User Manual

Easy DR

Rev.: 27-08-2024

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Revision List

Equipment	Easy DR
Document	User Manual
Document number	ODB-104-5073ENG

Revision	Datum	Commentary
00	21-08-2012	First edition (DV+RHD)
01	21-06-2013	Attached software manual NE2.14 (DV)
02	31-05-2016	Updated collimator info.
03	02-03-2017	Correction telephone- and fax number
04	07-09-2018	Add Variant 183cm arm/correction environment conditions /correction WEEE symbol
05	17-04-2020	Add Lateral positioning arm (option)
06	25-07-2024	Changes regarding art.22 (MDR). Removed Fax nr
07	27-08-2024	Update to latest model and design specifications

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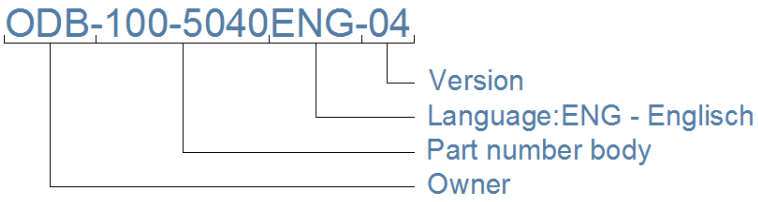
Preface

Identification

Manuals are identified by a part number.



The part number is printed at the bottom of the title page. Numbers printed on other pages are for internal revision control and may differ.

CE Classification

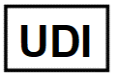
Manuals made for products that have been CE (Conformité Européenne) marked have the CE mark on the front page. The number behind the CE Mark defines the responsible notified body. Oldelft Benelux B.V. systems are classified according to IEC 60601-1 as Class II, type B.

Oldelft Benelux B.V. systems meet the relevant provisions of the European MDR (Medical Device Regulation); this is based on conformity of the products and the quality system according to ISO 13485:2016.

The system meets the relevant provisions of the European Medical Device Regulation (EU) 2017/745 (MDR).

The Easy DR designed under the MDR art.22 can still have MDD certificates for the components due the transition period.

Symbols

Symbol	Meaning	Remarks
Location: Near or on the type identification plate. 	Symbol for separated collection of electrical and electronic equipment per Directive 2002/96 of the European Parliament and the Council of the European Union (Directive on Waste of Electrical and Electronic Equipment - **WEEE**). If applicable to the type of device, it indicates legally imposed obligations within EU member states, Iceland, Norway and Switzerland when the equipment is disposed of, at the end of its lifetime.	Owners of marked equipment should contact the organization that imported the equipment into their country, when they want to dispose of the equipment, at the end of its lifetime. The Directive prioritizes re-use of equipment over re-use of components over re-use of materials over disposal as waste. Article 5 part 2d allows producers to decline the return of any used equipment that is or may be biologically or radiologically contaminated.
	Medical device	
	Legal manufacturer	
	Date of manufacture	
	Serial number	
	UDI code	Unique Device Identification
	This mark indicated that this is CLASS II Equipment according to EN60601-1.	
	This mark indicated that this is CLASS I Equipment according to EN60601-1.	
	This mark indicated that this is a Type B Applied Part according to EN60601-1.	
	Consult Instructions for Use	
	Consulting the accompanying documents is a mandatory action.	
	General warning sign	Placed together with a supplementary symbol or text. The text associated shall be an affirmative statement (i.e., a safety notice) describing the principal risk(s) foreseen (e.g. “Causes burns”, “Risk of explosion”, etc.).

CE	The CE Mark is a declaration by the manufacturer that the product complies with the requirements of the applicable European Union (EU) medical device directive and that the product has been subject to conformity assessment procedures as provided in that directive.	

Conventions

The Easy DR has been designed to meet all safety requirements applicable to medical equipment. However, anyone using the Easy DR must be fully aware of potential safety hazards. The information contained in this chapter is provided to help users to operate the Ease DR safely.

Throughout this manual, certain conventions are used. These are Warnings, Cautions and Notes. They provide a means of prioritizing information to be brought to the attention of the user. They are given as follows:

WARNING:	**Indication of an important warning that is to be obeyed to eliminate the risk of personal injury or an incorrect clinical diagnosis.**
CAUTION:	**Indication of important information to avoid serious system equipment damage.**
Note:	**Additional information for reader understanding or simplification of a task.**

Precautions

The user is expected to use the product (soft and hardware) in accordance with the instructions given in this manual, which must be read before the system is used. Any unauthorized deviation from the procedures laid down in this manual can affect the contractual obligations between purchaser and vendor.

WARNING:	**This product was designed and manufactured to ensure maximum safety of use. It should be installed and serviced in strict compliance with safety instructions described in this Document.**
WARNING:	**Do not use the system before carefully study the Instructions For Use (IFU), it is assumed that the operator is a professional and trained X-ray user or service engineer, who has gained sufficient knowledge to operate the system safely.**
WARNING:	**Never attempt a shortcut to procedures which may degrade the safety considerations of the system.**
WARNING:	**Class 1 MD: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.**
WARNING:	**The user shall take care that potential electromagnetic or other interferences between the unit and other equipment are avoided. If necessary certain actions must be taken.**

WARNING:	**Do not modify any part of Oldelft Benelux supplied hardware, software or software configuration. Any modification, installation or running an application that has not explicitly been approved by Oldelft Benelux may compromise patient safety and will result in termination of all warranty and service contracts.** **a. If this equipment is modified, repaired or maintained, appropriate inspection and testing must be conducted to ensure continued safe use of the equipment.** **b. Do not leave problems unattended that may affect the safety of the product. In case you have doubts concerning the Easy DR `s safe operation, call the service number of your vender for further instructions.** **c. The Easy DR should be cleaned regular to prevent the accumulation of dust. The contact surface should be cleaned after each patient for hygienic reasons.**
WARNING:	**The Oldelft Benelux products are designed for use and maintenance using only parts available from Oldelft Benelux. No liability for failure can be accepted by Oldelft Benelux through the use of parts obtained from other suppliers unless written permission is obtained from Oldelft Benelux.** **Copyright** All rights reserved. No part of this manual may be reproduced or transmitted in any form whatsoever, including photocopying and recording without written permission of the copyright holder: Oldelft Benelux B.V., Wiltonstraat 41, 3961 KW VEENENDAAL, The Netherlands. **Concerning this Publication** Information contained in this publication is subject to change without notice. Whenever the equipment is delivered with a documentation medium such as a CD or DVD, the user shall always check the medium for latest information. This information is part of Release Notes and Document Upgrade files. Neither Oldelft Benelux B.V. and its subsidiaries nor anyone else who has been involved with the development, production or delivery of the documentation be liable for any special, incidental or consequential damages, whether based upon breach of warranty, breach of contract, negligence, strict liability in tort or any other legal theory. This manual was originally drafted in the English language.

1 Introduction

1.1 Variants

The Easy DR is produced in two variants:

Easy DR	FDD	Rotation	Use
1	145cm	0° ~ -90°	Chest screening Multipurpose
2	183cm	Non-rotation	Chest screening

FDD = Focus Detector Distance (distance between Focal spot of X-ray tube to the detector)

Note:	**This manual is based on variant 1.** **When the Easy DR is variant 2:** **the 145cm must be substituted by 183cm;** **rotation of the arm is not possible and can be skipped.**

Al other functions are similar as variant 1.

1.2 About this manual

This user manual is a guide for the operator of the Easy DR multifunctional X-ray unit. In this manual it is assumed that the operator is a professional and trained X-ray user, who has gained sufficient knowledge to operate Easy DR system safely.

This document describes the daily operation and interpretation of the user interface for the Easy DR. It also contains:

- A brief description of the Easy DR system
- System safety
- Operating procedures
- User maintenance procedures

Please study this manual carefully before attempting to use the Easy DR. Proper functioning of the apparatus can be guaranteed only if the instructions in this manual are adhered to.

1.3 Classification

The Easy DR is classified according to Class I type B.

	This mark indicated that this is CLASS I Equipment according to EN60601-1.	Equipment with two levels of protection against electrical shock. **- Basic insulation** is insulation that is sufficient to protect patients and device operators during normal use. This protection is achieved using air clearance and/or solid insulation. **- Protective earth ground** is required so that if the basic insulation for touchable parts of the device fails the parts will not become live.
	This mark indicated that this is a Type B Applied Part according to EN60601-1.	No Electrical contact with patient and the patient can be immediately released from the LLS-1.

Product meets the relevant provisions of the European MDR (EU 2017/745 - Medical Device Regulation); this is based on conformity of the products and the quality system according to ISO 13485:2016.

1.4 Installation

The installation procedure can be found in the:

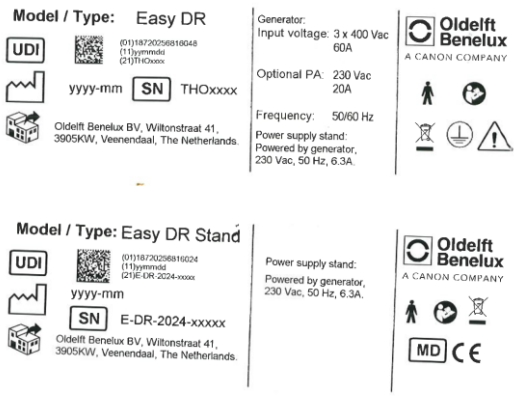
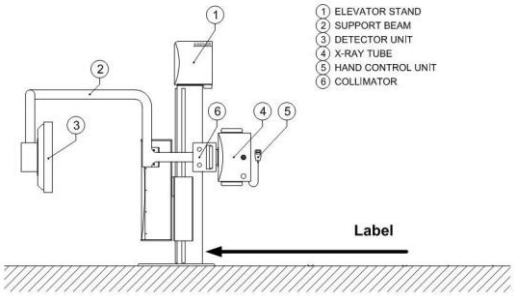
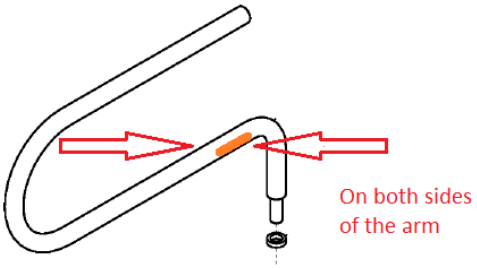
- Service Manual Easy DR / ODB-104-5080ENG

1.5 Technical specifications

The technical specifications can be found in the:

- Technical specifications Easy DR / ODB-104-5090ENG

1.6 Label and symbols

Label	Location
	
 **Dimensions:** 20 x 75	

This label is described in document: Labels / ODB-104-5100ENG

1.7 Reference manuals

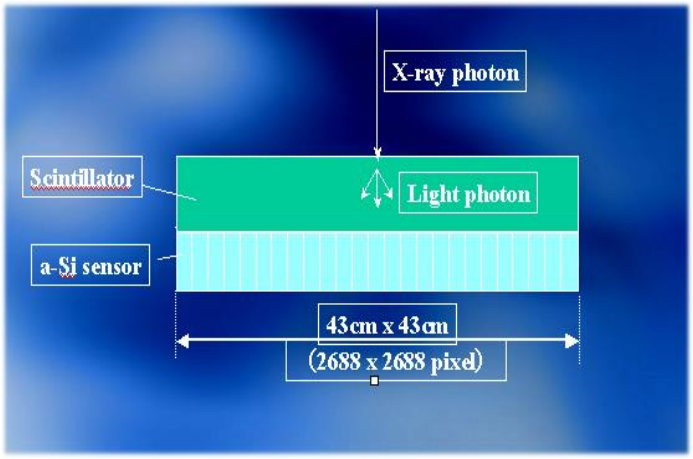
Note:	**This document complements the reference manuals provided with this system and cannot replace these manuals. The user should therefore take note of the reference manuals, especially the safety rules, before using the system. When this document and the reference manual differ, the reference manuals are considered as leading.**

List with manuals delivered with the Easy DR	
ODB-100-5070ENG	User manual
	Key-User Manual Easy DR
	Operation manual HF Generator
	Computer
	Monitor
	Detector, CXDI-420CF
	Multi Box MB-02
	CXDI Control Software Operation manual
	CXDI Control Software Setup guide

1.8 General description/indications for use

The Easy DR is a film-less X-ray system suitable for a wide range of radiological exams. The design is based on the WHO (World Health Organization) recommend WIS-RAD system and together with the Rogan ROX and VPX viewing station is very suitable for (mass) screening on tuberculosis.

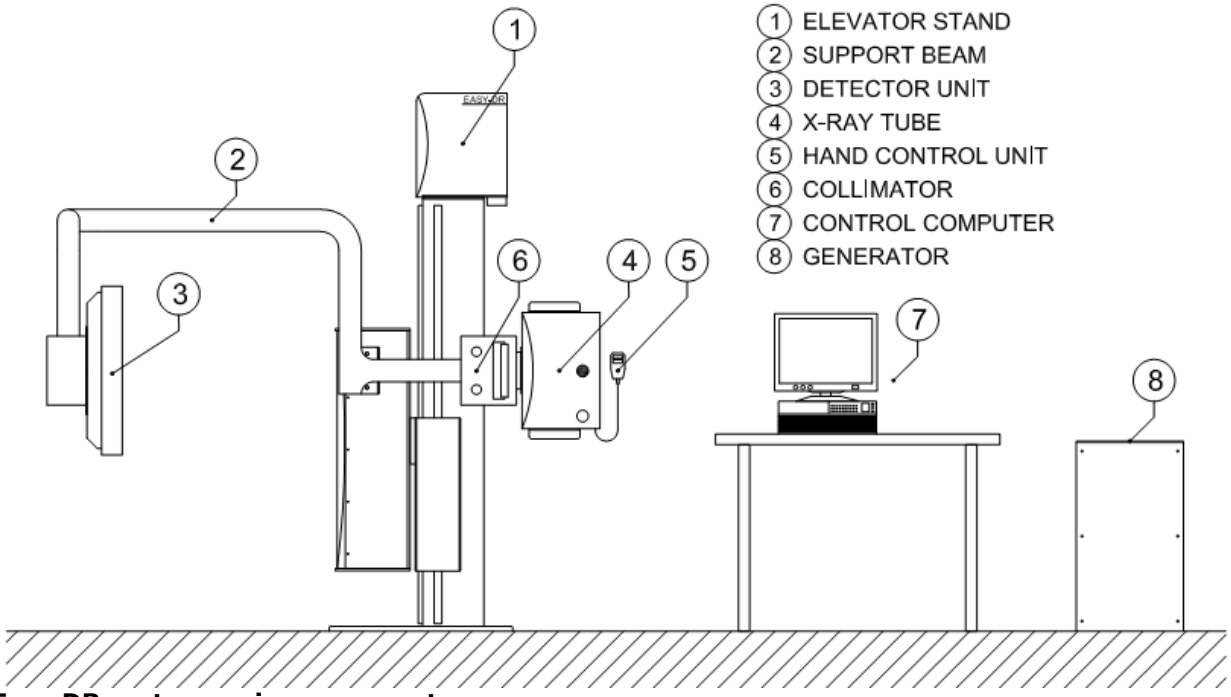
X-ray photons arrive at the DR plate (sensor) and the scintillation cause a reaction in which light is released. This light is absorbed and converted into a current through a photoelectric converter, a SI-sensor.



Example of a DR sensor

A sensor contains lines and rows with pixels. These pixels are read out directly after exposure. All the different currents from the pixels are converted into a corresponding value so the computer can display an image. The captured X-ray image is stored in digital memory. Digitized images are transferred as DICOM 3.0 (Digital Imaging and Communications in Medicine) compatible files to a PACS (Picture Archive and Communication system). The PACS system is used to distribute to diagnostic viewing station.

The Easy DR is equipped with an elevator stand, which is firmly bolted to the floor. It can lift the support frame to the desired height. The support frame can also turn between o and -90 degree. This allows for a bed trolley to be placed over the detector so bed patients can be done. The support frame consists of the detector unit and the X-ray tube unit.
The X-ray generator may be installed outside the operator area. The X-ray generator control panel (on/off) is located in the X-ray protected area. Both the detector and X-ray unit are controlled by the control computer.



Easy DR system main components

Depending on the configuration the Easy DR System may contain the following sub-systems:

- The Easy DR unit (Elevator stand and support frame)
- The Control computer (separate manuals)
- X-ray equipment (separate manuals)
- Optional PACS and Diagnostic Viewing Station (separate manuals)
- Optional printer (separate manuals)
- Optional UPS/battery system

1.9 Physical description

In this paragraph only the Easy DR main hardware items are described. These are:

- Elevator stand
- Support frame
- Control computer
- X-ray tube unit
- X-ray generator and control panel
- Collimator unit
- Lateral Positioning Arm.
- Removable grid

1.9.1 Elevator stand

The support frame is mounted on the elevator stand. The detector and X-ray tube can move vertically on the elevator stand to adapt the chin rest to the patient height suitable for PA Thorax imaging. The support frame can also turn from 0 to -90 degrees. Rotation can only be done when the support frame is between 850 and 1350 mm above the ground. This prevents the unit from being damaged by the floor or ceiling.

When an obstacle touches the safety switch that is mounted at the bottom side of the detector unit, the downward and/or rotation movement of the unit immediately stops. The down and/or rotation control switch on the hand control unit is overruled as long as the safety switch is activated.

Another way to stop the operation of the elevator stand and support frame is pressing the emergency switch located next to the collimator unit (see 2.2.2 Emergency stop button).

1.9.2 Support frame

The support frame holds the detector and X-ray unit. The system has a fixed focus detector distance (FFD) of 145 cm and can rotate from 0 to 90º. This allows for a wide range of radiological exams. The second variant has a fixed focus detector distance (FFD) of 183 cm and cannot rotate, special designed for chest screening.
The support frame is designed in such a way that in all position's patient placement is flexible and no cables or frames are in the way.

Easy DR	FDD	Rotation	Use
Variant 1	145cm	0º ~ -90º	Chest screening Multipurpose
Variant 2	183cm	Non-rotation	Chest screening

1.9.3 Control computer

The control computer is used to operate the detector and X-ray unit. The system comes with a wide range of preconfigured protocols for optimal image quality. By selection of a protocol the correct X-ray settings (kV, mA and ms) are automatically set. The Automatic Exposure Control (AEC) will give the most optimal image quality at the lowest possible patient dose. The Control computer is also used to temporarily store the X-ray images. It is interfaced via a network to the PACS and Diagnostic Viewing stations.

1.9.4 X-ray tube unit

The X-ray tube unit consists of an X-ray tube, a filter unit and a collimator unit. The X-ray tube is mechanically aligned with the detector unit. The X-ray tube focus is always directed to the detector unit.

The filter unit contains a rotating disc with four types of X-ray filters. The filter unit is intended for maintenance purposes only; its setting should not be changed by the operator.

1.9.5 X-ray generator and control panel

The X-ray generator has its own documentation.

	Advice to consult the accompanying documentation: • Operation manual HF generator.

A two-step radiation exposure switch is connected to the (mini) generator interface panel. The following functions are available on the generator control panel:

- Switching the X-ray system ON or OFF

1.9.6 Collimator unit

The collimator unit comprises an adjustable diaphragm and a field illumination indicator.

The adjustable diaphragm has two setting knobs: one to adjust two vertical shutters for symmetrical lateral adjustment, the other to move the horizontal shutters to adjust vertical field size.

The field illumination indicator delineates the total extent of the field to be exposed. It can be switched on and off by a push button. If left on, the light will turn off automatically.

In general, the lateral diaphragm is adjusted to maximum for Posterior-Anterior (PA) exposures of normal patients, and to less than maximum for lateral exposures or for exposures of small patients.

1.9.7 Lateral Positioning Arm.

As an option, for the Easy DR, a Lateral Positioning Arm can be mounted to the detector frame. The mounting hardware is already set by the manufacturer when the equipment is ordered with this option. It only requires inserting the arm bar into its working position.
To do this:

- Insert the Lateral positioning Arm into the support block located on the detector frame.
- Lock the Lateral Positioning Arm into the extension rod by using the control knob.

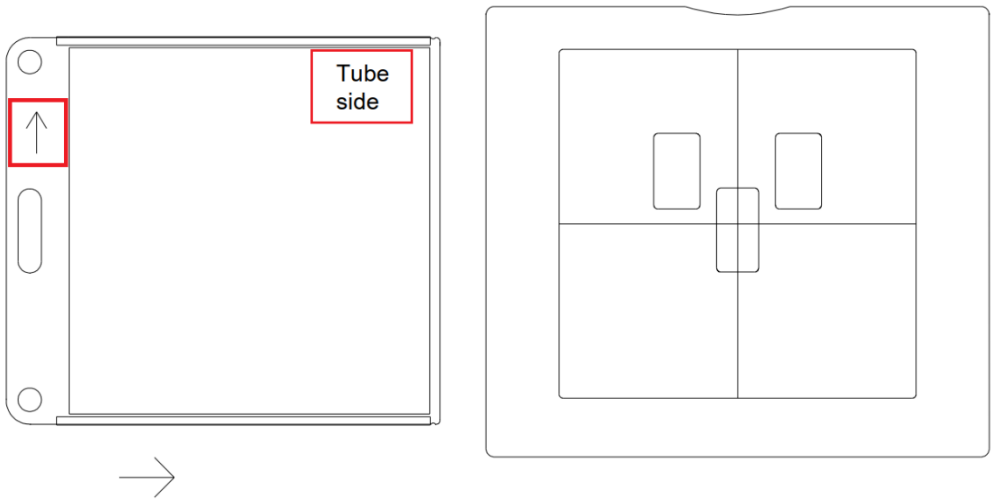
WARNING:	**Ensure the Lateral Positioning Arm is properly secured before using the system with patients.**
WARNING:	**In cases where it is deemed necessary the use of the Lateral Positioning Arm, take caution before making any movement of support frame mounted on the elevator stand, in order to make sure that there is no risk of collision.**
WARNING:	**Max Load 15kg**

1.9.8 Removable Grid

The docking unit is equipped with a removeable grid.

CAUTION:	**Structure of the grid is delicate. Handle the grid with care!**

The removable grid is marked with the "tube side" and the "this side up" labels. Pay attention to these markings when inserting the grid.



Grid Markings

1.10 Functional description

The Easy DR operates without X-ray film: the X-ray image is captured with the X-ray detector and stored in digital memory. Digitized images are stored as DICOM 3.0 compatible files on a local hard disk (short term) and automatically via a network link to the PACS and diagnostic viewer station.

After positioning the patient, the operator prompts the Easy DR to make an X-ray exposure. Before the actual X-ray exposure can be made the patient's data has to be entered on the control computer. After patient data is entered the X-ray exposure is taken.

1.10.1 Exposure interval

The actual exposure starts when the two-stage exposure switch is pressed. The AEC automatically switches off the radiation as soon as the desired dose is measured by the system.

1.10.2 Elevator stand

The elevator stand moves the support frame up and down to accommodate the patient's height. This movement is controlled by means of the elevator control switches on the hand control unit. In case of a collision, a safety switch fitted to the bottom of the detector unit prevents the elevator from moving down.

In case of emergency an emergency stop button, located just next to the collimator unit, can be pushed. Pushing the emergency stop button will immediately stop the movement of the scanner unit. After removing the threat, and after releasing the emergency stop button, the unit is ready for use again.

1.10.3 Support frame

The support frame holds the detector and X-ray unit. The X-ray tube unit is placed on a fixed, 145 cm, distance from the detector unit. The support frame can be turned from 0 to -90°. In the -90° positions a bed can be placed over the detector to accommodate other radiological procedures. In case of a collision, a safety switch fitted to the bottom of the detector unit prevents the elevator from moving down.

In case of emergency an emergency stop button, located just next to the collimator unit, can be pushed (see 2.2.2 Emergency stop button). Pushing the emergency stop button will immediately stop the movement of the scanner unit. After removing the threat, and after releasing the emergency stop button, the unit is ready for use again.

1.10.4 Control computer

The control computer is the controlling device for the Easy DR rather than a means for advanced diagnostics, which would require very high resolution/brightness as in fast viewing stations. These are beyond the scope of this manual.

