



Technical Publications

Direction 5841814-1EN

Rev. 2



LOGIQ P8/P9/P10 User Guide

Version R4

[Operating Documentation](#)

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Regulatory Requirement

LOGIQ P8/P9/P10 complies with regulatory requirements of the following European Directive 93/42/EEC concerning medical devices.



First CE marked in 2014.

This manual is a reference for the LOGIQ P8/P9/P10. It applies to all versions of the Version R4 software for the LOGIQ P8/P9/P10 ultrasound system.



GE Healthcare www.gehealthcare.com
P.O. Box 414, Milwaukee, Wisconsin 53201 U.S.A.
(Asia, Pacific, Latin America, North America)

GE Healthcare GmbH: TEL: 49 212.28.02.208
Beethovenstrasse 239: FAX: 49 212.28.02.431
Postfach 11 05 60
D-42655 Solingen GERMANY

Revision History

Reason for Change

REV	DATE (YYYY/MM/DD)	REASON FOR CHANGE
Rev. 1	2020/05/21	Initial release
Rev. 2	2020/10/16	Enhancement feedback

List of Effective Pages

PAGE NUMBER	REVISION	PAGE NUMBER	REVISION
Title Page	Rev. 2	Chapter 2	Rev. 2
Revision History	Rev. 2	Chapter 3	Rev. 2
Regulatory Requirements	Rev. 2	Chapter 4	Rev. 2
Table of Contents	Rev. 2	Index	Rev. 2
Chapter 1	Rev. 2		

Please verify that you are using the latest revision of this document. Information pertaining to this document is maintained on ePDM (GE electronic Product Data Management). If you need to know the latest revision, contact your distributor, local GE Sales Representative or in the USA call the GE Ultrasound Clinical Answer Center at 1 800 682 5327 or 1 262 524 5698.

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Regulatory Requirements

Conformance Standards

The following classifications are in accordance with the IEC/EN 60601-1:6.8.1:

- According to 93/42/EEC Medical Device Directive, this is Class IIa Medical Device.
- According to IEC/EN 60601-1,
 - Equipment is Class I, INTERNALLY POWERED ME EQUIPMENT, Type BF or CF Applied Parts.
- According to CISPR 11,
 - Equipment is Group 1, Class A ISM Equipment.
- According to IEC 60529,
 - The footswitch rate IPX8 is suitable for use in surgical rooms.
 - Probe head (immersible portion) and cable are IPX7

Probe connector is not waterproof.

This product complies with the regulatory requirement of the following:

- Council Directive 93/42/EEC concerning medical devices: the CE label affixed to the product testifies compliance to the Directive.

The location of the CE marking is shown in the Safety chapter of this manual.

Authorized EU Representative

European registered place of business:

GE Medical Systems SCS

283 rue de la Minière

78530 BUC, France

Tel: +33 (0) 1 30 70 4040



Conformance Standards (continued)

- Classified to ANSI/AAMI ES60601-1 2005 R1 2012 Medical Electrical Equipment, Part 1: General Requirements for Safety by a Nationally Recognized Test Lab
- Certified to CSA CAN/CSA-C22.2 No60601-1 :14 General requirements for safety
- CE Marked to Council Directive 93/42/EEC on Medical Devices Conforms to the following standards for safety:
- IEC/EN 60601-1 3.1 Edition. Medical electrical equipment - Part 1: General requirements for basic safety and essential performance
- IEC/EN 60601-1-2 Medical electrical equipment - Part 1-2: General requirements for safety - Collateral Standard: Electromagnetic compatibility - requirements and tests
- IEC/EN 60601-1-6 Medical electrical equipment Part 1-6: General requirements basic safety and essential performance - Collateral Standard: Usability
- IEC/EN 60601-2-37 Medical electrical equipment - Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
- IEC 61157 (Standard means for the reporting of the acoustic output of medical diagnostic ultrasonic equipment)
- IEC/EN 62366 Application of usability engineering to medical devices
- IEC/EN 62304 Software Life Cycle Processes
- IEC/EN 62359 Ultrasonic - Field characterization - Test methods for the determination of thermal and mechanical indices related to medical diagnostic ultrasonic fields
- EN ISO 15223-1 : Symbols to be used with medical device labels, labelling and information to be supplied
- ISO 10993-1 Biological evaluation of medical devices - Part 1 Evaluation and testing
- ISO 14971:2012 (Medical devices - Application of risk management to medical devices)
- EMC Emissions Group 1, Class A device requirements as per Sub clause 4.2 of CISPR 11
- WEEE (Waste Electrical and Electronic Equipment)
- ROHS according to 2011/65/EU Including national deviations
- Wireless equipment shall be certified to FCC, RED and Japan Radio Law.
- Medical Device Good Manufacturing Practice Manual issued by the FDA (Food and Drug Administration, Department of Health, USA)

Certifications

- General Electric Medical Systems is ISO 13485 certified.

Original Documentation

- The original document was written in English.

Country Specific Approval



The following optional features ARE NOT available in the USA and its territories:

- Elastography Quantification

Importer Information

- Turkish Importer
GE Medical Systems Türkiye Ltd. Şti.
Esentepe Mah. Harman Sok. No: 8
34394 Şişli İstanbul Türkiye

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Chapter 1

Getting Started

*Console Overview, Moving the System, System
Start-up, Probes and Beginning an Exam.*

Site Requirements

Introduction



All the warnings in the Safety chapter should be read and understood before operating the unit.



Do not unpack the LOGIQ P8/P9/P10. This must be performed by qualified service personnel only.



Always use the system on a flat surface in the patient environment.

Do not attempt to install the system alone. General Electric, Affiliate, or Distributor Field Engineers and Application Specialists will install and setup the system. See 'Contact Information' on *page 3-93 for more information*.

Perform regular preventive maintenance.

Maintain a clean environment. Turn off, and if possible, disconnect the system before cleaning the unit.

Training

Only qualified physicians or sonographers should perform ultrasound scanning on human subjects for medical diagnostic reasons. Request training, if needed.

Before the system arrives

The ultrasound unit must operate within the proper environment and in accordance with the requirements described in this section. Before using the system, ensure that the requirements are met.

Power Requirements

- A separate power outlet with a 15 amp circuit breaker.
- Frequency: 50 Hz, 60 Hz (+/-2%)
- 100V - 240V AC

Electromagnetic interferences

This medical equipment is approved, in terms of the prevention of radio wave interference, to be used in hospitals, clinics and other institutions which are environmentally qualified. The use of this equipment in an inappropriate environment may cause some electronic interference to radios and televisions around the equipment.

Ensure that the following is provided for the new system:

- Take precautions to ensure that the console is protected from electromagnetic interference.

Precautions include:

- Operate the console at least 5 meters (15 feet) away from motors, typewriters, elevators, and other sources of strong electromagnetic radiation (non-medical grade UPS must be at least 2 meters (6 feet) away from console).
- Operation in an enclosed area (wood, plaster or concrete walls, floors and ceilings) helps prevent electromagnetic interference.
- Special shielding may be required if the console is to be operated in the vicinity of radio broadcast equipment.



Do not operate the system in the vicinity of a heat source, of strong electric or magnetic fields (close to a transformer), or near instruments generating high-frequency signals, such as HF surgery. These can affect the ultrasound images adversely.

Environmental Requirements

The system should be operated, stored, or transported within the parameters outlined below. Either its operational environment must be constantly maintained or the unit must be turned off.

Table 1-1: System Environmental Requirements

	Operational	Storage	Transport
Temperature	10° - 35°C/50° - 95°F with 2D probe 18° - 30°C/64.4° - 86°F with 4D probe	-10° - 50°C 14° - 122°F	-10° - 50°C 14° - 122°F
Humidity	10 - 80% non-condensing	10 - 90% non-condensing	10 - 90% non-condensing
Pressure	700 - 1060hPa	700 - 1060hPa	700 - 1060hPa



CAUTION

Check the room temperature before you use the 4D probe.



CAUTION

Ensure that the probe face temperature does not exceed the normal operation temperature range.

Operating Environment

Ensure that there is sufficient air flow around the ultrasound unit when installed in a fixed location.



CAUTION

Do not cover the ventilation holes of the LOGIQ P8/P9/P10.

Operating altitude

Maximum operating altitude for use: 3000m

Probe

Probes should be operated, stored, or transported within the parameters outlined below.

NOTE: See provided TEE probe user manual for the environmental requirements of the TEE probe.

Table 1-2: Probe Environmental Requirements

	Operational
Temperature	10° - 35 °C for 2D probe 18° - 30 °C for 4D probe
Humidity	10 - 80% (non-condensing) for 2D probe 30 - 80% (non-condensing) for 4D probe
Pressure	700 - 1060hPa

Console Overview

Attention

This manual contains necessary and sufficient information to operate the system safely. Advanced equipment training may be provided by a factory trained Applications Specialist for the agreed-upon time period.

Read and understand all instructions in this manual before attempting to use the LOGIQ P8/P9/P10 system.

Keep this manual with the equipment at all times. Periodically review the procedures for operation and safety precautions.

Disregarding information on safety is considered abnormal use.

Not all features, products, probes, or peripherals described in this document may be available or cleared for sale in all markets. Please contact your local GE Ultrasound representative to get the latest information.

NOTE: *Please note that orders are based on the individually agreed upon specifications and may not contain all features listed in this manual.*

NOTE: *All references to standards / regulations and their revisions are valid at the time of publication of the user manual.*

Documentation



CAUTION

Safety instructions must be reviewed before operating the unit.

LOGIQ P8/P9/P10 documentation consists of various manuals:

- The Basic User Manual, User Guide, and Online Help (TRANSLATED) provides information needed by the user to operate the system safely. It describes the basic functions of the system, safety features, operating modes, measurements/calculations, probes, and user care and maintenance.
- The Advanced Reference Manual (ENGLISH ONLY) contains data tables, such as OB and Acoustic Output tables.
- AIUM Booklet (USA Only)
- The Service Manual (ENGLISH ONLY) supplies block diagrams, lists of spare parts, descriptions, adjustment instructions or similar information which helps qualified technical personnel in repairing those parts of the system which have been defined as repairable.

The LOGIQ P8/P9/P10 manuals are written for users who are familiar with basic ultrasound principles and techniques. They do not include sonographic training or detailed clinical procedures.

NOTE: *The Service manual is only provided in electronic format on the eDoc USB.*

NOTE: *The eDoc USB includes English and all translations.*

NOTE: *Dates on screenshots are represented in MM/DD/YYYY format throughout the manual. Information on how to change the system's date can be found in Customizing Your System.*

NOTE: *The screen graphics in this manual are only for illustrational purposes. Actual screen output may differ.*

Principles of Operation

Medical ultrasound images are created by computer and digital memory from the transmission and reception of mechanical high-frequency waves applied through a transducer. The mechanical ultrasound waves spread through the body, producing an echo where density changes occur. For example, in the case of human tissue, an echo is created where a signal passes from an adipose tissue (fat) region to a muscular tissue region. The echoes return to the transducer where they are converted back into electrical signals.

These echo signals are highly amplified and processed by several analog and digital circuits having filters with many frequency and time response options, transforming the high-frequency electrical signals into a series of digital image signals which are stored in memory. Once in memory, the image can be displayed in real-time on the image monitor. All signal transmission, reception and processing characteristics are controlled by the main computer. By selection from the system control panel, the user can alter the characteristics and features of the system, allowing a wide range of uses, from obstetrics to peripheral vascular examinations.

Transducers are accurate, solid-state devices, providing multiple image formats. The digital design and use of solid-state components provides highly stable and consistent imaging performance with minimal required maintenance. Sophisticated design with computer control offers a system with extensive features and functions which is user-friendly and easy to use.

Indications for Use

The LOGIQ P8/P9/P10 is intended for use by a qualified physician for ultrasound evaluation.

Frequency of Use

Daily (Typically 8 hours)

Operator Profile

- Qualified and trained physicians or sonographers with at least basic ultrasound knowledge.
- The operator must have read and understood the user manual.

Clinical Applications

Specific clinical applications and exam types include:

- Fetal/Obstetrics
- Abdominal (includes renal, GYN/Pelvic)
- Pediatric
- Small Organ (breast, testes, thyroid)
- Neonatal Cephalic
- Adult Cephalic
- Cardiac (adult and pediatric)
- Peripheral Vascular
- Musculo-skeletal Conventional and Superficial
- Urology (including prostate)
- Transrectal
- Transvaginal
- Intraoperative (abdominal, vascular)
- Transesophageal

Image Acquisition is for diagnostic purposes, including measurements on acquired images.



This machine should be used in compliance with law. Some jurisdictions restrict certain uses, such as gender determination.

Contraindication

The LOGIQ P8/P9/P10 ultrasound system is not intended for ophthalmic use or any use causing the acoustic beam to pass through the eye.

Prescription Device

Rx Only

CAUTION: United States law restricts this device to sale or use by, or on the order of a physician.

Console Overview

Console Graphics



Figure 1-1. LOGIQ P8/P9/P10 System (High cabinet type example)

- | | | |
|---|---|------------------------------------|
| 1. LCD Monitor | 9. DVD Drive (Option) | 16. Paper tray (Option) |
| 2. USB port | 10. BW printer (Option) | 17. Audio speaker |
| 2-1> USB Port (additional option with HD Display) | 11. Drawer (Option) | 18. OPIO tray (Option) |
| 3. Touch panel | 12. Foot rest | 19. Rear handle (Option) |
| 4. Probe holder | 13. CW pencil probe port (Option) | 20. ECG connector (Option) |
| 5. Control panel swivel button | 14. Side tray (Standard) | 21. Articulating arm |
| 6. Control panel up/down button | 15. Probe ports - 4 active probe ports (3 RS, 1 DLP) | 22. External I/O panel |
| 7. A/N keyboard (Option) | | 23. Extended Battery Life (Option) |
| 8. Multi purpose holder (Option) | | 24. Probe Light |

Low cabinet type



Figure 1-2. Low cabinet

a. DVD Drive (Option)

High cabinet type



Figure 1-3. High cabinet

- a. DVD Drive (Option)
- b. B/W Printer or Drawer

Speakers

Audio is provided by speakers. For the location of the speaker, see Figure 1-1 on page 1-11.

NOTE: *You make volume corrections on the Utility Touch Panel (Master Volume, Effects Volume).*

- Audio Doppler operation
- Audio playback of recorded scan sessions
- Audio error notification.

Peripheral/Accessory Connection

Peripheral/Accessory Connector Panel

LOGIQ P8/P9/P10 peripherals and accessories can be properly connected using the Peripheral/Accessory Connector Panel.



CAUTION

For compatibility reasons, use only GE-approved probes, peripherals, or accessories.

DO NOT connect any probes or accessories without approval by GE.



CAUTION

The connection of equipment or transmission networks other than as specified in these instructions can result in electric shock hazard. Alternate connections will require verification of compatibility and conformity to IEC/EN 60601-1 by the installer.



CAUTION

DO NOT touch the conducting parts of the USB or Ethernet cables when connecting equipment to the unit.



CAUTION

When using peripheral device, observe all warnings and cautions given in peripheral operator manuals.

Peripheral/Accessory Connector Panel (continued)

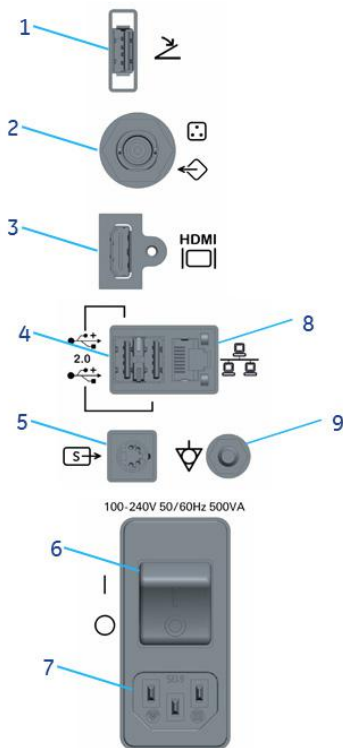


Figure 1-4. Peripheral/Accessory Connector Panel

1.	USB Port	USB2.0 Full Speed
2.	Composite connector	Composite connector for external monitor
3.	HDMI connector	HDMI connector for external monitor
4.	USB Port	USB2.0 Full Speed
5.	S-Video connector	S-Video connector for external monitor
6.	Circuit breaker	10A
7.	AC Inlet	100-240Vac
8.	Ethernet	LAN for InSite, DICOM, Network storage Connection
9.	Equipotential terminal	

Peripheral/Accessory Connector Panel (continued)



CAUTION

When connecting external peripherals on USB port, composite connector, HDMI connector or S-video connector, the external peripheral and external monitor shall be powered through a medical grade isolation transformer (Figure 1-5) if it requires external AC power source. Please contact GE Service Representative for installation of medical grade isolation transformer.



Figure 1-5. MED 300 WR (medical grade isolation transformer)

Storage areas

Probe holder and Gel warmer



Figure 1-6. Probe holder and Gel warmer (Gel holder)

- a. Probe holder
- b. Gel warmer (Gel holder)

Turn on the system, then turn on the gel warmer.

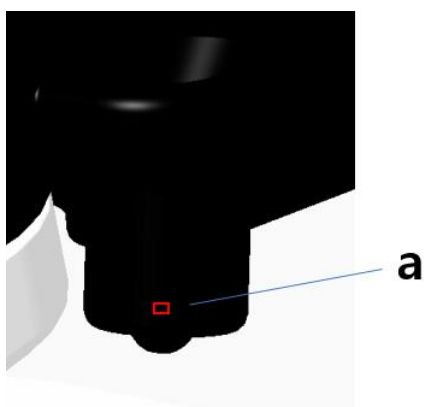


Figure 1-7. On/Off switch of Gel warmer

- a. On/Off switch (Left: Off, Right: On)

Trays (Option)



Figure 1-8. Trays

- a. OPIO tray
- b. Paper tray



CAUTION

DO NOT place the probe, the footswitch and/or any peripherals on the side tray when moving/transporting the system.

Multi purpose holder (option)



Figure 1-9. Multi purpose holder (Option)

- a. Optional multi purpose holder

Attachment for small probe (Option)



Figure 1-10. Attachment (Option)

Push the attachment into the probe holder as below.



Figure 1-11. Push the attachment



Figure 1-12. Attachment in the proper position

Extended Battery (Option)



Figure 1-13. Extended Battery

a. Optional Extended Battery

The recommended battery usage is:

- Power Assistant: 15 minutes of offline scanning
- Extended battery: 60 minutes of offline scanning

View current battery status

When the system is running on battery power, the following icons display on the status bar at the bottom of the display:

Table 1-3: Battery status icons

Icon	Description
No icon	AC Plugged; no battery present
	AC Plugged; battery is fully charged (100%)
	AC Plugged; battery is partially charged (50%-94%)
	AC Plugged; battery is partially charged (20%-49%)
	AC Plugged; battery is partially charged (0%-19%)
	AC Unplugged; battery is fully charged (100%)
	AC Unplugged; battery is partially charged (50%-94%)
	AC Unplugged; battery is partially charged (20%-49%)
	AC Unplugged; battery is partially charged (0%-19%)

View current battery status (continued)

Battery error icon

When an abnormal status of the battery is detected, the system displays the following icon:

Table 1-4: Battery error icon

Icon	Description
	• Battery Temperature error • Communication error or battery charge error

NOTE: If this icon displays, do not initiate Power Assistant. Contact the technical service department or your local GE representative.

Starting Power Assistant

When the AC cable is unplugged or if there is an AC power failure, the system transitions to Power Assistant. The following dialog displays before entering Power Assistant.

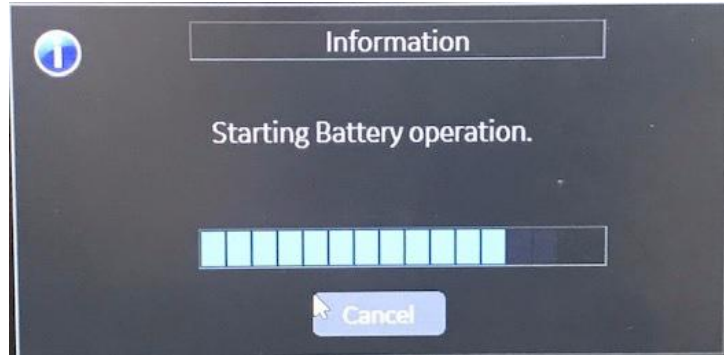


Figure 1-14. Power Assistant mode

NOTE: Verify that the system is in Power Assistant after unplugging the power cable. The following message "Running on Battery. Key operation locked" appears on the display during Power Assistant.

NOTE: If the system does not transition to Power Assistant, contact the technical service department or your local GE representative.

When in Power Assistant

In Power Assistant, most of the console devices, such as the keyboard, gel warmer and printers, are turned off to minimize battery usage.



CAUTION

When in Power Assistant, DO NOT perform the following operation:

- Connect and disconnect probes.
- Remove peripheral devices.
- Eject or insert CD/DVD media and the external USB storage device.

NOTE: *To shut down the system while in Power Assistant, plug in the power cable, exit from Power Assistant, and then perform regular shut down operations.*



CAUTION

When remaining battery capacity is 30% or less, the LED on the operator panel starts blinking. Plug in the AC cable without delay if the LED starts blinking.

If the remaining battery capacity is too low, the system will automatically start the full shutdown sequence.

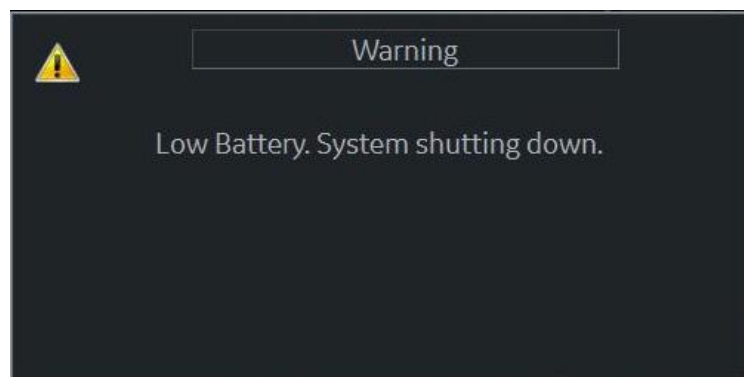


Figure 1-15. Battery low power warning message

Recovering from Power Assistant

The system recovers from Power Assistant when power is supplied to the LOGIQ P8/P9/P10. The system returns to full functionality in 10 seconds.

Refreshing the battery

To maintain the battery life, it is recommended to refresh the battery every 6 months. Refresh procedure:

1. Turn on the system.
2. Wait until the battery is fully charged. it takes at least 1 hour to fully charge the battery.
3. Turn off the system.
4. Remove all probes.
5. Turn on the system.
6. Unplug the AC cable and wait until the system shuts down. It may take 30 minutes or more to complete shutdown.
7. Wait at least 5 hours.
8. Plug in the AC cable.
9. Turn on the system.
10. Wait until the battery is fully charged. It takes about 3 hours to fully charge the battery.

Battery deterioration

When the system detects battery deterioration, the following dialog displays:

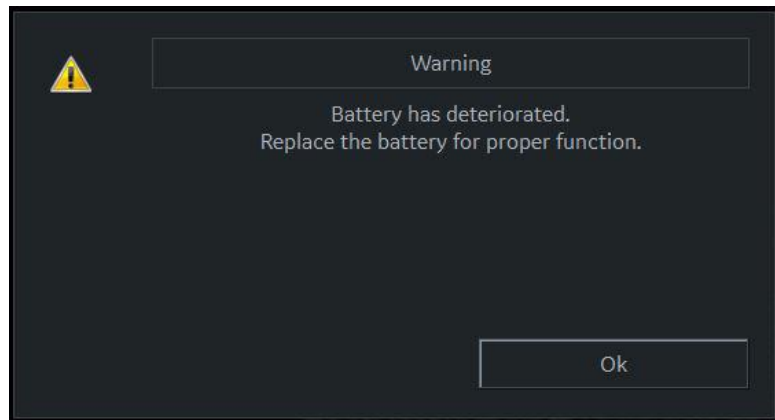


Figure 1-16. Battery life message

If this message displays, contact the technical service department or your local GE representative.

Battery Disposal

Power Assistant uses a Lithium Ion battery. Used battery will require to discard as chemical waste. Please contact your local authority for the directions.

NOTE: *When removing a defective battery, ensure that it is disposed of in accordance with local regulations. Alternatively, forward it to GE for proper disposal.*

Offline Scanning (Option)

Offline scanning feature allows user to scan using battery power (AC unplugged) and automatically switches to power assistant mode (power saving mode) when the battery is running out to prevent data loss.

Activating Offline Scanning

To use offline scanning feature, please go to utility and check "Allow Offline Scanning (restart needed)" from System > General page to activate offline scanning. You need to restart application after updating the check box.

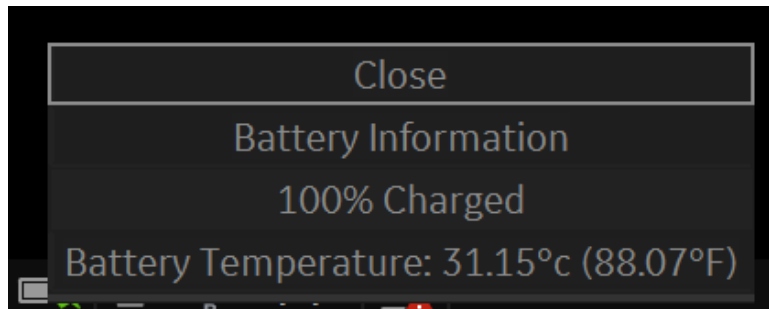


Figure 1-17. Allow Offline Scanning check

How to use Offline Scanning

When Offline scanning is activated, the system enters an offline scanning mode automatically when the system is disconnected from AC power. (When Offline Scanning is disabled, the system enters power assistant mode.)



