



Annex II
of MedDream USER MANUAL (version 8.3.1)

**MedDream video viewing and converting
functionalities
version 4.6.6**

The annex describes the usage of MedDream video viewing and converting functionalities.

See the MedDream USER MANUAL document for general information about the MedDream product, installation requirements, and verification, IT security measures.

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MedDream video viewing and converting functionalities



NOTE! Further in text MedDream video viewing and converting functionalities will be referred to MedDream **VideoStation** or short name **VS**.

The annex describes the usage and configuration of MedDream video viewing and converting functionalities.

See the MedDream USER MANUAL document (<https://www.softneta.com/files/meddreamviewer/doc/MedDream-User-Manual.pdf>) for more information about MedDream product:

- general information about the MedDream product,
- list of applicable standards,
- warnings regarding residual risks,
- installation requirements and verification,
- IT security measures .

Selecting patient

The user can select the patient from:

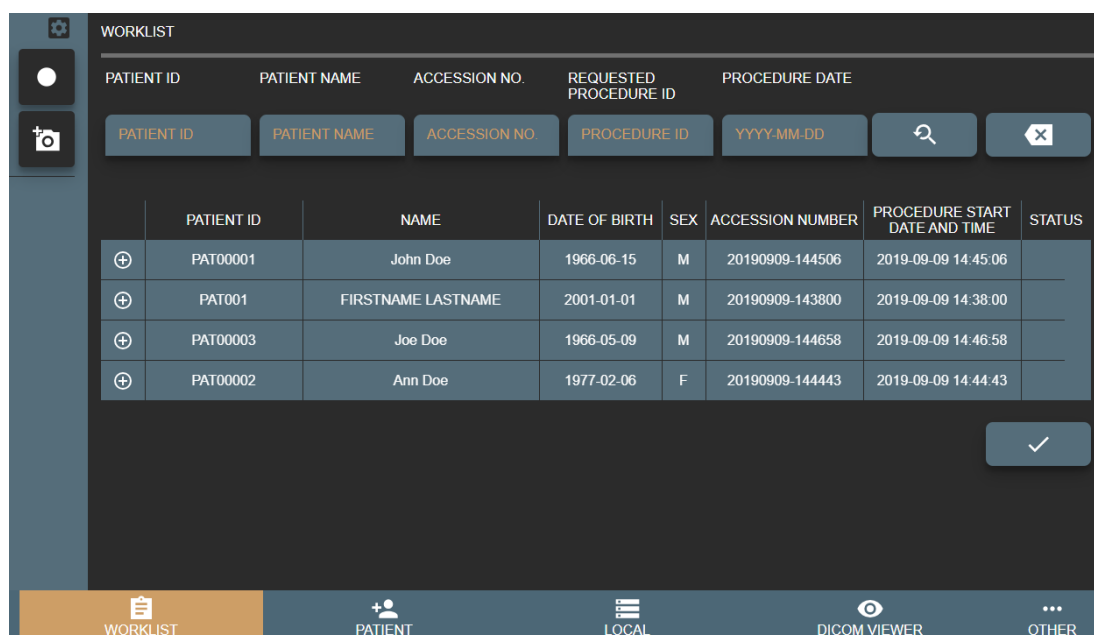
- **WORKLIST** – select scheduled modality worklist from DICOM worklist server (to setup worklist server - see 7.1.2 Network settings).
- **PATIENT** – manually fill/update patient information.
- **LOCAL** – select from VS existing patients.



Figure 1. Select patient for recording video

Selecting patient from DICOM modality worklist

Select **WORKLIST** window in main menu:



The screenshot shows a software interface titled 'WORKLIST'. At the top, there are search filters for PATIENT ID, PATIENT NAME, ACCESSION NO., REQUESTED PROCEDURE ID, and PROCEDURE DATE. Below these is a table with columns: PATIENT ID, NAME, DATE OF BIRTH, SEX, ACCESSION NUMBER, PROCEDURE START DATE AND TIME, and STATUS. The table contains four rows of patient data. A bottom navigation bar includes icons for WORKLIST, PATIENT, LOCAL, DICOM VIEWER, and OTHER.

| PATIENT ID | PATIENT NAME | ACCESSION NO. | REQUESTED PROCEDURE ID | PROCEDURE DATE |
|------------|--------------------|-----------------|------------------------|-----------------|
| PAT00001 | John Doe | 20190909-144506 | | |
| PAT001 | FIRSTNAME LASTNAME | 2001-01-01 | M | 20190909-143800 |
| PAT00003 | Joe Doe | 1966-05-09 | M | 20190909-144658 |
| PAT00002 | Ann Doe | 1977-02-06 | F | 20190909-144443 |

Figure 2. Patient from Worklist

The search can be performed by:

- Patient ID
- Patient Name
- Accession Nr.
- Procedure ID – modality worklist scheduled procedure id.
- Procedure Date – modality worklist scheduled procedure start date.

NOTE! To display correct DICOM modality worklist search result, please see Network settings and adjust correct worklist character set and wildcard options.

To display more detailed information – press button 



The screenshot shows a 'Worklist details' dialog box overlaid on the worklist interface. It contains detailed patient and procedure information.

| Worklist details | |
|-------------------------------------|---|
| Study accession number | 20190909-144506 |
| Patient name | |
| Family name | Doe |
| Given name | John |
| Patient id | PAT00001 |
| Patient birth date | 1966-06-15 |
| Patient sex | M |
| Study uid | 1.2.826.0.1.3680043.2.737.24567.2019.9.9.14.46.11 |
| Scheduled procedure step sequence | |
| Modality | OT |
| Scheduled station aetitle | VSSTATION |
| Scheduled procedure step start date | 2019-09-09 |
| Scheduled procedure step start time | 14:45:06 |

Figure 3. Patient information from Worklist

The same information can be accessed via CURRENT STUDY window patient information.




| PATIENT DATA | | | | | | |
|----------------|------------------|-------------------------|-------------------------------------|-------------|---|---|
| ID PAT00001 | NAME John Doe | BIRTHDATE 1966-06-15 | ACCESSION NUMBER 20190909-144506 | DESCRIPTION |  |  |

Figure 4. Patient information from Current study

Select worklist item with required patient (will highlight in orange) and press button . Confirm your action.

Create new study

Create study and patient from worklist?

ID: PAT00001
Name: John Doe
Date of birth: 1966-06-15
Gender: M







Figure 5. Create new study from worklist

Column STATUS can have icon -  - which indicates, that worklist item study already created on VS. In this case, by selecting and pressing button  - system will open existing study with the same worklist information.

Create new patient

Create patient by pressing PATIENT button in main menu:

Figure 6. Selecting patient from Worklist




NOTE! It is recommended to look for existing patient in LOCAL archive, see 1.3 Select patient from local storage.

Fill form fields:

1. Patient ID - max 64 characters, if left empty – will generate automatically from current date and time;
2. First Name – max 64 characters, patient first name;
3. Last Name - max 64 characters, last patient name;
4. Sex – patient sex options of male/female/other.
5. Date of Birth - patient birth date in format YYYY-MM-DD (e.g. 1985-01-10).
6. Description - max 64 characters for short study description.



NOTE! Please fill all fields correctly to identify patient and avoid editing patient with already existing studies.

In the end, press button  to create new study with patient.

If patient ID already exist but other data is different – VS will open conformation window to select one of the options:

- Update existing patient with data? – will update patients data and create new study,
- Select existing patient? – will create new study with existing patient,
- Create new patient? – will create patient with new patient ID (will add extra random number to added patient ID) and create new study.

Create new study

Update existing patient with data?
☒ ID: PAT333
 Name: Test Test
 Date of birth:
 Gender:

Select existing patient?
☐ ID: PAT333
 Name: Name last name
 Date of birth: 1955-02-03
 Gender: M

Create new patient?
☐ ID: PAT333(82)
 Name: Test Test
 Date of birth:
 Gender:

Figure 7. Enter/Select existing patient from form

Select patient from local storage

VS creates patients and studies on local machine that can be accessed by pressing LOCAL button in main menu.

LOCAL ARCHIVE

SEARCH BY PATIENT ID, NAME, ACCESSION NO, STUDY ID, UID, SEPARATELY

DATE YYYY-MM-DD

| PATIENT ID | NAME | DATE OF BIRTH | SEX |
|-------------------|-----------|---------------|-----|
| 20190910095347858 | | | |
| 20190910085229544 | | | |
| PAT00001 | John Doe | 1966-06-15 | M |
| TEST | TEST TEST | 2011-01-01 | M |

WORKLIST PATIENT LOCAL DICOM VIEWER OTHER

Figure 8. Select patient from Local archive

Search result is combination of patients and its studies (patient list, where you can expand and see patient studies). To get exact patient or study in search result - fill search field with patient ID, name, accession number, study description, study id or study UID. DATE field will allow search patients studies with desired study date (see more on section 3. Search for patients and studies).

To create empty study - select row with patient information and press the button . Confirm the action.

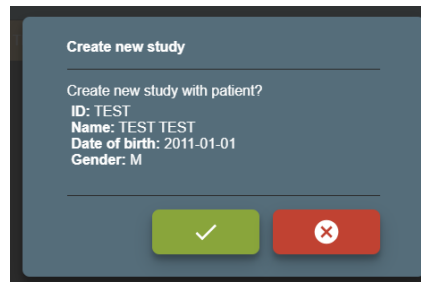




Figure 9. Select patient to create study

Updating patient data

User can start recording process without filling or selecting patient in CURRENT STUDY window. It will automatically generate patient ID from current date and time. If the study recording is completed or will be closed for today (will review records on other day) - recommended not to forget and update/select correct patient.



NOTE! Please ensure, that video recording is not active.

Expand patient information section by pressing on it or on button , and press edit button .