The control computer offers a graphical user interface to perform the following functions:

- Input of patient data, either directly (touch screen) or via import from peripheral systems (network, barcode scanner)
- Control of X-ray detector (Data acquisition, post processing and display)
- Control of X-ray unit (kV, mA and mS settings)
- Database management for patient data and related X-ray images
- Export of digital X-ray images to peripheral systems (network)

Radiation on/off switching is controlled by the Control computer and X-ray generator interface but always executed by the two-stage exposure switch. Generator technique settings are controlled by the control computer. However, Radiographers should follow well-known guidelines and procedures for operating the X-ray generator and are supposed to have read and understood the manufacturer's instructions for that device.

	Advice to consult the accompanying documentation: • Operation manual HF generator.

2 Safety devices

2.1 General safety

The Easy DR and X-ray generator are equipped with safeguards to prevent injury to operator and patient during use and in case of system malfunctions. For the safeguards of the X-ray generator refer to the X-ray generator documentation.

	Advice to consult the accompanying documentation: • Operation manual HF generator.

In case of equipment malfunction, bring the patient to safety and seek the assistance of a qualified technician.

2.1.1 Radiation precautions

Always take radiation safety precautions following the local safety rules.

ALARA is a philosophy of excellence used in one's day-to-day work with radiation sources. It is when one strives to keep one's radiation exposure **A**s **L**ow **A**s **R**easonably **A**chievable.

2.1.2 Biocompatibility

To prevent infections, clean all parts of the equipment that are touched by the patient (such as handgrips, chin rest, front plate), before the next patient is examined. Do this according to the instructions in par.: Cleaning

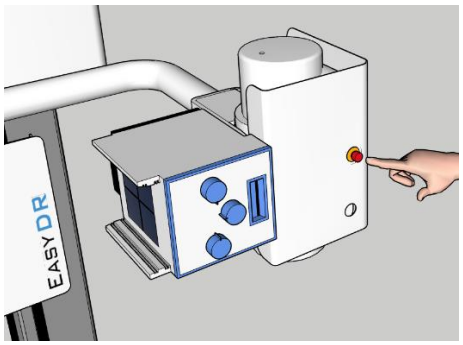
2.2 System safety

2.2.1 Safety switch

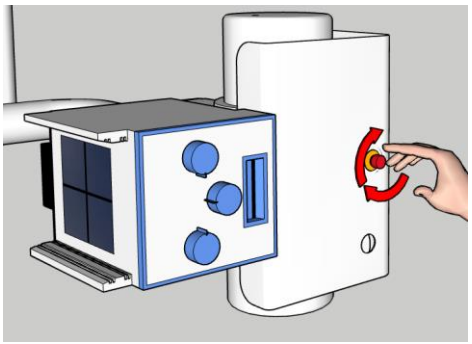
A safety switch is mounted underneath the detector unit. When the pressure of an obstacle pushes on this plate, the control switch for downward and rotation movement on the hand control unit becomes inactive. The upward movement, however, remains possible.

2.2.2 Emergency stop button

An emergency stop button is part of the scanner unit and is located just next to the collimator unit. In case of an emergency this button can be pressed, and it will stop any movement. To release the button, rotate it a quarter of a turn.



Location of emergency stop



Release of emergency stop

Before releasing the button, bring the patient to safety. Then clear the area of obstacles.

2.2.3 Transport locking

Mobile units: Underneath the locking device bolted on the floor a switch is mounted. When the system is locked fore transport, the transport switch is open and functions the same way as the E-stop, e.g. no movements possible.

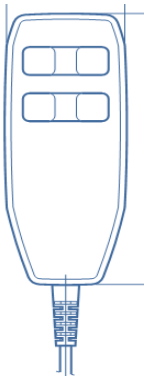
3 Operating controls

There are hardware (buttons and LED indicators) and computer controls. The hardware controls are located on the hand control unit, on the X-ray generator mini control panel, and on the collimator. The computer controls are the touch screen buttons provided in the user interface of the control computer unit.

3.1 Hand control

WARNING:	**Motorized movements are only allowed if the operator stands in front of and outside the working area of the Easy DR.**
WARNING:	**Motorized movements are only allowed if the patient and system are observed by the operator, because of squeezing hazards.**
WARNING:	**Operating the Easy DR from the hand control unit is only allowed when patient and system are observed and are under supervision of personnel because of squeezing hazards.**
WARNING:	**Due to squeezing hazard, patients shall always be placed outside the Working area during motorized rotation of the Easy DR.**
WARNING:	**Special precautions from the user have to be taken when using the Easy DR together with a table. Squeezing hazards exist in these situations.**

The hand control unit has four push buttons they control the following functions:



Support frame height up and down controls. With these buttons the system can be positioned to a convenient height for the patient

Support frame rotation controls. With these buttons the system can be positioned from 0 to -90 ° to accommodate multiple radiological exams. The rotation buttons only work when the support frame is between 850 and 1350 mm above the ground

3.2 X-ray generator control panel

The description in this paragraph applies to the CPI MP200 generator with a special interface to the Easy DR system. For more details, see the documentation of the X-ray generator.

	Advice to consult the accompanying documentation: • Operation manual HF generator.

The X-ray unit may be dangerous to the patient and operator unless safe exposure factors and operating instructions are observed.

The generator mini control panel contains various indicators and controls. The relevant controls are:

- ON/OFF switch
- Exposure switch and indicator (audible). Starting X-ray radiation.

3.3 Collimator controls

The collimator unit contains three control knobs, a push button and a filter.

- Control knob (1) controls both lateral X-ray field collimator blades
- Control knob (2) controls the upper X-ray field collimator blade
- Control knob (3) controls the lower X-ray field collimator blade
- Push button (4) switches on the field illumination. The field illumination switches off automatically after a brief time interval.
- An additional filter can be selected by 5, rotating the disk will change the filter. The amount of actual filtering is shown on the disk.

4 Operating Instructions

4.1 Releasing the shipping locks

Mobile Easy DR units are fitted with a two shipping locks: a locking screw or bolt to secure the elevator (only used during installation/transport) and a locking device for the support frame bolted on the floor. Fixed units do not have shipping locks.

When the Easy DR is locked in the locking device the e-stop switch is activated by the switch underneath the locking device, this will prevent the movements.

4.2 Powering up

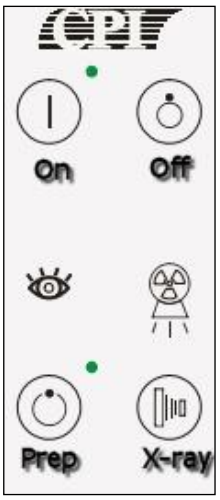
Power up the system. The X-ray generator, Elevator stand, and support frame are all powered on by the control of the generator.
In some cases, a separate (optional) UPS is provided for the computer. Switch on UPS first, and then switch on the control computer. Log on to the control computer (see Paragraph 5 Workflow Step by Step).

Several indicators, including the ON/OFF indicator on the X-ray generator mini control panel, light up.
There is no power switch on the Elevator stand.

4.3 Power on Easy DR

Note:	**When the system is on 24/7, it is recommended to restart the system once a week to clean up computer memory and automatically save the database.** **First turn on the x-ray generator and then the acquisition computer.**

Turning on the x-ray generator



The generator mini console is a small box with on the upper side the on and off button and on the lower side the prep and exposure button.

In the middle there are indicators for fluoroscopy and exposure. When active the indicator symbol will light up.

Turn on the generator by pressing the On button  .

Turning on the Acquisition computer

Turn on the acquisition computer by pressing the power button.

Logon with the appropriate credentials:

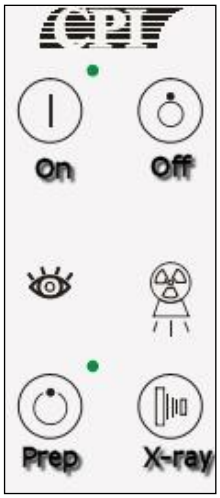
User Name:_____

Password:_____

Note:	**Canon Inc. is the legal manufacturer of the CXDI Control Software used on the Easy DR Acquisition/Control Computer.**

4.4 Shutdown Easy DR

Note:	**Before turning off the system park the arm in its parking position. When the power is off the arm cannot be moved.**



Turn off the generator by pressing the off button  .

Turn off the acquisition computer by selecting  and 

.
The computer will shut down automatically. The monitor will go standby.

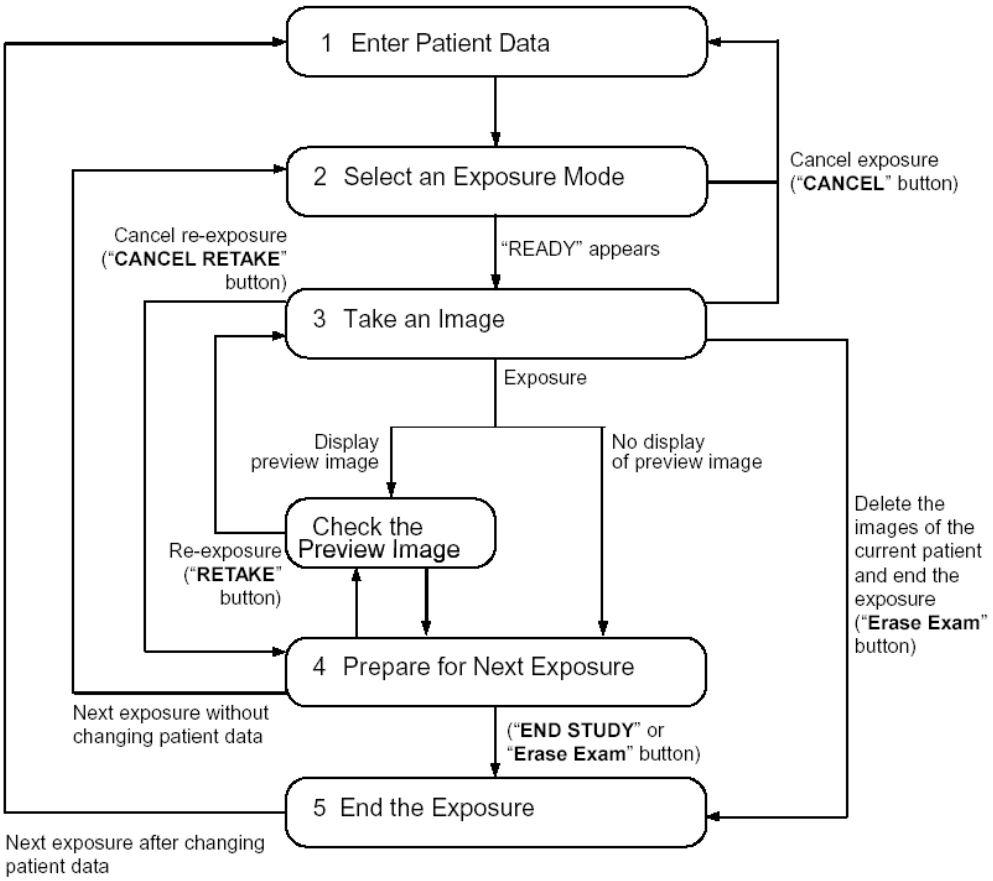
5 Workflow Step by Step

After turning on the acquisition computer a login screen will be shown:

Login screen

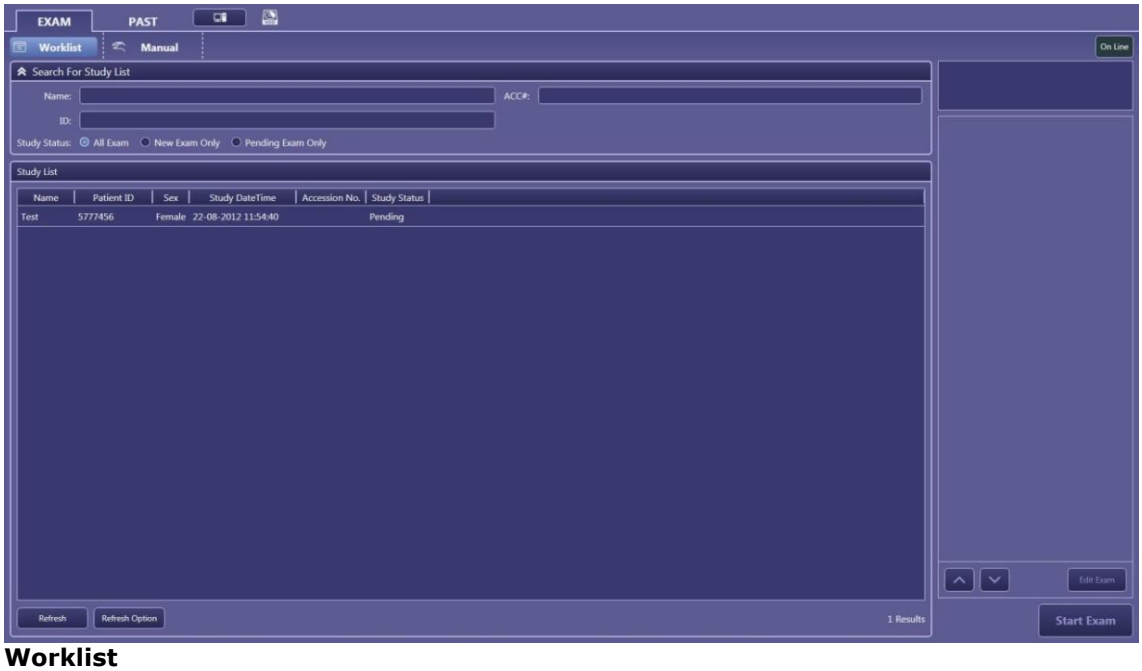
Login
User Name:
Password:

workflow

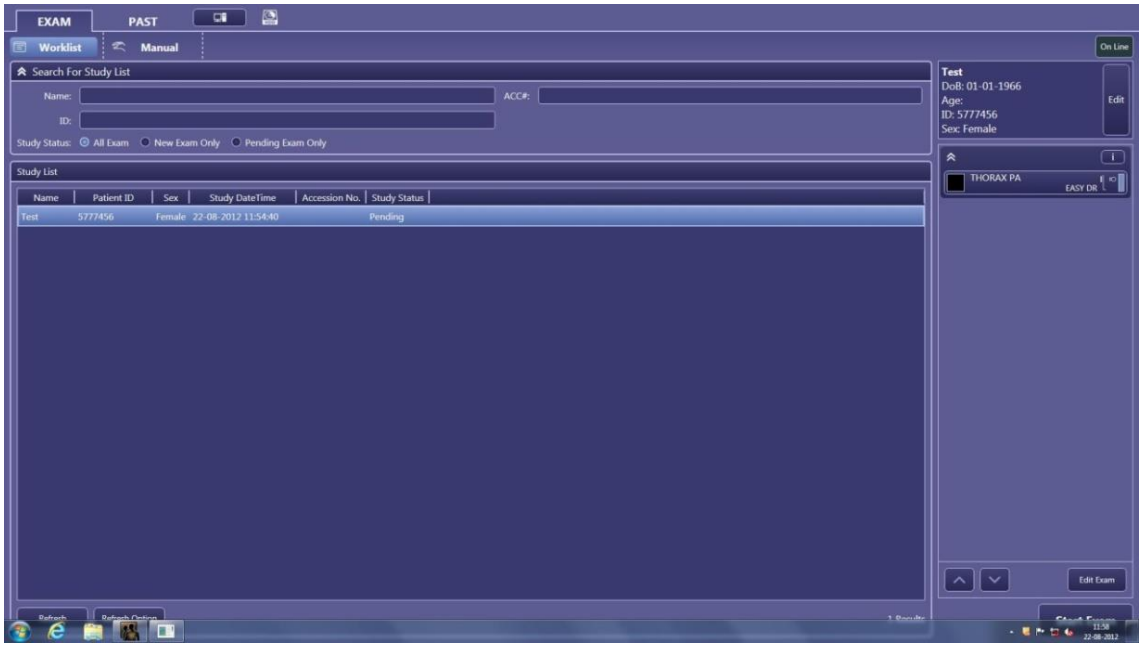


5.1 Patient selection from worklist.

When the patiënt is not shown in the worklist, press Refresh



Worklist



Worklist with selected patient

Select the desired patient. The Easy-DR will add the exposure protocol "Thorax PA" automatically. If another exposure protocol is desired, see 5.4. Press Start Exam to continue. If the Thorax PA protocol does not open automatically, click on start exam and then you can choose the desired protocol.

5.2 Taking an exposure

The system will prepare for exposure. During preparation it will show PLEASE WAIT in the upper right corner.
When the detector has been prepared it will show READY.

Detector status: Ready

If the generator is ready exposure can be taken.

Generator ready for exposure

If desired, exposure settings can be changed on the X-ray Generator Settings panel on the right side of the screen.

Give breathing instructions and press the exposure button halfway to prepare. When breathing instructions are finished and the patient holds its breath, press further for immediate exposure. The exposure will be accompanied by an audio signal.

5.3 End exam, back to worklist

After exposure press End Exam to finish this exam and to go back to the worklist.

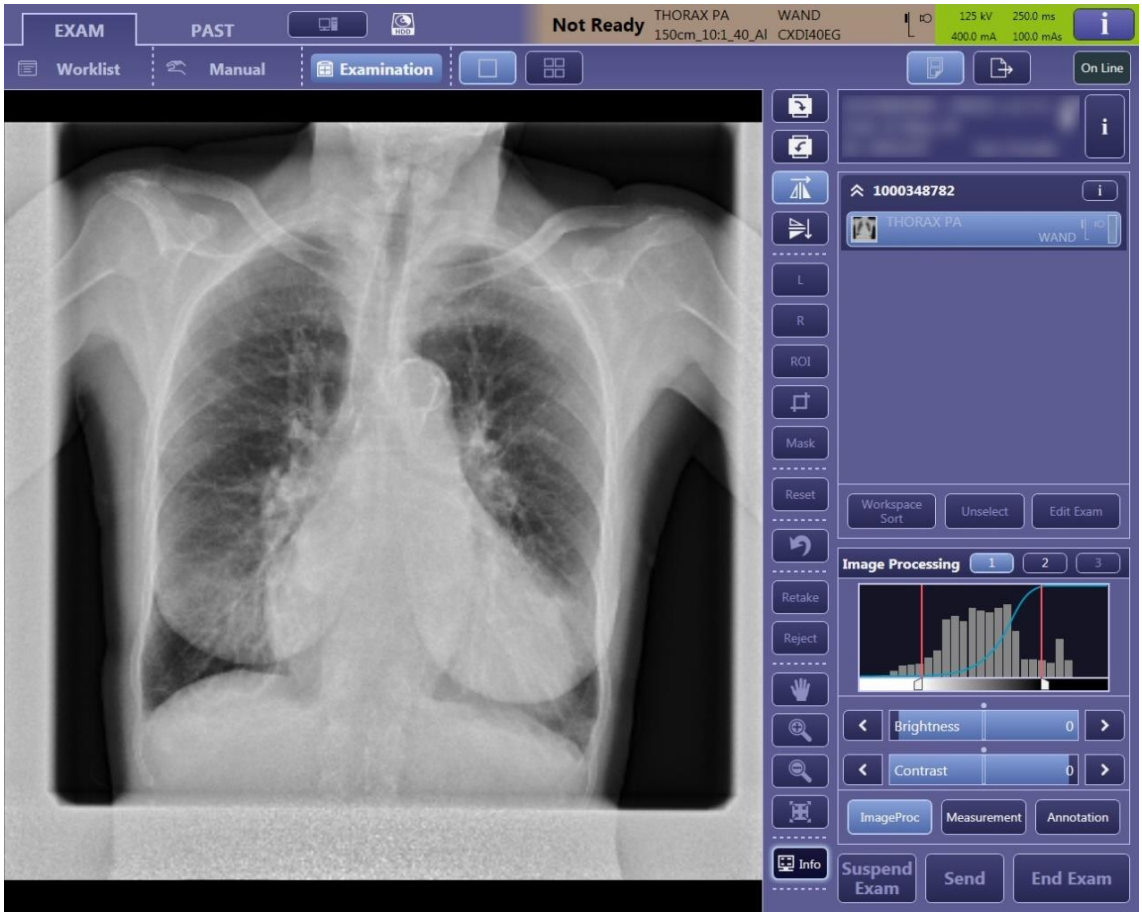


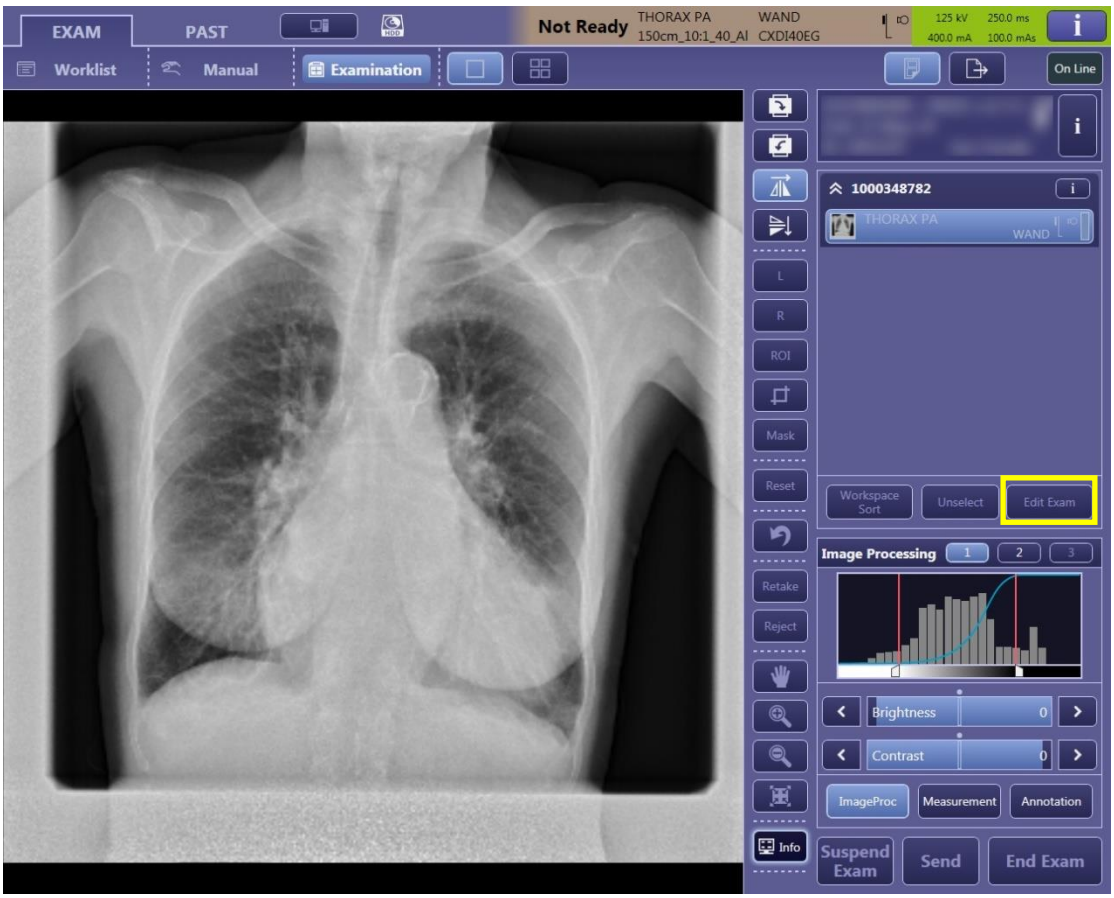
Image after exposure

The image will be sent to the destinations which are set as default.

after End Exam the worklist will be refreshed and displayed for the next patient selection.

5.4 Select another exposure protocol

Standard, the Thorax PA is selected for every patient. If this is not the desired protocol, or an extra protocol has to be added, then this protocol can be selected with the Edit Exam button.



Screen after pressing Edit Exam

Click on the desired protocol to add this protocol to the workflow manager. It is also possible the delete not desired protocols by select them in the workflow manager and press Delete.

