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MedDream (version 8.9.0)

INSTALL MANUAL

of MedDream video viewing

and converting functionalities

version 4.7.2

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Explanation of symbols used

The symbols used in this daily workflow refer to important safety information that warns against possible health risks or fatal injuries and contain useful notes. Whenever you see these symbols, read the accompanying information carefully and observe all safety notes and information in the user manual, daily workflow, and on the device labels.

WARNING! This indicates a hazardous situation that may cause patient death, potential injury, or serious health impairment, requiring professional medical intervention.

CAUTION! This indicates a hazardous situation that may cause minor potential injury, not require professional medical intervention, or simply cause inconvenience to medical professionals using software without affecting patient health status or health changes.

NOTE! Information, hints, and advice for a better understanding of the instructions to be observed in the operation of the instrument.

Warnings regarding residual risks

No	Hazard	Warning/ Caution
1	Incorrect configuration	**CAUTION!** VS software will try to scale the 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. **CAUTION!** VS software will try to scale the 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.

Introduction

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

The intuitive user interface is simple, but very powerful software controlled by a touchscreen Medical Panel PC. Storing locally more than 125 hours of HD videos and up to 100.000 still images.

The core functions:

- High-quality video recording into DICOM by using MPEG2 and MPEG-4 AVC/H.264 compression.
- Record/take multiple low and high (full HD) quality videos/snapshots during the surgery or other procedures.
- Live stream video during the procedure.
- Record, stream, play video, and take snapshots at the same time.
- Record video/take images from multiple connected devices (special video card needed).
- Flexible patient data assignment: selecting already existing a patient, manually entering the patient details, or selecting from the hospital DICOM worklist server.
- Possibility to start a new study recording, while other videos/snapshots are in progress for saving to DICOM or sending to DICOM archive.
- Review medical images/video during the surgery or other procedures.
- Trim the recorded video.
- Recorded studies can be stored locally, sent to the hospital DICOM archive (PACS), or exported to other storage devices.
- View saved images/videos with integrated DICOM Viewer.

Customization possibilities:

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

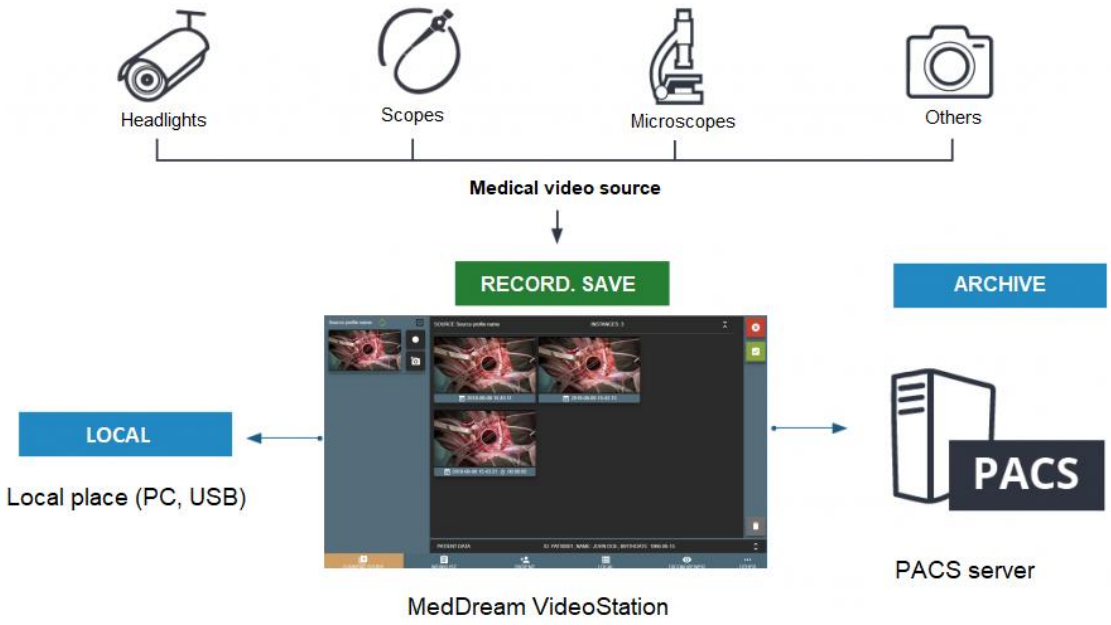

Figure 1. Connection diagram

Minimal Requirements

Minimal hardware and software requirements:

Parameter	Requirements
CPU	Intel® Core™ i5 or i7 When using FHD streaming, recording, and playing at the same time: 4 threads, 4 GHz or 8 threads, 1.8 GHZ.
RAM	8+ GB
Storage space	Storage disk 500 GB (Storage disk speed directly affects application performance) depends on usage workflow, can be >=256 GB, ~7 days requires 56 GB
Network Bandwidth	100+ Mbit/s
Operating system	Windows 10, Windows 11
Screen resolution	1920x1080 pixels (lower resolution not supported)

⚠ **NOTE!** We recommend upgrading PC, or reducing video quality, if it does not match the minimal requirements for recording, playing, and streaming at the same time.

If you are faced with such a problem, please contact MedDream UAB Customer support – e-mail support@meddream.com and we will help you resolve it.

General consideration

VS software based on JAVA, C/C++, ELECTRON (CSS/HTML/JavaScript) built applications, JAVA WEB server, and PostgreSQL database. So, all data is stored in the PostgreSQL database, program configurations are saved into files, and studies are stored as image/video/DICOM in the local PACS system.

Installation

Physical installation

VS works with video devices or capture cards installed on the same PC and can record, make snapshots, and stream one or more signals at the same time.

VS solutions are mostly used in operating rooms, but they can also be used in doctors' offices where it is necessary to record interactions with a patient (for example, a psychiatrist's session). Therefore, the physical installation depends on who will be recording and what kind of equipment is used to capture the video signal. We recommend consulting with us before purchasing, and below we present two main scenarios:

1. Video recording and snapshots without YUAN capture card.

To record video and create snapshots, you need a device that supports the Microsoft DirectShow API. Most devices that can be installed on Windows OS support the DirectShow API.

2. Video recording, snapshots, and streaming with YUAN capture card.

To record, make snapshots, and stream videos, requires YUAN USB/PCIe capture card with **software compression**. Currently tested capture cards: SA7160 PCI, QP0203 PCI, FH8735 PCI, CY3014 USB.

VS supports YUAN capture card inputs: COMPOSITE, SVIDEO, HDMI, DVI_A, DVI_D, COMPONENTS, SDI.

⚠ **NOTE!** Please contact us for more details about the required capture card for your business workflow.

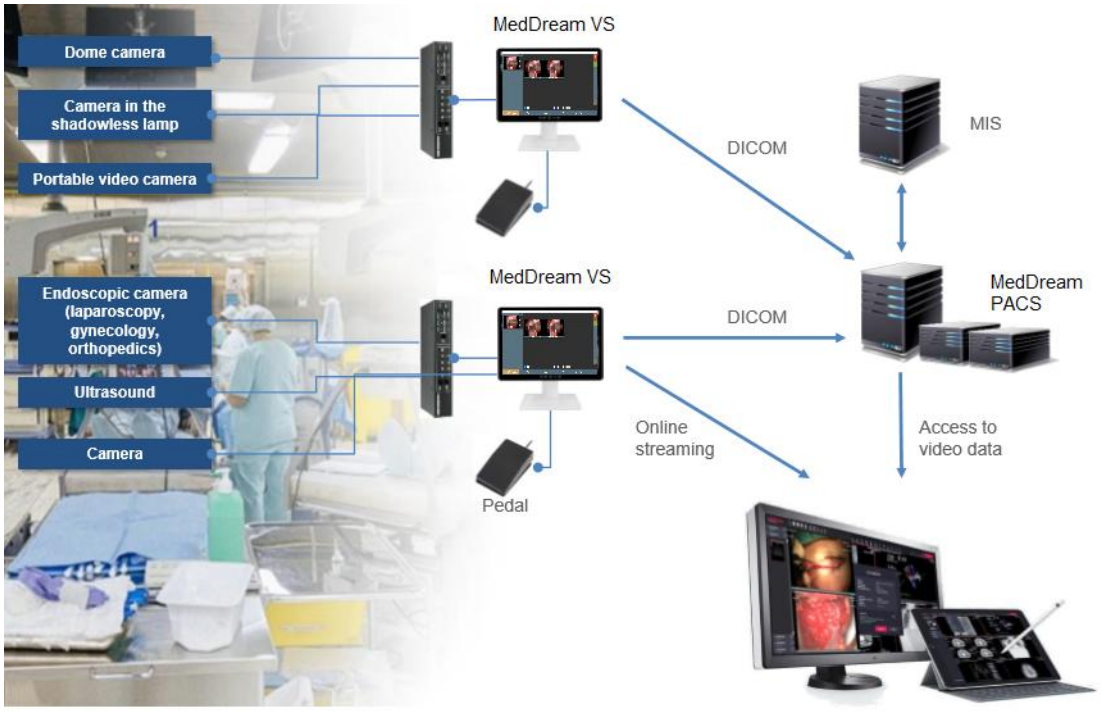

Figure 2. Physical installation scheme

Software installation / updates

Install software

VS software setup will install workstation files.

