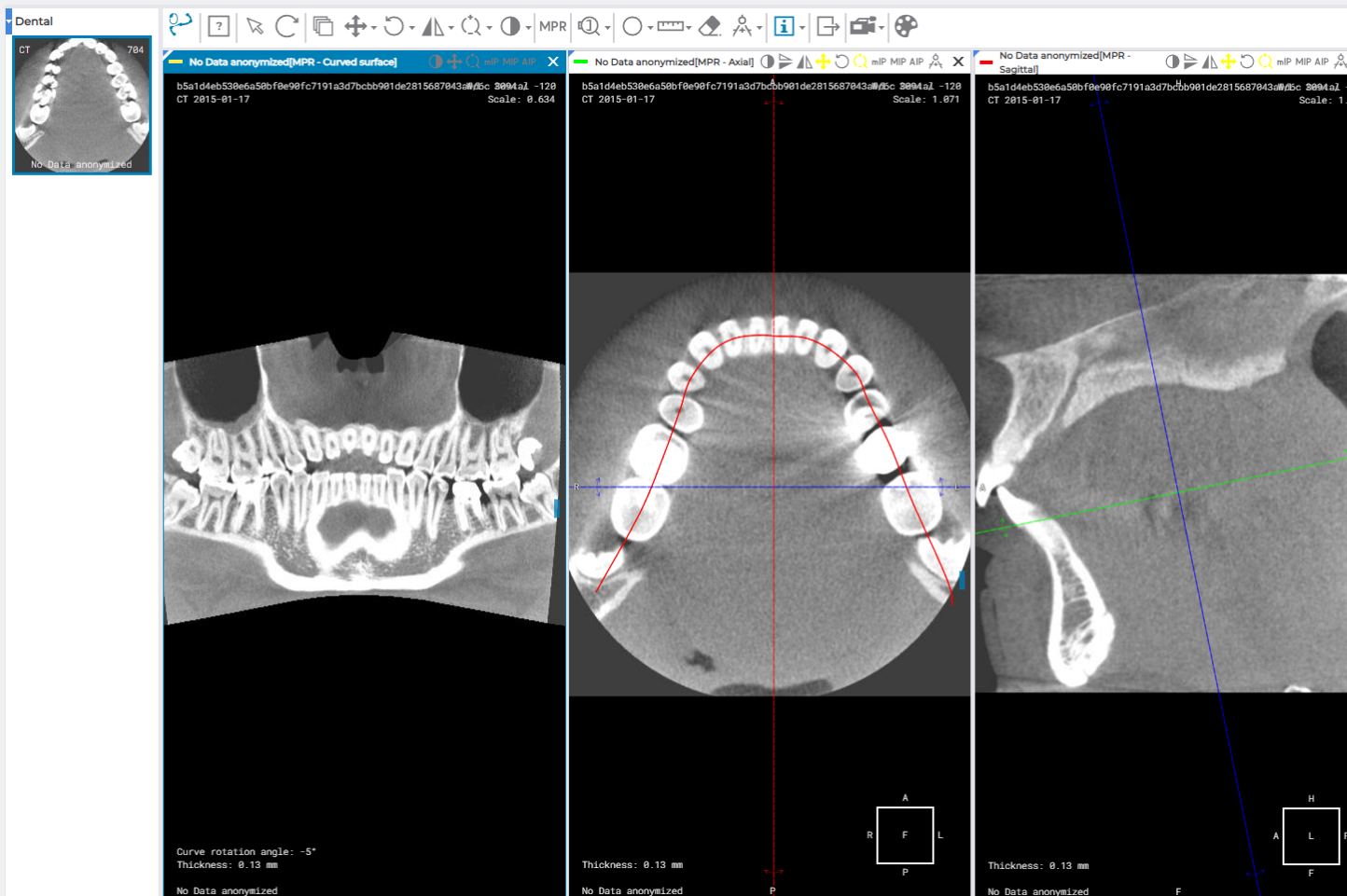


Inobitec [Web](#) DICOM Viewer version 2.8

# USER'S MANUAL



---

The information contained in this User Manual belongs to INOBITEC Software FZ-LLC, Dubai Media City, Building 05, Dubai, UAE, P.O. Box 73030. The Manual is delivered to the users of «Inobitec Web DICOM Viewer» software product exclusively for the purpose of working with this product. No part of the information contained herein can be modified, used for any other purpose or delivered to any third party without the prior written consent of INOBITEC Software FZ-LLC. The INOBITEC Software FZ-LLC reserves the right to alter this Manual without prior notice.

# Contents

<b>Contents</b>	<b>3</b>
<b>About this Manual</b>	<b>6</b>
Accepted Conventions . . . . .	6
<b>Technical Support</b>	<b>7</b>
<b>About the Product</b>	<b>8</b>
Web DICOM Viewer Functionality . . . . .	9
Getting Started . . . . .	14
<b>1 Login to the Web DICOM Viewer</b>	<b>15</b>
1.1 Login . . . . .	15
1.2 Tutorial and Usermanual . . . . .	17
1.2.1 Version of Web DICOM Viewer . . . . .	18
<b>2 Web DICOM Viewer Settings</b>	<b>19</b>
2.1 Common settings . . . . .	19
2.2 Hotkeys . . . . .	20
2.3 Security . . . . .	21
2.4 License . . . . .	21
<b>3 Program Window Elements</b>	<b>22</b>
3.1 Toolbar . . . . .	22
3.2 Select Data Source . . . . .	24
3.3 Search filter . . . . .	24
3.3.1 Setting Dates in the Calendar . . . . .	26
3.4 Study Panel . . . . .	28
3.4.1 Uploading Studies . . . . .	28
3.4.2 Sort Studies . . . . .	29
3.4.3 Downloading Studies . . . . .	29
3.5 Series Panel . . . . .	29
3.6 View Images . . . . .	30
3.7 View Multiple Series . . . . .	31
3.7.1 Auto Mode . . . . .	32
3.7.2 Stacked Mode . . . . .	32
3.7.3 Grid Mode . . . . .	32

3.8	Cancel Tool Actions	33
3.9	Tool Control Buttons	34
3.10	Context menu	35
<b>4</b>	<b>View Flat Images</b>	<b>36</b>
4.1	View Images in a Series	36
4.2	Play images	36
4.3	Zoom. Move. Rotation	37
4.3.1	Zoom	37
4.3.2	Move	38
4.3.3	Rotation	38
4.4	Set Window Level and Width	38
4.5	Magnifier	39
4.6	Interpolation Filters	40
4.7	Measurements	40
4.7.1	Distance measurement ruler	41
4.7.2	Polyline for measuring distances	42
4.7.3	Angle measurement	42
4.7.4	Point ROI measurement	43
4.7.5	Measure the Intensity Average and Standard Deviation in an Area	43
4.7.6	Cobb angle meter	43
4.7.7	Drawing Parameters	44
4.7.8	Move Measurements	44
4.7.9	Moving the measurement data	44
4.7.10	Delete Measurements	45
4.8	Graphic Label Tools	45
4.8.1	General	45
4.8.2	Graphic Label Tool	45
4.8.3	Actions with Labels	46
4.9	Synchronize Images	47
4.10	Mirror Image Horizontally/Vertically	47
4.11	Calibration sizes	47
4.12	Visualize Images	48
4.13	Scout Lines	49
4.14	Set Up Viewer Workspace	49
4.14.1	Orientation Cube	50
4.14.2	Scale	50
4.14.3	Image Information	50
4.14.4	Patient Information	51
4.15	Viewing PDF documents	51
4.16	View DICOM Tags	53
4.16.1	DICOM Tags. General Information	53
4.16.2	DICOM Tag Viewer Window	53
4.16.3	Toolbar	55
4.16.4	Tag Tree	57
4.16.5	Search	57
4.16.6	Changing the Character Set	57
4.17	Viewing Structured Reports	58

---

4.17.1	General Information about Structured Reports . . . . .	58
4.17.2	Structured Reports Viewer Window . . . . .	58
4.17.3	«Search» Field . . . . .	59
4.17.4	Changing the Character Set . . . . .	60
4.18	Export series . . . . .	60
<b>5</b>	<b>Volume Reconstruction</b>	<b>61</b>
5.1	Model Positioning Tools . . . . .	61
5.2	Model Playing . . . . .	61
5.3	Cutting Tools . . . . .	62
5.3.1	Polygonal Cut . . . . .	62
5.3.2	Inverse Polygonal Cut . . . . .	62
<b>6</b>	<b>Multiplanar Reconstruction (MPR)</b>	<b>63</b>
6.1	View Images . . . . .	63
6.2	Reconstruction Modes. Slice Thickness . . . . .	64
6.2.1	Render Modes . . . . .	64
6.2.2	Slice Thickness . . . . .	64
6.3	Working with Orthogonal Planes . . . . .	65
6.4	Curvilinear Reconstruction. Build Surface . . . . .	65
6.4.1	Actions with a Curve . . . . .	67
6.5	Measurements . . . . .	68
6.6	Annotations . . . . .	68
6.7	Calibration . . . . .	68
<b>7</b>	<b>ECG Viewer</b>	<b>69</b>
7.1	View Graphs . . . . .	69
7.2	Toolbar . . . . .	69
7.2.1	ECG Speed . . . . .	69
7.2.2	Scale . . . . .	69
7.2.3	Length Interval . . . . .	70
7.2.4	Value Interval . . . . .	70
7.2.5	Set Up Coordinate Plane . . . . .	70
7.3	Frequency Filters . . . . .	71
7.4	Export series . . . . .	71
<b>8</b>	<b>Licensing</b>	<b>72</b>
8.1	Personal User Licenses . . . . .	72
8.2	Concurrent licenses . . . . .	72

# About this Manual

This User Manual describes the functionality of «Inobitec Web DICOM Viewer» (version 2.8) and provides instructions on how to use this software product.

## Accepted Conventions

Names of program interface elements, key names and important notes are printed in **bold**. Image captions are printed in *italics*.

---

# Technical Support

Technical support of «Inobitec Web DICOM Viewer» users is provided by the INOBITEC Software FZ-LLC team. If you apply for technical support, please include the following information in your message:

- the name, version and bitness of the operating system of the computer(s) on which the software server components are installed (you can get this information from your system administrator);
- your operating system version from which a client connects to the server (you can get this information from your system administrator);
- product version. The program version is specified in the **About** section of the user's menu. For details, see Section 1.2.1.

To apply for technical support, or if you have any further questions or comments, please email us at [support@inobitec.com](mailto:support@inobitec.com)

# About the Product

The «Inobitec Web DICOM Viewer» software product is intended for viewing, analyzing and printing medical data obtained from various DICOM equipment (modality). The product is deployed on diagnostic workstations and integrated with DICOM servers. The Web DICOM Viewer propels the capabilities of diagnostics to a new level and makes it possible to detect pathological conditions timely and efficiently, predict their development and plan their elimination.

For the purpose of establishing a diagnosis, «Inobitec Web DICOM Viewer» software must only be used by properly qualified personnel.



**Making a diagnosis is not allowed when the Web DICOM Viewer is running on mobile devices.**

The «Inobitec Web DICOM Viewer» software product and installer does not:

- collect and transfer confidential user information;
- intercept network traffic;
- show ads;
- send spam;
- show messages not related to work;
- automatically update itself without notifying the user.

After uninstalling you do not need to restore your operating system and browser settings. Uninstalling is free of charge. Uninstalling does not adversely affect the operation of the computer and installed software. Files not related to the Web DICOM Viewer are not removed and changed after uninstalling.

For details on the structure of «Inobitec Web DICOM Viewer» package, its installation, launch, licensing, setting up and integration with DICOM servers, see the **Admin's Manual**.

License Agreement is available from the link [inobitec.com/eng/about/webviewerLic/](https://inobitec.com/eng/about/webviewerLic/).



## Web DICOM Viewer Functionality

### INOBITEC Products Comparison Table

Function	Lite	Pro	Web
View flat images with the following options:	✓	✓	✓
rotate, pan, zoom, mirror	✓	✓	✓
change window width and level	✓	✓	✓
change the window width and level based on the image parameters (Full dynamic W/L)	✓	✓	
customization of WL presets	✓	✓	
opening DICOM studies from zip archives	✓	✓	
opening several DICOM studies at the same time	✓	✓	✓
automatic filling tab windows with the series	✓	✓	
synchronization of series windows in case of window level/width alteration, movement, scaling, and scrolling	✓	✓	✓
calibrate image size	✓	✓	✓
show image scout lines on other series images	✓	✓	✓
flat image view with orthogonal projections	✓	✓	
merge series into phases	✓	✓	
measure length, angles	✓	✓	✓
play series images subsequently as a movie	✓	✓	✓
choose image resampling filter in the Flat Images View window	✓	✓	
build freeform contours with the Pencil tool	✓	✓	
add comments, labels and various graphic elements on images	✓	✓	✓
moving comments, measurements, measurement results and various graphic elements on images	✓	✓	✓
measure Cobb angles and intensity at a certain point or in a certain area	✓	✓	✓
export images to a graphic file	✓	✓	
export images to a new series of DICOM images	✓	✓	✓
DSA (Digital Subtraction Angiography)	✓	✓	
applying different CLUTs to images	✓	✓	✓
edit CLUTs	✓	✓	

Function	Lite	Pro	Web
browse DICOM image tags	✓	✓	✓
cerebral Perfusion		✓	
blood flow parameters evaluation on the basis of phase-contrast images		✓	
calcium scoring		✓	
measurement of apparent diffusion coefficient (ADC)		✓	
View three-dimensional tissue reconstruction with the following options:	✓	✓	✓
rotate, pan and zoom the model	✓	✓	✓
view scaled-down multiplanar reconstruction of the series simultaneously (with automatic synchronization)	✓	✓	
cut the outside and inside parts of the model	✓	✓	✓
MIP (Maximum Intensity Projection)	✓	✓	
measure length, angles	✓	✓	
export the model to a graphic file	✓	✓	
export the model to a new series of DICOM images	✓	✓	✓
export of several images obtained by rotating the model to a graphic file	✓	✓	
export of several images obtained by rotating the model to a new series of DICOM images	✓	✓	
switching projection	✓	✓	
add markers and line markers	✓	✓	
delete bone tissue in the manual mode (interactively and automatically)	✓	✓	
delete bone tissue for merged series		✓	
build the surface by the model		✓	
surface construction for the main volume		✓	
surface building for each phase of the main volume in multiphase series		✓	
individual change of parameters for each constructed surface		✓	
measure the shortest path on the surface of a visible volume with the Surface Ruler tool		✓	
import of multiple surfaces		✓	

Function	Lite	Pro	Web
segmentation		✓	
build a curvilinear reconstruction		✓	✓
View multiplanar reconstruction with the following options:	✓	✓	✓
view axial, frontal and sagittal sections of tissue	✓	✓	✓
rotate cutting planes in space	✓	✓	✓
3D view	✓	✓	✓
measure length, angles	✓	✓	✓
add markers and line markers	✓	✓	
build freeform contours with the Pencil tool	✓	✓	
setting modes MIP, MinIP, AIP	✓	✓	✓
set slice thickness	✓	✓	✓
MPR view sync on several monitors	✓	✓	
display of MPR planes on 3D view	✓	✓	
build a section of a spatial model by a random surface		✓	
cross-section view for curvilinear reconstruction		✓	
export sections of any of the planes with a selectable increment to a series		✓	
segmentation		✓	
surface construction for the main volume		✓	
surface building for each phase of the main volume in multiphase series		✓	
individual change of parameters for each constructed surface		✓	
import of multiple surfaces		✓	
contour based segmentation		✓	
displaying the boundaries of the segmented structure mask in MPR		✓	
histogram display for ROI		✓	
mixed RGB colors Fusion		✓	
Diffusion Tensor Imaging (DTI) support		✓	
Virtual endoscopy (viewing the inner surfaces of cavities in tissues) with the following options:		✓	
automatically and manually navigate the inside a cavity		✓	

Function	Lite	Pro	Web
build cavity surfaces		✓	
view scaled-down multiplanar reconstruction of the series simultaneously (with automatic synchronization)		✓	
Merge series with the following options:		✓	
remove bone tissue for DualScan and DualEnergy studies		✓	
build three-dimensional models based on multiple series of images of the same tissue in different modes		✓	
quickly switch to a full-scale view of three-dimensional reconstruction, multiplanar reconstruction and virtual endoscopy of the model built by merging series		✓	
stitch images		✓	
View electrocardiogram with the following options:	✓	✓	✓
measure time intervals and values on graphs	✓	✓	✓
using filters		✓	✓
export images to a new series of DICOM images		✓	✓
Print images on paper or film using a DICOM printer with the following options:	✓	✓	
adding reference images	✓	✓	
exporting pages to the PACS server for printing	✓	✓	
adding logo	✓	✓	
Open studies by dragging and dropping on the program icon and program window	✓	✓	
Open studies in the background	✓	✓	
Transformation indicators in the series window with an opportunity to undo the transformations			✓
Open/save file using Native OS dialogs	✓	✓	
Voxel and polygon rendering support on Metal for macOS starting with Version 10.15	✓	✓	
Set up the interface and the Web DICOM Viewer functionality with the capability to export and import the settings configuration	✓	✓	
Tool control with the left, the right and the middle mouse buttons	✓	✓	✓
High resolution monitor support	✓	✓	✓
The support of secure connection with TLS	✓	✓	

Function	Lite	Pro	Web
PDF data support and presentation in DICOM files			✓
Structured reports support and presentation			✓
The opportunity to view several types of data in one window simultaneously: flat images, volume reconstructions, MPR, ECG, video, PDF documents and structured reports			✓
Minimize application window to system tray	✓	✓	
Integrated help system	✓	✓	✓
Create series display templates for various modalities	✓	✓	
Write data to CD, DVD and flash cards	✓	✓	
Integration with PACS servers	✓	✓	✓
Store data in a local storage	✓	✓	✓
Work as a PACS server, support C-FIND and C-MOVE	✓	✓	
Save studies to the folder	✓	✓	
Save studies as archives	✓	✓	✓
Integration with third-party systems	✓	✓	✓
Edit patient name and study description on the Local Storage	✓	✓	
Anonymize studies and series with the ability to change DICOM tags	✓	✓	
PLY, OBJ, STL, GLB formats surface export		✓	
PLY, OBJ, STL formats surface import		✓	
Saving the model orientation and projection in spj-projects		✓	
Embedded WebViewer		✓	
Register images		✓	
Record video from viewing windows		✓	
Play video contained in DICOM files			✓

«Pro» and «Lite» are the Inobitec DICOM Viewer editions. This is another product. More information can be found in the [Products](#) and [Downloads](#) pages.