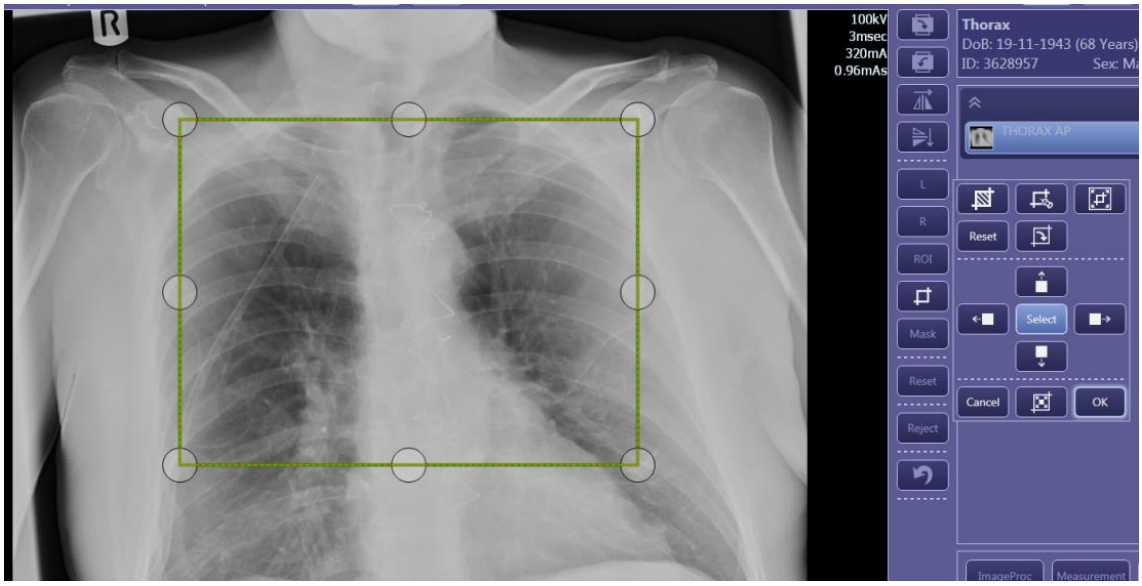
Press OK to go back to the main screen for acquisition. Select the appropriate protocol if multiple protocols are visible in the workflow manager.

5.5 Adjusting an Image

The system will process the image according to the protocol settings.

The system will detect the radiated area on the detector and mark this area with a *Cropbox.* Only the inside of the cropbox will be sent to the destinations which are set as default in the system.

The cropbox can be changed by pressing  .Then the cropbox can be changed by clicking within one of the circles and drag the corner, or border in or out.



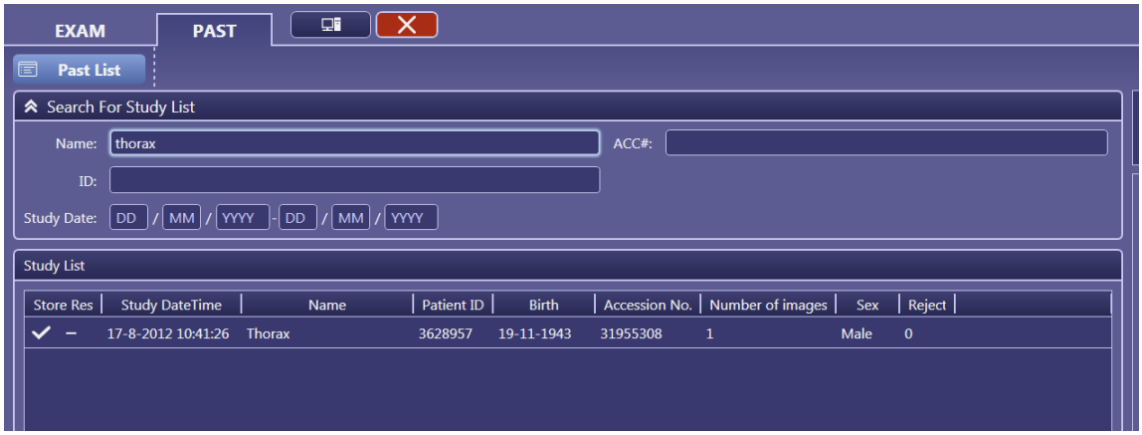
Adjusting Cropbox

After adjusting the cropbox press OK to confirm.

Ok after adjusting Cropbox

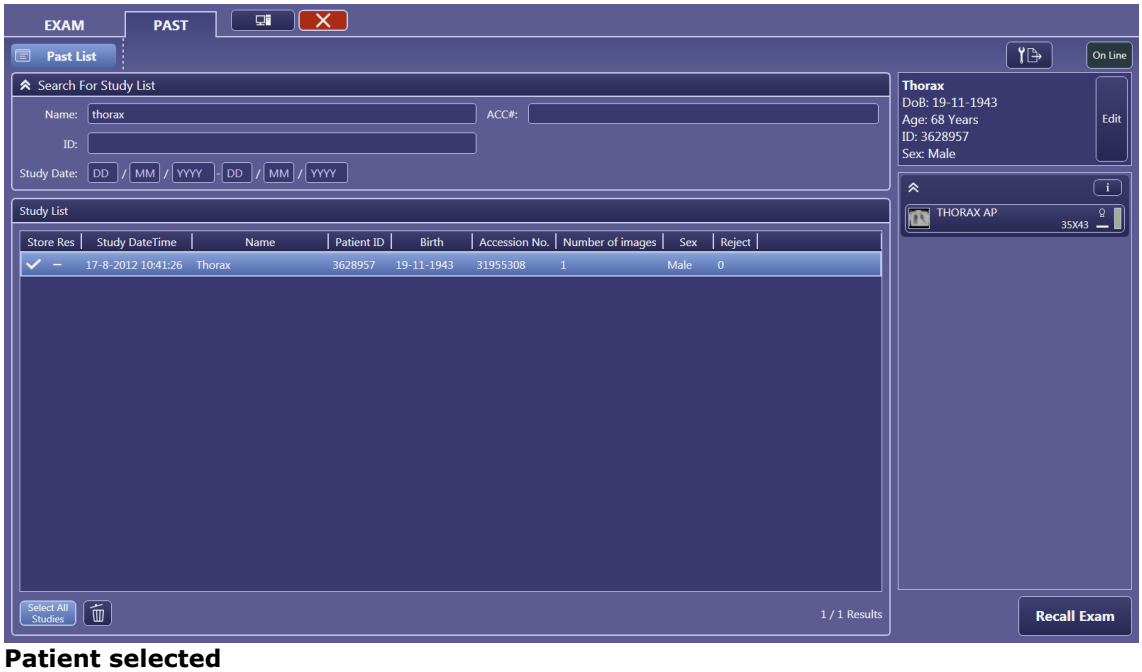
5.6 Show Patient List History

All images being made are locally stored in the Past List. They can be retrieved again, altered and resend to a destination.



Past List with history

Select the desired patient. Searching for a particular patient can be done by entering the search key in the specific field.



Patient selected

Press **Recall Exam** open this study.

The image will be displayed and can be changed for orientation, or with Image Proc with different image processing.

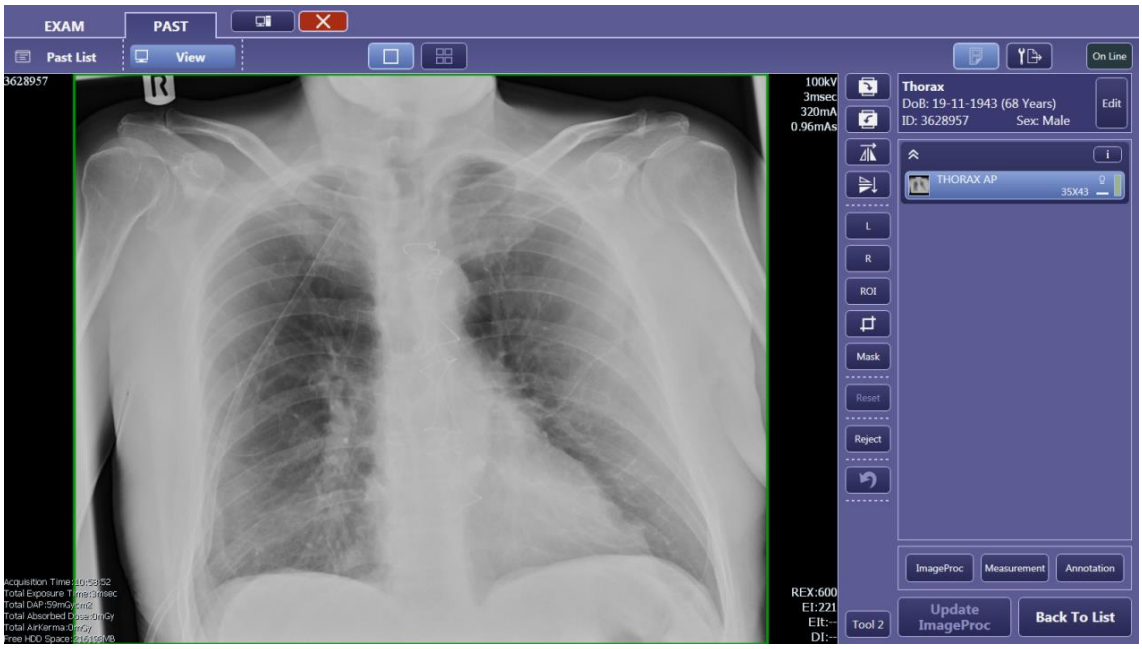
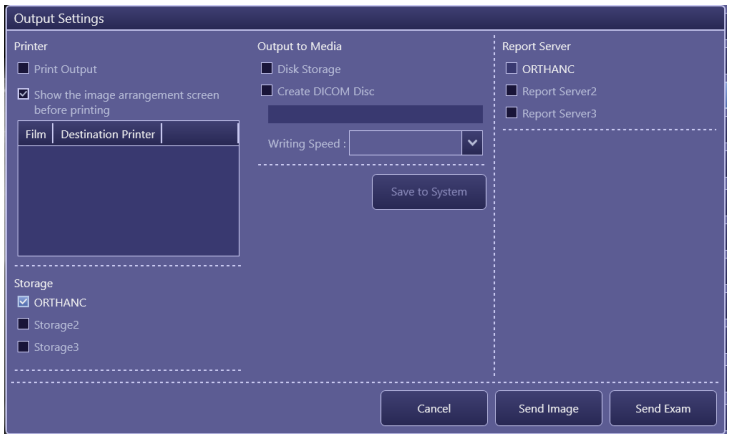


Image from Past List

5.7 Resend Image from Past List

Press from the above screen  .



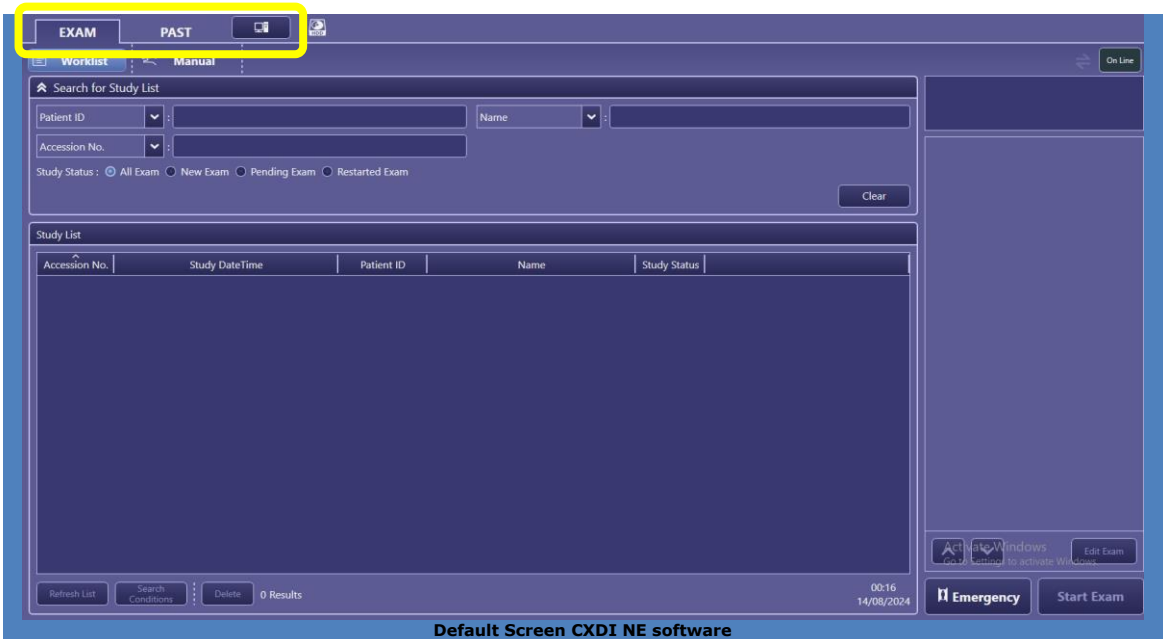
Send Image

Press  to resend the image to the checked destinations. The default destinations are checked and can be changed.

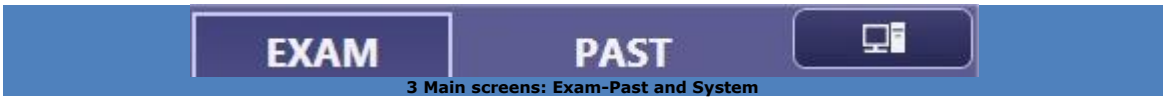
***Be aware*: If destinations are changed and the *Save Setting* button is pressed the checked destinations are stored as the new default destination setting!**

6 Introduction CXDI NE software

Note:	**The user interface contains 3 main screens.** **Each main screen can be called from the upper left side of the default screen.** **For easy reading this manual calls the  screen the "System" screen.**



Default Screen CXDI NE software



3 Main screens: Exam-Past and System

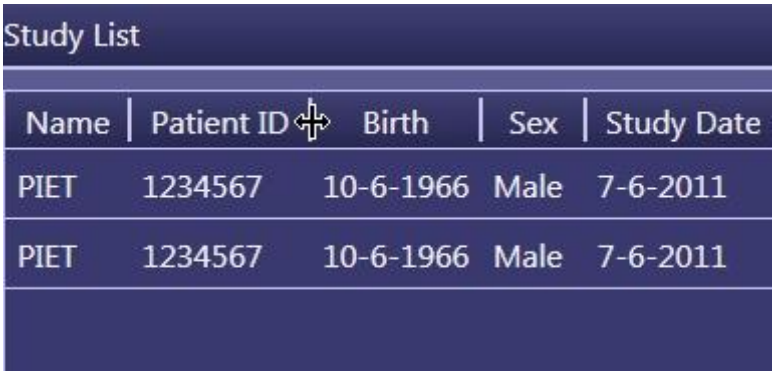
	Exam screen: Worklist, manual and emergency patient input
	Past screen: Patients / images made in the past
	System screen: Adjust system settings and Shutdown.

6.1 Image Acquisition: Exam Screen

Note:	**The Exam screen contains the worklist, a manual patient information input possibility and an emergency patient option.**

6.2 Select patients form the Worklist: Exam → Worklist

In the screen Exam → Worklist patients will be displayed which are retrieved from the worklistserver.



The different information columns are adjustable in order and in width.

To change the order of a column, just select the column name and drag the column to the desired place while keeping the left mouse button pressed.

To change the column width: select the column separator when the mouse pointer changes in  and then press the left mouse button to drag and change the width.

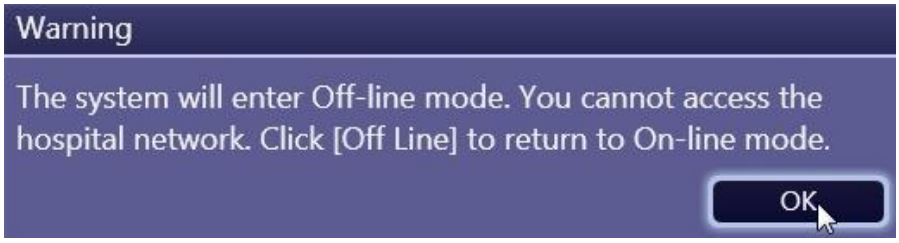
6.3 Online - Offline

Note:	**The system can work in Online and Offline mode. During Offline mode the acquisition computer does not refresh the worklist and acquired images will not be send to a destination, PACS or DICOM printer.**

The system is Online and connected to the hospital information system and destinations. The worklist will be retrieved and when an exam has been ended, the acquired images are being sent automatically when a destination has been set.

The system is Offline, not connected to hospital information system and destinations. The worklist will show the last patient list at the time the system is set to Offline.

Acquired images will stay in queue to be sent to their destinations when the system has been set to Online.



System warning when it is put in Offline mode.

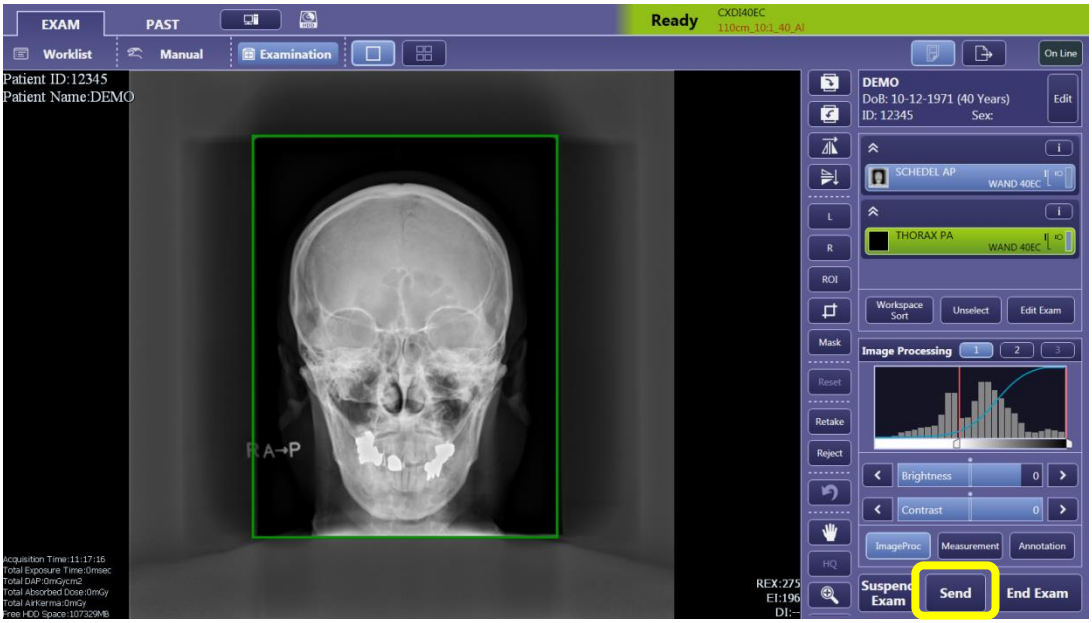
6.4 Search the Worklist for a patient

Note:	**It is possible to search for a patient or patient ID in the worklist.**

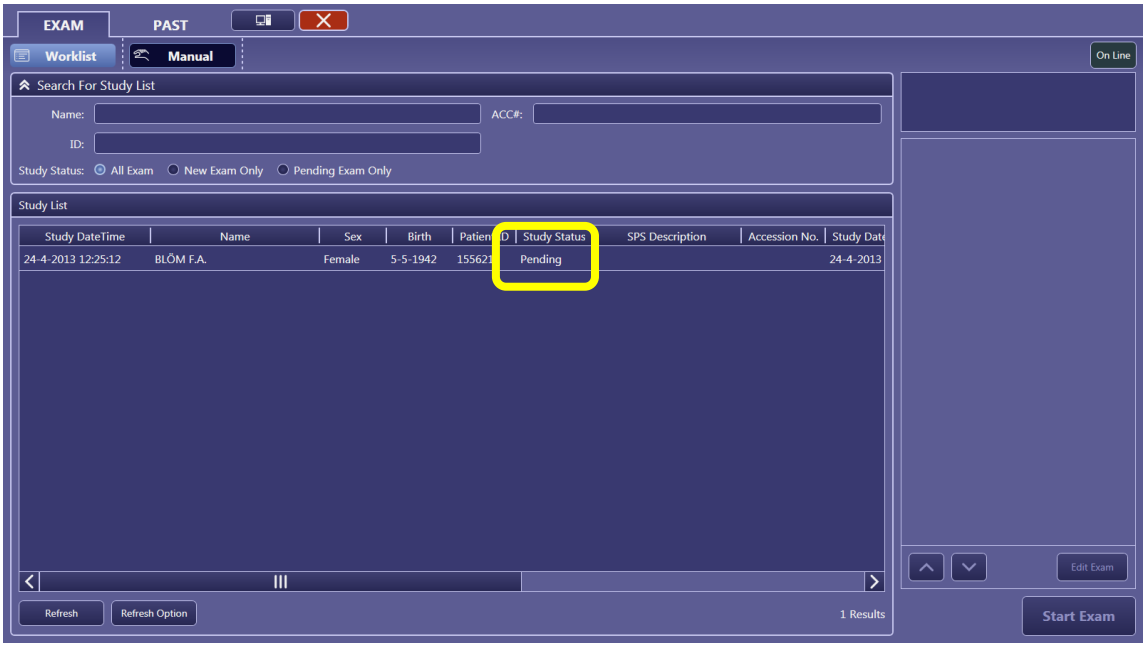
When the "Search for Study list" is being folded out it is possible to filter the worklist for name or ID.
It is not necessary to insert the complete name or ID, just a part is enough.
The results are being displayed instantly while typing.

	Fold out / in Search for Study list input filter.
All Exam	Displays current worklist and pending patients.
New Exam	Displays current worklist patients only.
Pending Exam	Displays pending patients only.
Restarted Exam	Displays restarted patients only.

6.5 Pending patients



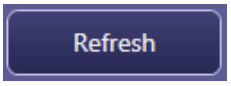
Patients who are suspended with the button **Suspend Exam** will have the Study Status **Pending** in the worklist.



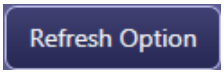
Pending patients will sustain in the worklist. To delete a pending patient, one has to select the pending patient, start the exam and then select, end or cancel, dependent if images are acquired in the exam.

6.6 Refresh Worklist: Refresh

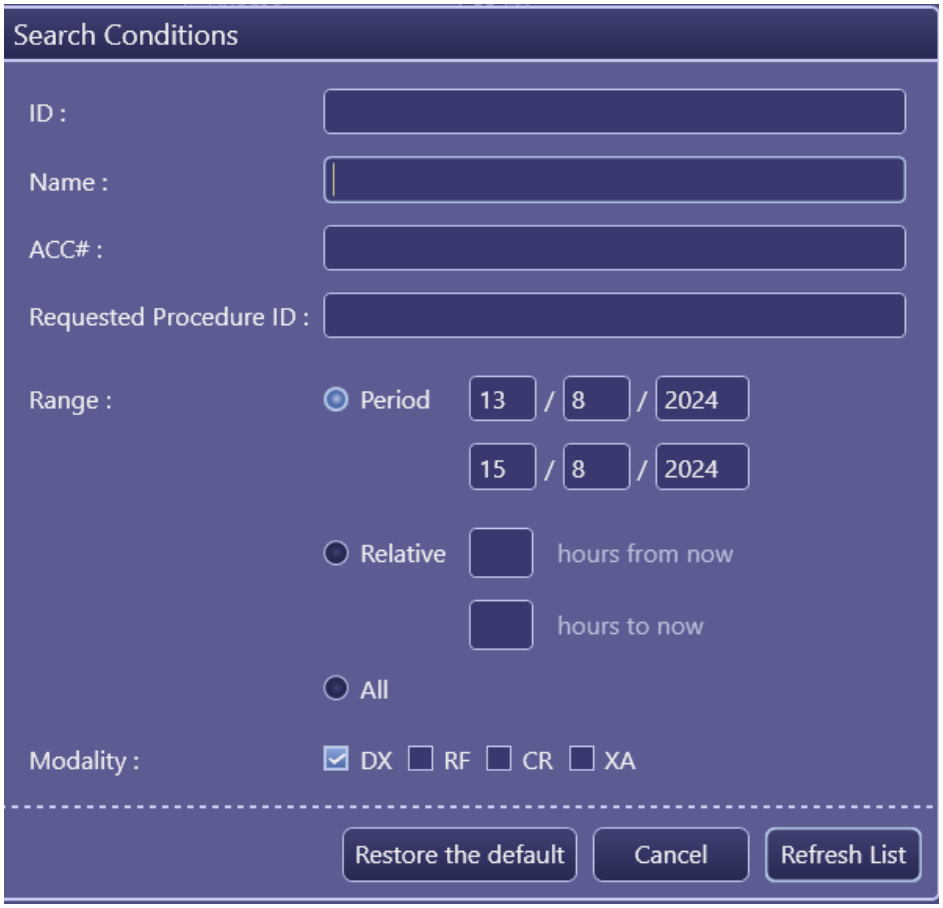
Note:	**The worklist will be retrieved automatically after an acquisition is ended by End Exam.** **When the worklist is being displayed it will not refresh automatically.**



Refresh will update the worklist with the latest data. This is only possible in Online mode; if the Offline mode is active this button will be grayed out.



