

uMammo

Instruction for Use

Digital Mammographic X-ray Imaging System

uMammo 890i

uExceed R001

51001165-03-202306-ENG

UNITED IMAGING

CE
0123

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Foreword

This manual provides instructions on the functions, operation methods, software features, clinical applications, and daily maintenance methods of the system.

Audience

- Users of the UIH system.
- UIH training and customer service engineers.
- UIH marketing personnel.
- Authorized distributors of UIH.

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01	2019-12, release version 1
02	2020-12, release version 2
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1.1 About this manual

This manual provides information on safety, system components, system operations, software applications, and system maintenance and repair.

To be able to operate this system safely and effectively, users must have the required expertise and be familiar with the contents of this manual.

Before operating this system, you need to carefully read through this manual and pay particular attention to all the information in the chapter “Safety”.

Personnel mentioned in this manual include:

- Responsible party: The entity that is accountable for the use and maintenance of the equipment.
- User: Personnel authorized to operate the system.
- Patient: Person who receives the exam. Both male and female patients are called "the patient".
- Customer service engineers: Installation, maintenance, and repairing personnel authorized by UIH.

1.2 About this system

The Digital Mammographic X-ray Imaging System can provide various solutions for digital mammographic X-ray imaging.

The system consists of the X-ray generator, X-ray imaging system, accessories, and optional components.

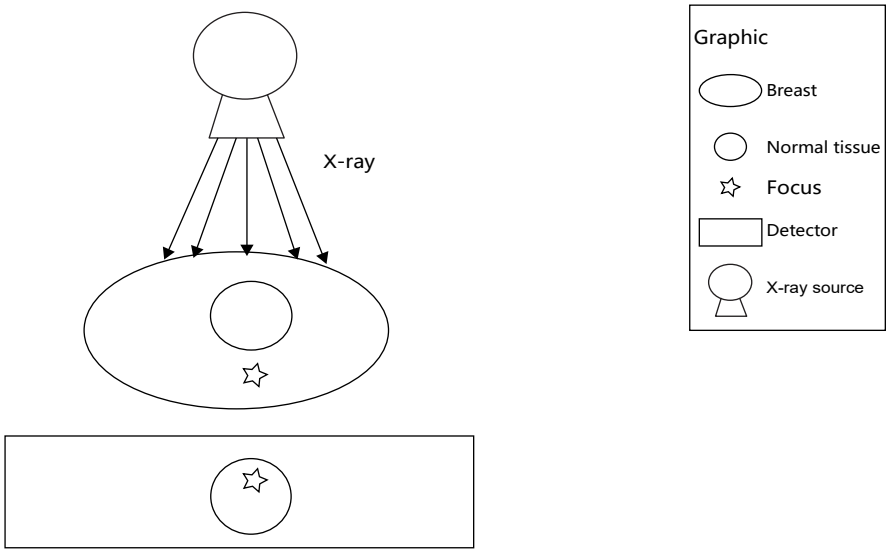
- X-ray generator
  - High-voltage generating device
  - X-ray tube assembly
- X-ray imaging system
  - Detector
  - Moving grid mechanism of digital mammographic system
  - Acquisition workstation
- Device for adjusting X-ray radiation field: Collimator
- Accessories and optional components
  - C-arm
  - Compression unit
  - Control box
  - Operating table (optional)
  - Magnification table (optional)
  - Exposure foot switch
  - Exposure hand switch

1.2.1 Principle of image acquisition

1.2.1.1 Principle of 2D image acquisition (Mammo)

The system compresses the breast vertically and acquires a mammographic projection image.

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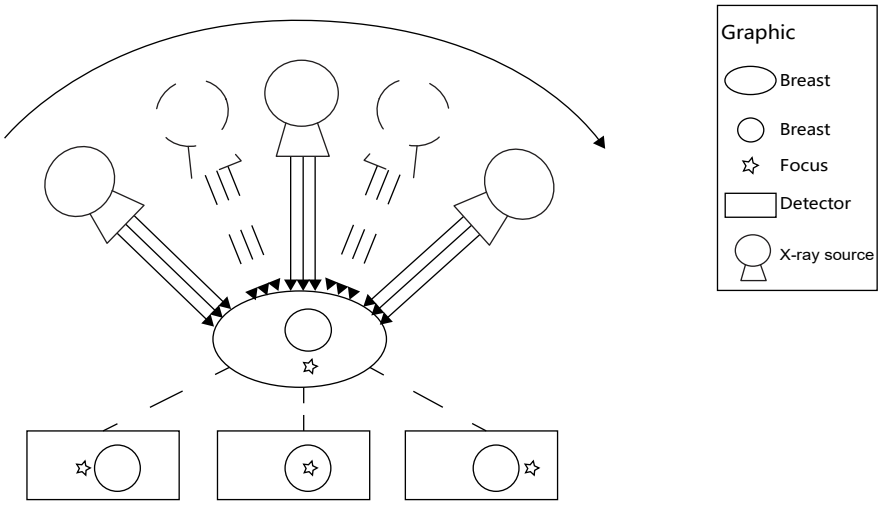


1.2.1.2 Principle of tomosynthesis (Tomo)

The system carries out low-dose X-ray exposure on the breast from multiple angles, obtains mammographic slice images, and generates a 2D image through reconstruction and synthesis.

Tissue overlap and structural noise in 2D mammography are reduced to the maximum extent through reconstruction, which improves diagnostic accuracy.

In the process of image acquisition, the FPD and the breast are kept stationary. The X-ray tube assembly is rotated within a certain range. After each rotation, a low-dose exposure is performed at the corresponding angle and a projection image is acquired. After the acquisition of projection images, they are reconstructed into a series of high-resolution slice images parallel to the detector. The reconstructed slice images can be synthesized into a 2D image.



1.2.1.3 Scanning modes of breast tomosynthesis

There are two scanning modes for breast tomosynthesis: Fast Scan and HD Scan. You can select the scanning mode based on specific clinical needs.

- In Fast Scan mode, 15 frames of projection images are acquired over a small angular range (-7.5° to +7.5°). It produces low radiation dose and takes short acquisition time.
- In HD Scan mode, 21 frames of projection images are acquired over a wide angular range (-20° to +20°). It provides a higher depth resolution and is used for medical examinations for people with symptoms.

1.2.2 Software information

Language

- The user interface of the acquisition workstation can be displayed in Chinese or English.
- In this manual, all the menus, interfaces, buttons, and prompt messages are in Chinese or English.

Copyright

- The equipment and the user software are both protected by copyright.

Compliance

- The operation processing software complies with the DICOM standard communication protocol.
- The network communication complies with the DICOM 3.0 standard.
- The wireless transmission protocol complies with the TCP/IP communication protocol.
- The storage medium uses the DICOM standard image format.
- The data interfaces comply with the DICOM standard and the TCP/IP communication protocol.

Third-party software

- Only software authorized by UIH for this equipment can be used.

⚠CAUTION

- Unless specifically instructed by UIH, do not add any other software to the system or make changes to the configuration. Obtain guidance and permission from UIH before installing or using any other software. Failure to do so may compromise the safety and effectiveness of the product.
- The computer and software used for the system are designed to work in an internal local area network of the medical institution or an independent system network. In order to protect the system against viruses and malwares from the network and reduce risks during system operation, ensure that the computer is not exposed to the Internet or high-risk networks.

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1.3 Clinical application

1.3.1 Intended use

The uMammo 890i system with Digital Breast Tomosynthesis (DBT) option generates digital mammographic images that can be used for screening and diagnosis of breast cancer. The uMammo 890i (2D or 3D DBT) system is intended for use in the same clinical applications as a 2D mammography system for screening mammograms. Specifically, the uMammo 890i system can be used to generate 2D digital mammograms and 3D mammograms. Each screening examination may consist of:

- a 2D FFDM image set, or
- a 2D and 3D DBT image set, where the 2D image can be either a FFDM or a 2D image generated from the 3D DBT image set

The uMammo 890i system may also be used for additional diagnostic workup of the breast.

1.3.2 Operators

The operators must have the skills and knowledge required for the medical application of this system.

1.3.3 Prohibited use

- This system is only applicable to mammography. It shall not be used for radiography of other body parts.
- The monitor of the acquisition workstation cannot be used for diagnosis. To view the images for diagnostic purpose, please send the images to the diagnostic workstation or print the images on films.

1.3.4 Contraindications

This product does not have known contraindications, but it should be used with caution for radiation-sensitive people such as pregnant and lactating women.

1.3.5 Operating environment

All components that can be seen are suitable for use in patient environment.

1.3.6 Prerequisites for diagnosis and treatment

The images displayed on the monitor of the acquisition workstation cannot be used directly for diagnosis. Please send them to the diagnosis workstation or print them on films.

- Test image quality

  Due to the aging and normal wear of system components, the quality of images acquired by the system decreases with the increase of use time. Therefore, the image

quality needs to be checked regularly after the installation of the system to avoid affecting the diagnosis.

NOTICE
Image quality must be checked by qualified personnel to ensure that the image quality meets the standards for clinical diagnosis.

■ Diagnosis modes

This system supports the following image diagnosis modes:

- 2D images (2D mammographic images)
- Slice images and 2D images (3D tomographic images and 2D mammographic images)
- Slice images and a synthesized 2D image (3D tomographic images and a synthesized 2D image)

NOTICE
Fused images or slice images cannot be used for clinical diagnosis independently.

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1.4 Personnel training

Users or operators of this system should have the basic knowledge about medical images and system operation, such as examination procedures, and basic principles and features of medical imaging.

Before operating this system, the users must undergo strict training to be qualified. User training must cover contents related to the basic technical knowledge and safe operations of this system.

Users must fully understand the contents of this manual, be familiar with potential risks and safety principles, and abide by local laws and regulations, so as to ensure correct and safe operations.

This system must only be operated by qualified personnel that have received training. Operation of this system by not properly trained personnel may result in system damages or misdiagnosis. Users must not operate this system if they have not received training on how to use this system safely and effectively.

⚠CAUTION

Operate the system, applications, or functions according to the instructions in the accompanying documents.

⚠CAUTION

Only qualified and authorized personnel who have received the professional training required by national or local laws and regulations can operate the equipment, applications, or functions.

UIH provides technical support for this system. In case of any problem, please contact UIH Customer Service Center.

- Telephone: 0086 400-686-6088
- E-mail: services@united-imaging.com

Website: http://www.united-imaging.com

1.5 Compliance statement

This medical equipment complies with relevant regulations regarding the marketing of medical equipment.

If there are regulations relevant to the use and operation of this equipment, operators are obliged to comply with such regulations.

This equipment complies with the following standards:

- IEC 60601-1 Medical electrical equipment – Part 1: General requirement for basic safety and essential performance
- IEC 60601-1-3 Medical electrical equipment – Part 1-3: General requirement for basic safety and essential performance – Collateral Standard: Radiation protection in diagnostic X-ray equipment
- IEC 60601-2-28 Medical electrical equipment – Part 2-28: Particular requirement for the basic safety and essential performance
- IEC 60601-2-45 Medical electrical equipment – Part 2-45: Particular requirement for the basic safety and essential performance of mammographic X-ray equipment and mammographic stereotactic devices
- IEC 60601-1-2 Medical electrical equipment – Part 1-2: General requirement for basic safety and essential performance – Collateral Standard: Electromagnetic compatibility – Requirements and tests

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1.6 Text conventions

Text	Convention
Items in a list	"■" symbol
Sub-items or list items in a table	"♦" symbol
One-step operation	"▶" symbol
Steps within operating sequences	Numbers
Elements in the user interface (such as buttons, window titles, and menu items)	Bold font
Cross references	Blue font
File names, paths, and inputs that the user provides	Monospaced font
Keystrokes	"<>" symbol

Help information with a single item:

Help information.

Help information with multiple items:

- **Help information 1.**
- **Help information 2.**

1.7 Disclaimers

This manual describes the system features to the greatest extent, including its functions, options, and accessories. This manual is provided for your convenient use of the system only and may be updated in a future version. UIH reserves the right to change the information in this manual at any time without prior notice.

This manual only describes product features. The actual configuration may vary.

The photos, graphics, screenshots and images in this manual are for illustration only. Please refer to the actual system appearance and software interfaces. The hospital and patient names in this manual are fictitious. Any similarities to actual persons or hospitals are purely coincidental. Configuration names mentioned in this manual, such as names of the drivers, network nodes, and database, may be different from those in the actual clinical scenarios.

Using third-party accessories or assemblies may reduce the product performance or level of safety. Please use accessories or assemblies approved by UIH.

As the designer and manufacturer, UIH is responsible for its products only when the repair, maintenance, and installation are performed by UIH, or by personnel or organizations expressly authorized by UIH.

UIH shall not take any responsibility for system safety, reliability, or any other issues arising out of:

- Wrong operations, improper maintenance, or unapproved modifications due to non-compliance with the manual instructions.
- Use of third-party accessories, assemblies, or any other auxiliary components without the approval or authorization of UIH.

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1.8 Optional components

- Your system may not have some optional components. Some optional components have multiple specifications to choose from.
- If you need more functions, please contact UIH Customer Service Center.
- If the operation guidelines and technical instruction of some optional components are not mentioned in this manual, you can refer to the user manuals of these optional components.
- Before using any third-party assembly or optional part, you should acquire UIH's approval for compatibility.

1.9 Abbreviations

Abbreviation	Full form	Chinese
AT	Axillary Tail	Axillary tail
CC	Cranio Caudal	Cranio caudal
CV	Cleavage	Cleavage
FB	From Below (Caudocranial)	From below (Caudocranial)
ID	Implant displaced	Implant displaced
ISO	Inferomedial-to-Superolateral Oblique	Inferomedial-to-superolateral oblique
L	Left	Left
LM	Latero Medial	Latero medial
LMO	Latero Medial Oblique	Latero medial oblique
ML	Medio Lateral	Medio lateral
MLO	Medio Lateral Oblique	Medio lateral oblique
R	Right	Right
RIS	Radiology Information System	Radiology information system
RL	Rolled Lateral	Rolled lateral
RM	Rolled Medial	Rolled medial
S	Spot	Spot
SIO	Superolateral-to-Inferomedial Oblique	Superolateral-to-inferomedial oblique
TAN	Tangential	Tangential
XCC	Exaggerate Cranio Caudal	Exaggerate cranio caudal
XCCL	Exaggerated Cranio Caudal (Lateral)	Exaggerated cranio caudal (lateral)
XCCM	Exaggerated Cranio Caudal (Medial)	Exaggerated cranio caudal (medial)

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2 Safety

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2.1 Overview

Read all the safety information in this manual. Pay special attention to the safety notes marked with "DANGER", "WARNING", "CAUTION", and "NOTICE" and be familiar with the safety measures, so as to prevent safety incidents.

⚠WARNING

Safety training shall be included in the trainings on operations.

⚠CAUTION

The customer should train the staff (users, janitors, etc.) on the potential risks of the system and the safety requirements on a regular basis.

UIH shall not bear any legal responsibility for undesirable consequences caused by users' failure to follow the instructions in this manual.

2.1.1 Safety level definitions

"DANGER", "WARNING", "CAUTION", and "NOTICE" are defined as follows:

"DANGER": Failure to follow these instructions will cause personal death or serious injury.

"WARNING": Failure to follow these instructions could cause personal injury or serious damage to the equipment or other property.

"CAUTION": Failure to follow these instructions may cause slight personal injury or potential damage to the equipment or other property.

"NOTICE": Provides additional information to notify users of the potential risk for personal safety or property protection directly or indirectly.

Format of the safety information:

⚠DANGER

Safety information – risks and possible consequences.

- Safety information – preventive measures.

⚠WARNING

Safety information – risks and possible consequences.

- Safety information – preventive measures.

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⚠CAUTION

Safety information – risks and possible consequences.

- Safety information – preventive measures.

NOTICE

Safety instructions to be followed.

2.1.2 Symbols and labels

Warning safety signs and symbols must be permanently and securely attached to the equipment or other appropriate areas.

NOTICE

The safety labels must be firmly attached and legible, and must comply with local laws and regulations.

2.1.2.1 Safety labels

Table 2-1 Instruction symbols

Label	Description	Position
	Refer to instruction manual/ booklet (Mandatory requirement)	Close to the location that prompts the user

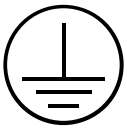
Table 2-2 Warning symbols

Label	Description	Position
	Warning, electricity	♦ Covers of the high-voltage generator ♦ Surface of the X-ray tube assembly ♦ PDU
	Warning, ionizing radiation	Covers of the high-voltage generator
	Warning, hot surface	Surface of the X-ray tube assembly

Table 2-3 Classification and indication of equipment

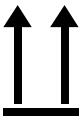
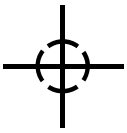
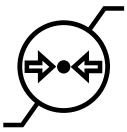
Label	Description	Position
	Type B applied part	Covers of the high-voltage generator
	50 years environmental protection service life of electrical and electronic products	Covers of the high-voltage generator

Table 2-4 Electricity and electronics safety

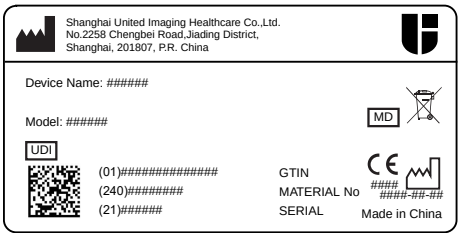
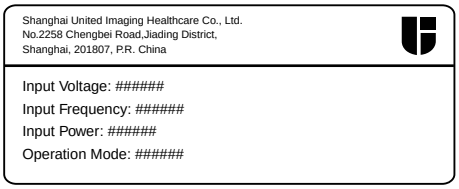
Label	Description	Position
	Protective earth (ground)	Connection point of protective earth conductor

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2.1.2.2 Packaging labeling

Label	Description	Position
	Fragile, handle with care	Packing case
	This side up	Packing case
	Keep dry	Packing case
	Center of gravity	Packing case
	No stacking	Packing case
	Temperature limit	Packing case
	Date of manufacture	Packing case
	Recycling	Packing case
	Atmospheric pressure limit	Packing case

2.1.2.3 Product labels

Label	Description
 (not for the U.S.A.)	Device label
	Specification label

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2.2 Radiation safety

This Digital Medical X-ray Imaging System complies with IEC 60601-1-3 general requirements for radiation protection in diagnostic X-ray equipment. Radiation protection must meet local regulations on radiation safety. Protective equipment must be provided. At a location that is at a safe distance away, the radiation dose is within the safe range.

When this system is performing a scan, the X-ray tube produces X-rays. X-rays are produced only when the system is powered on and is performing a scan. There will be no X-ray when a scan has ended or the system is shut down.

⚠WARNING

- The system must only be used in the specified site with radiation protections.
- Do not use devices other than this system in the scanning room.

⚠WARNING

Authorized professionals shall be familiar with the standards concerning radiological protection, and shall have received training.

⚠WARNING

Excessive exposure to radiation will cause personal injuries.

- Improper radiation protection in the scanning room can cause harm to operators or other personnel. Necessary radiation protection measures must be taken.

⚠WARNING

X-ray radiation hazard.

- Before exposure, make sure that there is no unauthorized personnel in the scanning room.
- Make sure that all necessary protective measures have been taken before each X-ray exposure.
- Do not expose hands, wrists, arms, or other body parts to direct X-rays when operating or maintaining X-ray equipment.
- Do not repair the equipment during patient examination.

⚠CAUTION

Do not start X-ray exposure when the protection door of the exam room is not closed.

⚠CAUTION

Before exposure, check whether the exposure parameters meet the clinical requirements. Adjust any inappropriate parameters in time. Otherwise, the patient may be exposed to excessive radiation dose due to repeated exposure.

Recommended principles of X-ray radiation protection:

- Time: The longer the exposure is, the greater the total absorbed dose will be. Minimize exposure duration. Reduce the time spent in radiation area as much as possible
- Distance: Radiation exposure is inversely proportional to the square of the distance from the radiation source. If the distance between a person and the radiation source (focal spot) is doubled, the exposure dose is reduced to one-fourth of the original dose. When an X-ray equipment is working, all personnel (except the patient) should be as far away from the X-ray source as possible. During an examination, the focal spot to skin distance should be increased as much as possible while the image quality meets the requirements of diagnosis.

2.2.1 Radiation protection for patients

Abide by relevant requirements on radiation protection to prevent patients from receiving excessive radiation and to reduce the radiation dose.

- To protect other parts of the patient's body from radiation, you should use other protective accessories in addition to the devices of this system such as the collimator.
- Minimize the examination time to reduce the total radiation dose.
- Keep the distance between the X-ray source and skin as long as possible, so as to minimize the absorbed dose of patient skin.
- In the contact mode, install the standard face shield and use a focal spot to skin distance greater than 45 cm. In the magnification mode, use a focal spot to skin distance greater than 20 cm.
- The air kerma rate of leakage radiation at any point 100 cm away from the focal spot does not exceed 1.0 mGy/h.
- Do not remove or modify any circuit that prevents unexpected X-ray exposure.

2.2.2 Radiation protection for operators

Abide by relevant requirements on radiation protection to reduce or avoid excessive radiation for operators.

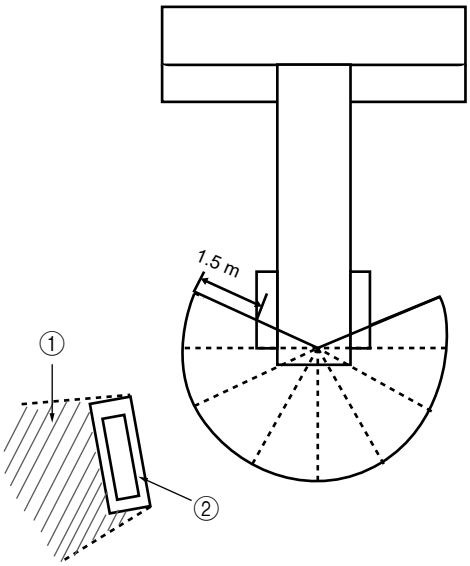
- Sufficient shielding must be provided in the main protection layer to prevent the operators and other people from the main X-ray beam and scattered radiation. The main protection layer includes the walls, windows, doors, etc. Thickness of the shielding must be determined based on the expected operating parameters of the X-ray system.
- Keeping distance is the most effective protection against radiation. Avoid direct exposure to X-rays during work.

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- If you have to stay in the scanning room during the exam, keep away from the radiation object and the X-ray tube assembly as far as possible.
- If you have to stay in the scanning room during the exam, wear protective clothing and gloves.
- If you have to stay outside the radiation protection area, the lead equivalent of the radiation protection materials must be greater than or equal to 0.36 mmPb.
- You can wear dosimeters to detect the absorbed radiation dose.

2.2.3 Effective area occupied

- Ground: 160 cm × 160 cm
- Height: 200 cm



1. Radiation protection area
2. Radiation shield

2.3 Electrical safety

⚠WARNING

Part of the system components still carry voltage after the shutdown. To avoid electric shock, do not remove covers of the system.

⚠WARNING

Multiple socket-outlets provided with this system shall only be used for supplying power to equipment that is intended to form part of the system. Do not connect any equipment that has not been supplied as a part of this system to the system. Do not connect such equipment to the same multiple socket-outlet (MSO) with system components.

⚠WARNING

Do not press the System Off button during exposure. Otherwise the high-voltage generator will be damaged or the patient will receive extra radiation dose.

⚠WARNING

Turn off the system and cut off all power supplies before system maintenance.

NOTICE

Connect the external cables nearby and keep the cables on the ground to protect users from being tripped by the cables.

- Only qualified UIH customer service engineers that can use the tools correctly are allowed to install, calibrate, maintain, or modify the equipment.
- After the system is powered off, the high-voltage generator and UPS still carry voltage. Wait for 5 minutes before you clean, disinfect, or maintain the equipment.
- This equipment does not provide protection against ingress of water. Do not spill any liquid on the equipment.
- Do not move the system when it is running. Before you move the system, shut down the system and power it off. Make sure that all peripheral components of the system, such as the monitor, mouse, keyboard, and cables, are disconnected.
- Do not open covers of this system or remove the cables by yourself unless otherwise clearly stated in this manual.
- Work under safe voltage. If the voltage exceeds the safety limit, power off the system immediately.
- Make sure that all protective earthing devices are correctly connected to prevent the leakage of dangerous voltage.

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- Operators are prohibited from touching the patient and the system parts that carry voltage or parts that may carry voltage under single failure conditions at the same time.
- Do not use the system when any electrical or mechanical failure occurs, or when the protection circuit and facilities of the system are removed.
- When cables are found to be pulled, twisted, or worn during the system movement, stop the movement immediately and make adjustments. If the problem is unavoidable, please contact UIH Customer Service Center.

2.4 Mechanical safety

NOTICE

Select the correct screws and torques to avoid mechanical damages or property damages.

⚠WARNING

When the equipment moves, keep monitoring the equipment to prevent collisions or crushes.

NOTICE

Be aware of the gaps between moving parts and fixed parts to avoid squeezing fingers.

⚠WARNING

- If associated equipment does not meet the safety requirements of this equipment, the safety level of the system may be degraded. Only original parts of this system or third-party parts approved by UIH can be used.
- Failure of any system component can degrade the safety level of the system. In such cases, stop operating the system immediately and contact UIH Customer Service Center.

- The system components may crush or collide with human body, causing system damages or personal injuries.
- The system components can move vertically or rotate. Only move the system components when there is no danger to the patient, operator, or any third party, and when there is no obstacles. Before operation, make sure that you and any third party are not within the path of the system, and that all objects within the path have been removed.
- Prevent body or clothing from getting stuck or clamped in the moving parts of the system.
- Damaged or missing components (such as wire ropes and washers) must be replaced with spare parts of the same model.

2.4.1 Abnormal movement

In case of abnormal system movements, press the E-Stop button closest to you immediately. You can release the E-Stop button only after the problem that causes the abnormal movements is found and solved. If the problem persists, please contact UIH Customer Service Center.

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2.4.2 Crushing hazards

Pay attention to the crushing hazards near the moving components. Be aware of the gaps between moving parts and fixed parts to avoid squeezing fingers.

Before you move any system component, make sure that the patient is not holding any part that may collide.

The compression force of the compression paddle does not exceed 200 N. The force exerted on the patient is controlled through motor current limitation and software monitoring.

2.4.3 Areas with crushing hazards

Operators must keep the patient and themselves away from areas with crushing hazards during the examination and positioning.

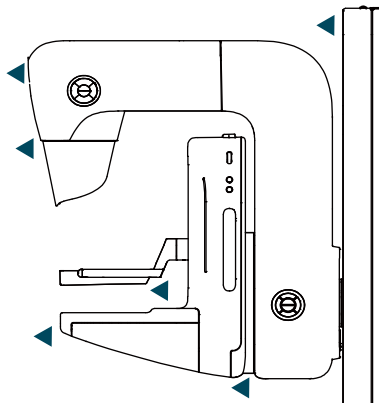


Figure 2-1 Hazardous areas on the gantry

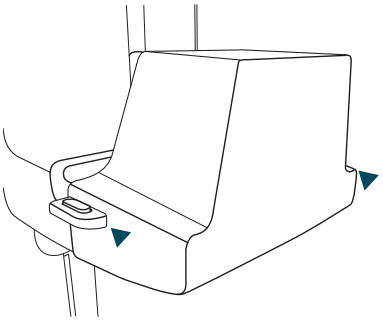


Figure 2-2 Hazardous areas on the magnification table

2.5 Electromagnetic compatibility

This system complies with the standards for the electromagnetic compatibility of IEC 60601-1-2. These standards stipulate the radiation level allowed by the equipment and the equipment immunity against external electromagnetic interference.


Non-ionizing electromagnetic radiation

This equipment must be installed and put into service according to the EMC information provided in the accompanying documents.

⚠WARNING

Other electronic devices in the working area should be turned off.

⚠WARNING

- The system must only be used in the specified site with radiation protections.
- Do not use devices other than this system in the scanning room.

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2.6 Fire and explosion safety

2.6.1 Fire protection

⚠WARNING

Prevent ingress of liquid into the system to prevent corrosion of components and short circuit.

NOTICE

Do not place containers with liquids, such as water cups and medicine bottles, on the equipment.

- Fire protection systems must be designed and installed on site.
- It is the responsibility of the customer to actively communicate with the local fire department and establish fire emergency procedures to ensure that the fire department is familiar with the system and the site.
- A fire near or in the system may cause property loss, as well as burns, collisions, or gas poisoning to patients and operators.
- Ingress of conductive liquid into console components in use may cause short circuit and fire. Do not place any liquid or food on the console table or other components.
- Make sure that the fire extinguisher is placed in an easily accessible position and that the operators are familiar with how to use it.
- Make sure that doctors and patients know the escape routes.
- In the event of a fire in electrical equipment, cut off the power supply immediately. The electrical appliances and cables on fire may carry voltage. This may cause electric shocks when the fire spreads or when you try to put out the fire.

2.6.2 Fire extinguishing agent

NOTICE

Never use water for fire fighting. Fire extinguishers with carbon dioxide or difluorodibromomethane are recommended.

If the system cannot be shut down for special reasons or the power cannot be cut off due to other needs, you must use non-conductive fire extinguishing agents. For example:

- Carbon dioxide fire extinguisher
- 1211 fire extinguisher
- Difluorodibromomethane fire extinguisher

2.6.3 Explosion protection

⚠WARNING

Some anesthetic gases and disinfectant sprays are flammable and explosive, and can cause fire or explosion.

- ♦ If flammable and explosive gases and liquids (such as anesthetic gases and disinfection sprays) are used during combined treatment, be careful when using the equipment.

⚠WARNING

To avoid explosion, do not use this system in areas with explosion hazards.

This system is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide. Detergent and disinfectant (including those used on patient bodies) may produce explosive gas mixtures. Please follow all relevant safety regulations.

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2.7 Image quality

2.7.1 Image quality

NOTICE

Image quality must be checked by qualified personnel to ensure that the image quality meets the standards for clinical diagnosis.

NOTICE

The monitor of the image processing system cannot be used for diagnosis. To view the images for diagnostic purpose, send the images to the diagnostic monitor or print the images on films.

Due to the aging and normal wear of system components, the quality of images acquired by the system decreases with the increase of use time.The image quality needs to be checked regularly.

The system can be connected to film printers that support the DICOM protocol and DX images.

2.7.2 Image orientation

Operators must ensure that the image orientation on the monitor or film is correct.

⚠WARNING

- Flipping images may cause confusion on orientation, resulting in misdiagnosis.
- Users should use image flipping correctly, explain the images, and be responsible for the conclusions drawn based on the images.

⚠WARNING

Users should fill in the left and right labels correctly to prevent misdiagnosis. If necessary, use lead letters or other similar tools during acquisition.

2.7.3 Room lighting

Avoid reflection from windows, lights, and observation windows at the location where you use the monitor. Such reflection may affect image viewing and diagnosis.

2.8 Patient care

2.8.1 Visual contact with the patient

In the process of using this system, the visual and auditory contact with the patient must be kept continuously. The operator is responsible for ensuring the patient's safety by visually confirming the patient's position and using special protective equipment.

2.8.2 Components in contact with patients

The compression unit is in frequent contact with patients, and should be maintained and cleaned properly.

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2.9 Handling of emergencies

2.9.1 Emergency procedures

⚠CAUTION

Due to the complexity of the system, unavailability of the system due to abnormal external power supply, wear parts (for example the X-ray tube) approaching the end of their service life, accidental damage to parts, failure, or interference cannot be completely avoided. Before examination or treatment, emergency procedures should be formulated to deal with the above situations.