⚠ **NOTE!** All physical installations must be completed before software installation.

Intel Media SDK has some restrictions. Also, there is more information about Intel Media SDK installation here: C:\MedDreamStation\software\README.md.

To install software for the first time, follow the steps below.

⚠ **NOTE!** VS uses: 80, 3310, 8081, 4568 ports for main applications to work. Other ports can be configured via VS application settings.

⚠ **NOTE!** If you use a capture board - install drivers before VS setup.

1. Download the VS setup file from MedDream https://meddream.com/products/meddream-medical-video-recording/.
2. Run the executable file MedDreamVideoStationSetup-x.x.x.exe to start the installation.

Figure 3. Setup file

3. VS setup will display the license agreement. Select “I accept the agreement” and click “Next”.

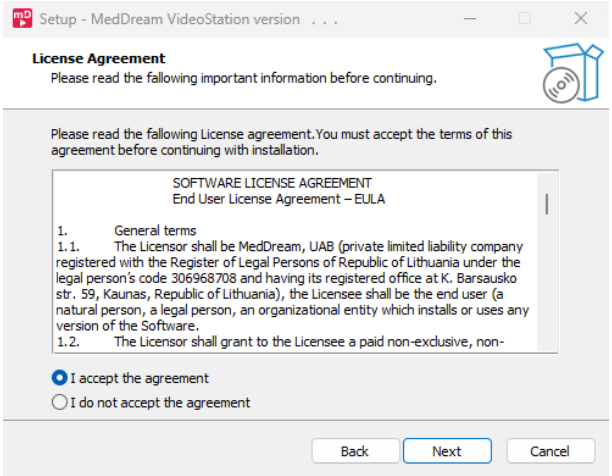

Figure 4. License Agreement page

4. Select the components you want to install. Clear the selection for the components you do not want to install. Select the Language which you want to install. And click next when you are ready to continue.

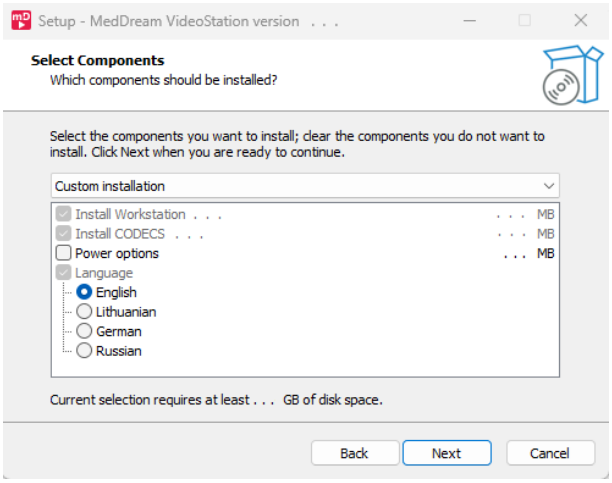

Figure 5. Select the components you want to install

5. VS setup will generate passwords, but you can change and set your own known passwords. All data about passwords will be placed in C:\MedDreamStation\login.txt file.

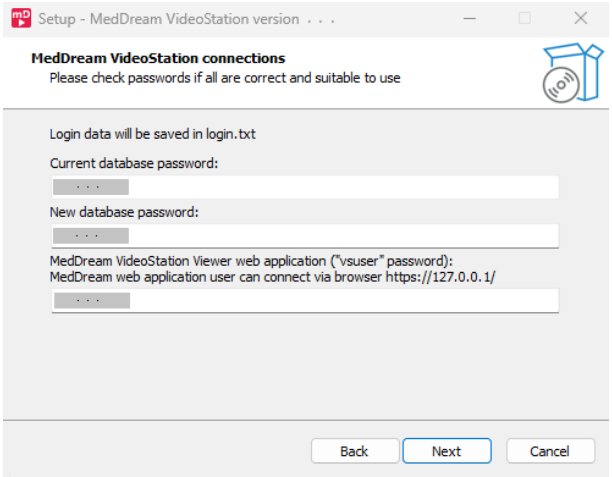

Figure 6. VS connections

After the change, click "*Next*".

6. VS setup displays information about installing software. To start installation, click "*Install*".

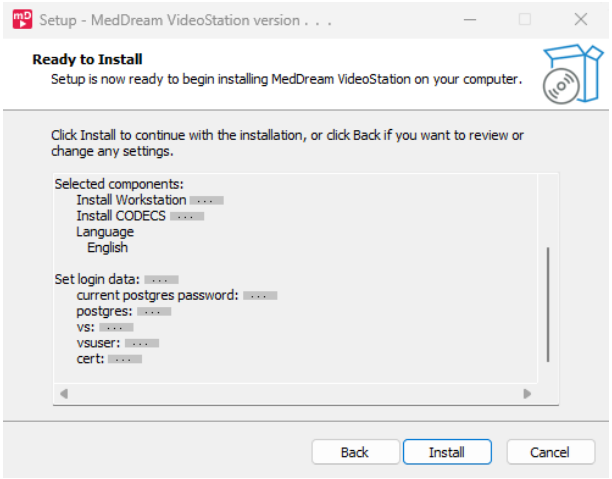

Figure 7. Ready to install the page

7. Wait while the installation is completed (copying files, installing, and starting the application services).

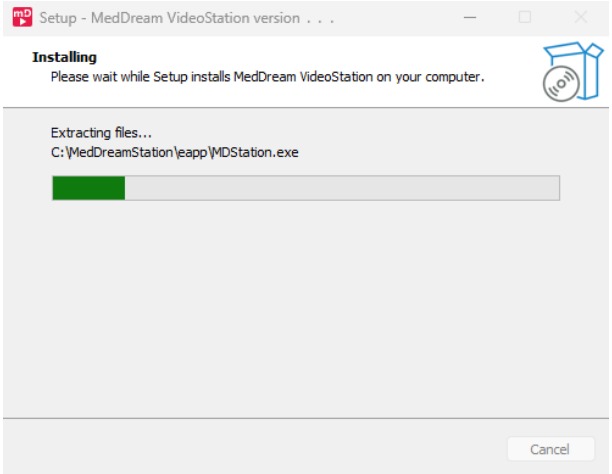

Figure 8. Progress page

8. Complete VS installation:

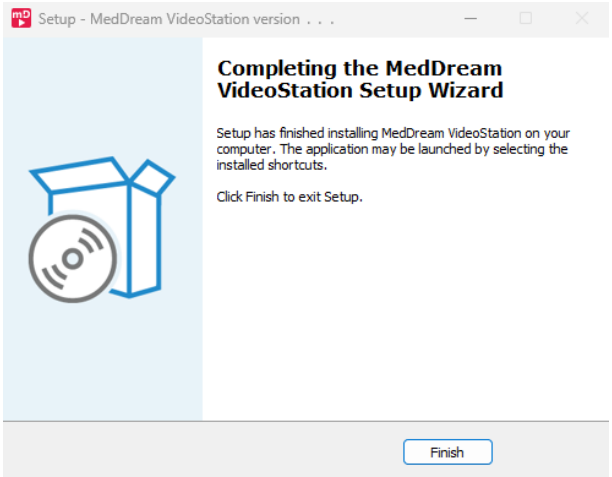

Figure 9. Finished VS installation

The installation will create a shortcut to the main application on the Desktop and Windows startup.