## Getting Started

To avoid problems with the Web DICOM Viewer, do the following before you start working with the program:

1. Examine the browser you are using to work with the Web DICOM Viewer. Do not use keyboard shortcuts that can close the browser (for example Ctrl + W) or interfere with its operation.
2. Limit the access to the computers with the program installed in order to protect the patients' personal data and unauthorized deletion of information.
3. Do not give your login and password to the system and license keys to unauthorized persons. Store this data in a safe place.
4. If you need to download data from other software, check the connection settings by downloading test data.
5. Make sure that the data downloaded from the modality can be viewed in the modes chosen.
6. To avoid data loss in the event of a failure of the computer on which the storage is located, back up data regularly.

Before starting a procedure that requires the flawless operation of the Web DICOM Viewer, connect the PC to an uninterruptible power supply and check that it is working properly.

---

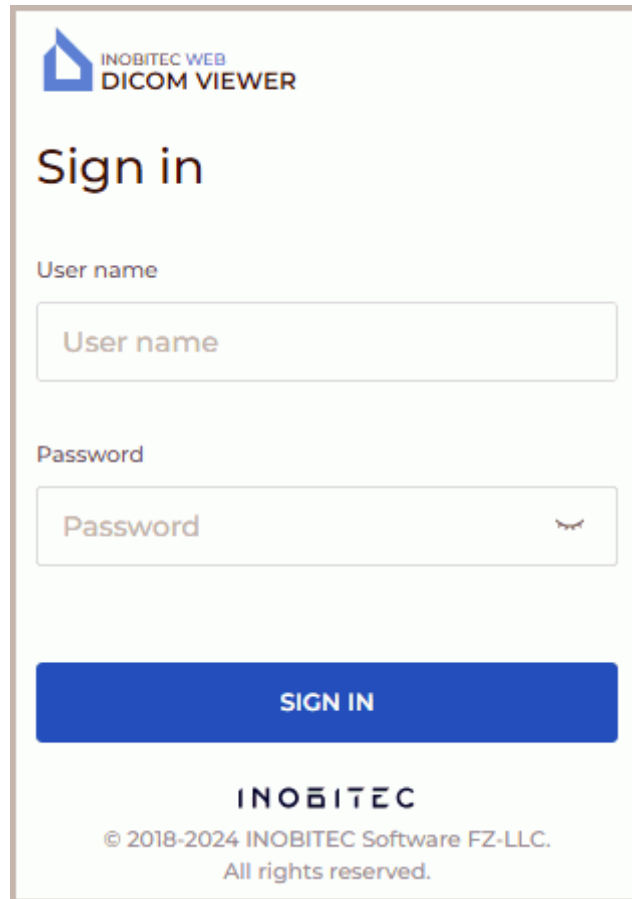
# Chapter 1

## Login to the Web DICOM Viewer

### 1.1 Login

Open the user console by the link  
*http://<ip address>:8090*

After opening the page, the login form will be displayed (Fig. 1.1). When a field is empty, its name is displayed in it. To type data in a field, place the cursor in it with a left-click. To move to the next field, press the **Tab** key on the keyboard or use the left mouse button to position the cursor. To go to the previous field, press the keys **Shift + Tab**.



The image shows a login form for 'INOBITEC WEB DICOM VIEWER'. At the top left is the logo, a blue square with a white triangle pointing up and right, followed by the text 'INOBITEC WEB DICOM VIEWER'. Below the logo is the heading 'Sign in'. There are two input fields: 'User name' and 'Password'. The 'User name' field is a simple text box with the placeholder text 'User name'. The 'Password' field is a text box with the placeholder text 'Password' and a small eye icon on the right side to toggle visibility. Below the input fields is a large blue button with the text 'SIGN IN' in white. At the bottom of the form, the text 'INOBITEC' is displayed in a bold, sans-serif font, followed by the copyright notice '© 2018-2024 INOBITEC Software FZ-LLC. All rights reserved.'

Figure 1.1: Login Form

Type the following data:


- type user name to the **User name** field;
- type password to the **Password** field.

You can get this information from the program administrator. All fields are required.

Click the **Sign in** button.

In case of an error, a message appears in the lower right corner.

To escape the program, click the button with the user's initial in the top right-hand corner.

E.g., the button for a user named **User** will be displayed as . Choose **Exit** in the button menu (Fig. 1.2).



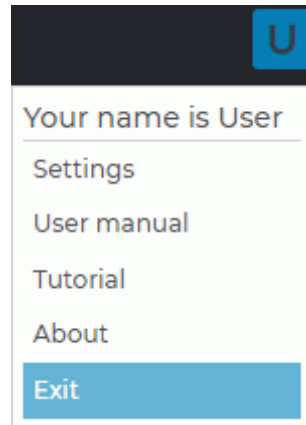


Figure 1.2: Escape the program

## 1.2 Tutorial and Usermanual

When the user first logs in, the window shown in Fig. 1.3 will be displayed.

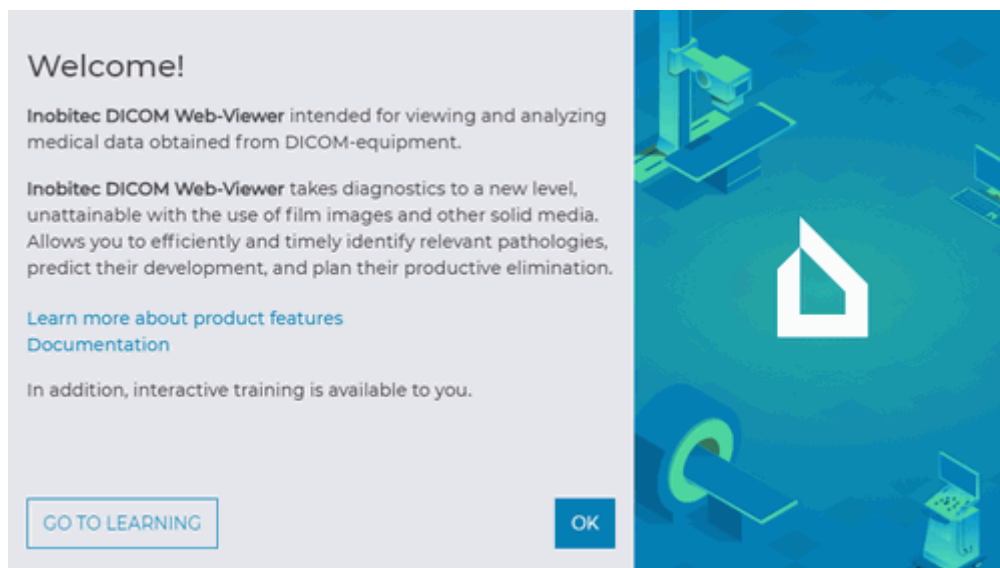



Figure 1.3: Welcome Window

To view the program features, click the **Learn more about product features** link, to open usermanual (pdf file) click the **Documentation** link. To view the tutorial click the **GO TO LEARNING** button. To start learning, click the button with the first letter of the user name (e.g.  for **User**) and select the **Tutorial** item (Fig. 1.2).

## 1.2.1 Version of Web DICOM Viewer

To find out the Web DICOM Viewer version, click the button with the first letter of the user name (e.g. **U** for **User**) and select the **About** item (Fig. 1.2).

A window will pop up with the following information about the program (Fig. 1.4):

- Web DICOM Viewer version;
- Link to the website of the software developer;
- Email address of INOBITEC Software FZ-LLC Technical Support.




Figure 1.4: Product information

---

# Chapter 2

## Web DICOM Viewer Settings

To change settings click the button with the first letter of the user name (e.g.  for **User**) and select the **Settings** item. The window shown in the Fig. 2.1 will be opened.

To apply parameters, click **Apply**, to cancel, click **Cancel**. Always click **Apply** when you change a tab.

### 2.1 Common settings

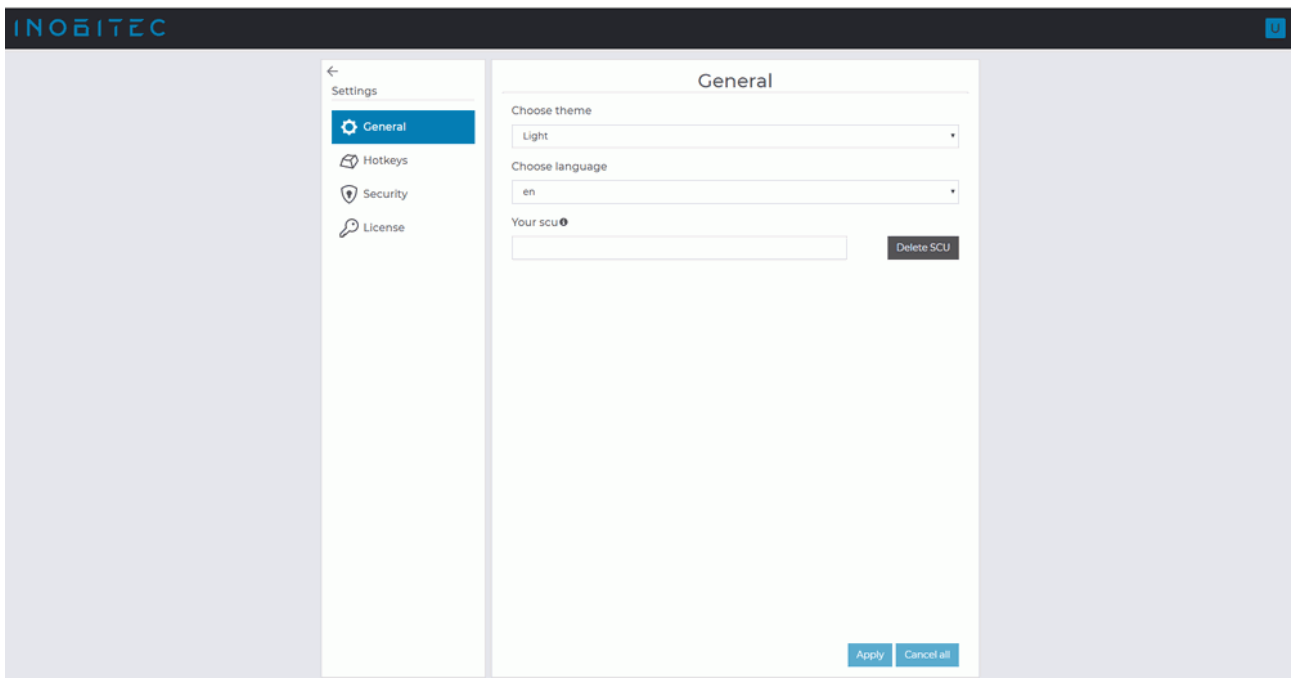


Figure 2.1: Common settings

The following parameters are set up in this tab:

- interface theme (light and dark);
- interface language (Russian, English, Portuguese);
- SCU to connect to DICOM Server.

## 2.2 Hotkeys

The **Hotkeys** tab is used for customizing the tools availability on the toolbar or the context menu, as well as for assigning key combinations to certain tools or actions.

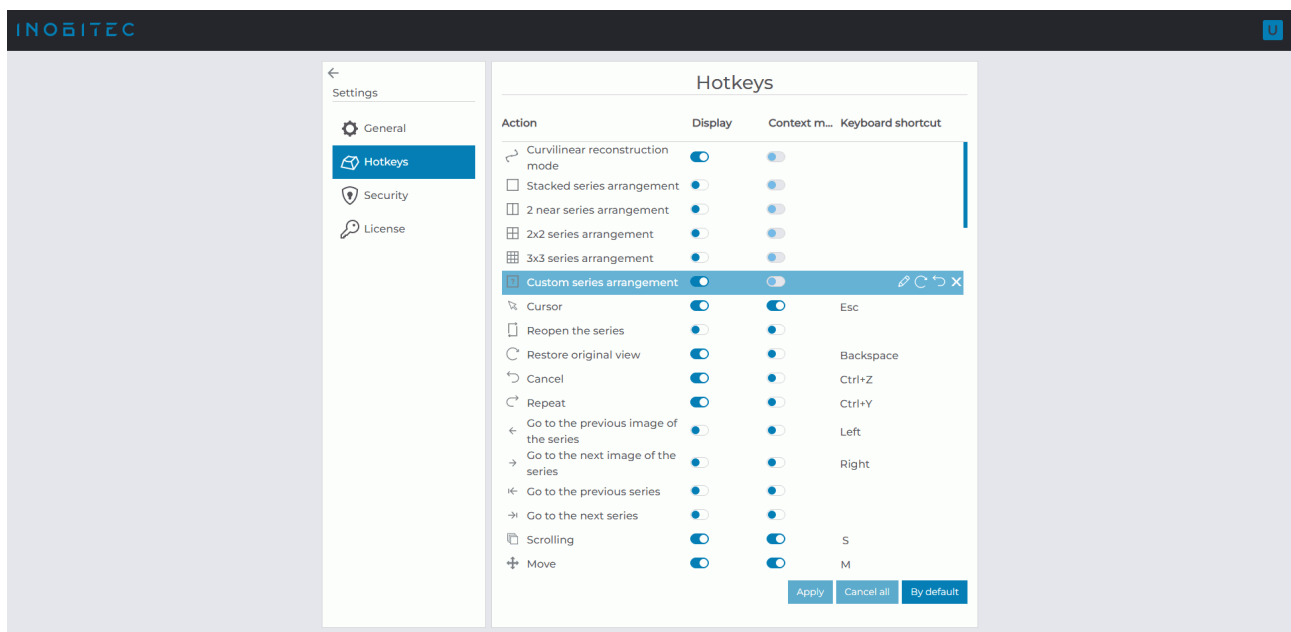






Figure 2.2: Hotkeys

If you want a tool or action to be displayed on the toolbar, put the switch in the **Display** column in the right position. If you want to hide the tool, choose the left position of the switch. If you want a tool to be shown on the context menu, put the switch in the **Context menu** column in the right position. If you don't want the tool to be shown, choose the left position of the switch.

In the **Keyboard shortcut** column, you can see the hot keys assigned to the respective tools or actions.

To change or assign a hot key for a selected tool or action, click the  **Change hotkey** button and enter the name of the key in the respective field. If the key is already being used for another action, a warning will pop up. To cancel an assigned hot key, click the  **Cancel change** button. To restore the default key combination assigned to a tool or action, click the  **Set default settings** button. To delete a hot key assigned to a tool, click the  **Remove hotkey** button.

