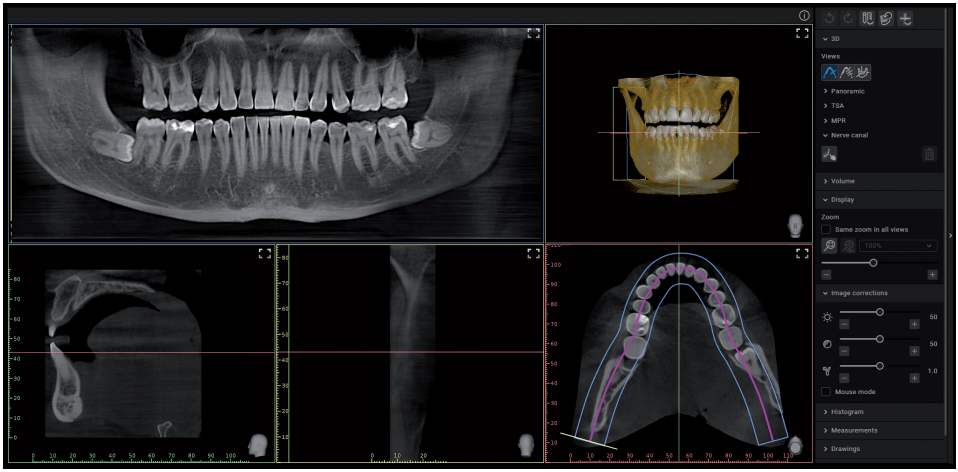
VistaSoft Cloud View



EN Manual

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Important information

1 About this document

This manual forms part of the software. It corresponds to the version of the software and the technical standards valid at the time of installation.

In the event of non-compliance with the instructions and information contained in this manual, the manufacturer and the distributor will not offer any guarantee or accept any liability for the safe operation and the safe functioning of the unit and the software.

The German version of the instructions is the original manual. All other languages are translations of the original manual.

1.1 Explanation of symbols used

These symbols are used within this document and in the software:

Note, e.g. specific instructions regarding efficient and cost-effective use of the unit.

Manufacturer

1.2 Copyright information

2 Safety

2.1 Intended purpose

The software offers only functions for displaying digital or digitalized 2D/3D X-ray images and videos. The software is exclusively for information and education purposes as well as for the use in regards to data exchange intended.

2.2 Improper use

The software must not be used for diagnostic purposes.
Information obtained with the help of this software must not be used for the purposes of any treatment or planning of a treatment.
The software does not have any specific filter for diagnosis or functions for managing patients. Images on which filters are used cannot be stored.
Any other usage or usage beyond this scope is deemed to be improper. The manufacturer accepts no liability for damages resulting from improper usage. The user bears the sole risk.

2.3 General safety information

- When using the software, always comply with all guidelines, laws and other rules and regulations that are applicable at the site of operation.
- Do not modify the software.
- Observe software manual.

2.4 Protection from threats from the Internet

The web application is downloaded from the Internet. The computer must therefore be protected from threats from the Internet.

- Use antivirus software and update it regularly. Look for evidence of possible virus infection and, if applicable, check with the antivirus software and remove the virus.
- Use, properly configure and regularly update your firewall.
- Update the computers operating system regularly.

Product description

VistaSoft Cloud View is a web application for looking at x-ray or video images.
The software is downloaded from the Internet and executed locally in the browser. The images remain in the local storage.
The images can be opened and modified with editing tools but not saved. The selection of editing tools depends on the opened image format.
The following image formats can be displayed:
– DICOM (*.dcm)
– PNG (*.png)
– JPEG (*.jpg)
– TIFF (*.tif)