The fresh battery allows user to keep scanning for 20 minutes (B Mode). However, it depends on scan condition and hardware configurations.



Do not use offline scanning mode when you need to handle (transfer/ export/ import) patient data. (Export/Import/ Backup/ Burn Media, Dicom Transfer, etc.) The system can be unexpectedly shutdown when the battery capacity is not enough and resulted in losing patient data. Please note the message in the status bar when offline scanning is activated. It is strongly recommend to use AC power to use patient data handling actions.

System is working with battery power. Make sure the battery has enough capacity to prevent any data loss!

Figure 1-18. Warning message

How to see the current battery status

There is a battery icon in the status bar, but also user can access to detailed information from battery information popup.

Click battery icon in the status bar to display the battery information popup, which is including the current battery capacity, brief condition, and current temperature.



Please note that the system switches to power saving mode automatically when the capacity is under 50%.

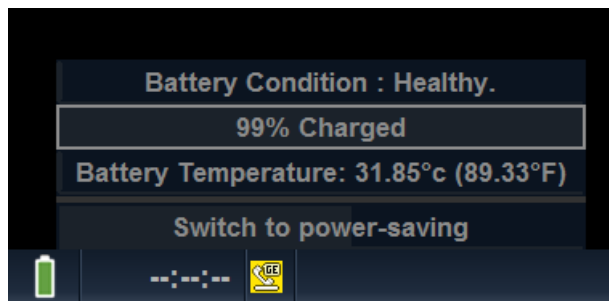


Figure 1-19. Battery Condition

Recommendation

Please plug in AC power if possible, keep using the battery power can impact to the battery life.

Optional Battery Power Saving Mode

When the system located away from AC power, user can switch to optional power-saving mode using the button in the battery status popup. The system allows back to Offline Scanning mode with the pressing Power button or Freeze button when the system is in optional power-saving mode.

Information

To notify that the battery is running out, the system displays a dialog to confirm user want to keep scanning or not. User can keep scanning more as possible or, go to optional power saving mode to find near AC power.

Operator Controls

Control Panel Map

Controls are grouped together by function for ease of use. See the callout for this figure on the following page.



Figure 1-20. Console Panel Map

- | | |
|---------------------------------------|---|
| 1. Probe Holder and Cable Management | 6. Trackball, Trackball Keys, Pointer, Measure, Comment, Body Pattern, Clear, Programmable Keys |
| 2. Touch Panel Joystick controls | 7. L/R, Start/Stop, Freeze, Simultaneous |
| 3. Power On/Off | 8. Steer/Zoom/Depth |
| 4. User Define keys (include BT Keys) | 9. Auto, PW Auto Positioning |
| 5. Mode/Gain/XYZ (3D/4D) Controls | 10. P1(Print) key |
| | 11. Freeze key |

Control panel adjustment



CAUTION

To avoid injury or damage, make sure nothing is within the range of motion before moving the control panel. This includes both objects and people.

The control panel position can be adjusted for easy viewing and easy-to-use.

To raise/lower the Control panel

1. Push the up/down button of the right front handle and hold it.
2. Release the button at the desired height.



Figure 1-21. Up/Down Control

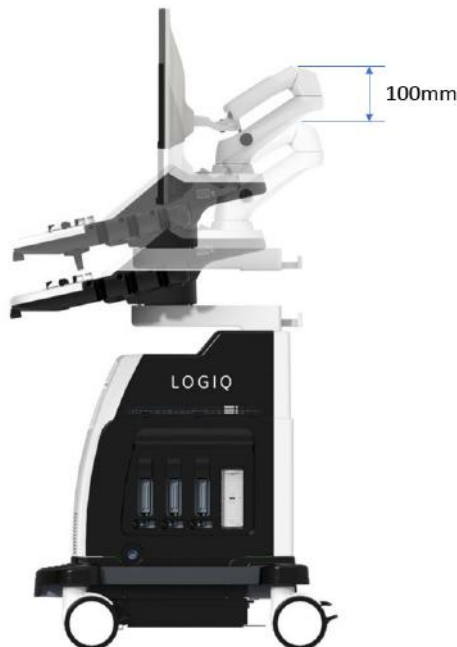


Figure 1-22. Up/Down

To swivel the Control panel

1. Push the swivel button of left front handle and hold it.
2. Release the button at the desired position.



Figure 1-23. Swivel Control

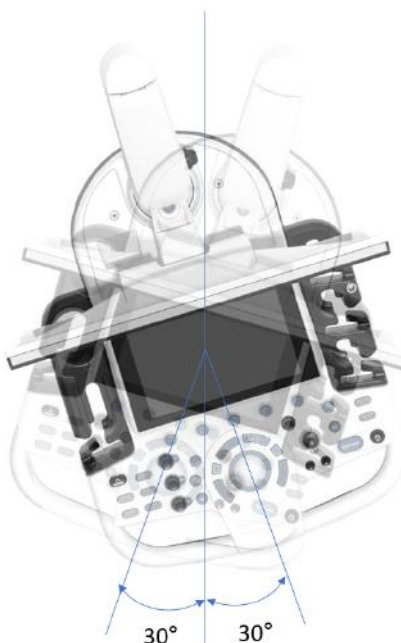


Figure 1-24. Swivel range

Key Illumination

All the keys on the front panel, except for the keyboard, and some rotaries have a two-level backlight capability. The following backlighting indicates availability.

The keyboard area must have task lighting or equivalent to allow operation in a dark room.

Table 1-5: Key Illumination

Backlight Capability	Availability
OFF	Function is not available
Green	Activated/ON
Blue	Inactive/Available

Keyboard (Optional)

	The standard alpha-numeric keyboard has some special functions.
Esc	Exit current display screen.
Help (F1 Key)	Access Online help / user manual.
Arrow (F2 Key)	Annotation arrow.
Eject (F3 Key)	Eject media.
Spooler (F4 Key)	Activates DICOM Job Spooler screen.
Create a Fast Key (F5 Key)	Creates a Fast Key.
Play a Fast Key (F6 Key)	Plays a Fast Key.
Home/Set Home (F7 Key)	Move annotation cursor to home position; shift+key to set current annotation cursor position as the new home position.
Text1/Text2 (F8 Key)	Switch between user text annotation overlays.
Grab Last (F9 Key)	Activate the last selected data for edit.
Word Delete (F10 Key)	Erase word associated with comment cursor.
	If you encounter a problem and cannot collect the logs immediately:
Alt+1 or Alt+2	Place a time stamp marker in the log.
Alt+D	Collect the logs. Once the logs are collected, the engineering team would be able to see the marker you added which will help engineering to troubleshoot the problem.
Ctrl + N	Create New Model.
Ctrl + S	Overwrite Current Model.

On Screen Keyboard

You can use "On Screen Keyboard" on touchscreen. Keyboard will show up when you press "Keyboard" button on touchscreen. And you can hide it with "Exit" button on Keyboard. see Figure on page 1-37 .

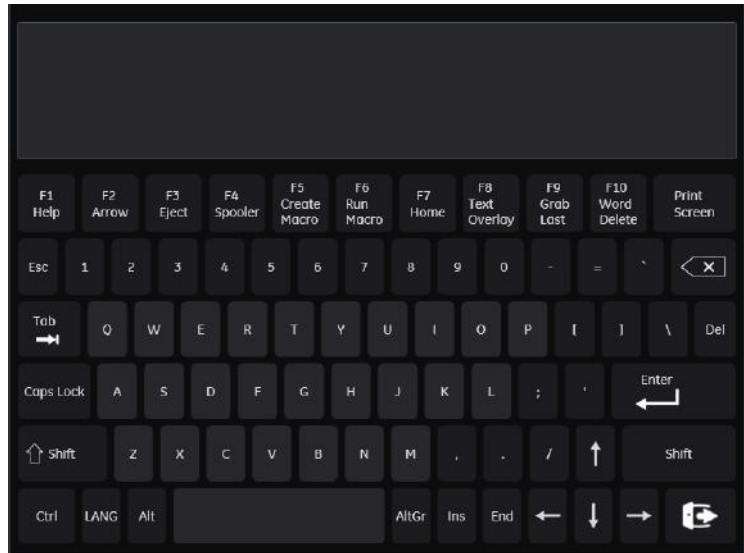


Figure 1-25. On Screen Keyboard

User defined hard key

You can arrange the order of User defined hard key on the control panel as you have programmed in the Utility page.



Figure 1-26. User defined hard key

- 1. Assign the function to each key in Utility -> System -> User Configurable Key -> User Defined Hard Key

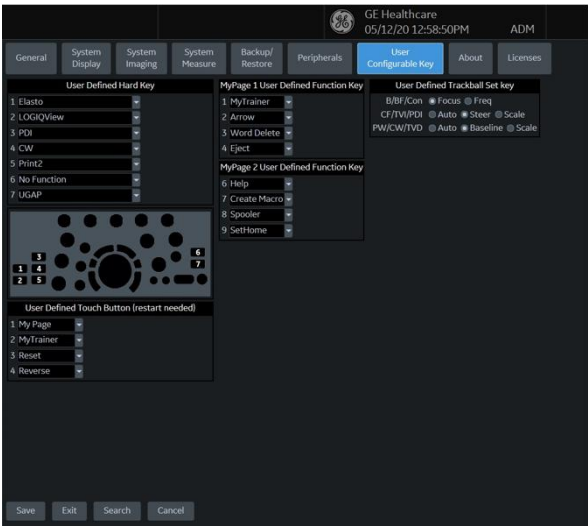


Figure 1-27. Utility page

User defined hard key (continued)

2. On the Control Panel, remove the key cap and replace it in the order shown on the Utility Screen.

NOTE: *Number 1 is located at the top, on the left key; Number 5 is located at the bottom, on the right key.*

- a. Stick the flat-blade screwdriver in the hole on the upper side of the key cap and bring up.



Figure 1-28. Remove the key cap

- b. Push the key cap until it clicks into the new position.



CAUTION

Before cleaning the control panel, make sure the key cap is firmly in place.

Touch Panel

The Touch Panel contains exam function and mode/function specific controls.

Exam Function Controls

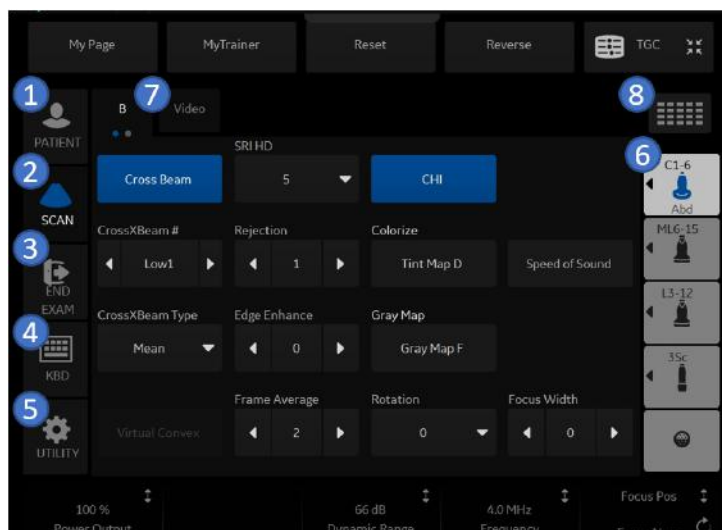


Figure 1-29. Exam Function Controls

1. Patient: Enters Patient screen
2. Scan: Enters scanning mode screen
3. End Exam: Activates Image Management and Touch Panel with end of exam options.
4. Keyboard: Activates on screen keyboard.
5. TGC: Activates TGC function.
6. Probe Indicator: Indicates and selects the probes, changes models as well as Create New or Save As.
7. Indicates the number of pages for this mode. To move to the next page, touch the "dot" or swish your hand from right to left/left to right.
8. To view all/fewer of the controls for this Touch Panel, press this Research/Clinical button.

Touch Panel (continued)

NOTE: Different menus are displayed depending on which Touch Panel is selected.

At the bottom of the Touch Panel, there are five combination rotary dials/push buttons. The functionality of these rotaries changes, depending upon the currently-displayed menu. Press the button to switch between controls, or rotate the dial to adjust the value, or move the control left/right or up/down to adjust the value.

Mode/Function Specific Controls

In general, the key name is indicated at the top of the key. There are different types of Touch Panel keys as illustrated below:

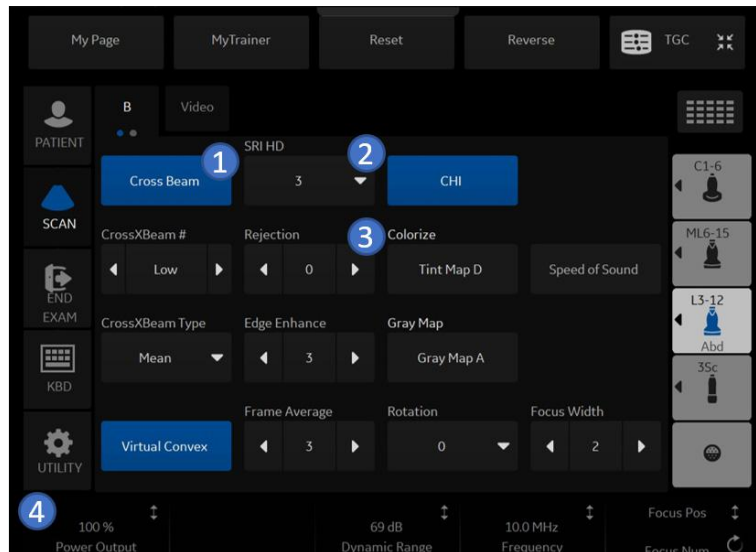


Figure 1-30. Mode/Function Specific Controls

1. Press to toggle control on/off.
2. Progress/Select keys are used for controls that have three or more choices.
3. Progression keys are used to assess the impact of the control on the image progressively.
4. 6-way functionality knobs (below the touch panel): Adjust controls by pressing (dot symbol), rotate (circled arrow symbol), move up/down (vertical line with arrows) or left/right (horizontal line with arrows).

Key descriptions

Mode, Display and Print

This group of controls provides various functions relating to the display mode, display orientation, image recording/saving, freeze, gain and Cine scroll.

The Mode Controls select the desired display mode or combinations of display modes.

- During dual display modes the **L** and **R** keys activate the Left or Right displayed image.
- Auto is used to:
 - initiate auto optimize
 - turn off auto optimize.
- Depth controls the image display depth.
- Print keys are used to activate/print the designated recording device.
- The Freeze key is used to stop the acquisition of ultrasound data and freeze the image in system memory. Pressing **Freeze** a second time continues live image data acquisition.
- To activate a specific mode, press the appropriate mode key. Each mode has its own gain control via the larger gray knob surrounding the mode key.

The gain is control by rotating the mode assigned rotary button below the touch panel.

Measurement and Annotation

This group of controls performs various functions related to making measurements, annotating and adjusting the image information.

- The Comment key enables the image text editor and displays the annotation library Touch Panel.
- The Clear key is generally used to erase functions, such as annotations/comments, body patterns and measurements. Pressing the Clear key again exits the selected function.
- The Body Pattern/Ellipse control has a dual purpose:
 - Press the Body Pattern/Ellipse control, it enables the Body Pattern Touch Panel and displays the default pattern on the screen. When body patterns are active, the knob rotates the probe position indicator.
 - Rotate the Body Pattern/Ellipse control, it activates the ellipse measurement function after the first distance measurement has been set and the second caliper is activated.

Press Set to fix the measurement after the ellipse adjustment is complete. The measurement is then displayed in the measurement result window.

- The Measure key is used in all types of basic measurements. When the Measure key is pressed, the measurement Touch Panel is displayed.
- The Set key, located on the Trackball on-screen controls, is used for various functions, but is generally used to fix or finish an operation (e.g. to fix a measurement caliper).
- The Trackball is used with almost every key function in this group. Trackball control depends on the last key function pressed.

Powering the System

Connecting the System

To avoid risk of fire, the system power must be supplied from a separate, properly rated outlet. See 'Before the system arrives' on *page 1-3 for more information*.

Under no circumstances should the AC power plug be altered, changed, or adapted to a configuration rated less than specified. Never use an extension cord or adapter plug.

To help assure grounding reliability, connect to a "hospital grade" or "hospital only" grounded power outlet.



Use the appropriate power cord provided by or designated by GE.



Ensure that the retaining clamp for the power plug is fixed firmly.



Use caution to ensure that the power cable does not disconnect during system use.

If the system is accidentally unplugged, data may be lost.

Connecting the System (continued)



WARNING

Failure to provide an adequate earth circuit can cause electrical shock, resulting in serious injury.

Connection of additional protective earth conductors or potential equalization conductors is not necessary in most cases and is only recommended for situations involving multiple equipment in a high-risk patient environment to provide assurance that all equipment is at the same potential and operates within acceptable leakage current limits. An example of a high-risk patient would be a special procedure where the patient has an accessible conductive path to the heart such as exposed cardiac pacing leads.

Voltage level check

Check the rating label on the rear side of the system. Check the voltage range indicated on the label.

Connecting to the electrical outlet



WARNING

POWER OUTAGE MAY OCCUR. The ultrasound unit requires a dedicated single branch circuit. To avoid circuit overload and possible loss of critical care equipment, make sure you **DO NOT** have other equipment operating on the same circuit.

To connect the system to the electrical supply:

1. Ensure that the wall outlet is of the appropriate type.
2. Ensure that the power switch is turned off.
3. Unwrap the power cable. Make sure to allow sufficient slack in the cable so that the plug is not pulled out of the wall if the system is moved slightly.
4. Attach the power plug to the system and secure it in place by using the retaining clamp.
5. Push the power plug securely into the wall outlet.

NOTE: *Do not use an extension cord or adapter plug.*



CAUTION

Disconnect the plug from the wall outlet in case an emergency should occur. Ensure easy access to the power outlet.

Power On



Press the **Power On/Off** switch to turn the power on. The circuit breaker must also be in the on position. For circuit breaker location, see 'Circuit breaker' on *page 1-59* for more information.

To turn on the system

1. Ensure that the unit is properly plugged into an AC outlet of sufficient capacity (120V/10A or 240V/5A).
2. Turn on the breaker at the back of the system (refer to Figure 1-38). At this point, the On/Off switch should be turned off.
3. Momentarily press the On/Off switch. The switch turns on a light. (refer to Figure 1-38).
4. The system should now go through its boot-up process with no further user intervention (approximately 1 to 2 minutes).



Figure 1-31. Power On/Off Switch Location

- a. Power On/Off switch

Power Up Sequence

The system is initialized. During this time:

- The system boots up and the status is reflected on the monitor.

NOTE: If no probe is connected, the system goes into freeze mode.

- Peripheral devices are activated on power up.

After initialization is complete, all lighted controls on the Control Panel light and the default B-Mode screen is displayed on the monitor.

Password Protection

Login

At login, you are notified that “You are accessing a diagnostic medical device that is provided by authorized usage only. Data stored on this device may be subject to various regulations including but not limited to regulations which govern disclosure and privacy of this data. By using this device you are acknowledging that you are authorized to do so and are trained in appropriate use and regulatory guidelines.”

NOTE: *You can change the wording that appears on the Login screen. Please refer to Chapter 10, System Administration section, for more information (Utility -> Admin -> Logon).*

1. **Operator:** Enter the Operator ID.
2. **Password:** Enter Operator’s password (optional).
3. **Logon or Cancel.**
 - **OK:** Proceed with the logon
 - **Emergency:** Data stored only for the duration of the current exam (EUSR).
4. **Change Password:** Change password, as specified by the Password Policy.

Initial Login to the LOGIQ P8/P9/P10

When first logging in to the LOGIQ P8/P9/P10,

1. The Administrator should log in, typing “ADM” as the Operator Login.

NOTE: *No password is needed for the initial administrator log in.*

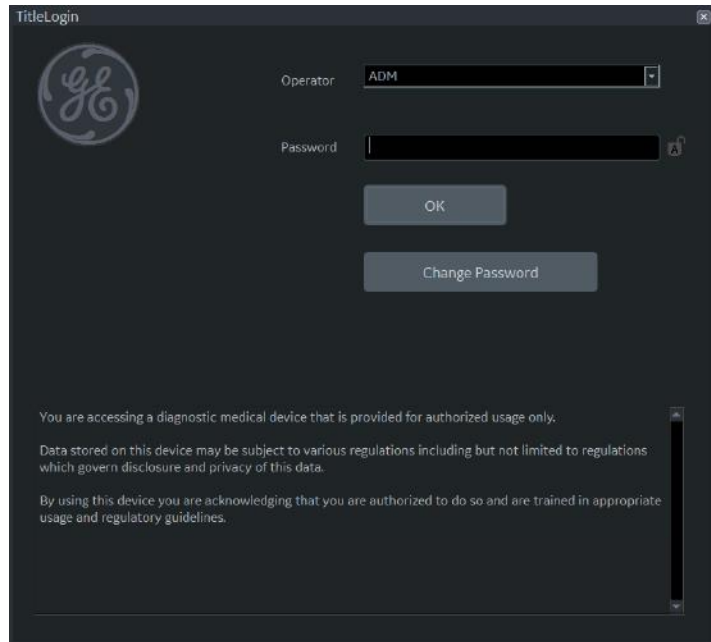


Figure 1-32. First Admin Login to the LOGIQ P8/P9/P10

Initial Login to the LOGIQ P8/P9/P10 (continued)

- 2. Upon ADM Login, specify the institution’s Default Security Level for the LOGIQ P8/P9/P10: Lowest, Medium, High (Recommended), or Highest, then select **Apply Change**.

NOTE: You may choose Skip For Now up to 20 times total to postpone choosing the Security Level. After 20 skips the system will require a Security Level to be chosen.

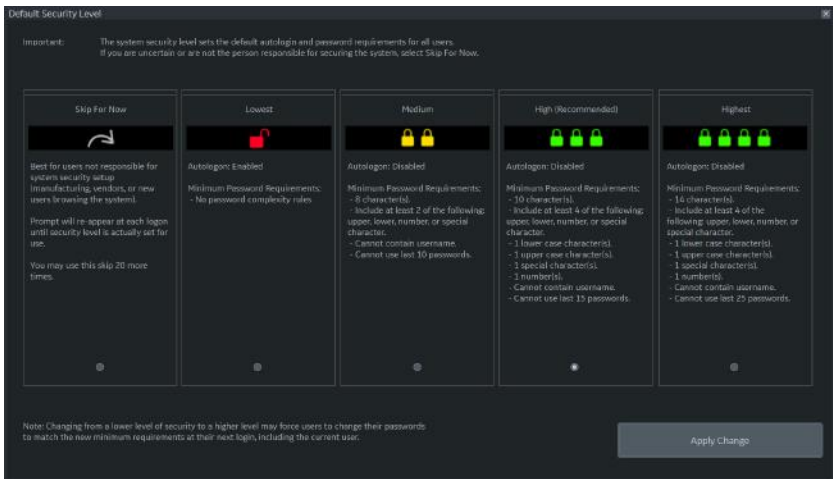


Figure 1-33. Default Security Level

Initial Login to the LOGIQ P8/P9/P10 (continued)

Table 1-6: Security Levels

Security Level	Complexity Rules
Skip For Now	Best for users not responsible for system security setup. Prompt will re-appear at each logon until security level is set up for you. This skip can be chosen 20 total times before the system will require a security level to be chosen.
Lowest	Autologon enabled. No password complexity rules.
Medium	Autologon disabled. Minimum Password Requirements: • 8 characters. • Include at least two of the following: upper case character, lower case character, number or special character. • Password cannot contain username. • Cannot use the last 10 passwords.
High (Recommended)	Autologon disabled. Minimum Password Requirements: • 10 characters. • Include at least one of each of the following: upper case character, lower case character, number or special character. • Cannot contain username. • Cannot use last 16 passwords.
Highest	Autologon disabled. Minimum Password Requirements: • 14 characters. • Include at least one of each of the following: upper case character, lower case character, number or special character. • Cannot contain username. • Cannot use last 25 passwords.

Initial Login to the LOGIQ P8/P9/P10 (continued)

3. If a Security Level is chosen, the Confirm Change screen appears.

If *Lowest or Medium Security Level* was chosen, you will be prompted to acknowledge that the security setting is lower than GE Healthcare recommends to secure the system. You will not be able to Confirm Change unless the “I Agree” box is selected.

If *Medium, High or Highest Security Level* was chosen, you can choose to change your password immediately and/or to force all users to change their password at next login.

