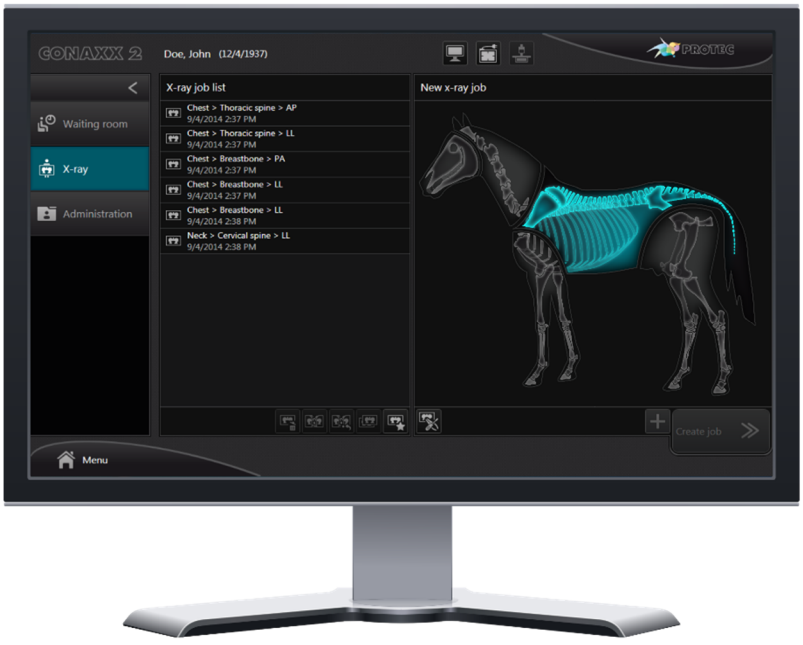
CONAXX 2 VET

X-ray acquisition software

Model/ID: 4330-0-0000

Installation Instructions
and
Technical Description

ID. no. 5330-0-0134



PROTEC X-ray Systems GmbH
In den Dorfwiesen 14, 71720 Oberstenfeld, Germany
Telephone: +49 (0) 7062/92 55-0 E-Mail: protec@protec-med.com

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NOTE

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Comments and questions about the documentation, please contact:

PROTEC X-ray Systems GmbH

In den Dorfwiesen 14, 71720 Oberstenfeld

Germany

Phone: (+ 49) 7062 – 92 55 0
Fax: (+ 49) 7062 – 92 55 60
E-Mail: protec@protec-med.com
Internet: www.protec-med.com

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NOTE

The information contained in these instructions for use corresponds to the software status at the date of manufacture. Improvements made after the date of manufacture are described in the current service notes distributed by PROTEC X-ray Systems GmbH's technical customer service.

Revision Status

Revision	Date	Updated pages	Comments	Author
2.2.1	2024-03-12	all	Original issue	MM
2.2.3	2025-01-17	page 31	Chapter 8.2.1 Common: PROPAXX 2 added	MM
		page 19	Chapter 5 Installation instructions: warning added: required administrator rights	FR
2.2.3-A	2025-07-01	all	Company name changed from " PROTEC GmbH & Co. KG" to "PROTEC X-ray Systems GmbH"	MM
2.2.5	2026-03-20	page 10	Chapter 1.1.1 Modules: additional modules "Triple Panel module" added	MM
		page 17	Chapter 4.1 System requirements CONAXX 2: RAM increased tof 8 GB	MM
		page 32	Chapter 8.2.5 Modality: Detector mapping (Second section) added	MM
		page 34 and 35	Subchapter 8.3.1.x reorganize	MM

Radiation Warning

WARNING!

In these accompanying documents, a system or a component for such a system is documented, which is used for the intended generation of X-rays in medical diagnostics.

X-rays are ionizing radiation that can cause damage to living organisms (e.g., cancer or mutations).

X-rays represent a potential risk for patients and employees. Therefore, the application of X-rays with a given medical issue, must aim at the minimization of radiation exposure for both groups of people.

The group of people responsible for the application must have the necessary specialist knowledge in accordance with the ordinances and guidelines and apply the procedures for the safe operation of such systems.

The national regulations must also be observed during planning and installation.

The X-rays are created in the X-ray tube by strong braking of previously accelerated electrons, which emit energy in the form of electromagnetic waves. The intensity depends on the set parameters voltage (kV), current (mA) and time (s) on the X-ray generator. The X-rays are only emitted at a radiation exit window of the tube and are limited by the collimator mounted directly below.

To the User

NOTE

The user of these accompanying documents is required to carefully read through and carefully consider the instructions, warnings and cautions contained therein before starting operation.

Even if you have already used similar software products, there may still be differences in the structure and functional sequence of the software product described here, which have a significant influence on the operation.

Although the product was subject to a risk analysis and the design corresponds to the current state of the art, residual risks remain in clinical use. These are displayed in the following Instructions for use by application limits, contraindications, warnings and precautions.

Installation and configuration of the software described here must be carried out by the authorized and qualified personnel of PROTEC X-ray Systems GmbH. Persons who are not employees of the technical service department of PROTEC X-ray Systems GmbH are requested to contact the local branch of PROTEC X-ray Systems GmbH before starting installation or service work.

For assembly and service works, it is necessary to use the "Technical Description" of the product and to observe the points it contained therein.

NOTE

CONAXX 2 is solely determined for applications according with its intended purpose.

1 Product description

1.1 Description

CONAXX 2 is an intuitive and user-friendly software for the acquisition of X-ray images. Whether at the touch screen or with the mouse, CONAXX 2 guides you efficiently through the individual work steps to the finished X-ray image.

Supporting functions such as the radiographic positioning helper or the digital X-ray journal, in which all parameters from the generator and the dose area product measuring device (DAP) are saved for the X-ray image, make work easier and save time.

A generator can be controlled directly from CONAXX 2. In the case of a DR upgrade, this can also be operated as before via the generator control panel if it cannot be integrated digitally.

The transfer of patient data or the transfer of complete X-ray jobs via GDT/BDT/Worklist from an upstream system can be implemented. The transfer to a downstream PACS (e.g., our PROPAXX) is automated, whereby several jobs can be started at the same time - e.g., export image to PACS, save image.

If the generator and dose area product measuring device are connected, the X-ray journal automatically supplies all the required patient and X-ray image data.

1.1.1 Modules

The CONAXX 2 software has a modular structure. This means that there is a basic module that can be supplemented with additional modules. These additional modules then unlock additional functions.

Basic module

- Acquisition module – Article-Nr. 4330-0-2000

Additional modules

- X-Ray Journal module - Article - No. 4330-0-2001
- GDT/BDT/EMR module – Article - No. 4330-0-2006
- E-mail module – Article - No. 4330-0-2007
- Gridline suppression module - Article - No. 4330-0-2008
- DICOM Print module - Article - No. 4330-0-2010
- Generator connection module - Article - No. 4330-0-2012
- Triple Panel module - Article - No. 4330-0-0013
- Dual Panel module - Article - No. 4330-0-2014
- Patient CD module - Article - No. 4330-0-2015
- Advanced Image Processing module – Article - No. 4330-0-0020
- Diagnostic Viewer module - Article - No. 4330-0-2023
- DICOM Query module - Article - No. 4330-0-2024
- DICOM Worklist module - Article - No. 4330-0-2025
- DICOM Store module – Article - No. 4330-0-2026

1.2 Intended purpose

The product CONAXX 2 is a software for image data acquisition, processing, transmission and diagnosis in the conventional radiology.

2 Safety instructions

NOTE Contains information that must be observed during operation.

CAUTION! Contains information which, if not observed, can cause property damage.

WARNING! Contains information which, if not followed, can cause personal injury.

WARNING! Warning of radioactive substances or ionizing radiation. Contains information which, if not observed, can cause personal injury.

