Brivo XR118
Digital X-Ray Imaging System

Learning and Reference Guide

5474059-8EN

Rev.1

Brivo XR118 5474059-8EN Rev.1

IMPORTANT!...X-RAY PROTECTION

X-Ray equipment if not properly used may cause injury. Accordingly the instructions herein contained should be thoroughly read and understood before you attempt to place this equipment in operation. The General Electric Company, Healthcare Division, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator or his assistant to take adequate precautions to prevent the possibility of authorized or unauthorized persons carelessly, unwisely, or unknowingly exposing themselves or others to direct or secondary radiation.

It is important that everyone having anything to do with x-radiation be fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Ave., Bethesda, MD 20814, and of the International commission on Radiation Protection, and take adequate steps to insure protection against injury.

It is assumed that all persons authorized to use the equipment are cognizant of the danger of excessive exposure to x-radiation and the equipment is sold with the understanding that the General Electric Company, Medical Systems Division, its agents, and representatives have no responsibility for injury or damage which may result from exposure to x-radiation.

Various protective materials and devices are available. It is urged that such materials and devices be used.

If you have any comments, suggestions or corrections to the information in this document, please write them down, include the document title and document number, and send them to:

GENERAL ELECTRIC HEALTHCARE

ADDRESS: NO.1 YONGCHANG NORTH ROAD, ECONOMIC & TECHNOLOGY DEVELOPMENT AREA, BEIJING, P.R.CHINA 100176

TEL: 86-10-58068888

FAX: 86-10-67881850

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT

All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing shall be performed by qualified GE Healthcare personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

CAUTION: This manual is prepared, approved in English, English version is the original version, manuals in any other language are translated by GE approved suppliers. Always refer to the English version if non-consistency is found.

Medical Device Directive

This product complies with the following requirements when it bears the following CE marking of conformity:

Council Directive 93/42/EEC concerning medical devices :

The location of the CE mark label on the equipment is in the service system manual.

European registered place of business:

GE Healthcare Europe

Quality Assurance Manager

BP 34

F 78533 BUC CEDEX

Tel: +33 (0) 1 30 70 40 40

Green QSD 1990 Standard issued by MDD (Medical Devices Directorate, Department of Health, UK).

Medical Device Good Manufacturing Practice Manual issued by the FDA (Food and Drug Administration, Department of Health, USA).

Underwriters' Laboratories, Inc. (UL), an independent testing laboratory.

Canadian Standards Association (CSA).

International Electrotechnical Commission (IEC), international standards organization, when applicable.

GE Healthcare reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation.

The original language of this manual is English.

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Contact Information

Company Website: www.gehealthcare.com

Manufacturer:

Company Name:	GE HEALTHCARE (TIANJIN) COMPANY LIMITED
Registration Address:	No.266 Jingsan Road, Tianjin Airport Economic Area, TIANJIN 300308 CHINA
Manufacture Address:	No.266 Jingsan Road, Tianjin Airport Economic Area, TIANJIN 300308 CHINA
Telephone:	022-58803188
Fax:	022-58803188

Product Name: Digital X-Ray Imaging System

Model: Brivo XR118

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Chapter 15Maintenance

Chapter 16Set Preferences

Appendix A: Login Administration

Appendix B: Specifications

Appendix C:
Inhibit Messages

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Chapter 1
About This Guide

This chapter explains the purpose and design of this Learning and Reference Guide. It is an introduction to the guide, providing information on the purpose, prerequisite skills, guide organization, chapter format, and graphic conventions that identify the visual symbols used throughout the guide.

Topics covered include:

- Safety Information
- Graphic Conventions and Legends
- Safety Notices

Safety Information

Please refer to Chapter 2: Safety and Regulatory in this Learning and Reference Guide. The Safety chapter describes the safety information you and the physicians must understand thoroughly before you begin to use the system. Note that you will find additional safety information throughout your Learning and Reference Guide. Additional training is available, contact qualified GE Healthcare personnel for a training. The equipment is intended for use by qualified personnel only. This guide should be kept with the equipment and be readily available at all times. It is important for you to periodically review the procedures and safety precautions. It is important for you to read and understand the contents of this guide before attempting to use this product.

Graphic Conventions and Legends

Table 1-1describes the conventions used when working with menus, buttons, text boxes and keyboard keys.

Table 1-1 Conventions for menus, buttons, text boxes, and keyboard keys

Example	Description
Select	• Marking an option in a group of check boxes or radial buttons • Choosing an option from a drop-down list • Activating a tab • Highlighting text • Highlighting row items
Press ENTER	Pressing a hard key on the keyboard.
Press **CTRL + ALT + DELETE**	Pressing a combination of keys on the keyboard. The key that should be pressed first is listed first.
Press and hold **SHIFT**	Pressing and holding down a hard key on the keyboard.
Click [START EXAM]	Clicking a button on a workstation screen.
In the **Matrix** text box...	The name of text box in which you can select or type text or the name of a drop-down list from which you select an option.
Type **DICOMAE** in the Patient Position text box (different font and bold)	Text you enter into a text box.
Select **Sort > Sort by date**	The pathway of selecting option(s) in a drop-down list.

Safety Notices

The following safety notices are used to emphasize certain safety instructions. This guide uses the international symbol along with the danger, warning, or caution message. This section also describes the purpose of a Note.

Danger: **Danger is used to identify conditions or actions for which a specific hazard is known to exist which will cause severe personal injury, death, or substantial property damage if the instructions are ignored.**

Warning: **Warning is used to identify conditions or actions for which a specific hazard is known to exist which may cause severe personal injury, death, or substantial property damage if the instructions are ignored.**

Caution: **Caution is used to identify conditions or actions for which a potential hazard may exist which will or can cause minor personal injury or property damage if the instructions are ignored.**

Note: A Note provides additional information that is helpful to you. It may emphasize certain information regarding special tools or techniques, items to check before proceeding, or factors to consider about a concept or task.

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Chapter 2
Safety and Regulatory

Preface

This chapter explains the safety considerations, general equipment and patient related precautions, and the symbols used for the safe operation of your equipment. This chapter also includes information about the emergency procedures.

This chapter presents the concepts necessary to successfully operate your system safely. Topics covered include:

- Indications for Use
- Safety
- Know the Equipment
- Electromagnetic Compatibility
- Radiation Safety
- Emergency Procedures
- Safe Operation Precautions
- Symbols
- Identification And Compliance Plates
- Regulatory Requirements

Indications for Use

Brivo XR118 digital X-Ray imaging system should be used in combination with conventional X-ray imaging system to generate a digital image.

Important Notice

This device is not intended for mammographic and dental applications.

WARNING:It is forbidden to use this device to take exposure repeatly and frequently for a same patient, especially a child.

WARNING:It is forbidden to use this device for a pregnant woman.

Safety

The electrical wiring of the relevant rooms complies with all national and local codes, as well as the Regulations for the electrical equipment of buildings published by the Institution of Electrical Engineers. All assembly operations, extensions, re-adjustments, modifications, or repairs are carried out by GE Healthcare Technologies authorized service representatives. The equipment must be used in accordance with the instructions for use.

WARNING:This X-Ray unit may be dangerous to patient and operator, unless safe exposure factors, operating instructions and maintenance schedules are observed.

WARNING:To be used by authorized personnel only.

WARNING:An additional MULTIPLE PORTABLE SOCKET-OUTLET or extension cord shall not be connected to the system.

WARNING: Only GEHC validated equipment can be plugged into the interface in any part of this system. MULTIPLE PORTABLE SOCKET-OUTLETS provided with the SYSTEM shall only be used for supplying power to equipment which is intended to form part of the SYSTEM.

WARNING: Radiographic equipment must be operated by qualified personnel and only after sufficient training.

WARNING: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

WARNING: Electric shock hazard. To prevent possible electric shock, do not insert fingers inside the RJ 45 connector (Ethernet port).

WARNING: Make sure all the plugs are fixed before using this equipment.

WARNING: If any danger occurs, unplug the power supply unit immediately

WARNING: MULTIPLE PORTABLE SOCKET-OUTLETS shall not be placed on the floor.

WARNING: The facility must establish procedures for handling the patient in case of the loss of radiographic imaging or other system functions during an exam.

WARNING: If safety problem occurs, please contact Authorized service immediately.

WARNING: **Electric Shock Hazard! Prevent possible electric shock by leaving covers or panels on the equipment. Only trained and qualified personnel should be permitted access to the internal parts of this equipment.**

WARNING: **Workstation, display and any other non-medical electrical equipment used in this system shall only be connected to the system power distribution units. never supply electrical power directly from the wall outlet (mains outlet).**

WARNING: **Only digital detector which is specified to be installed in the examination room is suitable for use in patient environment. Any other equipment or component specified to be installed in control room shall not be brought into and use in patient environment.**

WARNING: **Upgraded objective (analog radiographic product) should meet the local market requirements, and meet the related IEC standards or equivalent standards. Also should have been verified with XR118. The detail technology information please contact GE service.**

WARNING: **Rough handling is prohibited during the transport.**

WARNING: **The system shall not be dropped during the normal use.**

WARNING: **Make sure the wireless signal strength is strong enough before the exposure.**

WARNING: **Never touch patient and connectors simultaneously. Electrical shock may occur.**

CAUTION: Do not place any object on the system that would restrict air flow.

CAUTION: Always be alert to safety when you operate this equipment. You must be familiar enough with the equipment to recognize any malfunctions that can be a hazard. If a malfunction occurs or a safety problem is known to exist, do not use this equipment until qualified personnel correct the problem.

CAUTION: It is the User’ s responsibility to provide the means for audio and visual communication between the Operator and the patient.

Know the Equipment

Read and understand all of the instructions in this Learning and Reference Guide before attempting to use the product.

Equipment Classifications

The following equipment classifications are applicable to the product:

- Equipment classification with respect to protection from electric shock: Class I
- Degree of protection from electric shock: Type B
- Degree of protection against ingress of liquids: IPX0
- Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with nitrous oxide
- Mode of operation: Continuous operation with intermittent loading

This equipment meets the following Safety Standards:

- IEC 60601-1 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
- IEC 60601-1-1 Medical electrical equipment – Part 1-1: General requirements for safety – Collateral standard: Safety requirements
- for medical electrical systems
- IEC 60601-1-2 Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral standard: Electromagnetic compatibility – Requirements and tests
- IEC 60601-2-32 Medical electrical equipment Part 2: Particular requirements for the safety of associated equipment of X-ray equipment

Electromagnetic Compatibility

WARNING: This system is intended for use by healthcare professionals only. This system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the system or shielding the location.

WARNING: This medial electrical equipment/system needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the accompanying documents.

WARNING: Portable and mobile RF communications equipment can affect this medical electrical system. Make sure those communication equipment are powered off before they are taken near this equipment/system.

WARNING: Power line anomalies or electrostatic discharges in all equipment areas may cause the monitor image to become momentarily disrupted or to go to blank; the mouse and/or keyboard may become inoperable or an error may be displayed on the Work list or Image Viewer screens. The system may recover by itself or you may need to reboot the system. The system may shut itself down, and will require a reboot.

WARNING: A power surge during image transmission to the workstation after acquisition may cause the image to be lost. The system will operate normally after the power surge, but the image must be reacquired.

WARNING: Power line anomalies or electrostatic discharges to the system cause a image write failure error. A new storage device should be used and the image re-written.

Radiation Safety

Always use the proper technical factors for each procedure to minimize X-ray exposure and to produce the best diagnostic results. In particular, you must be thoroughly familiar with the safety precautions before operating this system. Default system techniques are recommended for AEC acquisition. Default techniques are designed to optimize the image processing parameters.

CAUTION: Please protect the families and any other company of the patients' around this device from radiation. Please protect the technologists who are around this device from radiation.

CAUTION: Always use the proper technical factors for each procedure to minimize X-ray exposure and to produce the best diagnostic results. In particular, you must be thoroughly familiar with the safety precautions before operating this system. Default system techniques are recommended for AEC acquisition. Default techniques are designed to optimize the image processing parameters.

CAUTION: There should be no persons other than the patient in the exam room during x-ray exposure. If circumstances require another person to enter the room while x-ray exposures are planned or possible, that person should be well protected in accordance with accepted safety practices.

CAUTION: Make sure the examined object is located within the primary X-ray beam during exposure, otherwise that will result in a poor image quality.

CAUTION: Use the largest possible focal spot-to-skin distance appropriate for the anatomy being imaged, to keep the patient absorbed dose as small as possible.

CAUTION: Always use protective devices and protective clothing for the patient, operator or even other persons as appropriate to the workload and examination involved.

CAUTION: Hospital is responsible to provide means for audio and visual communication between the operator and the patient.

Emergency Procedures

The facility must establish procedures for handling the patient in case of the loss of radiographic imaging or other system functions during an exam.

WARNING: Do not use device should a safety problem occur and contact authorized service immediately.

Safe Operation Precautions

General Use Warnings

WARNING: For continued safe use of this equipment, follow the instructions contained in this Guide. Study this guide carefully before using the equipment and keep it at hand for quick reference. It may be desirable for the facility to print this manual from a standard PC to have a hard copy available within the Radiology department if only electronic manual is provided with this equipment.

WARNING: Only qualified personnel trained in the operation of this equipment should operate this system. Read and become familiar with all instructions in this manual before using this equipment If further assistance is needed, please contact GE.

WARNING: Some experts believe that use of any keyboard may cause serious injury to hands, wrists, arms, neck, or back.

WARNING: System PC can only be used for proper purpose. Do not load non-system software onto the system computer or visit internet, operating system may crash down causing data lost.

WARNING: Use of operation methods other than those specified herein may result in hazardous radiation exposure.

WARNING: Always be alert to safety when you operate this equipment. You must be familiar enough with the equipment to recognize any malfunctions that can be a hazard. If a malfunction occurs or a safety problem is known to exist, do not use this equipment until qualified personnel correct the problem.

WARNING: **This device should be used by or on the order of a physician.**

WARNING: **It is the responsibility of the operator to ensure the safety of the patient at all times. The patient should be monitored by visual observation, use of proper patient positioning, and use of the protective devices provided.**

WARNING: **Thoroughly check that there is no interference or possibility of collision between the patient and other equipment.**

WARNING: **Perform periodic maintenance to ensure continued safe use of the equipment. Follow recommended preventative maintenance schedule as outlined in the GEHC Field Service Manual.**

WARNING: **Never exceed the rated load of patient handling devices. The maximum supported weight of image detector is 135kg provided the patient is fully prostrate. Exceeding this limit may cause equipment damage or injury to the patient.**

WARNING: **Part of the circuit inside the system has dangerous voltages, so part of the electriferous circuits should be powered off by wall brake.**

WARNING: **Do not use device should a safety problem occur and contact authorized service immediately.**

WARNING: **Do NOT use this system in the ambulance.**

CAUTION: **Always use GEHC recommended accessories to ensure best performance and to avoid possible hazards.**

CAUTION: **Please carefully monitor all equipment motions to prevent collisions. Attention shall be drawn during operation to prevent possible injuries that could result from collision of the equipment parts with other moving or stationary items likely to be in the environment.**

WARNING: **Use the largest possible focal spot-to-skin distance appropriate for the anatomy being imaged, to keep the patient absorbed dose as small as possible.**

Patient Positioning Warnings

WARNING: During patient procedures, ensure the patient’ s head, hands and feet are completely within the tabletop area. If any portion of the patient’ s body extends over the edge of the tabletop, serious injury may result.