Click **Apply** to apply the settings or **Cancel all** to cancel all the changes. To restore the default tool display settings and hot keys, click the **By default** button.

By default, hot keys are assigned by the administrator for all the users on the **Hotkeys** page of the admin panel.

## 2.3 Security

The **Security** tab is used to change the user's password.

To change the password, type an old password to the **Old password** field, next type the new password to the **New password** and **Confirm new password** fields. Passwords are hidden during entry.

To save the new user's password, click on the **Update password** button.

## 2.4 License

If the system is in the personal user licensing mode, the user can:

- See the license key number.
- Delete the license key.
- Activate a new license key.
- See the list of the functions available for the current license key.

**Attention! If a license key has been deleted, it cannot be used in future.**

If the system is in the competitive licensing mode, in the **License** window, you will only see the list of the functions available for the current license key.

# Chapter 3

## Program Window Elements

### 3.1 Toolbar

The **Toolbar** is shown in Fig. 3.1 (highlighted in red).

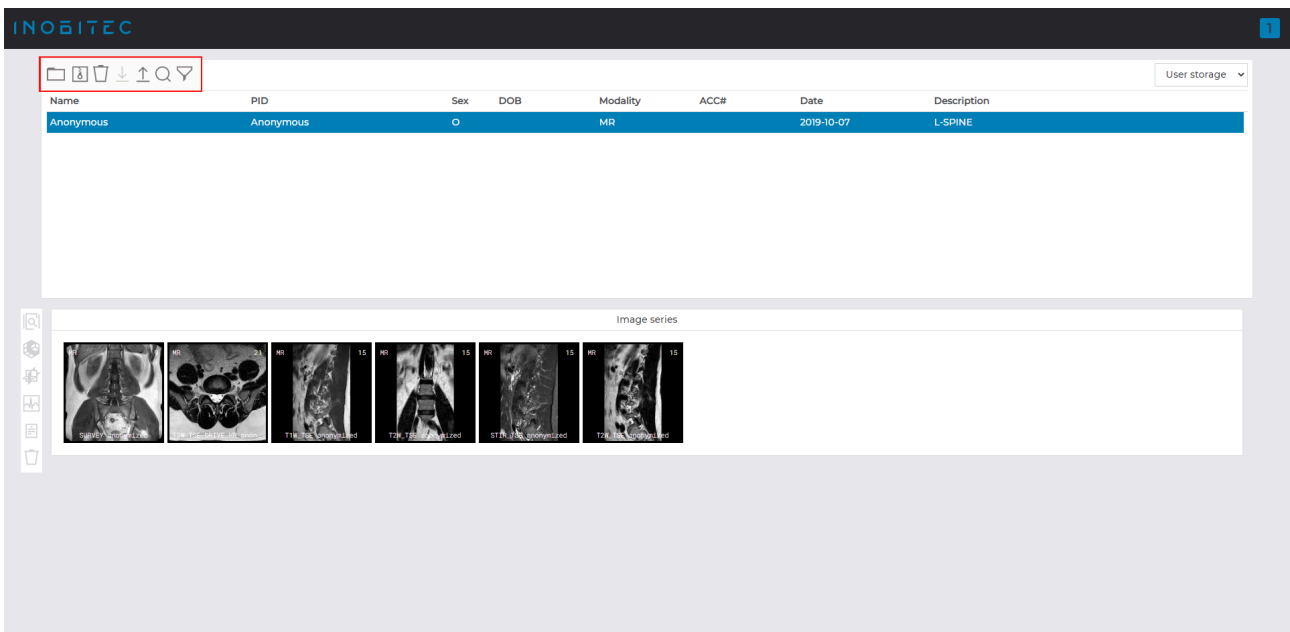



Figure 3.1: Toolbar location in the Web DICOM Viewer window

Buttons on the toolbar:

	<p>The <b>Download study</b> button loads data to the storage.</p>
---	--













	The <b>Add to archive</b> button downloads studies as archives.
	The <b>Delete study</b> button removes data from the storage.
	The <b>Download from PACS</b> button downloads data to a server.
	The <b>Upload to PACS</b> button uploads data to a server.
	The <b>Update</b> button searches for studies in the storage or on the server based on the search filter parameters. The list of studies is updated after the search is completed.
	The <b>Filter</b> opens the search filter.

Image view buttons on the toolbar:

	The <b>Image viewer</b> button opens images in the flat image view window.
	The <b>Volume reconstruction</b> button opens images in the volume reconstruction window.
	The <b>MPR reconstruction</b> button opens images in the multiplanar reconstruction window.
	The <b>ECG viewer</b> button opens images in the ECG view window.
	The <b>Show tags</b> button opens a window for viewing the tags of the series.
	The <b>Remove series</b> button removes the selected series from the storage.

If the action corresponding to a button is not available, the button looks pale and cannot be pressed (inactive). In Fig. 3.2 the only **ECG viewer** button is inactive.



Figure 3.2: The buttons on the toolbar

## 3.2 Select Data Source

To open studies stored on a DICOM Server or in a local folder, select the source from the drop-down list (Fig. 3.3).

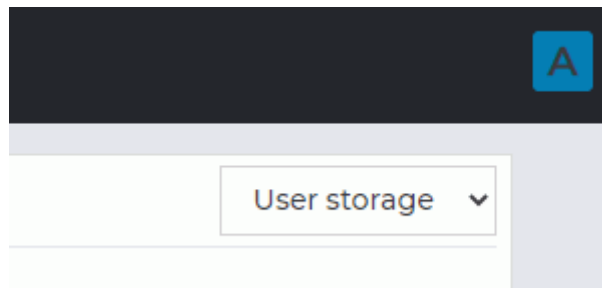



Figure 3.3: Data source panel

## 3.3 Search filter

To open the panel, click the  **Filter** button on the toolbar. The search panel is shown in Fig. 3.4.



**Patient**

Name  PID

Sex   DOB

Modality

**Studies date**

Exact date

Interval

Period

Figure 3.4: Search panel

The search can be performed by the following parameters:

- **patient name**;
- **patient sex** (select from the list);
- **patient ID**;
- **date of birth** (is entered manually or select using the calendar, see Section 3.3.1);
- **modality**;
- **study date**. You can search by exact date, date interval, or select a period from the list.

The selected search criteria are displayed in the toolbar. To delete a search criterion, click the **X** symbol next to the criterion or in the corresponding field of the search panel.

Click **Apply** to apply parameters, click **Clear filter** to clear the filter or **Cancel** to cancel.

### 3.3.1 Setting Dates in the Calendar

Dates in the fields **DOB**, **Exact date** and **Interval** can be entered manually (from the keyboard) or by using the calendar in the search panel.

To enter a date using the calendar, left-click in the appropriate field.

Use one of the following methods to specify the date:

1. Use « < » and « > » buttons to choose the month of birth. The months will be spaced at one-month intervals. Use « << » and « >> » buttons to choose the year of birth. The years will be spaced at one-year intervals. Choose the date (see Figure 3.5).



Figure 3.5: Calendar drop-down box

2. Select the area inside the red box (see Figure 3.5). Now, only the current year is displayed (see Figure 3.6). Use « < » and « > » buttons to choose the year with a one-year spacing or « << » and « >> » buttons to choose the year with a 10-year spacing. Then select the month and the date in the box below.

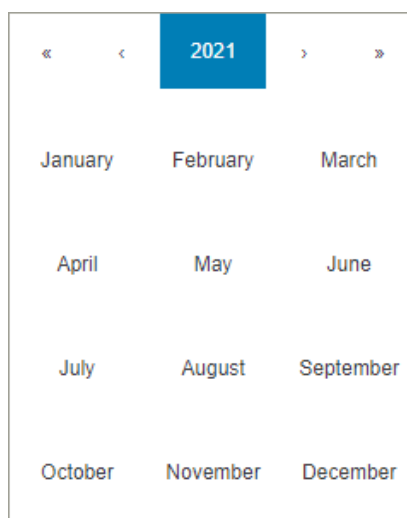


Figure 3.6: Calendar drop-down box. Selecting the month

- Double-click on the area inside the red box (see Figure 3.5). The current decade will be displayed (Fig. 3.7). Use « < » and « > » buttons to choose the time interval with a 10-year spacing or « << » and « >> » buttons to choose the time interval with a 100-year spacing. Select the year, month and date in the box below.



Figure 3.7: Calendar drop-down box. Selecting the year

- Click on the area inside the red box once again (see Figure 3.5). The current century will be displayed (see Figure 3.8). Use « < » and « > » buttons to choose the century. Then select the decade, year, month, and date.

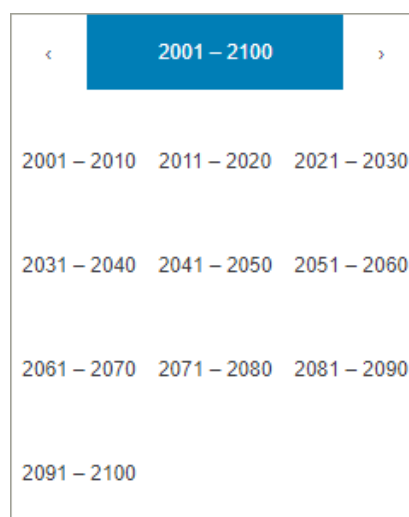



Figure 3.8: Calendar drop-down box. Selecting the decade

To delete the date from the search panel, click the  symbol in the corresponding field.

## 3.4 Study Panel

The study panel is shown in Fig. 3.9 (highlighted in red).

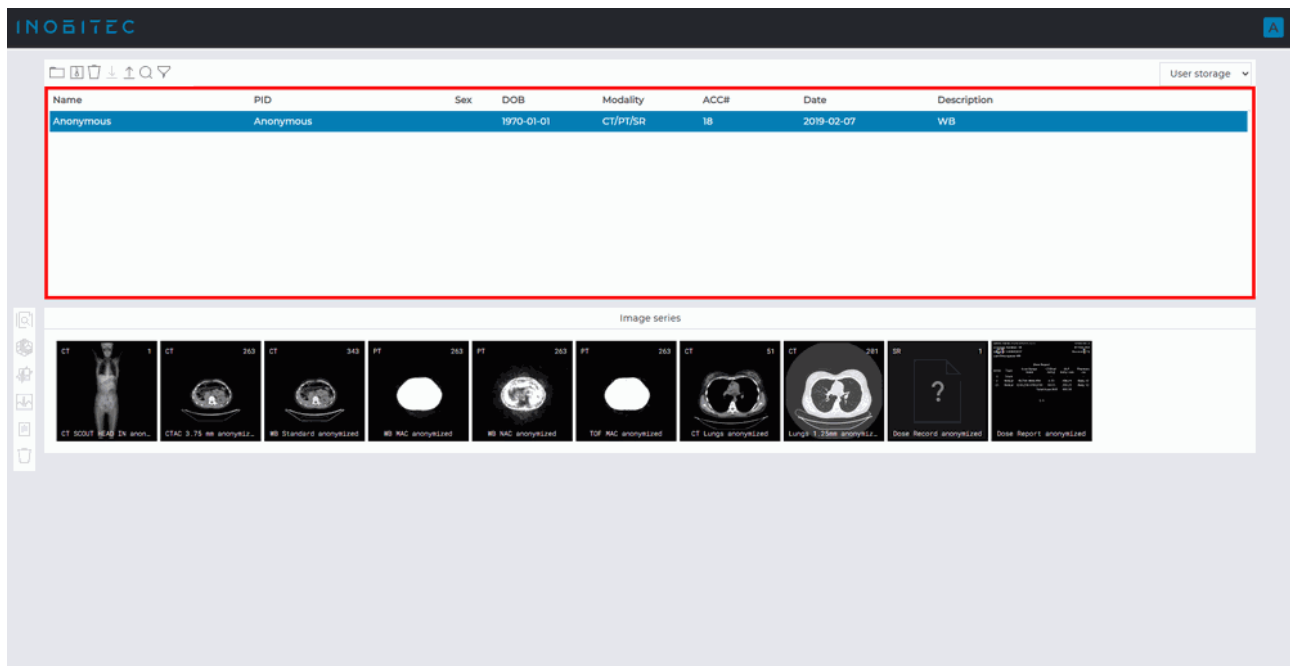




Figure 3.9: Study panel in the Web DICOM Viewer window

The study panel displays the list of studies stored in the selected location (local storage or PACS server).

### 3.4.1 Uploading Studies

There are two ways to upload DICOM files to the server:

1. Click the  **Download study** button on the toolbar. In the dialog box that pops up, choose a study or a folder with DICOM studies and click the **Load** button. Click the **Cancel** button to cancel.
2. Drag a study or a folder with DICOM studies to the Web DICOM Viewer study panel. When a file or a folder is being dragged, the study panel is replaced by a receive window. Release the mouse button when the cursor is inside the area marked with a dotted line to drop the file or folder.

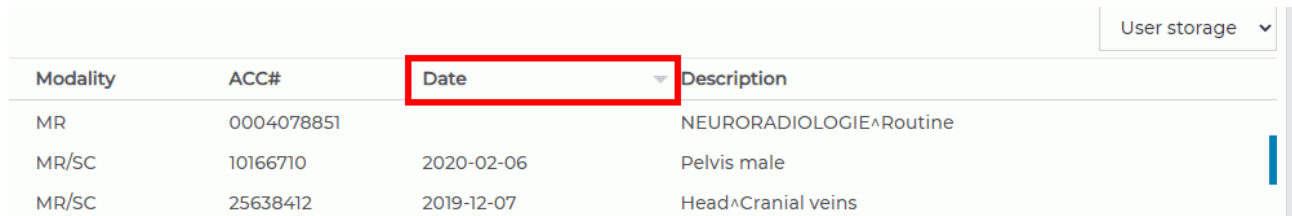
When uploading studies, you will see a progress bar in the right-hand bottom corner. To interrupt the uploading process, click  in the right-hand top corner of the progress bar.

If the current DICOM upload process is not completed, no new DICOM files are uploaded by drag-and-drop. In this case, a message is displayed: **Wait for download to finish**. Try again after the download is complete.

The list of uploaded studies is displayed on the Web DICOM Viewer study panel.



### 3.4.2 Sort Studies

If two or more studies are displayed, they can be sorted by a certain parameter. To do this, click on the header of the column the parameter is located in. For instance, to sort by date, click on the area highlighted in red in Fig. 3.10.



Modality	ACC#	Date	Description
MR	0004078851		NEURORADIOLOGIE^Routine
MR/SC	10166710	2020-02-06	Pelvis male
MR/SC	25638412	2019-12-07	Head^Cranial veins



Figure 3.10: Date column header

Next to the column name, there is an arrow showing the sorting order (down arrow — descending , up arrow — ascending ). To change the sorting order, click on the column header again. Studies can be sorted only by one parameter at a time.

### 3.4.3 Downloading Studies

The Web DICOM Viewer allows for downloading studies as archives. The selected study is saved as an archive and may be opened by another viewer program, such as the professional edition of Inobitec DICOM Viewer.

To download a study, proceed as follows:

1. On the study panel, select from the list the study you want to download.
2. Click the  **Add to archive** button on the toolbar. You will see the progress indicator in the right-hand bottom corner while the study is being archived.
3. To cancel the archiving process, click the  button in the right-hand top corner of the progress indicator.

Depending on the browser settings,

- The archive with the study may be saved in the **Downloads** folder, or
- A standard file saving dialog box may pop up.

## 3.5 Series Panel

The panel is shown in Fig. 3.11 (highlighted in red). Select the study from the study panel to see the list of series for it.