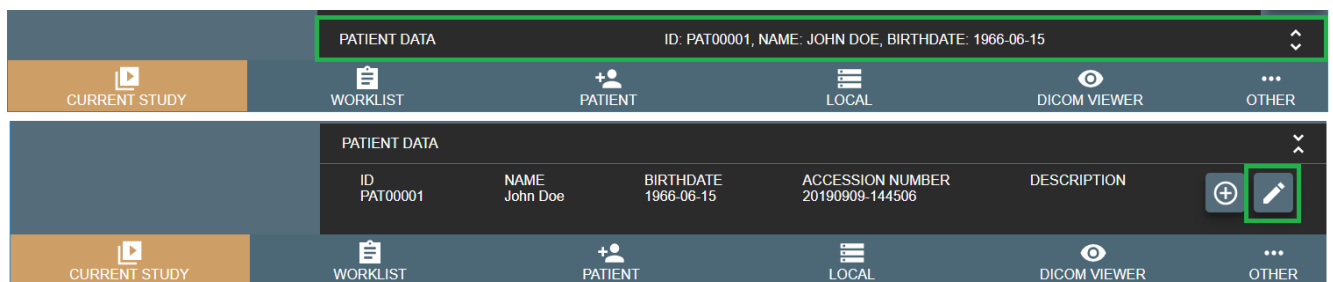


Figure 10. Expanding patient data information and possibility to update patient data

Will appear dialog with options, how to update or replace patient data:

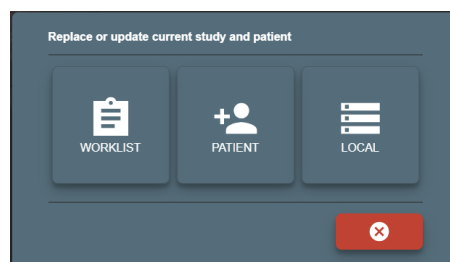


Figure 11. Updating patient data

User can select from where to take patient data: WORKLIST, PATIENT or LOCAL

WORKLIST – will open WORKLIST window to select and replace patient and update study data from remote worklist server. After selecting – will ask to confirm patient replace:

Update patient and study

Replace patient and study data with worklist?

Current
 ID: PAT333
 Name: Name last name
 Date of birth: 1955-02-03
 Gender: M
 Description: Some description

From worklist
 ID: PAT00001
 Name: John Doe
 Date of birth: 1966-06-15
 Gender: M

Buttons: [Green checkmark] [Red X]

Figure 12. Confirming patient update from worklist

PATIENT – will open PATIENT window to manually update patient form.

If updated patient is different patient with the same patient ID – will open confirmation window:

- Update existing patient with data?
- Select existing patient?
- Create new patient ?



NOTE! See more details in section 1.1 Selecting patient from DICOM modality worklist.

If study and patient was created from worklist – changing patient data, will lose worklist information (will generate new study UID).

After changes – will ask to confirm:

Update patient and study

Update patient and study data?

Current
 ID: PAT333
 Name: Name last name
 Date of birth: 1955-02-03
 Gender: M

Updated
 ID: PAT333
 Name: Name TEST last name
 Date of birth: 1955-02-03
 Gender: M
 Description: Some description

Buttons: [Green checkmark] [Red X]

Figure 13. Confirming patient update from form

LOCAL – will open LOCAL window to select patient from local archive.

If study and patient was created from worklist – changing patient, will lose worklist information (will generate new study UID). After change – will ask to confirm:

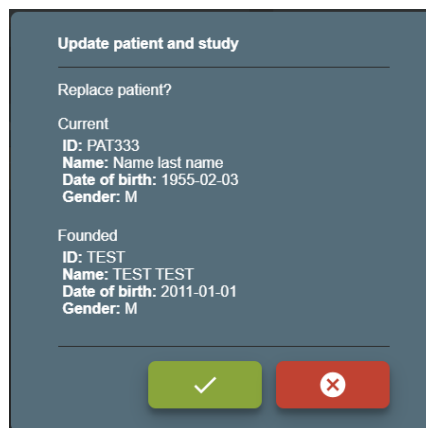


Figure 14. Confirming that patient update from local storage

Recording study

New study can be recorded by pressing CURRENT STUDY button in main menu. If user select patient or just start recording by pressing pedals - will open CURRENT STUDY window.

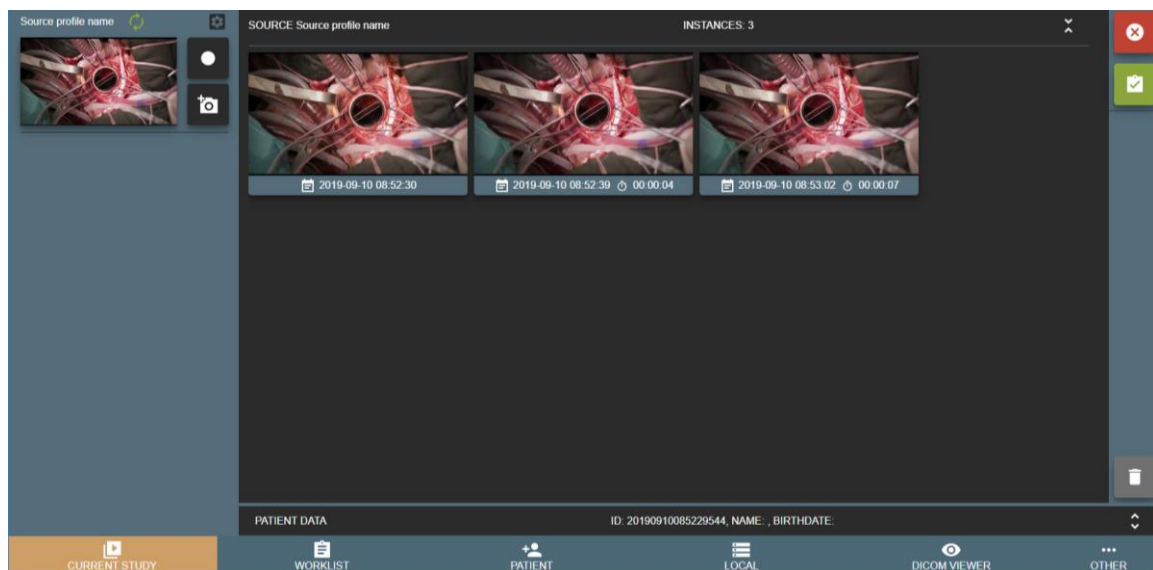







Figure 15. Recording study

Left side of VS software reserved for multiple input signals streaming windows (max 4 sources for 1920x1080 current design) and right side is for study records.

VS software is designed to record every input signal into separate series. Series description will be input signal source profile name – to identify device input for every series. For other situations, then input signal stream window is reloaded or study was opened to continue recording – will cause to create another separate series for every input source signal.

- To take a snapshot/photo - press button  (can take a snapshot while recording).

- To start recording - press start button  and button becomes red , and will blink , indicating that recording started.
- To stop recording - press recording button  and button becomes .

Images thumbnails can be seen after snapshot is done and displays just date and time under thumbnail (Figure 19). Video thumbnail can be seen just after video is done and adds video duration under thumbnail (Figure 18).

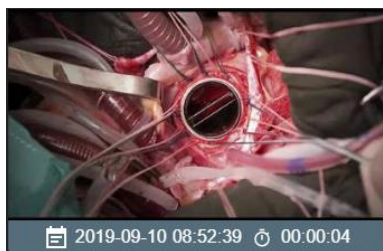


Figure 16. Recorded video



Figure 17. Recorded image

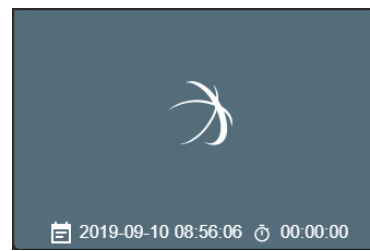



Figure 18. Recording video

 **NOTE!** To record multiple signal inputs with pedals, do not forget to change source profile **ENABLE RECORDING KEYS** option in Recording settings. To setup pedals keys – see General settings.

During recording, user can expand input signal streaming window by pressing on the window. To minimize – press again on the window.

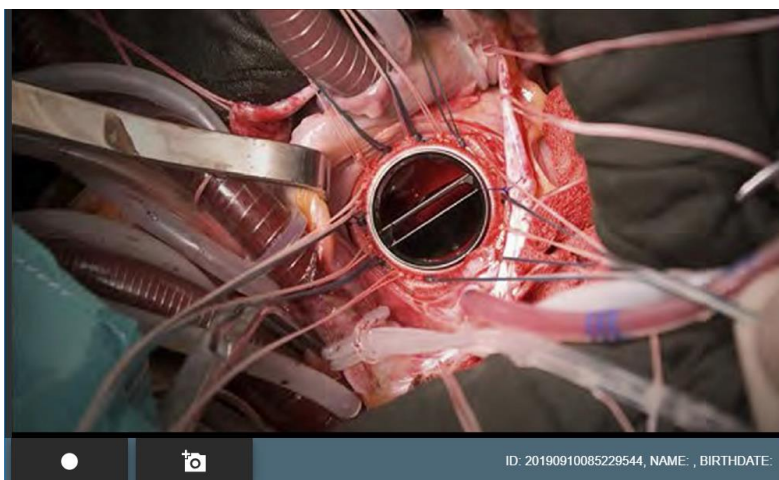



Figure 19. Maximized recording window

To expand video or image - press on the recorded video or image thumbnail. To minimize – press on button  in the bottom right corner.

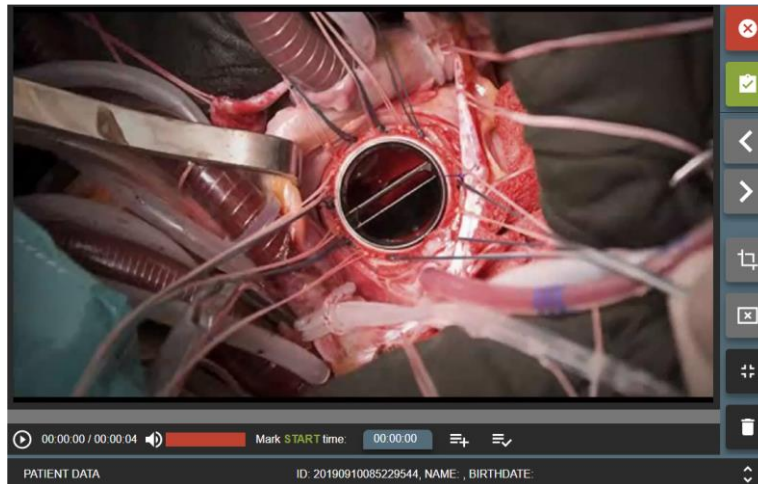


Figure 20. Maximized video

Images or completed video can be deleted by pressing button  and confirming delete action.