More advanced search criteria can be entered.

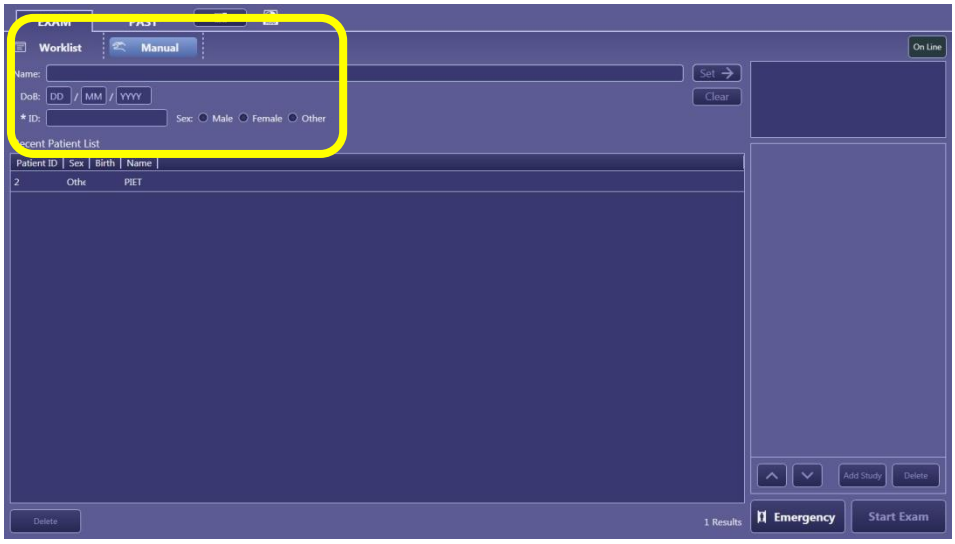


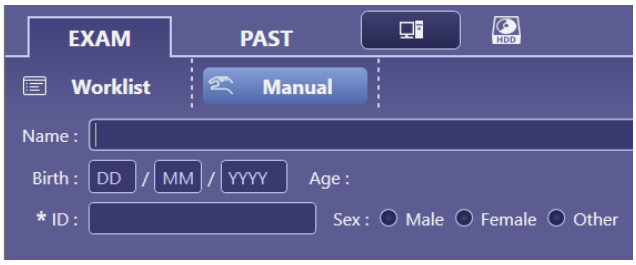
Refresh options can be changed from day-period to time-period to retrieve patient data. The settings in the Refresh options will not be persistent, after login out the default refresh as set in the Service Tool will be used.

6.7 Manual Input: Exam → Manual

Note:	**In the screen Exam → Manual all patients are being displayed which has been selected from the worklist or entered manual in the past. It is possible to select a patient from this list but keep in mind that only patient information will be used. Other information, like accession number will not be present.**

Manually input patient information via Exam → Manual





Input fields for patient information.

Fields with an asterisk (*) are mandatory. (Which fields are mandatory can be set in the service tool).

In this example the ID and Sex are mandatory input fields.

 	When patient data has been entered press Set or Start Exam to continue.
	Patient data is filled automatically with a unique patient ID. After acquisitioning this exam can be bind to patient data from the worklist.
	After selecting the desired protocols press Start Exam to begin the image acquisition.
	Image acquisition can be divided into several studies. This can be done only in manual entered mode. When Emergency is been used this option is not available.
	The order of the selected protocol can be changed.

6.8 Secure Images against erasure: Protect Image

Note:	**The CXDI NE software erases the images with the First In First Out principle. This means that the oldest image will be erased when the data disk has reached its upper limit (only when the images have been sent to a PACS or printer).** **To prevent an important image for erasure it is possible to protect it. This can be done during the acquisition as well from Exam → Past.**

To protect a Study, press the  button.

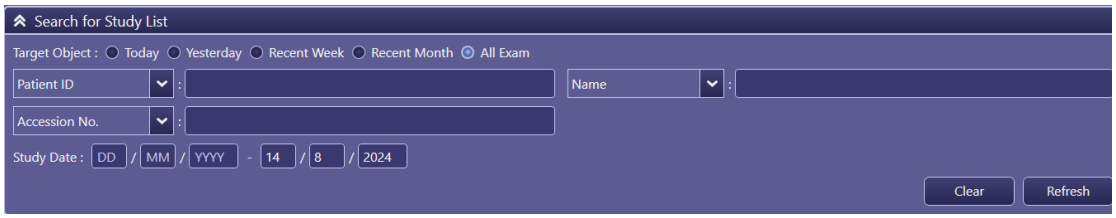
Select Edit.

Check Protect Image to prevent this study from automatic erasure.

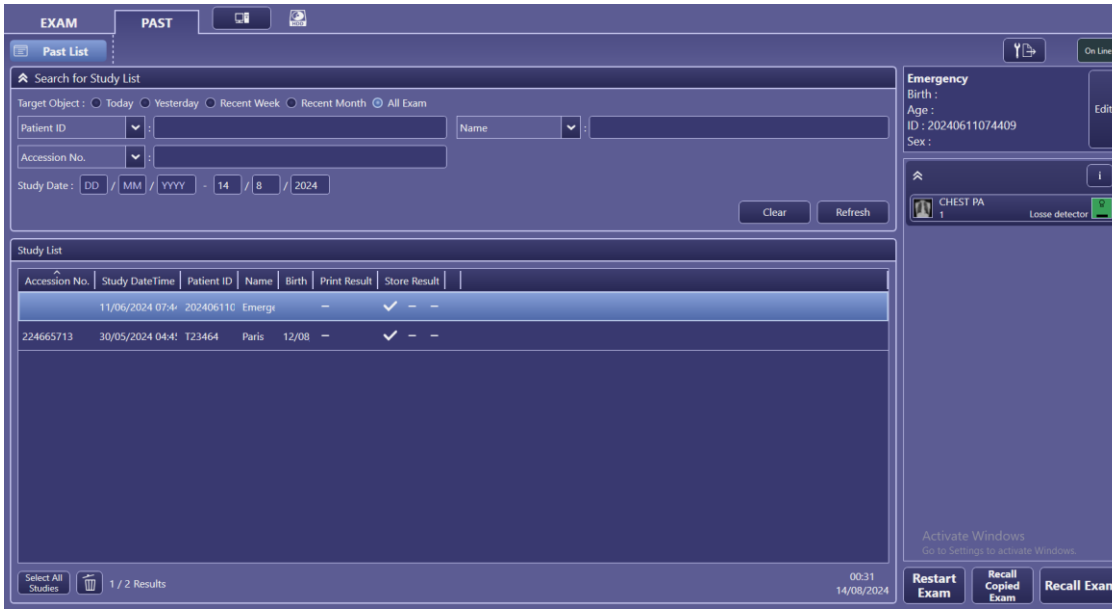
6.9 Retrieve old images: Past

Note:	**Old images can be retrieved. Retrieved images can be changed and resend to a destination.**

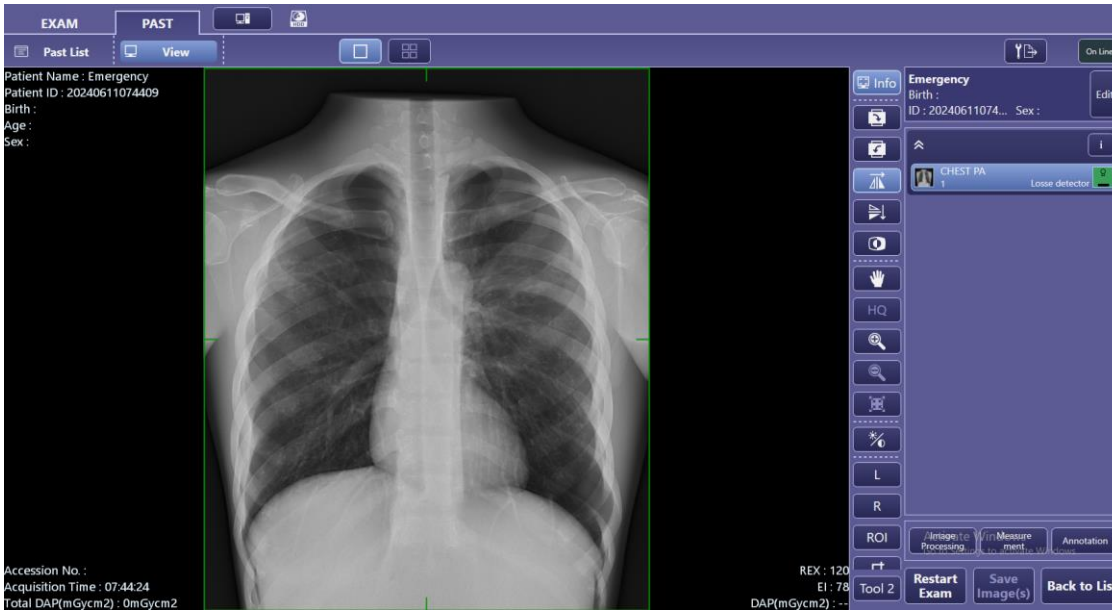
The Past List can be called by selecting the Tab Past in the main screen.



It is possible to fill in a target object or search criteria.



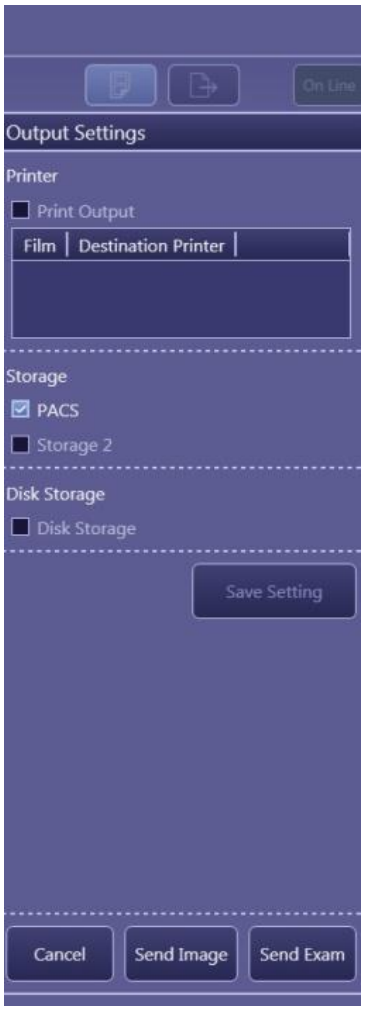
When a patient is selected in the Past List it will show all exams for this patient. The exams will be presented by name and a small thumbnail preview of the image.
Press Recall Exam to go to the next screen.



Select a protocol for displaying and changing the image.
For Resending the image see next paragraph.

6.10 Resending images to a destination: Output Settings

Note:	**The images can be resent, only when the system is set to** On Line**.**



If an image has been changed press Save Image(s), and afterwards on  to call the output menu.

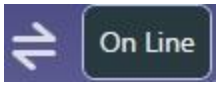
Select Send Image for resending the current image only.

Select Send Exam for resending the complete exam containing all images.

The destinations with a checkmark are the active destinations.

Changing the active destination will change it for this time only.

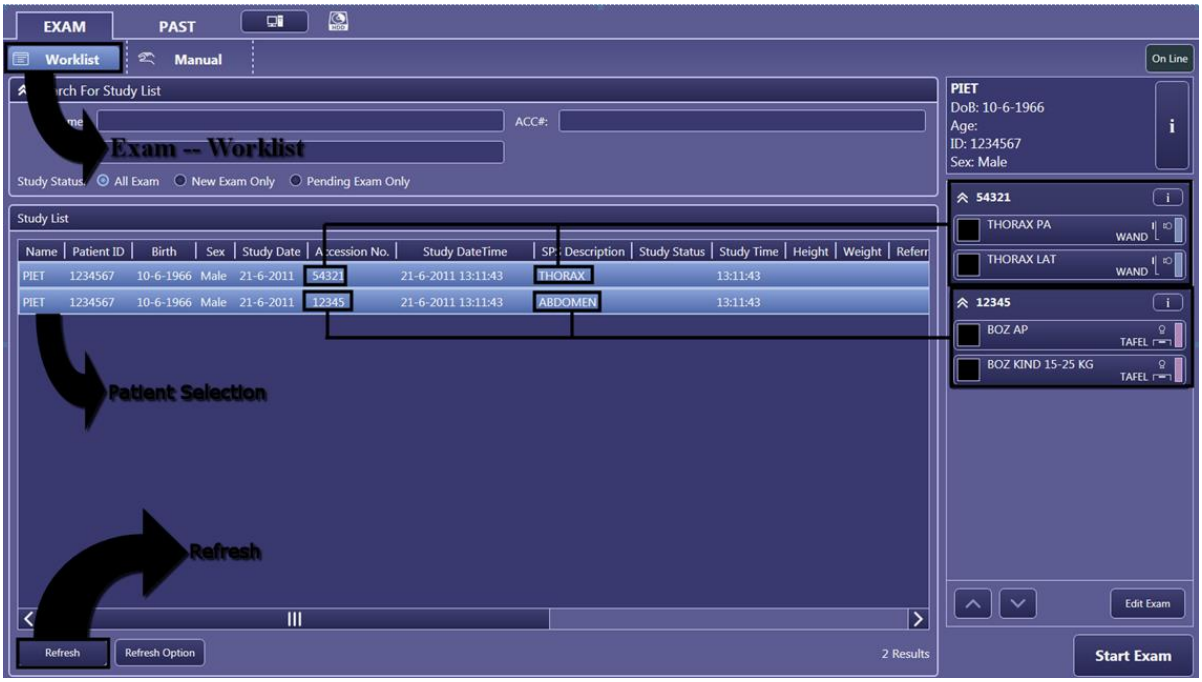
If Save Setting is pressed the current active destinations will be set as default.



When images are being transferred to a destination a blinking cursor will be present next to the Online button.

6.11 Worklist Patient Selection

Note:	There are multiple workflow methods possible. This manual will explain only some of them.



Select the patient from the worklist. If the patient has multiple studies planned in the worklist the CXDI NE software will select them all.

If the patient is not present in the list press refresh. Also, if not all studies are not visible yet press refresh till all exams are present in the worklist.

If the system is programmed with prepacked protocols the studies will be filled automatically with protocols.

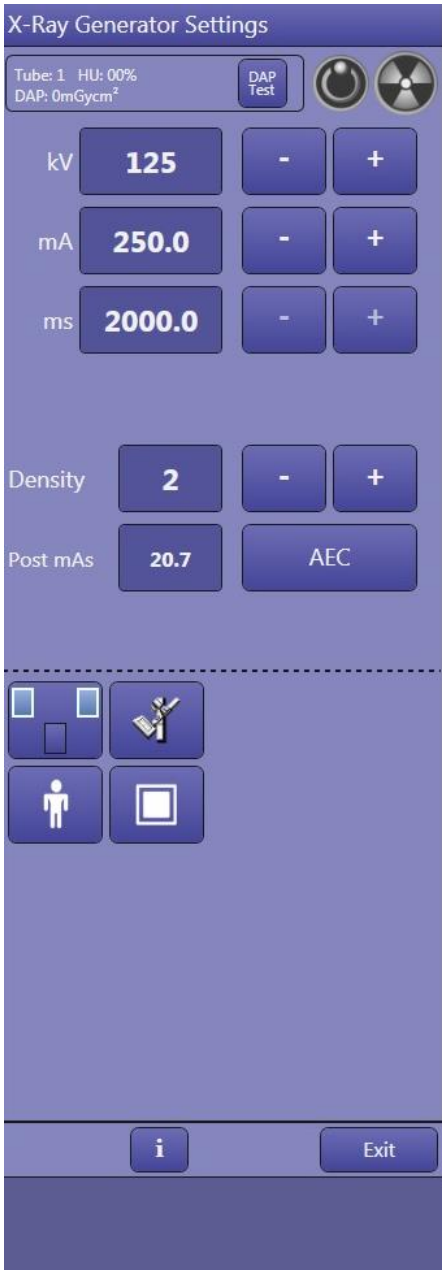
With Edit Exam protocols can be added to the studies.

Press Start Exam to begin the acquisition.

6.12 X-Ray Generator Settings Panel

After patient selection and Start Exam has been selected the system will show a X-ray Generator Settings Panel on the right side of the screen.

In this Panel the actual exposure settings are displayed for the selected protocol. Before taking an exposure, it is possible to change specific exposure settings to more appropriate settings for the current patient.



With the - + buttons one can decrease – increase values for the specific parameter.

Button AEC can change technique to manual exposure settings.

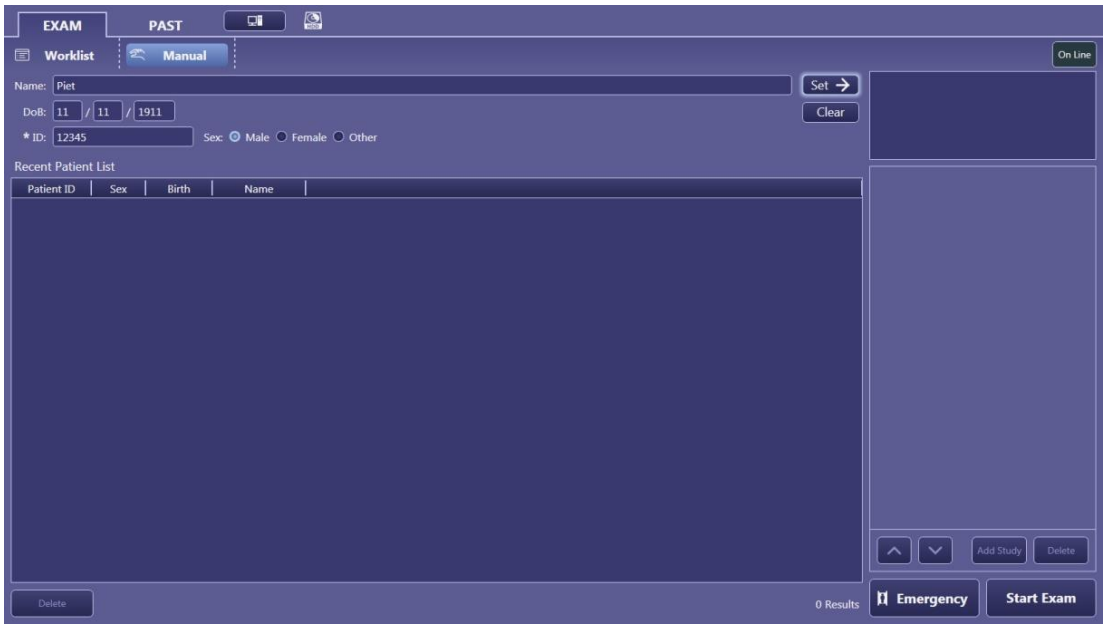
Button displays a new window for changing AEC chambers, when not pressed for several seconds this window will hide automatically.

Button will toggle between large and small focus.

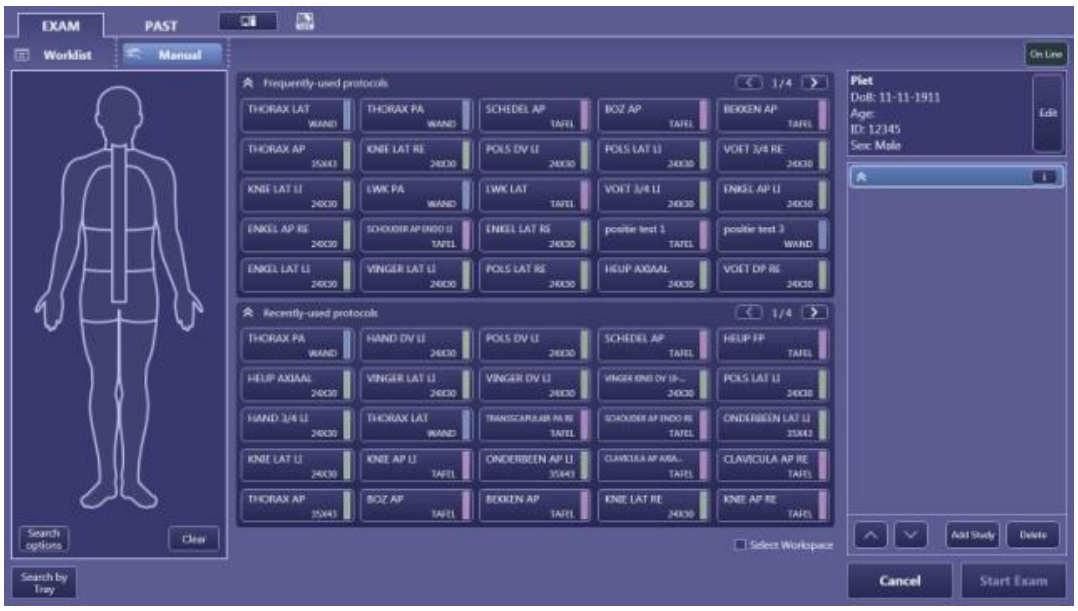
Button Will show the several patient size buttons.

Button DAP Test can be pressed for resetting the accumulated DAP value acceded error message and select DAP reset.

6.13 Manually input Patient data



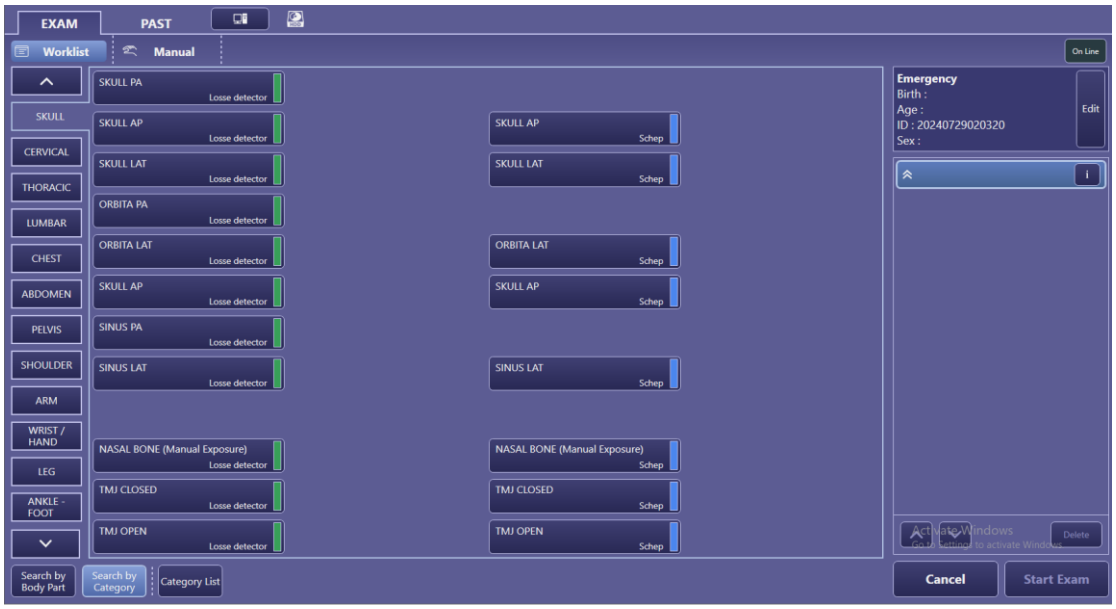
Fill in the appropriate patient data. Fields with an asterisk (*) are mandatory. Press **Start Exam** for next screen.



There are two possibilities to search and add protocols:

1. Search by Category
2. Search by Bodypart

6.14 Search by Category



The protocols are presented in different tabs. With the / buttons one can scroll through all the tabs. A protocol can be added to the active study by clicking once on it.

This screen displays all available tabs. It can be accessed via the Category List button. Press Category List again to go back to the previous screen.