Update software

To update the software, follow the steps below.

1. Follow 1-3 steps from “*To install software for the first time* section”.
2. Installation setup asks you to select which components should be installed. We recommend leaving all components checked. Click „Next“.

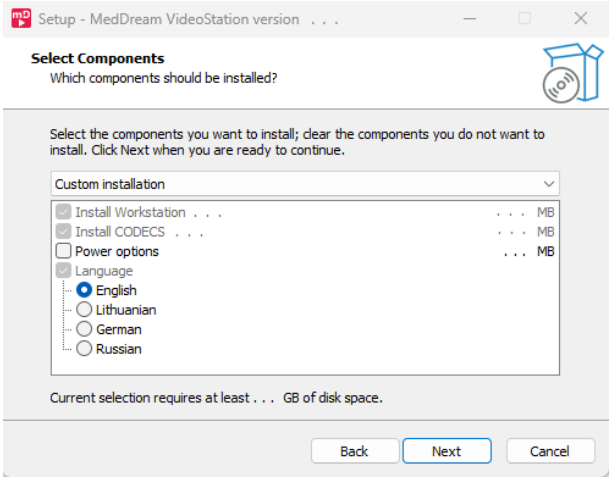

Figure 10. Select components

3. The VS setup detects existing passwords from files and tests the connection, but you can change them and set your own passwords. All password data is stored in the file C:\MedDreamStation\login.txt.

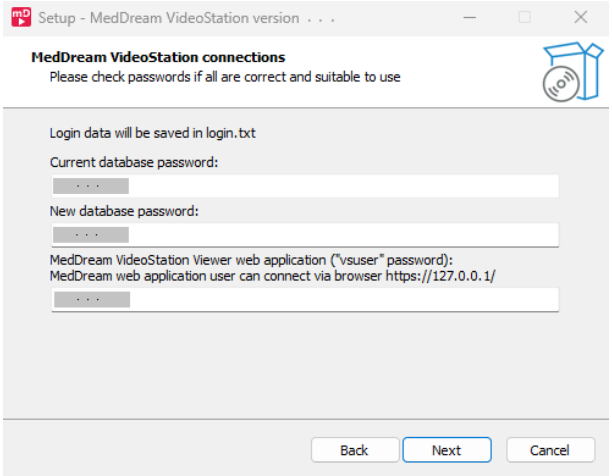

Figure 11. Connection test page

After the change, click “*Next*”.

If, for some reason, the setup cannot detect the correct password for the current root user or the services are not running, it will display the following message. You must then enter the correct current root password (in the first field) or start the VS services.

If you are sure that the password is correct but cannot start the workstation services, click the “Yes” button to continue the installation.

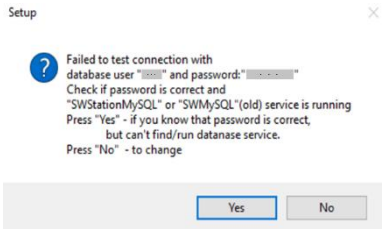

Figure 12. Bad root password

4. VS setup displays information about installing software. To start installation, click "*Install*".

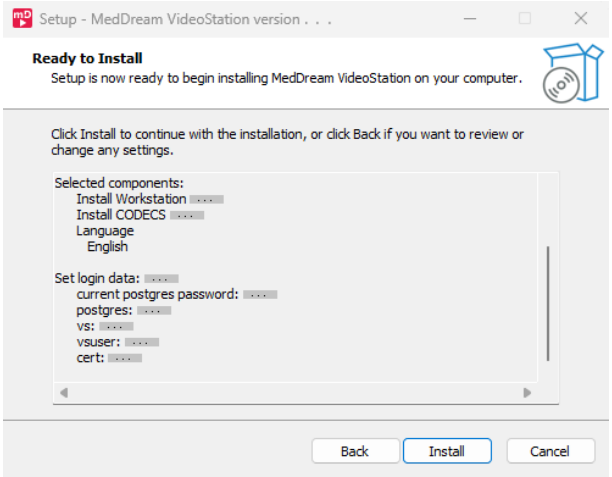

Figure 13. Ready to install the page

5. Wait while the setup installation is completed workstation, the first older version will be uninstalled and the new one installed.

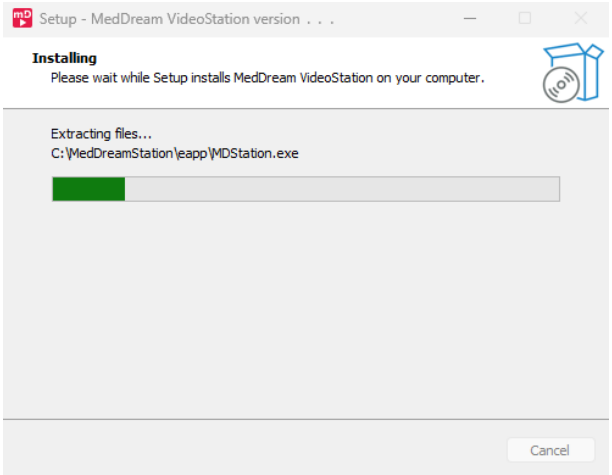

Figure 14. Progress page

6. Complete VS installation:

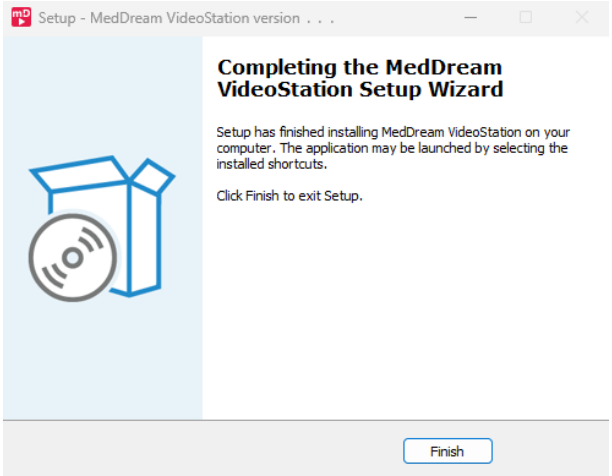

Figure 15. VS success installed

Software uninstalls

1. To uninstall software, go to Control or Settings and select Uninstall.

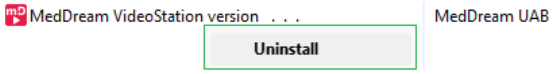

Figure 16. VS entry in Programs and Features used for uninstallation

Or go to the installed VideoStation directory and select “unins00x.exe”.

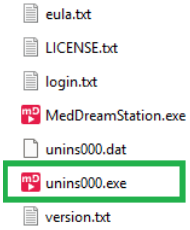

Figure 17. VS file for uninstalling

2. Windows ask permission to uninstall VS software. Select “*Yes*”.

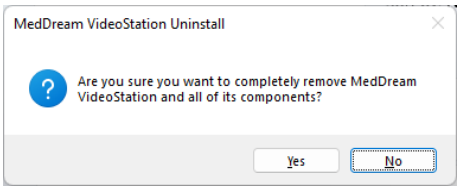

Figure 18. Uninstalling permission question

3. The Uninstall process begins. This will uninstall VS software.
4. Windows let you know when the uninstall process is complete. After uninstalling remains these files and information: license, DICOM/image/video, and settings files. They should be deleted manually.

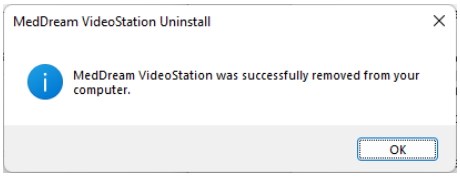

Figure 19. Uninstall process complete

VideoStation Setup

VS settings are located in OTHER > SETTINGS of the main menu.

NOTE! To ensure proper operation of the Video Service (VS), the settings should be modified only by the system administrator.

Figure 20. VS settings

Settings

Contains the following settings: GENERAL, NETWORK, RECORDING, and STORAGE.