WARNING: Never let patient put limbs outside of tabletop area, serious injury could occur if patient is not attended properly. at the same time, operators shall also watch themselves for the moving parts on the table to avoid possible injury to fingers, hands, feet or any other parts of body structure.

Symbols

This section explains the symbols used on this system and in its accompanying documents.

Special Notices

Table 2-1 Special Notices

Symbol	Description
	This symbol on the equipment indicates the operating instructions should be consulted to assure safe operation.
	Follow operating instructions. This symbol directs you to consult this manual for more information.
	Non-ionizing electromagnetic radiation symbol.
RoHS **Compliant**	RoHS compliance symbol.
	Warning label. Body weight no more than 135kg.
	This device is delivered with electronic Instructions For Use (eIFU), identified as Operator Manual or Learning and Reference Guide. The eIFU symbol means that the instructions can be displayed on the device workstation computer (if applicable) or a personal computer.
	CE wireless symbol
	This product conforms with the requirements of council directive 93/42/EEC concerning medical devices, when it bears this CE mark of Conformity.
	Exposure inhibit symbol
	CMII wireless symbol

Electrical Type

Table 2-2 describes the electrical protection rating based on system type.

Table 2-2 Electrical Type

Symbol	Description
	Type B Equipment indicates the equipment provides a particular degree of protection against electrical shock regarding leakage current and protective earthing per IEC60601-1.

Electrical Current

Table 2-3 describes the symbols for the different types of electrical current that may be used on your system.

Table 2-3 Electrical Current Types

Symbol	Description
	Alternating Current indicates the equipment is suitable for alternating current only.
	Direct Current indicates the equipment is suitable for direct current only.

Ground

Table 2-4 describes the different types of grounding used in your system.

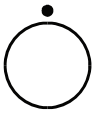
Table 2-4 Ground types

Symbol	Description
	Protective earth (ground) identifies any terminal which is intended for connection of an external protective conductor to protect against electrical shock in case of a fault.

Power Switch

Table 2-5 describes the different types of power switch used in your system.

Table 2-5 Power Switch Type

Symbol	Description
	Power ON switch. This symbol is used in all cases where safety is involved.
	Power OFF switch. This symbol is used in all cases where safety is involved.

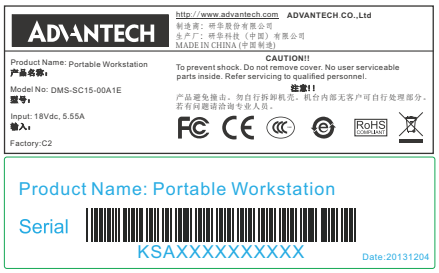
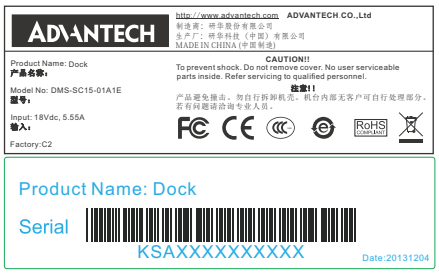
Identification And Compliance Plates

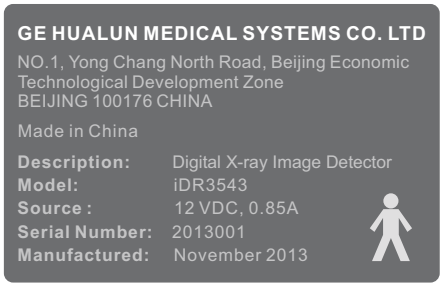
Product identification labels can be found on the tops and sides of the dock, the rear of workstation, and other exterior surfaces on the equipment. The types of system identification compliance plates are located in Table 2-6. Contact service personnel if you can not find these plates.

Note: Periodic review of labels is recommended.

Rating Plates

Table 2-6 Rating Plates

Product OR Components	Rating Plates	Location
System		
Workstation		
Dock		

Product OR Components	Rating Plates	Location
Detector		
Detector Other Labels		

NRTL Listed Label

The Nationally Recognized Testing Laboratory (NRTL) label indicates that the assembly is listed or recognized by a nationally recognized testing laboratory (i.e. ETL, UL, CSA).

Figure 2-1 ETL Listed Label

Identification And Compliance Plate Locations

Table 2-7 identifies the type of compliance plates and their location on your system.

Table 2-7 System identification and compliance plates

Component	Plate Type
Workstation	Identification, NRTL
Dock	Identification
Detector	Identification, Label, NRTL

Regulatory Requirements

Disposal of Waste

This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

Figure 2-2 Disposal of waste symbol

Battery Disposal

The separate collection symbol is affixed to a battery, or its packaging, to advise you that the battery must be recycled or disposed of in accordance with local or country laws. The letters below the separate collection symbol indicate whether certain elements (Pb=Lead, Cd=Cadmium, Hg=Mercury) are contained in the battery. To minimize potential effects on the environment and human health, it is important that all marked batteries that you remove from the product are properly recycled or disposed.

For information on how the battery may be safely removed from the device, please consult the service manual or equipment instructions. Information on the potential effects on the environment and human health of the substances used in batteries is available at this URL:

http://www.gehealthcare.com/euen/weeerecycling/index.html

Figure 2-3 Battery Disposal Symbol

FCC Statement of Conformance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user’ s authority to operate the equipment.

Note: This product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

After the laboratory measurement, For Digital X Ray Imaging System-detector part, the SAR value is 0.402W/kg which satisfies the RF exposure requirement.

To satisfy RF exposure compliance the user should operate the device as the User Manual introduced and the antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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Chapter 3
Pediatrics and small patients

GE Healthcare strongly suggests reducing radiation dose to As Low As Reasonably Achievable (ALARA) in all patients, especially pediatric and small patients, whenever it is determined that an x-ray is necessary. X-ray is an extremely valuable tool for diagnosing injury and disease, but its use is not without risk. This section discusses the importance of minimizing the radiation dose in children and small adults consistent with ALARA principles.

Topics covered include:

Pediatric Use

Radiation exposure is a concern in both adults and children. However, children are more sensitive to radiation. Using the same exposure parameters on a child as used on an adult may result in larger doses to the child. X-ray settings can be adjusted to reduce dose significantly while maintaining diagnostic image quality.

Optimize Pediatric Protocols for your facility

The protocols supplied with the system represent examples for procedures commonly conducted in radiography. Based on the needs of a particular practice, these protocols may be modified to optimize factors such as image quality or dose reduction.

Work with your team of Radiologists, Medical Physicists and Technologists to evaluate techniques that may reduce radiation dose and provide adequate diagnostic information. In addition to the recommended protocols installed on your system and suggestions in this guide, the following websites offer excellent sources of additional information on how to optimize protocols:

- American College of Radiology (ACR): www.acr.org

- Society of Pediatric Radiology (SPR): www.pedrad.org
- National Cancer Institute (NCI): www.nci.nih.gov/aboutnci
- Image Gently: www.imagegently.org
- US Food and Drug Administration (FDA): www.fda.gov

What Do I Need to Know About?

This section presents the concepts necessary to understand Pediatric x-ray imaging. The concepts you need to understand are:

- Radiation Exposure Sensitivity
- Suggestions for Minimizing Unnecessary Dose
- Guidelines for Adjusting Individual Exposure Parameters by patient
- Patient Dose Reporting
- Dose Index Reporting Considerations
- Protocol Database Edit

Everyone shares the responsibility of minimizing pediatrics dose. There are several steps that can be taken to reduce the amount of radiation that pediatrics and small patients receive from x-ray examinations.

Radiation Exposure Sensitivity

Radiation exposure is a concern in all people of all ages, however, pediatrics are more sensitive to radiation exposure. Radiation risk is higher in the young as they have more rapidly dividing cells than adults. The younger the patient, the more sensitive they are.

Suggestions for Minimizing Unnecessary Dose

- Image the Anatomical Region Indicated (Collimation): Collimation and anatomical coverage should be carefully considered prior to each exposure. Follow your facility imaging guidelines to determine appropriate collimation.
- Properly Center All Patients: In addition to collimation, centering of intended anatomy should be considered. This is especially true when utilizing AEC/ion chambers. Improper centering over ion chambers may cause more or less than the desired dose which may lead to overexposure or repeat exposure.
- Check Technical Factors Before Exposure: Review technical display carefully before making an exposure to verify selected and intended technique are the same. Pay particular attention to placement of decimal point in display of numerical values.
- Use Pediatric Positioning Accessories: Approved Pediatric positioning accessories are often useful for certain patients and exams. These may be helpful in decreasing motion that may contribute to repeat exposure. Understand your facilities guidelines when implementing these devices.

- Protective Apparel/Barriers/Shielding: When applicable, utilize proper protective measures as they comply with your facility guidelines.
- Consider Patient Radiation Safety Protocols: Ensure understanding and conformance of Patient Radiation/Protection Safety and ALARA principles as required by your facility. This includes patient shielding to reduce exposure to unintended areas.

Guidelines for Adjusting Individual Exposure Parameters by patient

Adjust Parameters: The single most important thing you can do is to always use pediatric protocols to avoid over exposure. Protocols based on patient size are installed on the system. There are six patient sizes available: Adult and Pediatric; Small, Medium and Large Patient Size. These protocols should be considered a baseline. GE strongly recommends that you work with your Radiologist and Physicist to determine the lowest possible dose for the desired image quality.

Figure 3-1 Patient Size

Once patient size is selected, further adjustments to kVp, MAS, Filtration and Grid can be made to further minimize patient dose.

Automatic - Exposure or Fixed Exposure: Consideration should be made when utilizing Automatic Exposure (AEC) or Fixed Exposure. Each protocol on your system has been installed with a preset method of exposure; however, GE recommends reviewing each protocol and utilizing the method that will allow for the lowest possible dose.

Use of ion chambers for AEC require careful positioning of patient and should be considered prior to making an exposure. GE recommends that each facility work with your Radiologist and Physicist. Refer to Image Acquisition Chapter located in this operator manual for more information on AEC chambers and sensing areas.

Figure 3-2 Ion Chamber

Patient Dose Reporting

Estimates of patient dose are calculated after each acquisition and displayed (optionally) as part of the image annotations. The information is also stored in the DICOM header of each image. Reference Patient Dose Reporting in this operator manual for more information.

- Dose Index Reporting Consideration

Your system is provided with a Dose Index visual indicator. This indicator is displayed as an amount of exposure received by the receptor. These are estimated ranges and can be changed as technical factors are changed. Reference the DEI/DI section of this operator manual for more information.

Protocol Database Edit

In collaboration with your Radiologist and Physicist, protocol techniques can be changes as a default on your system. This should not replace observing the technical acquisition screen carefully prior to each exposure, but can assist in displaying an appropriate range of techniques for selected pediatric size. Further changes to techniques are recommended based on each individual patient.

Refer to the Protocol Database Edit chapter in this operator manual to ensure proper editing. Always complete a protocol database back up. Should any changes occur to your system, the database back up may be retrieved with saved protocols.

For questions or further information, contact your local GE Healthcare representative.

Chapter 4
Quick Step Guide

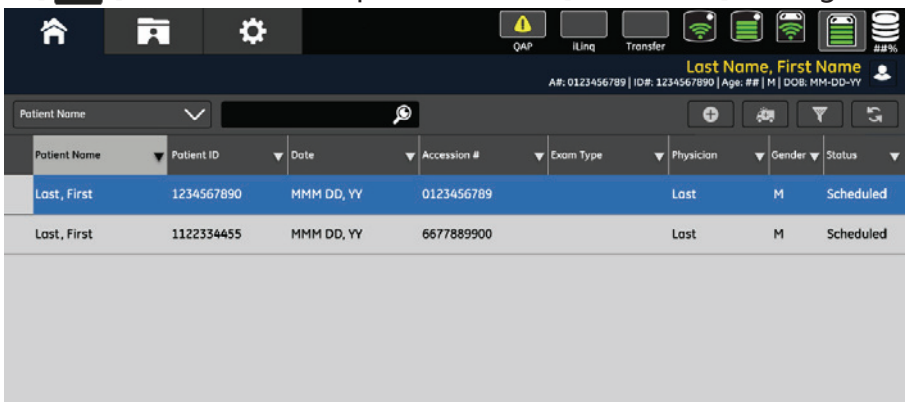
This section provides an overview of common tasks. Refer to the relevant chapters for detailed information.

Current Workflow

This section outlines the common operation workflow.

1. Before you are able to begin making X-ray exposures, you need to start up the target analog system, refer to target system' s user manual for more information.
2. Power on Brivo XR118, refer to procedures in System Start up and Shut Down for more detailed information.
   - Ensure the whole system is completely powered on prior to beginning first exam.
3. System login, refer to System Log in and Log Off for more information.
4. Worklist.

Note: If the patient information has been stored in RIS/HIS system, click Refresh List[ ] button->Select patient->Click [Start Exam], then go to step 7.

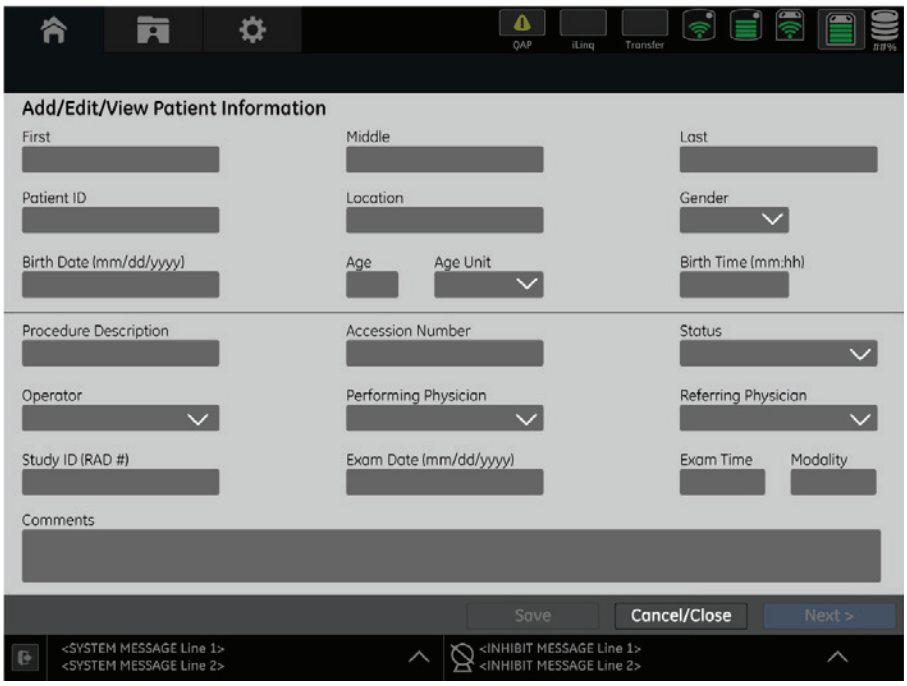


Note: You will not be able to make selections or access Worklist functions while the worklist is refreshing.

Note: If the patient information is not store in RIS/HIS system, continue with the following steps.