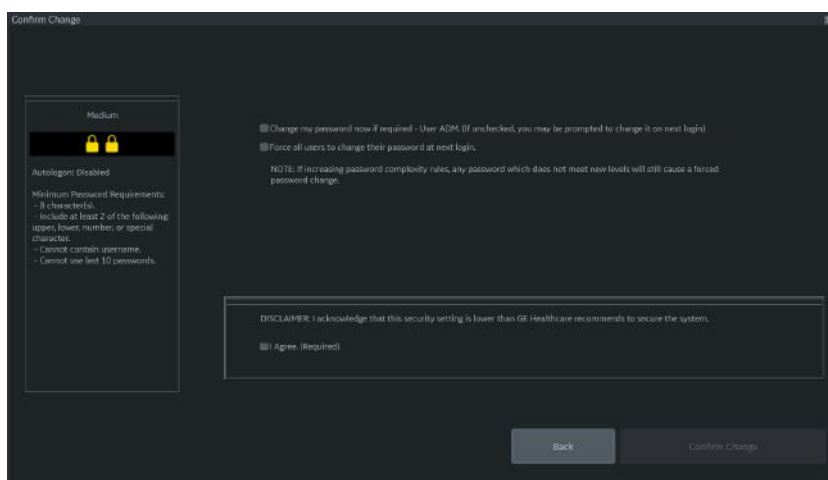


Figure 1-34. Confirm Change Screen

Initial Login to the LOGIQ P8/P9/P10 (continued)

4. You will be prompted to set up the ADM password, based on the selected Security Level.

NOTE: *If the password you type doesn't meet the selected Security Level's password complexity rules, the screen will prompt you (in red) to correct the password, as shown below.*

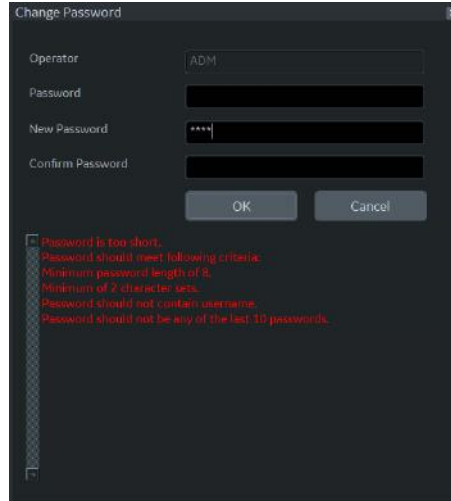


Figure 1-35. Change Password

Changing Your Password

The System Administrator manages system groups, users, and permissions. After you have been added as a valid user, the System Administrator will assign you a temporary password. When you log into the system for the first time, you will be prompted to change your password.

You can change your password at any time when first logging onto the system. To change your password

1. Type your name in the Operator field.
2. Press the Change Password button. The Change Password pop-up appears.

A screenshot of a 'Change Password' dialog box. The dialog has a title bar with the text 'Change Password' and a close button (X). Inside the dialog, there are four text input fields labeled 'Operator', 'Password', 'New Password', and 'Confirm Password'. The 'Operator' field contains the text 'ADM'. Below the input fields are two buttons: 'OK' and 'Cancel'.

Figure 1-36. Password Change

3. Type the following:
 - **Password:** Type your current password.
 - **New Password:** Type your new password.
 - **Confirm Password:** Retype your new password.

Logoff

To logoff, press the **Power On/Off** switch momentarily and a SYSTEM-EXIT window appears.

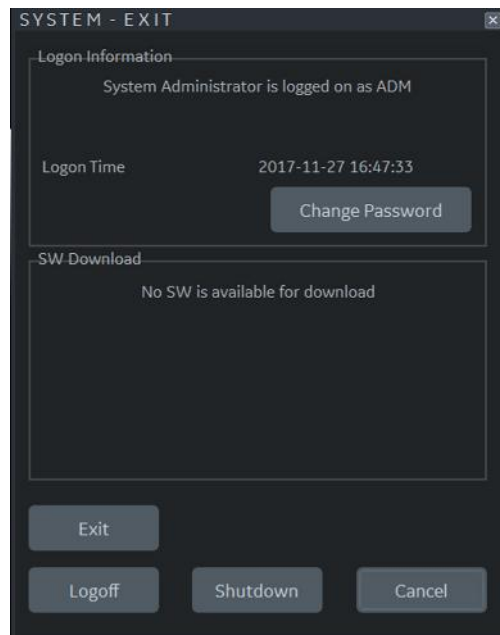


Figure 1-37. System Exit Window

Power Off



CAUTION

DO NOT turn off the circuit breaker before the monitor display turns off.

Data may be lost or system software damaged if the circuit breaker is turned off before the system shuts down.

To power off the system:

1. Set the brake and use the operator panel movement to lock the control panel in place.
2. When you shutdown the system, enter the scan screen and lightly press the **Power On/Off** switch at the front of the system once. The System-Exit window is displayed.

NOTE: *DO NOT press and hold down the Power On/Off switch to shutdown the system.*

3. Using the **Trackball**, select Shutdown.
The shutdown process takes a few seconds and is completed when the control panel illumination shuts down.

NOTE: *DO NOT select Exit for Shutdown. Exit is only available to Service representative.*

NOTE: *If the system has not fully shut down in 60 seconds in the power-off sequence, press and hold down the On/Off switch until the system shuts down.*

4. Disconnect the probes.
Clean or disinfect all probes as necessary. Store them in their shipping cases or another appropriate probe storage system to avoid damage.

Circuit breaker

The Circuit Breaker is located at the rear panel of the system. On supplies main power to all internal systems. Off removes main power from all internal systems. The circuit breaker automatically shuts off power to the system in case of a power overload.

If a power overload occurs:

1. Turn off all peripheral devices.
2. Reactivate the Circuit Breaker switch.

The Circuit Breaker switch should stay in the **On** position; **DO NOT** hold the switch in the **On** position. If the Circuit Breaker switch remains **On**, follow the Power On procedure.



Figure 1-38. Circuit Breaker (located on the rear panel)

- a. Circuit Breaker

NOTE: *If the Circuit Breaker switch does **not** remain in the **On** position or trips again:*

1. Disconnect the Power Cable.
2. Call Service immediately.

DO NOT attempt to use the system.

Introduction

Only use approved probes.

Selecting probes

- Always start out with a probe that provides optimum focal depths and penetration for the patient size and exam.
- Begin the scanning session by choosing the correct application and preset for the examination by selecting **Model**.
- Begin the scan session using the default Power Output setting for the probe and exam.

NOTE: *Selecting a new probe unfreezes the image.*

Connecting the Probe



CAUTION

Inspect the probe before and after each use for damage or degradation to the housing, strain relief, lens, seal, cable and connector. DO NOT use a transducer which appears damaged until functional and safe performance is verified. A thorough inspection should be conducted during the cleaning process.



CAUTION

Remove any dust or foam rests from the probe pins.



CAUTION

Fault conditions can result in electric shock hazard. Do not touch the surface of probe connectors which are exposed when the probe is removed. Do not touch the patient when connecting or disconnecting a probe.

Probes can be connected at any time, regardless of whether the console is powered on or off. To ensure that the ports are not active, place the system in the image freeze condition.



Figure 1-39. Probe port

- a. Active probe port
- b. Pencil probe port

Connecting the Probe (continued)

To connect a probe:

1. Place the probe's carrying case on a stable surface and open the case.
2. Carefully remove the probe and unwrap the probe cord.
3. Put the probe in the probe holder.



DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage. Use the integrated cable management hook to wrap the cord.



Inspect the probe before and after each use for damage or degradation to the housing, strain relief, lens, seal, cable and connector. **DO NOT** use a transducer which appears damaged until functional and safe performance is verified. A thorough inspection should be conducted during the cleaning process.

4. Hold the probe connector vertically with the cable pointing upward.
5. Prior to inserting the probe, ensure that the connector locking handle is positioned to the left.
6. Align the connector with the probe port and carefully push into place.

Before inserting probes, inspect the probe connector pin. If the pin is bent, do not use the probe until it has been inspected and repaired/replaced by a GE Service Representative.

7. Push the connector locking handle to the right to secure the probe connector.
8. Carefully position the probe cord so it is free to move and is not resting on the floor.

Connecting the CW Pencil Probe

Insert the probe connector into the probe port all the way, seated in. Carefully position the probe cord so it is free to move and is not resting on the floor.

Cable Handling

Take the following precautions with probe cables:

- Keep free from wheels.
- Do not bend the cable acutely
- Avoid crossing cables between probes.

Activating the Probe

To activate the probe, select the appropriate probe from the probe indicators on the Touch Panel.

The probe's default settings for the mode and selected exam are used automatically.



CAUTION

Make sure that the probe and application names displayed on the screen correspond to the actual probe and application selection.

Deactivating the Probe

When deactivating the probe, the probe is automatically placed in freeze mode.

To deactivate a probe:

1. Ensure the LOGIQ P8/P9/P10 is in freeze mode. If necessary, press the **Freeze** key.
2. Gently wipe the excess gel from the face of the probe.
3. Ensure that the probe is placed gently in the probe holder.

Disconnecting the Probe

Probes can be disconnected at any time. However, the probe should not be active when disconnecting the probe.

1. Ensure the probe is deactivated. Deactivate by selecting another probe or pressing Freeze.
2. Move the probe locking handle to the left.
3. Pull the probe connector straight out of the probe port carefully.



CAUTION

DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage. Use the integrated cable management hook to wrap the cord.

4. Ensure the cable is free.
5. Be sure that the probe head is clean before placing the probe in its storage box.

Transporting Probes

- Secure the probe in its holder for moving short distances.
- When transporting a probe a long distance, store it in its carrying case.

Storing the Probe

It is recommended that all probes be stored in the provided carrying case for probe storage.

Carrying case:

- First place the probe connector into the carrying case.
- Carefully wind the cable into the carrying case.
- Carefully place the probe head into the carrying case. **DO NOT** use excessive force or impact the probe head.



CAUTION

DO NOT store probes in the side tray. To avoid damage, store the probe in its carrying case.

Probe Description

Table 1-7: Probe Description

Probe	Illustration	Application	Feature
C1-5-RS		Abdomen (incl. Pleural), Vascular (No transcranial), OB/GYN, Urology	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Contrast, Elastography, Shearwave Elastography, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy, B Steer+
8C-RS		Pediatrics, Neonatal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, B Steer+
E8C-RS		OB/GYN, Urology, Transvaginal, Transrectal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy
E8CS-RS		OB/GYN (Transvaginal), Urology (Transrectal)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Elastography, Biopsy
IC9-RS		OB/GYN, Urology, (Transvaginal, Transrectal)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Elastography, Shearwave Elastography, Biopsy, Contrast, Max Angle

Table 1-7: Probe Description (Continued)

Probe	Illustration	Application	Feature
BE9CS-RS		Urology (Transrectal)	B, CHI, CF, PDI, B-Flow, B-Flow Color, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Elastography, Contrast Biopsy
ML6-15- RS		Abdomen (incl. Pleural), Small Parts, Vascular (No transcranial), Pediatric, Neonatal, Musculoskeletal, Breast	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Shearwave Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy, B Steer+
L3-12-RS		Abdomen (incl. Pleural), Vascular (No transcranial), Small Parts, Pediatric, Neonatal, OB, Breast, Musculoskeletal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy, B Steer+, Shear Wave Elastography
L4-12t-RS		Abdomen (incl. Pleural), Small Parts, Vascular (No transcranial), Pediatric, Neonatal, Musculoskeletal, Breast	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy, B Steer+
12L-RS		Abdomen (incl. Pleural), Small Parts, Vascular (No transcranial), Pediatric, Neonatal, Musculoskeletal, Breast	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Shearwave Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy, B Steer+
L6-12-RS		Abdomen (incl. Pleural), Vascular (No transcranial), Small Parts, Pediatric, Neonatal, Breast	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced3D, Biopsy, B Steer+

Table 1-7: Probe Description (Continued)

Probe	Illustration	Application	Feature
9L-RS		Abdomen (incl. Pleural), Small Parts, Vascular (No transcranial), Pediatric, Neonatal, OB, Breast, Musculoskeletal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Biopsy, B Steer+
L10-22-RS (LP10/LP9 only)		Small Parts, Musculoskeletal, Neonatal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D
L8-18i-RS		Small Parts, Vascular (No transcranial), Neonatal, Pediatrics, Intraoperative (Not for China) Musculoskeletal, Peripheral Vascular	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D
3Sc-RS		Cardiac, Abdomen (incl. Pleural), Transcranial	B, CHI, CF, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, CTO, Stress Echo, SRI-HD, Advanced 3D, Biopsy, Contrast
6S-RS		Abdomen (incl. Pleural), Cardiac, Pediatrics, Neonatal, OB	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D

Table 1-7: Probe Description (Continued)

Probe	Illustration	Application	Feature
12S-RS		Abdomen (incl. Pleural), Pediatrics, Neonatal	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced3D
RAB2-6- RS		Abdomen, OB/GYN, Urology	B, CHI, CF, PDI, M, PW, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, 3D/4D real-time imaging, Biopsy, Advanced 3D, B Steer+
RIC5-9A-RS		OB/GYN (Transvaginal), Urology (Transrectal)	B, CHI, CF, PDI, M, PW, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced3D, 3D/4D, Biopsy, Max Angle
P8D		Cardiac, Vascular (No transcranial)	CW, ASO
P6D		Cardiac, Vascular (No transcranial)	CW, ASO
P2D		Cardiac, Vascular (No transcranial)	CW, ASO
L3-9i-RS (LP10/LP9 only)		Small Parts, Vascular, Musculoskeletal, Neonatal, Intraoperatives (Not for China)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D

Table 1-7: Probe Description (Continued)

Probe	Illustration	Application	Feature
6Tc-RS		Cardiac (Transesophageal)	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D Note: 6Tc-RS probe requires special handling. Refer to the TEE Probe User Manual enclosed with 6Tc-RS probe.
C1-6-D (LP10/LP9 only)		Abdomen (incl. Pleural), OB, Gynecology, Vascular (No transcranial), Urology	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Contrast, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, Elastography, Shearwave Elastography, Biopsy, B Steer+, UGAP
C2-7-D		Abdomen (incl. Pleural)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Contrast, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, B Steer+
C3-10-D (LP10 only)		Abdomen (incl. Pleural), Neonatal, Pediatric, Vascular (No transcranial)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, B Steer+
10C-D		Neonatal, Pediatric, Vascular, (No transcranial)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, CTO, SRI-HD, Advanced 3D, B Steer+
M5Sc-RS (LP10 only)		Cardiac, Transcranial, Abdomen (incl. Pleural)	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Contrast, Virtual Convex, LOGIQView, ATO/ASO, CTO, Stress Echo, SRI-HD, Advanced 3D, Biopsy

Biopsy Special Concerns

Precautions Concerning the Use of Biopsy Procedures



WARNING

Do not freeze the image during a biopsy procedure. The image must be live to avoid a positioning error.

Biopsy guidezones are intended to assist the user in determining optimal probe placement and approximate the needle path. However, actual needle movement is likely to deviate from the guideline. Always monitor the relative positions of the biopsy needle and the subject mass during the procedure.



WARNING

NEVER reuse the TR5° disposable biopsy guide attachment and Disposable sterile Ultra-Pro II Needle guide kits.



CAUTION

The use of biopsy devices and accessories that have not been evaluated for use with this equipment may not be compatible and could result in injury.

Precautions Concerning the Use of Biopsy Procedures (continued)



CAUTION

The invasive nature of biopsy procedures requires proper preparation and technique to control infection and disease transmission. Equipment must be cleaned as appropriate for the procedure prior to use.

- Follow the probe cleaning and disinfection procedures and precautions to properly prepare the probe.
- Follow the manufacturer's instructions for the cleaning of biopsy devices and accessories.
- Use protective barriers such as gloves and probe sheaths.
- After use, follow proper procedures for decontamination, cleaning, and waste disposal.



CAUTION

Improper cleaning methods and the use of certain cleaning and disinfecting agents can cause damage to the plastic components that will degrade imaging performance or increase the risk of electric shock.



CAUTION

Ensure that the needle (especially the needle tip) is always visible in the ultrasound image during the whole biopsy procedure.



CAUTION

Ensure the correct position and optimal fit every time before using a biopsy guide.

Freehand Biopsy



CAUTION

When performing a freehand biopsy, i.e. without a biopsy guide, it is the user's responsibility to use appropriate equipment.

Perform a biopsy

Displaying the Guidezone

Activate the Biopsy Kit by selecting it from the B-Mode Touch Panel.

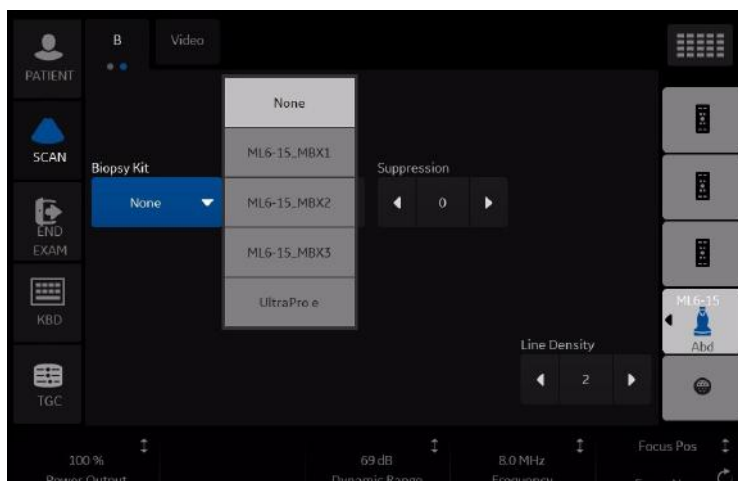


Figure 1-40. B-Mode Touch Panel menu

The available biopsy options appear when Biopsy Kit is selected. There are fixed and adjustable angle biopsy kits and plastic/disposable and reusable biopsy guides available with the LOGIQ P8/P9/P10 depending on the probe. Select the desired biopsy kit.

NOTE: You can display the biopsy guideline on the CFM image in simultaneous mode. Enabling Color Flow allows for visualization of the vascular structure around the area to be biopsied. Select the Show Biopsy Mark on CFM simultaneous Mode preset in the Utility -> System -> System Image -> Biopsy Guide screen.

Displaying the Guidezone (continued)



Figure 1-41. Biopsy Guidezone display (example)

The biopsy guidezone represents a path of the needle. The dots which make up the guidezones is the depth readout where:

- Yellow represent 1 cm increments.
- Red represents 5 cm increments.

The display should be carefully monitored during a biopsy for any needle deviation from the center line or guidezone.

NOTE: *Biopsy Guide Lines do not appear on Recalled Images and PACS when the Print Button is set to DICOM or Secondary Capture.*

Displaying the Guidezone (continued)

The Biopsy Guidezone adjusts along with image adjustments, such as image inversion/rotations, zoom and depth changes.

NOTE: *To set up biopsy guidezones, refer to Table 16-9 for more details.*

The needle may vary from the center line or guidezone for various reasons:

- Needle barrel to needle clearance or strength.
- Bracket manufacturing tolerance.
- Needle deflection due to tissue resistance.
- Needle size chosen. Thinner needles may deflect more.



DANGER

Failure to match the guidezone displayed to the guide may cause the needle to track a path outside the zone.

It is extremely important that when using the adjustable angle biopsy guides, the angle displayed on the screen matches the angle set on the guide, otherwise the needle will not follow the displayed guidezone which could result in repeated biopsies or patient injury.

Preparing the Biopsy Guide Attachment

Convex, Sector and Linear probes have optional biopsy guide attachments for each probe. The guide consists of a non-disposable bracket to attach to the probe, disposable needle clip to attach to the bracket, sheath, gel (sterile gel if necessary) and disposable needle barrels.



DO NOT attempt to use the biopsy bracket and needle guide until the manufacturer's instructions, provided with the biopsy bracket and needle guide in the kit, have been read and thoroughly understood.

Table 1-8: Biopsy Guide Attachments

Probe	Attachment	Attachment with Probe
C1-5-RS Multi-angle		
9L-RS Multi-angle		
ML6-15-RS Multi-angle		

Table 1-8: Biopsy Guide Attachments (Continued)

Probe	Attachment	Attachment with Probe
3Sc-RS Multi-angle		
12L-RS Multi-angle		
12L-RS Infinite-angle		
12L-RS Transverse Bracket		

Table 1-8: Biopsy Guide Attachments (Continued)

Probe	Attachment	Attachment with Probe
RAB2-6-RS Multi-angle		
E8C-RS with reusable		
E8C-RS with TR5 (PROTEK)		
E8C-RS with TR5 (CIVCO)		
L6-12-RS Multi-angle		
RIC5-9A-RS with reusable		

Table 1-8: Biopsy Guide Attachments (Continued)

Probe	Attachment	Attachment with Probe
RIC5-9A-RS (CIVCO)		
BE9CS-RS with reusable		
BE9CS-RS (PROTEK)		
BE9CS-RS (CIVCO)		
BE9CS-RS (CIVCO)		
E8CS-RS with reusable		
E8CS-RS with TR5 (PROTEK)		

Table 1-8: Biopsy Guide Attachments (Continued)

Probe	Attachment	Attachment with Probe
E8CS-RS with TR5 (CIVCO)		
L4-12t-RS Multi-angle		
L4-12t-RS Infinite-angle		
L4-12t-RS Transverse Bracket		
L3-12-RS Multiangle		

Table 1-8: Biopsy Guide Attachments (Continued)

Probe	Attachment	Attachment with Probe
IC9-RS with reusable		
IC9-RS Disposable		
C1-6-D Multi-angle		
C2-7-D Stainless reusable		
C2-7-D Multi-angle		
M5Sc-RS Multi-angle		

Multi Angle Biopsy Guide Assembly



WARNING

DO NOT attempt to use the biopsy bracket and needle guide until the manufacturer's instructions, provided with the biopsy bracket and needle guide in the kit, have been read and thoroughly understood.

1. Scan the patient and identify the target for biopsy. Move the probe to locate the target to the center of the image. Enable the system biopsy guidezone and try guidezone angles MBX1 to MBX3 to decide the best angle setting for needle path.

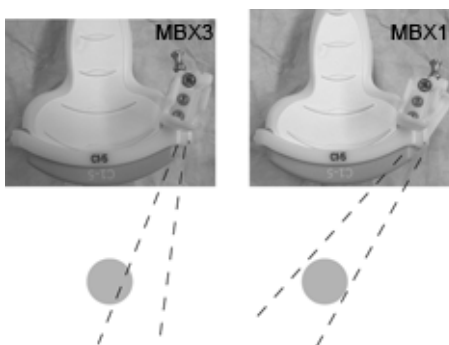


Figure 1-42. Example

2. Pull up on the pin (Figure 1-43 a) to freely move the needle guide attachment. Align the pin with the selected position of the needle guide attachment.

Push the pin down (Figure 1-43 b) into the desired slot to secure the angle position of the needle guide attachment.



Figure 1-43. Pull up and push down the pin

Multi Angle Biopsy Guide Assembly (continued)

3. Fit a convex piece of the biopsy bracket (a) into the concave position of the probe (b).

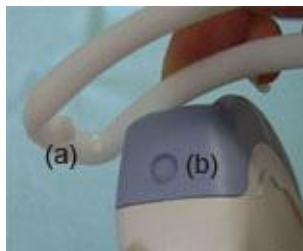


Figure 1-44. Probe/Bracket Alignment

Hold the side (a) and tuck down the needle guide side (b) until it clicks or locks in place.

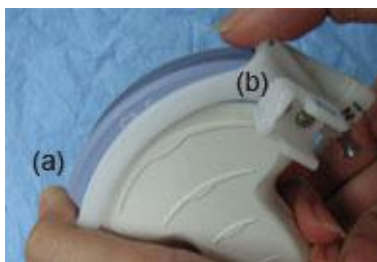


Figure 1-45. Probe/Multi-angle Bracket Alignment 2

4. Place an adequate amount of coupling gel on the face of the probe.

Multi Angle Biopsy Guide Assembly (continued)

5. Place the proper sanitary sheath tightly over the probe and biopsy bracket. Use the rubber bands supplied to hold the sheath in place.

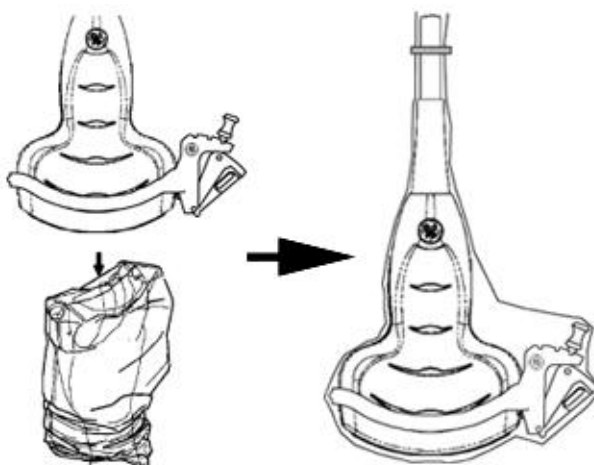


Figure 1-46. Applying Sanitary Sheath

6. Snap the needle guide onto the biopsy guide bracket.

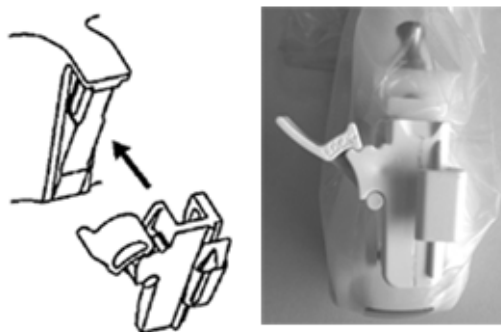


Figure 1-47. Snap the needle guide

Multi Angle Biopsy Guide Assembly (continued)

7. Push the locking mechanism towards the bracket to secure the lock (a). Make sure the needle guide is firmly attached to the bracket.