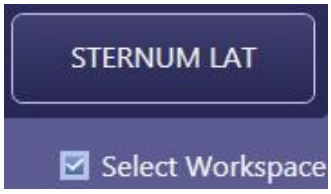
6.15 Search by Bodypart

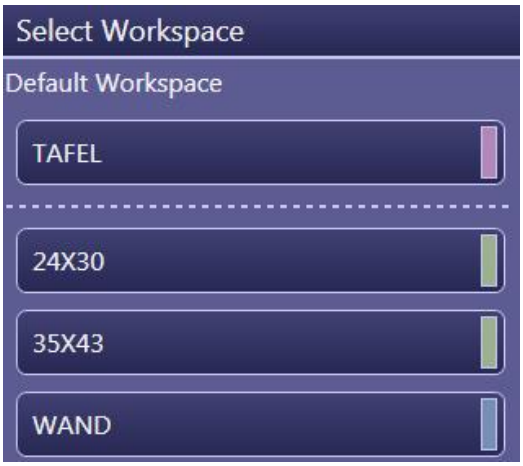
With search by Bodypart one can find a protocol quickly by using the anatomical diagram. Selecting an anatomical region will display all frequently and recently used protocols from that anatomical region.

With Search options one can search by protocol name or view position.

With Clear all search criteria will be cleared.

	
When Select workspace is not been checked, the CXDI NE will show the protocols based on their frequently – or recently used workspace.	When Select Workspace is checked the CXDI NE will show the frequently – or recently used protocols without workspace.





When Select Workspace is checked the workspace selection is after the protocol selection. The system will show only those workspaces available for that protocol.

6.16 Change between Search by Category and Search by Bodypart

The CXDI NE can be set with a default for showing Search by Category or Search by Bodypart.

It is possible however to change from one view to the other by pressing Search by Body Part or Search by Category at the lower left corner.

6.17 Manually add studies and enter accession numbers.

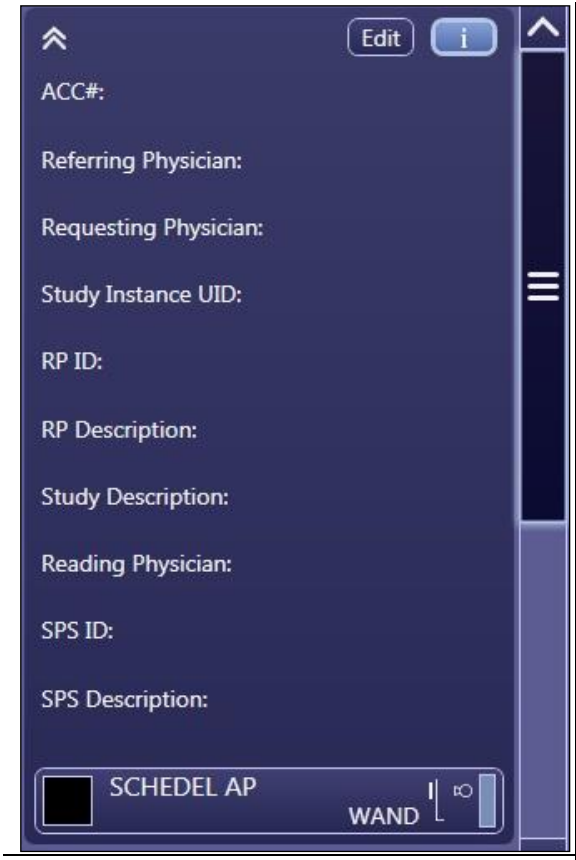
Note:	**Manually adding studies is only possible when a patient has been set manually. When a patient has been selected from the worklist, or selected via the Emergency button, it is not possible to add studies.**

Example of a manually entered patient. When the patient was selected from the worklist the Edit button would be an Info button.

With the Add Study button the protocols are subdivided into different studies. Each study can have an accession number and study description by pressing the i button for that study.

Be sure that Delete will delete the selected item, this can be one protocol or one complete study.

With ^ v the protocol order of the selected protocol can be changed.



Screen after pressing i. Some information fields can be filled by the worklist server only.

Screen after pressing Edit.

Information fields filled by the worklist server cannot be changed.

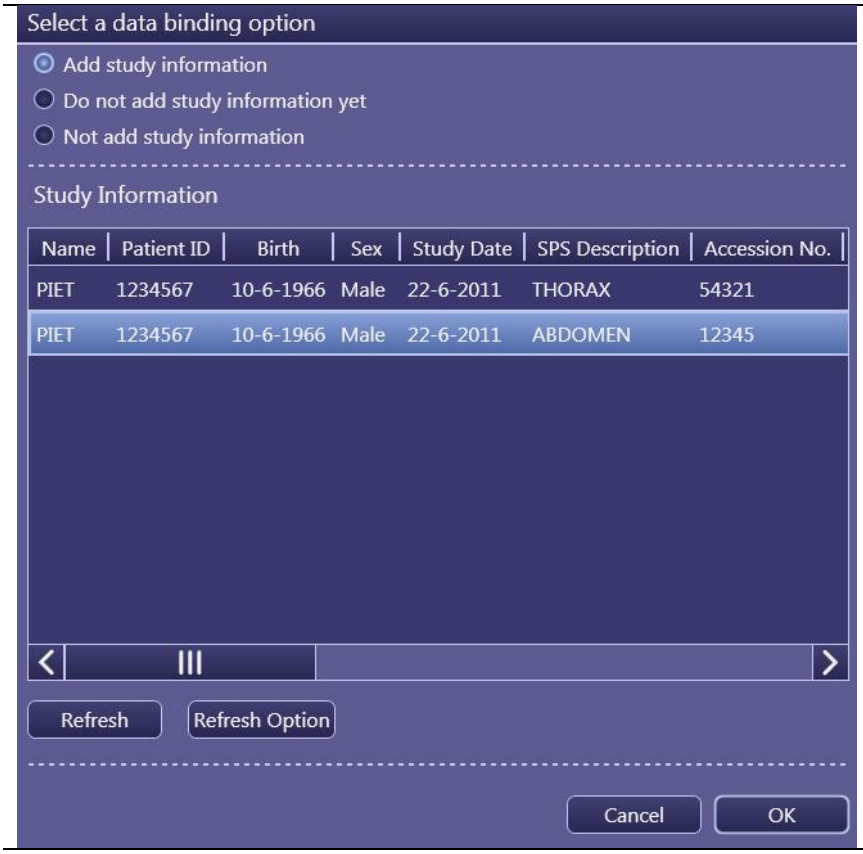
6.18 Emergency Patient

Note:	**Emergency Patient can be used if it is necessary to begin acquiring images without knowing the patient information.** **Main advantage is that it is possible to bind the images to a patient from the worklist. Disadvantage is that all images within the emergency patient are collected in only one study.**

Select Emergency from the Exam screen. Patient name will be filled with Emergency (can be set in the service tool) and a unique patient ID

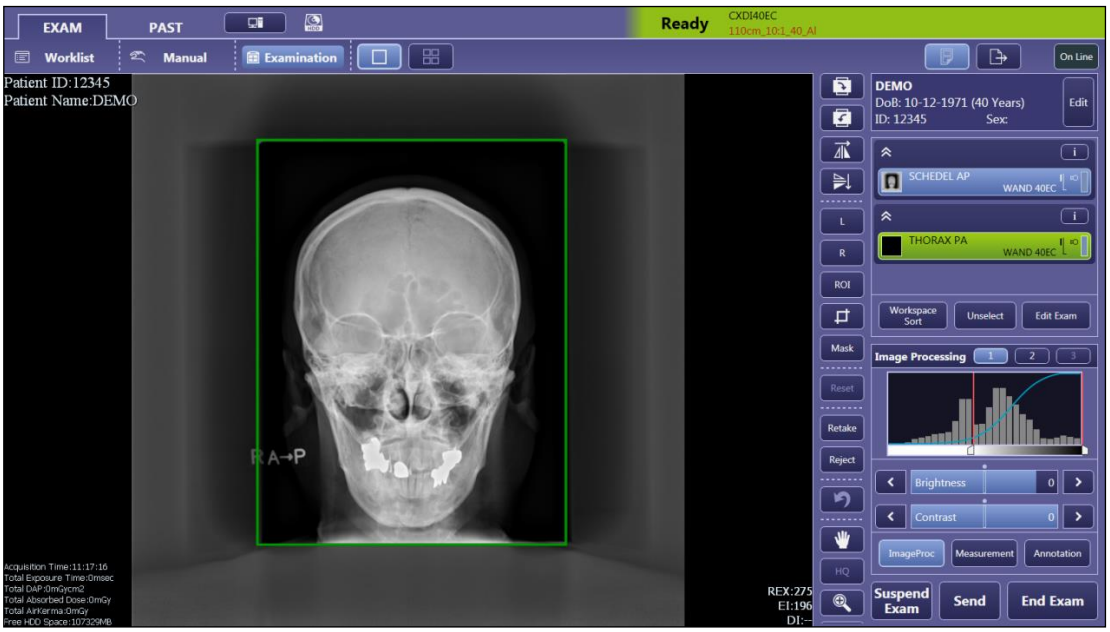
Select the appropriate protocols and press Start Exam.

When finished acquiring images, pressing End Exam will display a "Data Binding" screen. This screen has a worklist of all recent patients from the worklist server. From here it is possible to select a patient and bind this patient data to the recently acquired images.



WARNING:	**1. It is not possible to divide the images into several studies.** **2. It is not possible to send images with Send.**

6.19 Finish an Exam



To end the image acquisition of a patient and for automatically sending the images to their default destinations press **End Exam**.

For sending the images to the default destinations for this patient which have been acquired till now, but not end this exam, press **Send**.

To end this acquisition temporarily and not send the images, press **Suspend Exam**.
This patient will sustain in the worklist with study status Pending.

6.20 Image processing

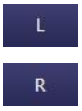
Note:	**The quality of an image is largely determined by the digital image processing.** **Keep in mind that the digital image processing is strongly dependent on sufficient exposure parameters.**

6.21 Toolbar

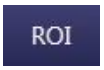
The Toolbar can be adjusted in the system properties. The order or presence of buttons within the toolbar may differ in this manual by the system.

Rotate and mirroring. Rotation is set by 90 ° steps.

Free rotation is possible with the free rotation button  .

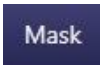


Left - Right marking letter. Depending on system settings, it will be shown at the bottom or top side.



ROI (Region of Interest). The brightness (density) of the photo using the ROI can be modified.

The system will put a crop box around the X-ray field. The content of this crop box is sent to the specific destinations. With this button the crop box size can be changed.

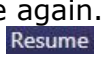


Normally, the area outside the X-ray field will be blackened, called black mask. With this button the black mask can be customized.

All actions will be undone.

Last action undone.

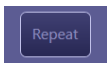
Overlay on - Off

The currently selected photo is rejected, and the protocol is added to acquire the image again. The rejected image will not be sent to its destination. With 

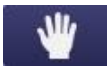
alternately the first image or second image is being rejected. A rejected image can be sent from the Past List.

The currently selected photo is rejected. With rejection, the protocol is not added automatically. If a rejected image has to be sent afterwards it is possible with 

to change back the status of the image to normal.



The protocol is added to acquire the image again.



Pan the image when zoomed in.

Zoom the image

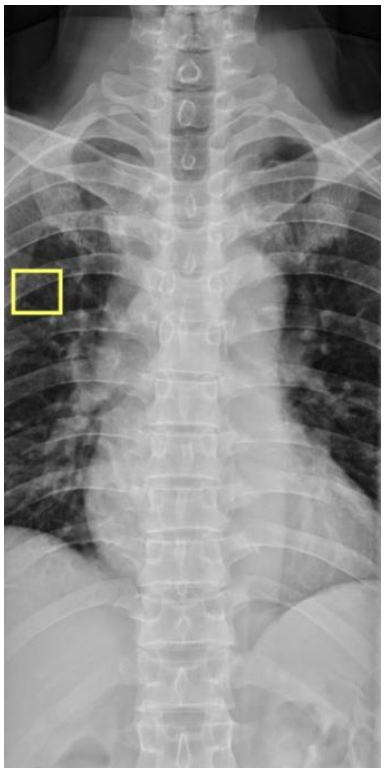
Advanced Edge Enhancement (option) An option to show by example the lines very good with a big edge enhancement.

External Image processing System (is not currently in use)

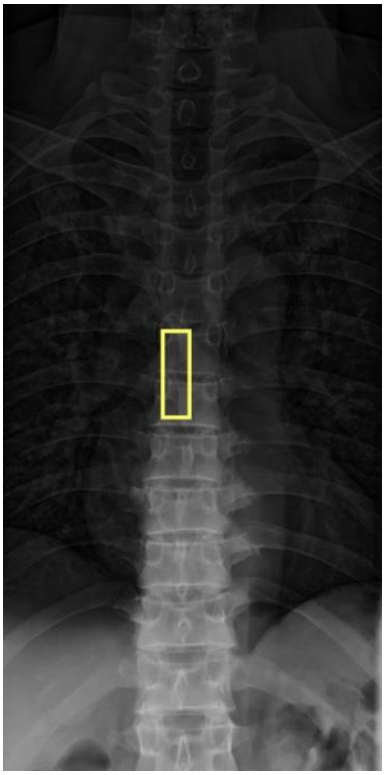
6.22 ROI

When the button ROI is pressed one can create a new box by clicking 2 opposite corners with the left mouse button. It is also possible to create a new box by drawing a box while keeping the left mouse button pressed.

The system will see the new ROI area as the Region of Interest and the picture will adjust the brightness accordingly.

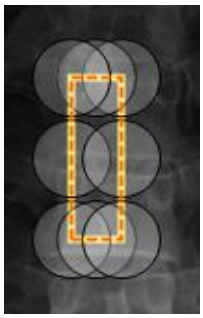


ROI in lung area



ROI in vertebra area

ROI- acknowledge



ROI - Select

When Select is pressed, the size of the ROI area can be changed by dragging one of the circles.

Be aware to acknowledge with OK.

6.23 Crop

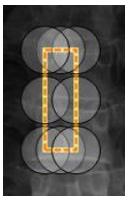
The system will put a crop box around the X-ray field. The content of this crop box is sent to the specific destinations. With this button the crop box size can be changed.

If the radiated area on the detector has been rotated, so not in line with the detector borders, the crop box will be a square surrounding the complete radiated area.

When  is pressed, one can create a new box by clicking 2 opposite corners with the left mouse button. It is also possible to create a new box by drawing a box while keeping the left mouse button pressed.

Automatic Crop box

Crop box modified



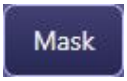
When  is pressed it is also possible by dragging one of the circles.

With the buttons  the Crop box can be shifted.

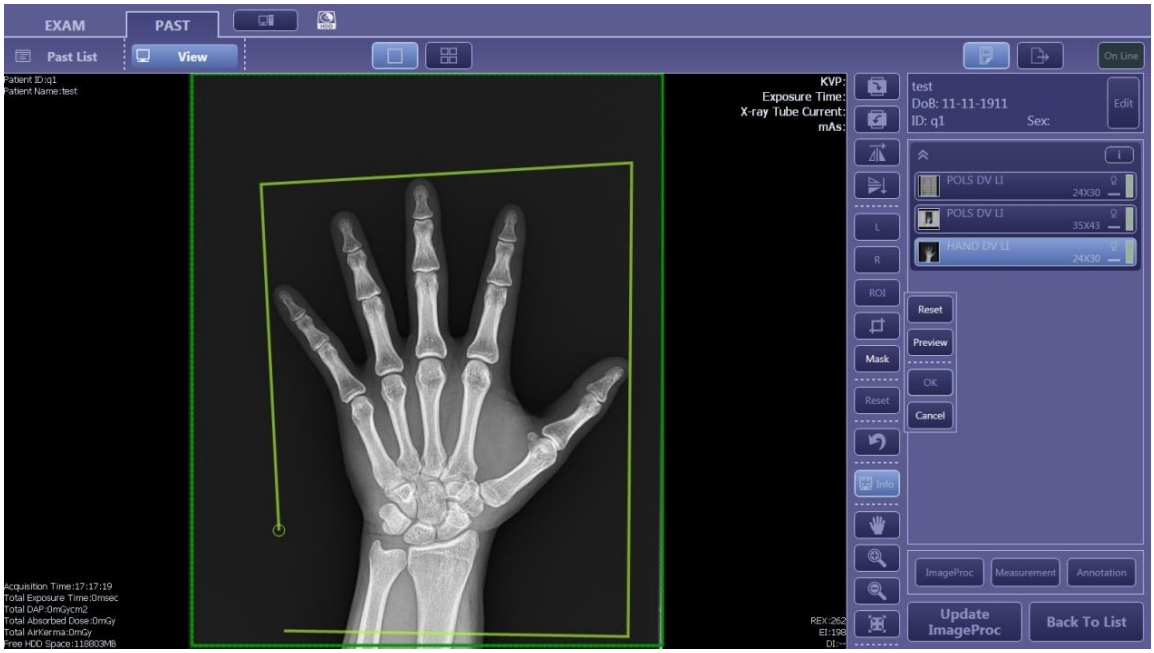
Irradiated Field = exposed area
Custom Area = specific area set in service tool
Effective Area = Entire detector area

Be aware to acknowledge with  .

6.24 Mask



Normally, the area outside the exposed area is given a black mask. With this button it is possible to customize the black mask area.



After the 

button is pressed, one can draw a self-defined field. By pressing the left mouse button to create an anchor point. There can be up to 12 anchor points.

The black mask on the system is shown semitransparent but on a PACS screen or on a hard copy it will be shown completely black.

Be aware to acknowledge with 

.

7 Cleaning and disinfect

7.1 Cleaning

• Clean the equipment with a damp cloth or a cotton swab. Use a non-abrasive cleaning material. To moisten use water or lukewarm water with a diluted solution of liquid detergent of the common household type.

• Do not use abrasive cleaners or organic solvents or cleaning agents containing solvents (e.g. alcohol, ether, etc.). Do not use hydrogen peroxide which enhances the corrosion of metals.

• Do not use spray liquids! Agents for cleaning fluids must not enter under any circumstances within the enclosures!

7.2 Disinfecting

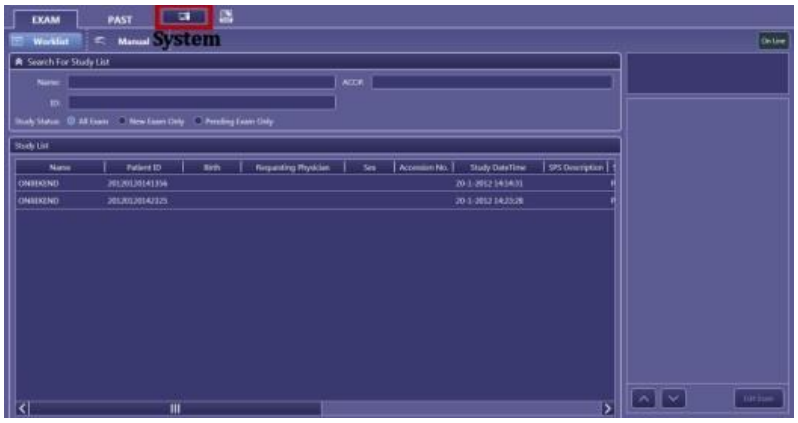
For surface disinfection, it is recommended to use aqueous solutions commercially available for the disinfection of surfaces based on aldehyde or amphoteric surfactants (e.g., Tego 103, Kohrsolin). Disinfectant substitutes based on phenolic and chlorine-containing compounds are partially aggressive and therefore normally to be avoided. The same limitations apply to agents which have an alcohol content when they are applied in undiluted form (e.g. for the disinfection of hands).

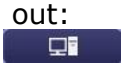
Strictly prohibited are spray disinfectants, because the spray could penetrate inside the device. As a result, the safety of the appliance can no longer be guaranteed (damage to electronic components, formation of flammable mixtures of air and solvent vapors).
Where the entire exam room is to be disinfected, remember to cover the unit with plastic sheeting.

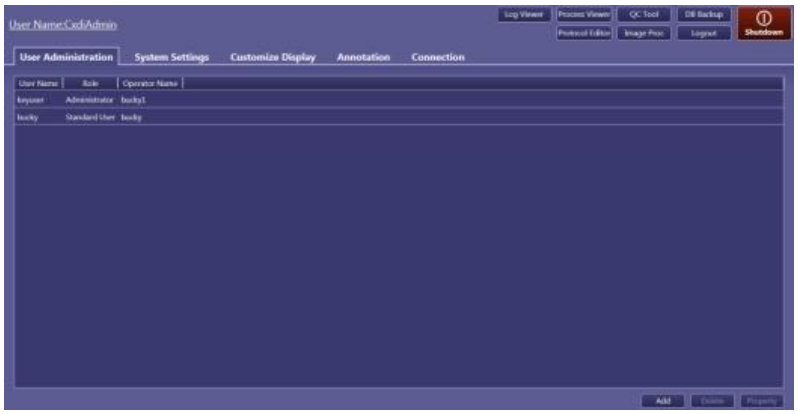
8 Key user: change system settings

Note:	**The system can be set up for key users which have special permission for changing system settings.** **When finished as key user, do not forget to log off as key user from the system.**

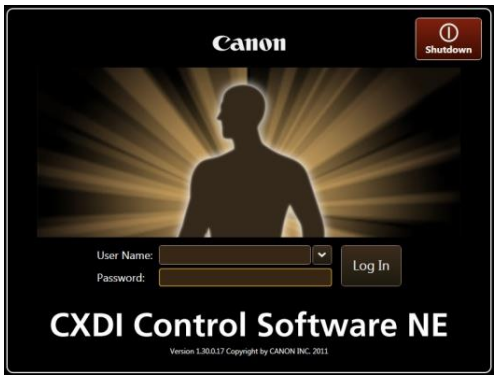
To change protocols the user has to be logged in with a key user account.
This can be done immediately after the system is booted.
If the system is already logged into the normal user account one can log out of this account and log in again with the key user account.



To log out:
Press 



Press 



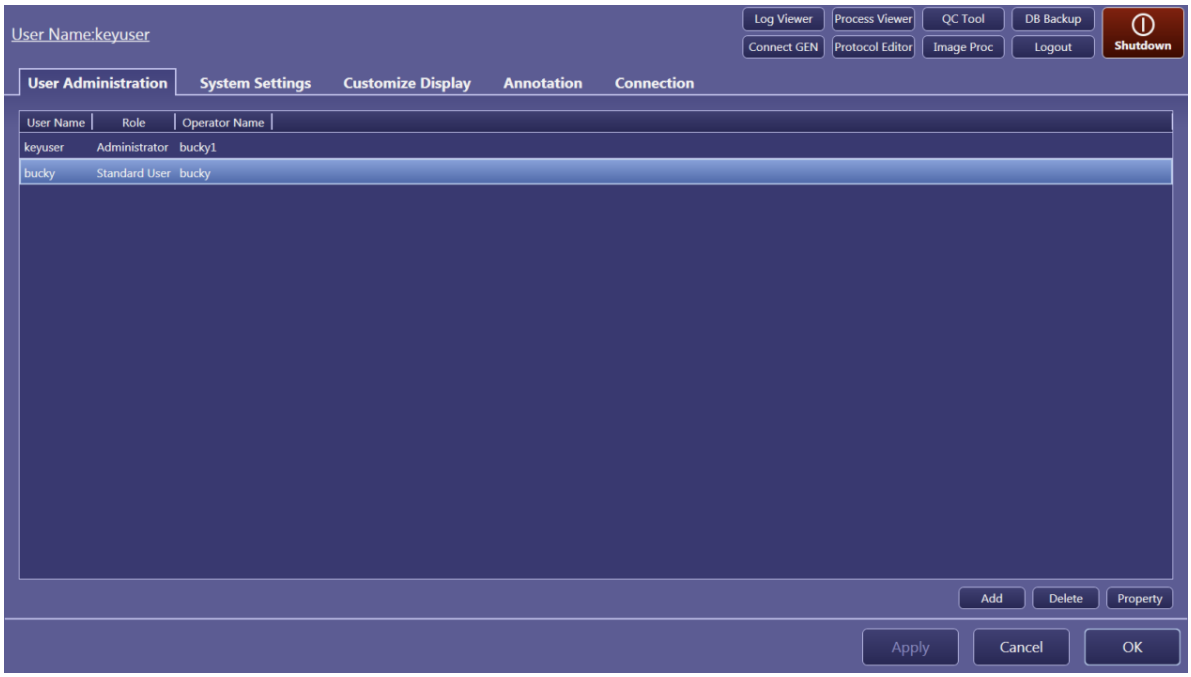
Login as key user with the appropriate password [1]

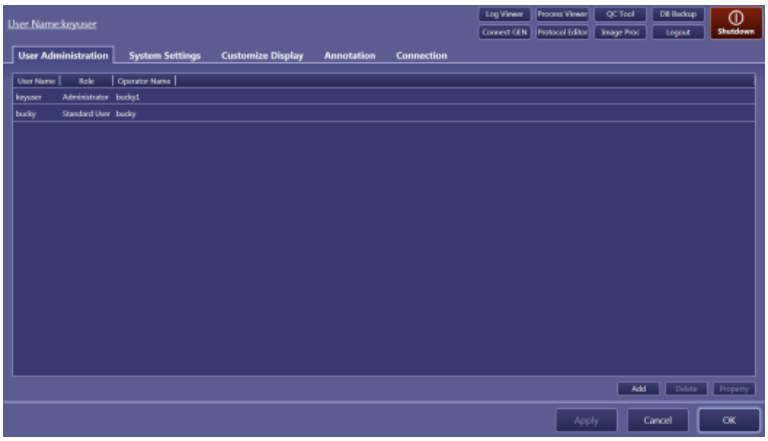
[1] Ask your dealer's application specialist the key users login details.