2.1 General Safety Notes

NOTE

All instructions supplied with the software CONAXX 2 must be observed and the safety instructions contained therein must be carefully read and adhered to.

2.1.1 Requirements for Operation

In case of a malfunction, do not use the software CONAXX 2 anymore and notify PROTEC service department or a service company authorized by them.

2.1.2 Radiation Protection

X-rays can pose a risk to patients and other people if the regulations for the operation of such systems are not observed.

For this reason, the principles of radiation protection must have top priority and must be strictly adhered to:

- **Keeping distance from the radiation source**
  The dosage is reduced as a factor of the square of the distance from a (dot shaped) radiation source, i.e., double distance ¼ dose, triple distance 1/9 dose, etc.
- **Keeping exposure time as short as possible**
  The longer the exposure time, the higher the dose, i.e., halving the exposure time leads to halving the dose, and so on (applies especially to radioscopies; for exposures, the exposure value (mAs) is specified).
- **Utilize shielding and protective clothing**
  The protection value increases exponentially with the thickness of the shielding, i.e., 2 half-value layers weaken a (homogeneous) radiation to 1/4, 3 half-value layers to 1/8 and 10 half-value layers to less than 1/1000 of the initial value.
- **Do not reach into the direct X-Ray beam**
  The dose in the non-attenuated direct beam is about 100 times greater than that in the area of scattered radiation.
- **Utilize personal dosimeters**
  When working with radiation, dosimeters should be used for monitoring that are appropriate for the activity.

Persons who must be in the vicinity of the patient must wear protective clothing (e.g., lead aprons). The same applies to maintenance and repair work.

2.2 Notes on IT security

2.2.1 Definitions

Update	Software Product Update
Patch	Update, which fixes a vulnerability of the product.
Cyber threat	Circumstances or threats that create the possibility of affecting a product through unauthorized access, destruction, disclosure, alteration of information
Vulnerability	Vulnerability of a product that could be exploited by a cyber threat

2.2.2 Obligations of the operator to cooperate

In order to protect against cyber threats, it is necessary that the operator has implemented a comprehensive, state-of-the-art security concept for its IT infrastructure.

If the operator detects a vulnerability during the operation of the product, it must be reported to PROTEC immediately. The disclosure of such information requires the consent of PROTEC.

The operator of the product is responsible for preventing unauthorized access to the product, e.g. by changing passwords and other security settings individually so that the product does not operate with the default security settings.

The user of the product is responsible for preventing unauthorized access to the product, e.g. by logging out when the product is not used. In addition, it is recommended that the operating system activate automatic logout or lock.

If the product is connected to the Internet, the operator must implement appropriate security measures, such as firewall and network authentication.

The operator is only permitted to connect USB storage media or other removable storage devices if a state-of-the-art virus scanner is installed on the system and if it is regularly maintained.

The operator must immediately install patches provided by PROTEC in accordance with the update instructions. Failure to use the latest version of the product may result in an increased risk of cyber threats.

3 Maintenance & Safety Inspection Check

WARNING!

No maintenance or repair work may be performed while the software CONAXX 2 is being used with a patient!

All maintenance and repair work may only be performed by personnel trained or authorized by PROTEC.

NOTE

For every maintenance or service work it is necessary to use the corresponding "Technical Description" of the system and to observe any containing information.

3.1 Maintenance

The required maintenance as soon as a software update is available must be carried out by PROTEC service department or a service company authorized by them in order to ensure the safe and reliable functionality of the software.

In the event that the planned maintenance is not carried out, PROTEC X-ray Systems GmbH assumes no liability whatsoever for damage to the user and third parties if damage results from inadequate or not carried out maintenance.

Prior to the examination operation, the user must satisfy himself that all appliances listed in the operating instructions and serving safety are in working order and that the software is ready for operation.

3.1.1 Maintenance checklist

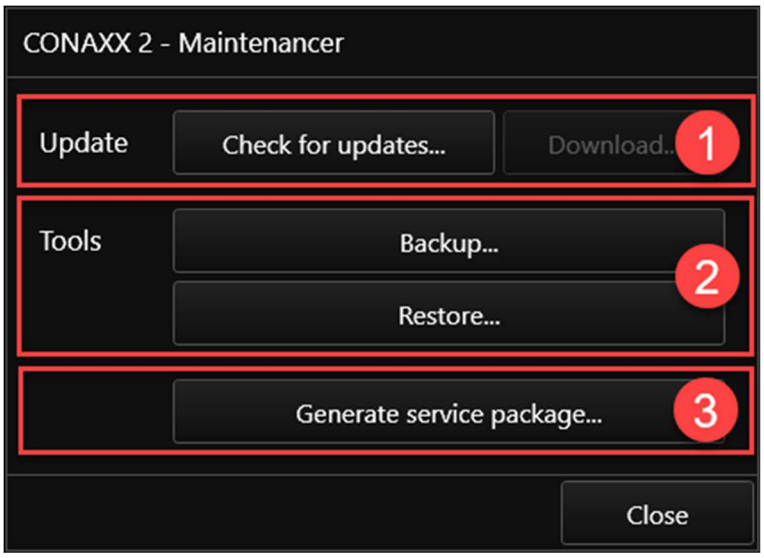
This maintenance checklist *(FB-04-07A6)* is a work aid for maintenance of the software CONAXX 2 and should be carried out every 12 months.

Please note that there are several optional modules for the CONAXX 2 software. It may well be that there are points listed here that are not included in your installation.

3.1.2 Service-Tool "CONAXX 2 Maintenancer"

The "*Maintenancer*" software is a tool for maintaining CONAXX 2. The following functions are available:

1) Looking for updates
2) Backup / Restore
3) Generate service package



The "*Maintenancer*" software is located in the installation path of CONAXX 2. Start the software by double-clicking on "*CONAXX.Maintenancer.exe*". To exit the software, click on "*Close*".

3.1.2.1 Looking for updates

NOTE

The computer needs an internet connection.

To check whether an update is available for the installed software, please click on "*Check for updates*".

If the software is up to date, this is confirmed by a message.

If an update is available, the latest version is displayed. In addition, the "*Download*" button is enabled. Click the "*Download*" button to save the update on the PC. The downloaded zip file contains the update files and update instructions.

3.1.2.2 Backup

To back up the CONAXX 2 software, click the "*Backup*" button.

If the image data are stored in the CONAXX 2 installation path, you have two options performing a backup.

- Backup without image data (*Without images*)
- Backup with image data (*Complete*)

Otherwise only the entry "*Without images*" is available.

The backup creates a file with the extension "*.backup*".

3.1.2.3 Restore

To start a restore, click the "*Restore*" button. Confirm the warning message. Select the backup file with the extension "*.backup*".

3.1.2.4 Service package

In a service case, data (e.g. log files, information about the hardware ...) are required for analysis. The "*Generate service package"* button can be used to easily compile these data.

The data are saved in a zip file.

3.2 Warranty

NOTE

You will find the current warranty conditions in your order documents or in the price list valid at the time of purchase.

Repairs and spare parts in the event of improper use are also excluded.

Warranty work may only be carried out by trained specialists.

3.3 Product Service Life

The service life ends with the discontinuation of product support. After reaching the product lifetime, further use is at your own risk.

4 System requirements

NOTE

Please note that the country-specific requirements for data protection and IT security are complied with.