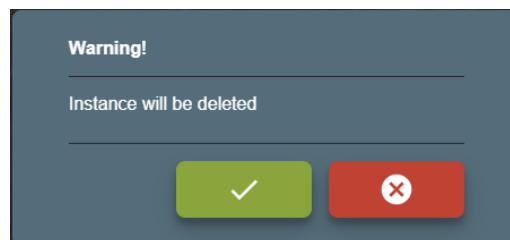


Figure 21. Deleting selected image/video

To delete multiple images or video – press (to select) on thumbnail bottom (date and time bar) and press button

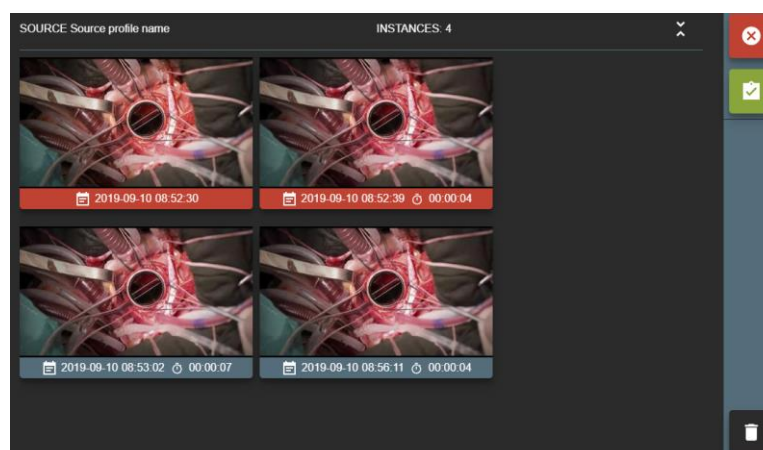


Figure 22. Selected multiple image/video

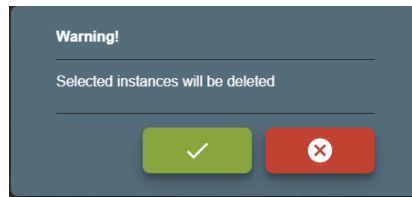



Figure 23. Delete multiple image/video

Saving recorded study:

Then recording completed (bad images or video was deleted or video trimmed) and patient data is correct – press save button  and confirm action to complete study.

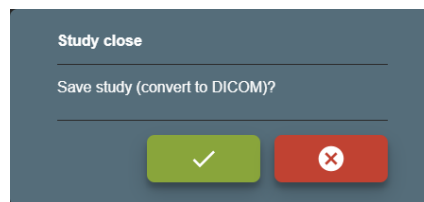





Figure 24. Close study and complete

User will be redirected to TASKS window and can see information about saved and send study: files will be converted to DICOM format. After study is completed (converted to DICOM) – will try to send to hospital PACS (requires to setup remote DICOM archive in Network settings).

 **NOTE!** During conversion to DICOM – user will not be able to open this study. User can stop the task and roll back to image and video. After roll back task is completed – can open study for editing in CURRENT STUDY window.

 **NOTE!** After conversion complete – can open study in DICOM VIEWER window.

If user press close button  and confirm action - study will be closed (no conversion to DICOM). This is not recommended action, but in quick situations, where need to start new patient recording and previous study requires review/edit – press the button and confirm study close.

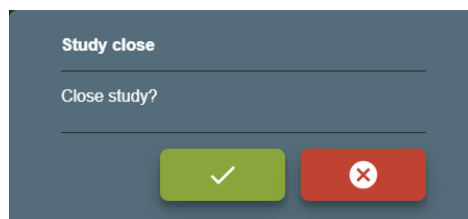


Figure 25. Close study



Button to export the study to local or external drive.



Button to forward study to hospital PACS (requires to setup remote DICOM archive in Network settings).



New study in the list, not reviewed.



Study is not stored in hospital PACS.



Study is stored in hospital PACS.




Study and patient information are selected from scheduled modality worklist.

Trim video

This function is to cut good video parts and combine into new shorter video file. For example, if video recording started before patient comes into operating room or finished when operating room starts cleaning after surgery – user can remove these video parts. Can edit completed video and return to original as many times as you like. If video trim completed and saved - will override original video.

Main idea is to select desired scenes/video chunks of times (make time list) and combine into one video.

To trim video, follow steps bellow:

- Press on selected video thumbnail and open video.
- Manually select in the progress bar or write the start time of the video and press button .

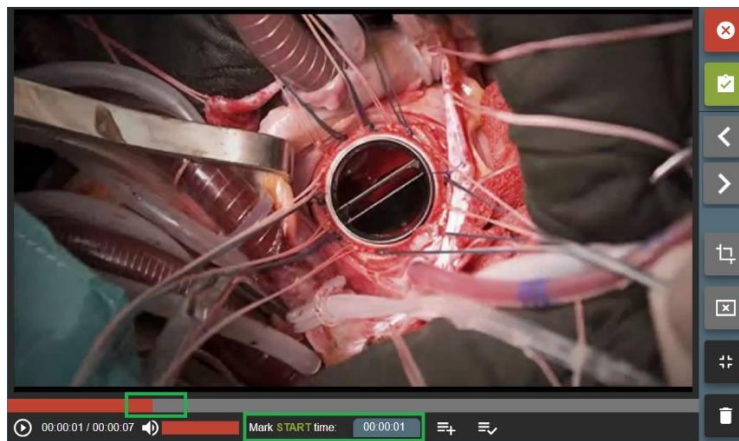



Figure 28. Trim start time

- Then select in the progress bar or write the end time of the video and press .

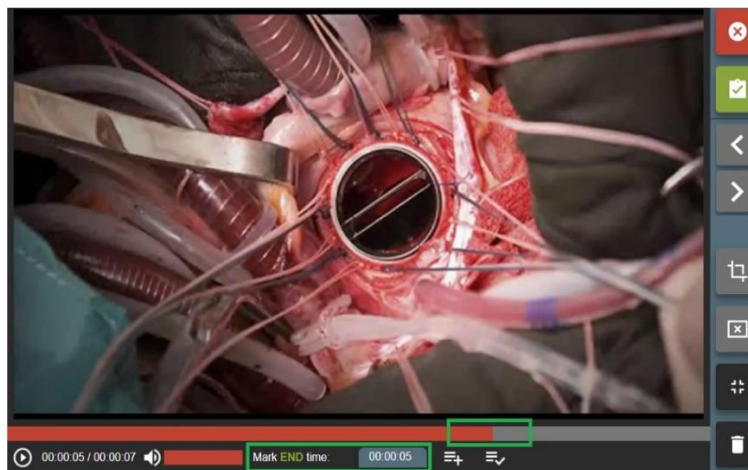


Figure 29. Trim end time

- Will display times of video from where start and where to end video cut in the right upper corner:

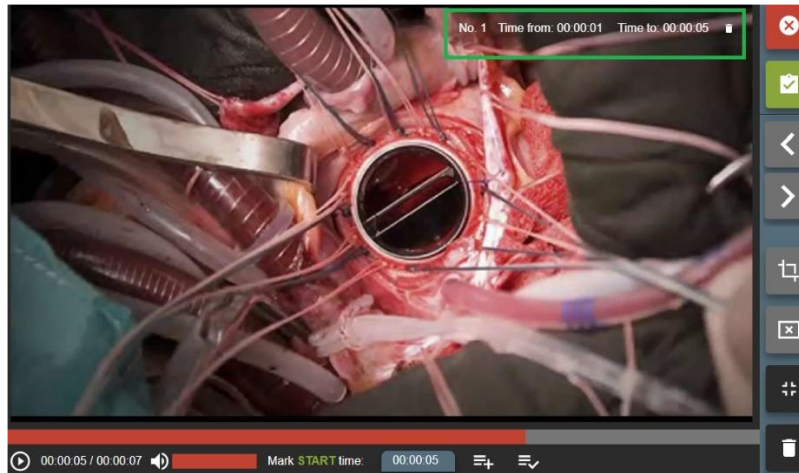


Figure 30. Trim time interval

- Time periods can be updated, deleted or added more.
- To trim video – press button  and confirm video time pieces:

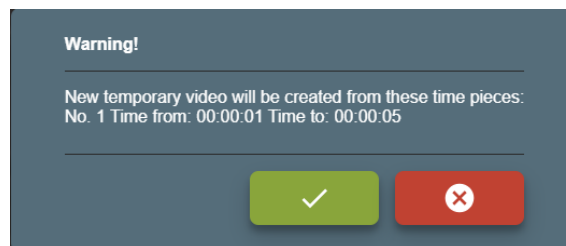




Figure 31. Make trim

After a few seconds (depends on system load) will combine new temporary video. You can review video and see if all been done correctly. If some parts are missing – press cancel button  to remove temporary video and go back to original.

 **NOTE!** Video cut time error is +/- 1s (depends on video frame rate and frames on particular time).

- To save new video and replace original – press button .



Figure 32. Save or cancel modified video

DICOM Viewer

VS has integrated DICOM viewer and can view saved (converted to DICOM) or received from hospital PACS studies in DICOM VIEWER window.

Find patient study from LOCAL window and press button .

| | | | | | | | | | | |
|---------|------|----|-----------|---------------------|----------|------------|---------------------|-------------|--------|---|
| ⊖ | TEST | | TEST TEST | | | | | 2011-01-01 | | M |
| ACTIONS | | | STUDY ID | ACCESSION NUMBER | MODALITY | SOURCE AET | CREATED | DESCRIPTION | STATUS | |
| 👁 | ⬇️ | ☁️ | 132456 | 20190909-1 44506 | OT | SW | 2019-09-09 15:05:17 | TEST | ☁️ | |

Figure 33. Opening saved study

Study opens in integrated DICOM VIEWER window.

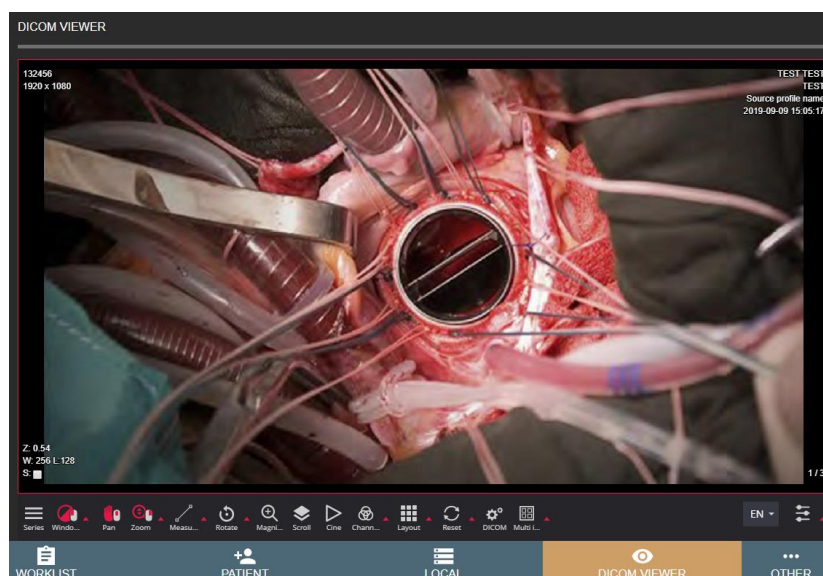


Figure 34. DICOM viewer

Tasks

Tasks represents VS process actions, that can be done in background.