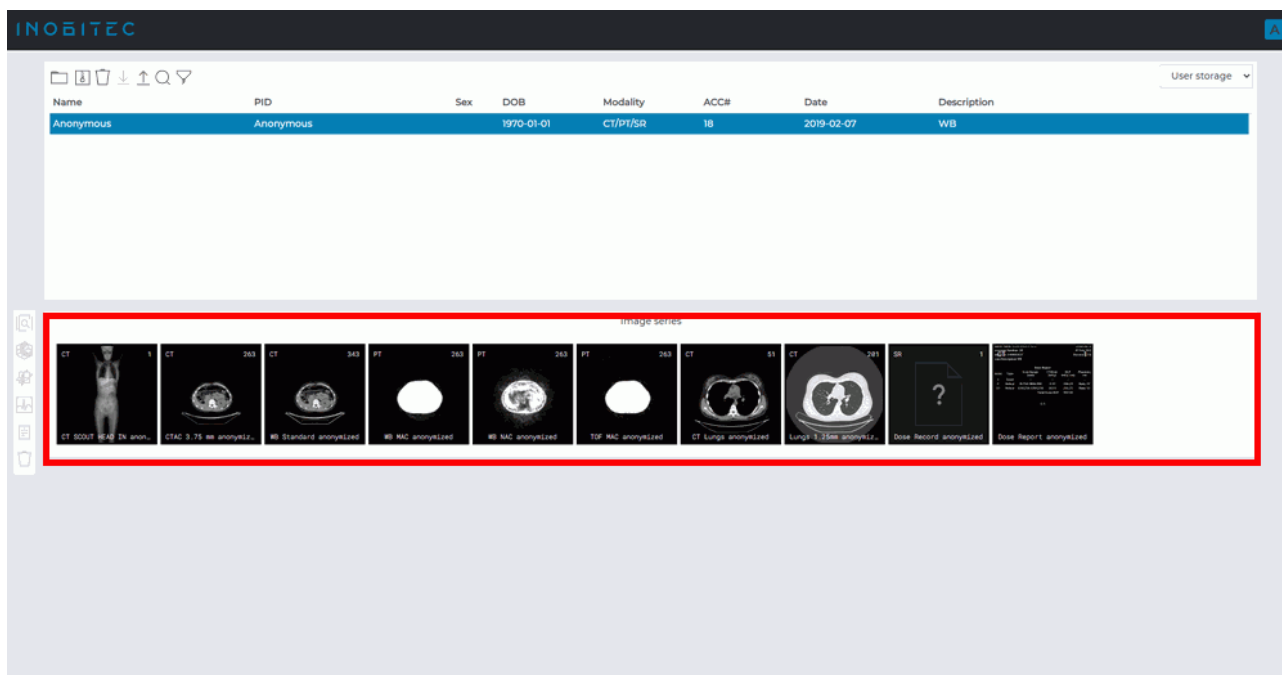







Figure 3.11: Series panel in the Web DICOM Viewer window

### 3.6 View Images


The Web DICOM Viewer allows you to open a series of one or different studies in all available viewing modes in one tab.

You can open series in the desired mode in 4 ways:

- Click one of the  **Image viewer**,  **Volume reconstruction**,  **MPR reconstruction**,  **ECG viewer**,  **Show tags** on the left toolbar.
- Double-click on the thumbnails of the series on the series panel. The series will be opened in the **Image viewer** or **ECG viewer** window depending on the modality. If the series cannot be displayed, the DICOM tag viewer window will be opened.
- Right-click on the study and select one of the **Open in new tab** (the series will be opened in a new tab) or **Open in tab -> desired tab**. In this case, the first series of the study will be opened in a new window of the tab selected. The series thumbnails will be added to the series panel of the tab.
- Right-click on the series and select one of the **Open in 2D**, **Open in 3D**, **Open in MPR**, **Open tags** (the series will be opened in a new tab) or **Open in tab -> desired tab**. In this case, the selected series of the study will be opened in a new window of the tab selected. The series thumbnails will be added to the series panel of the tab.

The series panel will be displayed on the left. It displays studies and thumbnails of the series of the studies opened in this tab. The studies added are highlighted for some time when you go to the tab.

To maximize the study window and display the series thumbnails, left-click on the study on the series panel. You can choose the thumbnails of another study by left-clicking on the name of this study.

To delete a study from the series panel, click the  button in the name of the study. When you delete a study, its series are deleted from the series panel. The windows with the open series from this study are closed. You cannot delete the first study to be opened or its thumbnails. Close the tab with this study to escape.

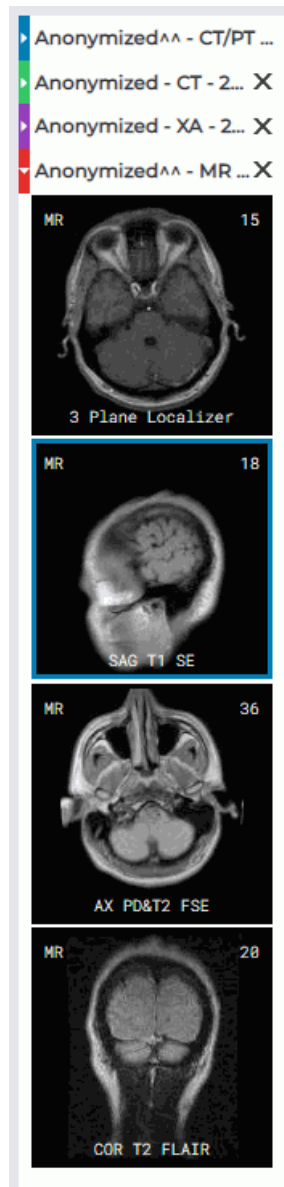


Figure 3.12: Series panel

### 3.7 View Multiple Series

There are several modes for positioning series windows in the study window. The selected mode is saved when the Web DICOM Viewer is closed.

When you open a new tab, automatic mode is always selected.

If when opening a new series of free cells to accommodate the images is not enough, then the automatic arrangement mode is activated and the required number of cells is added. For example, if only one cell is free, then two more cells are added to open the series in the MPR mode.

### 3.7.1 Auto Mode

This mode is active by default. If two or more series are open, they will be located in the window and scaled automatically, occupying the entire window. Three series are displayed in Fig. 3.13.

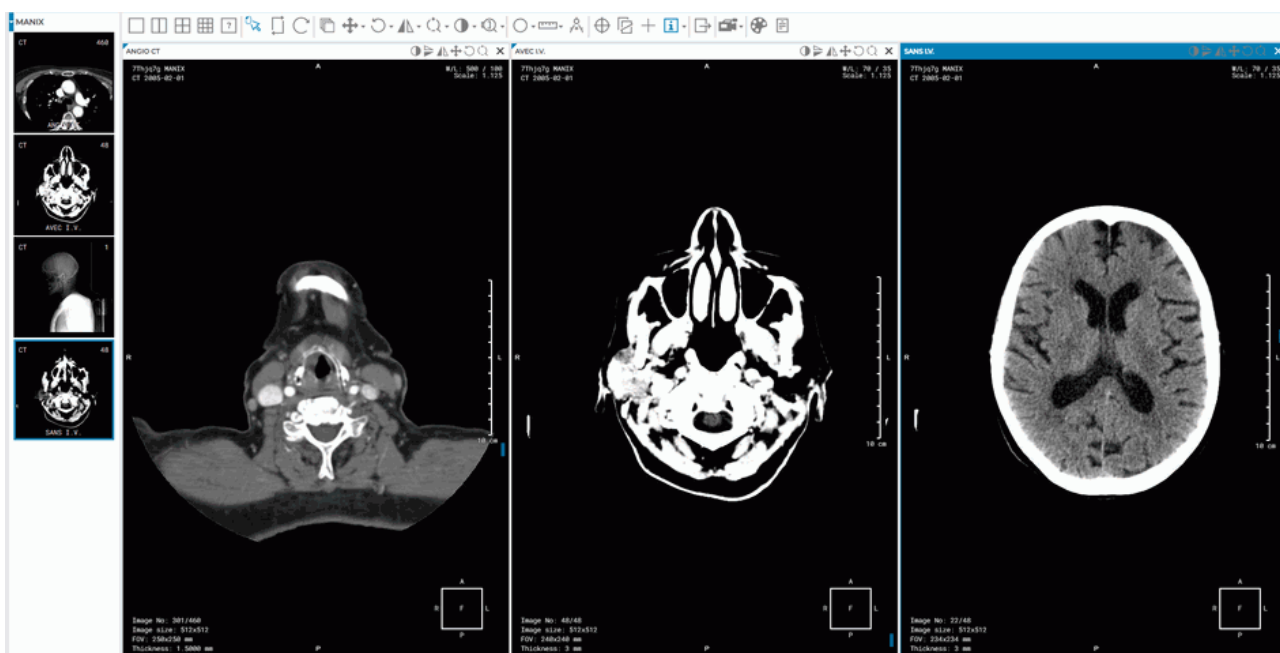


Figure 3.13: Auto Arrangement Mode

### 3.7.2 Stacked Mode

This tool allows you to receive only left-hand cell in the study window. In this case, the Web DICOM Viewer will request confirmation for closing the current series. If you try to open another series, the Auto Mode will be activated.

To activate this mode, click the  button.

### 3.7.3 Grid Mode

In this mode the study window is split into parts, and a series window can be opened in each of them.

If all cells in the grid are filled, then auto mode will be activated.

A grid may have from 1 to 25 cells. The maximum number of rows and columns is 5.



Fig. 3.14 illustrates a 2\*4 grid with three cells filled.

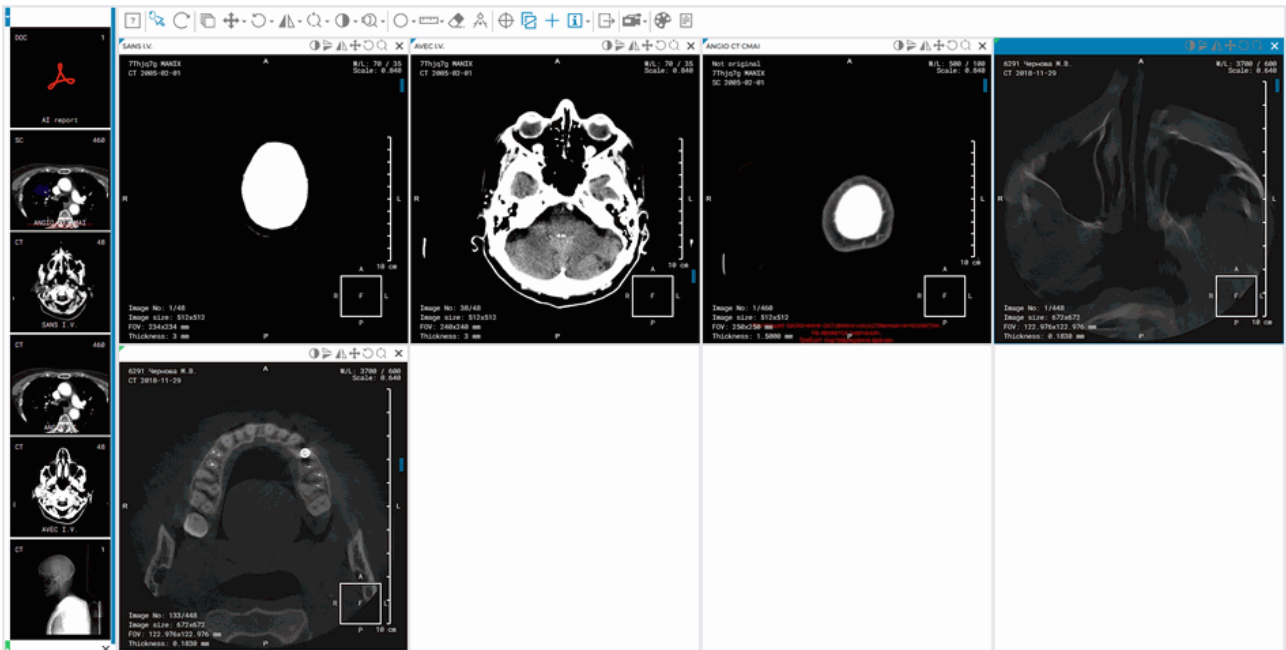



Figure 3.14: Displaying series in a 2\*4 grid

To set up a 1x2, 2x2 or 3x3 grid, use the  ,  ,  buttons on the toolbar.

To define your own grid configuration, click the  button. drag the cursor over the panel that opens and select the desired row and column counts (1 to 5). Click the left button in the desired cell to apply the configuration.

If the number of already open windows in the tab exceeds the number of cells in the selected configuration, a warning **Are you sure you want to do it? (The number of open series more than the number of cells you want to display)** appears.

To apply a configuration, click **Yes**, to cancel, click **Cancel**. If the number of cells is less than the number of open windows, then windows that do not fit will close. If at least one of the three MPR windows is not enough space, then all three windows for this series will be closed. If the tab has a sufficient number of unoccupied cells, then the newly opened series are reshared in them.

If a configuration from one cell is selected, this is equivalent to activation of the automatic mode.

## 3.8 Cancel Tool Actions

In the title of each window there are pictograms of the tools available for this window (Fig. 3.15). After the tool is applied to this series, its icon is highlighted in yellow (Fig. 3.16). To undo the tool action, left-click on its icon.

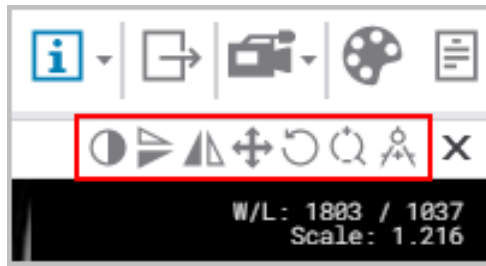



Figure 3.15: Available tools



Figure 3.16: Move and rotate tools are applied

To cancel all the changes made with different tools, click the  **Restore original view** button on the toolbar.

### 3.9 Tool Control Buttons

Starting with the version 2.1, you can use the left, the right and the middle mouse button, which allows you to activate up to three tools at the same time. To activate a tool, click on the left-hand side of the button with the mouse button. There are two ways to deactivate a tool:

1. Activate another tool with the same button or
2. Click on the left-hand side of the tool button with the same mouse button.

On the tool button, you will see a symbol representing the mouse with the respective button selected (see Fig. 3.17).



Figure 3.17: The tools activated with the left, the middle and the right mouse button respectively (from left to right)

If a limited number of clicks is needed to create a graphic object (e.g. three clicks for corner measurements), then the creation process will be completed after these clicks. If you need an unlimited number of points to create a graphic object (e.g. a polygon or an MPR curve), you have to double-click the button with which the tool was activated to complete the creation process.

Whether the tool is active or not, the graphic objects created with this tool can be edited with any mouse button, and the right button click invokes the context menu.

## 3.10 Context menu

The context menu is available in the DICOM data view window (Fig. 3.18). The menu contains:

- tools available for the window in which it is open;
- series that can be opened in the current window.

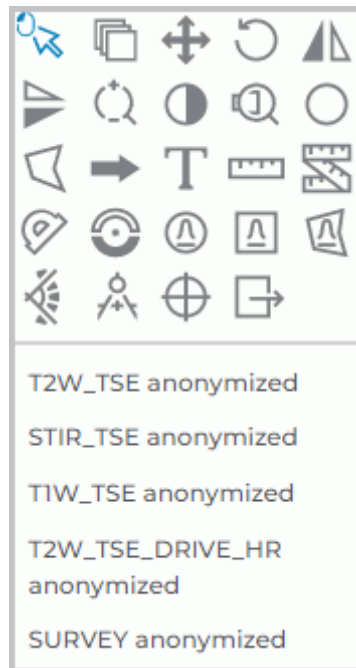


Figure 3.18: Context menu

The tools are activated with the left, right and middle mouse buttons (see Section 3.9).

# Chapter 4

## View Flat Images




When viewing images, you may see some artifacts that can be attributed to the image compression method. If you see any artifacts, scale the image.




256 shades of gray or color are used to show the tissue density. As there are more than 256 density values, similar densities are represented by the same shade. To differentiate between similar values, decrease the window width and level. Hence, the 256 shades will be used to represent fewer density values.

### 4.1 View Images in a Series


When a series is opened, its first image is displayed in the series window. There are three ways to switch to other images:

- Roll the mouse wheel up to switch to the previous image or down to go to the next one. One click of the wheel changes the position by one image.
- Use the scroll bar on the right-hand side of the series window. Move the slider along the bar to go to the image required.
- Use the **Scrolling** tool. Activate the tool by choosing the  button with the left, right, or middle mouse button. While holding this mouse button, move the cursor down to go to the next image or up — to go to the previous image. You will find the details concerning the use of the tools in Section 3.9.

### 4.2 Play images

The Web DICOM Viewer allows you to automatically play back images of a series at a certain speed. To set up playback, click on the right part of the **Play**  and choose parameters.



1. Select the speed (5, 10, 15, 20, or 25 frames per second).
2. If you want to play images cyclically, select the **Replay** item. The item will be marked with a flag. To disable the cyclic playback, select this command again. The flag will be removed.

To play the images click on the left side of the  button on the toolbar with the left-/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9. To end playback, click on the left side of the button again.