4.1 System requirements CONAXX 2

The Software can only run on systems (hardware and software) that fulfill the following general system requirements:

Recommended system configuration	
CPU	Multi-core processor ≥ 2 GHz
Operating system	Microsoft® Windows 10 32/64 Bit; Microsoft® Windows 11;
Environment	Microsoft .NET Framework 4.8.1 Microsoft Visual C++ Redistributable 2019
RAM	≥ 8 GB
Hard disk	≥ 80 GB (if possible ≥ 7200 U/Min.)
Graphics card	Min. OpenGL Version 2.0 Resolution min. 1200 x 1024, ≥ 128 MB memory Supported chipsets: - NVIDIA at least GeForce 8000 series - ATI at least Radeon X1 series - Intel at least HD Graphics series; no support for GMA series For 10-bit grayscale resolution: 10-bit monitors und 10-bit graphics card
Monitor	Color or grayscale monitor, min. resolution 1200 x 768, for diagnosis please consider the law; particularly suitable: Touch screen monitor
Mouse, keyboard	Standard PS/2 or USB
CD/DVD writer	Required for use of the Patient CD function
Network card	network card with min. 100 MBit/s

NOTE

Please consider that there may be different system requirements, depending on the applied modality.

4.1.1 RAPIXX DR systems

RAPIXX 3325V1i X WiFi RAPIXX 4336M1i X WiFi RAPIXX 4336V1i X WiFi RAPIXX 4336M1i WiFi RAPIXX 4336V1i WiFi RAPIXX 4343M1i X CC RAPIXX 4343V1i X CC RAPIXX 4343M1i X WiFi RAPIXX 4343V1i X WiFi RAPIXX 4343M1i WiFi RAPIXX 4343V1i WiFi	• Network card with min. 100MBit/s when using an access point or backup cable • WLAN adapter when using no access point • USB interface (not required when using automatic exposure detection) Hint: When using an anti-scatter grid, the optimal compatibility with the detector must be clarified in advance.
RAPIXX 4336M1F ES WiFi RAPIXX 4336M2F ES WiFi RAPIXX 4336M1F ES CC RAPIXX 4336M2F ES CC RAPIXX 4343M1F ES WiFi RAPIXX 4343M2F ES WiFi RAPIXX 4343M1F ES CC RAPIXX 4343M2F ES CC	• Network card with min. 100MBit/s

5 Installation instructions

WARNING!

To ensure a correct installation, the installation must be run as an administrator.

NOTE

After the initial installation, the commissioning must be recorded with the PROTEC acceptance protocol FB-04-07A6.

NOTE

PROTEC is not liable for any incompatibility or other effects which may arise between this software and with any software already installed on the computer system.

NOTE

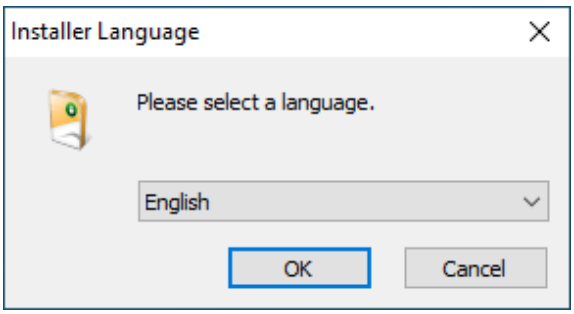
Please note the system requirements from chapter 4.

Whether these requirements are met can be checked with the "SystemAnalyzer" tool.

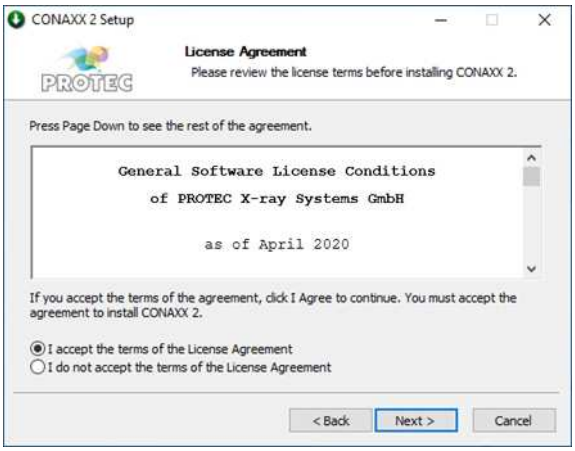
5.1 Installations instruction CONAXX 2

The installation must be run as administrator. We recommend the closing of all other programs before starting the installation.

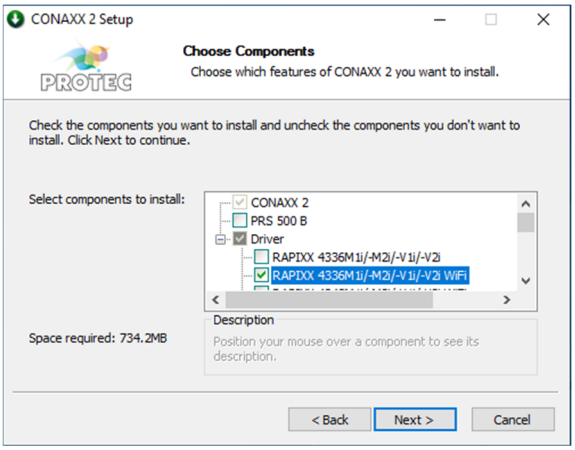
- Start the file "*CONAXX2Setup.exe*" from the installation medium.
- Select the required installation language and follow the on-screen instructions from the Installation Manager.



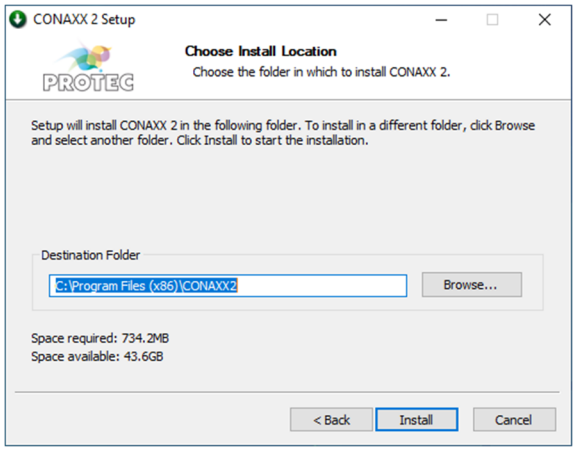
- The licence agreement is displayed on the next screen. If you disagree with the terms of the licence agreement, you can cancel the installation and contact your supplier. Otherwise, indicate your acceptance by activating the corresponding radio button in order to proceed with the installation.

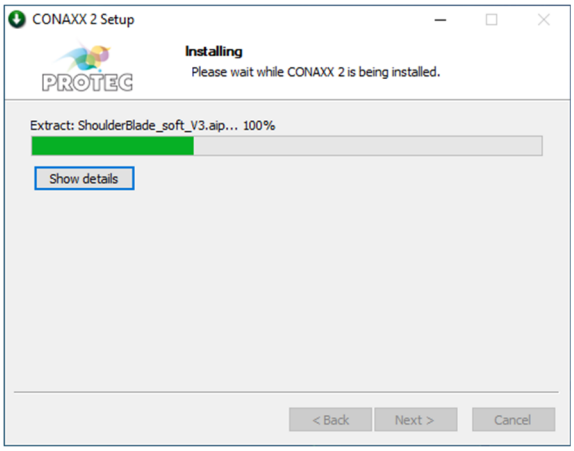


- After that the components you want to install can be selected. The CONAXX 2 software will always be installed. Depending on the license and the version of the CONAXX 2 Software the corresponding driver of the applied modality can be selected and installed. Be sure to select the correct modality at this point! If CONAXX 2 is to be operated together with the PRS 500 B or PRS 500 X-ray system, the option "PRS 500 B" or "PRS 500" must be additionally selected during the installation.

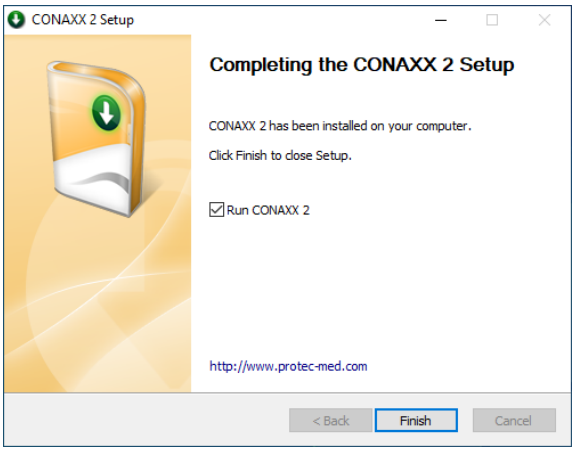


- Once you have selected the installation folder for the CONAXX 2 (default is C:\Program Files (x86)\CONAXX2), the actual installation process is started.