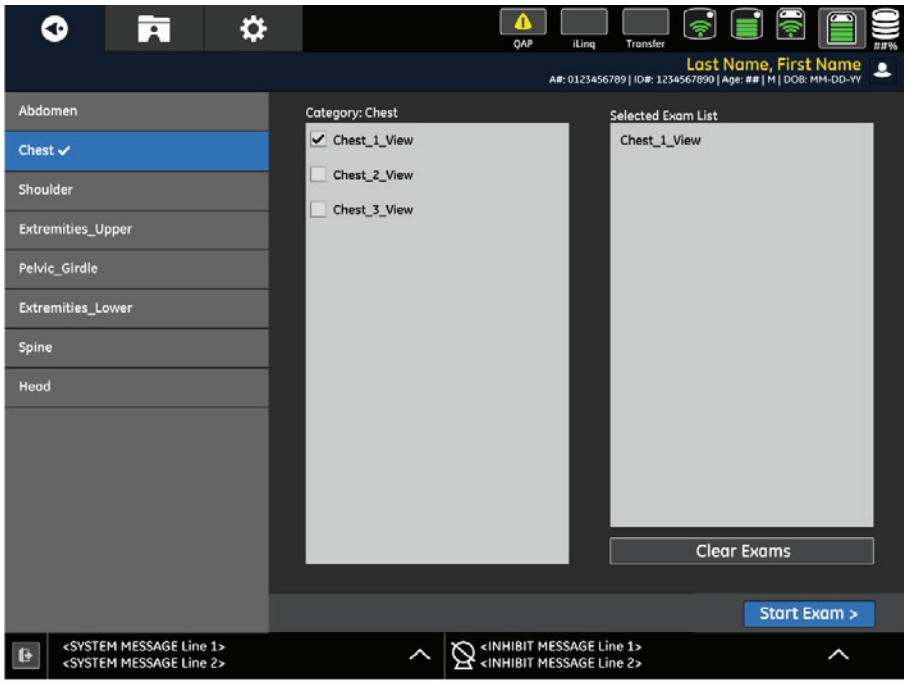
5. Click add patient [ ]button on worklist. "Add/Edit/View Patient Information" screen appears.

6. Enter or select the appropriate patient information, then click [Next>] to select protocols.

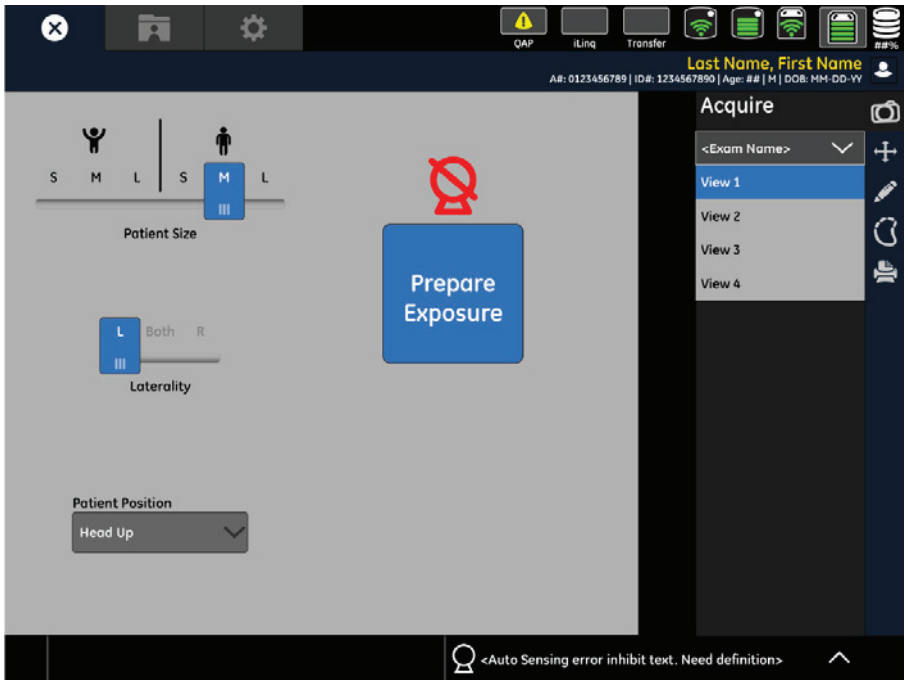


Note: Input method?

7. The category and exam name appear in the “Selected Protocol list”. Select views in exams from the list.



8. Click [Start Exam] to access acquisition screen.



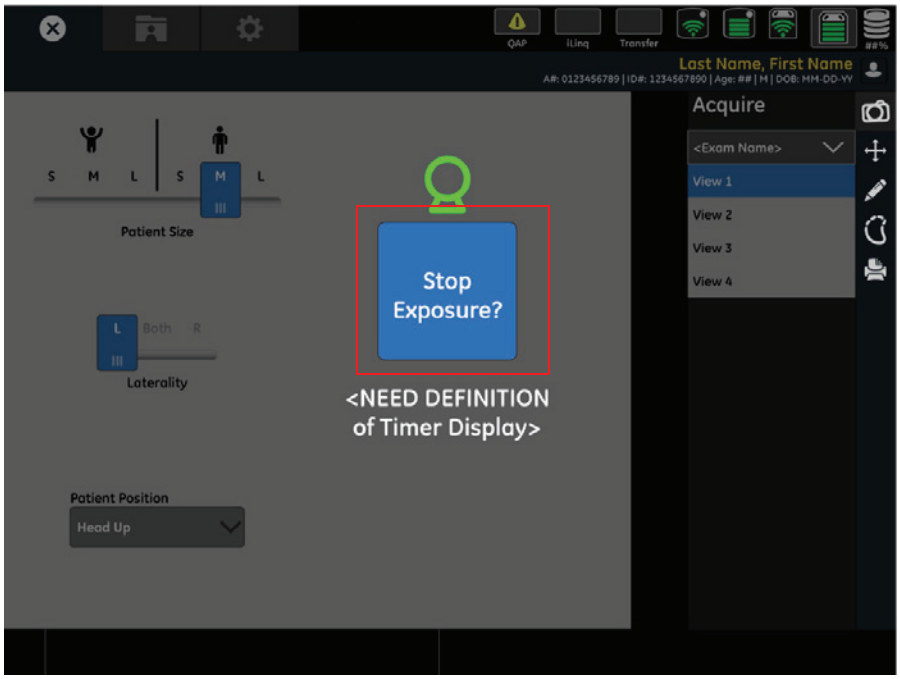
9. Use x-ray tube and table/wall stand together with digital detector to position patient. Please refer to Digital Detector Application for more information on digital detector applications.

10. Set technique parameters on analog console (Select focal spot and Adjust exposure parameters, etc.).

Warning: Make sure the right receptor on the analog is selected.

11. On the acquisition screen, confirm/adjust the [Patient Size/Laterality/Patient Position]

12. Click the [Prepare Exposure] button to get ready for x-ray exposure. [Exposure Ready] icon with a counter displayed on the screen shows the time remaining before the digital detector stops the x-ray detection.



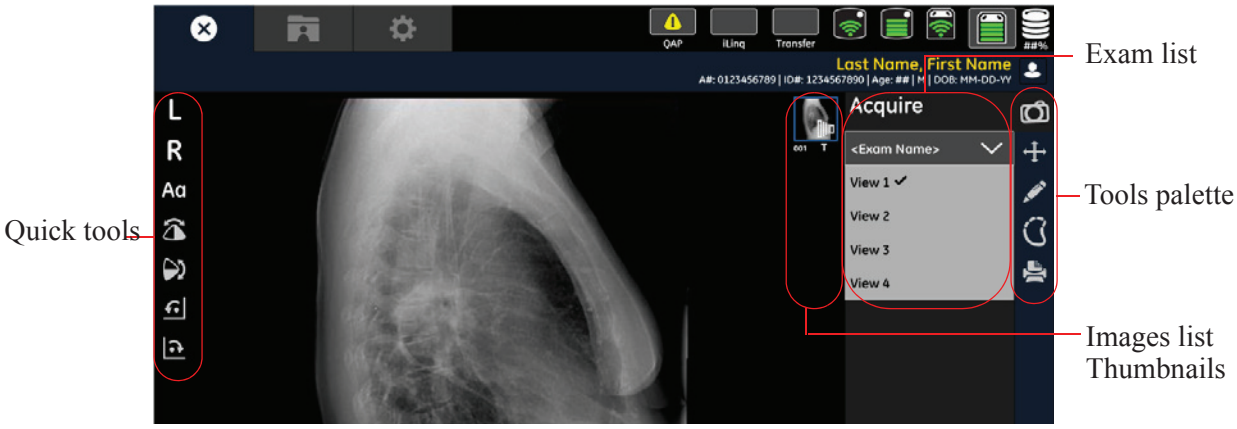
Note: Make sure there is no exposure inhibit warning in message bar before clicking the [Prepare Exposure] button. More information about this function, please refer to Detector Auto-Sensing.

Note: User should take exposure on the analog system before the timer stops. If the detector is not in prepared mode, the exposure shall be prohibited. A re-click [prepare exposure] action is required to get ready for x-ray exposure again.

Warning: Do NOT move the detector during the exposure.

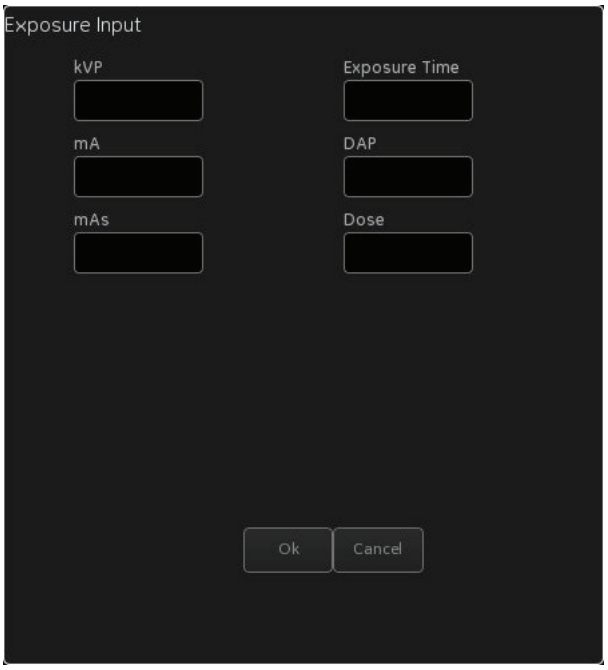
13. Take exposure on analog system.

14. Image viewer screen appears.



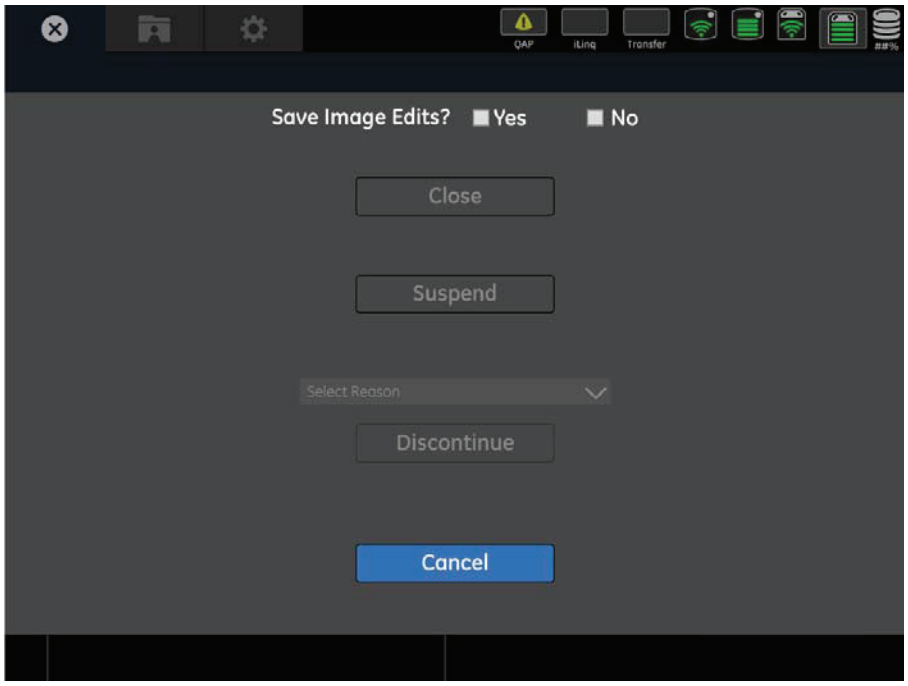
- Exam list: lists all available exam protocols for current patient.
- Images list: lists thumbnails for all completed exam of current patient.
- Quick tools: Quick tools on the left list the common tools used for image processing.
- Tools palette: lists all available tools, including Orientation tab, Annotation tab, Reprocess tab and Print tab.

15. Click [Exposure Techniques] button to input the exposure parameters.



Warning: Make sure the correct exposure parameters is entered.

16. Print Images, if required. Please refer to Chapter 11: Image Viewer - Printing Images Palette for more detailed information.
17. Select the next exam from the "Acquire" list at the right of the window, and then repeat step 8.
18. After the exam, click the close button [⊗] on the upper left corner, and then click the [Close] button on pop-up menu.



19. Shutdown.
    a) Close all current exams.
    b) Click the utilities icon [⚙] at the upper left of your screen.
    c) Click the [System] button on the Utilities page.
    d) Click [Shutdown System] button.
    - A message pops up " System will be shutdown" .

    e) Click [Confirm] to proceed.
    - System powers off
    - Click [Cancel] to abort the shutdown and return to utilities screen.

Chapter 5
Image Detector

This section outlines the basic detector functions, usage, care, and specifications.

Detector Overview

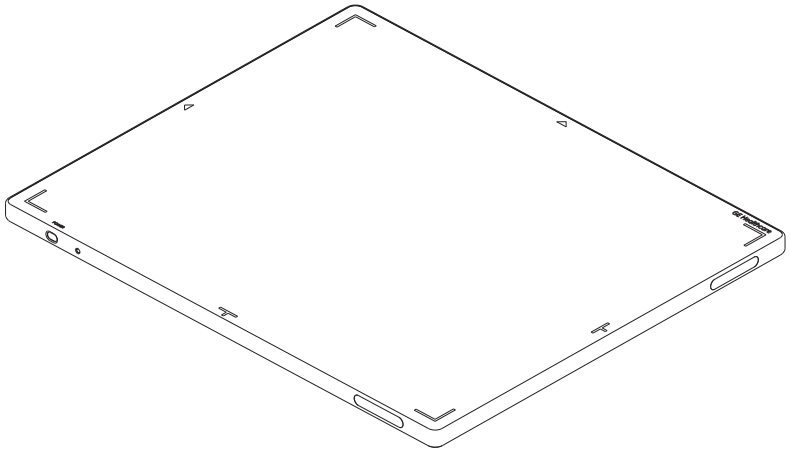
Detector primary functions are:

- To convert x-ray data into digital image data.
- To transfer the digital data to an image workstation for processing and display.

The detector is an x-ray imaging device. It consists of an array of 1740 x 2120 pixels. Each pixel is attached to a data acquisition circuit that converts incoming x-ray signal to 14-bit digital data.

The detector is constructed from a carbon fiber. The front face contains a graphite x-ray imaging window. The back of detector contains safety warnings.

