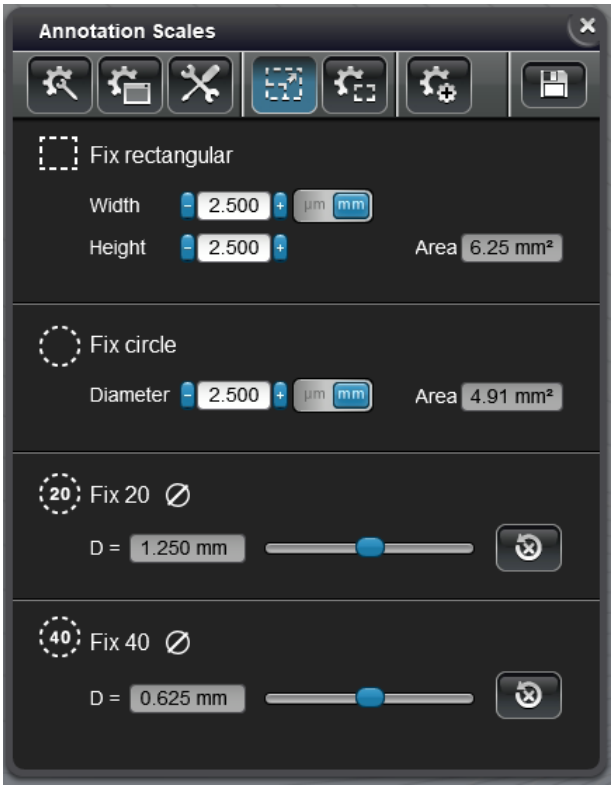


- **Multi-core support**: the program is capable to use multiple CPU cores to improve the speed of processing. The maximum number of cores that is supported is 16.
- **Available slide cache memory**: Size of memory allocation for caching slide data
- **Preferred usage rate:** Percentage of available RAM used for caching
- **Release unused connection:** connections, if not in use, will be checked and released after the specified time has passed.
- **Optimization for Slow Connections:** Enable when using slow connection
- **SlideDriver**: enables or disables SlideDriver device for more efficient use of the application. When using SlideDriver for the first time, the hardware must be detected by clicking the auto detect hardware settings button.

  Select **Zoom dependent** or **Fixed** motion option to set motion dependent from the magnification level used or to use a fixed value between steps during moving the slide image.

  The speed of panning can be set with the **Speed** slider, and the COM port of the device is selectable from the drop-down list. If you do not know the specific port, click **Auto Detect**.

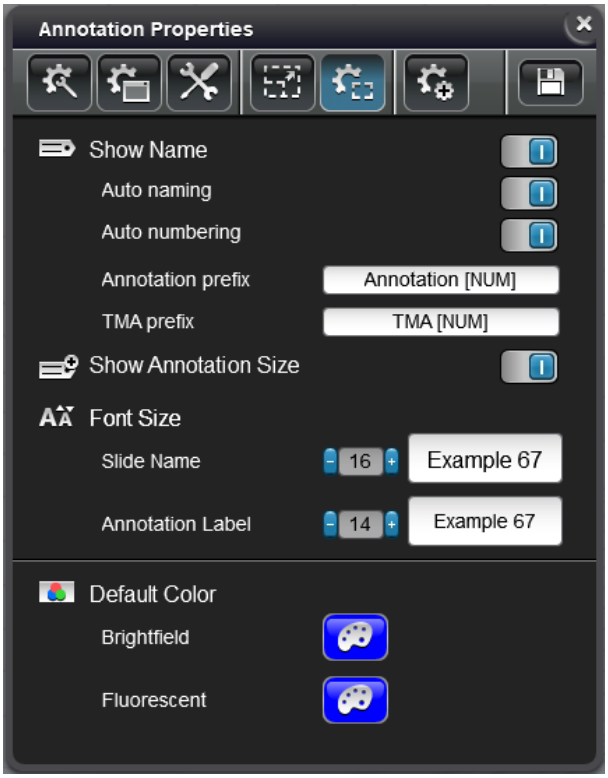
- **- Fixed proportions for annotations**



The size of annotations can be set in micrometers or millimeters.