- During the installation process, depending on the modality, data and drivers are eventually installed. For appearing specific windows and advices, please consider the corresponding 'installation and configuration manual' of the particular modality.
- The installation will be finished after a click on "*Finish*".



- Make sure that all users have read and write permissions on the installation folder of CONAXX 2.

6 Important start-up information

6.1 User roles and permissions

Each user account is assigned to a user role. CONAXX 2 contains the following roles:

- Restricted user
- User
- Dealer

The user account "Dealer" has more configuration permissions than other accounts. The user account "Restricted user" has no configuration permissions.

6.2 Default user accounts

By default, a CONAXX 2 installation includes one predefined user account:

Username: *demo*
Password: *demo*

User role: *Dealer*

Other user accounts should be configured after installation by the user. It is recommended to delete the predefined user account "demo" in order to ensure secure access to CONAXX 2.

6.3 Password requirements

The passwords must meet the following requirements:

- Minimum length 8 characters
- At least 1 lowercase letter
- At least 1 capital letter
- At least 1 number
- At least 1 special character

6.4 Network services (ports)

The following table describes all used network service ports. Setup the system firewall manually when changing these ports in the configuration of CONAXX 2.

Service	Port
PROPAXX	304
CONAXX 2 TOUCH2 Service	11000
CONAXX 2 TOUCH2 Callback Service	12000

6.5 Image archiving

If CONAXX 2 is used for archiving of the images (e.g. in case of a single user installation without PACS connection), the automatic purging must be disabled in the configuration. Otherwise CONAXX 2 delete after some time all exported images.

6.6 Tips

6.6.1 Backup

It is recommended to regularly back up the CONAXX 2 software.

6.6.2 Power supply

It is recommended to use an uninterruptible power supply (UPS), as well as a voltage stabilizer and surge protector.

7 Handling

The handling of the CONAXX 2 software is described in detail in the instruction for use. This chapter provides only additional information.

7.1 Exposure index of test x-ray jobs

To ensure that for test exposures (signal normalization, homogeneity etc.) no irrelevant or false areas are used for calculating of the, the calculation of the exposure index will not be performed automatically. The exposure index must be calculated manually by using the exposure index mask (see chapter "Drawing the exposure index mask" in the document "Instruction for use").

NOTE

To get a deviation index for test jobs you have to define the Target Exposure Index in the configuration.

7.2 Exposure index calibration

First, you have to perform a calibration first to use the dose indicator. In the following the calibration procedure will be explained. Note: If you use a dual-panel installation, you have to run all steps in chapter 2 for the second modality. In this case use the section "M*odality 2*".

CAUTION

Please make sure that you do not overheat the X-ray tube during the calibration procedure to not endanger the system and persons. If the X-ray tube is too hot, please leave a longer interval between the separate exposures.

Materials needed for calibration:

- CONAXX 2
- 2 mm aluminum as an additional filter
- 0,5 mm copper as an additional filter
- Dose meter (possibly tape for fixing the sensor)
- Lead cloth to shield the sensor from back radiation
- Possibly measuring tape to measure the detector-focus-distance

7.2.1 Dose investigation

In order to determine the dose you have to carry out exposures with a dose meter.

7.2.1.1 Preparations

Please perform the following steps in preparation for the exposures:

1. Place the detector on the bucky respectively on the table.
2. Adjust the distance between the detector surface and film focus on 150 cm.
3. Adjust the shutter to the active matrix of the detector.
4. Remove the detector from the bucky respectively from the table.
5. Place a lead cloth on the bucky respectively on the table to shield the sensor from back radiation
6. Place the dose meter on the top of the lead cloth and center the lead cloth and the dose meter to the center of the shutter.
7. Adjust the distance between the surface of the dose meter and the film focus on 150cm.
8. Use the following additional filters: 0,5mm copper and 2mm aluminum.

7.2.1.2 Exposures

Use the big focus for all exposures. When all preparations are completed, please perform the following steps:

1. Start CONAXX 2 and log on (user account must have dealer rights – see document "Instruction for use").
2. Go to the configuration of CONAXX 2 by clicking on the menu button (labeled "*Menu*") and then select the entry "*Configuration*".
3. Navigate to the configuration section "*Image processing > Exposure index*".
4. Activate the export mode by selecting the entry "*Expert mode*".
5. Set the desired number of iterations per step in the field "*Iterations*". To compensate the measurement variations of the dose meter, we recommend 3 iterations per step.
6. Click on the button with the label "*1. Step*".
7. You will see a message box with information about the parameters that must be set on X-ray generator for this step.
    a. Confirm the message box by clicking on the button "*OK*".
    b. Set the parameters of the X-ray generator to the values of the message box.
    c. Perform an exposure.
    d. An input message box appears.
    e. Read the value from the dose meter and enter this value into the input message box. Make sure that you enter the value in µGy. If your dose meter shows the value in another unit please convert the value into the unit µGy.
    f. Confirm the entry by clicking on the button "*OK*".
    g. Repeat the described sections "a" to "f" for every iteration.
    h. If all iterations are finished, the average value will be displayed in the column "*Microgray*".
8. Click on the button with the label "*2. Step*" and repeat the section "*7*".
9. Click on the button with the label "*3. Step*" and repeat the section "*7*".
10. Save your values by clicking on the button "*Apply*" at the bottom right side of the configuration window.

7.2.2 Gray scale value investigation

In order to determine the gray scale values you have to carry out exposures with a detector.

7.2.2.1 Preparations

Please perform the following steps in preparation for the exposures:

1. Remove the dose meter from the bucky respectively from the table.
2. Remove the lead cloth from the bucky respectively from the table.
3. Remove the additional filters (0,5mm copper and 2mm aluminum).
4. Place the detector on the bucky respectively on the table.
5. Calibrate the detector (see installation manual of the detector).
6. Adjust the distance between the detector surface and film focus on 150 cm.
7. Check if the shutter is adjusted to the active matrix of the detector.
8. Use the following additional filters: 0,5mm copper and 2mm aluminum.

7.2.2.2 Exposures

When all preparations are completed, please perform the following steps:

1. Start CONAXX 2 and log on (user account must have dealer rights – see user manual).
2. Go to the configuration of CONAXX 2 by clicking on the menu button (labeled "*Menu*") and then select the entry "*Configuration*".
3. Navigate to the configuration section "*Image processing* > *Exposure index*".
4. Activate the export mode by selecting the entry "*Expert mode*".
5. Set the desired number of iterations per step in the field "*Iterations*". To compensate the measurement variations, we recommend 3 iterations per step.
6. Click on the button with the label "*4. Step*".
7. Confirm the displayed message box by clicking on the button "*Yes*". All existing exposures for the exposure index calibration get lost (old X-ray jobs for the exposure index calibration).
8. Confirm the message box by clicking on the button "*OK*".
9. The area "*X-Ray*" for the created patients appears. Please check that the Patient "Exposure Index Calibration, Patient" from today is shown.
10. Select a job with the status "Created" (▭)
    a. Set up the X-ray generator parameters according to the description of the selected X-ray job.
    b. Press "*Start acquisition*"
    c. Perform the exposure
    d. The image will be imported and gets the status "Exposed" (🖭).
    e. Repeat step "a" to "d" for all other jobs in status "Created" (▭).
    f. When all jobs are in status "Exposed" (🖭), continue with step 11.
11. Go to the configuration of CONAXX 2 by clicking on the menu button (labeled "*Menu*") and then select the entry "*Configuration*".
12. Navigate to the configuration section "*Image processing* > *Exposure index*".
13. Activate the export mode by selecting the entry "*Expert mode*".
14. Click on the button with the label "*5. Step*".
15. Confirm the displayed message box by clicking on the button "*OK*".
16. Save all values by clicking in the button "*Apply*" in the configuration window and close the configuration.