General settings

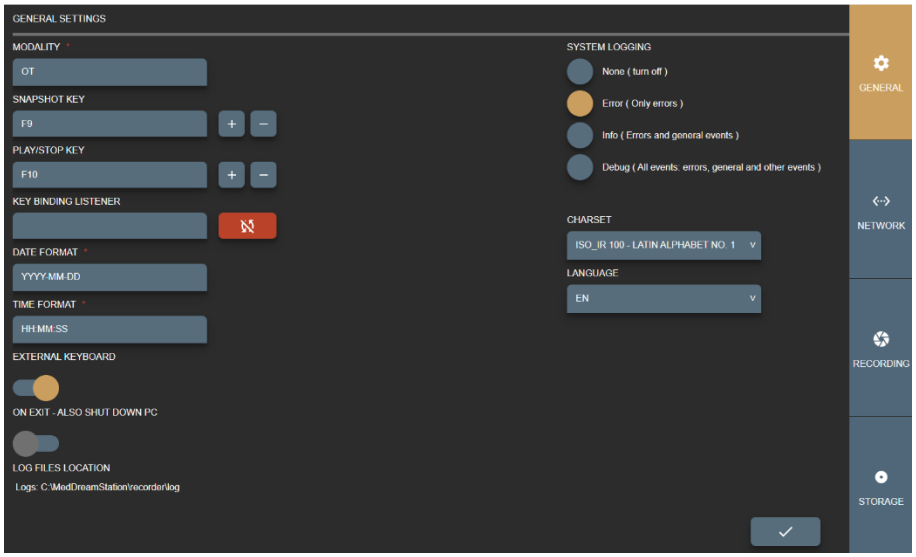

Figure 21. VS general settings

In GENERAL settings you can modify the following options:

- MODALITY – set DICOM modality attribute for studies without modality worklist. By default, after installation, the recorded files modality will be set to OT. Can be changed according to study type and we recommend choosing one of these modalities: http://www.dicomlibrary.com/dicom/modality/.
- SNAPSHOT KEY – pedal signal key combinations to make an image.
- PLAY/STOP KEY – pedal signal key combinations to start or stop video recording.
- KEY BINDING LISTENER – function for retrieving the pedal signal keys.
- DATE FORMAT - data format, e.g. ”YYYY-MM-DD”.
- TIME-FORMAT – time format, e.g. “HH:MM:SS”.

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

⚠ **NOTE!** Some pedals produce different signal key combinations 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 the 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 to key press.

Press the pedal button and see KEY BINDING LISTENER will display the key combination.

Add key combination to SNAPSHOT or PLAY/STOP KEY by pressing the button. To remove the previous key combination - press .

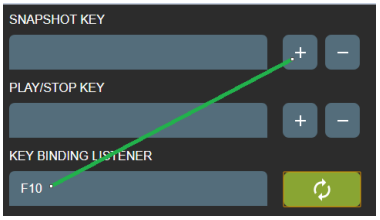

Figure 22. Shortcuts for recording and image making

The user can add several possible keyboard combinations.

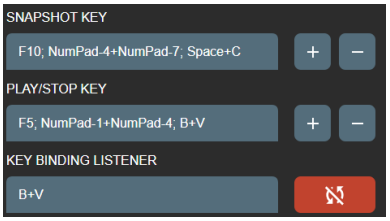

Figure 23. Shortcuts for recording and image making

After completing press the button to turn off the key listener – will change to .

After the update settings, navigate to recording settings and change the device profile key option (Recording settings >ENABLE RECORDING KEYS).

- EXTERNAL KEYBOARD – enable to use physical keyboard connected to PC or windows keyboard on screen. The default is to use the keyboard on the screen due to a touch screen monitor, but sometimes the monitor is hung very high and cannot be controlled by hand. This requires connecting the 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 the process (complete recordings and shut down services).
- LOG FILE LOCATION - displays the location of log files.
- SYSTEM LOGGING – set the 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. The log file can be viewed with a text editor.
- CHARSET – set DICOM character set (0008, 0005) for studies to be encoded. For now, there are 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. However, it is recommended to consult your PACS administrator.
- LANGUAGE - language selection from a drop-down menu.

⚠ **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 – which 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 the save 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 sending saved studies to the hospital PACS.

- WORKLIST - network settings for DICOM modality worklist server connection. This enables us 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 – depending on the hospital infrastructure. Recommended to consult your DICOM archive or worklist server administrator.

Local settings

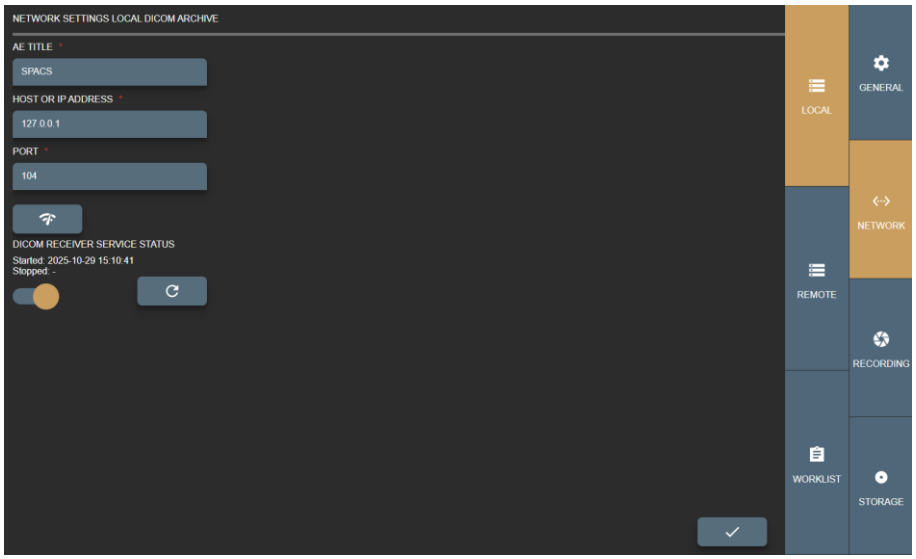

Figure 24. Local VS settings

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

- AET TITLE – max 16 Latin1 characters. Requires asking 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 the receiver, it is recommended to leave 127.0.0.1 local IP address.
- PORT – max 65535 number. DICOM protocol common use is 104 or 11112 ports that should not be reserved by OS process. Recommended to consult the administrator. For the 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 the receiver and refresh the status:
  - Press to refresh the status info.
  - Press to check the receiver status: DICOM C-ECHO will be sent to verify basic connectivity by DICOM protocol. In case of success, the Echo Succeeded message will appear.

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

Remote settings

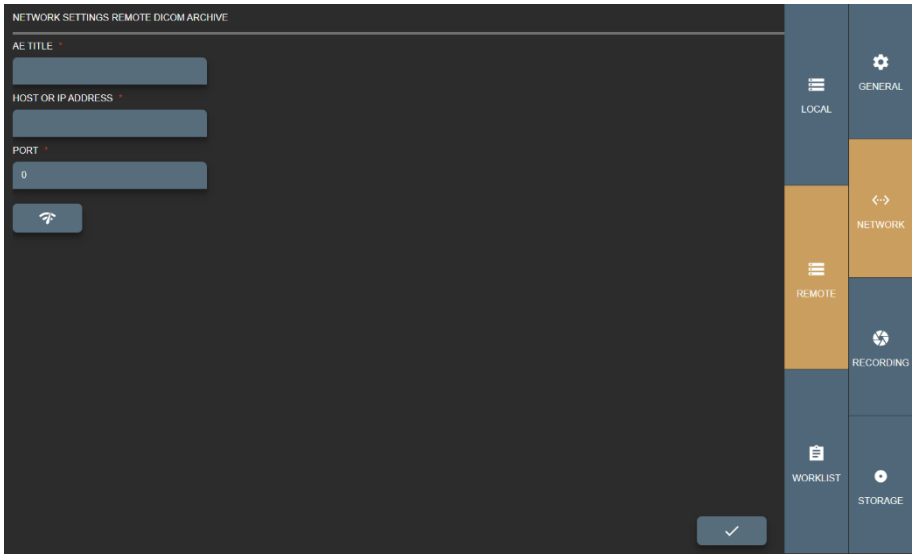

Figure 25. Remote DICOM archive settings

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

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

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

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

NOTE! If a timeout occurs, the waiting time can be increased in the application.properties file. The default values are as follows:

```
forward.connectTimeout=7200000
forward.requestTimeout=10000
forward.acceptTimeout=10000
forward.releaseTimeout=1000
forward.sendTimeout=0
forward.storeTimeout=0
forward.responseTimeout=20000
forward.retrieveTimeout=0
forward.idlTimeout=0
```

