Dicompass Gateway

User guide

Medoro s.r.o.

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Contents

1 Introduction

1.1 Purpose of this document

This document is a user manual in electronic form, describing the functions and operation of the SW Dicompass Gateway.

The user manual is intended for professional users, i.e. for trained operators of SW Dicompass Gateway, i.e. trained medical and intermediate medical personnel. User training is carried out once after the implementation of the MD and then with each released version with a change in the MAJOR number, i.e. the first number of the versioning format.

Administration of SW Dicompass Gateway does not apply to the regular user, therefore it will not be described here. It is described in detail in the Administrator’s Guide.

Please read this manual carefully before using the Dicompass Gateway medical device.

If necessary, this instruction manual is provided in paper form, at no additional cost to the user, within 7 days of receiving the request. The request can be sent by email to helpdesk@medoro.org.

Name and address of the manufacturer: **MEDORO s.r.o.**, Štrossova 567, 530 03 Pardubice, Czech Republic, ID: 26002612, VAT number: CZ26002612, http://www.medoro.org, http://www.dicompass.cz,

e-mail: info@medoro.org

1.2 Reporting serious adverse events

According to Regulation 2017/745 of the European Parliament and Council (EU) from 5th April 2017 on medical devices, amending Directive 2001/83/ES, Regulation (ES) No 178/2002 and Regulation (ES) No 1223/2009 and repealing Council Directives 90/385/EHS and 93/42/EHS, serious adverse event refers to an event which directly or indirectly leads to, may have or may lead to one of the following consequences:

1. death of a patient, user or other person
2. temporary or permanent deterioration of patient's, user's or other person's health
3. serious threat to public health

Any serious adverse event that has occurred in connection with the device in question should be reported to the manufacturer and the competent authority of the Member State in which the user and/or the patient is established.

In the event of an adverse event, contact us using the HelpDesk, by phone on +420 775 324 005, or by email at dicompass@medoro.org.

1.3 Description of the intended purpose of use

The intended purpose of SW Dicompass Gateway:

The specialized modular software Dicompass Gateway is intended as a tool for working with image data for the purposes of diagnostic and therapeutic actions in the healthcare sector. Dicompass contains not only a DICOM viewer, but also modules for a complete solution for video digitization from endoscopes, ultrasounds, microscopes, as well as other devices that do not have a direct DICOM output, conversion of recordings from digital cameras, scanners and cameras into DICOM format (DICOMization). Dicompass also offers functions for radiodiagnostics and radiotherapy.

The Dicompass Gateway software is an active medical device that does not come into contact with the patient and its purpose is to display and work with image medical documentation. The Dicompass software is thus intended for all groups of patients undergoing radiological or other (e.g. endoscopic) examinations that generate image documentation.

The Dicompass Gateway software is used for the diagnosis of health conditions requiring radiological or other (e.g. endoscopic) examination generating image documentation.

The indication for the use of MD Dicompass Gateway is connected with the need for a specialized doctor to diagnose the deteriorated condition of the patient using imaging methods. Dicompass enables this image documentation to be archived and subsequently worked with.

Contraindications - Patients in whom it is not possible to obtain evaluable imaging documentation.

Warning: The use of Dicompass is conditioned by the training of users.

Dicompass Gateway is a certified tool for archiving, viewing and postprocessing DICOM data acquired using DICOM modalities, such as X-ray, CT, MR, SONO, ECG and others. This SW uses web technologies and for its purpose it is necessary to use standard HTML browsers (current versions) supporting WebGL (Edge, Chrome, Firefox) across all system platforms (Windows, Apple iOS, Linux, Android). The program's interface aims at user convenience and clarity.

The software is classified and certified as a Class IIb medical device in accordance with applicable legislative requirements.

CE 2265

Figure 1: img

Dicompass Gateway is a purely web-based DICOM tool that, in addition to a web browser, does not require any additional support resources installed on the workstation. Thanks to traceless technology, it leaves no traces on the user's PC.

Considering the HTML technology used, it can also be operated on any mobile device (a tablet or a smartphone), both inside and outside of your medical facility.

Dicompass Gateway is a very sophisticated tool for remote consultations and all work performed within this SW is fully audited.

Not only does it contain the basic tools for viewing and working with DICOM images, such as distance measurement, area measurement, windows, annotations, rotation options, screen splitting, support of multiple monitors, including diagnostic ones, etc., but also supports image captions, any image filters, or a wide variety of image displays.

In multiple windows, it is possible to use synchronized image viewing or browsing images marked as important.

Dicompass Gateway supports a number of standardized formats such as JPEG, PNG, SR, MPEG2, MPEG4 and more. Images or recordings can be exported to an external device, burned to a CD/DVD, or sent via metropolitan exchange ePACS / ReDiMed to another medical facility. Dicompass Gateway also supports multiple PACS archives at once. You don't have to search and switch between different functions. The

search dialog allows you to set exact parameters. The overall browser settings can be saved to each user account. After logging in, your labels or measurement tools will not be shuffled by your colleagues previous usage.

Thanks to use of web technology, all image documentation is not stored on the end device of the doctor's diagnostic workstation in advance, thus, when it is opened, there may be a delay before loading. This delay is affected by the speed of the internet connection or the response of the line of the internal network of the medical facility.

MD Dicompass Gateway is a separate device and for its intended purpose of use does not use additional accessories and is not part of the system or kits.

MD Dicompass Gateway does not contain a medicinal substance, including derivatives of human blood or plasma, or tissue or cells of human origin or their derivatives, or tissues or cells of animal origin or their derivatives. It is not intended for introduction into the human body.

Dicompass Gateway is not a single-use resource. It is supplied non-sterile and is not intended for sterilization.

Dicompass Gateway is delivered exclusively electronically and thus does not use a storage requirement.

We recommend using the Dicompass Gateway measurement function only on calibrated images by the modality manufacturer. For non-calibrated images, the results of the MD Dicompass Gateway measurement function are only informative, and to clarify the result, we recommend using the calibration tools of the used modality.

The technical description of the device is part of the service manual.

1.4 System requirements

The chart describes the minimum required configuration per server for SW operation Dicompass Gateway:

Parameter	Requirement
CPU	4 cores
RAM	8 GB
HDD	according to desired volume of data
Network interface	1 Gbps

The chart describes the minimum required configuration of a PC for SW operation Dicompass Gateway:

Parameter	Requirement
OS	Windows 10, 11 (64 bit) with current updates
	MacOS with current updates
Internet browser	Google Chrome (current stable version)
	Microsoft Edge (current stable version)
	Mozilla FireFox (current stable version)
	Safari (current stable version)
CPU	2 cores
RAM	4 GB
HDD	0.5 TB
Network interface	100 Mbps

For the correct functionality of MD Dicompass Gateway, it is required that no restrictions be applied to the amount of data transferred or to the number of requests.

The installation and configuration of the MD Dicompass Gateway is carried out according to the service manual, and a handover protocol containing its validation is kept on the correctness of the installation and the functionality of the device at the customer's place. Installation and configuration of the device is performed only by service technicians trained by the manufacturer.

Based on the terms of the customer's service contract, MD Dicompass Gateway is remotely monitored and serviced 5/8, 24/7, or according to other agreed conditions.

Requests can be reported in three ways, by creating a request directly in the Helpdesk system at: - https://helpdesk.medoro.cz/ - by email at helpdesk@medoro.org - by phone +420775324005, or to a specific service technician, who then enters the request into the Helpdesk system

Regular maintenance is carried out on the basis of released resource updates and their installation.

For the correct and safe functioning of the device, it is not necessary to calibrate MD for the entire specified period of its life.

There are no risks for persons involved in the installation, calibration or servicing of the devices.

Safety precautions and product life cycle

1. Security precautions and environment context

The security of the Dicompass Gateway relies on a combination of internal mechanisms and the customer's protected infrastructure. From a product perspective, security is provided by the Linux operating system and an integrated firewall management tool (iptables / UFW), which is configured during implementation. Access to the server part of the system is only granted to trained service technicians of the manufacturer (secured by an encrypted SSH key). User access is protected by two-factor authentication (2FA) or integration with the customer's LDAP/AD.

To ensure the declared level of security, it is necessary for the operator's IT department to ensure the following operating conditions: * Physical security: The server infrastructure with virtual machines must be located in a secure room with controlled access. * Network isolation: The product must run on a dedicated VLAN, whose communication is strictly controlled by the healthcare facility's central firewall. * Remote service: The customer must provide secure access (VPN) for updates and service by the manufacturer.

2. Instructions for secure software removal

Due to the closed architecture of the system, users do not have access to the application's file system. When you stop using the product (take it out of service), proceed as follows: * Contact the manufacturer's service department, whose technicians will ensure the professional and secure migration of all patient data and the following complete deletion of application data from the system. * After confirmation of data deletion, the customer's IT department is responsible for securely removing the relevant virtual machine (VM) from the hypervisor and permanently revoking the associated network permissions (firewall rules, VPN access).

1.5 List of terms and abbreviations used

List of used terms and abbreviations

Term	Explanation
AD	Microsoft Active Directory
AE	Application Entity
DICOM	Digital Imaging and COmmunication System - it is a standard for imaging, distribution, storage and printing of medical data
DPGW	Dicompass Gateway
DVR	Direct Volume Rendering - in addition to color, it also uses transparency and can display everything at once. All voxels of volume contribute to the final image

Term	Explanation
HP	Hanging Protocol - a protocol enabling to change and automate the form of display of the opened study based on many parameters (type of examination, image position …)
MinIP	Minimum Intensity Projection
MIP	Maximum Intensity Projection
MPR	Multiplanar reconstruction
MWL	a service enabling transmission of patient demographic data within the DICOM protocol - Modality worklist
SSD	Shaded Surface Display, 3D projection way, voxels with a density higher than the given limit contribute to the resulting image
SSO	Single Sign On - automatic user login with their identity logged in the operating system
ID	Patient ID number
VRT	Volume Rendering Technique, 3D projection way

2 Login to the system

DPGW supports multiple ways of user authentication / authorization when logging in to the web interface:

- with user name and password from local DPGW database
- with a user name and password authenticated against LDAP or Active Directory
- two-factor authentication (username, password and authenticator)
- Single Sign On (SSO) on stations in the domain in the MS Windows environment
- with certificate - local user
- with certificate - LDAP/AD user
- by passing login information from HIS (information about currently supported HIS which are able to pass user's identity to DPGW can be given to you by the system supplier)
- with temporary one-off token generated directly in DPGW for online consultations

To log in to the web interface, enter the IP address or domain name of the server running DPGW in the address bar of the web browser. If you do not have SSO, login certificate or other advanced authentication method configured, the system will require you to fill in a username and password:

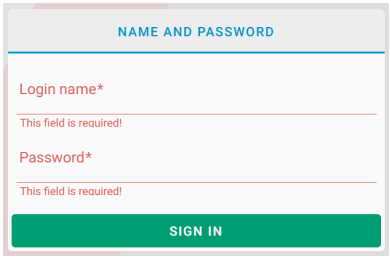


Figure 2: img

By clicking on the SIGN IN button the user will be logged in. If the login fails (incorrect username or password), a red bar with an error message will be displayed and the login must be repeated with the correct login information. By default, password guessing prevention function is turned on, so that each time you try to log in incorrectly, the time required to authenticate the user to the server increases. If you have forgotten your login details, contact your system administrator or supplier before your account is completely suspended due to random password guessing.

In the case of two-factor authentication, it is also required to enter the numerical code generated in the selected authenticator. If you are logging in to DPGW using two-factor authentication for the first time, you will be redirected to a page with a QR code that you scan with your mobile device in the selected authenticator and you will be assigned an account with a generated unique number for your login to –PRODUCT- SHORT-NAME–. As an authenticator, we recommend, for example, Google Autheticator, which can be downloaded for free from the online distribution service Google Play and the App Store. To work with Google Autheticator, follow the manufacturer's instructions.

3 Basics of user interface

After a successful login into the system, the basic screen for searching the system registers will be displayed.

Warning: The logged-in user may not have all the features described below available. It depends on the type of license and the functional roles that the user has assigned in the system.

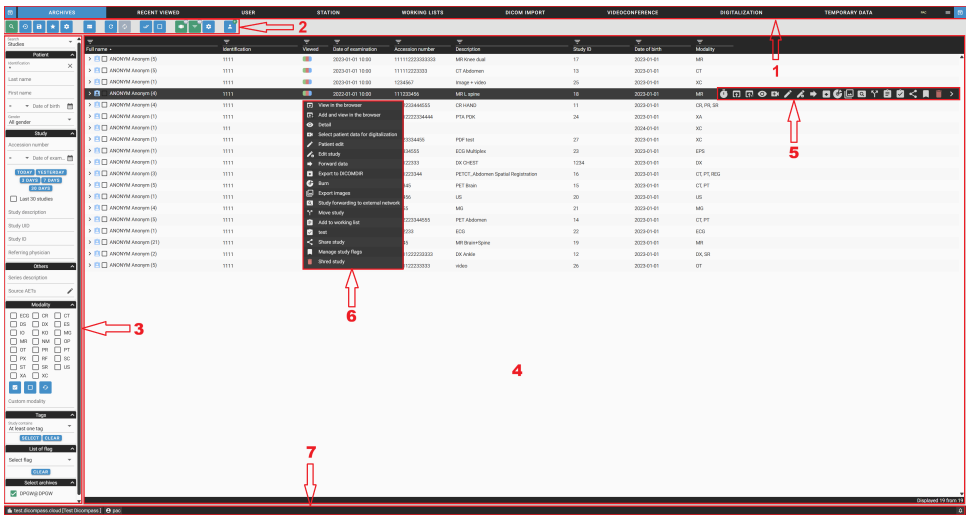


Figure 3: img

The web user interface contains the following sections:

1. Toolbar with tabs for individual parts of the DPGW system
2. Search toolbar
3. Search parameters
4. Search results
5. Floating panel actions
6. Context menu
7. Information bar

You can intuitively switch between sections using interface controls. If you use a multiple monitor setup, it is possible to configure the web environment so that the search and data displaying are shown separately on the preview monitor and the DICOM browser window on other (diagnostic) monitors.

3.1 Searching in system registers

After a successful login into the web interface, the basic dialog box for working with registers of DPGW is displayed. At the top you will find a bookmark bar:

Figure 4: img

- **Archives** ARCHIVES - searching through user-accessible DICOM archives, including the internal database of DPGW (patients, studies, orders). You can edit, delete, or forward the retrieved

data to other AEs or exchange networks (ePacs, ReDiMed). The retrieved data can be opened in integrated DICOM viewer by double-clicking.

- **Recent viewed** RECENT VIEWED - viewing recently viewed studies. It is possible to select a filter on User/Station/Organizational Unit - it is affected by whom the studies were displayed. The User filter displays recently viewed studies only by the logged in user. Station filter displays recent studies displayed on the entire station with respect to access rights. Organizational unit filter shows recently displayed studies of the entire organizational unit, again taking into account access rights.
- **User** USER - private DICOM user data box. The user can import data into this box, for example from a CD/DVD, or another user can forward the data there or the user can forward it himself. The data in this box is visible only to the given user and is thus available at any station where the user logs in.
- **Station** STATION - private DICOM station data box. The same rules apply to it as to the user's data box. Only the stored data belonging to the station can therefore be seen by any user who logs into the given station. On the other hand, the user will not see this data on any other station.
- **Working lists** WORKING LISTS - work (visit) lists created by user or automatically. Each user/group of users can create any number of worklists that they can share with each other. Individual exams can be added to the worklist simply from the search dialog box or directly from the DICOM viewer. DPGW can even create worklists automatically and execute them based on pre-defined rules when saving modality exams, or when receiving an HL7 message from HIS. This setting must be made by the system administrator.
- **DICOM Import** DICOM IMPORT - import DICOM data from CD/DVD/folder into user folder, station or archive. The imported data can then be edited in the user/station folder, displayed in a browser or, after checking, forwarded directly to the PACS archive.
- **Videoconference** VIDEOCONFERENCE - interface for real-time video and audio sharing via video conferencing call with support for multiple call participants.
- **Digitalization** DIGITALIZATION - interface for digitization and dicomization of images and videos from the grab card, or local folder with support of categorization and loading of the Modality Worklist.
- **Temporary data** TEMPORARY DATA - management of areas for temporarily stored DICOM data. Above all, these are the so-called "**Unreceived Data**", i.e. data that could not be stored in the archive due to invalid or inconsistent data. You can correct the data in this area and have it saved again, or download the data in dicomdir format. It is also possible to define an area for the so-called "**Recycle Bin**", where the data deleted by the user from the web interface is moved, so that it can be restored in case of incorrect deletion.

To the right of the tabs, the name of the currently logged in user, the main menu icon and the icon for hiding the entire dialog box are displayed - the DICOM viewer window is displayed . If you have a multiple monitor setup where the search dialog is still open on a separate monitor, this close icon is replaced by the logout icon from the web interface of DPGW.

In the main menu you will find the following items:

- **Settings** Settings - access to the administrator menu for system administration and configuration
- **Logout** Logout - logout from the web interface
- **Change Password** Change password - password change of the currently logged-in user
- **User guide** User guide - displays the user's manual
- **About** About application - displays a dialog box with information about the application version, the user and the station to which the user is logged in
- The last item displays information about the instance name of DPGW and the domain to which the user is logged on.

3.2 Searching in Archives

ARCHIVES

Figure 5: img

Searching in archives serves the user for searching available DICOM archives or internal databases and thus serves as one of the main pillars of - PRODUCT-SHORT-NAME–. This search engine tool is displayed as soon as you log into DPGW or select the Archives tab. It includes 3 areas for searching and working with visual documentation: - Search toolbar - Search parameters - Search results

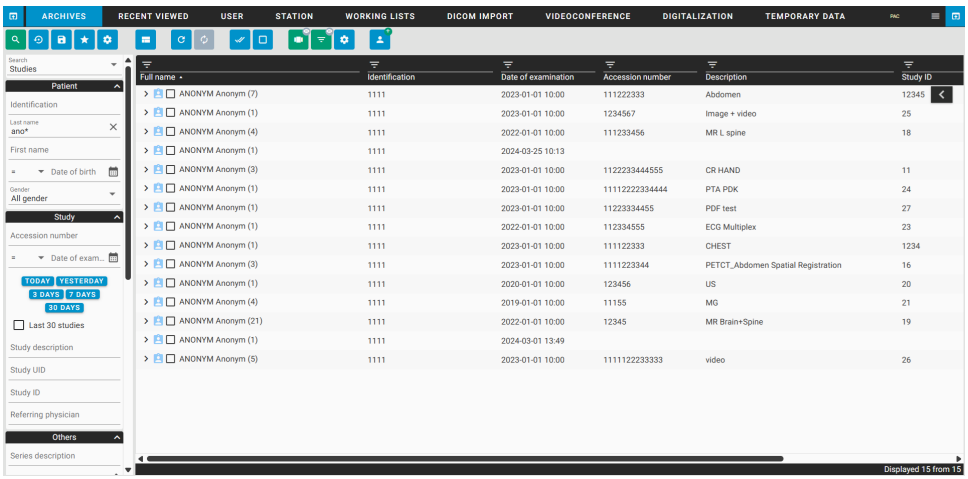


Figure 6: img

3.2.1 Search Toolbar

Figure 7: img

The individual functions of the search toolbar are listed in the following table:

Icon	Function	Description
	Search	confirmation of patient or study search according to selected parameters in the form
	Clear Tab	clears all added parameters in the form
	Add to Favourites	selected search parameters can be saved as a favourite search and then brought up from the favourites list instead of time-consuming filling out of the search fields
	Show Favourites List	displays a list of saved favourite search parameters
	Forms Settings	possibility to define fields that will be offered during the search on individual levels (Patient, Study, Order)
	Change Layout	possibility to change the layout of search parameters
	Refresh	reloading of the search box

Icon	Function	Description
	Enable Auto Refresh	turns on automatic reload of the search box (if this option is enabled, this icon is green)
	Select All	selects all search results for bulk processing
	Deselect All	removes the selection from the previous point
	View Thumbnails	switches on/off series thumbnails preview (preview on - green icon)
	Hide Manual Filters	switches on/off displaying of manual filters (displaying on - green icon)
	Clear manual filters	removes all added parameters in the searched parameters columns
	Column Settings	settings for displayed columns in search results
	New patient	creating a new patient folder
	Replace and View	displays selected studies with the replacement of the last displayed ones (double-clicking on the line of the given study also works)
	Add to new tab	display of selected studies in a new DICOM browser tab
	View patients in tabs	display of selected studies in individual DICOM browser tabs
	Add and View	displays selected studies with adding them to recently viewed
	Move series	marks selected study for transfer to another patient
	Send selected	forwards selected studies to another DICOM node
	Export Selected to DICOMDIR	exports selected images to DICOMDIR
	Burn Selected	prepares selected studies for burning in .iso format
	Export Selected Images	exports selected images to the selected format
	Add to Worklist	adds selected studies to the worklist - either an existing one or allows you to create a new one
	Add Tags	adding information to the selected study
	Share selected	action for sharing a study with an external user

Icon	Function	Description
	Delete Selected	deletes selected studies or series

Some of these tools are also accessible in the context menu, after right-clicking on the selected study.

3.2.2 Search Parameters

The search parameters are used to find the required study stored in the selected PACS archive. To get the most accurate search results, we recommend using all fields for data entry.

After entering the required data, it is possible to bring up the search results using the “Search” button , or using the “Enter” key. To clean the form use the function “Clear form” . Both functions are located in the Search Toolbar.

Individual search categories can be expanded up/down using the / button, located on the right of the category name.

To enter data in each category of search parameters, click in the required field and enter alphanumeric characters. To delete them, it is possible to use the “backspace”/“delete” key or the × on the right of the text field.

To speed the work up when searching, you can use the characters entered in the individual text fields:

Character	Description	Example
*	Wildcard for series of characters	when you enter “Tes*” in the “Name” field, it searches for all results whose name starts with Tes + all characters, e.g. Test, Tester, Tested, etc.
?	Wildcard for one character	when you enter “Tes?” in the “Name” field, it searches for all results whose name starts with Tes + one character, e.g. Test

The search parameters contain 3 main areas that allow you to search for:

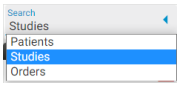


Figure 8: img

- Patients - contains categories Patient and Archive Selection
- Studies - contains categories Patient, Study, Other, Modality, Tags and Archive Selection
- Orders - contains categories Patient, Order, Examination and Archive Selection

The individual categories are listed and described below:

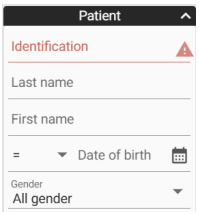


Figure 9: img

3.2.2.0.1 Patient The “Patient” category contains a field to identify the patient being searched for and contains the following search fields:

- Identification - allows entering the patient’s birth number
- Last Name - allows entering the patient’s surname
- Name - allows entering the patient’s name
- Date of Birth - allows entering the patient’s date of birth by entering the date in the format YYYY-MM-DD. To make the search easier, this field contains a search calendar function , located on the right of the field. After opening it, you can search in this calendar or select today’s date as the picture shows:

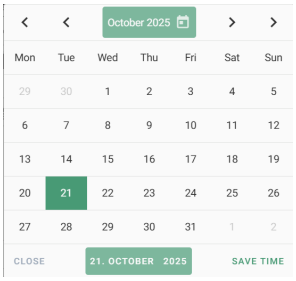


Figure 10: img

For the advanced search of the “Date of birth”, it is possible to use special characters =, >, < and “between” which can be offered by using the “Expand” icon :

Figure 11: img

1. The “=” character - used to search for patients with the date of birth on a specific selected date
2. Character “>” - used to search for patients with date of birth after the selected date
3. Character “<” - used to search for patients with date of birth before the selected date
4. “Between” option - used to search for patients with date of birth between the selected dates

Figure 12: img

- Gender - allows you to enter the patient’s gender. The drop-down menu is used to select it:

Figure 13: img

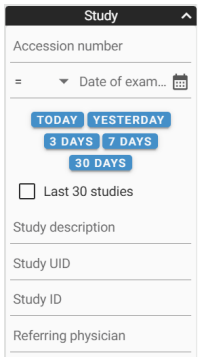


Figure 14: img

3.2.2.0.2 Study The “Study” category contains fields to identify the study you are looking for and contains the following search fields:

- Accession Number - allows you to enter the number of order on which the examination was performed
- Date of Examination - allows you to enter the examination date in a similar way as described above in the field “Date of birth”, or by selecting one of the offered options
- Last 30 studies - enables the display of the last 30 examinations received in PACS
- Study Description - allows you to enter the name of the study
- Study UID - allows you to enter a unique study number
- Study ID - allows you to enter a study ID
- Referring Physician - allows you to enter the referring physician

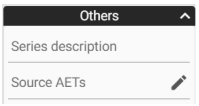


Figure 15: img

3.2.2.0.3 Others The “Others” category contains the following search boxes:

- Series Description - allows searching by series name
- Source AETs - allows searching by DICOM device name (AE Title) from which the data was sent to DPGW

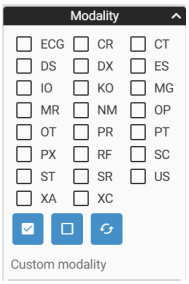


Figure 16: img

3.2.2.0.4 Modality The “Modality” category contains boxes for refining the search for studies based on the selection of the source modality:

Abbr.	Description	Abbr.	Description	Abbr.	D
ECG	Electrocardiography	CR	Computed Radiography	CT	C

Abbr.	Description	Abbr.	Description	Abbr.	D
DS	Digital Subtraction Angiography	DX	Digital Radiography	ES	E
IO	Intra-Oral Radiography	KO	Key Object	MG	M
MR	Magnetic Resonance	NM	Nuclear Medicine	OP	O
OT	Other	PR	Presentation State	PT	P
PX	Panoramic X-Ray	RF	Radio Fluoroscopy	SC	S
ST	Single-photon emission computed tomography (SPECT)	SR	Structured Report	US	U
XA	X-Ray Angiography	XC	External-camera Photography		

To speed up the search, it is possible to use the functions listed in the table:

Character	Description	Example
☑	Select All	Marks all modalities
☐	Deselect All	Deselect all modalities
↻	Invert	Inverts marked modalities

If you do not find the required modality, you can search for it in the “Custom modality” text box by entering the modality name.

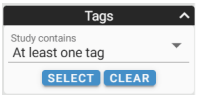


Figure 17: img

3.2.2.0.5 Tags The “Tags” category contains the option to select and then search for labeled studies, i.e. studies containing this added information.

- studies can be searched by value for all selected tags or one of the selected tags:

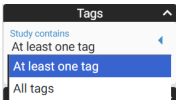


Figure 18: img

Using the “SELECT” button, it is possible to open a table with the option of filtering and marking defined tags:

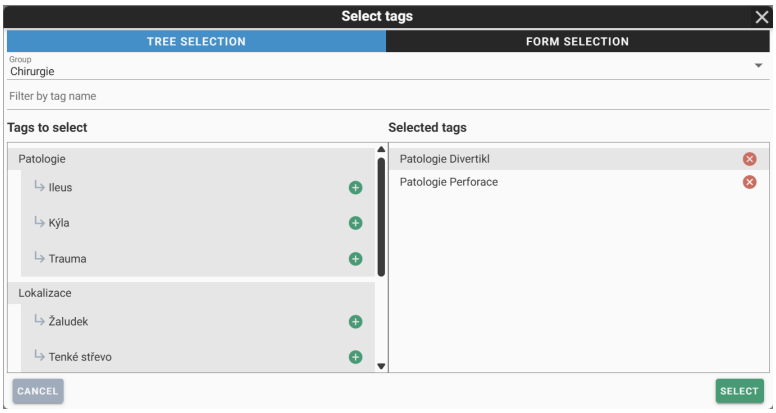


Figure 19: img

In the “TREE SELECTION” dialog, it is possible to search for and then assign already created labels. In the “Group” bar, you can select the desired set of created labels. In the “Filter by label name” window, you can quickly find this label by entering the desired label name. The left column “Select Label” contains all available labels for the given group and can be selected using the icon ⊕ to move it to the right column “Selected Labels”. Selected labels can then be removed using the icon ⊗.

In the “FORM SELECTION” dialog, you can similarly select labels for a given study, but here in the “Group” bar you can find e.g. individual departments of the hospital and according to the group selection, labels can be selected by ticking them ☑ / □.

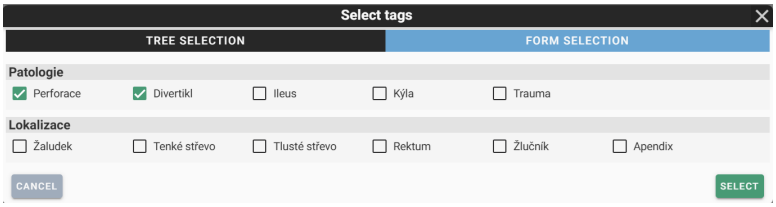


Figure 20: img

After selecting individual labels, select the “SELECT” action to select and then search for the selected labels. With the “CANCEL” action, you cancel the action.

Use the “CLEAR” button to remove labels from the search

Warning: Labels are created and managed only by the system administrator. The user is not allowed to add, modify or delete these labels.

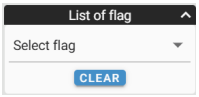


Figure 21: img

3.2.2.0.6 List of flag The category “List of flag” allows you to search for studies according to the assigned flags. Use the “Select Flag” scroll bar to select the desired flag to search for. Individual flags can be edited, see more in the “Add Flags” chapter. To remove the selected flag from the search, select the “CLEAR” action.

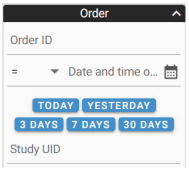


Figure 22: img

3.2.2.0.7 Order The “Order” category contains a field to identify the searched orderes and contains the following search boxes:

- Order ID - allows you to enter the number of order which the examination was performed on
- Date and time of creation - allows you to enter the date of creation of the order in a similar way as described above in the field “Date of birth”, or by selecting one of the options offered
- Study UID - allows you to enter a unique study number

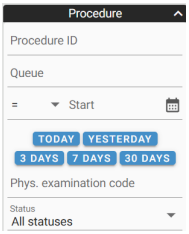


Figure 23: img

3.2.2.0.8 Procedure The “Examination” category contains fields to identify the exam you are looking for and includes the following search boxes:

- Procedure ID - allows you to enter the examination number

- Queue - allows you to enter the name of the workplace where the examination is performed
- Start date - allows you to enter the date of the examination in a similar way as described above in the field “Date of birth”, or by selecting one of the options offered
- Physician examination code - allows you to enter the examination code
- Status - allows you to search for active and already completed examinations. The status contains 3 examination options: “All statuses”, “Active” and “Completed”, which can be marked in the menu opened by the “Expand” icon ⌄:

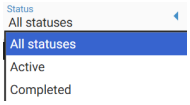


Figure 24: img

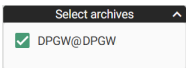


Figure 25: img

3.2.2.0.9 Select Archives The “Select Archives” category is used to specify the source PACS repositories from which the results are to be searched and displayed. This category can contain multiple archives depending on the customer’s SW infrastructure.

Use the ☑ / □ checkboxes to select archives.

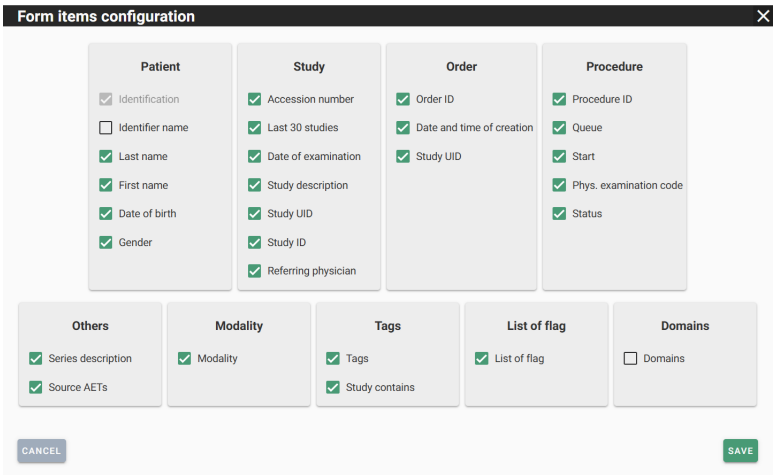


Figure 26: img

3.2.2.1 Form Items Configuration The form items configuration determines displaying/hiding ☑ / ☐ fields of each search category. fields of each search category. This setting is located in the search toolbar under “Form items configuration” .

3.2.3 Favourite Search Parameters

3.2.3.1 Saving Filters To make the user’s work easier, it is possible to save the most frequently used parameters as filters for searching using the “Add to Favorites” function . This function is located in the Search Toolbar and saves the complex of currently set search parameters with the option of naming it.

When using the search box “Examination date”, DPGW always uses the current date and time.

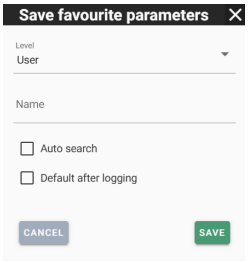


Figure 27: img

The “Save favorite parameters” feature includes the following saving options:

- Level - possibility to save to a logical drive in the menu opened by the “Expand” icon :

Figure 28: img

  - User - saves the filter to the currently logged in user’s account
  - Station - saves the filters to the currently used station (e.g. PC). The parameters then can be used by all users using this station
- Name - used to name the favorite filter
- Automatic search - after selecting a favorite filter, it will automatically search for the desired results and it is not necessary to use the “Search” function
- Default after login - after the user logs in, it automatically fills in the search filter according to the specified criteria

3.2.3.2 Load Filters The “Favourite Items” function located in the Search Toolbar allows you to select an already saved search filter.

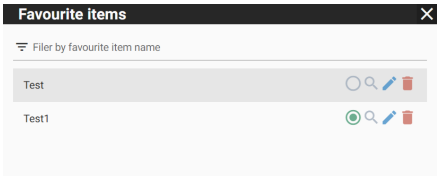


Figure 29: img

The consequently opened “Favourite Items” table allows you to select or specify the saved filters using the “Filter by favourite item name”.

The tools for the saved filters administration are on the right of the saved filters:

Icon	Function	Description
/	Default after login	After the user logs in, it automatically fills in the search filter according to the specified criteria
	Search	Searches for results according to the parameters of the saved filter
	Edit	allows you to edit a saved filter. Selecting this function changes the Search Toolbar with the option “Save Changes” , or “Cancel changes”
	Delete	Removes the saved filter from the favorite parameters list

3.2.4 Search Results

The “Search Results” are used for displaying the search results corresponding to the entered search parameters.

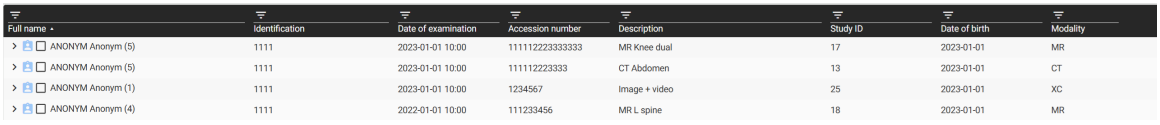


Figure 30: img

3.2.4.1 Table Columns Configuration The search results are sorted by value columns which can be set with the “Column Settings” function . After opening it, it is possible to specify displaying of individual columns using the checkboxes. The “Save” button then saves the required columns to the user’s account. The “Column settings” parameters may vary depending on the selected search parameter area:

- Patient

Figure 31: img

- Study

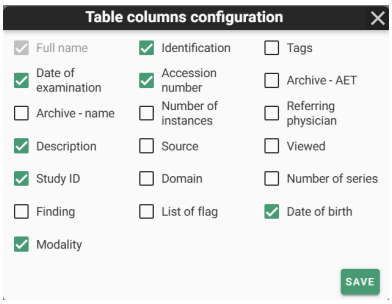


Figure 32: img

- Orders

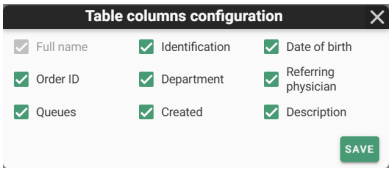


Figure 33: img

After finding the required study parameters, these results can be sorted in descending/ascending order ▲ / ▼ by clicking on the value of the required column.

Figure 34: img

To specify the searched parameters, it is possible to use text boxes for individual column values:

Figure 35: img

These text boxes can be hidden by using the “Hide manual filters” function , located in the search toolbar.

When entering parameters in the text boxes of the columns of the searched parameters, these can be removed by the “Clear manual filters” function , located in the Search toolbar.

If the “Viewed” box is checked in the column settings of the study table, the “Viewed” column will be displayed:

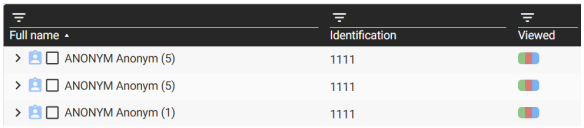


Figure 36: img

The viewing status of the studies is expressed by a colour bar, the colours representing: - green - viewed by logged in user - red - displayed on the station on which the user is currently working (the study could have been viewed by another user) - blue - viewed in the healthcare facility (the study could have been viewed by another user and on another workstation) - grey - study not viewed (this colour replaces one or more of the previous colour statuses)

If you check the “Number of instances” box in the study table column settings, a “Number of instances” column will be displayed in the “Search results” containing the total number of images for each study.

3.2.4.2 Categories of found data

DPGW works with data depending on following sequence:

- PATIENT - the main folder containing all performed examinations and stored data, i.e. Studies and Orders
  - Study - a component of the examination (X-ray, CT, MRI, etc.), containing individual series
    - Series - a folder with individual instances (e.g. performed protocol for CT examination)
      - Instance - specific stored files (e.g. X-ray image)

The search results may vary depending on the selected search parameter area:

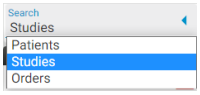


Figure 37: img

- Patients - searches for patients according to the required criteria, i.e. main folders containing individual studies

Figure 38: img

- Studies - searches for individual studies according to the required criteria. The same patient may then appear multiple times in the search results, however, with a different study. When selecting this area, we recommend entering as many search parameters as possible.

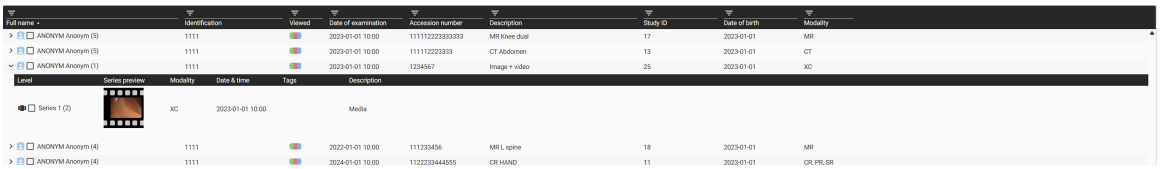


Figure 39: img

- Order - searches for input orders according to the required criteria. The same patient may then appear multiple times in the search results, however, with a different order. When selecting this area, we recommend entering as many search parameters as possible.

Figure 40: img

3.2.4.3 Creating a new patient The “New Patient” tool is used to create a new patient folder if this folder is missing in the PACS system. It is then possible, for example, to move to this folder the documentation of a patient where demographic data were incorrectly selected already on the device modality.

Selecting the “New Patient” action brings up the “New Patient” table:

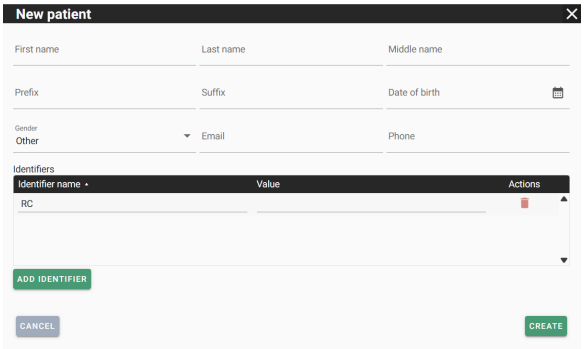


Figure 41: img

In this table, you can enter patient demographic data in the text fields. In the identifiers section, enter the identifier’s name (ID) and also its value; if necessary, you can add another identifier using the “ADD IDENTIFIER” action.

The “CREATE” action creates a new patient folder with the selected parameters. The “CANCEL” action cancels the work performed.

If you enter patient information that already exists in the PACS system, you will be notified by a message:

Figure 42: img

Warning: the created new patient folder can only be found in the “Patient” search category, because it does not contain any studies.

3.2.5 Actions with Search Results

After finding the required parameters, DPGW allows you to work with this documentation using the functions located in the search toolbar or in the floating panel on the line of the found patient, study, series and order. These features may vary depending on the search category selected.

The individual steps are described in more detail in this chapter:

3.2.5.1 Search Toolbar Actions

3.2.5.1.1 Selecting Search Results The “Select All/Deselect All” function / allows the user to select or deselect all search results.

If the user wants to select/deselect individual search results, he can do so with a checkbox in the search results column on the left of the patient’s name ✓/□.

Marking multiple consecutive search results is enabled using the “Shift” key on the keyboard.

3.2.5.1.2 Viewing Search Results Search results can be opened and displayed in the integrated DICOM viewer in three modes:

- Replace and View -replaces the data opened in the DICOM viewer with the selected search results data
- Add to new tab - will display the selected studies in a new DICOM browser tab
- Add and View - adds the selected search results data to the already open DICOM browser data

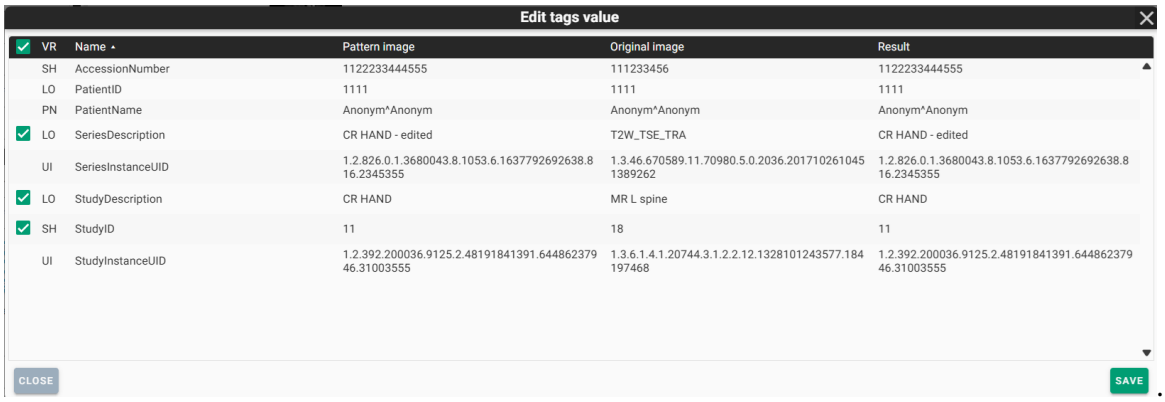
You can also view the search results in the DICOM viewer by double-clicking on the result itself. This function substitutes the “Replace and View” mode of a specific result.

According to the above-mentioned “Select Search Results” function of DPGW described above, specific search results can be marked and viewed at the same time.

3.2.5.1.3 Moving Series After selecting the chosen series in the “Studies” filter category of the “Archives” window, these series can be moved into the selected study using the “Move Series” icon located in the Search toolbar.

Selecting this function changes the icon and the function becomes active. Click on this icon to cancel the action.

To insert selected series into another study, perform the action on the floating panel of the study by using “Insert Selected Series” . To confirm this action, it is necessary to agree to the change of DICOM tags of the series contained in the table “Edit tags value” to move the series by clicking “Save”:



If the series are successfully moved, the system notifies you at the bottom of the screen:

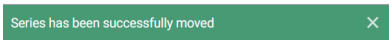


Figure 43: img

3.2.5.1.4 Forwarding Data In the “Archives” window, the marked data can be forwarded to the selected destination with the “Forward selected” .

Selecting this function displays a table for possible forwarding of the selected data:

Figure 44: img

This table contains: - Forwarding area: - Forward to AET - forwards the selected data to AEtitle (another DICOM modality) - Forward to external facility - forwards the selected data to another medical facility - Forward to user - sends data to a specific user’s tab (can be found in the system header after logging in) - Forward to station - sends data to the specific station tab (can be found in the system header after logging in)

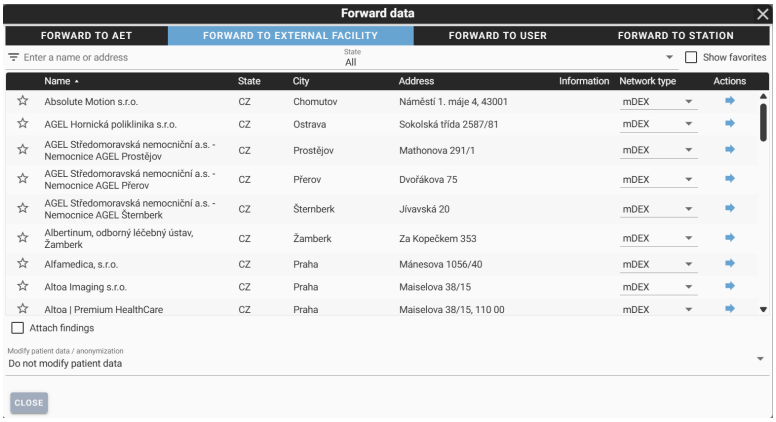
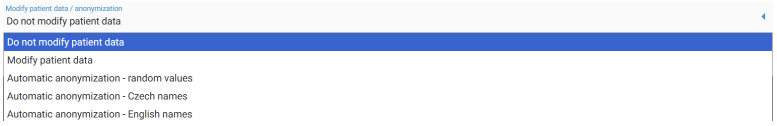


Figure 45: img

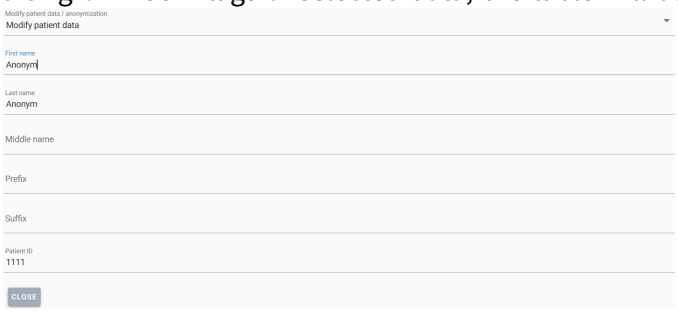
In the list, you can search for the desired medical facility and choose the type of exchange network ePACS, ReDiMed, or mDEX. The selected study can then be sent using the “Forward” action . If you select the mDEX exchange network, you can choose whether to send the data normally or urgently (mDEX statim), data sent in this way will be prioritized for upload.

Individual medical facilities can be marked with a star icon and included as favorites. By checking the “Show favorites” box, you will subsequently filter out only marked medical facilities.

- Text filter to simplify searching - enter the name or address of the desired healthcare facility (the search allows you to enter data with or without diacritical marks)
- State - select the country you want
- List of possible destinations - after selecting a specific destination to send data to, data can be sent with the action “Forward”
- Attach findings - by checking this box, the findings/examination description in SR (structured report) format will be attached to the forwarded study, provided that ReportProvider (ESB, HL7, etc.) is configured
- Modify patient data/anonymization - before forwarding, the selected data can be modified using the drop-down bar function:



  - Do not modify patient data - DICOM tags will not be changed during forwarding
  - Modify patient data - manual editing of DICOM tags of selected data; the table will be extended by the following lines:



  - Automatic anonymization - random values
  - Automatic anonymization - Czech names
  - Automatic anonymization - English names

By selecting the “Forward” action, the process of sending data to the chosen destination is started. The status of the upload process is displayed in the lower right corner of the screen:

Figure 46: img

After the forwarding process is completed, the system informs about the status of the result in the “Complete data forwarding” window:

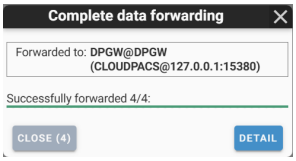


Figure 47: img

Warning: if you are sending anonymized data, the patient renaming information will be listed in the table called by the “DETAIL” action in the format “Identity changed from [PATIENT NAME (ID)] to [PATIENT NAME (ID)]”.

3.2.5.1.5 Exporting to DICOMDIR In the “Archives” window, the selected patients, studies or series can be saved into the local storage of the station in the set destination selected in the web browser settings. This data is stored in the DICOMdir format, i.e. the folder of DICOM files compressed by the zip method. The action can be performed by using “Export to DICOMDIR” icon .

Clicking the icon opens “Export to DICOMDIR” table:

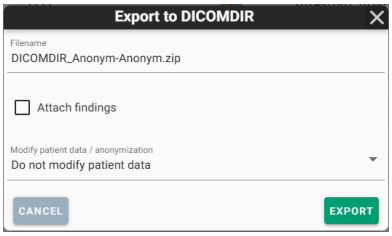


Figure 48: img

This table contains the following parameters: - Filename - text box for selecting the name of the saved .zip file - Attach findings - by checking this box, a finding/examination description in SR (structured report) format will be attached to the exported study if ReportProvider (ESB, HL7, etc.) is configured - Modify patient data/anonymization - allows anonymization of patient data, similar to the “Forward” function described above

Selecting the “Export” button starts the downloading process. The status of the export process is displayed in the lower right corner of the screen:

Figure 49: img

Warning: To enable file downloads, it is necessary to enable pop-ups in your web browser (Chrome, Firefox, etc.).

3.2.5.1.6 Burn selected In the “Archives” window, the selected patients, studies or series can be saved in the local storage of the station in the set destination selected in the web browser settings. This data is stored in ISO format, i.e. a CD image. The action can be performed by using “Burn” function .

Clicking the icon opens “Preparing data for burning” table:

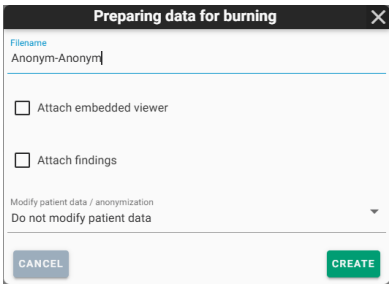


Figure 50: img

This table contains the following parameters: - Filename - text field for selecting the name of the saved .ISO file - Attach embedded viewer - an executable DICOM viewer will be integrated into the ISO file for possible displaying of burned DICOM data - Attach findings - by checking this box, the finding/examination description in SR (structured report) format will be attached to the burned study if ReportProvider (ESB, HL7, etc.) is configured - Modify patient data/anonymization - allows anonymization of patient data, similar to the “Forward” function described above

Selecting the “Create” button starts the downloading process. The status of the export process is displayed in the lower right corner of the screen:

Figure 51: img

Warning: To enable file downloads, it is necessary to enable pop-ups in your web browser (Chrome, Firefox, etc.).

3.2.5.1.7 Exporting Images In the “Archives” window, the selected patients, studies or series can be saved in the local storage of the station in the set destination selected in the web browser settings.

This data is saved in the selected file format (JPG, PNG, TIFF) compressed by the zip method. The action can be performed by using the “Export images” function .

Clicking the icon opens “Export images” table:

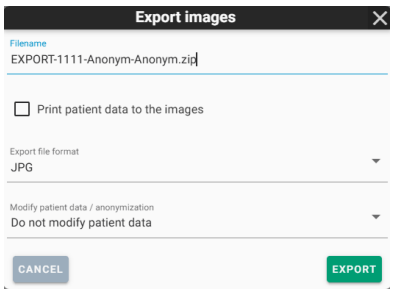


Figure 52: img

This table contains the following parameters: - Filename - text field for selecting the name of the saved .zip file - Print patient data to the images - adds OSD labels directly to the image - Export file format - option to select exporting to JPG, PNG and TIFF - Modify patient data / anonymization - allows anonymization of patient data, similar to the “Forward” function described above

Selecting the “Export” button start the downloading process. The status of the export process is displayed in the lower right corner of the screen:

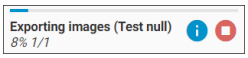


Figure 53: img

To enable file downloads, it is necessary to enable pop-ups in your web browser (Chrome, Firefox, etc.).

3.2.5.1.8 Adding to Worklist In the “Archives” window, you can add selected patients or studies to worklist using “Add to worklist” .Clicking this icon opens “Add to working list” table:

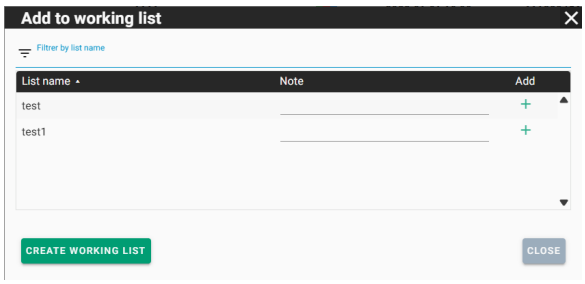


Figure 54: img

This table contains the following parameters: - Text filter to facilitate searching for created work lists which can be sorted in descending/ascending order ▲ / ▼ - List of created worklists - List name - Note - the option to insert a note on the study shortcut added to the worklist - Add + - adds a study shortcut to the selected worklist - Create working list - displays a table with the option to create a new work list with its name and description:

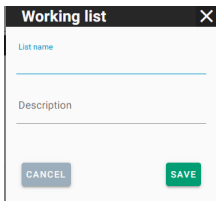


Figure 55: img

- Cancel - cancels performed action

If the data shortcuts have been successfully added to the worklist, the system notifies you at the bottom of the screen:

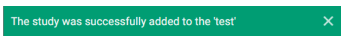


Figure 56: img

For more information on using worklists, refer to the “Worklists” chapter.

3.2.5.1.9 Adding Study Flags In the “Archives” window, you can assign flags to individual studies to add additional information. Clicking the “Add flags” icon , which brings up the following table:

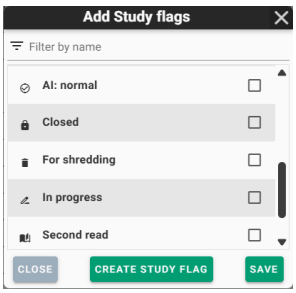


Figure 57: img

This table contains the following parameters:

- Filter by name - text field for finding a specific flag name
- List of created flags with the option to select a specific one
- Close - cancels the current action
- Create study flag - creates a new flag with the possibility of naming it and assigning an icon to it (icons follow Google fonts and can be found here: https://fonts.google.com/icons, after entering their name, the selected icon will appear):

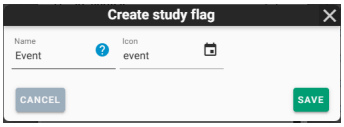


Figure 58: img

- Save - saves the selected flag for the study. If the flag was successfully added to the study, the system notifies you at the bottom of the screen:

Figure 59: img

Once saved, the individual flag icons will be visible in the search results window in the “Available Flags” column.

The flags assigned to the study can be managed using the “Manage Study Flags” function located in the floating study panel. The opened table allows you to add and remove flags:

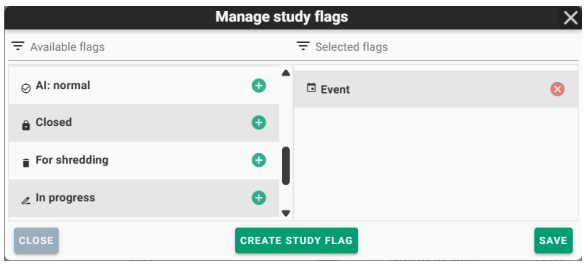


Figure 60: img

Individual flags can be managed in “Settings” of DPGW in the “Study Flags” tab. More detailed information on flag management is described in the “Settings” chapter.

3.2.5.1.10 Shredding In the “Archives” window, the selected data can be deleted using “Shred items” function .

Warning: This data will be irreversibly deleted from the archive, so use this action with caution.

Clicking the “Shred Items” icon opens “Shred” table with the following options:

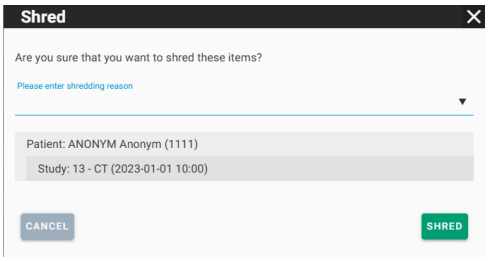


Figure 61: img

- Shredding reason - Text field for entry of required data shredding reason. Clicking in this field allows the user to select one of the options offered, or to enter their own reason:

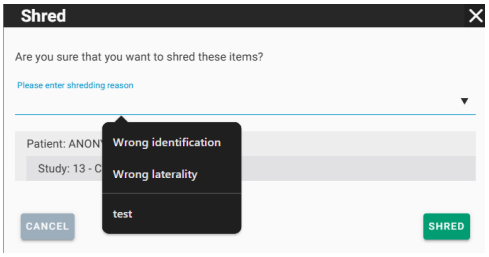


Figure 62: img

- Information about shredded data

- Cancel - cancels the performed action
- Shred - performs the action

Warning: For possible shredding of selected data, the user's authorization based on his roles is required. If you do not see this option and it is needed, contact your administrator.

Figure 63: img

3.2.5.2 Floating Panel Actions In the window of search results, it is possible to open a menu of floating panel actions for individual patients, studies, series and orders using the arrow for showing it and hiding it .

Floating panel actions vary depending on selected data areas (patients, studies, series, and orders).

Floating panel actions can also be called using the context menu by a right mouse click on the selected study:

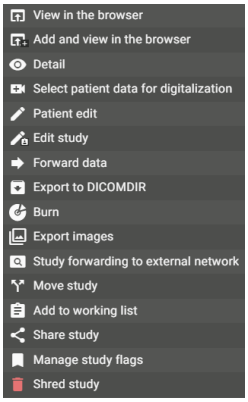


Figure 64: img

If you have multiple studies selected and you call up the context menu by right mouse click on a selected study, you are alerted to this in the context menu by double checking to the right of each tool:

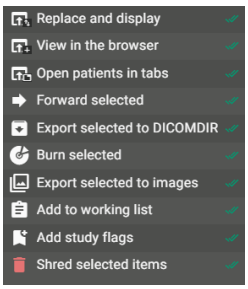


Figure 65: img

The individual functions of the floating panel are listed in the following table:

Icon	Function	Description
	View in Viewer	displaying of selected studies with replacing currently displayed (for more information, see chapter “Viewing Search Results”)
	Add and View in Viewer	displaying of selected studies with adding to already displayed (for more information, see chapter “Viewing Search Results”)
	Add to new tab	display of selected studies in a new DICOM browser tab (more information in the chapter “Displaying search results”)
	Detailed Information	opens a table with detailed information about selected data
	Select Patient for Digitalization	Selects patient’s initials and inserts them in the “Digitalization” window
	Edit Patient/Procedure	allows editing of patient’s information or editing information about procedure on order
	Edit Study/Order	allows editing of information about the selected study/order
	Forwarding data	forwarding selected studies to another DICOM node (for more information, see chapter “Forwarding Selected Data”)

Icon	Function	Description
	Export to DICOMDIR	exports selected images to DICOMDIR (for more information, see chapter “Export Selected to DICOMDIR”)
	Burn	prepares selected studies for burning in CD image format (for more information, see chapter “Data Burning”)
	Export Images	exports images to the selected format (for more information, see chapter “Exporting images”)
	Study Forwarding to External Network	allows sending selected studies using external networks (ePACS, ReDiMed, etc.)
	Patient Merge	merges two patients into one
	Move Study/Series	marks study/series for moving them to different patient/study (for more information, see chapter “Moving Series”)
	Move Images	marking for moving selected images to another patient/series
	Add to Worklist	adds selected studies to either existing worklist or allows to create a new one (for more information, see the chapter “Add to Worklist”)
	Add to Last Worklist	adds selected studies to last selected worklist (for more information, see chapter “Add to worklist”)
	Share the study	Action for sharing a study to an external user (for more information, see chapter “Workset Floating Panel”)
	Flags Management	adding and removing flags of selected study (for more information, see chapter “Adding Study Flags”)

Icon	Function	Description
	Add Last Flag	adds last selected flag to selected study (for more information, see chapter “Adding Study Flags”)
	Shred	deletes selected patient (for more information, see chapter “Shredding”)
	Shred instances	delete individual images

Figure 66: img

3.2.5.2.1 Detailed Information Clicking the “Detailed Information” icon opens a table with overview of detailed information of the selected data:

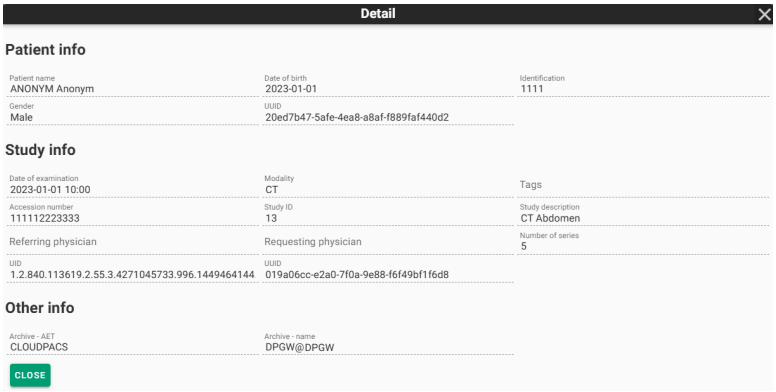


Figure 67: img

It has only informative function without the possibility of data modification.