Services: In menu “Other ->Settings-> Storage -> Services” administrator can stop/start services.

VS uses services:

- STUDY TO DICOM SERVICE STATUS – responsible to save (convert to DICOM) studies, recommended always ensure, that this service is running.
- STUDY TO DICOM ROLLBACK SERVICE STATUS – responsible to convert back DICOM files to image and video format. This service is used to convert back DICOM files, because conversion fails or study needs more changes.
- FORWARD STUDY TO DICOM ARCHIVE SERVICE STATUS - responsible to send saved studies to remote PACS,
- EXPORT STUDY SERVICE STATUS - responsible to export study to external storage.

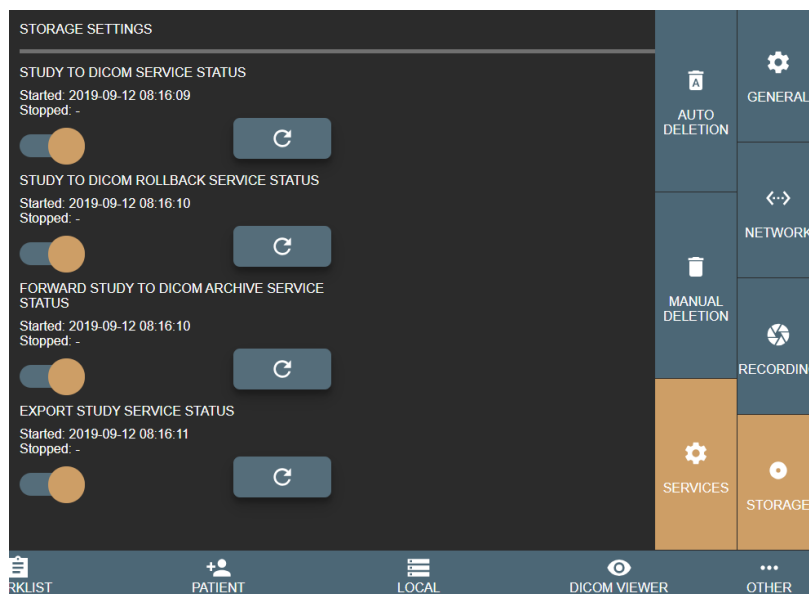



Figure 35. Services settings

Each Service status can be checked by pressing refresh button .

TASKS: In menu “Others -> Task” user/administrator can check each study saving process and find their status.

Task list is divided in 3 categories:

- NEW/STARTED – started or pending tasks.
- STOPPED – stopped tasks. User can try to load again later.
- COMPLETED – successfully finished tasks. All completed tasks without errors, will be deleted after 1 hour.






| TASKS | | | |
|---|--|--|---|
| NEW/STARTED | | | |
| Send DICOM to remote DICOM archive (PACS) Patient: ID: TEST, Name: TEST TEST Started: - Stopped: - Completed: - Completed files: 0/0 | | |  |
| STOPPED | | | |
| Send DICOM to remote DICOM archive (PACS) Patient: ID: TEST, Name: TEST TEST Started: 2019-09-10 10:24:38 Stopped: 2019-09-10 10:24:39 Completed: - Completed files: 0/3 Messages: Failed to establish association: Connection refused: connect | | |   |
| COMPLETED | | | |
| Send DICOM to remote DICOM archive (PACS) Patient: ID: TEST, Name: TEST TEST Started: 2019-09-10 10:07:57 Stopped: - Completed: 2019-09-10 10:07:57 Completed files: 3/3 | | |  |
| Convert JPG/VIDEO to DICOM Patient: ID: TEST, Name: TEST TEST Started: 2019-09-10 10:07:56 Stopped: - Completed: 2019-09-10 10:07:57 Completed files: 3/3 | | |  |

Figure 36. Task list

Buttons explanations:



Try run task again.



Stop running task.



Rollback the task. This button will appear on failed “CONVERT JPG/VIDEO to DICOM” task. Allow user to return all DICOM files to images or video for more study changes.



Delete task.

Tasks lists are refreshed automatically.

Settings

MedDream Video viewing and converting functionalities may be customised via settings. Customization possibilities:

- Custom video settings.
- Multi languages support: English, Lithuanian, Russian other languages by request.
- Additional foot pedal support.

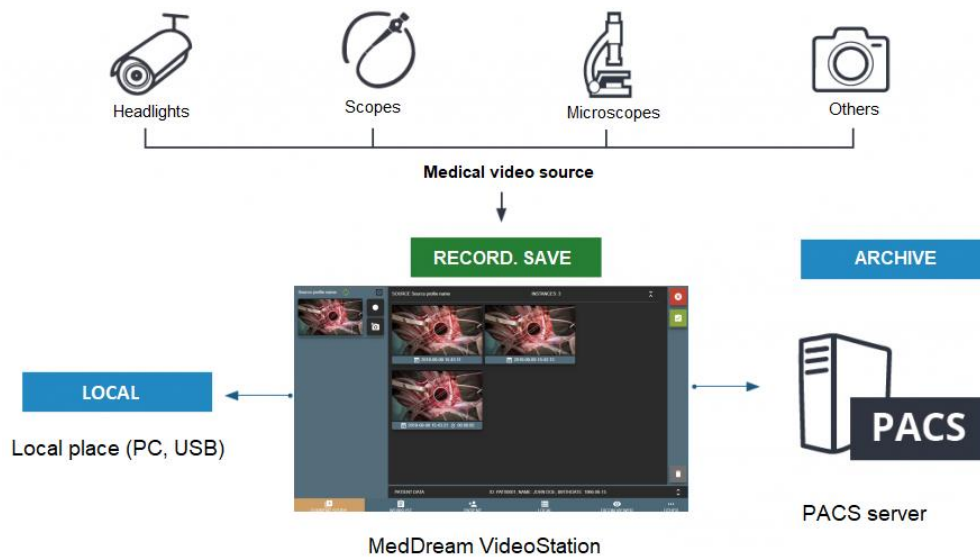


Figure 37. Connection diagram

VS settings located in OTHER > SETTINGS of main menu.



NOTE! In order to ensure successful VS work, the settings must be modified only by the system administrator.

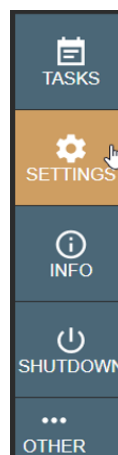


Figure 38. SETTINGS menu item in OTHER expandable menu

Settings are grouped in the following groups: GENERAL, NETWORK, RECORDING and STORAGE.

General settings



Figure 39. VS general settings

In GENERAL settings you can modify the following options:





- MODALITY – set DICOM modality attribute for studies without modality worklist. By default, after installation, recorded files modality will be set to OT. Can be changed according study type and we recommend choosing one of these modalities: <http://www.dicomlibrary.com/dicom/modality/>.
- SNAPSHOT KEY – pedal signal keys combinations to make image.
- PLAY/STOP KEY – pedal signal keys combinations to start or stop video recording.
- KEY BINDING LISTENER – function for retrieving the pedal signal keys.

Default, SNAPSHOT KEY and PLAY/STOP KEY are set, but it is recommended to review and update key combinations for every pedal. It is possible to add multiple key combinations (all pedals) for snapshot or video recording as long as they do not conflict with pressing habits.

NOTE! Some pedals producing different signal key combination on longer press. It is recommended to consult with active personal about pedal pressing habits (how long and how they press on snapshot or video recording buttons).

CAUTION! When connecting pedal and keyboard, review SNAPSHOT or PLAY/STOP KEY settings and try to avoid pressing configured keys.

How to change or update key combinations:

- Press the button,  and it will change to  indicating, that started listening key press.
- Press the pedal button and will see KEY BINDING LISTENER will display key combination.
- Add key combination to SNAPSHOT or PLAY/STOP KEY by pressing  button. To remove previous key combination - press .

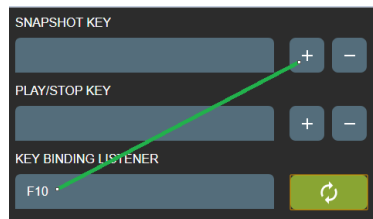


Figure 40. Shortcuts for recording and image making

- User can add several possible keyboard combinations.

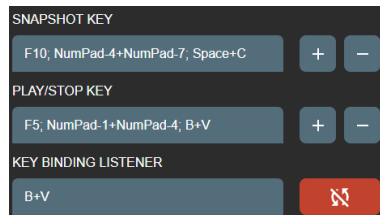




Figure 41. Shortcuts for recording and image making

- After complete press button  to turn off key listener – will change to .
- After settings update, navigate to recording settings and change device profile key option (Recording settings > ENABLE RECORDING KEYS).
- EXTERNAL KEYBOARD – enable to use physical keyboard connected to PC or windows keyboard on screen. Default is to use keyboard on screen due touch screen monitor, but sometimes monitor is hanged very high and cannot be controlled by hand. For this requires to connect mouse and keyboard.
- ON EXIT – ALSO SHUT DOWN PC - shut down PC after exiting the VS program. By default, this option is set to no. It may take some time (~3 - 20s) to stop process (complete recordings and shut down services).
- LOG FILE LOCATION - displays the location of log files.
- SYSTEM LOGGING – set logging level to None, Error, Info or Debug of all actions. The default, and recommended is turning on logs to Error level to identify system bugs or hazard situations. Log file can be viewed with text editor.
- CHARSET – set DICOM character set (0008, 0005) for studies to be encoded. For now, there is 3 common character sets: ISO_IR 100 (Latin1), ISO_IR 144 (Cyrillic) or ISO_IR 192 (UTF-8). To support most of the characters – use ISO_IR 192. But it is recommended to consult to your PACS administrator.



NOTE! Try to set the same character set for the patient studies, try open one the same study and look for DICOM tag “Specific Character Set” (0008, 0005). Some PACS, during study import, will update patient name from DICOM file with different encoding – may lead to display incorrect patient name in the DICOM viewer (this will not change/damage any DIOCM files – just database record).

Once all settings are set, double check and press save the button



Network settings

Network settings are grouped into three groups:

- LOCAL - network settings of local VS receiver, which handles received DICOM files (studies).
- REMOTE - network settings for hospital remote PACS. This allows to send saved studies to hospital PACS.
- WORKLIST - network settings for DICOM modality worklist server connection. This enables to search scheduled DICOM modality worklist (scheduled patient procedures).