Figure 1-48. Lock the Needle guide

8. Choose the desired gauge (size) needle barrel. Twist it back and forth to remove it from the plastic tree.

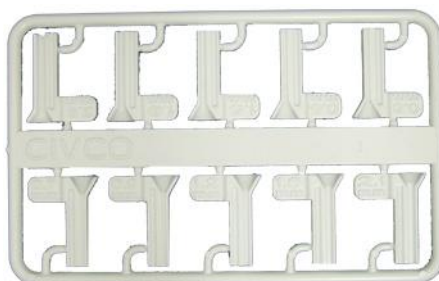


Figure 1-49. Needle Barrel

9. Place the needle barrel into the needle clip with the desired gauge facing the needle clip and snap into place.



Figure 1-50. Needle Barrel Installation

Multi Angle Biopsy Guide Assembly (continued)

Remove the biopsy guide

1. Hold the other side and push out the needle clip attachment side. See Figure 1-51 .



Figure 1-51. Remove the biopsy guide



CAUTION

Prevent damage to the probe lens with finger nails.

Releasing the needle

According to the following procedure, you remove the needle from a probe and an assembly without moving the needle.

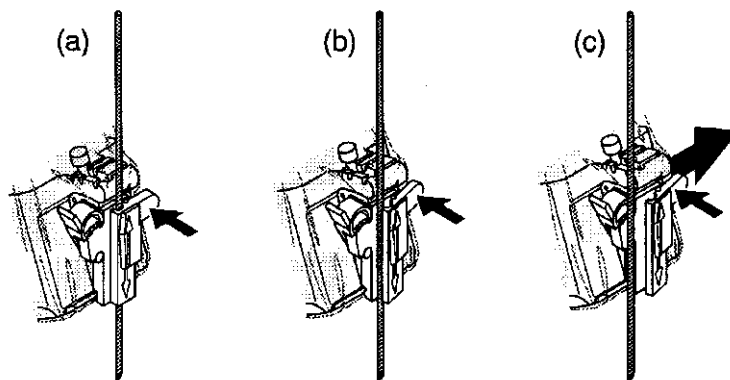


Figure 1-52. Release the needle from assembly

- a. Push the knob portion of a sleeve in the direction of the arrow.
- b. The needle is released from the assembly.
- c. Push the probe and the assembly in the direction of the larger arrow to remove the needle.

4D Biopsy Guide Assembly - Representative Example

1. Place the needle guide onto the probe.
2. Push the needle guide until the bracket (b) catches in the support on the housing of the probe (a).



Figure 1-53. Support on the housing

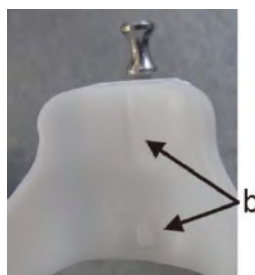


Figure 1-54. Biopsy Needle Guide

3. Fix the needle guide by locking the frame on the opposite side.

4D Endocavitary Probe

1. Place an adequate amount of ultrasound gel inside the sheath tip (the gel is between the sheath inner surface and the probe aperture).

NOTE: *Ensure that only acoustic coupling gel is used for this purpose.*

2. Place the sheath tip over the probe aperture and then pull the sheath end toward the probe handle.
3. Inspect the sheath for nicks, cuts or tears.
4. Rub a finger over the tip of the probe to ensure all air bubbles have been removed.
5. Position the small swelling of the needle guide on the notch at the probe tip. Snap the needle guide.

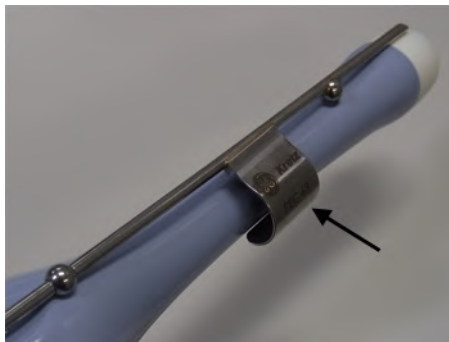


Figure 1-55. Installation (without probe sheath)

NOTE: *Material: Stainless Steel*

NOTE: *Needle guide sterilization with autoclave possible.*

4D Probe Biopsy Needle Path Selection

To select the needle path and verify that the path of the needle is accurately indicated within the guidezone on the system monitor, perform the following before use:

1. Properly install the bracket and biopsy guide.
2. Scan in a container filler with water (47° C).
3. Select **Biopsy kit**. The available biopsy options from the Touch Panel.

Select the biopsy guidezone where the needle echo passes through the center of the guidezone. Use the selected biopsy guidezone when performing the biopsy.

Biopsy Needle Path Verification

To verify that the path of the needle is accurately indicated within the guidezone on the system monitor, perform the following:

- Properly install the bracket and biopsy guide.
- Scan in a container filled with water (47° C).
- Display the biopsy guidezone on the monitor.
- Ensure that the needle echo falls within the guidezone markers.

Endocavitary Probe Biopsy Guide Assembly - Representative Example



WARNING

DO NOT use the needle with the catheter (soft tube). There is a possibility of breaking the catheter in the body.



CAUTION

Patient injury or repeated biopsies may result. The needle placement will not be as intended if the needle guide is not properly seated and secure.



CAUTION

Before inserting the needle, scan the patient to determine the correct puncture depth and site. Only the sterile/sanitary sheath and rubber band are on the probe during the pre-needle placement scanning.

Preparation

To prepare the endocavitary probe for use:

1. Remove the probe from the box and carefully examine it for any damage.
2. If the biopsy guide is to be attached, use the filling removal tool to clean out the attachment area on the probe head.

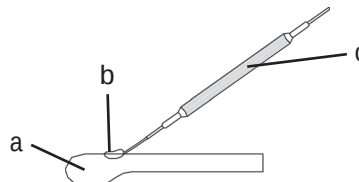


Figure 1-56. Attachment Filling Removal

- a. Probe Head
- b. Attachment
- c. Filling Removal Tool

3. Clean, then disinfect the probe.

NOTE: *Ensure that protective gloves are worn.*

Installing the sheath

To install the sheath:

1. Remove the sheath from its package. Do not unroll the sheath.

NOTE: *Remember to rinse all sanitary probe sheaths of powder before placing on the probe. Powder can degrade the displayed image.*

2. Place an adequate amount of ultrasound gel inside the sheath tip (the gel is between the sheath inner surface and the probe aperture).

NOTE: *Ensure that only acoustic coupling gel is used for this purpose.*

3. Place the sheath tip over the probe aperture and then pull the sheath end toward the probe handle.
4. Inspect the sheath for nicks, cuts or tears.

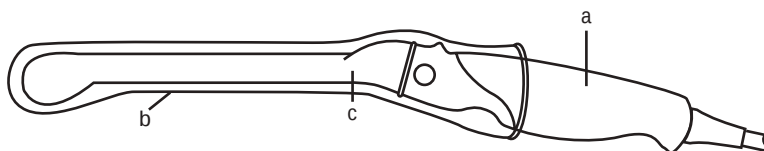


Figure 1-57. Endocavitary Probe with Sheath

- a. Probe Handle
 - b. Sanitary Sheath
 - c. Probe Body
5. Rub a finger over the tip of the probe to ensure all air bubbles have been removed.

Endocavitary Probe Biopsy Guide Preparation

1. If a biopsy is to be performed, snap the metal or plastic biopsy guide on to the probe over the sheath.

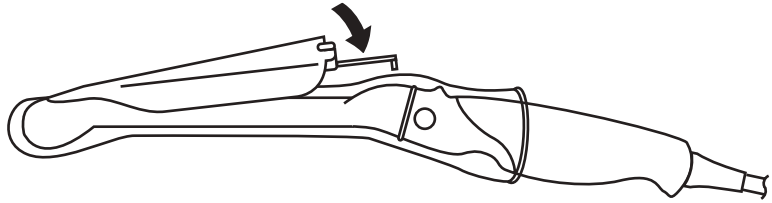


Figure 1-58. Disposable Biopsy Guide 5 degree Angle

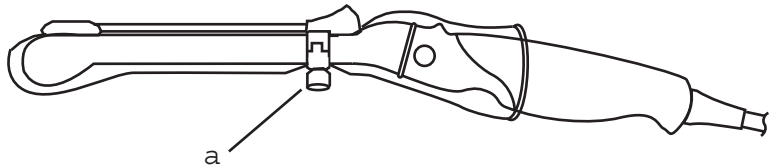


Figure 1-59. Reusable Biopsy Guide

- a. Fix with a screw

NOTE:

For the E8C-RS, E8CS-RS and IC9-RS probe, use the TR5 guidelines for the plastic (disposable-only) biopsy guides; use the RU guidelines with the stainless steel reusable biopsy guides.

2. Place an adequate amount of ultrasound gel on the gel-filled sheath tip's outer surface.
3. Ensure the guide is properly seated and secure by pushing forward on the needle insertion end of the guide until the attachment node is firmly in place in its hole.

Biopsy Guideline Display

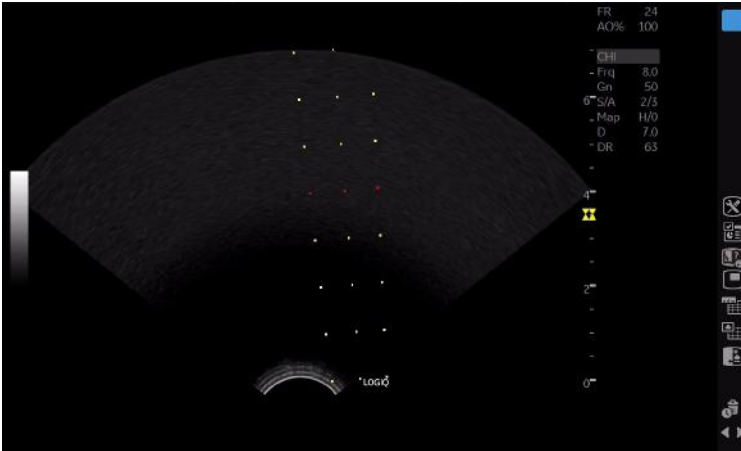


Figure 1-60. Endocavitary Probe Biopsy Guideline - Reusable

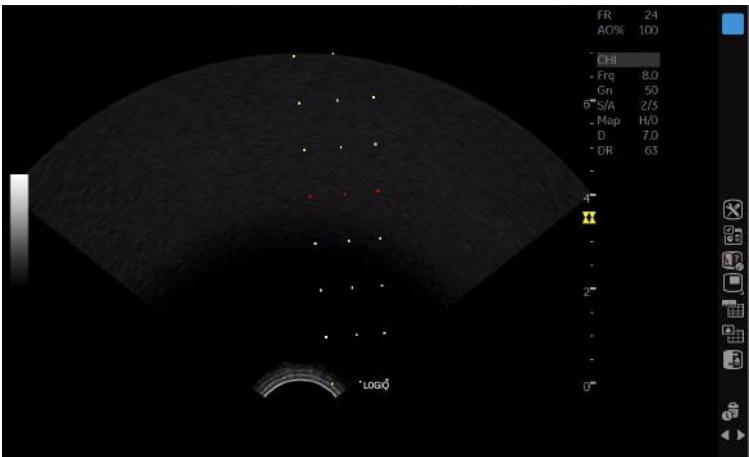


Figure 1-61. Endocavitary Probe Biopsy Guideline - TR5

BE9CS-RS Biopsy Guide Preparation

NOTE: The following graphics do not have a sheath pictured but a sheath must be installed before attaching the biopsy guide.

NOTE: Recommended Needle Length: greater or equal than 220 mm.

NOTE: Recommended Needle Gauge: 16 G or thinner needle

Reusable type

1. Ensure that the fixing screw is loose.

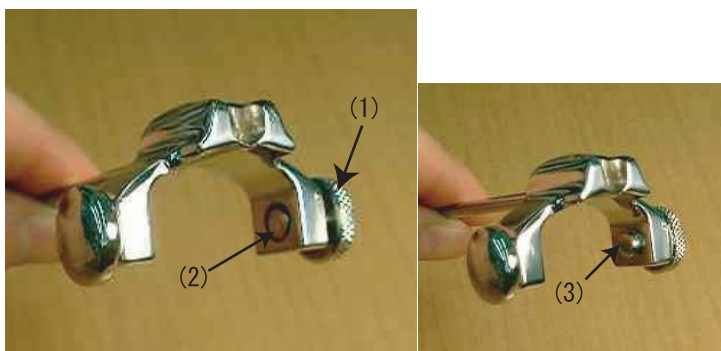


Figure 1-62. BE9CS-RS Biopsy Guide Screws

1. Fixing screw
2. Loosened fixing screw (ensure that the screw end is not sticking out). Left side is a spring (not a screw).
3. Tightened fixing screw (the screw end is sticking out)

Reusable type (continued)

2. Align the tip of the biopsy guide to the edge on the probe shaft.

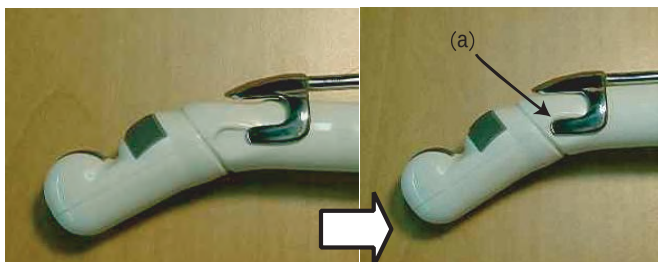


Figure 1-63. Biopsy Guide Alignment

- a. Align with edge of probe
3. Push the guide down to the probe and snap the guide in place.
4. The biopsy guide should mate with the dent of the shaft on the handle side.
5. The fixing screws of the biopsy guide must be securely tightened.

NOTE: Take care not to tear the sheath when tightening the screw.

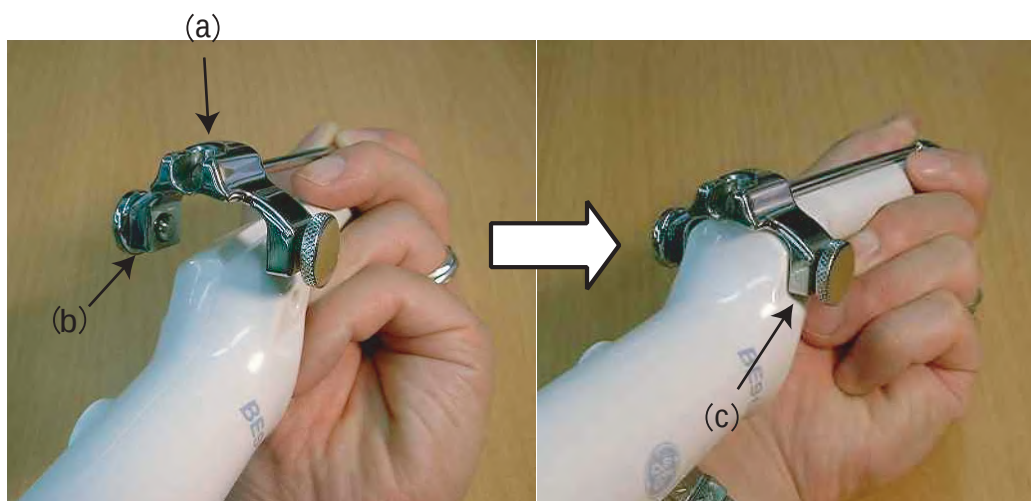


Figure 1-64. Biopsy Guide Setting 3

6. Place an adequate amount of ultrasound gel on the gel-filled sheath tip's outer surface.

Disposable type

1. Align the tip of the biopsy guide to the edge on the probe shaft.



Figure 1-65. Align the biopsy guide

2. Push the guide down to the probe and snap the guide in place.



Figure 1-66. Push down the biopsy guide



Figure 1-67. BE9CS-RS with disposable biopsy guide

Biopsy Guideline display

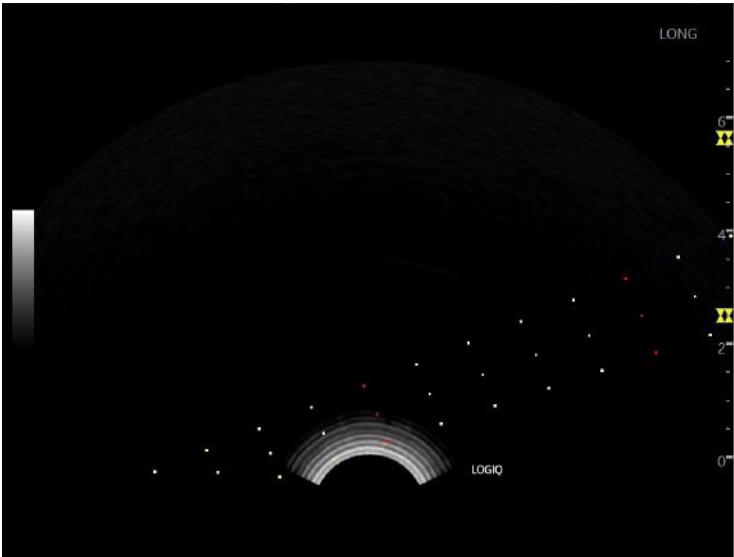


Figure 1-68. BE9CS-RS Biopsy Guide Line - Longitudinal

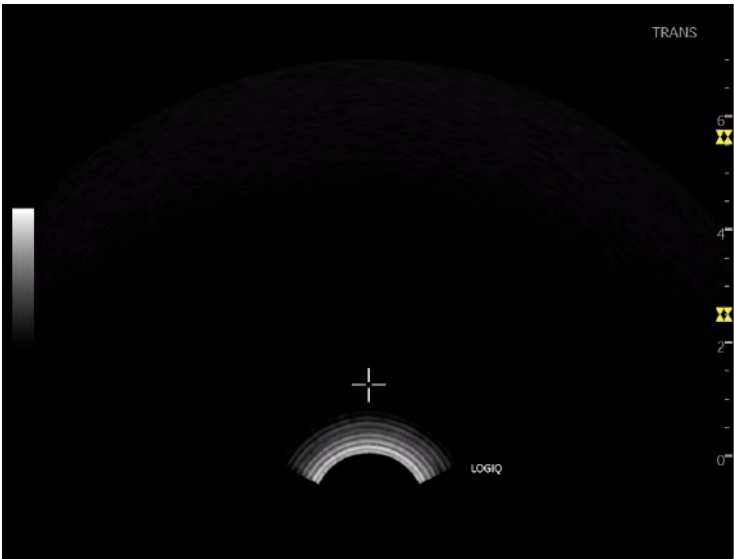


Figure 1-69. BE9CS-RS Biopsy Guide Line - Transverse

Biopsy Needle Path Verification

To verify that the path of the needle is accurately indicated within the guidezone on the system monitor, perform the following:

- Properly install the bracket and biopsy guide.
- Scan in a container filled with water (47° C).
- Display the biopsy guidezone on the monitor.
- Ensure that the needle echo falls within the guidezone markers.

The Biopsy Procedure



WARNING

Biopsy procedures must only be performed on live images.



CAUTION

Ensure that all guide parts are seated properly prior to performing a biopsy.

1. Place coupling gel on the scanning surface of the probe/sheath/biopsy guide assembly.
2. Activate the biopsy guidezone on the system through the B-Mode Touch Panel. When using multi-angle guides, ensure that the proper guidezone angle is displayed.
3. Scan to locate the target. Center the target in the electronic guidezone path.

NOTE:

Enabling color flow would allow for visualization of the vascular structure around the area to be biopsied.

4. Place the needle in the guide between the needle barrel and needle clip. Direct it into the area of interest for specimen retrieval.

Post Biopsy

When the biopsy is complete, remove the needle barrel, needle clip and probe sheath. Properly dispose of these items in accordance with current facility guidelines.

Clean and disinfect the probe.

The biopsy bracket can be cleaned and disinfected in a recommended disinfecting agent and reused.



When the biopsy needle guide kit is opened, all parts must be discarded after the procedure whether they have been used or not.

Moving the System

1. The system weighs approximately 67 kg (148 lbs.) (69 kg with HD Display (152 lbs.)), depending on which peripherals are loaded onto the system. To avoid possible injury and equipment damage:
 - Be sure the pathway is clear.
 - Limit movement to a slow careful walk.
 - Use two or more persons to move the system on inclines or long distances.

NOTE: *The swivel lock on the left-rear caster helps control the system while moving.*

Moving the system, no incline



Moving the system on incline



- Take extra care when moving the system long distances and on inclines (>5 degrees). Ask for help if necessary.
- DO NOT attempt to move the console using any cables or fixtures, such as the probe connectors.
- DO NOT attempt to move the system by pulling cables or belts placed around the monitor and/or monitor arm.
- Use the foot brake (pedal) when necessary.
- Avoid ramps that are steeper than ten degrees to avoid tipping over the system.

NOTE: *Wheel chair ramps are usually less than five degrees.*

- Moving the System (continued)

- Utilize additional care and personnel when loading into a vehicle for transport.
- Do not let the system strike walls or door frames.
- Use extra care when crossing door or elevator thresholds.

NOTE: When you cross the threshold with the LOGIQ P8/P9/P10, move quickly.

3. Once the destination is reached, lock the wheels.

Using MyTrainer+

Activate MyTrainer+

Move the cursor to **MyTrainer+** icon and press the right or left **Set** key and press the MyTrainer user defined touch button. MyTrainer+ is displayed on the left side of the monitor or in full screen.

Press **Esc** key on the keyboard or **Exit** on MyTrainer+ to exit from MyTrainer+.

MyTrainer+ automatically selects contents of active functionality or mode when there is contents of active functionality/mode.

If there is no contents of active functionality/mode, MyTrainer+ displays topics list.

Activate MyTrainer+ (continued)



Figure 1-70. My Trainer+

1. MyTrainer+ icon
2. MyTrainer+
3. MyTrainer user defined touch button

Small layout



Figure 1-71. Small layout

- When displaying contents in Small layout, you can use following keyboard-shortcut.
 - The up arrow (Pg Up) key: Go to the previous page within the current topic.
 - The down arrow (Pg Dn) key: Go to the next page within the current topic.
 - The left arrow (Home) key: Go back to the List of Available topics
- When displaying topics list in Small layout, you can use following keyboard-shortcut.
 - The up arrow (Pg Up) key: Go to the previous topic.
 - The down arrow (Pg Dn) key: Go to the next topic.
 - The right arrow (End) key: Display the content.

Full screen layout

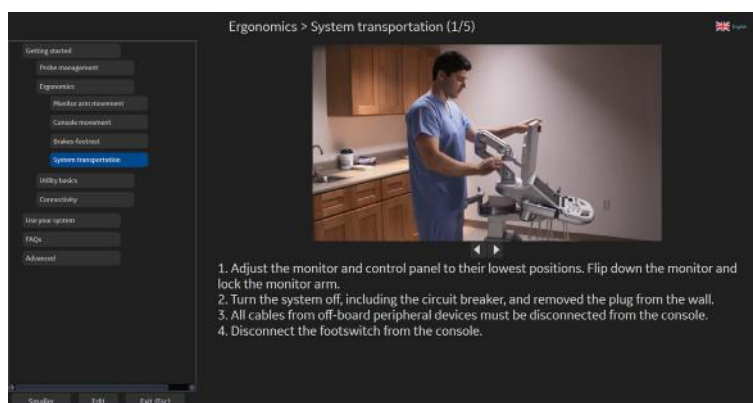


Figure 1-72. Full screen layout

Layout Setting

Select Small layout or Full screen layout.

- Small layout displays MyTrainer+ by side-by-side with a image.
- Full screen layout displays MyTrainer+ in the full screen over scan image.

Select languages

Select MyTrainer+ language.

Supported languages: English, French, Spanish, German, Italian, Brazilian Portuguese, Japanese, Simplified Chinese and Russian.

NOTE: *Language setting of MyTrainer+ is independent from Utility language setting. Only for MyTrainer+.*

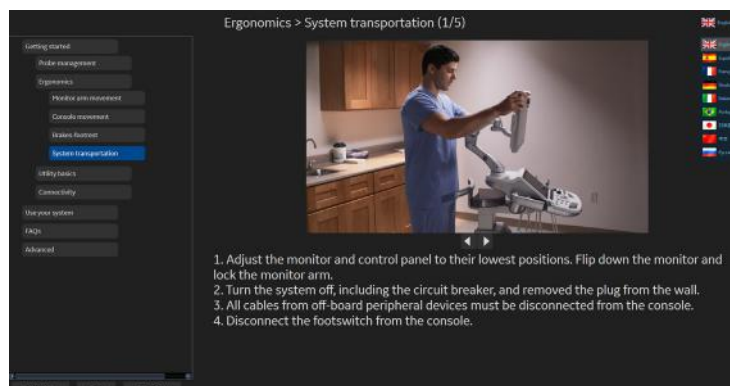


Figure 1-73. Select languages

Chapter 2

Performing an Exam

Optimizing the Image

B-Mode Controls

Table 2-1: B-Mode Controls

Control	Possible Bioeffect	Description/ Benefit
Depth	Yes	Depth controls the distance over which the B-Mode images anatomy. To visualize deeper structures, increase the depth. If there is a large part of the display which is unused at the bottom, decrease the depth.
Gain	No	B-Mode Gain increases or decreases the amount of echo information displayed in an image. It may have the effect of brightening or darkening the image if sufficient echo information is generated.
Focus	Yes	Increases the number of focal zones or moves the focal zone(s) so that you can tighten up the beam for a specific area. A graphic caret corresponding to the focal zone position(s) appears on the right edge of the image.
Auto Optimize	No	Auto Optimize (Auto) lets you optimize the image based upon a the actual B Mode image data (Auto Tissue Optimize, ATO). The preset levels (Low, Medium, and High) allow you to pick a preference for the contrast enhancement in the resulting image. Low does the least amount of contrast enhancement, high does the most. Auto is available in single or multi image, on live, frozen or CINE images (in B-Mode only), and while in zoom, in Color Flow Mode, and in Spectral Doppler. Auto in PW Doppler Mode optimizes the spectral data. Auto adjusts the Velocity Scale (live imaging only), baseline shift, dynamic range, and invert (if preset). Upon deactivation, the spectrum is still optimized.
CrossXBeam	No	CrossXBeam is the process of combining three or more frames from different steering angles into a single frame. CrossXBeam is available on Convex and Linear probes. CrossXBeam combines multiple co-planar images from different view angles into a single image at real-time frame rates, using bi-cubic interpolation.