Figure 68: img

3.2.5.2.2 Edit Patient/Exam DPGW allows you to edit patient demographics and exams on orders. This paragraph describes the procedure for editing the data of individual areas:

1. **Edit Patient**

Clicking the “Edit Patient” icon opens a “Pacient” table with following data to be edited:

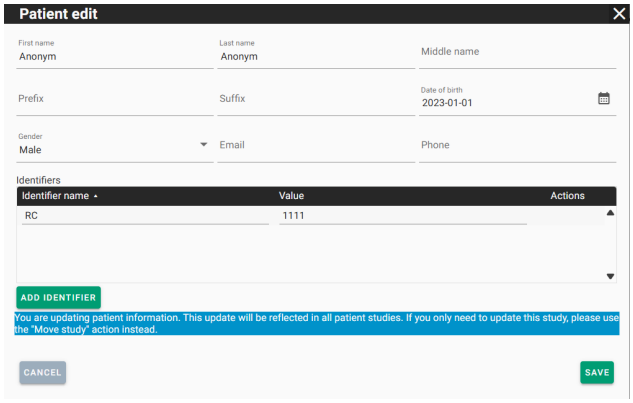


Figure 69: img

- Name
- Last name
- Middle name
- Academic title before
- Academic title after
- Date of birth - date of birth format in the form of YYYY-MM-DD, or the option to open a calendar (described in more detail in the section “Search criteria->Patient->Date of birth”)
- Gender - allows you to select the gender of the patient by selecting a parameter in the drop-down bar (described in more detail in the section “Search criteria->Patient->Gender”)
- Identifiers - a list of added identifiers and the possibility of removing them
- Add identifier - creating of new patient identifiers (in this case birth number with value 1111)
- Cancel - cancels the performed action
- Save - saves the modified patient data and if the modification was successfully saved, the system notifies you at the bottom of the screen:

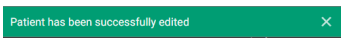


Figure 70: img

2. **Edit Procedure**

This action is located in the floating panel of the selected procedure.

Clicking the “Edit Procedure” icon opens a “Procedure” table with following data to be edited:

Figure 71: img

- Procedure ID - procedure designation
- Queue - the name of the workplace performing the procedure
- Status - indicates whether the patient has already undergone the procedure or not. This can be changed in the drop-down menu with the values Active/ Completed:

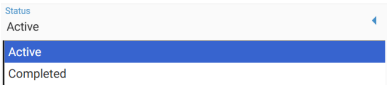


Figure 72: img

- Examination code - designation of the examination performed
- System - the system in which the order was created
- Start - the format of the examination commencement in the form of YYYY-MM-DD, or the option to open a calendar (described in more detail in the section “Search criteria->Patient->Date of birth”)
- End - the format of the examination completion date in the form of YYYY-MM-DD, or the option to open a calendar (described in more detail in the section “Search criteria->Patient->Date of birth”)
- Examination Text - the name of the performed procedure
- Description - the reasoned description of the required procedure
- Cancel - cancels the performed action
- Save - saves the modified exams

Figure 73: img

3.2.5.2.3 Edit Study/Order DPGW allows you to edit study data and orders. This paragraph describes the procedure for editing the data of individual areas:

1. Edit Study

Clicking the “Edit Study” icon opens a “Study” table containing the data to be edited:

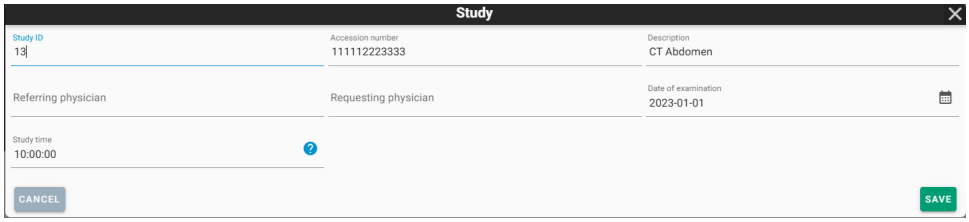


Figure 74: img

- Study ID - study designation
- Accession number - the designation of the order on the basis of which the procedure was performed
- Description - name of the performed procedure
- Referring physician - the doctor performing the examination
- Requesting physician - the doctor creating the request for the examination
- Date of examination - examination date format in the form of YYYY-MM-DD, or the option to open a calendar (described in more detail in the section “Search criteria->Patient->Date of birth”)
- Study time - examination time format in the form HH-MM-SS
- Cancel - cancels the performed action
- Save - saves the modified study, if the modification was successfully saved, the system notifies you at the bottom of the screen:

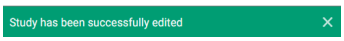


Figure 75: img

2. Edit Order

Clicking the “Edit Order” icon opens a “Order” table containing the data to be edited:

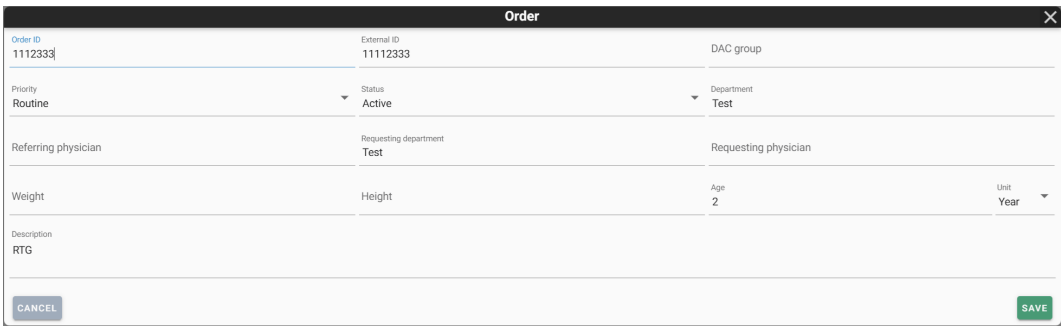


Figure 76: img

- Order ID - the designation of the order on the basis of which the examination was performed
- External ID - the identification of the order made by the external SW that sent the request (RIS)
- DAC group - the item used for data access control purposes
- Priority - the option to select the urgency of the examination request by selecting the priority in the drop-down menu:

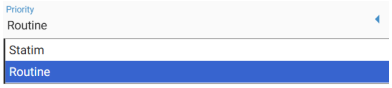


Figure 77: img

- Status - indicates whether the patient has already undergone the examination or not. This can be changed in the drop-down menu with the values of Active/Completed:

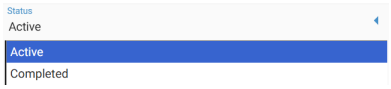


Figure 78: img

- Department - the designation of the department in which the patient is hospitalized
- Referring physician - the doctor performing the examination
- Requesting department - the designation of the department of the doctor creating the order for the examination
- Requesting physician - the doctor creating the order for the examination
- Weight
- Height
- Age - the ability to specify a unit of time in the case of a patient who has not reached 1 year of age in the drop-down menu:

Figure 79: img

- Description - the name of the performed procedure
- Cancel - cancels the performed action
- Save - saves the modified order

Figure 80: img

3.2.5.2.4 Study Forwarding to External Network This table contains audit records of the patient's referral to another medical facility through the excternal network.

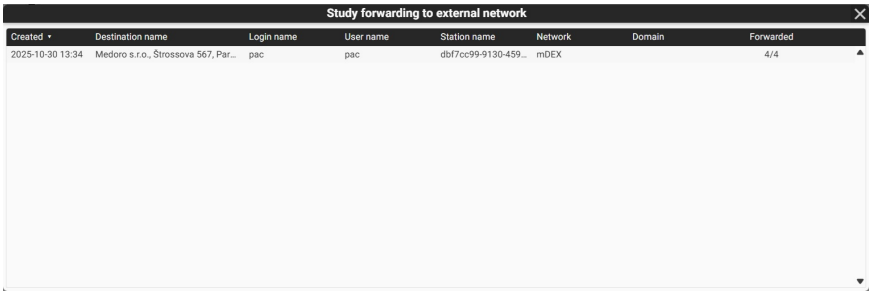


Figure 81: img

Figure 82: img

3.2.5.2.5 Patient Merge This function is used to merge two patients into one.

This action can be performed in the searched data window in the "Search Patients" area.

The implementation of the action process: 1. Mark the patient whose demographic data you want to keep by using the floating panel "Patient Merge" . When the patient is selected, the system notifies you at the bottom of the screen:

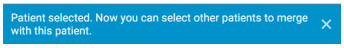


Figure 83: img

After selecting a patient to merge, a new icon will appear in the “Patient Merge” search toolbar with the number of selected patients 1.

2. Mark the patient to be merged into the first patient by clicking “Patient Merge” on the floating panel. If the patient has been selected, the system notifies you at the bottom of the screen:

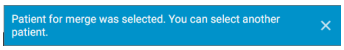


Figure 84: img

After selecting a patient to merge, a new icon will appear in the “Patient Merge” search toolbar with the number of selected patients 2.

3. If you want to merge more patients into the first, proceed as in point 2. The toolbar icon will change depending on the number of patients selected.
4. To merge, click the “Patient Merge” in search toolbar to open a table of patient merge options:

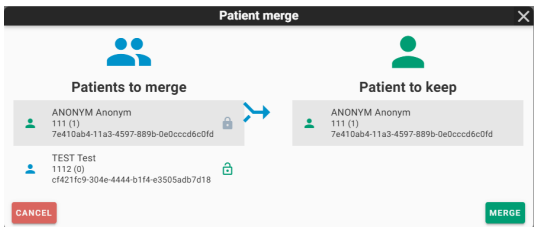


Figure 85: img

The Patient Merge table offers the option to swap patients using this function .

To perform the action, press MERGE or to cancel the action, press CANCEL.

If the patients are successfully merged, the system notifies you at the bottom of the screen:

Figure 86: img

3.2.5.2.6 Move study Move study to another patient

To move a study to another patient, follow these steps:

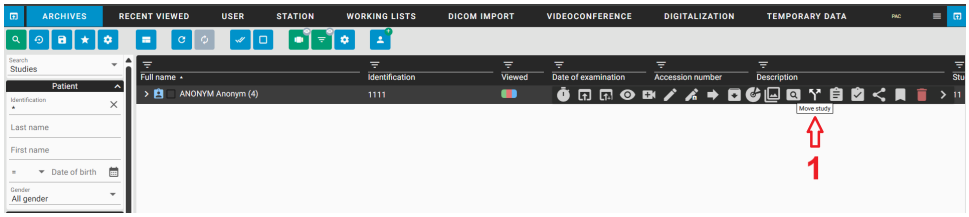


Figure 87: img

1. Find the desired study and select the “Move study” tool. You will be informed about the selection of the study in the footer of the system:

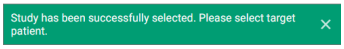


Figure 88: img

2. Find the desired patient by selecting “Search” -> “Patients” from the menu.

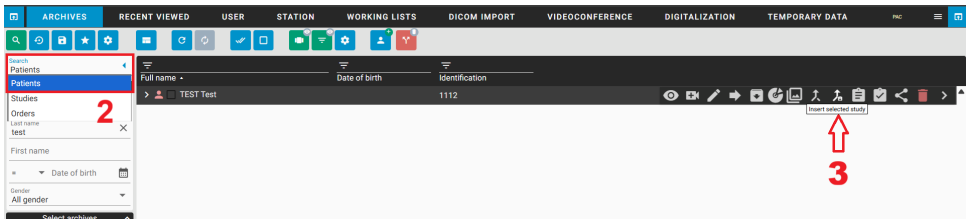


Figure 89: img

3. Insert the selected study into the selected patient using the “Insert selected study” tool. You will then be informed about the successfully transferred study in the footer of the system:

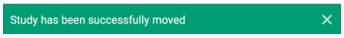


Figure 90: img

Warning: If the requested patient is not already stored in the PACS archive, you can create them using the “New Patient” function, which is described earlier in this manual. If HIS is integrated into your system and orders are generated, select the method of assigning the study to a specific order to preserve the patient’s demographic data. This procedure is described in the following paragraph:

Move study under order

To move a study under a order, follow these steps:

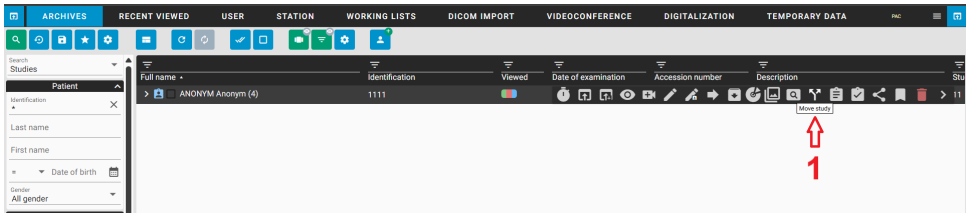


Figure 91: img

1. Find the desired study and select the “Move study” tool. You will be informed about the selection of the study in the footer of the system:

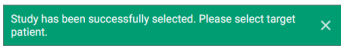


Figure 92: img

2. Find the desired request by selecting “Search” -> “Orders” from the menu.

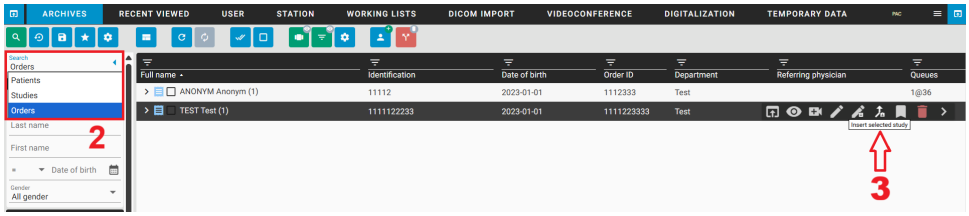


Figure 93: img

3. Insert the selected study into the selected order using the “Insert selected study” tool. You will then be informed about the successfully transferred study in the footer of the system:

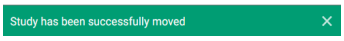


Figure 94: img

Warning: Moving a specific series is only possible to a selected order, where the study is then automatically created. If you want to move specific images from a series to another study, select the “Move Instances” function, select the images, and insert them as described in the previous points. More in the next paragraph:

Figure 95: img

3.2.5.2.7 Move instances The function serving the purpose of selecting specific images in the "Study" filter area in the "Archives" window, and moving these images into the selected series. Clicking the "Move instances" opens "Select images" table.

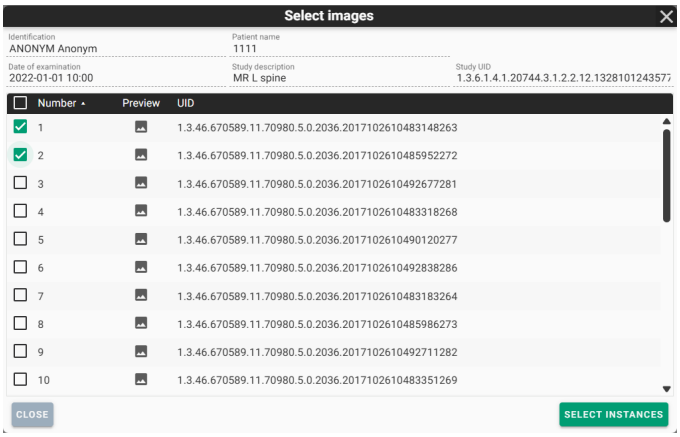


Figure 96: img

In this table, you can use the checkboxes ☑ / ☐ to select specific images and then confirm their selection by clicking "Select Instances".

If the images are successfully selected, the system notifies you at the bottom of the screen:

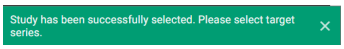


Figure 97: img

Using this function adds the "Delete selected data" to the toolbar. Click this icon to cancel the action.

To insert selected images into another series, use the "Insert selected images" . on the floating panel. To confirm the action, it is necessary to agree to the change of DICOM series tags by clicking "Save" in the table "Edit tags" to move images:

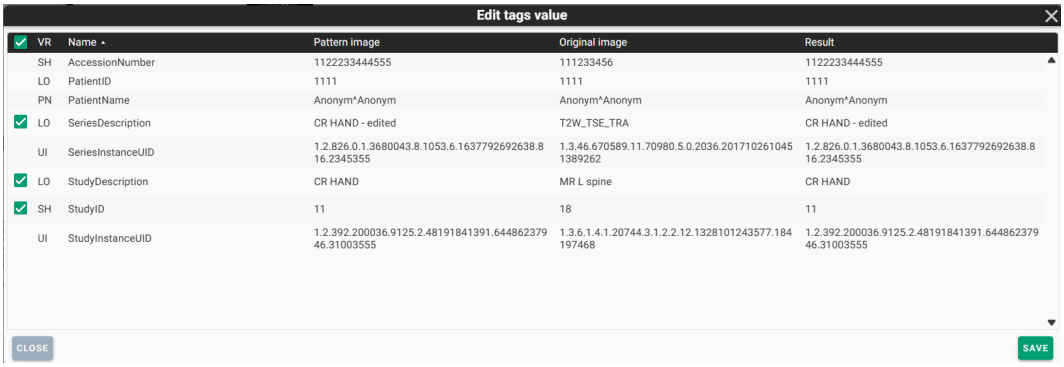


Figure 98: img

If the images are successfully moved, the system notifies you at the bottom of the screen:

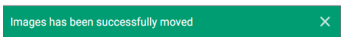


Figure 99: img

Figure 100: img

3.2.5.2.8 Shred instances

The function for deleting individual images.

Clicking the “Shred instances” icon on floating panel opens a table for selecting individual images:

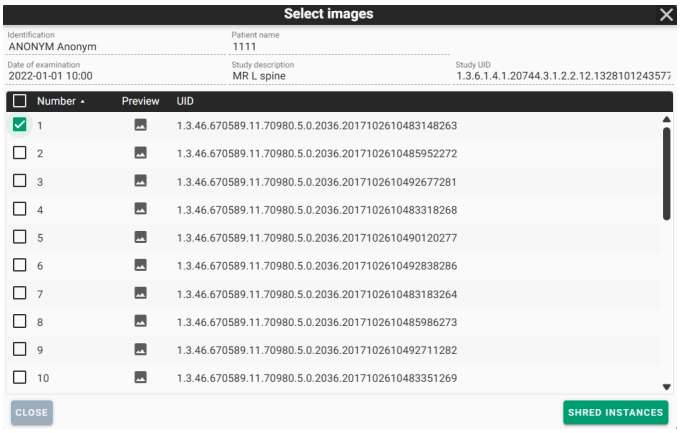


Figure 101: img

In this table, you can use checkboxes ☑/☐ check boxes to select specific instances and then confirm their shredding by clicking “Shred Instances”.

After confirming the action, you will call up the “Shred” table with the following options:

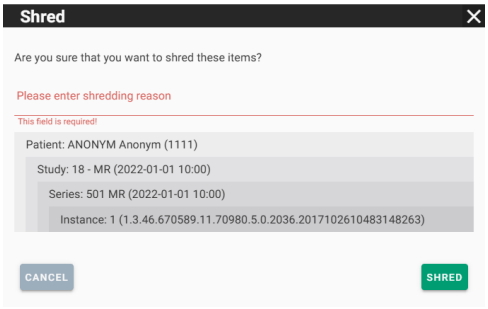


Figure 102: img

- Shredding reason - Text field for the required entry of the reason for data shredding. Clicking in this field allows the user to select one of the offered options or to enter their own reason:

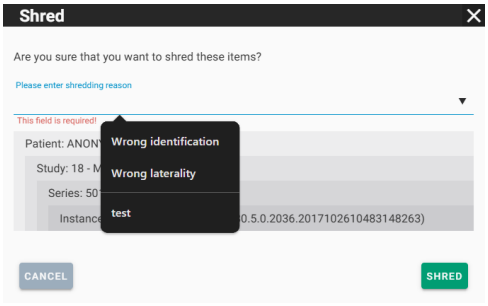


Figure 103: img

- Information about shredded data
- Cancel - cancels the action being performed
- Shred - performs the action

Warning: This data will be irreversibly deleted from the archive, so use this action with caution.

Warning: For possible shredding of selected data, the user’s authorization is required based on his role. If you do not have this option available and it is desirable, contact your administrator.

3.2.6 Information Bar

Figure 104: img

This bar contains information about: - The name of the instance to which the user is logged in, e.g.: test.dicompass.cloud [Test Dicompass] - Login name, e.g.: pac - if the user has multiple login accounts, it is possible to switch between these accounts by clicking on “Login name”. - System notifications and messages

After clicking on the notifications, the user is shown a list of received messages:

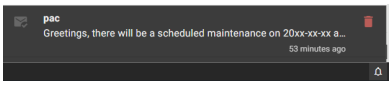


Figure 105: img

To view the entire message, click on the selected message to display the complete text of the message:

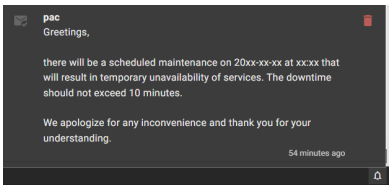


Figure 106: img

If you receive a notification, this message will be displayed immediately after the user logs in, e.g.:

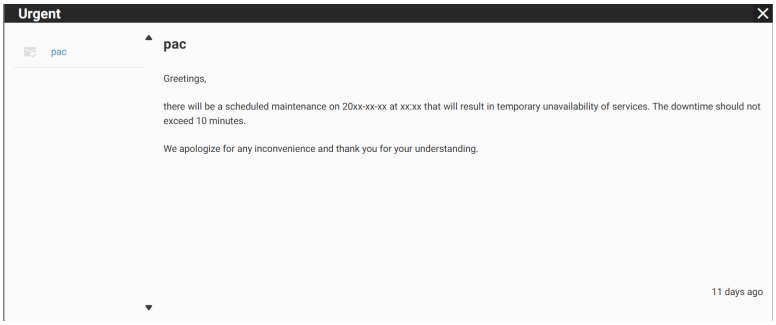


Figure 107: img

3.3 Recent Viewed

The “Recent Viewed” tab RECENT VIEWED is used for displaying recently viewed studies in a viewer window.

It is possible to select a level filter of User/Station/Organizational Unit that affects whom the studies were displayed by:

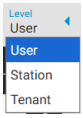


Figure 108: img

- User - displays recently viewed studies only from the user that is logged in
- Station - displays recent studies displayed on the workstation
- Tenant - recently viewed studies of the entire tenant, i.e., in the system

Working with these studies is then similar to working in the “Archives” tab, i.e. using the “Search toolbar” and “Floating panel actions” whose functions are described above in this user manual.

3.4 Local data - station / user

DPGW allows you to forward data to a specified organizational unit, i.e. to a specific user or station. To forward, use the “Forward selected” function in the “Search toolbar”, or “Floating panel actions”. The opened “Forward data” table contains several tabs. Select the bookmark FORWARD TO USER to forward data to the user , or select the bookmark FORWARD TO STATION to forward the data to the station. When you select the required tab, you can then search and browse existing users and stations. Use the “Forward” button to forward to the found destination . The forwarded data is stored in the organizational unit folder of the user/station located on the server with installed DPGW, so the user does not download the data directly to the used workstation. Access to the forwarded data thus depends on the selected organizational unit:

3.4.1 User

To access the data forwarded to the user, use the “User” tab USER.

The “User” tab is a private DICOM box for user data. The user can import data into this box, for example from a CD/DVD, or another user can forward it to him there or he can forward the data himself. The data in this box is visible only to the given user and is thus available at any station where the user logs in.

3.4.2 Station

Use the “Station” tab STATION to access data forwarded to the station.

The “Station” tab is a private box for DICOM data. The same rules apply to it as for the user’s box. The stored data belongs only to the station and can therefore be seen by any user who logs on to the given station. Conversely, the user will not see this data on another station.

3.4.3 Work with local data

Working with local data, whether by selecting the “User” or “Station” tab is similar to the “Archives” tab. The work is performed on data separated from the PACS archive, so it does not have a direct impact on the data already stored in the production archive. To work with local data, use the functions located in the “Toolbar” or “Floating panel actions”.

- Tool bar:

Icon	Function	Description
	Refresh	reloading of local data window
	Replace and View	displays selected studies with replacing already displayed (alternated by double-clicking on the line of the given study)
	Add and View	displays selected studies in addition to already displayed
	Delete	deletes selected studies or series from the local data tab

- Floating panel action:

Icon	Function	Description
	Edit patient	allows editing of patient demographic data
	Data forwarding	forwards selected studies to another DICOM node (for more information, see the “Forward selected” chapter)
	Delete	deletes selected studies or series from the local data tab

4 Working lists

The tab “Working lists” WORKING LISTS allows the user to manually or automatically create work (visitation) lists. Each user / group of users can create any number of working lists that they can share with each

other. Individual examinations can be added to the working list simply from the search dialog or directly from the DICOM browser. DPGW can automatically create and fill in working lists based on defined rules when saving examinations from modality, or when receiving an HL7 message from NIS. This setting must be made by the system administrator.

To add a study from the archives tab to the working list, follow the chapter User interface basics-> Search in archives-> Actions with retrieved data-> Actions of the search toolbar->**Add to worklist**

The tab Working lists contains three main areas for working and the displaying archives and studies in them. These areas will be described in the following paragraphs:

- Working list toolbar
- Manage working lists
- Working list studies

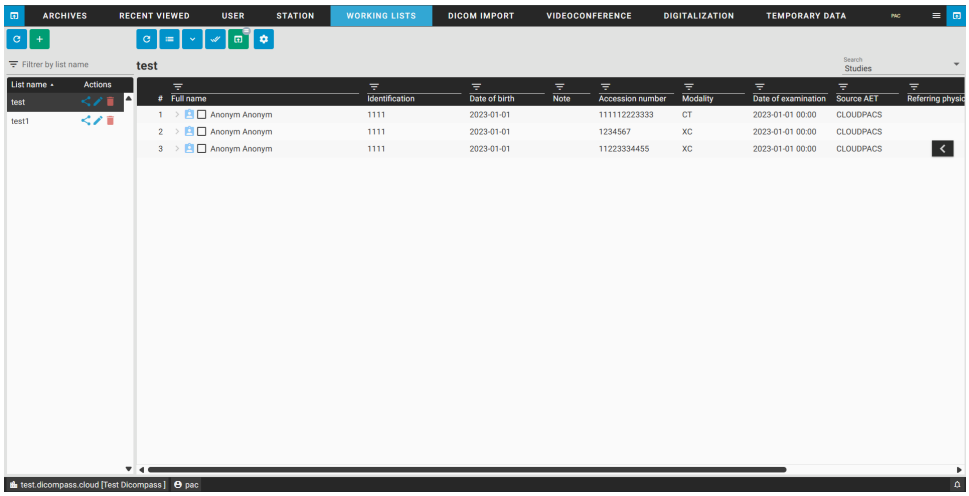


Figure 109: img

4.1 Working list toolbar

Figure 110: img

Individual functions of the working list toolbar are listed in the following table:

Icon	Function	Description
	Reload	realoads working list
	Create Working List	creates a new working list
	Change Working list Order	allows change of order of studies in a working list
	Open All Items	displays individual studies by expanding patients information in “Studies in working list”
	Mark All	marks all results in “Studies in working list” for processing more of them at once
	Deselect All	deselects all fromt the previous option
	Replace and View	displays selected studies with replacing of already displayed (double-clicking on the line of the given study also works)
	Add and View	displays selected studies with adding them to already displayed
	Add all and View	displays all studies in a working list with adding them to already displayed
	View patients in tabs	display of all marked studies in the search dialog in individual DICOM viewer tabs
	Replace, View and Delete	displays selected studies with replacing already displayed and removing them from the working list at the same time
	Delete	deletes selected patients off a working list
	Table Columns Configuration	configures displayed columns in “Studies in a working list”

4.2 Management of working lists

Management of working lists is located in the left panel in the tab “Working List”. Already created working lists are displayed in this area and DPGW allows working with them.

To simplify work, worklists can be filtered by their name using the “Filter by list name” text field:

Figure 111: img

Image documentation included in the work list can be switched at the study/patient level using the menu:

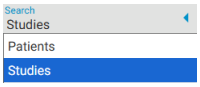


Figure 112: img

Working lists can be sorted alphabetically by clicking on the “List Name” line in ascending order List name, or in descending order List name.

After creating worklists using the “Create working list” function +, the names of these lists appear in the “List name” column in this area. The “Actions” column Actions allows you to work with lists and contains the following functions:

4.2.1 Share

Figure 113: img

This feature allows the user to share individual working lists with other users or groups of users created in the system DPGW.

“Working list share management” table can be opened by using the “Share” function:

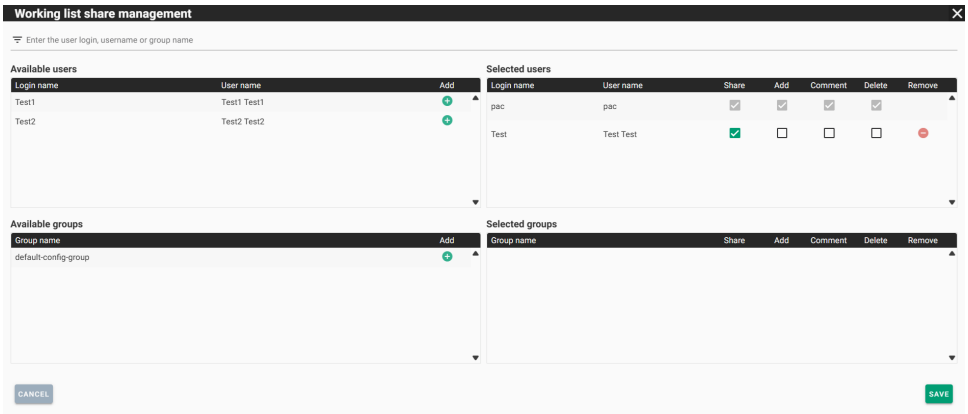


Figure 114: img

In the table header, the available users and user groups can be filtered using the text box Enter the user login, username or group name. The search result is applied to both areas at the same time.

To share with a specific available user or group, it is necessary to move the user/group to the area of selected by using action “Add” . After successful addition, the user or group will be displayed in the “Selected users / Selected groups” area.

Shared users/groups can be given permissions for working with shared worklists using the check boxes ☑ / ☐ in the columns of “Selected users / Selected groups”, containing following functions:

- Share - allows selected user / group to view the created working list
- Add - allows the selected user / group to add studies to the created working list
- Comment - allows the selected user / group to add comments to studies in the created working list
- Delete - allows the selected user / group to delete studies in the created working list
- Remove - removes a user / group from the “Selected users / Selected groups” area

After finishing work in the table “Working list share management”, “CANCEL” can be used to cancel the performed action, or “SAVE” to save the performed action.

If worklists have been successfully shared with users / groups, the system will notify you with the following bar at the bottom of the screen:

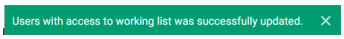


Figure 115: img

4.2.2 Edit

Figure 116: img

The “Edit” function allows you to change the name and description of the created work list. Selecting the “Edit” action will bring up the “Working list” table:

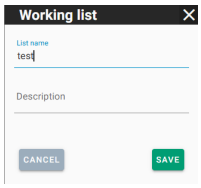


Figure 117: img

The table contains a text box for editing the name of the worklist, the “CANCEL” button - cancels the performed action or “SAVE” button - saves the performed action.

4.2.3 Remove

Figure 118: img

The function “Remove” allows to delete created working list. Selecting “Remove” action brings up “Question” table:

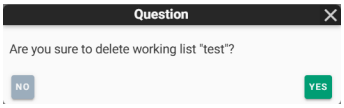


Figure 119: img

The table contains buttons: “NO” - cancels performed action and “YES” - deletes selected working list.

4.3 Working list studies

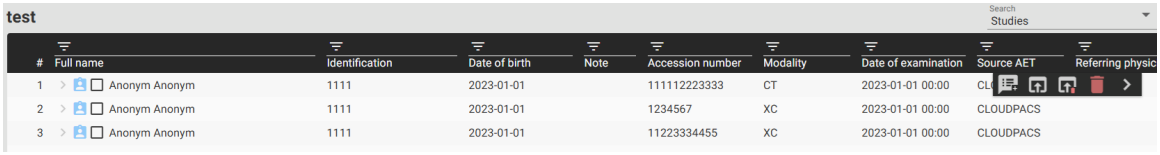


Figure 120: img

The “Working list study” area contains individual studies of created working list. To view the studies, it is necessary to select a specific worklist in the left panel “Manage working lists”. The name of the worklist (in this case TEST) is displayed in the header of this area and it is possible to work with it further.

4.3.1 Table columns configuration

Results can be sorted according to value column which can be set by using function “Table columns configuration” . After opening the table it is possible to set displaying of individual columns using the check boxes. The “Save” button then saves required columns.

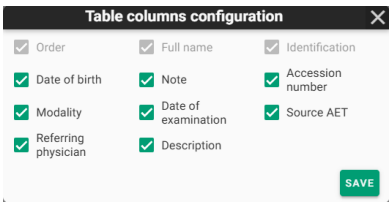


Figure 121: img

After selecting specific working list, it is possible to sort results in descending/ascending order ▾/▴ by clicking on the value of the required column.

Figure 122: img

To specify the searched parameters, it is possible to use text fields by the individual column values:

Figure 123: img

4.3.2 Change working list priority

The “Change working list priority” function located in “Worklist toolbar” allows user to change the order of patients added to a specific working list in the “Working list study” area. Selecting the action will bring up the “Change worklist order” table.

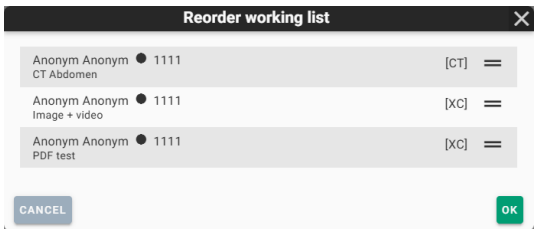


Figure 124: img

The change of order of selected patient is then performed by the drag&drop style, i.e. by dragging to the selected position.

The button “CANCEL” - cancels performed action and “OK” - saves order of patients into a working list.

This function is active in case of adding more patients into a working list.

4.3.3 Floating panel action

Figure 125: img

In the “Working list study” area, a menu for individual patients can be opened by the action of floating panel, using the arrow for opening and then hiding the menu.

Warning: The floating panel action expands when you add a note.

Individual functions of the floating panel are following:

Icon	Function	Description
	Add note	adds note to a selected patient in a working list
	Edit note	allows to edit added note
	Remove note	removes added note
	Replace and open	displays selected studies with replacing of already displayed ones (more information in chapter “Displaying of search results”)
	Replace, open and delete	displays selected studies with replacing of already displayed ones and deleting them from the working list
	Delete	removes selected patiens from a working list

4.3.4 Note action

DPGW allows user to add notes to individual patients and work with them in a specific worklist in the range of Add, Edit and Delete:

- Add note

Choosing the function opens the “Study note” table:

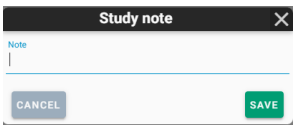


Figure 126: img

The table contains text box for inserting a note and the “CANCEL” button - cancels the performed action or “SAVE” - saves the performed action.

- Edit note

Choosing the function opens the “Study note” table with already filled-in test note for modification:

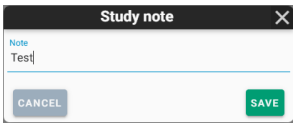


Figure 127: img

The table contains text box for modification of the note, the “CANCEL” button - cancels the performed action or “SAVE” - saves the performed action.

- Remove note

Choosing the function opens “Question” table:

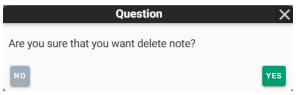


Figure 128: img

The table contains buttons “NO” - cancels the performed action and “YES” - deletes the note.

5 DICOM data import

DICOM data import tab DICOM IMPORT allows the user to upload DICOM files to system logical drives. Folders and .dcm or .zip files located in local storage or on removable media (flash drive, CD / DVD) can aslo be imported.

Warning: Follow your IT administrator’s security instructions when importing data from removable media.

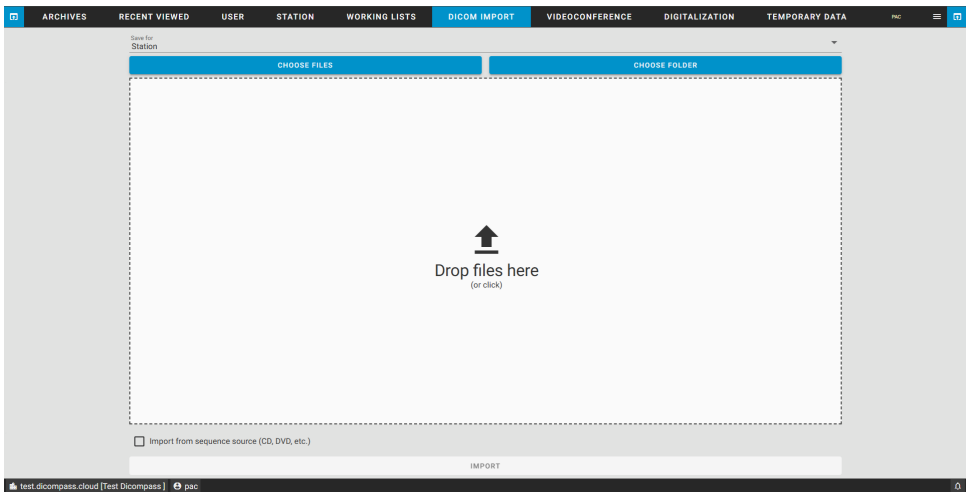


Figure 129: img

5.1 Destination selection

The destination selection for data entry is located in the header of the “Import DICOM” folder and contains the following system logical units:

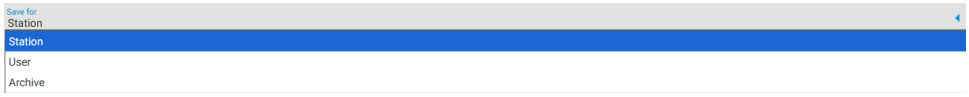


Figure 130: img

- User - imports data for currently logged-in used into “User” folder
- Station - imports data on currently used station (PC) into “Station” folder. The data can be used by all users using this station
- Archive - imports data directly into PACS archive DPGW

5.2 Data input

Only folders and files of the .dcm or .zip (containing .dcm files only) type can be imported from the local storage or removable media inserted into the workstation.

Warning: If you are importing files from removable media (CD, DVD, etc.), use the “Import from sequence source” tool Import from sequence source (CD, DVD, etc.) located at the bottom of the dialog box. This option will speed up the import of files from removable media.

To enter data, use one of the following options:

5.2.1 Choose files

Figure 131: img

Selecting the “Choose files” options opens a table with local files:

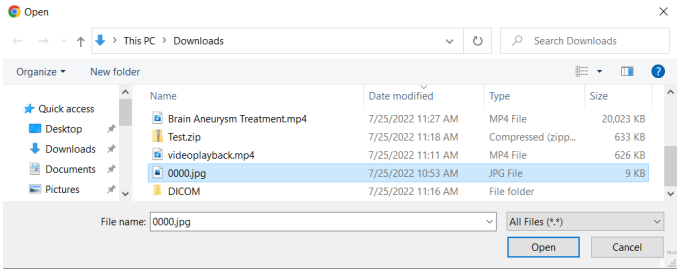


Figure 132: img

In this table, select the file you want to import. To select multiple files, use the ctrl or shift keyboard shortcuts in this table with the left mouse button or keyboard arrows. Only .dcm and .zip (containing .dcm files only) files can be imported.

After choosing the required files, insert them with the “Open” action, or use “Cancel” to cancel the action.

Files can also be inserted by clicking or using drag & drop style, i.e. by dragging them to the “Drop files here” area:

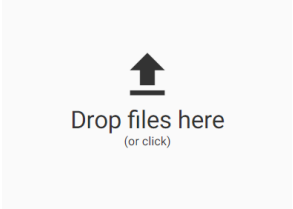


Figure 133: img

The inserted files appear in the list and other ones can be added as described above:

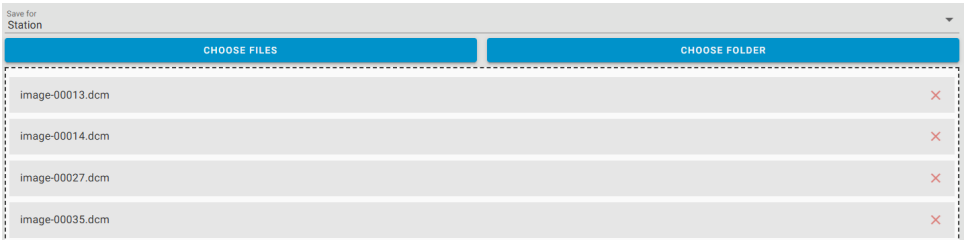


Figure 134: img

Use the cross icon on the right of the file name to remove files from the list.

Import of inserted files into chosen destination can be done by clicking the “Import” button.

Figure 135: img

5.2.2 Choose folder

Figure 136: img

Clicking the “Select folder” button opens a table with local folders:

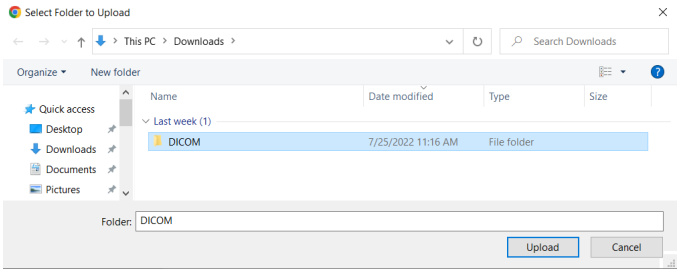


Figure 137: img

In this table, choose the folder you want to import and choose the “Upload” action to insert the data into the list for import. The import list will then contain all the files from the selected folder:

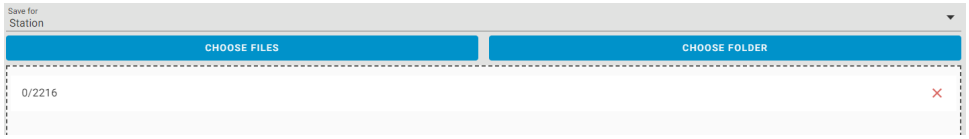


Figure 138: img

Use the cross icon on the right of the file name to remove files from the list.

Import of inserted files into the selected destination can be done by clicking the “Import” button:

Figure 139: img

5.3 Viewing progress and results of import

After clicking the “Import” button, you will be informed about the status of the import process.

1. Information about the status of upload to the browser cache with the display of a progress bar for each file in the list of inserted data:

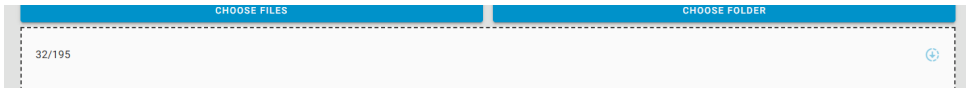


Figure 140: img

And the overall progress of all files:

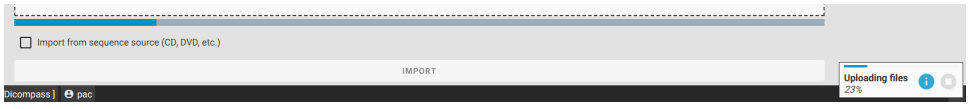


Figure 141: img

2. Information about the status of upload to selected system destination in DPGW. Information about the start of the import operation is displayed in the middle of the screen:

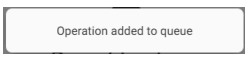


Figure 142: img

In the lower right hand corner, you will simultaneously be informed about the status of the data import:

Figure 143: img

action can be used to display more information about the import status. action can be used to cancel the import.

The data import time varies depending on the volume of the imported data.

3. After the data import is completed, you will be informed of the result by the table “Import of DICOM files has been completed”. These results may vary depending on the imported data, and one of the following may occur:

- Data imported successfully - This option reports that the data import was successful:

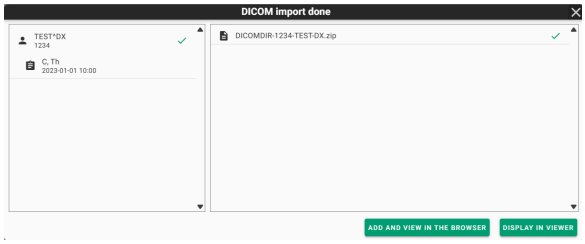


Figure 144: img

- Data was not imported - This option indicates that it was not possible to import the data and the process ended with an error:

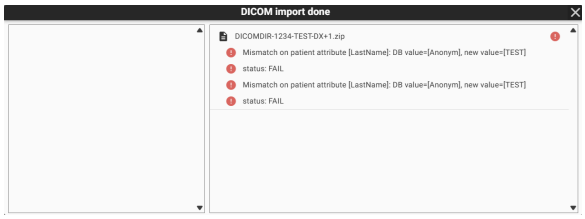


Figure 145: img

Possible causes of errors during data import: - discrepancies in patient data (first name, last name, gender, date of birth, patient ID) - invalid study, series, or image UID - unsupported SOP Class - unsupported file (you have probably selected a file that is not in DICOM format) - Unable to establish a DICOM association with the target AET (connection error with the selected modality “Connection refused”)

When exporting data to the DICOMDIR file folder, a compressed .zip folder is created and it contains a DICOMDIR file and a subfolder with individual images, i.e. .dcm files. In this case, a separate DICOMDIR file was imported but ended in error due to the fact that this file is only a representative of the study and does not contain data for possible import (individual slides).

Successfully imported data can be opened directly from the table of import results using “Display in viewer” button. This function is similar to the “Replace and view” function described in the chapter “Displaying search results”.

Warning: If the disk capacity of local data (user and station tabs) is running low, you will be notified by a message in the header of the “Import DICOM”, “User” and “Station” tabs. If this information is displayed, consider freeing up disk space in the “User” and “Station” tabs, or increase the disk capacity of local data. The default value for low disk space information is set to 80% and can be changed in the system settings with administrator privileges.

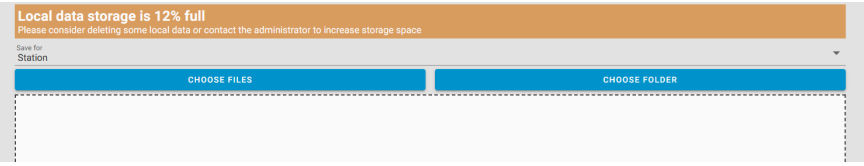


Figure 146: img

6 Digitalization and conversion of data into DICOM format

6.1 Digitalization tab

“Digitalization” tab DIGITALIZATION contains an interface for digitizing and dicomization of images and videos from the grab card, or local folders with support for categorization and loading of the Modality Worklist. This tab contains several main areas for uploading data:

1. Select digi station
2. Adding the patient and adding information to the procedure
3. Dicomization/digitization of data and its modification
4. Working record set
5. Saving and deleting of uploaded data

These areas are described in the following paragraphs:

6.2 Select digi station

If multiple digitizing stations are connected to the DPGW system, the user is allowed to select required digitizing station.

Figure 147: img

“Reload” action updates the list of digitization stations connected to the DPGW system.

Action “Continue without digitization” skips selecting a digitizing station.

The list of digitization stations includes:

- Name - the name of the digitizing station
- Host - IP address where the digitizing station is located
- Connected - information about the availability status of the digitizing station, information ✓ indicates the availability of the digitization station, information × indicates the unavailability of the digitizing station
- Free - information status about using the digitizing station, information ✓ means that the digitization station is not used by another user, information × means that the digitizing station is used by another user
- Used by user - if the digitizing station is already used by another user, the name of the user is indicated here
- Action - by clicking the “Select” action choose the selected digitization station for work (you can replace this action by double-clicking the selected line of the digitization station)

Select the “Digitization” tab to display a dialog for working with records:

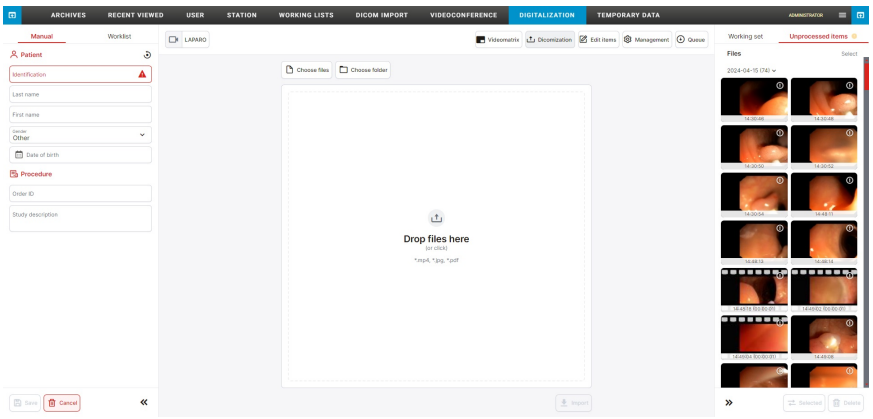


Figure 148: img

6.3 Adding the pacient and adding information to the procedure

Patient demographics can be entered manually or by selecting from the worklist.

Warning: it is very important to enter patient data with 100% accuracy! If you enter the wrong birth number, last name, first name, it is possible to accidentally duplicate one patient under different details and the images will not be paired.

6.3.1 Manual entry

To manually enter patient's demographic data, click the "Manual" tab Manual . Selecting this tab will allow you to enter data using the text boxes:

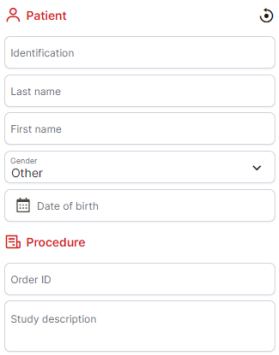


Figure 149: img

- Identification - allows entering the patient's birth number - this field is required
- Last name - allows entering the patient's last name - this field is required

- First name - allows entering the patient's name
- Gender - allows entering the patient's gender. The drop-down menu is used to select it
- Date of birth - allows entering the patient's date of birth by entering it in the format YYYY-MM-DD. To make the search easier, this field includes a calendar function , located to the right of the field. Once opened, you can search the calendar or select today's date
- Order ID - allows entering the order number on which the examination was performed
- Study description - allows entering the name of the study

Whispering can be used to fill text into text fields, i.e. it automatically completes text when typing in the text field.

To delete text in text fields, you can use the delete function × located in the field, to the right of the entered text.

For automatic completion of manual entry fields, it is possible to use the actions in the "Archives" dialog, "Floating panel actions" and select the "Select patient for digitization" action for the selected patient , after saving the digitization records, a new study will be created for this patient with the record saved in the PACS archive.

6.3.2 Worklist

The second option is to select the patient from the worklist Worklist . It includes patients who are pre-registered, booked or waiting for an examination. The image below shows the patients waiting for the examination from the worklist. Click the patient on the list to select them.

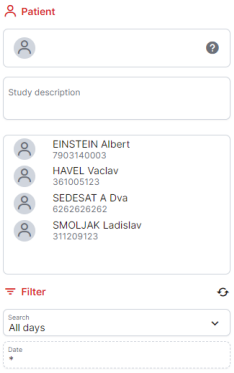


Figure 150: img

The worklist can be filtered by time period using the scrolling menu in the "Search" section:

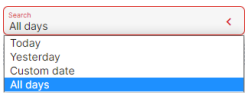


Figure 151: img

If you select “Custom date”, you can enter a specific day in the “Date” field or select it using the calendar .

The list of patients in the worklist can be updated using with the “Reload” button .

Select the patient from the worklist, which will move to the “Patient” field, including filling in the “Study description” field:

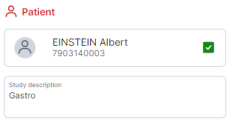


Figure 152: img

With this action, a patient will be selected for digitization or dicomization.

Warning: Carefully select the demographic data of the patient from the worklist section, to avoid possible substitution of the patient. If you have selected a patient other than the one you want in the worklist section, you can click on another patient from the worklist to make a change. If you have selected a patient from the worklist and it is necessary to enter the patient manually, click on the “Manual” tab and enter the patient data, the data will be applied according to the active tab.

6.4 Dicomization/digitization of data and its modification

This area allows the import of nonDICOM data and its modification with subsequent conversion to DICOM format. The options for each category is described below:

Warning: The individual categories of dicomization/digitization may differ depending on the selected digitization station, skipping the selection of digitization stations, or assigned user roles and the license used.

6.4.1 Dicomization

The category “DICOMIZATION” Dicomization is used for conversion of nonDICOM data into DICOM format and subsequent storage in the system of DPGW.

Only files and folders with files such as .jfif, .pjpeg, .jpeg, .pjp, .jpg, .m4v, .mp4, .pdf can be dicomized from the local storage or removable media inserted into the workstation. To enter data, use one of the following options:

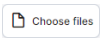


Figure 153: img

6.4.1.1 Choose file

Clicking the “Choose files” button opens a table with local files:

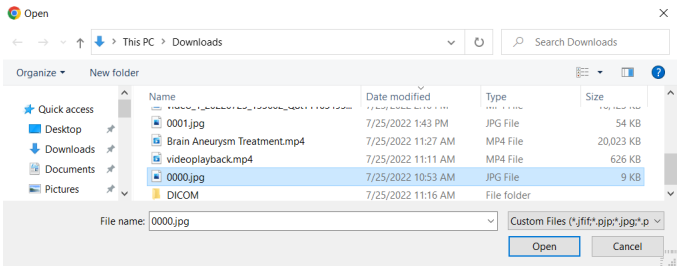


Figure 154: img

In this table, select the file you want to import. To select multiple files, use the ctrl or shift keyboard shortcuts with the left mouse button or keyboard arrows in this table. Only .jfif, .pjpeg, .jpeg, .pjp, .jpg, .m4v, .mp4, .pdf files can be dicomized.

After selecting the required files, insert them using the “Open” button, or use “Cancel” to cancel the action.

Files can also be insterted by clicking or using drag & drop style, i.e. by dragging them to the “Drag files here” area:

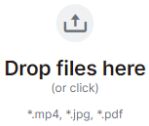


Figure 155: img

The imported files then appear in a list and you can add more to them in above-mentioned way:

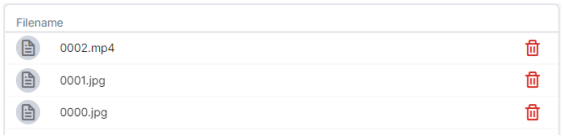


Figure 156: img

Use the “bin” action to the right of the file name to remove the file from the list.

Import the imported files into the “Working set” by selecting the “Import” action on the right under the list of selected files.

Figure 157: img

Figure 158: img

6.4.1.2 Choose folder

Clicking the “Select folder” action opens a table with local folders:

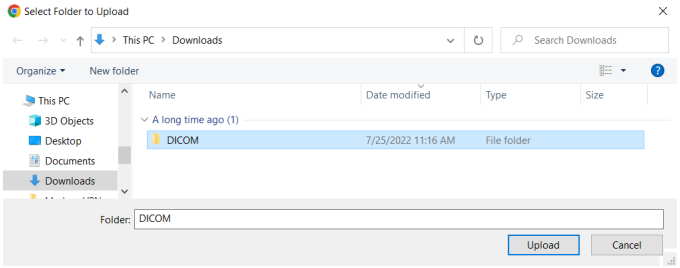


Figure 159: img

In this table, select the folder you want to dicomize and select the “Upload” action to put the data onto the dicomization list. The “Dicomization” category then contains all the files from the selected folder:

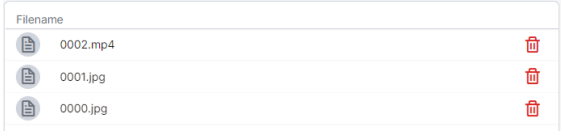


Figure 160: img

Use the “bin” action to the right of the file name to remove the file from the list.

Import the imported files into the “Working set” by selecting the “Import” action on the right under the list of selected files.

Figure 161: img

If you select files of any unsupported type, you will be notified by a web browser pop-up window and the files will not be added to the list for dicomization:

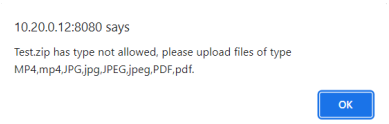


Figure 162: img

6.4.1.3 Displaying the process and results of dicomization After clicking the “Import” button, you will be notified about the status of the data upload process into the “Working set”.

1. Information about the status of the data upload progress into the “Working set” with displaying the progress indicator for the individual files in the list of imported data:

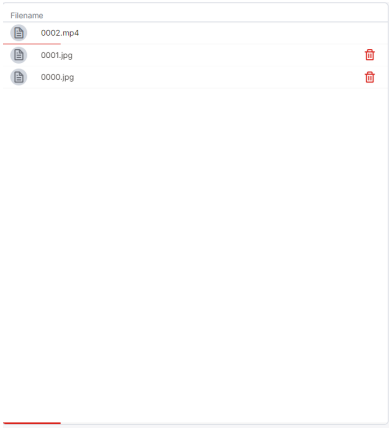


Figure 163: img

The data import time varies depending on the size of the imported files.

2. After the data import is completed, you will be informed about the result by the “Uploaded files info” table:

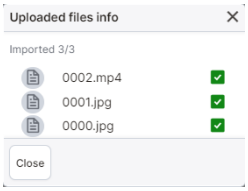


Figure 164: img

Shortcuts to the uploaded files will then appear in the “Working set” toolbar.

6.4.2 Digitization

Digitization is used for conversion of analog data from examination modalities (e.g. endoscope) to DICOM format and subsequent storage in the DPGW system.

Warning: The video preview must not be used for diagnostic purposes. The preview might be delayed.

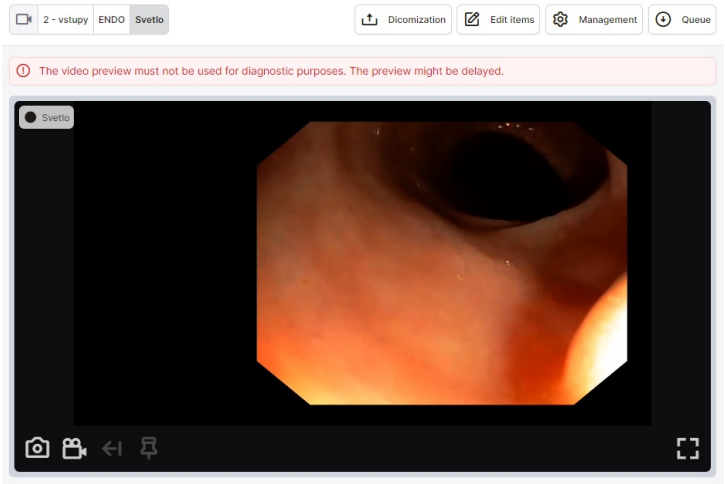


Figure 165: img

If the digitizing station contains multiple outputs, it is possible to display multiple inputs (previews):

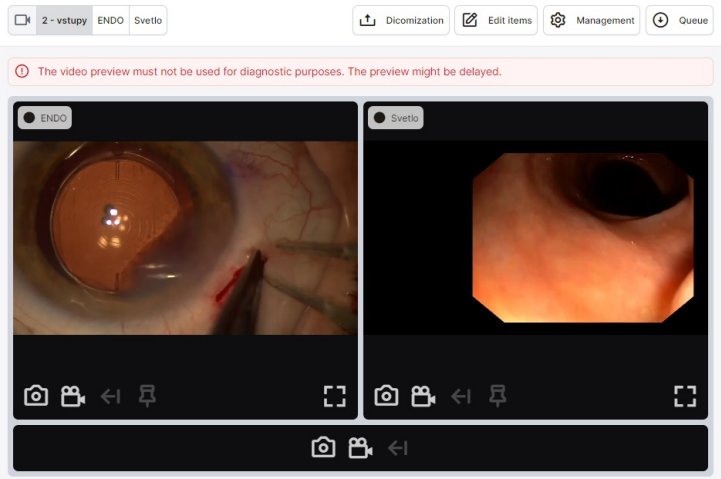


Figure 166: img

To capture a single image from the input of the digitizing station, select the action “Take snapshot” . The image will be captured in the “Working set”.

To capture video from the input of the digitizing station, select the “Start video recording” action . Video recording will be marked with an icon, the name of the recording modality and the time of the recorded video ENDO 0:00:03 in the upper left corner of the preview. After starting the video recording, the user is allowed to add marks to the video to mark important parts (see more in the “Edit video” section) . The mark action will change color to verify the marking of the video. To stop video recording, choose the action “Stop video recording” . The video will be captured in the “Working Set”.

Action “Maximaze video preview” allows you to expand the window with a preview of the input from the digitization station.