8.1 The System button

Note:	**The system button contains all entrances to the different system settings. Some of the system settings are available for all users; some of them are only accessible with elevated privileges by login with the appropriate user.**

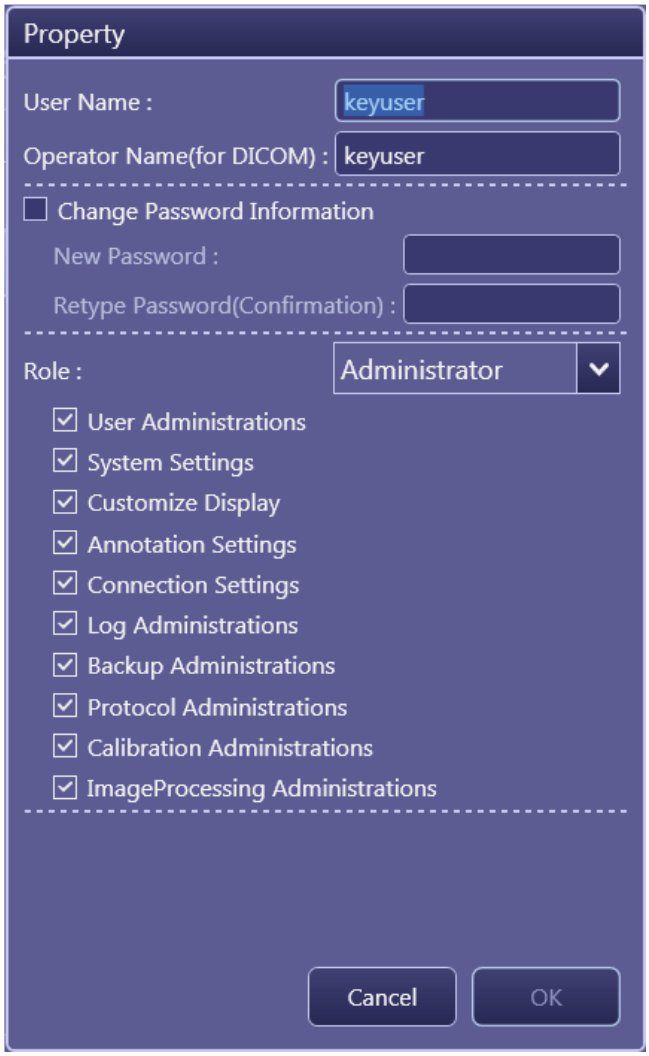
8.2 User Administration: Manage User Accounts





If logged in with key user privileges it is possible to see the currently created user accounts in the User Administration.

A new user account can be added via Add. A user account can be modified by clicking the button Property.



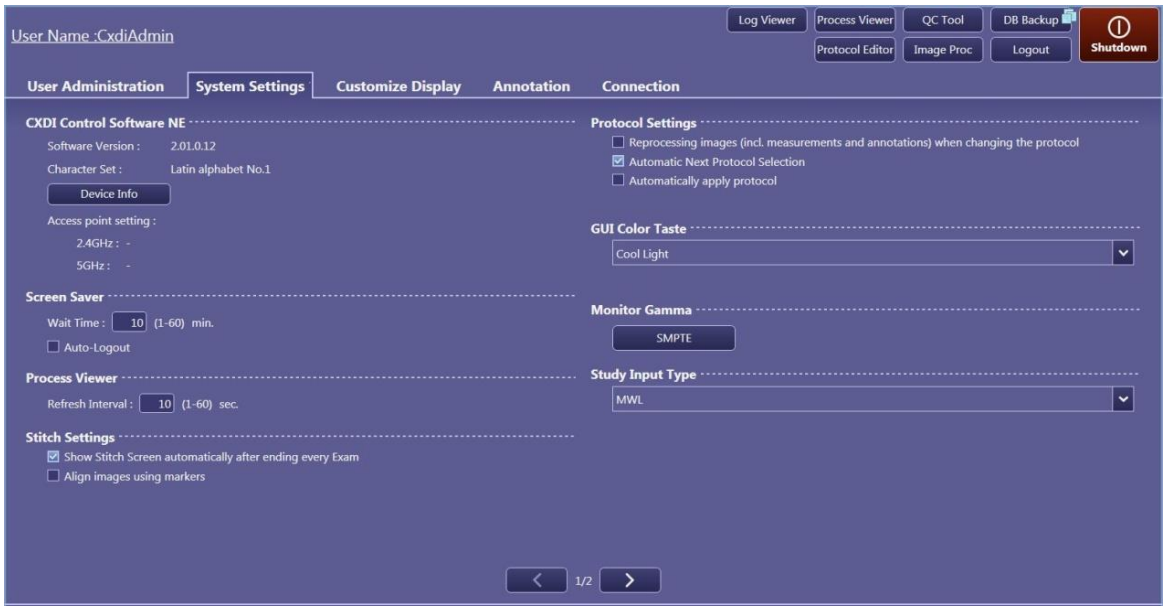
When Property has been selected the User Name and Operator Name for DICOM can be set.

To change the password check *Change Password Information*.

With Role one can choose a preset user role from a dropdown list.

The specific privileges for each user role can be set only by the application specialist or service engineer.

8.3 System Settings Screen 1/2



System Info

Information about software version

Screensaver

Wait Time: Turn screensaver on after x minutes
Auto-Logout: User has to log-on again when system goes out of screensaver.

Process Viewer

Refresh of the process viewer in seconds

Stitch Setting

Show Stitch...: Show stitch screen automatically when done with stitch acquisition.
Align images...: Automatically align the stitch images using the reference balls in the image.

Protocol Settings

Reprocessing Images: When changing the protocol all image processing will be performed again with the new image processing belonging to the new protocol.

Automatic Next protocol selection: The next acquisition protocol which has not been acquired yet will be selected.

Automatically Apply Protocol: The Auto protocol will be selected every time a patient has been registered.

GUI Color Taste

Change Color settings.

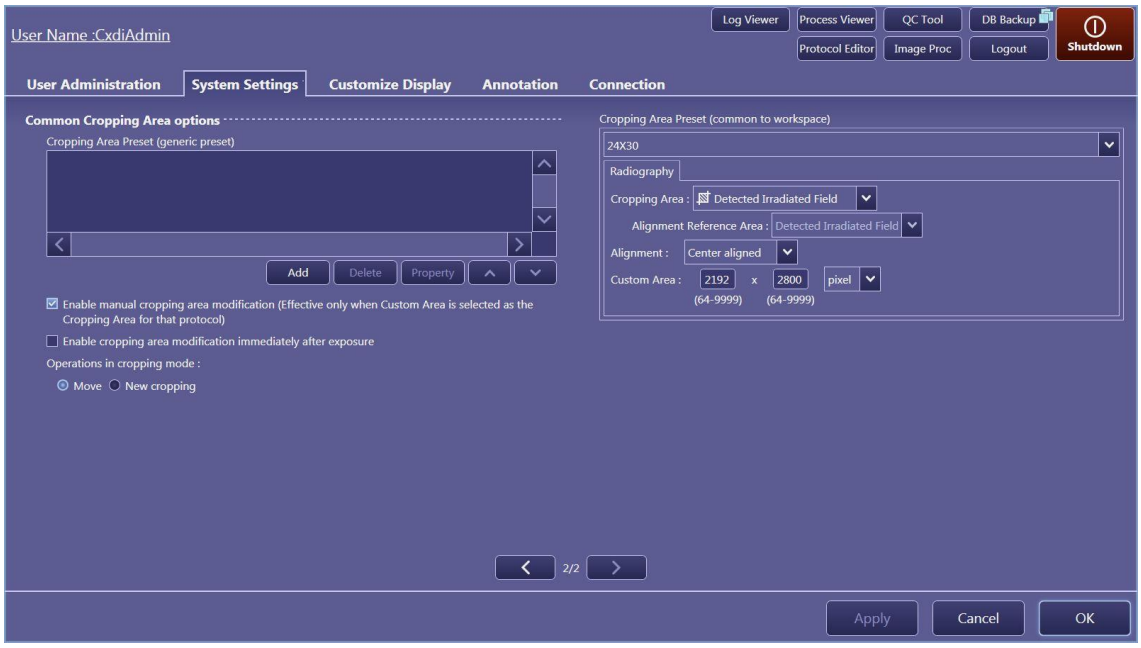
Monitor Gamma Test

For calibration of the monitor.

Study Input Type

MWL (Modality Work List) = Use the worklist.

8.4 System Settings Screen 2/2



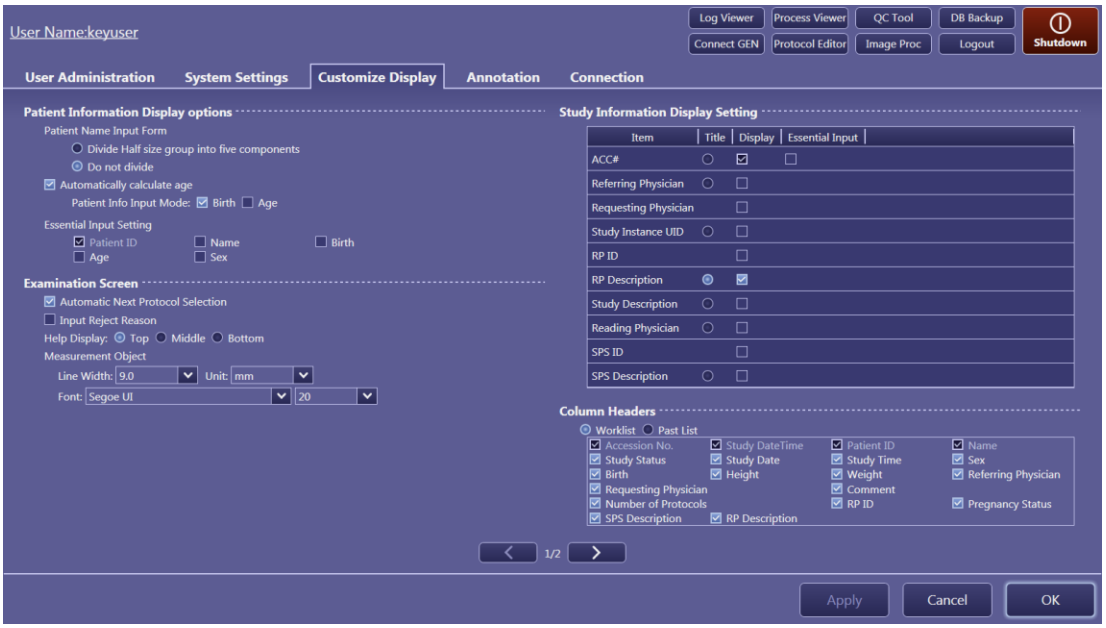
Common Cropping Area options

Cropping Area Preset: Define the desired crop box formats
Enable manual Cropping Area: When on, the crop box can be changed after acquisition. When off, the crop box cannot be changed after acquisition.

Enable cropping area modification immediately after exposure:
When enabled, after exposure it is possible to immediately crop the image without turning on the crop function.

Operations in cropping mode:
Move: After selecting the crop mode, the default action is moving to crop box.
New Cropping: After selecting the crop mode, the default action is changing the crop box in size.

8.5 Customize Display 1/2



Patient Information Display Options:

Default set to *Do not Divide*

Essential Input Setting:

Which patient information fields are mandatory.

Examination Screen:

Automatic Next....: The next acquisition protocol which has not been acquired yet will be selected.

Help Display:

Location where dialogue from the system will be displayed.

Measurement Object:

Settings for measurements.

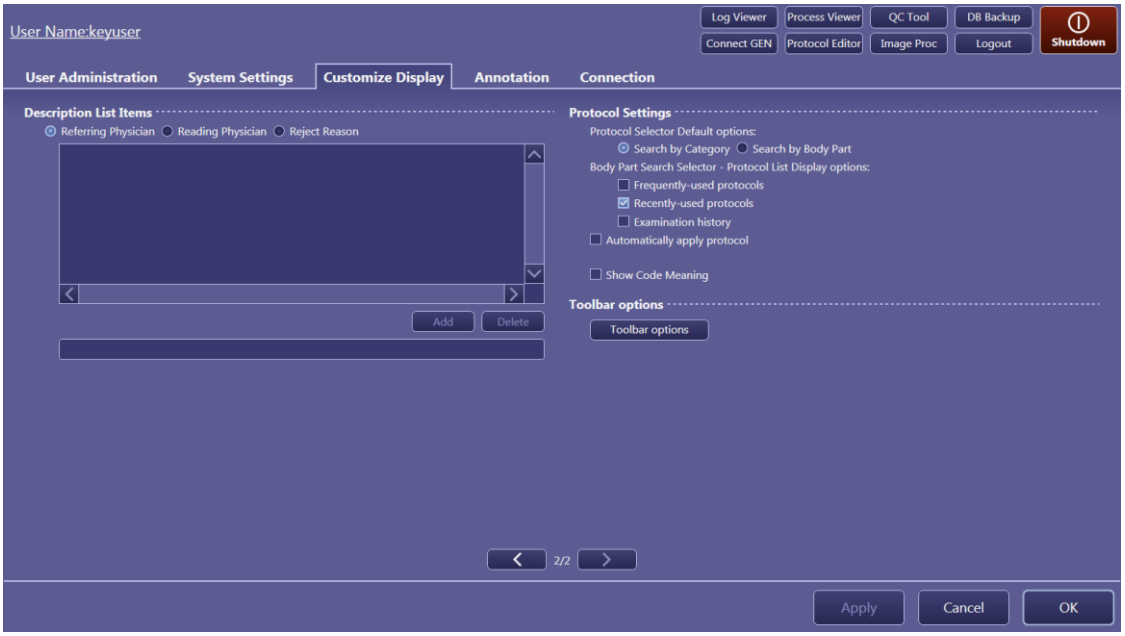
Study Information Display Setting:

Title: Information field which will be displayed as study header.
Display: Information fields which will be displayed when the  within a Study is pressed.
Essential Input: mandatory to fill these fields with information

Column Headers:

The checked information fields will be displayed in the selected list (Worklist or Past List).

8.6 Customize Display 2/2



Description List Items:

For each Item a preferred list can be made. Users can choose an item from the list if desired.

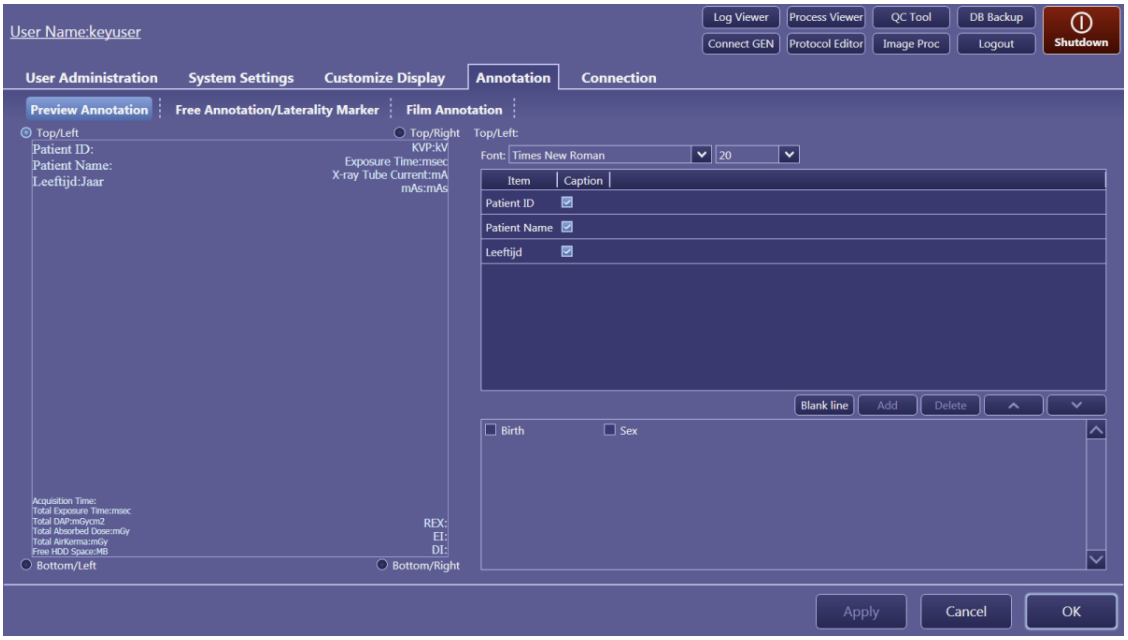
Protocol Settings:

Search by Category: search an acquisition protocol via tabs.
Search by Body Part: search via anatomical diagram.

Toolbar options:

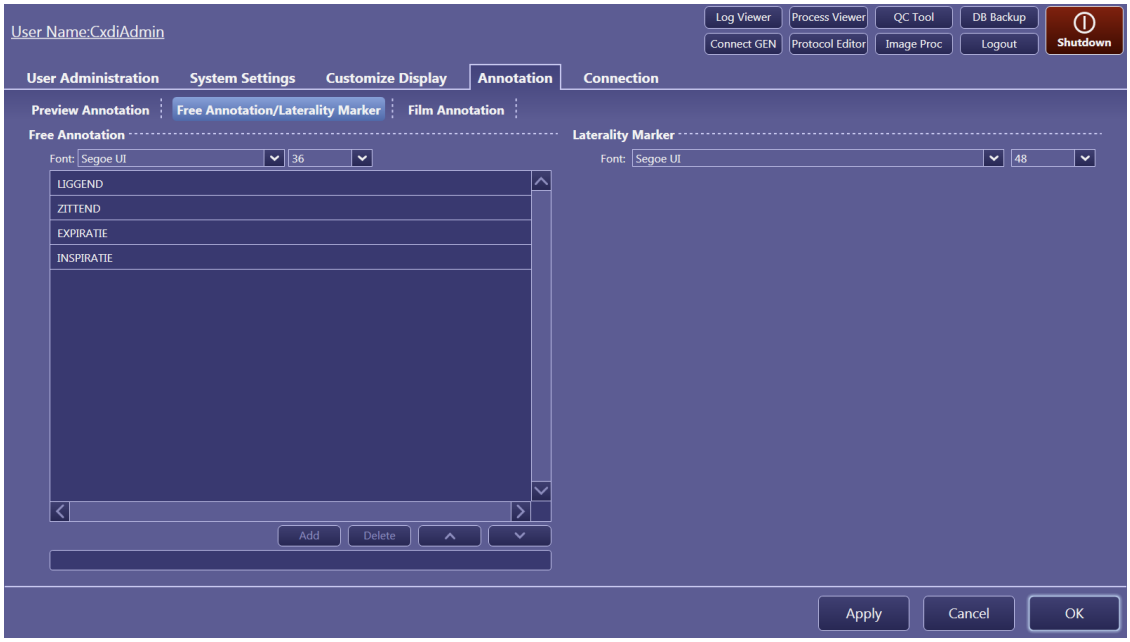
Divide and order the several toolbar tools between Toolbar #1 and Toolbar #2.

8.7 Annotation



Preview Annotation

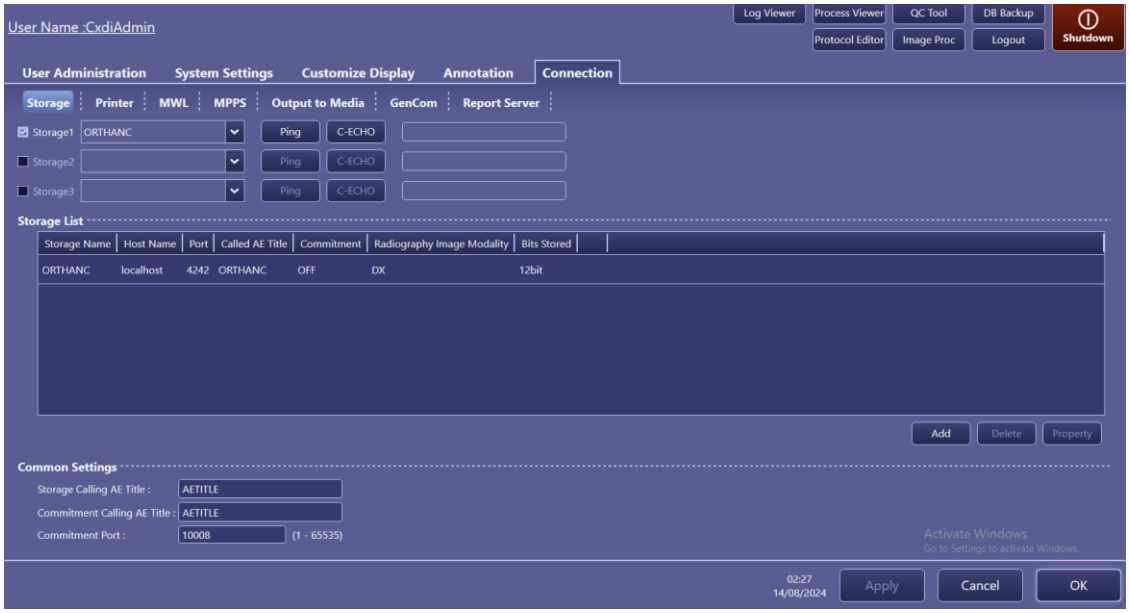
Select Top/Left - Top/Right - Bottom/Left or Bottom/Right to change the several overlay possibilities.



Free Annotation / Laterality Marker

Free Annotation: List with preprogrammed annotations
Laterality Marker: Font and size of the Left and Right marker. The position of the marker is set per protocol in the protocol editor.

8.8 Connection



Storage
Settings for sending to destination PACS.

Printer
Settings for sending to destination Printer.

MWL
Settings for retrieving a worklist from a Modality Worklist (MWL) server.

MPPS
Settings for the Modality Performed Procedure Step.

Output to Media
Settings to export images to a DICOM DIR folder on a CD or USB.

GenCom
Settings for the x-ray generator.

Report Server
Settings to export the Structured Dose Report.