Table 2-1: B-Mode Controls (Continued)

Control	Possible Bioeffect	Description/ Benefit
SRI-HD	No	SRI-HD (Speckle Reduction Imaging High Definition) is an adaptive algorithm to reduce the unwanted effects of speckle in the ultrasound image. Image speckle usually appears as a grainy texture in otherwise uniform areas of tissue. Its appearance is related to image system characteristics, rather than tissue characteristics, so that changes in system settings, such as probe type, frequency, depth, and others, can change the appearance of the speckle. Too much speckle can impair image quality and make it difficult to see the desired detail in the image. Likewise, too much filtering of speckle can mask or obscure desired image detail. Extra care must be taken to select the optimal SRI-HD level. SRI-HD is available in B-Mode imaging and may be used with any transducer or clinical application when image speckle appears to interfere with the desired image detail.
Coded Harmonic Imaging (CHI)	Yes	Harmonic imaging utilizes Digitally Encoded Ultrasound (DEU). Coded Harmonics enhances near field resolution for improved small parts imaging as well as far field penetration.
Frequency	Yes	Multi Frequency mode lets you downshift to the probe's next lower frequency or shift up to a higher frequency.
Steer	Yes	You can slant the B-Mode or Color Flow linear image left or right to get more information without moving the probe. The angle steer function only applies to linear probes.
Mode Cursor	No	Displays the M/D-Mode cursor on the B-Mode image.
Virtual Convex	Yes	On Linear and Sector probes, Virtual Convex provides a larger field of view in the far field. Virtual Convex is always active with Sector probes.
TGC	No	TGC amplifies returning signals to correct for the attenuation caused by tissues at increasing depths. TGC slide pots are spaced proportionately to the depth. The area each pot amplifies varies as well. A TGC curve may appear on the display (if preset), matching the controls that you have set (except during zoom). You can choose to deactivate the TGC curve on the image.
Width	Yes	You can widen or narrow the size of the sector angle to maximize the image's region of interest (ROI).
Tilt	Yes	You can steer the sector angle to get more information without moving the probe while in B-Mode, M-Mode, Doppler Mode, and Color Flow Mode. <i>Tilt</i> is not available on Linear probes.
Dynamic Range	No	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast. The Dynamic Range control name changes to Compression on frozen images.
Reverse (if Preset)	No	Flips the image 180 degrees left/right.
Line Density	Yes	Optimizes B-Mode frame rate or spatial resolution for the best possible image.

Table 2-1: B-Mode Controls (Continued)

Control	Possible Bioeffect	Description/ Benefit
Line Density Zoom	Yes	You can set the default value for Line Density in zoom independently.
Colorize	No	Colorize is the colorization of a conventional B-Mode image or Doppler Spectrum to enhance the user's ability to discern B, M, and Doppler Mode intensity valuations. Colorize is NOT a Doppler Mode. <i>NOTE: You can colorize realtime or CINE images or Timeline CINE, but not DVR images.</i> Colorizes the gray scale image to enhance the eye's discrimination capability. Spectrum Colorize colorizes the spectrum as a function of power using the inverse of the Colorize map for the signal intensity in each Doppler line. Colorize enhances the visibility of the spectrum's characteristics and enhances your ability to identify spectral broadening and the edge contours of the spectrum used to define the peak frequency/velocity. The gray bar displays while Colorize is activated.
PRF	Yes	Reduces noise artifacts in the image. When you activate PRF, the frame rate decreases and the noise artifacts are filtered.
Edge Enhance	No	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures. Adjustments to M-Mode's edge enhancement affects the M-Mode only. Edge Enhance cleans out the B-Mode image/M-Mode timeline by subduing some of the gray scale in order to highlight the vessel wall or organ. This is helpful when you cannot differentiate between the chambers of the heart.
Frame Average	No	Temporal filter that averages frames together, thereby using more pixels to make up one image. This has the effect of presenting a smoother, softer image.
Maps	No	The system supplies B, M, and Doppler Mode system maps.
Rejection	No	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
Rotation	No	Flips the image 180 degrees up/down. CAUTION: When reading a rotated image, be careful to observe the probe orientation to avoid possible confusion over scan direction or left/right image reversal.
Suppression	No	Suppresses the noise in the image.

M-Mode Controls

Table 2-2: M-Mode Controls

Control	Possible Bioeffect	Description/ Benefit
Sweep Speed	Yes	Changes the speed at which the timeline is swept. Available in M-Mode, Doppler Mode and M Color Flow Mode.
Anatomical M-Mode	Yes	Anatomical M-Mode gives you the ability to manipulate the cursor at different angles and positions. The M-Mode display changes according to a motion of the M cursor. Curved Anatomical M-Mode (Camm) displays a distance/time plot from a free-drawn cursor line. Camm is available in gray scale, color and TVI.

Color Flow Mode Controls

Color Flow Mode and Color M-Mode are Doppler Modes intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the B-Mode or M-Mode image.

Table 2-3: Color Flow Mode Controls

Control	Possible Bioeffect	Description/ Benefit
Flow Selection	No	In the Lower Extremity Vein (LEV) and Abdominal applications, you can quickly select the flow state via a shortcut on the Color Flow Mode Touch Panel menu.
Gain	No	Gain amplifies the overall strength of echoes processed in the Color Flow window or spectral Doppler timeline.
Scale (Velocity Scale)	Yes	Increases/decreases the Scale on the color bar.
Wall Filter	No	Filters out low flow velocity signals. It helps get rid of motion artifacts caused from breathing and other patient motion.
Wall Filter Target Override (Hz)	No	The algorithm selects a new regression wall filter and updates the wall filter setting and the wall filter cutoff on the user display.
Size/Position of the color window	No	Adjust size and position of the color window.
CF/PDI Width	No	You can set the default CF/PDI ROI width.
CF/PDI Vertical Size	No	You can set the default CF/PDI ROI vertical size.
Invert (Color Invert)	No	Lets you view blood flow from a different perspective, e.g., red away (negative velocities) and blue toward (positive velocities). You can invert a real-time or frozen image. <i>NOTE: Invert reverses the color map, NOT the color Scale.</i>
Baseline	No	Changes the Color Flow or Doppler spectrum baseline to accommodate higher velocity blood flow. Minimizes aliasing by displaying a greater range of forward flow with respect to reverse flow, or vice versa. Baseline adjusts the alias point. The default baseline is at the midpoint of the color display and at the midpoint of the color bar reference display.
Angle Steer	Yes	You can slant the ROI of the Color Flow linear image left or right to get more information without moving the probe. The Angle Steer function only applies to linear probes.
Accumulation	No	Accumulation enhances the flow in an image. Available in Contrast, Color Flow, and PDI.
Color Flow Line Density	Yes	Optimizes the Color Flow frame rate or spatial resolution for the best possible color image.

Table 2-3: Color Flow Mode Controls (Continued)

Control	Possible Bioeffect	Description/ Benefit
Map	No	Allows you to select a specific color map. After you have made your selection, the color bar displays the resultant map.
Map Compress	No	When you increase the value, high velocity elements in the map are compressed so that the map darkens. When you decrease the value, low velocity elements in the map are compressed so that the map lightens. The effect is visible in the color bar.
Threshold	No	Threshold assigns the gray scale level at which color information stops.
Frame Average	No	Averages color frames.
Transparency Map	No	Brings out the tissue behind the color map.
Spatial Filter	No	Smooths out the color, makes it look less pixely.
Flash Suppression	No	Activates/deactivates Flash Suppression, a motion artifact elimination process.
Packet Size	Yes	Controls the number of samples gathered for a single color flow vector.
Sample Vol (Sample Volume)	Yes	Places the sample volume gate on the Color Flow image. The gate is positioned over a specific position within the vessel.
CF/PDI Auto Sample Volume	No	You can set the default CF/PDI Auto Sample Volume.
CF/PDI Center Depth	No	You can set the default CF/PDI center depth.
CF/PDI Focus Depth (%)	No	You can set the default CF/PDI center depth.
CF/PDI Frequency (MHz)	No	You can set the default CF/PDI Frequency (MHz).
CF/PDI Auto Frequency	No	You can set the default CF/PDI Auto Frequency.
Power Doppler Imaging (PDI)	No	Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the flow rather than the frequency shift of the signal. Using this technique, the ultrasound system plots color flow based on the number of reflectors that are moving, regardless of their velocity. PDI does not map velocity, therefore it is not subject to aliasing.

Doppler Mode Controls

Table 2-4: Doppler Mode Controls

Control	Possible Bioeffect	Description/ Benefit
Doppler Sample Volume Gate Position (Trackball)	Yes	Moves the sample volume gate on the B-Mode's Doppler Mode cursor. The gate is positioned over a specific position within the vessel. Positions the sample volume gate to sample blood flow.
Doppler sample volume length (SV Length)	Yes	Sizes the sample volume gate.
Angle Correct	No	Estimates the flow velocity in a direction at an angle to the Doppler vector by computing the angle between the Doppler vector and the flow to be measured. <i>NOTE: When the Doppler Mode Cursor and angle correct indicator are aligned (the angle is 0), you cannot see the angle correct indicator.</i>
Quick Angle	No	Quickly adjusts the angle by 60 degrees.
Steer and Fine Steer	Yes	You can slant the ROI of the Color Flow linear image left or right to get more information without moving the probe. The angle steer function only applies to linear probes.
Audio Volume	No	Controls audio output.
Cycles to Average	No	The average value over a number of cycles (from 1-5).
Display Format	No	Changes the horizontal/vertical layout between B-Mode and M-Mode, or timeline only.
Update	Yes	Toggles between simultaneous and update presentation while viewing the timeline.
Simultaneous (Duplex/Triplex)	Yes	Toggles between simultaneous and update presentation while viewing the timeline. Update increases the Spectral Doppler display quality.
Baseline	No	Adjusts the baseline to accommodate faster or slower blood flows to eliminate aliasing.
Compression	No	Compression controls how echo intensities are converted to shades of gray, thereby increasing the range of contrast you can adjust. Optimizes the image's texture and smoothness by increasing or decreasing the amount of gray scale.
Invert	No	Vertically inverts the spectral trace without affecting the baseline position.

Table 2-4: Doppler Mode Controls (Continued)

Control	Possible Bioeffect	Description/ Benefit
Scale (Velocity Scale)	Yes	Adjusts the velocity scale to accommodate faster/slower blood flow velocities. Velocity scale determines pulse repetition frequency. If the sample volume gate range exceeds single gate Scale capability, the system automatically switches to high PRF mode. Multiple gates appear, and HPRF is indicated on the display.
Trace Method (Spectral Trace)	No	Traces the average mean and peak velocities in realtime or frozen images.
Trace Sensitivity	No	Adjust the trace to follow the waveform for signal strength.
Trace Direction	No	Specifies trace direction.
Cursor Moving	No	Cursor Moving lets you 'walk' Doppler through a vessel while the Doppler gate is moving.

3D Mode

Overview



WARNING

DO NOT scan any pacemaker patient using the sensor device. The magnetic fields emitted from the device may interfere with the pacemaker operation.

Easy 3D is compatible with every 2D transducer using a freehand acquisition to generate a volume dataset.

3D Volume datasets are allowing the navigation in the 3D cube itself and providing access to the 3 different main planes - axial, sagitta and coronal.

There are two 3D Packages:

Table 2-5: 3D Package Options

3D Type	Description	Sensor/No Sensor	Available Tabs
Easy 3D	Designed for rendering B Mode and Color Flow Mode images, e.g., Baby Face scans.	No sensor	3D Acquisition, Easy 3D, Movie
Advanced 3D	Designed for rendering B Mode and Color Flow Mode images, e.g., vessel trees.	No sensor	3D Acquisition, Easy 3D, Advanced 3D, Movie

Acquiring a 3D Scan

To acquire a 3D scan,

1. Optimize the B-Mode image. Ensure even gel coverage.
2. Press the **3D/4D** control panel key. Two screens appear.
3. Set appropriate values for Acq Mode and Scan Plane. Also, set the scan distance before scanning.
 - Acquisition mode

Sensorless Parallel is for all acquisitions done with the linear probes and on regular shapes, where you can move the probe parallel on the skin.

Sensorless Sweep is for the sweep acquisition using the curved probe (i.e. intercostal liver scan or kidney).
 - Scan Distance

The Scan Distance is an indicator for the size of the Volume: Have you acquired longer distance than 6 cm, increase the Scan distance. Have you acquired a shorter distance than 6 cm, decrease the Scan distance. For sweep acquisition 6 means a transducer angulation of around 60 degree.
4. To start acquiring the image, press **Start** (left Trackball key).
5. To perform a parallel scan, scan evenly. To perform a sweep (fan) scan, rock the probe once. Note the distance of the scan.
6. The 3D volume of interest (VOI) is dynamically assembled on the right side of the screen.

NOTE: *If the image stops before you're done scanning, start acquiring the 3D volume of interest again.*

7. To complete the 3D scan, press **End** (right Trackball key).

NOTE: *You can also press Freeze, but then you need to also press the 3D key to obtain the final render.*

Zooming an Image

Introduction

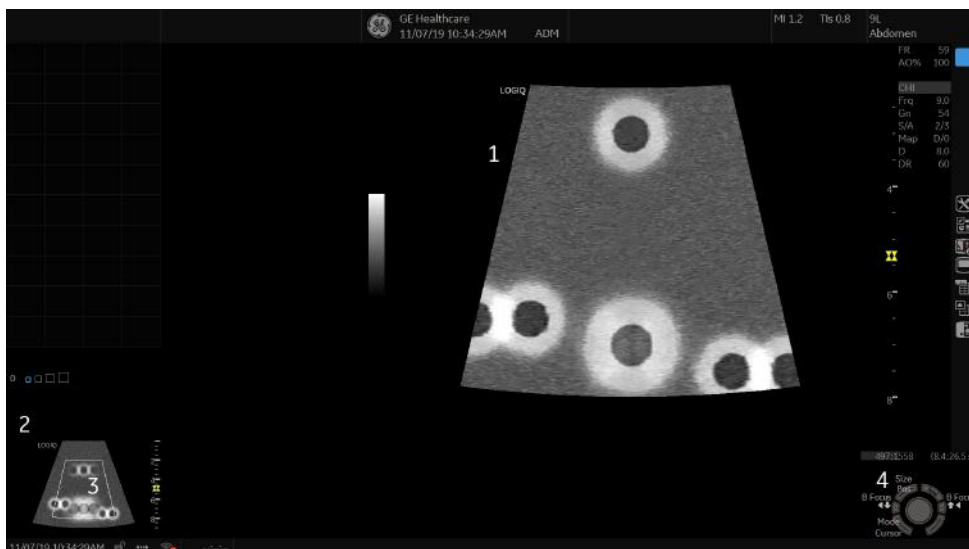


Figure 2-1. Zoom - Example

1. Zoom Image
2. Reference Image: Reference image is the small un-zoomed image.
3. Zoom ROI: Zoom ROI indicates the region of the image to zoom.
4. Pos/Size: Use the top trackball key to change position and size of ROI.

Two kinds of zoom exist: Pan Zoom and HD Zoom.

- Pan Zoom magnifies the display of the data without making any changes to the ultrasound image data acquired. The entire image is acquired and the ROI can be moved or resized.
- HD Zoom only acquires the image data within the ROI, increasing density of the image in the ROI. HD zoom can only be performed during live scanning.

Pan Zoom

To activate Pan zoom, rotate Zoom knob clockwise.

To deactivate Pan zoom, rotate Zoom knob counterclockwise until entire image is displayed.

HD Zoom

To activate HD zoom, press Zoom knob and rotate it clockwise.

To exit HD zoom, press Zoom knob again.

Bioeffect

HD zooming an image changes the frame rate which tends to change thermal indices. The position of the focal zones may also change which may cause the peak intensity to occur at a different location in the acoustic field. As a result, the MI (TI) may change.



Acoustic
Output
Hazard

Observe the output display for possible effects.

Split Screen

Overview

LOGIQ P8/P9/P10 supports the following multiple image format:

- Dual (split the window area into 2 areas)
- Wide Dual (split the window area into 2 areas, but wider than the normal dual)
- Quad (split the window area into 4 small areas)
This is useful, for example, when measuring AFI of OB.
- Simultaneous (Dual) (split the module window are into 2 areas, and both panes are live and active)

NOTE: *The recalled split screen cannot be edited.*

Dual screen

1. Press **L** to activate a dual screen. The single image is placed on the left side.

NOTE: When you activate the dual screen by pressing L, the single image is placed on the left side; when you activate by pressing R, the single image is placed on the right side.

2. Press **R**. The left side image is freezed and the image displays in the right side.
3. Press **Freeze** to freeze the image of the right side.
4. Press **Freeze** again to unfreeze the active image which has the gray bar under the image.

To switch between active images, press **L** or **R**.

5. Press **B**-mode key to return to the single screen.

NOTE: To put a copy of the image on the opposite side when entering dual split screen, use the "When Entering Dual Image" preset found on Utility --> Application --> Settings preset page.

Quad screen

1. Press and hold down **L** to activate a quad screen. The single image is placed on the upper left.
NOTE: When you activate the dual screen by pressing L, the single image is placed on the left side; when you activate by pressing R, the single image is placed on the right side.
2. Press **R**. The left side image is freezed and the image displays in the upper right.
3. Press **Freeze**.
4. Press **Freeze** again to unfreeze the image which has the gray bar under the image.
Press **L** or **R** to move the gray bar to the image of the left side or the right side.
5. Press **B-mode** key to return to the single screen.

Simultaneous mode

While using CFM or PDI, press **L** and **R** keys simultaneously to display B and B+CFM, or B and B+PDI in real-time on the left and right side.

It is useful to observe the ROI in B-Mode.

Dual Caliper

In split screen, you can draw a caliper, area, ellipse, or spline trace on both the left and right image at the same time.

Whichever side of the screen that you annotate is called the “Original” graphic. The copy is called the “Shadow” graphic.

This feature is available in the following modes:

- B-Mode:B-Mode
- Color Flow Mode:Color Flow Mode
- B-Mode:Color Flow Mode
- Simultaneous Mode.
- Contrast
- Elastography

NOTE: *Dual Caliper IS NOT available in B-Mode: B/PW Mode or in B-Mode:B/M Mode, or with different probes.*

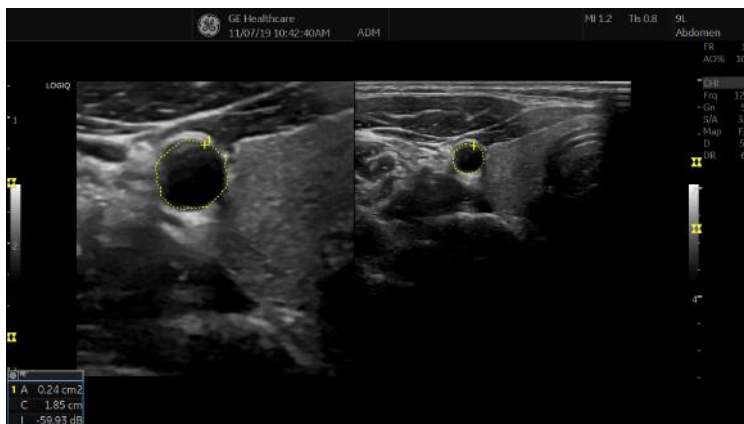


Figure 2-2. Original (Left), Shadow (Right)

Dual Caliper (continued)

- NOTE:** *Only the Original graphic contains the graphic numbering. In this way you can always distinguish between the Original and the Shadow graphic.*
- NOTE:** *You can only edit the Original graphic; however, when you do edit the Original graphic, the Shadow graphic is also edited at the same time.*
- NOTE:** *If you delete either graphic, both are deleted.*
- NOTE:** *When a measurement is selected without Dual B-Mode images or with different probe images, a warning message is displayed on the status bar and the selected measurement is cancelled.*
- NOTE:** *If the first point of the Original graphic is out of the Shadow image area, then a warning message displays on the status bar and the Shadow graphic is not drawn.*
- NOTE:** *The Trackball move area is limited to the narrow area of both images.*
- NOTE:** *You cannot take a measurement across dual images.*
- NOTE:** *The 2D Dual measurement tool cannot be copied.*

Dual caliper for 2D image

2D Dual Caliper / 2D Dual Area / 2D Dual Ellipse / 2D Dual Spline Trace / 2D Dual Circle are not available through the factory default. To enable these measurements, add a new measurement using “2D Dual Caliper”, “2D Dual Area”, “2D Dual Ellipse”, “2D Dual Spline Trace” or “2D Dual Circle” tool in the Utility--> Measure--> M&A preset menu.

1. Select Blank from Add measurement.

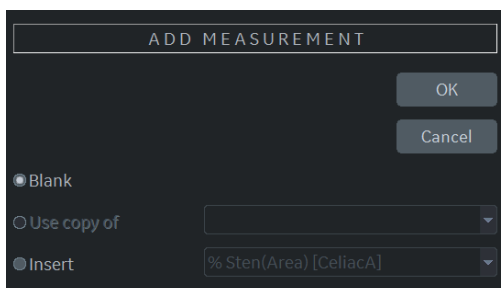


Figure 2-3. Add Measurement

2. Select appropriate dual caliper tool from Tool drop-down menu.

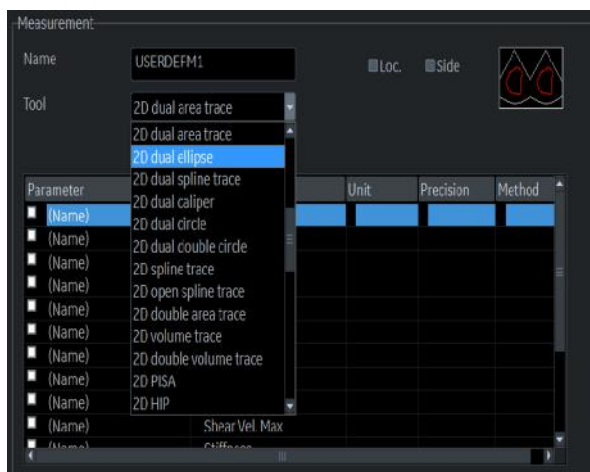


Figure 2-4. Drop-down menu

3. Type the measurement and parameter name as you like.
4. Add the created measurement to the Touch Panel.
5. Display the dual image and press **Measure**.

Dual caliper for 2D image (continued)

6. Select an added measurement from the Touch Panel to enable the appropriate measurement. A caliper displays.

NOTE: When the measurement is selected without dual B images or with different probe images, a warning message displays on the status bar and the selected measurement is cancelled.

7. To position the caliper at the start point, move the **Trackball**. You can use both images as an original image.

NOTE: If the first point of the original graphic is out of the shadow image area, then the warning message displays on the status bar and the shadow graphic is not drawn.

8. To fix the start point, press **Set**. The caliper changes to an active caliper.

NOTE: Only original graphic has graphic numbering to distinguish between original image and shadow image.

NOTE: The trackball move area is limited to the narrow area of both images.

NOTE: Only the original graphic can be edited. When the original graphic is edited, the shadow graphic is also updated.

9. To complete the measurement, press **Set**. The system displays the measurement result in the Results Window.

Body Pattern

An additional way to annotate the image display is with body patterns. Body patterns are a simple graphic of a portion of the anatomy that is frequently scanned. The body pattern and probe marker can serve as a reference for a patient and probe positioning when images are archived or scanned.

1. Press rotary corresponding to Bodypattern. The bodypatternrssi specific to the current application are displayed.
2. Touch the bodypattern to insert. The selected bodypattern with a probe marker is displayed on the scanning screen.
3. Using the trackball, adjust the position of the probe marker.
4. Rotate rotary of Bodypattern to set the probe marker orientation.
5. To move the bodypattern:
 - Press **Move Pattern**.
 - Move the bodymark to a new location with the trackball.
 - Press **Set** to anchor the bodypattern to the new location.
6. Press **Set** on the keyboard or **Scan** on the Touch Panel to exit without erasing the body pattern.
7. To clear the body pattern, Press rotary of Bodypattern to activate body patterns and then press the **Clear** key.

The body pattern packages may be customized to accommodate user preference. Up to 30 individual body patterns in the packages can be changed.

Using the Fast Key

Overview

A keyboard Fast Key is available to record and run a sequence of often-run keystrokes.

NOTE: *Ensure that you have a patient selected prior to running the Fast Key operation.*

Create a Fast Key

1. Press the **F5** key. The “Do you want to create the Fast Key?” dialog displays. Select OK to continue.
2. Select a key to assign a Fast Key to (a-z, 0-9).

If you select a Front Panel control, a Touch Panel key or any key besides a-z or 0-9, a warning dialog displays and the procedure is cancelled.