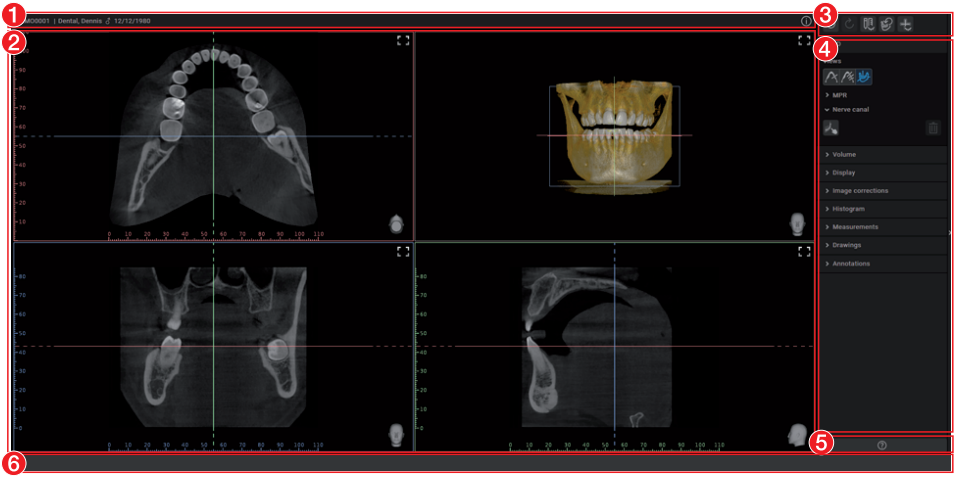
The web application has not been tested or certified for clinical use. It is not approved as a medical device and must not be used for diagnostic purposes.

3 System requirements

Browser:	Google Chrome Microsoft Edge Opera (Each in the current PC version)
Interface:	Internet connection

Usage

4 Notes on use



1	Patient data bar	Information on the patient and image if these are contained in the image file
2	Light table	Area in which the image is displayed
3	Menu bar	Various commands for the displayed image
4	Toolbox	Tools for temporary image processing The tools on offer differ depending on the image type.
5	Help	Opens the software help in a separate browser tab
6	Status bar	The status bar displays notes on operation, e.g. on the use of the tools in the toolbox. A new message pulses blue-grey for around 3 seconds.

The menu bar contains various commands for the image displayed on the light table, depending on the image type:

	Undo or repeat action
	Hide/show annotations and measurements
	Reset all MPR and TSA planes to their standard orientations (3D only)

	Hide/show all MPR/TSA lines and the panoramic curve (3D only)

5 Starting the software

› Open web application in the browser:

› *https://view.vistasoft.com*

6 Open image

Open image with drag & drop:

› Click and hold down the mouse button and drag the image file into the browser window (drag & drop).

› Release the mouse button.

Open image from the local file:

› Click on ***Select images ....***

› Select an image file and click on ***Open***.

7 Display image information

The image information can be displayed for each image.

Unable to edit image information.

› Click ⓘ in the patient data bar.
  The image information included in the image is displayed in a flyout.
› To change the display of the dental notation system (FDI, UNS, Palmer), select the desired dental notation system in the selection list.

8 Navigating

The following navigation aids can generally be used:
– Mouse wheel: zoom in/zoom out image section
– Right mouse button: ✥ Move image section

8.1 Navigating in CBCT images (3D)

In digital volume tomography (CBCT), three-dimensional volume data is reconstructed from a large number of individual two-dimensional X-ray images (layer images). Various views are available in the software (see "Views").

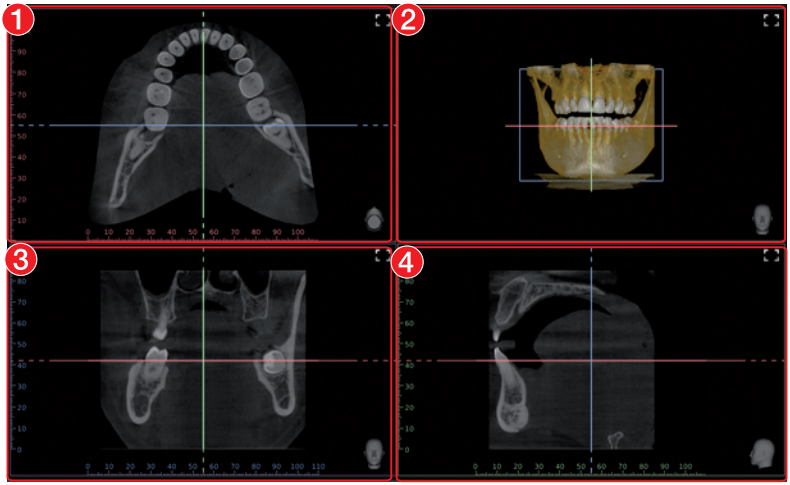


Fig. 1: Example: MPR view

Various functions can be used to navigate through the slice planes/layers in the CBCT images. With the aid of these functions the slice planes can be moved or rotated in such a way that the important regions can be made visible for the examination.
In the illustration below all of the navigation functions have been made visible.