Action “Timeshift” allows the user to go back a period of time in the recorded video, using the displayed table:

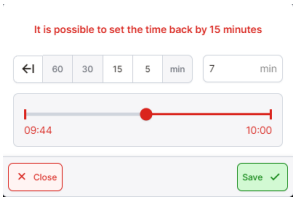


Figure 167: img

When reverse recording is active, this information will be displayed next to the video recording icon: Svetlo 0:06:06 +1min

Warning: The “Timeshift” action may vary depending on the configuration of the DPGW product.

Digitization control supports control directly from the camera head of the device or through the pedal control, touch monitor or tablet.

6.4.3 Edit items

Figure 168: img

The “Edit items” category allows the user to edit the uploaded data after selecting the specific record from the “Working set”. Data editing options vary depending on the type of record being edited, namely video, image, or pdf:

6.4.3.1 Edit Image By selecting an image from the “Working set” opens a preview of the selected image in the “Edit items” category with the following functions:

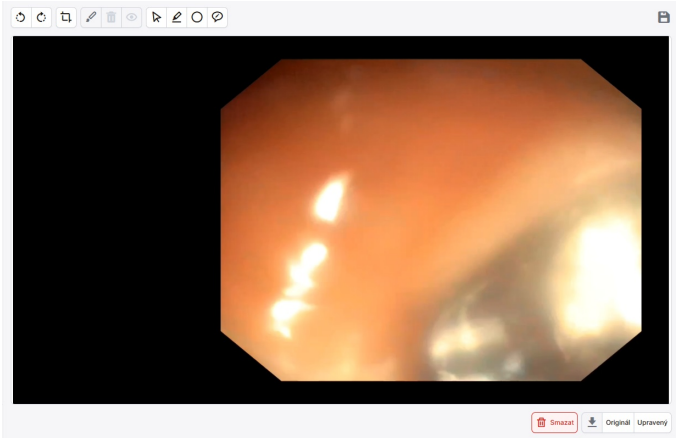


Figure 169: img

- Crop tool - this tool is used to crop out a certain area in the image:

Figure 170: img

You can resize the crop area by dragging the red squares located in the upper left and lower right corners of the crop area. When you hover the mouse over the crop area, the numeric values for these squares represent their location in pixels, relative to the cropped image. A numeric value in the center of the crop area indicates the resolution size of the image after cropping. Click in the image to be edited by cropping to display the “Crop area” table for possible manual entry of crop values:

Figure 171: img

- Rotate 90° - the image will be rotated 90° clockwise or counterclockwise, depending on the selected rotation direction
- Download Original Edited - the image will be downloaded to the local storage of the PC, in case you select “Original” the image will be downloaded without modifications, in case you select ” Edited” the image will be downloaded with modifications, in .jpg format
- Save changes - this is an informative icon indicating the save status of the edit

Electronic pencil

The “Electronic Pencil” function is used to draw objects, i.e. drawings, ellipses and labeled arrows, into the edited image or video. To use the “Electronic Pencil” function, use the tools in the top bar above the edited image documentation:

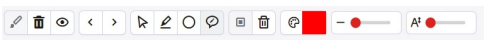


Figure 172: img

- Clear all notes - selecting this action will remove all drawn notes (before deleting all items you will be asked by a pop-up window to confirm the deletion)
- Notes visibility - select this action to hide/show all drawn notes
- Edit - tool for marking drawn objects and moving them
- Freehand - this tool is used for free drawing into the image (after drawing into the image, the thickness and color change function will be available)
- Ellipse - tool for drawing an ellipse into the image (after drawing it into the image, the thickness and color change function will be available)
- Arrow - tool for drawing an arrow and text into the image (after drawing into the image, the function of changing the thickness, color and size of the text will be available). After drawing the arrow into the image, a window will pop up for the possibility of inserting text to the arrow using the “Note” text field, selecting the “Save” action will insert the text to the arrow. In case you do not want to insert the text, select the “Cancel” action.
- Remove selected note - select this action to remove the selected drawn object
- Object color - this tool is used to select the color of the selected object, selecting this tool will open the color tab:

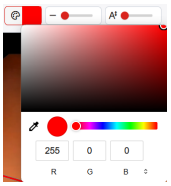


Figure 173: img

- Object Thickness - this tool is used to select the thickness of the drawn object. To change the thickness, move the knob on the slider.
- Text size - this tool is used to select the size of the inserted text. To change the text size, move the knob on the scroll bar.

Using the “Electronic Pencil” function when editing a video will also insert a marker into the timeline (see the following paragraph for more on inserting a marker in a video).

Figure 174: img

Warning: After drawing the objects using the “Electronic Pencil” tool and saving it to the PACS archive, the edited video/frame will be saved as the additional series of examinations. The original unedited data will be saved along with the edited video/image. For this reason, saving may take more time depending on the length of the video.

6.4.3.2 Edit video Selecting a video from the “Working set” opens the video viewer with the following functions in the “Edit items” category:

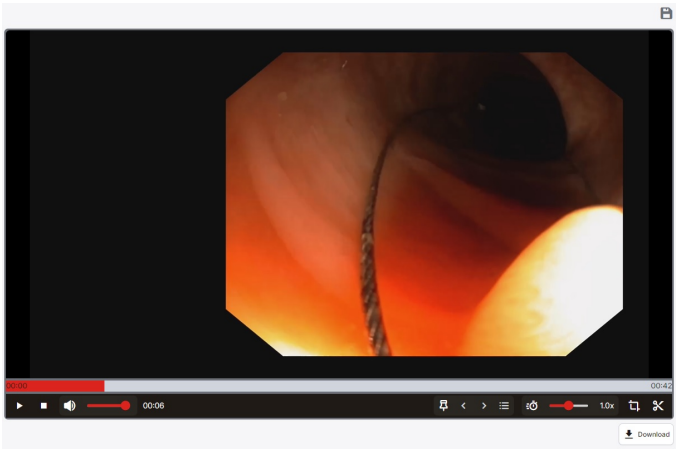


Figure 175: img

- “Timeline” - red bar which indicates the location in the selected video. Click or drag right/left to move in the timeline of the video. You can change the timeline scroll speed by dragging up/down:

Figure 176: img

- “Play” - the play function is used to play the video. The beginning of the video can be changed using the timeline.
- “Stop” - the video stop function
- “Volume” - the function for adjusting the volume of the playing video. You can change the volume by dragging the line
- “Time stamp” - for example 00:06 indicates the current position on the timeline
- “Add mark” - the function for adding a marker to the selected part on the timeline. Clicking the action adds the mark to the timeline as showed:

Figure 177: img

You can move between the markers with the left/right arrow .

To delete a selected mark, click it on the timeline. The original “Add mark” action will change to “Remove mark” . Clicking the icon removes the mark.

Action “Marks” allows the user to manage added marks. By selecting this action, you will display the “Marks” table, in which it is possible to manually edit individual mark times and add their description:

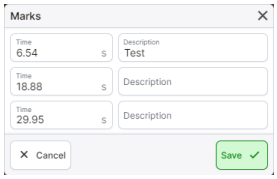


Figure 178: img

Hovering over a mark with a description will display it to the left of the mark insertion action .

After digitizing the video with the marks into the PACS archive, these marks will be visible when the video is opened in the DPGW DICOM viewer.

- “Speed” - the function for determining the video playback speed. The video can be slowed down to 0.1x playback speed, or accelerated to 4x playback speed using the line

- “Crop tool” - for more info, see chapter “Edit image”
- “Editing tool” - this tool is used for editing video that will be digitized and then sent to the PACS archive. Selecting this tool will display a bar for defining editing:

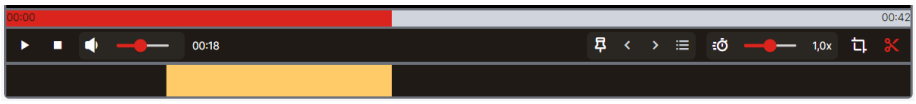


Figure 179: img

The bottom bar indicates the location of the video cut. To mark the beginning of video editing, click in the selected part of the bar. You then determine the start and end of the video by moving the squares to the requested area. The marked part of the video can be moved by dragging the yellow part of the section.

The edit tool allows you to add multiple edits to the selected video. To add, click outside the already selected cut and specify the length of the video cut:

Figure 180: img

- “Download” Download - the video will be downloaded to the local PC storage in .mp4 format.
- “Save changes” - this is an informative icon indicating the save status of the edit

6.4.3.3 Edit pdf Selecting a PDF file from the “Working set” will open an external pdf viewer in the “Edit items” category with the option to download it Download on a workstation (PC):

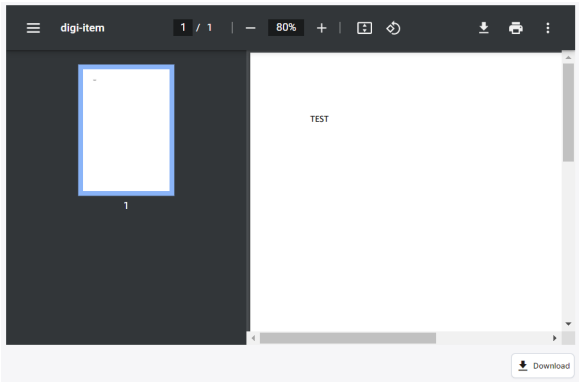


Figure 181: img

6.5 Working set

After uploading the data by dicomization/digitization, this data is moved to the “Working set” area in the right column:

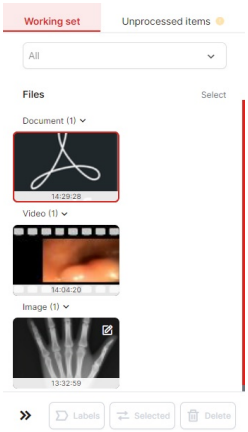


Figure 182: img

A working set allows the user to work with the imported data. When you click on the selected file, it is marked with a red frame and you will be redirected to the “Edit items” category described above.

The pencil icon to the right of the file in the “Working Set” indicates the edited file.

The “Working set” section allows you to perform the following actions:

- “Select” Select - allows you to select files for processing in the “Working set” section. Click the left half of the preview to select the image, and click the right half of the preview (with the eye icon) to view the image in the image editing window.

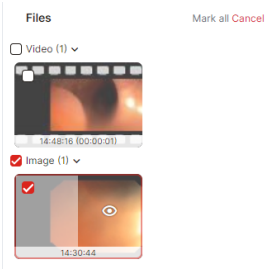


Figure 183: img

The “Select” action changes to “Mark all” to mark all files, or “Cancel” to deselect files.

If you select the “Select” action and mark the selected file, the following actions will be available:

- “Delete” Delete - removes selected files
- “Labels” Labels - this action allows the user to assign predefined labels to a file using the displayed table:

1. Table for label search - search for a label by entering text in the “Filter by tag name” field, click on the searched label in the “Tags to select” field, move it to the “Selected tags” field, and then choose to save:

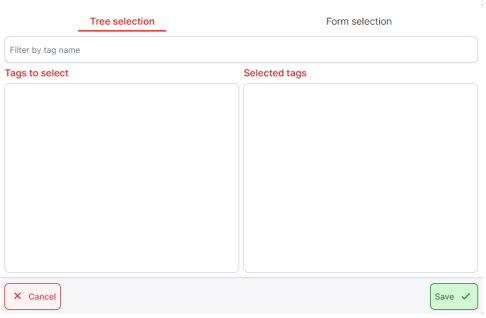


Figure 184: img

2. Table for label selection - First select the group of labels from the “Group” scrolling menu, then select the required label by clicking in the check box. If you have selected all the required labels, perform the save action:

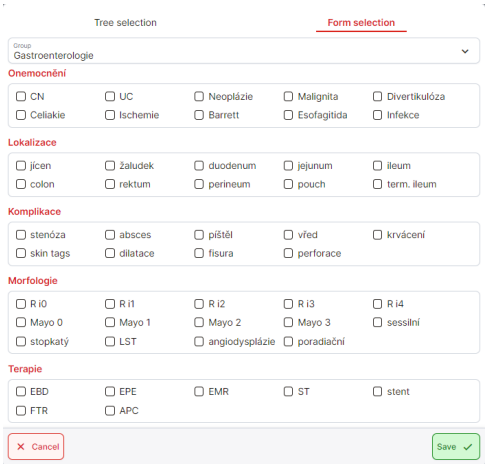


Figure 185: img

Warning: Labels may vary depending on DICOM viewer configuration. If you cannot find the label you are looking for, please contact your administrator for this product.

After choosing a label and saving it to a selected file, this file will be marked with a label:

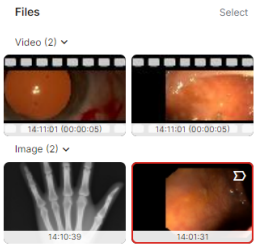


Figure 186: img

- "Selected" Selected - this action moves the selected files from the "Working set" to the "Unprocessed items" tab. The files moved in this way will not be subsequently stored in the PACS archive and it will be possible to work with these files in the future.

6.5.1 Unprocessed items

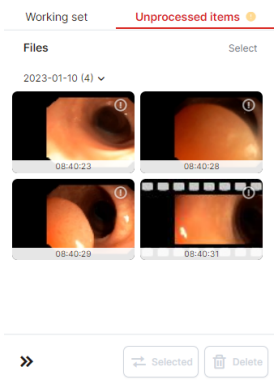


Figure 187: img

"Unprocessed items" are those files that have been moved from the "Working set" tab using the "Select" action Selected or have been moved automatically, according to a configurable time limit by the product administrator DPGW.

After selecting the selected files, these files can be moved to the "Working set" or deleted. After moving these files to the "Working set", they can be assigned to the required patient and then stored in the PACS.

6.6 Saving, deleting data

The last step for saving/deleting acquired data in to the PACS archive is located in the "Save, delete data" area, in the lower left part of the screen.

The following functions are located in the data storage/deletion section:

- “Save” Save - action for saving acquired data in the PACS archive. By choosing this action, you will display the informative table “Result of saving records”:

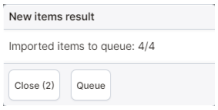


Figure 188: img

Select the “Queue” action to display the details of the import of stored data. If all the data has been saved correctly, you will be informed about this with a green check mark to the right of the name of the saved record:

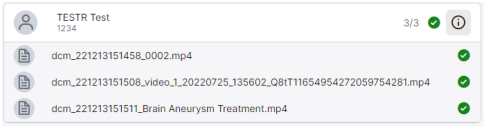


Figure 189: img

- “Cancel” Cancel - removal of all records and patient demographic data

Warning: Before uploading data to the PACS system, carefully check the data included in the work set to prevent possible misassignment of data to a patient.

DPGW allows the user, if necessary, to leave a job in the “Digitization” category with the possibility to return to this job later. The entered data is saved and the user can switch between categories or launch the DICOM viewer. Even if the user logs out of the system, the data entered in the “Patient” and “Working Set” areas are kept or moved to the “Unprocessed Records” tab, depending on the configuration and the time since the last logout. After a new login to the system, the user is then notified of this by a table:

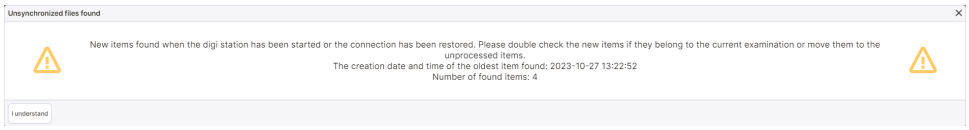


Figure 190: img

6.6.1 Videomatrix

The “Videomatrix” Videomatrix category is used for management of video input signals to individual display monitors.

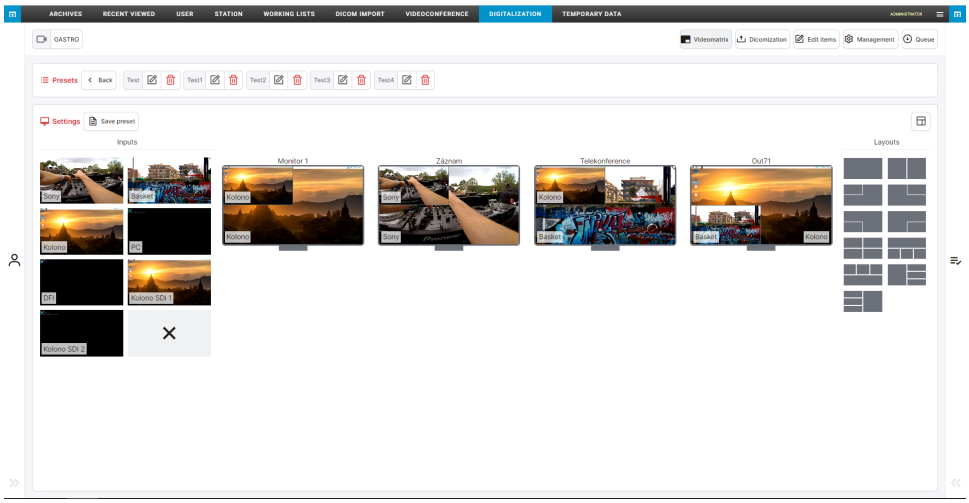


Figure 191: img

The “Videomatrix” category includes: - **Presets** Presets - selection of saved layouts of individual display monitors

To create a preset, edit the layout of each monitor and select the action “Save Preset” Save preset, to display the “New Preset” table:

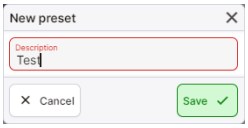


Figure 192: img

The “Cancel” action cancels the work in progress, the “Save” action saves the preset in the “Presets” field.

The “Edit” Edit action allows the user to edit the created preferences. Selecting this tool extends the individual presets you have created to edit them:

Figure 193: img

Use the “Edit” tool to open the “Edit preset” preset name editing table:

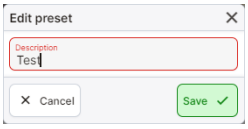


Figure 194: img

Use the “Remove” tool to remove the created preference.

- **Settings** - Settings - the settings tab contains the current input management, display monitor layout and the option to change the monitor layout.

Use the change view action of the settings tab to change the display layout of inputs, display monitors, and layouts:

Settings tab layout 1:

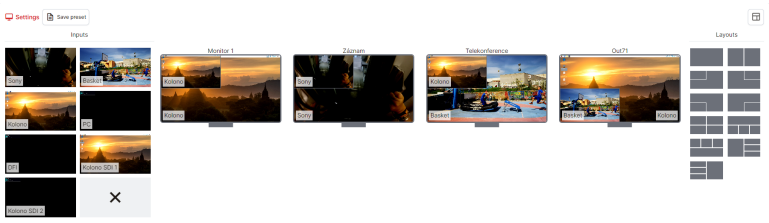


Figure 195: img

Settings tab layout 2:

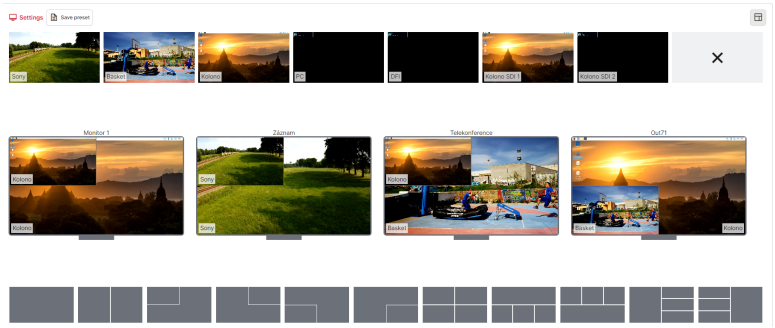


Figure 196: img

Changing the layout and input of signals:

To change the display monitor layout, select the desired layout from the “Layout” tab and then apply the selected layout to the selected display monitor:

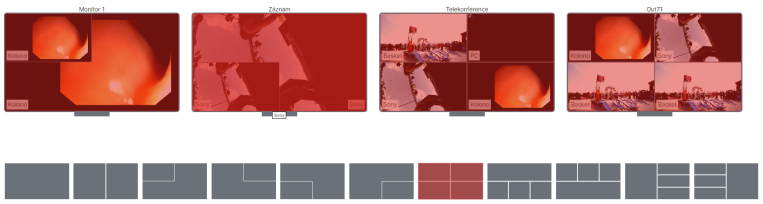


Figure 197: img

To change the display of a video input to a display monitor, click the desired input with the mouse, and then click in the location of the selected display monitor:

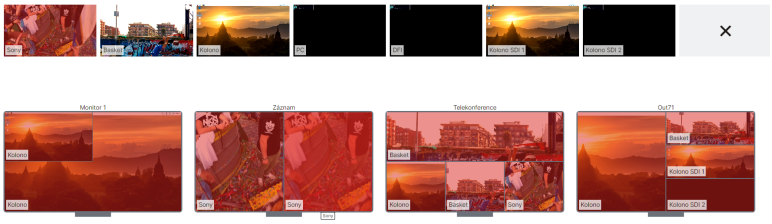


Figure 198: img

This changes the layout on the selected display monitor.

7 Videoconference

The “Videoconference” tab VIDEOCONFERENCE is used to share video and audio in real time using a videoconference call with support for multiple call participants.

7.1 User videoconference access

As a user of the DPGW system, select the “Videoconference” VIDEOCONFERENCE tab to open the videoconference dialog window:

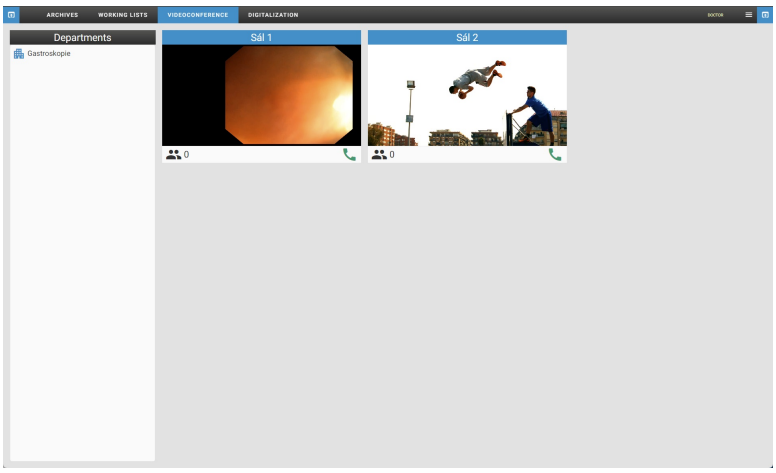


Figure 199: img

In the left column “Departments” you can see the individual departments, by selecting the desired department you can see the available rooms for possible connection via video conference calls. To join a videoconference call, select the desired department and room and then use the “Phone” function to request to join a videoconference call. If the call is approved, the videoconference call dialog will be displayed:

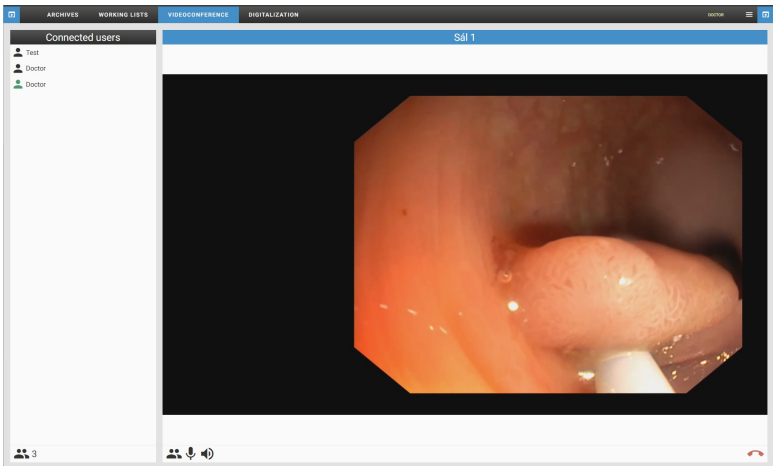


Figure 200: img

Warning: Some users may have privileged access. No confirmation is displayed for their room login and they are automatically logged into the room. For this setting, contact your system administrator DPGW.

In this dialog box, the left column displays the individual connected users. The right column shows the video conference call in session. In this right column, the user is allowed to:

- “Turn off/on microphone” / - this function is used to turn off/on the microphone
- “Mute/unmute” / - this function is used to mute/unmute the audio of a videoconference call
- “Exit videoconference” - select this function to exit the videoconference call
- “Hide/show users” / - selecting this function hides/shows the left column with the displayed users:

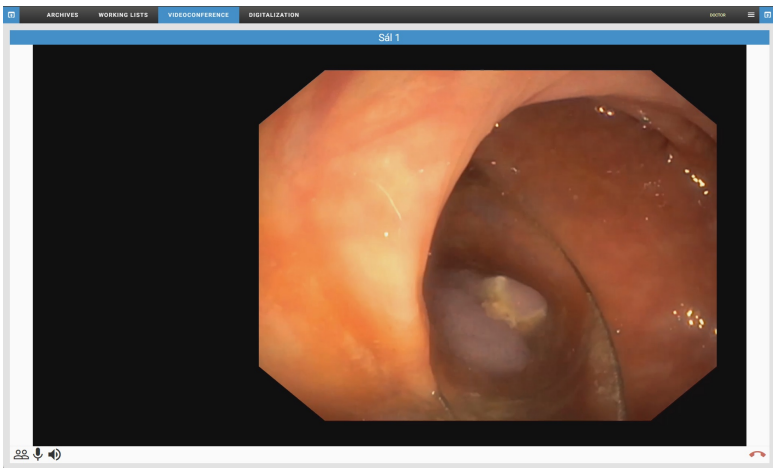


Figure 201: img

7.2 Administrator videoconference access

To create a videoconference call, go to the “Digitization” tab DIGITALIZATION and select the desired digitization station (see the Digitization section). The running digitizing station, which is configured for video conferencing, can be accessed remotely by users of this system. If a user wishes to connect to the running digitizing station by videoconference, you will be notified with the option to accept or reject the request:

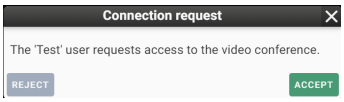


Figure 202: img

Warning: If privileged users are defined, the call is connected automatically without the need for confirmation.

If you have selected the “Accept” option, the individual connected users will be displayed at the top of the window:

Figure 203: img

And in the “Digitization” dialog window, the functions for the management of the videoconference call will be displayed:

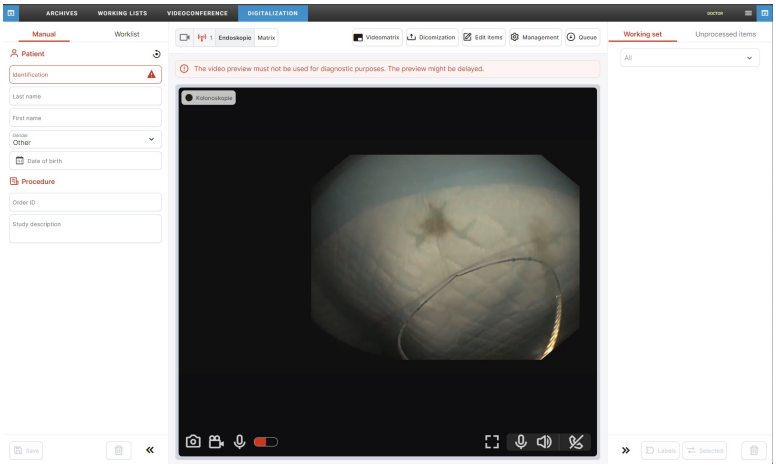


Figure 204: img

Video conferencing management functions: - “Microphone off/on” / - this function is used to turn off/on the microphone - “Mute/unmute” / - this function is used to mute/unmute the audio of a videoconference call - “Log out connected users” - selecting this function will log out all connected users of the currently running videoconference call

8 Temporary data

Tab “Temporary data” TEMPORARY DATA is used for managing temporarily stored DICOM data that has not been properly stored in the PACS archive or has been marked for deletion.

Warning: The “Temporary data” tab is dependent on the assigned user role. If you do not have access to the folder, contact your system administrator.

8.1 Cache

Figure 205: img

The individual cache destinations are: - Missed data - This is data that could not be stored in the archive due to invalid or inconsistent data. You can correct the data in this area and have it saved again, or download the data in dicomdir format. - Recycle Bin - The area where data deleted by the user from the web interface is moved so that it can be restored in case of erroneous deletion. To enable this feature, you must first configure it. - AI cache - data that could not be processed during communication with the integrated AI - mDEX cache - data that could not be processed during sending/receiving via the mDEX inter-hospital network

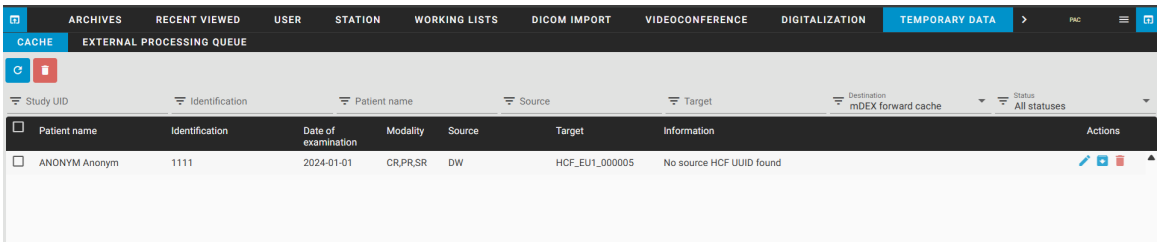


Figure 206: img

8.1.1 Viewing

To facilitate work, lists of data can be sorted and filtered in the tab “Temporary data”, using text boxes and drop-down bars which are described below:

Figure 207: img

- UID study - allows user to enter a unique study number
- Identification - allows user to enter patient’s birth certificate number
- Patient name - allows user to enter patient’s name
- Source - the original location of the data from which the request came for processing
- Target - the location where the data is to be moved
- Destination - viewing data lists in individual areas

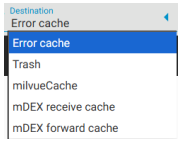


Figure 208: img

- Status - displaying of a list of active or inactive data

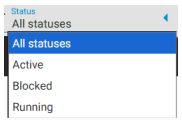


Figure 209: img

To update the list, you can use the “Reload” button .

The found list of temporary data is sorted into individual columns which can be sorted by clicking on the name of the selected column. The symbol is then displayed next to this column / .

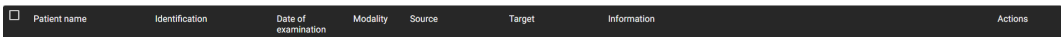


Figure 210: img

- Patient name - a column containing patients’ names
- Identification - a column containing patients’ birth certificate numbers
- Date of examination - a column containing the date when examination took place
- Modality - a column containing modality which was used for examination
- Source - the original location of the data from which the request came for processing
- Target - the location where the data is to be moved
- Information - a column containing information why the study was put in “Temporary data” tab
- Actions - a column containing functions for working with temporary data
  - Edit - data editing
  - Export to DICOMDIR - saves selected date to local folder on the workstation (PC) in DICOMDIR format
  - Delete - deletes data from temporary storage

8.1.2 Editing

Individual data in the list of “Temporary data” tab can be edited using the “Edit” function located in the “Actions” column. Select this function to open data editing table.

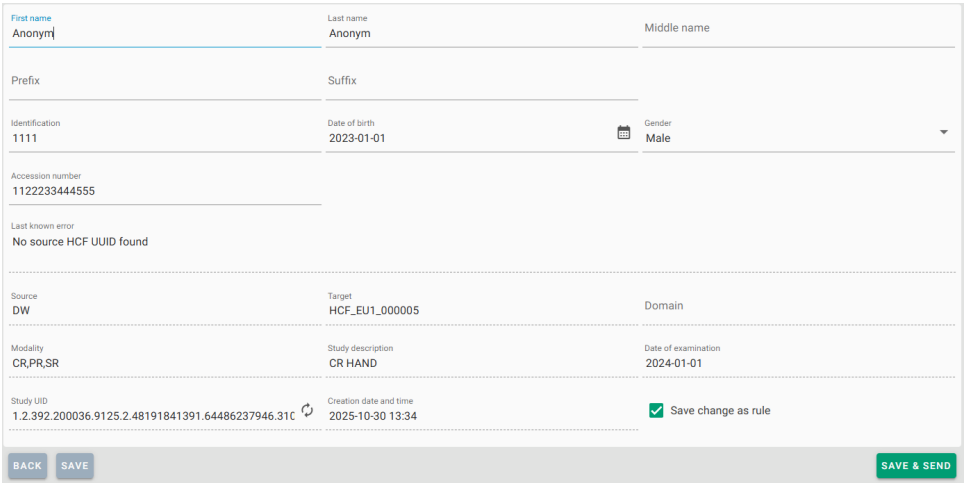


Figure 211: img

The data editing table contains:

- First name - option to edit patient's name
- Last name - option to edit patient's surname
- Middle name - option to edit patient's middle name
- Prefix - option to edit academic title before patient's name
- Suffix - option to edit academic title after patient's name
- Identification - option to modify patient's birth certificate number
- Date of birth - option to edit patient's date of birth by text field or selection
- Gender - option to edit the patient's gender (male, female, other)
- Last known error - informative message about the error which ocurred during saving to the PACS archive
- Source - name of the AETitle modality from which the data was sent
- Target - name of the AETitle modality to which the data was sent
- Domain - name of the domain established in the system
- Modality - types of modality which the data was sent from
- Study description - name of the examination
- Date of examination - date of performed examination
- Study UID - unique study number with the possibility to create new study using the "Generate new UID studies" function . When you select this function, you will be notified by a pop-up window:

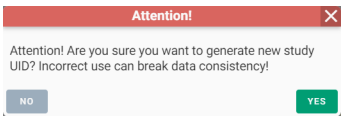


Figure 212: img

- Creation date and time - date and time of adding of the study in the tab “Temporary data”
- Save change as rule - remembers currently performed correction. If other studies of the same patient are stored in the temporary data, the correction will be performed automatically. (Applies only to patient demographic data. For example, it is not possible to automate generating of a new UID study.)

After finishing editing of selected parameters, made changes can be undone clicking the “Back” button BACK, saved and returned to later by clicking the “Save” button SAVE or these changes can be saved and sent to PACS archive by clicking “Save&send” SAVE & SEND.

8.1.3 Deleting

If you no longer want to keep the selected data in the temporary data store, you can delete it using the “Remove” action . If you use this function, you will be notified by a “Question” pop-up window where you need to confirm the deleting:

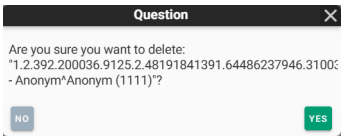


Figure 213: img

In case the study was successfully deleted from temporary data, the system notifies you at the bottom of the screen:

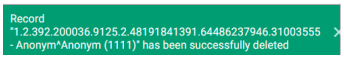


Figure 214: img

8.2 External processing queue

Figure 215: img

This is data that has been sent for processing by third-party applications, e.g. artificial intelligence, a queue of individual processing requests is created here, which can be managed.

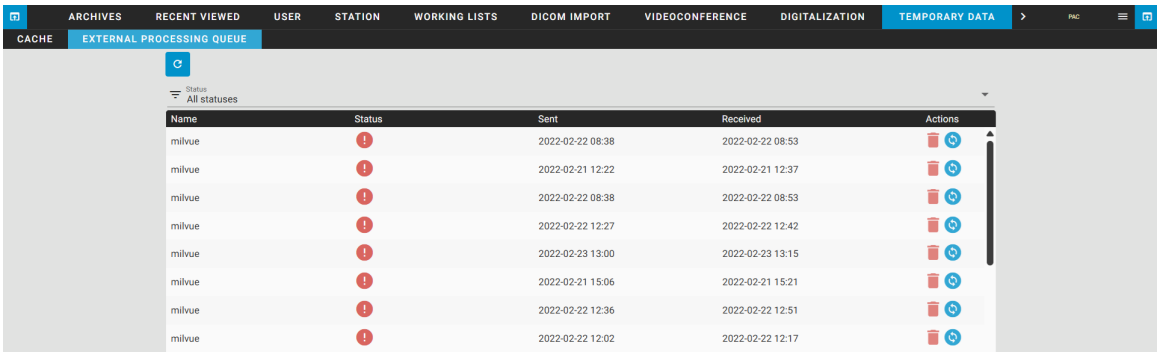


Figure 216: img

To update the list, you can use the “Reload” action. .

The displayed list can be filtered using the “Status” menu, which determines active and inactive data:

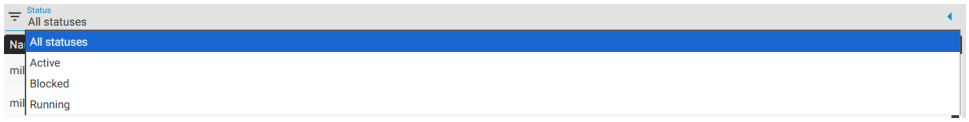


Figure 217: img

The list of external queues for processing is sorted into individual columns, which can be sorted by clicking on the name of the selected column. A symbol is then displayed next to this column. / .

Figure 218: img

- Name - source name
- Status - data status
- Sent - date and time of sending
- Received - date and time of receipt
- Actions - column containing functions for working with external queue data
  - Remove - removes data from the external queue
  - Retry - repeats the attempt to resend the data

9 Viewer

This chapter describes the second main part of DPGW which is a dialog box of DICOM viewer with tools for working with visual data. This dialog box can be opened by opening the patient/study or by action “Back to the exam” , which is located in the upper right hand corner of the basic dialog box for working with registries.

If you need to return to the basic dialog for working with registers from the DICOM viewer dialog, use the action located in the upper left corner of the DICOM viewer.

The DICOM viewer dialog with image data tools contains several main areas which will be described below in this user manual. These are: - Image data display window - desktop with open series display - Viewer working set - this set is located in the left column of the DICOM viewer dialog. It contains previews of individual series of examinations and work with image documentation, or tracing of studies of the selected patient - Viewer tools - the tools are displayed in the top bar of the DICOM viewer dialog and they include currently selected tools on individual mouse buttons, fixed tools, a user-configurable toolbar and tabs with all available tools: - Display tools - Measurement tools - Action tools for series - Volume operations, 3D displaying - Online consultation - Viewer settings - Working toolset

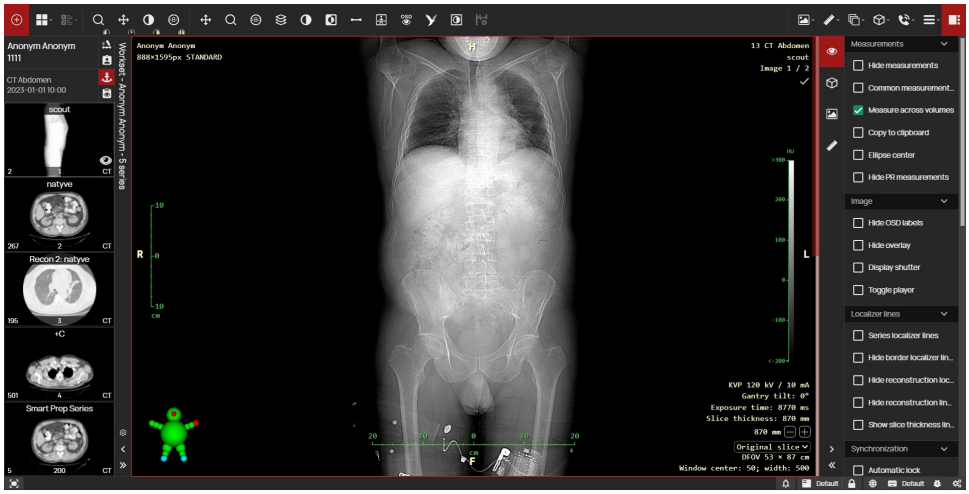


Figure 219: img

In case you are working on a diagnostic station equipped with multiple monitors, it is possible to set the DICOM viewer desktop - PRODUCT-SHORT-NAME– to individual monitors. DPGW allows you to automatically distribute desktops to individual monitors. For this function it is necessary to install the “DICOM viewer extension” add-on in the used internet browser. You can find more about the settings of the multi-monitor station in the chapter “Settings”, section “Display settings”.

9.1 Image data display window

Figure 220: img

The main workspace of the DICOM viewer dialog is the actual display of the selected patient series/image. The individual parts of this area are:

1. Image - this section displays all images, videos, and documents.
2. OSD Labels (On Screen Display) - information about the currently displayed image/series. In “Viewer settings” information to be displayed can be defined. This setting is applicable to the user/station.
3. Key images marking - actions for tagging images in the series . The selected image has a double check mark in the button (the opposite indicates unmarked). For description of the marking and its overview, see the section “Action tools for series”.
4. Brightness display scale - the scale shows the range of the selected brightness window. The brightness window settings are affected by two parameters: “center” and “width”. Current values of these parameters can be monitored in the lower right corner of the desktop while adjusting the brightness window. (OSD labels, item 6.)
5. Scroll bar - this bar contains a scroll bar that shows the current scroll position within the series. The behavior of the toolbar is affected by many parameters. These affect several key things:

- initial position of cursor - it is possible to parametrically set whether the cursor or the whole series, open on the first frame or in the middle so that the user can scroll smoothly forward or backward.
- surroundings loading - you can parametrically set the number of frames which are automatically loaded around the cursor position. DPGW automatically loads the cursor area because it expects the user to view images while moving around the position of the cursor. If the user jumps to

another position within the series, the loading of images from the vicinity of the previous position is automatically interrupted and the loading of the vicinity of the new cursor position begins. This ensures smooth viewing of the series even if it is not fully loaded. However, all images are loaded gradually in the background.

- range of automatically loaded images - the user can view images without having to load the entire series. If the series has a lot of frames, the cursor area is loaded and then the frames are always loaded automatically, omitting the defined number of frames. For example, if all 10 frames are loaded and the user then starts moving around the series, the preloaded images make it easier for him to move around and reduce the time the user would have to wait for all the images to load.

Warning: Thus, the behavior of images loading in a series is fully changeable and it depends on the type of modalities and the number of images that the user usually works with.

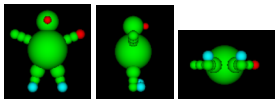
The control of the shift by one image within the series is enabled by using the mouse wheel or the PgDown/PgUp keys. If you require faster scrolling, you can use the scroll bar, or the Shift + PgDown/PgUp keyboard shortcut to scroll 10 frames in a series.

6. OSD Labels (On Screen Display) - Eposcopic parameters of the modality on which the study was taken. In “Browser settings” you can define what information is to be displayed. This setting is applicable to the user / station.
7. Vertical scale - indicates the size of the image and its parts horizontally and vertically. If the image is originally DICOM format, it carries information about the actual distance and it is possible to use scales or measuring tools to measure the distance. However, in the case of digitized images, they usually do not carry this information and it is first necessary to calibrate the image = determine the known distance. Based on this data, all measured distances are then recalculated.

Warning: if the image does not show a calibration object and the user does not perform an accurate calibration of the image measurement according to this object, this is only an indicative measurement.

8. Pictogram - shows the orientation of the image with respect to the position of the patient’s body. The pictogram can be displayed in two modes. Schematic figure or cube with lettering on the sides. The displaying can be changed in the “Label layout” settings.

- Schematic figure



- The cube is marked with letters according to orientation.

The letters can take the following values: - A (anterior) - P (posterior) - R (right) - L (left) - H (head) - F (foot)

The largest letter in the middle indicates the current direction. The lower case letters on each edge indicate the direction the view would be if the patient's cube (orientation) rotated in that direction.

9. Horizontal scale - indicates the size of the image and its parts horizontally and vertically. If the image is originally DICOM format, it carries information about the actual distance and it is possible to use scales or measuring tools to measure the distance. However, in the case of digitized images, they usually do not carry this information and it is first necessary to calibrate the image = determine the known distance. Based on this data, all measured distances are then recalculated.
10. OSD labels (On Screen Display) - information about the patient's and study demographic data (name, surname, date and time of creating of study, etc.) In "Browser settings", it is possible to define what information is to be displayed. This setting is applicable to the user/station.

9.1.1 Context menu

In this area, in addition to working on selected data, it is also possible to open the context menu by pressing the right mouse button:

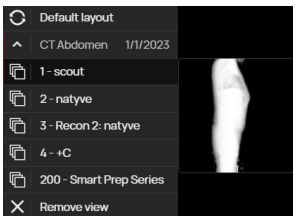


Figure 221: img

The floating panel contains: - Viewer tools - these tools can be set according to user's preference using the settings of individual areas of the viewer tools. For more information on configuring tools in the floating panel, see the section "Configuring tools display" - Series view - allows the user to open selected series of the open study. These series are listed under the date of the examination - Remove view - closes the open series

The context menu can also be invoked using a keyboard shortcut. This keyboard shortcut must be newly assigned using the "Keyboard Shortcuts" tool in the "Browser Settings" tool tab.

9.2 Viewer tabs

If you display the desired studies using the “Add to new tab” or “Show patients in tabs” action from the “Archives” dialog, a DICOM viewer dialog opens with individual tabs in its footer:

Figure 222: img

- Use the tool to display the currently open image/series of images in full screen mode, hiding any sidebars. To return to the original panel layout, click on the tool again.
- The “List tabs” tool allows you to open a menu of open tabs and then display or remove them:

Figure 223: img

- To remove a specific bookmark, move the mouse cursor over the targeted tab and select the trash can icon

Figure 224: img

and confirm

Figure 225: img

- Each tab contains an action for editing the name of the tab. This action is called by right-clicking on the selected tab and selecting the “Rename tab” tool

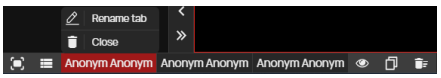


Figure 226: img

to start editing the tab name:

The “CANCEL” action cancels the action being performed. The “SAVE” action renames the tab name according to the text in the text field.

- “Show active tab” action by selecting this action, only the active “List tab” will be displayed. Selecting this action again will show all open tabs of the viewer.
- The “Clone tab” action copies the currently open tab and creates a new tab with its contents. When this tool is selected, a new tab will be created with the possibility of editing its name similarly to the “Rename tab” tool.
- The “Remove all tabs” action closes all open tabs. Before closing all tabs, you must agree to close them (if you check the option “Do not ask me again” you will not be asked to confirm next time and all tabs will be closed):

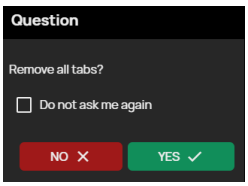


Figure 227: img

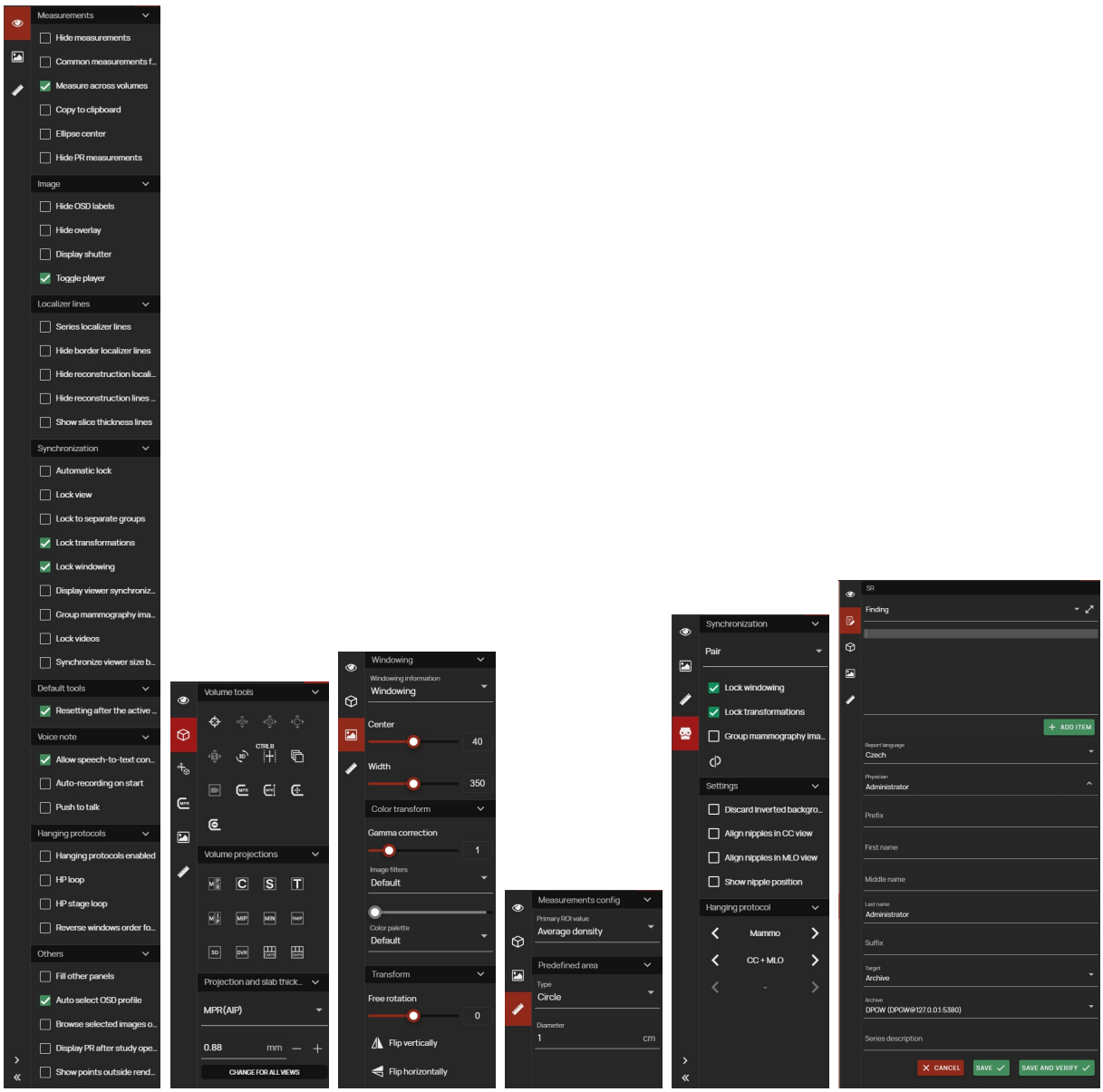
9.3 Working toolset

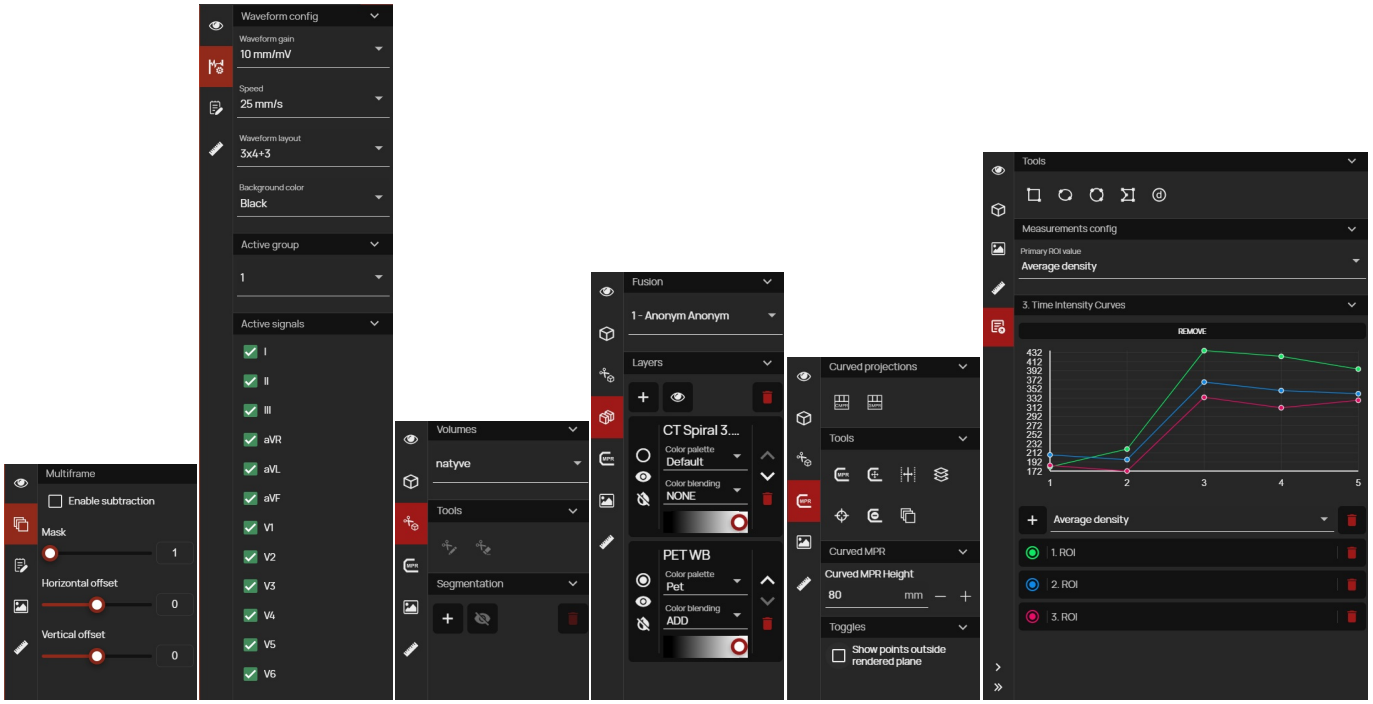
Select the “Working tool set” tab , located in the upper right corner of the viewer, to display the sidebar located on the right side of the viewer dialog. This sidebar contains individual tabs corresponding to the modality of the open study. The individual tabs include:

- Display toolset - The working display toolset contains items for displaying information over an image, or tools for synchronizing a series of images/videos
- Volume Toolset - The working volume toolset contains items for editing the created volume and changing the side orientation
- Postprocessing toolset - Postprocessing toolset contains items for adjusting the brightness window, colors and filters, or rotating
- Measurement toolset - The measurement toolset contains items for editing the ROI and its shape
- Mammography toolset - The mammography toolset contains items for editing mammography images and synchronizing them

- Report toolset - The report toolset is called up by the “Create SR” tool and is used to create a description of the examination by the user
- DSA toolset - The DSA toolset contains items for working with the digital subtraction angiography image and allows you to create and move the mask
- ECG toolset - The ECG toolset contains items for setting ECG curves and displaying individual signals
- Segmentation toolset - The segmentation toolset contains tools for cutting and editing the image
- Fusion toolset - The fusion toolset contains tools for displaying and editing fused image series
- Curved Projection Toolset - The Curved Projection Toolset contains the CMPR and SMPR projection views and their associated tools
- Time intensity curves toolset - The Time intensity curves toolset contains tools and a graph of created time intensity curves

The tools of the “Working toolset” tabs are described below, according to the individual tab chapters with all available tools. The “Working toolset” contains the following tools:


Measurements
Hide measurements
Common measurements f...
Measure across volumes
Copy to clipboard
Ellipse center
Hide PR measurements
Image
Hide OSD labels
Hide overlay
Display shutter
Toggle player
Localizer lines
Series localizer lines
Hide border localizer lines
Hide reconstruction locali...
Hide reconstruction lines ...
Show slice thickness lines
Synchronization
Automatic lock
Lock view
Lock to separate groups
Lock transformations
Lock windowing
Display viewer synchroniz...
Group mammography ima...
Lock videos
Synchronize viewer size b...
Default tools
Resetting after the active ...
Voice note
Allow speech-to-text con...
Auto-recording on start
Push to talk
Hanging protocols
Hanging protocols enabled
HP loop
HP stage loop
Reverse windows order fo...
Others
Fill other panels
Auto select OSD profile
Browse selected images o...
Display PR after study ope...
Show points outside rend...
Volume tools
Volume projections
Projection and slab thick...
MPR(AIP)
0.88
mm
CHANGE FOR ALL VIEWS
Windowing
Windowing information
Windowing
Center
40
Width
350
Color transform
Gamma correction
1
Image filters
Default
Color palette
Default
Transform
Free rotation
0
Flip vertically
Flip horizontally
Measurements config
Primary ROI value
Average density
Predefined area
Type
Circle
Diameter
1
cm
Synchronization
Pair
Lock windowing
Lock transformations
Group mammography ima...
Settings
Discard inverted backgro...
Align nipples in CC view
Align nipples in MLO view
Show nipple position
Hanging protocol
Mammo
CC + MLO
SR
Finding
ADD ITEM
Report language
Czech
Physician
Administrator
Prefix
First name
Middle name
Last name
Administrator
Suffix
Target
Archive
Archive
DPGW (DPGW@127.0.0.1:5380)
Series description
CANCEL
SAVE
SAVE AND VERIFY



9.3.1 Display toolset

Display toolset - The working display toolset contains items for displaying information over an image, or tools for synchronizing a series of images/videos:

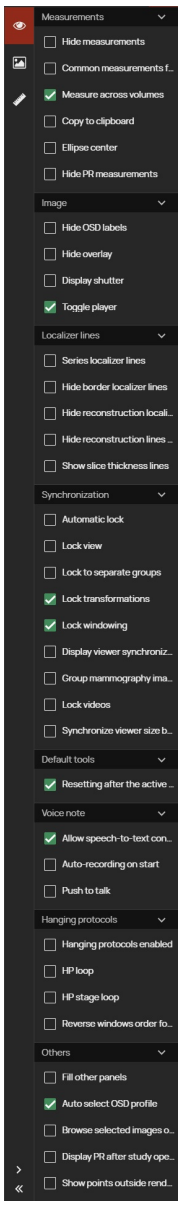


Figure 228: img

The Display tools working set contains the following tools:

Function	Description
Measurements	

Function	Description
Hide measurements	Hides all measurements from the image. Can be used when measured objects interfere with the image documentation, they can be temporarily hidden without removing them.
Common measurements for images in the series	It is used to keep all measured objects in the displayed window for all images in the series. When moving to the next image in the series, the measurement remains unchanged and is displayed on the next images.
Measuring across volumes	It is used to keep all measured objects in the display window for all images in the created volume. When moving to the next image in the reconstructed plane, the measurement remains unchanged and is displayed on the next images.
Copy to clipboard	This tool is used to copy the value of the last measurement to the clipboard, then paste it into the text field using the shortcut ctrl+v.
Ellipse center	Selecting this function will display the center point in the “Ellipse” ROI measurement
Hide PR measurements	Hides saved measurements in the image, or AI results saved as Presentation state, but keeps the current measurements performed
Image	
Hide OSD labels	Function to hide information in the image data display window.
Hide overlay	The tool provides the option to hide/show the saved measurements in the image.
Toggle player	Show or hide the player for automatic play through the series.
Localizer lines	
Series localizer lines	Display of localization lines, between two perpendicular series.
Hide border localizer lines	Hide border localizer lines (border lines shown in green)
Hide reconstruction localizer lines	Hiding localization lines, between reconstructed perpendicular series, in volume operations.
Hide reconstructions localizer lines on the active panel	Hiding localization lines in the active window panel for displaying image data, between reconstructed perpendicular series, in volume operations.

Function	Description
Show slice thickness lines	Display of localization lines including display of the selected slice thickness.
Synchronization	
Automatic lock	Synchronous scrolling through series in multiple panels with automatic finding of the corresponding image position in the series
Manual lock	Synchronous scrolling through series in multiple panels from the current image position in the series
Lock transformations	When using the sync function, the image adjustment will be applied to all synchronous series simultaneously
Lock windowing	When using the sync function, brightness and contrast adjustment will be applied to all synchronous series simultaneously
Display viewer synchronizability	Showing the option to lock individual panels in the “Display panel data window”
Lock to separate groups	Grouping of individual panels “Windows for displaying image data” for possible manual or automatic synchronization of series according to the data acquisition plane of the series or by manual entry
Group mammography images by patient	This tool allows you to enable synchronization of mammography images across patient mammography studies, without this tool you will only be able to synchronize mammography images within the currently viewed study. Warning: due to the non-standardized DICOM Tags of mammography studies, we do not recommend synchronizing older/newer MG studies of a patient, this synchronization is the user’s own responsibility.
Synchronize viewer size between windows	Synchronize the size of displayed studies in individual panels on a multi-monitor workstation
Lock videos	Synchronous scrolling through synchronously recorded videos
Default tools	
Resetting after the active viewer change	When switching to another panel in the “Image Data Display Window”, the currently assigned tools on the individual mouse buttons will be replaced by the default tools or the tools selected according to the “Tool selection” function
Voice note	

Function	Description
Allow speech-to text conversion	Selecting this tool will start automatic conversion of the recorded voice memo to text using the “Create SR” tool
Auto-recording on start	Selecting this tool will start automatic voice memo recording immediately after selecting the “Record voice memo” function from the viewer’s working set the next time you launch
Push to talk	Selecting this tool allows you to record a voice memo by holding down the “spacebar” key, if you do not select this tool you can also start/stop the voice memo by pressing the “spacebar” key
Hanging protocols	
Hanging protocols enabled	Disables/enables the ability to display hanging protocols
HP loop	Browse groups of hanging protocols in a loop using the “Switch to next HP” tool or a keyboard shortcut
HP stage loop	Browse individual hanging protocols in a loop using the “Switch to next HP stage” tool or keyboard shortcut
Reverse window order for HP	Reversing the order of applied hanging logs on individual monitors
Others	
Fill other panels	Automatic display of series, when changing the number of panels to display in the “Image Data Display Window”
Auto select OSD profile	Selecting this tool will automatically apply the set OSD profile when the study is opened with the corresponding modality
Browse selected images only	Browse only selected keyframes in a series with standard tools (mouse wheel, keyboard shortcuts)
Display PR after study opened	Enable/disable automatic display of stored measurements in the image after opening a study
Show points outside the rendered plane	This tool allows you to display user-created CMPR curved projection points in all planes across the entire view volume

9.4 Tool search

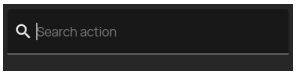


Figure 229: img

The “Tool Search” function is designed to quickly find the required DICOM viewer tool DPGW.