Figure 5-1 Detector Overview



Panel

The panel consists of a thin-film amorphous silicon integrated circuit on a glass substrate with a cesium iodide scintillator. The scintillating material absorbs the x-rays and converts the energy to light. The light is converted into a charge that is digitized by the detector electronics.

Electronics

The primary function of the readout electronics is to convert the charge into digital image data. This data is then transmitted to the system through a wireless link or an ethernet connection.

Physical Appearance / Finish

The detector unit is designed to be installable as 1) an external patient access/contact surface and 2) a non-external patient access/contact surface.

Detector surfaces have been treated with a finish to allow a smooth and easily cleanable surface. Care shall be taken to protect the surface from scratches.

Nameplates and Markings

A label on the back of the detector contains the GE part number.

Detector Handling

The device contains sensitive electronics that are susceptible to vibration, shock, drop, and impact.

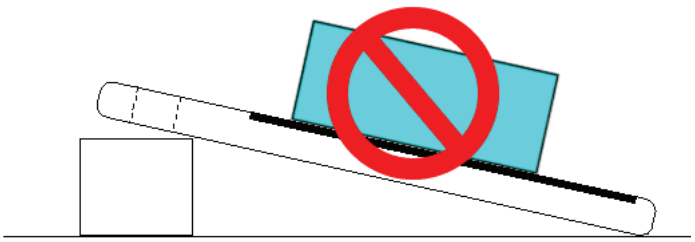
When handling the device, use the handle and/or use both hands to manipulate the detector into the correct anatomical position for the exam.

Warning: Do not swing the device into hard surfaces, especially corners, as this may scratch the cover, create an image quality artifacts, or damage the electronics inside.

Special Instructions if the detector is dropped: Inspect the exterior for any possible cracks. Run Detector Check to test the detector. It will be clear if the electronics are not functioning. Other possible failures may include communication problems, image quality degradation, and loss of power. If any or all of these occur, call your GE Service Representative.

- Do not drop objects onto the detector.
- Do not use the detector as a stretcher to lift a patient.
- Do not drop the detector at any time.
- Do not prop the device on an edge, against wall or bed. Keep detector in cradle, bucky, or other GE-supplied container.
- Do not use unapproved chemical cleaners. Refer to Cleaning for more information.
- Do not immerse detector into water or other liquids.
- Do not use a defibrillator while patient remains in contact with detector.
- Do not place other objects or patients on the detector if it is not on a flat surface, as shown below.

Figure 5-2



Detector surfaces have been treated with a finish to provide a smooth and easily cleanable surface. Take care to protect the surface from scratches.

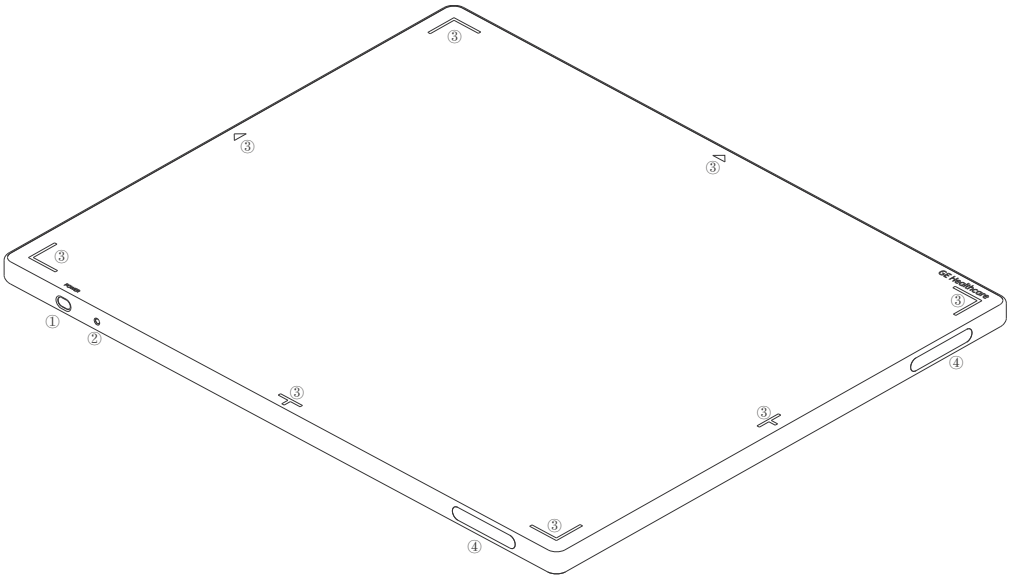
Warning: Extra precautions should be taken if the device will be exposed to excessive amounts of bodily fluids or liquids.

The detector is designed to prevent some liquids or particulate matter from getting inside the cover. It can sustain a temporary splash or spray, but it is not designed to be immersed in liquid (not even temporarily).

Hardware Overview

Front of the Detector

Figure 5-3 Front of the Detector



Item	Description
1	Power button.
2	LED indicator. Refer to LEDs for more information.
3	Detector Area (inside the white marks).
4	Antenna (inside the detector).

Back of the detector

Figure 5-4 Back of the detector

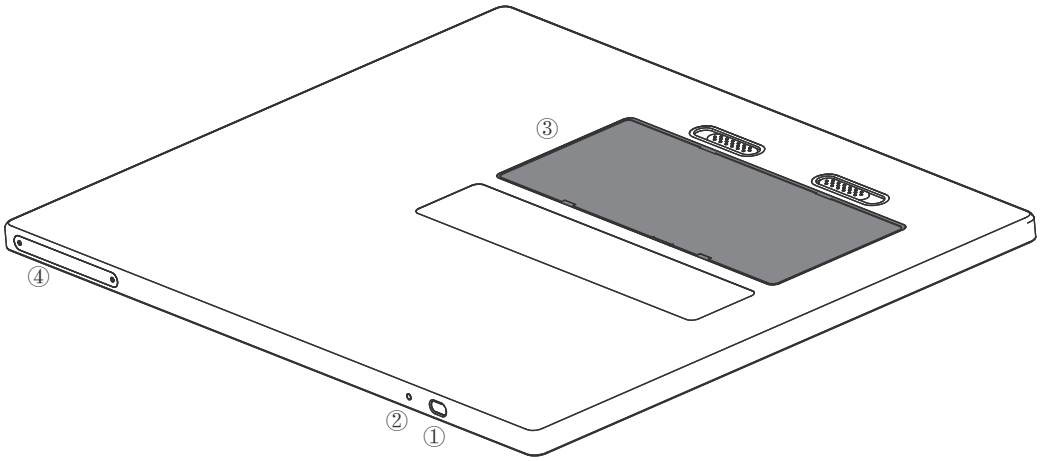


Table 5-1 Back of the detector

Item	Description
1	Power button.
2	LED indicator. Refer to LEDs for more information.
3	System battery.
4	Antenna (inside the detector).

Warning: **The back of the detector contains screws. This is the backside of the detector. Do not expose to the backside.**

Battery

Figure 5-5 Detector Battery

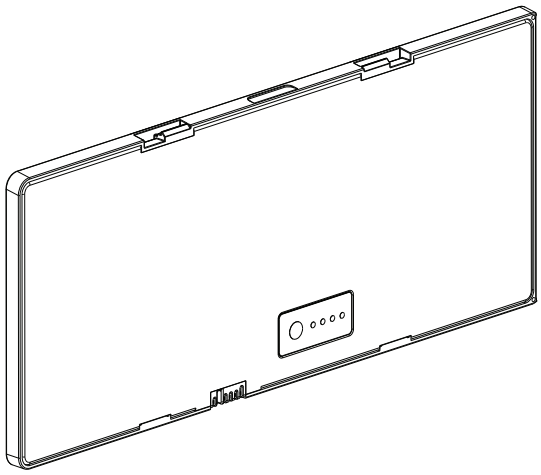


Table 5-2 Battery Specification

Item	Specification
Rating	11.1V
Capacity	32Wh
Material	Li-ion
Charger	System dock charging slots
Type	System battery.

Battery Operation

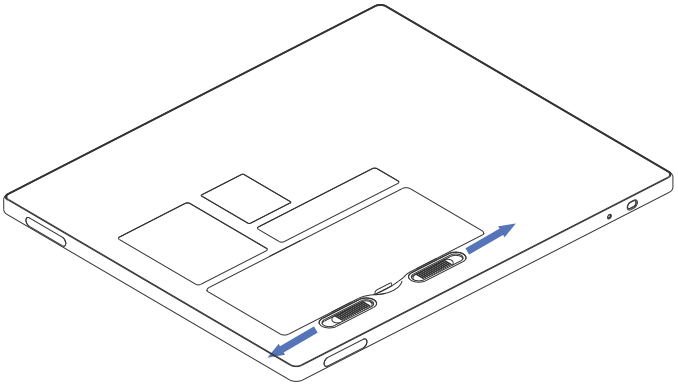
- System battery provides power to the image detector. Refer to Battery replacement about how to install a battery into the detector.
- Charge the battery before use if the remaining power is less than 25%.
- Battery capacity: More than 150 images acquistion. The portable monitor/handheld will display remaining power using a four-bar icon. When the battery is low, replace it with a fully charged battery and re-charge the battery.
- For battery replacement, insert the battery into the detector with the contacts facing down, and press the battery down to securely latch into place.
- To charge the battery, insert the batteries into the charging slots in dock. More information abouth how to charge the battery, refer to Battery charging.
- Take out the battery to save energy if the detector is not used for a long time.

Warning: Do not touch the battery pins and patient simultaneously when replacing detector batteries.

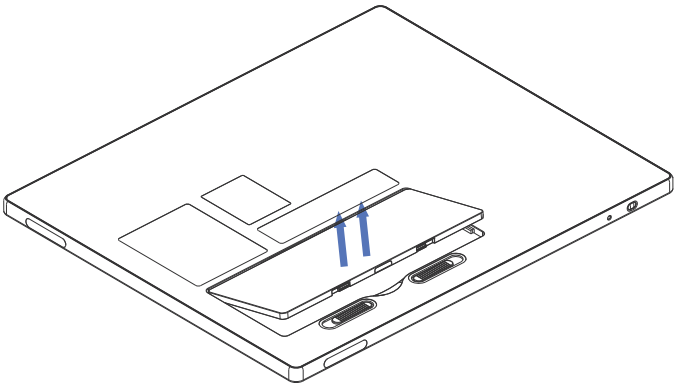
Warning: ONLY charge the battery in system dock’ s charging slots.

Battery replacement

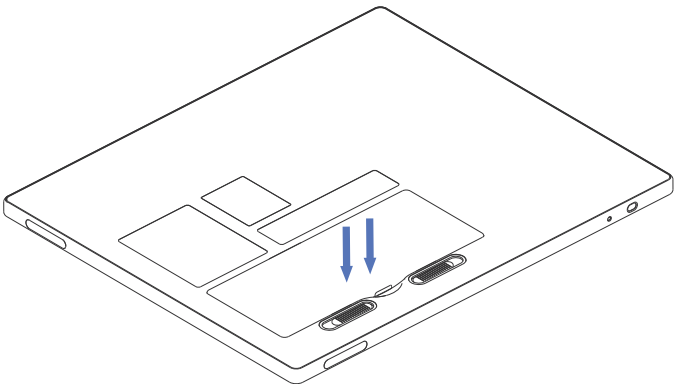
Figure 5-6 Replace the battery



1. Slide the latches apart.



2. The battery pops up for easy removal.

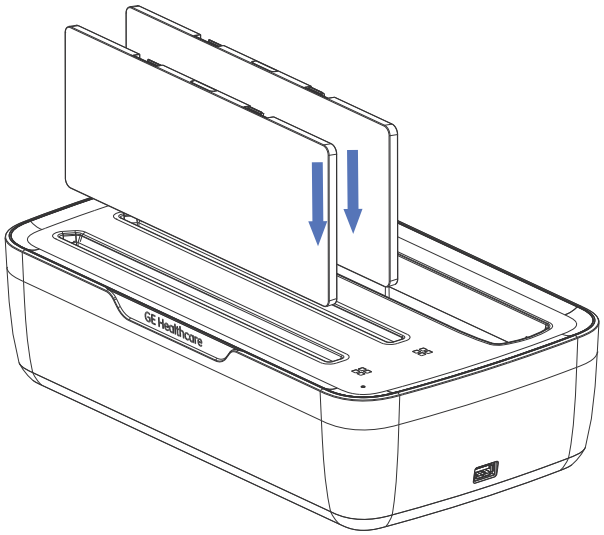


3. Insert a fully charged battery, push the battery down until the latch locks.

Battery charging

Use the battery charger when battery indicator is less than 10%.

Figure 5-7 Battery charger



Note: Insert the battery with the contacts facing the front side of dock to ensure proper orientation.

Note: Ensure the dock is powered on before the battery charging. More information about how to power on dock, refer to Charging the workstation with dock.

Warning: The system should not be tilted through an angle of 10° in normal use.

- The dock will start charging its battery once battery is inserted into slot.
- When the battery is fully charged, the four battery LEDs will become solid green.
- The color of the four battery LEDs indicates that how much power remains in the battery. The LEDs will be blinking to indicate that charging is taking place.

Figure 5-8 LEDs for charging slot

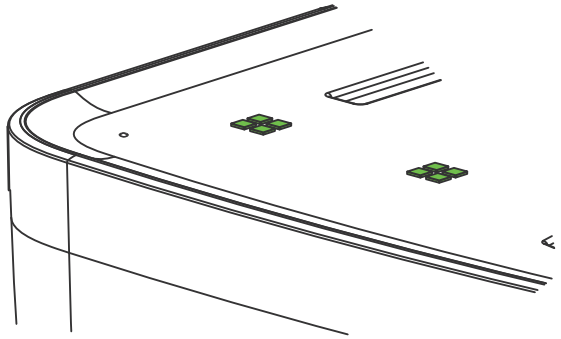


Table 5-3 LEDs for charging slot

Capacity LED	LED1	LED2	LED3	LED4
0%-24%	Blinking	-	-	-
>25%-50%	Solid	Blinking	-	-
>50%-75%	Solid	Solid	Blinking	-
>75%-<100%	Solid	Solid	Solid	Blinking
100%	Solid	Solid	Solid	Solid

Usage of image detector

Wake up

Press and hold the power button for more than 2 seconds to wake up the detector when the detector is in sleep mode.

Sleep Mode

Press and hold the power button for more than 4 seconds to put the image detector into sleep mode when detector is not in sleep mode.