NOTE: *Assign Fast Key Function to Key 0 - 9 in Utility -> System -> User Configurable Key before you create a Fast Key.*

NOTE: *There is no distinction between capital and small letters.*

NOTE: *The key code is the same in Russian and Greek (a-z, 0-9).*

3. If the selected key is already assigned to a Fast Key, a warning dialog displays.

Select Yes to continue. The Fast Key file is overwritten.
Select No to cancel the Fast Key setup.

4. Input the key sequence to be assigned.

NOTE: *It is impossible to save a power cycle sequence or any input from outside of the system.*

NOTE: *If a warning dialog displays due to the limitations of the number of key sequences, press F5 to finish and retry.*

5. Press the **F5** key to complete a Fast Key setup. The information dialog displays. Select OK.

Start a Fast Key

1. Press the **F6** key to start a Fast Key. The message "Select the key which the Fast Key is assigned to" displays on the status bar.

NOTE: The F6 key is ignored if another dialog displays on the system.

NOTE: If you press F5 after F6, the F6 function cancels and the F5 function is enabled.

2. Press the key assigned to the Fast Key macro. The message "Fast Key playback is finished" displays on the status bar when the macro is finished.

To stop the Fast Key during the operation, press **F6**. The message "Fast Key playback is cancelled" displays on the status bar.

NOTE: Select the running speed in the Run Fast Key Speed preset on Utility -> System -> General.

Backup and Restore the Fast Key

You can backup/restore the Fast Key via Utility -> System -> Backup/Restore.

To backup, select User Defined Configuration in the Backup section.

To restore, select User Defined Configuration in the Restore section.

Measurement and Analysis

Introduction

Measurements and calculations derived from ultrasound images are intended to supplement other clinical procedures available to the attending physician. The accuracy of measurements is not only determined by system accuracy, but also by the use of proper medical protocols by the user. When appropriate, be sure to note any protocols associated with a particular measurement or calculation. Formulas and databases used within the system software that are associated with specific investigators are so noted. Be sure to refer to the original article describing the investigator's recommended clinical procedures.



The system provides calculations (e.g. estimated fetal weight) and charts based on published scientific literature. The selection of the appropriate chart and clinical interpretation of calculations and charts is the sole responsibility of the user. The user should consider contraindications for the use of a calculation or chart as described in the scientific literature. The diagnosis, decision for further examination, and medical treatment must be performed by qualified personnel following good clinical practice.

Location of Measurement Controls



Figure 2-5. Locating Measurement Controls

Table 2-6: Measurement controls

Control	Description
1. Measure	Activates a measurement caliper and the calculation package associated with the currently selected preset.
2. Ellipse	After the first caliper for a distance measurement has been set and the second caliper positioned, Ellipse activates the area/ellipse measurement function. During the ellipse adjustment, use the Trackball to increase or decrease the size of the ellipse. Select Cursor Select to adjust the measurement calipers.
3. Ellipse Size	During the ellipse adjustment, Ellipse Size activates to control the ellipses size.
4. Clear	During a measurement sequence, erases the measuring caliper and measurement data from the display. When not performing a measurement sequence, clears all calipers and measurements from the display.
5. Pointer Key	Select to display a pointer on the monitor.
6. Trackball	Moves the measurement calipers, selects the measurement on the Summary Window and controls the ellipse size of the curved lines. Trackball also selects items on the Touch Panel with the Pointer and Set keys.
7. Trackball Keys	The functionality of these keys changes (e.g. Set, Change Measure, etc) depending on the mode or action. Current functionality is displayed on the lower-right corner of the monitor.

B-Mode Measurements

The following measurements can be made in B-Mode.

- Distance
- Circumference
- Circumference and Area
 - Ellipse Method
 - Trace Method
 - Spline Method
 - Intensity (Echo level) Method

NOTE: *The following instructions assume that you first scan the patient and then press **Freeze**.*



CAUTION

DO NOT perform a depth measurement using 4D probes.

Distance measurement

To make a distance measurement:

1. Press **Measure** once; an active caliper displays.
2. To position the active caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**.
The system fixes the first caliper and displays a second active caliper.
4. To position the second active caliper at the end point, move the **Trackball**.
A dotted line connects the measurement points, if preset accordingly.
5. To complete the measurement, press **Set**.
The system displays the distance value in the Results Window.



HINTS

- **Before** you complete a measurement:
 - To toggle between active calipers, press the top Trackball key.
 - To erase the second caliper and the current data measured and start the measurement again, press **Clear** once.
- **After** you complete the measurement:
 - To rotate through and activate previously fixed calipers, adjust **Cursor Select**.
 - To erase all data that has been measured to this point, but not data entered onto worksheets, press **Clear**.

Circumference and area (ellipse) measurement

You can use an ellipse to measure circumference and area. To measure with an ellipse:

1. Press **Measure** once; an active caliper displays.
2. To position the active caliper, move the **Trackball**.
3. To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper, move the **Trackball**.
5. Adjust the **Ellipse** control; an ellipse with an initial circle shape displays.
6. To position the ellipse and to size the measured axes (move the calipers), move the **Trackball**.
7. To increase the size, adjust the **Ellipse** control in a clockwise direction. To decrease the size, adjust the **Ellipse** control in a counterclockwise direction.
8. To toggle between active calipers, press the top **Trackball key**.
9. To complete the measurement, press **Set**. The system displays the circumference and area in the Results Window.



HINTS

Before you complete the ellipse measurement:

- To erase the ellipse and the current data measured, press **Clear** once. The original caliper is displayed to restart the measurement.
- To exit the measurement function without completing the measurement, press **Clear** a second time.

Circumference and area (trace) measurement

To trace the circumference of a portion of the anatomy and calculate its area:

1. Press **Measure**.
2. Press the top **Trackball key** to select Trace; a caliper displays.
3. To position the caliper at the start point, move the **Trackball**.
4. To fix the trace start point, press **Set**. The caliper changes to an active caliper.
5. To trace the measurement area, move the **Trackball** around the anatomy. A dotted line shows the traced area.
6. To complete the measurement, press **Set**. The system displays the circumference and the area in the Results Window.



HINTS

Before you complete the trace measurement:

- To erase the line (bit by bit) back from its current point, move the **Trackball** or adjust the **Ellipse** control counterclockwise.
- To erase the dotted line but not the caliper, press **Clear** once.
- To clear the caliper and the current data measured, press **Clear** twice.

Circumference and area (spline trace) measurement

To trace the circumference of a portion of the anatomy and calculate its area:

NOTE: *Spline trace is not available through the factory default. The system defaults to trace. To enable spline trace, modify the Measure Key Sequence preset found in Utility -> Measure -> Advanced preset menu.*

1. Press **Measure**.
2. Press the top **Trackball key** to select Spline Trace; a caliper displays.
3. To position the first caliper at the start point, move the **Trackball**.
4. To fix the trace start point, press **Set**. The first caliper turns yellow. The second caliper appears at the same position as the first caliper and is green.

NOTE: *When pressing the **Clear** key once, the second caliper disappears and the first caliper is activated.*

*If **Clear** is pressed again, the first caliper disappears and the Spline trace is cancelled.*

5. To position the second caliper, move the **Trackball** and press **Set**. The third caliper appears at the same position.

NOTE: *The **Clear** key functionality is the same as noted in the previous step.*

The spline trace requires at least three points to draw the trace. Continue setting the points of the trace until the desired points are set.

6. Press **Set** again after the last caliper is fixed to finalize the spline trace. All points are removed from the line and the spline trace turns yellow.

NOTE: *Pressing **Set** twice finishes the trace measurement.*

If **Clear** is pressed twice when more than 3 points exist on the trace, all points are removed and the first caliper again displays.

Circumference and area (spline trace) measurement (continued)

Edit the spline trace

1. Select **Cursor Select**. The spline trace changes to green and all points appear on the trace as yellow.

A pick-caliper appears on the center of the image and the message "Edit spline trace" displays at the bottom of the screen.

NOTE: *The pick-caliper is used to select and move the trace points.*

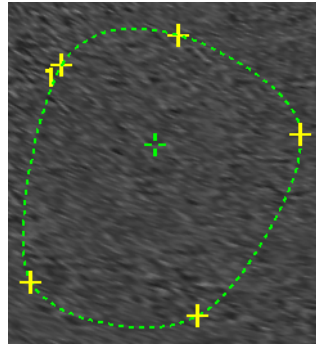


Figure 2-6. Edit spline trace

Select **Cursor Select** again. The trace is deactivated (changes to yellow) and all points, including the pick-caliper, are removed.

If the previous/next fixed caliper exists on the image, it is activated.

NOTE: *Pressing **Clear** at this time removes all points and the trace graphic.*

2. Move the pick-caliper to the desired point and press **Set**. The point is activated and turns green.
3. Move the point to the desired position and press **Set**. The point is fixed and turns yellow. The pick-caliper appears on the center of the image.

NOTE: *The spline trace is updated at run time.*

NOTE: *To remove a point, press **Clear** while moving the point. The trace turns green and the remaining points continue to be shown as yellow. If there are less than three points, the spline trace is removed.*

4. Press **Set** again. All points are removed from the trace and the trace is shown as yellow.

Intensity (Echo level) measurement

To make an echo level measurement:

1. Press **Measure**.
2. Press the top Trackball key to select Intensity. A caliper displays.
3. To position the caliper at the start point, move the **Trackball**.
4. To fix the trace start point, press **Set**. The caliper changes to an active caliper.
5. To trace the measurement area, move the **Trackball** around the anatomy. A dotted line shows the traced area.
6. To complete the measurement, press **Set**. The system displays the echo level, as EL __ dB, in the Results Window.

NOTE: The echo level measurement is only available on a frozen image, not on a B-paused image.

NOTE: Echo Level is not available through the factory default. To enable echo level, modify the Measure Key Sequence preset, found in the Utility -> Measure -> Advanced preset.

Doppler Mode Measurements

Five basic measurements can be made in Doppler Mode.

- Velocity
- TAMAX and TAMEAN (Manual or Auto Trace)
- Two Velocities with the Time Interval and Acceleration between them
- Time Interval
- Volume Flow

NOTE: *The following instructions assume that you do the following:*

1. In the B-Mode part of the display, scan the anatomy you want to measure.
2. Go to the Doppler Mode part of the display.
3. Press **Freeze**.

Velocity

To measure velocity:

1. Press **Measure**; an active caliper with a vertical dotted line displays.
2. To position the caliper at the desired measurement point, move the **Trackball**.
3. To complete the measurement, press **Set**. The system displays the velocity measurement in the Results Window.

Slope (Velocity, Time Interval and Acceleration)

To measure two velocity values, the time interval (ms), and acceleration (m/s^2):

1. Press **Measure**. Press the top Trackball key to select Slope; an active caliper with vertical and horizontal dotted lines displays.
2. To position the caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system displays the two peak end point velocities, the time interval, and the acceleration in the Results Window.

Time interval

To measure a horizontal time interval:

1. Press **Measure**. Press the top Trackball key to select Time; an active caliper with vertical and horizontal dotted lines displays.
2. To position the active caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system displays the time interval between the two calipers in the Results Window.

TAMAX and TAMEAN

Manual Trace

The value measured depends upon the Vol Flow Method preset. The two selections available are: Peak (TAMAX) and Mean (TAMEAN).

To do a manual trace of TAMAX or TAMEAN:

1. Press **Measure**. Press the top Trackball key to select Trace; a caliper displays. Select **Manual** on the Touch Panel.
2. To position the caliper at the trace start point, move the **Trackball**.
3. To fix the start point, press **Set**.
4. To trace the velocity spectrum boundary, move the **Trackball**.

*NOTE: To edit the trace line, move the **Trackball**.*

5. To complete the measurement, press **Set**. The system displays the measurement values in the Results Window.

TAMAX and TAMEAN (continued)

Auto Trace

The value measured depends upon the Vol Flow Method preset. The two selections available are: Peak (TAMAX) and Mean (TAMEAN).

To auto trace TAMAX:

1. Press **Measure**. Press the top Trackball key to select Trace; an active caliper with a vertical dotted line displays. Select **Auto** on the Touch Panel.
2. To position the caliper at the trace start point in the Doppler spectrum, move the **Trackball**.
3. To fix the start point, press **Set**.
4. To position the vertical caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system automatically fixes both calipers and traces the maximum value between the two points. The system displays this value in the Results Window.

NOTE: *When you set the Auto Trace for Both (above and below), the system picks up the maximum power of the signal, NOT the maximum velocity. If the maximum velocity is not the maximum power, the system may not trace accurately. If you want to use maximum velocity, select either Above or Below.*

Edit Trace

Auto Trace can be edited after taking an Auto Trace measurement.

1. After taking an Auto Trace measurement, select the measurement result on the result window. The Edit Trace (Edit Peak or Edit Mean) menu window appears.

NOTE: If the system cannot take the trace data correctly from the image, Edit Trace does not work.

2. Select Edit Trace. The first caliper (manual trace caliper) appears on the center of the image. Use the **Trackball** to move the caliper on the trace line to the start point.

*NOTE: To cancel Edit Trace at this time, press **Clear**, **Scan**, or **Freeze**.*

3. Press **Set** to fix the first caliper. The second caliper appears. Edit the trace manually using the second caliper.

The Ellipse control is used to edit the trace.

*NOTE: When pressing the **Clear** key once at this time, the second caliper disappears and the first caliper appears in the center of the image.*

*NOTE: If you press **Scan** or **Freeze** at this time, the caliper is automatically fixed and the result window updates.*

4. Press **Set** to fix the second caliper. The trace and the result window update. The trace data (TAMAX and TAMEAN) are updated, though the other points (e.g. PS, ED) are not updated by trace. The points can be edited with **Cursor Select**.

NOTE: While in Edit Trace, Cursor Select is disabled.

5. Repeat Edit Trace as needed.

Doppler Auto Calc Average Cycle

When using Auto Calc, a selection is available to average a number of cycles automatically. There is also a preset selection in the Utility Imaging PW page for this feature. When using average cycle:

- Selected cardiac cycle lines display on the image. Point calipers are not displayed.
- When changing the number of cycles from 1 to >1, all the data is reacquired from the image, recalculated and updated.
- When multiple cycles are selected in AutoCalc, the average values calculate and display automatically.
- When selecting Peak Value (PV), average cycle is not available.

NOTE: You cannot edit the lines while in Average Cycle. Cursor Select is not available at that time.

NOTE: Average Cycle data is acquired from the display image area only, for both live and frozen. The average cycle data fails if the setting for the number of cycles is larger than the number of image cycles.

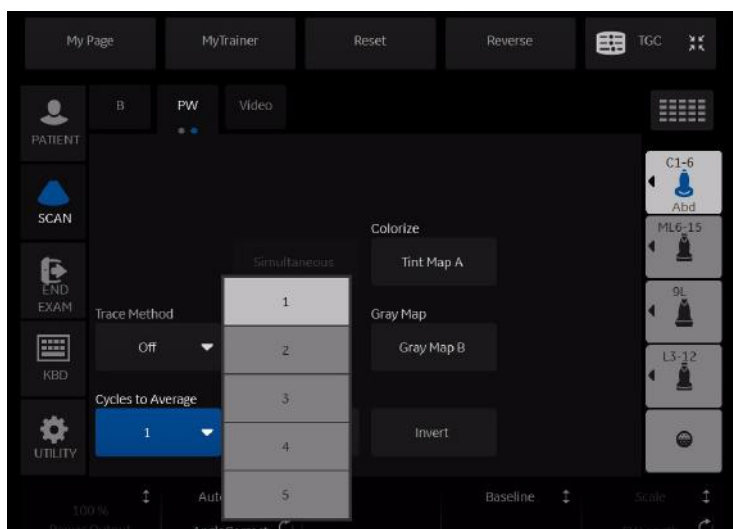


Figure 2-7. PW Touch Panel (Page 2)

Volume Flow - Manual Calc

You perform a manual Volume Flow measurement using the TAMAX plus a Volume Flow coefficient compensation.

1. To perform the Volume Flow measurement using the TAMAX plus a Volume Flow coefficient compensation, in Utility-->Measure-->Advanced, select the following:
 - Trace = Manual
 - Vol Flow Method = TAMAX [you MUST also select a Volume Flow coefficient for use with TAMAX.]
 - Vol Flow Compensation with TAMAX = [select value from 0.5 to 1.0]
2. Set Auto Calcs to Off via Doppler Mode-->Modify Auto Calcs-->Off.
3. Select a folder in Doppler Mode-->select a calculation folder-->select Show All.
4. Select **Volume Flow**. You'll notice that TAMAX is automatically selected.

NOTE: Ensure that you have placed the caliper in the spectral window when selecting the Volume Flow measurement.

5. Trace the TAMAX. The system prompts you to "Mark the first point on the spectral doppler." Press **Set**.
6. The system prompts you to "Trace the velocity spectrum boundary." Press **Set**.

NOTE: You can back up while tracing the TAMAX by using the Trackball.

7. Trace the vessel diameter. The system prompts you to "Mark first point of vessel diameter for volume flow calculation." Press **Set**.
8. The system prompts you to "Mark last point of vessel diameter for volume flow calculation." Press **Set**.
9. The Volume Flow is calculated in ml/min.

Volume Flow - Auto Calc

You can perform an automatic Volume Flow measurement using TAMEAN or using the TAMAX and a Volume Flow coefficient.

1. To perform the Volume Flow measurement using the TAMEAN, in Utility-->Measure-->Advanced, select the following:

- Trace = Auto
- Vol Flow Method = TAMEAN

OR, to perform the Volume Flow measurement using the TAMAX plus a Volume Flow coefficient compensation, select the following:

- Trace = Auto
- Vol Flow Method = TAMAX [if you use TAMAX, you MUST also select a Volume Flow coefficient for use with TAMAX.]
- Vol Flow Compensation with TAMAX = [select value from 0.5 to 1.0]

2. Set Auto Calcs to Live via Doppler Mode-->Modify Auto Calcs-->Live.
3. Perform the scan.
4. Select **Volume Flow** via Doppler Mode-->Modify Auto Calcs-->VOLUME FLOW. The system prompts you through the measurement.
5. Take vessel diameter for volume flow calculation. Set the first cursor.
6. Mark last point of vessel diameter for volume flow calculation. Press **Set**.
7. The calculation automatically completes the Volume Flow measurements as ml/min.

NOTE: *If you change the TAMAX coefficient, the Volume Flow is automatically adjusted when in Auto Calcs (but not in Manual Calcs).*

Flow Volume (FV)

Flow Volume estimates the volume of blood that flows through a vessel per unit time. It is derived from a vessel's cross-sectional diameter obtained from the B-Mode portion of the image and the mean velocity of flow in the vessel obtained from the Doppler portion of the image. It is measured in milliliters. When the FV measurement is made, FVO is automatically calculated.

To measure flow volume:

1. Select **FV** from Doppler Touch Panel.
2. Place the dotted horizontal line caliper at each of the time base on the Doppler spectrum.
 - If Trace Auto is selected, the waveform is automatically traced.
 - If Trace Auto is not selected, manually trace the desired portion of the waveform.

The caliper moves to the B-Mode area.

3. Use the Ellipse or Trace method to measure the circumference and area of the vessel.

The flow volume (FV) is calculated and displayed in milliliters. The flow volume output (FVO) is also calculated and displayed in milliliters/minute.

Flow Volume Output (FVO)

This measurement is used to measure the flow volume output in a vessel on the Doppler spectrum. It is measured in milliliters/minute. When the FVO measurement is made, FV is automatically calculated.

Auto vs. Manual Calculations

The same calculations can be performed using either manual or auto calcs.

Manual Calcs

To perform manual calcs:

1. To turn Auto Calcs off and perform manual measurements, choose **Auto Calcs -> OFF** on the PW tab of the Touch Panel.
2. After obtaining a waveform, press **Measure**. Choose the appropriate vessel folder or calculation. The system walks you through the measurement.

NOTE: To program which calculations are done under manual calcs when using measurement folders for measuring specific vessels, press the Utility key. Select Measure -> Doppler and program your manual calcs (Auto Calcs OFF). Each vessel must be programmed individually and saved after each change.

Auto Calcs

To perform auto calcs:

1. Ensure that the auto calcs function is on by choosing **Auto Calcs -> Frozen** or **Live** on the Doppler tab of the Touch Panel.
 - Live: Auto calculation activates when the system is in real-time.
 - Frozen: Auto calculation activates when you press Freeze.
 - Off
2. After obtaining a waveform, press **Measure**. Choose the appropriate vessel folder, side and location. The measurements that are pre-programmed are performed automatically and entered in the worksheet.

To modify auto calcs:

1. Select **Modify Auto Calcs** on the Touch Panel.
2. Choose the measurements to be performed with this preset.
3. To save these measurements:
 - If this is a temporary change, press **Return**.
 - If this is a permanent change, select **Save as default**.

The measurements are saved and can be performed with the auto calcs function.

Edit Auto Calcs

Auto Calcs can be edited after taking an Auto Trace measurement.

1. After taking an Auto Calc with a trace, select the measurement result on the result window. The Edit Trace menu window appears.

NOTE: *If the system cannot take the trace data correctly from the image, Edit Trace does not work.*

2. Select Edit Trace. The first caliper (manual trace caliper) appears on the center of the image. Use the **Trackball** to move the caliper on the trace line to the start point.

NOTE: *To cancel Edit Trace at this time, press **Clear**, **Scan**, or **Freeze**.*

3. Press **Set** to fix the first caliper. The second caliper appears. Edit the trace manually using the second caliper. The Ellipse control is used to edit the trace.

NOTE: *When pressing the **Clear** key once at this time, the second caliper disappears and the first caliper appears in the center of the image.*

NOTE: *If you press **Scan** or **Freeze** at this time, the caliper is automatically fixed and the result window updates.*

4. Press **Set** to fix the second caliper. The trace and the result window are updated. The data is retaken from the trace and updated.

NOTE: *While in Edit Trace, Cursor Select is disabled.*

The trace data (TAMAX and TAMEAN) is updated, but the other selections (e.g. PS, ED) are not updated by trace. The points can be edited using **Cursor Select** if needed.

5. Repeat Edit Trace as needed.

Modify Auto Calcs

When you select this key, the Modify Calculation menu is displayed as below. In this menu, you select parameters to display in the Auto Vascular Calculation window. Only parameters that can be used by the calculation are displayed.

Select **Save as Default** to save the selected parameters as the default calculations for this application.

Select **Return** to return to the previous Touch Panel screen.

If you select **PV**, all selected parameters are turned off. When you deselect **PV**, the system returns to the previously selected calculation.

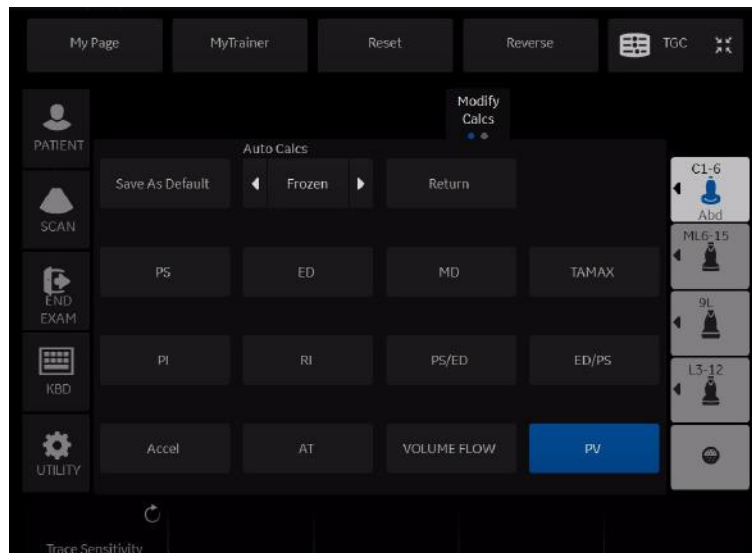


Figure 2-8. Modify Auto Calculation Menu (Page1)

M-Mode Measurements

Basic measurements that can be taken in the M-Mode portion of the display are:

- Tissue Depth (Distance)
- Time Interval
- Time Interval and Velocity



CAUTION

DO NOT perform a depth measurement using 4D probes.

NOTE: *The following instructions assume that you do the following:*

1. In the B-Mode part of the display, scan the anatomy you want to measure.
2. Go to the M-Mode part of the display.
3. Press **Freeze**.

Tissue depth

Tissue depth measurement in M-Mode functions the same as distance measurement in B-Mode. It measures the vertical distance between calipers.

1. Press **Measure** once; an active caliper with a vertical and horizontal dotted line displays.
2. To position the active caliper at the most anterior point you want to measure, move the **Trackball**.
3. To fix the start point, press **Set**.
The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the most posterior point you want to measure, move the **Trackball**.
5. To complete the measurement, press **Set**.

The system displays the vertical distance between the two points in the Results Window.

Time interval

To measure a horizontal time interval and velocity:

1. Press **Measure**. Press the top Trackball key to select Time; an active caliper with vertical and horizontal dotted lines displays.
2. To position the caliper at the start point, move the **Trackball**.
3. To fix the first caliper, press **Set**. The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**. The system displays the time interval between the two calipers in the Results Window.

Slope (Time interval and Velocity)

To measure time and velocity between two points:

1. Press **Measure**. Press the top Trackball key to select Slope; an active caliper with vertical and horizontal dotted lines displays.
2. To position the active caliper at the start point, move the **Trackball**.
3. To fix the start point, press **Set**.
The system fixes the first caliper and displays a second active caliper.
4. To position the second caliper at the end point, move the **Trackball**.
5. To complete the measurement, press **Set**.
The system displays time(s) and slope between the two points in the Results Window.

To view a worksheet

To view a worksheet, select **Worksheet** on the Touch Panel.