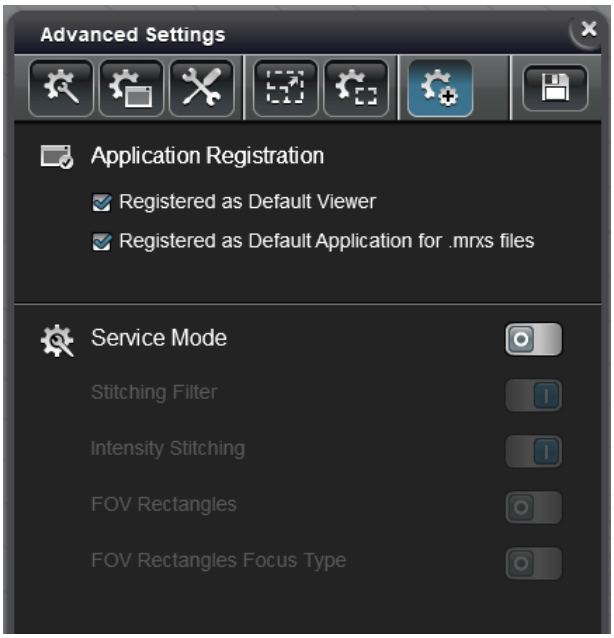
- **Fix rectangular***:* Type or click arrows to set values. Area is calculated and displayed automatically.
- **Fix circle***:* Type or click the arrow buttons to set diameter value of the annotation.
- **Fix 20** / **Fix 40**: Smaller adjustments can be made by dragging the sliders for both 20mm and 40mm FOVs.

- **- Annotation properties**



  - **Show Name**
    - *Auto naming*: activate this function to auto-name annotations with the set prefix text (default: Annotation).
    - *Auto numbering:* Automated numbering of annotations can be activated here.
    - *Annotation prefix:* Type a template for automated annotation naming and numbering.
    - *TMA prefix:* Type a template for automated naming and numbering of TMA markers.
  - **Show Annotation Size***:* The size of annotations are displayed if switched on.
  - **Font size***:* Font sizes of the following attributes can be set here:
    - *Slide Name*
    - *Annotation Label*
  - **Default Color**: the default border color of the annotation for brightfield or fluorescent slide images can be defined. Click the palette button of a predefined color to modify it.

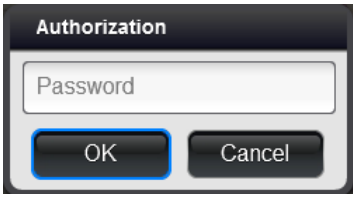
- **- Advanced settings**

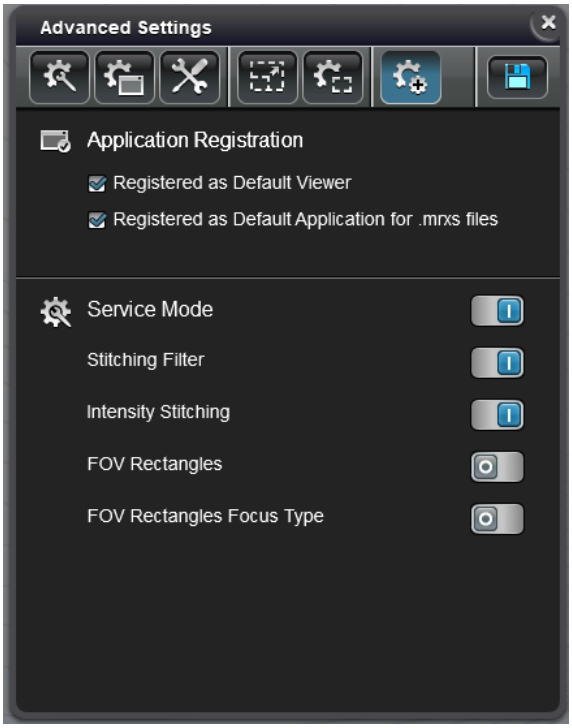


- **Application Registration**
  - **Registered as Default Viewer**: Set CaseViewer as default viewer for slides
  - **Registered as Default Application for .mrxs files**: Set CaseViewer as default viewer for .mrxs slides
- **Service Mode:** Enable/Disable Service Mode