Detector Alignment

To aid in proper alignment of the detector with respect to the X-ray source, there are alignment marks centered on the front side (imaging side) of the detector. The arrow represents the default head-up display orientation. See Figure 5-9。

Figure 5-9 Head Up Arrow

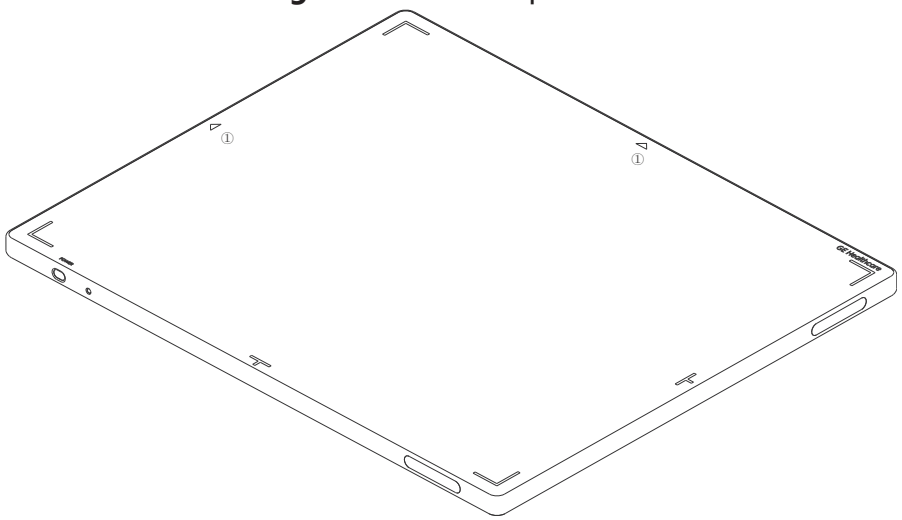


Table 5-4 Head Up Arrow

Item	Description
1	Head up arrow

LEDs

Figure 5-10 LEDs

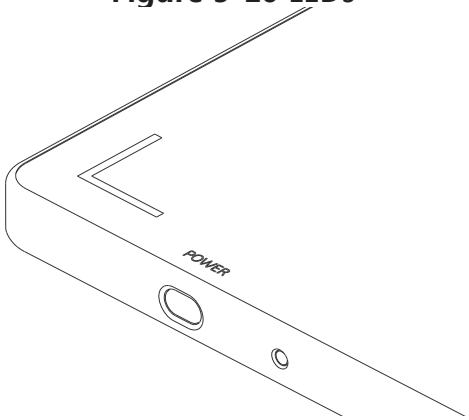


Table 5-5 LEDs

Colour	Status	Description
N/A	Off	Shutdown/Sleeping/Hibernate mode.
Green	Solid	Normal status, and all the following conditions required: • Remaining power >25% • Wireless signal strength >-75dBm。
Green	Blinking	Flashing 15s, detector is in identification mode.
Yellow	Solid	Any of the following conditions: • 10%<Remaining power ≤ 25%。 • -80dBm<Wireless signal strength ≤ -75dBm。
Red	Solid	Any of the following conditions: • Detector hardware failure. • Remaining power ≤ 10%。 • Wireless signal strength ≤ -80dBm。 • Detector overheat.

Electro-magnetic Interference

The detector has been designed and tested to meet all IEC regulations in regard to electro-magnetic (EM) susceptibility (and EMC).

However, there are no regulations for low frequency EM fields. All flat panel detectors have some susceptibility to these EM fields.

This detector is robust to EM fields up to 0.1mG over a broad low frequency range (DC - 250kHz).

It has been found that some common equipment in clinical environments can generate EM fields well over 0.1mG. Some measurements have shown 4mG field strengths which can cause artifacts on x-ray images.

EM fields are reduced by the square of the distance between the EM source and the detector. Thus, moving the EM source twice as far away will reduce the field strength by 4 times.

General suggestions:

- Keep IV pumps, patient monitoring, feeding pumps 1 meter or more away from any detector surface.
- Consider turning off equipment that cannot be moved.
- Change the patient or detector orientation /position to maximize distance from any equipment.

Possible sources of EM fields:

- IV pumps
- Monitors
- Feeding pumps
- Patient monitors
- ECG equipment
- EMG equipment
- Infusion pumps
- RF ablators
- Powered surgical equipment
- Heaters
- Air conditioners
- Refrigerators

Note: For EMI Reduction feature. Refer to Set Preferences.

Cleaning

All exterior surfaces should be cleaned after each exam.

- The detector must be allowed to dry before use.
- Do not leave disposable wipes or cleaning cloths on the detector for more than 60 seconds.
- Let the detector dry at least 60 seconds between cleanings.

The following chemicals and products have been tested and approved by GE for cleaning the Image Detector.

- 75% Medical Alcohol
- 3% Bleach
- 70% IPA (Isopropyl Alcohol)
- Neutral detergent
- Distilled water

Specifications

Detector Size and Weight

Table 5-6 Detector size and weight specs

Item	Specification
Overall detector size	Thickness: 15^{+1}_{-2} mm Width: 383.5±1 mm Height: 459.5±1 mm
Image size The active area of the x-ray panel	1740 * 2120 pixels or 35 cm * 43 cm
Weight	3.5kg (Battery included)

Environmental Constraints

This section describes the environmental conditions that the detector is designed to withstand.

小心： Operation or storage outside of these constraints may cause damage to the detector.

Table 5-7 Environmental Constraints

Item	Operating Environment Constraints	Non Operating Environment Constraints
	This column contains addi t ional operating environmental constraints, within which the subsystem function and performance capabilities shall be in compliance.	This column defines additional Non-operating environmental constraints, within which the subsystem function and performance capabilities shall be in compliance, when returned to the operational state, within operating environment conditions.
Environment	• External ambient temperature range: +10 ℃ to +35 ℃ • Ambient humidity range: 10% to 85%, non-condensing • Atmospheric pressure (altitude) range: 700hPa~1060hPa	• External ambient temperature range: 0 ℃ to +55 ℃ • Ambient humidity range: ≤ 90%, non-condensing • Atmospheric pressure (altitude) range: 700hPa~1060hPa
Mechanical Stress & Vibration Forces	The detector assembly shall not be exposed to operating vibration spectrum exceeding the following parameters: • Type: Random • Frequency Range: 20 to 350 Hz • Magnitude: 0.006g2 /Hz at 10-350 Hz • Duration: 8 hours/axis (x, y, z)	The detector assembly shall not be exposed to non-operating vibration spectrum exceeding the following parameters: • Type: Random • Frequency Range: 10 to 2000 Hz • Magnitude: 6 m/s2 RMS or 0.02g2 /Hz at 10-2000 Hz • Duration: 15 minutes/axis (x, y, z)
Shipping & Storage Environment	Not applicable	The non-operat ing shipping conditions shall be -20 to +55 with the detector and packing. The shipping container shall protect the detector from vibration of 2 Grms for 8 hours in the x, y, and z axes, random vibration from 10 to 2000 Hz such that the image quality is not degraded. Cargo hold during shipment shall be within the atmospheric pressure range of 700-1100hPa

Chapter 6
Hardware Overview

This chapter explains the different hardware components of your system, such as: Image detector, Image workstation, Dock, Access Point, Monitor (Fixed, handheld).

Topics covered include:

System Components

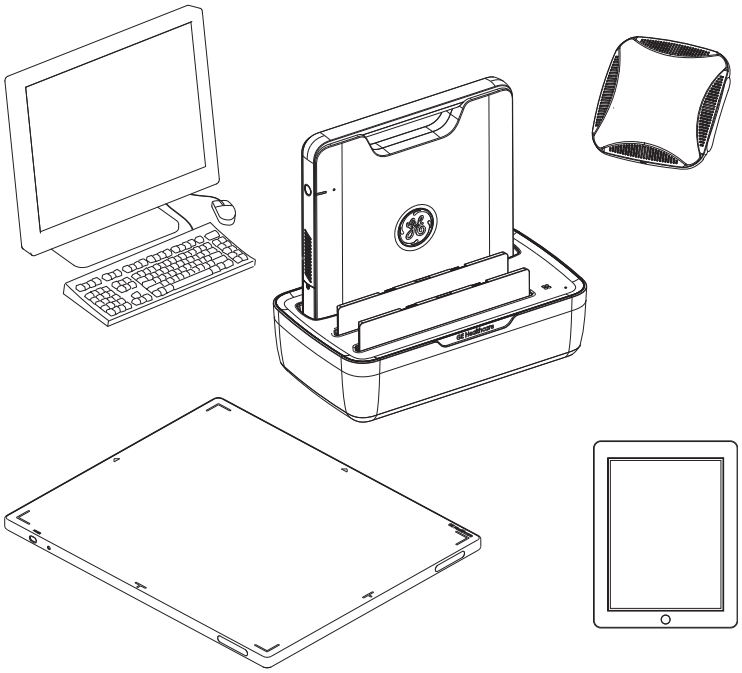


Figure 6-1 System Components

Main Components:

- Image Detector
- Image Workstation

Accessaries:

- Dock

Optional Parts:

- Monitor (Fixed)
- Monitor (Handheld)
- Access Point

Main specifications for this product:

- Active area: 35cm * 43cm
- Detector dimension: Width 383.5±1 mm; Length 459.5±1 mm
- Communication: Support WiFi network communication (Wireless protocol: 802.11n); Compatible with DICOM 3.0 standard.

System Description

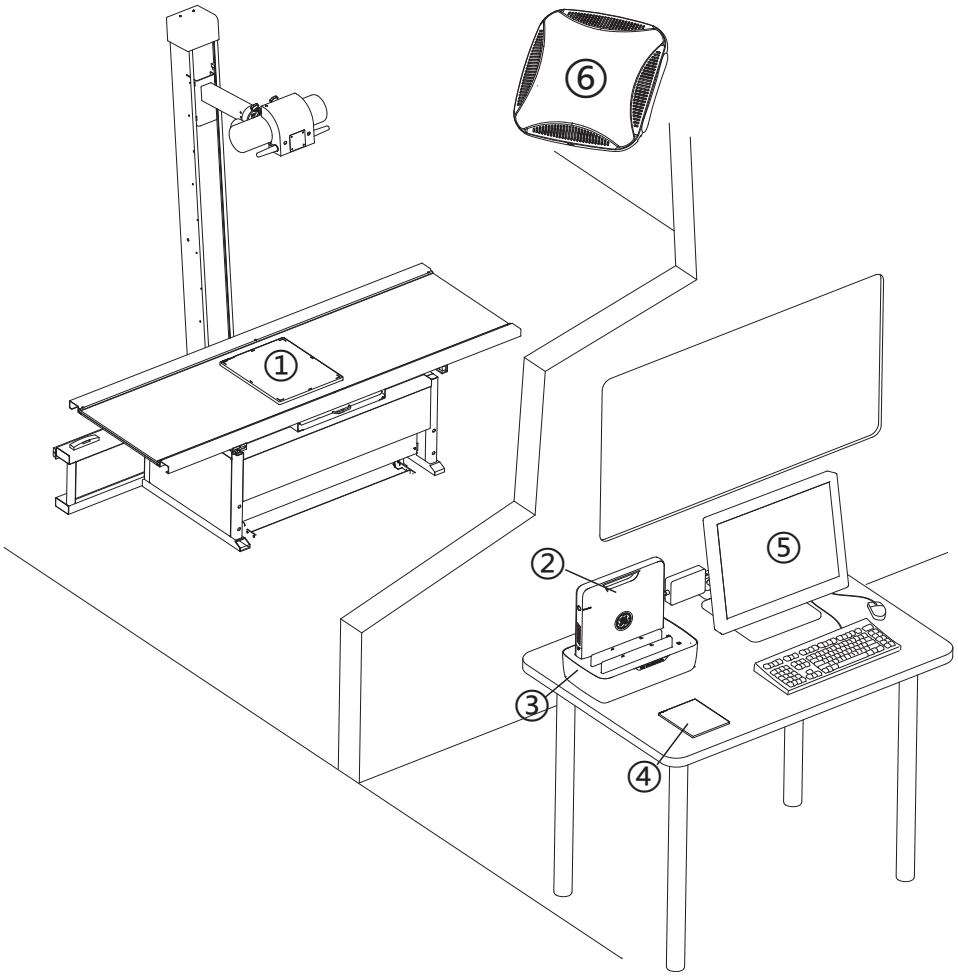


Figure 6-2 Fixed application scenario

- 1. Image detector (Applied part)(Part#5501661)
- 2. Image workstation (Part#5500786)
- 3. Dock (Part#5500787)
- 4. Handheld (Part#5501563)
- 5. Monitor, keyboard, mouse (Part#5501789)
- 6. Access Point (Part#5501606)

Note: For fixed application, system provides two alternative options for image acquisition and preview: Fixed monitor or handheld configuration.

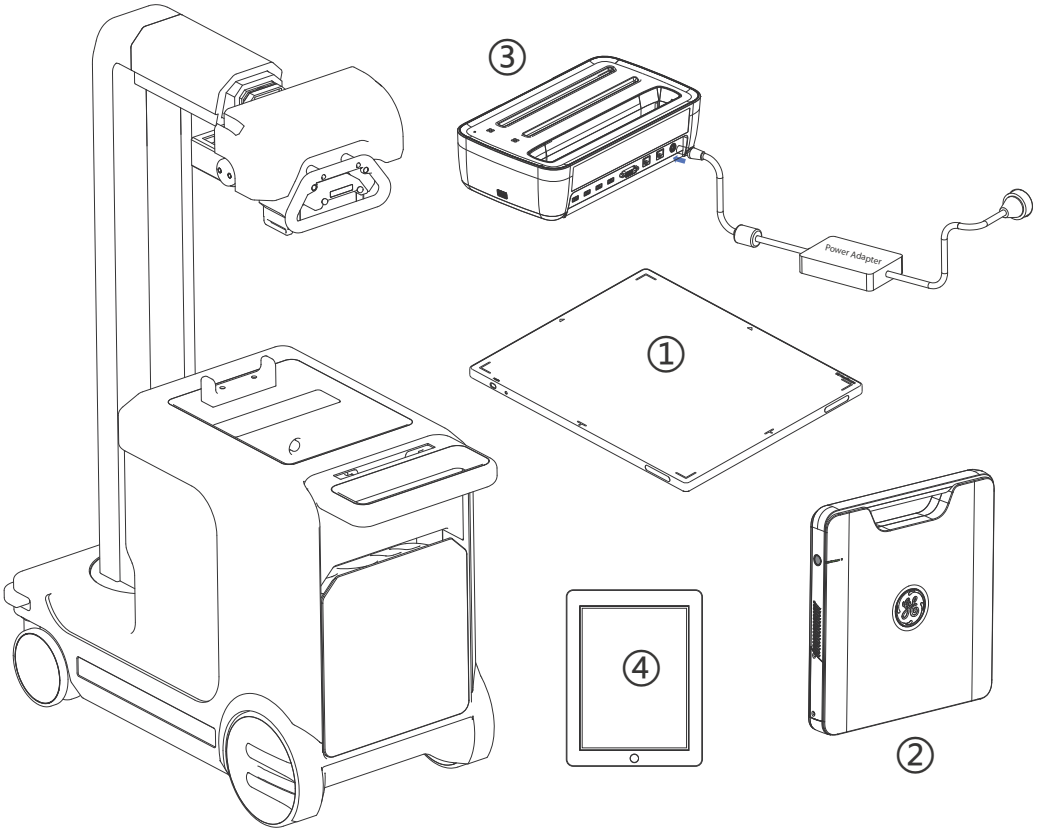


Figure 6-3 Mobile application scenario

- 1. Image detector (Applied part)(Part#5501661)
- 2. Image workstation (Part#5500786)
- 3. Dock (Part#5500787)
- 4. Handheld (Part#5501563)

Note: For mobile application, handheld is provided for image acquisition and preview.