The system provides two types of buttons for emergency use: Emergency Stop (E-Stop) button and Emergency Power Off (EPO) button.

When a system function fails, messages will be displayed on the host monitor. Please follow the messages for troubleshooting.

⚠WARNING

Some system function failures may not be resolved in a short period of time, resulting in exam delay or interruption. You should consider establishing appropriate emergency procedures.

2.9.2 E-Stop button

E-Stop buttons are provided to stop all movements of the system in emergencies, so as to reduce damages to the system and personnel.



Figure 2-3 E-Stop button

⚠CAUTION

If the system is activated by accident or if it moves when you are not operating it, press the nearest E-Stop button immediately to prevent personal injury or component damage.

If abnormal system movements cause an emergency that endangers the patient, operator, or system, you should press the E-Stop button closest to you immediately.

- After the E-Stop button is pressed, all motor drives of the system are stopped, system movement stops immediately, and exposure is disabled.
- Information of the system status that causes the stop will be displayed on the monitor of the acquisition workstation.

Releasing the E-Stop button

- You can release the E-Stop button only after the problem that causes the abnormal movement is found and solved.
- To release the E-Stop button, rotate it clockwise. After it is released, the motorized motion and exposure can be restored.
- In the first 5 seconds after the E-Stop button is released, the system movement will be temporarily disabled when the system restarts. After that, the system movement returns to normal.

2.9.2.1 Locations

The system has 3 E-Stop buttons. They are on the left and right sides of the stand and on the control box respectively.

2.9.3 Emergency Power Off button

- The Emergency Power Off (EPO) buttons are connected to the power distribution panel provided by the customer. The customer is responsible for installing the Emergency Power Off buttons.
- Once the Emergency Power Off button is pressed, power supply of the whole system will be cut off.
- This button should be used in case of emergencies such as fire and earthquake, so as to cut off the system power supply quickly. You can power on the system again after the faults and hazards are eliminated.

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2.10 Environment safety

This system was designed and manufactured according to the requirements of safety and environment protection. When none of the system cover is removed and the system is used correctly, this system will not cause harm to personnel or the environment.

A hazardous material is a substance that can ignite or cause an explosion, is toxic and harmful to health, or is corrosive or irritating. Before dealing with hazardous materials, you must be familiar with the relevant instructions to avoid causing environmental pollution or personal injury. The handling procedures must comply with local laws and regulations.

2.10.1 Disposal of radioactive wastes

Relevant components of the system must be recycled according to local laws and regulations or handled by the authorized personnel properly as stipulated by local waste collection stations. Never handle X-ray related equipment as general industrial or domestic wastes.

⚠CAUTION

- The flat panel detector is a precise instrument. Do not shake the flat panel detector violently or apply excessive loads to the flat panel detector.
- Do not use flat panel detectors with broken covers. Otherwise, it may cause environmental pollution. If there is particle leakage, put on protective gloves to collect the leaked particles, store the particles in a sealed container, and return them to the manufacturer.
- Do not expose the detector directly to X-ray beams.

⚠WARNING

If the X-ray tube is damaged, stop using the system immediately and contact UIH Customer Service Center.

2.10.2 Battery safety and recycling

The power supply or battery charger used for this equipment must comply with corresponding national and regional safety standards. Installation, use, and maintenance of batteries and rechargeable batteries should be carried out according to the requirements of the manual. Batteries must be replaced regularly to ensure operation safety.

⚠WARNING

Leakage of batteries may cause unacceptable risks.

- If the batteries will not be used for some time, remove the batteries.

NOTICE

Dispose of the batteries properly to prevent environmental pollutions. Do not put the batteries in the trash.

NOTICE

To avoid environmental pollution or personal injury caused by leaked particles containing hazardous materials, do not use the equipment if the battery is damaged.

Expired batteries and rechargeable batteries shall be recycled in accordance with the relevant national and regional laws and regulations.

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2.11 Equipment compatibility

Any non-conforming components in the system may result in degraded system safety performance. If any non-conforming component is found in the system, stop using the system and contact UIH Customer Service Center.

⚠WARNING

If unapproved accessories are connected to the system, the system performance may be adversely affected, causing errors during the scanning and resulting in misdiagnosis.

- Only use approved accessories.

⚠WARNING

Only the third-party software that has been validated by UIH can be installed on the equipment.

NOTICE

Signal input parts and signal output parts of the system can only be connected to equipment specified in IEC 60601-1.

The information technology equipment connected to this equipment through interfaces must meet the requirements of IEC 62368-1.

Do not replace the graphics cards or the driver of graphics cards without permission.

2.12 Service life of the product

The expected service life of this product is 10 years.

After the service life expires, the product should be handled according to relevant laws and regulations. In case of any problems, contact UIH Customer Service Center.

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2.13 Cybersecurity

Before the system is connected to an external network or uses third-party software, take measures to protect information against data loss or system attack.

To ensure cybersecurity:

- The client host should be locked in a cabinet.
- The server host should be deployed in a special computer room with lock.
- The place where server and client host are installed should be equipped with CCTV cameras.

⚠CAUTION

Loss or weakening of system function. This may damage the image files and delay the diagnosis.

- This system should be connected to hospital information systems such as PACS through the local area network. Do not connect this system to the Internet.
- Do not copy or install unauthorized software.
- This system provides secure network transmission methods that keep the information confidential. The remote service can only be activated with the permission of the local user.
- An error message will pop up when an error occurs to the network connection.

NOTICE

All unauthorized access requests will be rejected.

2.13.1 Operating conditions

2.13.1.1 Performance and efficiency

This system is a stand-alone software. For this system, the requirements on performance and efficiency refer to the requirements on the speed of loading images. In a typical operating environment, performance and efficiency are evaluated based on the following requirements. 1000 images (512 K each) are used as the main reference standard.

- The time from loading images to displaying the first image is no longer than 2 s.
- Loading 1000 images takes no more than 3 s.

To ensure system operation, you must make sure that the network connection, memory, and disk space meet the requirements.

- To ensure network transmission performance, a network bandwidth of at least 1 Gb/s is recommended.

2.13.1.2 System reliability

In case of system failure or power failure, unsaved data will be lost while saved data will not. The software can continue to run after restart.

If there is insufficient RAM or disk space, or if network failure occurs, please solve the problem as prompted.

Notification type	Description	Solution
Warning message	RAM is insufficient.	Free up RAM by closing applications that are processing large amounts of data.
Error message	RAM is seriously insufficient.	Free up RAM by closing applications that are processing large amounts of data.
Warning message	Video memory is insufficient when the application starts up.	Free up video memory by closing applications that are processing large amounts of data.
The disk space manager icon turns orange.	Warning. Available disk space is between 5% and 10%.	Clean up the disk regularly.
The disk space manager icon turns red.	Warning. Available disk space is less than 5%.	
A message is displayed in the System Status area.	Error. Network connection is lost.	Check whether the network port functions and whether the network cable is connected.
Printing failure message.	Information. Printing failed.	Try again. Check the communication and the configuration of the printer.

2.13.2 Anti-virus protection

An anti-virus software is built into the system to help guard the system against viruses and other malicious software.

The anti-virus software can regularly scan the documents and data in the system, and eliminate any viruses found.

The following data will be scanned:

- Data on the hard disk of the host
- Data on USB devices
- Data on CD/DVD

During the process of scanning and eliminating viruses, the system is able to function normally.

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The virus database of the anti-virus software can be upgraded manually or automatically.

Customer service engineers of UIH will help users upgrade the virus database if requested. To avoid unpredictable problems, virus database upgrade that is not authorized by UIH is forbidden.

NOTICE

- The anti-virus software runs automatically to monitor and ensure the system security.
- Perform full-system anti-virus scans when the system is not in use.
- After being evaluated by UIH, the system can be upgraded with anti-virus security patches.

NOTICE

- By default, the firewall is turned on in the local area network, home or work network, and public network at all time. Contact UIH customer service engineers if the firewall needs to be shut down or modified.
- Check regularly whether the anti-virus software is functioning. In case of any abnormality, please contact UIH customer service engineers.

NOTICE

Do not install any other types of software (including anti-virus software) on this system.

- Software that has not been verified by UIH is not guaranteed to be compatible with the system, and may cause data corruption or data loss.
- Incompatible software may lead to risks to patient safety.

2.13.3 External devices

This system supports two categories of external devices:

- Peripheral devices that support Digital Imaging and Communications in Medicine (DICOM).
- Common printing devices such as printers.

2.13.4 Data security

In order to protect patient privacy and data security, permissions of accessing data and performing operations are controlled in this software. Only authorized users can access data and perform operations through legal usernames and passwords.

If you need to leave the console temporarily or if you will not be using the system for a while, the screen should be locked. To resume where you left off, enter the username and password to unlock the screen.

To ensure data integrity, a reliable high-performance relational database is used, and transaction logic is adopted to store, update, delete, and transmit data.

Important events such as users accessing, creating, updating, or deleting data and operational events such as modification of key configurations are recorded in audit trails.

Only authorized administrators have the permission to access and manage audit trails.

The user should appoint cybersecurity administrators.

When the user deletes data, the system will ask for confirmation to prevent misoperations.

⚠CAUTION

The disclosure of patient information leads to the exposure of patient privacy.

- To protect patient privacy, you should archive the data anonymously so that patient identification information will not be exported when you export patient data.

NOTICE

Data encryption is recommended to protect privacy when you transfer or export sensitive data to an external system.

NOTICE

- To ensure data security and the normal use of the system, regularly archive, back up, store, and clear the data.
- To ensure system and data security, you can disable data archiving to USB devices or disable the USB ports.
- When the system warns about insufficient disk space, clean up the disk.
- The system will stop operating in case of power failure. Any unsaved data may be lost.
- While the system is running, do not disconnect the power or network. Otherwise, there may be data loss.
- Due to technical limitations, the patient information stored in the backup media may be lost.

The system can still operate normally even if the communication fails between the system and the external network. If the system is communicating with another device when the network is disconnected, reconnect the device and repeat the data transfer after the network recovers.

2.13.4.1 Managing applications and change control

Before you start:

- White-list licenses have been imported.
- Contact Technical Support for the white list activation code.

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Through management of applications and change control, you can block unauthorized executable files on servers, enterprise desktops, and console. You can also monitor and prevent changes to file systems.

1. In the **Privacy and Security** area, click **Application and Change Control**.
2. Enter the white list activation code in **Activation Code**.
3. Click **Active** to activate the white list.
   - ♦ The activation is completed. The state switching buttons become available.
4. Click a state switching button and click **Save**.

Button	Description
Enable	The white list is activated and enabled. Only the files in the white list can be copied in.
Disable	This is the default state when the activation is completed. The white list is activated but disabled. Files that are not in the white list can still be copied in.
Update	Switch to this state when you need to install patches so that you can add patch files to the white list.

Result:

- ♦ A message shows that the setting has been saved successfully. The setting will take effect after you restart the computer.

2.13.5 Software installation and update

⚠CAUTION

- ♦ Unless specifically instructed by UIH, do not add any other software to the system or make changes to the configuration. Obtain guidance and permission from UIH before installing or using any other software. Failure to do so may compromise the safety and effectiveness of the product.
- ♦ The computer and software used for the system are designed to work in an internal local area network of the medical institution or an independent system network. In order to protect the system against viruses and malwares from the network and reduce risks during system operation, ensure that the computer is not exposed to the Internet or high-risk networks.

⚠CAUTION

The software must be installed and upgraded by UIH customer service engineers or engineers expressly authorized by UIH.

- Unauthorized operations, changes of the software or hardware system, or connection to an unsecured network will damage the system.
- Copying or installing unauthorized software is prohibited. Only the software that is validated by UIH may be installed.
- System resource requirements must be met for this system. Installing the system on a public or personal computer may degrade the system performance.
- Check the language settings of the software when the software is started. Stop using the system if the language setting is incorrect.
- Keep the username and password confidential and change the password periodically. If you forget the password, contact UIH Customer Service Center.
- After the software installation, keep at least one backup of the system data for system restoration.
- Users should back up data before software upgrade.

Regularly check the license information and make sure that the licenses are valid. Within 30 days prior to the expiration of a license, a warning message pops up every day to remind you that the license is about to expire. If an extension is required, please contact the UIH Customer Service Center in time.

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2.14 Image evaluation

NOTICE

Accuracy of measurement and display

- On the acquisition plane, the measurement accuracy must not exceed the minimum pixel size.
- On the plane perpendicular to the acquisition plane, the measurement accuracy must not exceed the slice distance.
- The numbers displayed in the interface are rounded to one or two decimal places. Therefore, the measuring and calculation results may be slightly different from the data shown in the interface.

2.15 Filming

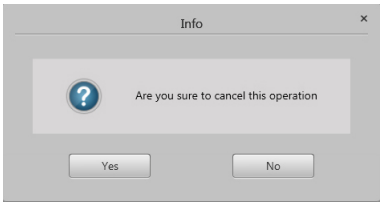
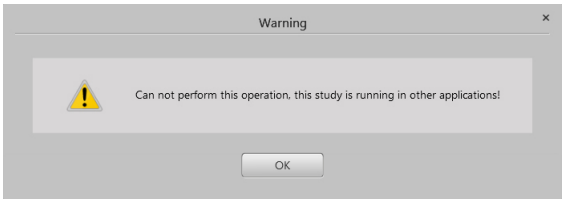
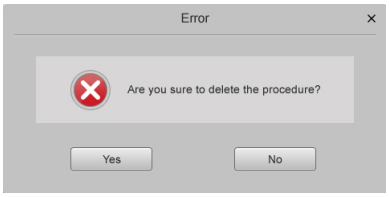
NOTICE

- When printing and saving films for diagnosis, make sure that the patient name and related information are displayed in all windows.
- The quality of images output by some film printers may not meet the requirements for diagnosis. Please use the laser printers recommended by UIH.
- The standard screen of the system is only used for the preview of films.
- The electronic version of films (E-films) saved in the system cannot be used for diagnosis.
- Except for producing training materials, do not add images of more than one patients to the same film.

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2.16 Messages

When a problem occurs, a dialog box will pop up.

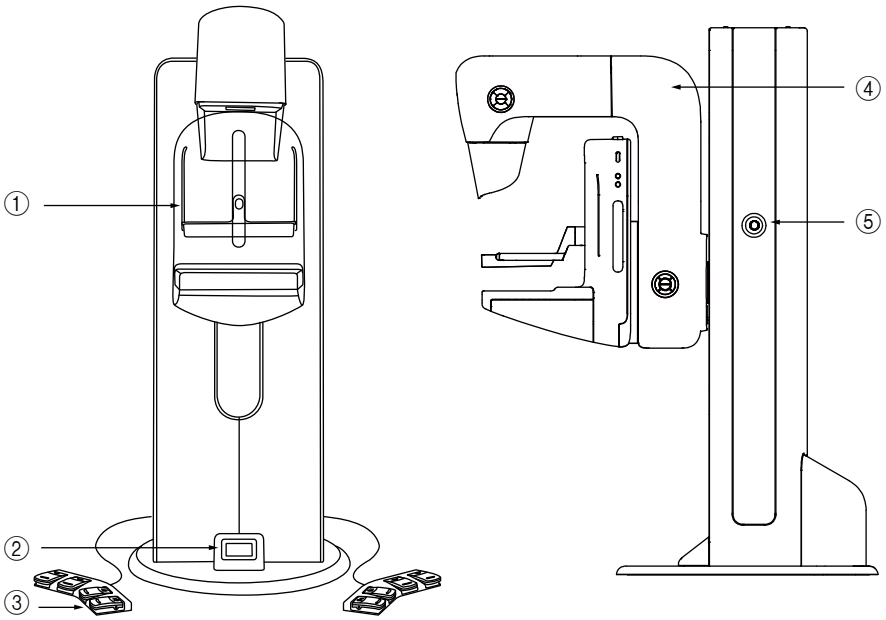
Message	Purpose
	Displaying information that worth noticing.
	Asking the user to confirm the next step.
	Displaying warning messages.
	Displaying operation errors.

3 System components

3.1 Gantry 3-2
3.1.1 Compression unit 3-2
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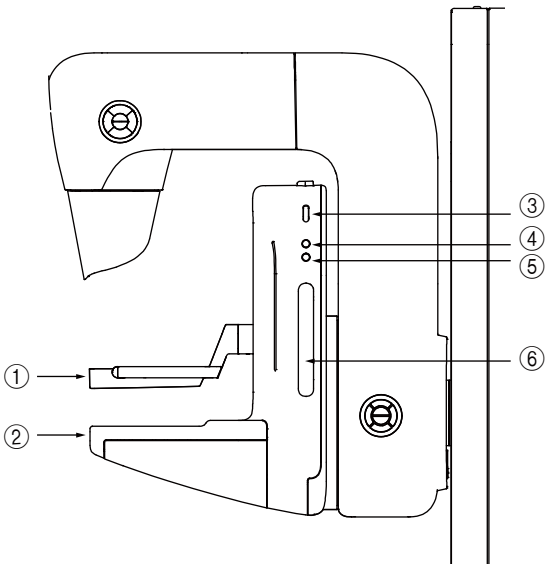
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3.1 Gantry



1. Compression unit
2. Angle feedback interface
3. Movement control pedal (both sides)
4. C-arm
5. E-Stop button

3.1.1 Compression unit



1. Compression paddle
2. Object table
3. Compression paddle adjustment thumbwheel (both sides)
4. Rotate Tube button (both sides)
5. Light Localizer button (both sides)
6. Patient armrest (both sides)

3.1.1.1 Compression paddles

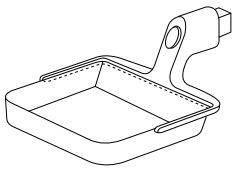
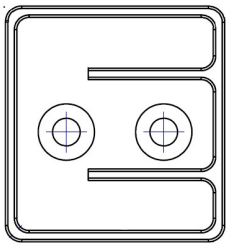
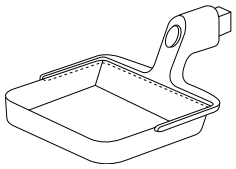
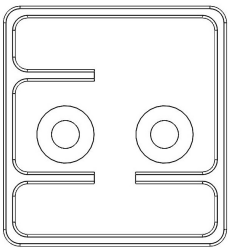
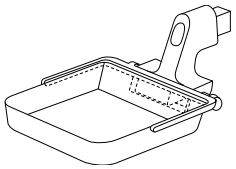
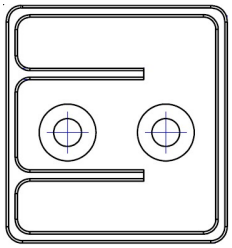
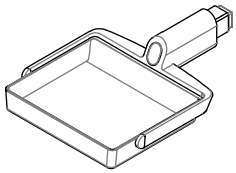
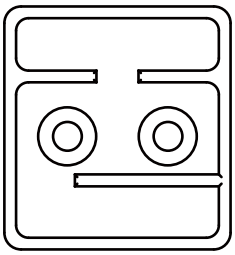
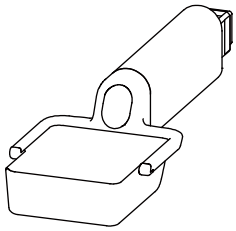
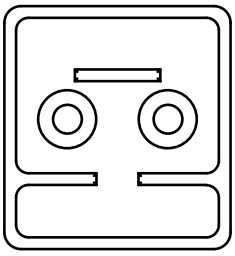
Compression paddles are used for imaging of compressed breasts. You should choose compression paddles according to clinical applications. You can use the movement control pedals and the compression paddle adjustment thumbwheel to control the vertical movement of the compression paddle and compress breasts.

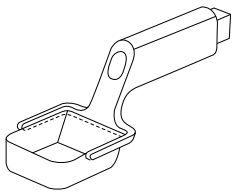
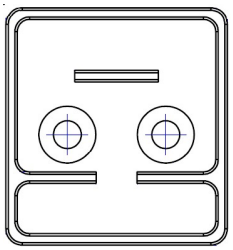
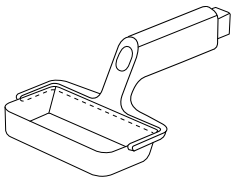
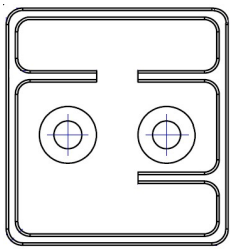
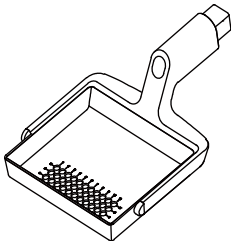
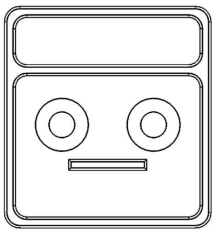
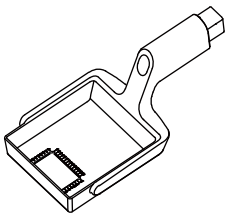
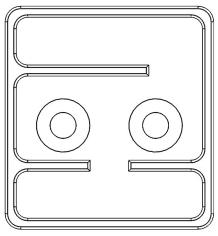
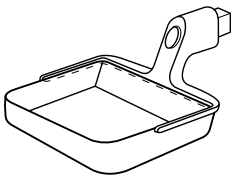
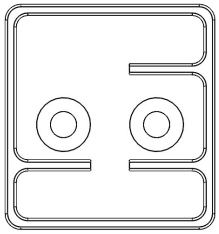
Only after a compression paddle is installed correctly, will the collimator window open and match the compression paddle so that the radiation field is of the same size as the compression paddle.

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3.1.1.2 Specifications of compression paddles

Table 3-1 Sizes and connectors of compression paddles

Name	Illustration	Description	Illustration for connectors
Standard compression paddle (18*24)		♦ It can be used for most purposes. ♦ Size: 18 cm × 24 cm	
Standard compression paddle (24*29)		♦ It can be used for most purposes. ♦ Size: 24 cm × 29 cm	
Shifting compression paddle		♦ It can slide from the center of the detector to the left or right position, which is convenient for positioning small breasts. ♦ Size: 18 cm × 24 cm	
Magnification compression paddle		♦ It is used with the magnification table. ♦ Size: 16 cm × 20 cm	
Magnification spot compression paddle		♦ It is used with the magnification table. ♦ Size: 9 cm × 9 cm	

Name	Illustration	Description	Illustration for connectors
Spot compression paddle		♦ With this paddle, local compression can be more effective, delivering better display of suspicious regions. ♦ Size: 9 cm × 9 cm	
Axilla compression paddle		♦ It is used to compress the axillary region and also can be used for the male breasts, small breasts, postoperative breasts, and breasts with implants. ♦ Size: 8 cm × 20 cm	
2D biopsy compression paddle		♦ It is used for localization and puncture. ♦ Size: 16 cm × 20 cm	
Single-aperture 2D biopsy compression paddle		♦ It is used for localization and puncture. This paddle, the localization crosshair device, and the 2D biopsy face shield make up the 2D biopsy unit. ♦ Size: 15 cm × 15 cm	
High-edge compression paddle		♦ The edge is 7 cm high. ♦ Size: 24 cm × 29 cm	

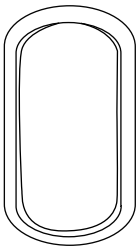
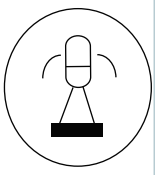
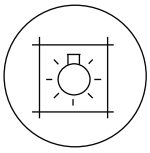
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3.1.1.3 Object table

The object table has a carbon fiber table top. It is used for supporting the breast and has a detector installed inside it.

There are lines on the object table top that indicate the image reception area. The lines serve as a reference for the safe alignment of the X-rays and the image reception area to avoid additional radiation.

3.1.1.4 Control buttons

Icon	Name	Function
	Compression paddle adjustment thumbwheel	♦ Roll up the wheel to slowly move the compression paddle up. ♦ Roll down the wheel to slowly move the compression paddle down.
	Rotate Tube button	♦ Hold down the button on the left to rotate the tube rightward to the +22.5° position. The compression paddle keeps still. Hold down this button again, and the tube rotates leftward to the 0° position. ♦ Hold down the button on the right to rotate the tube leftward to the -22.5° position. The compression paddle keeps still. Hold down this button again, and the tube rotates rightward to the 0° position.
	Light Localizer button	♦ Press this button to turn on the light localizer and display the light field. ♦ When the light localizer is on, you can press this button again to adjust the size of the light field. ♦ The light localizer turns off automatically in 30 seconds. The adjustment range is 5 to 60 seconds.

3.1.2 Readout display

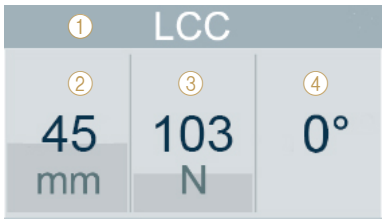
The readout display shows system information and helps users use the system reasonably and effectively.

3.1.2.1 Readout display during system startup or shutdown



When the system is turned on or off, the readout display shows the UIH logo.

3.1.2.2 Main screen



No.	Name	Function
1	View	Displaying the current position of the patient.
2	Compression thickness	Displaying the compression thickness in real time (the distance from the compression paddle to the object table) (unit: mm).
3	Compression force	Displaying the compression force of the compression paddle in real time (unit: N).
4	Rotation angle	Displaying the rotation angle of the C-arm in real time (unit: °).

3.1.2.3 Display of patient's name

When the system receives the patient's name, the name is displayed on the screen.

3.1.2.4 Display interface of the compression force and thickness

When you operate the object table and there are data of compression force and compression thickness, the interface displays the compression force, compression thickness, and angle of the C-arm.



3.1.2.5 Error messages

When an error occurs in the system, a warning icon is displayed in the upper right corner of the readout display.

3.1.2.6 Angle feedback interface

When the C-arm rotates, the readout display automatically switches to the angle feedback interface to show the rotation angle of the C-arm in real time.

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3.1.3 Movement control pedals

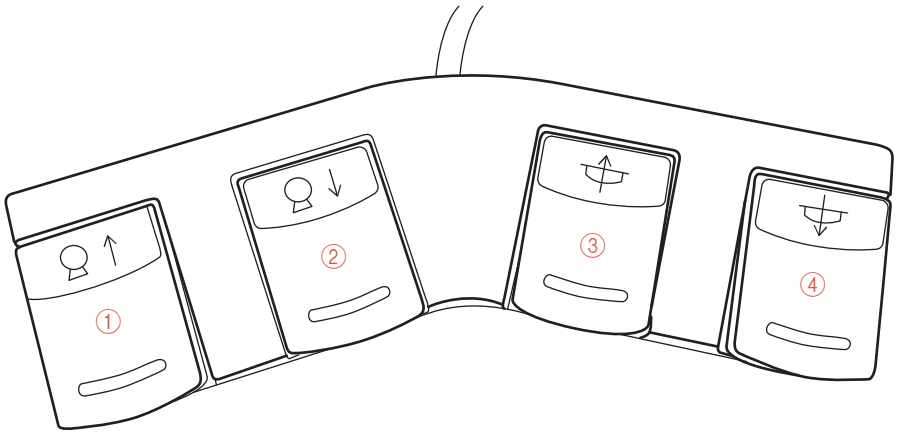
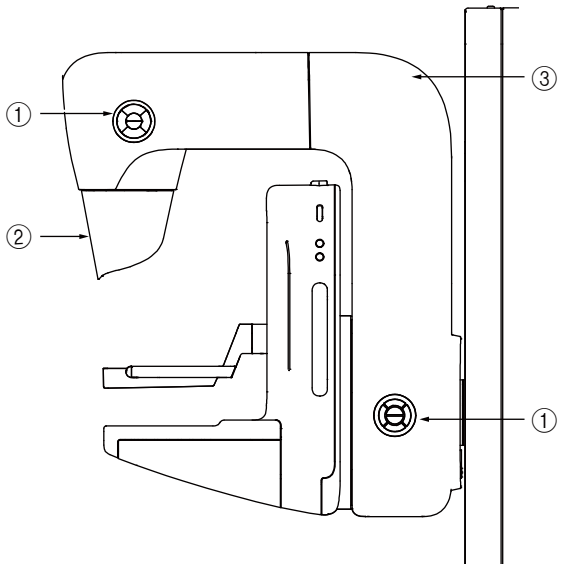


Figure 3-1 Movement control pedals

The movement control pedals are on both sides of the stand. They are symmetrically placed, and have the same functions. You can adjust their positions according to your needs.

No.	Name	Function
1	C-arm Up pedal	The C-arm moves up when you step on this pedal.
2	C-arm Down pedal	The C-arm moves down when you step on this pedal.
3	Paddle Up pedal	The compression paddle moves up (releasing) when you step on this pedal.
4	Paddle Down pedal	The compression paddle moves down (compressing) when you step on this pedal.

3.1.4 C-arm



1. Movement control buttons of the C-arm (both sides)
2. Standard face shield
3. C-arm

3.1.4.1 Movement control buttons of the C-arm

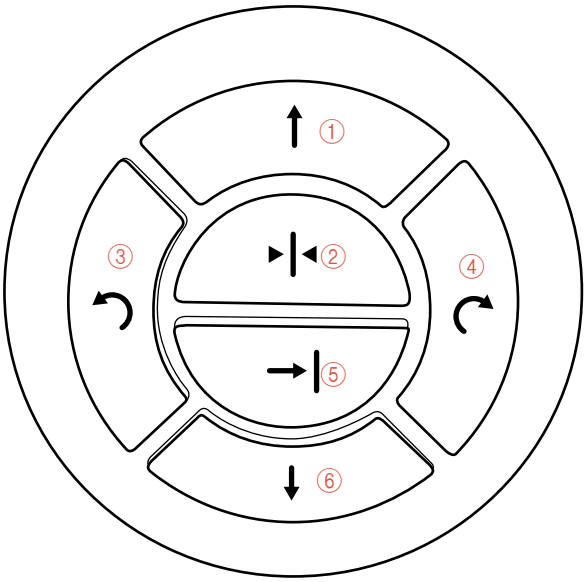


Figure 3-2 Movement control buttons of the C-arm

1. Move Up (button)
2. Move to Symmetrical Position (button)
3. Counterclockwise Rotation (button)
4. Clockwise Rotation (button)
5. Move to Next Position (button)
6. Move Down (button)

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3.1.4.2 Face shield

The face shield is used to prevent the face or other parts of the patient from entering the imaging field during the examination.

You need to remove the face shield when installing the magnification table.

The system has the following types of face shields:

- The standard face shield is used for standard examinations.

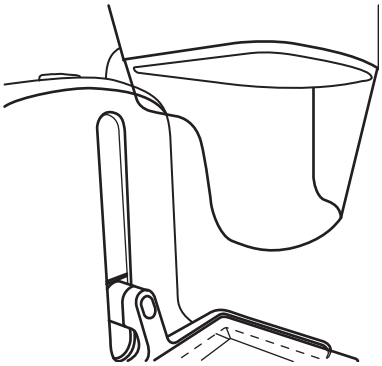


Figure 3-3 Standard face shield

- The 2D biopsy face shield is used for 2D biopsy localization. When the 2D biopsy unit is used, using the 2D biopsy face shield can facilitate the operation of the localization crosshair device and thus ensure the imaging quality.

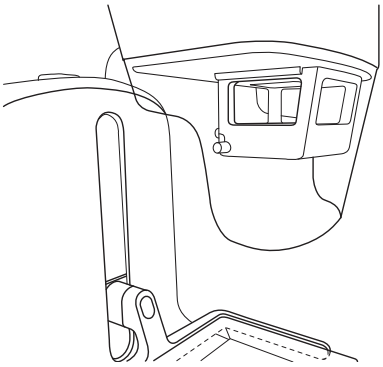


Figure 3-4 2D biopsy face shield

- The face shield for DBT is used for Tomo examinations.