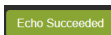


NOTE! Remote hospital DICOM archive and DICOM modality worklist server settings can be the same or not – depends on hospital infrastructure. It is recommended to consult your DICOM archive or worklist server administrator.

Local settings

Figure 42. Local VS settings

In LOCAL settings of the NETWORK group you can view and modify VS DICOM file receiver options:

- AET TITLE – max 16 Latin1 characters. Requires to ask your administrator for this entity title to identify VS PC.
- HOST OR IP ADDRESS – VS PC host or IP address. It is recommended to set IP address for faster network lookup. For receiver it is recommended to leave 127.0.0.1 local IP address.
- PORT – max 65535 number. DICOM protocol mostly use 104 or 11112 ports that should not be reserved by OS process. Recommended to consult administrator. For receiver it is recommended to leave 104 port as it is.
- DICOM RECEIVER SERVICE STATUS – will show receiver status (start/stop date and time). Also, you can turn off receiver and refresh the status:
 - Press  to refresh the status info.
 - Press  to check the receiver status: DICOM C-ECHO will be send to verify basic connectivity by DICOM protocol. In case of success, the  message will appear.



Once all settings are set, double check and press save button .

Remote settings

Figure 43. Remote DICOM archive settings

In REMOTE settings of the NETWORK group you can view and modify options to connect remote hospital PACS:

- AE TITLE – max 16 Latin1 characters. Requires to ask your administrator for this entity title to identify remote PACS.
- HOST OR IP ADDRESS – PACS host or IP address. It is recommended to set IP address for faster network lookup.
- PORT – max 65535 number. DICOM protocol mostly use 104 or 11112 ports. Recommended to consult administrator.

Press  to check the remote PACS status: DICOM C-ECHO will be send to verify basic connectivity by DICOM protocol. In case of success, the  message will appear.



NOTE! Sending DICOM studies from VS to DICOM archive typically requires LOCAL VS AE TITLE to be registered on remote DICOM archive.

Once all settings are set, double check and press save button



Worklist settings

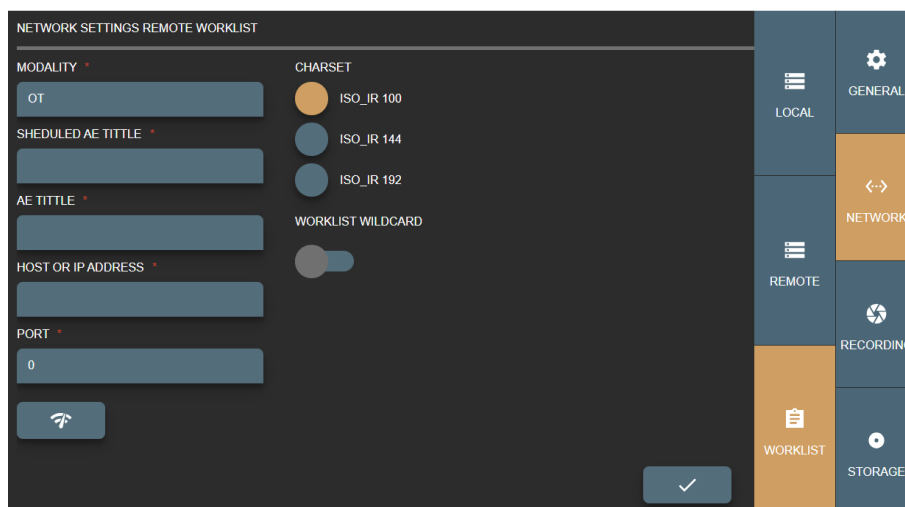

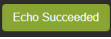


Figure 44. Worklist settings

In WORKLIST settings of the NETWORK group you can view and modify the following options:

- MODALITY – set modality attribute to fetch from the hospital's Worklist server. By default, after installation, worklist modality will be set to OT.
- SCHEDULED AE TITLE – set the AE TITLE to fetch from the hospital's Worklist server.
- AET TITLE – max 16 Latin1 characters. Requires to ask your administrator for this entity title to identify DICOM modality worklist server.
- HOST OR IP ADDRESS – worklist server host or IP address. It is recommended to set IP address for faster network lookup.
- PORT – max 65535 number. DICOM protocol mostly use 104 or 11112 ports. Recommended to consult administrator.
- CHARSET – setup encoding for worklist results. Result comes in DICOM standard and most results do not define encoding – need to be set and tested manually.
- WORKLIST WILDCARD – add wild card symbol “*” on search parameters. Some worklist servers do not support this, for example on patient ID or accession number and requires to search exact patient ID or accession number. Recommended to consult with administrator (typically this information can be found in worklist server or PACS conformance statement document).

Status checking control. Press  to check the remote DICOM archive status: DICOM C-ECHO will be send to verify basic connectivity by DICOM protocol. In case of success, the  message will appear.



NOTE! Receiving modalities worklist typically requires LOCAL VS AE TITLE to be registered on hospital's Worklist server

Once all settings are set, double check and press save button



Recording settings

Recording settings are used for configuring video input sources. It allows define several configurations for one input source, naming each configuration as profile. Recording settings window display all the configured profiles.

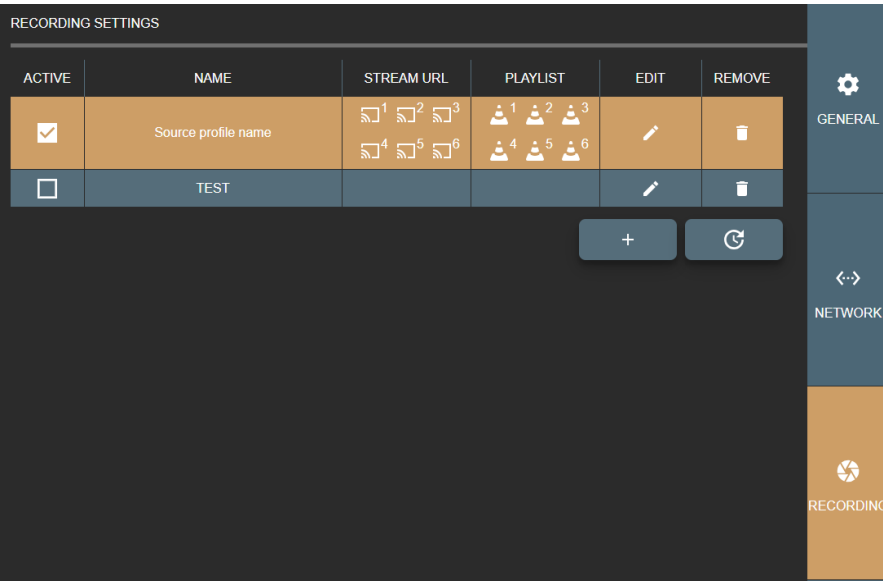












Figure 45. Recording settings window with list of configured input source profiles

The following actions are allowed in input source list of recording settings window:

-  Activate source profile. After application start, will start active devices
-  Update or change source profile settings.
-  Delete source profile. If source is active – requires to stop source.
-  Reload all active sources.
-  Add new source profile.
-  Copy full stream address.
-  Download VLC media player format playlist file, that contains the same stream address.

 **CAUTION!** Do not activate multiple profiles for the same video input source. For e.g. added camera to profile A and the same camera to profile B and enabled both of them, to be active in VS application. In this situation, just profile A will start and profile B will fail, because input signal will be busy.

It is possible to have A and B profiles active at the same time, if card allows this (for example, play input signal via windows direct show and other via capture card interface, if this exist). However, it does not make any sense to have 2 the same signals recording and it can cause unstable input stream recording process.

Clicking the update  or add new  controls in the profiles list, opens the RECORDING PROFILE SETTINGS window to configure the recording profile.

Also, there is direct access to recording profile settings from near stream window - settings button:

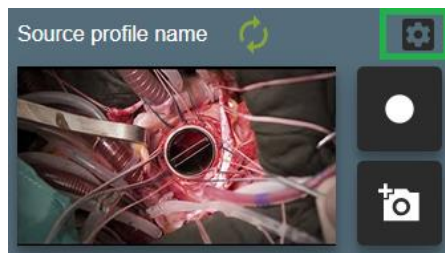


Figure 46. Fast entering into profile settings

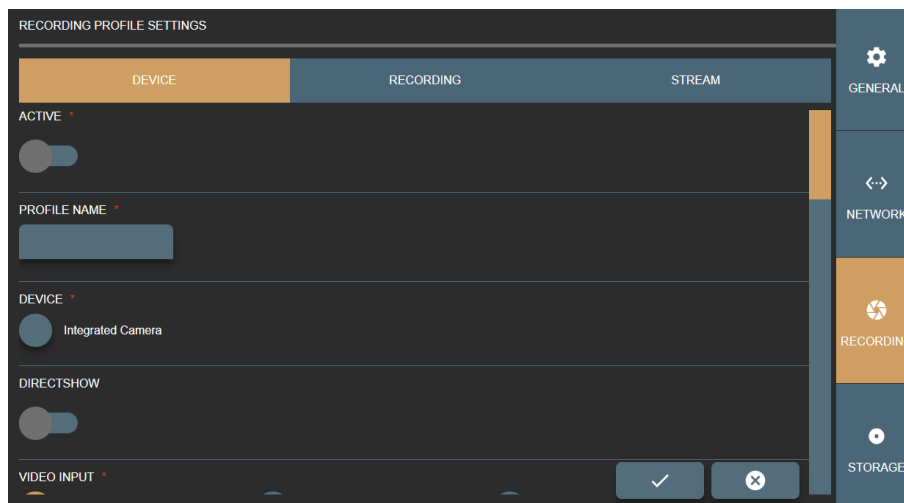


Figure 47. Device window of the Recording profile settings

Recording profile settings are grouped into three groups:

- **DEVICE** - contains input source options. Affects preview window, signal type.
- **RECORDING** - contains recording process setup and configuration options. For recording. Recommended select the same resolution and frame rate as in **DEVICE** options.
- **STREAM** - contains streaming set available when **DIRECTSHOW** disabled.



NOTE! GUI validates and checks available recording device option **combination** by DICOM TRANSFER SYNTAX option.

Requires to ensure, that PACS supports transfer syntax(ask PACS administrator or see PACS DICOM conformance statement document) and recorder DICOM files will be accepted by PACS

Some options can be updated in C:\MedDreamStation\recorder\configurationSettings.json, but during re-installation – will be overridden.