Image Workstation

The image workstation is a compact-designed portable computer host, which is designed to work with the dock. The image workstation embedded with a flash disk (where system software & image stores) is used to receive, process, mange and store the images acquired from wireless detector. Features are:

- Dedicated computing unit and image data base.
- Based on a graphical, mouse-driven/multi-touch screen interface.
- Images, lists, menus, and control panels are displayed within graphical screens.
- Make selections by using buttons, menus and control panels.

The workstation supports many functions:

- Image acquisition by using wireless image detector
- Image display and manipulation
- Image transfer to other storage server using the DICOM standard
- Image transfer to an USB storage device using the DICOM standard

Figure 6-4 Image workstation interfaces

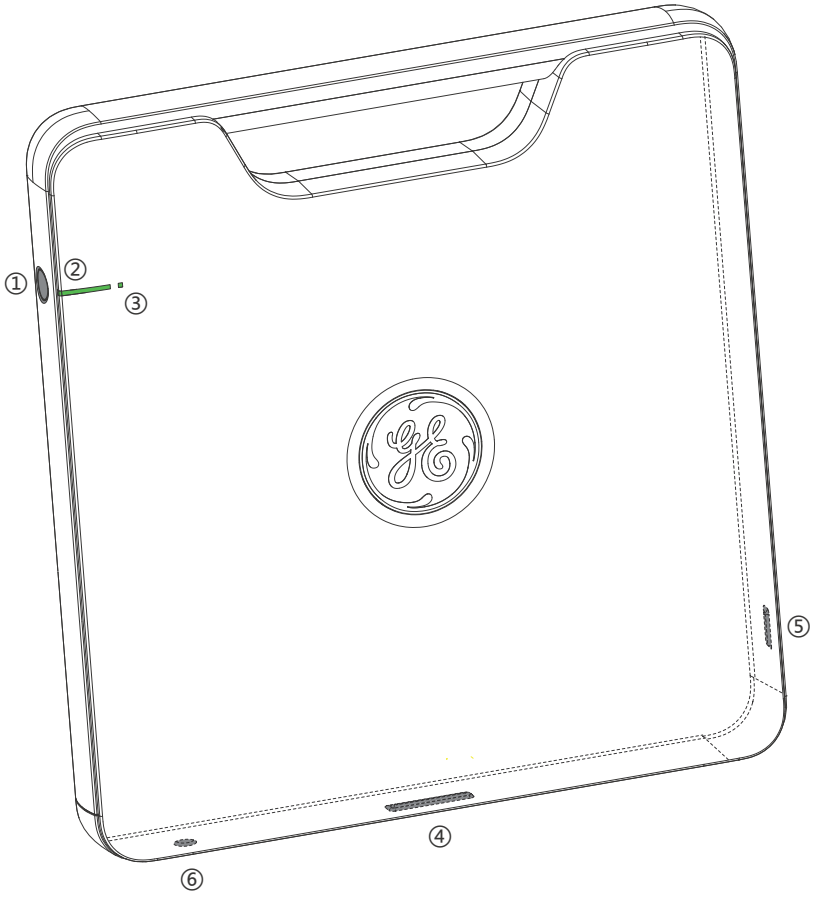


Table 6-1 Workstation LEDs & Interfaces

Index	Item	Description
1	Power button	• Power off status: Press and hold the power button for more than 2s to boot up. • Power on status: Press and hold the button for more than 4s to force the workstation shutdown.
2	Power LED	• OFF: Workstation shutdown. • Green (Solid): Normal work state. And, Battery remaining power >25%. Or workstation has external power supply. • Yellow (Solid): Low battery life, charging required. 10% < Battery remaining power <=25%. • Red (Solid): Hardware failure or Battery remaining power <=10% .
3	Charging LED	• OFF: Power off or powered by internal battery. • Green (Solid): Fully charged (100%). • Green (Blinking): Charging, 25%< Battery remaining power <100%. • Yellow (Blinking): Charging, Battery remaining power <=25%.
4	Dock connector	Connecting to dock.
5	USB interface	USB 3.0 port, compatible with USB2.0 standard. Used to connect USB device, i.e. data backup device.
6	Power input	Connecting to power adapter.

Warning: The handle can ONLY subjected to a force equal to four times the weight of the workstation.

Warning: To avoid image loss, please periodically backup the images from the Workstation to the given image storage system.

Warning: To guarantee a good working status, please make sure the used rate of system hardware space is less than 60% in the Workstation.

Dock

The Dock is an interface expanding device which enables connections to USB device, monitor and external network. It also provides the capability of charging the detector battery and workstation.

Figure 6-5 Dock application scenario

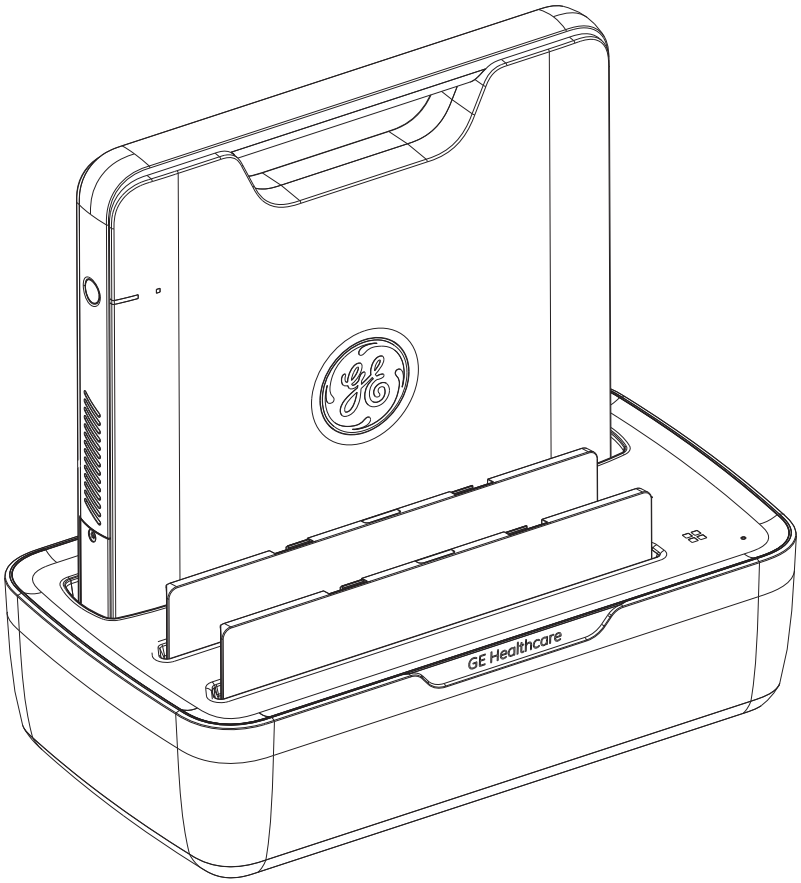


Figure 6-6 Dock LEDs & Interfaces

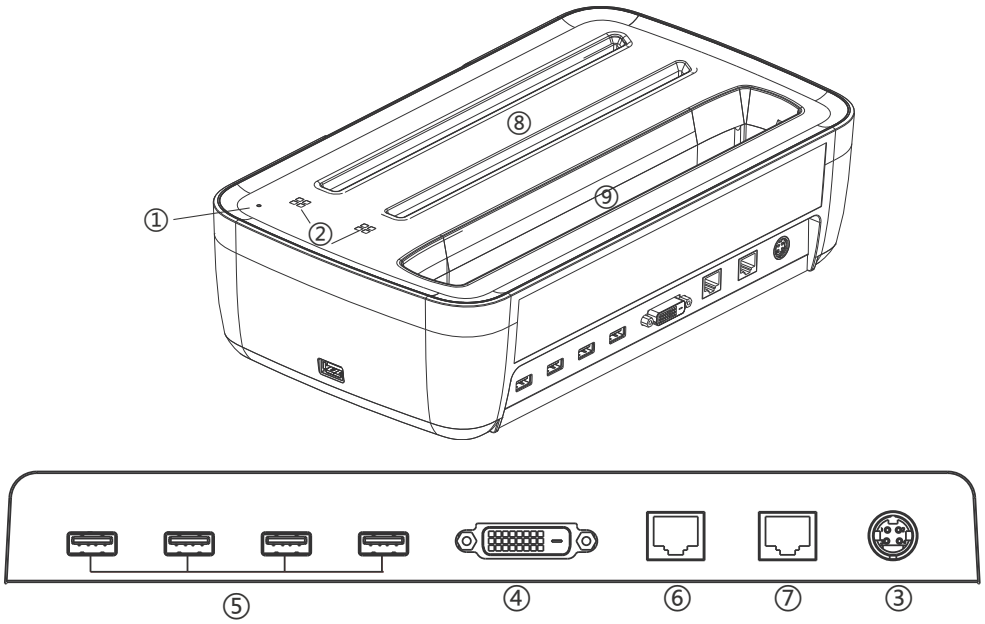


Table 6-2 Dock LEDs & Interfaces

Index	Item	Description
1	Power LED	Solid green indicates the dock is powered on.
2	Charging LEDs	Detector battery charging LEDs, refer to Table 5-3 LEDs for charging slot for more detailed information.
3	Power input	Use the adapter to provide power to dock.
4	DVI port	Connecting to monitor’ s DVI port.
5	USB port	Connecting to USB device.
6	Ethernet Port1	Connecting to hospital Ethernet network.
7	Ethernet Port2	Ethernet PoE port, used to connect wireless access point (AP). ONLY the Ethernet cable carried with the system can be used to connect this port with AP.
8	Battery charging slots	Slots for battery charging.
9	Workstation slot	Slot for Image Workstation expansion.

Charging workstation

For fixed application, use the dock to provide power to workstation.

Note: For fixed application, DO NOT pull the workstation out of the dock.

For mobile application, use its embedded battery to provide power to workstation.

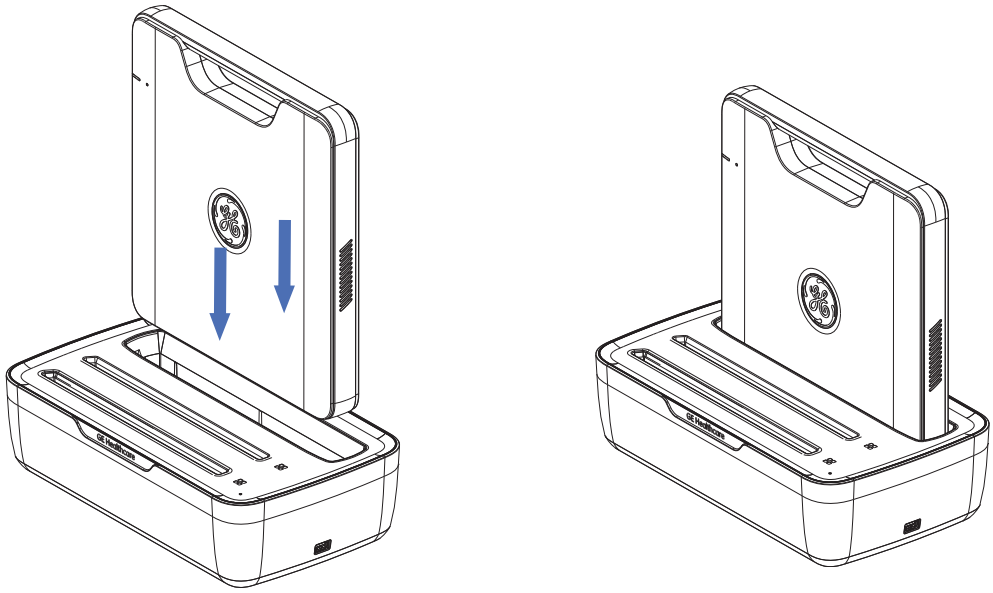
Note: For mobile application, use the dock or the optional power adapter to charge workstation’ s embedded battery.

Warning: Connect power to workstation by one of the following methods when the power LED is solid yellow/red.

Charging the workstation with dock

1. Insert the workstation into dock’ s workstation slot.

Figure 6-7 Connect workstation with dock

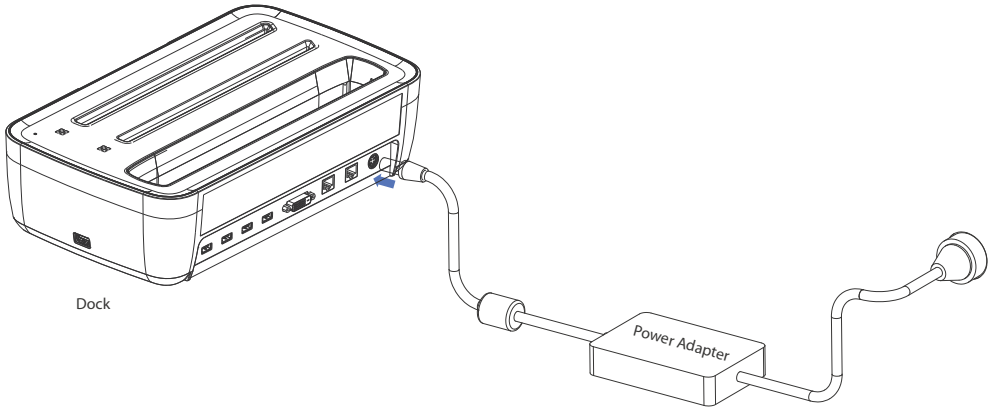


Note: Insert the workstation with the GE side facing the front side of dock to ensure proper orientation.

Warning: The dock should not be tilted through an angle of 10° in normal use.

2. Connect dock with power adapter.

Figure 6-8 Connect power adapter



3. Connect the power adapter with a power source.
4. Green/Yellow blinking Power LED indicates that the battery is charging, solid green LED indicates the battery is fully charged.

Note: Make sure the dock is powered on before the charging.

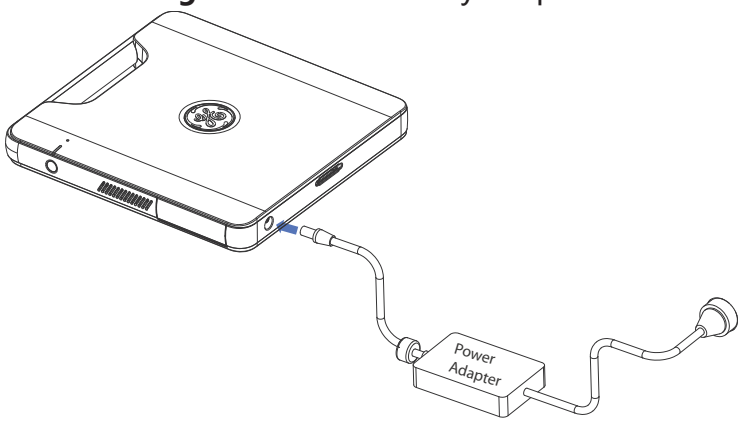
Warning: The power adapter can be ONLY used to provide power to dock and image workstation.

Charging the workstation with optional power adapter (Mobile application)

Use the optional power adapter to provide power to image workstation.

1. Connect one end of the power adapter with image workstation, see Figure 6-9.
2. Plug another end of the power adapter into power source.

Figure 6-9 Powered by adapter



3. Green/Yellow blinking Power LED indicates that the battery is charging, solid green LED indicates the battery is fully charged.

Warning: The power adapter can be ONLY used to provide power to dock and image workstation.