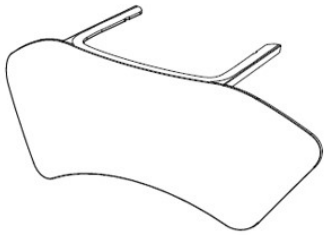


Figure 3-5 Face shield for DBT

3.1.5 E-Stop buttons



Figure 3-6 E-Stop button

There are E-Stop buttons on both sides of the stand so that you can stop all movement of the system in an emergency to reduce personal injury or system damage.

Related concepts

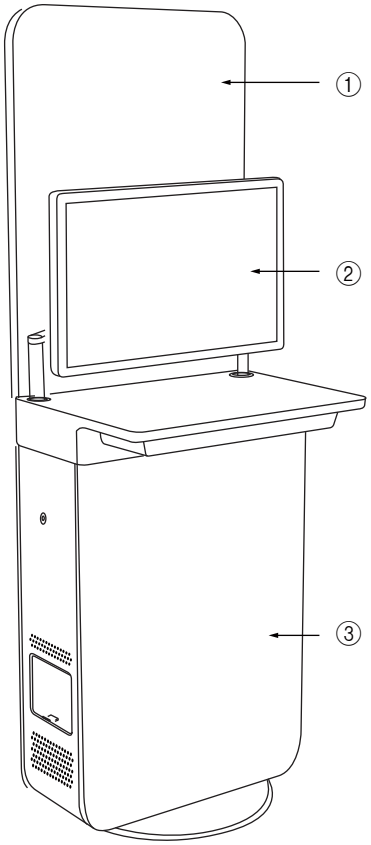
Page 2-20 E-Stop button

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3.2 Operating table

3.2.1 Operating table system

The operating table system consists of the radiation shield and the table. The host monitor, acquisition workstation, and the accessories such as mouse and keyboard are placed on the operating table.



1. Radiation shield
2. Host monitor
3. Operating table

3.2.2 Control box

The control box is used to turn on or off the system, release the compression paddle, and perform exposure.

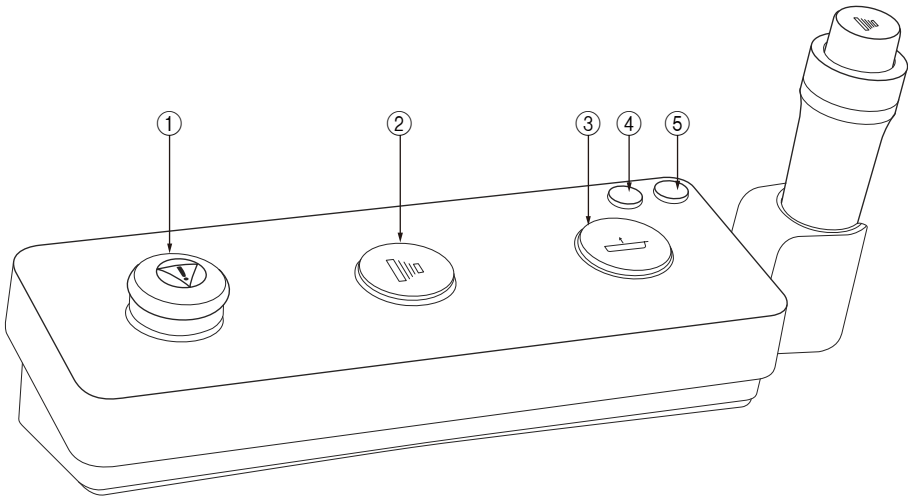


Figure 3-7 Control box (with the exposure hand switch)

No.	Name	Function
1	E-Stop button	In emergencies, press the E-Stop button to stop all motorized motion of the system. Exposure will be disabled after this button is pressed. Only release this button after making sure that the system status is normal.
2	Exposure button	Perform exposure. ♦ Green: Ready for exposure. ♦ Yellow: Exposure in progress.
3	Release button	Release the compression paddle.
4	System On button	The gantry and acquisition workstation start up after this button is pressed. When the system has been started up, the light of the System On button stays on.
5	System Off button	The system shuts down after this button is pressed. Then all the indicators on the control box go off.
6	Exposure hand switch	Perform exposure manually. Hold down this button until you hear the prompt tone to perform exposure.

3.2.3 External devices

Conventional or laser printers can be connected to this equipment. The printers should support DICOM 3.0 protocol.

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3.2.4 Mouse

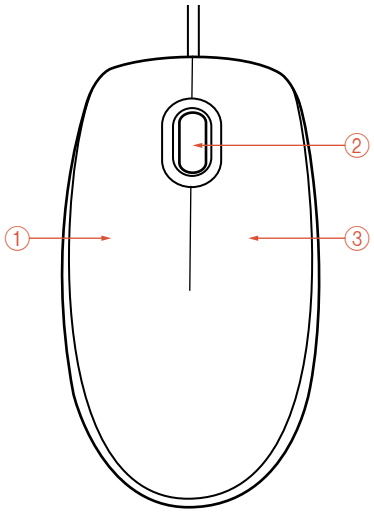


Figure 3-8 Mouse

1. Left mouse button
2. Mouse wheel
3. Right mouse button

Table 3-2 Mouse operations

Mouse button	Action	Function
Right mouse button	Click	Opening the context menu
	Hold down and drag	Zooming in or out on images
Mouse wheel	Scroll	Switching to the previous or next item
	Hold down and drag	Adjusting the window width and window level of the images
Left mouse button and right mouse button	Hold down both buttons and drag	Panning images
Left mouse button	Click	♦ Selecting an item ♦ Starting an application or function
	Hold down and drag	Quickly turning the images in a series.

3.2.5 Keyboard

The host of this system is equipped with the standard keyboard.

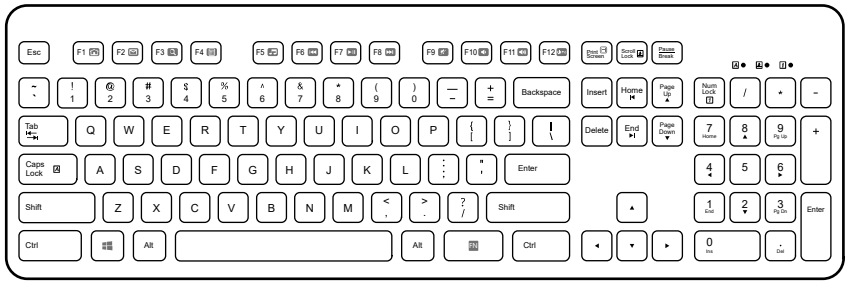


Figure 3-9 Keyboard

The keyboard is used for entering texts, numbers, and commands. Keyboard shortcuts can also be used to execute certain programs.

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4 Basic information

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4.1 Overview

In the user interface (UI) of the system software, you can use the following applications:

- Patient Administration (PA)
- Patient Registration (PR)
- Exam
- Review
- Filming

If there are two screens, the two screens can show different applications.

4.2 Interface layout

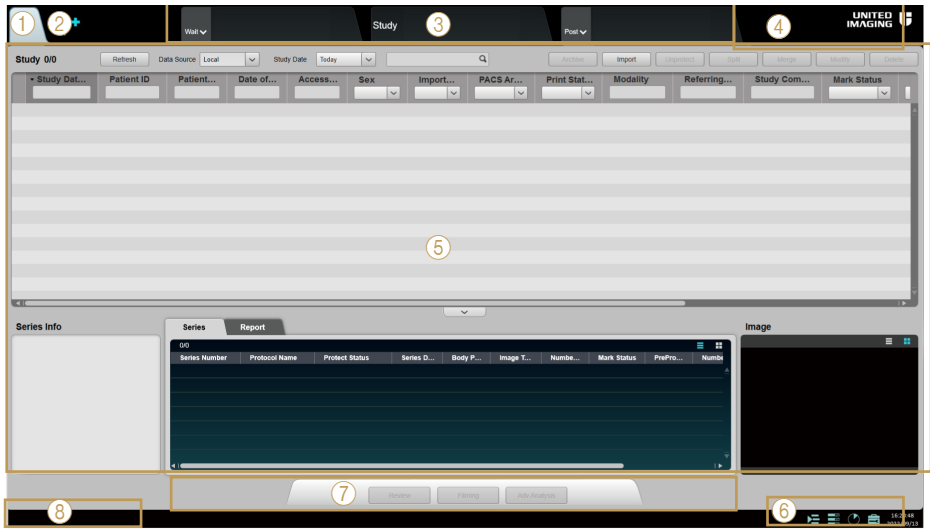


Figure 4-1 User interface areas

1. PA button
2. PR button
3. Study tab
4. UIH icon
5. Working area
6. System Status area
7. Navigation area
8. System Tools area

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4.3 Study tabs

Study tabs display the information of studies that are opened in applications.

- **Wait** tab: Displaying patients that are being registered.
- **Exam** tab: Displaying the patient that is being examined.
- **Post** tab: Displaying the studies that are being evaluated (for example image viewing and filming).

The number on the Study tab means the number of patient items.

When the patient items displayed in the Study tab exceed the limit, the first loaded patient items that are not locked will be closed automatically.

4.3.1 Showing or hiding patient items

► Click ∨ to extend the patient item list.

► Click ∧ to collapse the patient item list.

4.3.2 Closing patient items

1. Open the patient item list.
2. Click **x** of the patient item to be closed.
   - ♦ You can right-click the **Post** tab and select **Close All** or **Close Current**.
   - ♦ After all the patient items are closed, the PA interface is displayed.

4.3.3 Sorting patient items

1. Open the patient item list.
2. Drag a patient item to the target location.

4.3.4 Locking or unlocking patient items

In the **Post** tab or the **Exam** tab, you can lock or unlock patient items to avoid closing a study by mistake.

1. Open the patient item list.
   - ♦ In the **Exam** tab, there is only one patient item.
2. Click the  icon of the patient item to lock it.
   - ♦ Or right-click the patient item and select **Lock**.

3. Click the  icon of the patient item to unlock it.

   ♦ Or right-click the patient item and select **Unlock**. When you need to unlock multiple patient items, you can select **Unlock All**.

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4.4 System control and management

4.4.1 Starting up the system

Before you start:
Complete the routine function check.

► Press the System On button on the control box.

Result:

♦ The system is started up.

4.4.2 Logging on to the computer system

1. Start up the system.
   ♦ After system startup, the login interface is displayed.
2. Enter the username and password.
   ♦ In case of emergencies, select **Emergency Login**. Under such circumstances, some functions may be disabled.
   ♦ Customer service engineers can select **Service Login** and enter the service code.
   ♦ If domain users have been added, you can enter the domain name, username, and password to log in.

⚠CAUTION
Keep your username and password safe and private to prevent losing or leaking them and to prevent unauthorized operations. If there is any problem, contact UIH Customer Service Center or the system administrator.

3. Click **Login**.
   ♦ Change the password after logging in for the first time.

ⓘ
- **The interface displayed for users with different permissions may be different.**
- **Only one user account is allowed to log on to the system at a time. To log in to another account, log out first or switch account.**

4. Run system self-test.
   ♦ You can perform scans only after the self-test is passed.
   ♦ Contact UIH Customer Service Center if the self-test fails.

4.4.3 Restarting the system

Before you start:

- Make sure that there is no scan in progress.
- Make sure that data of the completed scans have been saved.

1. Click the UIH icon at the top right corner of the interface.
2. Select **Restart System**.
3. Confirm system restart.

4.4.4 Shutting down the system

Before you start:

- Make sure that there is no scan in progress.
- Make sure that data of the completed scans have been saved.

NOTICE
♦ Follow the instructions in this manual to shut down the system. ♦ Do not forcibly power off the system during normal operation. Otherwise, the system may be damaged.

Users should shut down the system once a week.

1. Click the UIH icon at the top right corner of the interface and select **Shutdown**.
2. Confirm that the system has been shut down.

4.4.5 Locking the screen

If you need to leave the console temporarily or if you will not be using the system for a while, the screen should be locked. To resume where you left off, unlock the screen.

⚠CAUTION
The user should lock the screen when leaving the control table for a while.

1. Click the UIH icon at the top right corner of the interface.
2. Click **admin_u** > **Lock**.
   - ♦ The **admin_u** here refers to the username of the current account.

Result:

- ♦ The screen is locked and your work remains as you left it.

What to do next:

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To resume where you left off, enter the username and password to log on.

4.4.6 Account management

Administrators can go to the Service interface and manage accounts. For example, they can perform the following operations:

- Add accounts
- Delete accounts
- Modify user group permissions.

4.4.6.1 Switching accounts

More than one user accounts can be created, but only one account can be used at a time. To log in to another account, you can switch the account.

1. Click the UIH icon at the top right corner of the interface.
2. Click **admin_u** > **Change User**.
   - ♦ The **admin_u** here refers to the username of the current account.
3. Enter the username and password in the opened login window.
4. Click **Login**.

- ♦ **One account may belong to several user groups. In this case, the user is given all the permissions of the user groups that contain this account.**
- ♦ **Accounts in the same user group have the same permissions.**
- ♦ **If the new account (account A) and the previous one (account B) belong to different user groups, after switching the account, patient information in archiving, filming or other tasks performed by account B will be invisible to account A.**

4.4.6.2 Logging off

When you have finished operation or when you need to switch account, you can log off.

1. Click the UIH icon at the top right corner of the interface.
2. Click **admin_u** > **Log Off**.
   - ♦ The **admin_u** here refers to the username of the current account.
3. Confirm logging off.

Result:

- ♦ The user login interface appears.

4.4.7 Setting data permissions

When user access control is turned on, you can change the user group settings for data.

1. Select a study, click the right mouse button, and select **Modify User Group**.
   - ♦ You can select more than one study of the same user group to modify their user group setting at the same time.
   - ♦ When studies of different user groups are selected, the menu item **Modify User Group** is unavailable.
2. In the **Modify User Group** window, set the user group of the study.
   - ♦ For the users without the permission to edit user groups, user group settings are read-only.
3. Click **OK**.

4.4.7.1 User group setting of imported data

New studies that are imported from external sources such as CD/DVD, USB, and PACS are added to the user group of the current user by default.

New studies that are imported from local folders are added to the user group of the current user by default.

4.4.7.2 Viewing data of other user groups

If you need to view the data of other user groups, you have to create a new user group.

Take the user groups Admin_u and User_u as an example.

1. In the Service interface, select **Configuration** > **User/Group Management** > **Groups**.
2. In the **Groups** window, click **Add** to add a new user group.
   - ♦ You can name it as View_Patient_Data.
3. Add the View Patient Data permission for this user group.
4. Return to the **Users** window, edit each user of the user groups Admin_u and User_u.
   a. Select a user and click **Edit**.
   b. In the **Edit User** window, add the View_Patient_Data user group for it.

Result:

- ♦ Users of the user groups Admin_u and User_u all belong to the user group View_Patient_Data and can view the data of scans performed by each other.

4.4.8 Opening the Service interface

In the user interface, you can use the system menu at the upper right corner to open the Service interface.

1. Click the UIH icon at the top right corner of the interface.

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2. Select **Service**.

Scenario	Description
User access control is turned on.	The Service interface is opened.
User access control is turned off.	Enter the service key and click **Enter** to open the Service interface. If the service key is incorrect, please contact UIH Customer Service Center.

4.4.9 Viewing the system information

1. Click the UIH icon at the top right corner of the interface.
2. Select **System Information**.
3. View system information such as the software version.

4.5 Basic operations

4.5.1 Data selection

Data that can be selected include the following items:

- Studies
- Series
- Images

A study includes multiple series. A series includes multiple images.

4.5.1.1 Selecting a single item

► Click the item with the left mouse button.

♦ The selected item is highlighted.

4.5.1.2 Selecting multiple items

1. Click the first item with the left mouse button.
2. Select multiple items.
   - ♦ To select non-consecutive items, hold down <Ctrl> and click the items to be selected one by one.
   - ♦ To select consecutive items, hold down <Shift> and click the last item.
   - ♦ To select all items, press <Ctrl+A>.

4.5.1.3 Canceling selection

► Click another item to cancel the selection of a single item.

♦ Or click any item to cancel the selection of multiple items.

♦ When you are selecting multiple items, hold down <Ctrl> and click a selected item to deselect it.

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4.5.2 Keyboard shortcuts

4.5.2.1 Common shortcuts

Table 4-1 Common shortcuts

Shortcut	Description
F1	Opening online help.
F12	Resetting to the default window width and window level.
Esc	Exiting the currently activated function.
PRINTSCREEN	Capturing a screenshot.
Delete	Deleting the selected items.

4.5.2.2 Shortcuts in the PA interface

Table 4-2 PA shortcuts

Shortcut	Description
F8	Modifying the selected study.
F9	Protecting or unprotecting the selected study.
F5	Refreshing the page or list.
↓	Selecting the next object of the same level. ♦ Object: Rows or images.
↑	Selecting the previous object of the same level. ♦ Object: Rows or images.
Shift + left mouse button	Hold down <Shift> and click two objects to select multiple objects of the same category (studies, images, series, etc.).
Shift + ↓	Extending the selection of items at the same level downwards.
Shift + ↑	Extending the selection of items at the same level upwards.
Ctrl + left mouse button	Hold down <Ctrl> and click multiple objects to select multiple objects of the same category.
Page Up	Turning to the previous page.
Page Down	Turning to the next page.
End	Moving the slider of the horizontal scroll bar to the right end or turning to the last page.
Home	Moving the slider of the horizontal scroll bar to the left end or turning to the first page.

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4.5.2.3 Shortcuts for image viewing

Shortcuts for image viewing

Table 4-3 Common shortcuts for image viewing

Shortcut	Description
F3	Sending the selected images to Filming.
Alt	When drawing an ellipse or rectangle, hold down <Alt> to draw a perfect circle or square.
Space	Switching between selecting one image and selecting the entire series.

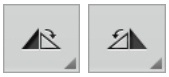
4.5.3 Common tools

4.5.3.1 Image viewing tools

Table 4-4 Common image viewing tools

Button	Function	Description
	Selecting objects or turning pages	♦ Click to select images or series. ♦ Drag the mouse upward or downward to turn pages. When you move the mouse up, the image number becomes smaller. When you move the mouse down, the image number becomes larger. ♦ The faster the mouse is moved, the more images are scrolled through.
	Panning images	Hold down the left mouse button and drag in any direction to pan the image.
	Zooming in or out on images	♦ Hold down the left mouse button and move the mouse up or down to zoom in or out. ♦ The zoom factor can be set between 0.10 and 15.00.
	Resetting the window width and window level	Setting the window width and window level of the selected image to the initial values.

Table 4-5 2D image viewing tools

Icon	Function	Description
	Magnifying ROI	Adjusting the size of a rectangular ROI to fit the window.
	Magnifier	♦ Zooming in on a circular area where the mouse cursor passes. ♦ You can configure the diameter and magnification factor of the circular area.
	Inverting color	Inverting the color display of the selected image.
	Rotating clockwise or counterclockwise by 90°	Rotating the selected image clockwise or counterclockwise by 90°.
	Flipping horizontally or vertically	Flipping the selected image horizontally or vertically.

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4.5.3.2 Image annotation and measurement tools

Table 4-6 Annotation and measurement tools for 2D images

Icon	Function	Description
	Pixel lens	Displaying the coordinates and pixel value of the location of the crosshair in real time. Click on the image to leave a marker for the coordinates and pixel value.
	Circle	Drag the mouse to draw a circular ROI.
	Rectangle	Drag the mouse to draw a rectangular ROI.
	Freehand ROI	Drag the mouse to draw a free curve, or click on the image to specify the points of a polyline. Double-click to finish drawing. ♦ Note: While drawing, hold down <Ctrl> and move the cursor back along the curve or polyline to erase the drawn lines. After the graphic is generated, place the cursor near the graphic and draw a curve to cut inwards or expand outwards.
	Ellipse	Drag the mouse to draw an elliptic ROI.
	Line measurement	Draw a line on the selected object to measure the distance.
	Angle measurement	Draw an angle on the selected object to measure the angle.
	Text annotation	Add comments on the selected object.
	Arrow text	Hold down the left mouse button and drag the mouse to draw a line with arrow. You can add comments. The arrow is at the end where the mouse is released.

Icon	Function	Description
	Deleting all graphics	Deleting all the graphics on the selected object.

4.5.3.3 Image saving and transfer

Image saving and transfer

Table 4-7 Saving images and screenshots of the Image Display area

Button	Function	Description
	**Save Image**	♦ Saving the selected images as a new series. ♦ Shortcut: <Ctrl+S>.
	**Save Display**	♦ Saving the screenshot of the Image Display area as a new series. ♦ Shortcut: <Ctrl+D>.

Sending to Filming

Button	Function	Description
	**Send to Film (Image)**	Sending the selected images to Filming. ♦ Shortcut: <F3>.

4.5.4 Online help

The online help provides detailed instructions on how to operate the software system. You can open it by pressing <F1>.

4.5.5 Workflow of reading films

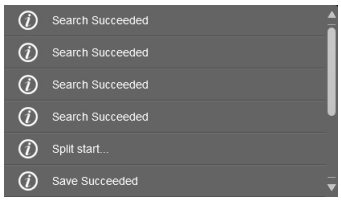
1. Select patient data from the PA interface and click **Review**.
2. View and edit the images, obtain statistics, and send images or screenshots of the Image Display area to Filming and Report.
3. Click **Filming**. Set the film layout, preview the films, and print the films.
4. Return to the PA interface to select the data of the next patient.

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When the patient items displayed in the Study tab exceed the limit, the first loaded patient items that are not locked will be closed automatically.

4.6 System status information

The system status bar displays the key information of the system and applications. You can open the system status list by clicking the system status bar.



Different colors indicate different information levels.

- Red: Error messages.
- Yellow: Warning messages.
- White: Status notifications.

♦ For some error messages or confirmation messages, you can click them to show details and further operations.

♦ Messages indicating severe problems will be repeatedly displayed in a scrolling manner.

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4.7 System tools

4.7.1 Task Manager

You can view and manage tasks such as printing tasks and archiving tasks in the Task Manager. The tasks can be paused, restarted, deleted, etc.

4.7.1.1 Management of printing tasks

You can manage printing tasks on the **Print** tab page of Task Manager.

Table 4-8 Management of printing tasks

Button	Function
Pause	Pausing a pending task.
Restart	Restarting a failed task.
Delete	Deleting a pending, completed, or failed task.
Urgent	Making a task urgent with high priority.
Refresh	Refreshing the status of all tasks in the window.
Transfer	Transferring a task to another printer.
Display Completed	Displaying completed tasks.

4.7.1.2 Management of archiving tasks

You can manage archiving tasks on the **Archive** tab of the Task Manager.

Table 4-9 Management of archiving tasks

Button	Function
Pause	Pausing a task in progress or a pending task.
Cancel	Canceling a task in progress or a pending task.
Restart	Restarting a failed task.
Restore	Resuming a paused task.
Delete	Deleting a pending task.
Emergency	Making a task an emergency with the highest priority.
Suspend	Pausing the selected task and the subsequent tasks that will be archived to the same node.
Display Completed	Displaying completed tasks.
Refresh	Refreshing the status of all tasks in the window.

- **Do not pause during the archiving to optical discs.**
- **Archiving to USB devices or PACS can be suspended or paused.**
- **If the archiving is stopped unexpectedly, the task will be resumed after the software is restarted.**

- Possible reasons for archiving to be interrupted: Network disconnection, shutting down or restarting the software system during archiving, removing the USB device during USB archiving, unexpected power failure of the host, etc.
- Scenario where archiving can be restarted automatically: Shutting down or restarting the software system during archiving.
- Scenario where archiving cannot be restarted automatically: If the task is "Canceled" or "Failed" when the system is shut down or restarted, you need to start the archiving again manually after the software system is restarted.

4.7.2 Protocol Editor (XPET)

You can use the Protocol Editor to manage and edit the exam protocols, add protocols or procedures, modify the preset parameters of protocols, and configure the favorite procedures, default procedure, template management, and data management.

When you have not logged in, you can only view the structure and parameters of protocols and cannot edit them.

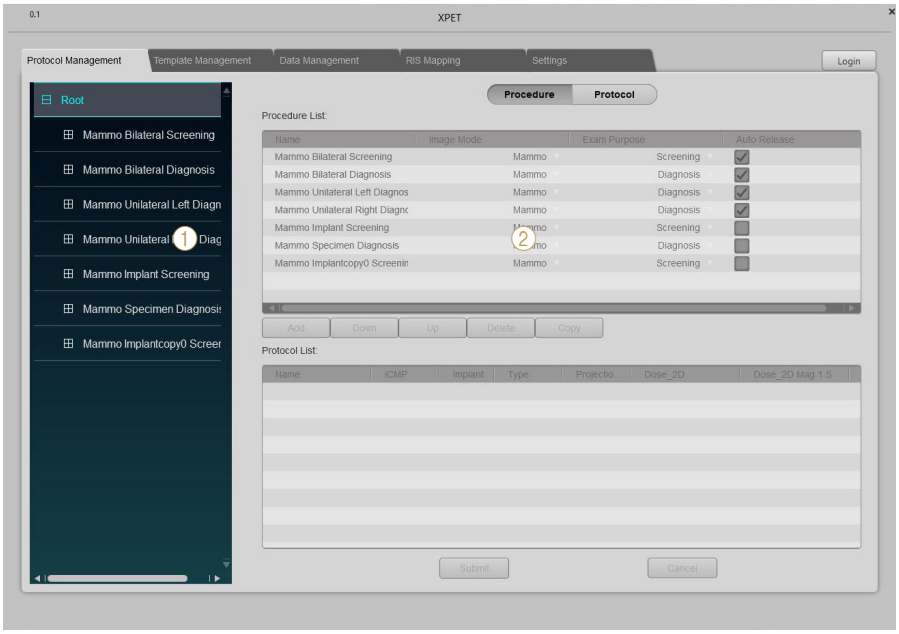
4.7.2.1 Opening Protocol Editor

Protocol Editor cannot be used during exams.

1. Click the **Protocol Editor** icon .
   - When user access control is off, you need to enter the username and password to log on to the Protocol Editor.
   - When user access control is on, you can open Protocol Editor directly by clicking Login if you have the permission.
2. Edit the protocols in Protocol Editor.

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4.7.2.2 Protocol Editor interface



No.	Name	Function
1	Protocol management list	♦ Displaying procedures or protocols. ♦ You can expand a procedure by double-clicking the selected procedure or clicking the + button in front of the procedure.
2	Protocol Management area	In the Protocol Management area, you can switch between procedures and protocols by clicking the procedure button or the protocol button.

Editing procedures

Adding procedures

1. Click **Procedure** in the Protocol Management area to show the procedure editing mode.
2. Click **Add** to open the editing window.
3. Edit the procedure name in the procedure information area. Select the exam purpose and the image mode.
   - ♦ The protocol list displays the detailed information of protocols in the procedure, for example names, intelligent compression, and dose information.
   a. Click **Add Protocol** or **Remove Protocol** to add or delete protocols in the procedure.
   b. Click **Up** or **Down** to adjust the sequence of protocols.
4. Click **Submit** to save and complete the settings of the new procedure.

Adjusting procedures

1. Click **Procedure** in the Protocol Management area to show the procedure editing mode.
2. Select a procedure and click **Up** or **Down** to move it up or down.

Deleting procedures

1. Click **Procedure** in the Protocol Management area to show the procedure editing mode.
2. Select the procedure that you want to delete and click **Delete**.

Copying procedures

1. Click **Procedure** in the Protocol Management area to show the procedure editing mode.
2. Select the procedure that you want to copy and click **Copy**.

Editing protocols

Adding new protocols

1. Click **Protocol** in the Protocol Management area to switch to the protocol editing mode.
2. Click **Add** to open the editing window.
3. Select the protocol.
4. Edit the protocol name, application type, algorithm, and dose information in the protocol information area.
5. Set the view of the new protocol in the view information area.
6. Click **Submit** to save and complete the settings of the new protocol.

Deleting protocols

1. Click **Protocol** in the Protocol Management area to switch to the protocol editing mode.
2. Select a protocol, and click **Delete**.
3. In the dialog box, click **Yes**.

Copying protocols

1. Click **Protocol** in the Protocol Management area to switch to the protocol editing mode.

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2. Select a protocol, and click **Copy**.
   - ♦ For the new protocol, you can choose whether to select intelligent compression and whether to modify the Mammo dose and the Mammo algorithm.

4.7.2.3 Template management

Dose information management

Adding dose information

1. Click the **Dose Info** tab.
2. Click **Add**.
   - ♦ Dose information is added.
3. In the dose information area, you can edit the added dose information, including name, filtration, acquisition mode, and dose level.
4. Click **Submit** to save the settings of the new protocol.

Copying dose information

1. Click the **Dose Info** tab.
2. Select the target dose information, and click **Copy**.
3. Edit the dose information, including name, filtration, acquisition mode, and dose level.

Deleting dose information

1. Click the **Dose Info** tab.
2. Select the target dose information, and click **Delete**.
3. In the dialog box, click **OK**.

Checking views

► Click the **View Information** tab to check information on the existing views.

Algorithm templates

You need corresponding permissions to edit the algorithm templates. You can perform the following operations on algorithm templates:

- ■ Import or export the algorithm template.
- ■ View the parameters of the algorithm template.
- ■ Modify the parameters of the algorithm template.

4.7.2.4 Data management

Importing or exporting protocols

1. Click **Data Management**.
2. Import or export protocols.

Action	Description
Click **Import**	Select the files to be imported.
Click **Export**	Select the files to be exported.

Backing up data

1. Click **Data Management**.
2. In the **Backup** area, back up data.

Action	Result
Click **Backup User Data**	User data are saved to the local disk.
Click **Backup Clinical Data**	Clinical data are saved to the local disk.

Restoring data

There is only one clinical database and one factory database, so there is no need to choose the target database. To select a different database, select the target database from the drop-down list of the databases and click Backup.

1. Click **Data Management**.
2. In the **Date Restoration** area, select the database for which you want to restore the backup.

Action	Result
Click **Restore Clinical Data**	The clinical database is restored
Click **Restore Factory Data**	The factory data are restored
In the drop-down list of **Select a backup file to be restored**, select the database to be restored. Click **Restore User Data**.	The backed up database is restored

4.7.2.5 Managing RIS mapping

1. Click the **RIS Mapping** tab.
2. Click the RIS Key of the procedure.
3. Modify the RIS Key in an editable state.
4. Click **Submit**.

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- To restore the previous mapping between the procedures and the RIS Keys, click **Import** and select the backup file.
- To export the current mapping between the procedures and the RIS Keys for backup, click **Export**, select the path, and enter the file name.

4.7.2.6 Settings

On the settings tab page, you can set your favorite procedures, the projection views, the password, and the settings for Combo.

- The language setting is only effective for names of algorithm templates.
- For Combo, you can choose to turn 2D synthesis on or off. When2D synthesis is turned on, an additional synthesized 2D image will be generated automatically.

Procedure management

The **Protocol Management** includes the list of favorite procedures, the procedure list, and the default procedure. The procedure list includes all procedures.

Adding items to the default procedure

In emergency registration, the default procedure will be loaded automatically to the Exam interface.

1. Select an item from the procedure list.
2. Click >> to add it to the default procedure.
3. Click **Submit**.

Adding favorite procedures

1. Select an item from the procedure list.
2. Click << to add it to the list of favorite procedures.
3. Click **Submit**.

Deleting favorite procedures

1. Select an item from the list of favorite procedures.
2. Click >> to remove it from the list of favorite procedures.
3. Click **Submit**.