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

Worklist settings

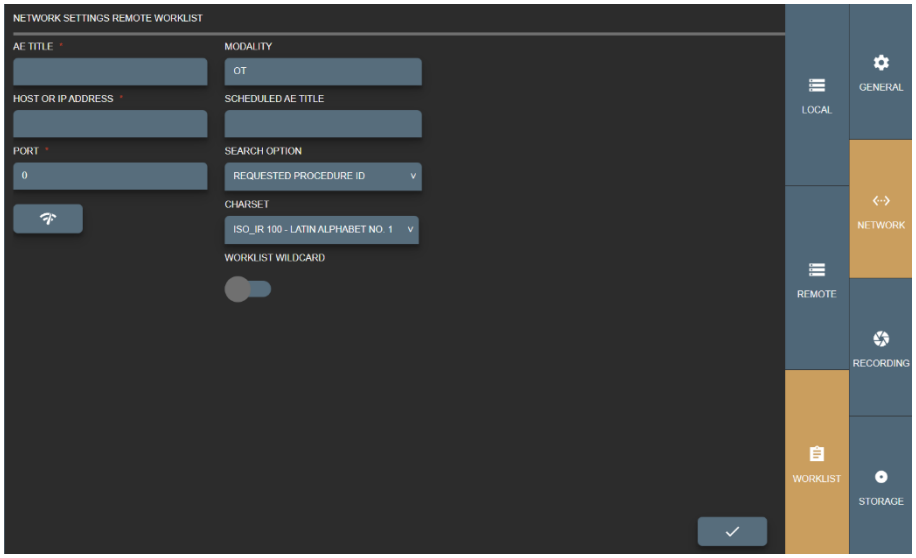

Figure 26. Worklist settings

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

- AET TITLE – max 16 Latin1 characters. Requires asking 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 common use is 104 or 11112 ports. Recommended to consult the administrator.

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

message will appear.

- MODALITY – set modality attribute to fetch from the hospital's Worklist server. By default, after installation, the worklist modality will be set to OT.
- SHEDULED AE TITLE – set the AE TITLE to fetch from the hospital's Worklist server.
- SEARCH OPTION - it is allowed to select values from the list that define the search mode:

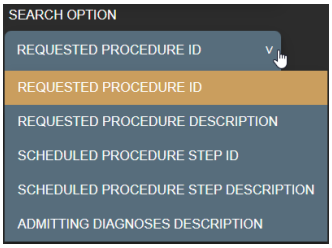

Figure 27. Worklist settings. Search option

- CHARSET – set up encoding for worklist results by selecting a value from the list. The 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 the patient ID or accession number and require searching exact patient ID or accession number. Recommended to consult with the administrator (typically this information can be found in the worklist server or DICOM archive conformance statement document).

To check the worklist server - requires LOCAL VS AET TITLE to be registered on the worklist server. Press the button to send DICOM C-ECHO and verify basic connectivity by DICOM protocol.

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

NOTE! If a timeout occurs, the waiting time can be increased in the application.properties file. The default values are as follows:

```
worklist.connectTimeout=7200000
worklist.requestTimeout=10000
worklist.acceptTimeout=10000
worklist.releaseTimeout=1000
worklist.sendTimeout=0
worklist.storeTimeout=0
worklist.responseTimeout=20000
worklist.retrieveTimeout=0
worklist.idlTimeout=0
```

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

Recording settings

Recording settings are used for configuring video input sources. It allows defining several configurations for one input source, naming each configuration as a profile. The recording settings window displays all the configured profiles.

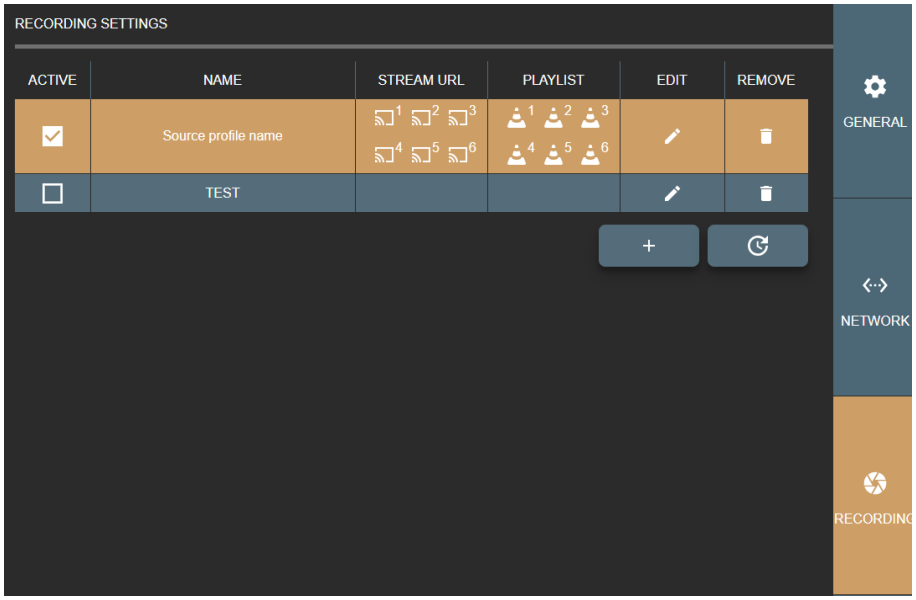

Figure 28. Recording settings

	Activate source profile - display video input source streaming window in the application including startup.
	Update or change source profile settings.
	Delete source profile. If the source is active – required to stop source.

	Reload all active sources.
+	Add a new source profile.
	Can 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 adding 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 the near stream window - settings button:

Figure 29. Fast entering profile settings

Recording profile settings are grouped into three groups:

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

NOTE! GUI validates and checks the 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.