Device settings

In **DEVICE** window of the **RECORDING PROFILE SETTINGS** you can view and modify options:

- **ACTIVE** – enable or disable recording device profile.
- **PROFILE NAME** – enter or edit name for the profile. Each input source profile is identified by profile name. If user enters the already existing profile name, the system will overwrite the existing input source profile data. In order to create a new profile, enter different unique profile name.

- **DEVICE** – select found video devices, like camera or video capture board.



NOTE! If cannot see any devices or some is missing – please check connection cables to the device. If problem persist - check Windows OS device list, if all drivers installed properly.

- **DIRECTSHOW** - enables getting input device signal through Windows OS DirectShow API. Disabled by default. VS application is using YUAN video capture board SDK API and can access capture board signal with lowest latency compared to DirectShow.

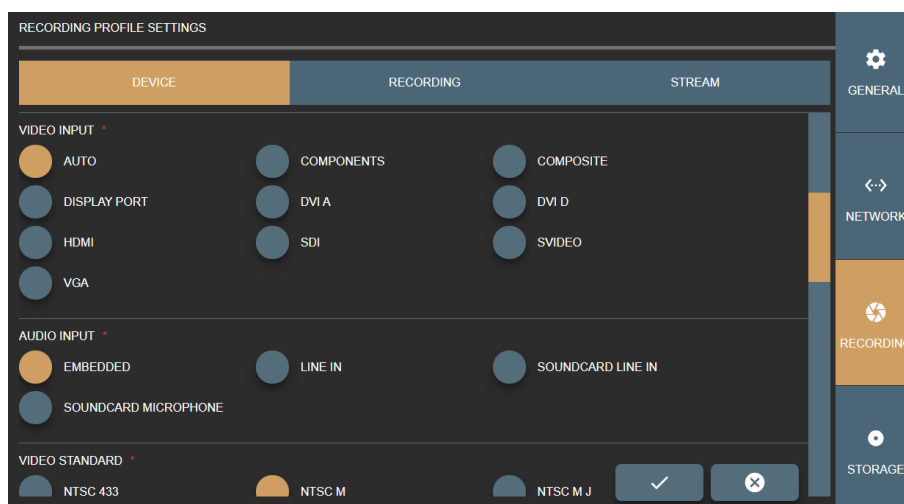


Figure 48. Specifying video and audio inputs in the Recording profile Device settings

- **VIDEO INPUT** – specify the type of video input. The default selection is AUTO, and system tries to find capture board signal. But it's recommended to consult with VS PC administrator about capture board input type and select the correct one.
- **AUDIO INPUT** – specify, how to get audio signal. This option depends on device input or device itself. For example, default selection EMBEDDED should work with simple USB camera with microphone array, or device with HDMI video input (audio should come by the same cable).

With other audio capture boards or other audio input device signals, it is required to see and setup WINDOWS OS audio devices or redirect audio signal to capture board. This situation is a little bit tricky and requires testing to configure input signal environment properly.

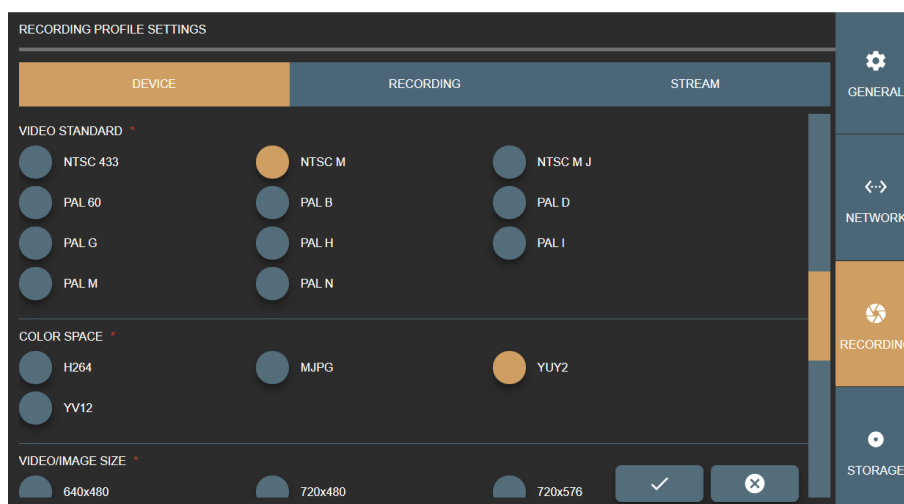


Figure 49. Specifying video standard and color space in the Recording profile Device settings

- VIDEO STANDARD – specify standard for the analog video signal, if creating profile for analog input device.

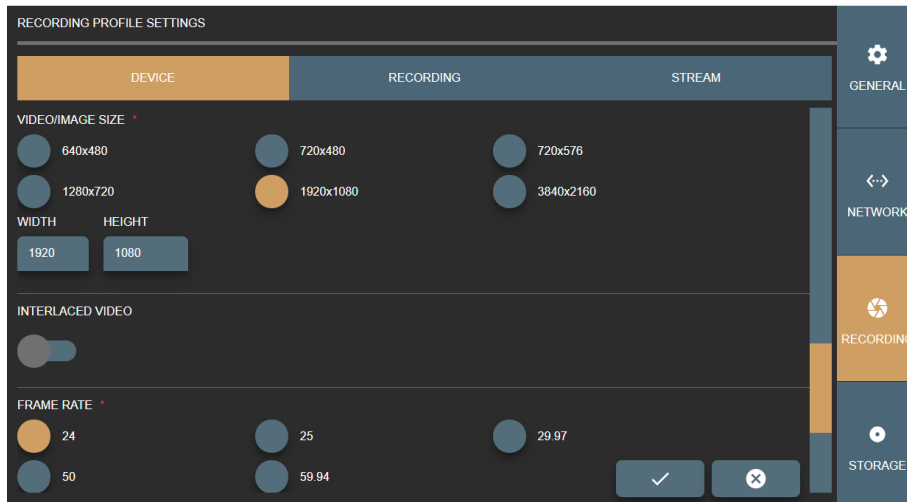


Figure 50. Specifying video and image attributes in the Recording profile Device settings

- Specify other attributes of the video output of the profile:
 - COLOR SPACE - select color space.
 - VIDEO/IMAGE SIZE – select or fill video or image resolution.

VS software will try to scale medical device output signal to match settings. It is recommended to select close enough or the same resolution for medical device output signal to ensure best quality. Use WIDTH and HEIGHT entry controls to adjust the selected size or enter the custom size.

- INTERLACED VIDEO – set if video signal is interlaced.
- FRAME RATE – set wanted frame rate.

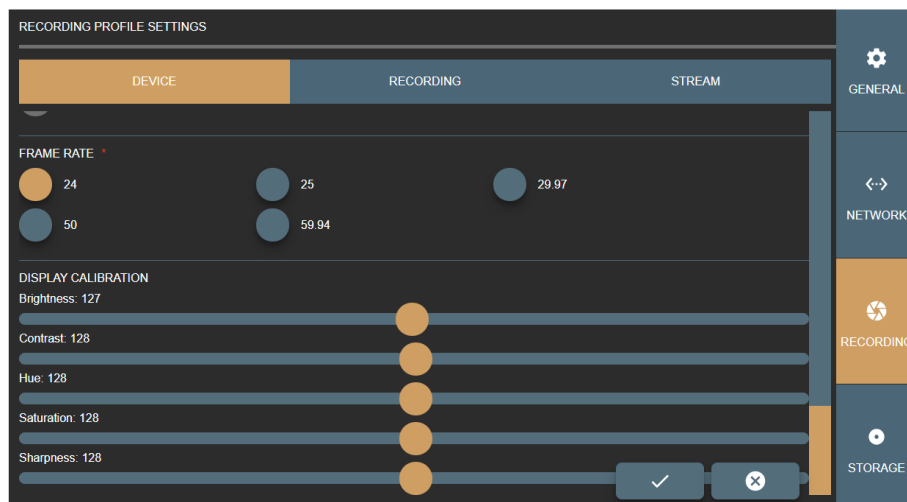


Figure 51. Display calibration options in the Recording profile Device settings

- DISPLAY CALIBRATION – enhance video for better view.

Recording settings



Figure 52. Recording and video output options in the Recording profile Recording settings

In RECORDING window of the RECORDING PROFILE SETTINGS, you can view and modify the following options:

- **ENABLE RECORDING KEYS** – enable to control profile source recording with pedals (see pedal setup description in General settings on page 23).
- **DICOM TRANSFER SYNTAX** – select the transfer syntax for DICOM file:
 - 1.2.840.10008.1.2.4.100 and 1.2.840.10008.1.2.4.100 - MPEG2 video with strict combination options for older medical devices.
 - 1.2.840.10008.1.2.4.102 and 1.2.840.10008.1.2.4.101 - MPEG2 video for older medical devices.
 - 1.2.840.10008.1.2.4.102 and 1.2.840.10008.1.2.4.102 - MPEG-4 video options for most of devices.
 - 1.2.840.10008.1.2.4.102 and 1.2.840.10008.1.2.4.103 - MPEG-4 video with strict combination options.

It is important to select DICOM transfer syntax according hospital PACS. Some archives are very old and do not support some of transfer syntax. Recommend to consult with administrator (see DICOM archive conformance statement document).

- **MAXIMUM RECORDED VIDEO FILE SIZE (MB)** – enter the maximum allowed size for recorded video. The maximum value according to DICOM standard is 4096Mb, but it may depend on PACS (how big files can be accepted) and requires testing.
- **VIDEO/IMAGE SIZE** – select resolution.

VS software will try to scale medical device output signal to match settings. It is recommended to select close enough or the same resolution for medical device output signal to ensure best quality.