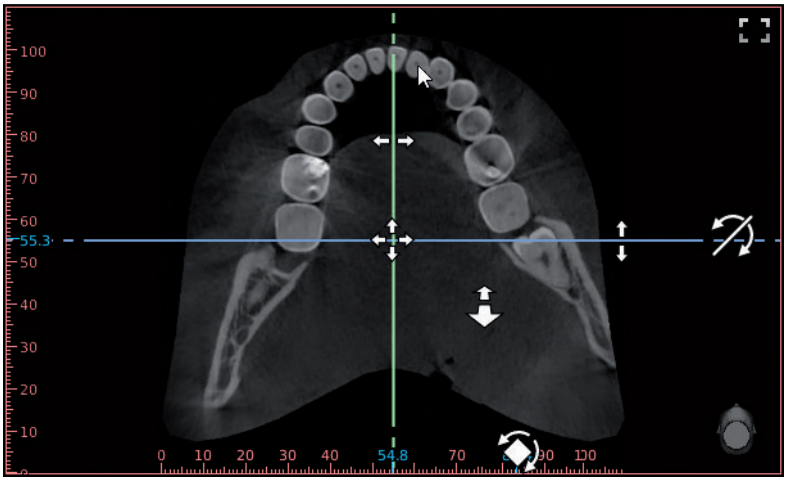


Fig. 2: Example image showing all of the navigation functions

	Jump to this point	Double-click in any view (except the volume view) to jump to this point in the volume. The slice planes in all views are moved accordingly.
	Move individual slice plane	Press and hold the left mouse button on a slice plane to drag it horizontally/vertically.
	Move two slice planes together	Press and hold the left mouse button on the intersection between two slice planes to move them together at the same time.
	Rotate slice plane	Press and hold the left mouse button on the dotted edge of a slice plane to rotate it.
	Tilt slice plane	Press and hold the left mouse button in the edge region of the view to tilt the view.
	Scroll layers	Press and hold the left mouse button in a free area in the view to scroll through the layers.

An orientation button is displayed at the bottom right of each view showing the current viewing angle onto the patient.
The view can be changed in the volume view. The slice planes are displayed in the volume view, but they cannot be changed here.

	Move image section	Press and hold the right mouse button to move the image section upwards/downwards or to the left/right.
	Rotate view	Press and hold the left mouse button to rotate the view.
Zoom image section in/out		Rotate the mouse wheel to increase or reduce the image section. The zoom tools of the toolbox (*Display*) are not active in the volume view.

The orientation head always displays the current viewing angle onto the patient. In the volume view the viewing angle can be selected directly via the orientation head:

	Orientation head front	Move the mouse cursor onto the orientation head. The views onto the orientation head are displayed and can be clicked on to select them.
	Orientation head rear	
	Orientation head left	
	Orientation head right	
	Orientation head top	
	Orientation head bottom	

9 Edit image temporarily

The toolbox contains tools for temporarily changing the presentation of the images on the light table.
The tools are divided into groups and can be expanded or collapsed with ›.
Selection of tools depends on which image is open on the light table.
Image changes can be reversed with ↺ and restored with ↻.

The changes to the image are not saved.
All changes are deleted when the image is closed.