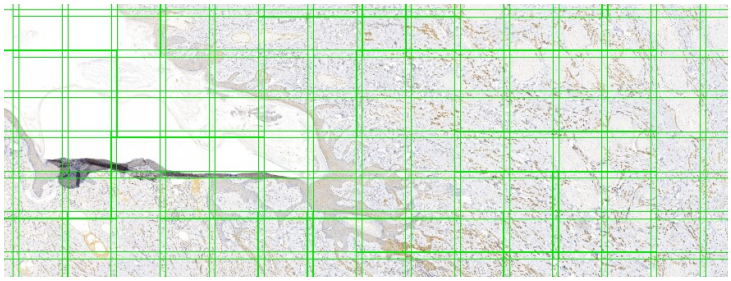
Important!

This option is password protected, the following settings are available for you to set only if you type in the password for authentication.

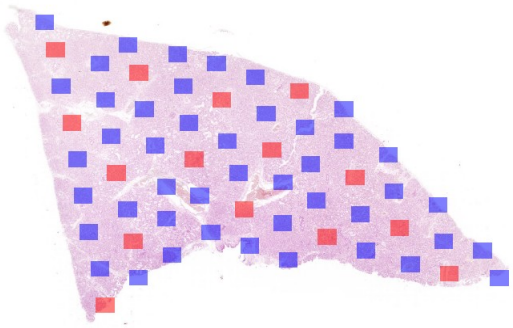




- **Stitching Filter***:* Enable/Disable Stitching Filter
- **Intensity Stitching***:* Enable/Disable Intensity Stitching
- **FOV Rectangles***:* Enable/Disable displaying of FOVs on the slide



- **FOV Rectangles Focus Type***:* Enable/Disable displaying of a Focus Map showing course and fine focus points used during scanning



Click to save modifications when finished.

16. Z-Stack panel

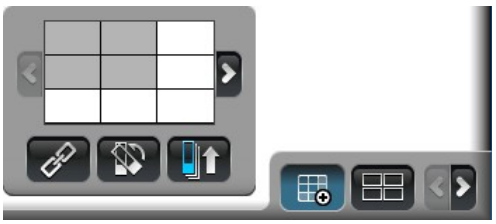
Pannoramic scanners are capable of acquiring Z-Stack images (consisting of several layers of different focus levels). By default, the viewer displays the so-called *Extended Focus Level* (for details see the user guide of the specific scanner).

Z-Stack mode is activated and displayed as by default, otherwise click to turn on Z-Stack mode. Different Z-Stack levels can be viewed by moving the slider up- or downwards by dragging or scrolling. The desired value can be entered in the indicator field that shows the actual distance from the center focal level in micrometers.

To turn on Z-Stack prefetching click , thus transition between layers becomes smooth as the maximum of 17 layers (8 above and 8 below the initial layer) are preloaded by the software.