Deleting items from the default procedure

1. Select a protocol from the default procedure.
2. Click << to remove it from the default procedure.
3. Click **Submit**.

Setting the projection view

1. Click the **Protocol Editor** button  to open the Protocol Editor.
2. Click **Setting**.
3. Click **Projection View**.
4. Select the target projection view and enter the angle.
   - The angle should be within 0°–60°.

Managing passwords

Before you start:
You can change the login password of the Protocol Editor when the user access control is not turned on.

1. In **Old Password**, enter your current password.
2. In **New Password**, enter your new password.
3. In **Confirm Password**, enter your new password again.
4. Click **OK**.

4.7.3 Disk space

4.7.3.1 Disk state

The system monitors the available disk space. It notifies you by showing the disk space manager icon in different colors when the available disk space is low.
Table 4-10 Disk state

Icon	Available disk space
Yellow icon	≥ 5% and < 10%
Red icon	< 5%

When the system warns about insufficient disk space, the user needs to clean up the disk. If automatic clean-up is turned on, the system will clean up the disk automatically

4.7.3.2 Cleaning up data manually

To avoid saving failure due to lack of disk space, data should be cleaned up on a regular basis. You can set the rules for auto clean-up in the Service interface. If auto clean-up is not turned on, the system will prompt you to clean up the disk when the used disk space of the system reaches the preset threshold.

1. In the pop-up warning dialog box, click **Delete**.

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♦ Or click the disk space manager icon  .

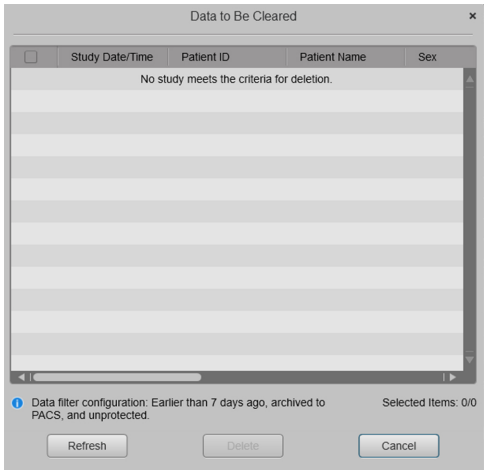


Figure 4-2 List of data to be cleared

2. Select the data that need to be deleted and click **Delete**.
   ♦ You can cancel it during the process.

What to do next:
Check the available disk space. If necessary, delete more data.

4.7.4 Toolbox

The toolbox  is at the bottom right corner of the interface, including mini tools, service tools, and other tools.

- Mini tools: Small tools that are commonly used.
- Service tools: Tools that are related to problem-solving or system checks.
- Other tools: The configuration panel, which is used to adjust configurations related to system operations.

4.7.4.1 Calculator

1. Click the **Calculator** icon.
2. Click buttons to calculate the result.

4.7.4.2 Recording screen

1. Click the **Screen Recorder** icon  .
2. In the **Screen Recording** window, select the recording range.
   ♦ **Full Screen**: Recording the entire screen.
   ♦ **Window**: Recording the currently active window.
3. Select whether to record voice.

a. Select **Record Audio** to record voice from the microphone while recording the screen.

b. Click **Volume**, check the state of the microphone, and adjust the volume based on actual needs.

4. Click **Start**.
5. Press <Shift+Esc> to pause the recording.
   - ♦ If you need to continue the recording, click **Continue**.
   - ♦ If you need to stop and save the recording, click **Save**.

4.7.4.3 User folder

You can click the **User Folder** icon  to open the **User Folder** window and manage folders.

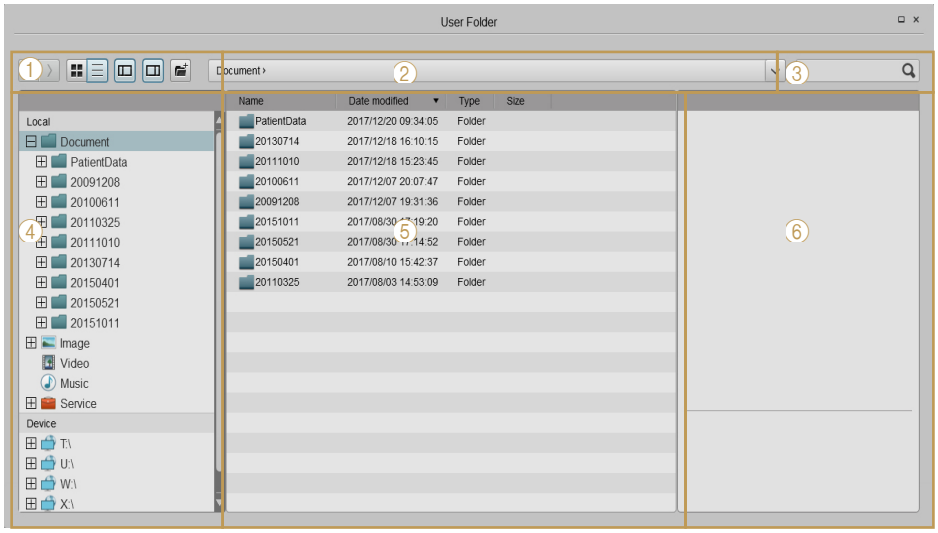


Figure 4-3 User folder

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No.	Name	Description
1	Toolbar	♦  : Switching display mode (image mode or list mode). ♦  : Showing or hiding the navigation area. ♦  : Showing or hiding the preview area. ♦  : Creating a new folder.
2	Folder path	Displaying the folder path.
3	Search box	Enter keywords to search the data.
4	Navigation area	Displaying all the folders.
5	List area	♦ Displaying the contents of the selected folder. ♦ You can copy, cut, paste, delete, or rename the selected file or folder by using the context menu.
6	Preview area	Previewing the selected images.

4.7.4.4 Recorder

You can use the recorder to record the Auto Voices used during exams.

1. Click the **Recorder** icon .
2. In the **Record Settings** window, create and record the audio.
   - ♦ Manage and record the Auto Voices based on the language and types.
     - ♦ **Pre**: Auto Voices to be played before the scanning.
     - ♦ **Post**: Auto Voices to be played after the scanning.
3. Optional: After selecting the type, click **Import** to import recorded Auto Voices from the user folder.

4.7.4.5 Remote Assistance

Functions

uRemoteAssistant is intended for remote support and service, but not intended for remote diagnosis or imaging viewing.

⚠CAUTION
Do not use the remote monitor for diagnosis during remote assistance.

uRemoteAssistant can be used in the following scenarios:

- Radiologic technologists request senior colleagues to remotely assist them with the examinations.
- Radiologists assist radiologic technologists in modifying the scanning plans.
- Customer training engineers remotely operate the equipment that is at the customer site during the trainings.
- Customer service engineers provide remote services such as troubleshooting and collecting logs with user approval.
- Other scenarios that require remote access.

uRemoteAssistant consists of a remote side and a local side.

- The local side can only be run on the host of a UIH imaging equipment (license required). Local users can request assistance and share desktop. The local side is included in the factory configuration. You do not need to install it.
- Remote users provide assistance by accessing the local desktop through the remote side. If remote users need to run the remote side on a computer that is not part of a UIH imaging equipment, uRemoteAssistant needs to be installed.

The local side or the remote side can only be involved in one connection at one time. To join a new connection, you have to end the current session first.

Preparations for remote assistance

When the local user and remote user both use the host of a UIH imaging equipment, they need to start the local side or remote side by clicking **Tools** > **Service Tools** > **Request Assistance** or **Tools** > **Service Tools** > **Provide Assistance**.

Remote users such as customer training engineers, customer service engineers, radiologists, or senior radiologic technologists can install the remote side on a computer that is not part of a UIH imaging equipment. To install the remote side, open the browser and enter `https://solar.uihcloud.cn/api/v1/resources/download/remote-assistant` in the address bar. Press <Enter> and the installation file is downloaded automatically. Double-click the file to start it.

Workflow

The basic workflow of remote assistance is as follows.

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Step	Local user	Remote user
Starting the session	Click **Request Assistance** and select the connection mode. Send the access code and IP address to the remote user.	N.A.
Establishing the connection	N.A.	♦ Host of UIH equipment: Click **Provide Assistance**. Enter the IP address of the local side and the access code. Click **Connect**. ♦ Other computers: Double-click `uRemoteAssistant.exe` to run it, enter the IP address of the local side and the access code, and click **Connect**.
	Accept the request for remote control.	N.A.
Remote assistance	Monitor the remote assistance to guarantee the system safety and data security. When necessary, operate the system according to the instructions of the remote user.	Provide assistance remotely.
Ending the connection	Complete the task and end the connection. Or end the connection in case of abnormal situations.	Complete the task and end the connection.

Requesting assistance on the local side

To receive remote support, training, instructions, or service, you can use the local side to request assistance.

During remote assistance, you should keep monitoring the actions of the remote user.

1. At the bottom right corner of the user interface, click **Tools** > **Service Tools** > **Request Assistance** to acquire the access code and local IP address.
2. Send the access code and IP address to the remote user and select the connection mode.

Connection mode	Description
View Only	The remote user can only view the screen display.
Full Access	Both the local user and the remote user can control the system.
Direct Login	The remote user can directly access the system using a username and a password. Authorization from the local user is not needed. This mode is suitable for situations where the local side is unattended. ♦ Without time limit on authorization: Access is allowed at any time. ♦ With time limit on authorization: You should select the start time and end time. Access is allowed only during the defined time range.

- ♦ In the direct login mode, the toolbar on the local side is minimized and shows the state of the remote assistance.
  - ♦ Ready for connection: The remote side can connect the local side directly, without time limit on authorization.
  - ♦ Not started: There is time limit on authorization and the authorization has not started yet.
  - ♦ Countdown: There is time limit on authorization and the authorization has already started. The countdown indicates when the authorization ends.
- ♦ The user on the local side can view information of the local side by placing the cursor on the icon of the minimized toolbar.

3. Wait for the connection request from the remote user. Click **Yes** to accept the request.
   - ♦ Connection is established.
4. Optional: After the connection is established, you can change the connection mode.



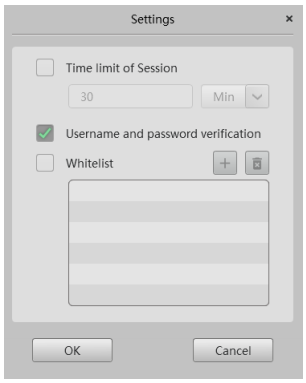
5. Monitor the actions of the remote user.
   - ♦ The local user must monitor the actions of the remote user throughout the remote session and be responsible for the safety of the patient. The local user must end the connection in case of abnormal situations.
   - ♦ If the network bandwidth is low, the system displays a prompt message, indicating that network is not suitable for remote connection and asking for your confirmation to end the connection.
   - ♦ You can end the connection by clicking **x** when necessary, for example, when data or system security may be undermined.
   - ♦ When the connection exceeds the predefined time limit, it will be ended automatically. In this case, you need to request assistance again.

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Configuring the local side

The local users can set the time limit, edit the white list, and activate or deactivate the verification of username and password on the local side. This helps to ensure the system safety and data security during the remote collaboration.

1. In the assistance request window, click the **Settings** icon  .



2. Optional: Select **Session Timeout** and enter the time limit.
   - ♦ When the connection exceeds the predefined time limit, it will be ended automatically. If the assisting work has not finished, you can start a new session.
3. Optional: Select **Username and Password Verification**.
   - ♦ You can select this item only when **User Access Control** is selected in the Service interface.
   - ♦ You can select the direct login mode only when this item is selected.
   - ♦ The remote user has to enter the username and password to establish the remote connection.
4. Optional: Select **Whitelist**, click **+**, and enter the IP address.
   - ♦ The remote side is allowed to request access to the local side only when the IP address of the remote side is included in the white list.

Toolbar on the local side

During the remote connection, the toolbar is displayed. Through the toolbar, you can adjust the display, check status, switch connection mode, chat, or end the remote connection.



1. IP address and account of remote side
2. Connection mode
3. Local side screen that is connected to
4. Chat
5. Extending or folding the toolbar
6. Connection Status
7. Connection time
8. Network state
9. Ending the connection

Providing assistance on the remote side

Before you start:

The remote user receives the IP address of the local side and the access code.

1. At the bottom right corner of the user interface, click **Tools** > **Service Tools** > **Provide Assistance**.
   - On non-UIH equipment, double-click the installation file of uRemoteAssistant to start the remote side.
2. Send the request for remote connection.

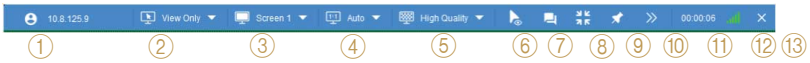
Scenario	Description
The target local side is in the list	Select the target local side, click **Connect**, and enter the access code.
The target local side is not in the list	Click **+**, and enter the **Connection Name**, **Host name or IP**, and **Access Code**.

   - You can define the **Connection Name** by yourself for easy recognition.
   - You can click  to check the software version. Unmatched software versions may result in connection failure.
3. Wait for the local user to grant the access.
   - If the direct login mode is turned on, enter the username and the password. Login will be validated automatically within the authorization time limit.
   - If a username and a password are required on the local user's side, enter the username and password, or change the user type to "Service Engineer" and enter the service key.
   - Before the local user accepts the request, functions such as changing the display quality cannot be used. The corresponding icons become unavailable.
   - If there are more than one host monitors on the local side, select the screen that you need to control.
   - If the toolbar is blocking the area that you are working on, click the **Unlock** button to float the toolbar and move it away.
4. Provide assistance. When necessary, click **Chat** to communicate with the local user in texts.
   - If the network bandwidth is low, signal transmission may keep freezing up. You can change the display quality on the toolbar for smoother transmission.
   - If the network bandwidth is very low, the connection may be interrupted. You can contact the local user for a new access code and try again.
   - If you are notified that the access code is wrong during the attempt, contact the local user for a new access code.
   - You can switch the remote access mode when necessary. Switching from the view-only mode to the full-access mode requires approval from the local user.
5. When you have finished the assistance, click **x** to end the connection.

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Toolbar on the remote side

During the remote connection, the toolbar is displayed on the remote side (which is hidden by default). Through the toolbar, you can adjust the display, check status, switch connection mode, chat, or end the remote connection.



1. IP address of local side
2. Connection mode
3. Local side screen that is connected to
4. Display mode
5. Switch display quality
6. Display or hide the mouse on the local side
7. Chat
8. Minimize
9. Lock
10. Extend or fold the toolbar
11. Connection time
12. Network state
13. End the connection

Audit trails

Operations related to remote assistance are recorded in audit trails. Events that will be recorded in audit trails are listed below.

- The remote user logging on to or logging off the system.
- Switching on or off the function of automatically ending the connection when it exceeds the time limit.
- Switching on or off the verification of username and password.
- Switching on or off the white list of IP addresses.
- Connection being automatically ended when it exceeds the time limit.
- Verification failure of username and password.

4.7.4.6 Feedback on configuration problems

By using the problem feedback function, you can export a list of problems over a period of time. The exported problem list is saved in the local disk. Only UIH customer service engineers can view the list.

1. Click the **Tools** icon .
2. Click the **Feedback** icon .
3. Enter the name of the error, phone number, and E-mail address.
4. Enter the start time.
   - ♦ The current time is entered automatically, and you can edit it.
5. Select the acquisition duration (in minutes) from the drop-down list.
6. Enter the description for the error.
7. Click **OK**.

4.7.4.7 Managing rejected protocols

You can delete or restore the rejected images in the Rejected Image Manager. Only rejected images of a completed exam can be restored.

1. Click the **Tools** icon .
2. Click the **Rejected Protocol Manager** icon .
3. Set the **Acquisition Time**.
   a. Click the **Acquisition Time** calendar.
   b. Click the calendar on the left and select the start date.
   c. Click the calendar on the left and select the end date.
   d. Click **Query**.
4. Select a reason for rejection from the **Rejection Reason** drop-down list.
   ♦ Rejected images that meet the searching conditions are displayed.
5. Select the list mode or the thumbnail mode at the top right corner.
6. Double-click the target image.
   ♦ The image is displayed in the Image Display area on the right.
7. Click **Delete Protocol** or **Restore Protocol** based on actual needs.
   ♦ You can delete all the searched images by clicking **Delete All**.

Exporting information of rejected protocol

Before you start:
Find the target rejected images through filtering.

1. Click **Export List**.
2. Select the export path in the dialog box that appears.
3. Click **Save**.
   ♦ Information on filtering, statistics, and rejection details are included.

Analyzing information of rejected protocols

Before you start:
Find the target rejected images through filtering.

1. Click the **Analysis** drop-down list.
2. Select **Procedure**, **Operator**, or **Rejection Reason**.
3. View the analysis result.
   ♦ Information on filtering, statistics, rejection details, and a bar graph of detailed rejection information are included.
4. Click **Export**.

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5. Select the export path in the dialog box that appears.
6. Click **Save**.

4.7.4.8 Configuration panel

You can open the configuration panel by clicking **Configuration Panel** to set the image properties, the image text, the film header and footer, etc.

Configuring screensaver

1. Click the **Screen Saver** icon.
2. Select **Activate Screen Saver**.
   - When user access control is turned on, the **Waiting Time** is unavailable and can only be modified in the Service interface.
3. Set the parameters.
4. Click **Save**.

Configuring image properties

1. Click the **Image Properties** icon.
2. Set the parameters.
   - **Magnifier Configuration**: Adjust the radius and magnifying level of the magnifier in the image viewing tools.
   - **Text Configuration**: Set the font size of the text annotations and set the size of the L/R marks on images.

Configuring image text

1. Click the **Image Text** icon.
2. Select the modality.
3. Select the application, for example **Review 2D**.
4. In the four areas of the window, select the information items that need to be displayed at the four corners of images.
5. Select the default font size.
6. Click **Save**.

Configuring anonymity

Patient's name, operator's name, and patient's date of birth are all hidden by default in display and archiving.

1. Click the **Anonymity Configuration** icon.
2. Click **Display** and select the items to be hidden.

3. Click **Archiving** and select the items to be hidden.

Configuring patient administration

1. Click the **Patient Administration** icon.
2. Set the time range of the studies that are displayed in the PA interface by default.
3. In **After Double-clicking Study**, select the default operation.
4. In **Patient Data Management**, select the required operation.
   - **Merge Studies from RIS**: Automatically merging studies of a same patient when data are imported from RIS.
   - **Split Studies before Archiving**: Automatically splitting studies of a same patient when data are archived to PACS.
5. Click **Save**.

Configuring patient registration

1. Click the **Patient Registration Configuration** icon.
2. Select **Enable Automatic APR Mapping**.
   - When patient information is imported from RIS for patient registration, procedures recorded in RIS are automatically converted to corresponding factory procedures of UIH.
3. Set the parameters.
4. Click **Save**.

Configuring filming

1. Click the **Filming Configuration** icon.
2. Select **Header** or **Footer** from the drop-down list.
3. Select the logo in **Logo**.

Scenario	Description
Default logo	UIH icon
Custom logo	Upload a logo file.

   - When a custom logo is selected, the header is displayed in the maximum range by default and adaptive display of the logo is supported.
4. Set **Font Size**.
5. In the **Items** area, select the items to be displayed.
6. Configure the printer.
   - If **Remember Last Used Printer** is selected, the system always uses the previous setting.

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- If **Use Default Printer** is selected, you need to select a default printer from the drop-down list.

7. Click **Save**.

Configuring measurement properties

1. Click the **Measurement** icon.
2. Set the parameters in **Graphics properties**.
   a. Select the graphic type from the **Type** drop-down list.
   b. Select the product modality from the **Modality** drop-down list.
   c. In the **Statistics** area, select the items to be displayed.
3. Select **Hover properties** and set the parameters.
   - **Hanging Type**: The type of graphics that is marked when the cursor is hovering in an image.
   - **Displaying time**: The duration of a displayed graphic when the cursor is hovering in an image.
   - **Waiting Time**: The waiting time before the lesion and statistics are marked and displayed once the cursor stops.
   - **Diameter**: The diameter of the measuring area when the cursor is hovering in an image.
4. In the **Arrow properties** area, set the color and weight of arrows.
5. In the **Pixellens properties** area, select the statistics to be displayed when you use pixel lens.
6. Click **Save**.

Configuring units

1. Click the **Unit Configuration** icon.
2. Select the units for different parameters.

> **1 kg ≈ 2.204 lbs; 1 cm ≈ 0.393 inch.**

3. Click **Save**.

Configuring default layout of image windows

1. On the configuration panel, click the **Review Layout** icon.
2. Select the default image layout.
3. Click **Save**.

Result:

- When data is loaded to the Review 2D interface, images are displayed in the default layout automatically.

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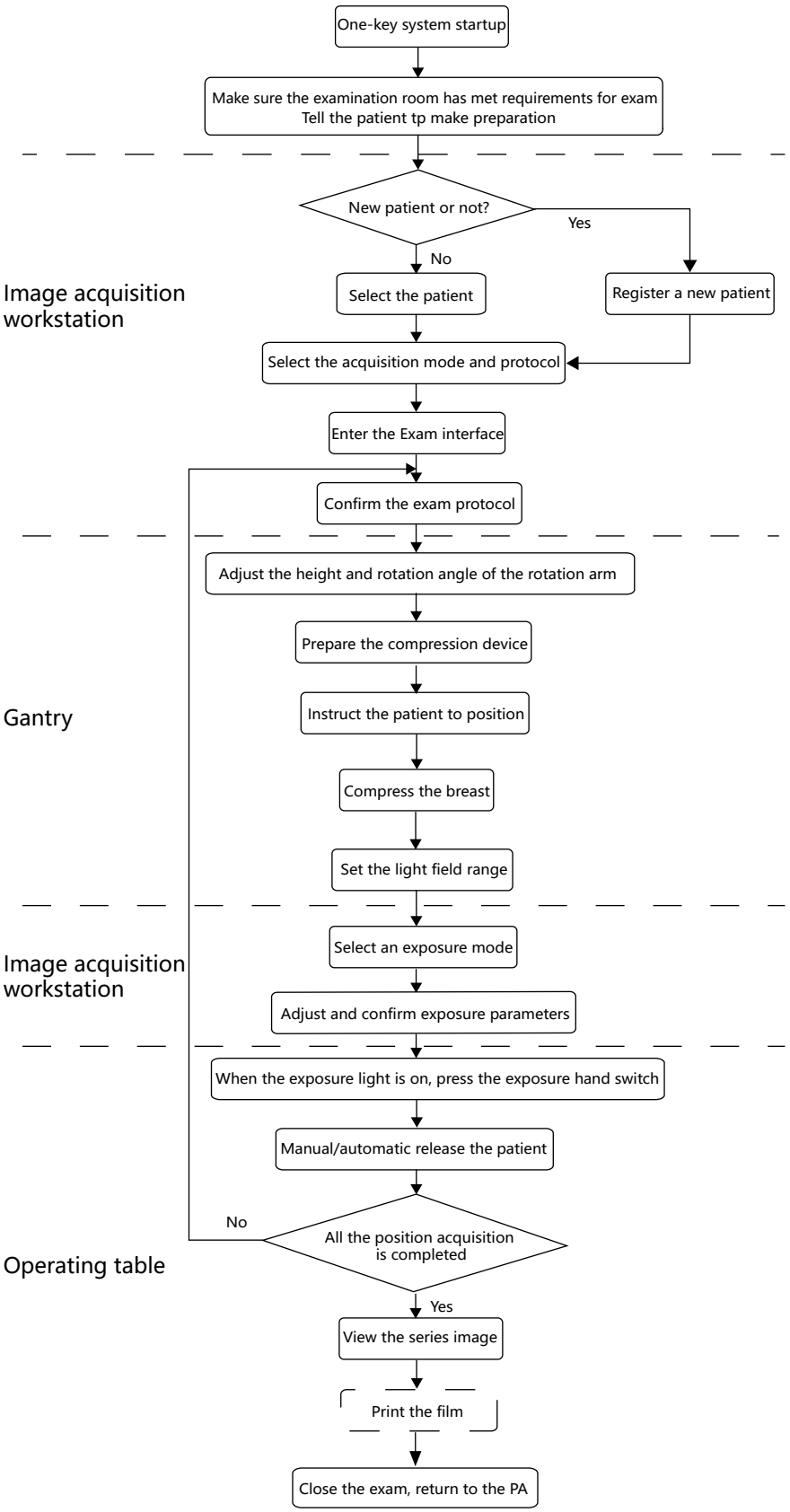
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5.1 Exam workflow



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5.2 System power-on and power-off

5.2.1 Starting up the system

Before you start:
Complete the routine function check.

► Press the System On button on the control box.

Result:

♦ The system is started up.

5.2.2 Logging on to the computer system

1. Start up the system.
   ♦ After system startup, the login interface is displayed.
2. Enter the username and password.
   ♦ In case of emergencies, select **Emergency Login**. Under such circumstances, some functions may be disabled.
   ♦ Customer service engineers can select **Service Login** and enter the service code.
   ♦ If domain users have been added, you can enter the domain name, username, and password to log in.

⚠CAUTION
Keep your username and password safe and private to prevent losing or leaking them and to prevent unauthorized operations. If there is any problem, contact UIH Customer Service Center or the system administrator.

3. Click **Login**.
   ♦ Change the password after logging in for the first time.

ⓘ
- **The interface displayed for users with different permissions may be different.**
- **Only one user account is allowed to log on to the system at a time. To log in to another account, log out first or switch account.**

4. Run system self-test.
   ♦ You can perform scans only after the self-test is passed.
   ♦ Contact UIH Customer Service Center if the self-test fails.

5.2.3 Shutting down the system

Before you start:

- Make sure that there is no scan in progress.
- Make sure that data of the completed scans have been saved.

NOTICE
♦ Follow the instructions in this manual to shut down the system. ♦ Do not forcibly power off the system during normal operation. Otherwise, the system may be damaged.

Users should shut down the system once a week.

1. Click the UIH icon at the top right corner of the interface and select **Shutdown**.
2. Confirm that the system has been shut down.

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5.3 Opening the Exam interface

5.3.1 Registering patients from RIS

► In the Patient Administration interface, select a RIS patient and double-click the study.

Scenario	Action
Protocol match with RIS has been completed.	Protocols are matched automatically and the Exam interface opens.
Protocol match with RIS has not been completed.	Select the acquisition mode and protocols, and then click **Exam** to open the Exam interface.

5.3.2 Registering local patients

⚠WARNING

The clinical protocols proposed by manufacturer and preloaded on equipment constitute recommendations to be applied directly to optimize operation, the user can set customize protocols according to their different scenarios.

1. Click the **PR** icon .
   - ♦ The Patient Registration interface is opened.
2. Enter the patient information.
3. Select protocols.
4. Click **Exam**.
   - ♦ The Exam interface is opened.

5.3.3 Registration of existing patients

5.3.3.1 Registration of existing patients

Information of pre-registered patients and patients with completed studies is recorded in the system.

There is no need to enter the information again for an existing patient. You can save time by searching for the patient information and loading it.

Registering pre-registered patients

1. Select a pre-registered study from the study list of the Patient Administration interface.
2. Double-click the study or click **New Study**.
   - ♦ Or right-click the study and select **New Study** in the context menu.

Result:

♦ The Patient Registration interface is opened.

Registering patients with completed studies

1. Select a completed study from the study list of the Patient Administration interface.
2. Click **New Study** or **Repeat Study**.
   ♦ Or right-click the study and select **New Study** or **Repeat Study** in the context menu.

Result:

♦ The Patient Registration interface is opened.

5.3.3.2 Opening the Exam interface

Before you start:
Enter all the required information in the Patient Registration interface.

1. Click **Exam**.
2. Click **Yes**.

Result:

♦ The Exam interface is opened.

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5.4 Gantry preparation

5.4.1 Adjusting the height and angle of the C-arm

5.4.1.1 Using the control buttons to adjust the height of the C-arm

1. Press the Move Up button or Move Down button to adjust the height of the C-arm.
2. Release the button.
   - ♦ The C-arm stops moving.

5.4.1.2 Using the movement control pedals to adjust the height of the C-arm

1. Step on the C-arm Up pedal or the C-arm Down pedal to adjust the height of the C-arm.
2. Release the pedal.
   - ♦ The C-arm stops moving.

5.4.1.3 Using the rotation buttons to adjust the angle of C-arm

You can use the rotation buttons to change the projection angle at any time.

⚠WARNING

Prevent personnel from getting caught between the C-arm and fixed objects near the system during adjustment of the C-arm.

1. Press the Counterclockwise Rotation button or Clockwise Rotation button to rotate the C-arm to one of the following positions.
   - ♦ Positions for counterclockwise rotation: 0°, -45°, -90°, -135°, and -150°.
   - ♦ Positions for clockwise rotation: 0°, 45°, 90°, 135°, and 180°.
   - ♦ The rotation angle is displayed on the readout display.
2. Release the rotation button.
   - ♦ The C-arm stops rotating.
3. Press the Counterclockwise Rotation button or Clockwise Rotation button again to rotate the C-arm to the next position.
4. Release the rotation button when the C-arm reaches the target position.
   - ♦ The C-arm stops rotating.

5.4.1.4 Moving to the next position

The projection angle of each exposure is preset according to the selected type of examination. When a protocol has been loaded, you can press the Move to Next Position

button to move the system to the position for the next protocol or the selected protocol. This function is not available if no protocol is loaded. It is only available when the angle of the position is within ±60° and the initial position of the C-arm is also within ±60°.

► To move the C-arm to the next preset position, hold down the Move to Next Position button, and release the button when you hear two beeps.

- ♦ The angle information is displayed on the readout display.
- ♦ You can press any button to stop the C-arm from moving to the next position.

5.4.1.5 Moving to the symmetrical position

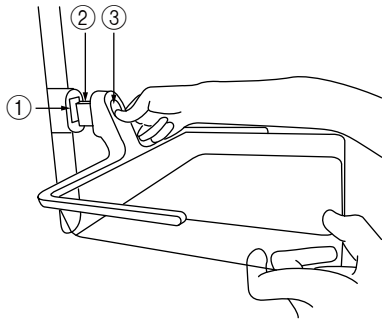
This function is only available when the angle of the position is within ±60° and the initial position of the C-arm is also within ±60°.

► Hold down the Move to Symmetrical Position button.

- ♦ If the C-arm is not in vertical position, it rotates to the symmetrical position about the vertical axis when you hold down this button.

5.4.2 Installing or removing the compression paddle

5.4.2.1 Installation assembly of the compression paddle



1. Socket
2. Paddle guide
3. Release button

5.4.2.2 Installing the compression paddle

⚠WARNING

Before installing the compression paddle, visually check if the compression paddle is deformed or cracked. Do not use a damaged compression paddle.

► Insert the paddle guide into the socket.

- ■ The compression paddle locks in place.
- ■ The radiation field and light field change according to the size of the compression paddle.