RECORDING PROFILE SETTINGS

DEVICE RECORDING STREAM

ENCODER *

☐ AMD VCE ☐ INTEL MEDIA SDK ☐ NVIDIA CUDA
☐ NVIDIA NVENC ☒ SOFTWARE

ENCODER FORMAT *

☒ H264

VIDEO IMAGE SIZE *

☐ 1280x720 ☒ 1920x1080

ENCODING PROFILE *

☒ HIGH

ENCODING PROFILE LEVEL *

☒ 41

ENCODING MODE *

☒ CBR ☐ VBR

ENCODING BIT RATE *

8388608 For CBR, 8*1024*1024 = 8388608 = 8Mbps

ENCODING COMPLEXITY *

0 0 - best speed for low resources, 6 - best quality

ENCODING GROUP OF PICTURES(GOP) *

48 Max 255, recommended 'frame rate' * 2 (every 2s), 0 - auto

QUANTIZER MIN, MAX *

17 28 0 - best quality, 51 - worst quality, recommended 17-28

FRAME RATE *

☐ 24 ☐ 25 ☒ 29.97

AUDIO ENCODER FORMAT *

✓ ✕

Figure 53. Video encoding options in the Recording profile Recording settings

- ASPECT RATIO X,Y – set aspect ratio by resolution or manually change values, that ensure square pixel aspect ratio.
- ALLOW DOWN SCALE – set restriction to re-scale image/video. Recommended leave as it is, but in some cases it allows ensure original resolution as device signal resolution or expand to fit DICOM standard.
- ENCODER – define, what PC resources are used during video compression. The default option is SOFTWARE, and the CPU is used for video compression. If your system supports GPU video processing and is properly configured, select the other following option: ADM VCE, INTEL MEDIA SDK (requires install Intel media SDK), NVIDIA CUDA, NVIDIA ENVENC.
- Customize video compression by setting the parameters:
 - ENCODER FORMAT – set available encode format.
 - ENCODING PROFILE – set available encoding profile.
 - ENCODING PROFILE LEVEL – set available encoding profile level.
 - ENCODING MODE – set available encoding mode.
 - ENCODING QUALITY – enter the value from 0 for the worst quality to 10000 for the best quality encoding for VBR encoding mode. The default value is 8500.
 - ENCODING BIT RATE – enter bit rate value for CBR encoding mode. The higher bit rate means the higher quality. Default value is 8388608 (what equals to 8Mbps).
 - ENCODING COMPLEXITY – enter the values from 0 for the best speed to 6 for the best quality.

- ENCODING GROUP OF PICTURES (GOP) – enter values from 0 up to 255. 0 is for auto selection. The recommended value is frame rate multiplied by 2.
- QUANTIZER – enter MIN and MAX values from 0 for the best quality to 51 for the worst quality. The default and recommended values are from MIN 17 to MAX 28.



Figure 54. Audio encoding options in the Recording profile Recording settings

- Customize audio encoding and compression by setting the parameters:
 - AUDIO ENCODER FORMAT – set available format.
 - AUDIO CHANNELS – set available channels.
 - AUDIO BITS – set available bits.
 - AUDIO FREQUENCY – set available frequency.
 - AUDIO BIT RATE – enter bit rate value. The higher bit rate means the higher quality.
 - AUDIO VOLUME – enter audio volume from 0 to 100 percent. The default value is 100 percent.

Stream settings

To view and edit the streaming settings for the profile, select the STREAM menu in RECORDING settings.



NOTE! If profile has DIRECTSHOW enabled in DEVICE settings, streaming is not possible and the STREAM settings menu is not available.

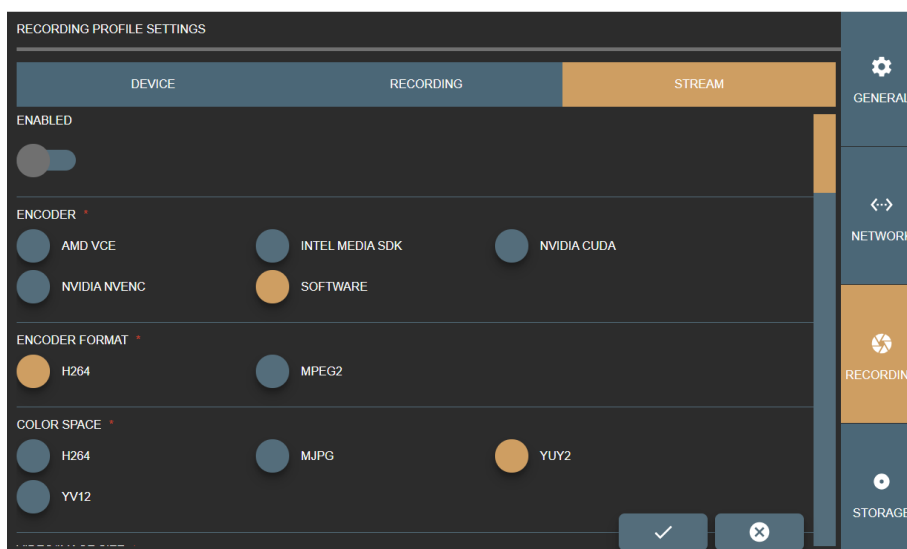


Figure 55. Video encoding options in the Recording profile Stream settings

In STREAM window of the RECORDING PROFILE SETTINGS you can view and modify the following options:

- **ENABLED** – enable or disable input source signal to stream by RTSP protocol via network for the profile.
- **ENCODER** – define, what PC resources are used during stream compression. The default option is SOFTWARE, and the CPU is used for video compression. If your system supports GPU video processing and is properly configured, select the other option from following: ADM VCE, INTEL MEDIA SDK (requires install Intel media SDK), NVIDIA CUDA, NVIDIA ENVENC.
- **ENCODER FORMAT** – set available format for stream output.
- **COLOR SPACE** – set available color space for the stream output.

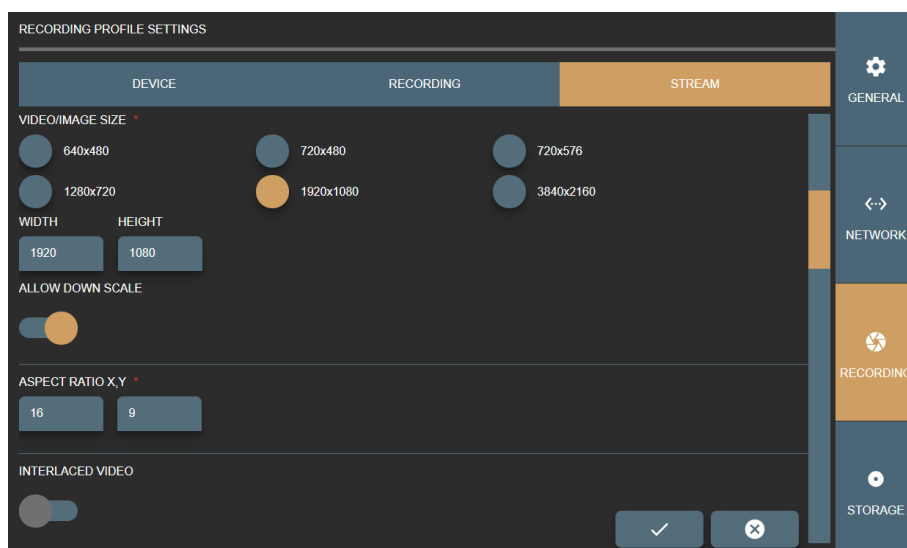


Figure 56. Stream output options in the Recording profile Stream settings

- **VIDEO/IMAGE SIZE** – set available video resolution.

It is recommended to select close enough or the same resolution for medical device output signal to ensure best quality. Use WIDTH and HEIGHT entry controls to adjust the selected size or enter the custom size: the controls are automatically filled with values of the selected option.

- **ALLOW DOWN SCALE** – set restriction to re-scale image/video. Recommended leave as it is, but in some cases it allows ensure original resolution as device signal resolution or expand to fit DICOM standard.

- ASPECT RATIO X,Y – set aspect ratio by resolution or manually change values.
- INTERLACED VIDEO – enables interlace. The default value is disabled.

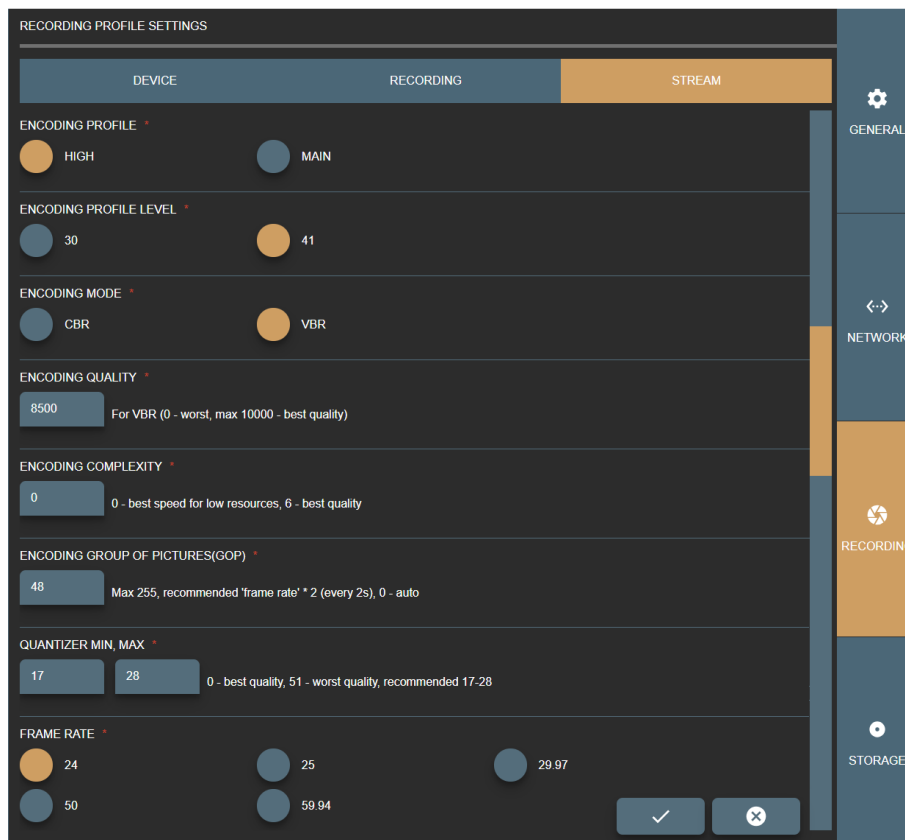


Figure 57. Stream video compression options in the Recording profile Stream settings

- Customize stream video compression by setting the parameters:
 - ENCODING PROFILE – set available encoding profile.
 - ENCODING PROFILE LEVEL – set available encoding profile level.
 - ENCODING MODE – set available encoding mode.
 - ENCODING QUALITY – enter the value from 0 for the worst quality to 10000 for the best quality encoding for VBR encoding mode. The default value is 8500.
 - ENCODING BIT RATE – enter bit rate value for CBR encoding mode. The higher bit rate means the higher quality. Default value is 8388608 (what equals to 8Mbps).
 - ENCODING COMPLEXITY – enter the values from 0 for the best speed to 6 for the best quality.
 - ENCODING GROUP OF PICTURES (GOP) – enter values from 0 up to 255. 0 is for auto selection. The recommended value is frame rate multiplied by 2.
 - QUANTIZER – enter MIN and MAX values from 0 for the best quality to 51 for the worst quality. The default and recommended values are from MIN 17 to MAX 28.
 - FRAME RATE – set available frame rate.