To find a tool quickly, follow these steps: - display the wanted image/series in the image data display window - press the keyboard shortcut “ctrl + K” - Type part of the name of the tool you are searching for:

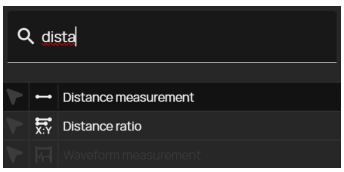


Figure 230: img

- hover over the selected tool and click the selected mouse button to assign the tool to that button, if the tool is already assigned to a mouse button, that button will be highlighted:

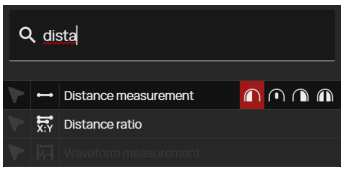


Figure 231: img

9.5 DICOM viewer status bar and its functions

Figure 232: img

The status bar of this DICOM viewer contains the following tools: - System notifications and messages (information about this feature is provided in the “Information bar” section above in this manual) - Default Automatic layout of OSD labels and the ability to lock them - Allocated memory indicator - Default Placement of keyboard shortcuts and their multilevel assignment - Bug reporting - Global configuration

These tools are described in the following paragraphs.

9.5.1 Automatic layout of OSD labels and the ability to lock them

Figure 233: img

The “Automatic layout of OSD labels” function is used for automatic switching between different profiles of OSD labels (On Screen Display), if they are configured and assigned to individual modality types (DX, CR, CT, MR…). These profiles can be configured using the “Profile editor” function.

When the examination is displayed in the “Image data display window”, the OSD profile will be automatically selected according to the displayed examination and the modality used to perform the examination when the function is enabled.

It is also possible to switch between the OSD profiles manually by clicking the mouse on this function, which will bring up the menu for selecting the OSD profile e.g.:

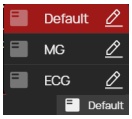


Figure 234: img

Click on the desired OSD profile to apply it.

In case you want to apply only the selected profile to all examination modalities without auto-selection, it can be locked with the , icon, after locking the icon will be undercoloured .

9.5.2 Allocated memory indicator

Figure 235: img

The “Allocated memory indicator” function is used to display the used memory of the viewer and to adjust its size.

Each open study in this DICOM viewer needs a certain amount of RAM memory of the PC station you are working on and this function serves both an informative purpose for displaying the used memory and the possibility of setting and allocating additional memory for working with image documentation.

When the allocated memory is exhausted, the viewer may “freeze” and must be restarted.

The default value of allocated memory is 5GB, in case you are working with larger studies or more open studies, we recommend allocating more memory to work properly with this product.

When you hover the mouse over the icon of this function, an informative table will be displayed about the allocated memory of the DICOM viewer “Allocated memory” and about the total memory usage of the PC station you are working on “System memory” e.g.:

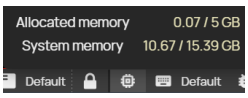


Figure 236: img

By clicking on this function, you can set the size of the “Allocated memory” (the current size of the viewer’s allocated memory is displayed below the text field line):

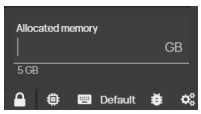


Figure 237: img

Warning: For proper functionality of this tool it is necessary to have the “DICOM viewer extension” web browser extension installed. If this extension is not installed, the “System Memory” will not be displayed.

9.5.3 Placement of keyboard shortcuts and their multilevel assignment

The “Keyboard shortcut layout” tool Default , located in the bottom right corner of the browser, is used to visually display the assigned shortcuts on the virtual keyboard.

To select the level of the keyboard shortcut layout, use the “Keyboard shortcut layout” tool Default, to call up the levels menu:

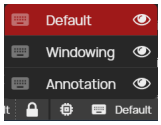


Figure 238: img

Multi-level switching of the keyboard shortcut layout can also be done with keyboard shortcuts that you can select using the “Keyboard Shortcuts” tool (see more in “Viewer Tools”). You can return to the original “Default” level layout with the “ESC” key.

To view the virtual keyboard with assigned shortcuts, select the icon to the right of the level description in the menu. To view the assigned shortcuts, hover over the target key to view its assigned shortcuts. Keys highlighted in grey do not have an assigned shortcut:

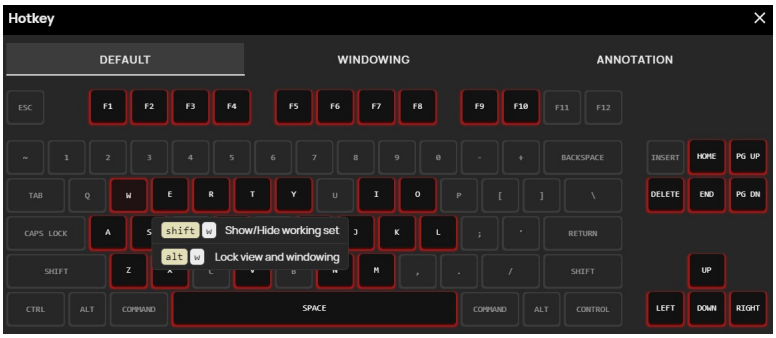


Figure 239: img

9.5.4 Bug reporting

In case the system behaves non-standardly, it is possible to use the “Bug Report” tool to capture the current system status in a log file with the necessary information for the manufacturer’s support department. This tool is located in the bottom right corner of the screen.

Selecting this tool will bring up the “Would you like to send a bug report?” table:

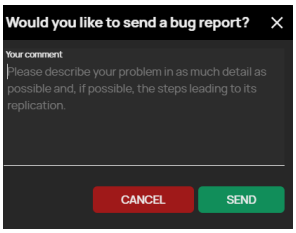


Figure 240: img

You can enter a note with more detailed information about the error in the “Your comment” text field.

By selecting “CANCEL,” you cancel the action; by selecting “SEND,” an error report will be created and information about the report will be displayed:

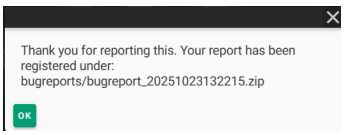


Figure 241: img

9.6 Viewer working set

Viewer working set is located, by default, in the left column of the DICOM viewer dialog, it contains previews of individual series of examinations and work with image documentation, or finding studies of the selected patient.

Figure 242: img

Viewer working set is sorted according to the sequence of categories (“Patient” and “Study”):

1. Patient - Displays the patient’s name, surname and ID number (the functions of the action icons are described in the aricle “Workset display options”).

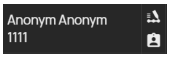


Figure 243: img

2. Study - Displays the date and time of the examination. The anchor icon indicates “Reference Study Flag”, i.e. the study determining the primary examination to which the timeline and other operations will relate.

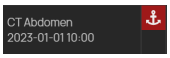


Figure 244: img

By selecting the empty field below the anchor icon, you can select the action that will be displayed in this field. Right-click in the empty field to call up the context menu:

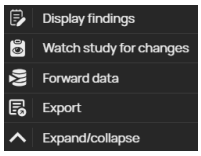


Figure 245: img

- Display findings - this action allows you to view the text description of the examination that is part of the study stored in the structured examination description format “SR”, or in case of integration is pulled from the external system in which the examination description is stored
- Watch study for changes - Display alerts when the number of frames in the displayed study has changed, and reload a series of frames to update the number of frames. If you have an incomplete series displayed in the “Image Data Display Window” and additional frames are added to this series, you will be alerted by a flashing “Watch study for changes” tool icon, clicking on this tool icon will reload the series with the current frame count. After the series of images have been reloaded, the measurements taken and the image postprocessing will be removed. The blinking “Track study changes” tool icon is located at the bottom of the ” Viewer working set”:

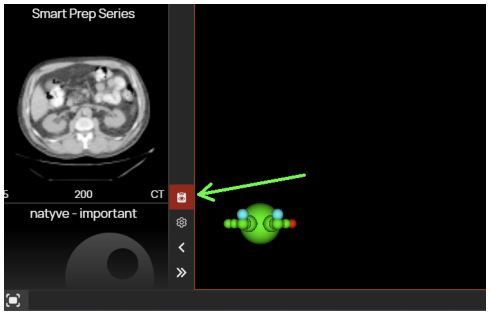


Figure 246: img

- Forward data - action for sending the image documentation to another DICOM device, see section “Forward selected”
- Export - action to export data to local storage or print it
- Expand/collapse - action to expand/collapse all series (thumbnails in the viewer working set) of the selected study

3. Series - Displays previews of the series in the selected patient study

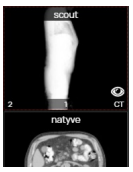


Figure 247: img

Warning: If the alert icon is displayed in the viewer's working set, patient studies with the same birth number but different name, gender, or date of birth are opened in the viewer. Take extra caution.

The selected series can be displayed by double-clicking on the preview of the series in the viewer working set, or by drag&drop style into the "Image Data Display Window". A preview of an open active series is highlighted with a red border and marked with an eye icon:

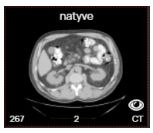


Figure 248: img

If the selected study contains more series than can be displayed in the monitor resolution, the user can scroll through the viewer working set using the mouse wheel.

The viewer working set can be configured in "Display settings" to the left or right side of the monitor. If you are working on a multi-monitor workstation, the browser working set can be displayed on each monitor.

9.6.1 Viewer working set display options

The viewer working set can be used with the "Hide/show working set" action or pull it to the edge, or expand it to a larger size, using the "Normal/Wide view working set" event to display multiple series:

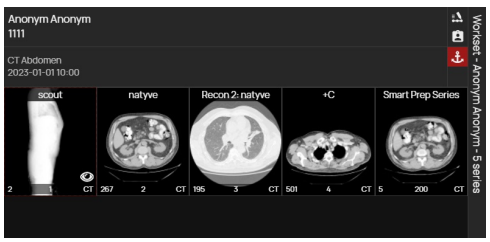


Figure 249: img

Figure 250: img

9.6.1.1 Viewer working set configuration Selecting the “Work Set Configuration” action calls up the “Working Set Configuration” table, which allows the user to display the viewer working set, to select the side of the viewer working set display, and to switch between the default and optimal working set display:

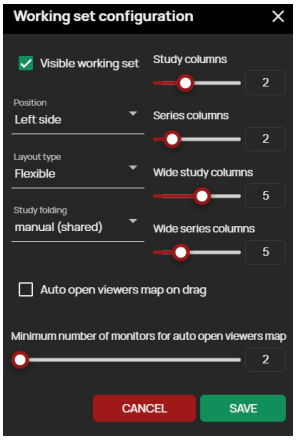


Figure 251: img

Warning: turning off viewer working set display can be reverted in the viewer configuration tools tab by turning it on in the “Working set configuration” tool.

“Work Set Configuration” allows you to align the work set in a “Flexible” or “Optimal” way, automatically study folding and to display a map of the panels for dragging and dropping. These features are listed below:

9.6.1.1.1 Flexible viewer working set display Flexible view shows enlarged previews of series. If the number of series exceeds the views in the displayed working set, the user is allowed to move using the mouse wheel:

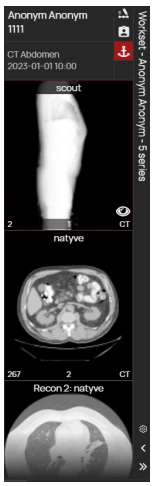


Figure 252: img

The default view follows the sequence of view levels: patient -> study -> series -> subseries -> instances -> volumes -> fusion -> segmentation.

The display of thumbnails in the flexible workset view can be changed using the “Workset Configuration” tool described in the previous paragraph.

9.6.1.1.2 Optimal viewer working set display By selecting the “Optimal working set display” action, all series of all studies will be displayed and their size will be adjusted to the monitor resolution:

Figure 253: img

This feature of the viewer serves to better orient the user within the view of one or more studies of a single patient.

Move the mouse over the thumbnail of the series to view information about the series number, number of frames, modality, and series description:

Figure 254: img

9.6.1.1.3 Study folding The “Study folding” tool is used to automatically collapse multiple open studies of a “ Workset of images” in a single window. The method of automatic collapsing of the studies can be selected using the menu that is called up by clicking on the “Study folding” field in the “Workset of images”:

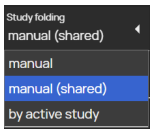


Figure 255: img

You can choose from the following options: - Manual - unpacking/packing of the study in the “ Workset of Images” is possible only by selecting the action “ Expand/collapse” from the “Floating panel of the viewer workset” or from the optional field for adding an action located to the right of the study information in the “ Workset of Images”, in case of a multi-monitor station the expand/collapse will be applied only to the “ Workset of Images” in the monitor, on which you have selected this action - Manual (shared) - unpacking/packing of the study in the “Working set of images” is only possible by selecting the “ Expand/collapse” action from the “Floating panel of the browser workset” or from the optional field for adding an action located to the right of the study information in the “Working set of images”, in the case of a multi-monitor station, expand/collapse will be applied to all “ Worksets of Images” of all monitors - By active study - only the study that is displayed in the “Image Data Display Window” will be expanded and all others will be automatically collapsed

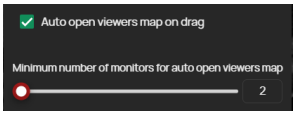


Figure 256: img

9.6.1.1.4 Map of panels for dragging The “Drag and Drop Panel Map” tool, when turned on, displays a panel map for dragging the image to a specific panel in case you have multiple monitors set up for display.

If this function is not enabled, drag&drop the series to the “Image Data Display Window” of the selected monitor to display the series of images:

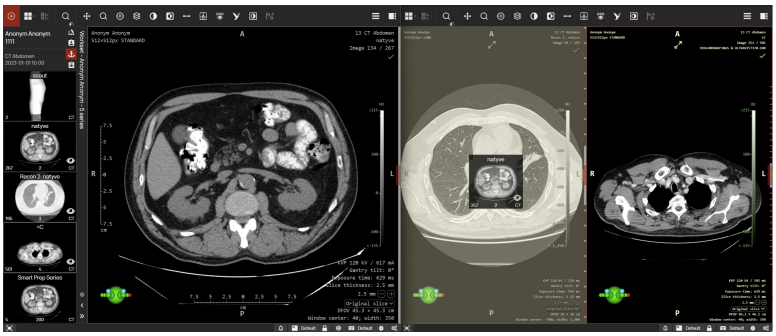


Figure 257: img

If this function is enabled, or if you hold the “CRTL” key while dragging, drag & drop the series to a specific panel using the “Drag and Drop Panel Map”:

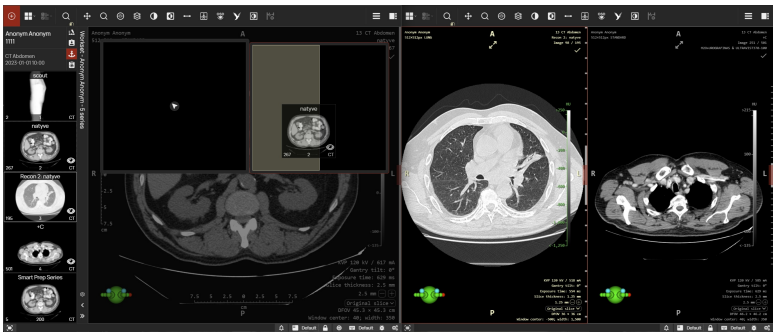


Figure 258: img

Figure 259: img

9.6.1.2 Function All patient studies By selecting the “All patient studies” function, you will call up a table at the bottom of the screen displaying all the performed examinations of the selected patient:

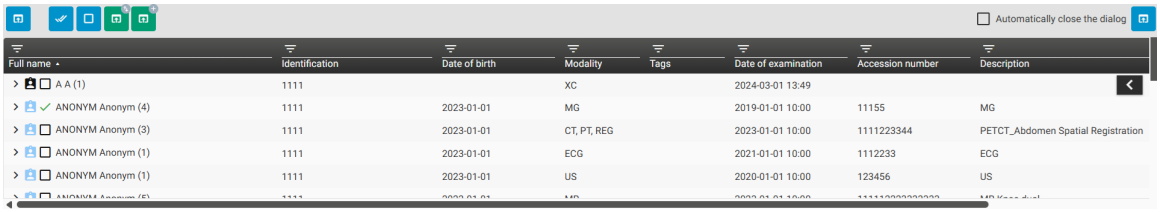


Figure 260: img

The “All Patient Studies” functions is listed in this table:

Icon	Function	Description
	Replace and display	display of selected studies with replacement of the last displayed ones
	Add to new tab	display of selected studies in a new DICOM viewer tab
	Add and view	display of selected studies with addition to the last ones displayed (double-clicking on the selected study line also works)
	Back to examination	Closes the “All Patient Studies” table

The “All patient studies” table contains all studies of the selected patient stored in the PACS archive and is divided into columns with individual values. You can search and sort in these columns, see more in the “Search results” chapter.

By checking the “Automatically close dialog” Automatically close the dialog function, the “All Patient Studies” table will be automatically closed when the patient study is opened.

After hovering the mouse over a specific line of the patient study, a floating panel containing the following actions can be used:

Icon	Function	Description
	View in DICOM viewer	display of selected studies with replacement of currently displayed
	Add to new tab	display of selected studies in a new DICOM viewer tab
	Add and view	display of selected studies with addition to the last ones displayed

Figure 261: img

9.6.1.3 Timeline A timeline is used for a simple overview of the patient's examination history. After the display, the history of all examinations is clearly shown. Opening the timeline together with the SHIFT key opens the timeline on all set monitors of the multi-monitor diagnostic station. You can open the required historical examination by double-clicking or dragging.

Figure 262: img

In the left part of the timeline, there is information about the name and ID number of the selected patient.

In the middle part is the timeline itself, containing information about the saved studies/examinations of the selected patient. This timeline is divided into individual years showing the type of study/modality on which the study was performed, with the date of the study. The anchor icon indicates the "Reference Study Flag", the study identifying the primary examination. The eye icon indicates the study displayed in the "Image Data Display Window". In case the patient has too many studies to display all of them in the monitor resolution timeline, the user is allowed to scroll through the timeline using the mouse wheel. More detailed information about the study in the timeline,can be obtained by hovering the mouse over the desired study:

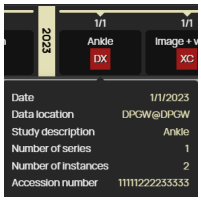


Figure 263: img

Warning: if there are studies opened in the viewer for a patient with the same ID number but different name, gender, or date of birth, you will be alerted to this in the study description located in the timeline. So take extra care:

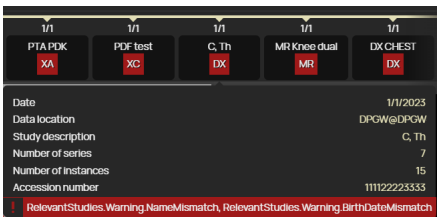


Figure 264: img

In the right part of the timeline there are actions “Pin” for inserting the timeline to the action bar, “Configure filter”, “Filter” and “Hide Timeline” used to close the timeline.

The “Filter” action brings up a table with options for displaying results in a timeline.

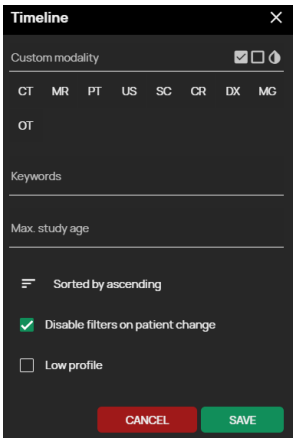


Figure 265: img

The timeline filtering table includes the following options:

1. Custom modality/modalities - text field to indicate the modality shortcut
2. Modalities - this section contains checkboxes to specify the modalities to be displayed in the timeline, for easy work there is the option of “Mark all”, “Unmark all” and “Invert” actions to flip marked/unmarked modalities
3. Keywords - text field for entering, for example, the name of the study, etc.
4. Max. examination age - text field for specifying the display of studies in a timeline bordering the age period in months
5. Sorting direction - by clicking the sorting direction arrow, you determine the order in which the study will be displayed in the timeline according to the examination date
6. Turn off filters when changing patient - option to turn off/keep the timeline filter when another patient is displayed
7. Low profile - option to display the timeline in minimized/compact mode:

Figure 266: img

8. Cancel, Save - the “Cancel” action cancels the performed filtering, the “Save” action saves and applies the applied filter to the timeline

9.6.2 Workset Floating Panel

The viewer’s working set allows you to perform actions, above the open patient examination, contained in a floating panel that can be called up by pressing the right mouse button in the patient/study/series area. The actions of the floating panel may be differ depending on the call from a specific area and includes the following functions:

Icon	Function	Description
	Expand/collapse	Action to expand/collapse all series (thumbnails in the viewer working set) of the selected study
	View	Displays the images in the “Image data display window”
	View connected	Displays the images in all open panes in the “Image data display window” and synchronizes the passage through the series
	Create report	Action to call up a table to create a “Structured Report”, i.e. a description of the examination
	Record voice note	Allows you to record an audio track, e.g. a spoken note for the selected study
	All studies of patient	Actions to call up the table “All patient studies” see article above
	Reverse item order	Actions for changing the order of images, e.g. for CT axial section, changing the direction of scanning a series of images from craniocaudal to caudocranial.
	Create volume	Actions to create multiplanar planes and 3D volume
	Create fusion	Action to merge two series with overlay
	Create time intensity curves	Option to create time intensity curves based on ROI density for each time series in the study
RT	Load RT Struct	Actions to display the created radiotherapy plan of the RTS modality (Radiotherapy Structure)

Icon	Function	Description
	Forward data	Actions for sending image documentation to another DICOM device, see article “Forward selected”
	Export	Action to export data to local storage, or print
	Share the study	Action for sharing a study to an external user
	Add to worksheet	Selecting the action adds the study to the worklist, see paragraph “Add to worklist”, if this action is selected at the “Patient” level, all open studies in the ” Viewer work set” of the selected patient will be added to the worklist
	Report a non detected or interesting case	Option to report AI manufacturer non-match with detected AI finding
	Split the series	Devide series into subseries, for example, in dual scans of MR examination
	Group series	Grouping series of images in the viewer workset
	Edit tags	Allows you to assign a label in the selected series, see article “Labels”
	Watch study for changes	Display a notification of the changed number of images in the displayed study and the ability to reload a series of images with the updated number of images
	Remove	Removes a patient/study/series from the DICOM viewer workset

Figure 267: img

9.6.2.1 Create report Selecting the “Create report” action from the floating toolbar will call up a side toolbar with the Findings toolset and the option to create a description of the examination.

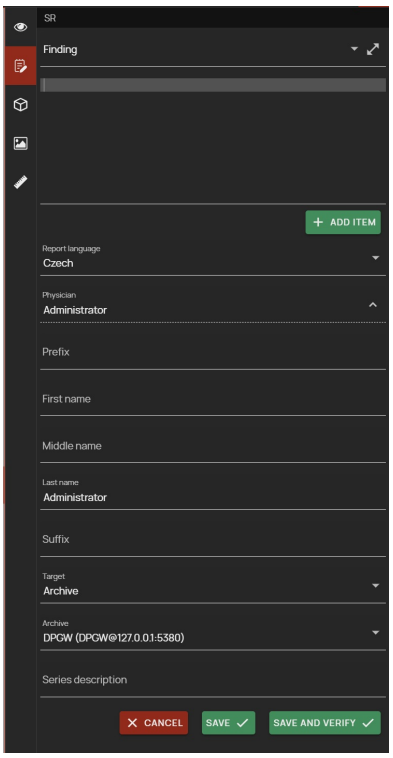


Figure 268: img

The finding toolset contains the following text boxes and drop-down menus:

- Information Disclosure Area - when the Finding toolset is opened, the name of the area “Finding” is selected, but the user has the option of selecting the area from the drop-down menu that it contains:

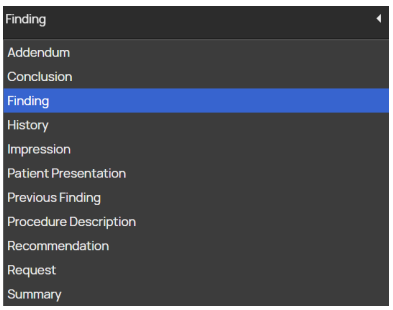


Figure 269: img

It is also possible to add additional message areas with the “Add” action ADD ITEM, or subsequently remove with the close action ✕:

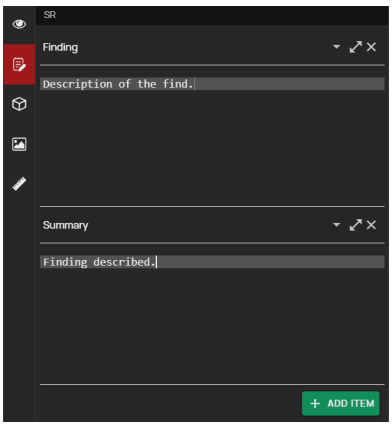


Figure 270: img

When describing the examination, the user can enter keywords using predefined shortcuts and then call them up using the shortcut key “ctrl+spacebar”:

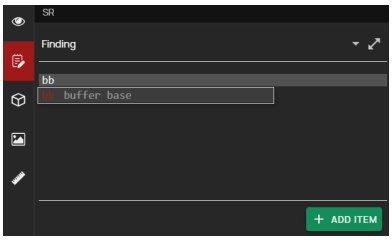


Figure 271: img

Adding and editing keyboard shortcuts can be done in the “Settings” dialog, using the “SR Macro Editor” tool.

Warning: access to the “SR Macro Editor” is controlled by user roles. If you do not have access to this editor, please contact your system administrator DPGW.

The text field of the examination description can be enlarged to full screen with the tool, for shrinking to the original layout select the tool.

Full-screen mode of SR finding tab:

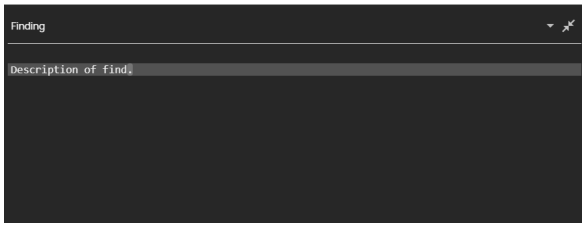


Figure 272: img

- Language of the report - determination of the language in which the description of the examination is written, Czech is selected by default for Czech users, but the following languages can be selected from the drop-down menu:

Figure 273: img

- Physician - by clicking on the “Physician” area, you can specify the doctor who creates the description of the examination, by default the doctor is determined according to the logged-in user, but when changing these values can be filled in the text fields
- Target - In this section you can specify whether the created description should be saved to the PACS archive with its selection, or to the user or station.

To save the concept of the created examination description, use the “Save” action, this saves the SR examination description, which can still be edited.

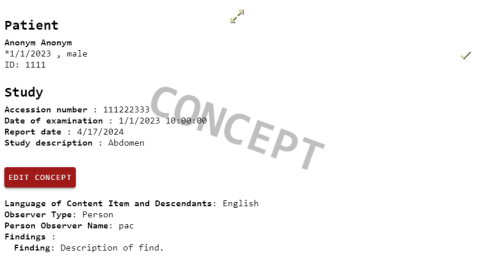


Figure 274: img

The saved SR concept will be displayed in the viewer working set, as another patient study.

Figure 275: img

Edit the concept by displaying SR in the image data display window and then selecting the “EDIT CONCEPT” action to open the sidebar with the finding toolset.

Select the “Save and Close” action to complete the SR examination description. This action will save the SR finding according to the target destination specified for saving and you will no longer be able to edit the SR:

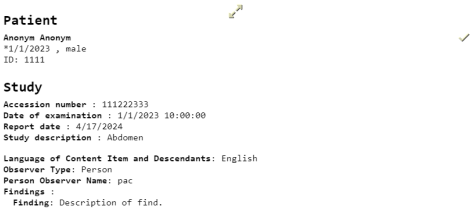


Figure 276: img

If you do not want to save the created examination description, select the “Cancel” action and the “Finding toolset” will be cancelled.

Figure 277: img

9.6.2.2 Record voice note The “Record voice note” function is used to record and archive an audio track, e.g. a spoken note for a selected study and its speech-to-text conversion options.

Opening the “Record voice note” function will bring up the “Voice Note” toolset sidebar:

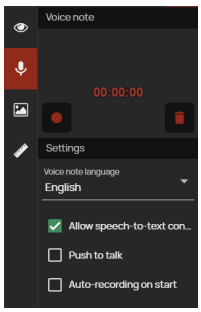


Figure 278: img

- This sidebar contains the voice note tools and its options for recording speech to text:
  - Start recording - a tool to start/stop recording a voice note, after starting the recording the time of recording will be displayed

Figure 279: img

  - Reset recording - select this tool to overwrite the current voice note
  - Stop recording and save - a tool to save a voice note that you have created
  - Cancel recording - tool to delete a created voice note

- **Settings:**
  - **Voice note language** - A drop-down bar to select the language in which the voice note will be recorded
  - **Allow speech-to-text conversion** - selecting this tool will bring up the “SR” toolbox sidebar for writing findings after the voice note has been completed and saved, where the text of the recorded voice note will be inserted
  - **Push to talk** - selecting this tool allows you to record a voice note by holding down the “spacebar” key, if you do not select this tool you can also start/stop the voice note by pressing the “spacebar” key
  - **Auto-Recording on start** - selecting this tool will start automatic recording of the voice note immediately after selecting the “Record voice note” function from the viewer working set on the next start

To record an Voice note, proceed as follows:

- select the “Record voice note” function to bring up the “Voice Note” toolset sidebar

- select whether the voice note is to be recorded as text by using the “Allow speech-to-text conversion” tool in the “Settings” section of the toolset sidebar
- to record a voice note, select the “Start recording” or press the “spacebar” key (if “Push to talk” is selected, hold the spacebar key while recording)
- to end the voice note, select the ” Stop Recording” tool, or press the “spacebar” key (if “Push to talk” is selected, release the spacebar key to end the recording)
- when you have finished recording your voice note, select one of the following actions:
  - Reset recording - select this tool to overwrite the current voice note
  - Stop recording and save - a tool to save a voice note that you have created
  - Cancel recording - tool to delete a created voice note
- if you select the action “Stop recording and save” you will bring up the “Voice Note” table:

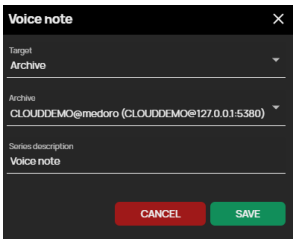


Figure 280: img

- select the “Target” (archive, station, user), if the archive destination is selected, choose the “Archive” and name the saved voice note in the “Series description”
- by selecting “CANCEL” you cancel the action performed, by selecting “SAVE” a new series will be created in the selected study containing the voice note of the AU modality.
- after saving, the voice note can be played directly from the “Viewer working set” by clicking on the play button:

- playback is also possible after moving the voice note from the “Viewer working set” to the “Display window for image data”:

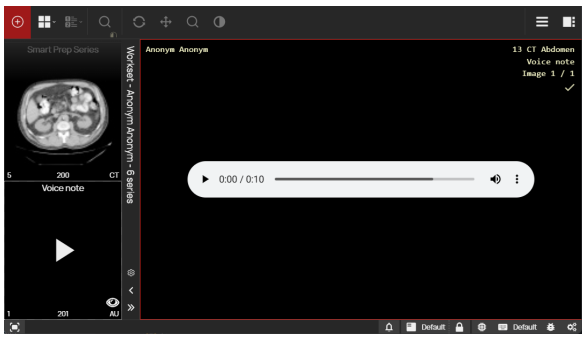


Figure 281: img

After saving the voice note, if you have selected the option "**Allow speech-to-text conversion**" you will be informed about the success of generating text from the voice note:

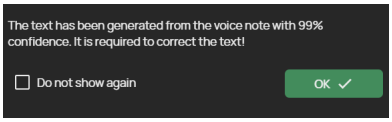


Figure 282: img

After confirming the success of the text generation, will be opened a "SR" sidebar toolset for typing findings, where the text of the recorded voice note will be inserted:

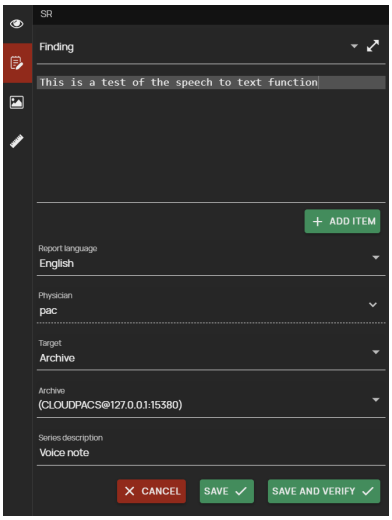


Figure 283: img

Warning: Always check the generated text from a voice note and make corrections.

Figure 284: img

9.6.2.3 Create volume The function “Create volume” is used for the spatial reconstruction of series data with multiple images, e.g. CT, MR with the creation of MPR planes and 3D volume. By selecting this function and if both license and hardware resources are available, volume = new series will be created. The volume loading speed depends on the size of the given series of images, you will be informed about the loading progress by the “Loading volume…” progress window:

Figure 285: img

After the volume has been successfully loaded, a new volume series will be created with a cube label in the corner of the preview, which is intended for spatial processing:

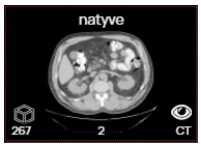


Figure 286: img

It can be opened in two ways, by double-clicking or by dragging it into the viewing window. Each of these methods will cause a different response from the DICOM viewer:

1. Double-click to open

After opening the volume series marked with a cube by double-clicking, the display selection tab will be called up:

Figure 287: img

- Series - displays the selected series of images without applying volume operations
- MPR - displays the selected image series in multiplanar reconstruction with 3 planes display

- MIP - displays the selected image series in multiplanar reconstruction with 3 planes displayed in the MIP maximum intensity projection
- CMPR - displays the selected image series in a curved multiplanar reconstruction with 3 planes and curved reconstruction
- SMPR - displays the selected series of images in a straightened multiplanar reconstruction with 3 planes and a straightened reconstruction

When selecting MPR or MIP from the menu using a mouse double-click, each displayed window corresponds to a different viewpoint. Each window displays the axes, which can be moved by , or rotated by holding the rotated arrows . Changing the position of any cross of the axes automatically changes the image in the other two windows. Scrolling is also made possible by a wheel at the imaginary intersections of the localization lines: 1. If the mouse cursor is outside the area, this wheel is hidden 2. If the mouse cursor is in the area , this circle is shown as a minimized 3. If the mouse cursor is positioned at the intersection of the localization lines, this wheel is zoomed in and if you press the left mouse button and drag, you will scroll in the MPR view

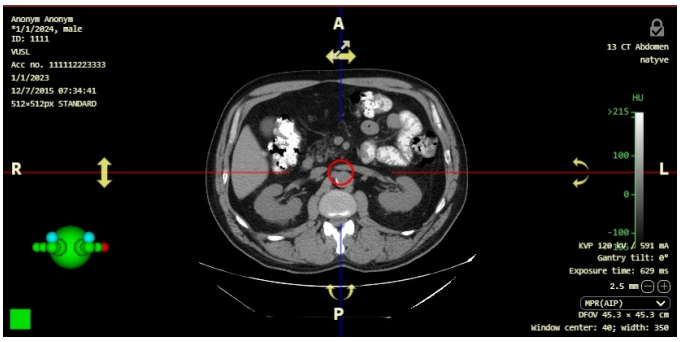


Figure 288: img

2. Drag and drop to open

When opened by dragging a volume series into the “Image data display window”, you call up the “Display” table:

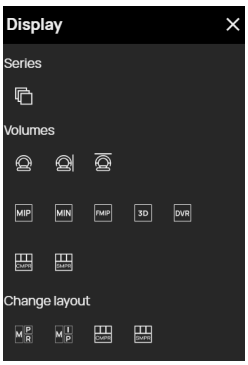


Figure 289: img

By choosing a specific action in this menu, it is possible to display only the required volume data reconstruction.

The “Display” table contains the following functions:

Series - Series - displays the selected series of images without applying volume operations

Volumes - Acquisition plane - the volume will be displayed in the same plane as the original collection. - Top reconstruction view - the volume will be displayed in the plane that is the top view of the patient. It varies according to the original orientation of the patient (if he was lying, standing, …) - Side reconstruction view - the volume will be displayed in the plane that is the side view - C S T Coronal, sagittal, transverse view (this option appears only if the original data acquisition is other than transverse) - MIP MIP - maximum intensity projection - MIN MinIP - minimum intensity projection - FMIP FADE MIP - fading maximum intensity projection - 3D 3D projection - 3D projection, it is possible to change the displayed structures with the windowing tool. The image can also be changed by changing slice thickness - DVR DVR - more advanced 3D display, the displayed structures can be changed with the “Transfer function” tool - CMPR CMPR - curved multiplanar reconstruction - SMPR SMPR - straightened multiplanar reconstruction

Change layout - MPR MPR - displays the selected image series in multiplanar reconstruction with 3 planes display - MIP MIP - displays the selected image series in multiplanar reconstruction with 3 planes displayed in the MIP maximum intensity projection - CMPR CMPR - displays the selected image series in a curved multiplanar reconstruction with 3 planes and curved reconstruction - SMPR SMPR - displays the selected series of images in a straightened multiplanar reconstruction with 3 planes and a straightened reconstruction

You can find more about displaying and working with volumes in the paragraph “Volume operations, 3D display”.

Figure 290: img

9.6.2.4 Create fusion

Example of a created fusion including the “Fusion toolset”:

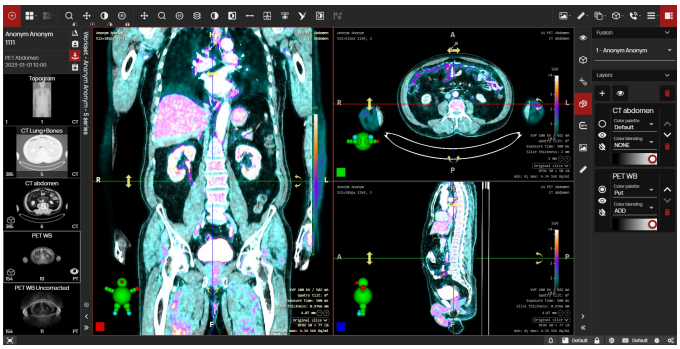


Figure 291: img

The function “Create fusion” is used to merge two series of the patient with an overlap on top of each other. This function can be used, for example, in PET examinations in nuclear medicine, when it is necessary to display accumulated radiopharmaceuticals on a CT examination. By selecting the “Create fusion” action, you will see a table for selecting series to merge:

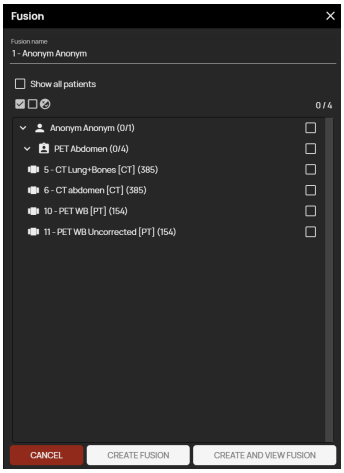


Figure 292: img

This table includes: - Name - name of the created fusion - Show all patients - if you have several patients open, this will show their series as well, if this box is not checked, only the series of the patient whose series you chose the “Create fusion” action will be displayed - Patient’s name and the option to select

series for fusion - this area allows the selection of selected series to be merged, scrolling in this area is enabled with the mouse wheel or the scroll bar located to the right of the series area

If you have selected specific series to merge, additional actions will appear at the bottom of the table:

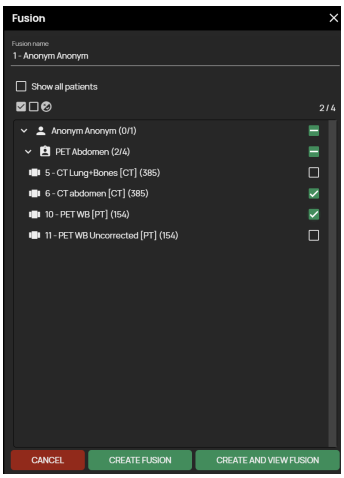


Figure 293: img

- Cancel - cancels the performed action
- Create fusion - by selecting this action, the fusion of the selected series will be created and displayed only by the illustrated volume cube in the “Viewer working set” without any change in the “Image data display window”. By dragging the thumbnail into the image data display window, the fusion in the selected projection will be displayed in the called-up tab:

Figure 294: img

To view the fused layers in MPR mode, display the desired fused series by double-clicking the thumbnail located in the viewer working set and selecting the fusion action:

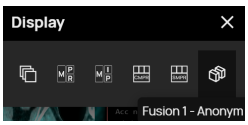


Figure 295: img

- Create and display fusion - select this action to create a fusion of the selected series with display in the “Image data display window” with a three-window display for each of the MPR planes, the “Fusion toolset” will also be displayed

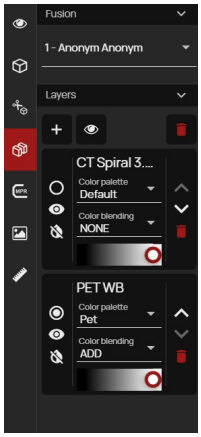


Figure 296: img

The “Fusion toolset” contains:

- **Fusion** - this area contains the selection of the created fusion using the drop-down menu:

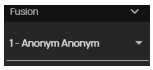


Figure 297: img

- **Layers** - this area contains tools for editing the selected fusion
- Add layers + - select this action to call the tab to add additional series for fusion:

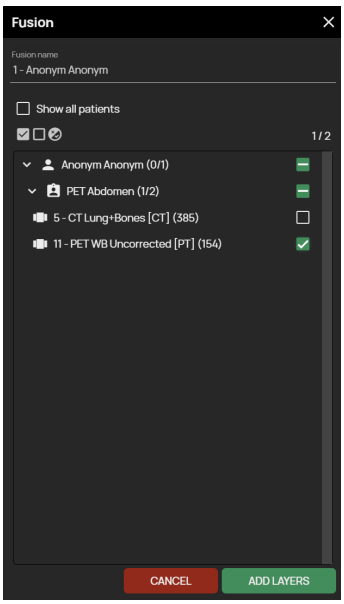


Figure 298: img

- View - tool for redisplaying the created fusion panel
- Delete fusion - selecting this action removes the created series fusion
- **Fused Layer Tab** - this tab is used to work with the fused layer/series

Figure 299: img

The fused layers tab contains: 1. Active layer marking - by marking the active layer, the user is allowed to work with a specific layer in the fused panel in the “Panel data display window”. The active layer marking is shown by a filled circle to the right of the series name CT abdomen, the inactive layer marking is shown by an empty circle CT abdomen.

2. Show layer - option to show and hide the selected layer/series using the “Show layer” action / .
3. Invert - option to invert the view of the selected layer/series using the “Invert” action .
4. Palette - the color palette allows the user to change the color display of the fused layer by selecting it from the drop-down menu:

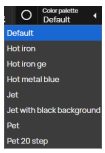
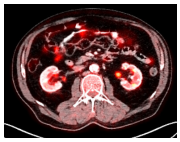
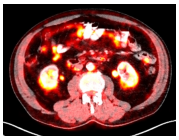
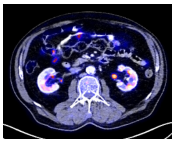
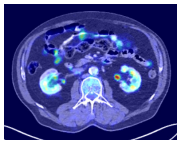
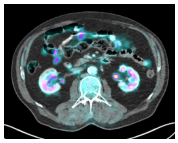
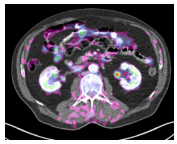


Figure 300: img

Hot iron	Hot iron ge	Hot metal blue	Jet	Pet	Pet 20 step
					

5. Color blending - choosing how the final fusion is calculated, whether the individual series are simply laid over each other, added, subtracted or projected where there is a difference:

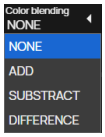
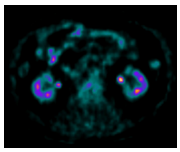
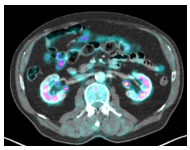
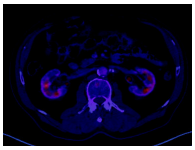
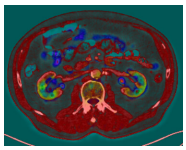


Figure 301: img

None	Add	Substract	Difference
			

6. Alpha - selection of the display strength of the layer/series, determining its transparency

This option can be changed by dragging the scroll wheel on the % bar or by using the mouse wheel:

Figure 302: img

7. Move down/up - option to change the layer/series order in the “Fusion Toolset” using the “Move down/up” action / .
8. Remove Layer - option to remove the selected layer/series from the “Fusion Toolset” using the “Remove” action .

Figure 303: img

9.6.2.5 Create time intesity curves The “Create time intesity curves” function is used to create perfusion curves based on ROI density in individual time series of the study. This function can be used, for example, in dynamic MRI sequences, where it is necessary to compare ROI density at a specific location in individual time intervals.

To create time intesity curves, proceed as follows: 1. Select the “Create time intesity curves” function from the floating panel of the viewer workset to open the “Create time intesity curves” table:

```
![img](img/8/workcolumn-floatpanel-tic-tab.png){ width=350px }
```

2. Select the series of images for which time intesity curves are to be created in the checkboxes located to the right of the series name (these series can also be selected collectively by holding down the left mouse button and then moving it). At least 2 series must always be selected, with the same number of images in each series. If this is not followed, you will be notified in the footer of the table. After selecting the series, select the “CREATE” function, which will select the marked series for the creation of time intesity curves and display the “Time intesity curves toolset”:

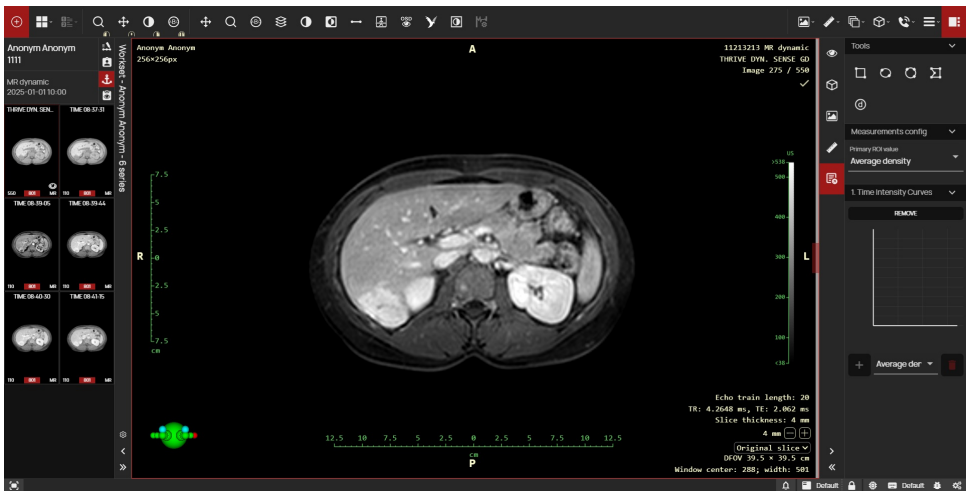


Figure 304: img

3. Draw the desired ROI shape in the selected location, keep the ROI marked/highlighted, and select the “+” function in the “Time intesity curves toolset” (for visibility, split the “image data display windows” panels and drag the selected series into these windows and select the “auto synchronize” function). This will create a perfusion curve. To add additional curves, proceed in a

similar way, where the color of the drawn ROI will always correspond to the color of the given curve:

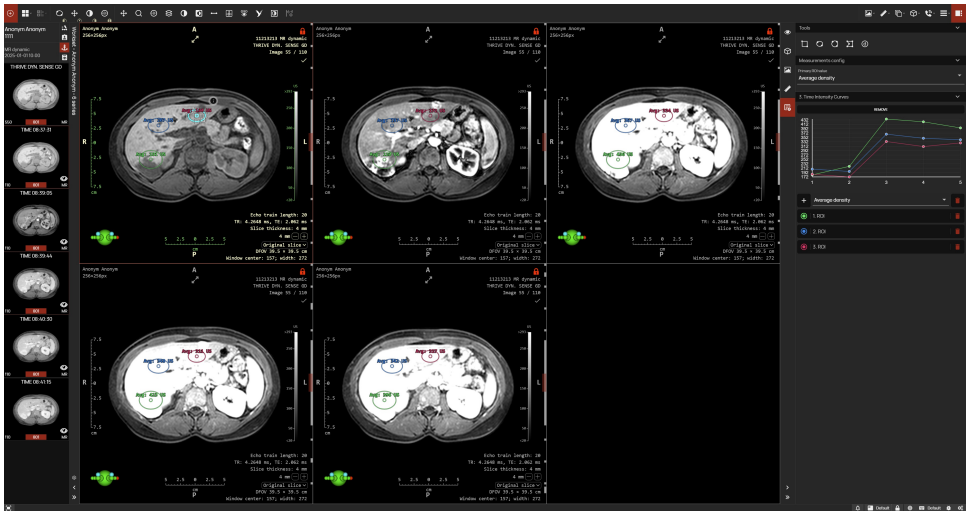


Figure 305: img

Time intesity curves toolset

Figure 306: img

The Time intesity curves toolset contains the following functions: - Tools - contains functions for drawing ROIs into the image according to the desired shape - Measurement config - Primary ROI value - option to select the displayed values of the drawn ROIs in the image - Time intesity curves - REMOVE - deletes all drawn ROIs in the image and cancels the selection of series for creating perfusion curves -

Time intesity curves graph - displays graph of the created Time intesity curves, where the values on the X-axis correspond to the individual selected series, which are sorted according to the DICOM tag “Acquisition Time,” and the values on the Y-axis correspond to the measured values in the ROI - “+” - function for adding the drawn ROI to the Time intesity curves graph. To the right of this function, you can select the ROI density value (minimum, maximum, and average). To the right of these functions is a trash can icon; selecting it will remove all drawn ROIs. - ROIs added to the graph - each ROI has its own color, which is displayed on this line, in the “image data display window,” and in the Time intesity curves graph. To the right of these added ROIs is a trash can icon; selecting it will remove the selected drawn ROI.

Figure 307: img

9.6.2.6 Load RT Struct The “Load RT Struct” function allows the user to view Radiotherapy Structure (RTS) modality data, for example, a radiotherapy plan created over a series of CT modality images.

To view the RTS data, proceed as follows: - right-click on the RTS data displayed in the image working set to bring up the “Workset Floating Panel” and select the “Load RT Struct” action:

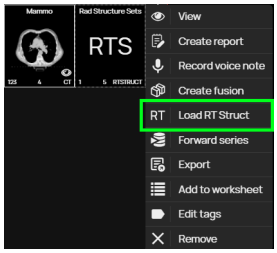


Figure 308: img

- this action will display the RTS data in a series of images, you will be informed by the text “RT Struct has been successfully loaded”:

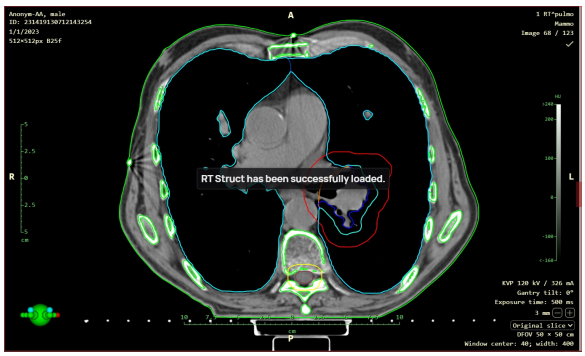


Figure 309: img

In case you want to hide the RTS data, proceed similarly as in the first point by calling the “Floating panel of the browser working set” and selecting the “Unload RT Struct” action.

Figure 310: img

9.6.2.7 Export The “Export” function allows the user to download selected image data to the workstation’s local storage. If you have edited the image in the “Image data display window”, these changes will be reflected in the export.

By selecting the “Export” action, you will call up the “Export” tab:

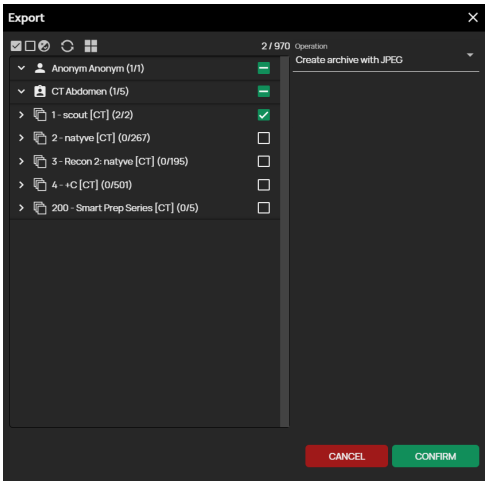


Figure 311: img

The actions in the header of the “Export” table allow the user to perform the following actions: - ☑

- Mark all - ■ - Unselect all - ⊘ - Invert to reverse marked/unmarked examination series - ⟳ - Reset selection, only the series over which the floating panel was clicked and the “Export” function selected will be marked. - ⊞ - Select from open panels; series will be selected according to the data displayed in individual panels “Windows for displaying image data” - 2 / 970 - Number of selected images out of the total number of images in the study

Warning: If you require automatic filtering, e.g., for AI results, you can configure this filtering in the administrator setting, where these AI results will be assigned a label and automatically unchecked from the “Export” table based on this label. This configuration will add a filter icon, and if it is active, it will not be possible to select these AI results for export:

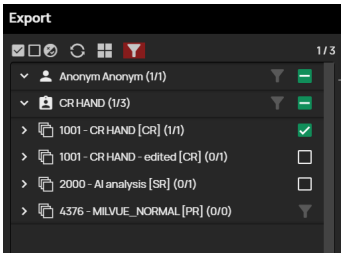


Figure 312: img

The middle part of this table allows the user to select data for export by checking the ☑ / ■ to the right of the selected area (patient, study, series, image). Individual areas can be downloaded or expanded using the arrow to the left of the area name, up to individual images. By hovering the mouse over the selected area for export, a preview will be displayed to the user, to simplify the work:

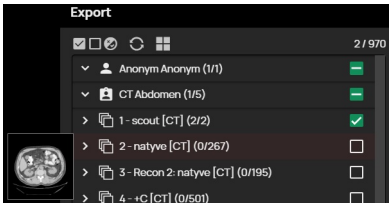


Figure 313: img

If the study contains more items than can be displayed simultaneously in the “Export” table, the user is allowed to scroll in this table using the scroll bar located to the right of the middle part, or by moving the mouse wheel.

If you have selected the “Export” function using the “Workset Floating Panel,” the series of images will be marked in the export list based on the selected position of the floating panel, i.e., if you have called up the floating panel by right-clicking on the patient’s position in the work set, all studies and images will be marked. When you click on a study, all series will be checked, and when you click on a series

thumbnail in the work set, only that series will be checked. If the export function is selected from the “Viewer Settings” -> “Active Panel Actions” tab, the series that you have open in the individual “Image Data Display Windows” panels will be checked.

The right part of the tab allows the user to select the method for exporting the data called “Operations” using the drop-down menu:

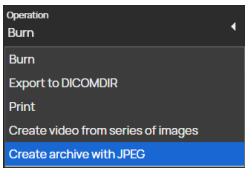


Figure 314: img

By selecting the desired operation and confirming the “Confirm” action, you will invoke one of the selected actions described below. By choosing the “Cancel” action, you cancel the export action.

If you do not select any data, the export operation will display “This field is required!”.

9.6.2.7.1 Create a video from a series of images Selecting this option from the “Operations” drop-down menu will display a table of options for creating a video from the selected series of images:

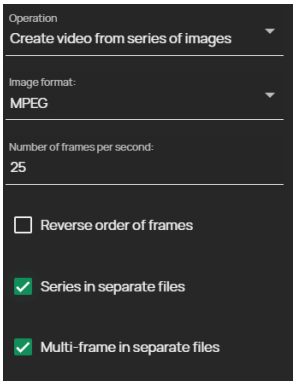


Figure 315: img

This tab includes: - Image format - allows you to choose the format of the saved file, namely MPEG or AVI - Number of frames per second - option to choose video playback speed - Reverse order of frames - checking this box will invert the position of the frames in the video - Series in separate files - checking this box will split the exported series into individual video files - Multi-frame in separate files - checking this box will split the exported multiframe images into individual video files

The “Confirm” action will start the export process, where an informative window will then appear in the bottom right corner about the progress of uploading the export for download:

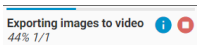


Figure 316: img

By choosing the action “Stop” you cancel the action being performed.

By choosing the “Info” action you can call up a detailed tab to preview the export progress:

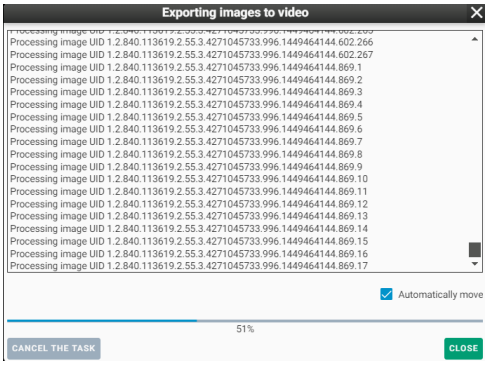


Figure 317: img

After a successful export for download, the exported data is automatically downloaded to the workstation’s local storage.

9.6.2.7.2 Create archive

See more in “Export selected images”.

9.6.2.7.3 Print

The “Print” function allows the user to print selected images on the printer. You only need to select one series or specific images from one series to be able to print. Selecting this action calls up a tab with print options:

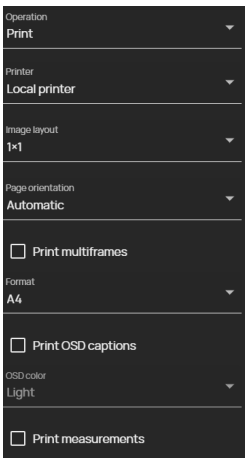


Figure 318: img

This tab contains: - Printer - option to choose one of the available, configured printers - Image layout - option to choose the layout of images on the page 1x1, up to 10x10 - Page Orientation - the option to select the orientation of the image on the page when printing, either Automatic, Portrait, or Landscape - Print multiframe - Format - option to choose the page size print format: A3, A4, A5, A6, PHOTO 10x15, LETTER - Print OSD labels - option to choose to print information about the image - OSD Color - option to select a light/dark color variant of the image information to be printed. This option is only active when “Print OSD labels” is selected - Print measurements

By choosing “OK” you go to the printer settings for printing and then start printing, or by choosing “Cancel” you cancel the action.

9.6.2.7.4 Export to DICOMDIR See more in the article “Export selected to DICOMDIR”.

9.6.2.7.5 Burn See more in the “Burn selected” article.

Figure 319: img

9.6.2.8 Share study The “Share study” function is used to create a one-time URL web link for sharing the study to an external user. Right-click on the name of the study, choose the “Share study” function, which brings up the “Create an external link to share data” tab:

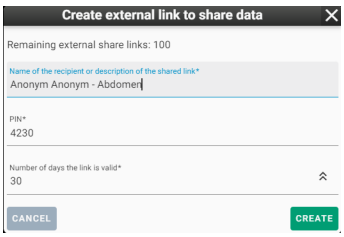


Figure 320: img

The called tab contains a pre-filled text field that can be edited:

- Name of the recipient or description of the shared link - enter the name of the designated user or a short description of the study being sent
- PIN - enter the password for possible opening of the external link (alphanumeric characters can be entered)

Warning: Do not send the shared URL link together with the PIN in one communication due to the security of the data being sent. Always use two types of communication, e.g. email and SMS.

- Number of days of validity of the link - determines the period for which the link will be active (the default maximum validity period is 30 days, this value can be configured by the administrator), by selecting the arrows to the right of the set validity period, you select the maximum possible validity period
- Use the “CANCEL” button to cancel the action, use the “CREATE” button to create a URL link to share the selected study, you will be informed about this by the “Share link” table:

Figure 321: img

- “Save to Clipboard” icon copies the created URL link for possible pasting using keyboard shortcut ctrl+v
- The “Print link” icon will create a document with the appropriate data to access the shared study with the option to print it:

Figure 322: img

Figure 323: img

9.6.2.9 Report a non detected or interesting case The “Report a non detected or interesting case” feature allows you to report a discrepancy between the AI’s detected findings to the manufacturer of the integrated AI, alerting them to the need to adjust the AI model. This feature thus serves as feedback for artificial intelligence manufacturers.