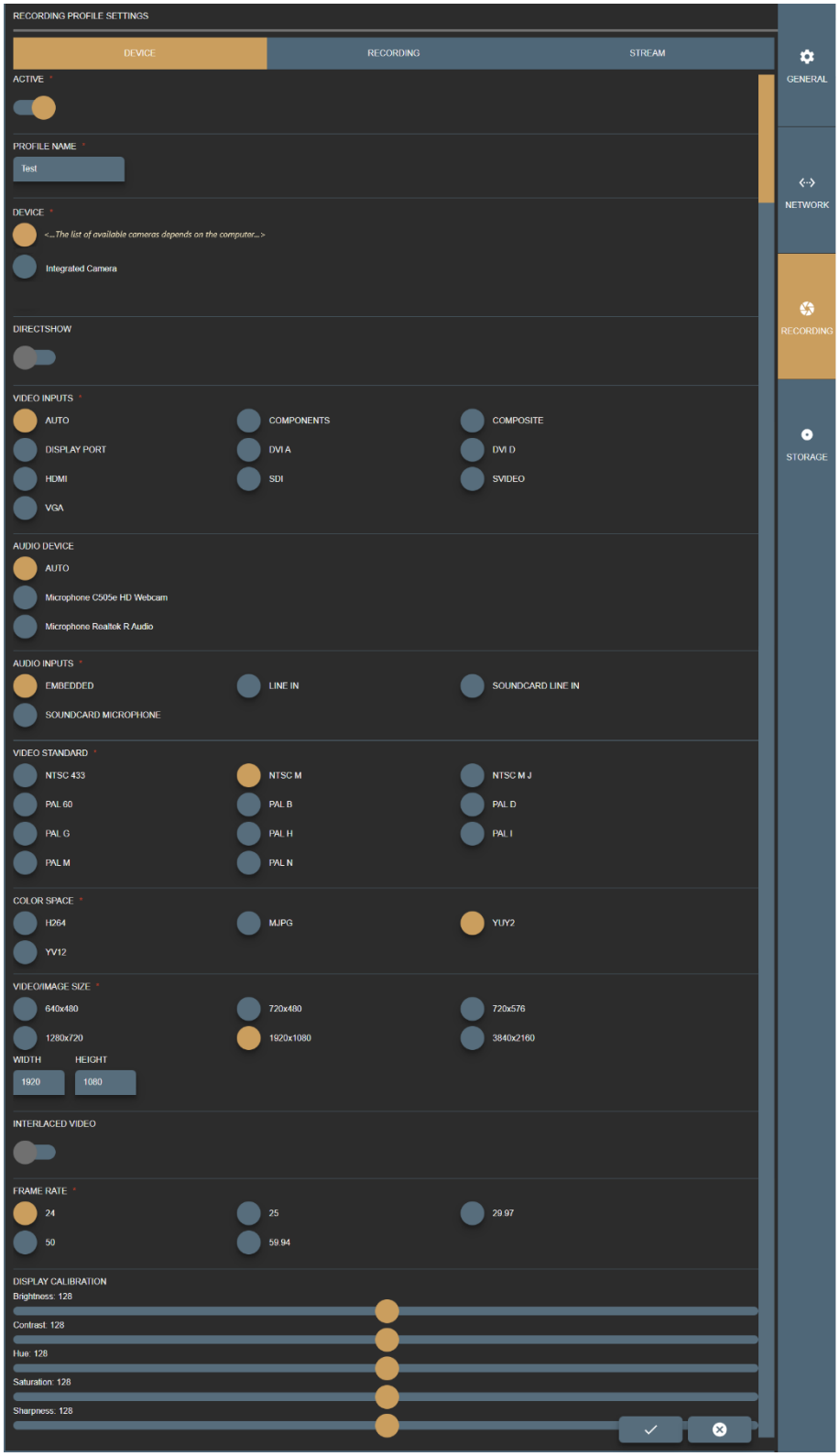

Figure 30. Recording settings. Device settings

- PROFILE NAME – enter or edit the name for the profile. Each input source profile is identified by profile name. If the user enters the already existing profile name, the system will overwrite the existing input source profile data. To create a new profile, enter a different unique profile name.
- DEVICE – select found video devices, like a camera or video capture board.

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

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

- VIDEO INPUT – specify the type of video input. The default selection is AUTO, and the system tries to find the capture board signal. But it's recommended to consult with VS PC administrator about the capture board input type and select the correct one.
- AUDIO DEVICE - select the detected audio devices.
- AUDIO INPUT – specify, how to get an audio signal. This option depends on device input or the device itself. For example, the default selection EMBEDDED should work with a simple USB camera with a microphone array or a 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 set up WINDOWS OS audio devices or redirect audio signal to the capture board. This situation is a little bit tricky and requires testing to configure the input signal environment properly.

- VIDEO STANDARD – specify a standard for the analog video signal, if creating a profile for analog input device.
- Specify other attributes of the video output of the profile:
  - COLOR SPACE - select color space.
  - VIDEO/IMAGE SIZE – select or fill in video or image resolution.

VS software will try to scale the 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 the video signal is interlaced.
  - FRAME RATE – set wanted frame rate.
  - DISPLAY CALIBRATION – enhance the video for a better view.

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).
- 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 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.

⚠ **NOTE!** It is important to select the DICOM transfer syntax according to the hospital's PACS. Some archives are very old and do not support certain transfer syntaxes. It is recommended to consult with the system administrator (see the 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 require testing.

Figure 31. Recording settings. Recording settings

⚠ **NOTE!** VS software will try to scale the 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.

- 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 options: ADM VCE, INTEL MEDIA SDK (require installing Intel media SDK), NVIDIA CUDA, or NVIDIA ENVENC.

Customize video compression by setting the parameters:

- ENCODER FORMAT – set available encode format.
- VIDEO/IMAGE SIZE - specifies the width and height of the video/image in pixels.

- 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 COMPLEXITY – enter the values from 0 for the best speed to 6 for the best quality.
- ENCODING GROUP OF FIGURES (GOP) – enter values from 0 up to 255. 0 is for auto selection. The recommended value is the 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 - Sets the video playback speed in frames per second (24, 25, 29.97).
- Audio BIT RATE - The number of bits processed per second in an audio stream, determining audio quality and file size (e.g., 128 kbps = 128 × 1024 bits per second).
- AUDIO VOLUME - Sets how loud the audio will sound during playback.

Stream settings

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

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

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 a 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 the following: ADM VCE, INTEL MEDIA SDK (requires installing 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.
- VIDEO/IMAGE SIZE – set available video resolution.

NOTE! 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.

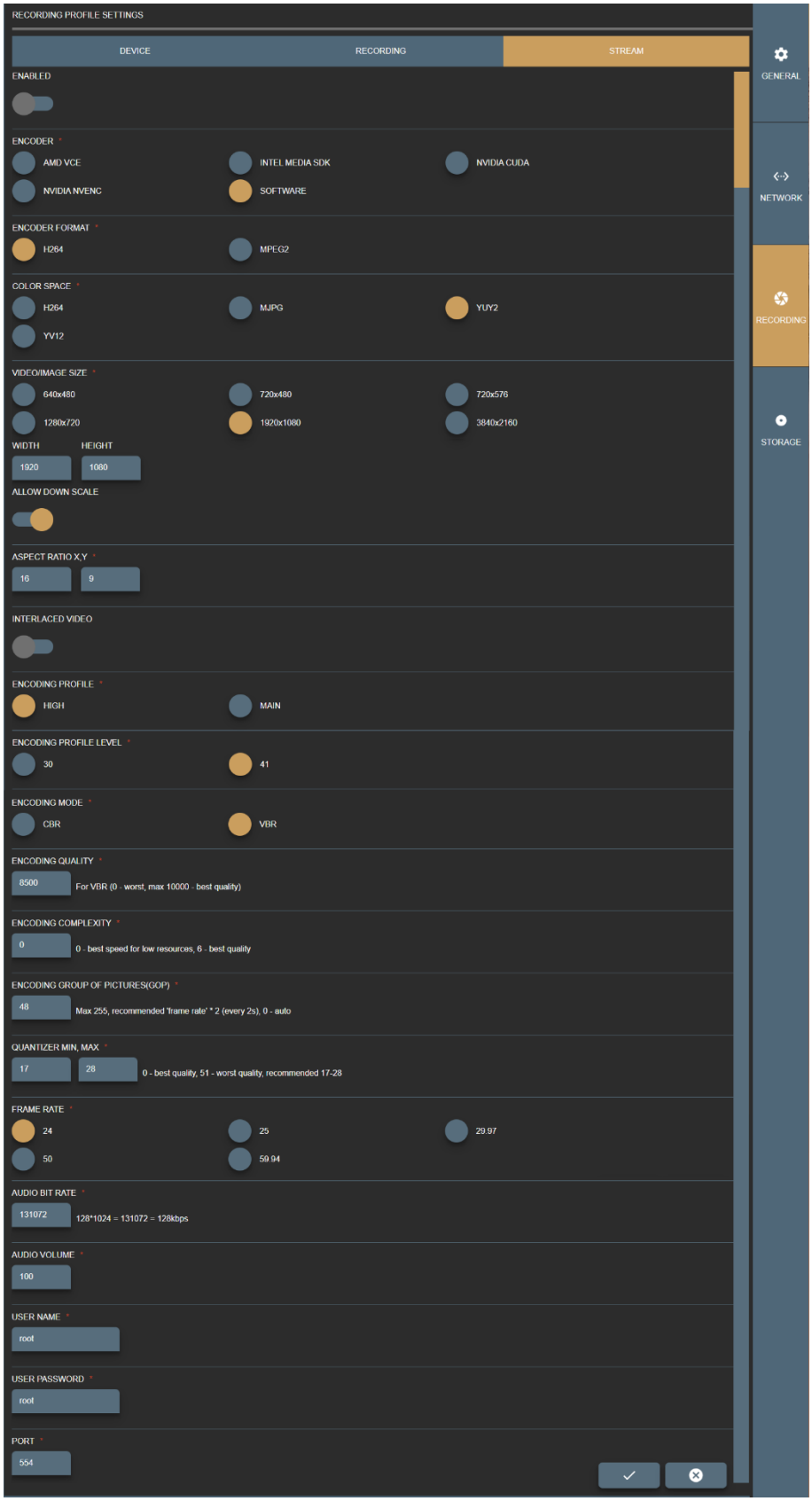

Figure 32. Recording settings. Stream settings

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 the bit rate value for CBR encoding mode. The higher rate means the higher quality. The default value is 8388608 (which equals 8Mbps).