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5.4.2.3 Removing the compression paddle

1. Press the Release button of the compression paddle.
2. Pull the compression paddle out.

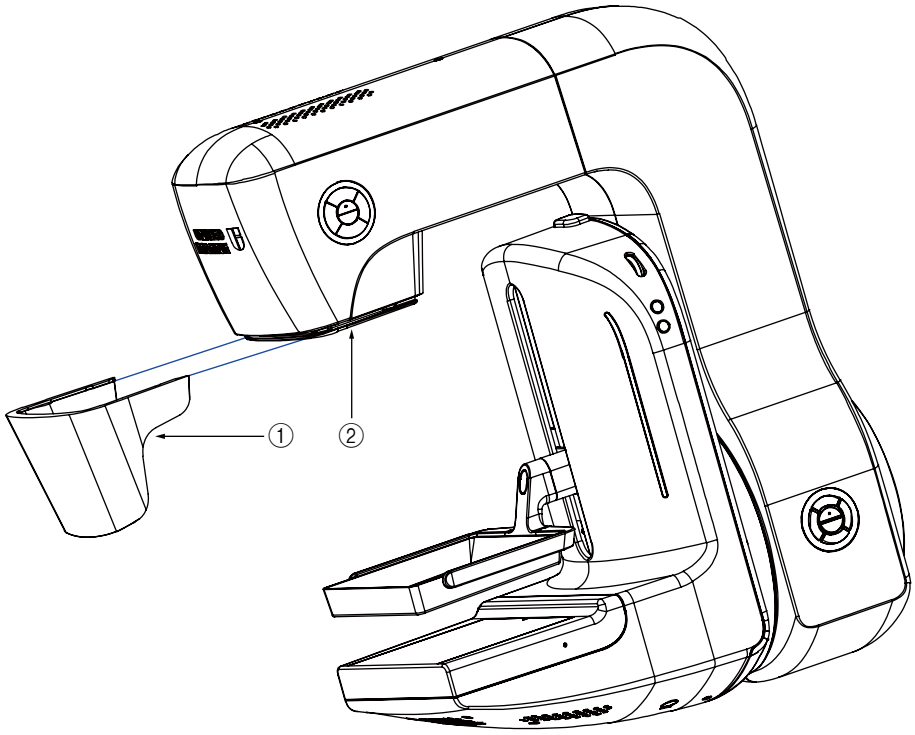
What to do next:
Place the compression paddle properly.

5.4.3 Installing or removing the face shield

5.4.3.1 Installing the face shield

The standard face shield is taken as an example.

1. Keep your hands parallel and hold both sides of the face shield.
2. Push the face shield horizontally into the slot on the C-arm till it cannot be pushed anymore.



1. Face shield
2. Slot for the face shield

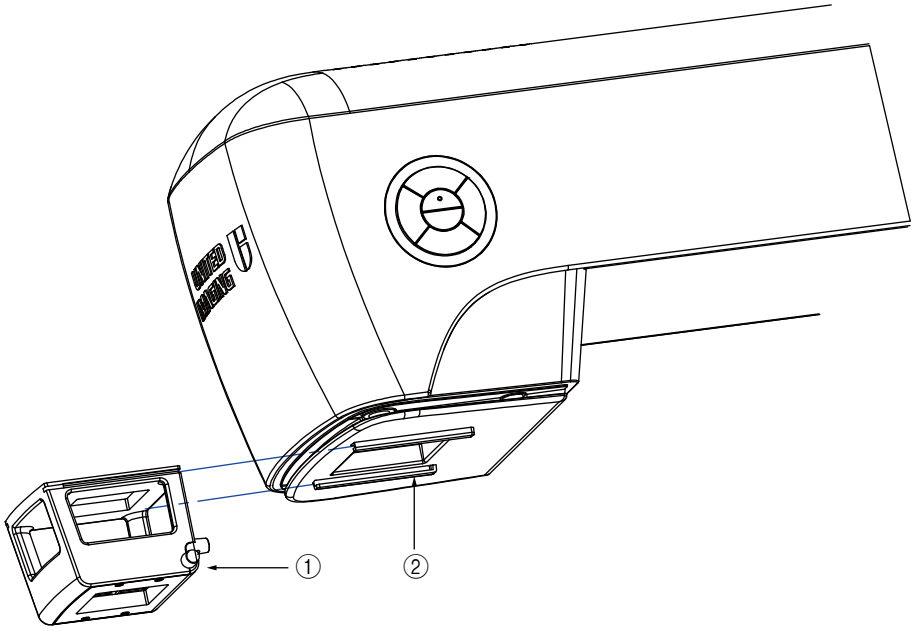
5.4.3.2 Removing the face shield

1. Hold the face shield horizontally with both hands and bend it outwards slightly.
2. Pull out the face shield along the slot.

What to do next:
Place the face shield properly.

5.4.4 Installing or removing the localization crosshair device

5.4.4.1 Installing the localization crosshair device



1. Localization crosshair device 2. Slot for the localization crosshair device

1. Remove the face shield.
2. Keep your hands parallel and hold both sides of the localization crosshair device.
3. Push the localization crosshair device horizontally into the slot.
4. Install the face shield.

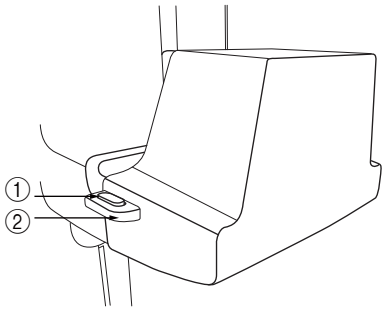
5.4.4.2 Removing the localization crosshair device

1. Remove the face shield.
2. Pull the localization crosshair device out of the slot horizontally with both hands.
3. Place the localization crosshair device safely into the storage device.
4. Install the face shield.

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5.4.5 Installing or removing the magnification table

5.4.5.1 Magnification table



1. Release button
2. Handle

5.4.5.2 Installing the magnification table

► Hold the handles of the magnification table. Place the magnification table onto the object table.

♦ After the magnification table clicks into place, release the handles of the magnification table.

5.4.5.3 Removing the magnification table

1. Hold down the release buttons on both sides of the magnification table and pull the magnification table out.
2. Place the magnification table properly.

5.4.6 Use of the light localizer

Turning the light localizer on:

- When you step on a paddle movement pedal, the light localizer is turned on automatically.
- While the compression paddle is moving down to compress the breast, the light localizer is turned on automatically.

Using the light localizer:

- When the light localizer is on, you can press the Light Localizer button to adjust the size of the light field.
- If you press the Light Localizer button when no compression paddle is inserted, the light field range is 0 cm × 0 cm.
- If you press the Light Localizer button after the standard compression paddle or spot compression paddle is inserted, the range of the light field changes in a fixed order.
- When the shifting compression paddle, magnification compression paddle, axilla compression paddle, high-edge compression paddle, or 2D biopsy compression

paddle is inserted, the size of the light field matches the size of the compression paddle. You cannot change the light field size.

Turning the light localizer off:

- The light localizer will be turned off automatically. You can change the default lighting duration. If you need to modify the lighting duration, please contact UIH Customer Service Center.
- If exposure is performed before the default lighting duration ends, the light localizer will be turned off immediately.

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5.5 Positioning the patient

1. Guide the patient to remove anything that will interfere with breast examination.
   - ♦ Remove clothes that will interfere with diagnosis.
   - ♦ Remove jewelry that will interfere with diagnosis such as earrings and necklaces.
   - ♦ Change into clothes that are convenient for examination.
2. Guide the patient to put the hands on the patient armrest so as to reduce patient movement.

5.6 Compression or release

NOTICE
After compression, ask the patient not to move during image acquisition, so as to avoid misdiagnosis or increase in radiation dose.

Calibrate and test the accuracy of compression force regularly, so as to avoid patient injury caused by inaccurate compression force. For detailed operations, please contact the UIH Customer Service Center.

Compression force and thickness will be displayed on the readout display in real time. During compression, the light localizer will be turned on automatically.

Once the compression paddle touches the breasts, the downward movement of the compression paddle becomes slower.

Operators should be trained to operate under special circumstances such as presence of implants.

Please adjust the compression force for compression or release:

- When there is no compression force, exposure is not allowed.
- When the compression force is less than 15 N, the breasts may move and the image quality may be affected.
- When the compression force is more than 20 N, the height and angle of the C-arm cannot be adjusted.

5.6.1 Intelligent compression

Do not use intelligent compression when the patient is carrying implants, and the AEC mode for exposure should be used with caution.

1. Turn intelligent compression on in the Exam interface.
2. Step on the Paddle Down pedal. The compression stops automatically when the compression force and paddle position are appropriate.
3. To continue the compression, first release the Paddle Down pedal to disable intelligent compression and then step on the pedal again.

5.6.2 Using pedals for compression or release

1. Step on the Paddle Up pedal or Paddle Down pedal to move the compression paddle up or down.
2. Release the pedal.
   - ♦ The compression paddle stops moving.

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5.6.3 Using the compression paddle adjustment thumbwheel

NOTICE
Rotate the adjustment thumbwheel carefully and slowly to avoid patient discomfort caused by excessive compression force.

► Rotate the compression paddle adjustment thumbwheel down to slowly move the compression paddle down for compression. Or turn the thumbwheel up to slowly move the paddle up for release.

5.7 Performing exposure

5.7.1 Confirming the exposure parameters

⚠CAUTION

Before exposure, check whether the exposure parameters meet the clinical requirements. Adjust any inappropriate parameters in time. Otherwise, the patient may be exposed to excessive radiation dose due to repeated exposure.

When cleavage mammography (CV position) is selected, you need to use physical markers to mark the left and right breasts before the examination so that the left and right breasts can be distinguished easily during image viewing.

1. Check whether the acquisition information is correct in the Exam interface.
2. Adjust the exposure parameters.
   - ♦ For tomosynthesis, set the rotation angle of the C-arm.

Result:

- ♦ When the system is ready for exposure, the X-ray exposure indicator turns green.

5.7.2 Exposure prompt

5.7.2.1 Mammo mode

- ■ AEC mode

  Hold down the Exposure button until you hear two beeps. Then release the Exposure button to complete the exposure.

- ■ Manual mode

  Hold down the Exposure button until you hear one beep. Then release the Exposure button to complete the exposure.

5.7.2.2 Tomo or U-View mode

The number of short exposure prompt tones varies in different scanning modes. FastScan mode: 15 beeps. HDScan mode: 21 beeps.

- ■ AEC mode
  - ♦ You will first hear the pre-exposure prompt tone when the C-arm is at the 0° position.
  - ♦ When the C-arm rotates to the starting position of the scan, there will be a series of short beeps.
  - ♦ Release the Exposure button after the prompt tone ends. The exposure is completed.
- ■ Manual mode: When the C-arm rotates to the starting position of the scan, there will be a series of short beeps.

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5.7.2.3 Combo mode

The number of short exposure prompt tones varies in different scanning modes. FastScan mode: 15 beeps. HDScan mode: 21 beeps.

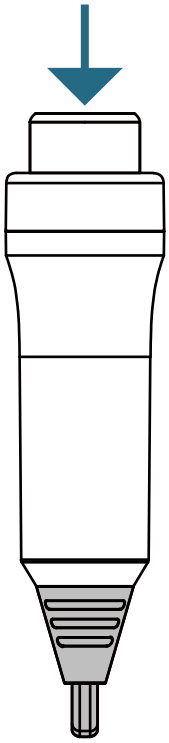
- AEC mode
  - You will first hear the pre-exposure prompt tone when the C-arm is at the 0° position.
  - Then you will hear the exposure prompt tone of the Mammo mode when the system enters the Mammo acquisition mode.
  - When the system enters the Tomo acquisition mode and the C-arm rotates to the starting position of the scan, there will be a series of short beeps.
- Manual mode
  - You will first hear the exposure prompt tone of the Mammo mode when the C-arm is at the 0° position.
  - When the C-arm rotates to the starting position of the scan, there will be a series of short beeps.

5.7.3 Using the exposure hand switch

⚠WARNING

If the exposure hand switch remains half-pressed for a long time, the X-ray tube may overheat and the service life of the tube may be reduced.

1. Half-press the Exposure button to prepare for exposure.



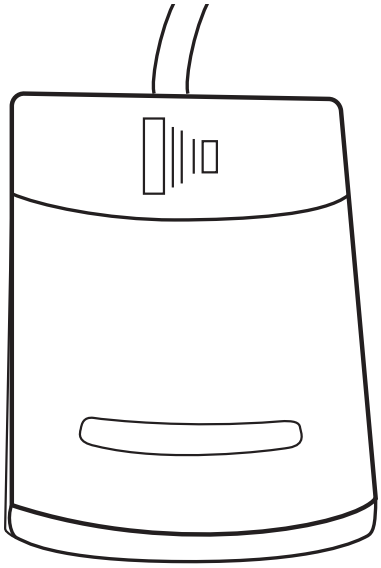
2. Fully press the Exposure button until you hear the prompt tone.
3. Release the Exposure button 2 seconds after the prompt tone ends.

4. After exposure, place the exposure hand switch into its holder.

5.7.4 Using the Exposure button on the control box

1. Press the Exposure button on the control box.
2. After you hear the exposure prompt tone, release the Exposure button. The exposure is completed.

5.7.5 Using the exposure foot switch



1. Step gently on the exposure foot switch.
2. After you hear the exposure prompt tone, release the exposure foot switch. The exposure is completed.

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5.8 Displaying acquired images

5.8.1 Reprocessing images

The exposure information of the Image Display area must be consistent with the view information set before the exam. After the exposure, if you find that the image annotations or views are wrong, you can reprocess the images.

1. Right-click on the image, and select **MarkChange**.
2. Select the correct annotations and view information on the image reprocessing panel.
3. Click **OK**.

Related reference
Page 1-13 Abbreviations

5.8.2 Adding positioning crosshair

1. Right-click on the image, and select **Add Ref Cross**.
2. Click on the image to add the positioning crosshair.
3. Hold down the left mouse button to drag the crosshair.

5.8.3 Image loading in Tomo mode

In the Tomo mode, the Image Display area displays each frame of the projection images acquired during the exposure.



After the exposure, the synthesized slice images are automatically loaded to the Image Display area.

The slice images in the series are played using cine.

5.8.3.1 Using cine to preview the slice images

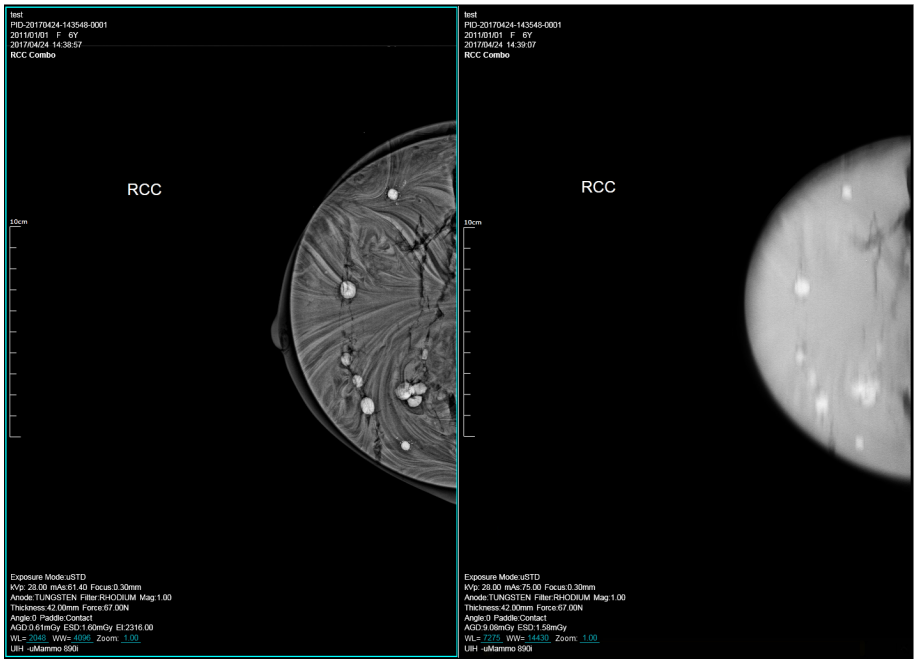
1. Move the mouse cursor to the bottom of the Image Display area, and the cine tool appears.
2. Click the Play button.
3. Click the Pause button.
   - ♦ Cine is paused.
4. Drag the slider of the progress bar or click on the progress bar to view images slice by slice.
   - ♦ The progress bar of cine shows the progress of playing. When the cine is paused, the slider marks the location of the selected image in the series.

5.8.3.2 Using the mouse to preview the slice images

1. Select the slice images in the Image Display area.
2. Use the mouse wheel to scroll through the slice images.

5.8.4 Image loading in Combo mode

In the Combo mode, the Image Display area is divided into the left part and the right part, which display the 2D image and the slice images respectively.

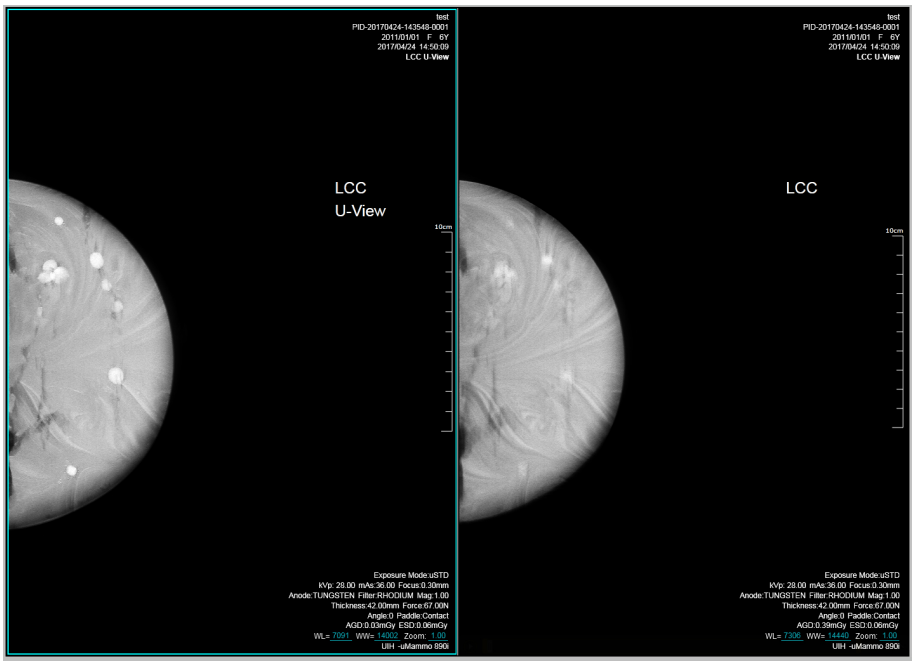


A 2D image is acquired first and automatically loaded to the left part of the Image Display area. After the 2D image has been acquired, the slice images are acquired based on the settings. During the process, the right part of the Image Display area displays each frame of the projection images acquired. After the acquisition, it displays the synthesized slice images.

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5.8.5 Image loading in U-View mode

In the U-View mode, the Image Display area is divided into the left part and the right part, which display the synthesized 2D image and the slice images respectively.



Slice images are acquired based on the settings. During the process, the right part of the Image Display area displays each frame of the projection images acquired. After the acquisition, it displays the synthesized slice images.

After the slice images have been acquired, the synthesized 2D image will be displayed in the left part of the Image Display area after a few seconds.

5.8.6 Confirming image information

Image information is displayed in the two corners of the Image Display area in texts.

You can go to **User Configuration** > **Configuration Panel** > **Image Text** and configure the information to be shown at the four corners of images.

Related concepts
Page 4-38 Configuration panel

5.8.7 Rejecting images

If you find through preview that the obtained images do not meet the clinical requirements, you can reject the images and acquire new images.

1. Select an image from the image list.
2. Click the **Reject** button.
3. Select a reason for rejecting the image from the Reject Reason drop-down list.
   - ♦ If you cannot find the reason from the list, select Other and enter a reason in the text box below.
4. Click **OK**.

5.9 Releasing the patient manually or automatically

If automatic release has been set in the current protocol, the compression paddle will move up automatically after the exposure is completed.

NOTICE
To avoid patient discomfort, do not make the compression paddle to collide with the patient while you lift the paddle.

1. Lift the compression paddle manually.
   - ♦ Ways to lift the compression paddle:
     - ♦ Press the Release button on the control box.
     - ♦ Rotate the compression paddle adjustment thumbwheel.
     - ♦ Step on the Paddle Up pedal.
2. Release the patient.

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5.10 Emergency release

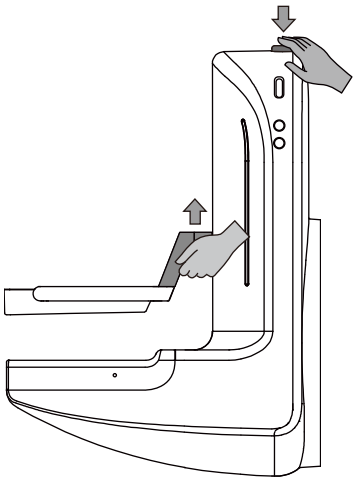


Figure 5-1 Emergency release button

In an emergency where the patient cannot be released normally, you can press the emergency release button.

NOTICE

Be aware that the compression paddle may fall off when you hold down the emergency release button, especially when no object exists under the compression paddle.

NOTICE

To avoid patient discomfort, do not make the compression paddle to collide with the patient while you lift the paddle.

1. Press down the emergency release button to the bottom.
   - ♦ The system mechanically releases the compression lock.
2. Push the compression paddle upward to release the patient.

5.11 Completing the exam

5.11.1 Setting the automatic sending of images

After the exam is completed, the acquired images can be sent automatically to the PACS server.

- When automatic sending is started, the bar below the **Auto Send** button is blue.
- When automatic sending is not started, the bar below the **Auto Send** button is gray.

1. In the Function Buttons area, click **Auto Send**.
   - ♦ The dialog box pops up.
2. Select **Is Auto Send**.
   - ♦ Settings of automatic sending are displayed.
3. Select the destination for automatic sending.
4. Click **OK** to save the settings.

5.11.2 Completing the exam

► Click one of the buttons in the Function Buttons area.

Action	Result
Click **Suspend**	Suspending the exam and returning to the Patient Administration interface.
Click **Cancel**	Canceling completing the exam.
Click **Complete**	Completing the exam and returning to the Patient Administration.

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5.12 Viewing series

1. View the acquired 2D images, slice images, and projection images in the Review interface.
2. Use tools to process the acquired images, for example adding annotations, adjusting window width and window level, and zooming.
3. Save the images.

5.13 Printing films

While films are being printed, you can view the status of printing tasks in the task manager.

1. Select the films to be printed.
2. Click the **Print** icon.

Result:

♦ Films are sent to the printer for printing.

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5.14 2D biopsy workflow

5.14.1 Preparing the patient

1. In the study list of the Patient Administration interface, select a patient who needs to undergo a 2D biopsy examination or register a new patient.
2. Refresh the RIS or enter the patient information manually.
3. Select protocols and go to the Exam interface.
4. Make sure that the scanning room is ready for exam.
   - ♦ For example, components that may be contacted by patients have been cleaned.

5.14.2 Positioning the patient

1. Adjust the height and angle of the C-arm.
2. Remove the non-biopsy compression paddle.
3. Install the 2D biopsy compression paddle or 2D biopsy unit and change the face shield.
   - ♦ The 2D biopsy unit should be used with the localization crosshair device and the 2D biopsy face shield.
   - ♦ The system switches to 2D localization mode.
4. Confirm the light field of the collimator.
5. Place the patient's breast on the compression paddle, and position the patient according to the settings of the protocol.

5.14.3 X-ray exposure and puncture

5.14.3.1 Using the 2D biopsy compression paddle for biopsy

Automatic release cannot be used during 2D biopsy. Please release the patient manually.

NOTICE
Check whether the compression paddle matches the recognized type. Before the system correctly recognizes the compression paddle, do not start image acquisition.

1. Install the 2D biopsy compression paddle.
   - ♦ The system switches to 2D localization mode.
2. Set the exposure parameters.
3. Position the patient.
4. Press the Exposure button.
   - ♦ The hole of the compression paddle can be seen on the acquired image.

5. Confirm the lesion location and insert the biopsy needle through the hole of the compression paddle.
6. Perform another exposure to check the position of the biopsy needle.
   - ♦ Adjust the biopsy needle if it is not correctly positioned.
7. Release the patient manually.
8. Remove the 2D biopsy compression paddle.
9. Install the non-biopsy compression paddle.
10. Rotate the C-arm to 90°.
11. Perform exposure and view the acquired image.
12. Check whether the biopsy needle is at the correct depth and location.
13. Release the patient manually.

5.14.3.2 Using the 2D biopsy unit for biopsy

Automatic release cannot be used during 2D biopsy. Please release the patient manually.

NOTICE
Check whether the compression paddle matches the recognized type. Before the system correctly recognizes the compression paddle, do not start image acquisition.

1. Install the 2D biopsy unit.
   - ♦ The system switches to 2D localization mode.
2. Set the exposure parameters.
3. Move the positioning crosshair out of sight.
4. Position the patient.
5. Press the Exposure button.
   - ♦ The hole of the compression paddle can be seen on the acquired image.
6. Turn on the electronic positioning crosshair.
   - ♦ The electronic positioning crosshair is shown in the Image Display area.
7. Drag the electronic positioning lines manually to locate the lesion.
8. Move the positioning crosshair on the localization crosshair device to the lesion position on the image.
9. Turn on the light localizer of the collimator. Make sure that the target point of the puncture coincides with the intersection point of the positioning crosshair.
10. Insert the biopsy needle.
11. Move the positioning crosshair of the localization crosshair device out of sight.
12. Perform another exposure to check the position of the biopsy needle.
    - ♦ Adjust the biopsy needle if it is not correctly positioned.
13. Release the patient manually.

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14. Remove the 2D biopsy compression paddle.
15. Install the non-biopsy compression paddle.
16. Rotate the C-arm to 90°.
17. Perform exposure and view the acquired image.
18. Check whether the biopsy needle is at the correct depth and location.
19. Release the patient manually.

Related concepts

Page 13-3 2D biopsy unit

6 Patient administration

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6.1 Overview

Patient Administration (PA) is used to display and manage the image data in the system.

In the PA interface, you can search for and select patient data, and load the data to other applications such as Review.

6.1.1 Opening the PA interface

► From any other interface, click the **Patient Administration** icon  to switch to the PA interface.

6.1.2 Interface description

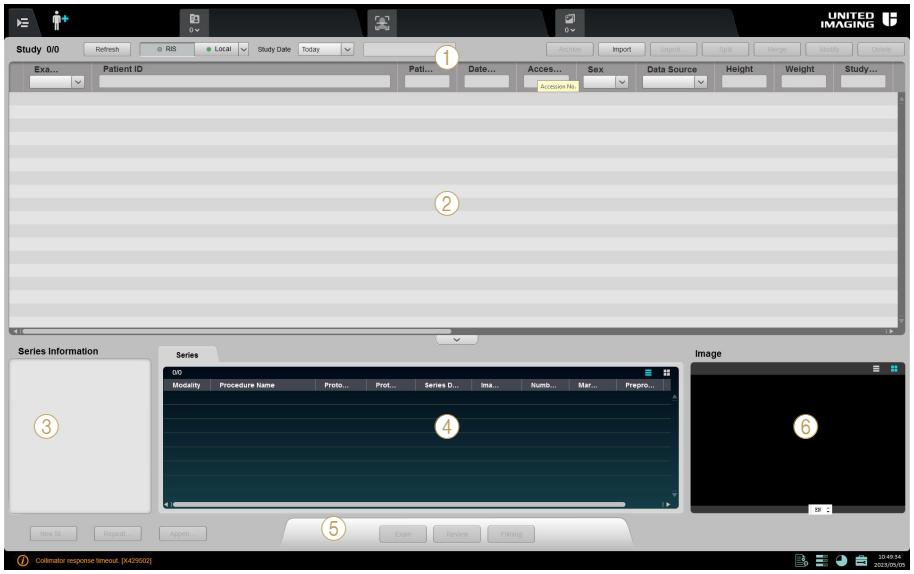


Figure 6-1 Patient Administration interface

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No.	Area	Function
1	Data Management area	♦ Switching data source, searching for keywords, and filtering by date. ♦ Archiving, importing, protecting, splitting, merging, modifying, and deleting data.
2	Study List area	Displaying the studies that meet the filter criteria.
3	Series Information area	Displaying information of the selected series.
4	Series List area/Report area	Displaying the series and reports of the selected study.
5	Navigation area	Opening applications or loading the selected data to an application.
6	Image Preview area	Displaying the image list of the selected series.

6.2 Data display

6.2.1 Setting the displayed columns

1. Right-click the column header in the list area.
2. Select the items to be displayed.

6.2.2 Adjusting column width

1. Move the cursor to the left or right edge of a column header till the cursor becomes a double-headed arrow.
2. Drag the mouse to the left or right to adjust the column width.
3. Release the mouse.
   - ♦ The column width is changed.

6.2.3 Adjusting column positions

1. Move the cursor to a column header.
2. Drag it to the target position.

6.2.4 Resetting column headers

After the order and width of columns have been changed, you can reset the column headers to the default settings.

1. Right-click in a blank area (not on buttons or in the study list).
2. Click **Reset Column Header**.

Result:

- ♦ The column headers are reset to the default settings.

6.2.5 Switching display mode

You can change the display mode if you want.

► Click the **List Mode** icon  to display series or images in the list mode. Or click the **Image Mode** icon  to display series or images in the image mode.

6.2.6 Refreshing data

► Press <F5> to refresh the data in the Study List area.

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- Or click **Refresh**.

6.2.7 Collapsing and expanding the study list

1. Click the **Expand** icon  to maximize the study list.
   - The Series List area is hidden.
2. Click the **Collapse** icon  to restore the default size of the study list.

6.2.8 Image preview

You can preview images in the PA interface, and select the right data for image viewing and analysis.

In the Image Preview area, you can switch to **Image** mode to view images and adjust the display.

Table 6-1 Image preview

Operation	Description
Double-click the Image Preview area	Displaying the image in a large preview window
Hold down the mouse wheel and move the mouse	Adjusting window width and window level
Hold down the left and right mouse buttons and move the mouse	Panning images
Hold down the right mouse button and move the mouse	♦ Drag upwards to zoom in ♦ Drag downwards to zoom out
Enter the scale factor in the **Scale** box in the preview window.	The image is zoomed according to the scale factor.

6.2.9 Viewing data

6.2.9.1 Viewing DICOM information

1. Right-click the data and select **View DICOM Info**.
2. Search for the related DICOM information in the **DICOM Viewer** window.

6.3 Data locating

In the PA interface, you can use different methods to find and locate data.

6.3.1 Sorting data

In the PA interface, you can sort data of the study list, series list, image list, or report list in ascending or descending order. Sorting the list by date of birth is taken as an example.

1. Click the **Date of Birth** search box.
   - ♦ The study list is sorted in descending order by date of birth.
2. Click the **Date of Birth** search box again.
   - ♦ The study list is sorted in ascending order by date of birth.

6.3.2 Data searching

There are different ways to search for the required data.

- Search box
  - ♦ Select the keyword type from the drop-down list of the search box.
  - ♦ Select **Study** or **Series** and enter the keywords in the search box to run a fuzzy search for the studies and series.
  - ♦ Select **Adv. Query** and set the searching conditions in the **RIS Adv. Query** window, including time and ID. Click the **Query** button.
- Column header searching
  - ♦ Enter the keywords in the search box of the column header.
  - ♦ The column header search box cannot be used at the same time with the fuzzy search.
- Column header filtering
  - ♦ Select a filtering condition from the drop-down list of the column header search box.
  - ♦ The column header search box cannot be used at the same time with the fuzzy search.
- Other
  - ♦ Select a filtering condition from the drop-down list of data source or study date.

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6.4 Data import

You can import data to the local database for viewing. Sources of imported data are as follows:

- CD/DVD
- PACS
- USB
- Folders

NOTICE
♦ Only the data with DICOM DIR can be imported from CD. ♦ Before importing data from PACS, configure the PACS node in the Service interface.