Monitor

When configured, a hardware keyboard/mouse may also be configured for input. The monitor connects to workstation through the dock displaying Worklist and Acquisition screens.

The monitor is an acquisition console displaying Worklist and Acquisition screens. The monitor is an Viewer displaying Image Viewer and the Image Management screens.

Note: In periods of inactivity longer than 10 minutes, the monitor screen goes black. Press any key on the keyboard or move the mouse to restore the monitor’ s image.

Warning: The monitor is a view monitor, and does not support diagnosis. To guarantee the accuracy of diagnosis, please print films or transfer the images to a diagnosis monitor to make diagnosis.

Mouse Controls

The mouse is a hand-operated device that you maneuver across the surface of a pad. As you do, the on-screen cursor mimics the movement of the mouse, allowing you to move among screens.

Table 6-3 Mouse actions

Mouse Action	Description
Click	Press and release the left mouse button to select an item, activate a button or icon, or set an insertion point at the cursor’ s location. The action performed depends on the item that is being clicked.
Click and drag	Press and hold the left mouse button down while moving the cursor to the desired location. This is used to select multiple items, move items, or use annotation tools.

Handheld

The handheld is an acquisition console for mobile application. The monitor is an Viewer displaying Worklist, Image Viewer and the Image Management screens.

Note: In periods of inactivity longer than 10 minutes, the monitor screen goes black. Press any key on the keyboard or move the mouse to restore the monitor’ s image.

Warning: The handheld is a view monitor, and does not support diagnosis. To guarantee the accuracy of diagnosis, please print films or transfer the images to a diagnosis monitor to make diagnosis.

Warning: DO NOT use the handheld if it’ s under the charging status.

Note: For detailed information about basic operations of the handheld, please refer to the user guide for handheld.

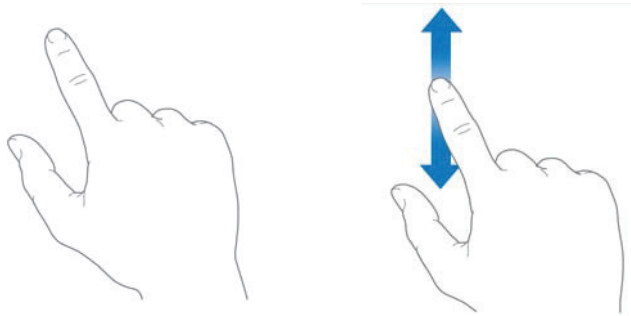
Touch Screen Controls

The handheld use the finger gestures as its input method.

Table 6-4 Touch screen controls

Gesture	Description
Tap	Use the finger to tap an item, activate a button or icon, or set an insertion point at the desired location. The action performed depends on the item that is being clicked.
Drag	Use the finger to drag the icon to the desired location.

Figure 6-10 Touch screen controls



Tap **Drag**

Important H.H. Operations

Below operations on the H.H. have significant impact on the system after the Brivo XR118 application launched.

Table 6-5 Important H.H. Operations

Operation	Then reopen the Brivo XR118 shortcut on the screen
Pressing Home button, Power button and long time no operation on H.H.	The H.H. displays the current UI state when H.H. reconnects to image workstation.
Close the browser on H.H.	The H.H. needs to re-login to the system. If user closes the browser during exam, the exam will be saved and suspended.

Bar Code Reader

The bar code reader is a fast, easy way to enter data into the system. The bar code scanner allows you to aim at a printed bar code on paper and scan the information into the system. The printed bar code information comes from a RIS or HIS system through a network.

The reader reads the bar code information and enters it into the selected text box. An audible beep sounds as the system detects and automatically enters the information. Some bar code readers move the mouse cursor to the next text box for you. Others require you to manually move the cursor to the next text box.

Figure 6-11 Bar code reader

CAUTION: The valid distance between the bar code reader and the paper for the bar code reader to read the printed bar code on paper is less than 15cm.

CAUTION: Laser Light. Do not stare into beam, IEC class 2 laser product 630 - 680 nM, 1.0 mW Laser.

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Chapter 7
General Information

This chapter explains the startup and shutdown procedures for your system.

Topics covered include:

System Start up and Shut Down

Start up

Note: Make sure the target x-ray system is ready for use. For how to start up the target x-ray system, refer to target system' s user manual for more information.

1. Wait for the target system to get ready, then power on XR118 system.
   a) Connect the power supplies of Dock and Monitor (Optional) with hosipital power to power on dock and monitor.
      - Refer to Dock for the information about the dock indicators.
   b) Press the power button on image workstation > 2 seconds, start image workstation and AP (Optional).
      - Refer to Image Workstation for the information about the workstaion button and indicators.
   c) Press the power button on the detector > 2 seconds.
      - Refer to LEDs for the information about the detector' s button and indicator.
      - Make sure the detector is installed with a fully charged battery.
   d) Power on handheld (Optional).
      - Refer to handheld' s accompany documents for how to operate the handheld.
2. For fixed system:
   - Monitor (Optional): The Login screen appears on the monitor when the image workstation is ready.
   - Handheld (Optional): Refer to step 3 for detailed information.

Note: At one time, only one method (H.H. or monitor) is allowed to login the system. If you are trying to use another method to login the system, please firstly logout from system.

3. For mobile system:
   a) Click the "Brivo XR118" shortcut on the handheld.
   b) Web brower connects to image workstation automatically.

Note: If the handheld is failed to connect to image workstation, please follow the instructions on the error page.

   c) The Login screen appears on the handheld when the workstation is ready.

Note: For the information about how to control the touch-screen of handheld, please refer to handheld’ s user manual.

Shutdown

1. Close all current exams.
2. Shutdown image workstation.
   a) Click the utilities icon [] at the upper left of your screen.
   b) Select [System] menu on utilities page.
   c) Click [Shutdown System] button.
   - A message pops up ” System will be shutdown”.

   d) Click [OK] to proceed.
   - Image workstation powers off automatically.
   - Click [Cancel] to abort the shutdown and return to utilities screen.
3. Press and hold the power button on the detector more than 4 seconds to put the image detector into sleep.
4. Shut down handheld (Optional).

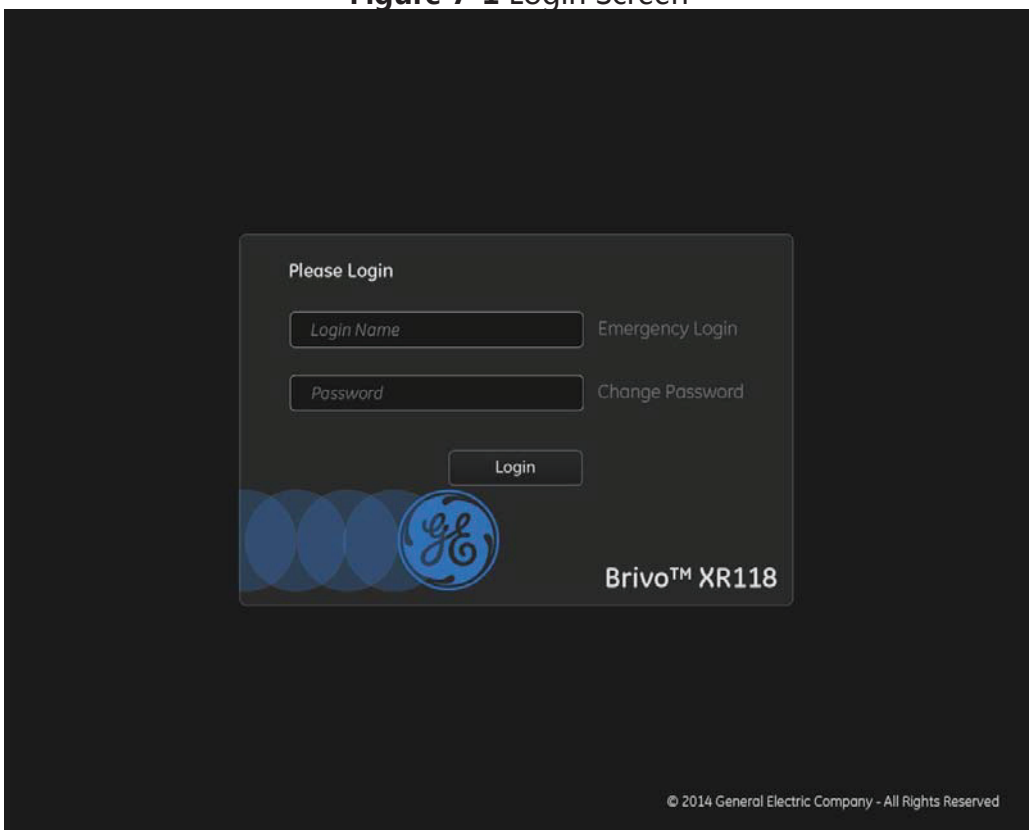
System Log in and Log Off

Refer to Login Administration for information on administering the login function.

Standard Login

The login screen (Figure 7-1) appears when the system is started, reset, or after a user logs off.

Figure 7-1 Login Screen



1. Start up the system or log off the previous user.
   - The Login screen appears.
2. Enter your Login Name, if necessary.
3. Enter your Password.
4. Click [Log in].
   - The Worklist appears.

Note: If you have administrator access, a message appears: "You have both regular user and admin user privileges. To access the admin screen, select the check box before continuing with the login, otherwise just continue with the login."

- To login and begin working with the unit, press [Log in] and the Worklist appears.
- To login and access login administrator functions, select the Enter admin screen checkbox and then press [Log in]. The login Admin screen appears. Refer to Login Administration for more information.

Invalid Password Message

Your Password must be entered correctly for you to log in. If the password you entered is not the correct password for the selected User Name , an error message will appear in the top portion of the Login screen: "An unknown error has occurred. Please try again or contact your System Administrator for more details. "

If you see the error message, do the following:

1. Make sure that the correct Login Name is displayed in the field. Depending on the configuration, the login name may be case sensitive. That is, "aBc " is not the same login name as "ABc ".
2. Retype your Password carefully. Your password is case sensitive; that is, "xYz " is not the same password as "Xyz ".
3. Click [Log in].
   - Contact your technical support group if you still are not able to login.

Emergency Login

Emergency Login is a HIPAA required function to allow quick access to medical systems in the event of an emergency. Depending on the system's configuration, this option may not be available. Refer to Login Administration to configure the Emergency login function.

Emergency Login will allow exposures, but does not allow connection to HIS/RIS or PACS hosts.

CAUTION: The Emergency Login function should NOT be used when there is time to login normally, when there is time to receive assistance from technical support, or if there is no emergency situation. Your facility may track the use of this function.

1. Press [EMERGENCY LOGIN].
   - Depending on the system' s configuration, you may be prompted to enter your name. Enter your name and click [Log in].
2. The Worklist screen appears.

Log Off

1. Close, suspend, or discontinue any open exams, if necessary.
2. Close the Image Viewer, if necessary.
3. Click [Log off] at the bottom of the Worklist screen.
   - Or open the Utility screen, go to System and click [Log off] (Figure 7-2).

Figure 7-2 Utilities screen logoff button

   - A message appears: "Do you really want to log off?"
4. Click [OK].
   - The Login screen appears.
   - [CANCEL] closes the screen and returns you to the last screen.

System Status and Messages

Several types of messages and indicators are displayed on the Acquisition Workstation screens to inform you of the system and subsystem operational status as well as error messages. The complete list of error messages is available in the Service Manual.

System status bar

Figure 7-3 System status bar

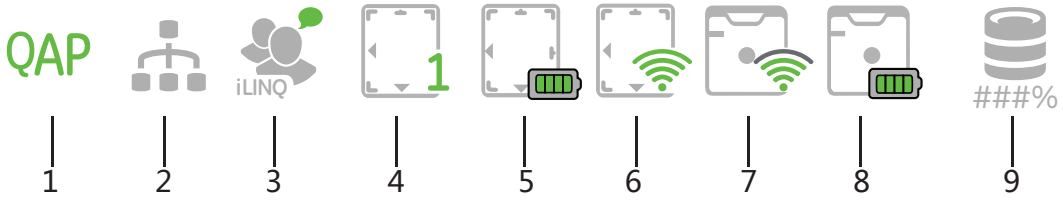
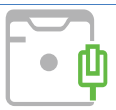
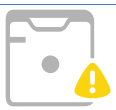
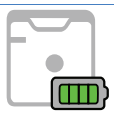


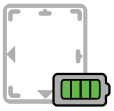
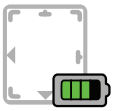
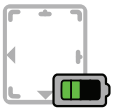
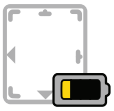
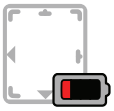
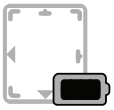
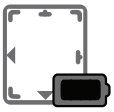
Table 7-1 System status bar items

Index	Item	Description
1	QAP	QAP (Quality Assurance Program): When QAP is needed, a yellow warning is displayed in icon window. More information, refer to Quality Assurance Process.
2	Transfer	Displays status of images networked to Printer, PACS or USB.
3	iLinq	ILinq is an optional feature of your system that allows access to remote service and clinical applications support. Refer to ILinq for more information.
4	Detector status	Displays the operation status of associated detector. Clicking on icon will open to Detector Management window.
5	Detector power capacity	Displays the battery capacity of Primary detector.
6	Detector wireless strength	Displays the wireless signal strength of Primary detector.
7	Workstation network connection	• Local area connection for fixed application. • Wireless network connection for mobile application.
8	Workstation power input	• Power input/battery charging status of image workstation for fixed application. • Battery capacity of image workstation for mobile application.
9	Remaining Space	Shows how many free space on workstation.

Table 7-2 System status bar icon list

Item	Description
	QAP
	QAP required
	Transfer status
	Transfer status
	iLinq
	iLinq message
	iLinq talk
Image Workstation’ s network connection	
	No local area connection.
	Local area connection.
	No wireless connection.
	Wireless network connection, and its signal strength is very good.
	Wireless network connection, and its signal strength is good.
	Wireless network connection, and its signal strength is normal.
	Wireless network connection, and its signal strength is bad.

Item	Description
	Wireless network connection, and its signal strength is very bad.
	Wireless network connection, but no signal strength.
	Image Workstation’ s power status
	Powered by dock/power adapter.
	Powered by embedded battery. Bars indicate different battery capacity. Battery capacity: 76% ~ 100%.
	Powered by embedded battery. Bars indicate different battery capacity. Battery capacity: 51% ~ 75%.
	Powered by embedded battery. Bars indicate different battery capacity. Battery capacity: 26% ~ 50%.
	Powered by embedded battery. Bars indicate different battery capacity. Battery capacity: 11% ~ 25%. Please charge the workstation immediately by dock or power adapter.
	Detector Wireless Signal Strength
	Wireless signal strength is very good.
	Wireless signal strength is good.
	Wireless signal strength is normal.
	Wireless signal strength is bad.
	Wireless signal strength is very bad.
	No wireless connection.