7.2.3 Fixed installed detector

If you use a fixed installed detector, you must apply the inverse square law when determining the dose. In this case apply the result of the following formula in the appearing entry window:

$$D_Z = \left(\frac{FFA_M}{FFA_P} \right)^2 * D_M$$

D_Z = Target dose

FFA_M = Film focus distance of the dose measurement device

FFA_P = Film focus distance of the fixed installed detector

D_M = Displayed value (dose) of the dose measurement device

7.3 Information for the dose indicator

7.3.1 Information of the calculation of the dose indicator

The calculation of the dose indicator is the following:

Dose indicator = Measured object dose in µGy * 100 * (1 / µGy)

7.3.2 Display of the dose indicator

The exposure index can be displayed as an overlay in the section "X-Ray > Image viewing". Please perform the following steps:

1. Start CONAXX 2 and log on.
2. Go to the configuration of CONAXX 2 by clicking on the menu button (labeled "*Menu*") and then select the entry "*Configuration*".
3. Navigate to the configuration section "*Common > View*".
4. Click the "*Add*" button of the desired area (top left, top right, bottom left or bottom right).
5. A window appears where the entry "*Exposure Index*" can be selected. After selecting the entry click on the button "*OK*" to close the window.
6. Save all values by clicking in the button "*Apply*" in the configuration window and close the configuration.

The information "*Deviation index*" and "*Exposure index target value*" can be configured in the same way.

7.3.3 The dose indicator in the DICOM header

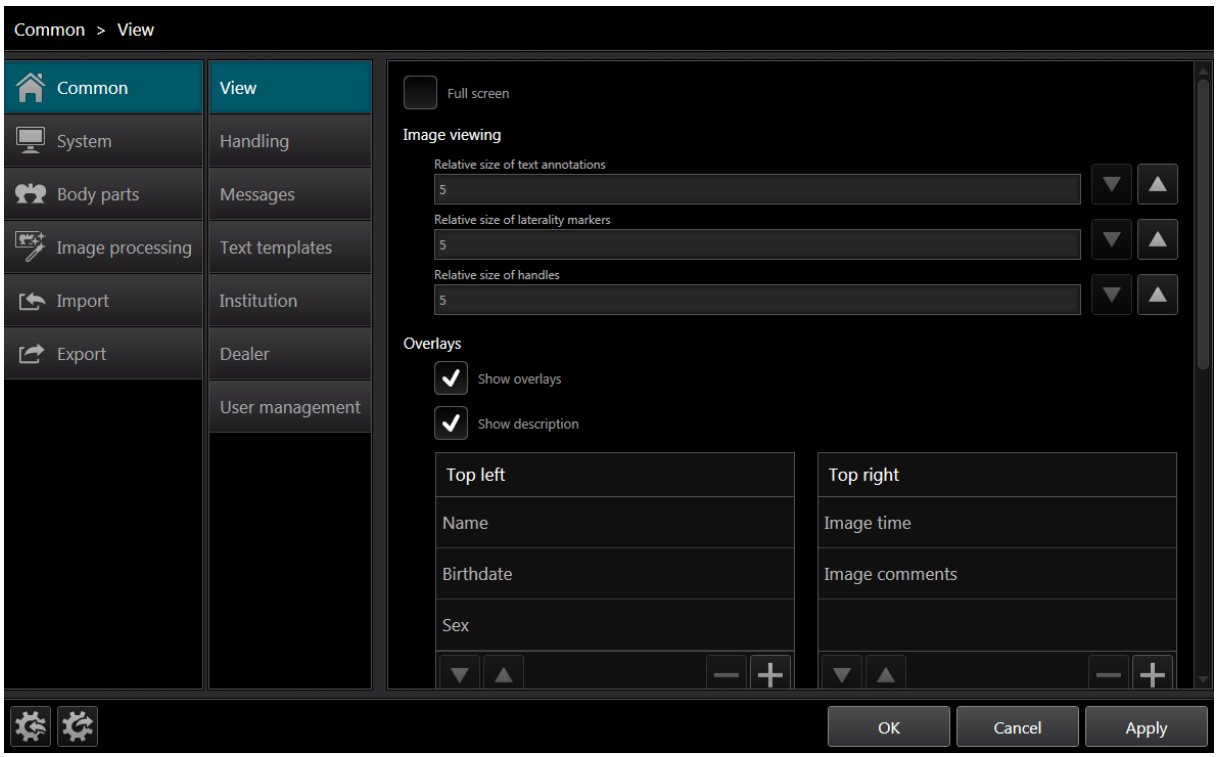
The dose indicator is saved in the DICOM header of every image. The following tags are used for these data:

Tag name	Tag address
ExposureIndexValue	(0018,1411)
TargetExposureIndexValue	(0018,1412)
DeviationIndexValue	(0018,1413)

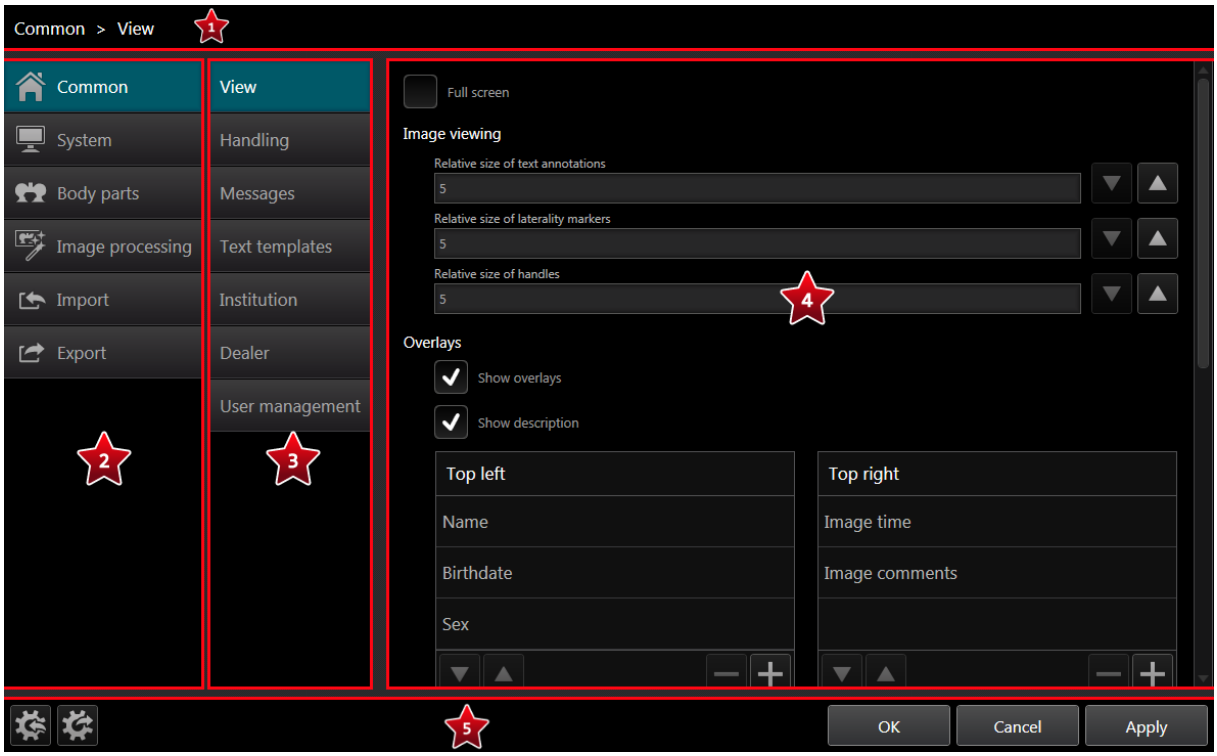
8 Configuration

The configuration options that can be configured with the user role “User” are described in the user manual. This chapter describes the additional configuration options that can be configured with the user role “Dealer”.