8.9 Protocol management

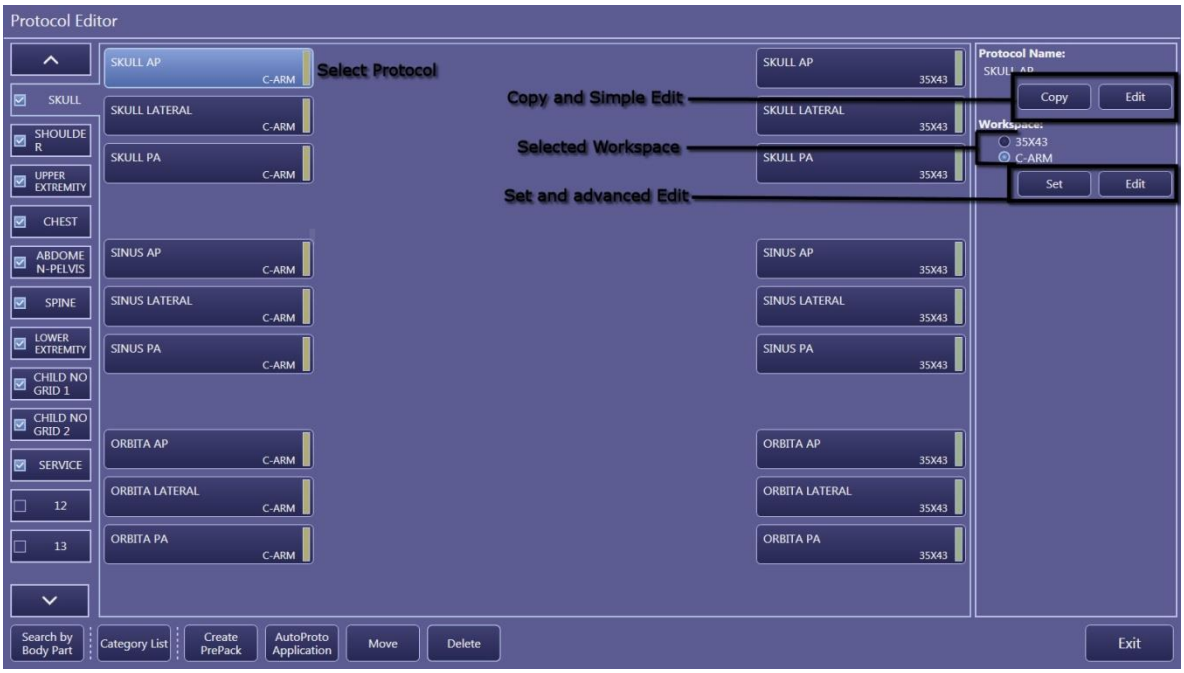
Note:	**The Protocol Editor and Image Proc buttons can be used only if no patients are active in the worklist and the past list.**

Protocol Editor

Pressing the System button  will show the Protocol Editor  .

With the Protocol Editor a protocol can be modified. The next Items can be modified:

- Name and position of a protocol.
- Name and position of the tabs.
- Prepacked protocols.
- DICOM information.
- Default Workspace, important if attached to a RIS (Radiology Information System) code.
- Preferred orientation of the image after acquisition.
- Crop settings.
- Film Options, if printed to a DICOM printer.
- Exposure settings, kV, mAs, AEC, Focus size.



After selecting Protocol Editor, the Easy-DR will display the several tabs and protocols. This is called the Button Layout.

The Button Layout can show protocols with their corresponding workspaces. In this case all C-ARM workspaces are displayed on the left side of the screen and the 35X43 workspace are displayed on the right side of the screen. It is also possible to show only the commonly most used workspace in the button layout. To modify a workspace from a protocol which has not been placed (Set) into the button layout one can select the workspace between the simple and advanced Edit. By selecting the workspace from here, one can modify the protocol for that workspace, or one can set a button in the button layout with Set.

Move a Protocol

Select the protocol and press Move. All empty slots will be highlighted. Click an empty slot to move the selected protocol towards the empty slot. It is also possible to move to another tab.

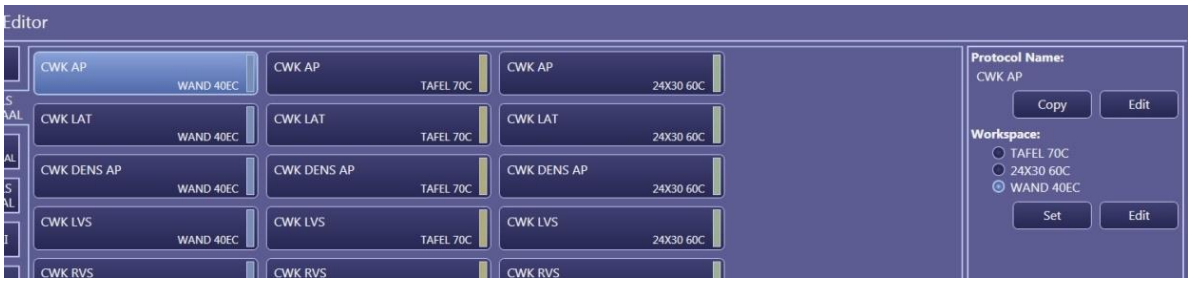
Delete a Protocol

Select the protocol and press Delete.

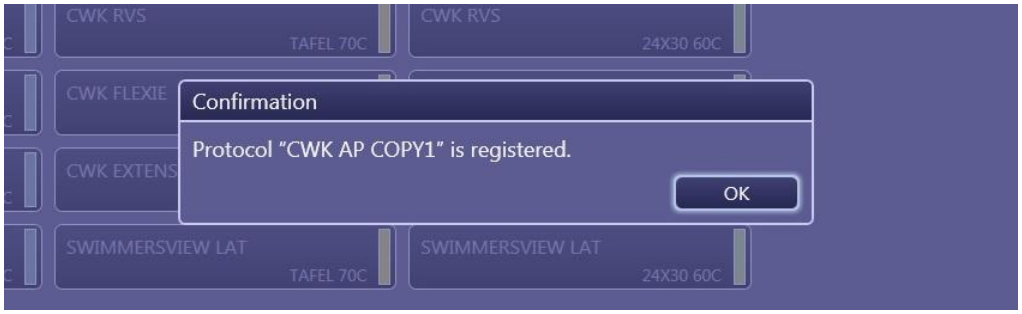
8.10 Add a new protocol

To add a new protocol, one must make a copy from a similar protocol. This duplicate can be modified into the desired protocol.
Image processing can be changed afterwards with Image Proc.

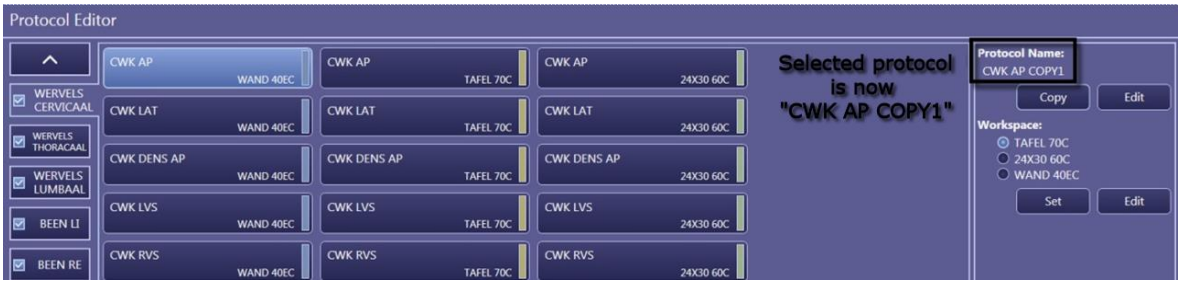
This manual will show how to make a new protocol named "CWK PA". This will be made from the original "CWK AP".



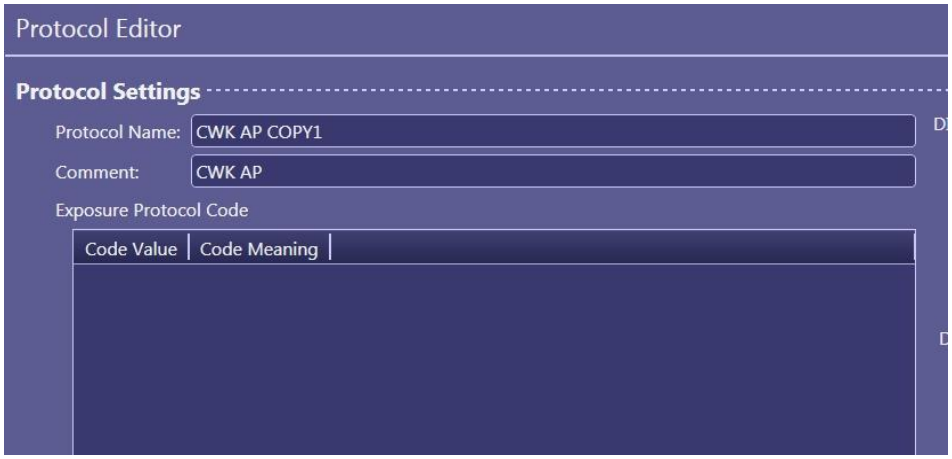
Select the original protocol and press "Copy"



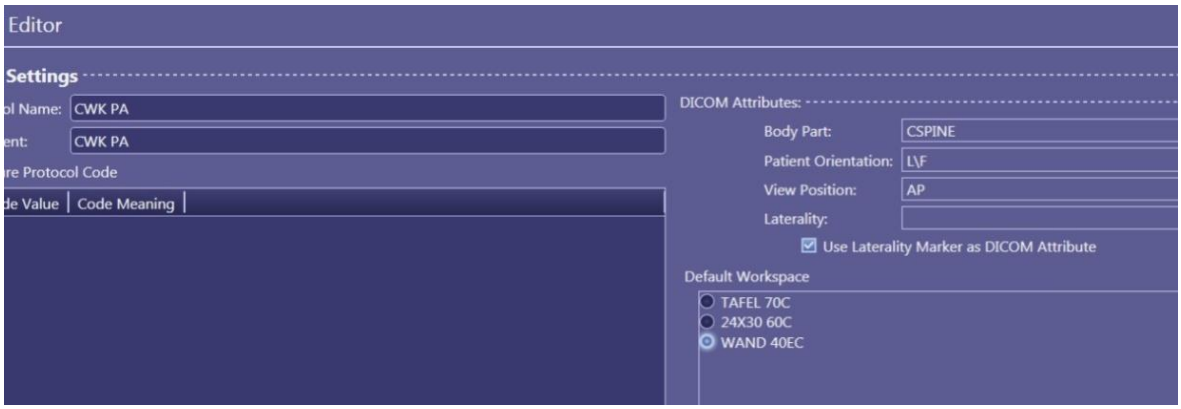
Confirmation that a copy from "CWK AP" has been made.
Be aware that this protocol still is not visible in the button layout.



Notice that the system now has selected the new copy.
We will first rename the protocol. Press Edit next to Copy.

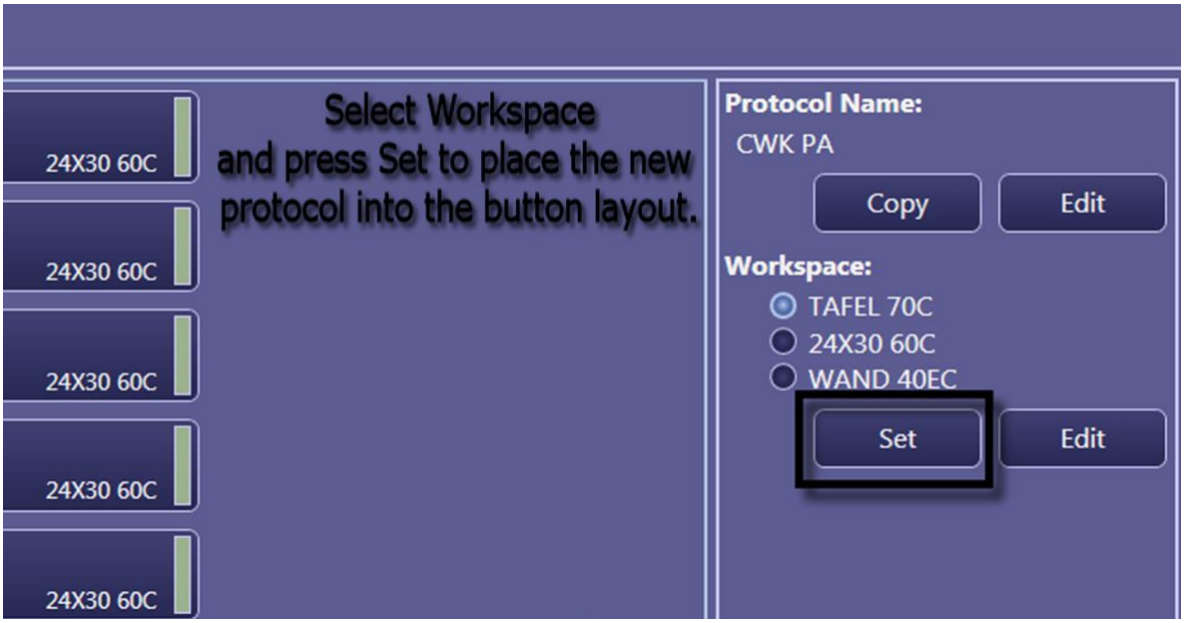


Give the new protocol a new name, in this case "CWK PA"

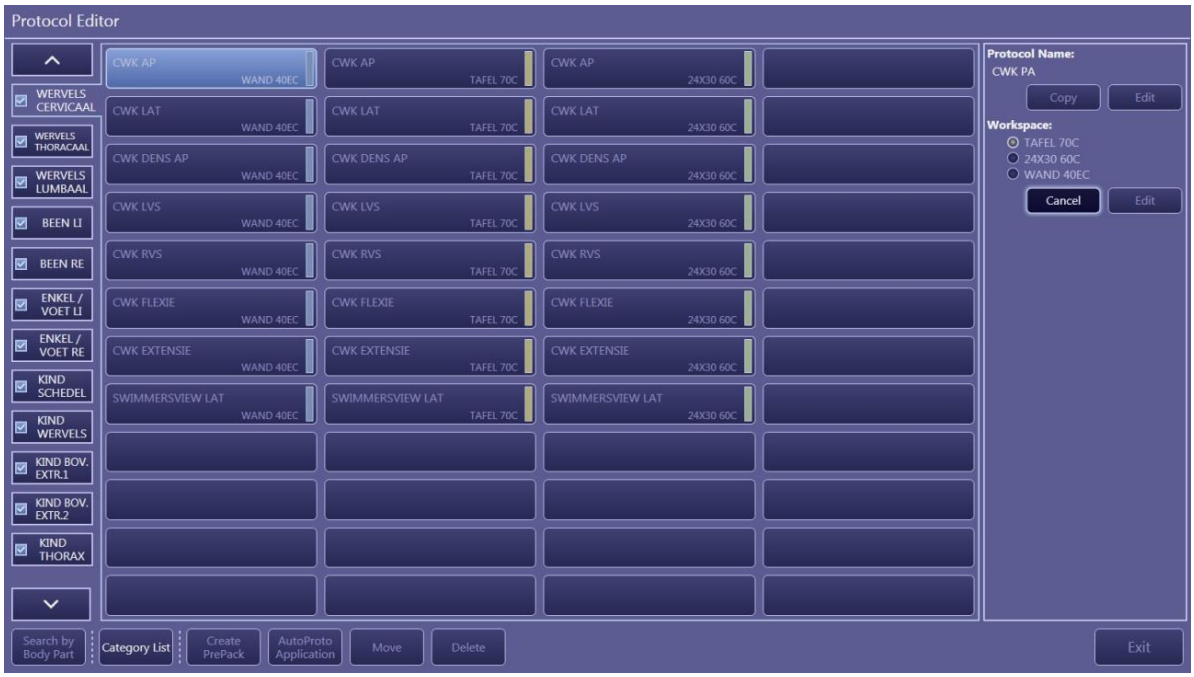


Also select the default workspace; this can be important if this protocol is directly linked to a RIS code.

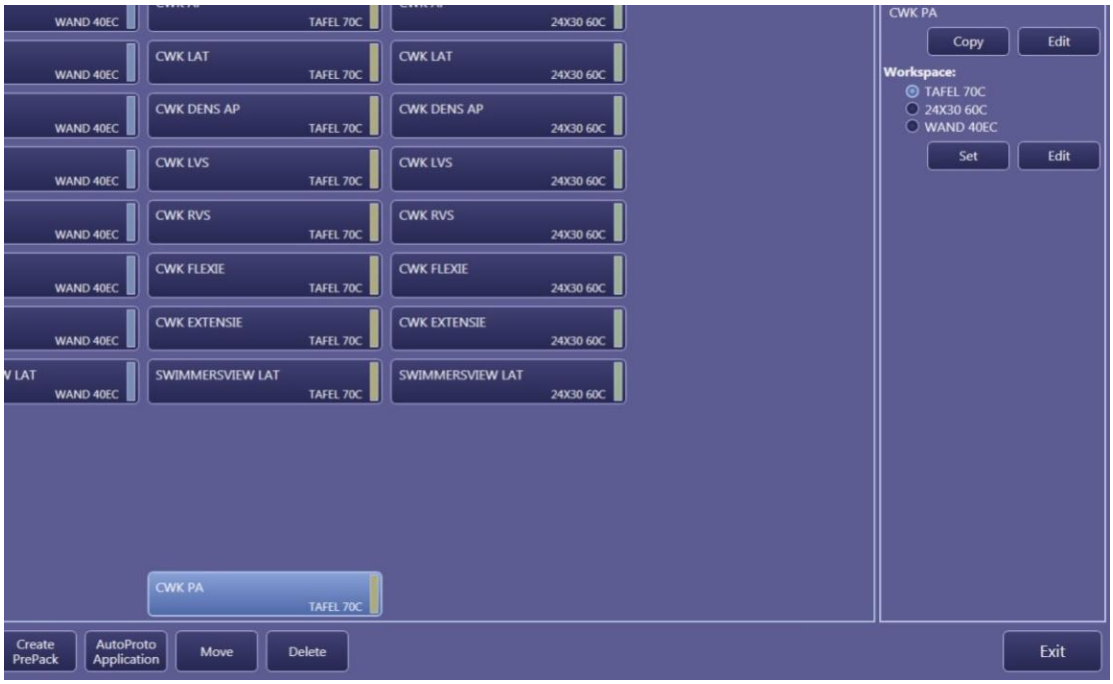
Press OK



Now for every workspace an acquisition protocol button can be placed onto the button layout. To do so select the workspace and press Set.

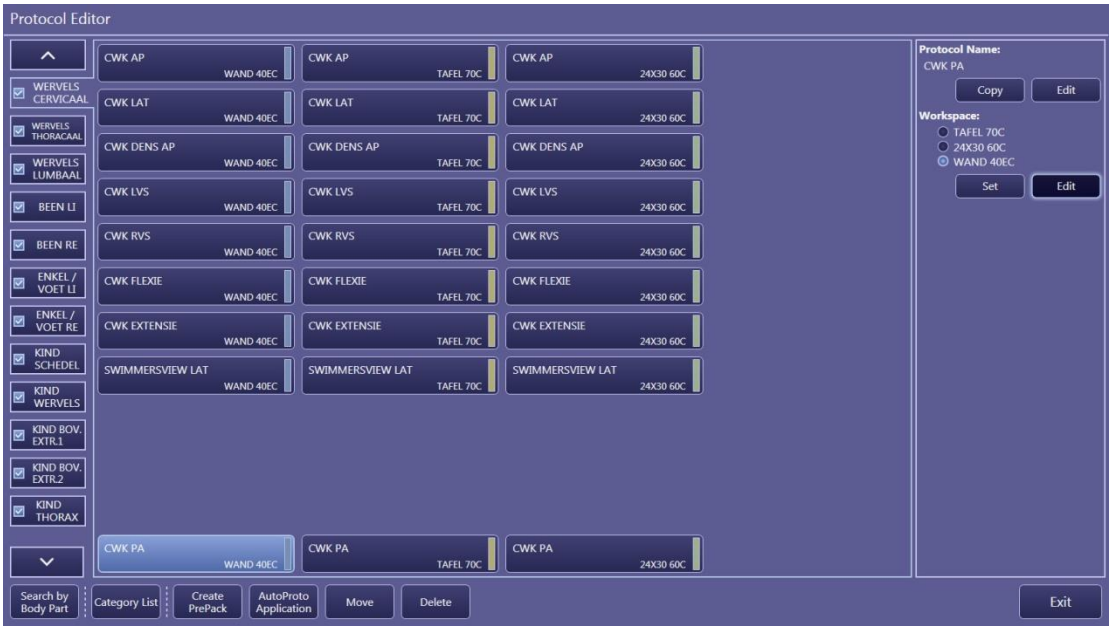


All empty slots are highlighted, and an empty one can be assigned.

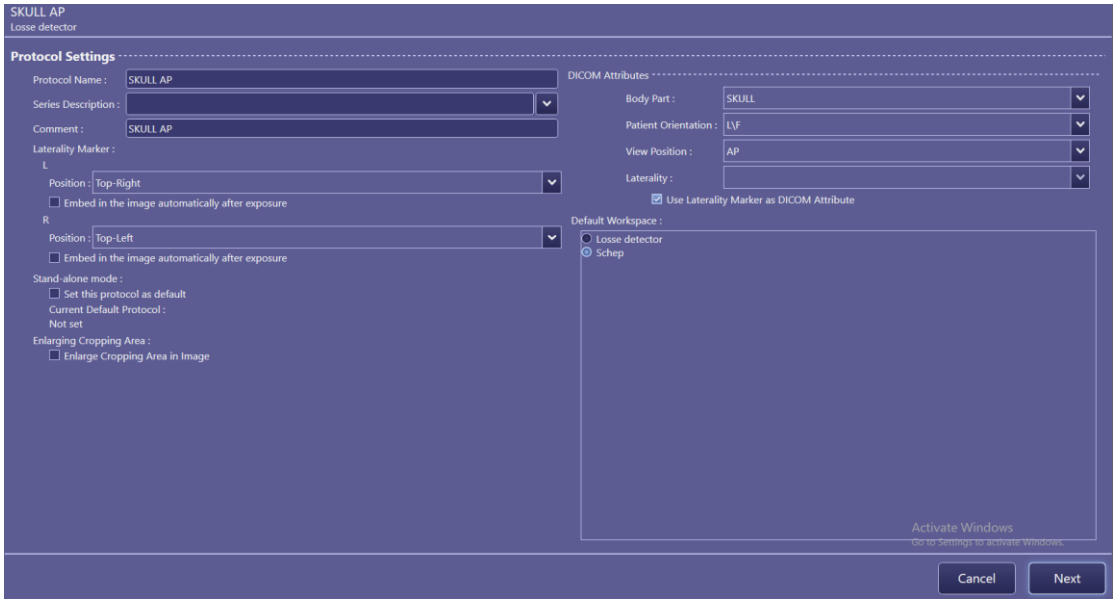


The first workspace for "CWK PA" has been assigned onto the button layout.

Repeat this for all other workspaces.

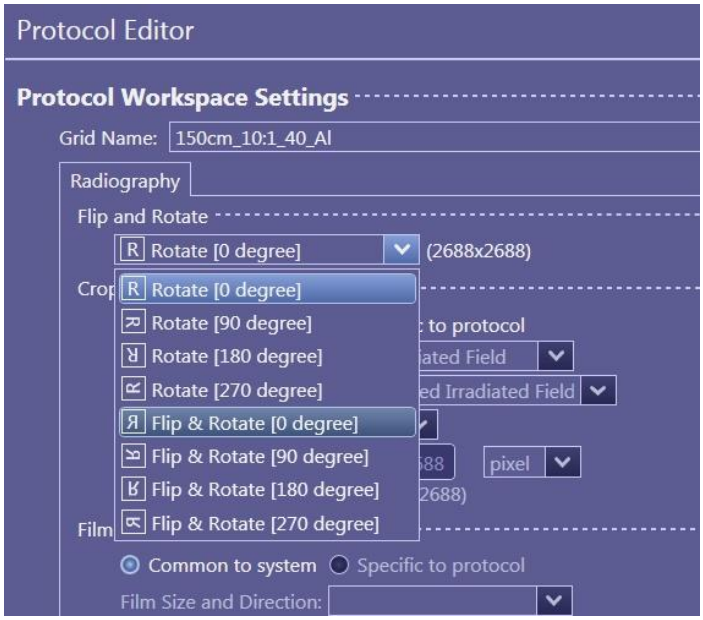


Select one of the new workspaces and press on Edit next to the Set button.