## 4.3 Zoom. Move. Rotation

### 4.3.1 Zoom

To zoom an image, you can choose one of the following options:

1. Roll the mouse wheel while holding down the Ctrl key. To enlarge the image, roll the wheel forward; to shrink it, roll the wheel backward. The center of the zoomed image will be in the point where the cursor is placed.
2. Use the **Zoom**  tool on the toolbar. Click the arrow on the right-hand side of the **Zoom** button and choose one of the following options from the drop-down list:
  - fixed zoom level: 0.5x, x1, x2, x3, or x4;
  - **Custom zoom**. For this, you need to provide the zoom level from 0.001 to 1,000,000,000 in the dialog box. If the value entered is less than 1, the image will be shrunk. If the value is larger than 1, the image will be enlarged;
  - **Reset zoom** to fit the image to the screen;
  - for simultaneous zooming of all the images in the open windows of the tab, choose **Zooming synchronization**. The icon representing the active tool will be highlighted in blue. When zooming is completed, click the **Zooming synchronization** button again to deactivate the tool.
3. Activate the **Zoom**, tool by clicking the left-hand side of the  button with the left, right, or middle mouse button. To work with this tool, use the button with which it was activated. You will find the details concerning the use of the tools in Section 3.9. To zoom the image, move the cursor up or down while holding the mouse button with which the tool was activated. In the window, you will see the point that is the center of the zoomed image. The current zoom level is displayed next to the cursor. When zooming has been completed, click the **Zoom**, button again to deactivate the tool.


### 4.3.2 Move

To pan an image, activate the **Move** tool by clicking on the  button with the left, right, or middle mouse button. Use the same button to work with the tool. For details on working with tools, see Section 3.9. Drag the image with the mouse, holding the left button.


To restore the initial position of the image, click the arrow on the right-hand side of the **Move** button and select **Position reset**. If you want to change the position of images in all the open windows of the tab, select **Moving synchronization**.

### 4.3.3 Rotation


To rotate an image, you can choose one of the following options:

1. Use the **Rotation**  tool on the toolbar. Click the arrow on the right-hand side of the **Rotation** button and choose one of the following options from the drop-down list:

- a fixed rotation angle (a multiple of 90°): 90° clockwise, 180°, or 90° counterclockwise;
- **Custom rotation**. For this, you need to provide the rotation angle from -1,000° to 1,000° in the dialog box;
- **Reset rotation** to restore the initial position of the image;
- for simultaneous rotation of all the images in the open windows of the tab, choose **Rotation synchronization**. The icon representing the active tool will be highlighted in blue. When rotation is completed, click the **Rotation synchronization** button again to deactivate the tool.

2. To rotate an image by an arbitrary angle, click the left-hand side of the **Rotation**  button with the left, right, or middle mouse button. To work with this tool, use the button with which it was activated. You will find the details concerning the use of the tools in Section 3.9. To rotate the image, move the mouse while holding the button with which the tool was activated. The image is rotated about the center of the window. While the image is being rotated, the current rotation angle is displayed. When rotation is completed, click the **Rotation** button again to deactivate the tool.

## 4.4 Set Window Level and Width


To change the parameters, activate the **Change W/L**  tool on the toolbar with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9. Move the mouse in the study window, holding the right mouse button

- to increase the window level — down;
- to reduce the window level — up;

- to reduce the window width — left;
- to increase the window width — right.

The terms «window width» and «window level» in digital images commonly refer to «contrast» and «brightness» respectively on your computer.

The current window level and width values are displayed in the top right-hand corner of the window.


The contains predefined width and level values for some specific tissues. To select them, click on the left side of the **Change W/L**  button. The following modes will be available in the newly opened window:

- to view abdomen tissues;
- to view bone tissues;
- to view brain tissues;
- to view lung tissues;
- to view chest tissues;
- to view headneck tissues;
- custom mode. The values defined by the user can be edited;
- **Reset W/L** to set optimal default values;
- **W/L synchronization** for changing the level and width of all the open windows of the tab simultaneously. The icon representing the active tool will be highlighted in blue. When you have changed the level and width, click the **W/L synchronization** button again to deactivate the tool.

You cannot edit the values predefined for specific tissues.

## 4.5 Magnifier

This tool allows you to increase the tissue with a zoom increment of 2 to 100 (Fig. 4.1). To magnify the tissue:

1. Activate the **Magnifier** tool by clicking the  button.
2. Move the cursor to the area you want to make out.
3. The radius and the zoom increment of the tool are set in the context menu of the tool.

To set these parameters, click on the arrow on the right side of the button .

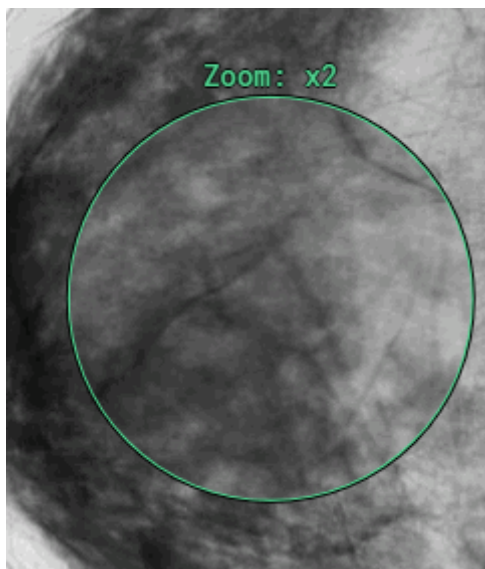


Figure 4.1: Tool Magnifier

## 4.6 Interpolation Filters

Interpolation may be needed when an image is being transformed in some way. The most common type of transformation is image enlargement.

Depending on the complexity of the image interpolation algorithm, from 1 to 256 adjacent pixels are used for image transformation. The greater is the number of the adjacent pixels included in the process, the more accurate are the enlarged images. This accuracy is achieved at the cost of the time required for image processing.



**When filters are used (except for the Bilinear filter), distortions may occur. If you see any dubious artifacts, select the Bilinear filter.**

To change the image interpolation method, you need to refer to the system administrator. Web DICOM Viewer allows for the use of the following filters:

- Bilinear;
- Bicubic;
- Lanczos3;
- Lanczos5.

By default the Lanczos5 filter is active.

## 4.7 Measurements











**For projections (such as x-rays), you have to use the Calibration tool (see Section 4.11) to avoid the mistakes associated with the mismatch between the image size and the real size.**





The measuring accuracy is one screen pixel. As screen pixels are smaller than the pixels of the original image, the actual linear measurement error will be equal to the size of the original image pixel. Certain inaccuracy is also associated with density measurements.

The following tools are used to measure various parameters: **Distance measurement ruler**, **Polyline for measuring distances**, **Angle measurement**, **Point value**, **ROI ellipse**, **ROI rectangle**, **ROI polygon**, **Kobb angle**. To select one of these tools, click on the arrow on the right side of the tool selection button. The button will look different depending on the selected tool:

	<b>Distance measurement ruler</b>
	<b>Polyline for measuring distances</b>
	<b>Angle measurement</b>
	<b>Point value</b>
	<b>ROI ellipse</b>
	<b>ROI rectangle</b>
	<b>ROI polygon</b>
	<b>Cobb Angle</b>

To activate or deactivate the tool that is currently selected, just click on the left side of the tool selection button with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9. If some tool is activated, the button is highlighted. The drawn objects will be displayed in the window while it is open, and you can pan, zoom or rotate them together with the image.

#### 4.7.1 Distance measurement ruler

To measure distance in an image:


1. Activate the **Distance measurement ruler**  tool on the toolbar by clicking the left

mouse button.

2. Click the mouse button on the image to mark the first point and hold down the button.
3. Move the cursor over the screen. The distance from the first point to the current point will be displayed next to the line.
4. Release the mouse button to fix the current point.
5. To cancel an incomplete measurement, press **Esc** on the keyboard.

### 4.7.2 Polyline for measuring distances

To perform polygonal linear measurements:


1. Activate the **Polyline for measuring distances**  tool by clicking the mouse button.
2. Mark the first point on the toolbar by clicking the mouse button.
3. Drag the cursor over the screen. The distance from the first point to the current point will be displayed beside the line.
4. To fix the current point, click the mouse button.
5. Repeat Steps 3 and 4 until the last but one point is fixed.
6. Fix the last point by double-clicking the mouse.
7. To cancel an incomplete measurement, press **Esc** on the keyboard.

To move the polygonal measurement point:

1. Activate any measurement tool.
2. Locate the cursor on the point to be moved.
3. Drag the point, holding the mouse button.
4. Release the mouse button.


### 4.7.3 Angle measurement

To measure an angle:

1. Activate the **Angle measurement**  tool from the toolbar by clicking the mouse button.
2. Put two points on the image, clicking the mouse button. The second point is the angle apex.
3. Move the cursor over the screen to set the other side of the angle.
4. Click the mouse button to fix the second side of the angle.
5. To cancel an incomplete measurement, press **Esc** on the keyboard.

#### 4.7.4 Point ROI measurement




To measure intensity at some point:

1. Activate the **Point value**  on the toolbar.
2. Click on the target point.

The point will be highlighted at the image, and the intensity value will be displayed next to it.

#### 4.7.5 Measure the Intensity Average and Standard Deviation in an Area

To measure the average intensity value and standard deviation in a particular area:


1. Activate one of the **ROI** tools (rectangle , ellipse , or polygon ) from the toolbar by clicking the left/right/middle mouse button.
2. To draw a rectangle, press the mouse button in its top left-hand and release on right-hand corners.
3. To draw an ellipse, just draw the rectangle the ellipse is inscribed in.
4. To draw a polygon, click the mouse button to mark each apex and then double-click the mouse to finish.
5. To cancel an incomplete measurement, press **Esc** on the keyboard.

The following parameters will be displayed next to the highlighted area:

- minimum intensity value;
- maximum intensity value;
- average intensity value;
- standard deviation;
- area perimeter;
- area space.

#### 4.7.6 Cobb angle meter

To measure a Cobb angle:

1. Activate the **Cobb angle**  tool from the toolbar.
2. Draw a line that runs along the border of one of the vertebrae. To do this, click the mouse button to set two points through which the line must pass.
3. Likewise, construct a line for the second vertebra.
4. To cancel an incomplete measurement, press **Esc** on the keyboard.

### 4.7.7 Drawing Parameters

To set the default drawing parameters for measurement tools:

1. Click on the arrow on the right side of the measurement tool selection button.
2. Select the item **Measurement tool settings**.
3. In the dialog box that appears, set the color, line thickness and the font size.
4. Set length and area units (millimetres or centimetres).
5. To apply the settings, click **Yes**. To cancel the settings, click **Cancel**.

To edit the drawing parameters of an existing measurement:

1. Locate the cursor on the measurement to highlight a line or a point.
2. Right-click the mouse.
3. Select the **Set render params...** item from the context menu.
4. In the dialog box that appears, set the parameters in the same way as the default drawing parameters.

### 4.7.8 Move Measurements

To move a measurement:

1. Activate any measurement tool.
2. Locate the cursor on the measurement to highlight the line or point or to magnify the cross, marking the angular point. Do not locate the cursor on angle points.
3. Move the measurement, holding the mouse button.

### 4.7.9 Moving the measurement data

The measurement data and other text information is provided next to lines, indices and highlighted areas. Sometimes the text is illegible; it may overlap the important parts of the image or other text.

In Web DICOM Viewer, you can move the texts placed next to graphics.


To move the text, activate any measuring or drawing tool. Mouse over the text you need to move. You will see a dotted frame round the text, and the text itself will be in bold. Press the mouse button with which the tool was activated and move it to another spot. For the user's convenience, the text is bound to the graphic element or to the respective image area with a dotted line.

When you move a measurement, the text area is also moved.

### 4.7.10 Delete Measurements

To delete measurement:

1. Locate the cursor on the measurement to highlight a line or a point.
2. Right-click the mouse.
3. Select the **Delete** item from the context menu.

To delete all annotations and measurements, click the **Delete all user overlay**  button on the toolbar. In the dialog box that appears, Click **Yes** to delete or **Cancel** to cancel. **Please note that all other graphic objects created manually will be deleted as well.**

## 4.8 Graphic Label Tools

### 4.8.1 General


This tool allows you to create graphic labels (as arrows, ellipses, polygons and text fields) on an image. The labels will be applied during the entire session of working with the series. The labels are attached to specific points on the image and panned, scaled or rotated together with the image.

The button design depends on the selected tool.


To activate/deactivate the selected tool, click on the left side of the graphic label tool selection button with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9. To select and activate one of the tools, click on the right side of the tool selection button and select the tool.

### 4.8.2 Graphic Label Tool

To create a label on an image:


1. Activate the **Arrow** tool. The button will look as follows: .
2. Click the mouse button at the location the arrow should point to and hold it down.
3. Release the mouse where the opposite end of the arrow should be. The pointer will be displayed.
4. To cancel an incomplete creation, press **Esc** on the keyboard.

To create a text label on an image:


1. Activate the **Text** tool. The button will look as follows: .
2. Click the mouse button where the text should be located.
3. Enter text in the field that appears.

4. Click outside the field.

To create a polygon on an image:

1. Activate the **Polygon** tool. The button will look as follows: .
2. Click the mouse button where the first point of the polygon should be located.
3. Move the cursor to the location of the next point. The lines connecting the points of the polygon will be displayed on the screen.
4. Click the mouse button to save the point.
5. Repeat Steps 3 and 4 until the last but one point is set.
6. Double-click the mouse to create the last point. The polygon is complete.
7. To cancel an incomplete creation, press **Esc** on the keyboard.

To create an ellipse on an image:


1. Activate the **Ellipse** tool by clicking the left mouse button. The button will look as follows: .
2. To build an ellipse, just build the rectangle the ellipse is inscribed into. Click the mouse button where the first angle of the rectangle should be located and hold it down.
3. Move the cursor to the location of the opposite angle. The ellipse will be displayed on the screen.
4. Release the mouse button to fix the opposite angle. The ellipse is complete.
5. To cancel an incomplete creation, press **Esc** on the keyboard.

### 4.8.3 Actions with Labels

To edit annotations, activate any annotation tool. The Web DICOM Viewer allows you to perform the following actions with labels:


- Drag. Locate the cursor on the figure line or text and drag the object, holding the left mouse button.
- Drag a point (an apex for an arrow or polygon and a rectangle apex for an ellipse). Locate the cursor on a point and drag the point, holding the left mouse button.
- Delete. Locate the cursor on the label border, right-click the mouse and select the **Delete** item from the context menu.
- Set render params. Locate the cursor on the label border, right-click the mouse and select the **Set render params...** item from the context menu. In the dialog box that appears, set the line color, thickness for a figure and size for text. Click **Yes** to apply the changes or **Cancel** to cancel the actions.

To set the default render parameters, click on the right side of the button and select the **Paint tool settings** command. In the dialog box that appears, set the line color, thickness for a figure and size for text. Click **Yes** to apply the changes or **Cancel** to cancel the actions.




To delete all annotations and measurements, click the **Delete all user overlay**  button on the toolbar. In the dialog box that appears, Click **Yes** to delete or **Cancel** to cancel. **Please note that all other graphic objects created manually will be deleted as well.**

## 4.9 Synchronize Images

Synchronization is applied if two or more series are opened for the same study. This function allows you to scroll images in several series synchronously. By default the option is disabled.

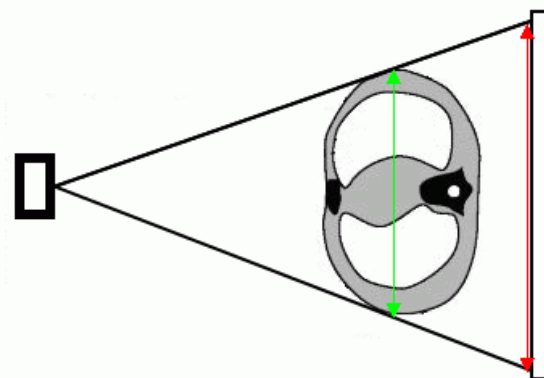
To enable/disable synchronization, click the **Sync series scroll**  button on the toolbar.

## 4.10 Mirror Image Horizontally/Vertically

To flip image horizontally, click the  button. To flip image vertically, click on the arrow on the right side of the  button and select the  **Flip Vertically** command. If several series are opened in the view window, the mirroring is activated for each series independently.

## 4.11 Calibration sizes




X-ray image sizes are increased as compared with the real size of the tissues (Fig. 4.2).