In the configuration the user can configure CONAXX 2. The configuration is always accessible in the *“Main menu”* of CONAXX 2.



The user interface of the configuration is separated in the following areas:



1 - **Current section:**
Shows the currently active section.

2 - **Navigation area “main section”:**
Shows a list with all main sections.

3 - **Navigation area “sub section”:**
Shows a list with all sub section of the current selected main section.

4 - **Configuration area:**
In this area all configuration options are displayed.

5 - **Functions:**
This section provides functions that affect the entire configuration.

The button *“OK”* saves all changes and closes the configuration.

The button *“Cancel”* discards all changes and closes the configuration.

The button *“Apply”* saves all changes without closing the configuration afterwards.

With the button “⚙” the user can import a previous exported configuration or a previous exported body part configuration.

With the button “⚙” the user can export the complete configuration or only the body part configuration.

NOTE

The content of the configuration sections is depending on the user role of the logged-in user.

8.1 Common

In this section the user can configure common settings.

8.1.1 View

The configuration options that can be configured with the user role "User" are described in the user manual.

8.1.2 Handling

To allow the user to edit the radiographic positioning in the working area *"Image viewing"* you have to activate the option *"Allow edit radiographic positioning"*.

The configuration options that can be configured with the user role "User" are described in the user manual.

8.1.3 Messages

The configuration options that can be configured with the user role "User" are described in the user manual.

8.1.4 Text templates

The configuration options that can be configured with the user role "User" are described in the user manual.

8.1.5 Institution

In this section the institution (*"Institution name"* and *"Institution address"*) can be configured.

Use the fields *"Department name"* and *"Station name"* to specify the installation more detailed.

8.1.6 Dealer

In this section the dealer can enter his data.

8.1.7 User management

This section covers the user management of CONAXX 2.

To add a new user account use the button "+". To remove the selected user use the button "−". To edit the user account use the button "✎".

8.2 System

In this section the user can configure system settings.

8.2.1 Common

To change the character of all DICOM files generated by CONAXX 2 change the option *"Character set"*.

Also configurable at this point are following options:

- "*Adjustment for easyVET/easyIMAGE*"
- *"Create no new DICOM UID when re-accepting an image"*
- *"Start program when computer starts"*
- *"Shut down computer after closing the program"*
- *"Display "Show Desktop" button in main menu"*
- "*Display "PROPAXX 2" button in the main menu*" incl. link to the PROPAXX 2 viewer
- *"Use 10 bit image display"*

  Activating this option 10 bit grey scales will be used for the image display instead of 8 bit gray scale (10 bit support of monitor and graphic card required).
- *"Generate patient ID automatically"*

  Activating this option the patient ID will be automatically filled in with a numerical value by creating the patient. The start number for the IDs can be defined.
- "*Generate owner ID automatically*"
- *"Emergency patient"*

  If this option is activated, the button 🚑 will be available in the section "*New patient*" to create emergency patients.

8.2.2 Mandatory fields

In this section the user can configure mandatory fields for "*Owner fields*", "*Owner fields (user-defined)*" "*Patient fields*", "*Patient fields (user-defined)*", "*X-ray jobs*" and "*X-ray journal fields*". Further, the visibility of these fields can be controlled.

Use the buttons "▲" and "▼" to change the order of the fields.

The 🚑 button can be used to configure predefined values for the data of an emergency patient. After clicking on this button a window will appear in which you can enter the value. In addition, the buttons "*Date*" and "*Time*" are available. Clicking on these buttons a placeholder for the date or time will be inserted. While creating an emergency patient, the current date or time will be entered.

No emergency data can be configured for the fields "*Age*", "*Sex*" and "*Neutered*". The additional buttons "*Date*" and "*Time*" are not available for the fields "*Birthdate*" and "*Species*".

User-defined fields can be added, removed or edited via the buttons "+", "−" and "✎". Also the visibility of these fields can be controlled. Furthermore it can be configured in which DICOM-Tag the values of the fields will be stored.

The *"✎"* button is also available for the field *"Pregnancy"* in the *"X-ray jobs"* list. It allows adjusting the age range of female patients, where this field is considered mandatory.

8.2.3 Visible functions

In this section the user can configure which functions will be not visible in the software. To hide a function in the surface of the software, the equivalent button must be deactivated.

8.2.4 Diagnosis

In this section the user can configure settings for the diagnosis area.

The option "*Use extra lines at the end points for measurement distance*" can be activated or deactivated.

Also the quick access bar can be configured.

Whether the quick access bar appears on the top, left, right or bottom can be defined with the option "*Position*".

Beneath this option the current configured quick access bar is shown. Use "drag & drop" to add a button to the quick access bar. Therefore, press the left mouse button on a function button and drag it to the quick access bar while holding the left mouse button. If you release the left mouse button, the function button will be added to the quick access bar. You can remove a function button from the quick access bar by selecting a function button and clicking "**−**" afterwards.

In order to change the position of the function buttons in the quick access bar you can use "drag & drop".

8.2.5 Modality

The section *"Modality > Detector"* controls the connected modality of CONAXX 2. According to the selected modality different options appear. For further details see the installation manual of the modality.

If more than one detector is used, you can define in the "Mapping" area for each modality and location whether the respective detector should be set as "Default" or "Optional". Furthermore, the option "Deactivated" is available. This means that this detector cannot be used for this workstation.

To activate an automatic rotation of images define this in the option *"Rotations"*.

The connection mode for the x-ray generator control must be selected in the section *"Interface box"*. The options *"Bucky start"* and *"Hand switch"* are available.

In the section "*Cropping*" can be defined, if the images are to be cropped automatically after acquisition.

The "*Automatic connection*" to a WiFi detector can be activated in the "*Wireless Network*" section. After activation, the "*SSID***"** of the detector WLAN must be selected in the "*SSID*" box.

8.2.6 X-ray generator

To control an x-ray generator by CONAXX 2 activate the option *"Active"*. The option *"X-ray generator"* specifies the controlled generator model. According to the model different options are displayed.

The option *"Port"* specifies the used serial port where the x-ray generator is connected.

In case of not using all work stations deactivate the unused with the option *"Work stations"*.

To send child organ program automatically to the generator activate the option *"Use child organ program automatically for young patients"*. In that case specify the age limit in the field *"Years"*.

If no AEC measuring chambers are installed in the X-ray system, the predefined organ programs can be automatically reconfigured from 1-point technique to 2-point technique. Therefore, you can use the function „*Update organ programs (Deactivate AEC chambers)*". Clicking on this button opens a context menu. In this context menu, the workstation can be selected. After the action has been executed, a dialog appears with the changed organ programs. This message can be saved to a text file using the button "*Export* (⮋)". Check the mAs values that are now being used.

8.2.7 X-ray journal

In the "*Image Reject Analysis"* area, the option "*Activate query for reject reason"* can be activated. This will prompt the reason for rejection as soon as an X-ray job with the status "*Exposed*" is deleted. The pre-configured rejection reasons can be adjusted in the configuration in the "*Common > Text templates*" section.

To control a *"Dose area product measurement"* device by CONAXX 2 activate this with the option *"Active"*. Specify the model in the field *"Device"*. According to the model different options appear. To check the correct connection settings you can use the button *"Test communication"*.

8.2.8 Purging

The automatic purging of exported x-ray jobs can be configured in this area. There are the following possibilities to control the purging:

"Number of jobs":

Defines the limit at which purging should begin. The *"Purge level"* defines the percentage that should be purged.