Selecting this feature will bring up a table for entering comments:

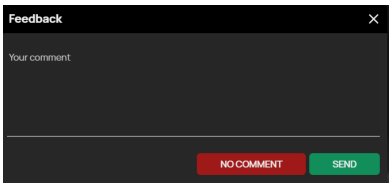


Figure 324: img

Warning: This feature can only be used with presentation state data, marked as PR images in the work set.

Figure 325: img

9.6.2.10 Split series The “Split series” function is used to separate a series into two or more sub-series. This function can be used, for example, with MR dual protocol, when the series contains two series with different sequence parameters:

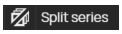


Figure 326: img

By choosing this action, you will create a new series in the “Viewer working set”:

Figure 327: img

The selected split series can be displayed by double-clicking on the series thumbnail in the viewer working set, or by drag&drop into the “Image Data Display Window”.

Figure 328: img

9.6.2.11 Group series The “Group series” function is used to merge series of images in the viewer’s workset for better orientation in the “viewer’s workset” and, after dragging the merged series into the “image data display window,” to browse through this merged series.

To merge series, follow these steps: 1. Select the “Group series” tool from the floating panel of the viewer workset to open the “Group series” table:

```
![img](img/8/workcolumn-floatpanel-groupseries-tab.png){ width=350px }
```

2. Select the series of images to be merged in the checkboxes located to the right of the series name (these series can also be selected collectively by holding down the left mouse button and then dragging). After selecting the series, select the “GROUP” function, which will merge the selected series in the viewer’s workset:

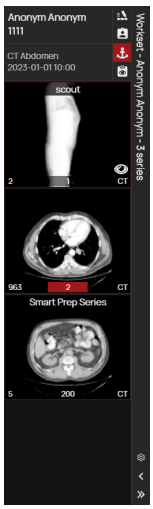


Figure 329: img

If you want to split this merged series again, select the “Split Series” function in the floating panel of the viewer workset.

Warning: This function does not affect the data stored in the PACS archive and is therefore not a manipulation of data. When you reopen a study where series have been merged, these series will be split and, if necessary, you will need to merge them again.

9.7 DICOM viewer tools

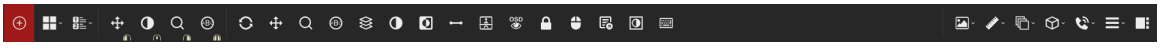


Figure 330: img

The DICOM viewer tools are used to work with the examination displayed in the “Window for displaying image data” and is divided into several areas:

1. Icon to **return to main dialog** for searching and managing registries.
2. **Configure the layout of the panels** in the current window/monitor . - Selecting this action allows the user to layout the “Window for displaying panel data” into individual panels according to this configuration:

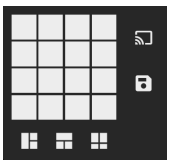


Figure 331: img

If you work at a workstation with multiple monitors, the selected layout can be applied to all DICOM viewer windows simultaneously using the “Change layout on all monitors” action , if this feature is active, it will appear on a red background .

To save the currently selected panel layout in the “window for displaying panel data” select the “Save current layout” action . When the study is reopened, the panel layout will correspond to the newly set value selected during saving, in case the hanging protocol is not applied.

If you have multiple panels displayed in the “Window for displaying image data”, the selected panel can be maximized into one panel with the icon located in upper part of the window, without losing the work in progress on the other panels. To return to the original layout of the panels, then minimize this panel with the icon .

3. **Selecting the Hanging protocol** - action for selecting the Hanging protocol, i.e. displaying the study, according to the parameters set in the “Window for displaying image data” , such as the number of panels, selected windowing, display size, etc.

By selecting this action, you will call up a window for selecting a specific Hanging protocol:

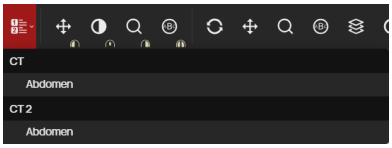


Figure 332: img

This action is made available on the condition that the user has multiple Hanging protocols set for a specific type of study. The names and number of Hanging protocols may differ, depending on the set values.

In the case of opening a mammography study (MG), the Hanging protocols are already prepared. The “Hanging protocol selection” thus contains the following window layouts (the currently selected hanging protocol is then highlighted in red):

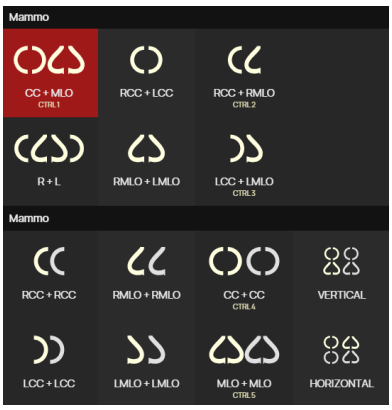


Figure 333: img

4. Currently **selected tools on individual mouse buttons**. They change according to the browser configuration and user saved configuration.

Figure 334: img

Tools, can be set to left, middle, right and left+right mouse buttons.

If a tool is selected from the “User configurable toolbar” or from the “Tab with tools”, the active tool on the mouse button will change, according to the mouse button used when selecting the tool.

The configuration of the tools on the mouse buttons after opening the study can be found in the “DICOM viewer settings” chapter.

Use the “ESC” key to return to the default tools for each mouse button.

5. **User configurable toolbar**

Figure 335: img

Available tools depend on DICOM viewer configuration and user settings. If the user changes and saves the tools configuration, the tools will be loaded at the next login. They may vary between users and stations.

6. **Tabs** with all the tools for working with image documentation and their settings

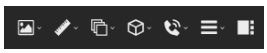


Figure 336: img

Individual tabs with tools will be detailed in the following chapters: - Display tools - Measurement tools - Action tools for series - Volume operations, 3D visualization - Online consultation - DICOM viewer settings - Working toolset

9.7.0.1 Configuring the tool display The display of tools for working with image documentation can be configured by the “Settings” action located to the left of the open tab:

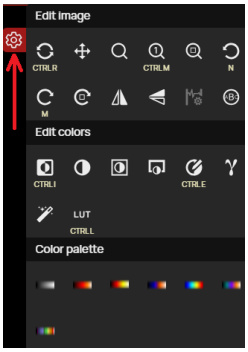


Figure 337: img

Selecting this action displays the tools for configuring the tool display:

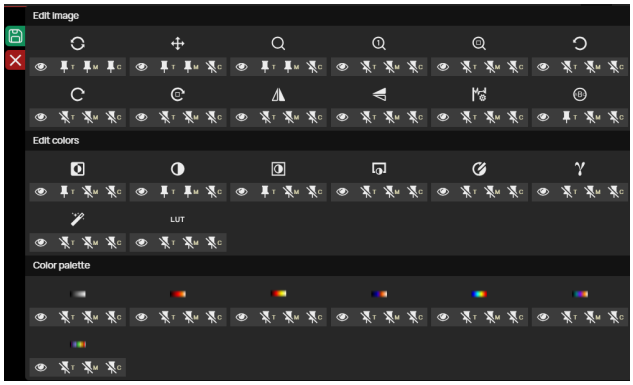


Figure 338: img

The following actions will appear under each tool in the tool group: - Hide/show action / - choosing this action hides / restores the tool of the tool group in the selected tool tab

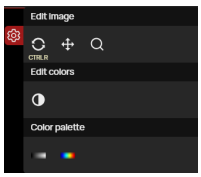


Figure 339: img

- Unpin/pin from top bar / - choosing this action will hide / restore the tool in the “User Configurable Toolbar”
- Unpin/pin to top bar for mobile view / - selecting this action will hide/restore the tool in the “User Configurable Toolbar” in minimized/mobile mode
- Unpin/pin from context menu / - choosing this action hides / restores the tool in the “Context menu” called by the right mouse button in the “Window for displaying image data”

You can save the changes made to the tool tabs using the function, or cancel the changes using the function located to the left of the open tool tab.

9.7.1 Display tools

Figure 340: img

The “Display tools” tab is mainly used for modifying the display of image data, i.e. as postprocessing of the image. In case you want to reset the image editing to the original state, you do it by selecting the “Default layout” tool.

This tab contains the following tool groups: - Edit image - Edit colors - Color palette

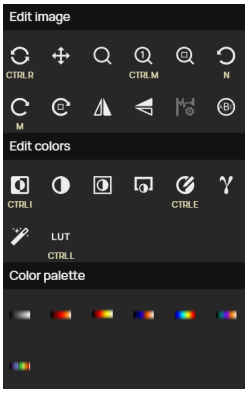


Figure 341: img

If a keyboard shortcut is displayed under the tool icon, it can be used to perform the tool action.

9.7.1.1 Edit image The “Edit image” tool group contains the following tools:

Icon	Function	Description
	Default Layout	Resets the display - window size, center and width, offset, pseudo-color palette
	Move	Enables moving the image within the displayed window
	Zoom	After pressing and holding the selected mouse button, scrolling up and down increases and decreases the image
	Zoom 1:1	Selects the image size so that the image is displayed pixel by pixel on the monitor. There is no recalculation
	Optimal zoom	Magnifies and shifts the image so that the maximum of the work area designated for displaying the image is used
	Rotate 90° CCW	Rotates the image 90° counterclockwise
	Rotate 90° CW	Rotates the image 90° clockwise
	Free rotation	Allows you to rotate the image by a free angle, smoothly scrolling with
	Flip vertically	Flips the image along the vertical axis
	Flip horizontally	Flips the image along the horizontal axis
	Waveform config	Allows changing the layout of the ECG waveforms in the display window

Icon	Function	Description
	Magnify glass	After pressing and holding the selected mouse button, a circle will appear with an enlarged area under the mouse cursor. This tool is also available without the need to select a tool. After pressing and holding the SHIFT keyboard key, the same tool will appear. In this case, it is possible to gradually and cyclically increase the magnification in 5 steps by clicking the left mouse button.

9.7.1.1.1 Free rotation The “Free Rotation” tool allows you to rotate the image by dragging it to a position selected by the user, to rotate the image, follow these steps: - Select the “Free Rotation” tool with the desired mouse button in the ” Display Tools” tool group. - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to select a new rotation of the image to the desired position and then release the mouse button - the image will be rotated according to the position selected by the user

For free rotation, you can also use the side “Postprocessing toolset” allowing you to adjust the brightness window, colors and filters, or rotate:

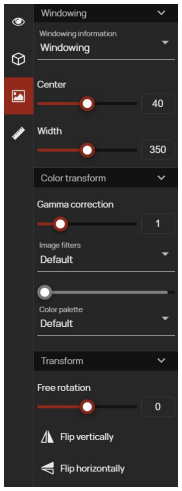


Figure 342: img

As part of the transformation, the “Working toolset” includes: - Free rotation - by using the scroll bar or by typing a value into the text field, the user can rotate the image by -180° to 180°, the default value is 0

- Flip by vertical axis - flips the image according to the vertical axis - Flip by horizontal axis - flips the image by the horizontal axis

Figure 343: img

9.7.1.1.2 Waveform config Selecting this tool calls up the “ECG toolset” for changing and displaying individual ECG curves:

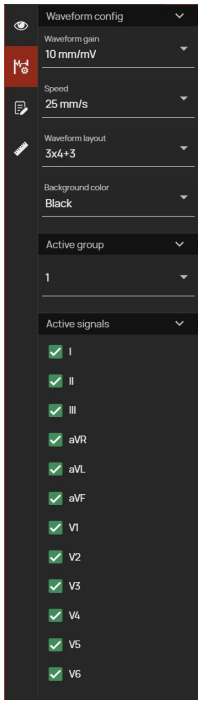


Figure 344: img

This table contains: - Waveform gain - allows you to vary the waveform signal strength from 5mm/mV to 40mm/mV - Speed - allows you to vary the speed of the waveform between 25mm/s and 50mm/s - Waveform layout - allows you to change the layout of individual curves, using the drop down menu:

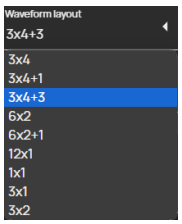


Figure 345: img

- Background colour - allows the user to choose between a dark and light background for the ECG study
- Active Group - if the modality contains a multiplexer, this drop-down menu can be used to select the desired active group of ECG signals
- Active group - display and hide individual waveform signals

9.7.1.2 Edit colors

The “Edit colors” tool group contains the following tools:

Icon	Function	Description
	Invert	displays the image in reverse. If the image is black and white, the black/white display will be inverted to white/black. In the case of choosing a color palette, the image is inverted within the given color representation
	Windowing	after pressing and holding the selected mouse button, it is possible to change the width and center of the brightness window by moving the mouse up/down and left/right to improve the readability of the image or highlight the given structures. If the OSD labels are not changed, the values of the window can be read in the lower right corner, or on the brightness axis (standardly located at the right edge of the image). If you use this tool in a 3D projection, you can change the display of volume structures
	Reset contrast according image values	this tool will select a brightness window calculated from the entire image
	Area windowing	after selection, it is possible to mark the area with a rectangle. From this, the optimal window for displaying all structures will be calculated
	Set contrast values	allows manually enter the brightness window through its values

Icon	Function	Description
	Gamma correction	allows you to change the gamma correction using a called-up sidebar with the option to select gamma values from 0.1 to 5 with a sliding bar
	Image Filters	for more detailed image processing, smoothing, edge detection and sharpening filters are available
LUT CTRL L	Toggle VOI LUT	for some images it is possible to switch the VOI LUT (The Value Of Interest lookup table). It is basically a curve that in a way transforms the display of the given image in a different presentation of contrast, shades of gray, … Very often this function is used to switch the display between the display set on the modality and the display using a standard DICOM curve

CTRL E

Figure 346: img

9.7.1.2.1 Set contrast values

Selecting this tool calls up the “Postprocessing toolset” sidebar:

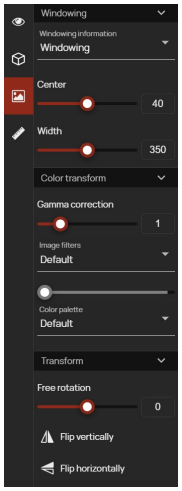


Figure 347: img

Within the setting of contrast values, the “Working toolset” in the “Windowing” section contains:

- Windowing - allows the user to select predefined values of the brightness window from the drop-down menu (the values of the Center and Width of the sidebar will be subsequently adjusted according to the selected window of values):

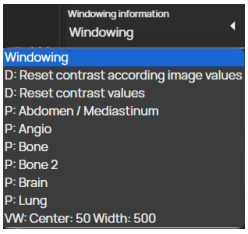


Figure 348: img

- Center - option to select the center of the brightness window using the text box or the scroll bar
- Width - option to select the width of the brightness window using the text box or the scroll bar

Figure 349: img

9.7.1.2.2 Image filters

Selecting this tool calls up the “Postprocessing toolset” sidebar.

Within the image filter settings, the “Working toolset” in the “Color transform” section contains:

- Gamma correction - allows you to change the gamma correction using a text field or sliding bar gamma values from 0.1 to 5
- Image filters - allows the user to select individual filters from the scroll bar and specify their intensity using the slider bar:

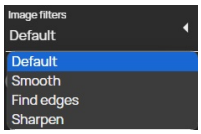
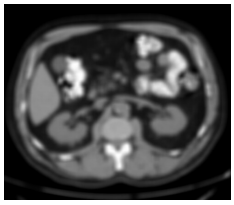
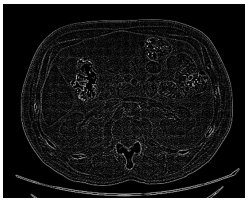
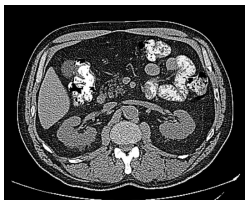


Figure 350: img

Default	Smooth	Find edges	Sharpen
			

- Color palette - contains palettes according to the standard and allows the user to select a palette from the drop-down menu:

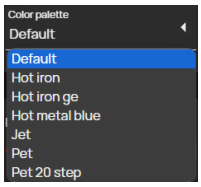
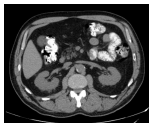
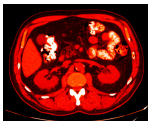
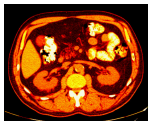
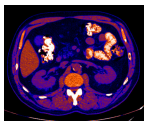
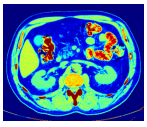
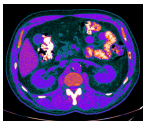
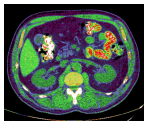


Figure 351: img

Figure 352: img

9.7.1.3 Color palette The group of tools “Color palette” contains palettes according to the standard, converting gray levels to a fixed color palette. The tool group contains the following palettes:

Default	Hot iron	Hot iron ge	Hot metal blue	Jet	Pet	Pet 20 step
						

9.8 Measurement tools

The “Measurement tools” tab is used for measuring, labeling and editing measurements, including saving them in an image data frame. In case you want to use the measurement tool, assign the

measurement functions to the selected mouse button. This function will then be displayed in the currently selected tools on individual mouse buttons (paragraph 2 of the “DICOM viewer Tools” chapter) and become active.

This tab contains the following groups of tools:

- Distance measurement
- Area measurement
- Measurement other actions

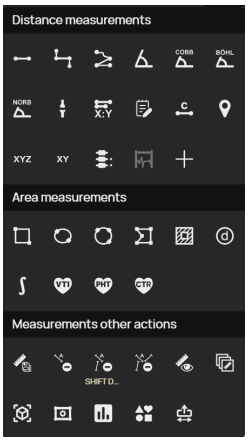


Figure 353: img

9.8.1 Distance measurement

The “Distance measurement” tool group contains the following tools:

Icon	Function	Description
	Distance measurement	Measuring the distance between two points in the image
	Height differences	Measuring the height difference between two points
	Freehand	Distance measurement using multiple points, or to measure the perimeter of an object in the image
	Angle measurement	Angle measurement in the image
	Cobb angle	Measuring the angle between two line segments in the image

Icon	Function	Description
	Böhler angle	Measurement of the angle of intersection of line segments in the image
	Norberg angle	Measurement of the angle of the femur heads and their distance
	Lower limb angles	Measurement of individual angles of the lower limb in the image
	Distance ratio	Measuring the size difference of two line segments in the image
	Note	Inserting text with a directional arrow into the image
	Calibration	Calibration of the measured values in the image, by changing the values of the measurement range
	Optical density	Informative function to display the blackening value of the photographic layer in units of HU/US
	Coordinates	Informative function for determining the position of the point of interest, relative to the image
	XY value	Informative function for determining the position of the point of interest in the XY axis, relative to the image
	Vertebra note	Marking of individual vertebrae in the image
	Waveform measurement	Measurement of two values relevant to ECG imaging
	XY axis	Inserting horizontal or vertical axes into an image

Figure 354: img

9.8.1.1 Distance measurement The “Distance measurement” tool measures the distance between two points in the image: - Select the “Distance measurement” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to the end point of interest and release the selected mouse button with the tool - in the image, the distance will be drawn with a line, with the measured value in mm

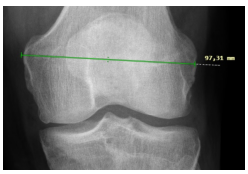


Figure 355: img

If you press and hold the Ctrl key during measurement, the measurement will be performed along the XY axis, i.e., vertically or horizontally, depending on the direction of the measurement.

Figure 356: img

9.8.1.2 Height differences The “Height Differences” tool measures the height difference between two points in the image: - Select the “Height Differences” tool with the desired mouse button in the “Distance Measurement” tool group - Move the mouse to the point of interest, press and hold the selected mouse button with the tool - Move the mouse to the end point of interest and release the selected mouse button with the tool - The distance will be drawn in the image, with the measured value in cm

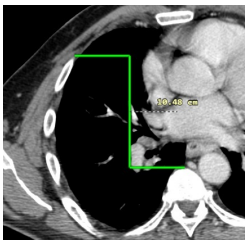


Figure 357: img

If you press and hold the Ctrl key during measurement, the measurement will be taken along the horizontal axis; without pressing the key, the measurement will be taken along the vertical axis.

Figure 358: img

9.8.1.3 Freehand The “Freehand” tool measures distance using multiple points, or to measure the perimeter of an object in the image: - Select the “Freehand” tool with the selected mouse button in

the “Distance measurement” tool group - hover the mouse over the point of interest and click on the selected mouse button with the tool - move the mouse to the next point of interest and click on the selected mouse button with the tool - if you want to complete the measurement, move the mouse to the end point of interest and double-click the selected mouse button with the tool to complete the measurement - the measured distance will be drawn in the picture, with the value in mm

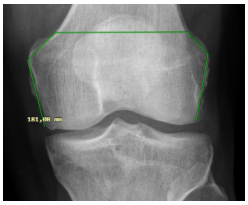


Figure 359: img

Figure 360: img

9.8.1.4 Angle measurement The “Angle measurement” tool measures an angle in an image: - Select the “Angle measurement” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest and click on the selected mouse button with the tool - move the mouse to the next point of interest (vertex) and click on the selected mouse button with the tool - move the mouse to the end point of interest and click on the selected mouse button with the tool - an angle will be drawn in the image, with the specified value in degrees

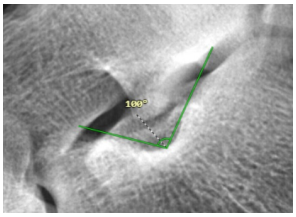


Figure 361: img

Figure 362: img

9.8.1.5 Cobb angle The “Cobb angle” tool measures the angle between two line segments in the image: - Select the “Cobb angle” tool with the selected mouse button in the “Distance measurement”

tool group - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to the end point of interest and release the selected mouse button with the tool - this will create the first segment, proceed in the same way for the second segment - the angle between two line segments will be drawn in the image, with the specified value in degrees

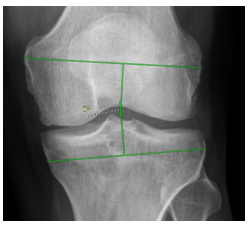


Figure 363: img

Figure 364: img

9.8.1.6 Böhler angle The “Böhler angle” tool measures the angle of intersection of line segments in the image: - Select the “Böhler angle” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest and click on the selected mouse button with the tool - hover the mouse over the next point of interest (intersection of line segments) and click on the selected mouse button with the tool - move the mouse to the end point of interest and click on the selected mouse button with the tool - the angle at the intersection of the line segments will be drawn in the image, with the specified value in degrees

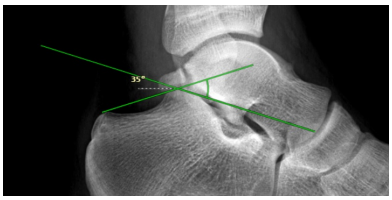


Figure 365: img

Figure 366: img

9.8.1.7 Norberg angle The “Norberg angle” tool measures the angle of the femur heads and their distance: - Select the “Norberg angle” tool with the selected mouse button in the “Distance measure-

ment” tool group - hover the mouse over the point of interest and click and hold the selected mouse button with the tool to create a circle corresponding to the left femoral head - this circle will be copied for possible placement on the right femoral head, click the mouse to confirm - the measurement will be drawn in the image

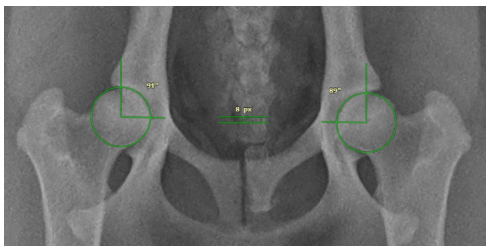


Figure 367: img

Warning: Use the “Norberg angle” only for veterinary purposes.

Figure 368: img

9.8.1.8 Lower limb angles The “Lower limb angles” tool measures the individual angles of the lower limb in the image: - Select the “Lower limb angles” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to the end point of interest and release the selected mouse button with the tool - this will create the first segment, proceed in the same way for the second segment - the angles of the lower limb will be drawn in the image, with the values in degrees: - HKA - hip-knee-ankle angle - mLDFA - mechanical lateral distal femoral angle - mPTA - medial proximal tibial angle - JLCA - joint line convergence angle

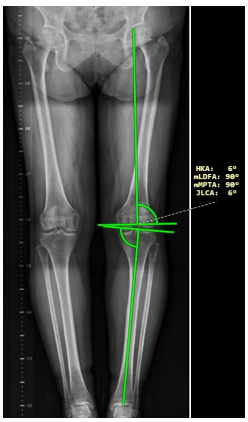


Figure 369: img

To select or change the laterality of the lower limb angle measurement, open the “Measurement toolset” sidebar and select the lateral designation from the “Laterality” drop-down menu under the “Lower limb angles” tab:

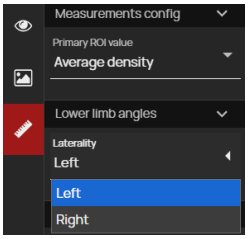


Figure 370: img

Figure 371: img

9.8.1.9 Distance ratio The “Distance ratio” tool measures the size difference between two line segments in the image: - Select the “Distance ratio” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to the end point of interest and release the selected mouse button with the tool - this will create the first segment, proceed in the same way for the second segment - the measurement of the ratio of lengths will be drawn in the image, with the specified value of the difference

Figure 372: img

Figure 373: img

9.8.1.10 Note The “Note” tool is used to insert text with a directional arrow into the image: - Select the “Note” tool with the selected mouse button in the “Distance measurement” tool group - move the mouse to the point of interest where the text of the note will be placed, press and hold the selected mouse button with the tool - hover the mouse over the point to which the note will point and release the selected mouse button with the tool - a table will be displayed with the possibility to insert the text note

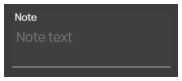


Figure 374: img

- use the “Esc” key to cancel the action, or type text and use the “Enter” key to insert the selected text into the image
- an arrow with a text note will be drawn in the image

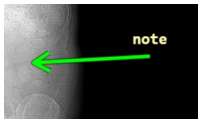


Figure 375: img

Figure 376: img

9.8.1.11 Calibration The “Calibration” tool is used to calibrate the measured values in the image by changing the values of the measurement range: - Select the “Calibration” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to the end point of interest and release the selected mouse button with the tool - a table will be displayed with the possibility of entering a numerical value in cm for calibration

Figure 377: img

- using the measurement tool icon, located on the right side of the displayed table, select the tool that will be applied after the calibration is completed, on the mouse button that you used to perform the calibration

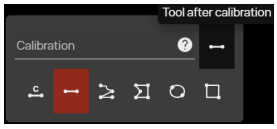


Figure 378: img

- use the “Esc” key to cancel the action, or type the value and the “Enter” key will calibrate the measurement according to the specified value

Figure 379: img

9.8.1.12 Optical density The “Optical density” tool serves as an informative function to determine the measure for the blackening value of the photographic layer in HU “Houndsfield unit” value. It expresses the radiation absorption of a given voxel relative to the absorption of water radiation (for water HU = 0) from different radiation directions. Examples of values are shown in the following table:

Tissue	CT number, HU density
air	-1000
fat	-50 - -100
water	0

Tissue	CT number, HU density
liquor	5
cerebral white matter	30
cerebral gray matter	34
blood	47
liver	40-60
muscles	35-75
fibrous tissue	60-90
cartilage	80-130
bone	1000-3000

To view optical density in a CT series: - Select the “Optical density” tool with the selected mouse button in the “Distance measurement” tool group - this makes the tool active and you can dynamically display the HU in the image by moving the mouse over the area of interest

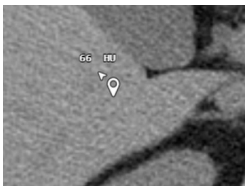


Figure 380: img

- if you want to record a static point of optical density in the image, hover the mouse over the area of interest and click on the selected mouse button with the tool
- a point with a displayed optical density value will be drawn in the image

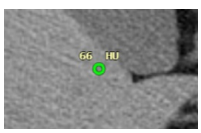


Figure 381: img

- to end the optical density display, select another tool from the “Distance measurement” tab

Warning: the value of the optical density measurement on the X-ray image, i.e. from the CR, DX modality,

is expressed using the US unit “Unspecified” or HU “Hounsfield unit”, depending on the modality of the examination on which the measurement is performed.

Figure 382: img

9.8.1.13 Coordinates The “Coordinates” tool serves as an informative function for determining the position of the point of interest, relative to the image, these coordinates of the patient are recalculated according to the DICOM tag “PatientImagePosition”: - Select the “Coordinates” tool with the selected mouse button in the “Distance measurement” tool group - this makes the tool active and you can dynamically display the position in the image by moving the mouse over the area of interest

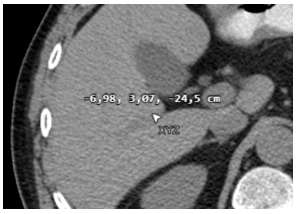


Figure 383: img

- if you want to record a static point of coordinate in the image, hover the mouse over the area of interest and click on the selected mouse button with the tool
- a point with the displayed coordinate value will be drawn in the image

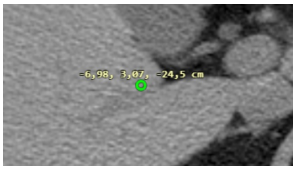


Figure 384: img

- to end the display of coordinates, select another tool from the “Distance measurement” tab

Figure 385: img

9.8.1.14 XY value The “XY value” tool serves as an informative function to determine the position of the point of interest in 2 planes, relative to the image, these patient coordinates are recalculated,

according to the DICOM tag PatientImagePosition: - Select the “XY values” tool with the desired mouse button in the “Distance measurement” tool group. - This makes the tool active and you can dynamically display the position in the image by moving the mouse over the region of interest

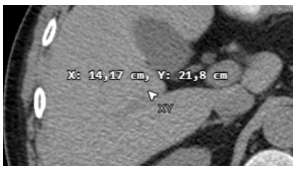


Figure 386: img

- if you want to record the position in the image, hover over the area of interest and click the selected mouse button with the tool
- a point with the displayed XY value will be entered in the image

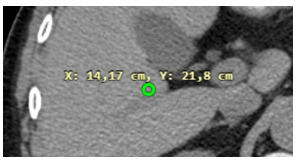


Figure 387: img

- to end the display of coordinates, select another tool from the “Distance measurement” tab

Figure 388: img

9.8.1.15 Vertebra note The “Vertebra note” tool is used to marking individual vertebrae in the image: - Select the “Vertebra note” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the vertebra to mark and click on the selected mouse button with the tool - a table will be displayed with the option to select the marked vertebra:

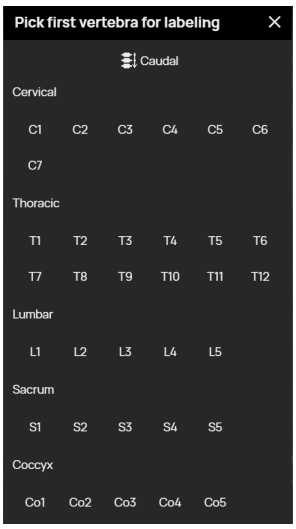


Figure 389: img

- select the direction of marking the vertebrae Caudal/Cranial
- select the name of the vertebrae to label
- the vertebra will be marked in the image:

Figure 390: img

- to mark more vertebrae, just click on the other vertebrae in the image, they will be marked according to the sequence:

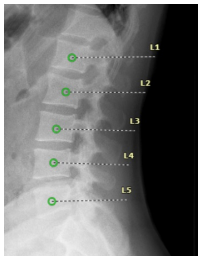


Figure 391: img

- to cancel the marking of vertebrae, select another tool from the “Distance measurement” tab, the marking will also be inactive if you mark a whole series of vertebrae in a sequence

Figure 392: img

9.8.1.16 Waveform measurement By selecting the “Waveform Measurement” tool, it is possible to measure two parameters relevant to the ECG display: - Select the “Waveform measurement” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest, press and hold the selected mouse button with the tool - move the mouse to the end point of interest and release the selected mouse button with the tool - in case of dragging the mouse horizontally between two points on the curve, the time will be measured in ms:

Figure 393: img

- in case of dragging the mouse vertically between two points on the curve, the magnitude of the signal will be measured in µV:

Figure 394: img

Figure 395: img

9.8.1.17 XY Axis By selecting the “XY Axis” tool, you can insert horizontal or vertical axes into the image: - Select the “XY Axis” tool with the desired mouse button in the “Distance Measurement” tool

group - Move the mouse to the point of interest, press and hold the selected mouse button with the tool - Move the mouse to select the direction in which to draw the axis, i.e., horizontally or vertically - When you release the mouse button, the axis will be drawn in the image in the direction in which you moved the mouse

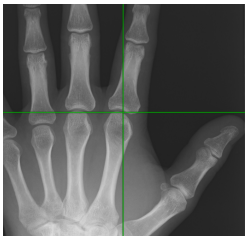


Figure 396: img

These axes can be adjusted by selecting the axis and dragging it to the desired position.

9.8.2 Area measurement

The “Area measurement” tool group contains the following tools:

Icon	Function	Description
	Rectangle	Measurement of the value contained in the rectangle
	Ellipse	Measuring the value contained in the ellipse
	Circle defined by 3 points	Measuring the value contained in a circle
	Freehand area	Measurement of the value contained in the polygon
	Group area measurements	Tool for subtracting two or more areas from each other
	Shape	Measurement of the value contained in the object selected by the user
	Integral	Measurement of area integration values in Doppler ultrasonography
	Velocity Time Integral	Measurement of blood flow values corresponding to the area under the time-velocity curve in Doppler ultrasonography

Icon	Function	Description
	Preassure Half Time	Measurement of the time required for the pressure gradient to fall to half of its maximum value in Doppler ultrasonography
	Cardiothoracic index	Measurement of the ratio of the maximum width of the cardiac shadow to the maximum internal chest width

Figure 397: img

9.8.2.1 Rectangle The “Rectangle” tool measures the values contained in the user-created rectangle drawn in the image: - Select the “Rectangle” tool with the selected mouse button in the “Distance measurement” tool group - move the mouse to the point of interest, press and hold the selected mouse button with the tool, this will start recording the rectangle from the corner and expand it by dragging - move the mouse to the end point of interest and release the selected mouse button with the tool - the rectangle area and the measured value of the HU diameter will be drawn in the image

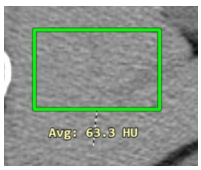


Figure 398: img

- To get more information about the measured values, you can use the icon located below the measured value of the HU average to call up the “Measurement toolset”, which is enhanced with a histogram and other options (see paragraph “ROI measurement settings” for more information):

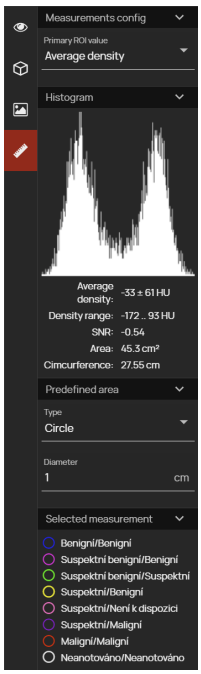


Figure 399: img

Special functions: - Ctrl + drag - If you hold down the Ctrl key while creating a “Rectangle,” the “Rectangle” will be created from the center of the selected area - Shift + drag - If you hold down the Shift key while creating a “Rectangle,” the “Rectangle” will be created symmetrically - These functions can be combined Ctrl + Shift + drag

Figure 400: img

9.8.2.2 Ellipse The “Ellipse” tool measures the values contained in a user-created ellipse drawn in the image. To create an ellipse, follow the same procedure as when creating a rectangle. This creates an ellipse with the measured values in the image:

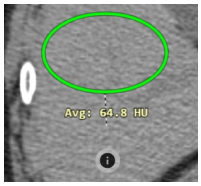


Figure 401: img

Special functions: - Ctrl + drag - If you hold down the Ctrl key while creating an “Ellipse,” the “Ellipse” will be created from the center of the selected area - Shift + drag - If you hold down the Shift key while creating an “Ellipse,” the “Ellipse” will be created symmetrically - These functions can be combined Ctrl + Shift + drag

If you check the “Ellipse Center” function in the “Display toolset,” the center point will be displayed for both the ellipse being created and the ellipse that has been created:

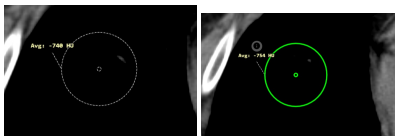


Figure 402: img

9.8.2.3 Circle defined by 3 points The “Circle defined by 3 points” tool measures the values contained in a user-created circle placed in the image. To create a circle, follow the same steps as for creating a rectangle. This will create a circle with the measured values in the image, which can be adjusted using 3 points:

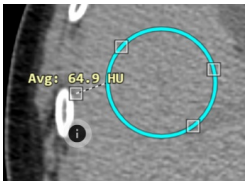


Figure 403: img

Figure 404: img

9.8.2.4 Freehand area The “Freehand area” tool measures the values contained in a user-created polygon drawn in the image: - Select the “Freehand area” tool with the selected mouse button in the “Distance measurement” tool group - hover the mouse over the point of interest and click on the selected mouse button with the tool - move the mouse to the next point of interest and click on the selected mouse button with the tool - if you want to complete the measurement, move the mouse to the first point of the free contour, highlighted by a circle, and click the selected mouse button with the tool to complete the measurement

Figure 405: img

- the area of the polygon and the measured value of the HU diameter will be drawn in the image

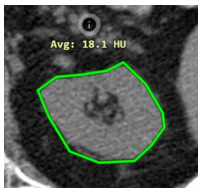


Figure 406: img

- for more information about the measured values, use the icon to display the “Frequency histogram” table, see section “Rectangle”

Figure 407: img

9.8.2.5 Group area measurements The “Group area measurements” tool is used to subtract two or more areas from each other, it is possible to draw area measurements with cutouts in this area. To subtract two or more measurement areas, proceed as follows: 1. Draw the outer area in the desired location:

```
![img](img/10/measurementtool-groupROIouter-function.jpg){ width=300px }
```

2. Draw the inner areas in the outer area (you can draw one or more areas).

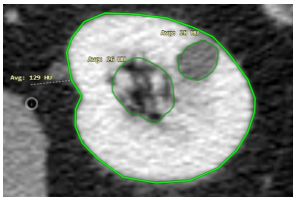


Figure 408: img

3. Select/highlight the drawn outer area (see figure in point 2).
4. Select the “Group area measurements” function from the “Area measurement” tool group. This will subtract the individual areas from each other, color the drawn area, and project the measurement values from this modified area:

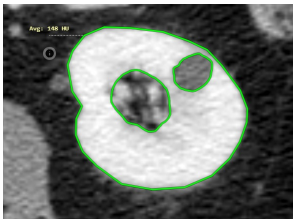


Figure 409: img

The grouped measured area can be adjusted by moving the mouse over this area, which will display individual points of the area. Dragging the mouse over these points allows you to adjust the size of the area.

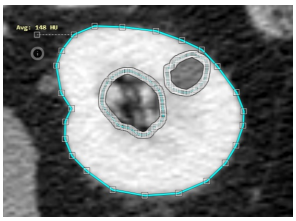
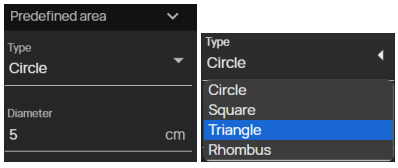


Figure 410: img

Figure 411: img

9.8.2.6 Shape The “Shape” tool is used to define the shape and size of the area, using a selection and a text field by the user: - Select the “Shape” tool with the selected mouse button in the “Distance measurement” tool group - use the “Measurement toolset” to select the desired shape type:



- enter a numeric value for the area size in cm in the “Diameter” field

- after selecting the desired values, click the mouse in the selected part of the image to plot the selected area shape and the measured HU diameter value

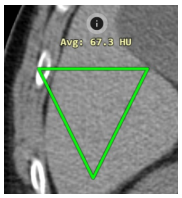


Figure 412: img

- if you have closed the “Measurement toolset” for more information about the measured values, use the icon to call up the “Frequency histogram”, see paragraph “Rectangle”

Figure 413: img

9.8.2.7 Integral The “Integral” tool serves as a general function for measuring area integration values in Doppler ultrasonography:

- Select the “Integral” tool with the desired mouse button in the “Distance measurement” tool group
- hover the mouse over the point of interest and click on the selected mouse button with the tool
- This is how you trace the curve in the measured sonogram
- double-click to end the measurement, this will display the measurement in the image with the measured values in mm

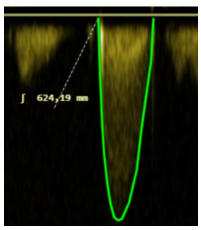


Figure 414: img

Figure 415: img

9.8.2.8 Velocity Time Integral The “Velocity Time Integral” tool is used to measure blood flow values that correspond to the area under the velocity time curve in Doppler ultrasonography: - Select the “Velocity Time Integral” tool with the desired mouse button in the “Distance Measurement” tool group - hover the mouse over the point of interest and click on the selected mouse button with the tool - in this way draw a curve in the measured sonogram - double-click to end the measurement, this will display the measurement in the image with the measured values: - Vmax - Velocity maximum in units of m/s - Vmean - Velocity average in units of m/s - Pmax - Peak maximum in units of mmHg - Pmean - Peak average in units of mmHg - VTI - Velocity Time Integral in units of cm

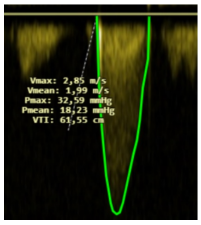


Figure 416: img

Figure 417: img

9.8.2.9 Preassure Half Time The “Preassure Half Time” tool is used to measure the time required for the pressure gradient to drop to half of its maximum value in Doppler ultrasonography: - Select the “Preassure Half Time” tool with the desired mouse button in the “Distance Measurement” tool group - hover the mouse over the point of interest and click on the selected mouse button with the tool - draw a curve in the measured sonogram in this way - double-click to end the measurement, this will display the measurement in the image with the measured values in ms:

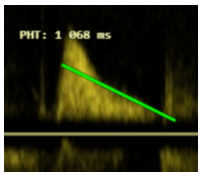


Figure 418: img

Figure 419: img

9.8.2.10 Cardiothoracic Index The “Cardiothoracic Index” tool is used to measure the ratio of the maximum width of the cardiac shadow to the maximum internal chest width. To use it, proceed as follows:

- Select the “Cardiothoracic Index” tool with the desired mouse button in the “Distance Measurement” tool group.
- to mark the inner chest width distance, hover the mouse over the point of interest, click on the selected mouse button with the tool and drag the mouse to the second point of interest to measure the maximum inner chest width
- to mark the maximum width of the heart shadow, hover the mouse over the point of interest, click on the selected mouse button with the tool and drag the mouse to the second point of interest of the heart to measure the maximum width of the heart shadow
- the result will be the measured value of the ratio of the maximum heart shadow width to the maximum inner chest width in percentage:

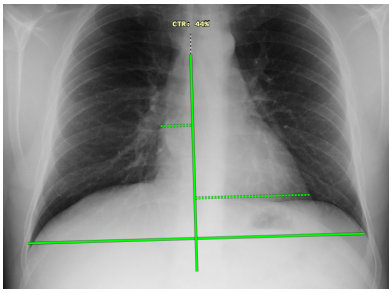


Figure 420: img

9.8.3 Measurement other actions

The group of tools “Measurement other actions” contains the following tools:

Icon	Function	Description
	Save all measurements	Create a presentation state with embedded measurements taken over the entire patient study
	Remove measurement	Remove the selected measurement from the image
	Remove all measurements	Remove all measurements from the displayed image
	Remove all measurements from current session	Remove all measurements from all series and all open studies

Icon	Function	Description
	Hide measurement	Hides all measurements from the image
	Common measurement for images in series	Keeping of all measured objects in the displayed window for all images in the series
	Volume of measurements in series	Measurement of the volume in cm^3 between the areas marked “Area measurement”
	ROI measurements config	Specifying the display of the primary value “Area measurement” in the image
	Frequency histogram	Displaying information about the measured values of the measured and selected area
	Display PR after study opened	Enable/disable automatic display of saved measurements in the image after opening the study
	Export measurements	Automatic sending of measured values to a third party system

Figure 421: img

9.8.3.1 Save all measurements The “Save all measurements” tool is used to create a presentation state, or “Secondary scan”, saving all measurements taken throughout the patient’s study. Thus, this save does not modify the original study stored in the PACS archive, but only adds information about the editable measurements in DICOM PR format, or creates a new snapshot without editing the measurements. To save a measurement to a snapshot, proceed as follows: - Select the “Save all measurements” tool by left mouse button in the “Distance Measurements” tool group to call up the “Save Measurement” table.

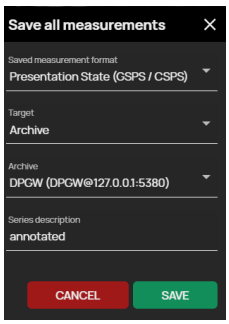


Figure 422: img

- select the format of the saved measurement:
  - Presentation State - saves only the measurements in PR format over the measured images and the measurements can be edited afterwards.
  - Secondary Capture - saves the measurement including the image/series over which the measurement was made in a non-editable format

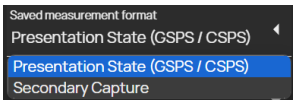


Figure 423: img

- select the save destination from the drop-down menu

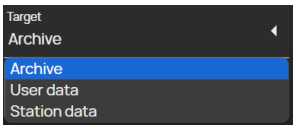


Figure 424: img

- in case you have selected the save target “Archive” and have configured multiple PACS targets, select the desired PACS archive to save (If the user target is selected, the station will make this window inactive)

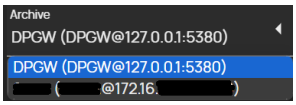
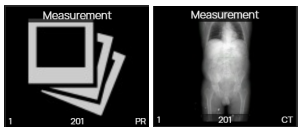


Figure 425: img

- name the saved series with measurements in the image

Figure 426: img

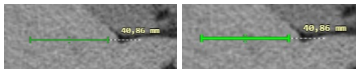
- “Cancel” to cancel the action, “Save” to create a presentation state or “Secondary capture” with measurement in frame/series
- the newly created presentation state or new series with saved measurements will be added to the “Viewer working set”:



Keyboard shortcuts can be used to view or toggle stored measurements. These are not set in the default interface and must be assigned using the “Keyboard Shortcuts” tool located in the “Viewer Settings” tab under “Load next/previous saved measurements”.

Figure 427: img

9.8.3.2 Remove measurement The “Remove measurement” tool is used to remove the selected measurement from the image: - Mark the selected measurement for deletion by clicking on it with the left mouse button, it will be highlighted



- select the “Remove measurement” tool with the left mouse button in the “Distance measurement” tool group, or press the DELETE keyboard key
- the selected measurement has been removed

Figure 428: img

9.8.3.3 Remove all measurements The “Remove all measurements” tool is used to remove all measurements from the displayed image: - Select the “Remove all measurements” tool with the left mouse button in the “Distance measurement” tool group, or press the keyboard shortcut SHIFT+DELETE - this removed all measurements from a specific image in the series

Figure 429: img

9.8.3.4 Remove all measurements from current session The “Remove all measurements from current session” tool is used to remove all measurements from all series and all open studies: - Select the “Remove all measurements from current session” tool with the left mouse button in the “Distance measurement” tool group, which will display the action confirmation table (if you check the option “Do not ask me again” you will not be asked to confirm next time and all measurements will be removed):

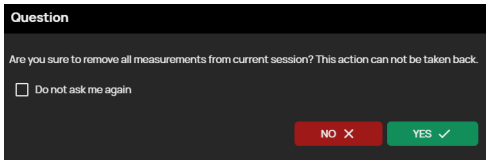


Figure 430: img

- press the “NO” button to cancel the action, press the “YES” button to delete all the measurements

Figure 431: img

9.8.3.5 Hide measurement In the event that the measured objects prevent work with image documentation, they can be temporarily hidden, without the need to remove them with the “Hide measurement” tool: - Select the “Hide Measurement” tool with the left mouse button in the “Distance Measurement” tool group, or in the “Display toolset” - This will hide all measurements, the “Hide Measurements” icon in the “Distance Measurements” tool group will be marked with a red background  and you will be alerted with information:

Figure 432: img

- in case you want to display the measurement again, select the “Hide measurement” tool again with the left mouse button in the “Distance measurement” tool group or in the “Display toolset”, by selecting this action you will be notified with information:

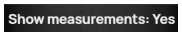


Figure 433: img

Figure 434: img

9.8.3.6 Common measurement for images in series The tool “Common measurement for images in series” is used to keeping all measured objects in the displayed image for all images in a series. When moving to the next images in the series, the measurement remains unchanged and will be displayed on the next images as well: - In case all the required measurements have been created in the image, select the “Common measurements for images in a series” tool by left-clicking in the “Distance measurement” tool group or in the “Display toolset” - This will anchor the measurements from a specific image for the entire series, the “Common measurements for images in a series” icon in the “Distance measurement” tool group will be marked with a red background  and you will be informed about this:

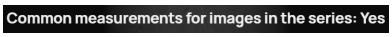
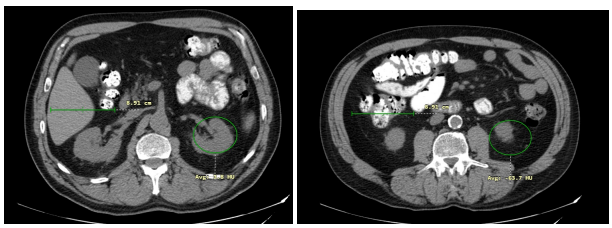


Figure 435: img

- measurement objects remain unchanged when moving to the next images in the series



- in case you no longer want to use the common measurement action, re-select the “Common measurement for images in series” tool by left-clicking in the “Distance measurement” tool group or in the “Display toolset”, by selecting this action you will be notified with information:

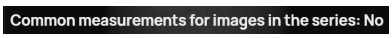
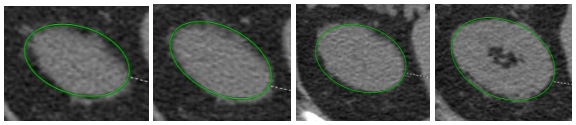


Figure 436: img

Figure 437: img

9.8.3.7 Volume of measurements in series The “Volume measurement in series” tool measures the volume in cm^3 between the areas marked with “Area measurement”: - Mark the area of interest with “Area measurement” in consecutive images in a series, e.g:

 etc.

- if you have marked all the required areas in the series, select the tool “Measurement volume in series” with the left mouse button in the tool group “Distance measurement” to call up an informative table with the volume calculation:

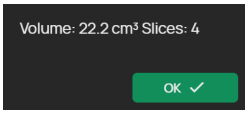


Figure 438: img

- this table contains information about the measured volume value in cm^3 and the number of frames from which this value was created
- click on the “OK” button to close the table

Warning: The values measured by the “Volume of measurements in series” function may vary for image data obtained from different modalities, depending on the parameters of slice thickness orientation and overlap between slices.

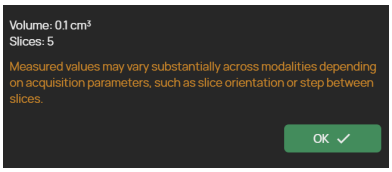


Figure 439: img

Figure 440: img

9.8.3.8 ROI measurements config The “ROI measurements config” tool is used to determine the display of the primary “Area measurement” value in the image: - Select the “ROI Measurement Settings” tool with the left mouse button in the “Distance Measurement” tool group to call up the “Measurement toolset” sidebar enhanced with a histogram and other options

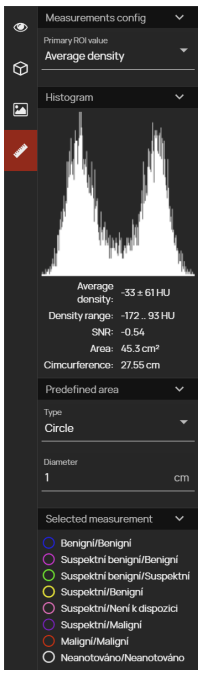


Figure 441: img

In this toolset, the following settings are possible: - Primary ROI value - a drop-down menu allows the user to select the displayed ROI value in the image:

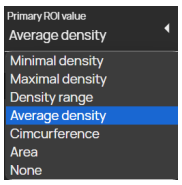
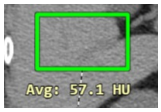
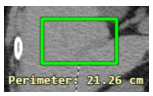
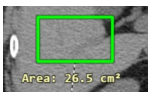


Figure 442: img

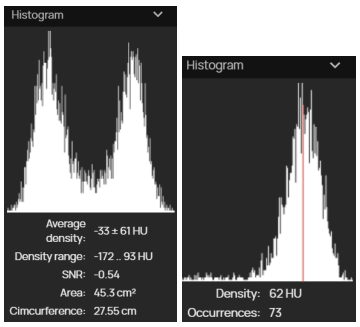




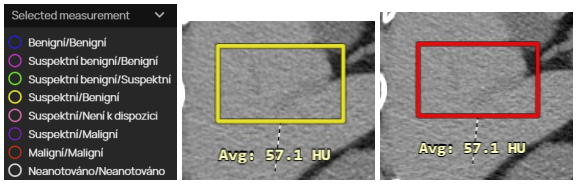


etc.

- Histogram - used to get more information about the measured values of the measured and selected area, if the mouse is moved to the histogram graph, the specific value is displayed:



- Predefined area - using the type selection dropdown menu and scale text box, allows the user to define the shape using the “Type” dropdown menu (circle, square, triangle, rhombus) and the area size of the “Shape” tool using the “Diameter” text box to enter a value in cm
- Selected measurement - by selecting from the predefined labels, the colour of the measured area in the image can be changed to indicate, for example, the severity of the condition:



etc.

Figure 443: img

9.8.3.9 Frequency histogram The “Frequency Histogram” tool is used to get more information about the measured values of the measured and selected area. Select this action to call up the “Measurement toolset” with the display of the Frequency Histogram. This toolset can also be called up with the icon displayed next to the measured area. For more information see the paragraph “Rectangle”.

Figure 444: img

9.8.3.10 Display PR after study opened The “Display PR after study opened” tool is used to enable/disable automatic display of stored measurements in the image, AI results, etc., in PR (Presentation state) format after opening a study.

By selecting this tool, the icon will be highlighted in red and you will be notified when the feature is enabled:

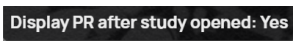


Figure 445: img

To disable this function, select this tool again, the icon will no longer be highlighted and you will be informed about the disabling:

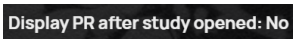


Figure 446: img

This tool can also be found in the “Display toolset”.

Figure 447: img

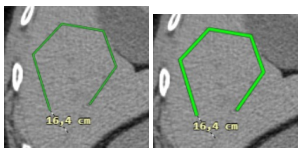
9.8.3.11 Export measurements The “Export Measurements” tool is used to automatically send the measured values to a third-party system. This tool is used e.g. for integration with NIS (hospital information system), where the measurements in this DICOM viewer are sent directly to the written findings by the radiologist.

Warning: integration and configuration of this viewer with a third-party application is required for the possible use of this tool. If necessary, please contact your IT administrator of the PACS system.

9.8.4 Editing measurement

Individual measured objects can be edited or the measured value can be moved by editing them.

To edit a measurement: - mark the selected measurement object by clicking the left button on it, which will highlight its outline



- hover the mouse over the selected measurement object, the individual measurement points will be displayed

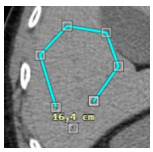


Figure 448: img

- by clicking and holding the selected point, you can move the point to the place of interest

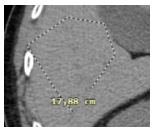


Figure 449: img

- the measured value can also be moved, you can do so by moving the point with the value to the place of interest

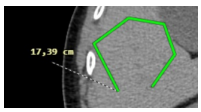


Figure 450: img

- by clicking outside the measured object, or by creating a new measurement object, the modified measurement object will be unmarked with a display of the modifications made

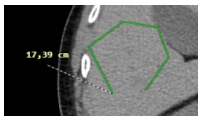


Figure 451: img

9.9 Series action tools

The tab “Series action tools” is used for working with the displayed series, locating the position in the series and synchronizing series.

This tab contains the following groups of tools: - Series actions - Lock view

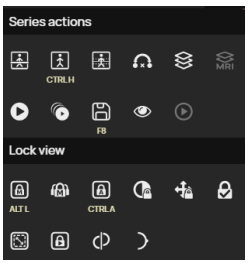


Figure 452: img

9.9.1 Series actions

The “Series actions” tool group contains the following tools:

Icon	Function	Description
	Localizer lines	Display of locating lines, between two mutually perpendicular series
	Hide reconstruction localizer lines	Hiding localization lines, between reconstructed mutually perpendicular series, during volume operations
	Show slice thickness lines	Display of localization lines including display of selected slice thickness
	Browse selected images only	Browsing only tagged key images in the series
	Stacking	Browse through the series with the selected mouse button
	Dynamic MRI stacking	Dynamic walk-through of the MRI series with the selected mouse button
	Toggle Player	Display or hide the player for automatic browse through the series
	Play/Pause in all windows	Shows the video player in all panels “Windows for displaying image data”
	Save key images	Save the marked key images to the new created series
	Fill other panels	Automatic series display, when changing the number of panels to display in the “Image data display window”

Icon	Function	Description
	Video player tool	Tool for playing and working with video in DICOM format

Figure 453: img

9.9.1.1 Localizer lines The “Localizer lines” tool is used to display localization lines between two mutually perpendicular series and displays the current position of the image in the series.

To display “Localizer lines” proceed as follows: - Split the “Windows for displaying image data” into two panels by “Configure the layout of the panels” - in these panels display two series whose reconstructions are perpendicular to each other - select the “Localizer lines” tool in the “Series Actions” tool group, or in the “Display toolset” - in the series that is perpendicular to the currently selected series, the localization lines are displayed

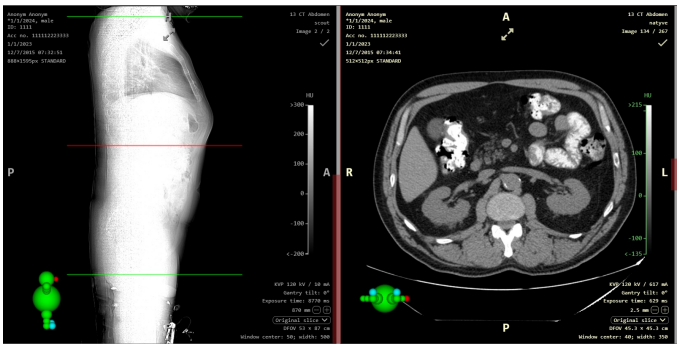


Figure 454: img

- to hide the localizer lines, re-select the “Localizer lines” tool in the “Series actions” tool group, or in the “Display toolset”

To hide the border localizer lines (border lines shown in green), use the “Hide border localizer lines” action located in the “Working toolset” tab of the “Display toolset”.

Figure 455: img

9.9.1.2 Hide reconstruction localizer lines The “Hide reconstruction localizer lines” tool is used to hide localization lines, between reconstructed mutually perpendicular series, during volume operations.

To hide the “Localizer lines for reconstruction” proceed as follows: - Split the “Image data display window” into the selected panel layout “Configure the layout of the panels” and display the individual series of the reconstructed images in the panels. They will be displayed with localization lines for the reconstructed series

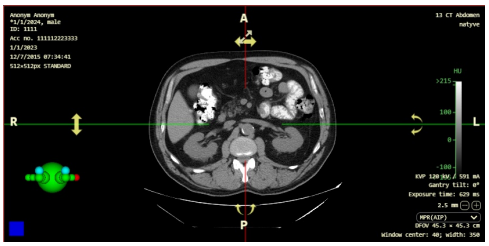


Figure 456: img

- to hide the localizer lines for the reconstructed planes, select the tool “Hide Reconstruction Localizer Lines” in the tool group “Series Actions” or in the “Display toolset”
- localization lines for reconstructed series were hidden

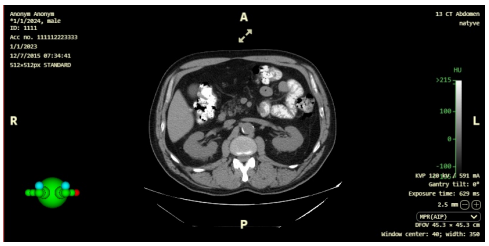


Figure 457: img

- to redisplay the localizer lines for the reconstructed planes, select the “Hide Reconstruction Localizer Lines” tool in the “Series Actions” tool group or in the “Display toolset”

Figure 458: img

9.9.1.3 Show slice thickness lines The “Show slice thickness lines” tool is used to display the section thickness along localizer lines, between reconstructed perpendicular series, in volume operations. Activate this tool to display the thickness of the slice using dashed lines along the locator lines.