*Figure 4.2: The green arrow shows the actual size of the tissues and red arrow shows the size of the image*

Hence, the size determined by X-ray modality may be incorrect. If a picture contains an object whose size is known (e.g., a catheter), it is possible to calibrate the image size. To

calibrate the size:



1. Click the  **Calibration** button on the toolbar with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9. When the tool is activated, the cursor is displayed as . To disable the tool, click the  **Calibration** button again. When the tool is reactivated, the length and the position of the current segment can be edited.
2. Mark the first point on the picture by clicking the mouse button and holding it down.
3. Drag the cursor over the screen. The calibration interval and its length will be displayed.
4. To set the second point, release the mouse button.
5. In the dialog box that appears, type the real length of the interval constructed.
  - To calibrate all the images of the series, choose the **Series** position of the switch. The images from the same study series may differ in the size of pixels. All the images of the series displayed in the current window are calibrated. As a result, the pixel size for all the images of the series is changed to reflect the actual dimensions of the object;
  - To calibrate only the current image, choose the **Current image** position of the switch.

To calibrate the size, click **Yes**, to cancel, click **Cancel**.

Calibration is factored in for measurements that depend on linear dimensions. After calibration, previously made measurements are automatically adjusted.

Calibration is maintained until the window containing the current series is open.



There are two ways to reset calibration:

- click the arrow on the right-hand side of the  **Calibration** button and select **Calibration reset**;
- left-click on the  icon in the header of the view window (see Section 3.8).

If you reset the calibration, the calibration interval remains in the image.


## 4.12 Visualize Images

Color look-up tables (CLUTs) are intended for marking pixels characterized by different density with different colors in order to improve perceptibility. The colors you see on the screen do not match the actual colors.

To change the CLUT click the  **CLUTs** button on the toolbar. Select **CLUTs** in the window that pops up. The current CLUT is marked with a flag. To close the CLUT window click the  button at the top right of the window.



## 4.13 Scout Lines

The  **Show scout lines** tool is used if two or more series are opened for a particular study. The tool allows you to display the series image scout lines in images from other series if they are synchronized.

The current image scout line is highlighted in green, and the boundary scout lines are highlighted in yellow (Fig. 4.3).

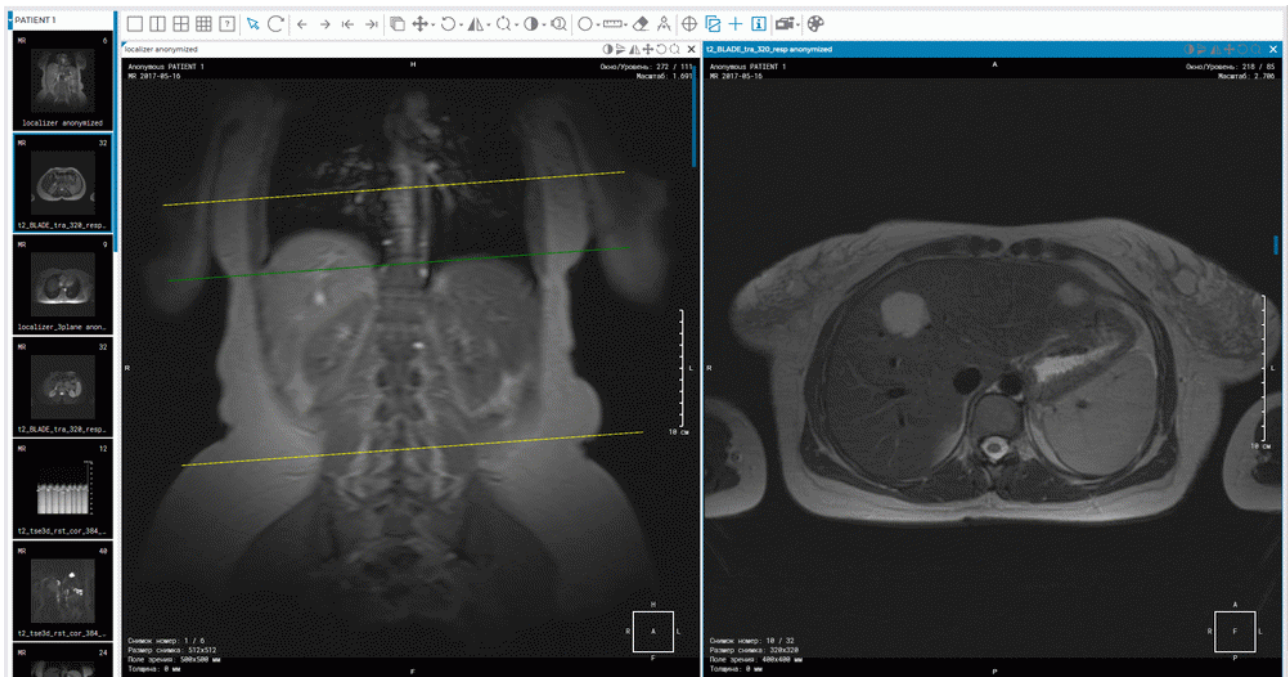



Figure 4.3: The left-hand image scout line is displayed in the right-hand image


## 4.14 Set Up Viewer Workspace

The **Show/hide annotations** tool allows you to display or hide the information about an image in the series windows. The settings are applied to all the series opened in the current tab. By default, the tool is active. To activate/deactivate the tool, click the **Show/hide annotations**

 button on the toolbar.

You can adjust the visibility of:

1. Orientation cube;
2. Orientation letters;
3. Render annotations;
4. Tag values.
5. Rulers.

To customize the Annotations text size, click the arrow on the right side of the **Show/hide annotations**  button, select the **Label settings** command and in the dialog that opens, enter a value. Click **Yes** to apply the changes or **Cancel** to cancel.

#### 4.14.1 Orientation Cube

The **Orientation Cube** is located in the bottom right-hand corner (Fig. 4.4). The markers on the cube show the side the image is viewed from:

A — Anterior

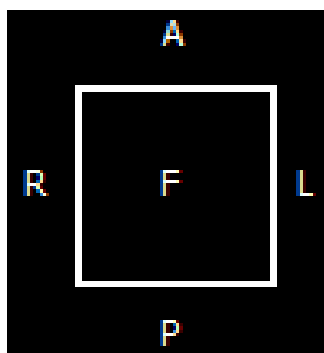
R — Right

L — Left

P — Posterior

F — Foot

H — Head.



*Figure 4.4: Orientation cube*

If «F» is written on the cube face, it means that the image is viewed from below; if «R» is written beside a rib, it means that the patient's right side is on this side of the image.

#### 4.14.2 Scale

A graduated scale is displayed on the right side of the window.

#### 4.14.3 Image Information

The image information is displayed in the bottom left-hand corner. It may include the following parameters, depending on the study type:

- **Image No** — current image number in the series/total number of images in the series;

- **Image size** — image size (pixels);
- **FOV (field of vision)** — image size (millimeters);
- **Thickness** — interval between slices.


#### 4.14.4 Patient Information

The information about the patient is displayed in the top left-hand corner.

## 4.15 Viewing PDF documents

Web DICOM Viewer has several modes for viewing PDF documents.


To print a document or copy the text to a text editor, open a PDF document as a text. There are three methods to do that:

1. Double-click with the left mouse button on the document thumbnail on the series panel. By default, the document will be opened in a new window as a text.
2. Select the PDF document thumbnail on the series panel and click the  **Image viewer** button.
3. Open the context menu by right-clicking on the PDF document thumbnail, and choose **Open PDF as text**.

It is more convenient to view PDF documents containing graphs, charts, and pictures as images. If you open a PDF document as an image, you can use **Zoom**, **Move** and **Rotation** tool (see Section 4.3).

To open a PDF document as an image, open the context menu by right-clicking on the PDF document thumbnail, and choose **Open PDF as image**.

There are two ways to view the tags of the series containing a PDF document:

1. Select the PDF document thumbnail on the series panel and click the  **Show tags** button.
2. Open the context menu by right-clicking on the PDF document thumbnail, and choose **Open tags**.

If you choose **Open in tab -> desired tab** in the context menu, the study will be added to the series panel in the tab you have selected.

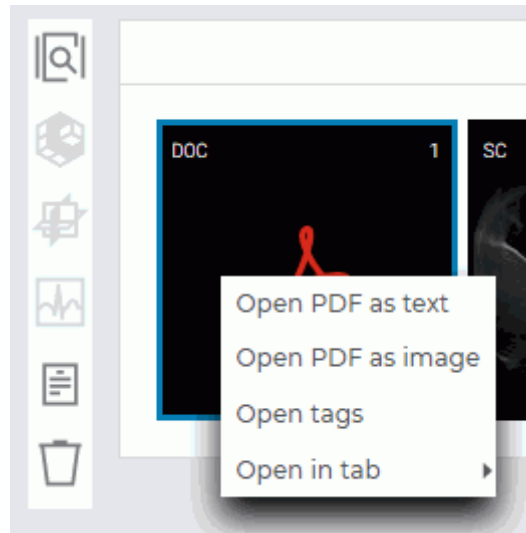


Figure 4.5: Context menu

Figure 4.6 shows a PDF document opened as an image/as a text and the DICOM tags of the series in the Web DICOM Viewer tab.

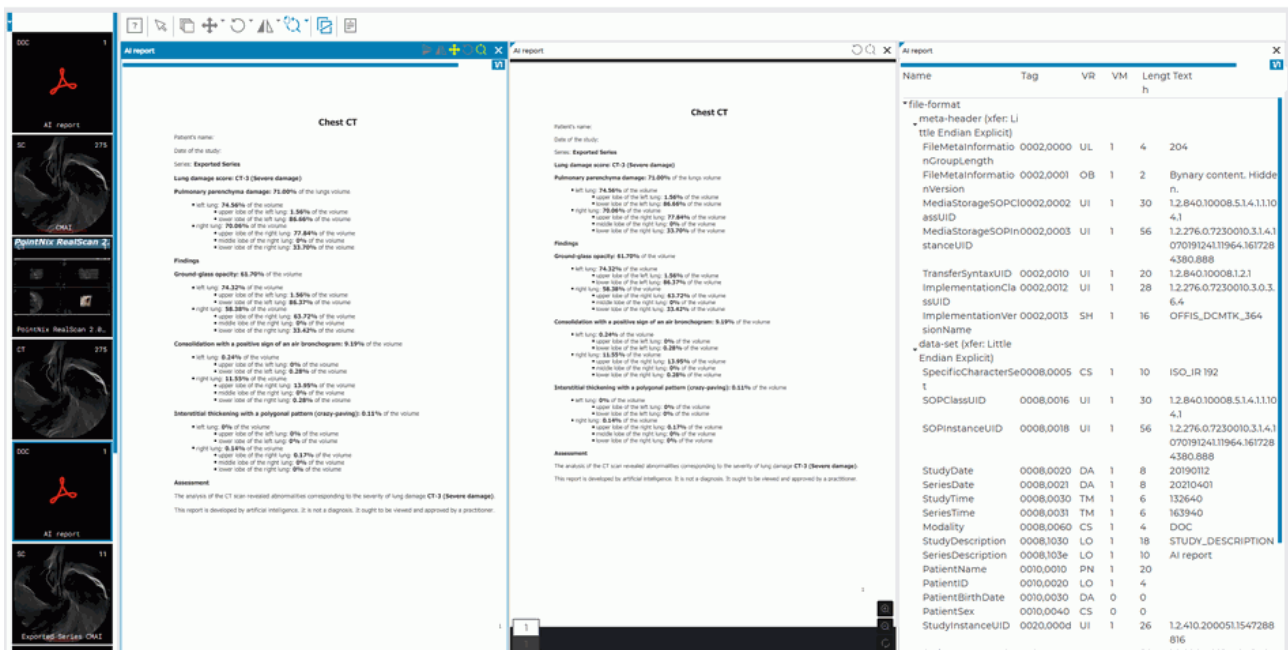


Figure 4.6: Tab Web DICOM Viewer with an open PDF document

## 4.16 View DICOM Tags

### 4.16.1 DICOM Tags. General Information

A DICOM file presents data as a sequence of elements containing information about the image (graph etc.), where the last element has the image (graph etc.) itself. Each element comprises several parts, including:



- **Name;**
- **Tag** — a unique element identifier comprised of a pair of values represented in the hexadecimal number system and determining the group number and the element number;
- **Data type (VR)** — a line showing the data type abbreviation (two symbols);
- **The Value Multiplicity of a data element (VM)** — specifies the number of values that may be encoded in the value field of the data element;
- **Data field length;**
- **Data text** — the information comprised in the element, including the image (graph etc.) itself.

If the **Text** field contains information that cannot be represented in the form of a text (e.g. an image or graph), then the respective column will read: **Binary content. Hidden.**

If the tag is standard, its name will be shown. If the tag is reserved by a certain modality manufacturer or there is an error in its name, then the field will read: **Unknown Tag & Data.** To learn about the data contained in this tag, you will need to study the documents for the modality used in the study.

### 4.16.2 DICOM Tag Viewer Window

There are four ways to view DICOM tags:

1. Select the series thumbnail on the series panel and click the **Show tags**  button on the viewer mode panel. The DICOM tag viewer window will be opened in a new tab.
2. Right-click on the series thumbnail and select the **Open tags** option in the context menu. The DICOM tag viewer window will be opened in the new tab.
3. Right-click on the series thumbnail on the series panel and select the **Open tags** option in the context menu. The DICOM tag viewer window will be opened in the current tab.
4. To view the DICOM tags of an open series, click the **Show tags**  button on the toolbar. The DICOM tag viewer window for the current series will be opened in a pop-up box.



The DICOM tag viewer window is shown in Fig. 4.7.

Name	Tag	VR	VM	Length	Text
* meta-header (xfer: Little Endian Explicit)					
• FileMetaInformationGroupLength	0002,0000	UL	1	4	170
• FileMetaInformationVersion	0002,0001	OB	1	2	Binary content. Hidden.
• MediaStorageSOPClassUID	0002,0002	UI	1	26	1.2.840.10008.5.1.4.1.1.2
• MediaStorageSOPInstanceUID	0002,0003	UI	1	28	1.2.410.200051.1543504284.0
• TransferSyntaxUID	0002,0010	UI	1	18	1.2.840.10008.1.2
• ImplementationClassUID	0002,0012	UI	1	28	1.2.276.0.7230010.3.0.3.5.4
• ImplementationVersionName	0002,0013	SH	1	16	OFFIS_DCMTK_354
* data-set (xfer: Little Endian Implicit)					
• ImageType	0008,0008	CS	3	22	ORIGINAL\PRIMARY\AXIAL
• SOPClassUID	0008,0016	UI	1	26	1.2.840.10008.5.1.4.1.1.2
• SOPInstanceUID	0008,0018	UI	1	28	1.2.410.200051.1543504284.0
• StudyDate	0008,0020	DA	1	8	20181129
• SeriesDate	0008,0021	DA	1	8	20181129
• AcquisitionDate	0008,0022	DA	1	8	20181129
• ContentDate	0008,0023	DA	1	8	20181129
• StudyTime	0008,0030	TM	1	6	181108
• SeriesTime	0008,0031	TM	1	6	181108
• AcquisitionTime	0008,0032	TM	1	6	181108
• ContentTime	0008,0033	TM	1	6	181108
• AccessionNumber	0008,0050	SH	0	0	
• Modality	0008,0060	CS	1	2	CT
• Manufacturer	0008,0070	LO	1	8	PointNix
• InstitutionalName	0008,0080	LO	1	32	PointNix

Figure 4.7: DICOM tag viewer window

To go to the tags of another image, move the slider along the horizontal scroll bar at the top of the window. Alternatively, you can scroll the mouse wheel when the cursor is on the slider line.

The tag display options may be changed from the drop-down list on the toolbar:


- **Full.** Set by default. All the columns with tag parameters are displayed in the window;
- **Compact.** All the columns except the column with the tag name are displayed as one (Fig. 4.8). Next to the name of the column, you will see the navigation buttons you can use to go to the previous  and the next  column.

When the window is reduced ( $\leq 768$  pixels) e.g. when series are arranged in a grid, or when a mobile device is being used, the tag view mode is automatically switched to **Compact** type. If the window size is  $> 768$  pixels, the tag view mode is automatically switched to **Full** type.



Figure 4.8: Reduced DICOM tag viewer window

To copy text from the DICOM Tag Viewer Window into a text editor, highlight the selected text open the context menu of the browser by right-clicking on the highlighted text and choose **Copy**.

To close the DICOM tag viewer window click the  button at the top right of the window.

### 4.16.3 Toolbar

The toolbar is placed in the upper part of the window (Fig. 4.9).