OR

Select **Worksheet** on the measurement summary window.

The system displays the worksheet for the current study.

GE Healthcare									
10/30/19 10:26:45AM		ADM TESTJK							
Origin	LMP	LMP	BBT	GA	EDD(LMP)				
Fetus A/I	CUA	18w1d +/- 1w0d	EDD(CUA)	03/31/2020					
FetusPos	PLAC	Ref.Physician	Page	1/1					
B Mode Measurements									
BPD(Hadlock)	id	5.87 cm	3.21	2.94	11.47	Avg.	24w0d	1w5d	
HC(Hadlock)	id	11.36 cm	11.52	12.66	9.92	Avg.	15w4d	1w1d	
OFD(HC)		4.54 cm	4.64	5.12	3.85	Avg.		1w1d	
AC(Hadlock)	id	10.45 cm	10.53	10.38		Avg.	16w3d	1w5d	
FL(Hadlock)	id	2.25 cm	2.29	2.21		Avg.	16w5d	1w3d	
ZD Calculations									
EFW(AC,BPD,FL,HC) Hadlock		163.53g +/- 24.53g		(6oz +/- 1oz)					
CII(Hadlock)	-> 129.47	(70.00-86.00)		FL/AC(Hadlock)		21.51 (-)			
FL/BPD(Kohler)	38.30 (-)			FL/HC(Hadlock)		-> 19.79 (15.84-18.04)			
HC/AC(Campbell)	1.09 (1.08-1.27)								
Exit									

Figure 2-9. OB Worksheet

The OB Worksheet has three sections of information:

1. Patient data
2. Measurement information
3. Calculation information

To return to scanning, do one of the following:

- Select **Worksheet**.
- Press **Esc**.
- Select the **Exit** button.

To view a worksheet (continued)

To view a different worksheet, select the worksheet key for the desired worksheet.

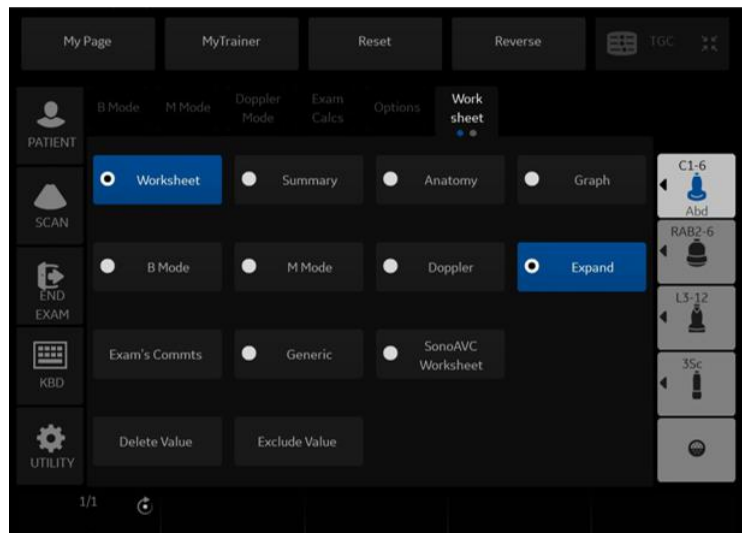


Figure 2-10. Worksheet Display Touch Panel

To view worksheet data for a particular mode, select the key for that mode. To view a worksheet with data for more than one mode, select **Expand**. When Expand is selected, it defaults to view all measurements, noted by mode, on the worksheet.

If a worksheet has more data on a second page, to view the next page, adjust the **Page Change** control.

To edit a worksheet



HINTS

Some fields on the worksheet are view only, and others you can change or select. To easily see which fields you can change or select, move the **Trackball**. As the cursor moves over a field that you can change or select, the field is highlighted.

Change data

1. Select **Worksheet** from any page of the Vascular Calculation Touch Panel.
2. Position the cursor at the field you want to change by moving the **Trackball**.
The cell is highlighted. Press **Set**. The field backlights.
3. Type the new data in the field and move the cursor to another place. Press **Set**. The new data, displayed in blue with an asterisk, is appended to the updated value and resultant value to indicate that it was manually entered.

The average measurements, calculations and ratios are automatically updated to reflect the edited values.

NOTE: *If the user moves the cursor to the edited value and presses the **Set** key once, the value returns to the original value before the edit was made.*

Exclude data

When the user selects a particular value on the Worksheet and selects **Exclude Value**, this value is excluded from result line and resultant value is re-calculated without this value and also calculation values using this value is 'blank'.

1. To position the cursor at the field you want to delete or exclude, move the **Trackball**. The field is highlighted.
2. Do one of the following:
 - To exclude the field, select **Exclude Value**.
The data in the field is not visible and is not included in worksheet calculations.
 - To include a value that you previously excluded, select **Exclude Value**.

To edit a worksheet (continued)

Delete data

1. Select **Worksheet** from any page of the Vascular Calculation Touch Panel Menu.
2. Position the cursor at the field you want to delete or exclude by moving the **Trackball**.
The field is highlighted.
3. Select **Delete Value** from the Touch Panel.

For Example:

1. If the user measured RI 4 times, the latest 3 sets of RI measurements are displayed in the worksheet.

Table 2-7: Example of Latest Measurements in Worksheet

Result Number	#2	#3	#4
PS	0.500	0.600	0.700
ED	0.100	0.200	0.300
RI	0.800	0.667	0.571

2. Then, the user deleted PS value of #3 from the worksheet.
3. Then, if the user deletes the PS value in column #3 from the worksheet, the whole set of measurements from column #3 is deleted from the worksheet and measurements from column #1 are shifted and displayed, as below.

Table 2-8: Example of Latest Measurements in Worksheet

Result Number	#1	#2	#4
PS	0.500	0.600	0.700
ED	0.100	0.200	0.300
RI	0.800	0.667	0.571

To edit a worksheet (continued)

Examiner’s comment

To type a comment on a worksheet:

- 1. Select **Examiner’s Comments**. The Examiner’s Comments window opens.
- 2. Type comments about the exam.
- 3. To close the Examiner’s Comments window, select **Examiner’s Comments**.

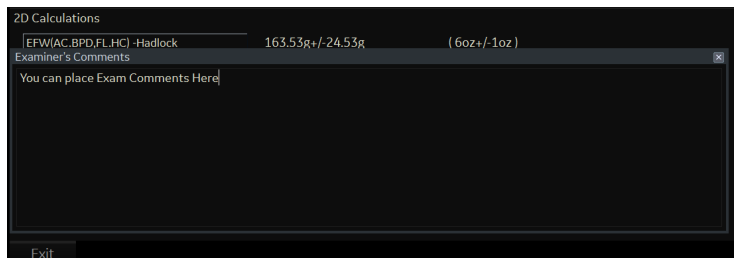


Figure 2-11. Examiner’s comments field

Volume measurement value off

- 1. Select the method type **Off**. The value field becomes blank.

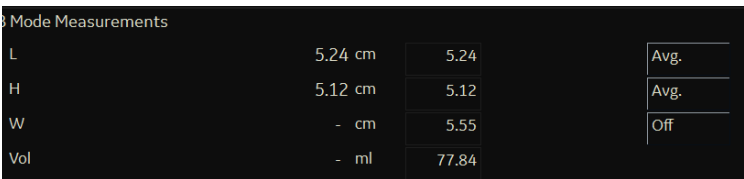


Figure 2-12. Volume Parameter Off

To edit a worksheet (continued)

To select a method

1. Move the cursor over the value in the method column and press **Set**.
2. The pull-down menu displays. Move the cursor to select the method and press **Set**. The selected method is displayed in the column.

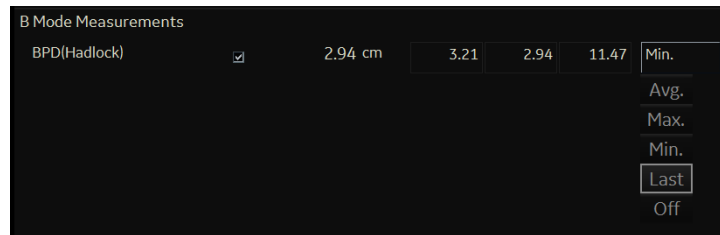


Figure 2-13. Pop-up menu of methods - example

1. Avg.: Average of the measurements taken
2. Max.: Maximum measurement
3. Min.: Minimum measurement
4. Last: Last measurement that was taken

Delete All Worksheet Values

You can delete all worksheet values on a worksheet.

1. When the Worksheet is displayed on the monitor, press the **Clear** key; the following warning message appears:

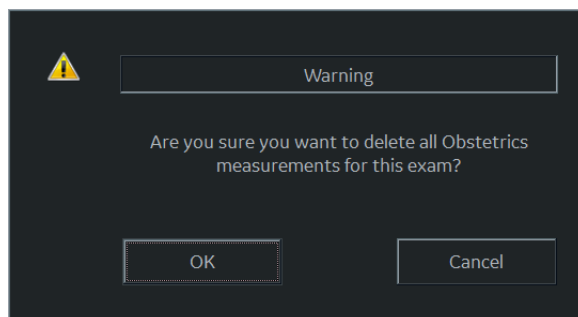


Figure 2-14. Delete All Warning Message

2. Select **OK** to delete all.
Select **Cancel** to cancel the deletion.

Setting up the Off-Line Paper Printer

You can connect an off-line paper printer via the USB connection (need USB Isolator).

Plug in devices to the USB isolator. Then insert a cable of USB isolator to the USB port located at the rear of the system WHILE the LOGIQ P8/P9/P10 is NOT powered up.



ONLY plug in devices to the USB ports located at the rear of the system WHILE the LOGIQ P8/P9/P10 is NOT powered up. If you plug in a device while the LOGIQ P8/P9/P10 is powered on, your system may become unusable.



DO NOT place an off-line paper printer inside the patient environment. This assures compliance to leakage current.

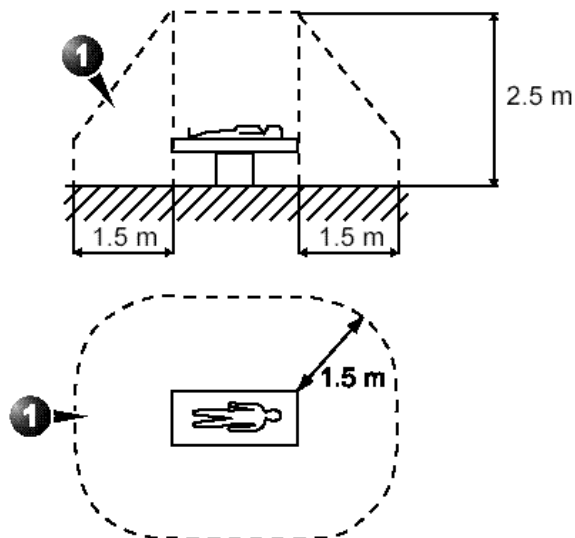


Figure 2-15. Patient Environment

Chapter 3

After the Exam is Over

*Probe Overview, System Presets, Data Backup,
Configuring Connectivity, Electronic ocumentation,
Contact Information, System Data, System Care and
Maintenance, and Accessories*

Probe Overview

Probe Naming Conventions

Table 3-1: Probe Naming Convention

Type	Application	Frequency	Connector Type
C=Convex L=Linear M=Matrix S=Sector R=Real time 4D	AB=Abdominal IC=Intracavitary NA=Neonatal SP=Small Parts	"1-5"	RS D=DLP

Probe handling and infection control

This information is intended to increase user awareness of the risks of disease transmission associated with using this equipment and provide guidance in making decisions directly affecting the safety of the patient as well as the equipment user.

Diagnostic ultrasound systems utilize ultrasound energy that must be coupled to the patient by direct physical contact. Depending on the type of examination, this contact occurs with a variety of tissues ranging from intact skin in a routine exam to recirculating blood in a surgical procedure. The level of risk of infection varies greatly with the type of contact.

One of the most effective ways to prevent transmission between patients is with single use or disposable devices. However, ultrasound transducers are complex and expensive devices that must be reused between patients. It is very important, therefore, to minimize the risk of disease transmission by using barriers and through proper processing between patients.



Adequate cleaning and disinfection are necessary to prevent disease transmission. It is the responsibility of the equipment user to verify and maintain the effectiveness of the infection control procedures in use.



To minimize the risk of infection from blood-borne pathogens, you must handle the probe and all disposables which have contacted blood, other potentially infectious materials, mucous membranes, and non-intact skin in accordance with infection control procedures. You must wear protective gloves when handling potentially infectious material. Use a face shield and gown if there is a risk of splashing or splatter.

Endocavitary probe safety

If the sterilization solution comes out of the endocavitary probe, please follow the cautions below.



Sterile/sanitary sheaths are to be used on the probe during its actual use with patients. Wearing gloves protects the patient and operator.



Sterilant Exposure to Patient (e.g., Cidex)-Contact with a sterilant to the patient's skin or mucous membrane may cause an inflammation. If this happens, refer to the sterilant's instruction manual. Sterilant Exposure from Probe Handle/Connector to Patient (e.g., Cidex)-DO NOT allow the sterilant to contact the patient. Only immerse the probe to its specified level. Ensure that no solution has entered the probe's handle before scanning the patient. If sterilant comes into contact with the patient, refer to the sterilant's instruction manual. Endocavitary Probe Point of Contact-Refer to the sterilant's instruction manual.

Cleaning and disinfecting probes



WARNING

Ultrasound transducers can easily be damaged by improper handling and by contact with certain chemicals. Failure to follow these precautions can result in serious injury and equipment damage.

Use only germicides that are listed in the Probe Care Card enclosed with the probe. In addition, refer to the local / national regulations.



WARNING

Do not steam, heat autoclave on general surface probes.



CAUTION

You **MUST** disconnect the probe from the LOGIQ P8/P9/P10 prior to cleaning/disinfecting the probe. Failure to do so could damage the system.



CAUTION

Avoid cross-contamination, follow all infection control policies established by your office, department or hospital as they apply to personnel and equipment.



CAUTION

Inspect the probe before and after each use for damage or degradation to the housing, strain relief, lens, seal, cable and connector. **DO NOT** use a transducer which appears damaged until functional and safe performance is verified. A thorough inspection should be conducted during the cleaning process.



CAUTION

Take extra care when handling the lens face of the ultrasound transducer. The lens face is especially sensitive and can easily be damaged by rough handling. **NEVER** use excessive force when cleaning the lens face.

Cleaning and disinfecting probes (continued)



CAUTION

Probes for neuro surgical intra-operative use must NOT be sterilized with liquid chemical sterilants because of the possibility of neuro toxic residues remaining on the probe. Neurological procedures must be done with the use of legally marketed, sterile, pyrogen free probe sheaths.



Biological Hazard

CREUTZFELD-JACOB DISEASE

Neurological use on patients with this disease must be avoided. If a probe becomes contaminated, there is no adequate disinfecting means.

Probe Cleaning Process

To clean the probe:

NOTE: *Do not immerse the probe into any liquid beyond the level specified for that probe (See 'Immersion Level' on page 3-13 for more information.). Never immerse the transducer connector into any liquid.*



CAUTION

- Do not use paper products or products that are abrasive when cleaning the probe. They damage the soft lens of the probe.
 - Before storing the probes, ensure that they are thoroughly dry. If it is necessary to dry the probe after cleaning, blot the probe with a soft cloth.
1. Inspect the probe's lens, cable, casing, and connector for cracks, cuts, tears, and other signs of physical damage.
 2. Disconnect the probe from the ultrasound console and remove all coupling gel from the probe by wiping with a soft cloth and rinsing with flowing water.

NOTE: *DO NOT wipe the probe with a dry cloth.*

3. Soak the probe head in water. Scrub the probe as needed using a soft sponge, gauze, or cloth to remove all visible residue from the probe surface.
4. Rinse the probe with enough clean potable water.
5. Air dry or dry with a soft cloth.
6. After cleaning, inspect the probe's lens, cable, casing and connector. Look for any damage that would allow liquid to enter the probe. Also, inspect the probe functionality by live scan. If any damage is found, do not use the probe until it has been inspected and repaired/replaced by a GE service representative.

Choosing a Disinfectant

When choosing a disinfectant, determine the required level of disinfection. If the possibility of cross-contamination or exposure to unhealthy or non-intact skin exists, then high level disinfection should be performed. Good hand hygiene practice is highly recommended to help further reduce the risk of cross-contamination.



WARNING

Disinfectant wipes and topical spray products are not FDA cleared high level disinfectants and do not provide adequate protection should the probe become cross contaminated or in contact with unhealthy or non-intact skin.

NOTE:

For additional information about cleaning and disinfection, refer to the recommendations of the Association for Professionals in Infection Control (APIC), the U.S. Food and Drug Administration (FDA), and the U.S. Centers for Disease Control (CDC). For country-specific disinfection regulations, check with your local regulatory infection control authorities.



HINTS

A validated, high-level disinfection process, combined with the use of a sterile gel and a probe cover/sheath is an accepted method of infection control for Ultrasound probes. Adequate records or a log book detailing the time, date, disinfection method, and verification of disinfectant effectiveness or test results is recommended. For more information about establishing an evidence based disinfection protocol for your practice, refer to the FDA, CDC, HICPAC, APIC, or the Joint Commission websites.

Disinfecting probes

In order to provide users with options in choosing a germicide, GE routinely reviews new medical germicides for compatibility with the materials used in the transducer housing, cable and lens. Although a necessary step in protecting patients and employees from disease transmission, liquid chemical germicides must also be selected to minimize potential damage to the transducer.

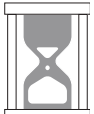
Refer to the Probe Care Card enclosed in the probe case or to the following web site for the latest list of compatible cleaning solutions and disinfectants.

- http://www3.gehealthcare.com/Products/Categories/Ultrasound/Ultrasound_Probes#cleaning
- http://www3.gehealthcare.com/en/Products/Categories/Ultrasound/Ultrasound_Probes#cleaning

Table 3-2: Description of Pictogram on Probe Care Cards

Pictogram	Description
	"ATTENTION" - Consult accompanying documents" is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.
	"CAUTION" - Dangerous voltage (the lightning flash with arrowhead) is used to indicate electric shock hazards.
	Biohazard - Patient/user infection due to contaminated equipment. Usage • Cleaning and care instructions • Sheath and glove guidelines
	Ultrasound probes are highly sensitive medical instruments that can easily be damaged by improper handling. Use care when handling and protect from damage when not in use.
	Do not immerse the probe into any liquid beyond the level specified for that probe. Refer to the user manual of the ultrasound system.

Table 3-2: Description of Pictogram on Probe Care Cards (Continued)

Pictogram	Description
	Since there is a possibility of having negative effects on the probe, observe the specified immersing time by the germicide manufacturer strictly. Do not immerse the probe in liquid chemical germicides more than the time prescribed in the care card.
	“Consult accompany document” - Refer to the ultrasound system user manual for important probe care and cleaning instruction.

Disinfecting probes (continued)

Use additional precautions (e.g. gloves and gown) when decontaminating an infected probe.

NOTE: *About the recommended disinfectant, review the probe care card that is packed with each probe.*

Low-level disinfection

1. After cleaning, the probe and cable may be wiped with a tissue sprayed with a recommended disinfectant.

NOTE: *In order for liquid chemical germicides to be effective, all visible residue must be removed during the cleaning process. Thoroughly clean the probe, as described earlier before attempting disinfection.*

2. After disinfecting, inspect the probe's lens, cable, casing and connector. Look for any damage that would allow liquid to enter the probe. Also, inspect the probe functionality by live scan. If any damage is found, do not use the probe until it has been inspected and repaired/replaced by a GE service representative.

NOTE: *See 'Probe Cleaning' on page 3-121 for more information.*

Disinfecting probes (continued)

High-level disinfection

High-level Disinfection destroys vegetative bacteria; lipid & non-lipid viruses, fungi and, depending highly on time of contact, is effective on bacterial spores.

1. Prepare the high-level disinfectants solutions according to the manufacturer's instructions. Be sure to follow all precautions for storage, use and disposal.

NOTE: *In order for liquid chemical germicides to be effective, all visible residue must be removed during the cleaning process. Thoroughly clean the probe, as described earlier before attempting disinfection.*

2. Place the cleaned and dried probe in contact with the germicide for the time specified by the germicide manufacturer. High-level disinfection is recommended for surface probes and is required for endocavitary and intraoperative probes (follow the germicide manufacturer's recommended time).

NOTE: *DO NOT soak probes in liquid chemical germicide for longer than is stated by the germicide instructions for use. Extended soaking may cause probe damage and early failure of the enclosure, resulting in possible electric shock hazard.*

3. Rinse the part of the probe which was in contact with the germicide according to the germicide manufacturer's instructions. Flush all visible germicide residue from the probe and allow to air dry.

NOTE: *Do not immerse the probe into any liquid beyond the level specified for that probe. Never immerse the transducer connector into any liquid.*

4. After disinfecting, inspect the probe's lens, cable, casing and connector. Look for any damage that would allow liquid to enter the probe. Also, inspect the probe functionality by live scan. If any damage is found, do not use the probe until it has been inspected and repaired/replaced by a GE service representative.

Immersion Level

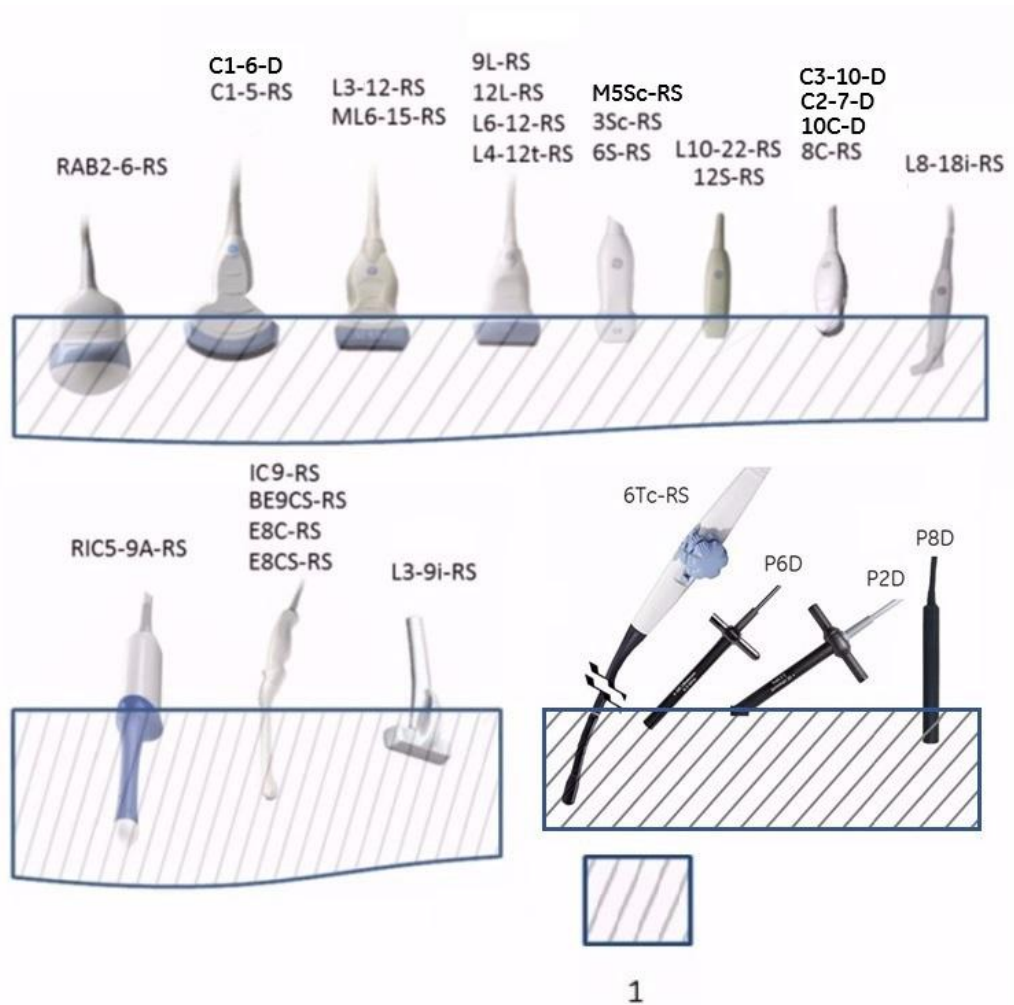


Figure 3-1. Probe Immersion Level

1. Fluid Level

Inspecting probes



CAUTION

If any damage is found, DO NOT use the probe until it has been inspected and released for further use by a GE service representative.

Before each use

1. Inspect the probe's lens, cable, casing, and connector for cracks, cuts, tears, and other signs of physical damage.
2. Test the functionality of the probe.

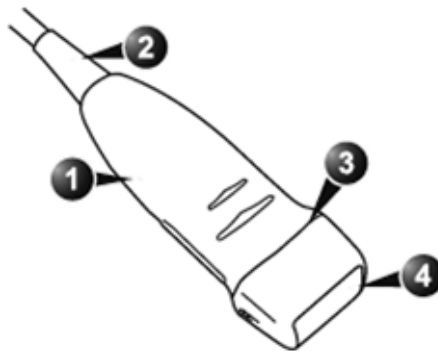


Figure 3-2. Probe parts

1. Housing
2. Strain relief
3. Seal
4. Lens

After each use

1. Inspect the probe's lens, cable, casing, and connector for cracks, cuts, tears, and other signs of physical damage.
2. Look for any damage that would allow liquid to enter the probe.