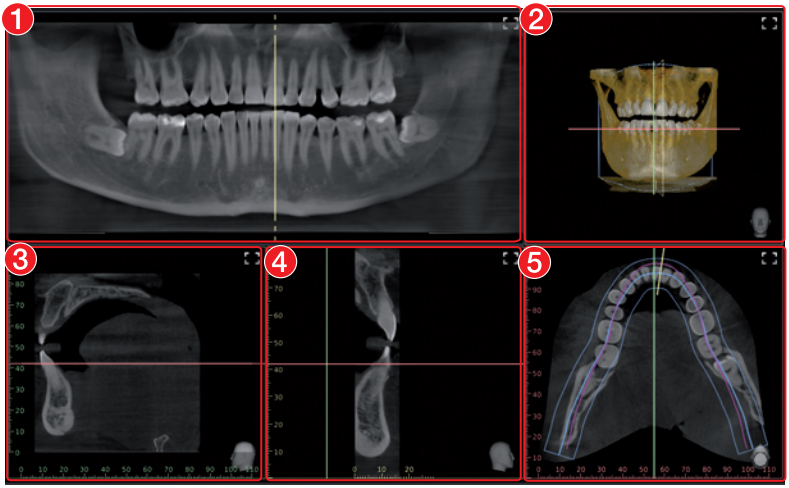
9.1 3D

Views

In digital volume tomography (CBCT), three-dimensional volume data is reconstructed from a large number of individual two-dimensional X-ray images (layer images). Different views are available for evaluation of the data. These views can be selected under *View* .

Panoramic view

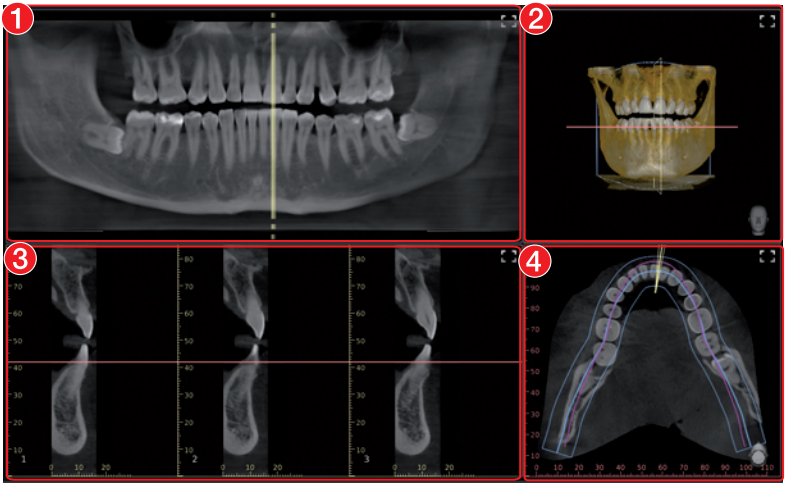
In the panoramic view a panoramic view is also displayed in addition to the slices. This panoramic view is calculated on the basis of the panoramic curve along the arch of the jaw. In addition, a slice of a transversal layer image (TSA slice) is displayed, which is calculated orthogonally to the panoramic curve.
Every CBCT image is initially opened in the panoramic view.



1 Panoramic view (calculated along the arch of the jaw)
2 Volume view
3 Sagittal MPR slice (view from left/right)
4 TSA slice (orthogonal to the panoramic curve)
5 Axial MPR slice (view from the top/bottom)

TSA view

With the TSA view, several transversal layer images (TSA) are displayed in addition to the panoramic view.
The TSA slices are numbered (bottom left). The numbering allows adjacent TSA slices to be recognised, which makes drawing the nerve channel easier.

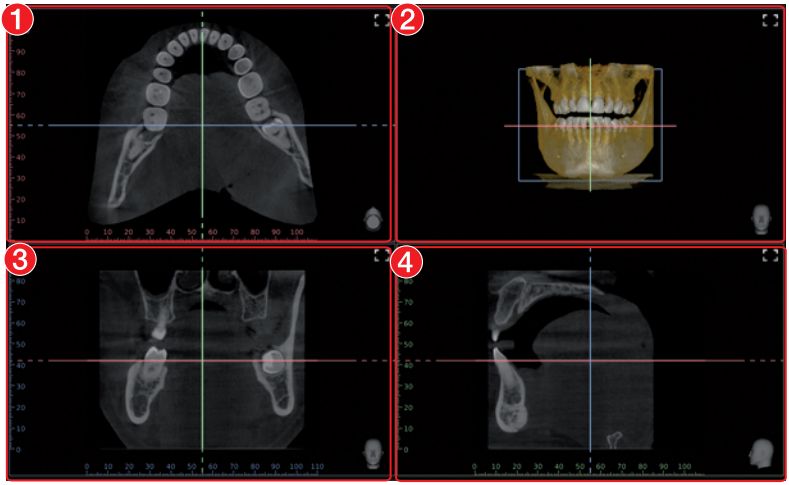


1 Panoramic view (calculated along the arch of the jaw)
2 Volume view
3 TSA slices (orthogonal to the panoramic curve), the number of slices can be chosen via the layout
4 Axial MPR slice (view from the top/bottom)

If the mouse cursor is positioned above one of the TSA slices, this TSA slice is highlighted in colour in the other views.