To show “Show slice thickness lines”, proceed as follows: - Expand the “Window for displaying panel data” into the desired panel layout by “Configuring the panel layout in the current window/monitor” and display the individual planes of the reconstructed panel in the panels. - Display the localization lines for the reconstructed planes - To display the slice thickness of the localizer lines, select the “Show slice thickness lines” tool in the “Series Actions” tool group or in the “Display toolset”. You will be informed about the display of the localizer lines including the slice thickness:

Figure 459: img

- This shows the localization lines including the thickness of the slice

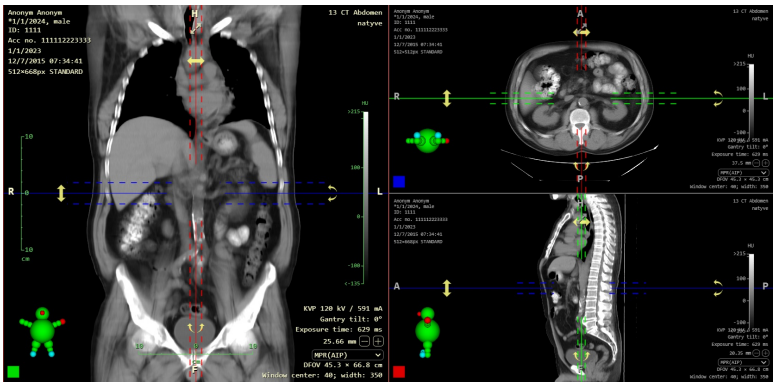


Figure 460: img

- To hide the localizer lines including the slice thickness, select the “Show slice thickness lines” tool again in the “Series actions” tool group or in the “Display toolset”. You will be informed about hiding the localizer lines including the slice thickness:

Figure 461: img

Figure 462: img

9.9.1.4 Browse selected images only The tool “Browse selected images only” is used for browsing only marked key images in a series with standard tools (mouse wheel, keyboard shortcuts).

To tag and browse key images, follow these steps: - In the “Windows for displaying image data”, display the selected series - when going through a series, you can mark individual images with the area of interest as a so-called key image with the icon of the check mark located in the upper right corner of the “Image data display window”. By marking it, the check mark icon is doubled . The individual key images will also be displayed in the scroll bar for series passage on the right side of the screen.

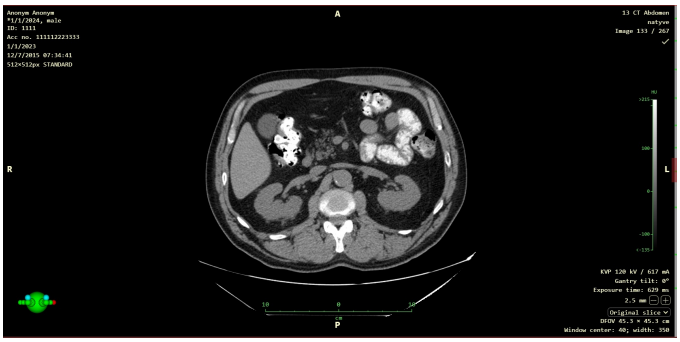


Figure 463: img

- to browse only selected key images, select the “Browse selected images only” tool in the ” Series actions” tool group, or in the “Display toolset”, selecting the action will notify the system of this information:

Figure 464: img

- this way, when going through the series, you will only skip over marked key images
- to go through the whole series again, select the “Browse selected images only” tool in the ” Series actions” tool group, or in the “Display toolset”, selecting the action will notify the system of this information:

Figure 465: img

Figure 466: img

9.9.1.5 Stacking The “Stacking” tool is used to scroll through the series with the selected mouse button and thus complements the possibility of scrolling through the series with the mouse wheel or arrow keys.

To browse the series with the “Stacking” tool, proceed as follows: - Select the “Stacking” tool with the selected mouse button in the “Series actions” tool group - hover the mouse over the selected display panel with the series - by clicking the selected mouse button and dragging at the same time, you will go through the series - to cancel “Stacking”, choose another tool on the selected mouse button

Figure 467: img

9.9.1.6 Dynamic MRI stacking The “Dynamic MRI stacking” tool is used for scrolling and switching MRI series subseries with the selected mouse button and therefore complements the series scrolling possible with the mouse wheel or arrow keys and the “Split series” tool.

To navigate through the series with the “Dynamic MRI stacking” tool, proceed as follows: - Select the “Dynamic MRI stacking” tool with the desired mouse button in the “Series actions” tool group. - hover the mouse over the desired image series display panel in the “Image Data Display Window” - click the selected mouse button and simultaneously drag sideways (left, right) to scroll through the series, drag the mouse up and down to switch between subseries - to exit the “Dynamic MRI stacking” select another tool on the selected mouse button

Figure 468: img

9.9.1.7 Toggle Player The “Toggle Player” tool is used to display or hide the player for automatic browse through the series as with a classic video player.

Figure 469: img

The player includes the following tools:

Icon	Function	Description
	Previous frame	Moves back one frame in the series
	Play	Starts an automatic browse through the series

Icon	Function	Description
	Pause	Stops the automatic browse through the series
	Next frame	Advances one frame in the series
	Selecting playback section	Allows you to select a section of playback in a series
x1	Playback speed	Automatic playback speed selection
15 FPS	FPS playback speed	Selectable autoplay speed by selecting frame per second (FPS)
	Loop	Repetitive automatic browse through series
	Loop back and forth	Autoplay through series will continuously play from beginning to end and backwards
	Close player	Turning off the player

Playback speed

To change the playback speed of a series, select the “Playback Speed” tool x1 and expand the drop-down menu:

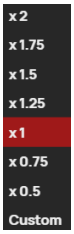


Figure 470: img

Select a playback speed from the selected values, or select the “Custom” value to open the FPS speed change tab:

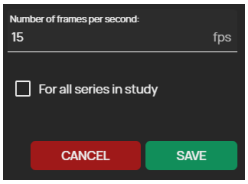


Figure 471: img

Type the desired value in the text field and choose to apply the selected speed to all series in the study. The “Cancel” option cancels the work performed, the “Save” option applies the entered values.

FPS playback speed

To change the playback speed of a series using frames per second values, select the “FPS Playback Speed” tool and expand the drop-down menu:

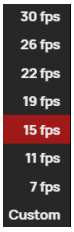


Figure 472: img

Select a playback speed from the selected values, or select the “Custom” value to open the FPS speed change tab:

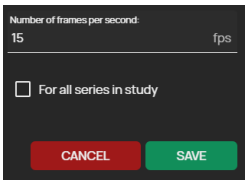


Figure 473: img

Enter the desired value in the text field and choose to apply the selected speed to the displayed series in all panels of the “Image data display windows”. The “Cancel” option cancels the work performed, the “Save” option applies the entered values.

Warning: when you enter a custom FPS value, the preset values in the drop-down menu will be affected according to the selected value.

Selecting playback section

The player allows automatic passage of only parts of the series. To select a playback segment, select the “Select playback section” tool . This displays the scroll bar located in the current position bar of the frame in the series:

Figure 474: img

Drag the end points of the triggered bar to control the size of the playback segment in the frame series:

Figure 475: img

DSA - Digital Subtraction Angiography

Figure 476: img

If you have a digital subtraction angiography study open, the “DSA” tool will also be displayed in the playback bar:

Figure 477: img

Selecting this tool will open the “DSA toolset”

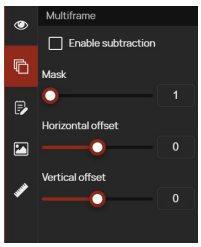


Figure 478: img

This toolset includes: - Enable subtraction - functions to show/hide the DSA mask - Mask - sliding bar to adjust the DSA mask strength - Horizontal Offset - slider bar to move the DSA mask horizontally - Vertical Offset - sliding bar to move the DSA mask vertically

Examples of unapplied/applied DSA masks:

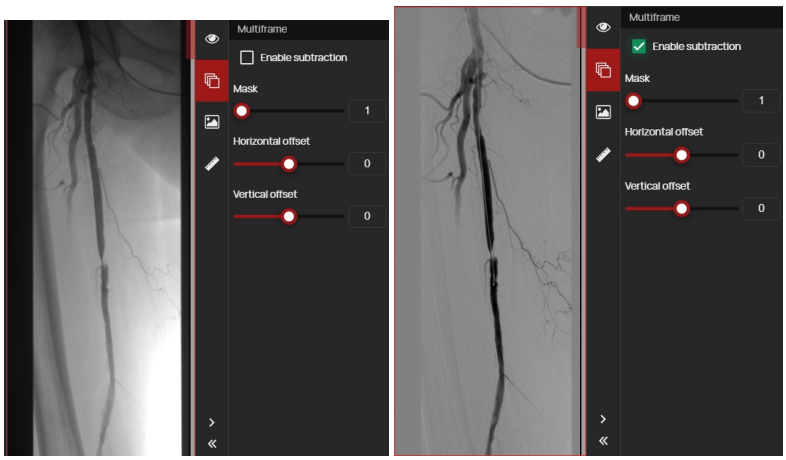


Figure 479: img

9.9.1.8 Play/Pause in all windows The “Play/Pause in all windows” tool will display the player in all “Windows for displaying image data” panels in which a series of images is displayed and automatically start browsing them.

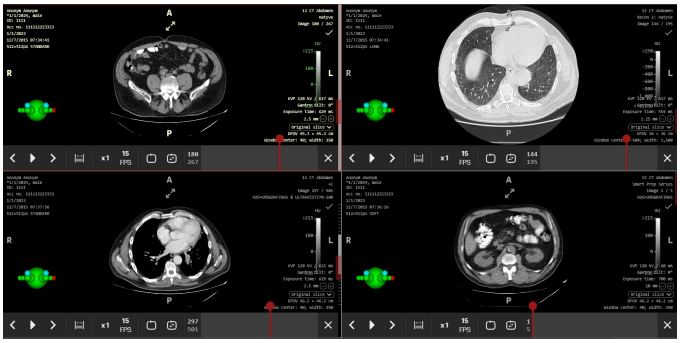


Figure 480: img

Figure 481: img

9.9.1.9 Save key images The “Save key images” tool is used to save marked key images into the new created KO series.

- Select the “Save key images” tool in the “Series actions” tool group to display the “Save key images” table

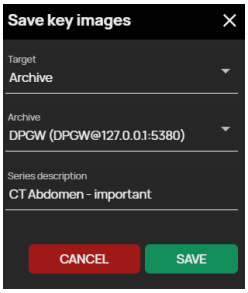


Figure 482: img

- select the save destination from the drop-down menu

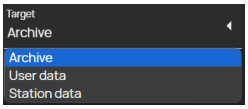


Figure 483: img

- in case you have chosen the storage destination “Archive” and you have configured multiple PACS destinations, select the selected PACS archive for saving (If the user destination is selected, this window will be inactive)

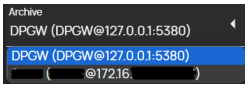


Figure 484: img

- name the new saved key images series

Figure 485: img

- the cancel button cancels the action, the save button creates a new series with key images
- the new created series will be added to the “Viewer Working Set”

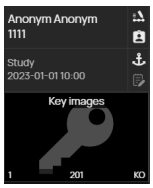


Figure 486: img

Figure 487: img

9.9.1.10 Fill other panels The tool “Fill other panels” is used for automatic display of series, when changing the number of panels for display in the “Window for displaying image data”. The series are added to the panels according to the order in the study, skiping already displayed series. If this action is not turned on, when other panels are displayed, they remain empty.

By selecting the “Fill other panels” tool in the “Series actions” tool group or in the “Display toolset”, you will be notified of this by the system:

Figure 488: img

To turn it off, select the “Fill other panels” tool again in the ” Series actions” tool group or in the “Display toolset”, you will be notified by the system:

Figure 489: img

Figure 490: img

9.9.1.11 Video player tool “Video player tool” is used for playing and working with video in DICOM format.

Figure 491: img

The “Video Player Tool” contains the following tools:

Icon	Function	Description
	Play	To start video playback
	Stop	Stop video playback
5s	Skip a time period	Moving the video loop according to the defined value
	Volume	Change the video audio volume
x1,0	Playback speed	Change the video playback speed
	Crop video	Resize a video cutout for export or saving
	Cut video	Selecting the time period of the video for export or saving
	Marks	Calls up a tab for managing assigned marks
	Add mark	Marking a frame of interest in a video
	Previous/next mark	Browse the associated marks in the video
	Download video frame	Export the video frame to the user’s local storage in .jpg format
	Download video	Export video to the user’s local storage in .mp4 format
	Save	Archiving edited video

1. Video playback

To play the video, use the “Play” icon in the player toolbar.

To stop the video, use the “Stop” icon located in the player toolbar.

To scroll through the video loop, click in the video location bar located in the player toolbar. You can also click and drag the mouse at the same time to scroll through the video.

Figure 492: img

For skipping by a period of time in the video, use the arrows 5s, where the value between the arrows indicates the time by which the video will be advanced. Clicking on the time value will call up a drop-down menu with predefined values that can be selected:

Figure 493: img

To change the video audio volume, select the volume icon to display a drop-down menu with predefined volume values:

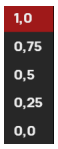


Figure 494: img

To change the video playback speed, select the playback speed icon , which will show a drop-down menu with predefined playback speed values:

Figure 495: img

2. Video Editing

Marking images in video

To mark a frame of interest in a video, use the player's scroll bar to display the desired frame and then mark it using the "Marks" icon . When clicked, the icon will turn red and a vertical white line will appear on the player scroll bar:

Figure 496: img

You can navigate between the selected frames by clicking on the flag icons placed in the scroll bar of the player, or by using the arrow icons located in the player toolbar.

If you click on the icon again, the marked image will be unmarked.

You can manage the selected images in a collective way using the table displayed by the icon:

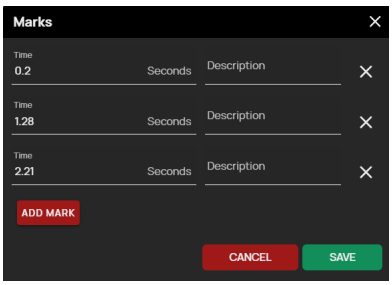
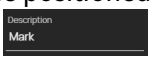


Figure 497: img

In this tab, the individual parameters of the mark can be edited: - The “Time” field  - allows you to define the positioned marker of the marked frame in the video using a value in seconds - The “Description” field  - allows you to define the name of the placed marker, in the preview of the marked frame of the video this description will be shown:

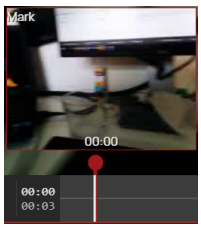


Figure 498: img

- “Delete” icon  - selecting this action removes the placed marker
- “Add tag” button  - select this action to add a new tag row to the table with the option to define it:

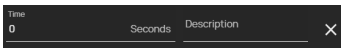


Figure 499: img

- Use the “Cancel” option to cancel the action, the “Save” button to confirm the changes
- If you do not have any marks in the video, start with the “Add mark” button:

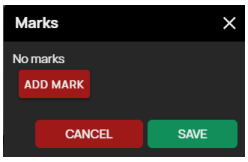


Figure 500: img

Video cutting

In case you want to cut only part of the video, select the “Cut video” icon from the player toolbar.

This displays a border to mark a section of the video, located in the player toolbar:

Figure 501: img

By moving the ends of the border to mark a section of the video, you determine the time period of the video that will be cut and then saved to PACS:

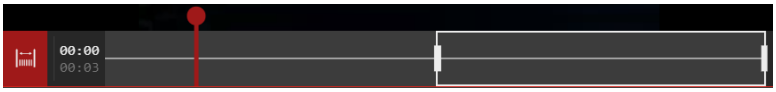


Figure 502: img

If you want to add another cut of video to a single saved loop, hover your mouse cursor over the player’s toolbar to display the grey border of the next cut, and left-click to add that section:

Figure 503: img

To remove a section of a video cutout, hover over the player scroll bar of the selected section and right-click to remove the section.

Video area cropping

By selecting the “Crop Video” tool in the player toolbar, you can resize the video crop by dragging the red squares located in the upper left and lower right corners of the crop:

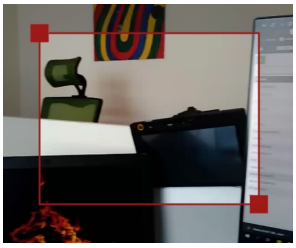


Figure 504: img

3. Archiving edited video and images

Export image

The “Download video frame” tool located in the player toolbar, is used to export a video frame to the user’s local storage in .jpg format. This exported image does not contain OSD captions. In case you have defined a “Video area crop”, only the selected crop will be saved.

Selecting the “Download video frame” tool will call up the “Download current frame” tab:

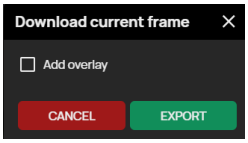


Figure 505: img

- Add overlay - if a logo is configured in DPGW, selecting this field will insert a watermark into the saved image located in the upper left corner
- Cancel - selecting “Cancel” will cancel the operation being performed
- Export - selecting “Export” will start downloading the image to the user’s local storage in .jpg format

Export video

The “Download Video” tool located in the player toolbar, is used to export video to the user’s local storage in .mp4 format. In case you have defined a “Video crop area” or “Video cut”, only the selected crop/section of the video will be saved.

Select the “Download Video” tool to call up the “Download Video” tab:

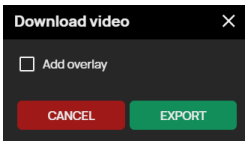


Figure 506: img

- Add overlay - if a logo is configured in DPGW, selecting this field will insert a watermark into the saved video located in the upper left corner
- Cancel - selecting “Cancel” will cancel the operation being performed
- Export - selecting “Export” will start downloading the video to the user’s local storage in .mp4 format

Save edited video

The “Save” tool located in the player toolbar, is used to archive the edited video.

In case you want to save the selected cut and crop of the video, including the markers, select the “Save” tool, the “Forward data” tab will be called up:

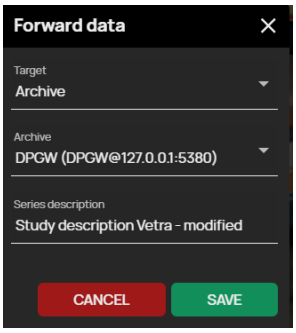


Figure 507: img

- select the save destination from the drop-down menu

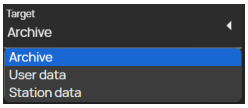


Figure 508: img

- in case you have selected the save target “Archive” and have configured multiple PACS targets, select the desired PACS archive to save (If the user target is selected, the station will make this window inactive)

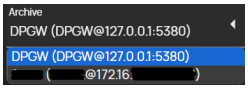


Figure 509: img

- name the edited video for saving

Figure 510: img

- the “Cancel” button cancels the action performed, the “Save” button creates a new video that will be added as another patient study to the “Viewer Work Set”

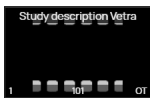


Figure 511: img

- if the video is not edited, the save icon remains inactive , edit the video to activate it.

9.9.2 Lock view

If you want to browse or work with two or more series synchronously, you can use one of the offered “Lock view” tools:

Icon	Function	Description
	Lock view	Synchronous multi-panels series scrolling from the current image position in the series
	Lock to separate groups	Section into groups of individual panels “Windows for displaying image data” for possible manual or automatic synchronization of series according to the level of data acquisition of the series, or by manual entry
	Automatic lock	Synchronous browsing of series in multiple panels with automatic finding of the corresponding image position in the series
	Lock windowing	When using the sync feature, the windowing adjustment will be applied to all sync series simultaneously
	Lock transformations	When the sync function is used, the image adjustment will be applied to all the sync series simultaneously
	Display panel synchronizability	Displaying the option to lock individual panels in the “Window for displaying image data”
	Synchronize viewer size between windows	Synchronize the size of displayed images in individual panels of “Windows for displaying image data” on a multi-monitor workstation
	Lock videos	Synchronous browsing of synchronously recorded videos
	Mammography Image Alignment	Automatic zooming and placement of mammographic images, according to the ideal parameters of the unfolded panels in the “Image data display window”

Icon	Function	Description
	Set nipple position	Manual adjustment of nipple position for automatic alignment of mammography images

Figure 512: img

9.9.2.1 Lock view The “Lock view” tool is used to synchronously scroll through series in multiple panels. By selecting this tool in the “Series actions” tool group, or in the “Display toolset”, all series will be scrolled from the current frame position in the series. Synchronization will be applied to all series and reconstructed views in the same data acquisition plane.

Figure 513: img

9.9.2.2 Lock to separate groups The “Lock to separate groups” tool located in the “Series actions” tool group or in the “Display toolset” is used to divide into groups the individual panels of the “Image data display windows” for possible manual or automatic synchronization of series according to the data acquisition plane of the series or by manual input.

In the event that you have placed and displayed series of studies in several “Windows for displaying image data” panels, by selecting the “Lock to separate groups” tool and then selecting automatic or manual synchronization, they will be marked into individual groups according to the level of data collection:

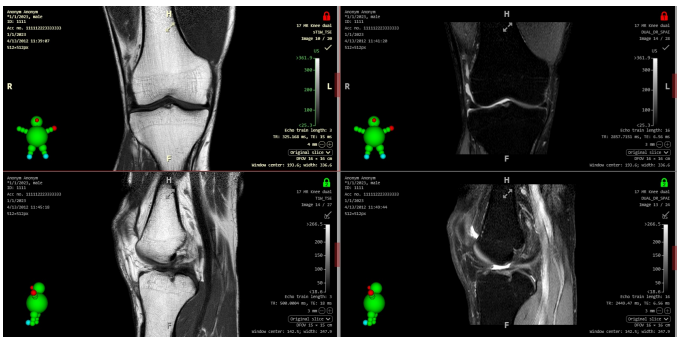


Figure 514: img

If the “Display panel synchronizability” tool is selected (see below), it is possible to manually mark and unmark individual “Windows for displaying image data” panels for their synchronization in groups:

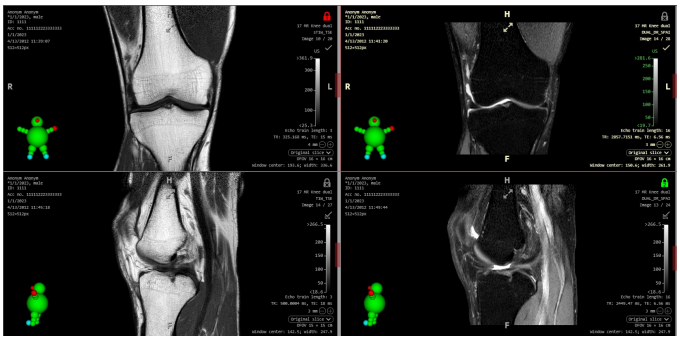


Figure 515: img

Figure 516: img

9.9.2.3 Automatic lock The “Automatic lock” tool located in the “Series action” tool group or in the “Display toolset” is used for synchronous scrolling through series in multiple panels. Automatic synchronization automatically finds the same patient positions according to the data in the DICOM file, aligns the series to the same location, and then locks their simultaneous scrolling. The synchronization will be applied to all series in the same data acquisition plane.

Figure 517: img

9.9.2.4 Lock windowing The “Lock windowing” tool located in the “Series actions” tool group, or in the “Display toolset” can be applied to manual or automatic synchronization and allows the user to synchronously edit the image, in all synchronized series, using the “Windowing” tool, see paragraph “Display tools”.

Figure 518: img

9.9.2.5 Lock transformations The “Lock transformations” tool located in the “Series actions” tool group, or in the “Display toolset” can be applied to manual or automatic synchronizations and allows the user to synchronously edit the image, in all synchronized series, using the tools in the “Display tools” and “Measurement tools” group, except for the “Windowing” tool, see paragraph “Edit image”.

Figure 519: img

9.9.2.6 Display panel synchronizability The “Display panel synchronizability” tool located in the “Series actions” tool group, or in the “Display toolset” is used for the possible locking of individual “Windows for displaying image data” panels and their subsequent manual or automatic synchronization. Selecting this tool will display a lock icon in the upper right corner of the “Windows for displaying image data” panel. Left click on the lock icon to lock this panel for sync , clicking the lock icon again will unlock this panel .

Figure 520: img

9.9.2.7 Synchronize viewer size between windows The “Synchronize viewer size between windows” tool is used to automatically synchronize the size of the display of images in each panel of the “Image data display windows” on a multi-monitor workstation. This utility preserves the size of the display of images in the panels in case only one monitor is displaying the ” Viewer Working Set” on a multi-monitor workstation and the panel sizes differ.

Figure 521: img

9.9.2.8 Lock videos The “Lock videos” tool located in the “Series actions” tool group, or in the “Display toolset” is used for synchronous playback of synchronously recorded videos. This tool is thus applicable to videos obtained using “Capture” (the digitization tool of this product), which enables the so-called synchronous recording of multiple video inputs, when the videos are of the same length. If the videos were not taken by synchronous recording, you will be warned about this with the information “Not enough synchronizable videos from the same group”.

9.9.2.9 Synchronisation of mammography images Advanced options for synchronizing and setting up the display of mammography images can be displayed by selecting the “Mammography toolset” tab:

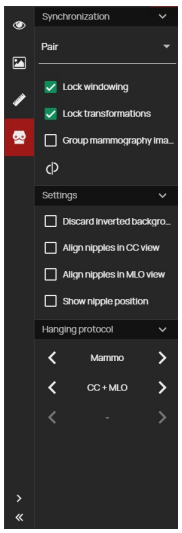


Figure 522: img

Synchronization

Synchronization can be divided according to the displayed mammographic images: - None - synchronization will not be applied - Pair - synchronization will be applied only to a pair of images in one direction - All - synchronization will be applied to all images

Lock windowing - synchronization of display adjustments (e.g., brightness and contrast, invert, etc.)

Lock transformations - synchronization of position adjustments (e.g., shift, zoom, etc.)

Group mammography images by patient - selecting this tool will group images of the same patient in pairs

Alignment of mammography images - used for automatic zooming and positioning of mammography images according to the ideal parameters of the panels laid out in the “Image Data Display Window”.

Settings

Discard iverted background - when using the “Invert” tool, only objects in the image will be inverted and the background will remain black

Align nipples in CC view - a pair of images in the CC direction will be aligned according to the positions of the nipples

Align nipples in MLO view - a pair of images in the MLO direction will be aligned according to the positions of the nipples

Show nipple positions - selecting this action will display the position of the nipples in the image using a yellow dot

Hanging protocol

This part of the “Mammography toolset” is intended for selecting image displays using hanging protocols. This part thus replaces the “Hanging protocol selection” tool in the viewer header:

Figure 523: img

This section is divided into individual lines: - Mammo/Mammo compare - Mammo displays the hanging protocol for a single study / Mammo compare is used to display two historical studies for one patient - Display direction selection - option to select the display direction of image projections in individual panels - Image history - option to select a historical study -1 to -3 in Mammo comparison

Figure 524: img

9.9.2.10 Set nipple position The “Set nipple position” tool is used to adjust the position of the nipple, which is the starting point for automatic alignment of mammography images in a pair.

To adjust the nipple position, perform the following steps: - Split the “Image data display window” into two panels by the action “Configure the panel layout in the current window/monitor” - in these panels, display the mammographic images in the same plane to be compared - Recommended: show the current nipple position - open the “Mammography toolset” - check the box “Show nipple positions” - select the “Set nipple position” tool with the desired mouse button in the “Lock view” tool group - click the selected mouse button with the tool on the real position of the nipple to move the yellow marking circle and if the “Align nipples CC/MLO” box in the “Mammography toolset” is checked, the position of the images will be automatically moved

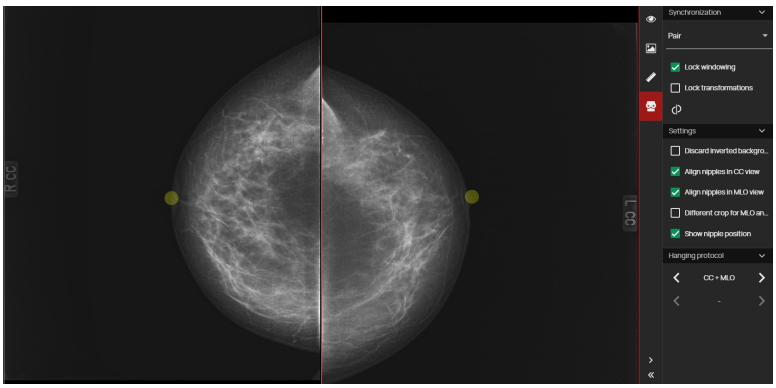


Figure 525: img

9.10 Volume operations, 3D visualization

The “Volume operations, 3D visualization” tab is used for working with created volumes or fusions from a series of images. To create a volume, proceed according to the paragraph “Create volume”, to create merged series, proceed according to the paragraph “Create fusion”.

This tab contains the following groups of tools: - Volume tools - Volume projections

Figure 526: img

9.10.1 Volume tools

The “Volume Tools” tool group contains the following tools:

Icon	Function	Description
	3D Cursor	Localization of the point of interest in mutually perpendicular planes of the created series volume
	Fusion active layer move	Manual adjustment of the overlay of layers in the created fused series of volume
	Fusion active layer rotation	Manual rotation of the active layer in the created fused volume series
	Reset active layer transformation	Restoring the original position and rotation of the active layer in the created fused volume series
	Save active layer transformation	Store the active layer movements and rotations in the created fused volume series in REG format
	Rotate volume	Free rotate of planes in the created series volume
	Interactive slab thickness change	Change thickness of the volume slice
	Create new series with the actual orientation	Creation of a new reconstructed series, according to the selected direction of the MPR projection of the patient
	Select transfer function	Changing the display of the DVR volume, according to the default options
	Video from volume	Creating a video from the DVR volume by rotating it by 180° or 360°
	Set curve of Curved MPR	Tool for marking individual points on the axis of the curved MPR
	Curved MPR Height	Specify the display size of the curved MPR volume
	CMPR curve translation tool	Curved MPR curve shift tool
	Delete all selected CMPR curve points	Curved MPR curve removal tool
	Segmentation drawing	Draw a cutting area in the created segmentation

Icon	Function	Description
	Segmentation cutting	Undrawing the cutting area in the created segmentation

Figure 527: img

9.10.1.1 3D Cursor The “3D cursor” tool is used to locate a specific point of interest in mutually perpendicular planes of the created volume of the series. To locate a point, select this tool from the “Volume Tools” group of tools with the selected mouse button and then apply to the point of interest in the plane of the displayed series.

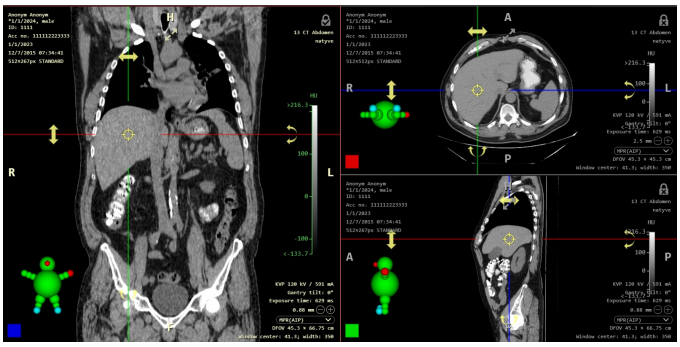


Figure 528: img

Figure 529: img

9.10.1.2 Fusion active layer move The “Fusion active layer move” tool is used for manual adjustment of layer overlap in created fused volume series. To adjust the overlay of layers, follow these steps: - Create and display the merged layers according to the paragraph “Create fusion” - select the “Fusion active layer move” tool in the “Volume Tools” tool group with the selected mouse button - mark the active layer, see paragraph “Create fusion” - hover the mouse over the view of the fusion plane - press and hold the selected mouse button with the tool, then move the active layer to the position of interest by moving the mouse

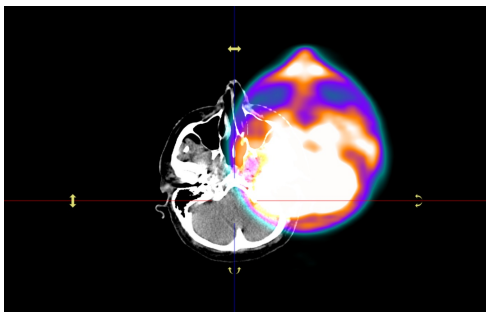


Figure 530: img

Figure 531: img

9.10.1.3 Fusion active layer rotation The “Fusion Active Layer Rotation” tool is used to manually rotate the active layer in the created fused volume series. To adjust the layer overlay, follow these steps: - Create and display the fused layers according to the paragraph “Create fusion”. - Select the “Fusion Active Layer Rotation” tool in the “Volume Tools” tool group with the desired mouse button - select the active layer, see paragraph “Create fusion” - hover the mouse over the desired view of the fusion plane - press and hold the selected mouse button with the tool, then move the mouse to rotate the active layer to the desired position

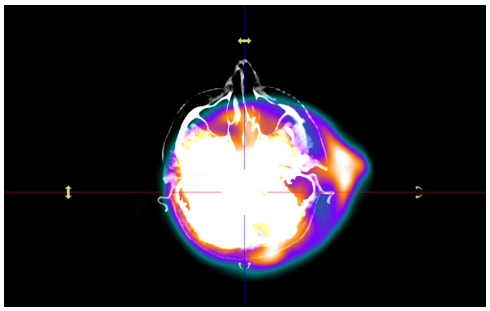


Figure 532: img

Figure 533: img

9.10.1.4 Reset active layer transformation The “Reset active layer transformations” tool is used to restore the original position and rotation of the active layer in the created fused volume series. Select

the “Reset Active Layer Transformations” action to reset to the original state of the overlay layers, the rotated/offset fusion layers will be returned to their original state before the transformations.

Figure 534: img

9.10.1.5 Save active layer transformation The “Save Active Layer Transformations” tool is used to save the active layer movement and rotation in the created fused volume series to a newly created series in REG format. To save the performed active layer fusion transformation, proceed as follows: - Create and display the fused layers according to the paragraph “Create fusion”. - Perform the required image transformations (move, rotate) - Select the “Save active layer transformations” tool to call up the table:

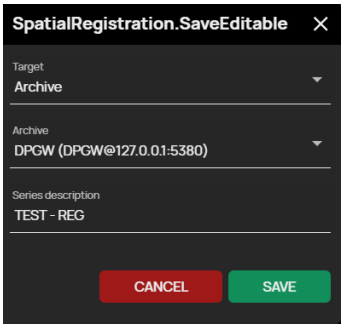


Figure 535: img

- Select “Target” (Archive, User Data, or Station Data)
- If you have selected the archive save target, select the desired “Archive”
- If necessary, change the name of the active layer transformation to be saved using the “Series description” text box
- Select “SAVE” to create a new series in REG format with the saved position of the active fusion layer, or select “CANCEL” to cancel the performed work
- If the “SAVE” action is selected in the table described above, a new series in the “REG” format will be created and added to the “Viewer working set”:

Figure 536: img

Display the saved transformation of the active layer

In case you want to view the saved fusion layer transformation, do the following: - Create and display the merged layers according to the paragraph “Create fusion”. - Right-click on the thumbnail preview of the saved transformation state in “REG” format to call up the context menu in which you select the “Activate Spatial Registration” tool:

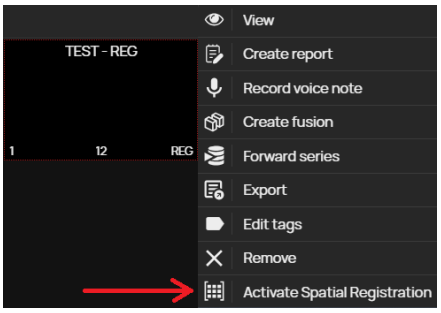


Figure 537: img

- Select this action to recall the saved transformation state of the fusion layer, e.g.:

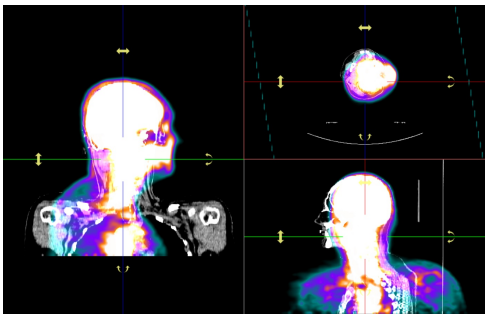


Figure 538: img

- In case you want to return to the original state, the saved fusion layer transformation can be deactivated with the “Deactivate spatial registration” action in a similar way to the activation from the context menu. The original state will then look like this:

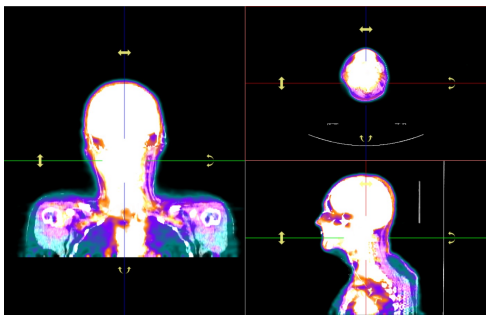


Figure 539: img

Figure 540: img

9.10.1.6 Rotate volume The “Rotate volume” tool is used to rotate planes in the created volume. To rotate a plane, proceed as follows:

- Create and view series volume, see “Create volume”
- select the “Rotate volume” tool in the “Volume Tools” tool group with the selected mouse button
- hover the mouse over the view of the volume plane
- press and hold the selected mouse button with the tool, move the mouse to rotate the created volume

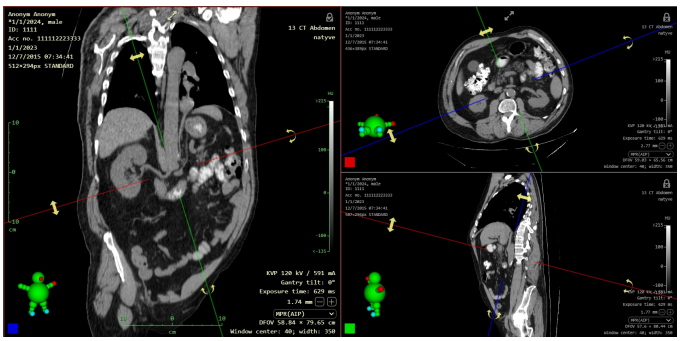


Figure 541: img

Figure 542: img

9.10.1.7 Interactive slab thickness change The “Interactive slab thickness change” tool is used to change the thickness of the displayed slice. To change the slice thickness, proceed as follows:

- Create and view series volume, see paragraph “Create volume”
- select the tool “Interactive slab thickness change” in the tools group “Volume Tools” with the selected mouse button
- hover the mouse over the view of the volume plane
- press and hold the selected mouse button with the tool, move the mouse up and down to change the slice thickness to the required size
- the current size of the slice thickness is displayed in the OSD label of the displayed image, the location of the OSD label is configured by the user, or is set by default in the lower right corner of the display window, e.g.: 2,75 mm
- if you have enabled the “Show slice thickness lines” function, the current slice width size will also be visually displayed using the dashed lines of the volume axes:

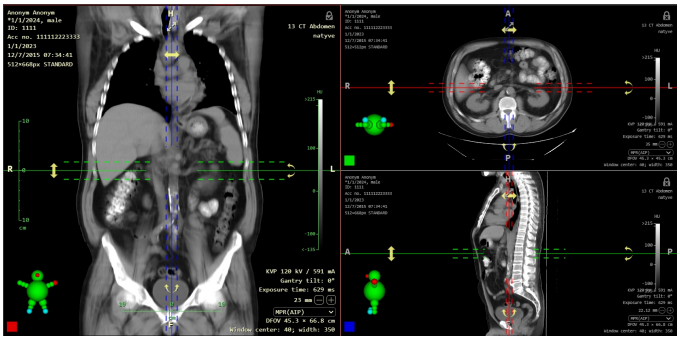


Figure 543: img

9.10.1.7.1 Change slice thickness and volume reconstruction Changing the slice thickness and volume reconstruction can be changed in the “Volume toolset” if you have created and displayed a volume series:

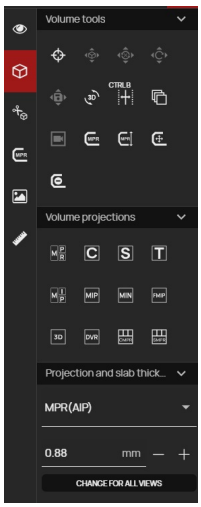


Figure 544: img

The “Volume toolset” contains the following functions:

Volume tools

The “Volume Tools” tab contains the selected tools of the “Volume Operations, 3D visualization” tab: - 3D cursor - Rotate volume - Interactive slab thickness change - Create new series with the actual orientation - Video from volume

Volume projections

The “Volume projections” tab contains the individual planes and the 3D volume for reconstructing the actively selected window for display.

Projections and slab thickness editor

To change the slice thickness and reconstruct the volume, proceed as follows: - Create and display the volume of the series, see “Create volume”. - Open the “Volume toolset” and go to the “Projections and slab thickness editor” tab - select the desired reconstruction using the drop-down menu:

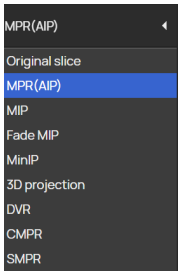


Figure 545: img

- select the desired width of the slice by typing the values into the text box or using the - / + tool

Figure 546: img

- the selected section width can be applied to all reconstructed and displayed planes by the “Change for all views” action 

Figure 547: img

9.10.1.7.2 Quick switching of slab thickness To quickly change the slice thickness of the displayed series volume, you can use the actions directly from the OSD label location:

To quickly change the slice thickness, proceed as follows: - Create and view the volume of a series, see “Create volume” - The current size of the slice thickness is displayed in the OSD label of the displayed image, the location of the OSD label is user-configured or set by default in the lower right corner of the display window:

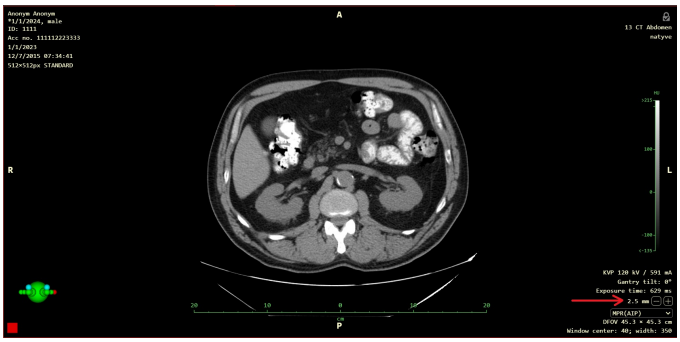


Figure 548: img

- using the - / + function you can decrease / increase the slice thickness of the currently selected volume plane of the image series in the “Image data display window”, this function can also be used by clicking the mouse on a numeric value and moving it sideways to adjust the thickness

Warning: this function can be hidden, to display it you need to set this function using the “Profile editor” tool located in the ” Viewer settings” tab.

9.10.1.7.3 Quick volume reconstruction switching To quickly change the volume reconstruction of the displayed series volume, you can use the actions directly from the OSD label location under the “Change slice thickness” tool:

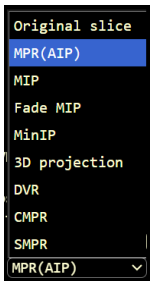


Figure 549: img

To change the volume reconstruction, click the drop-down menu and select the requested reconstruction. This reconstruction will be applied.

Warning: this function can be hidden, to display it you need to set this function using the “Profile editor” tool located in the ” Viewer settings” tab.

Figure 550: img

9.10.1.8 Create new series with the actual orientation The “Create new series with the actual orientation” tool is used to create a new reconstructed series, according to the selected direction of the patient’s MPR projection and the selected slice thickness. To create a new reconstructed series, proceed as follows: - Create and view series volume, see paragraph “Create volume” - Drag the created volume to the selected “Image data display windows” panel and select the desired reconstruction plane from the “Display” tab - Select the “Create new series with current orientation” tool in the “Volume tools” tool group to call up the “Create new series with current orientation” tab:

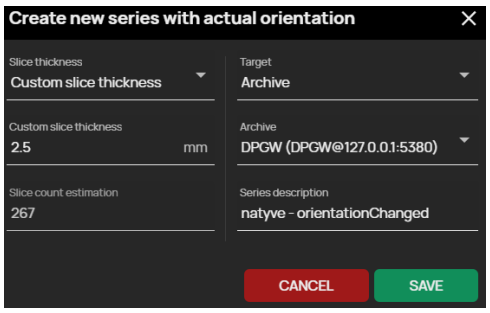


Figure 551: img

- In this tab, use the drop-down menu to select the desired slice thickness:

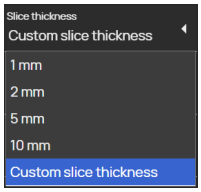


Figure 552: img

- If “Custom slice thickness” is selected, enter the desired thickness in mm in the “Custom slice thickness” text field:

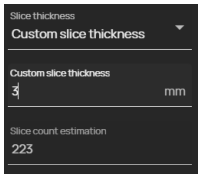


Figure 553: img

- The ” Slice count estimate” field in the table serves as an informative message about the number of images in the newly created series.
- Select the save destination of the reconstructed series from the “Target” drop-down menu, if you have set up multiple archives, select the desired archive from the “Archive” drop-down menu and enter the series name in the “Series description” text box
- Selecting the action “Cancel” cancels the action performed, in case of selecting “Save” you create a new reconstructed series, the system will notify you about the start of the series creation
- the newly created series will be added to the “Viewer working set”

Figure 554: img

9.10.1.9 Select transfer function The “Select transfer function” tool is used to change the DVR volume display, according to the default options. To change the DVR view, proceed as follows: - Create and view series volume, see paragraph “Create volume” - Drag the created volume to the selected view panel and select “Direct volume rendering (DVR)” from the “Display” tab Select the “Select transfer function” tool in the “Volume tools” tools group to display the “Volume toolset”:

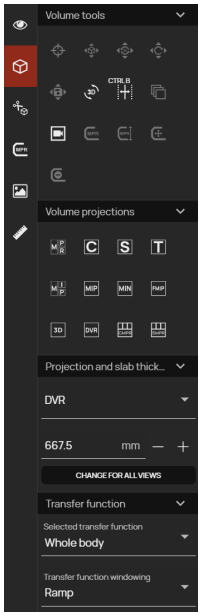


Figure 555: img

- go to the “Transfer function” tab
- use the “Selected transfer function” drop-down menu to select the display area:

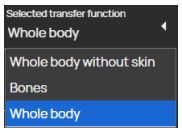


Figure 556: img

- use the drop-down menu “Transfer Function Windowing” to select a change of view:

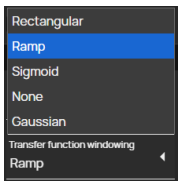


Figure 557: img

Changing the DVR display will be immediately visible after selecting the display change from the drop-down menu.

Figure 558: img

9.10.1.10 Video from volume The “Video from volume” tool is used to create and then export video from the created DVR volume. To create a video, follow these steps:

- Create and view series volume, see paragraph “Create volume”
- Drag the created volume to the selected view panel and select “Direct volume rendering (DVR)” from the “Display” table
- select the “Video from volume” tool in the “Volume tools” tools group to display the “Video from volume” table:

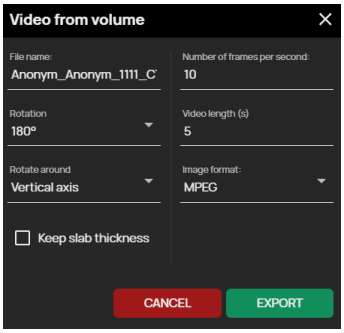


Figure 559: img

- fill in the required data in the displayed table:

Field	Description	Field	Description
Filename	Naming the exported video	**Number of frames per second**	Selection of playback speed
Rotation	Option to choose rotation by 180° or 360°	**Video length**	Choice of video duration in seconds
Rotate around	Option to choose rotation horizontally / vertically	**Image Format**	Choice of video export format in .MPEG and .AVI
Keep slab thickness	Keeps the currently selected slice thickness width		

- the action “CANCEL” cancels the performed action, the action “CONFIRM” starts the process of exporting the video to the local PC user, you will be informed about the start of the export:

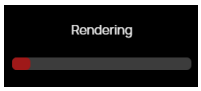


Figure 560: img

- then the table “Video from volume” will be displayed with a queue of export requests, and if the video is created successfully, the download to the user’s local PC will start.

9.10.1.11 Curved MPR toolset The Curved Projection toolset contains the CMPR and SMPR projection views and their associated tools.

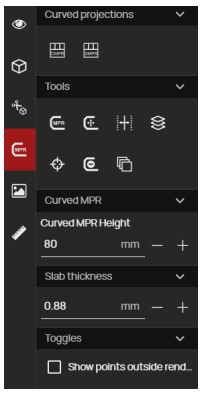


Figure 561: img

The “Curved Projections” tab contains: - Curved MPR - display of the created curve in volume in four panels of the “Image data display windows” - Straightened MPR - display of the straightened projection according to the created curve in the volume in four panels of “Image data display windows”

The “Tools” tab contains:

Icon	Function	Description
	Set curve of Curved MPR	Tool for marking individual points on the axis of the curved MPR
	CMPR curve translation tool	Curved MPR curve shift tool
	Interactive slab thickness change	Change thickness of the volume slice
	Stacking	Browse through the series with the selected mouse button
	3D Cursor	Localization of the point of interest in mutually perpendicular planes of the created series volume
	Delete all selected CMPR curve points	Curved MPR curve removal tool
	Create new series with the actual orientation	Creation of a new reconstructed series of curved projection (to create a new series with the created curved projection, follow the “Create a new series with the actual orientation” described above)

The “Curved MPR” tab contains a tool for changing the size of the display area around a curved MPR curve by typing values into the text field, moving the values with the mouse, or using the - and + symbols.

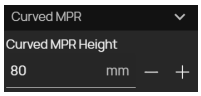


Figure 562: img

The “Slab Thickness” tab contains a tool for changing the width of the displayed slice of the created curved MPR projection by typing values into the text field, by moving the values with the mouse, or by using the - and + symbols.

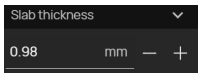


Figure 563: img

The “Toggles” tab contains the “Show points outside rendered plane” tool, which allows you to display the plotted points of a curved projection created by the user in all planes throughout the entire view volume.

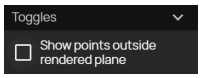


Figure 564: img

If this function is active, the lines between points outside the current view area will be dashed, e.g.:

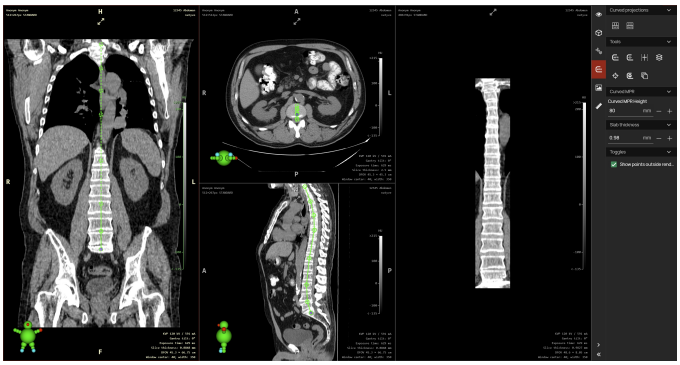


Figure 565: img

Figure 566: img

9.10.1.12 Set curve of Curved MPR The “Set curve of Curved MPR” tool is used to create and display a curved surface created from the volume of the selected series, allowing the user to display, for example, the stretched path of a blood vessel, spine, etc. To determine the curved MPR curve, proceed as follows:

- Create and view the volume of a series, see “Create volume”
- select the “Curved MPR” view in the ” Volume projections” tool group (can also be displayed by double-clicking on the series thumbnail with the created volume in the viewer working set)
- to make your work easier, maximize the panel by displaying the desired plane across the entire window with the icon located at the top of the panel
- select the “Set curve of Curved MPR” tool in the “Volume tools” tool group with the selected mouse button or from the “Curved MPR toolset”
- scroll through the series to locate the location of the first point and then click the selected tool button to place the point
- as you go through the series, click to place the other points
- individual points can be moved by dragging with the mouse, or by hovering the mouse over the selected point and pressing the DELETE key to delete the point, points can be added to the created curve by hovering the mouse between two created points, when the mouse pointer changes to the + symbol and clicking the left mouse button to add a new point
- to edit the curve in other planes, always find the approximate slice to the point you want to move in the desired plane and drag the mouse to move the point
- if you have placed all the desired points, a curved MPR curve will be displayed, e.g:

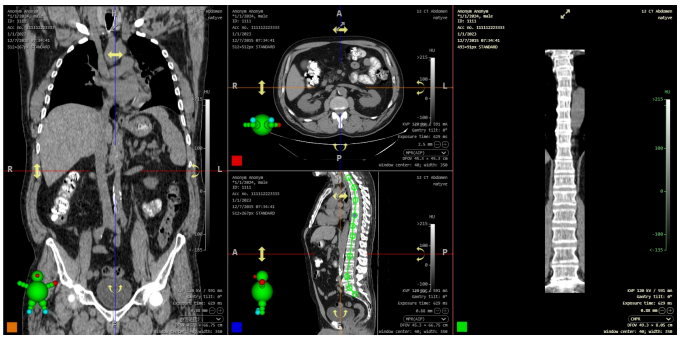


Figure 567: img

To create an “Straightened MPR” follow a similar process, the result in this case is a transversal projec-

tion that is straightened compared to the curve of the curved MPR, i.e. it is always perpendicular to the curve, e.g:

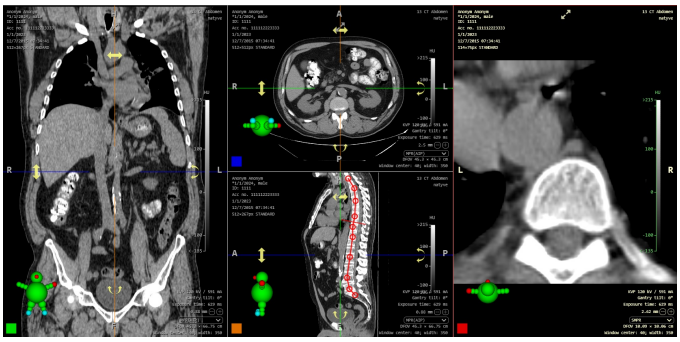


Figure 568: img

Figure 569: img

9.10.1.13 Curved MPR Height The “Curved MPR Height” tool is used to specify the size of the curved MPR curve display. To determine the size, proceed as follows: - create a curved MPR curve according to the procedure of the previous paragraph - select the “Curved MPR Height” tool in the “Volume Tools” tool group, this calls up the “Curved MPR Toolset” sidebar with the “Curved MPR” tab:

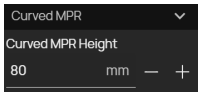


Figure 570: img

- enter a size value in mm in the text box to display the size range of surrounding structures from specific points on the curved MPR curve, the size will be adjusted automatically after entering the value. This value can also be changed by moving the values with the mouse, or by using the - and + signs.

Figure 571: img

9.10.1.14 CMPR curve translation tool The “CMPR curve translation tool” tool is used to offset all points of the created curved MPR curve simultaneously. To move the curve, select this tool with the

selected mouse button and then the curve can be moved by dragging.

Figure 572: img

9.10.1.15 Delete all selected CMPR curve points The “Delete all selected CMPR curve points” tool is used to remove a curved MPR curve. Selecting this tool removes the created curve including all its points.

9.10.1.16 Segmentation toolset The “Segmentation toolset” contains tools for cropping objects in the created volume of a series of frames.

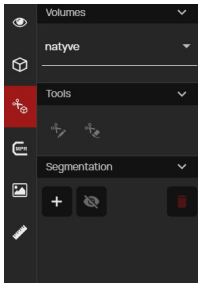


Figure 573: img

The “Tools” tab of the “Segmentation toolset” contains: - Segmentation Drawing - tool used to draw an area in the created segmentation - Segmentation cutting - tool used to delete part or all of the created segmentation

The “Segmentation” tab of the “Segmentation toolset” contains: - Create Segmentation - a tool to create a new segmentation layer - Hide/Show All - tool to hide/show all applied segmentation layers - Unload Segmentations - tool to remove all created segmentations

To create a new segmentation, do the following:

1. Create and display a volume from the selected series of images (see “Create volume” for more information).
2. Open the “Segmentation toolset”
3. In the “Segmentation” tab, select the “Create Segmentation” button to call up the “Segmentation” table

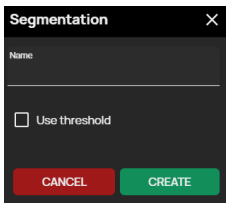


Figure 574: img

Name the new segmentation by inserting it into the “Name” text field. If the “Use threshold” field is checked, this table will be expanded to select a threshold value (all points of the created volume containing optical density according to the selected threshold value will be deleted):

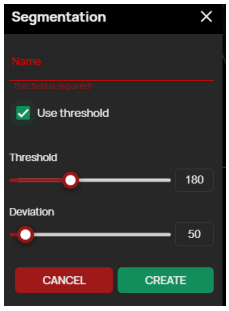


Figure 575: img

The “Cancel” action cancels the performed task, the “CREATE” action will add a new segmentation in the “Segmentation toolset” on the “Segmentation” tab:

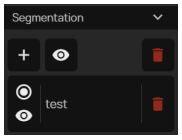


Figure 576: img

The created segmentation contains: - “Selected” button is used to select a segmentation, in case of creating multiple segmentations the other icons are empty - The “Hide/Show” button is used to hide or show the segmentation - Name of the created segmentation - The “Delete segmentation” button is used to remove the created segmentation, after selecting this action you will call the table for confirmation:

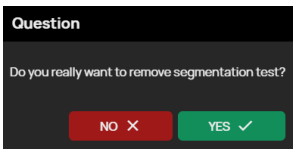


Figure 577: img

- Repeat step 3 of this paragraph to add another segmentation

4. Draw the segmentation contours in the selected volume area using the “Draw segmentation” or ” Segmentation cutting” tools by selecting from the “Volume tools” tab, or by selecting from the “Segmentation toolset” of the “Tools” tab.

The cut out areas will then not be displayed in other planes or 3D views.

Figure 578: img

9.10.1.17 Segmentation drawing The “Segmentation drawing” tool is used to draw the area in the created segmentation. To draw an area, proceed as follows: - Create an area segmentation from the selected volume of the image series, see more in “Segmentation toolset” - select the “Segmentation drawing” tool in the “Volume tools” tool group, or by selecting it from the “Segmentation toolset” of the “Tools” tab with the selected mouse button - move the mouse to the starting point in the selected plane of the volume image - by clicking, or by clicking and holding the selected mouse button with the tool, draw the surface of the area of interest - by completing the drawing of the segmentation area, the volume will be recalculated:

Figure 579: img

- the result is cutting out part of the volume:

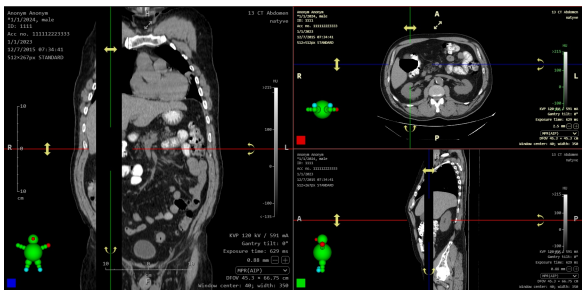


Figure 580: img

Figure 581: img

9.10.1.18 Segmentation cutting The “Segmentation cutting” tool is used to delete part or all of the created segmentation. To remove segmentation, proceed as follows:

- Display the volume with the segmentation created that you want to edit
- select the “Segmentation cutting” tool in the “Volume Tools” tool group, or by selecting it from the “Segmentation toolset” of the “Tools” tab with the selected mouse button
- move the mouse to the starting point in the selected plane of the volume image
- by clicking, or by clicking and holding the selected mouse button with the tool, draw the area you want to cut out
- The result is the cut out part or all of the created segmentation.

9.11 Volume projections

The group of tools “Volume projections” is used to display the projections and planes of the created volume. For more on the possibility of creating volumes, see the paragraph “Create volume”. Measurement and post-processing tools of the DICOM viewer can be used in the created volumes, e.g. the “Windowing” tool, 3D volume structures, or MIP, etc. can be added or removed.