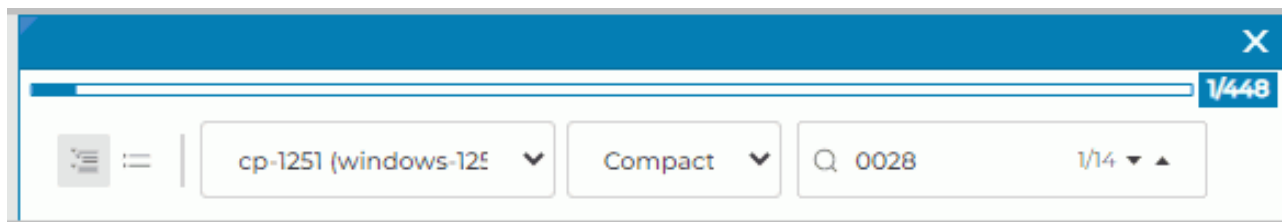














Figure 4.9: Toolbar

Tools:



	The <b>Expand all</b> button shows the tag tree.
	The <b>Collapse all</b> button is used to collapse the tag tree.
	The <b>Charset</b> drop-down menu allows for the selection of the character set used for displaying data. By default, the character set provided for in the DICOM file is used. If the character set is not mentioned in the DICOM file, <b>windows-1251</b> character set is used by default. For details see Section 4.16.6.
	The <b>View mode</b> drop-down list allows for the selection the <b>Full</b> or <b>Compact</b> view mode of the tag window. By default the <b>Full</b> mode is activated. When the window is resized, the view mode changes automatically. For details see Section 4.16.2.
	Search panel. To perform a search, print some text in the <b>Search...</b> field. For details see Section 4.16.5.
	The <b>Next element</b> button. The button is used to go to the next search result.
	The <b>Previous element</b> button. The button is used to go to the previous search result.
	The image indicator shows the current image number and the total number of images in the series. The number is assigned to the image by the modality, and it may be different from the sequence number of the image shown in the <b>Image viewer</b> window.
	The <b>Switch to previous column</b> button shows the DICOM tags for the previous column in the series.
	The <b>Switch to next column</b> button shows the DICOM tags for the next column in the series.



#### 4.16.4 Tag Tree

The tag tree is placed under the toolbar. If several tags belong to the same group, the group is unfolded and the tags are shown. Groups can be nested, one inside another. To unfold a group, click on the  button to the left of its name, to collapse a group, click on the  button. To expand all the groups, click on the  **Expand all** button on toolbar; to collapse all the groups, click on the  **Collapse all** button.

#### 4.16.5 Search

You can perform search by any data contained in the element. To perform search, enter the text you need to find in the **Search...** field. The elements with fully or partially matching values will be highlighted in DICOM tag viewer window. In the search field, you can see the number of the current match and the total number of matches found. To go to the next element found, click the  **Next element** button, to go to the previous element, click the  **Previous element** button.

#### 4.16.6 Changing the Character Set

In the viewer window, the character set provided for in the DICOM file is used for the tags. When working with corrupted DICOM files with invalid character sets, the tags cannot be read. If the character set is not provided in the DICOM file, **cp-1251 (windows-1251)** character set is used by default. Web DICOM Viewer interface provides an opportunity for forced change of the character set.

The **Charset** dropdown list provides for the following character sets:

- **cp-1251 (windows-1251);**
- **latin-1 (ISO-8859-1);**
- **latin-2 (ISO-8859-2);**
- **latin-3 (ISO-8859-3);**
- **latin-4 (ISO-8859-4);**
- **latin-5 (ISO-8859-9);**
- **cyrillic (ISO-8859-5);**
- **arabic (ISO-8859-6);**
- **greek (ISO-8859-7);**
- **hebrew (ISO-8859-8);**
- **utf-8 (utf8).**

Choose the character set you need by left-clicking on the respective option.

## 4.17 Viewing Structured Reports

### 4.17.1 General Information about Structured Reports

Structured reports (SR) are used for transfer and storage of medical documents. Such documents include both, standard reports in free format and structured data. In the latter case, the accuracy, clarity and usefulness of the documents are improved.

A structured report contains information on the patient and the study performed. Structured reports series have SR modality.

### 4.17.2 Structured Reports Viewer Window

There are two ways to view a structured report:

1. Double-click on the series thumbnail placed on the series panel.
2. Right-click on the series thumbnail and choose the **Open in SR** option on the context menu.

The structured reports viewer window is shown in Fig. 4.10.

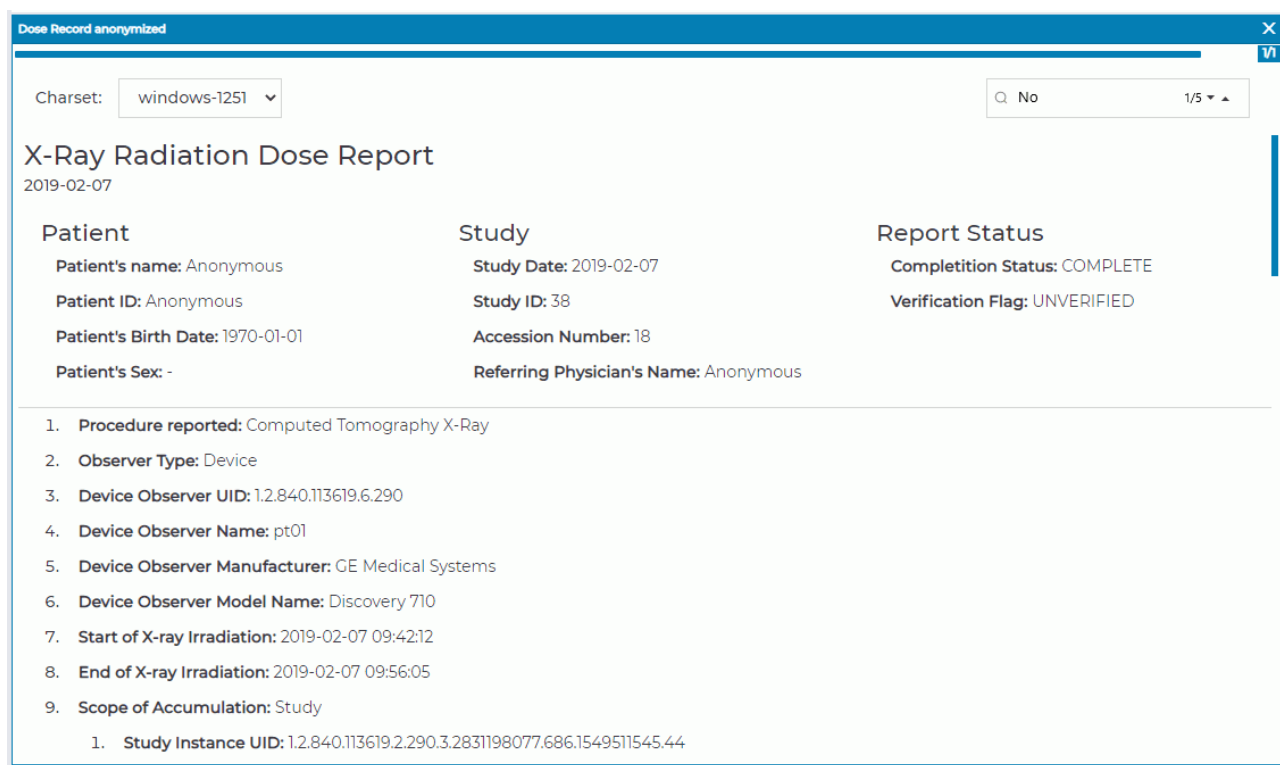


Figure 4.10: Structured Reports Viewer Window

General information on the patient is provided at the top of the structured reports viewer window. It is arranged in three columns: **Patient**, **Study** and **Report Status**. When the window is reduced ( $\leq 768$  pixels) e.g. when series are arranged in a grid, or when a mobile device is being used, all the columns with general information are displayed as a vertical option box

(see Fig. 4.11). If the window size is >768 pixels, the structured reports viewer window is automatically switched to full screen mode. To get the details, left-click on the **Patient**, **Study** or **Report Status** option.

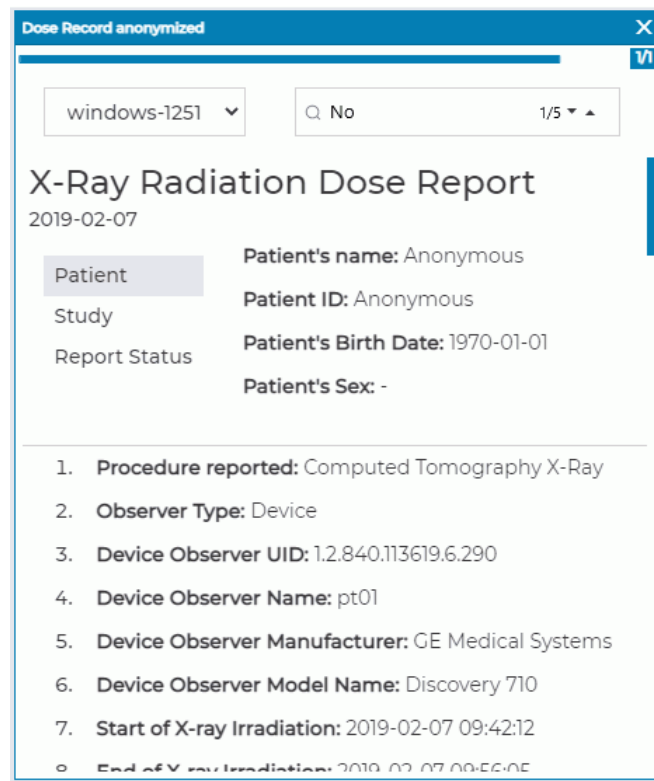


Figure 4.11: Reduced structured reports viewer window

In the lower part of the window, structured information is displayed. To copy text from the structured report viewer window into a text editor, highlight the selected text open the context menu of the browser by right-clicking on the highlighted text and choose **Copy**.

To close the structured reports viewer window, click the **X** button in the right-hand top corner.

### 4.17.3 «Search» Field

You can perform search for any data contained in the element. To perform search, enter the text you need to find in the **Search** field. The elements that match the character combination at least partially will be highlighted. In the search field, you can see the number of the current match and the total number of matches found. To go to the next element, click the **Next result** button. To go to the previous element, click the **Previous result** button.

If the window is reduced, search can only be performed for the visible part of the information — the column displayed in the upper part of the window and the structured information in the lower part.

### 4.17.4 Changing the Character Set

The character set provided for in the DICOM file is used for structured reports. When the user is working with corrupted DICOM files with invalid character sets, the information from the report becomes inaccessible. If the character set is not provided in the DICOM file **cp-1251 (windows-1251)** character set is used by default.

Web DICOM Viewer interface provides an opportunity for forced change of the character set.


The **Charset** dropdown list provides for the following character sets:

- **cp-1251 (windows-1251);**
- **latin-1 (ISO-8859-1);**
- **latin-2 (ISO-8859-2);**
- **latin-3 (ISO-8859-3);**
- **latin-4 (ISO-8859-4);**
- **latin-5 (ISO-8859-9);**
- **cyrillic (ISO-8859-5);**
- **arabic (ISO-8859-6);**
- **greek (ISO-8859-7);**
- **hebrew (ISO-8859-8);**
- **utf-8 (utf8).**

Choose the character set you need by left-clicking on the respective option.

## 4.18 Export series

When exporting, the image is stored in the local storage in a new series of the same study.

To export, click the  **Export** button.

---

## Chapter 5

# Volume Reconstruction




In the volume reconstruction window, a diagnosis may only be established on the basis of analysis of the series with CT, MR, MG, or XA modality.





The Web DICOM Viewer supports 16-bit image format. If the quality of the original image is higher, some of the information will be lost.

### 5.1 Model Positioning Tools

To activate/deactivate the tool click the tool button with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9.

The **Move** tool allows you to model holding down the mouse button. To activate/deactivate tool click the  button on the toolbar.

The **Rotation** tool allows you to model holding down the mouse button. To activate/deactivate tool click the  button on the toolbar. Note that the initial point of the cursor does not affect the rotation. If the cursor is moved vertically, the image is rotated round the horizontal axis. If the cursor is moved horizontally, the image is rotated round the vertical axis. That is, the image follows the cursor. If the cursor moves along a slanting line, the image slants the same way.

The **Zoom** tool allows you to model holding down the mouse button. To activate/deactivate tool click the  button on the toolbar.

### 5.2 Model Playing

The Web DICOM Viewer allows you to automatically rotate a volume model around one of the vertical axes relative to the center. The tool is described in Section 4.2.


## 5.3 Cutting Tools

There are cutting tools on the side panel. To activate/deactivate the tool click the tool button with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9.



### 5.3.1 Polygonal Cut

The tool allows you to build a polygon or an area with smooth borders that the cut area is projected on.

To build a polygon:

1. Activate the **Polygonal Cut**  tool.
2. Click the mouse button to set the apices of the polygon marking the figure to be cut, except the last point.
3. Fix the last point by double-clicking the mouse.
4. To cancel an incomplete building, press **Esc** on the keyboard.

The part of the model to be projected on the area will be cut.

To undo this action, click the **Cancel**  button; to redo the action, click the **Repeat**  button.

### 5.3.2 Inverse Polygonal Cut

The tool is similar to the previous one, except that the part of the model not to be projected on the area will be cut. To activate/deactivate the tool, click on the arrow on the right side of

the  button and select the  **Inverse Polygonal Cut** command.

# Chapter 6

## Multiplanar Reconstruction (MPR)

### 6.1 View Images

There are two ways to open a series in the MPR reconstruction mode:


- select a study series on the series panel and click the  **MPR reconstruction** button;
- open the context menu for the series thumbnail by right-clicking and select the **Open in MPR** option.

Fig. 6.1 illustrates the multiplanar reconstruction window.

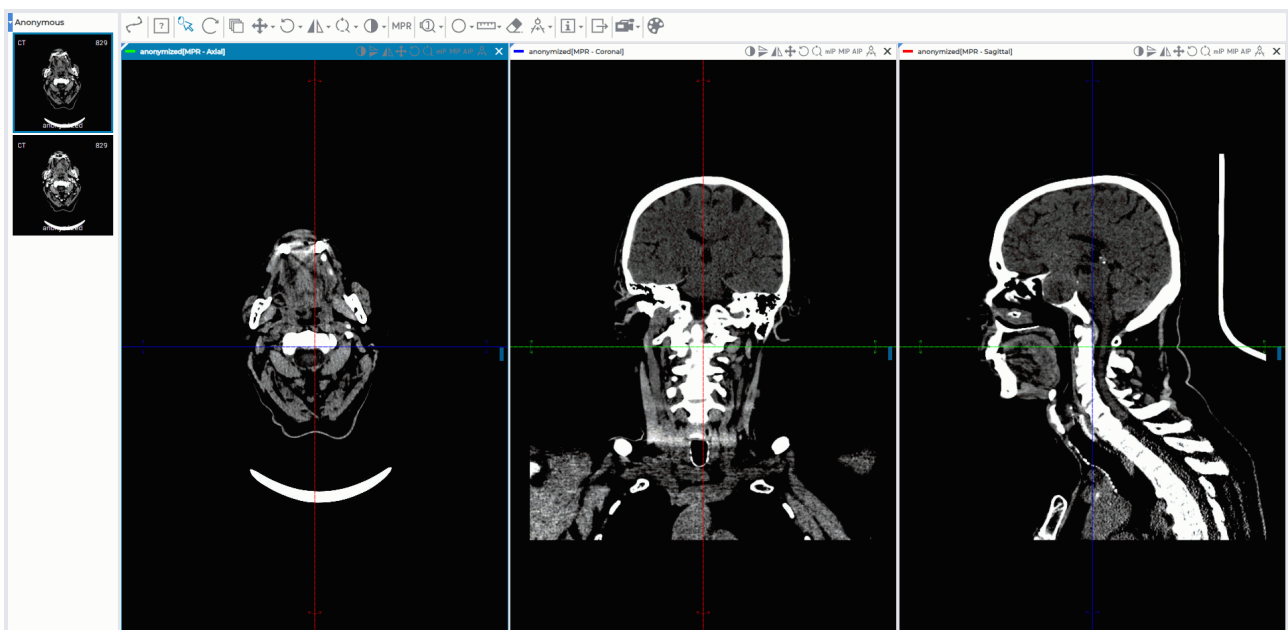


Figure 6.1: Multiplanar reconstruction tab

The series will be opened in a new tab. There will be three image viewing windows: one with the axial plane, one with the frontal plane, and one with the sagittal plane.

View images in the MPR windows is similar to view flat images. To move to the another image, rotate the mouse wheel or use the scroll bar on the right side of the window.

To expand any section plane window of the **MPR reconstruction** tab and restore its size, double-click with the left mouse button on the window header.