MPR view

With the multiplanar reconstruction (MPR), any two-dimensional layer and slice images can be displayed.



1 Axial MPR slice (view from the top/bottom)
2 Volume view
3 Coronal MPR slice (view from the front/rear)
4 Sagittal MPR slice (view from left/right)

Panoramic

	Standard panoramic curve, lower jaw	The standard curve form is automatically positioned on an axial layer that extends through the lower jaw
	Standard panoramic curve, upper jaw	The standard curve form is automatically positioned on an axial layer that extends through the upper jaw
	Standard panoramic curve on current slice plane	The standard curve form is manually positioned on the current axial slice. The centre point of the arch of the jaw is manually positioned by the user.
	User-defined panoramic curve on current slice plane	A free curve form is manually positioned on the current axial slice. The individual points of the panoramic curve are manually positioned one after the other.
	Abort creation of user-defined panoramic curve	During creation of the user-defined panoramic curve the points that have already been positioned are deleted again.
	Panoramic thickness	The layer thickness of the panoramic curve can be freely adjusted with a slider. With a lower thickness the panoramic view is sharper but noisier. With increasing thickness the noise is reduced, but the panoramic view appears less sharp. Here, with increasing thickness the panoramic view approaches the character of a panoramic X-ray image (2D).

The panoramic curve (except for the anatomically adjusted panoramic curve) can be moved and edited once it has been positioned.
The panoramic curve is also shown in the annotations.

Positioning the panoramic curve automatically:

› Click  (maxilla) or  (mandible).
The panoramic curve is positioned. The panoramic view is calculated.

Position standard panoramic curve on current slice plane:

› Adjusts the slice plane in the axial MPR slice.
› Click  .
› In the axial MPR slice click on the centre point of the arch of the jaw.
The standard panoramic curve is positioned. The panoramic view is calculated.

Creating a user-defined panoramic curve:

› Adjusts the slice plane in the axial MPR slice.
› Click  .
› In the axial MPR slice left-click on the edge of the arch of the jaw.
› Position the further points of the arch of the jaw with the left mouse button.
› Place the end point of the arch of the jaw with the right mouse button.
The panoramic view is calculated.

Moving a panoramic curve:

› Press and hold the left mouse button on the line of the panoramic curve (not on a point) and move the curve.
The entire panoramic curve is moved. The active layer is moved at the same time in parallel.

Editing a panoramic curve:

› To move a point of the panoramic curve, press and hold the mouse button on the point and drag it.
› To add a point, press the Ctrl key and left-click on the panoramic curve between the points.
› To delete a point, press the Ctrl key and left-click on the point on the panoramic curve.
› To scale the panoramic curve, press the Shift key, left-click on the panoramic curve and hold the button pressed while increasing/reducing the panoramic curve.

TSA

	Select TSA layout	Flyout for selection of the layouts or the number of transversal slices that are to be displayed (maximum of 6 rows x 10 columns)
	TSA distance	With the aid of a slider the distance between the transversal slices can be changed (0.2 mm - 10.0 mm).
	TSA length	With the aid of a slider the length of the transversal slices can be changed (2 mm - 200 mm).
	TSA width	With the aid of a slider the width of the transversal slices can be changed (0.1 mm - 10.0 mm).

Select TSA layout:

› Click  .
The flyout with the matrix for selection of the TSA views opens.

› Move the mouse cursor over the matrix.

› When the required TSA views are selected (marked blue) click on the matrix.

Result:

The TSA slices are displayed and shown in the other views.

Moving TSA slices:

› In the panoramic view or the axial slice, use the left mouse button  to move the TSA slices.
All TSA slices are moved together along the panoramic curve.

Tilting TSA slices:

› In the panoramic view, use the left mouse button  to tilt the TSA slices.
The TSA slices can be tilted by max. ± 75°.
TSA slices are tilted together in parallel. The position of the TSA slices is also displayed in the volume view, but cannot be changed in this view.