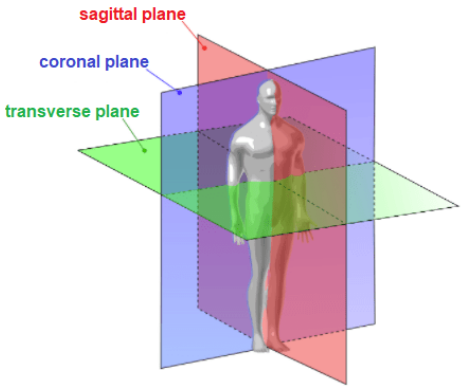


Figure 582: img

DPGW allows these projections/planes to be displayed in volume:

Icon	Projection/plane
	Multiplanar reconstruction (MPR)
	MPR Frontal view
	MPR Sagittal view
	MPR Transverse view
	Max. intensity projection (3 views)
	Max. intensity projection (MIP)
	Min. Intensity projection (MinIP)
	Fading max. Intensity Projection (Fade MIP)
	3D projection
	Direct volume rendering (DVR)
	Curved MPR
	Straightened MPR

9.11.1 Multiplanar reconstruction (MPR)

Figure 583: img

The “Multiplanar reconstruction (MPR)” tool is used to display the reconstructed planes in three panels “Window for displaying image data”:

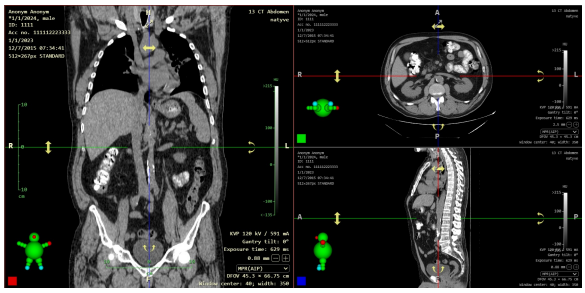


Figure 584: img

9.11.2 MPR Frontal view

Figure 585: img

The “MPR Frontal view” tool is used to display the reconstructed coronal plane in one “Window for displaying image data” panel:

Figure 586: img

Figure 587: img

9.11.2.1 MPR Sagittal view The “MPR Sagittal view” tool is used to display the reconstructed sagittal plane in one “Window for displaying image data” panel:

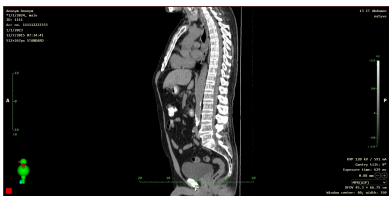


Figure 588: img

Figure 589: img

9.11.2.2 MPR Transverse view The “MPR Transverse view” tool is used to display the reconstructed transverse plane in one “Window for displaying image data” panel:

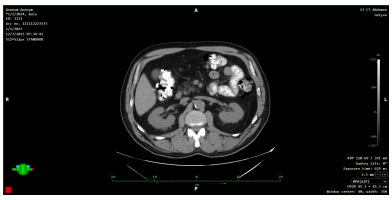


Figure 590: img

Figure 591: img

9.11.2.3 Max. intensity projection (3 views) The “Max. Intensity Projection (3 Views)” tool serves as a 3D rendering technique that examines each voxel and selects the one with the highest intensity. This is subsequently used in the displayed volume. The others are ignored. (90% of the acquired information will be lost). With this method, calcifications and surgical staples can be better differentiated. Another advantage can be considered greater visibility of bright objects. Disadvantages include a lack of depth information, high-intensity materials (calcifications) can obscure the desired organs. By choosing this tool, the reconstructed MIP planes will be displayed in three panels “Window for displaying image data”:

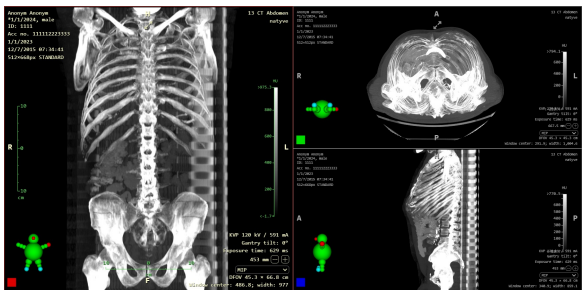


Figure 592: img

Figure 593: img

9.11.2.4 Max. intensity projection (MIP) The “Max. Intensity Projection (MIP)” tool is similar to the previous tool, but displays the reconstructed MIP in the currently selected plane in one “Window for displaying image data” panel:

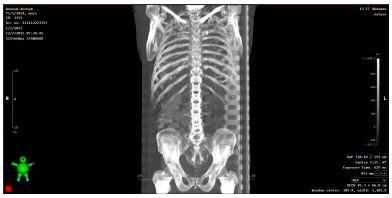


Figure 594: img

Figure 595: img

9.11.2.5 Min. Intensity projection (MinIP) The “Min. Intensity projection (MinIP)” tool is used to reconstruct the projection with the display of only the area with the lowest attenuation coefficient in the given area. It is used, for example, in the description of the bile ducts and pancreatic duct, diagnosis of lung diseases. Generally for very weak signal areas. The tool displays the reconstructed MinIP in the currently selected plane in one panel “Window for displaying image data”:

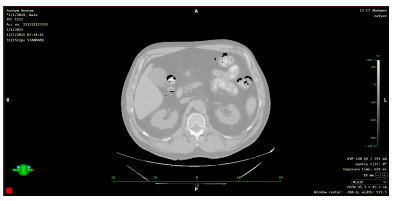


Figure 596: img

Figure 597: img

9.11.2.6 Fading max. Intensity Projection (Fade MIP) The “Fading max. Intensity Projection (Fade MIP)” tool differs from the MIP tool, which displays the highest density from the volume in each projection beam, in that a linear attenuation is also applied to the displayed density according to the distance from the beginning of the displayed section of the volume (slab). The tool displays the reconstructed FMIP in the currently selected plane in one panel “Window for displaying image data”:

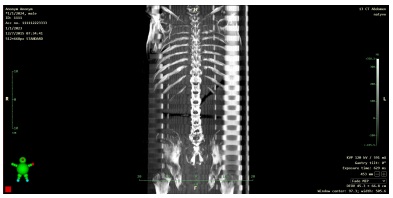


Figure 598: img

Figure 599: img

9.11.2.7 3D projection The “3D projection” tool is used to reconstruct a three-dimensional image of the created volume. The tool displays the 3D reconstruction in the currently selected plane in one panel “Window for displaying image data”:

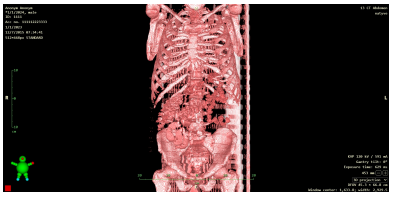


Figure 600: img

Figure 601: img

9.11.2.8 Direct volume rendering (DVR) The “Direct volume rendering (DVR)” tool is used for the complete reconstruction of a three-dimensional image of the created volume, where color intensity = object density. The tool will display the DVR in the currently selected plane in one panel “Window for displaying image data”:

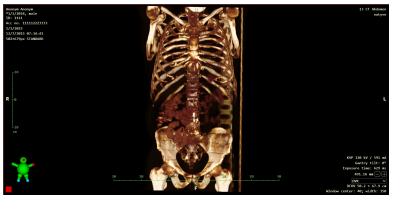


Figure 602: img

Figure 603: img

9.11.2.9 Curved MPR The “Curved MPR” tool is used to display the created curve in volume in the four panels of the “Image data display windows”, to create a curve, see more in the paragraph “Curved MPR toolset”:

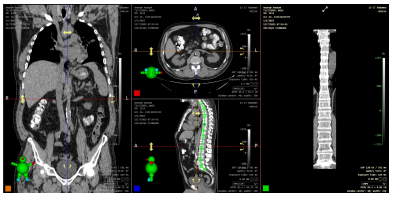


Figure 604: img

Figure 605: img

9.11.2.10 Straightened MPR The “Straightened MPR” tool is used to display the straightened projection according to the created curve in the volume in four panels of the “Image data display

windows". The created transversal projection is aligned against the created curve of the curved MPR, i.e. it is always perpendicular to this curve. To create a curve, see more in "Curved MPR toolset":

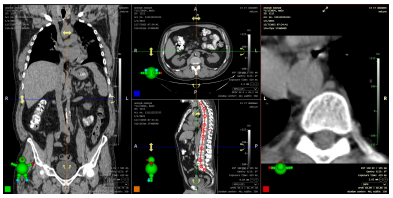


Figure 606: img

9.12 Online consultation

Action DWShare enables online consultations. This is the online transfer of the image and mouse cursor between connected users.

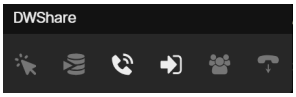


Figure 607: img

The DWshare tab contains the following tools:

Icon	Function	Description
	Share cursor	switch to share / unshare cursor position during remote session
	Share actions	switch to share / unshare actions performed during a remote session
	Create session	creating a new session, defining the name and users who can connect
	Connect	if the user wants to join an existing session to which he is invited, he uses this option
	Manage session users	option to manage users with session access. Users can be added, removed or external users can be added
	Hang up	if connected to a session, it is possible to end this session with this tool

9.12.1 Setting up a new online consultation

The master user creates a session using the “Create session” tool.

Figure 608: img

This will display the “Create new session” table, in the “Description” text field, choose the name of the online consultation and choose the “Create” action. The “Cancel” action cancels the action being performed.

Figure 609: img

By selecting the “Create” action, you will display the following table “Manage users in session” for adding users and managing them (after the session is established, this table can be displayed with the “Manage session users” tool located in the “DWshare” tool tab):

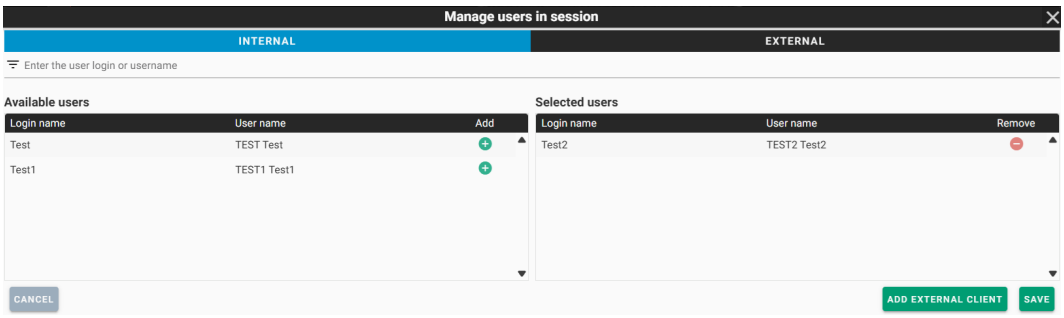


Figure 610: img

This table contains two tabs “Internal” and “External”. Internal users are users who are connected to the same server within the internal network. External users are users who are connecting from an external environment, outside of the medical facility.

Internal users can be searched using the “Enter the user login or username” text field in the header of the “Internal” tab. You can find the selected user in the “Available users” field and add it with the icon in the “Add” column. The user added to the session will appear in the “Selected users” field and you can remove it if necessary using the icon.

External users can be added using the “Add external user” action ADD EXTERNAL CLIENT , which displays the “Add external client” table:

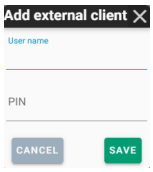


Figure 611: img

In this table, enter the user name “User name” and password “PIN” in the text fields, then choose the “Save” action, the “Cancel” action cancels the action being performed.

After creating a new external user, it will be displayed in the “External” tab, in the “Manage users in session” table:

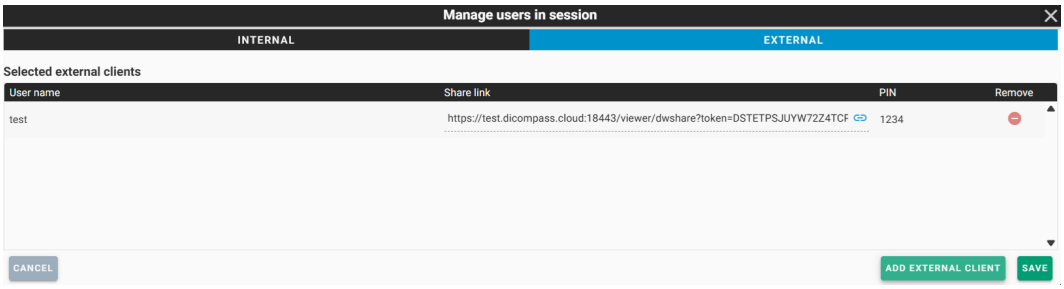


Figure 612: img

Then send the “Share Link” to the external user (for copying you can use the icon) and the selected password. To maintain security, we recommend choosing a different way of communicating link and password information. This will create one-time access for an external user, without access to search in the PACS archive. To remove a user, use the icon .

After finishing adding users, choose the “Save” action, this will start a new online consultation. “Cancel” action cancels the action being performed.

In case of user login in the created online consultation, you will be informed about the number of logined users by the number displayed next to the icon of the “DWshare” tab .

To connected users, the shared examination study will be displayed by the master of the consultation, including the mouse cursor and work on it:

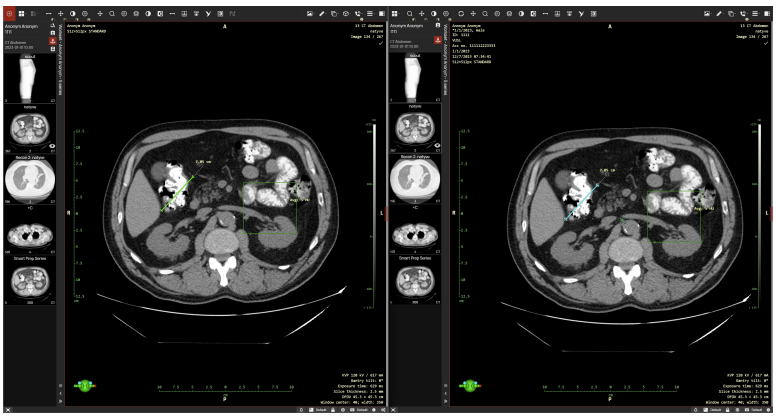


Figure 613: img

9.12.2 Login to the online consultation as an internal user

You have two options for logging in to the online consultation as an internal user, if you are working in DICOM viewer and you are added to the online consultation, the “Incoming request for remote consultation” table will be diaplayed:

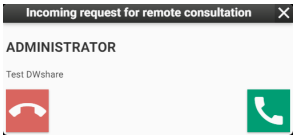


Figure 614: img

If you choose “Accept remote consultation”, the examination study of the master remote consultation and the shared work on it will be displayed.

If you choose “Reject remote consultation” or you are not working on image documentation in DICOM viewer, you can connect to the created online consultation to which you are added using the “Connect” tool . Select the tool to display the “Join the session” table:

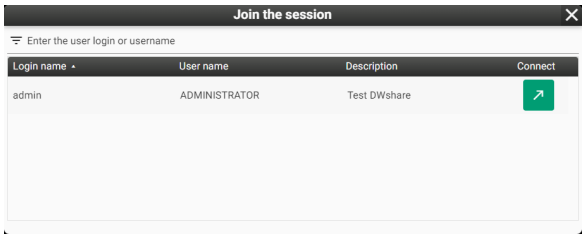


Figure 615: img

Select online consultation and choose the “Connect” action, the examination study of the master remote consultation and the shared work on it will be displayed.

9.12.3 Login to the online consultation as an external user

To log in to the online consultation as an external user, enter the obtained url of the “Share link” into the Internet browser, this will display the login page of the Dicompass Gateway DICOM viewer:

Figure 616: img

Enter the “PIN” and select the “Sign in” action. You will be connected to the online consultation:

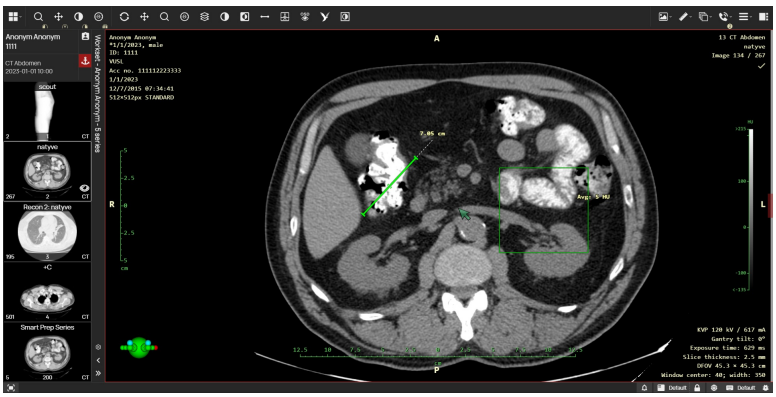


Figure 617: img

As an external user, you can use the following tools for DWshare: - Share cursor - Share actions - Hang up

9.13 DICOM viewer settings

The “DICOM viewer settings” tab contains general tools for managing DICOM viewer settings and preferences.

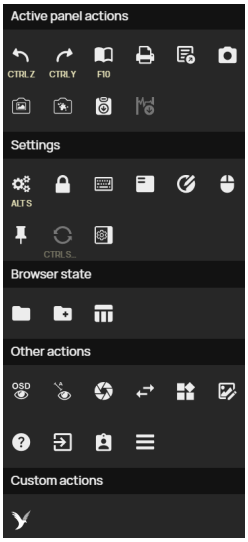


Figure 618: img

This tab contains the following groups of tools:

- Active panel actions
- Settings
- Browser state
- Other actions

9.13.1 Active panel actions

The group of tools “Active panel actions” contains the following tools:

Icon	Function	Description
	Previous Action	allows you to undo the action taken
	Next action	allows you to perform the returned action
	DICOM tags viewer	viewer of DICOM tags that are stored in the displayed image

Icon	Function	Description
	Print	enables you to print the displayed study, see more chapter “Viewer Working set” paragraph “Print”
	Export	allows you to export the displayed study, see more chapter “Viewer working set” paragraph “Export”
	Secondary capture	allows the user to archive the currently displayed image without editing
	Capture active viewer	allows the user to archive the currently displayed image of the active panel, including its measurements and OSD labels
	Capture desktop	allows the user to archive the currently displayed screenshots of the desktop, including its layout
	Capture active viewer to clipboard	select this tool to export a screenshot of the selected panel in the “Image data display window” to the local storage in .png format
	Export ECG	allows the user to export ECG examination results

Figure 619: img

9.13.1.1 DICOM tags viewer The “DICOM tag viewer” tool is used to display DICOM tag information about the selected image/series of the selected study. By selecting this tool, you will display the “DICOM tags viewer” table:

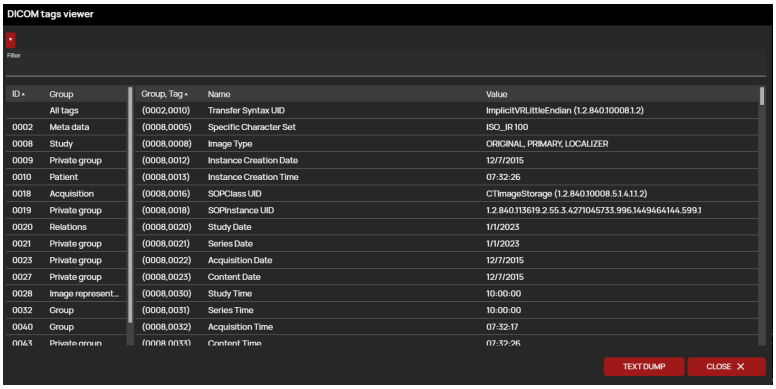


Figure 620: img

To speed up your search, you can enter the desired parameter in the “Filter” field, e.g:

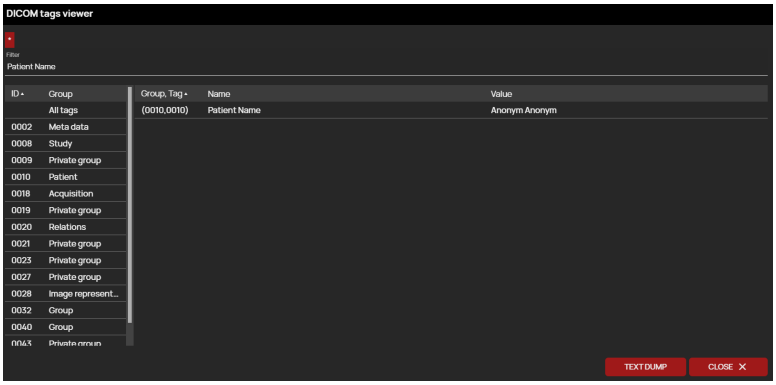


Figure 621: img

The left column shows groups of DICOM tags, and the right column shows individual DICOM tags of the selected group.

The “Text dump” action is used to display all DICOM tags in text form:

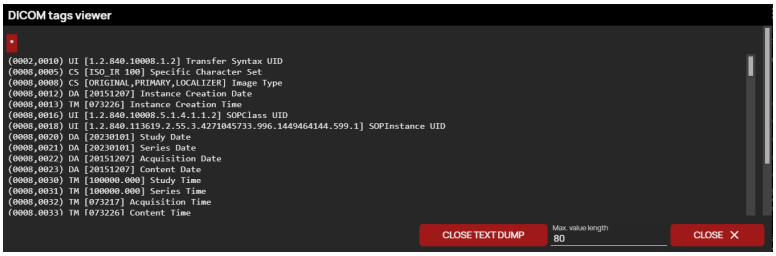


Figure 622: img

The “Close” action allows you to close the “DICOM tags viewer” table.

If you open a sequence with information it is possible to go back to all data using the “*” , located above the search sequence.

Figure 623: img

9.13.1.2 Secondary capture The “Secondary capture” tool is used to save the currently displayed image in the marked “Image data display window” panel without editing and measuring in the image. By selecting this tool, the “Secondary capture” table is called up:

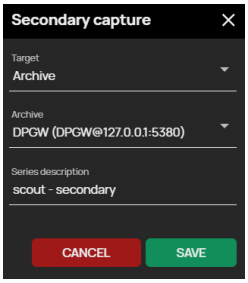


Figure 624: img

This table contains the following fields:

- Target - the option to choose the destination of archiving the image to “Archive”, “User data” or “Station data”
- Archive - in the case of configured multiple PACS archives, you can choose selected archive for saving, the field is active if you have selected “Target” “Archive”
- Series description - allows you to name the saved image
- The “Save” action archives the selected image, the “Cancel” action cancels the performed action

If you have saved the selected image, it will be added to the “Viewer Working Set” and saved to the selected “Target”:

Figure 625: img

Figure 626: img

9.13.1.3 Capture active viewer The “Capture active viewer” tool is used to save the currently displayed image in the marked window “Image data display window”, including its measurements and OSD labels. To save, proceed similarly according to the paragraph “Secondary capture”.

Figure 627: img

9.13.1.4 Capture desktop The “Capture desktop” tool is used to save the currently displayed images in all “Image data display window” panels, including measurements and OSD labels. To save, proceed similarly according to the paragraph “Secondary capture”.

Figure 628: img

9.13.1.5 Capture active viewer to clipboard The “Copy active viewer to clipboard” tool exports a screenshot of the selected panel in the “Image data display window” to the local storage in the “.png” format. This serves as a quick way to save the active image to the user’s PC.

Figure 629: img

9.13.1.6 Export ECG The “Export ECG” tool is used to export the currently displayed ECG series in the active panel “Image data display window” to a text file with ECG examination parameters. Select this tool to start automatic file download.

9.13.2 Settings

The “Settings” tools group includes the following tools:

Icon	Function	Description
	Global configuration	Open system configuration Dicompass Gateway
	Change password	Changing the password of the currently logged in user
	Shortcuts	Displaying or defining new keyboard shortcuts
	Profile editor	Editor for display and location of OSD labels in panels “Image data display window”
	Preset windows management	Defining windowing profiles
	Tool Selection	Adding and editing saved DICOM viewer configurations
	Position of pinned actions	Determining the display order of tools in “User configurable toolbar” and “Context menu”
	Restart windows layout	Reloading the displayed images/series in the “Image data display window”
	Working set configuration	Allows configuration of the “Viewer Working Set” view containing thumbnails of series

Figure 630: img

9.13.2.1 Global configuration The “Global configuration” tool is used to display the configuration of the Dicompass Gateway system. See more chapter “Settings”

Figure 631: img

9.13.2.2 Change password The “Change password” tool is used to change the password of the currently logged-in user. To change the password, select the “Change password” tool, which display the “Change password” table:

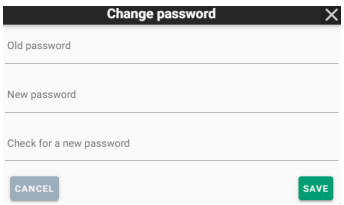


Figure 632: img

To change your password, follow these steps:

- enter the currently selected password in the “Old password” text field
- enter new password in the “New password” text field
- in the “Check for a new password” text field, re-enter the choosed new password to check it
- use the “Save” action to change the password, the “Cancel” action cancels the action

You will be informed about a successful password change with information in the DICOM viewer footer:

Figure 633: img

Figure 634: img

9.13.2.3 Shortcuts The “Shortcuts” tool is used for displaying or defining new Dicompass Gateway viewer shortcuts. Selecting this tool will call up the “Shortcuts config” table:

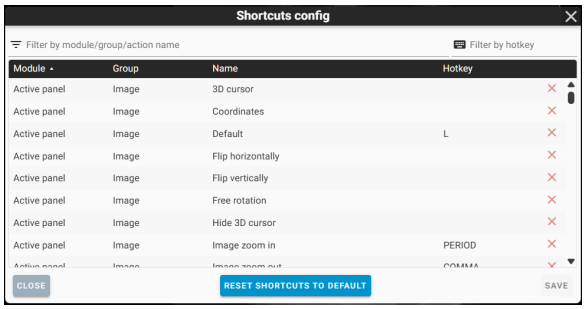


Figure 635: img

To find a specific tool for assigning or modifying a new keyboard shortcut, use the “Filter by module/group/action name” or “Filter by hotkey” text fields.

The individual tools in the table are arranged in columns with the sequence Module -> Group -> Name, in the column “Hotkey”, the currently selected keyboard shortcut is displayed. To remove a shortcut, click the × icon in the selected line of the tool.

To change or edit a keyboard shortcut, click on the line of the selected tool, which will display the table for entering a new keyboard shortcut:

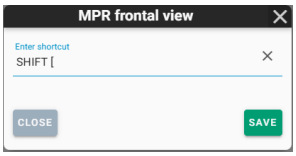


Figure 636: img

Use the “Save” action to insert a new keyboard shortcut for the selected tool, the “Cancel” action cancels the performed action.

If the keyboard shortcut is already in use, when you select the “Save” button, you will see warning information in the footer of the viewer:

Figure 637: img

The “Overwrite” action will be added to the table for defining the keyboard shortcut, which allows you to transfer the keyboard shortcut to a new tool:

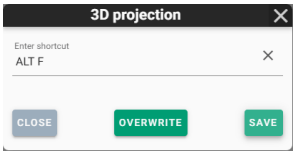


Figure 638: img

Example - Filtered “Frontal view” tool with new assigned keyboard shortcut ALT+F:

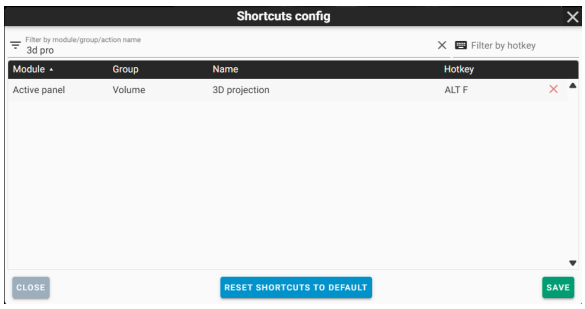


Figure 639: img

With the “Save” action in the “Shortcuts config” table, you save new selected keyboard shortcuts to logged-in user. You will be informed of this fact by the information in the footer of the page:

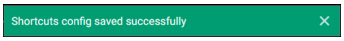


Figure 640: img

Use the “Cancel” action to cancel the action.

The “Reset shortcuts to default” action restores the original layout of the keyboard shortcuts. To restore the original settings, select the “Reset shortcuts to default” action and then the “Save” action. You will be informed about the return to the original settings by the information in the footer of the page:

Figure 641: img

Figure 642: img

9.13.2.4 Profile editor The “Profile editor” tool is used to display and position OSD labels in the individual panels of the “Windows for displaying image data”. OSD labels (On Screen Display) represent information about the given images (their acquisition, date, names, etc.) and the content of the information displayed in the image (size, measurements, etc.).

To change the layout of the OSD labels, select the “Profile editor” tool, which display the “Profile editor” table:

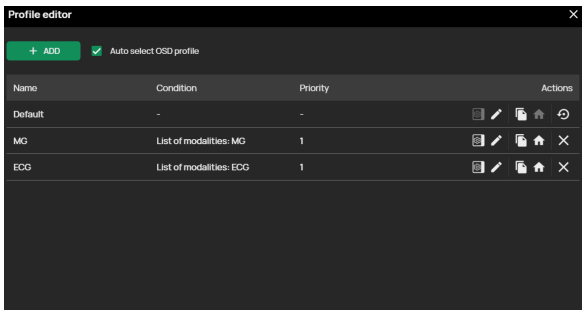


Figure 643: img

This table contains: - ADD Add - actions to create a new OSD label layout - Auto select OSD profile Auto select OSD profile - option to choose automatic selection of OSD labels layout according to the condition, i.e. priority and modality of examination, in case of disabling this function only the default OSD labels layout will be displayed - List of saved OSD label layouts - contains Name, Condition, Priority and specific Actions: - Edit Condition - tool for specifying the condition for automatic OSD profile selection - Edit - tool for editing the created OSD profile - Duplicate - create a new OSD profile with the same parameters according to the selected profile - Set as default - selecting this action will set the selected profile as default - Restore - by selecting this action the selected profile will be set to the default values - Remove - selecting this action will delete the selected profile

Edit Condition

Figure 644: img

Tool for specifying the condition for automatic selection of the OSD profile, selecting this action brings up the table:

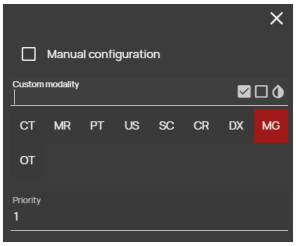


Figure 645: img

This table contains:

- Manual Configuration - a tool to enable/disable the selection of a modality determining condition, selecting this action will not allow the modality to be selected for automatic OSD profile selection
- Text box for selecting a custom modality
- Modality selection for automatic OSD profile selection
- Priority - specify the priority for automatic OSD profile selection, the highest priority is number 1

Create a new OSD profile

To create a new profile, choose the “Add” action + ADD to create a new empty profile, or choose the “Duplicate” action from the desired profile line, selecting this action will duplicate the assigned OSD profile values. Selecting the “Add” or “Duplicate” action will bring up the “Profile editor” table:

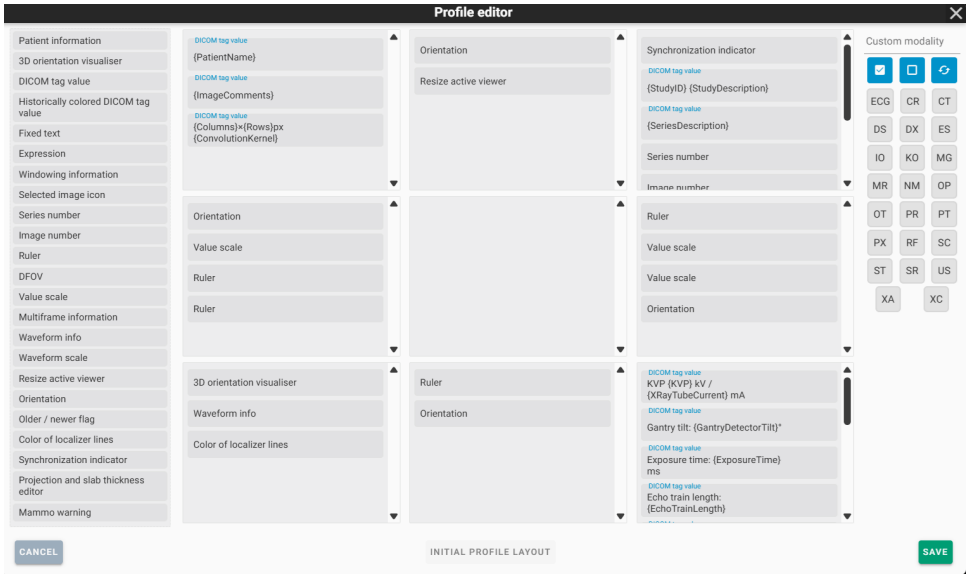


Figure 646: img

In this table, it is possible to edit the profile for displaying selected OSD labels under certain conditions:

- **Profile name**

The “Profile name” text field allows you to name the new created profile. To name it, enter the text in this text field:

Figure 647: img

- **Layout of OSD labels in the image**

This part of the table clearly shows the distribution of the OSD labels in the image into 9 parts:

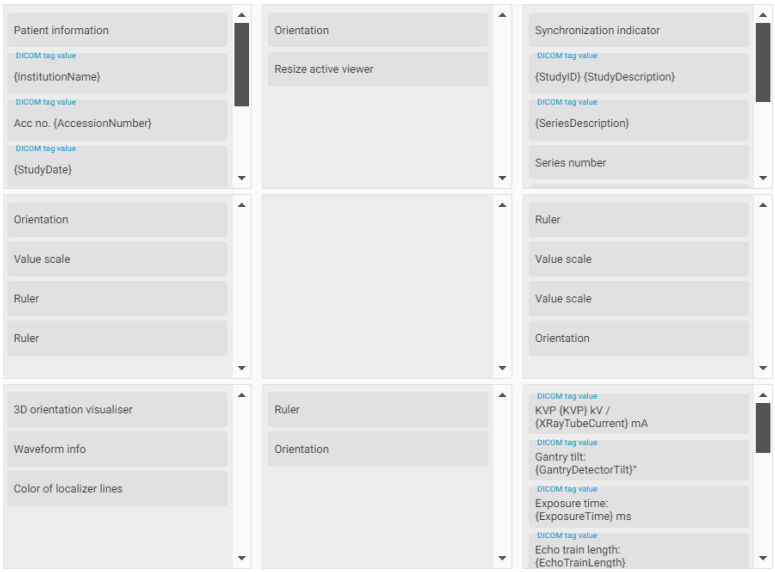


Figure 648: img

Individual assigned OSD labels can be “Edited” or “Removed” by hovering the mouse over the selected OSD label and selecting one of the icons:

Figure 649: img

By selecting the “Edit” action, you will display table for editing the OSD label.

9.13.2.4.1 OSD label: DICOM tag value Text field `Value caption` specifies the template into which the values of the tags listed in the item `Codename values` are added. The position in which the value is replaced is written as empty braces `{}`. Tag names are entered as an 8-digit hexadecimal number. E.g. we write the Patient’s Name tag (0010,0010) as `00100010`. The individual values are then separated by a comma. The format `sequence_tag[index]/tag` is used to enter the sequence. An integer (numbering starts from 0) or an asterisk (`*`) can be used as an index , which means that we want to use all the descendants of the sequence and connect the values with a comma.

For example, the template can look like this: `Name: {}, sex: {}` and values `00100010,00100040`

If we would like to list all patient identifiers from the sequence, the following settings can be used: Template: `Additional patient identifiers: {}`, values: `00101002[*]/00100020`

9.13.2.4.2 OSD label: Expression The https://pub.dev/packages/expressions library is used to process expressions. You can also find syntax information on this page.

In addition to the basic syntax, the following features are supported:

- `string(value)` - converts `value` to a string
- `replace(value,pattern,replacement)` - replaces all matches of the regular expression `pattern` with `replacement` in `value`
- `digits(value,digits)` - converts the `value` number to a string with a fixed number of decimal places specified in the `digits` parameter
- `nonNull(a,b,c)` - supports 2-3 parameters and returns the first one that has a `non-null` value
- `time(value)` - converts the timestamp to a time in the format corresponding to the language setting
- `date(value)` - converts the timestamp to a date in a format corresponding to the language setting
- `dateTime(value)` - converts the timestamp to a datetime in a format that matches the language setting
- `abs` - absolute value
- `round` - arithmetic rounding to a whole number
- `floor` - rounding down to the nearest whole number
- `ceil` - rounding up to the nearest whole number

Example expressions:

```
time(nonNull(${(0008,0032)?},${(0008,0033)?}))
digits(${(0018,0088)}-${(0018,0050)},1)
```

- **Modalities**

This part of the table allows you to select the modalities for which this OSD label profile will be displayed:

Figure 650: img

- **OSD label items**

This part of the table contains individual OSD labels for assignment to “Layout of OSD labels in the image”:

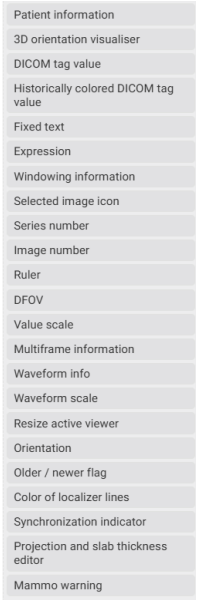


Figure 651: img

To add an OSD label, click the left mouse button on the selected OSD label and hold and drag to move it to the selected part “Layout of OSD labels in the image”, releasing the mouse button will place the OSD label in the selected part and the editing table will be display (this table may differ according to the selected OSD label):

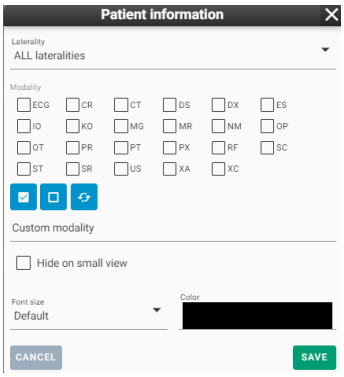


Figure 652: img

In this table, edit the parameters of the OSD label. After finishing, press the “Save” action to insert the

OSD label into the selected section “Layout of OSD labels in the image”, press the “Cancel” button to cancel the action.

- Use the “Cancel” button in the “Profile editor” table to cancel the action
- The action “Initial profile layout” will remove the changes made to the OSD labels
- The “Save” action will save the changed “Profile editor” profile

If you have saved a new profile, it will be displayed in the “Label layout” table and can be edited using the “Edit condition”, “Edit”, “Duplicate”, “Set as default”, “Remove” tools:

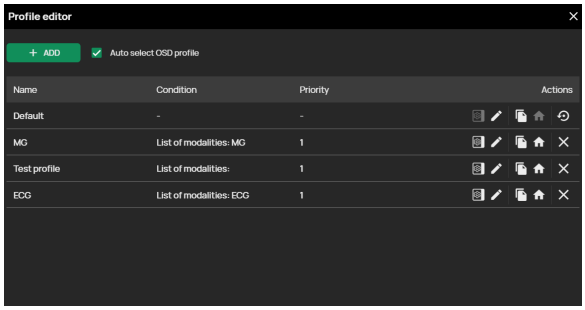


Figure 653: img

9.13.2.4.3 OSD label: Historically colored DICOM tag value OSD labels can be colored according to the DICOM tag value contained, from lowest to highest, using this palette:

Figure 654: img

A colored OSD label can be created using the following steps: - In the window for creating or editing the layout of OSD labels, drag the OSD label “Historically colored DICOM tag value” to the selected field for display, e.g.:

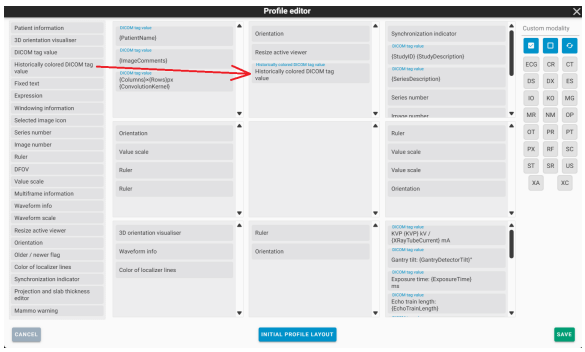


Figure 655: img

- This will display the “DICOM tag value” table. In this table, select:
  - the displayable OSD name and brackets {}, in which the DICOM tag value will be displayed
  - DICOM tag
  - modalities for which this value will be displayed

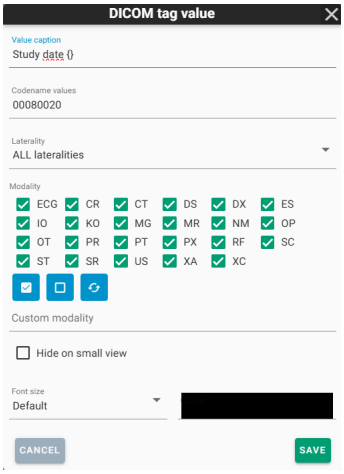


Figure 656: img

- After saving the OSD profile, the OSD label will be displayed according to the selected location:

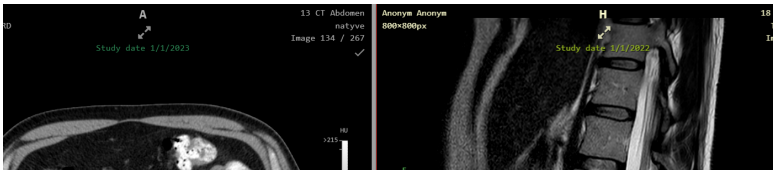


Figure 657: img

Figure 658: img

9.13.2.5 Preset windows management The “Preset windows management” tool is used to define the windowing profiles of selected windows. By selecting this tool, you will display the “Windowing preset” table:

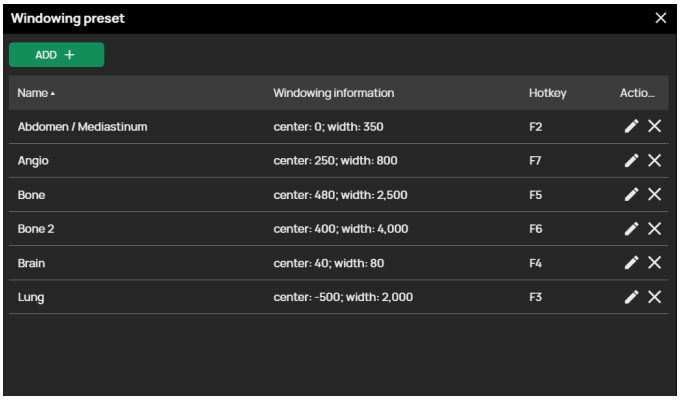


Figure 659: img

This table shows the individual created profiles. The columns contain information about presets: - Name - windowing name - Windowing information - windowing preset center and width value - Hotkey - selected keyboard shortcut for applying the windowing preset - Actions - contains actions for “Edit” and “Remove” the predefined windowing preset

The “Add” action allows you to create a new predefined windowing preset. Select this action to display the “Add” table:

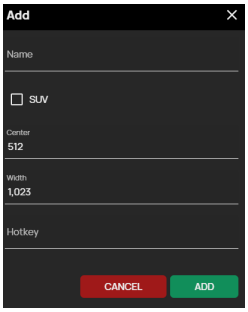


Figure 660: img

In this table, select the desired parameters for the new profile and then select the “Add” button to add the new profile to the ” Window preset” table. The “Cancel” button cancels the action performed.

To make the work easier, in this table the values of the center and width of the window are selected according to the currently displayed image, the checkbox “SUV” indicates the use of Standardized Uptake Value.

Figure 661: img

9.13.2.6 Tool Selection The “Tool Selection” tool is used to add and edit saved DICOM viewer configurations. Selecting this tool display the “Tool selection” table:

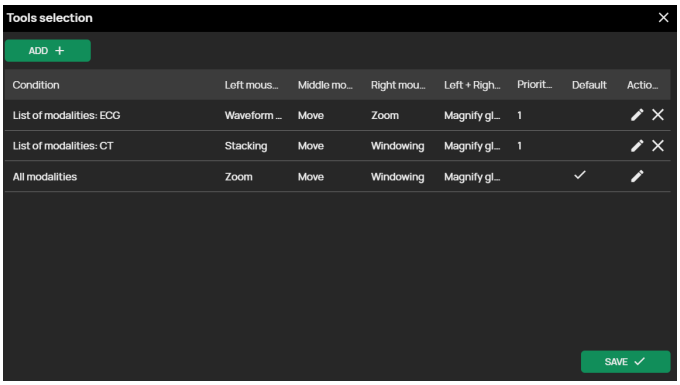


Figure 662: img

This table contains:

- **Viewer configuration profiles** - individual columns on the profile row contain the selected parameters, the “Actions” column contains “Edit” buttons to call up the profile parameter configuration table and the “Delete” button to remove the selected profile.
- **Button “Save”** - saves the changes made
- **Button “Add”** ADD + - selecting “Add” calls up the table for creating a new viewer configuration profile:

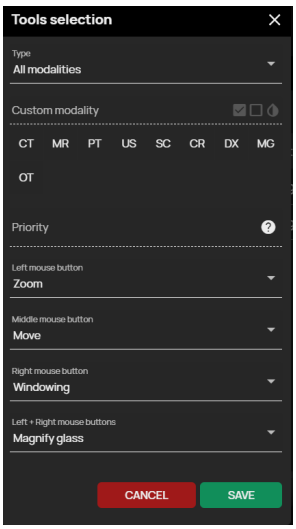


Figure 663: img

This table contains:

- Type - option to choose for which modality the configuration will be set, you can choose from:
  - All modalities
  - List of modalities
- Modality - text field for entering individual modalities, this window is active if you have chosen “List of modalities”, enter modalities in this window and separate them with a comma, e.g. CT, MR, PT, etc.
- Priority - The priority determines the order in which the tools will be selected. Tools with a priority of 10 will be selected before those with a priority of 1
- Left, Middle, Right mouse buttons - drop-down menu for defining the selected tool on the mouse button, in this line, after expanding the menu, click on the selected tool for assignment, move in this menu with the mouse wheel:

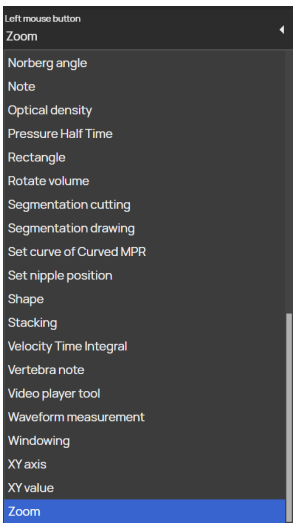


Figure 664: img

- Left + right mouse button - drop-down menu for defining the selected tool when the left + right mouse button is pressed at the same time, this menu contains only some tools:

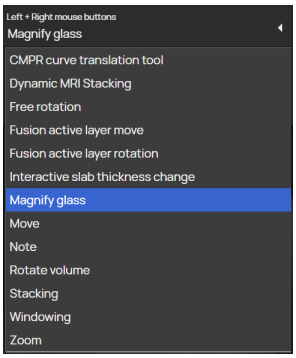


Figure 665: img

- The “Save” button saves the defined viewer configuration, the “Cancel” button cancels the action performed. The changes will be applied at the next login to the system Dicompass Gateway. In case you want to return to the defined viewer configuration while working, you can use the “Select default tools” keyboard shortcut, this keyboard shortcut must be defined first, see paragraph “Shortcuts”.

The change to switch to the default tools can also be controlled using the functions located in the “Display toolset” under the “Default tools” tab:

- “Resetting after the active viewer change” - When switching to another panel in the “Image Data Display Window”, the currently assigned tools on each mouse button will be replaced by the

default tools

Figure 666: img

9.13.2.7 Position of pinned actions The “Position of pinned actions” tools are used to determine the order in which the tools are displayed. Select this tool to call up the “Position of pinned actions” table:

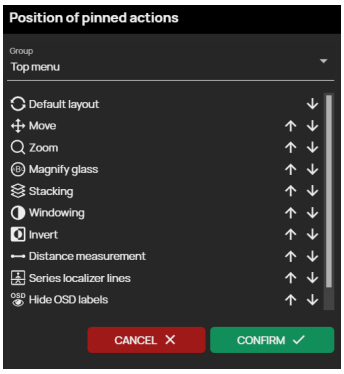


Figure 667: img

In this table, use the “Group” drop-down menu to select the desired area to reposition the tools:

- Top menu - tools in “User configurable toolbar”
- Mobile menu - tools in the “User configurable toolbar” in mobile mode
- Context menu - tools in the “Context menu”

The position of the tool can be changed by clicking on the arrows located to the right of the selected tool.

After making the required changes, choose the “Save” action to save the changed state, the “Close” action cancels the action.

Tools in the “Position of pinned actions” table, you can choose the settings of the display of tools, see the chapter “DICOM viewer tools” paragraph “Display tools”.

Figure 668: img

9.13.2.8 Restart windows layout The “Restart Window Layout” tool is used to reload viewer windows. If you have a multi-monitor workstation with multiple viewer windows running and you close one of these windows, you can use this feature to reload the display and distribution of all windows according to the system’s display configuration settings.

Figure 669: img

9.13.2.9 Working set configuration Selecting the “Work Set Configuration” tool brings up the “Work Set Configuration” table, which allows the user to modify the Viewer work set sidebar, select the viewer work set side position, and switch between the flexible and optimal viewer work set configurations:

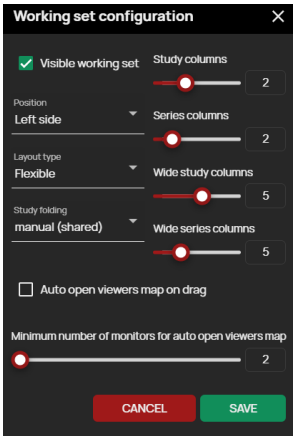


Figure 670: img

Warning: turning off viewer working set display can be reverted in the viewer configuration tools tab by turning it on in the “Working set configuration” tool.

9.13.3 Browser state

The “Browser state” tools group includes the following tools:

Icon	Function	Description
	Load viewer state	View saved DICOM viewer states

Icon	Function	Description
	Save viewer state	Saving or sharing edited study, including its measurement, post-processing, localization, etc.
	Save state as hanging protocol	Takes the current view of the DICOM viewer state and inserts these parameters into the configuration of the new hanging protocol

Figure 671: img

9.13.3.1 Load viewer state The “Load viewer state” tool is used to work with and display saved DICOM viewer states. To create a DICOM viewer state, follow the “Save viewer state” paragraph. By selecting this tool, you will display the “Browser states” table:

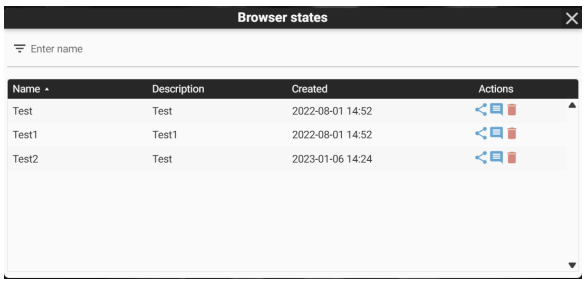


Figure 672: img

In this table, it is possible to filter individual saved DICOM viewer states using the “Enter name” text field.

This table contains saved DICOM viewer states and allows you to perform actions on them:

- Share - this action allows you to share the saved DICOM viewer state with other users logged into the Dicompass Gateway system. Selecting this action will display the “Manage users” table where you can add users to share the saved state. You can use the check boxes to assign them rights for further sharing “Share” or for possible modification of the status “Edit”. The “Save” action activate sharing to users, the “Cancel” action cancels the action:

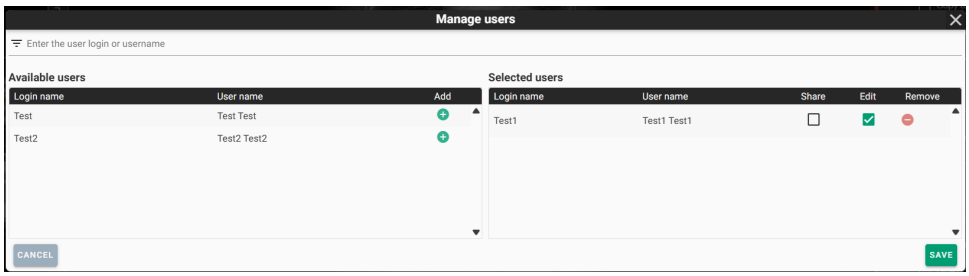


Figure 673: img

- Comments - the “Comments” action is used for sending messages and writing information about the saved state. By choosing this action, you will display the “Comments” table. Enter text in the “Comment” text field and press the “Add” action ADD + to add a comment. This comment will then be visible to shared users.

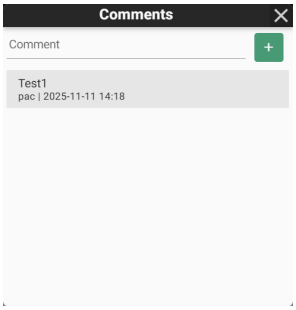


Figure 674: img

- Remove - removes the saved DICOM viewer state. By choosing this action, you will be asked to confirm or cancel by the YES/NO action, using the “Question” table. If you confirm the removal of the saved state, you will be informed about the successful removal of the state by information in the footer of the DICOM viewer:

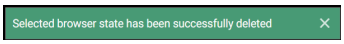


Figure 675: img

Figure 676: img

9.13.3.2 Save viewer state If the work in the browser must be finished and you want to continue it later, it is possible to save all the work for the possibility of reloading. The entire state of the windows,

the studies in progress are saved. This status can still be shared with other users, who can add their comments to it. It is a so-called off-line consultation.

By selecting this tool, you will display the “Save browser state” table:

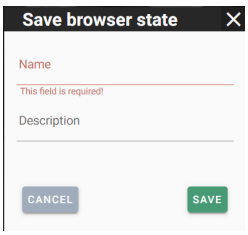


Figure 677: img

In this table, enter in the “Name” text field the name of the state and “Description” more detailed information about the state. Use the “Save” action to create a new saved DICOM viewer state, use the “Cancel” action to cancel the action. You will be informed about successful saving by information in the DICOM viewer footer:

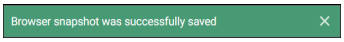


Figure 678: img

Figure 679: img

9.13.3.3 Save state as hanging protocol The “Save state as hanging protocol” tool accepts the current display of the DICOM viewer status and inserts these parameters into the configuration of a new hanging protocol, opening the “Hanging protocol manage” window for possible specification of parameters. More detailed information about the creation of hanging logs can be found in the chapter “My hanging protocols”.

9.13.4 Other actions

The “Other Actions” tool group contains the following tools:

Icon	Function	Description
	Hide OSD labels	Hiding/displaying OSD labels in individual windows “Image data display window”
	Hide overlay	Hide/show saved measurements in the image
	Display shutter	Allows you to hide all pixels that are outside the specified area
	Reverse windows order for HP	Reversing the order of applied hanging protocols on individual monitors
	Hanging protocols enabled	Disables/enables the option to display hanging protocols
	Image editor	Tool for editing the selected image
	Help	Product label view and User Guide link
	Logout	Logging out and ending work in the Dicompass Gateway system
	All Studies of Patient	View all studies performed on the selected patient
	Active viewer context menu	Display the context menu on the selected mouse button (if this function is not selected, it is possible to call up the context menu by right-clicking on the panel with the image)

Figure 680: img

9.13.4.1 Hide OSD labels The “Hide OSD labels” tool is used to hide/display the OSD labels in individual windows “Image data display window”. Select this tool to hide the OSD labels:

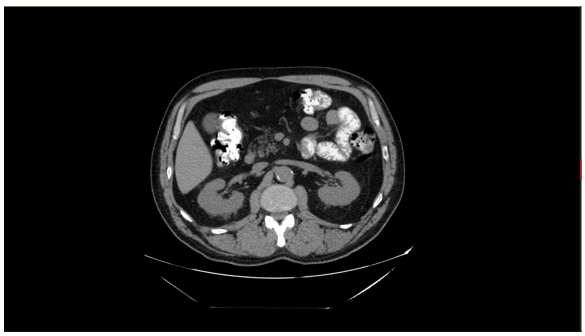


Figure 681: img

To display the OSD labels, select this tool again, the OSD labels will be displayed:

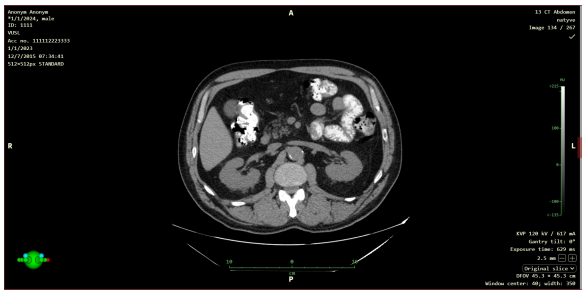


Figure 682: img

Figure 683: img

9.13.4.2 Hide overlay The “Hide overlay” tool allows you to hide/show saved measurements in the image. Selecting this will hide the saved measurements:

Figure 684: img

To display the overlayed measurements in the image, select this tool again, the saved measurements will be displayed:

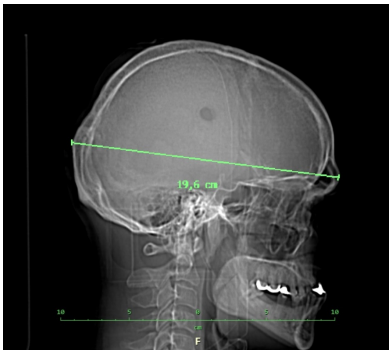


Figure 685: img

Warning: The “Hide overlay” tool is used to hide measurements entered directly into the DICOM image information, the so-called overlay. This tool does not hide measurements saved as “PR” - presentation state.

Figure 686: img

9.13.4.3 Display shutter The “Display shutter” tool allows you to hide part of the image where appropriate. Turn on this function to hide part of the image:

Figure 687: img

Selecting this action again will disable this feature:

Figure 688: img

Figure 689: img

9.13.4.4 Reverse windows order for HP In case you have set hanging protocols for multiple monitors, the “Reverse windows order for HP” tool reverses the order of applied hanging protocols on the monitors, i.e. that the hanging protocol for the second monitor will be displayed on the first monitor and vice versa.

When you choose this tool, you will be notified by the system of the information: “Reverse windows order for HP: Yes/No”.

Figure 690: img

9.13.4.5 Hanging protocols enabled The “Hanging protocols enabled” tool disables/enables the option to display hanging protocols. In case of deactivation, the “Hanging protocols” icon will be inactive .

When you choose this tool, the system will alert you with the information: “Hanging protocols enabled: Yes/No”.

For more information about displaying hanging protocols, refer to “Viewer Tools” (“Selecting a Hanging Protocol”). The HP settings are described in the section “Hanging Protocols Settings”.

Figure 691: img

9.13.4.6 Image editor The “Image Editor” tool allows the user to create a new edited image, e.g. with a change of side marking, image flipping or rotation.

To edit an image, follow these steps:

- open the selected image for editing in the “Image data display window” and keep the image panel active
- select the “Image Editor” tool to call up the “Image Editor” tab:

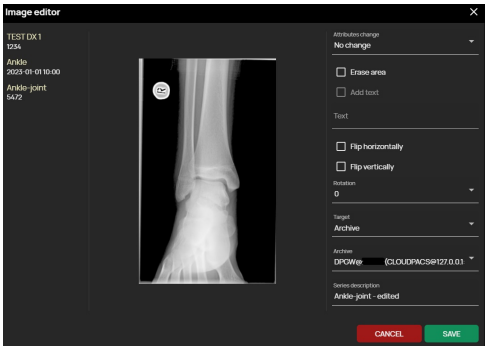


Figure 692: img

- the table contains:
  - left column - patient’s name with ID, study name with date of creation and series name with image value
  - middle column - preview of the edited image
  - right column - options for image editing and save destination
- to edit the image, use the options in the Right column, which includes:
  - Attributes Change - the ability to edit the side labels of the mammography image:

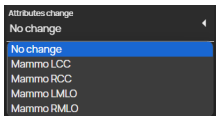


Figure 693: img

  - Erase Area - this function adds the option to mark the part of the image to be erased. After selecting this tool, hover over the desired area and click and drag to create a rectangular selection of the area to be deleted:

Figure 694: img

- Add text - if you have selected and marked “Erase area”, it is possible to select the function “Add text”. Use the “Text” field to enter the desired text, which will then be inserted in the place of the “Delete area” marking:

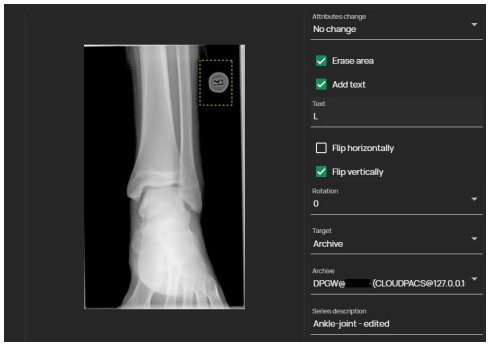


Figure 695: img

- Flip horizontally - flips the image according to the horizontal axis
- Flip vertically - flips the image according to the vertical axis
- Rotation - select to rotate the image in degrees “°” using the text field
- select “Target” (archive, station, user), if archive destination is selected, select the chosen “Archive” and name the saved image in “Series description”

- selecting the “CANCEL” action cancels the work performed, selecting the “SAVE” action saves the modified image according to the selected “Target” and adds it to the viewer working set.