ENCODING COMPLEXITY – enter the values from 0 for the best speed to 6 for the best quality.

ENCODING GROUP OF FIGURES (GOP) – enter values from 0 up to 255. 0 is for auto selection. The recommended value is the 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.

- 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 rate means the higher quality. The default value is 131072.

AUDIO VOLUME – enter audio volume from 0 to 100 percent. The default value is 100 percent.

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

Press the save button to create or update profile.

Or press the cancel button to discard the changes.

Storage settings

Manage disc space and services. You can set auto-deletion or delete studies manually by study date.

Auto delete

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

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

ENABLE AUTO DELETE – turn on auto delete.

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

MINIMUM MAKE FREE DISK SPACE (GB) – specify how much space to make free.

DELETE IF DISK SPACE IF LOWER THAN (GB) – when to trigger the auto-delete function at VS application startup (on computer startup starting the application).

NOTE! If the parameter DELETE IF DISK SPACE IF LOWER THAN (GB) TO 5GB and MINIMUM MAKE FREE DISK SPACE (GB) value is 2.1GB – autodeletion expected result will be 7.1GB disk free space.

LEVEL – Auto delete process has a number of steps to free space by finding studies and removing them to meet desired free space (MINIMUM MAKE FREE DISK SPACE (GB)):

1. oldest studies, older than calculated date from current date, saved and sent to DICOM archive,
2. oldest saved and sent to DICOM archive studies,
3. oldest received studies older than the calculated date from the current date,
4. oldest received studies,
5. oldest studies older than the calculated date from the current date, saved and not sent to DICOM archive,
6. oldest saved and not sent to DICOM archive,
7. oldest studies older than the calculated date from the current date and not saved,
8. oldest not saved studies,
9. oldest studies older than the calculated date from the current date,
10. the rest of the oldest studies.

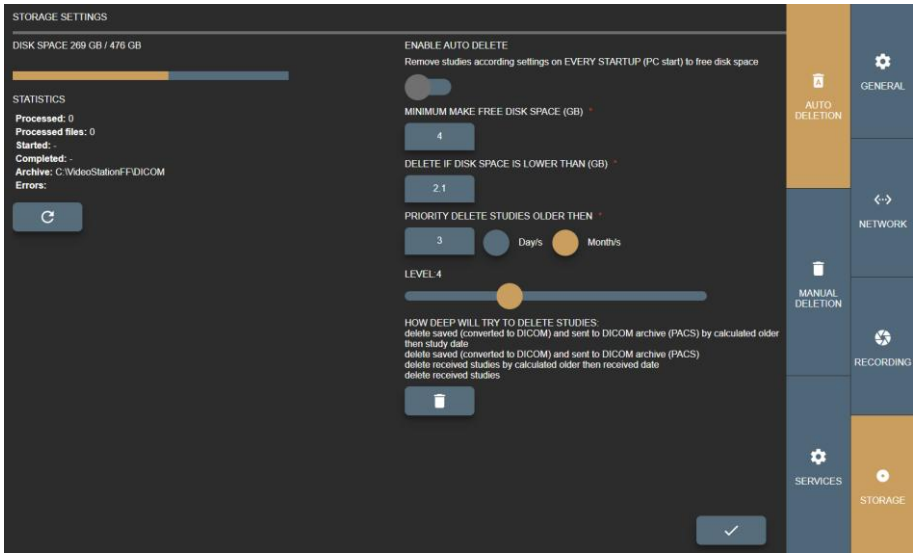

Figure 33. Auto deletion settings

Save changes by pressing the button ✓.

To start auto delete manually – press on button 🗑 (requires activating ENABLE AUTO DELETE).

Manual deleting

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

− In the DATE FROM field enter the start date, when studies were created.

− In the DATE TO field enter the end date, when studies were created.

− When dates are entered, press Delete the 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 the refresh button .

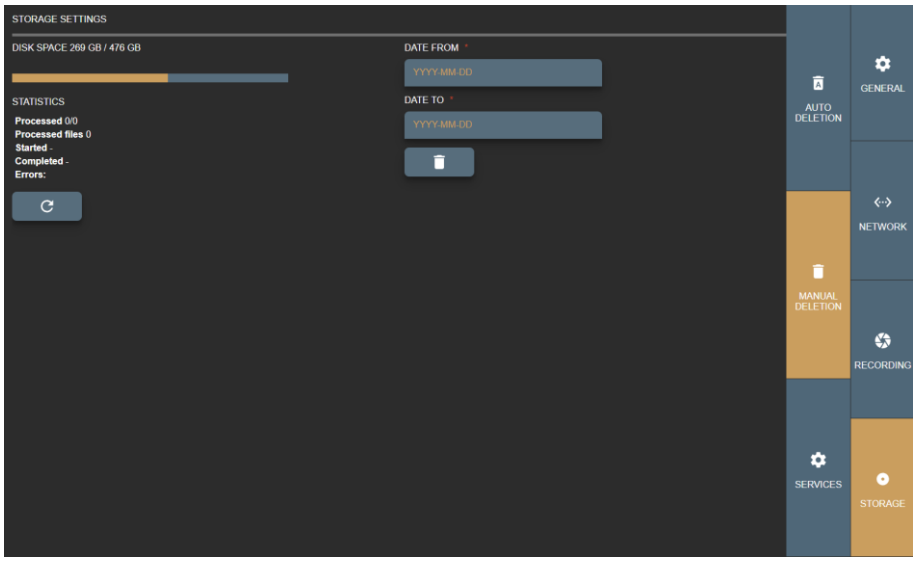

Figure 34. Manual deleting settings

Service

On the Services page, you can see the status of system services.

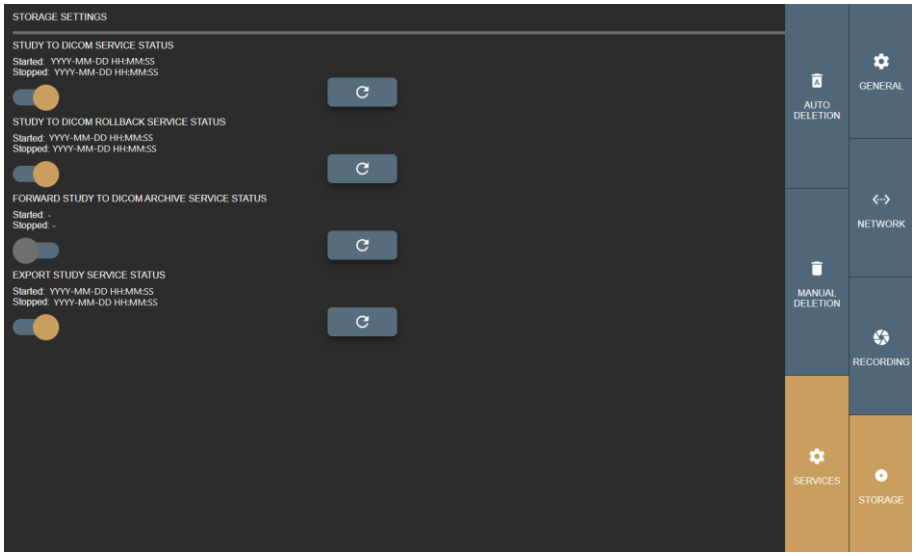

Figure 35. Services page in Storage settings

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 Updated. If the status cannot be changed, the error message is displayed on the screen Missing PACS settings. 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 the refresh button .

About VS and license

Displays information about the VS product and license.

The license can be registered by filling small form and pressing the registration button ✓.

- SERIALKEY – provided serial key from the software provider.