MPR

	Thickness of MPR slices	The thickness of the MPR slices can be changed with the slider. The lower the thickness, the sharper but the noisier the image. The higher the thickness, the lower the noise but the less sharp the image.

The adjustment always applies to all slices (sagittal, coronal, axial) of an MPR view.

Nerve canal

	Draw nerve canal in image	The nerve channel can be drawn in all two-dimensional views (panoramic view and slices). The individual anchor points of the nerve channel are manually positioned one after the other. Once the nerve channel has been drawn, it is visible as a semitransparent "tube" in all views, including the volume view. It is saved as an annotation.
	Delete nerve channel	Deletes a nerve channel that has already been created. To do this, the nerve channel must be selected in a view or in the annotations.

In the list of annotations, the drawn nerve channel can be called up again. When it is called up, the slices and the panoramic view are reset to the representation in which the nerve channel was drawn.

The nerve channel can be drawn in all two-dimensional views (slices and panoramic view) and is displayed in all views (including the volume view).

Drawing the nerve canal manually:

› Click  .

› Left-click with the mouse to position the anchor points of the nerve channel.
You can also hold the shift key and use your mouse wheel to scroll through the layers.

› Set the last anchor point with the right mouse button.

Edit nerve channel:

› To move an anchor point of the nerve channel, click on the anchor point, hold the mouse button and move the point.

› To add an anchor point, press the Ctrl key and left-click on the nerve channel between the anchor points.

› To delete an anchor point, press the Ctrl key and left-click on the point of the nerve channel.

Change display of nerve channel:

› To change the colour and thickness, select the nerve channel in the annotations and click ⚙.

Delete nerve channel:

› Select the nerve channel in a two-dimensional view or in the annotations.

› Click 🗑.

Volume

There are different display options in the volume view:

X-ray	Simulated X-ray projection image
Maximum value	Simulated X-ray projection image, the brightest point is shown for every image point in the viewing direction
ISO layer	View of the volume combining two opaque surfaces: soft tissue (brown) and bone structures (white)
3D	3D rendering
User-defined	3D rendering with simulated illumination. Skin tissue and muscle tissue are displayed in addition.

Slice		**Display of the slice planes in the volume view**
	Show slice plane edges only	Only the edges of the slice planes are displayed (may be masked by the volume display).
	Show slice planes with semitransparent surface	The slice planes are displayed with colour-filled surfaces (may be masked by the volume display or other slice planes).
	Hide slice planes	The slice planes are not visible.
Axial		Region above or below the slice plane is hidden.
Sagittal		Region to the left or right of the slice plane is hidden.
No slice		Everything is visible, all regions are displayed.
Reverse		Hidden regions are inverted (top/bottom or left/right).

In the *3D* view different tissue types are shown with different colours. The visibility of the tissue types can be adjusted with the relevant slider.

Tissue types in the *3D* view:

- Bone
- Dentine
- Enamel
- Metal

Tissue types in the *User-defined* view:

- Skin
- Muscle
- Bone
- Dentine
- Enamel
- Metal

The colours for the tissue types can each be chosen via a flyout in the *User-defined* view.

9.2 Display

These tools allow you to alter the image view. The zoom tools change the size that the image is displayed on the light table. The settings are not saved.
The settings for rotating and inverting an image are not saved.
With CBCT images (3D) the zoom tools can only be used on the MPR slices (axial, sagittal and coronal). The tools for image rotation and mirroring are not available for CBCT images (for information on how to rotate a slice, see "8.1 Navigating in CBCT images (3D)").

Zoom


This matches the size of the image to the size of the window.

This magnifies the image so that one screen pixel equals one image pixel.

The current zoom factor is displayed. A defined zoom factor can be selected. (only 2D)


The zoom can be adjusted to any required setting via the slider. You can also use the mouse wheel to adjust the zoom. (only 2D)

Rotate image


Rotate the image anti-clockwise by 90°.


Rotate the image clockwise by 90°.

Mirroring


Horizontally invert the image


Vertically invert the image

9.3 Image corrections

The image brightness, contrast and gamma can be corrected. As you adjust the sliders, you can see the changes directly in the image itself.