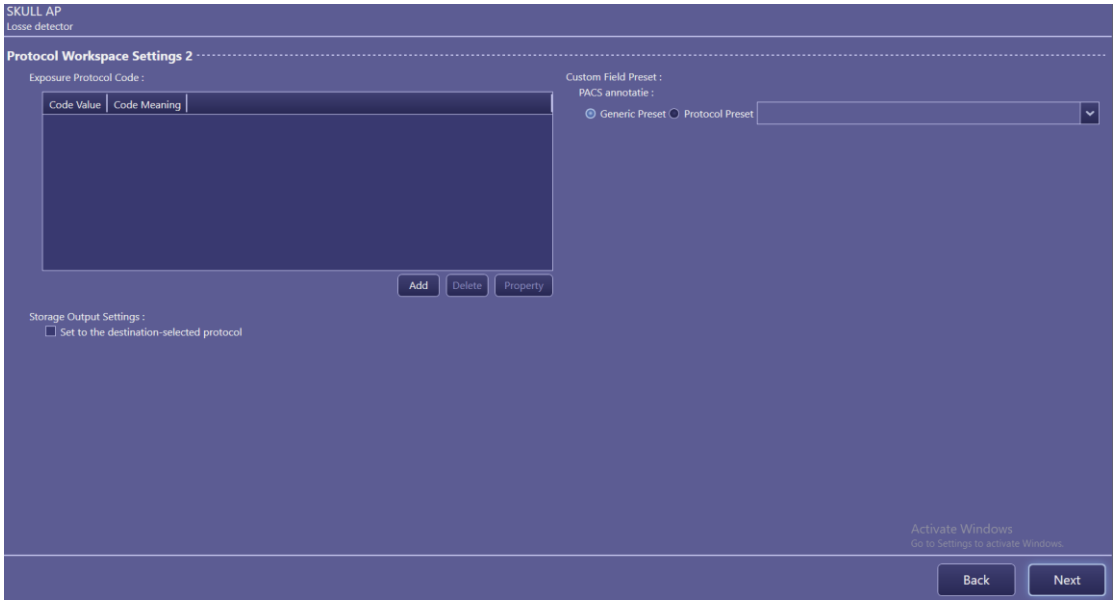


Change settings if desired. Press Next for next screen.

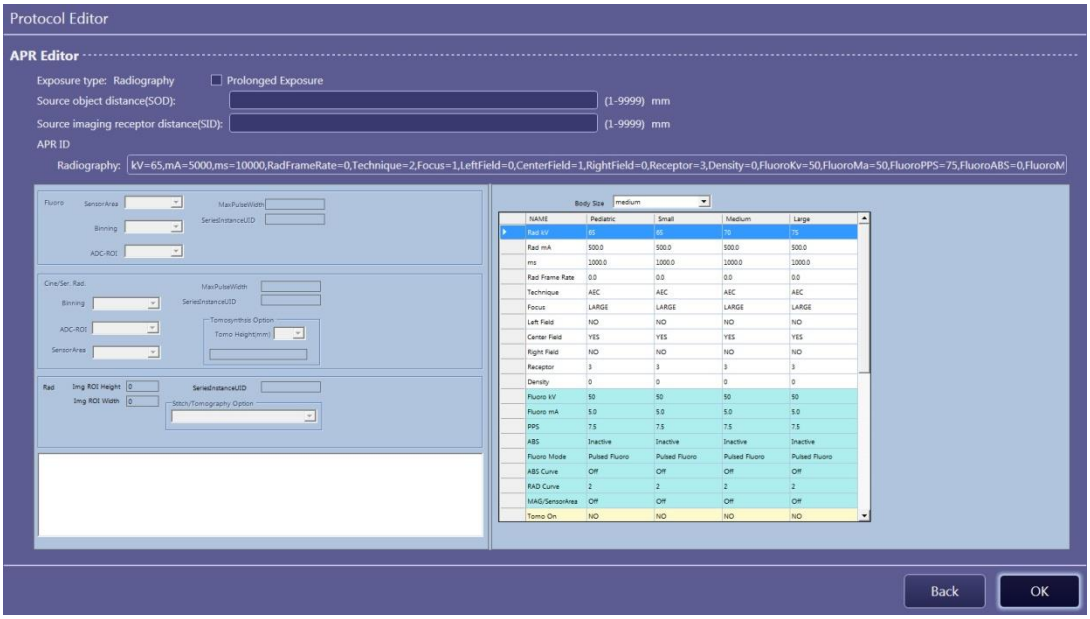
For a PA protocol it's necessary to modify the orientation at "Flip and Rotate" This has to be done for every single workspace for this protocol.



For a PA protocol the "Flip and Rotate" has to be set on  . The rotation is room specific. Check orientation and set correctly.
Press Next for next screen.



If you want to use 1 protocol with a RIS code, you can fill it in here. Normally we do not use this option, and we make Prepacs.



In the generator screen, exposure settings can be changed.
Be aware that changing kV has to be confirmed with Enter on the keyboard.

WARNING:	**In this screen, exposure settings can be set which can exceed the power limitations of the x-ray tube or generator. Always test in advance in normal acquisition mode if a combination of exposure settings with the desired focus size is possible.** **If AEC is set, the system will use the mA and ms as the backup limit, so set up these parameters accordingly.**

8.11 Settings x-ray generator

(Crossed items are not applicable.)

NAME	Pediatric	Small	Medium	Large
Rad kV	63	66	70	75
Rad mA	400.0	400.0	400.0	400.0
ms	400.0	400.0	400.0	400.0
Rad Frame Rate	[redacted]			
Technique	AEC	AEC	AEC	AEC
Focus	LARGE	LARGE	LARGE	LARGE
Left Field	NO	NO	NO	NO
Center Field	YES	YES	YES	YES
Right Field	NO	NO	NO	NO
Receptor	Receptor=3			
Density	0	0	0	0
Fluoro kV	[redacted]			
Fluoro mA	[redacted]			
PPS	[redacted]			
ABS	[redacted]			
Fluoro Mode	[redacted]			
ABS Curve	[redacted]			
RAD Curve	2	Always on 2		2
MAG/SensorArea	[redacted]			
Tomo On	[redacted]			
Tomo Angle	[redacted]			
Tomo Cutline	[redacted]			
AutoPosition On	[redacted]			
Auto Position	[redacted]			
Receptor Ori. On	[redacted]			
PortraitLandscape	[redacted]			
AEC Lock	[redacted]			
Filter On	[redacted]			
Filter	[redacted]			
Collimator On	[redacted]			
Collimator	[redacted]			
CollimatorWidth	Not Negative			
CollimatorHeight	Not Negative			
CollimatorIris	Not Negative			
CollimatorCenteri...	[redacted]			
Grid Info	No grid	Always "No Grid"		No grid
Grid Density	[redacted]			

8.12 Modify a Tab

Note:	**The system can contain up to 50 tabs. These tabs represent the different body categories. The name and order can be modified. It is also possible to switch on or off a tab by a key user. A switched off tab will not be visible for a user with standard privileges.**

Modify name and order of a tab

Select in the protocol editor the button Category List for displaying a list with all category tabs.

Select a tab name and press one of these buttons to Rename or re-order:

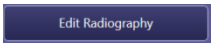
Hide or unhide tab for standard users

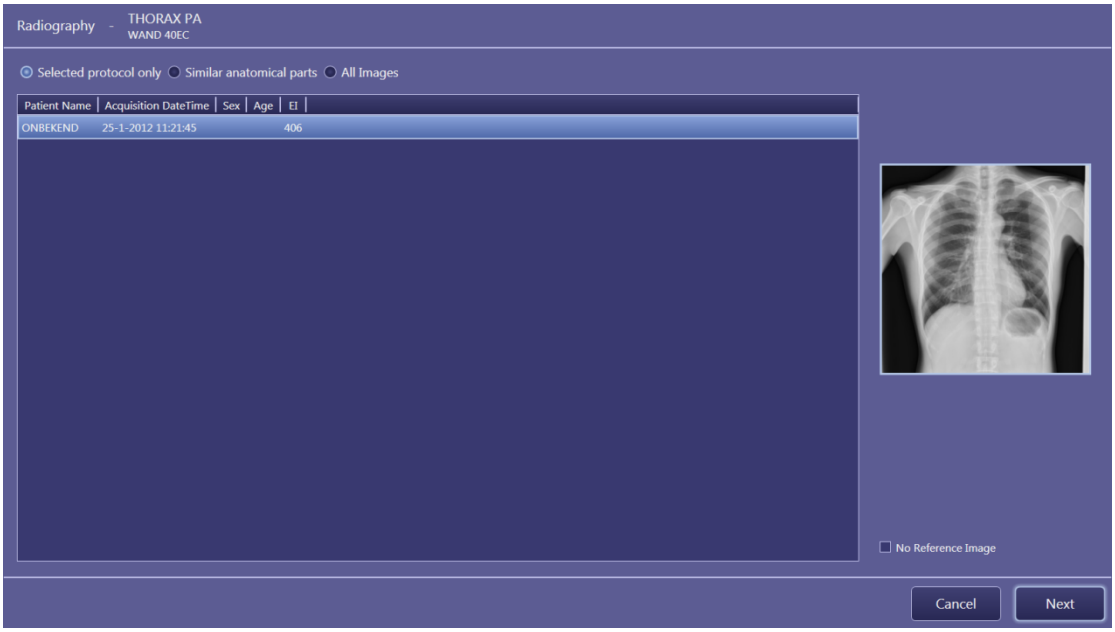
Tab checked: Visible for standard users.
Tab unchecked: Not visible for standard users.

8.13 Modify Image Processing: Image Proc.

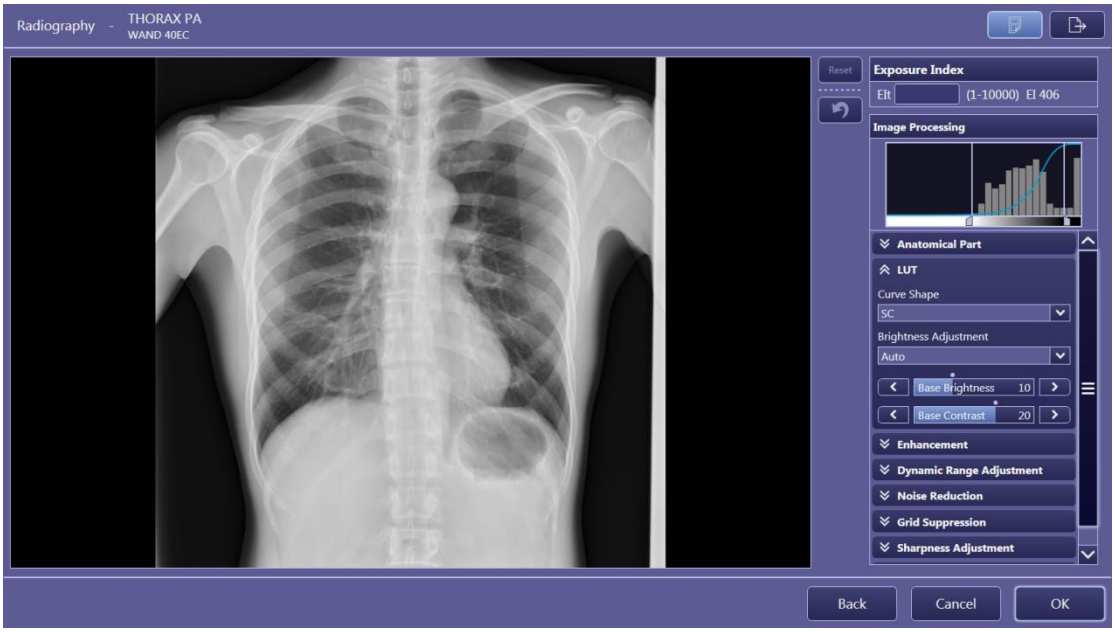
Note:	**Adjusting Image Processing can have a great impact on image quality. Let radiologist decide if the image processing is set to satisfying results. If protocols are modified remember to track which protocols have been changed and do so for all other workspace protocols belonging to the same protocols.**

Press  to change Image Processing.

Select the protocol/workspace and press 



All images acquired with the selected protocol will be shown in a list. Select one for reference. Or check "No Reference Image" if a reference image is not available or necessary.



In several Image processing categories, the image processing can be modified.

When modification has been set to a satisfactory level; press OK.
The modification is set directly; no confirmation dialogue will be displayed.

8.14 Image Processing: The parameters

User Levels

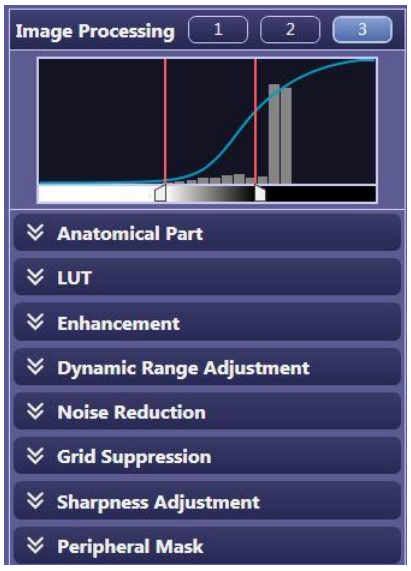
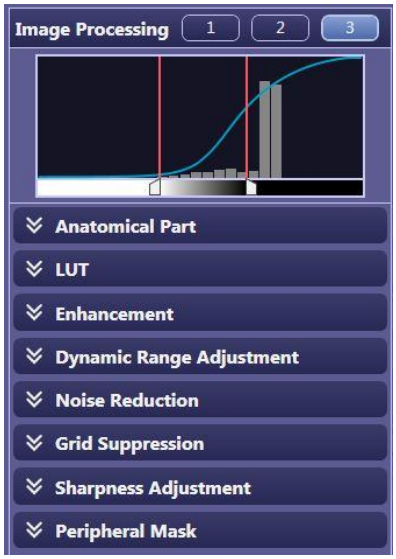
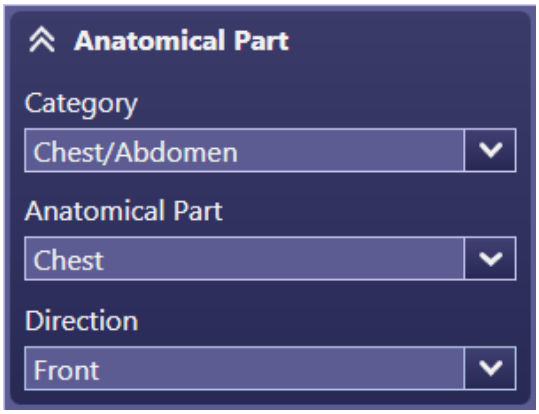


Image Processing is divided into several user levels. The example shown here shows the image processing on level 3, where the user has rights to adjust all parameters.

The normal user has privileges for level 1 only; this means that brightness and contest can be modified only.

Anatomical Part





The anatomical part describes the part / organ for the system.

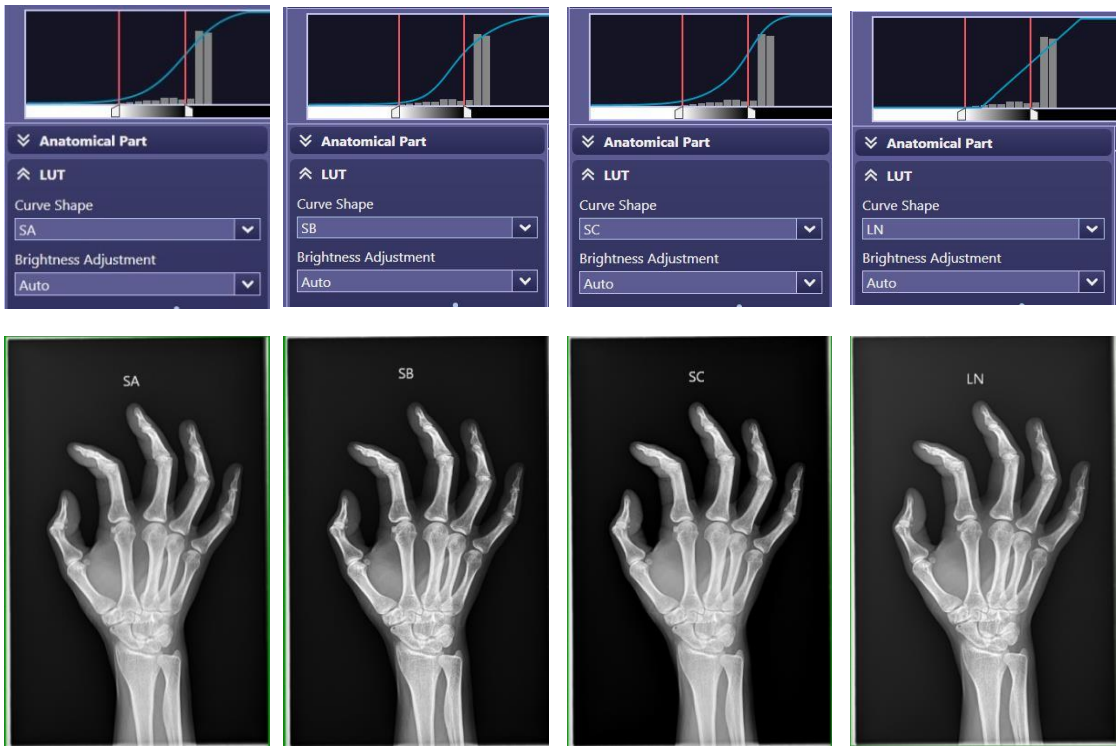
This means that the system will set its automatic Region of Interest according to the Anatomical Part. If set on Chest, it will display the image with optimized brightness for lung tissue. If set on Thoracic Spine, it will display the image with optimized brightness for spine. With adjusting the Base brightness, the image can be optimized more to the radiologist's taste.

LUT

The Base Brightness and Base Contrast are the "real" brightness and contrast. These values are not visible for normal users on level 1.

Normal users will see brightness and contrast which will be set on "0" always directly after image acquisition. Changing brightness and contrast is just an offset from the real base brightness and base contrast. Whenever an image in the past list has not 0 for brightness or contrast it is quickly visible that an image has been modified.

Curve Shape



The 4 different Look Up tables: SA, SB, SC and LN.

Each LUT has its own characteristics for brightness and contrast.

Enhancement

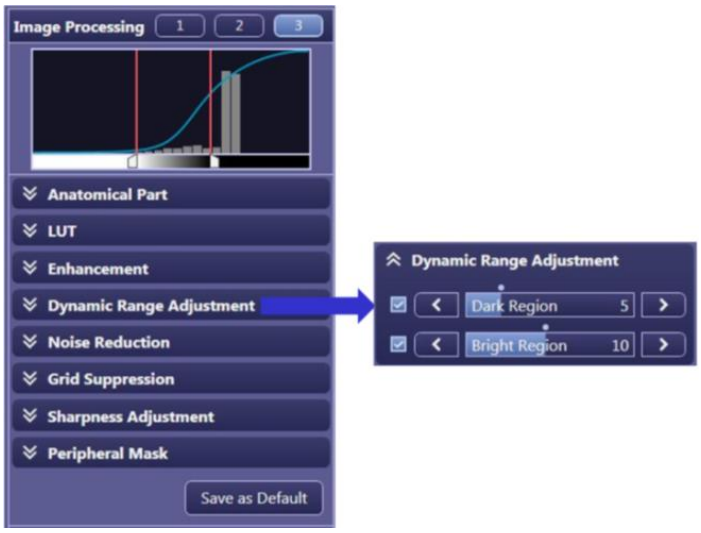
Edge Enhancement: 1=minor, 20=major

Edge Frequency: 1=large structures, 7=small structures

Contrast Boost: 1=minor, 20=major

Dynamic Range Compression deteriorates the local contrast.
Contrast Boost will compensate for the deterioration.

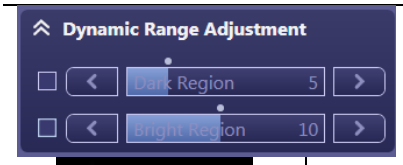
Dynamic Range Adjustment

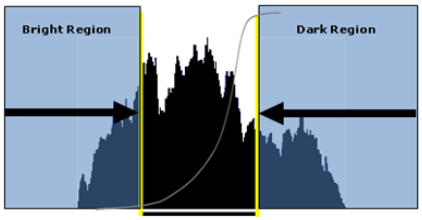


Dynamic Range Adjustment consists of 2 parameters: Dark Region and Bright Region.

An image will be optimized first by the anatomical part, which will place the LUT within the histogram on the Region of Interest (ROI). After this a minor shift takes place for setting the correct base brightness.

All information to the right side of the LUT is Dark Region. All information to the left side of the LUT is Bright Region. With these 2 parameters the dark and bright regions can be modified.





Adjust image in bright and dark area by data compression left and right from LUT.

Image without Dynamic Range Adjustment

Image with Dynamic Range Adjustment

Noise Reduction

Noise Reduction: 1 minor effect.
10 major effects.

Use it wisely; noise reduction also blurs the image.
This can be used for Low Dose, like age prognosis or hip dysplasia.

Sharpness Adjustment

With Sharpness Adjustment small structures can be seen more clearly. This is more obvious on a PACS monitor than on the acquisitions screen.

Peripheral Mask

With Peripheral Mask the area outside the exposed surface is made black.

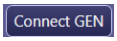
9 Troubleshooting

Image acquisition fails
Possible Solution:
Is the notification "Ready" on the screen? Image acquisition is possible only when the status is on "Ready".

Worklist cannot be retrieved
Possible Solution:
Is the acquisition computer Online (upper right corner)
Are there troubles with the network?

Image cannot be send
Possible Solution:
Is the acquisition computer Online (upper right corner)
Are there troubles with the network?

Some columns are missing from the worklist
Possible Solution:
The columns are perhaps resized too small. Check width of the columns.

The exposure values are not set correctly for the selected protocol.
Possible Solution:
Is the system on "Ready"? The exposure settings are being set after the check if the detector is available.
Check the generator status with  . If the button 

is visible. If so, press this button to recover generator communication.

Incomplete protocols exist appears
This means that not all added protocols are used for exposure, check if are necessary exposures are being made.

Error while retrieving worklist or sending images
Possible Solution:
Probably there is a malfunction on the hospital network. Check all possible network settings, restart the acquisition computer. If problem remains call hospital IT department.

PACS is temporarily not available.

Possible Solution:

Press  and select the secondary PACS if available or uncheck the PACS and save settings. Check back on when PACS is available again and resend from PAST list all un-send images.

DAP accumulated value has been exceeded

Possible Solution:

Press in the X-ray generator panel on 

and select DAP reset. If error remains, temporarily end this patient and select a new one to reset the DAP.

Error Image analysis processing failed

Cause

The image processing tries to identify the ROI in the image, and it fails to do so.

Possible Solution:

Check image brightness and adjust if necessary, by setting the ROI.

10 Technical specifications

Stand	Vertical travel	675 mm
	Kind of movement	Electrical
	Kind of balancing	By gas springs
	Braking	By motor unit
	Travel speed	50 mm/s
	Up and down end stop	Adjustable by micros witches
	Down safety	Knee switch at detector side
	Continues operation	Max 20 complete up/down movements per hour
C arm	Angle of rotation around the telescope vertical axis	0° - 90°
	Condition	Rotation, depending on stand height (Adjustable)
	Braking of rotation movements	Electrical with permanent magnet
	Focus/film distance	145 cm
	Travel speed	17,5 °/s
	Rotation safety	Knee switch at detector side
	Continues operation	Max 3 complete rotations per hour (0° - 90°)
Control box	Hand control	With up/down and rotation membrane switches
Powering	Voltage, frequency	230 VAC +/-10%, 50/60Hz single phase
	Max. absorbed power	1600 VA
X-ray	Max. tube voltage	150 kV
	Max. tube current	630mA
Colors	Painted parts	RAL 9002
	Adhesive membrane	Pantone 658
Weight	Stand including, tube, collimator and detector	375 kg
Equipment identification (according to EN 60601)	Classification	Class I
	Typology of installation	Permanently connected
	Operation mode	Continuous with intermittent load
Note: Easy DR 183cm / Non-Rotation		
C arm		
	Focus/film distance	183cm
	Angle of rotation around the telescope vertical axis	Non-Rotation

Standard compliance	Safety	EN 60601
Transport and stock environment	Temperature range	-10 °C ~ 50 °C
	Relative humidity range	10 % ~ 95 %, non-condensing
	Atmospheric pressure range	700 ~ 1060hPa
Operative environment	Temperature range	10 °C ~ 35 °C
	Relative humidity range	30 % ~ 80 %, non-condensing
	Atmospheric pressure range	700 ~ 1060hPa

*Note: The Easy DR may only be used in combination with generator:	1. Manufacturer CPI, type: CMP200D 2. Manufacturer Sedecal, type: SHF515C

Powering CPI generator	Voltage, frequency	3x 400 VAC + zero + ground, 50/60Hz
	Protection	63 A slow
See for more information: Site planning manual / ODB-104-5075ENG		

Installation:	Installation instructions are provided in the Maintenance Manual: OBD-104-5080ENG