6.4.1 Importing data from CD/DVD or PACS

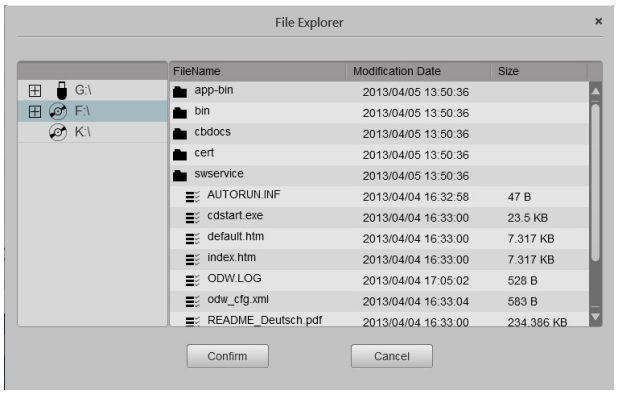
Operations of importing data from PACS and importing data from USB devices or CD/DVD (not including DIR) are basically the same. Importing from PACS is taken as an example.

1. Click **Import** and select the source.
2. Click **PACS**.
3. In the opened **Import** window, edit the search conditions and click **Search**.
   - ♦ The search results are displayed in the study list and series list.
4. Select the studies and series to be imported.
5. Choose **whether to clear search** or **close the window** after importing the data by selecting the corresponding checkbox.
   - ♦ These settings will be memorized and saved by the system.
6. Click **Import Study**.

6.4.2 Importing data from local folders

Operations of importing data from local folders and importing data from USB devices or DVD (not including DIR) are basically the same. Importing from local folders is taken as an example.

1. Click **Import**.
2. Select **Folder**.
3. Open the target folder in the **File Explorer** window.



4. Select the files or folders to be imported.
5. Select the studies and series to be imported.
6. Click **Confirm**.

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6.5 Data editing

After you have found the target data, you can edit the data (merge, modify, etc.) for data management.

6.5.1 Viewing data in certain editing status

You can filter data by the editing status.

1. Right-click the column header and select **Edit Status**.
2. Select a study type from the **Edit Status** drop-down list.

Option	Description
All	Displaying all studies.
Modified	Displaying the modified studies.
Split	Displaying the studies generated after splitting.
Merged	Displaying the studies generated after merging.
Empty	Displaying the studies that have not been edited.

3. View the data in the selected editing status.

6.5.2 Data source management

You can classify and manage data from different sources for quick filtering.

Imported data are stored in the **Local** folder by default. You can create new folders as well.

By clicking the function buttons, you can select different data sources and narrow the data down. There are two available data sources: **Local** and **RIS**.

6.5.2.1 Selecting data folders

You can create local folders for the management of different types of data. When a folder is selected, the studies in this folder are displayed.

► Select the folder from the **Data Source** drop-down list.

Menu item	Description
Local	Studies in the default folder are displayed.
All	All studies in local disks are displayed.
Custom folders	Studies in the corresponding folders are displayed.

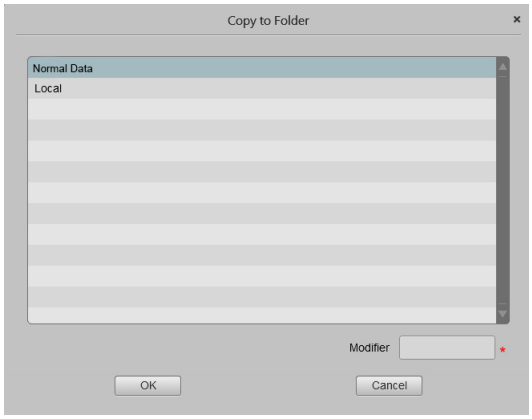
Result:

♦ Studies in the selected folder are displayed in the study list.

6.5.2.2 Copying data to folders

The user can copy the scanned studies to the folders.

1. Right-click a study in the Study List area.
2. Select **Copy to Folder**.



3. Select the target folder, for example the **Normal Data** folder.
4. Fill in the **Modifier** text box.
5. Click **Confirm**.

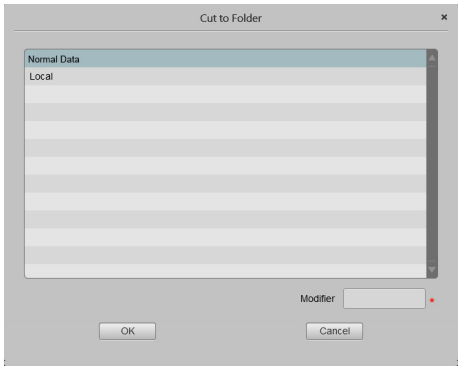
Result:

♦ The selected study is displayed in the “Normal Data” folder.

6.5.2.3 Cutting data to folders

The user can cut the scanned stuies and paste them to the folders.

1. Right-click a study in the Study List area.
2. Select **Cut to Folder**.



3. Select the target folder, for example the **Normal Data** folder.
4. Fill in the **Modifier** text box.
5. Click **Confirm**.

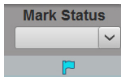
Result:

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♦ The selected study is transferred to the “Normal Data” folder.

6.5.3 Marking data

You can mark some special data for quick filtering.

1. Right-click the data.
2. Select **Mark**.
   ♦ The data is marked with a symbol.
   

3. Optional: You can right-click a marked data and select **Remove Mark** to remove the mark.

6.5.4 Protecting data

In order to avoid unintended alteration or deletion of data, you can protect data.

► Select a study or series, and click the **Protect** button.

♦ Or right-click a study or series, and select **Protect**.

♦ Or select a study or series, and press <F9>.

Result:

♦ The protected data cannot be modified or deleted.

6.5.5 Data modification

You can edit the study information, series information, and the series numbers.

The editing status of an edited study is **Modified**.

■ The data cannot be edited when it is protected or loaded to an application. Unprotect the data or exit the application before editing the data.

■ The patient information cannot be edited when it is anonymized.

6.5.5.1 Modifying information

When the patient information is wrong, you can modify the patient information and study information.

⚠WARNING

Incorrect patient information may cause misdiagnosis.

♦ Make sure that the key information (such as weight, name, and sex) is correct.

1. Select a study in the study list of Patient Administration interface and click the **Modify** button at the top.

- Or select a study, and then click the **Modify** button at the top of the interface or press <F8>.

2. Modify the information.
   - Make sure that the entered information is correct.
   - "Modified by" is a required field.
3. Click one of the buttons to save the changes.

Button	Description
Save	Saving the changes and overwriting the original information. When you save the changes that are made to archived data, the system will prompt you to confirm whether to overwrite the original data.
Save As	Saving the edited data as a new study.

   - The Save button is available only when the study is local data. Otherwise, the button is gray and unavailable.
4. Optional: Click the button next to **History** to view the change history of the data.
   - When you click **Save As**, the change history is saved in the new study together with the data.

Information requirements

In the Modify window, the information that you enter must meet the following requirements.

Item	Description
Last name	64 characters at most
First name	64 characters at most
Middle name	64 characters at most
Patient ID	64 characters at most.
Age	With default unit of year. A number between 1 and 150.
Date of Birth	Not later than the current date.

6.5.5.2 Modifying series information

You can add series description or image description.

1. Right-click a series in the series list. Select **Modify**.
   - Or select the series and click the **Modify** button.
   - Or select the series and press <F8>.
2. Modify the series information.

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Information requirements

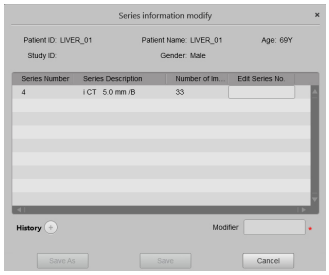
In the Modify window, the requirements for the filled information are as follows.

Item	Description
Series Description	64 characters at most.
Image Comments	64 characters at most.
Body Part	16 English characters at most.

6.5.5.3 Modifying series numbers

Series numbers are generated automatically based on the protocols used, but you can modify series numbers in the **Series information modify** window.

1. Right-click the data.
2. Select **Modify Series Number**.



3. Edit the serial number and enter the **Modifier**.
4. Click **Save** or **Save As**.

6.5.6 Deleting data

You need to delete data on a regular basis to clean up the disk.

The data cannot be deleted when it is protected or loaded to an application. Unprotect the data or exit the application before deleting the data.

NOTICE
Deleted data cannot be recovered. Please back up important data.

► Right-click an item and select **Delete**.

- ♦ Or select an item and press <Delete>.
- ♦ Or select an item and click the **Delete** button at the top of the interface.

- Or click the **Disk space manager** icon and delete data in the **Data to Be Cleared** window.

6.5.7 Merging data

You can merge multiple studies of the same patient into a new study for comparison or archiving.

The data cannot be merged when it is protected or loaded to an application. Unprotect the data or exit the application before merging the data. Data of different patients cannot be merged.

1. Select multiple studies of the same patient.
   - The name, sex, date of birth, and patient ID must be the same.
2. Click the **Merge** button at the top of the interface.
   - Or click the right mouse button and select **Merge**.
   - In the **Merge** window, required fields are marked with red asterisks (*).
3. Enter the description of the new study.
4. Fill in the **Modifier** text box.
5. Click **Confirm**.

Result:

- The editing status of the generated study is **Merged**.

A new study is generated after merging, and the original studies remain unchanged.

6.5.8 Data splitting

You can split one study or series into several studies or series.

6.5.8.1 Splitting studies

The data cannot be split when it is protected or loaded to an application. Unprotect the data or exit the application before splitting the data.

1. Right-click a study in the study list and select **Split**.
   - Or select the study and click the **Split** button.
   - In the **Split** window, required fields are marked with red asterisks (*).

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2. Select the checkboxes next to series numbers to select the series to be contained in the new study.

> **New studies are generated after splitting the data, and the original study remains unchanged. The new study consists of the selected series.**

3. Enter the**Modifier** and the **Study Description**.
4. Click **OK**.

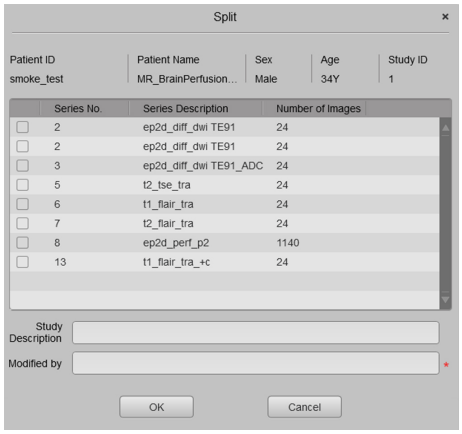
Result:

- The editing status of the generated study is **Split**.

6.5.8.2 Splitting series

> **The data cannot be split when it is protected or loaded to an application. Unprotect the data or exit the application before splitting the data.**

1. Right-click a series in the Series List area.
2. Select **Series Split**.
   - Or click the **Split** button.
   - In the **Series Split** window, required fields are marked with red asterisks (*).



3. Click to change the **Begin No.** and **End No.** of the first row.
4. Click **+** at the bottom right corner of the table to add new series.
5. Click to change the **Begin No.** and **End No.** of the second row.
6. Optional: If necessary, click **+** to add new series.
   - You can click the  button at the bottom right corner of the table to delete all the rows.
7. Fill in the **Modifier** text box.
8. Click **Confirm**.

Result:

- The series generated after splitting are displayed in the series list. The number of the generated series is the same with the number of rows in the Series Split window. The series description contains the keyword “Split”.

New series are generated after splitting the data, and the original series remains unchanged. The new series consists of the selected images

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6.6 Data archiving

You can archive data to CD/DVD, USB, local folders, or network nodes.

The following data can be archived in one archiving task:

- Studies of multiple patients.
- Multiple studies of the same patient.
- Multiple series in one study.
- Multiple images in one series.
- Raw data.

6.6.1 Archiving data

⚠WARNING

Do not remove the USB while archiving data. Otherwise, the data archiving may fail, and the data may be lost.

When loading archived images to non-UIH devices, the graphics (such as arrow text) may not be displayed.

1. Select the target data and click the **Archive** button.
   - ♦ Or right-click the data and select **Archive**.
2. Set the parameters.
3. Click **Confirm**.

What to do next:
You can view the archiving progress in the Task Manager.

6.6.2 Quickly archiving data

Archiving nodes can be set in the Service interface. Open the Service interface, click **DICOM** > **Archiving**, and check the archiving nodes displayed in **Default Display Name**.

1. Right-click the data.
2. Select **Fast Archiving**.
   - ♦ Shortcut: <Shift+A>.

6.6.3 Archiving parameters

Table 6-2 Data archiving parameters

Parameter	Description
Selecting the archiving node	Types that can be selected: ♦ CD/DVD (discs) ♦ USB (USB flash drives or mobile hard disks) ♦ PACS ♦ Network (network shared disks)
With DICOM Viewer	Archiving the DICOM images and DICOM viewer at the same time. Note: The DICOM viewer is only for quick review of the DICOM data and is not a medical device.
With DICOMDIR	Only applicable to CD/DVD. Including the data storage structure when archiving data to make subsequent searches more convenient.
Rename DVD	When this item is selected, you can rename the optical disc when archiving data to CD or DVD.
With Graphics	Including the graphics on DICOM images when archiving data.
Eject After Burn	Automatically ejecting the optical disc after burning completes.
Close After Burn	Automatically turning the disc burning function off after burning completes.
Compress Images	Only for DVD, USB, and Network. Compressing and archiving data.
Anonymous	The anonymizing mode for exporting data. ♦ **None**: Not anonymizing the data. ♦ **Partial**: Key information such as the patient name, date of birth, and time of birth are hidden by default. You can also choose to hide other information such as hospital information and patient age. ♦ **All**: Anonymizing the data completely in accordance with the DICOM 3.0 standard (15 Security Profiles, Table E.1-1 Application Level Confidentiality Profile Attributes). The secondary capture images, structured reports, and GSPS files will not be archived when data are archived to a USB device.
Pseudonym	Available when anonymizing is enabled. You need to create a new name for each anonymized patient of the archived data.
Disc Name	You can add or edit the name of the optical disc when archiving data to CD or DVD.

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Parameter	Description
Format	Selecting the format of the archived images.

6.7 Data anonymity management

To ensure data security and patient privacy, the patient information can be anonymized manually or automatically.

6.7.1 Hiding PHI manually

1. Click the UIH icon at the top right corner of the interface.
2. Select **Hide PHI** in the system menu.
   - ♦ You can select other information to be anonymized in **Tools** > **Configuration Panel** > **Anonymous Configuration** > **Display**.
   - ♦ By default, information such as patient name is hidden using asterisks (*).
3. Optional: If display is required, select **Display PHI** in the system menu.

6.7.2 Automatic anonymization

The patient information will be anonymized automatically when customer service engineers connect to the system remotely.

6.7.3 Showing patient information

1. Click the UIH icon at the top right corner of the interface.
2. Select **Display PHI** in the system menu.

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6.8 Switching applications

6.8.1 Loading data to Patient Registration

6.8.1.1 Creating a new study

► Select a registered study and click **New Study**.

♦ The Patient Registration interface is opened and the patient information is loaded automatically.

What to do next:
Edit the patient information or protocols.

6.8.1.2 Repeating studies

► Select a completed study and click **Repeat Study**.

♦ The Patient Registration interface is opened and the patient information, patient position, and protocols are loaded automatically.

What to do next:
Add new protocols.

6.8.2 Loading data to Exam

6.8.2.1 Appending series

You can add new protocols for completed studies by appending series.

1. Select a completed study.
   ♦ Be sure to select a study that was completed within 24 hours.
2. Click **Append Series**.

What to do next:
Add new protocols in the Exam interface.

6.8.3 Loading data to Review

1. Select a completed study or series in the PA interface.
2. Click **Review**.
   ♦ Or double-click the data to be loaded.

Result:

♦ The selected data are loaded to Review.

6.8.4 Opening the Filming interface

1. Select the studies, series, or images.
2. Click the **Filming** button.
   - Or select **Filming** in the context menu.

Result:

- The Filming interface is opened.

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6.9 Quick operations

6.9.1 Shortcuts

In the PA interface, you can use the combination of mouse and keyboard to quickly locate, view, or edit data.

6.9.2 Context menu

Item	Description	Area
Archive	Setting archiving parameters.	Study list, series list, and image list
Fast Archive	Quickly archiving data to preset nodes.	Image list
Delete	Deleting the selected items.	Study list, series list, and image list
Protect/Unprotect	Protecting or unprotecting the selected items.	Study list and series list
Split	Splitting the selected study.	Study list
Split Series	Splitting the selected series.	Series list
Merge	Merging the selected studies.	Study list
Copy to Folder	Copying the selected study to a designated folder.	Study list
Cut to Folder	Cutting the selected study and pasting it to a designated folder.	Study list
View DICOM Info	Viewing DICOM information.	Study list, series list, and image list
Modify Series Number	Editing the series number.	Study list and series list
Filming	Sending the selected study to Filming.	Study list, series list, and image list
Mark/Remove Mark	Marking the selected study or removing the mark.	Study list

7 Patient registration

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7.1 Overview

You must register the patient before performing scans.

There are different types of registration:

- Routine registration: Entering patient information or loading patient information from the system.
- Pre-registration: Enter patient information in advance and perform the scan later.

7.2 Interface layout

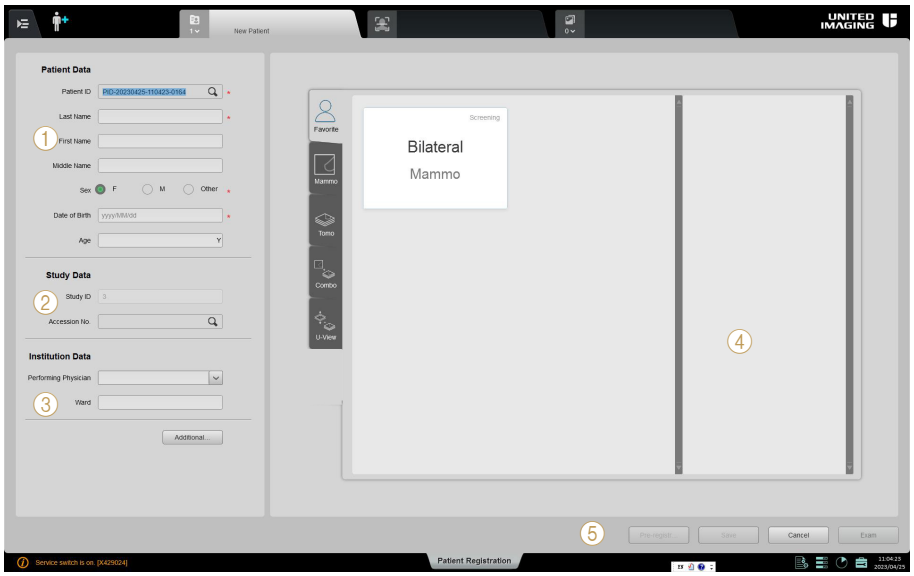


Figure 7-1 Patient Registration interface

No.	Area	Function
1	Patient Data area	Enter all information related to patients
2	Study Data area	Enter the patient ID and accession number
3	Hospital Data area	Enter the name of the radiologic technologist and ward
4	Protocols area	Select from the preset protocols
5	Function Buttons area	Select the patient registration mode and perform the next step

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7.3 Registration of new patients

You can open the Exam interface only after you have entered all the required information that is marked with asterisks (*).

In the toolbox of the system toolbar, you can configure the information items of the Patient Registration interface by clicking **Configuration Panel** > **Patient Registration**.

7.3.1 Opening the Patient Registration interface

► Click the **PR** icon  .

♦ The Patient Registration interface is opened.

7.3.2 Entering study information

⚠WARNING

Incorrect patient information may cause misdiagnosis.

♦ Make sure that the key information (such as weight, name, and sex) is correct.

1. Enter the patient information in the **Patient Data** area.
2. Enter the study information in the **Study Data** area.
   - ♦ **Study ID** is generated by the system and cannot be modified.
   - ♦ **Accession No.** can be loaded from RIS.

7.3.3 Selecting protocols

1. Select an acquisition mode in the Protocols area.
2. Select procedures in the acquisition mode.
   - ♦ You can select five procedures at most.
3. Select protocols in the procedures.

7.4 Registration of existing patients

Information of pre-registered patients and patients with completed studies is recorded in the system.

There is no need to enter the information again for an existing patient. You can save time by searching for the patient information and loading it.

7.4.1 Registering pre-registered patients

1. Select a pre-registered study from the study list of the Patient Administration interface.
2. Double-click the study or click **New Study**.
   - Or right-click the study and select **New Study** in the context menu.

Result:

- The Patient Registration interface is opened.

7.4.2 Registering patients with completed studies

1. Select a completed study from the study list of the Patient Administration interface.
2. Click **New Study** or **Repeat Study**.
   - Or right-click the study and select **New Study** or **Repeat Study** in the context menu.

Result:

- The Patient Registration interface is opened.

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7.5 Completing registration

7.5.1 Opening the Exam interface

Before you start:
Enter all the required information in the Patient Registration interface.

► Click **Exam**.

Result:

♦ The Exam interface is opened.

7.5.2 Pre-registering patients

Before you start:
Enter all the required information in the Patient Registration interface.

1. Click **Pre-Registration**.
   - The information that has been entered in this interface is saved and a new Patient Registration interface is displayed.
   - A study of the pre-registered patient is generated in the study list of the Patient Administration interface.
2. Register the next patient.

8 Exam

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8.1 Opening the Exam interface

8.1.1 Create a new study in the Patient Administration interface.

1. Select a pre-registered study.
2. Click **New Study** to open the Exam interface.

8.1.2 Repeating the exam from the Patient Administration interface

1. Select a completed study.
2. Click **Repeat Study** to go to the Exam interface.

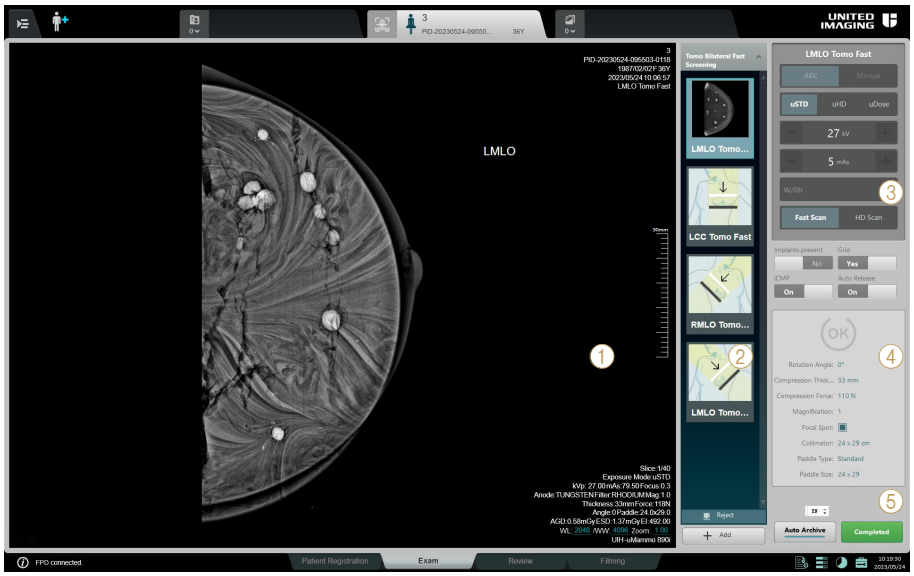
8.1.3 Opening the Exam interface from the Patient Administration interface

1. Select a pre-registered or paused study.
2. Click **Exam**.
   - ♦ The Exam interface is opened.

8.1.4 Opening the Exam interface from the Patient Registration interface

1. Complete patient registration in the Patient Registration interface.
2. Click **Exam**.
   - ♦ The Exam interface is opened.

8.2 Exam interface



No.	Name	Function
1	Image Display area	Displaying the acquired images.
2	Protocol list	Displaying the selected views and the sequence of exposure.
3	Exposure Parameters area	Setting the exposure parameters for the current exam.
4	Information Display area	Displaying the settings of the current exam and the exposure status.
5	Function buttons	Performing other operations for patient examination.

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8.3 Setting protocols

8.3.1 Adjusting acquisition order

The protocol list displays the protocols required for the current exam. You can modify the view of the selected protocol. The acquisition is performed in the order of the protocols by default. You can add or delete preset protocols in the protocol list.

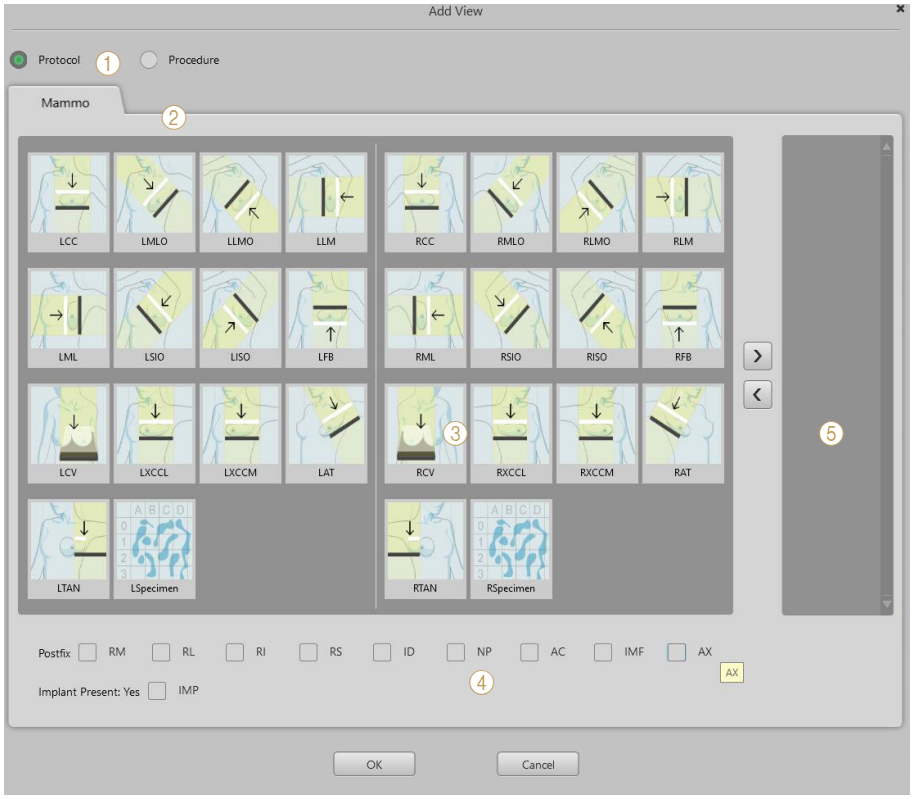
1. Select the current procedure in the protocol list.
   - ♦ Acquisition protocols have been preset under the procedure.
2. Select the protocol that you want to use, and perform exposure.
   - ♦ After exposure, the icon of the protocol becomes the acquired image.
3. The system automatically runs the next protocol according to the original protocol order.

8.3.2 Editing protocols or procedures

8.3.2.1 Adding views

Adding protocols is taken as an example.

1. Click **Add** in the protocol list.



1. Added type
2. Tabs
3. Protocol list
4. Protocol suffix
5. List of added items

2. In the **Add View** window, select the type of the item to added such as **Protocol**.
3. Select protocols of different acquisition modes by switching among different tabs.
4. Double-click a protocol. Or select the protocol and click ›.
   - If you want to remove a protocol from the list on the right, select the protocol and click ‹.
5. Select a suffix for the added protocol.
6. Click **OK**.

8.3.2.2 Deleting protocols

1. In the protocol list, select the protocol that you want to delete.
2. Click **Delete**.
3. Click **Yes** in the dialog box.

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8.4 Settings of acquisition parameters

This system supports mammography and breast tomosynthesis.

- Mammography: Mammo mode.
- Breast tomosynthesis: Tomo mode, Combo mode, and U-View mode.

Parameter settings vary for different acquisition modes.

8.4.1 Settings for Mammo acquisition

When you select an acquisition protocol in the Mammo acquisition mode, the Exposure Parameters area shows relevant settings.

There are two exposure modes: AEC mode and manual mode.

For small breasts, the manual mode is recommended to ensure better image quality.

8.4.1.1 Setting AEC exposure mode

1. Click the **AEC** button.
2. Select the exposure mode.
   - uSTD: Standard exposure mode with moderate contrast ratio and dose.
   - uHD: Contrast ratio is prioritized. The obtained image has the best contrast ratio, but the dose increases accordingly.
   - uDose: Dose is reduced, but the contrast ratio will be lower.

8.4.1.2 Setting parameters for manual exposure

1. Click the **Manual** button.
2. Select the filtration configuration from the drop-down list.
   - The collimator has two types of additional filtration: silver and rhodium, each 0.05 mm thick.
3. Set the values of kV and mAs.
4. Click the **Implant Present** button, and select whether there is an implant.
   - For patients with implants in breasts, the manual exposure mode without intelligent compression is recommended to ensure better image quality.
   - In an exam of breasts with implants, the brightness of images may fluctuate during image post-processing due to exposure errors. At this time, if you want to obtain the best image quality, use the predefined processing parameters for implants.
5. Click the **iCMP** button to turn intelligent compression on or off.
6. Click the **Automatic Decomp** button to turn automatic release on or off.
7. Click the **Grid** button to select whether to insert the grid.

8.4.2 Settings for Tomo acquisition

1. Click to select a protocol in the Tomo acquisition mode. Relevant settings appear in the Exposure Parameters area.



2. Select the exposure mode.
   - ♦ If the manual exposure mode is selected, adjust the exposure parameters according to clinical needs and set parameters such as implants.
3. Select the scanning mode.

8.4.3 Settings for Combo acquisition

The Combo acquisition mode is the combination of the Mammo mode and the Tomo mode. 2D images are acquired first, and then slice images are acquired.

1. Click to select a protocol in the Combo acquisition mode. Relevant settings appear in the Exposure Parameters area.



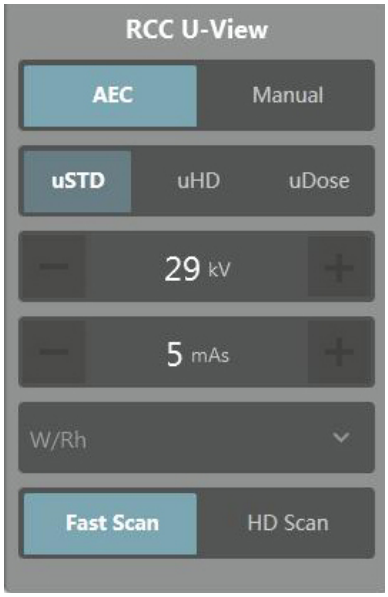
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2. Click the **Mammo** tab to set the exposure mode and parameters in the Mammo mode.
3. Click the **Tomo** tab to set the exposure mode, parameters, and scanning mode in the Tomo mode.
4. The system performs exposure according to the set parameters.

8.4.4 Settings for U-View acquisition

In the U-View acquisition mode, images are acquired in the Tomo mode and then a 2D image is generated through synthesis.

1. Click to select a protocol in the U-View acquisition mode. Relevant settings appear in the Exposure Parameters area.



2. Select the exposure mode. Adjust the exposure parameters in that mode.
3. Set implants or other parameters.

What to do next:
Wait for the feedback of acquisition status.

8.5 Display of acquisition conditions

After patient positioning, perform exposure according to the set exposure mode.

The Information Display area shows the compression parameters of the system in real time, for example the rotation angle of the gantry, compression thickness, compression force, type and size of the compression paddle, collimator size, focal spot size, and the magnification factor.