Figure 58. Stream audio options in the Recording profile Stream settings

- Customize stream audio encoding and compression by setting the parameters:
 - AUDIO ENCODER FORMAT – set available format.
 - AUDIO CHANNELS – set available channels.
 - AUDIO BITS – set available bits.
 - AUDIO FREQUENCY – set available audio frequency.
 - AUDIO BIT RATE – enter bit rate value. The higher bit rate means the higher quality. Default value is 131072.
 - AUDIO VOLUME – enter audio volume from 0 to 100 percent. The default value is 100 percent.

Figure 59. Real Time Streaming Protocol (RTSP) options in the Recording profile Stream settings

- STREAM USER NAME and PASSWORD – enter RTSP stream security option.
- STREAM PORT – enter free RTSP stream port number. For multiple profiles with stream enabled – set different port numbers. It is recommended to consult with network administrator for avoiding conflict with other streams.

Press save button  to create or update profile.

Or press cancel button  to discard the changes.

Storage settings

Customize Storage settings to manage disc space and services. Storage settings are grouped into three groups:

- AUTO DELETION – setup space monitoring to delete old studies.
- MANUAL DELETION - manual delete studies.
- SERVICES – handle system services(turn off/on, view status).

Auto deletion settings

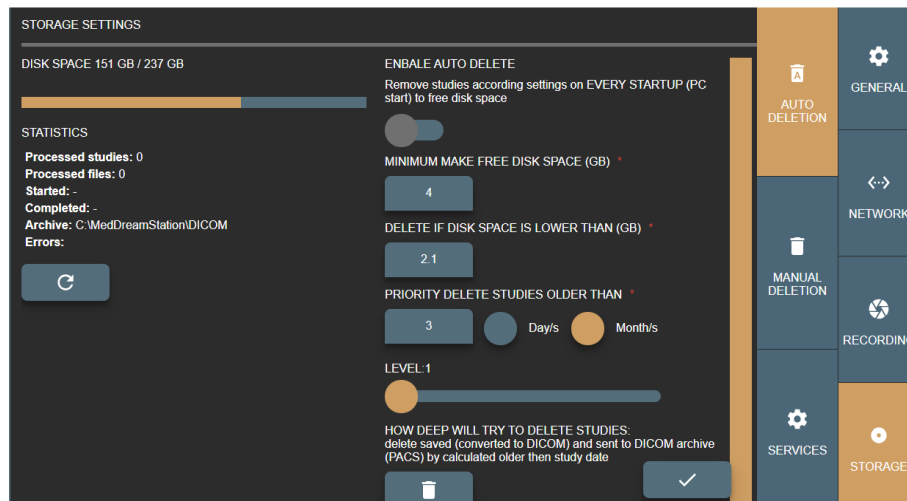



Figure 60. Auto deletion page in Storage settings

Auto delete main idea is to free space on VS application startup (on computer startup starting application).



CAUTION! On Windows OS it is recommended to have at least more than 2GB free space to function properly.

On the left side of the Auto Deletion page you can see the information about disk space, archive location, and statistics of the last auto deletion process. Statistics can be updated by pressing refresh button .

On the right side of the Auto Deletion page you can set the following settings for automatic deletion process:

- ENABLE AUTO DELETE – turn on auto delete.
- MINIMUM MAKE FREE DISK SPACE (GB) – specify how much space to make free.
- DELETE IF DISK SPACE IS LOWER THAN (GB) – specify required empty disk space, when to trigger auto delete function at VS application startup (on computer startup).



NOTE! If parameter DELETE IF DISK SPACE IS LOWER THAN (GB) is set to 5GB and MINIMUM MAKE FREE DISK SPACE (GB) value is 2.1GB – auto deletion expected result will be 7.1GB disk free space.

- PRIORITY DELETE OLDER THAN – specify how old studies should be deleted from current date in days or months.

- LEVEL – specify the condition for how deep the system should try to delete studies. Auto delete process have number of steps to free space by finding studies and removing them to meet desired free space (MINIMUM MAKE FREE DISK SPACE (GB)). The following levels are allowed:
 1. delete saved (converted to DICOM) and sent to DICOM archive (PACS) by calculated older than study date,
 2. delete saved (converted to DICOM) and sent to DICOM archive (PACS),
 3. delete received studies by calculated older than study date,
 4. delete received studies,
 5. delete saved (converted to DICOM) and NOT sent to DICOM archive (PACS) by calculated older than study date,
 6. delete saved (converted to DICOM) and NOT sent to DICOM archive (PACS),
 7. delete NOT saved (not converted to DICOM) by calculated older than study date,
 8. delete NOT saved (not converted to DICOM),
 9. delete by calculated older than study date,
 10. delete any.

Save changes by pressing button



To start auto delete manually – press on button



(requires to activate ENABLE AUTO DELETE).

Manual deletion

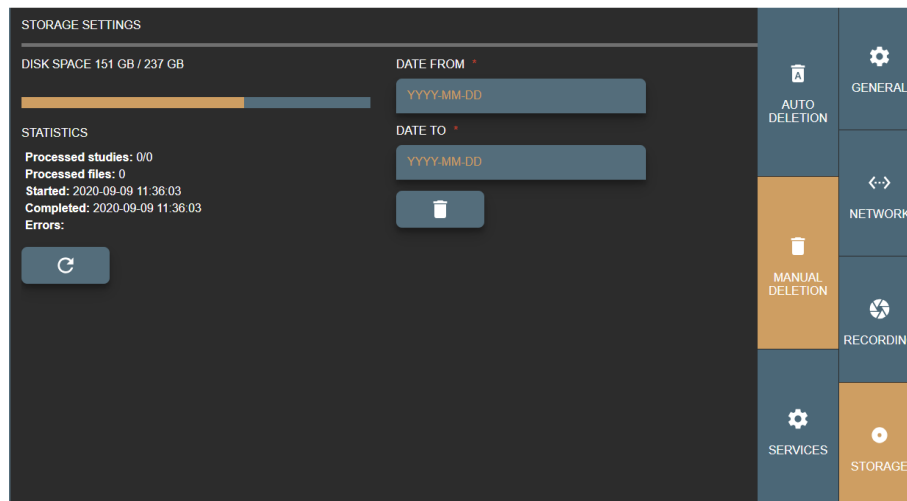




Figure 61. Manual deletion page in Storage settings

Manual deletion main idea to delete all studies that is created between date range. To delete the studies, apply the following steps:

- In DATE FROM field enter the start date, when studies were created.
- In DATE TO field enter the end date, when studies were created.
- When dates are entered, press delete  button.

On the left side of the Manual Deleting page you can see the information about disk space, and statistics of the manual deletion process. Statistics can be updated by pressing refresh button .

Services

In Services page you can see the status of system services.

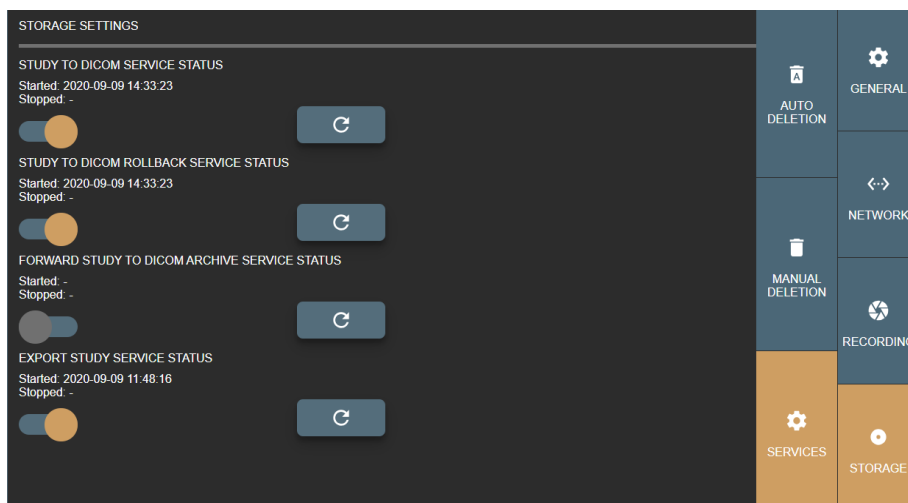

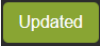
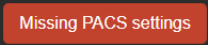


Figure 62. Services page in Storage settings

Service can be started/stopped by clicking on/off control . The service status is automatically updated, and the information message is displayed on the screen . If the status cannot be changed, the error message is displayed on the screen . In such cases you should fix an error (for example, go to the network settings and enter the settings for DICOM archive), and then try to start the service.

Service status information can also be updated by pressing refresh button .

About VS and license

Information about the MedDream video viewing and converting functionalities is displayed on the left side of the License and product info window.

| LICENSE AND PRODUCT INFO | |
|----------------------------|--|
| License to | DEMO ⓘ |
| Concurrent connections | 1 (Connected 0) |
| Valid to | 2024-12-15 |
| ✓ Update to | 2024-12-15 |
| <hr/> | |
| Product | MedDream |
| ✓ Version | 8.3.1 |
| | Video recording func. 4.6.6 |
| 📅 Release Date | 2023-12-15 |
| 📄 Unique device identifier | (01)04779049590105(10)MDSY8310 |
| 📄 Catalogue number | MDSY |
| 📄 Medical device class | Regulation (EU) 2017/745, Class IIb active medical device |
| ID of the notified body | 0197 |
| FDA Cleared | For diagnostic use including mammographic images K222320 (device class: 2) |
| ⚠ Warning for USA | Mobile device display is intended for informational purposes only, not for diagnostic purposes. |
| ⚠ ⚠ ⚠ | Warnings, cautions and notes are described in User Manual. Instructions for use ⓘ |
| <hr/> | |
| Manufactured by | Softneta, UAB |
| 📄 Country of manufacture | Lithuania |
| Address | K. Barsausko str. 59b, LT-51423, Kaunas, Lithuania |
| Contacts | info@softneta.com , https://www.softneta.com |
| | |

Figure 63. About MedDream video viewing and converting functionalities

To register or update the license, use the license registration form on the right side of the License and product info window:

REGISTER LICENSE TO:

SERIAL KEY:

Figure 64. License registration form

- In REGISTER LICENSE TO field enter the organization or end user name.
- In SERIAL KEY field enter the serial key, that you have got from software provider.

Press registration button



NOTE! Registration requires internet access to <https://lic.softneta.com>.

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