Item	Description
	Detector Battery Information
	Detector Battery Remaining Power: 76%~100%
	Detector Battery Remaining Power: 51%~75%
	Detector Battery Remaining Power: 26%~50%
	Detector Battery Remaining Power: 11%~25%, detector battery replacement required.
	Detector Battery Remaining Power: 1%~10%, detector battery replacement required immediately.
	Detector Battery Remaining Power: 0%, detector battery replacement required immediately.
	Detector Battery status is non-available.
	Detector Operation Status
	Image Detector - Normal operation mode
	Image Detector - Sleep mode
	Image Detector - No associated digital detector
	Image Detector - Communication failure

System Messages

System messages are displayed on the bottom of all main Workstation screens (Figure 7-4), including system message bar and inhibit message bar.

System messages are displayed when the system detects an irregularity in system operation. The message informs you when remedial action is required to correct the situation.

A console beep announces the arrival of an informational message. There are situations where a system condition is detected that does not require stopping the procedure. The message tells you to Continue or to Continue/Call Service (continue and call service).

Note: To clear the message area, open the Message log (described below) and close it again.

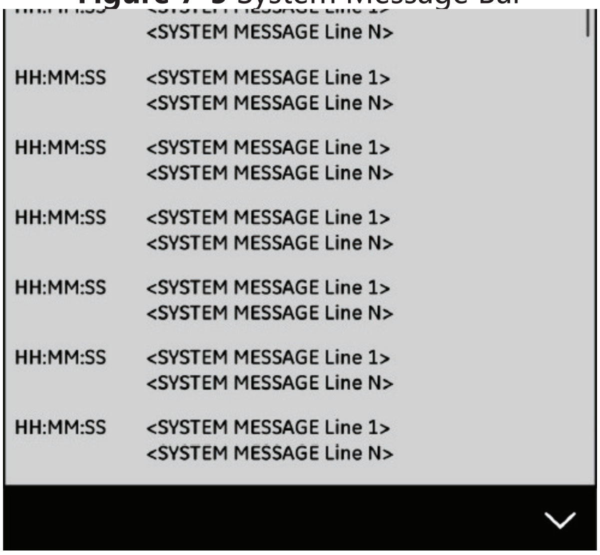
Figure 7-4 System Message Example

System Message Bar

Clicking the System Message arrow at the right-bottom of any screen opens the System Message log (Figure 7-5). The System Message log shows all status messages since the last system restart. The messages are listed in descending chronological order, that is, the latest message is listed first. This screen allow operators and service personnel to display, review, and analyse system status messages.

If the message number is more than the messages in the list, scroll bar will be activated, and you can view all the useful messages.

Figure 7-5 System Message Bar

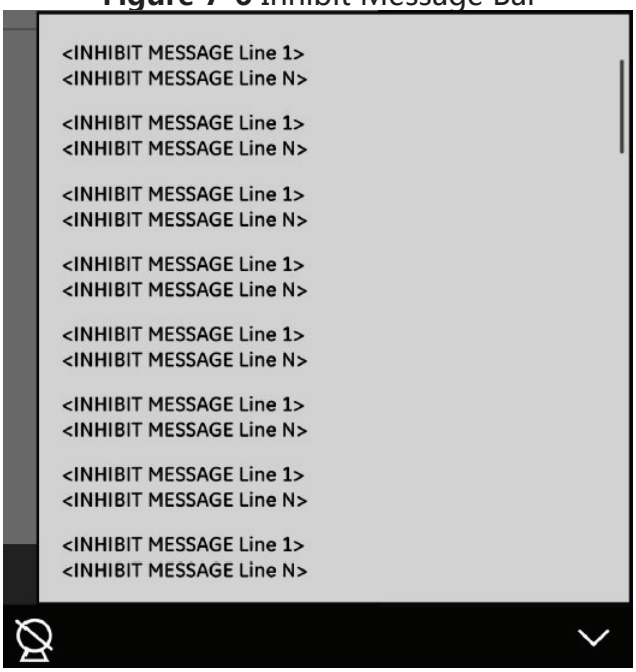


Inhibit Message Bar

The Inhibit Message log appears at the bottom of the Worklist or Acquisition screens when there is some condition that prevents an x-ray from being taken, such as the exam room door being open or the tube is not in alignment with the detector.

Click the Inhibit Message arrow to view a list of all errors and interlocks that are preventing the exposure (Figure 7-6). The items are removed from the list as they are corrected. The inhibit message disappears when all errors and interlocks are corrected.

Figure 7-6 Inhibit Message Bar



ILinq

ILinq is an optional feature of your system that allows access to remote service and clinical applications support.

The iLinq system lets authorized Service Engineers and Applications Specialists, located at GE Healthcare's Service Support Centers, access X-ray systems (with your permission) to provide the following services:

- Faster Emergency Service response.
- Customer Applications training and assistance.
- System troubleshooting and diagnostics.
- Accumulate system information for failure analysis, resolution and prediction to assist in maintaining optimal X-ray system performance.

Figure 7-7 ilinq Main Screen

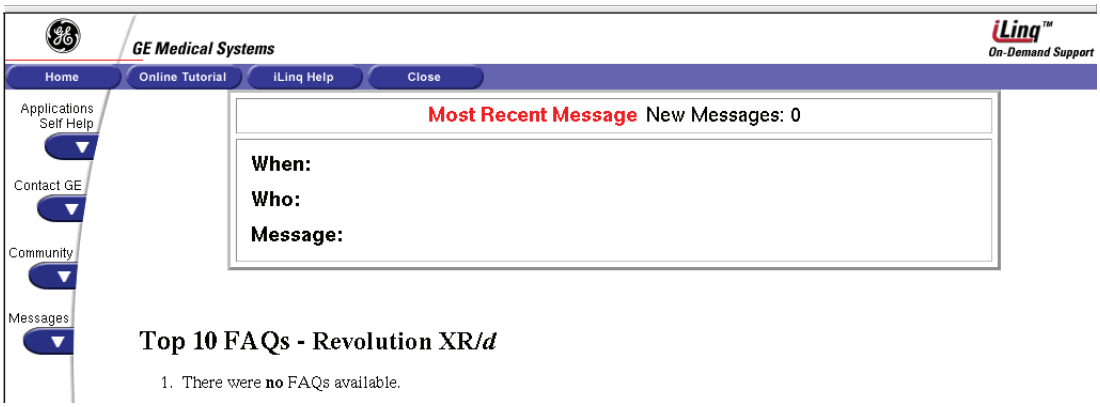
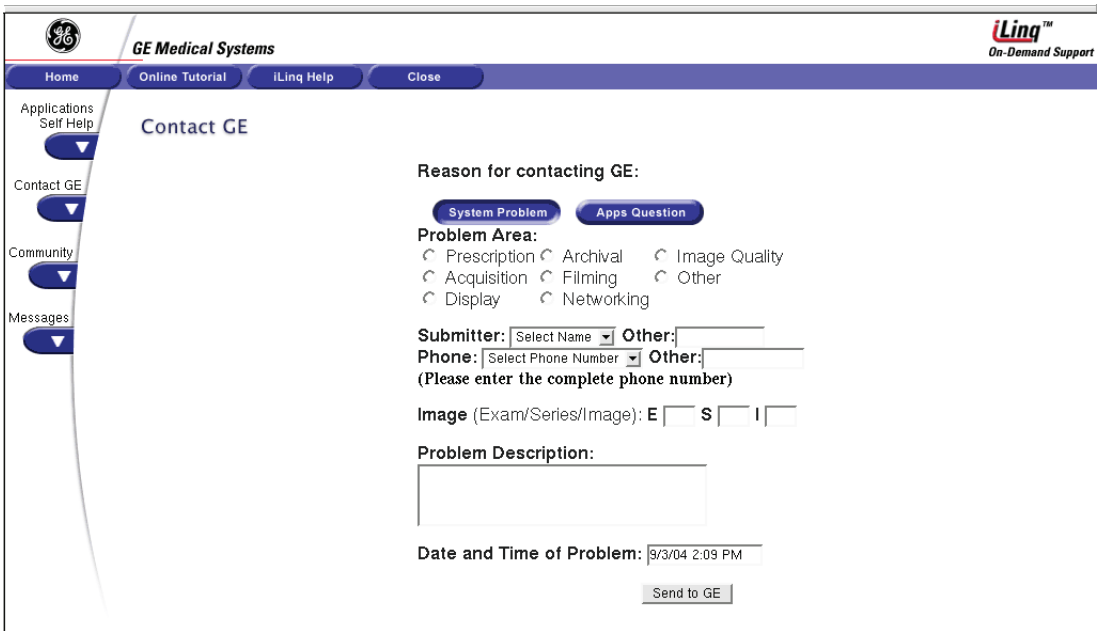


Table 7-3 iLinq Screen Functions

Function	Description
Application Self Help	Provides applications protocol descriptions, newsletters, and a list of frequently asked questions as well as additional TiP (Training in Partnership) educational opportunities.
Contact GE	Contact GE Allows the electronic submission of a service request or applications question directly to the Online Center. Figure 7-8 shows the screen you use to report a problem with your system, using the iLinq system.
Community	Community Connects you to GE Healthcare' s online community of experts.
Messages	Receives messages from the Online Center.
Online Tutorial	Access online training for iLinq features.
iLinq Help	Provides help for all of the iLinq features. In order to receive detailed help on a particular topic, simply make your selection from the items to the left side of the screen by clicking on them.
Close	Close iLinq and returns you the XR118 system.

Figure 7-8 iLinq Contact GE Screen



Use this procedure to connect to the iLinq system when you need to report a problem with your system.

1. Click the [iLinq] icon on the Worklist or Acquisition screens.
2. Click [CONTACT GE].
3. Enter the required information into the Contact GE iLinq screen.
4. Click [SEND TO GE].
5. Click [CLOSE].
   - iLinq closes and returns you to the Worklist or Acquisition screens.

Installation and use of the iLinq system is limited to GE Customers with an X-ray system that is under warranty or covered by a valid GE Service Contract, in accordance with the terms and conditions of the iLinq Agreement or GE Service Contract. The presence of the GE iLinq system alone, at a your site, does not provide you any rights or title to the iLinq system or any license or right to access, use or decompile the iLinq system. Any access to or use of the iLinq system beyond the conditions specified in the iLinq Agreement or GE Service Contract; or any decompilation of the iLinq system by anyone other than GE personnel is prohibited. By signing the iLinq Agreement, you agree to use reasonable effort to protect the iLinq system against damage or loss and to prevent access to, use of or decompilation of the iLinq system by unauthorized personnel.

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Chapter 8
Worklist

The Worklist is the starting point for selecting procedures for acquisition. All exams begin from this screen. The Worklist information and functions are based on DICOM standards.

This chapter explains the procedures for entering data into the system and setting up a patient.

Contents are:

Overview

The worklist (Figure 8-1) shows scheduled, completed, discontinued, suspended, and active procedures.

The majority of the Worklist is the Patient List. The Patient List is a large table made of standard columns and rows. Each row in the list is a procedure, or exam to be performed. A patient may have multiple procedures (rows) on the Worklist.

Procedures listed can be classified under two categories:

- Locally entered procedures: This category refers to procedures entered by the user on the workstation, either by manual or by using an bar code scanner. Locally entered procedures are only available to the workstation that they were entered on. They do not update automatically and no other workstation can access them.
- Hospital Information System (HIS) or Radiology Information System (RIS) Procedures: This category refers to procedures that the Worklist can automatically update from the central HIS/RIS database. Other units or workstations can be configured to access these procedures.

Figure 8-1 Worklist screen

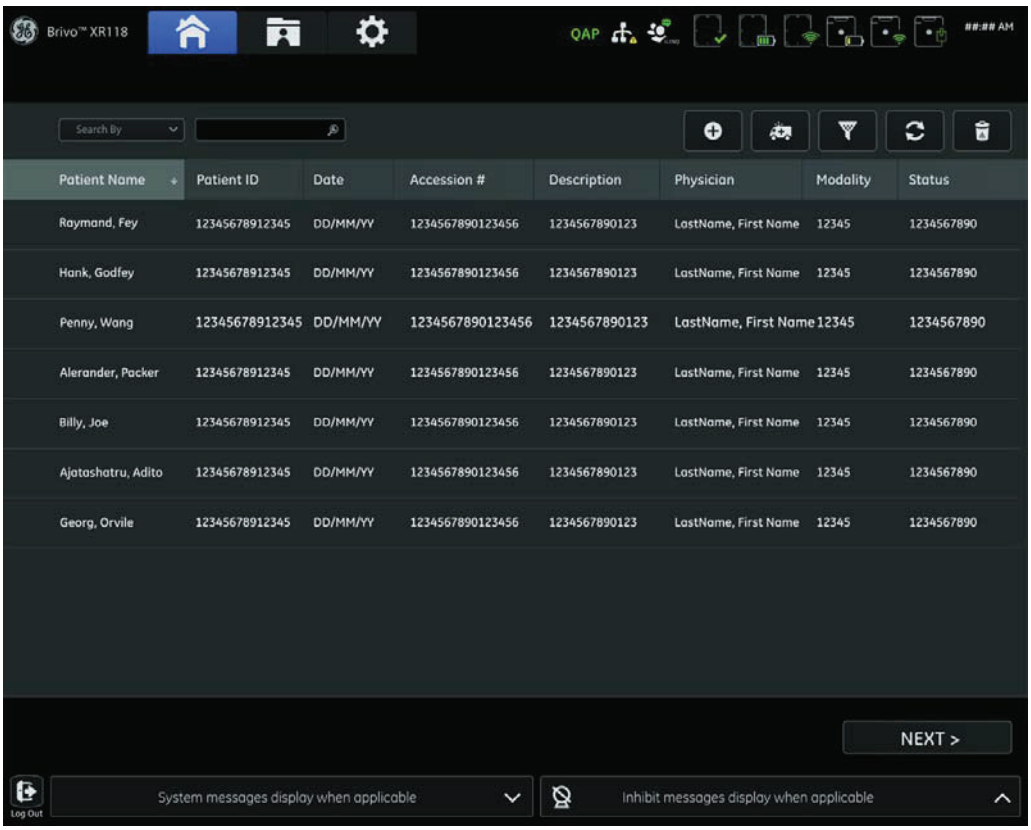

Table 8-1 lists and describes all functions displayed on worklist.

Table 8-1 Worklist Functions

Function	Description
[Worklist] 	Click this icon to show the whole worklist on the screen. All the patient detailed information can be found. The information can be updated from RIS/HIS or added from the system. The list can be displayed by different filters.
[Image Management] 	Click this icon to display all the image detailed information: study date, Series information etc.
[Utilities] 	Opens a screen where system settings (such as Network and Printer connections) and other preferences may be changed. If the Login function is enabled, the preferences you are allowed to change will vary depending on your level of access. Refer to Chapter 16: Set Preferences for more information.
[Exit] 	Click this button to log the current user off the system. Refer to System Log in and Log Off for more information.
[Patient Information] 	Shows the Patient Information screen for the selected procedure. **Note:** Patient Information is editable if the currently selected procedure has not been opened. Once the exam starts, the Patient Information is no longer editable. Patient Information is not editable if multiple procedures are selected. Refer to Adding/Editing/Viewing Patient Information for more information.
[Refresh] 	Updates the worklist view with new information from the HIS or RIS, which shows changes to the procedure records. Also removes any filters that have been applied. Refer to Refresh for more information on automatically refreshing the Worklist.
[Filter] 	Displays a worklist query screen and filters the RIS or HIS records to find procedures that meet specific criteria. Refer to Filter list for information on how to filter the Worklist.