"Used disk space":

Defines the limit (in gigabytes) at which the purging begins. The *"Purge level"* defines the percentage that should be purged.

"Number of days":

Defines the limit (in days) at which purging should begin. 60 means that all images which have been successfully exported and which are older than 60 days old should be purged.

8.2.9 Registration

This section shows information regarding the current license. It is possible to initiate a license request in the section *"Generate hardware key"*.

Use the button *"Import license"* to import a new license into CONAXX 2.

8.2.10 Paths

To store the image data in another file path change the option *"Path for image folder"*.

8.3 Body parts

In this section the user can configure body part settings.

8.3.1 Common

In this section all body parts and body part depending settings (e.g. filtering or rotations) can be made.

The lists *"Species"*, *"Body part"*, *"Fine part"* and *"View position"* show already created entries. The following functions for these lists are available:

+	-	Add a new entry
−	-	Delete the selected entry
✎	-	Rename the selected entry
⋮	-	Show more function
⤒	-	Move the selected entry to the top of the list
▲	-	Move the selected entry up
▼	-	Move the selected entry down
⤓	-	Move the selected entry to the bottom of the list
Duplicate	-	Duplicate the selected entry
Duplicate (Move)	-	Duplicate the selected entry and move the duplicate to another body part

To configure body part depending settings select a species, a body part, a fine part and a view position. After that body part depending settings can be made for the selected combination of species, body part, fine part and view position:

8.3.1.1 Common - Windowing

To use specific windowing parameters for a body part activate the option *"Windowing"*. The windowing is specified by *"Lower value"* and *"Upper value"* as percentage values. They control the not displayed gray scale range on the lower and upper histogram edge.

8.3.1.2 Common - Rotations

To use specific rotations/mirrors for a body part activate the option here.

8.3.1.3 Filter - AIP

For executing an AIP filter, check the option *"AIP"*. The desired filter has to be selected in the drop-down list. The button "↶" resets the complete AIP mapping for all body parts.

8.3.1.4 Filter - Professional Image Tuning

In this area the configured parameter values for the Professional Image Tuning are displayed. The column "*Changed*" documents when the change was made. You can view the name of the person who made the changes using the tooltip function (remain on the entry with the mouse).

The button "↶" can be used to reset all values for all body parts.

8.3.1.5 Filter - Exposure index

For calculating the exposure index, check the option *"Exposure index"*. The desired calculation type has to be selected in the drop-down list. In addition the *"Target value"* can be configured.

The button "↶" resets the complete exposure index filter mapping including the target values for all body parts.

8.3.1.6 Filter - Grid suppression

To suppress grid lines in the images activate the option *"Grid suppression"*.

8.3.1.7 X-ray generator - Organ program

To send body part depending organ programs to the generator activate the option *"Organ program"*. The number and type of organ program parameters can differ between different x-ray generator models. For each body part you can configure four different organ programs according to the anatomy "*child*", "*thin*", "*normal*" and "*thick*". The total number of organ programs in CONAXX 2 can exceed more than 1.000 because there is no limitation. The button "↶" resets all organ programs for all body parts.

8.3.1.8 X-ray journal - X-ray parameters

To show default x-ray parameters in the x-ray journal entry configure them in this option.

8.3.1.9 Radiographic positioning

In this area you can define the support information for every body part. It contains an image and text instructions for recommended exposure positioning. Following options are configurable: *"Image"*, *"Sample image"*, *"Patient positioning"*, *"Central ray"* and *"X-ray settings"*. The button "↶" resets the complete settings for the radiographic positioning for all body parts.

8.3.2 Procedures codes

In this section procedure codes can be defined for the automatic job creation when using GDT/BDT and DICOM Worklist. Unlimited number of x-ray jobs can be stored under each procedure code. When patient data with defined procedure code send to CONAXX 2, the system creates automatically all x-ray jobs assigned to this procedure code.

Activate the option "*Use procedure codes as DICOM study description (0008,1030)*" to take over the procedure code for the study description.

In case of receiving concatenated procedure codes, you can define the separator for the codes under "*Separator for procedure codes*".

8.3.3 QuickJobs

The configuration options that can be configured with the user role "User" are described in the user manual.

8.3.4 Breed

The section is used to configure breeds.

In the list *"Species"* all existing species are listed. When selecting a species the second list shows all contained breeds. Use the button "+" to add another breed. The button "−" removes the selected breed. The button "✎" renames the selected breed.

8.4 Image processing

In this section the user can configure settings for the image processing.

8.4.1 AIP

To execute the AIP filters automatically activate the option *"Activate automatic image processing"*.

In order to use the Professional Image Tuning the option "*Activate Professional Image Tuning*" has to be activated. If the option is deactivated, all associated buttons, even in the configuration, are not visible.

8.4.2 Exposure index

Use this section to calibrate the exposure index. In case of having exposure index calibration data for the modality you can enter them into the two columns *"Microgray"* and *"Gray value"*. Confirm the calibration by pressing *"Create"*.

To create a new calibration activate the option *"Expert mode"*. You can find further details regarding this calibration in the chapter *"*Exposure index calibration*"*.

8.4.3 Windowing

In case of adjusting the windowing of new images automatically activate the option *"Activate automatic window level"*.

The default values for the windowing can be configured by the fields *"Lower value"* and *"Upper value"* which are percentage values. They control the not displayed gray scale range on the lower and upper histogram edge.

8.4.4 Grid suppression

To suppress grid lines automatically activate the option *"Activate automatic grid line suppression"*.

8.4.5 Auto learning

In this section the auto learning function *"Rotations"* can be activated.

Learned values are saved directly in the body part depending settings in the configuration section *"Body parts"*.

8.5 Import

In this section the user can configure import actions of CONAXX 2. CONAXX 2 can handle the import of patient data and the import of x-ray job data.

8.5.1 DICOM Worklist

The option *"Active"* activates the DICOM Worklist import action.

After configuring common setting the area *"DICOM Worklist SCP"* describes the used server. CONAXX 2 queries this server periodically and adds new entries directly into the *"Patient list"* in the working area *"Waiting room"*. The delay between the requests is configured by the *"Polling time (seconds)"*.

To control the Worklist request CONAXX 2 provides different *"Request criteria"*. The option *"DICOM tag for examination description"* specifies the used data for the automatic creation of x-ray jobs in CONAXX 2. When more than one description send at the same time, the used separator can be configured under *"Separator for procedure codes"*.

To activate the DICOM MPPS status messages, the option "DICOM MPPS SCP" must be activated.

8.5.2 DICOM Query

To activate the DICOM Query import action activate the option *"Active"*. Specify the details of the *"DICOM Query SCP"* in the following fields.

8.5.3 PROPAXX

For activating of the PROPAXX import the option *"Active"* have to be checked. After that the host and port for the PROPAXX receive service have to be set.

8.5.4 GDT/BDT/EMR

In this section GDT/BDT/EMR import actions can be configured.

The delay between processing of single GDT/BDT/EMR files can be defined in the text field *"Import delay (1-30 seconds)"*.

The button "+" is used to add new observed folders. The button "−" removes the selected import action. With the button "✎" the user can change the observed folder of the selected import action. CONAXX 2 will observe the folder only, if the column *"Active"* is checked.

For each import action the field *"File extension"* and *"Encoding"* has to be configured. You can get the encodings for the most common patient information systems from your service partner. Furthermore the *"Mapping"* between CONAXX 2 data fields and imported data files has to be specified. When more than one description sent at the same time in the field "*StudyComment / Procedure codes*", the used separator can be configured under *"Separator for procedure codes"*.

To activate the reply function activate the option *"Activate reply"*. In this case the *"File name"* and *"Export folder path"* is necessary. The area *"Mapping"* specifies the content of the reply message.