Acquisition conditions	Description
Exposure status	The X-ray exposure indicator indicates two kinds of statuses: ♦ Green indicates that the system is ready for exposure. ♦ Gray indicates that exposure is completed or the system is not ready.
Rotation angle	The C-arm can be rotated from -150° to 190°, covering all patient positions.
Compression thickness and real-time compression force	The compression thickness and real-time compression force are displayed.
Magnification factor	1, 1.5, or 1.8 times
Focal spot	Large focal spot and small focal spot. Different protocols have a different default focal spot.
Collimator	The size of the collimator is displayed. The size of the collimator light field should be consistent with the size of the compression paddle currently inserted.
Type of the compression paddle	After the compression paddle is installed, the paddle type displayed on the Exam interface should be consistent with the actual paddle type. When the type of the installed compression paddle does not match the loaded protocol, exposure cannot be performed.
Size of the compression paddle	The system is equipped with compression paddles of different sizes. The size of the compression paddle is displayed on the Exam interface in real time.

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9 Review 2D

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9.1 Review 2D interface

In the Review 2D interface, you can use the measurement and annotation tools to evaluate images.

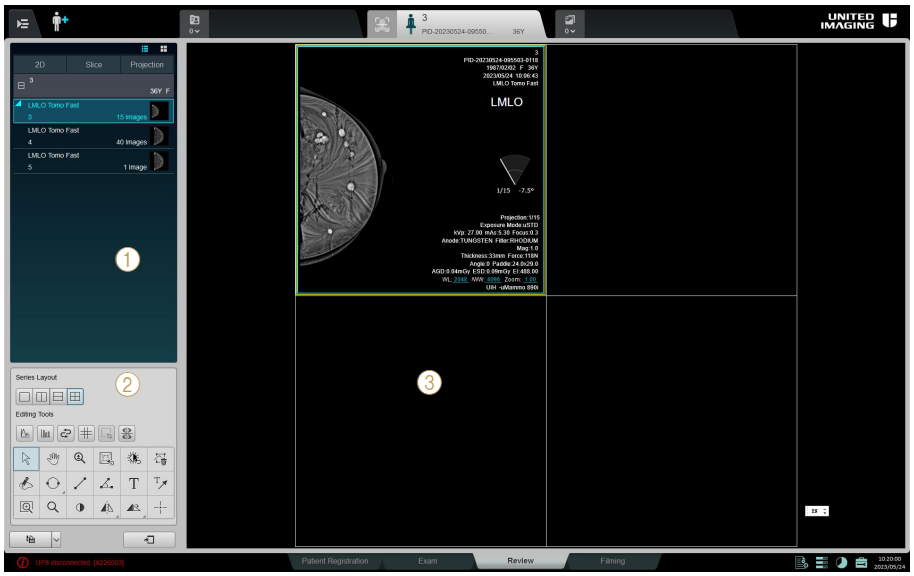


Figure 9-1 Review 2D interface

No.	Area	Description
1	Series List area	Displaying the series of the selected study.
2	Control panel	Providing tools for image editing and measurement.
3	Image Display area	Displaying all the selected images.

9.2 Data loading

9.2.1 Target data

The following data can be loaded to the Review 2D interface:

- All the series in a study.
- Some series in a study.
- All series in multiple studies of the same patient or different patients.
- Some series in multiple studies.

9.2.2 Methods of data loading

9.2.2.1 Loading data from the PA interface

1. Select the studies or series.
2. Click **Review**.
   - ♦ Or double-click the data to be loaded.

9.2.2.2 Loading data from the series list

You can load data from the series list in the interface of the image processing application.

► Select one or more series to be loaded in the series list and drag the series to the Image Display area.

9.2.2.3 Loading data from the series list

► Double-click a series in the Series List area.

- ♦ Or hold down the right mouse button and drag a series to the Image Display area.
- ♦ For example, the series A1 and A3 have been loaded to the Image Display area.

A1	A3

- ♦ When you double-click the series A2 in the series list, it is loaded and the viewport layout changes.

A1	A3
A2	

- ♦ If you hold down the right mouse button and drag the series A4 from the series list to the viewport of A2, the series A2 will be replaced by the series A4.

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9.3 Image text

Classification	Description
Patient data	Name, patient ID, date of birth, age, sex, etc.
Acquisition information	Acquisition date, acquisition time, protocol name, etc.
Acquisition parameters	Exposure control mode, kVp, mAs, anode target material, filtration material, magnification factor, compression thickness, compression force, gantry rotation angle, compression paddle type, average glandular dose (AGD), entrance surface dose (ESD), exposure index (EI), etc.
Image parameters	Window level (WL), window width (WW), zoom factor, etc.
Equipment information	Manufacturer, equipment model, etc.
Institution information	Institution name, institution address, operator, etc.
Note: The information items displayed in image text can be changed. Please refer to the actual interface display.	

9.4 Display layout settings

You can set the display layout after loading the data.

9.4.1 Types of image windows

In the Review 2D interface, the Image Display area has two types of image windows.

- Cell: Displaying an image.
- Viewport: Displaying a series.
  - A viewport can be divided into several cells. Rows are filled prior to columns.
  - When a viewport is divided into 2 × 2 cells, at most 4 images can be displayed at the same time. You can use the scroll bar on the right to view other images in the series.

9.4.2 Layout types

In the Image Display area, you can adjust the image layout (change the number and arrangement of images in a viewport).

There are several types of viewport layouts in the Image Display area.

- Series layout: The number and arrangement of viewports in the Image Display area.
- Image layout: The number and arrangement of images in a viewport.

You can configure the default viewport layout in **Tools** > **Configuration Panel** > **Review Layout**.

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9.5 Cine

9.5.1 Cine

Cine is used to view 2D images in a video.



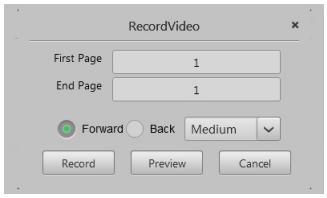
Figure 9-2 Cine

1. Play or pause
2. Previous series
3. Progress bar
4. Next series
5. Play speed

9.5.2 Recording video

You can record a video of 2D images.

1. Right-click the image.
2. Select **Record Video**.



3. Set the parameters.
   - ♦ Image range
   - ♦ Page turning order
   - ♦ Play speed
4. Click **Record**.
   - ♦ The system automatically scrolls through images. Then, the **Save As** window pops up.
5. Select the target folder, and enter the **Name** and **Format**.
6. Click **Save**.

9.6 Image analysis and editing

9.6.1 Viewing histograms

In a histogram, you can view the grayscale distribution in the selected region.

1. Click the **Histogram** icon  .
2. Drag the mouse to draw an ROI on the image.
   - ♦ Keep the ROI within the range of the image. Otherwise, the statistics will not be displayed.
   - ♦ The number of pixels within different ranges of grayscale values in the ROI are displayed in real time.
3. Release the left mouse button to finish the drawing.

Result:

- ♦ A histogram is displayed on the image.
  - ■ Horizontal axis: Pixel values.
  - ■ Vertical axis: The number of pixels.

9.6.2 Viewing profile information

Profiles are used to display the change of pixel grayscale on a line.

Do not draw the profile line outside the range of the image. Otherwise, the statistics will not be displayed.

1. Click the **Profile Information** icon  .
2. Drag the mouse to draw a line on the image.
3. Release the left mouse button to finish the drawing.

Result:

- ♦ A profile statistical curve and relevant information is displayed on the image.

9.6.3 Cropping images with the rectangular cropping tool

1. Select the image.
2. Click the **Rectangle Crop** icon.
3. Click the **Crop** icon.
4. Drag the mouse in the image to adjust the size of the cropping box.

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5. Release the left mouse button when appropriate.
6. Edit the cropping box.
   a. Drag the borders of the cropping box to move it.
   b. Drag the 4 control points on the borders of the cropping box to adjust its size.
      - ♦ You can see the original image when adjusting the cropping box. After the left mouse button is released, the image region outside the cropping box is hidden.
      - ♦ When you adjust the cropping box on an image, the cropping boxes on all images of the series change accordingly.
      - ♦ To delete a cropping box, you can select it and press <Delete>.
7. Click the **Rectangle Cropping** icon again or click another icon.
   - ♦ Rectangle cropping is turned off, but the cropping boxes and the image display remain the same.

9.6.4 Reloading images

Reloading is to restore the image to the state when it is loaded. Graphics or image processing parameters that have not been saved will be deleted.

1. Select the image.
2. Click the **Reload** icon  .
   - ♦ Or select **Reload** in the context menu.

9.7 Common tools

9.7.1 Image viewing

Image viewing tools include zooming, panning, and window width and window level adjustment. Please refer to related contents.

Related reference
Page 4-14 Image viewing tools

9.7.2 Image annotation and measurement

The image measurement and annotation tools include text annotation and ROI measurement. Please refer to related contents.

Related reference
Page 4-16 Image annotation and measurement tools

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9.8 Image saving and transfer

9.8.1 Saving images

1. Select the image.
2. Select the **Save Image(s)** icon in the drop-down list.
   - ♦ Shortcut: <Ctrl+S>.
3. Set the parameters, for example, **Description**.
   - ♦ To save more items, select **combined to**, open the drop-down list, and select the target series.
4. Click **Confirm**.

Result:

- ♦ The selected series is saved.

9.8.2 Saving the Image Display area

1. Select the **Save Display** icon in the drop-down list.
   - ♦ Shortcut: <Ctrl+D>.
2. Set the parameters, for example, **Description**.
   - ♦ To save more items, open the drop-down list and select the target series.
3. Click **Confirm**.

9.8.3 Sending images to Filming

1. Select the image.
2. Click the **Send to Film (Image)** icon in the drop-down list.
   - ♦ Shortcut: <F3>.

Result:

- ♦ The selected images are sent to Filming.

9.9 Context menu

Item	Description
Select All Images	Selecting all images. Shortcut: <Ctrl+A>.
Reset	Restoring the image to the original state and deleting the graphics.
Paste Graphics	After you have copied a graphic, you can paste it into the viewport.
Reload	Reloading the images to the viewport.
Scale	Showing the scale in the selected viewport to assist positioning and measurement.
Home Windowing	Resetting the window width and window level.
Image Text	♦ Showing or hiding the image text. ♦ You can customize the content of the image text in the sub-menu.

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10 Filming

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10.1 Overview

In Filming, you can use tools to adjust the film layout and print the films.

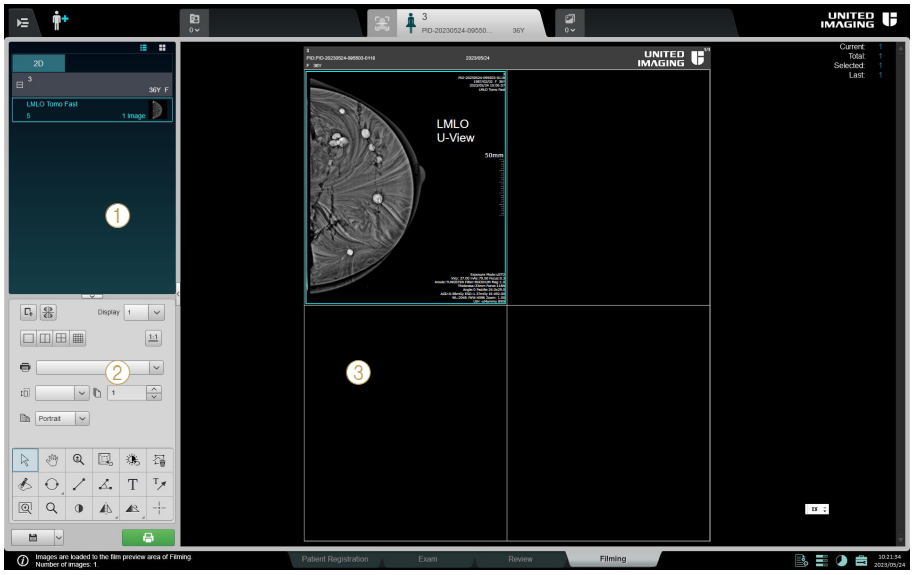


Figure 10-1 Filming interface

No.	Area	Description
1	Series list	Displaying the series of the selected study.
2	Control panel	Providing tools such as film layout settings, film editing, and measurement.
3	Film Display area	Displaying E-films with film information and previewing films.

Film information includes the following items.

- **Current**: The number of the current film.
- **Total**: The total number of films.
- **Selected**: The number of selected images.
- **Last**: The number of images that are loaded on the last film.

NOTICE

- When printing and saving films for diagnosis, make sure that the patient name and related information are displayed in all windows.
- The quality of images output by some film printers may not meet the requirements for diagnosis. Please use the laser printers recommended by UIH.
- The standard screen of the system is only used for the preview of films.
- The electronic version of films (E-films) saved in the system cannot be used for diagnosis.
- Except for producing training materials, do not add images of more than one patients to the same film.

10.2 Data loading

10.2.1 Loading data from the PA interface

► Select the studies, series, or images.

Result:

♦ Data are loaded to the Filming interface.

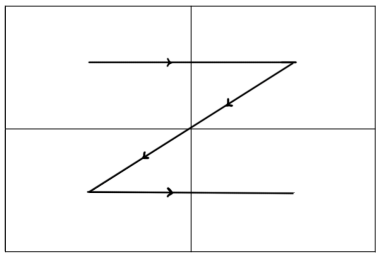
10.2.2 Loading data from Review

► In the Review interface, select the images to be printed. Click an icon to send the selected data to the Filming interface.

Icon	Description
	Sending the selected images to Filming. ♦ Shortcut: <F3>.

10.2.3 Sequence of loading

On E-films, the images are arranged from left to right and from top to bottom based on the order of loading.



If auto repack is turned on through the context menu, the images will be rearranged automatically after being loaded, moving forward and filling the empty cells.

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10.3 Editing films

10.3.1 Adding films

1. Select the films.
2. Click the **New Film** icon .
   - An empty film is inserted after the last film. The default layout of the new film is the same as that of the selected film.
3. Drag images to the film.
   - When loading images, if there are less empty cells than the images to be loaded, new films of the same layout will be generated automatically after the existing films.

10.3.2 Deleting films

10.3.2.1 Deleting the selected films

1. Select the films.
2. Click the right mouse button, and select **Delete** > **Selected Films**.
   - Or press <Delete>.

Result:

- The selected films are deleted. If there is only one film, an empty film with default layout will be displayed automatically after the selected film is deleted.

10.3.2.2 Deleting all films

1. Select one film.
2. Click the right mouse button, and select **Delete** > **All Films**.
   - Or press <Ctrl+A> and then <Delete>.
   - If auto repack is turned on, only an empty film with default layout will be displayed automatically after the films are deleted.

10.3.3 Displaying images in pairs

1. Click to select a film.
2. Click the **Match pair to show** button in the toolbar.
   - Or open the context menu to select **Match Pair to show**.

Result:

- The images are displayed in the sequence of RCC, LCC, RMLO, and LMLO in a 2 × 2 layout.

10.3.4 Common layout settings of films

10.3.4.1 Adjusting display mode

The Film Display area is arranged in three levels: films, viewports, and cells.

► From the **Display** drop-down list, select the number of films to be displayed at the same time.

♦ In the Film Display area, at most 8 films can be displayed at the same time.

10.3.4.2 Switching viewport layout

Before you start:
Click **Tools** > **Configuration Panel** > **Filming Configuration** and make sure that **Hide Viewport Layout Setting** is unselected.

1. Select the films.
2. Click a viewport layout icon, for example **2 × 1**  .

10.3.5 Smart scale

The smart scale is an imaginary linear scale applied to a reference plane 2 cm above the object table. Therefore, it does not correspond to the true size of the imaged object unless the imaged object lies entirely within the reference plane.

► Click the **True Size** button so that images are displayed on the film in true size.

♦ This function can be used only after being configured by UIH customer service engineers based on the film printer that is being used. If modifications are needed, please contact UIH Customer Service Center.

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10.4 Editing images

10.4.1 Image viewing

Image viewing tools include zooming, panning, and window width and window level adjustment. Please refer to related contents.

Related reference
Page 4-14 Image viewing tools

10.4.2 Image annotation and measurement

The image measurement and annotation tools include text annotation and ROI measurement. Please refer to related contents.

Related reference
Page 4-16 Image annotation and measurement tools

10.5 Sending to Filming

10.5.1 Printing films

While films are being printed, you can view the status of printing tasks in the task manager.

1. Select the films to be printed.
2. Click the **Print** icon.

Result:

♦ Films are sent to the printer for printing.

10.5.2 Setting printing parameters

1. Select a printer from the Printer drop-down list.
2. Select the film size from the Film Size drop-down list.
3. Select the film orientation from the Film Orientation drop-down list.
4. Enter the number of copies or click the increase or decrease button.

What to do next:
Click the Switch to Operation Panel icon to close the print configuration panel.

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10.6 Saving E-films

You can save films as E-films in DICOM format.

- Manual: Click the **Save E-film** icon to save all E-films in the Film Display area as a series.
- Automatic: In the Service interface, click **Configuration** > **DICOM** > **Printer** and select **Save Film (After Printing)**. All E-films in the Film Display area are saved as a series after printing.

If the current film includes data of multiple patients, there will be a prompt message. Click **OK**.

10.7 Context menu

Table 10-1 Context menu items

Item	Description
Select Films	Selecting the films that contain the selected images.
Select All Films	Selecting all films.
Cut	Cutting images.
Copy	Copying images.
Paste	Pasting images.
Delete	Deleting images or films.
Undo Delete	Undoing the last deletion. ♦ Shortcut: <Ctrl+Z>. ♦ When other operations have been performed after a deletion, the deletion cannot be undone.
Home Windowing	Resetting the window width and window level of the selected images to the initial values.
Image Text	Showing or hiding the image text.
Side Display	Aligning the chest wall side of the image with the left or right side of the viewport.
Match pair to show	Displaying images in the sequence of RCC, LCC, RMLO, and LMLO in a 2 × 2 layout.
Scale	Showing or hiding the scale near the right edge of the film.

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11 FPD calibration

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11.1 Situations requiring FPD calibration

If the flat panel detector is not calibrated after long time of use, the image quality will be degraded. Re-examination may be required, causing unnecessary radiation exposure. Therefore, quality control of the flat panel detector must be conducted regularly.

- When the image quality is clearly degraded, the flat panel detector must be calibrated.
- It is still recommended that the flat panel detector be calibrated every 180 days even if the image quality is not significantly degraded.

NOTICE
Calibration of the flat panel detector must be performed by trained users.

11.2 Preparing for FPD calibration

Before you start:

- Before calibrating the FPD, make sure that no abnormal image exists in the imaging area, such as the image of the lead plate or the compression paddle edge. If abnormal image exists, calibrate the collimator first, and then calibrate the FPD.
- The FPD should be powered on for 30 minutes before calibration. The temperature change should be less than 1°C within 20 minutes before FPD calibration.
- Make sure that the system has been started up for more than 15 minutes before FPD calibration.
- If the FPD temperature exceeds the limit during the calibration, complete the current procedure. Wait until the temperature becomes stable and perform the calibration again.

Tool: 40 mm PMMA phantom

1. Make sure that the temperature of the flat panel detector is stable.
2. Rotate the C-arm to the 0° position.
3. Remove the compression paddle.
4. Place the 40 mm PMMA phantom on the object table.
   - ♦ Ensure that the PMMA phantom is centered between the left and right sides and that its edge is aligned with the edge of the object table.
5. Turn on the Service switch.
6. Log on to the Service interface.
7. Click **XR Service** > **Service Panel** > **Adjustment** > **FPD**.

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11.3 FPD calibration

During the FPD calibration, the system runs defect correction and uniformity correction automatically. The result of the FPD calibration can indicate the results of the defection correction and uniformity correction.

1. Make sure that all the preparation steps are completed, and then click **Start**.
2. Test image quality.
   a. When the X-ray exposure indicator lights up, press the exposure hand switch to start exposure.
   b. Check whether the acquired image meets the requirements.
      - If not, perform another exposure after troubleshooting until the image quality meets the requirements.
3. Run the grayscale test.
   - If the grayscale value is within the allowable range, click **Accept**. Perform exposure again after the OK ring lights up.
   - If the grayscale value falls outside the allowable range, click **Reject**. Adjust the mAs and then run the grayscale test again.
4. Perform 4 exposures in Full Size mode and Binning mode, respectively.
5. Click **Next**.
6. Make sure that the gray levels of images are normal, and click **Accept**.
   a. When the X-ray exposure indicator lights up, press the exposure hand switch to start exposure.
   b. Make sure that the gray levels are normal.
7. The system automatically selects FFDM-W/Ag, Tomo Fast Scan-W/Rh, Tomo Fast Scan-W/Ag, Tomo HD Scan-W/Rh, Tomo HD Scan-W/Ag, BIO-W/Rh, and BIO-W/Ag. Perform exposures manually in sequence.
   - Tomo Fast Scan-W/Rh, Tomo Fast Scan - W/Ag, Tomo HD Scan-W/Rh, and Tomo HD Scan-W/Ag are only applicable to systems with the DBT license.
   - BIO-W/Rh and BIO-W/Ag are only applicable to systems that have biopsy stereotaxis modules and the BIO license.
8. Click **Finish** and view the results of calibration in the report interface.

What to do next:

If the FPD calibration fails, please contact UIH Customer Service Center.

12 Repair, maintenance, and disposal

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12.1 Maintenance

Routine maintenance of the system must be carried out in accordance with the requirements of laws and regulations to ensure the safe and stable operation of the equipment, improve the reliability of the system, reduce the failure rate of the equipment, prolong the service life of the equipment, ensure the image quality, and ensure the safety of patients, operators, and others.

Maintenance includes tests and maintenance performed by users, as well as maintenance performed by personnel who can perform such maintenance according to the service agreement or UIH service purchase order or who are explicitly authorized by UIH.

⚠WARNING
Do not maintain any parts when the patient is present.

Please see *Technical Instruction* for details about system installation and maintenance.

12.1.1 Preventive maintenance

The user must check the system regularly. In case of failure or other abnormal situations, the user must shut down the system and contact the UIH Customer Service Center.

System operation can be resumed only after all problems are solved. Using faulty components will cause safety hazards such as exposure to high dose radiation.

Interval	Item	Checking method
Every day	Ambient conditions	Check whether the ambient conditions meet the requirements.
Every day	Exit passageway	Check whether the exit passageway is clear of obstacles.
Every day	System covers	Check whether the covers are complete without damages.
Every day	Labels and warning signs	Check whether the labels are damaged or lost.
Every day	Indicators	Check whether the indicators work properly.
Every day	E-Stop button	Check whether the buttons work properly.
Every day	Control box	Check whether it is undamaged and works properly.
Every day	Angle feedback interface	Check whether it is undamaged and works properly.
Every week	All cables and terminals	Check whether they are undamaged.
Every month	Image quality	Check whether the image quality meets the clinical requirements.
Every month	FPD calibration	Calibrate the flat panel detectors.

12.1.2 Recording results

Record the process and results of preventive maintenance, including the following information:

- Type and scope of work.
- Detailed modification of rated values or working area.
- Date and operator signature.

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12.2 Cleaning and disinfection

⚠CAUTION

To ensure safe and effective system operation and prevent cross infections, the parts that come into contact with patients must be cleaned and disinfected regularly according to local laws and regulations. In case of special circumstances, clean and disinfect the components whenever needed.

⚠WARNING

Turn off the system power supply before cleaning the equipment or using disinfection sprays.

⚠WARNING

Prevent ingress of liquid into the system to prevent corrosion of components and short circuit.

⚠CAUTION

Operators must wear gloves during cleaning and disinfection.

NOTICE

- Shut the system down and cut off the power supply before cleaning and disinfection.
- Make sure that the floor of the exam room and the equipment surfaces are completely dry before using the equipment.

ⓘ

- **When using the commercially available cleaning agents, please follow the manufacturer's instructions.**
- **Use commercially available disinfectant, and follow the manufacturer's instructions.**
- **Do not use corrosive cleaning agent.**
- **Do not use any hard and sharp tools (for example, knives or tweezers) to clean up the residue. Otherwise, the components will be damaged.**

12.2.1 Cleaning

12.2.1.1 Precautions

NOTICE

- Do not use alcohol to clean the Acrylic parts of the gantry covers, UIH logo, control panels, and LCD screens.
- Only use alcohol to clean the relatively dirty parts of the covers.

NOTICE

When cleaning covers, make sure that no liquid gets inside the covers.

Clean all contaminated parts and all areas that the patient may or has come into direct or indirect contact with.

Only use a piece of damp cloth moistened with mild cleaning agent to wipe glazed parts or aluminum surfaces. Then use a piece of dry linen-free cloth to wipe them clean.

12.2.1.2 Cleaning the covers

⚠WARNING

To avoid patient discomfort or damage to the compression paddle, do not use rough compression paddles or compression paddles that have been cleaned with corrosive detergent.

1. Power off the system.
2. Use a piece of soft cloth (such as gauze and non-woven fabric) slightly moistened with water or mild cleaning agent to wipe the covers of the components.
   - Wipe the contaminated parts and surrounding areas for two or three times.
3. After using cleaning agent, use a piece of soft cloth slightly moistened with water to wipe the cleaned areas for two or three times.
4. Use a piece of clean soft cloth to dry the covers.

12.2.1.3 Cleaning furniture

1. Use a soft cloth moistened with commercially available neutral detergent to wipe the surface of furniture.
2. Use a piece of clean soft cloth to dry the furniture.

12.2.1.4 Cleaning the monitors

1. Power off the system.

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2. Use a piece of soft cloth (such as gauze and non-woven fabric) slightly moistened with water to clean the monitors.
   - ♦ Clean up the fingerprints left on the monitors regularly.
   - ♦ Do not spray liquids onto the monitors.
   - ♦ Do not scratch the monitors.
   - ♦ If water drops onto the monitors, wipe off the water immediately.
3. Use a piece of clean soft cloth to dry the monitors.

12.2.2 Disinfection

12.2.2.1 Precautions

⚠WARNING

Do not use any disinfectant that contains strong chlorine or is highly corrosive.

- ■ You can sanitize all system components (including optional accessories and cables) only by wiping them.
- ■ Spray disinfectant is not recommended, because spray can penetrate the equipment and damage the electronic parts.

12.2.2.2 Disinfecting the scanning room

1. Cut off the system power supply. Wait till the equipment cools down.
2. Use plastic sheet to completely cover the system.
3. Spray the disinfectant.
4. Only after all the disinfectant spray in the air has settled can you remove the plastic sheet and wipe the system.

12.2.2.3 Disinfecting the covers and the handles

1. Power off the system.
2. Use a piece of soft cloth slightly moistened with 75% alcohol to wipe the covers and the handles.
   - ♦ After disinfection, wait for some time before starting up the system.

12.2.2.4 Disinfecting monitors

1. Power off the system.
2. Use a piece of soft cloth slightly moistened with 75% alcohol to clean the monitors.
   - ♦ Do not spray liquids onto the monitors.
   - ♦ Do not scratch the monitors.

12.3 Disposal

Medical equipment is a special kind of products. After the product reaches its service life, it should be disposed of according to relevant laws and regulations. Users shall contact UIH Customer Service Center for recycling when the service life of the product expires. Please handle hazardous materials correctly.

Table 12-1 List of hazardous materials

Component	Hazardous material	Quantity
X-ray tube	Lead	0.08 kg
	Oil	1.25 kg
Collimator	Lead	0.43 kg
Host	Lithium battery	1 pcs
Monitor	LCD	1 pcs
Operation table	Lead	35 kg
Grid	Lead	97.21 g
Readout display	LCD	1 pcs
Detector	Lead	0.399 kg

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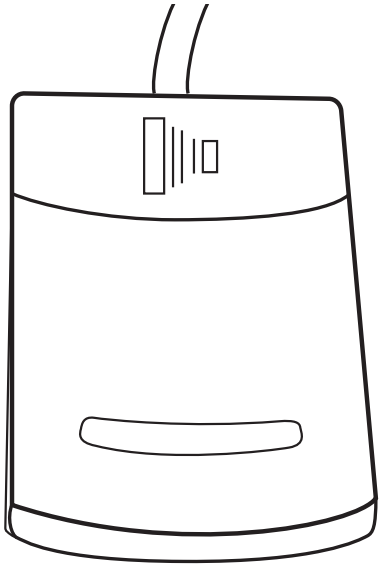
13 Accessories and optional components

13.1 Exposure foot switch (optional)..... 13-2
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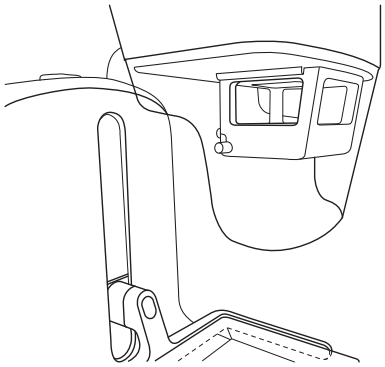
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13.1 Exposure foot switch (optional)

You can use the exposure foot switch to control exposure by foot.



13.2 2D biopsy unit



The 2D biopsy unit is used for 2D biopsy and is composed of a 2D biopsy compression paddle, a localization crosshair device, and a face shield.

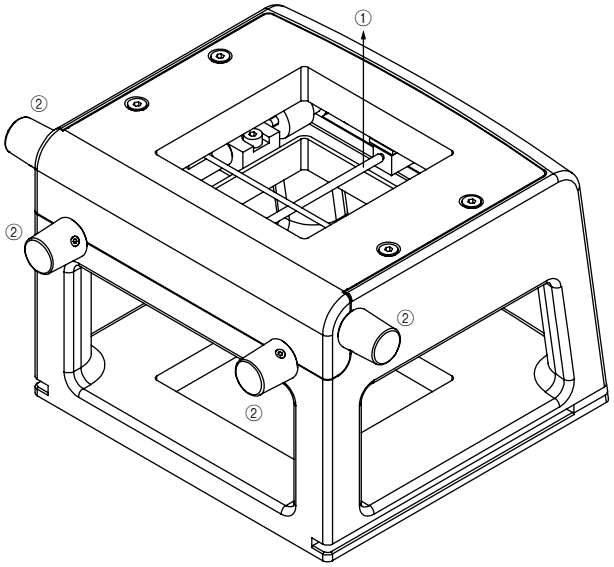
Related concepts

Page 3-4 Specifications of compression paddles
Page 3-10 Face shield

13.2.1 Localization crosshair device

The localization crosshair device is used to help users adjust the coordinates and determine the entry position of the biopsy needle during the 2D biopsy exam. According to the clinical requirements of the biopsy, you should use the single-aperture 2D biopsy compression paddle together with the localization crosshair device and the 2D biopsy face shield.

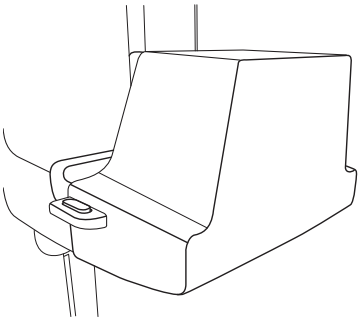
You can use the knobs to move the crosshair and adjust the coordinates. Then through the projection of the crosshair, you can confirm the location of the puncture point.



1. Crosshair
2. Knob

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13.3 Magnification table



The magnification table can be installed to the system for image magnification. The magnification factor can be 1.5 or 1.8.

Before installing the magnification table, you must remove the face shield.

If you choose to use the magnification table, it should be used together with the magnification compression paddle.

Table 13-1 Size of the magnification table

Name	Size of the tabletop	Height
1.5x magnification table	220 mm × 171 mm	205 mm
1.8x magnification table	185 mm × 144 mm	285 mm

13.4 Tools for quality control

The FPD calibration phantoms (PMMA) are standard accessories provided with the system. You can purchase the other tools with reference to the specifications recommended by UIH.