## 6.2 Reconstruction Modes. Slice Thickness

### 6.2.1 Render Modes

To switch between modes, the **MPR modes** **MPR** button on the toolbar is used. On the button, you can see the name of the mode. To change the mode, click the **MPR modes** button and select the mode in the window that pops up (see Fig. 6.2).

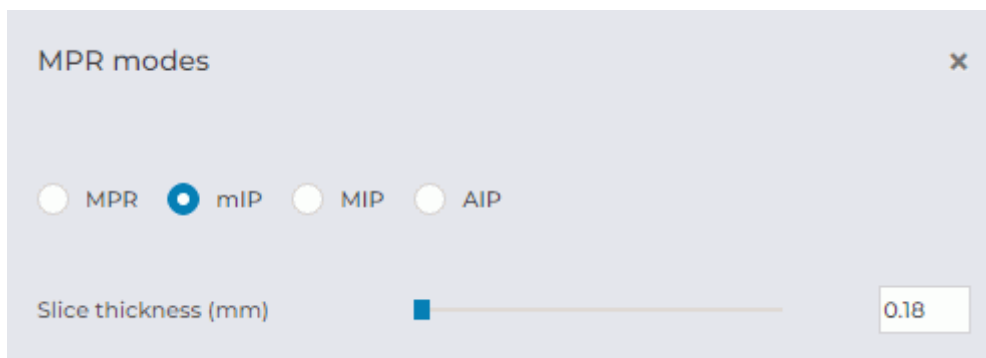


Figure 6.2: The window for reconstruction mode selection

Four render modes are available:


1. The **MPR** mode. Sections are available for viewing. Set by default.
2. The **MIP** mode . A slice of a particular thickness is viewed instead of a section. A point with maximum intensity in the slice is projected on each point in the image. For details on how to set the thickness, see the next section.
3. The **mIP** mode . Similar to the previous mode, but points with minimum intensity are projected on the image.
4. The **AIP** mode. Similar to the previous mode, but the intensity of each point equals the average intensity of the points projected on this point in the image.

### 6.2.2 Slice Thickness

In the **MIP**, **mIP** and **AIP** render modes, the slice thickness is set using the **MPR modes** window (Fig. 6.2). Click the **MPR modes** button and type the value or move the slider to change the value. In the projection window, the slice borders are marked by dotted lines.




## 6.3 Working with Orthogonal Planes

Activate the **Cursor**  tool with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9. By default the tool is activated by the left button. To move the cutting planes to the target place, click on this place or move the cursor holding down the left button.

To rotate a plane while maintaining orthogonality:

1. Locate the cursor on the radial bidirectional arrow on the plane line (see red arrows in Fig. 6.3). The bidirectional arrow will be highlighted.
2. Move the cursor, holding the mouse button to rotate the plane by the required angle. The images on the other planes will change.
3. Release the mouse button to fix the current position of the plane.

To undo the rotation of all planes, click the **Restore original view** button on the toolbar . **Note that all the other changes made with the tools used for editing images will also be canceled.**

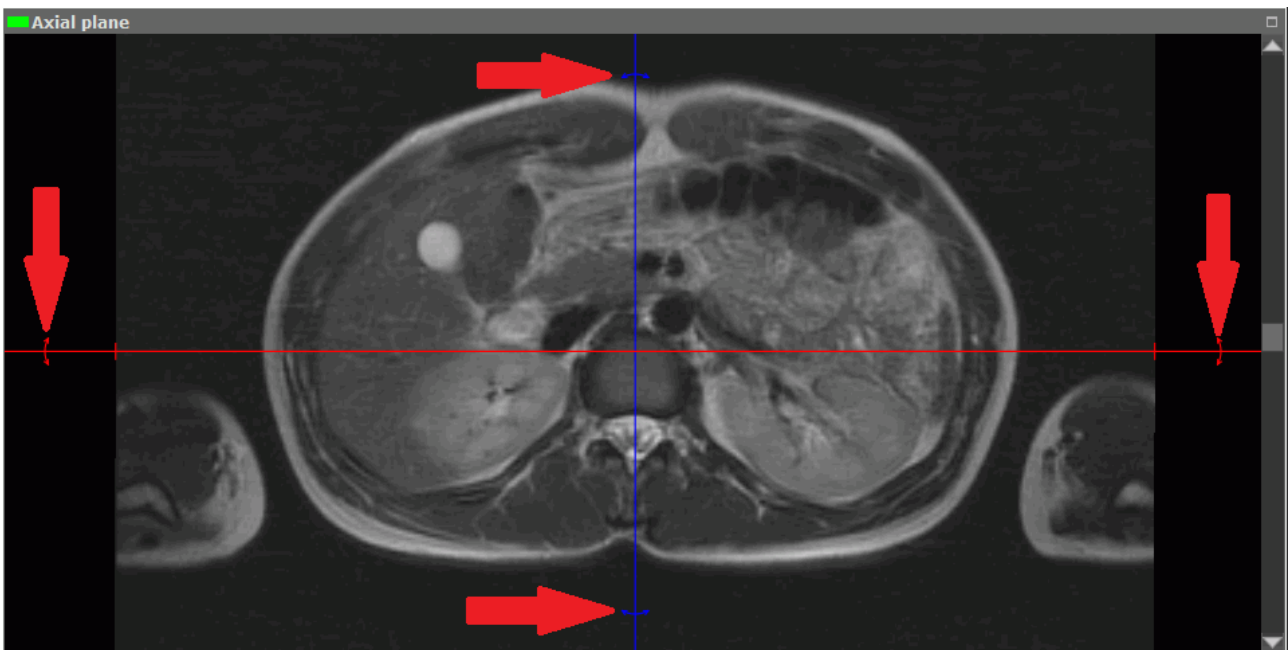





Figure 6.3: Rotate an orthogonal plane

## 6.4 Curvilinear Reconstruction. Build Surface

Curvilinear reconstruction is a section of tissues by a curvilinear surface whose configuration is set by the trajectory passing through the middle of this surface. This trajectory is called a **curve**.

To activate the Curvilinear reconstruction mode, click the **Curvilinear reconstruction mode**  button with the left, right, or middle mouse button. To work with this tool, use the button with which it was activated. You will find the details concerning the use of the tools in Section 3.9. When the tool is activated, the cursor looks like . To deactivate the tool, click the **Curvilinear reconstruction mode**  button again. When the tool is reactivated, the current curve may be edited.

To build a surface:

1. Select the plane in which it would be convenient to start building a curve.
2. Roll the mouse wheel to select the slice where the curve will be located.
3. Fix the first point on the image by clicking the mouse button with which the tool is activated.
4. If necessary, move to another slice by rolling the mouse wheel.
5. Move the mouse to select the location of the next point. Fix the point by clicking the mouse button with which the tool is activated. A red curve with a thickness of 1 pixel is drawn between the points.
6. Repeat Step 4 and 5 until the last but one point is fixed. While building the curve, the current section will be displayed in the **MPR - Curved surface** window (Fig. 6.4).
7. Fix the last point by clicking the mouse twice.
8. If necessary, correct curve. For details on how to correct, see the section 6.4.1.

To cancel the curve that has not been completed, press **Esc** on the keyboard.

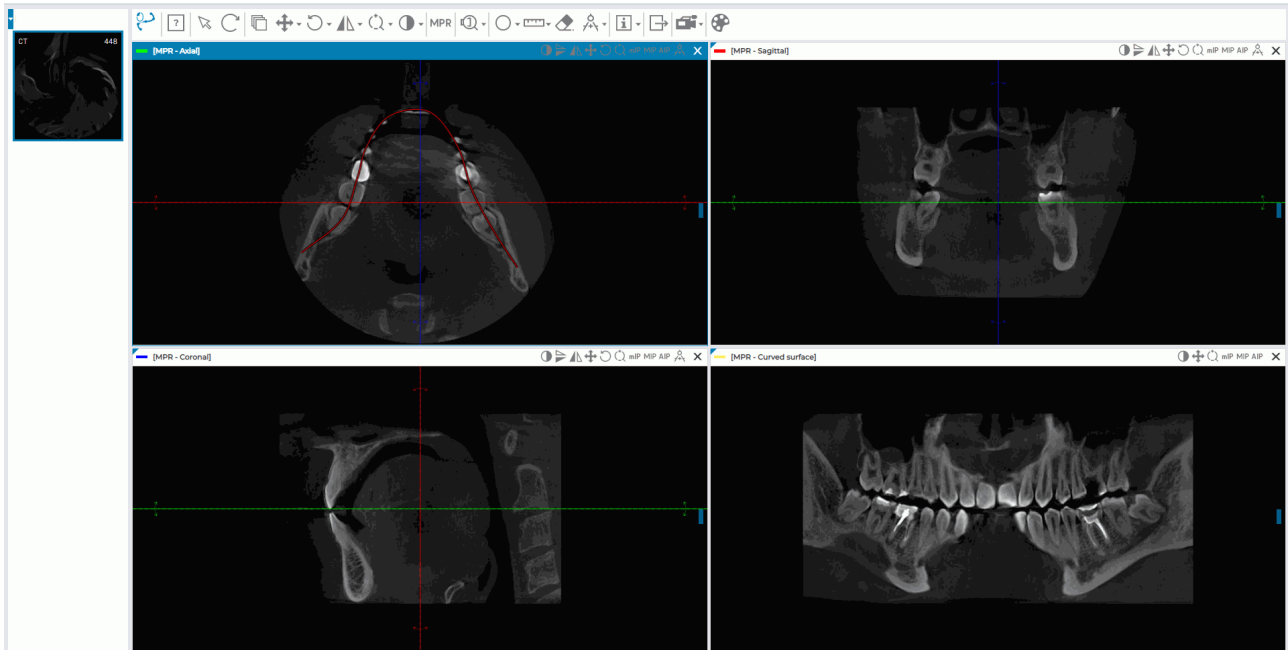


Figure 6.4: Reconstruction by a curve

In the left-hand bottom corner of the window, in the **Curve rotation angle** field, you see the current value of the section rotation angle (in degrees).

There are two ways to rotate a section with a surface in the **MPR - Curved surface** window:

- by rotating the mouse wheel. When you scroll up, the section is rotated by a positive angle. When you scroll down, the section is rotated by a negative angle. One click of the mouse wheel changes the rotation angle by one degree;
- with the help of the scroll bar on the right-hand side of the window. Move the slider up to rotate the section by a positive angle or down to rotate it by a negative angle.

A section with a surface built around the curve may be rotated within the range of  $-180^\circ$  to  $+180^\circ$ . Cyclic rotation is available when the **Playtool** is activated with the active **Replay** command. For details see Section 4.2.

To escape the curvilinear reconstruction mode, close the **MPR - Curved surface** window or one of the section plane windows.

### 6.4.1 Actions with a Curve

Actions with a curve can be performed if the **Curvilinear reconstruction mode** tool, paint tools, or measuring tools are active.

The following actions are available:

- **moving a point.** Mouse over a point. The point will be highlighted. Move the point while holding the mouse button with which the **Curvilinear reconstruction mode** tool, paint tool, or measuring tool was activated;
- **deleting a curve.** Mouse over the curve or a point on the curve. Right-click and select **Delete**.

## 6.5 Measurements

The measurements in the windows of the projections of cutting planes are conducted in the same way as for flat images (see Section 4.7).

The following tools cannot be used in the **MPR - Curved surface** window:

- **Curvilinear reconstruction mode;**
- **Reopen the series;**
- **Rotation;**
- **Flip Horizontally/Vertically;**
- **Magnifier;**
- measurement tools (**Distance measurement ruler, Polyline for measuring distances, Angle measurement, Kobb angle**);
- **Synk by point;**
- **Export;**
- **Show tags;**
- **Calibration.**

For **ROI ellipse, ROI rectangle** and **ROI polygon** tools, the area and perimeter values are not displayed in the **MPR - Curved surface** window.

## 6.6 Annotations

Annotations are described in Section 4.8.

## 6.7 Calibration

The procedure of image size calibration in the MPR reconstruction mode is similar to the procedure of image size calibration in the flat image viewer mode, except that you can only calibrate all the images of the series. The procedure of image size calibration is described in Section 4.11.

---

# Chapter 7

## ECG Viewer

### 7.1 View Graphs

If the graphs do not fit on the screen, then:

- pan them horizontally with the mouse, holding the left button;
- pan them vertically by rolling the mouse wheel.

### 7.2 Toolbar

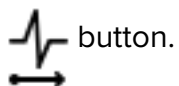
The toolbar is at the top of the tab (Fig. 7.1).



Figure 7.1: Toolbar

#### 7.2.1 ECG Speed

Two speed values are available: 25 and 50 millimeters per second. The default speed is 50 millimeters per second. The required value can be set using the «**Horizontal Scale ECG**»



button.

#### 7.2.2 Scale


Two scale values are available: 10 and 20 millimeters per millivolt. The default scale is 10 millimeters per millivolt. The required value can be set using the «**Vertical Scale ECG**»



button.

### 7.2.3 Length Interval

To select a length interval:


1. Activate the **Horizontal Measurement**  tool on the toolbar with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9.
2. Move the mouse along the graph to find the point to start with (it does not matter if the point is located on the left or on the right).
3. Click the mouse button to fix the point.
4. Move the mouse along the graph to locate the second point. The interval length value will be displayed against the interval background.
5. Click the mouse button to fix the point.

To move the interval, locate the cursor on it and drag it holding the left mouse button. Only one interval can be built at a time.

To hide the interval, deactivate the **Horizontal Measurement** tool.

### 7.2.4 Value Interval


To select a value interval:

1. Activate the **Vertical Measurement**  tool on the toolbar with the left/right/middle mouse button. To continue work with this tool, use the button with which the tool was activated. To learn more about tool control, see Section 3.9.
2. Move the mouse over the graph to locate the point to start with (it does not matter if the point is located at the top or at the bottom).
3. Click the mouse button to fix the point.
4. Move the mouse over the graph to locate the second point. The value matching the interval will be displayed against the interval background.
5. Click the mouse button to fix the point.

To move the interval, locate the cursor on it and drag it, holding the mouse button. Only one interval can be built at a time.

To hide the interval, deactivate the **Vertical Measurement** tool.

### 7.2.5 Set Up Coordinate Plane


To change the color scheme, click the **CLUTs**  button on the toolbar and in the **CLUTs** dialog box select a color scheme. Two color scheme options are available: **classic** (set by default) and **green**.


## 7.3 Frequency Filters


If an ECG is recorded with distortions, use filters to correct the graphs.




**Graphs are changed when filters are applied. To establish a diagnosis, you need to use the original data.**

These filters remove the components whose frequency is higher than 35 Hz (the )


**Low pass filter 35 Hz** button) or 75 Hz (the  **Low pass filter 35 Hz** button). To apply the filter, click the corresponding button. To cancel filtering, click the corresponding button again. Only one filter can be applied at a time.

To remove power line interference from the ECG signal, use the Notch filter. To apply the filter, click the  **Notch filter 50 Hz** button. The tool has current value 50 Hz. If you need to set a different value, click on the arrow on the right side of the **Notch filter 50 Hz** button and select the **Custom notch filter** item. In the **Render params** dialog box set the value of the frequency in your power supply. To apply the settings, click **Yes**. To cancel the settings, click **Cancel**.

To cancel filtering, click the button again.

To remove the walks of the baseline of the graph, use a High pass filter. To apply the filter, click the  **High pass filter** button. To cancel filtering, click the button again.

## 7.4 Export series

When exporting, a series is saved in the filtered form. The series is stored in the local storage in the same study. To export, click the  **Export** button.

# Chapter 8

## Licensing

### 8.1 Personal User Licenses

A personal user license is registered in the user's account on the **User settings** (see Section 2.4).

The license key activated for a certain user creates one personalized connection providing for continuous access to the system. The user with a personal license has constant access to the system.

### 8.2 Concurrent licenses

A concurrent license is a license limiting the number of users who can work in the system simultaneously.

The Web DICOM Viewer server automatically provides an unoccupied connection to the user when he/she logs in. The connection provided belongs to the shared unoccupied connection pool. The shared connection pool is a list of unoccupied concurrent connections. The connection stays active during the work session, which ends after the user logs out.

**Attention! If there are not enough concurrent connections, the user will be able to work in the system only after another user log out and an unoccupied connection appears.**



---

Thanks for selecting our product! The INOBITEC Software FZ-LLC team is constantly working to improve it. We will be grateful for any feedback, comments and suggestions how to enhance the product functionality, user-friendliness and visualization quality.

**We wish you success in your work!**