Adjust the image brightness


Adjust the image contrast


Adjust the image gamma value
< 1: Bright areas become darker
> 1: Dark areas become brighter

Mouse pointer icon


Brightness and contrast can also be changed directly in the image using the left mouse button. For this purpose, go to *Toolbox* > *Image corrections* and enable the option *Mouse mode* .
When the left mouse button is held down, making horizontal motions over the image changes the brightness, while vertical motions adjust the contrast. The sliders in the toolbox move along accordingly.
This option can be enabled separately for 2D X-ray/video images and for 3D X-ray images. It is preset for 2D X-ray/video images.

9.4 Histogram

The histogram shows the brightness distribution of the image.
Histogram windowing allows you to alter the image's grey scale values. The ***black limit*** shows the percentage of grey scale values changing to black, and the ***white limit*** shows the percentage of grey scale values changing to white. The limits can be altered to suit your requirements. The settings you have applied will be immediately apparent in the X-ray image on the light table.
The changes this makes to the image can emphasize structures that are otherwise too small to be distinguished by the human eye so that they can be identified.

Editing a histogram:

› Use the two sliders to adjust the black and white limits.

› To move the entire selected range between the black and white limits click  in the middle of the region and move it with the mouse button pressed.

9.5 Measurements

In order to estimate lengths and angles in 2D X-ray images, the image needs to be calibrated with the aid of a reference image object. Despite calibration, this estimation does not show the accuracy of a measurement and must not be used as a measured result. The accuracy depends greatly on the projection distortion of the object on the image detector area.

In video images, lengths and angles cannot be estimated to scale. Panoramic X-ray images are not suitable for measuring due to their projection technique.

On CBCT images (3D) the calibration is calculated geometrically. Measurements are only possible in the slices (axial, sagittal, coronal and TSA), but not in the volume view or panoramic view.

The accuracy of the measurement results depends largely on the accuracy of the metadata generated by the software that exported the image.

The following measurements can be performed:

	Simple line (start and end point)
	Polyline (start, intermediate point and end point)
	Angle (between two straight lines)

The image needs to be calibrated for the measurements.

	Calibration Calibrate the image using this length for the selected line

Rulers can be displayed on calibrated images. Rulers are not available for uncalibrated images or for the measurement unit 'pixels' (px).

	Show rulers
	Hide rulers

Perform calibration with a reference object:

› Click .

› In the image, click on the start point with the left mouse button.

› Click with the left mouse button on the end point.

› Under *Tools* and *Calibration* enter the actual length of the measured length (e.g. the diameter of a steel sphere).

› Click .

The values are copied to the image.

Measuring a simple line:

› Click .

› In the image, click on the start point with the left mouse button.

› Click with the left mouse button on the end point.

The measured result is displayed directly on the measurement line.

Measuring a polyline:

› Click .

› In the image, click on the start point with the left mouse button.

› Use the left mouse button to add as many intermediate points as you want.

› Click with the right mouse button on the end point.

The measured result for the overall distance is displayed directly on the measurement line.

Measuring an angle:

› Click .

› In the image, click on the start point of the first straight line with the left mouse button.

› Click with the left mouse button on the end point of the first straight line.

› Click on the start point of the second straight line with the left mouse button.

› Click with the left mouse button on the end point of the second straight line.

The angle between the two straight lines is displayed.

Editing a measurement:

› In the image, click on the measurement with the left mouse button.

This activates the measurement and the anchor points are displayed.

› To move the anchor point, click on the anchor point with the left mouse button , hold the mouse button and move it.

Change the display of the measurement:

› Click the measurement to activate it.

› Change the colour or line width.

Delete measurement:

› Click the measurement to activate it.

› Click .

9.6 Drawings

Drawings can be inserted into the image. All drawings are saved as annotations.
The following drawing tools are available:

	Create free-hand drawing
	Create a line
	Create an arrow
	Create a rectangle
	Create an ellipse

Create free-hand drawing:

› Click  .
› In the image, click on the start point of the free-hand drawing using the left mouse button.
› Keep left mouse button down and create a freehand drawing.
› Release the mouse button to finish the free-hand drawing.
The mouse cursor retains the function of the free-hand drawing.
› To create a second free-hand drawing, press the left mouse button and keep it pressed while you draw.
› To finish the free-hand drawing, press the right mouse button.

Create a line:

› Click  .
› In the image, click on the start point of the line using the left mouse button.
› Click on the end point of the line using the left mouse button.