17. MultiView toolbox

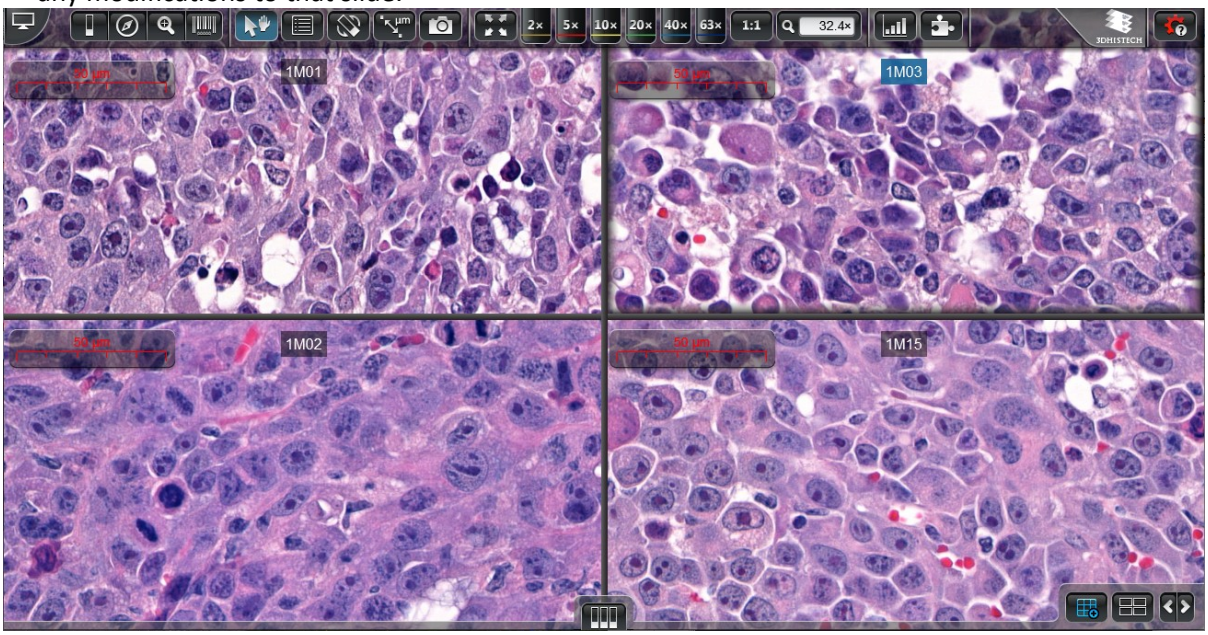
CaseViewer allows parallel and synchronized view of maximum nine slides at the same time. Splitter lines (borders of the panes) can be moved, making it available for you to modify the pane area in which the slide can have more space on the display.



Click to select the number of slides to be displayed in the MultiView window, then drag the area of maximum 3x3 panes.

- – Slides can be linked to each other, so they can be moved and magnified in a synchronized way.
- – Aligns the slides in the inactive panes to the slide in the active one, hence the same orientation and zoom level are adapted and any modification (in zoom level and navigation) be applied for all of the displayed slide images.
- – Opens all slides starting with the selected slide in the case or folder.
- and – Loads the next/previous batch slide within the case or folder depending on the selected number of views.

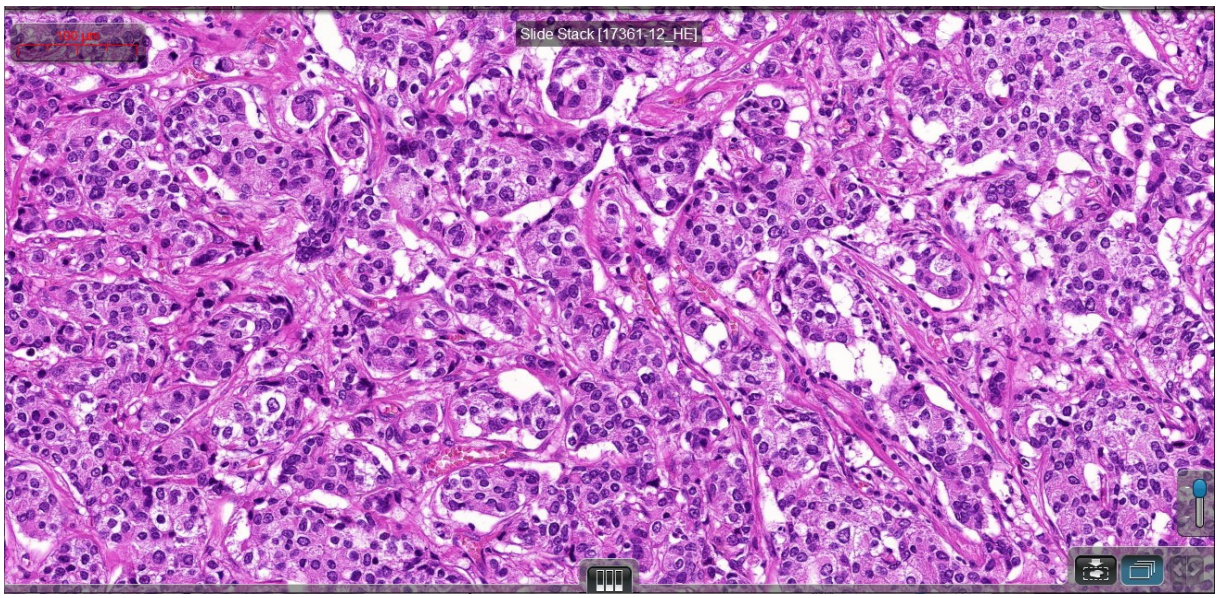
In MultiView mode first you must click the pane of the slide to select it before managing or making any modifications to that slide.