Table 13-2 Recommended tools for quality control

Name	Specifications
ACR phantom	Standard product (model: 015)
FPD calibration phantom (PMMA)	Thickness: 10 mm (1 pcs), 20 mm (1 pcs), 40 mm (1 pcs). Size: 245 mm × 320 mm.
Steel plate	250 mm × 320 mm × 2 mm

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13.5 Entering the patient ID using a barcode scanner

Notes for barcode scanning:

- Aim the scan window at the barcode on the front. If the angle of the barcode relative to the scanner is too small, patient information may not be read.
- The laser beam must cover the entire label. If only part of the label is scanned, the patient information cannot be read.

1. Click **Patient Registration** in the Patient Administration interface.
   - ♦ The Patient Registration interface opens.
2. Click the patient ID text box, delete the original patient ID, and position the cursor to the patient ID text box.
3. Aim the scan window at the barcode label and press the scanner's button.
   - ♦ The patient ID appears in the patient ID text box.

14 Technical data

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14.2 Equipment conditions....14-3
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14.1 Equipment classification based on safety levels

Table 14-1 Equipment classification based on safety levels

Classification	Safety feature
According to the type of protection against electric shock	Class I
According to the degree of protection against electric shock	Type B applied part
According to the degree of protection against ingress of water	♦ Equipment without protection against ingress of water ♦ Foot switch: IPX8
According to the degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide	Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide
According to the mode of operation	Continuous operation

14.2 Equipment conditions

14.2.1 Requirements for the mains supply

⚠WARNING

Multiple socket-outlets provided with this system shall only be used for supplying power to equipment that is intended to form part of the system. Do not connect any equipment that has not been supplied as a part of this system to the system. Do not connect such equipment to the same multiple socket-outlet (MSO) with system components.

NOTICE

- The customer is responsible for the site power supply.
- UIH should check whether the site power supply meets the requirements before the system is transported to the site.
- If the site power supply cannot meet the requirements of this system, the customer should contact the local electric power department for installing the suitable power supply. The installation of the power distribution equipment must comply with local laws and regulations.

Table 14-2 Requirements for the mains supply

Parameter	Nominal value	Allowable error
Voltage and phase	♦ Single-phase AC ♦ 220 V/ 230 V/ 240 V	±10%
Rated frequency	50 Hz, 60 Hz	±1 Hz
Internal resistance of the power supply	≤ 0.30 Ω	N.A.
Power capacity	♦ Maximum 10.5 kVA	N.A.

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14.3 Ambient conditions

14.3.1 Requirements for operating environment

Table 14-3 Requirements for operating environment

Parameter	Operating conditions
Temperature	+10°C to +30°C
Humidity	30%–75%
Atmospheric pressure	700–1060 hPa

14.3.2 Requirements for transport and storage

⚠WARNING

The system must be stored in a warehouse with controllable temperature and humidity to prevent harms caused by the changes of weather and the dust in the environment. Make sure that there is no corrosive substance such as acid or alkali around.

Table 14-4 Requirements for transport and storage conditions

Component	Temperature	Relative humidity	Atmospheric pressure
System	-10°C to +55°C	20%–80% (no condensation)	700–1060 hPa
X-ray tube assembly	-10°C to +75°C	10%–90%	700–1060 hPa
Collimator for mammography	-40°C to +70°C	10%–95%	500–1060 hPa
Detector	-10°C to +55°C	20%–80% (no condensation)	700–1060 hPa

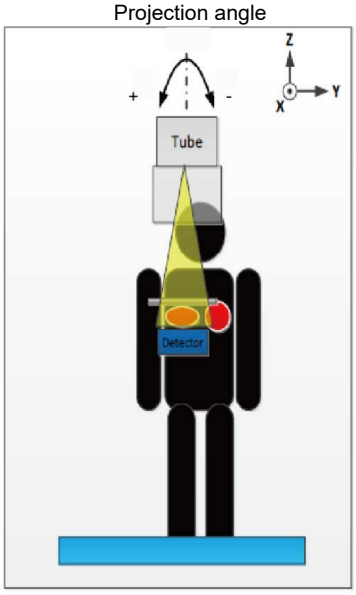
14.4 System performance

14.4.1 System movement

14.4.1.1 Definition of the coordinate axes

- X direction: On the horizontal plane and perpendicular to the chest wall. The positive direction points from the chest wall to the stand.
- Y direction: On the horizontal plane and parallel to the chest wall. The positive direction points from the right of a patient facing the gantry to the left.
- Z direction: On the vertical plane. The positive direction points from the ground to the ceiling.
- Origin of coordinates: The intersection point of the vertical plane that passes the chest wall side of the detector and the rotation axis of the C-arm.
- Yaw angle: The angle of rotation around the axis parallel to the X-axis. When the thumb of the right hand points to the positive direction of the X-axis, the direction in which the other four fingers curl is the positive direction.

Projection angle



- Pitch angle: The angle of rotation around the axis parallel to the Y-axis. When the thumb of the right hand points to the positive direction of the Y-axis, the direction in which the other four fingers curl is the positive direction.
- Roll angle: The angle of rotation around the axis parallel to the Z-axis. When the thumb of the right hand points to the positive direction of the Z-axis, the direction in which the other four fingers curl is the positive direction.

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14.4.1.2 Definition of movement directions

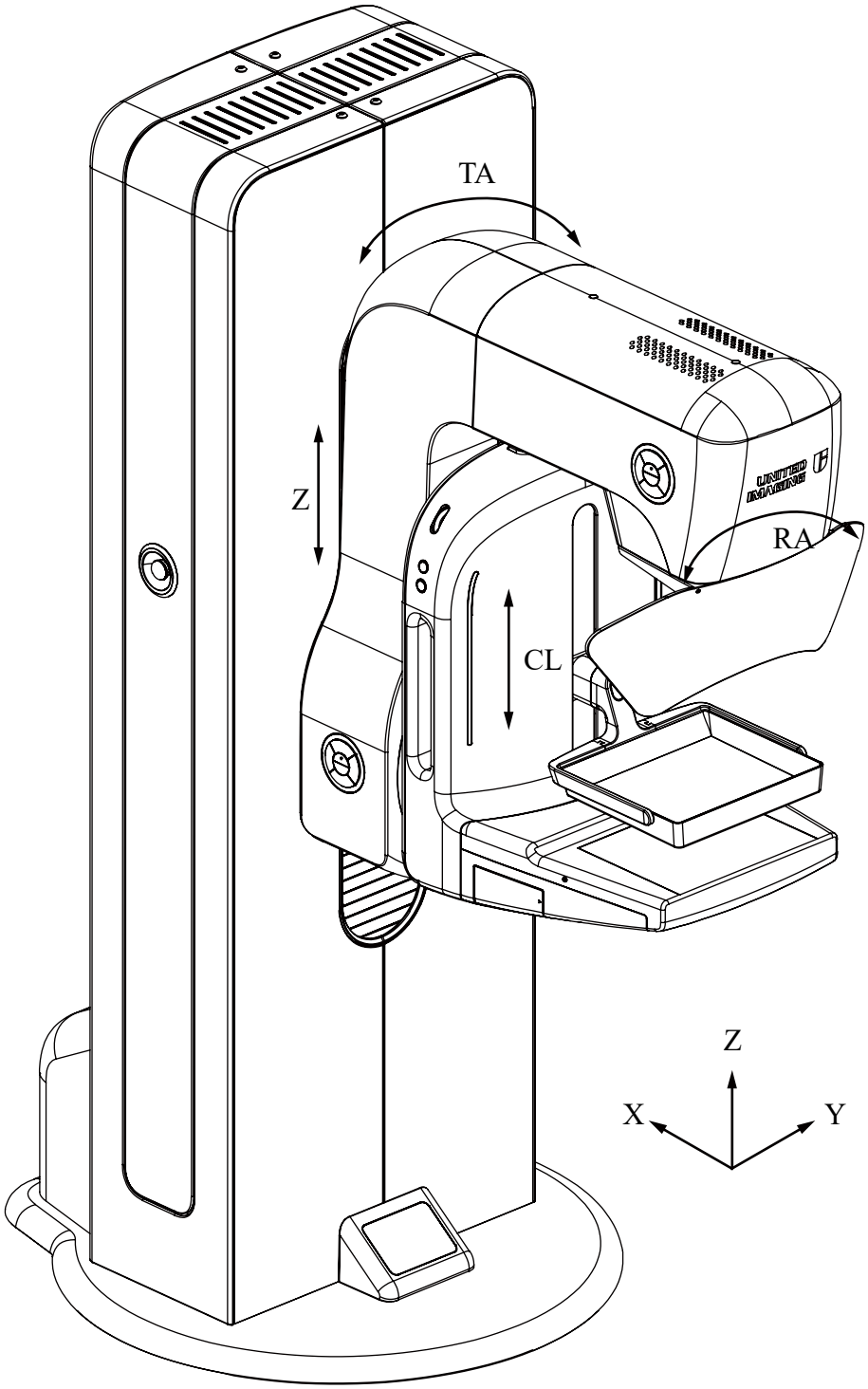


Figure 14-1 System movement

Movement direction	Description
Z-axis	Vertical movement of the C-arm along the stand
CL	Vertical movement of the compression paddle relative to the object table
TA	Rotation of the C-arm as a whole relative to the stand
RA	Rotation of the C-arm relative to the object table

14.4.1.3 Mechanical movement range

Table 14-5 Mechanical movement range

Parameter	Performance
Vertical movement range of the C-arm	Distance to the floor: 650–1480 mm, deviation ±5%
Overall rotation range of the C-arm	-150° to +190° (deviation: < 2°)
Relative rotation range of the X-ray tube	- 22.5° to + 22.5°, deviation < 2°
Source to image receptor distance (SID)	♦ Contact mode: 700 mm ± 3 mm ♦ Magnification mode: 705 mm ± 3 mm

14.4.1.4 Movement range of the compression unit

Parameter	Performance
Movement range of the lower surface of the compression paddle (distance to the upper surface of the object table)	> 290 mm
Carbon fiber attenuation equivalent of the object table	≤ 0.15 mmAl

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14.4.2 Main components

14.4.2.1 X-ray tube assembly

Table 14-6 Performance parameters of the X-ray tube assembly

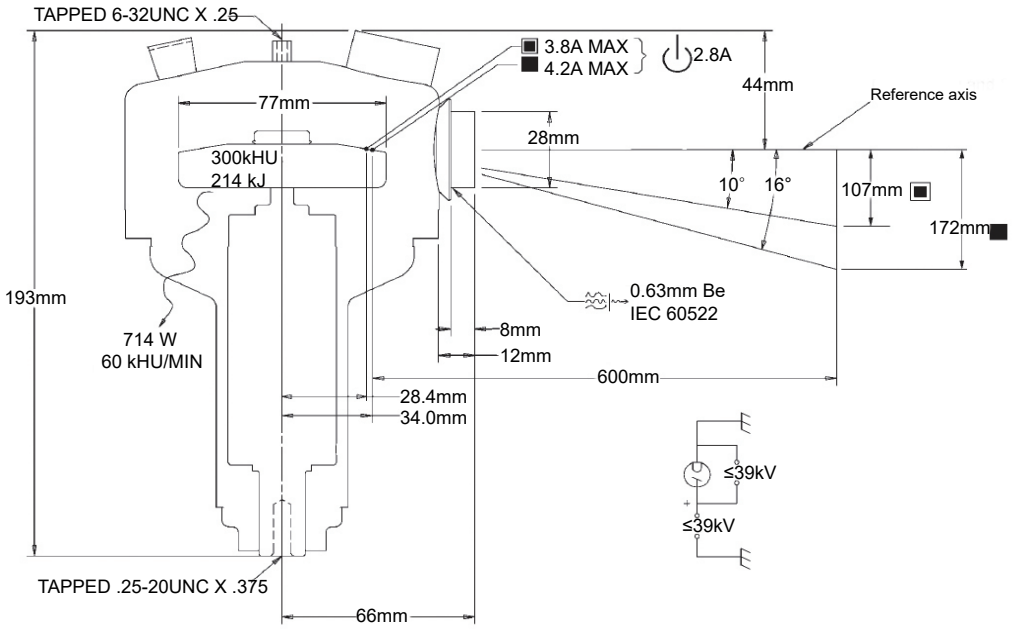
Parameter	Value
Manufacturer	Varex Imaging Corporation
Model	♦ Tube: M-113T ♦ Tube housing: B-121
Classification	Class I, Type B
Type of anode	Rotating anode
Material of the anode target	Tungsten
Anode target angle	10° (0.1) / 16° (0.3)
Continuous anode input power	294 W
Nominal focal spot value	♦ Large focal spot: 0.3 ♦ Small focal spot: 0.1
Inherent filtration	0.63 mm Be
Maximum heat content	♦ Tube housing: 370 kJ (500 kHU) ♦ Tube: 222 kJ (300 kHU)
Maximum tube voltage	49 kV
Maximum continuous heat dissipation of the X-ray tube assembly	300 W
Maximum continuous heat dissipation of the tube	714 W
Weight	9.3 kg (20.5 lbs ± 0.5 lbs)
Loading factor of X-ray leakage	49 kV, 6.0 mA
Cooling	Air cooling

X-ray tube assembly

The X-ray tube assembly consists of the tube and the tube housing.

Structure of X-ray tube

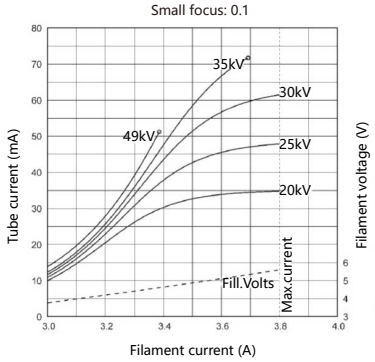
Structure of M-113T tube

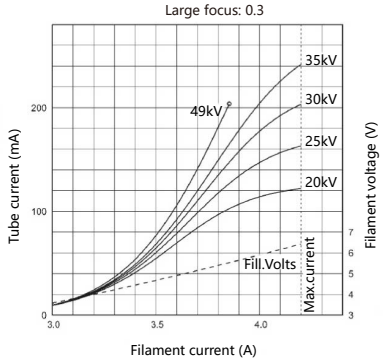


Symbol	Description	Symbol	Description
	Large focal spot		Earthing or earthing through covers
	Small focal spot		X-ray tube
	Standby		Filtration

Characteristics of cathode filament emission

Applicable to M-113T tube.

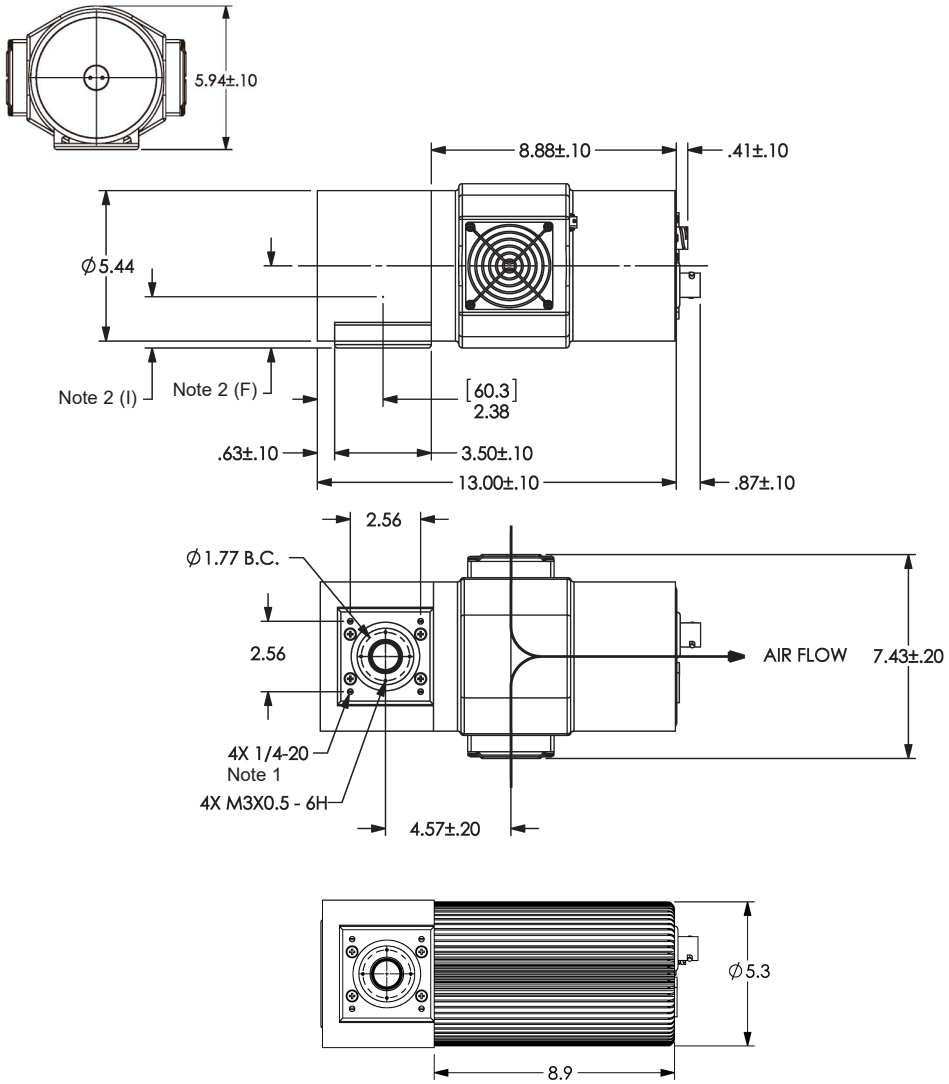




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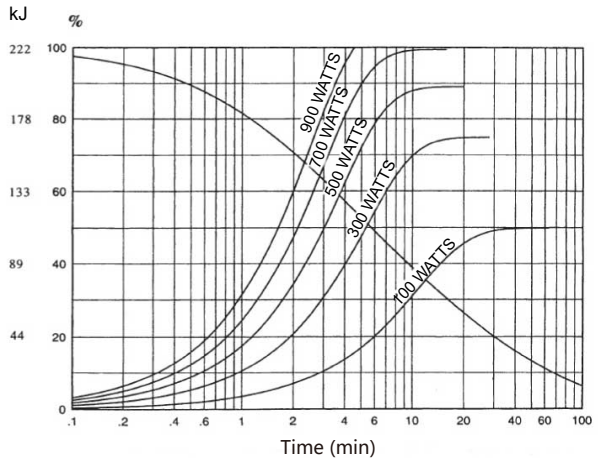
Size of X-ray tube housing

Size of the B-121 tube housing



Heating and cooling curves of the X-ray tube

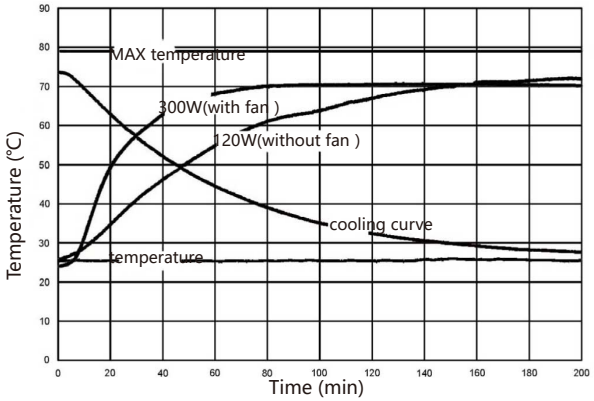
Applicable to M-113T tube.



The heat content of the X-ray tube assembly is monitored during exposure. If the X-ray tube assembly is overheated, the driver of the rotating anode is disconnected, the exposure is stopped, and the system displays an error message.

Heating and cooling curves of the X-ray tube housing

Applicable to B-121 tube housing.



Single load rating curves of the X-ray tube

Single load rating curves

Applicable to M-113T tube.

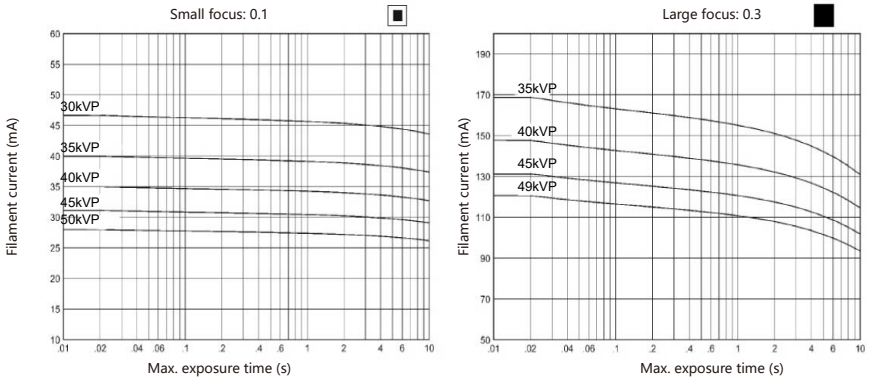


Figure 14-2 Single load rating curves of the X-ray tube with stator drive frequency of 50 Hz

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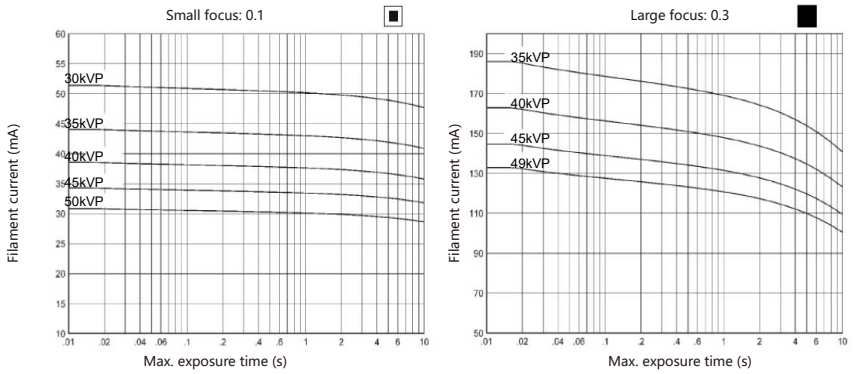


Figure 14-3 Single load rating curves of the X-ray tube with stator drive frequency of 60 Hz

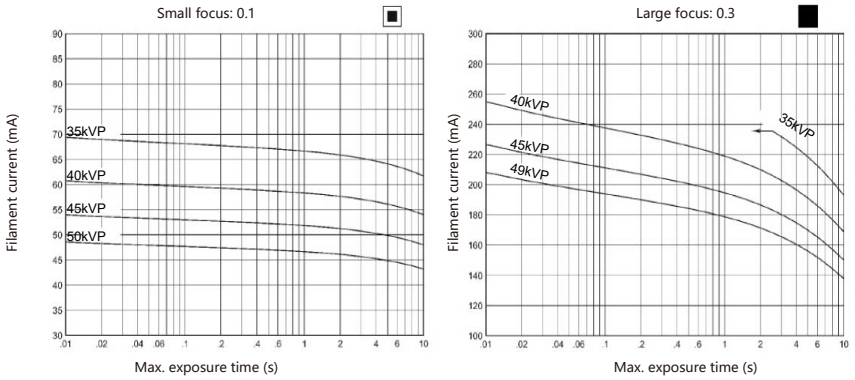


Figure 14-4 Single load rating curves of the X-ray tube with stator drive frequency of 150 Hz

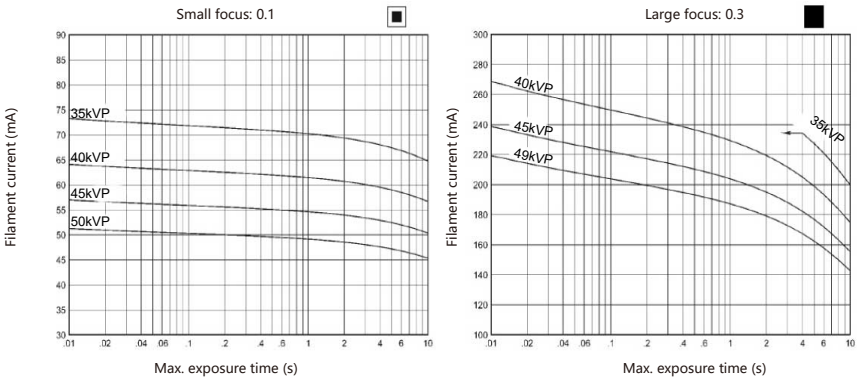


Figure 14-5 Single load rating curves of the X-ray tube with stator drive frequency of 180 Hz

14.4.2.2 High-voltage generator

Table 14-7 Performance parameters of the high-voltage generator

Parameter	Value
Nominal output power	4.8 kW @ 1.2 s
Tube voltage	20 kV – 49 kV, accuracy ≤ ±5%
Tube current	15 mA – 160 mA, accuracy ≤ ±20%
Loading time	5 ms – 10,000 ms, accuracy ≤ ±(10% + 1 ms)
Current–time product	♦ Large focal spot: 2 mAs – 600 mAs, accuracy ≤ ±5% ♦ Small focal spot: 2 mAs – 400 mAs, accuracy ≤ ±5%
Input power voltage	Single-phase AC, phase voltage 200 V /230 V/ 240 V AC
Input power frequency	50 Hz/60 Hz
High-voltage transformer structure	Non-power frequency

14.4.2.3 Power distribution unit

Table 14-8 Performance parameters of the power distribution unit

Parameter	Parameter
Input voltage	Single-phase AC, 200 V/208 V/220 V/230 V/240 V
Frequency	50 Hz / 60 Hz
Maximum output power	10.5 kW

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14.4.2.4 Collimator

Table 14-9 Performance parameters of the collimator

Parameter	Value
Product	R915
Light field control	Automatic
Inherent filtration	0.02 mmAl / 75 kV
Rh filtration	0.05 mm
Ag filtration	0.05 mm
Power input	24 V DC, 2 A
Input power	39.5 W
Type of collimator lights	LED
Illumination time of light localizer	0–30 s
Dimensions of the radiation field	♦ 18 cm × 24 cm ♦ 24 cm × 30 cm ♦ 9 cm × 9 cm ♦ 8 cm × 20 cm ♦ 16 cm × 20 cm
Maximum light field size	23 cm × 29 cm

14.4.2.5 Flat panel detector

Table 14-10 Performance parameters of the detector Xineos-2329

Parameter	Value
Type	CsI + photodiode, indirect, fixed, wired
Dimensions of the image receiving surface	228.1 mm × 291.3 mm
Pixel size	49.5 µm × 49.5 µm
Matrix	4608 × 5890
DQE	≥ 60% @ 1 lp/mm
Dynamic FPD	8 fps (@ 2×2 Binning), 2 fps (@ 1×1 Full)

14.4.2.6 Grid for mammography

The anti-scatter grid used for the system is a grid assembly with the moving grid mechanism.

Table 14-11 Performance parameters of grid for mammography

Parameter	Parameter
Type	Focused grid
Size (DBT)	321 mm × 260 mm
Focal length	70 cm
Grid density	36 L/cm
Grid ratio	5:1
Absorption material	Graphite

14.4.2.7 Barcode scanner

Table 14-12 Barcode scanner parameters

Parameter	Value
Power supply	Internal or external power supply (based on the type of the scanner)
Voltage	5 V
Minimum current	650 mA
Laser level	Class I

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14.4.2.8 Workstation configuration

Configuration of the acquisition workstation

Parameter	Specifications
Host monitor	♦ Size: 24 inch ♦ 16:10 ♦ Resolution: 1920 × 1200
RAM	32 GB
Hard disk	1 TB + 6 TB
Power supply	650 W, AC 100–240 V ± 10%, 50 Hz/60 Hz ±1 Hz
Network port	Two 1000 Mbps ports
Keyboard	USB port
Mouse	USB port
Operating system	Windows 7 64-bit or higher versions

Data interfaces

Table 14-13 Data interfaces

Data type	Health data	Equipment data
Transmission protocol	TCP/IP communication protocols based on DICOM standard	TCP/IP communication protocols
Storage format	DICOM format	Not applicable

14.5 Reference axis of the system

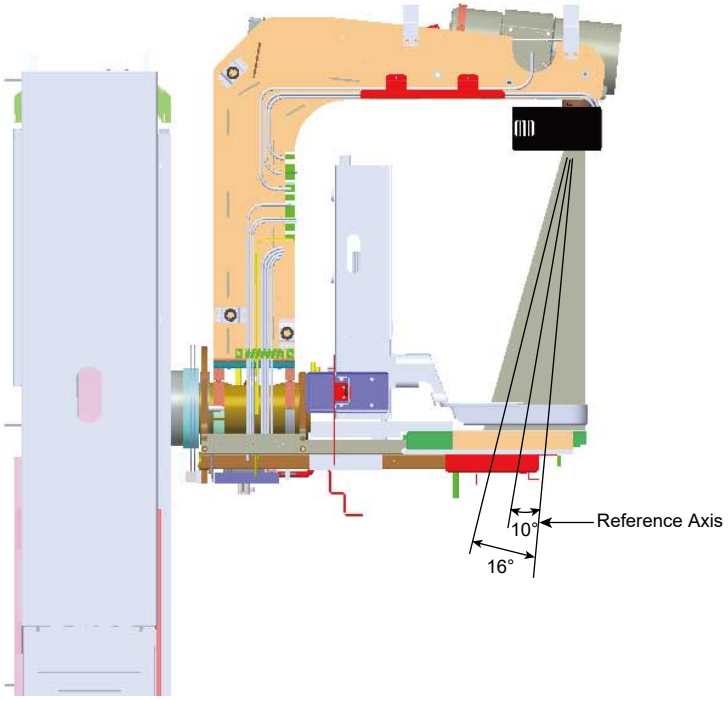


Figure 14-6 Position of the reference axis

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14.6 Control and display of loading factors

14.6.1 X-ray tube voltage

- The tube voltage can be adjusted in steps. The adjustment range should be between 20 kV and 49 kV, with 1 kV for each step.
- The deviation of the X-ray tube voltage should not be greater than 5%.

14.6.2 Current–time product

- The current–time product is chosen from the series R'20 for radiography. Some values are added on this basis. The range in the large focal spot mode is 2–600 mAs, and the range in the small focal spot mode is 2–400 mAs.
- The error of the value of the X-ray tube current–time product, in any combination, shall be not greater than ±(10% + 0.2 mAs).

14.6.3 Focal spots

- The X-ray tube assembly of the system has two focal spots: large focal spot and small focal spot. Their nominal values are 0.3 and 0.1 respectively.
- In the magnification mode, the nominal focal spot value is 0.1.
- In the contact mode, the nominal focal spot value is 0.3.
- The pre-selected focal spot can be shown before exposure, and the actual focal spot can be shown after exposure.

14.6.4 Target material

The target material of the X-ray tube assembly is tungsten.

14.6.5 Additional filtration

- The additional filtration adopted by the system is 0.05 mm Ag and 0.05 mm Rh.

14.6.6 AEC function

The system has the function of automatic exposure control (AEC).

- When the AEC function is selected, the system firstly performs pre-exposure and obtains pre-exposure images. According to the pre-exposure images, the optimal parameters for final exposure are calculated and the final exposure is performed.

Within the range of intended use, the coefficient of variation of the measured air kerma should not be greater than 0.05 for any combination of loading factors.

The repeatability of the AEC is measured by the deviation of the applied dose or mAs. The deviation value should not be greater than ±5%.

- kV range in AEC mode: 20 kV – 49 kV
- mAs range in AEC mode: 5 mAs – 600 mAs

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V03

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