Create an arrow:

› Click  .
› In the image, click on the start point of the arrow using the left mouse button.
› Click on the endpoint of the arrow using the left mouse button.

Create a rectangle:

› Click  .
› Click in the image with the left mouse button to place the first corner of the rectangle.
› Move the mouse cursor.
A preview of the rectangle is displayed.
› Click with the left mouse button to define the size of the rectangle.

Create an ellipse:

› Click  .
› In the image, click on the start point of the ellipse using the left mouse button.
› Move the mouse cursor.
A preview of the ellipse is displayed.
› Click with the left mouse button to define the size of the ellipse.

Shift drawing:

› In the image, click on the drawing using the left mouse button.
This activates the drawing and the anchor points are displayed.
› Keep the mouse cursor  pressed and move the drawing.
› Release the mouse button.

Edit drawing:

› In the image, click on the drawing using the left mouse button.
This activates the drawing and the anchor points are displayed.

The anchor points of pre-hand drawings cannot be edited.

› To move the anchor point, click on the anchor point with the left mouse button  , hold the mouse button and move it.

Change the display of the drawing:

› To change the colour and line thickness, select the drawing in ***Annotations*** and click  .

Delete drawing:

› Mark the drawing in ***Annotations*** in order to activate it.
› Click  .

9.7 Annotations

All drawings, measurements and nerve channels of an image are saved as annotations. The anno-

tations are displayed in the list and can be called up again.
When an annotation is called up on a 3D image, the views/slices return to the view in which the annotations were drawn.
Every measurement is indicated in the list with the type, colour and numerical value.

Type of annotation	
	Freehand annotation
	Line drawing
	Arrow drawing
	Rectangle drawing
	Ellipse drawing
	Simple line measurement
	Polyline measurement
	Angle measurement
	Nerve channel (3D only)
	Panoramic curve
	Implant

Display annotation in the image:
› Click on an annotation in the list.
If the annotation cannot be shown in the current view, the annotation cannot be selected.
Change the display of an annotation:
› Click ⚙ next to an annotation in the list.
The flyout opens.
› Select the colour.
› For lines: select the line thickness.
› For nerve channels: adjust the diameter of the line.
› Click outside the flyout to close it.
Edit annotation:
› Click on an annotation in the list or an annotation in the image.
The anchor points of the annotation are visible.
› Move the mouse cursor over one of the anchor points of the annotation.
The mouse cursor changes to ⤢.
› Press and hold the left mouse button and drag the anchor point to the required position.
› Release the mouse button.
Shift annotation:
› Click on an annotation in the list or an annotation in the image.
The anchor points of the annotation are visible.
› Click on the annotation between the anchor points.
The mouse cursor changes to ✥.
› Press and hold the left mouse button and drag the annotation to the required position.
› Release the mouse button.
Delete annotation:
› Click 🗑.
This deletes the annotation. The deletion cannot be undone.

The annotations are not stored in the image. All annotations are deleted when the image is closed.

10 Close image

All changes are deleted when the image is closed.

› In the browser, click on ← *Back* to open another image.
or
Close browser window.

Troubleshooting

11 Tips for operators and service technicians

Error	Possible cause	Remedy
Presentation of the software surface is not correct	Software not optimised for this browser	› Use another browser, see "3 System requirements".
Presentation of 3D images too slow	Graphic card does not meet the requirements	› Activate hardware acceleration in the browser. › Use a faster graphic card.

Appendix

12 Additional licensing terms

Parts of the product are based on third-party image libraries with a large number of available licences that are not covered by the EULA. Those that require a reproduction of the license text in the distribution are listed below.

- "12.1 Apache License 2.0"
- "12.2 MIT License"
- "12.3 DCMTK License"
- "12.4 GLEW License"
- "12.5 Mesa 3D License"
- "12.6 BSD licence"
- "12.7 FreeBSD licence"

Parts of the product are based on third-party software licensed under the GNU Lesser General Public License v2.1 (LGPL-2.1):

- FTGL library
- LibUsbDotNet library
- Qt framework

Parts of the product are based on the work of the Independent JPEG Group.

Some free software licences request but do not require confirmation of software use. We would like to express our gratitude to the following people and projects for their contributions to this product:

- zlib compression library (Jean-loup Gailly, Mark Adler and Team)
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