For example, the saved image looks like this:

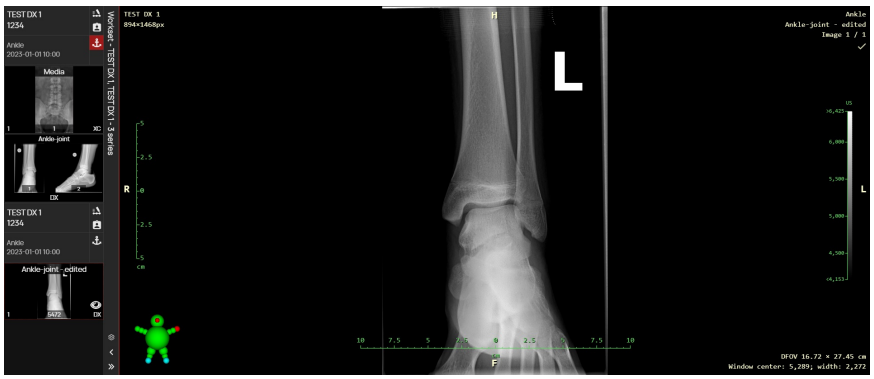


Figure 696: img

Figure 697: img

9.13.4.7 Help The “Help” tool is used to display a table containing basic information about the product, with the option of opening this “User guide”:

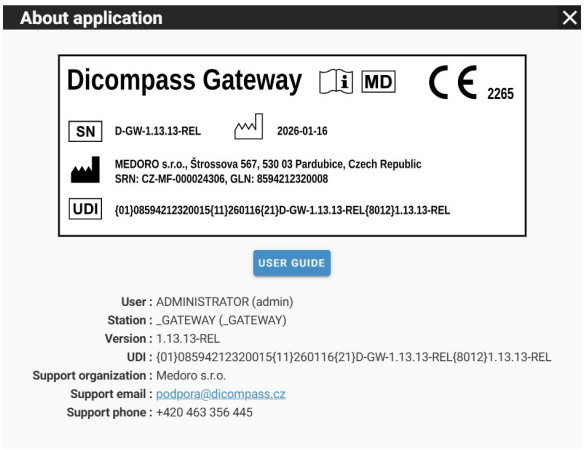


Figure 698: img

Figure 699: img

9.13.4.8 Logout The “Logout” tool is used for logging out and ending work in the Dicompass Gateway system.

Selecting this tool will display a page for a possible re-login:

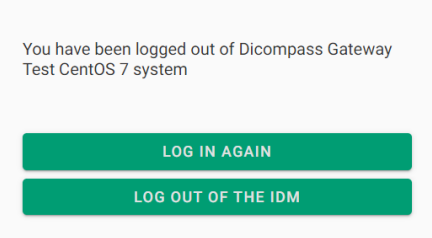


Figure 700: img

By selecting the “Log in again” action, you will be redirected to the Dicompass Gateway system login page.

Figure 701: img

9.13.4.9 All patient studies By selecting the “All patient studies” function, you will call up a table at the bottom of the screen displaying all the performed examinations of the selected patient. For more information, refer to the paragraph “Function All patient studies”.

9.13.5 Custom actions

The “Custom Actions” tool group contains the following tools:

Icon	Function	Description
	Artificial Intelligence	Submitting a Study to Evaluate Abnormalities Using Artificial Intelligence (the icon is only displayed if AI is integrated into the product interface)

Figure 702: img

9.13.5.0.1 Artificial Intelligence The “Artificial Intelligence” tool is used to submit a study to evaluate abnormalities using artificial intelligence (AI).

Warning: This tool is only available if you have purchased and installed an AI license and this AI is integrated in the DPGW system.

Warning: the “Artificial Intelligence” tool is only used to send anonymised data to a third-party application, which is artificial intelligence (AI) and is integrated with this application. The DPGW system does not contain or perform its own AI analysis. DPGW allows the automatic sending of anonymized data to the AI without user intervention according to configured rules. The DPGW system automatically downloads results from the AI in the background and stores them in the PACS according to the system configuration, or passively receives outputs directly from the AI, which are stored and accessed without the need for active downloading. If the AI is integrated in the DPGW system, the AI manual is provided by the AI manufacturer or is part of the AI output stored with the appropriate examination study.

To submit a study for AI evaluation, follow these steps:

- Open the desired study in a DICOM viewer window
- Select the “Artificial Intelligence” tool from the “Custom actions” tool group
- You will be informed about the initiation of the AI submission and evaluation process:

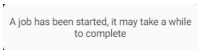
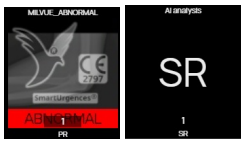


Figure 703: img

- To update the “Viewer Worksets” sidebar items, we recommend turning on the “Watch study for changes” function, see the “Workset Floating Panel” chapter

Example of X-ray study evaluation

Evaluation of the study using AI, this study will be supplemented with PR (Presentation state) and SR (Structured report) items:



In the case of a positive abnormality finding, PR  will be marked, in the case of a negative abnormality finding, PR  will be marked.

When the image is displayed in the DICOM viewer window, abnormalities will be marked, including text describing the abnormality:

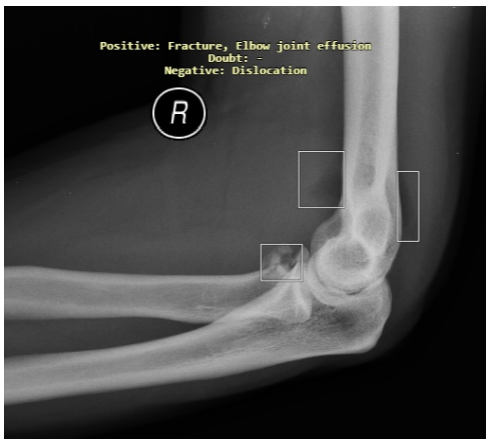


Figure 704: img

To hide the AI evaluation, select the function , located under the upper right OSD label. Selecting this action brings up a drop-down menu for selecting a view:

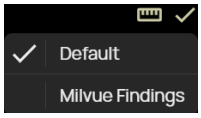


Figure 705: img

Keyboard shortcuts can be used to toggle AI evaluation or other measurements. These are not set in the default interface and must be assigned using the “Keyboard Shortcuts” tool located in the “Viewer Settings” tab under “Load next/previous saved measurements”.

The created SR contains the text of the conclusion evaluated by artificial intelligence.

Patient

Anonym Anonym
*1/1/2023 , male
ID: 1111

Study

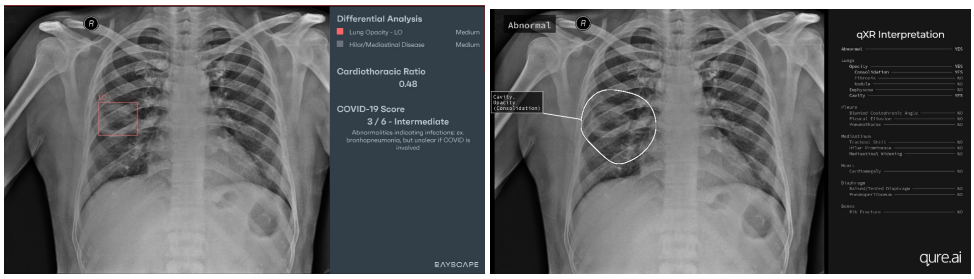
Accession number : 1122233444555
Date of examination : 1/1/2023 10:00:00
Study description : CR HAND

Language of Content Item and Descendants: English
Observer Type: Device
Device Observer Manufacturer: Milvue
Device Observer Name: SmartUrgences®
Device Observer Model Name: v1.20-8170f5c9
Findings :
Finding: hand radiography

No evidence of acute fracture or dislocation.
Bone density is normal.

Figure 706: img

Examples of study evaluation using AI by Rayscape and QureAI:



Example of CT study evaluation

Evaluation of the study using QureAI's AI, this study will be added with OT (Other) items:

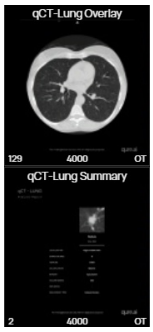


Figure 707: img

The first OT item contains a series of CT scans, including the display of the abnormality marked in the series progress bar:

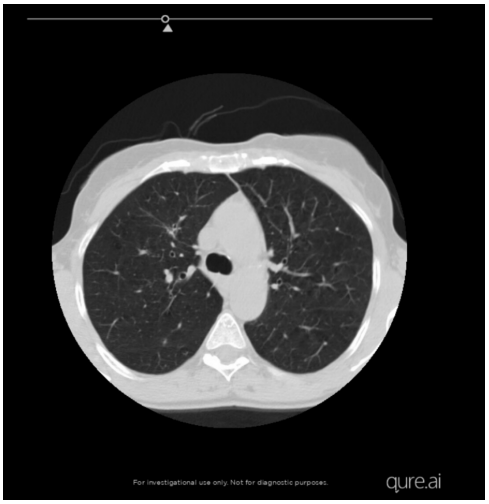
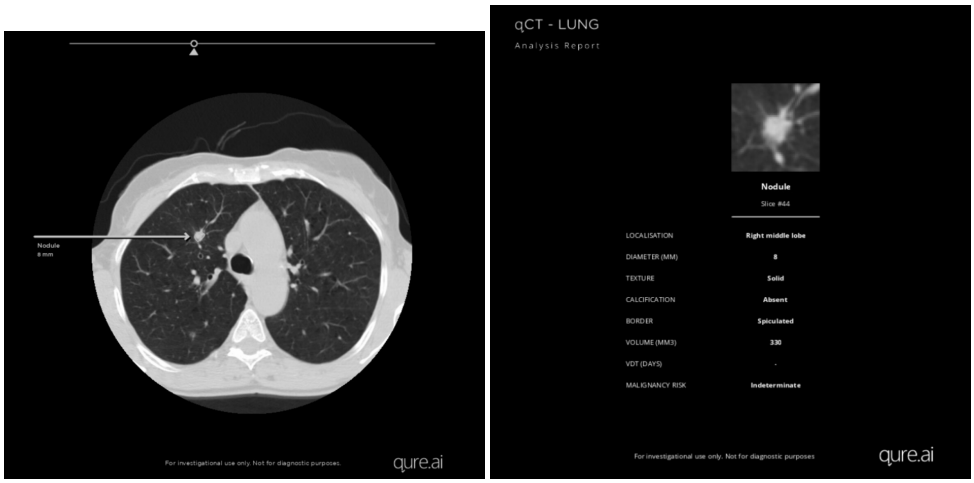


Figure 708: img

The second OT item contains the displayed abnormality finding and the detected finding:



Warning: The artificial intelligence function serves as a supporting tool for evaluating data from RDG modalities, so it does not replace the expert work of a radiologist. The performing physician is responsible for the final report of the examination evaluation.

10 Settings

In this chapter, the third main part will be described, namely the Dicompass Gateway configuration. This dialog can be displayed from the main menu ≡ by selecting the category “Settings” located in the upper right corner of the basic registry dialog. Another option for opening the “Settings” dialog is

from the DICOM viewer dialog, from the “DICOM viewer settings” tools group and selecting the “Global configuration” tool .

Choose one of these actions to open the “Settings” dialog:

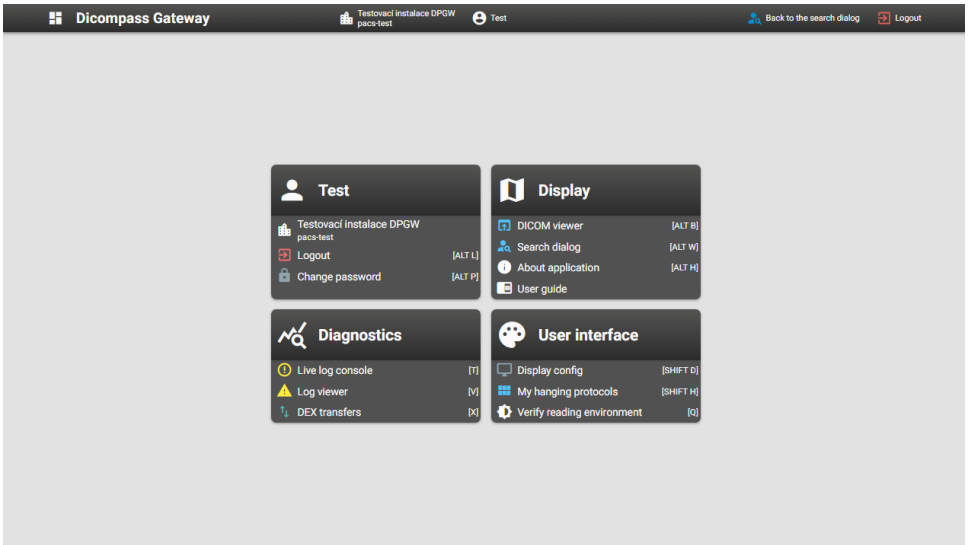


Figure 709: img

In case you opened “Settings” from the basic registry dialog and now want to close it, choose the icon Back to the search dialog, which you return to the previous work in the basic registry dialog. In case you opened “Settings” from the DICOM viewer dialog and now want to close it, select the icon by selecting this icon Back to the viewer, which you return to the previous work of the DICOM viewer dialog.

If you want to return from the configuration tool dialog to the main “Settings” dialog, use the icon .

If you want to log out of the DPGW system, select the “Logout” icon Logout.

The main dialog “Settings” contains configuration tools that are located in individual tabs, these are: - “User” - Display “Display” - Diagnostics “Diagnostics” - User interface “User interface”

Warning: Individual configuration tools are displayed based on the rights assigned to the user. If you need advanced system configuration, contact your administrator. All configuration tools are described in the administrator’s manual.

Warning: In the case of a DPGW system located in the cloud, the main dialog “Settings” also contains the tab “Account statistics” . This tab contains: - Tariff name - Number of opened studies - Storage usage - Number of users - External share links

10.1 User

Figure 710: img

The “User” tool group contains the following tools:

Icon	Function	Description
	Archive Name	Contains the name of the archive used DPGW
	Logout	Logging out of the system DPGW
	Change password	Changing the password of the currently logged in user

10.1.1 Change password

Figure 711: img

The “Change password” tool allows you to change the password of the currently logged-in user. By selecting this tool, you will display the “Change password” table:

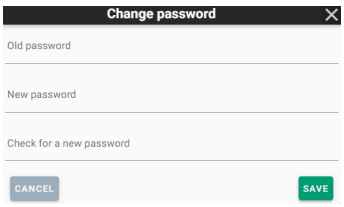


Figure 712: img

By choosing the “CANCEL” action, you cancel the action being performed. By selecting the “SAVE” action, a new password will be applied, according to the specified parameters. You will be informed about a successful password change in the footer of the screen:

Figure 713: img

10.2 Display

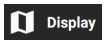


Figure 714: img

The “Display” tool group includes the following tools:

Icon	Function	Description
	DICOM viewer	Returning to the DICOM viewer dialog
	Search dialog	Returning to the basic registry dialog
	About application	Display information of the DPGW system, including its label
	User guide	Display this user manual

10.2.1 About application

Figure 715: img

The “About application” tool is only informative, containing basic information and the system label DPGW. By selecting this tool, you will display “About application” table:

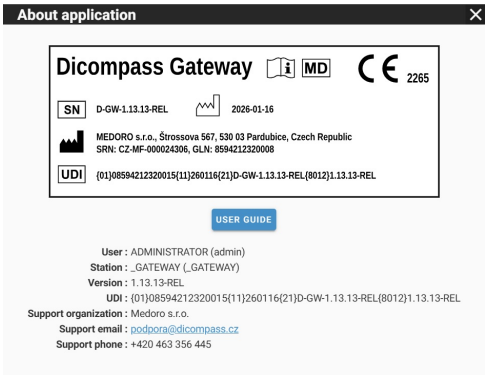


Figure 716: img

Close this table by selecting the “X” action.

10.2.2 User guide

Figure 717: img

The “User guide” tool is used to display this user manual. Selecting this tool will display a new web browser window containing this user manual.

10.3 Diagnostics

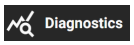


Figure 718: img

The “Diagnostics” tool group contains the following tools:

Icon	Function	Description
	Live log console	View the DPGW activity log in real time
	Log viewer	preview and search in already saved system log files DPGW
	DEX transfers	preview and search received and sent studies using the mDEX inter-hospital exchange network

10.3.1 Live log console

Figure 719: img

The “Live log console” configuration tool is used to display the DPGW activity log in real time. Using this configuration tool, it is possible to obtain detailed information about the processes performed by the system.

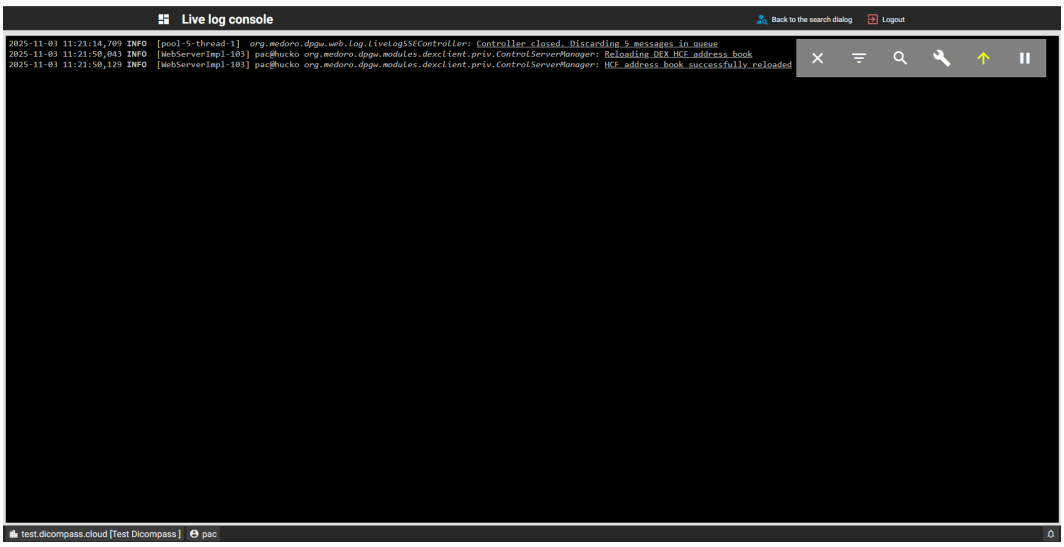


Figure 720: img

The configuration tool “Live log console” contains several tools to facilitate the work. These tools are located in the upper right corner of the dialog “Live log console”: - “Clear log console” - with this tool it is possible to clear the console - “Set log filter” - selecting this tool will display a line for possible console log filtering:

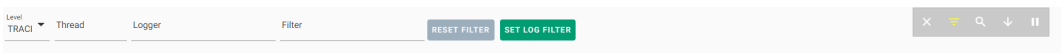


Figure 721: img

- “Log search” - selecting this tool will display a line for a possible search in the console log:

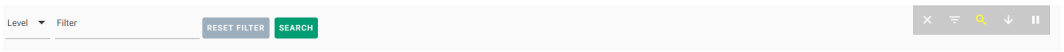


Figure 722: img

- Set log level - selecting this tool will bring up a line for possible logging level settings:

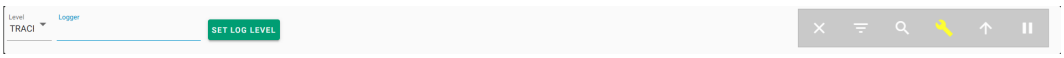


Figure 723: img

- “Autoscroll” - selecting this tool will always display the last line of information in the log console with autoscrolling
- “Pause log events” - choose this tool to pause the information listing in the log console lines

10.4 Log viewer

Figure 724: img

The “Log viewer” configuration tool is used for previewing and searching in already saved log files and thus allows you to obtain more detailed information about the operation of the DPGW system. Selecting this tool display the “Log viewer” dialog:

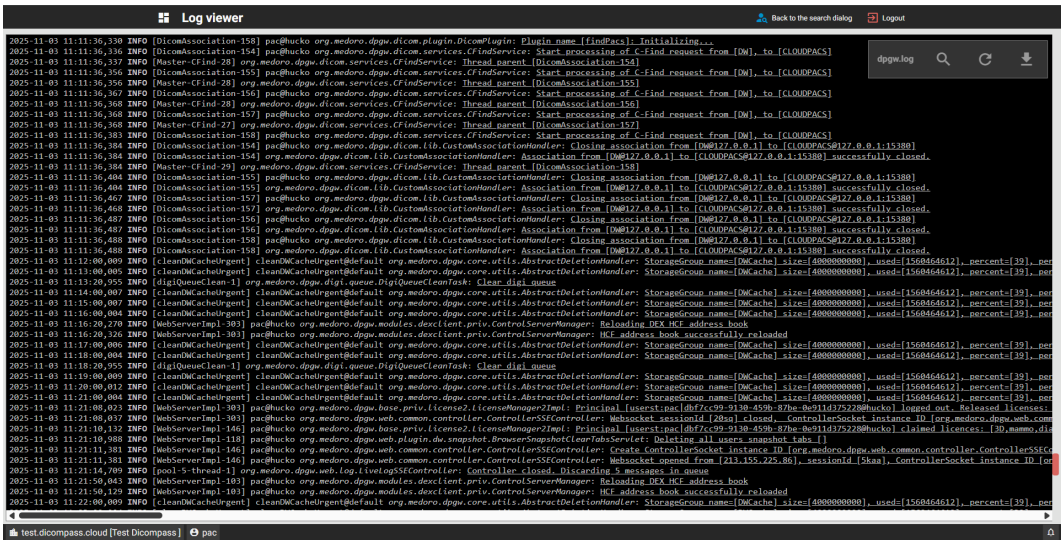


Figure 725: img

The configuration tool “Log viewer” contains several tools to facilitate the work. These tools are located in the upper right corner of the “Log viewer” dialog: - “Log file name” dpgw.log - by choosing this tool it is possible to open selected log file, e.g.:

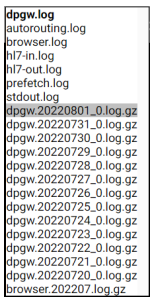


Figure 726: img

The text in the tool icon is displayed according to the name of the currently opened log file.

- “Log search” - selecting this tool will display a line for a possible search in the “Log viewer”:

Figure 727: img

- “Refresh log file” - “Log viewer” does not display information in real time, it is only used for reading saved information, so use “Refresh log file” tool to obtain latest information
- “Download log” - by selecting this tool, you will start downloading the open log in the “Log viewer” dialog to the station’s local storage in .log format, it is o text file with selected log

10.5 DEX transfers

Figure 728: img

The “DEX transfers” tool is used to preview and search for data received and sent via the mDEX inter-hospital network. Select this tool to display the search dialog for:

- Received data
- Sent data

These dialogs contain a history of sent/received data and filtering using text fields: - Sender/receiver - sending/receiving healthcare facility - Patient name - Patient identification - ID - Object identification - UID study

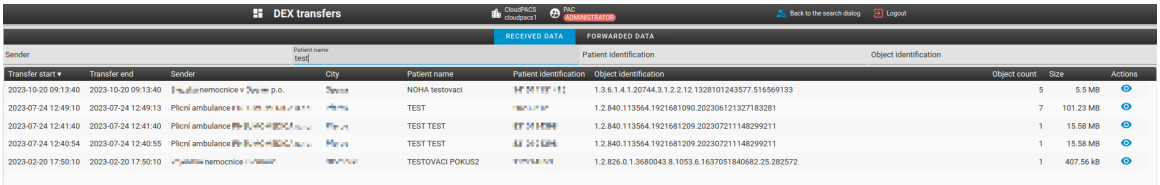


Figure 729: img

For more information about the sent/received study, use the “eye” action on the right side to call up the study detail dialog:

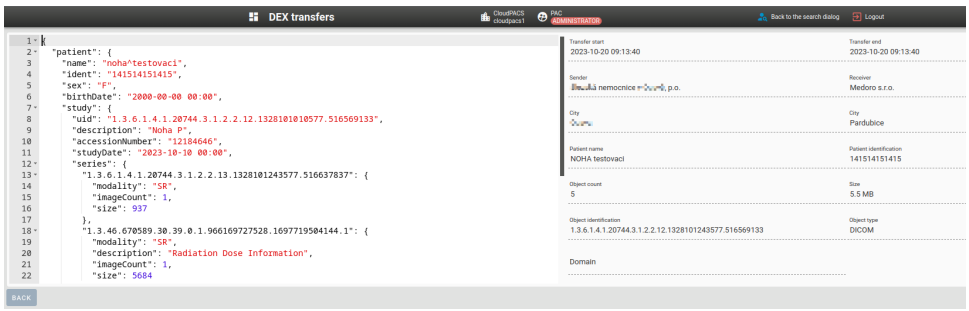


Figure 730: img

Use the “Back” action to return to the “DEX Transfers” dialog.

10.6 System tools

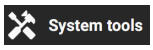


Figure 731: img

The “System tools” tools group contains the following tools:

Icon	Function	Description
	External share management	List of shared links used and option to manage them

10.6.1 External share management

Figure 732: img

By selecting the “External share management” tool, you can view the shared links used for external sharing of image documentation via a URL address/QR code and the selected pin. This tool allows you to manage these shared links and view information. Selecting the “External share management” tool opens an overview dialog box:

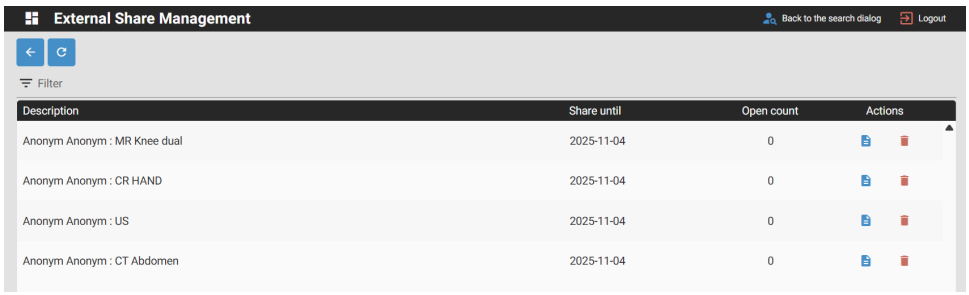
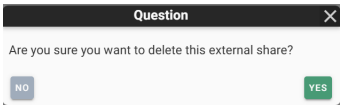


Figure 733: img

The following functions are located in the header of this dialog box: - Back - return to the global settings interface - Reload - this function serves as a refresh, i.e. reloading the list of shared links - Filter Filter - text field for entering filter values to make it easier to search the list of shared studies

The next part is the list of shared links itself, which is divided into individual columns: - Description - contains the patient's first and last name and a description of the examination study - Share until - the expiration date of the shared link (after this date, the shared link will be deleted) - Open count - contains the total number of times the image documentation has been opened using the shared link - Actions - this column contains the following actions - Detail - Selecting this action will display a table containing the details of the shared link, in this case the study UID:

- Delete - action to remove a shared link; selecting this action will bring up a table to confirm the deletion of the link:



10.7 User interface

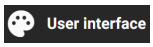


Figure 734: img

The "User interface" tools group contains the following tools:

Icon	Function	Description
	Display config	Configuring display of DPGW on the monitors connected to the workstation
	My hanging protocols	Editing and management of hanging protocols stored on the logged in user
	Verify reading environment	Indicative verification of the suitability of the environment for the purpose of diagnosis

10.7.1 Display config

Figure 735: img

The “Display config” configuration tool is used to configure the display of DPGW monitors connected to the workstation. Select this tool to open the “Display” dialog:

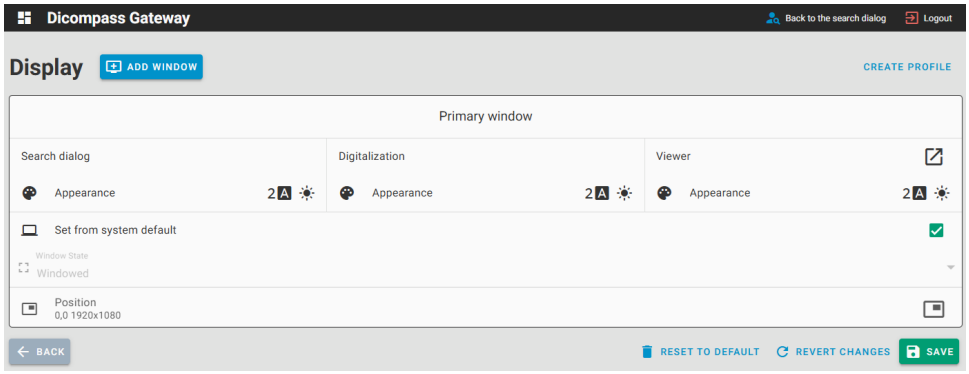


Figure 736: img

1. **Primary window settings**

In the “Primary window” table it is possible to select the parameters of the primary window of the system DPGW:

Primary window appearance

The appearance table allows you to select the parameters of the user interface (UI) display in the following dialogs: - Search dialog - this is the UI of the individual system tabs, such as “ARCHIVE”,

“RECENTLY VIEWED”, “USER”, “STATION”, etc. - Digitalization - this is the UI of the Digitalization module located in the “DIGITALIZATION” tab of the system - Viewer - this is the UI of the DICOM viewer

To change the appearance, click on the “Appearance” field of the desired part of the system to bring up the “Appearance” table:

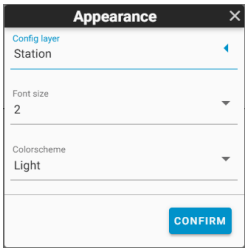


Figure 737: img

In this table, select the desired UI parameters: - Config layer - the selected appearance can be applied per user (the appearance will be saved to the logged-in user account) or per station (the selected appearance will be applied to the current workstation, for all logged-in users) - Font size - the possibility to select the size of the UI system display - Color scheme - the possibility to select the color scheme of the UI system to “Light, Dark, Grayscale”:

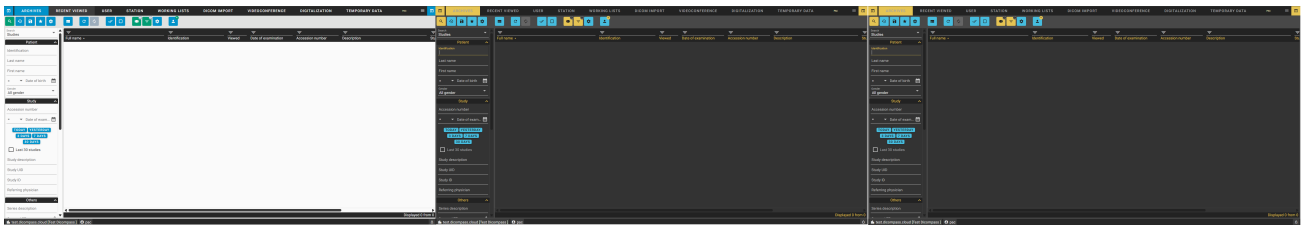


Figure 738: img

If you want to apply the changes, select the “CONFIRM” action, after that the text of the changed appearance will be color-coded:

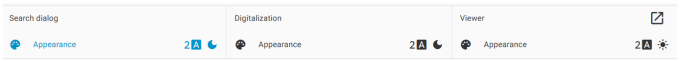


Figure 739: img

Primary window system settings

In the main window table, it is possible to configure the display of system windows DPGW:

- Set from system default

Figure 740: img

If this tool is active, it takes the monitor screen resolution settings from the workstation's operating system settings. By default this tool is active, in case you want to change the resolution and monitor position of the primary window dialog display, deactivate this tool.

- Window state

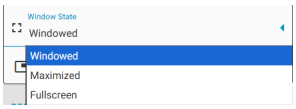


Figure 741: img

Option to choose the layout of the web browser in the following states:

  - Windowed - in reduced form
  - Maximized - across the entire screen
  - Fullscreen - across the entire screen, including hiding the status bar

Warning: Changing the "Window state" is only possible if the "Set from system default" tool is disabled.

- Position

Figure 742: img

Tool for assigning a separately opened browser window on the selected monitor. Depending on the individual monitor resolution or system settings, there are 2 types of assigning browser windows to the desired monitor (this type is enabled only if you have the "Manage windows" function of the web browser enabled):

  - Click in the " Position " line to open the monitor selection window, then select the desired monitor by clicking in the appropriate field to assign the "Primary window":

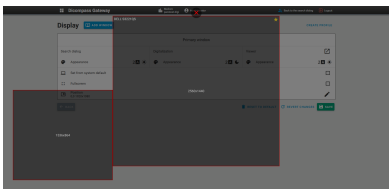


Figure 743: img

– Selecting the “Manual location” icon to the right of the same line, a web browser pop-up window will open, which you drag to the top left corner of the desired monitor, where the “Primary window” dialog will be assigned:

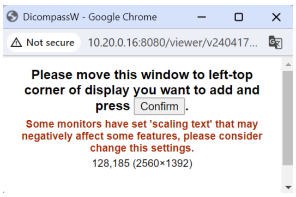


Figure 744: img

2. **Adding a window/monitor**

To add another window/monitor, select the “ADD WINDOW” action ADD WINDOW to add the “Viewer window” table to the right of the “Primary window” table:

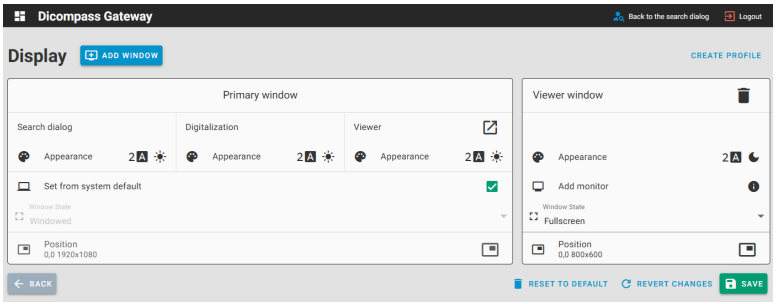


Figure 745: img

This table contains similar setup tools as the “Primary window”, but includes an extra feature:

- Add monitor Add monitor - this function is used to split one web browser window into several DICOM viewer windows, it serves as a so-called “splitscreen”. This function is suitable where the multi-monitor workstation does not have sufficient HW performance and it is possible to spread one web browser window over multiple monitor screens. When this action is selected, a field will be displayed with the option to select the number of identical monitors using a drop-down menu:

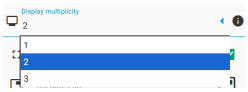


Figure 746: img

If more than one monitor is selected, the browser window will be split:

Figure 747: img

To remove the added window, select the “Remove” action .

In case you want to configure a multi-monitor station with displaying the “Search dialog” and “Digitalization” windows on a separate monitor and the “Viewer” window on another monitor screen, select the “Viewer on another screen” action located in the “Primary window” -> “Viewer” table. Selecting this function will split the table:

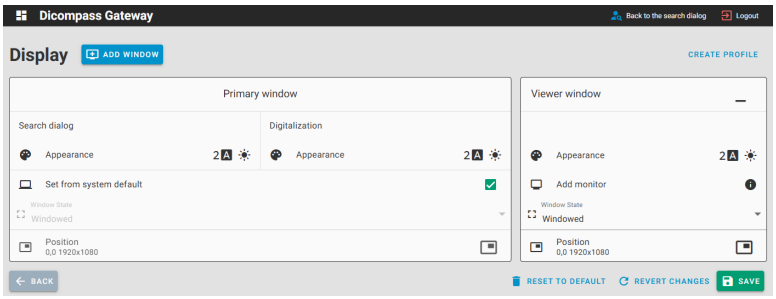


Figure 748: img

To configure the display of the separate “Viewer window”, follow the same procedure as in the previous paragraphs. To merging the windows, use the “Viewer under search dialog” action located in the header of the “Viewer window” table.

Warning: If you have configured multiple windows/monitors, it is necessary to enable the “Pop-ups” function in your web browser:

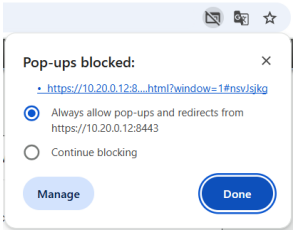


Figure 749: img

3. **Create profile**

In the “Display” dialog, it is possible to save a display profile that is associated with the layout from the currently connected monitors. If the user works at multiple workstations, he can set individual display settings at specific workstations and is not limited to saving only the display per user. The DPGW system recognizes the monitors connected to the workstation and adjusts the display according to the set profile.

To create a new profile, select the “Create profile” action CREATE PROFILE. Selecting this action will replace it with the profile selection box:

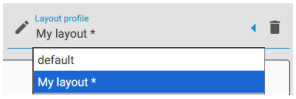


Figure 750: img

The following two profiles are then available: - Default - this is the default display setting applicable to the user or station. - My layout - this is a display setting that is only applicable to the station you are currently working with and cannot be applied to another station

To remove the added profile, select the action “Remove profile” 🗑 located to the right of the selected profile “My layout”.

4. **Display dialog window actions**

The footer of the “Display” dialog box contains actions for reverting and managing changes that have been applied to the settings:

- Back ← BACK - Action to return to global system settings DPGW
- Reset to default RESET TO DEFAULT - Select the action to return to the default configuration of monitor display settings. Selecting this action will pop up the table to reload the system:

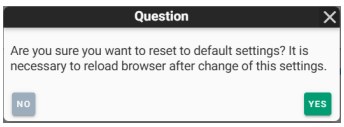


Figure 751: img

- Revert changes REVERT CHANGES - by selecting this action it is possible to reverse the changes made in the settings
- Save SAVE - select this action to save and apply the configuration of monitor display settings. Selecting this action will pop up a table to reload the system:

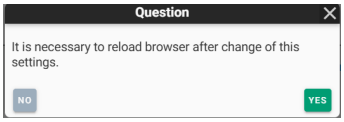


Figure 752: img

5. **Web browser extension “DICOM viewer extension”**

To make working with the DPGW system easier and more comfortable, use the “DICOM viewer extension” add-on. This add-on provides automatic placement of windows on each set monitor screen. In case this add-on is not installed and you have multiple monitors set up, individual windows are opened on one monitor only and the user then manually drags them to the selected monitors. The add-on can be found in the “Extensions” section of the Chrome web browser, by opening the “Chrome web store” and typing “DICOM viewer extension” in the search box:

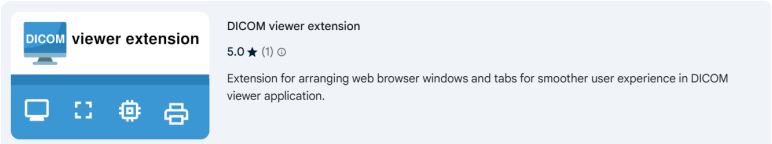


Figure 753: img

10.7.2 My hanging protocols

Figure 754: img

The “My hanging protocols” configuration tool is used for editing and managing hanging protocols stored on the logged in user. For more information about configuration hanging protocols, go to the

chapter “Setting Hanging Protocols”.

10.7.3 Verify reading environment

Figure 755: img

The configuration tool “Verify reading environment” is used for indicative verification of the suitability of the environment for the purpose of diagnostics. Select this tool to open the “Verify reading environment” dialog:

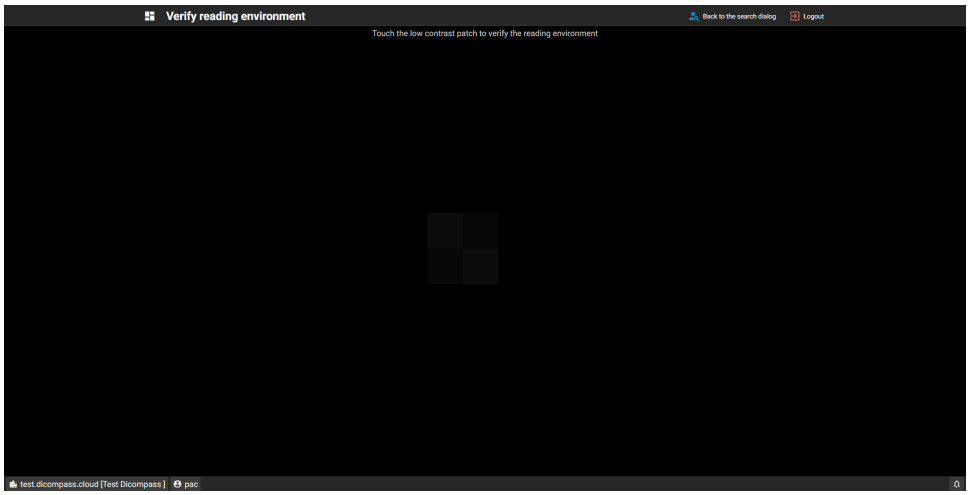


Figure 756: img

In this dialog, click the low-contrast check box to verify the suitability of the environment for diagnostic purposes. If you click on the low-contrast box, you will be notified of successful verification:

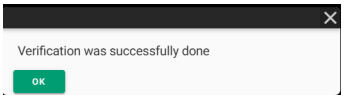


Figure 757: img

By selecting the “OK” action, you will be returned to the main “Settings” dialog.

If you click outside the low-contrast box, you will be notified of a failed verification:

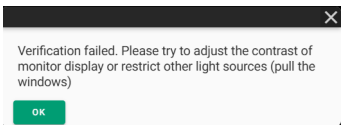


Figure 758: img

After selecting the “OK” action, the configuration tool “Verify reading environment” will still be opened with the option of clicking on the low-contrast box.

Warning: Please note that this quality check is only indicative. To verify the quality and suitability of the environment for diagnosis, use safety technical checks and calibration of diagnostic monitors as medical devices.

If set by the administrator, periodically validation of diagnostic monitors can be used. You will be prompted for this validation by a pop-up table with the option to perform the verification, or the option to postpone this verification with a certain number of postponements, after the completion of the postponement deduction, it will be necessary to perform the verification. Verification will be required every time Dicompass Gateway is run for the first time on a given station. The performed validations is recorded in the “Display device validation audit” tool and for individual stations in the administrator section “Settings”.

11 Setting Hanging Protocols

Hanging protocol (HP) is used to display images with parameters provided that the specified conditions are met.

This user guide contains basic HP settings, created and saved per logged in user. If advanced HP configuration is required, contact your DPGW system administrator. Advanced HP configuration is described in the Administrator’s Guide.

To edit and manage HP, display “Hanging protocols manage” dialog using the configuration tool “My hanging protocols” located in the main “Settings” dialog:

Figure 759: img

Select this tool to open the “Hanging protocols manage” dialog:

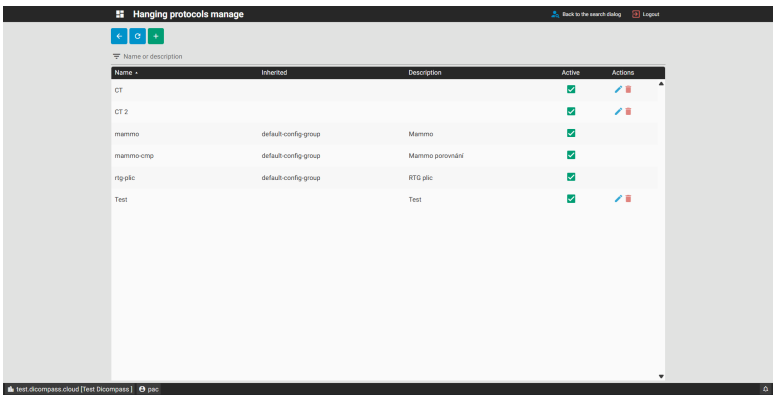


Figure 760: img

The dialog “Hanging protocols manage” contains:

- “Add HP” action + - by choosing this tool it is possible to create a new HP
- “Reload” action - selecting this tool will refresh opened dialog “Hanging protocols manage”, , which serves similarly to the “refresh” of the Internet browser
- Text field “Name or description” Name or description - this text field is used to search for selected created HP
- Field with created HPs - here you will find HPs created by the logged in user. This field contains:
  - HP name and description
  - Active - option to choose whether the given HP should be displayed/hidden in the DICOM viewer DPGW
  - Actions - the action column contains icons for editing HP “Edit” and icon for removing HP “Remove”

Figure 761: img

- “Back” action BACK - selecting this action will return you to the main “Settings” dialog

HP can be created in two ways, by clicking the “Add HP” action + from the “Hanging protocols manage” dialog, or by selecting the “Save state as hanging log” from the “DICOM viewer settings” tools group tab in the DPGW DICOM viewer.

11.0.1 Creating a new HP “Add HP”

Figure 762: img

To create a new HP, select the “Add HP” action  from the “Hanging protocols manage” dialog. This will redirect you to the new HP dialog box:

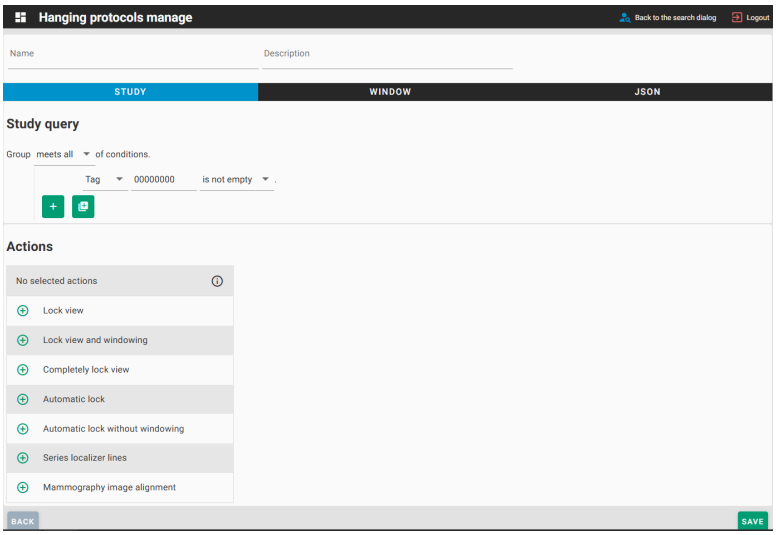


Figure 763: img

In the header of the dialog, it is possible to name the new HP using the “Name” text field and describe more detailed information about the HP in the “Description” text field.

The dialog contains three tabs for entering parameters: - “Study” - contains parameters for the HP application - “Window” - contains HP display parameters - “JSON” - configuration file in JSON format

“Back” action  - selecting this action will redirect you to the “Hanging protocols manage” dialog

The “Save” action  is used to save new HP to the logged-in user.

11.0.1.1 Study tab The “Study” tab contains parameters for the HP application according to the specified conditions:

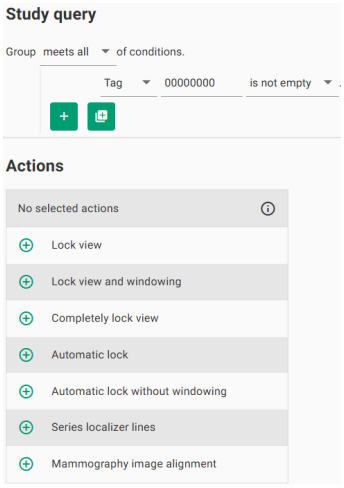


Figure 764: img

The study tab is divided into two areas:

1. **Study query**

This area contains conditions for initiation HP and is organized into a tree of condition groups, think of it as a file system where each file is located in a specific folder. The tree of groups and conditions can look like this, for example:

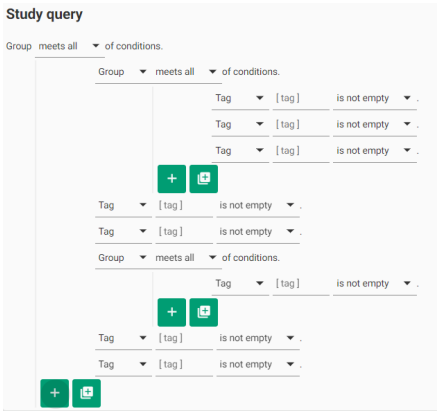


Figure 765: img

The main group, or any subgroup, may have certain conditions for initiation HP. These conditions can be displayed by clicking on the text “meets all” in the text “Group meets all of conditions.”:

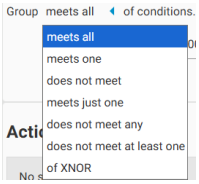


Figure 766: img

To add a new condition, select the “Add condition” action .

To add a new subgroup, select the “Add group” action .

By hovering the mouse over the added condition, it is possible to include it in a new group with the “Wrap with group” action, or remove it with the “Remove” action:

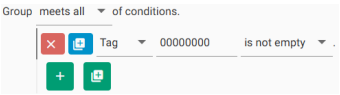


Figure 767: img

The value of the condition can be changed by clicking on the “Tag” field and choosing the selected range of values:

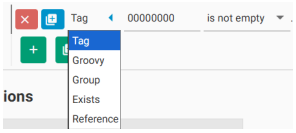


Figure 768: img

It contains the following areas: - Tag - the option to choose a value according to the selected DICOM tag of the study, by clicking in the second field [tag] you will display a scrolling menu for choosing the selected DICOM tag:

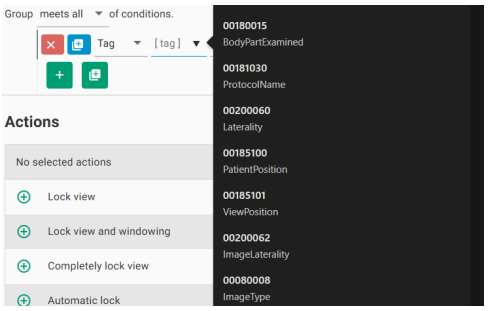


Figure 769: img

Click in the third field, in this case “is not empty” you can choose a value condition:

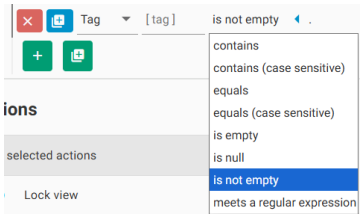


Figure 770: img

By choosing a value condition other than “is empty”, “is null” and “is not empty”, a fourth text field [value] will be displayed, in which you can enter the required parameter:

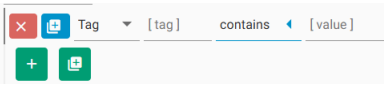


Figure 771: img

Here is an example of the selected HP display condition for the CT modality, according to the CT Modality DICOM tag:

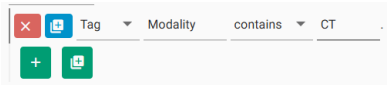


Figure 772: img

- Groovy - option to choose a value according to the Groovy script, enter the script value in the text field:

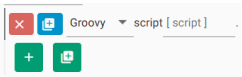


Figure 773: img

- Group - by selecting this area, you change the condition to a group
- Exists - by selecting this area, you will place the condition in the condition initiation state if it exists:

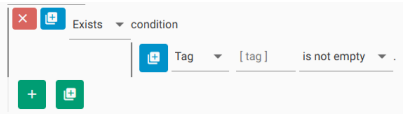


Figure 774: img

- Reference - by selecting this field, you can enter a reference to the created reference condition in the JSON configuration file of the HP settings into the text field

2. **Actions**

The second area in the create new HP dialog is the “Actions” area. This area contains the possible application of tools to the created HP. You can find a description of the individual tools in the “DICOM viewer tools” chapter.

The applicable tools are contained in this area and can be added by clicking on the row of the selected tool:

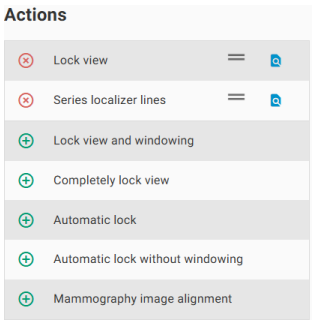


Figure 775: img

Click on the row of the added tool to remove this tool from the added list.

Click and drag the = icon to change the order of the tool in the added list.

Click the icon to go to the “JSON” tab and view the selected tool.

11.0.1.2 Window tab The “Window” tab contains tools for configuring the display of DICOM viewer layouts and assigning HP information. Go to this tab after completing the settings of the “Study” tab.

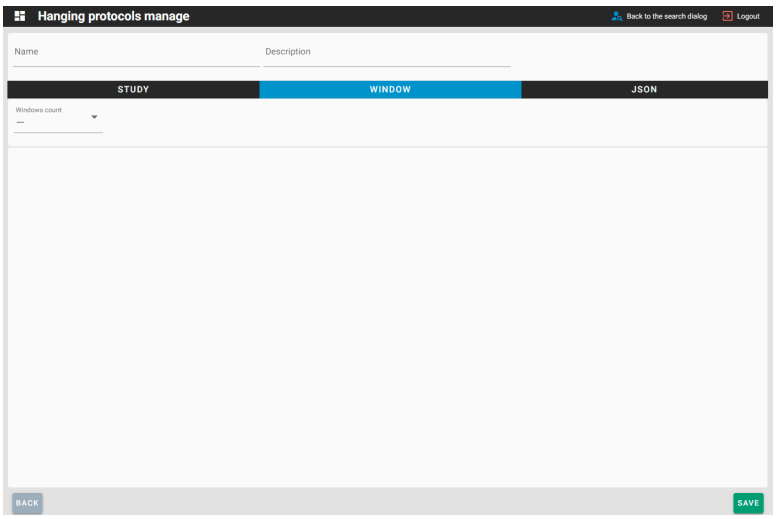


Figure 776: img

To set the HP display in this tab, proceed as follows:

- choose the number of monitor screens on which the DPGW DICOM viewer dialogs will be opened and press the “Add” icon:

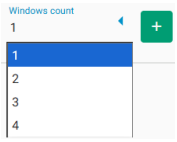


Figure 777: img

- this has created the HP display configuration and it is possible to continue working with it.

Now the “Window” tab now contains three subfolders “Basic data”, “Series”, “Layout”:

1. **Basic data**

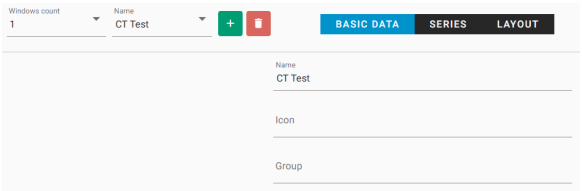


Figure 778: img

In this subfolder, type in the text fields - Name - naming HP, the name will be displayed in the DICOM viewer DPGW - Icon - assignment of an icon to HP (icons correspond to Google fonts and can be found

here: https://fonts.google.com/icons, after entering their name, the selected icon will appear) - Group - naming the HP group and then adding it to the HP groups displayed in the DICOM viewer DPGW

2. **Series**

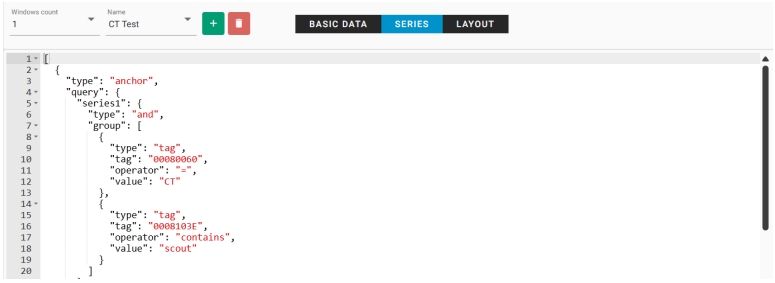


Figure 779: img

The “Series” part of the JSON configuration file is displayed in this subfolder. This is an advanced settings management, please contact your administrator to configure it.

3. **Layout**

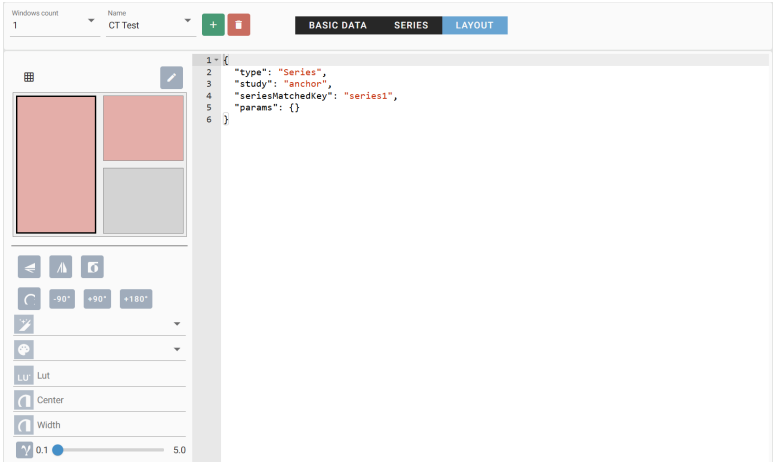


Figure 780: img

This subfolder contains tools for displaying series in a DPGW DICOM viewer dialog. This subfolder contains:

- Panels layout:

To layout panels, click the ⊞ icon and select the layout of the panels:

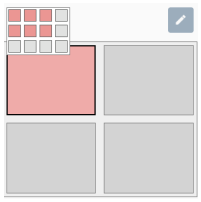


Figure 781: img

This layout can be entered manually by clicking the icon and changing the number of “rows” and the number of “cols”:

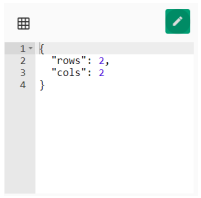


Figure 782: img

- Tool assignment:

By selecting a specific panel in “Panels layout”, it is possible to assign tools to it that will be applied to selected panel:

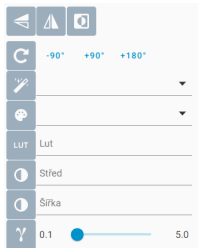


Figure 783: img

You assign a tool by clicking on the tool icon and assigning its value, e.g.:

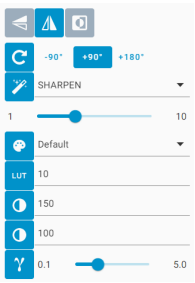
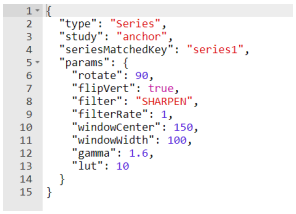


Figure 784: img

Information on individual tools can be found in the “DICOM viewer tools” chapter.

- JSON config

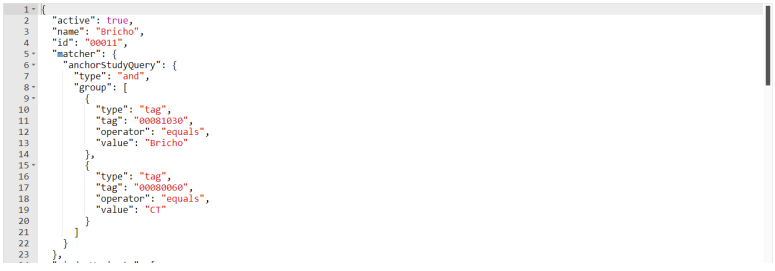
In this area of the “Layout” subfolder, a section of the JSON configuration file containing the selected tools of the selected HP panel is displayed. This is an advanced settings management, please contact your administrator to configure it. Example:



```
{
  "type": "Series",
  "study": "anchor",
  "seriesMatchedKey": "series1",
  "params": {
    "rotate": 90,
    "flipVert": true,
    "filter": "SHARPEN",
    "filterRate": 1,
    "windowCenter": 150,
    "windowWidth": 100,
    "gamma": 1.6,
    "lut": 10
  }
}
```

Figure 785: img

11.0.1.3 JSON tab The “JSON” tab contains the HP settings configuration file and allows its editing. This is an advanced settings management, please contact your administrator to configure it. Example:



```
{
  "active": true,
  "name": "Bricho",
  "id": "00011",
  "matcher": {
    "anchorStudyQuery": {
      "type": "and",
      "group": [
        {
          "type": "tag",
          "tag": "00081030",
          "operator": "equals",
          "value": "Bricho"
        },
        {
          "type": "tag",
          "tag": "00080060",
          "operator": "equals",
          "value": "CT"
        }
      ]
    }
  },
```

Figure 786: img

11.0.2 Creating a new HP “Save state as hanging log”

The second option to create a new HP is to select the “Save state as hanging protocol” tool from the “DICOM viewer Settings” tools group tab in the DICOM viewer – PRODUCT-SHORT-NAME–.

To create a new HP using this tool, first edit the panel layout in the DICOM viewer DPGW and assign the selected series. Then select the “Save state as hanging protocol” tool. This will take you to the new HP configuration dialog. If you want to edit a new HP, proceed according to the paragraph “Creating a new HP”Add HP”“, with the only difference being that the values are pre-filled according to the selected state of the DICOM viewer DPGW.

11.0.3 Error conditions

If the configuration was not set correctly, you will be warned about this by the information in the footer of the new HP configuration dialog, after pressing the “Save” action:

Figure 787: img

In this case, the invalid configuration area will also be highlighted, e.g.:

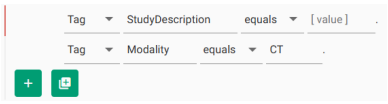


Figure 788: img

If all required fields are not filled in, these fields will be highlighted and new HP cannot be saved.

In the case that the HP modification using JSON is not valid, you will be warned about this by the information in the footer of the new HP configuration dialog, after pressing the “Save” action:

Figure 789: img

For an invalid line of JSON code, it will be marked as:

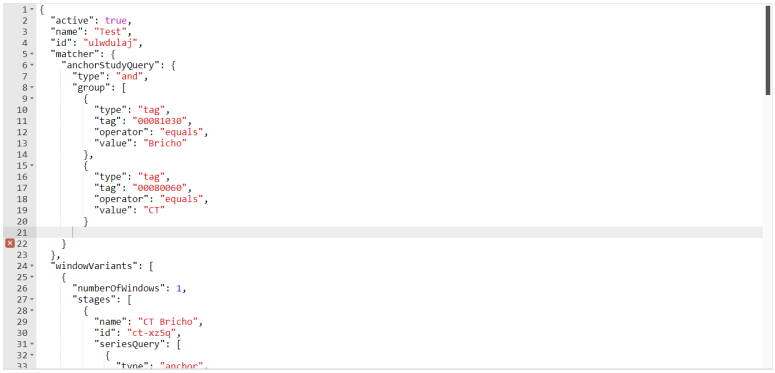


Figure 790: img