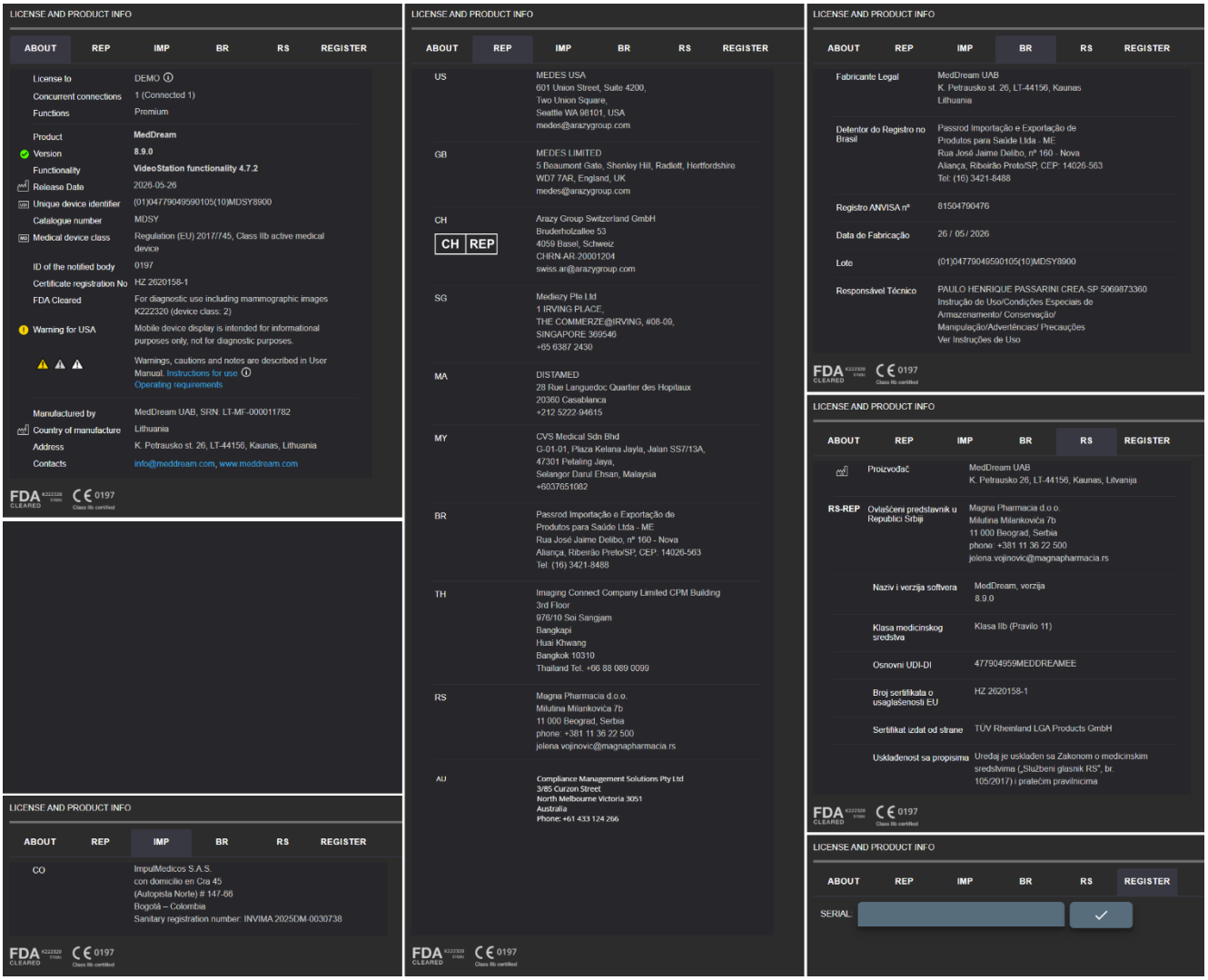

Figure 36. About windows, product registration

NOTE! Registration requires internet access to https://lic.meddream.com.

Image/Video access from the hospital network

Using a browser, log in to MedDream DICOM Viewer on http://127.0.0.1/meddream, user, and password are saved in C:\VideoStation\login.txt. Only one connection is allowed (depending on MedDream DICOM viewer license).

Functional test

When the physical and software installation is completed, we recommend doing some tests before starting work. Making sure everything works smoothly.

Create new study

To create a new study, follow the steps from the User manual, *Functionality description* paragraph.

Check connection with PACS

As soon as the test study was captured, save test data. Captured video/snapshots will be converted to DICOM and sent to PACS via background jobs. If there is no error, VS is ready to be used.

To check the connection with PACS, follow the steps from User manual, *VideoStation settings* paragraph.

Technical specification

For more technical information we suggest reading VS conformance statement https://meddream.com/files/VideoStation/doc/MedDream-VideoStation-DICOM-Conformance-Statement.pdf.

Security considerations

MedDream VideoStation is a stand-alone application, and it is intended to communicate with background applications via HTTP or TCP/IP localhost. Background applications must run as administrator and have access to Windows API.

API restriction

MedDream VideoStation JAVA background application API is restricted to access just by IP address. In /jhttp/application.properties file add the property “server.allowIps” with the list of IP’s. By default, it always allows just local IP – 127.0.0.1.

Other restrictions can be set by defining properties:

- server.denyEndpoints - deny multiple end-points for all requests
- server.connect.strict=1 – forbid to connect multiple clients. If this option is absent - always allow connection (if already connected to other clients - disconnect older clients)

The user can add a more secure connection by defining properties:

- server.port =4444 – set specific port
- server.ssl.enabled=true - enable https
- server.ssl.key-store-type=PKCS12 – certificate type
- server.ssl.key-store=someCertificateFile.p12 – valid certificate file path
- server.ssl.key-store-password=someCertificateFilePassword – certificate password

WebSocket can be connected just with “clientId”, which will be received after connection to the JAVA background application. This will ensure just one active client. WebSocket is also restricted by IP address.

Password

During MedDream VideoStation installation will offer to enter passwords for the “root” user (have full access to the database) and “vsuser” user (access to DICOM viewer web application). Passwords are randomized but can be changed. Manually passwords should be generated at least 12 characters with uppercase, lowercase, numbers, and special characters, and not listed in https://haveibeenpwned.com/Passwords

For every installation, the database password (root user) will be offered to change.

Database passwords are saved in “/database/users.ini” and it is used for reinstalling MedDream VideoStation – do not remove this file.

DICOM viewer login information is saved in the “login.txt” file.

Password can be changed only during the installation process. Manfully password change is not recommended, because it requires updating database and configuration files, to ensure working software and future updates.

Firewall

MedDream VideoStation background application will add/update firewall rules, to allow access to applications to the internet or open required ports (access PACS, Worklist server, or DICOM web viewer 80 port).

Manually changing DICOM web viewer port – requires manually updating the firewall.

Licensing address https://lic.meddream.com/ might need to be whitelisted in a corporate firewall, to ensure the ability to register the software.

When the API is used from a remote computer, the application port must be opened manually in the firewall.

Other programs

Must ensure that other software (antivirus, firewall, or other network monitoring programs) does not interfere:

- access to C:\MedDreamStation directory
- access background application via HTTP/HTTPS (default port 8081, 80), TCP/IP (default port 3310, 4568, 104)
- run command prompt (updating firewall, running external applications or commands)
- access Windows API (call keyboard or monitor client keyboard pressed keys – working with pedals).

By default, during installation, will add *.exe files and directories to the windows defender exclusion list (increase PC performance). If using other antivirus or monitoring programs – exclude from monitoring MedDream VideoStation applications and directories.

Access audio and video devices

Must ensure that OS or other programs allow access to video and audio devices for MedDream VideoStation recorder application (recorder.exe).

Ensure that audio and video device drivers are up to date and no other programs conflict with them. Must ensure, that no other application is in use of the same device – must be free.

There is the case that some modern cameras do not support standard Windows DirectShow API or require device special/dedicated software to run the device (probably installed as virtual devices). In this case, it requires testing and seeing if the device can be accessed by MedDream VideoStation recorder.

Local archive

MedDream VideoStation does not offer to change the file archive directory and the default is C:\MedDreamStation\DICOM (to keep real study files). It is recommended to have a large enough space to keep files. The application provides to delete files by date, and this cleaning must be implemented periodically.

MedDream VideoStation recorder will stop working if there is low space (ensure that have more than 2GB) in C:\MedDreamStation\DICOM directory.

Manually file archive directory can be changed by defining the “archiveDir” property in /jhttp/application.properties. If the new directory is a network drive – ensure, that the PC administrator user has access to this drive (MedDream VideoStation background applications are running with administrator rights).

Installator

MedDream VideoStation allows manually install/uninstall/start/stop background applications without changing the installed directory. Files(*.bat) in “/install” directory must run with administrator rights, to have full access PC running process, scheduler, and firewall.

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