– Loads the next/previous slide within the case or TC session. This is a built-in function of SlideDriver as well.

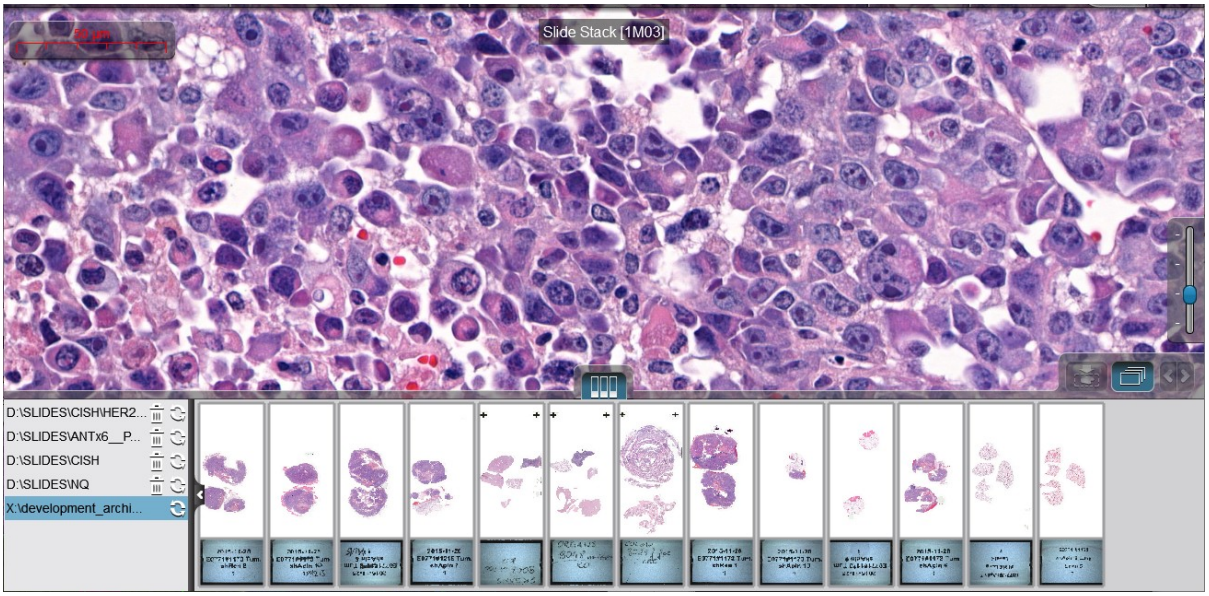
If clicking the button the slides will be displayed in slide stack display mode. The transition can become smooth between slides when dragging the slider gently between the layers/steps or click at the slider notches to view different slides. If using the **Ctrl+F11** shortcut, the selected view in MultiView mode is displayed in single-view. Click to return to MultiView mode.

– **Slide stack export**: A Virtual tray is created containing the slides that are open in MultiView mode into the folder of the first slide. This function is available for slides opened from CaseCenter server.



18. Quick slide access

If you want to open another slide from another location, first click to access **Local** or **CaseCenter** folder of the actually selected slide, then browse for the slide or drag the slide into one of the panes.



At the left bottom pane the paths of the previously opened slides are listed. This list is hidden by default, and can be opened by clicking the button.

If you click on any of the listed paths, the content of the folder is displayed as slide thumbnails at the right bottom pane.