The option *"Activate reply (VETERA)"* enables the export of a reply message that is adapted to the VETERA software. If this option is activated, the *"Export Folder (.gdt)"* for the reply message itself and *"Export Folder (.jpg)"* for the referenced JPEG images in it must be specified.

8.6 Export

In this section the user can configure export actions.

8.6.1 Common

To save images with the same fine part into the same series the user has to activate the option *"Save images with same fine part in the same series"*. Normally every image will be saved in its own series.

If the option *"Write patient field "Chip" into DICOM Tag "Other Patient IDs (0010,1000)""* is activated, the chip will be additionally recorded in the DICOM Tag "Other Patient IDs (0010,1000)".

In the section "*Show overlays*" the user can configure, if the overlays will be shown in the following file formats: "Bitmap", "JPEG", "PNG" and "TIFF". This option will be considered in the function "Save as". If the option "JPEG" is active it is also considered in the function "E-mail".

In the section "*File name*" a file name for the export ("Save as") can be defined. Using the "+" button, placeholders can be inserted into the file name. These placeholders will be replaced accordingly during export.

8.6.2 DICOM Store

In addition to common settings the user can configure one or more DICOM Store SCPs in the according area.

The button "+" is used to add a DICOM Store SCP. The button "−" removes the selected SCP. With the button "✎" the user can change properties of the DICOM Store SCP. In case of activating the property *"Send raw images too"* CONAXX 2 will send both accepted and raw images to the DICOM Store SCP. The option *"DICOM Storage Commitment"* activates the storage commitment requests for the server. It is used by the purging procedure of CONAXX 2. If the option is checked, an image will be purged only if the server, that has been received it per DICOM Store, confirms the successful storage.

The "*Encryption (TLS)*" option can be activated to send the data in encrypted form. This requires a certificate file and the associated password.

8.6.3 DICOM Print

In this section the user can configure the DICOM Print settings.

In the section "*DICOM printer*" the user can add one or more DICOM printer. The button "+" is used to add a DICOM printer. The button "−" removes the selected DICOM printer. With the button "✎" the user can change the name of the DICOM printer. The button "🖶" duplicate a DICOM printer entry with all settings.

After selecting a DICOM printer communication settings such as "*Remote AE title*", "*Host*" and "*Port*", can be done in the section *"DICOM Print SCP"*. Please check the supported "*Bits per pixel*" of the DICOM Printer and whether the DICOM Printer supports a status request.

In the section "*Print settings*" and "*Advanced print settings*" the user can configure the print settings. Please check the DICOM Conformance Statement of the DICOM Printer.

In the property "*Image Display Format*" the user can define different layouts:

- "STANDARD" means the film contains equal size rectangular image boxes with R rows of image boxes and C columns of image boxes.
- "ROW" means the film contains rows with equal size rectangular image boxes with R1 image boxes in the first row, R2 image boxes in second row, R3 image boxes in third row, etc.
- "COL" means the film contains columns with equal size rectangular image boxes with C1 image boxes in the first column, C2 image boxes in second column, C3 image boxes in third column, etc.

In the section "*Maximum image size*", the maximum pixel sizes for the different sizes can be defined (e.g. size "17IN", pixel "8800"). The button "+" can be used to create new entries. The "−" button removes the selected entry. The entry can be changed by clicking on the "✎" button. The "✎" button can be used to create predefined entries.

8.6.4 DICOM RDSR

This configuration area provides the possibility to define a target system for sending a DICOM RDSR (Radiation Dose Structured Report) report. The parameters of the target system are entered in the input fields *"Remote AE title*", *"Host"* and *"Port"*. These settings can be used to configure the automatic export (see Automatic Export).

8.6.5 Automatic Export

CONAXX 2 supports automatic export actions. These actions are executed directly after accepting an x-ray job.

The button "+" is used to add new export action. The button "−" removes the selected export action. CONAXX 2 executes only those actions whose column *"Active"* is checked.

Export action "DICOM Store":

This export action sends the image automatically via DICOM Store to an external PACS. To configure this action select a previous created DICOM Store SCP.

Export action "DICOM RDSR":

This export action generates and sends automatically a DICOM RDSR (Radiation Dose Structured Report) for the respective x-ray job. The parameters of the target system defined in chapter "DICOM RDSR" will be used while configuring this kind of export action.

Export action "Save as":

This export action saves the image automatically on hard disk or mobile media. To configure this action select a *"File format"* and the *"Export folder path"*.

Export action "DICOM Print":

With this type of export, the X-ray image is automatically added to the list for the DICOM print layout. The added images of the active patient can then be printed in the *"DICOM Print"* area.

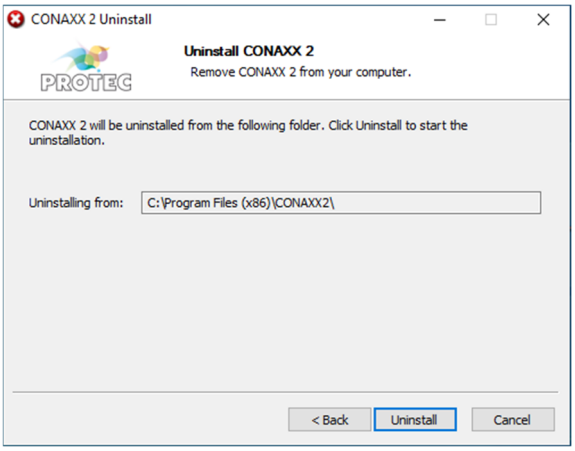
9 Uninstall

9.1 Uninstall CONAXX 2

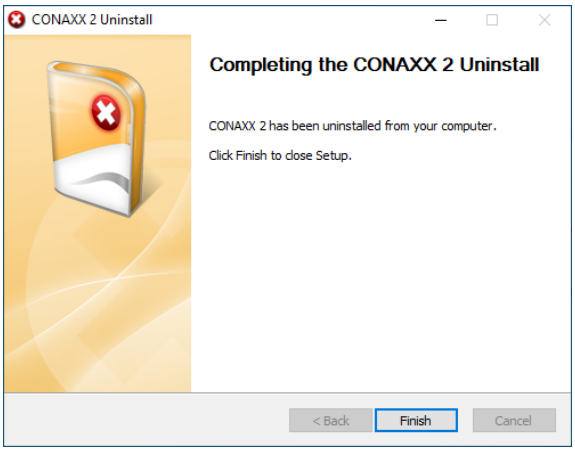
The uninstalling must be run as administrator. We recommend to close all other applications before starting the uninstalling.

- Start the file "*uninstall.exe*" in the installation path of CONAXX 2.
- By clicking on "*Next*" in the first uninstalling window only this information is confirmed.

- After a click on "*Uninstall*" CONAXX 2 will be deleted from the user's system. Thereby the driver of the modality will not be uninstalled.



- The uninstalling will be finished after a click on "*Finish*".

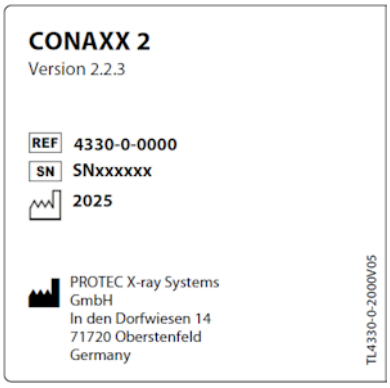


10 Description of Symbols, Labels and Abbreviations

10.1 Symbols

	Attention, observe accompanying documents
	Refer to Instructions for use
	Manufacturer
	Order reference
	Serial number
	Production date

10.2 Type Label



10.3 Abbreviations

mm	Millimeters
cm	Centimeters
DIN	Deutsche Industrie-Norm (German Industry Standard)
EN	European Standard
CE	CE marking
SN	Serial number
DR	Direct Radiography
SID	Source Image Distance