Coupling gels



Do not use unrecommended gels (lubricants). They may damage the probe and void the warranty.

About the recommended gel, review the probe care card that is packed with each probe.

Applying

In order to assure optimal transmission of energy between the patient and probe, a conductive gel or couplant must be applied liberally to the patient where scanning will be performed.



Do not apply gel to the eyes. If there is gel contact to the eye, flush eye thoroughly with water.

Precautions

Coupling gels should not contain the following ingredients as they are known to cause probe damage:

- Methanol, ethanol, isopropanol, or any other alcohol-based product
- Mineral oil
- Iodine
- Lotions
- Lanolin
- Aloe Vera
- Olive Oil
- Methyl or Ethyl Parabens (para hydroxybenzoic acid)
- Dimethylsilicone
- Polyether glycol based
- Petroleum

Sterile Ultrasound Procedures

ONLY ultrasound gel that is labeled as sterile, is sterile.

Ensure you always use sterile ultrasound gel for those procedures that require sterile ultrasound gel.

Once a container of sterile ultrasound gel is opened, it is no longer sterile and contamination during subsequent use is possible.

System Presets

Overview

System presets allows you to view or change the following parameters

- **General** – Location, Date/Time, Patient Info, Key Usage, and Utility configuration
- **System Display** - Presets related to the monitor display format.
- **System Imaging** – CINE Loop Store, Cardiac, Biopsy Guides, and Image Control and Display configuration
- **System Measure** – Measurement, Cursor, and Results Window configuration
- **Backup/Restore** – Backup, Media, EZBackup/EZMove, Restore, Detailed Restore of User Defined
- **Peripherals** – DVR, Print and Store Options, and Setup configuration
- **User Configurable Key** – BT keys, User Defined keys, Keyboard keys
- **About** – System software, patent, and image information
- **Licenses** – Licenses for software used on the LOGIQ P8/P9/P10.

Changing system parameters

To change system parameters:

1. On the Touch Panel, select **Utility**.
2. On the Touch Panel, select **System**.
The System screen is displayed.
3. On the monitor display, move the **Trackball** to select the tab that has the information you want to change.
4. Select values for the parameters you want to change.
5. To save the changes, select the **Save** button. Select **Exit** to return to scanning. In some cases, you may need to reboot the system for the change to take effect.

System/General Preset Menu

The System/General screen allows you to specify hospital name and system date and time.

Figure 3-3. System/General Preset Menu

Table 3-3: Location

Preset Parameter	Description
Hospital	Type the institution's name.
Department	Type the institution's department name.
Machine Description (1&2)	Type the machine name.
Preset Region (restart needed)	Select region (None, Americas, Asia, Europe or Japan, LATAM or PoC).
Dedicated Preset (restart needed)	Select the either Vet preset or not Vet preset (Gen)
Language (restart needed)	Select the appropriate language from the drop-down list. Note: If you select Japanese (JPN) or Chinese(CHN), only the warning and status messages and touch panel are displayed in Japanese. You can not type in Japanese or Chinese.
Units	Select metric or US units of measurement.

Table 3-3: Location

Preset Parameter	Description
Regional Options (restart needed)	Select to set up the keyboard.

Table 3-4: Date and Time

Preset Parameter	Description
Time Format	Select the time format: 12 Hr. AM/PM or 24 Hr.
Date Format	Select the date format: dd/mm/yyyy, mm/dd/yyyy, or yyyy/mm/dd.
Default Century	Select the default century for the system to use.
Date/Time (restart needed)	Select to display the Date/Time Properties window, to specify the system date, time, time zone, and to auto adjust for daylight savings time.

Table 3-5: General User Interface

Preset Parameter	Description
Color Level (restart needed)	Select System Color according to the condition of the room.

Table 3-6: Title Bar

Preset Parameter	Description
Hide Patient Data	When set to Always, patient information is removed from the scanning screen Title bar and when storing images; or you can set this to remove patient information only when storing the image (On Store); or Never. Note: Upon recall of images with measurements, Dual image, V Nav, the DICOM image is recalled. In this case, there is no patient data burned into the DICOM image. If you DO NOT want this to occur, set this to Never.
Font Size (restart needed)	Select to display patient information in the title bar using a small, medium, or Extra large font size. You need to reboot the system for this change to take effect.

Table 3-7: Trackball

Preset Parameter	Description
Speed	Set how fast you want the Trackball to move while performing actions such as tracing the anatomy. 0=Slow; 20=Very Fast
Acceleration	Set how fast you want to trackball to move across the display. 0, 1, and 2 with 0 being the slowest acceleration.

Table 3-8: Key Usage

Preset Parameter	Description
Run Fast Key speed	Select the maximum value of the key interval when running Fast Key.
Swap Print1/Freeze Key (restart needed)	Swap the control between Print 1 and Freeze key.
Enable Virtual Keyboard	If checked, the Virtual Keyboard appears automatically when selected on the Patient screen.
Auto Hide Delay Time for Virtual Keyboard (sec)	Off, 6, 8, 12, 16.

Table 3-9: Utility

Preset Parameter	Description
Prompt for Save on Exit	If selected, the system prompts you to save data when you select exit without saving.
Utility Font Size	Select the font size you want to use to view the Utility menus: Small, Medium, or Large.

Table 3-10: Scan Assistant

Preset Parameter	Description
Auto Selection	Off, Category, or Description. • Off. The Scan Assistant selection on the Patient screen is completely manual. It will say "None" when starting a new patient and you can make a selection manually if desired. • Category. Scan Assistant uses the combination of exam category (Abd, OB, etc.) and the currently-selected user to automatically select a Scan Assistant program. It chooses the same program that was used the last time this combination of exam category and user. The user can manually override this auto selection. • Description. Scan Assistant uses the combination of the exam description (often auto fills in if the patient was selected from the worklist) and the currently selected user to automatically select a Scan Assistant program. It will choose the same program that was used the last time this combination of exam description and user was selected. The user can manually override this auto selection. If the exam description is blank then it will do the auto selection based on Category as described in the previous paragraph.
Always Use Doppler Cursor	Use the Doppler Cursor when you activate Scan Assistant.

Table 3-11: Smart Start (Start Assistant)

Preset Parameter	Description
Use Smart Start (Start Assistant)	Checked to use Smart Start (Start Assistant) by default.
Edit Mappings	Select to open Smart Start (Start Assistant) Mapping Editor.

Table 3-12: Touch TGC

Preset Parameter	Description
Auto Hide Delay Time for Deigital TGC (sec)	Off, 6, 8, 121, 16.
Category dependent user defined digital TGC	Check to select.
Save the TGC curve when Oversrite Preset	Check to select.

Table 3-13: Extend Battery for Scanning

Preset Parameter	Description
Auto Switch to Power Saving Mode	Select 10, 30 minutes or 1 hour for automatically switching to Power Saving mode after the time specified on battery operation. Select "Never" to never switch to Power Saving mode. Select "Always" to always switch to Power Saving mode. (Extended battery option is required).

Table 3-14: Extended Battery for Scanning/Power Assistant

Preset Parameter	Description
Battery Low Warning with Sound	If checked, the system plays a beep sound when the battery capacity is low.

System/System Display Preset Menu

The System/System Display screen allows you to specify parameters for Image Display.



Figure 3-4. System/System Display Preset Menu

Table 3-15: Image Display

Preset Parameter	Description
Image Display Area	Select Image Display Area Size: Default, Large, Extra Large
Image size (probe selection required)	Select Default, Medium or Large.

Table 3-16: Side Panel Content

Preset Parameter	Description
Side Clipboard	Display On/Off.
My Desktop	
Measurement Summary	

Table 3-17: Clipboard

Preset Parameter	Description
Review Image	Display On/Off
Show Zoom Reference Image	
Bottom Clipboard	Display On (Always display)/ Off (Never display)/ Auto (Display whenever there is no side clipboard)
Bottom Clipboard Auto Dimming	On/Off When the windows pointer is moved over the clipboard area, the pointer is undimmed.
Side Clipboard Auto Dimming	

Table 3-18: Configuration Application (requires reboot)

Preset Parameter	Description
Abdomen	Display On/Off in the Model Screen
Obstetrics	
Gynecology	
Cardiology	
Vascular	
Urology	
Pediatrics	
Small Parts	
PoC	

Table 3-19: Use Wide Screen for...

Preset Parameter	Description
Dual Screen	Automatically switch to Wide Screen when in Dual Screen.
DualView (Simultaneous)	Automatically switch to Wide Screen when in Simultaneous DualView Screen.
Contrast DualView	Automatically switch to Wide Screen when in Contrast DualView Screen.
LOGIQView	Automatically switch to Wide Screen when in LOGIQView.
QAnalysis	Automatically switch to Wide Screen when in QAnalysis. Side by Side Timeline automatically switches to wide screen when in Timeline mode.
Display Format Horizontal Timeline	Side by Side Timeline automatically switches to wide screen when in Timeline mode.

Table 3-19: Use Wide Screen for... (Continued)

Preset Parameter	Description
Single Image	On/Off/Auto Auto turns on wide screen if 2D image exceeds width of non wide screen image area.

Table 3-20: Display

Preset Parameter	Description
Horizontal Scale	Select to display width markers.
TGC Display	Select to display TGC curve.
PW Velocity Units in cm/s	Select to change scale on timeline from centimeters per second to meters per second.
Shear Elasto Display Units	Select m/s or kPa.
Shear Stiffness and Velocity Measurement	Select to take both Stiffness and Velocity measurement.
Shear Elasto Color Map	Select Red as Hard or Blue as Hard.
Strain Elasto Color Map	Select Red as Hard or Blue as Hard.
UGAP Display Units	Select dB/cm/Mhz or db/m
Image Parameter Size (restart needed)	Choose Small, Medium, Large, or Extra Large. Must reboot the system.
Highlight Image Parameter Changes	Select if you want the display to indicate which controls you adjusted by highlighting the new value on the display.
Live/Freeze Indicator	Display On/Off.
Enable DICOM grayscale display mode (GSDF)	Enable On/Off. Adjust Gamma curve on DICOM GSDF.
Room profile	Enable Last used/. Adjust Room Profile.

System/System Imaging Preset Menu

The System/System Imaging screen allows you to specify Biopsy Guides, VNav Brackets, Compare Assistant and Imaging Control.

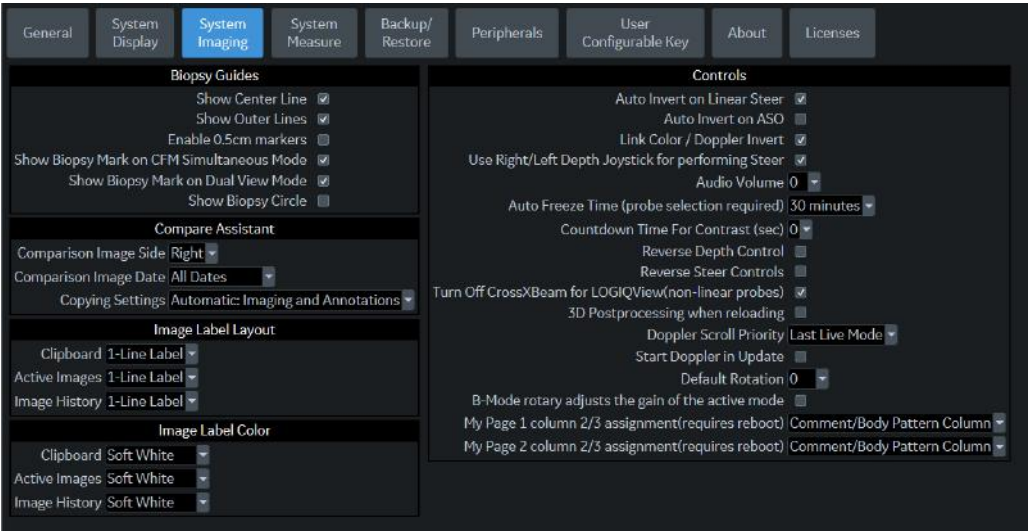


Figure 3-5. System/System Imaging Preset Menu

Table 3-21: Biopsy Guides

Preset Parameter	Description
Show Center Line	Displays center biopsy guideline.
Show Outer Lines	Displays outer biopsy guidelines.
Enable 0.5cm markers	Activates biopsy depth markers every 0.5cm.
Show Biopsy Mark on CFM Simultaneous Mode	Displays the Biopsy Guideline on the image while in Simultaneous Mode.
Show Biopsy Mark on Dual View Mode	Displays the Biopsy Guideline on the image while in Dual View Mode.
Show Biopsy Circle	Select to display a guide circle control on the monitor and Trackball key during Biopsy.

Table 3-22: Controls

Preset Parameter	Description
Auto Invert on Linear Steer	When selected, for auto calcs, automatically inverts the timeline if needed when using ASO.
Auto Invert on ASO	Automatically inverts the spectrum with ASO.
Link Color/Doppler Invert	When selected, the Doppler timeline scale inverts along with the color ROI.

Table 3-22: Controls (Continued)

Preset Parameter	Description
Use Right/Left Depth Joystick for performing Steer	When selected, Right/Left Depth Joystick activates for performing Steer.
Audio Volume	Adjusts the Doppler audio volume via a drop-down menu (for example, 0=softer; 20=louder).
Auto Freeze Time (probe selection required)	Select 10, 30 or 60 minutes to freeze the image automatically after the time specified of inactivity or Never to never freeze the image automatically.
Countdown Time For Contrast (Sec)	Specify time for the Contrast Clock to countdown during a contrast study, 0 (off), 3, and 5 seconds.
Reverse Depth Control	Changes key direction for the Depth control.
Reverse Steer Controls	Changes key direction for the Steer controls.
Turn Off CrossXBeam for LOGIQView (non-linear probe)	Deactivates CrossXBeam when you activate LOGIQView.
3D Postprocessing when reloading	When selected, the system re-processes the recalled 3D CINE Loop.
Doppler Scroll Priority	Set to 2D, Doppler, or Last Live Mode.
Start Doppler in Update	Select to allow the B/CF image to continue live while the PW image is frozen in triplex.
Default Rotation	Select 0 or 180 to default rotation image.
B-Mode rotary adjusts the gain of the active mode	If checked, use B rotary as the active tab mode gain rotary.
MyPage 1 column 2/3 assignment (requires reboot)	Depending on the user's configuration, First page of MyPage has one or two columns of body patterns or comments.
MyPage 2 column 2/3 assignment (requires reboot)	Depending on the user's configuration, Second page of MyPage has one or two columns of body patterns or comments.

System/System Measure Preset Menu

The System/System Measure screen allows you to specify measurement parameters such as the type of default OB measurements and calculations. You can also define cursor and Results Window default functionality.

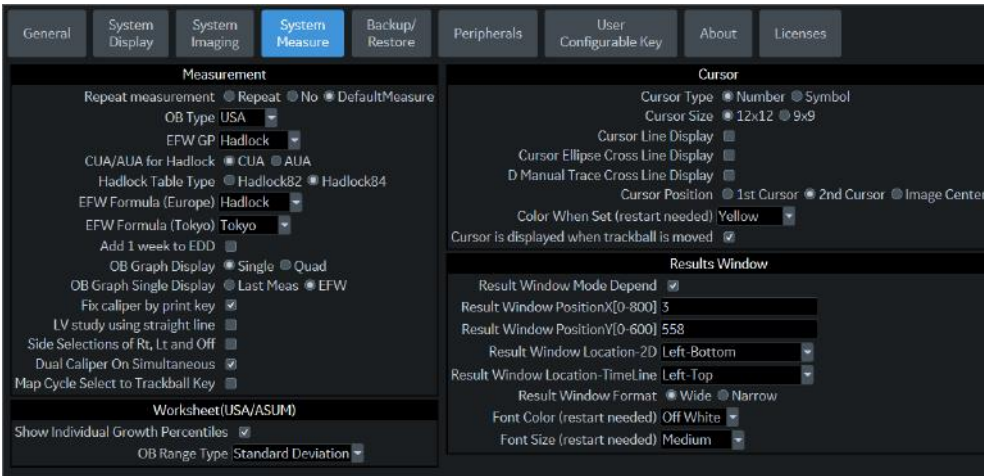


Figure 3-6. System/System Measure Preset Menu

Table 3-23: Measurement

Preset Parameter	Description
Repeat Measurement	Select No, Repeat, DefaultMeas No = After you take a measurement, you have to touch a Touch Panel key or Trackball key to start another measurement. Repeat = After you take a measurement, the system automatically starts the same measurement again. DefaultMeas = After you take a measurement, the system automatically starts a default measurement based on the current scanning mode (B-Mode = basic length measurement, M-Mode = basic length measurement, Doppler Mode = velocity measurement except after a volume flow calculation).
OB Type	Select which OB measurements and calculations studies to use: USA, Europe, Tokyo, Osaka, ASUM.
EFW GP	Select the source used to calculate EFW-GP Estimated Fetal Weight-Growth Percentile)
CUA/AUA for Hadlock	Select to use CUA (Composite Ultrasound Age) or AUA (Average Ultrasound Age) as the default
Hadlock Table Type	Select Hadlock 82 or Hadlock 84 tables
EFW Formula (Europe)	Select the source used to calculate EFW (Europe) (Estimated Fetal Weight), Shepard, Merz, Hadlock, German, Rich
EFW Formula (Tokyo)	Select the source used to calculate EFW (Tokyo) (Estimated Fetal Weight)

Table 3-23: Measurement (Continued)

Preset Parameter	Description
Add 1 week to EDD	Select to add additional week to estimated date of delivery
OB Graph Display	Select Single or Quad for displaying OB Graphs.
OB Graph Single Display	Select Last Meas or EFW Single OB Graph displayed by default.
Fix Caliper by Print key	Select to use the Print key like the Set key. <i>NOTE: If you select this during a generic volume measurement, the print key does not function like the Set key, but instead ends the measurement sequence and initiates the volume calculation based on the number of measurements taken so far.</i>
LV Study using straight line	Sets straight line as the default for 2D LV studies.
Side selections of Rt, Lt and Off	Select to use "Rt, Lt and Off" for Side Selection. When not selected, displays only "Rt and Lt".
Dual Caliper on Simultaneous	Select to enable Dual Caliper on Simultaneous.
Map Cycle to Select Trackball Key	Map "AutoCalc cycle select" to Left/Right Set key.

Table 3-24: Cursor

Preset Parameter	Description
Cursor Type	Select whether to mark measurements with numbers or symbols.
Cursor Size	Specify 12x12 or 9x9.
Cursor Line Display	If selected, after you press Set to complete a measurement, the cursor line is displayed. If not selected, after you press Set to complete a measurement, only the cursor number or symbol is displayed.
Cursor Ellipse Cross Line Display	Check box to display the cross line in Ellipse.
D Manual Trace Cross Line Display	Check box to display the cross line with the caliper.
Cursor Position	Select 1st Cursor, 2nd Cursor, or Image Center.
Color When Set (reboot)	Select white, yellow, bright red, or orange.
Cursor is Displayed when Trackball is Moved	The active cursor does not display until you move the Trackball. This assumes the following presets are set: Repeat Measurement, Repeat, Default Measurement, and Cursor.

Table 3-25: Worksheet (USA/ASUM)

Preset Parameter	Description
Show Individual Growth Percentiles	Check to display individual growth percentiles on the Worksheet.

Table 3-25: Worksheet (USA/ASUM)

Preset Parameter	Description
OB Range Type	Selections: Min-Max, Standard Deviation.

Table 3-26: Results Window

Preset Parameter	Description
Result Window Mode Depend	Select this if you want the measurement result window to be repositioned, depending on the mode.
Result Window Position X[0-800]	You can set the coordinates for the measurement result window when you do not have the result window set to be mode dependent. This is the X coordinate (left/right)
Result Window Position Y[0-600]	You can set the coordinates for the measurement result window when you do not have the result window set to be mode dependent. This is the Y coordinate (up/down)
Result Window Location-2D	Select the Result Window location on the Monitor Display: Left-Bottom, Left-Top, Right-Bottom, Right-Top, Extreme Right-Top, or Extreme Right-Bottom.
Result Window Location-Timeline	Select the Result Window location: Left-Bottom, Left-Top, Right-Bottom, Right-Top, Extreme Right-Top, or Extreme Right-Bottom.
Result Window Format	Select Wide or Narrow.
Font Color (restart needed)	Select White, Off White, Yellow, Bright Red or Orange (reboots the system)
Font Size (restart needed)	Select mini, small, medium, large, or extra large (reboots the system)

System Backup and Restore Preset Menu

Figure 3-7. System/Backup/Restore Preset Menu

Table 3-27: Backup

Preset Parameter	Description
Patient Archive	Select to back up patient data.
Report Archive	Select to back up report data.
User Defined Configuration	Select to back up the user-defined configuration settings.
Service	Select to back up Service (iLinq and Network) settings.
Backup	Select to begin the backup.

Table 3-28: Media

Preset Parameter	Description
Media	Select media type to use for backup and restore.

System Backup and Restore Preset Menu (continued)

Table 3-29: EZBackup

Preset Parameter	Description
Reminder Dialog Interval days	Specify the number of days after the last backup that you want the system to prompt you to perform an EZBackup procedure (only for moving images).
Enable Reminder Dialog	Select to activate the EZBackup reminder pop-up dialog.
Media	Select media type.

Table 3-30: Restore

Preset Parameter	Description
Patient Archive	Select to restore patient data.
Report Archive	Select to restore report data.
User Defined Configuration	Select to restore the user-defined configuration settings.
Service	Select to restore service iLinq and Network settings. CAUTION: DO NOT restore service presets on to a different LOGIQ P8/P9/P10 system. Only restore service presets to the same system.
Restore	Select to begin the restore process for the selected configuration files.

The detailed section of this menu allows you to restore one area at a time from the user defined configuration. This allows you to selectively restore what you want to restore across multiple machines. Check the box(es) you want to restore, insert the appropriate media, and press Restore.

NOTE: *When you restore backup data from the Utility menu, the LOGIQ P8/P9/P10 application usually restarts automatically when the restoring is complete.*

System Backup and Restore Preset Menu (continued)

Table 3-31: Detailed Restore

Preset Parameter	Description
Imaging Presets	Select to restore imaging presets.
Connectivity Configuration	Select to restore connectivity configurations.
Measurement Configuration	Select to restore measurement configurations.
Comment/Body Pattern Libraries	Select to restore comment and body pattern configurations.
Protocol Template	Select to restore Protocol Template.
Report Templates (Same software version only)	Select to restore Report templates.
3D/4D	Select to restore 3D.
Fast Key	Select to restore Fast Key.
Utility-->Application Presets	Select to restore Utility--> Application presets.
Custom Programs	Select to restore Scan Assistant programs.
All Others	Select to restore all other configurations not listed in the Detailed Restore section. This includes parameters defined on the System preset menus.
Restore	Select to begin the restore process for the selected configuration files.

System/Peripherals Preset Menu

The System/Peripherals screen allows you to specify parameters for the DVR and printers.

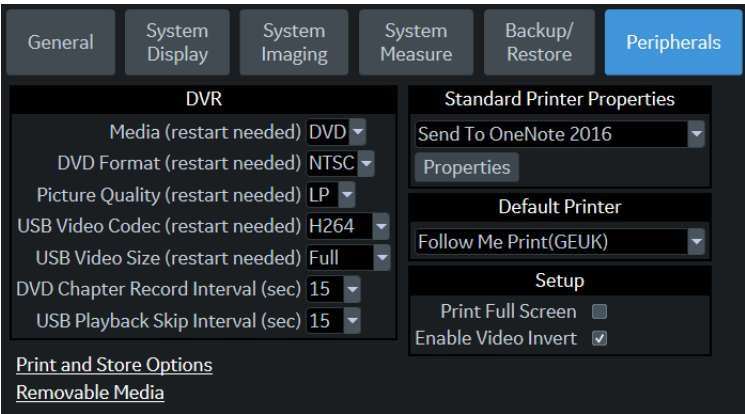


Figure 3-8. System/Peripherals Preset Menu

Table 3-32: DVR

Preset Parameter	Description
Media (restart needed)	Select recording media: Media: DVD or USB storage.
DVD Format (restart needed)	Select DVD video format: NTSC or PAL.
Picture Quality (restart needed)	Select from SP, HQ, SP, or EP.
USB Video Codec (restart needed)	Select from MPEG2 or H264.
USB Video Size (restart needed)	Select from Normal or Full.
DVD Chapter Record Interval (sec.)	Select the Interval of automatic chaptering for DVD recording from 15, 30, 60 and 120 seconds.
USB Playback Skip Interval (sec.)	Select the Interval of time skipping for USB playback from 15, 30, 60 and 120 seconds.

System/Peripherals Preset Menu (continued)

Print and Store Options. Press Print and Store Options to go to the Utility --> Connectivity --> Miscellaneous setup page.

Removable Media. Press Removable Media to go to the Utility --> Connectivity --> Removable Media page.

Table 3-33: Printer Setup

Preset Parameter	Description
Standard Printer Properties: [Printer] and Properties, and Default Printer	Select to add an additional standard printer via the USB serial port and to configure digital printers. This activates the Windows Add Printer wizard. NOTE: Most printer drivers are available via Windows; however, newer printers may require you to load the manufacturer-supplied print driver (must be on CD-ROM). Refer to the Basic Service Manual for more information.
Print Full Screen	Select for the standard printer to print the full screen.
Enable Video Invert	Select for the standard printer to print black on white rather than white on black.

System/User Configurable Key

This feature assigns functionality, that are invoked from the Touch Panel or windows controls, to the keys on the operator panel so that be able to invoke with single action.

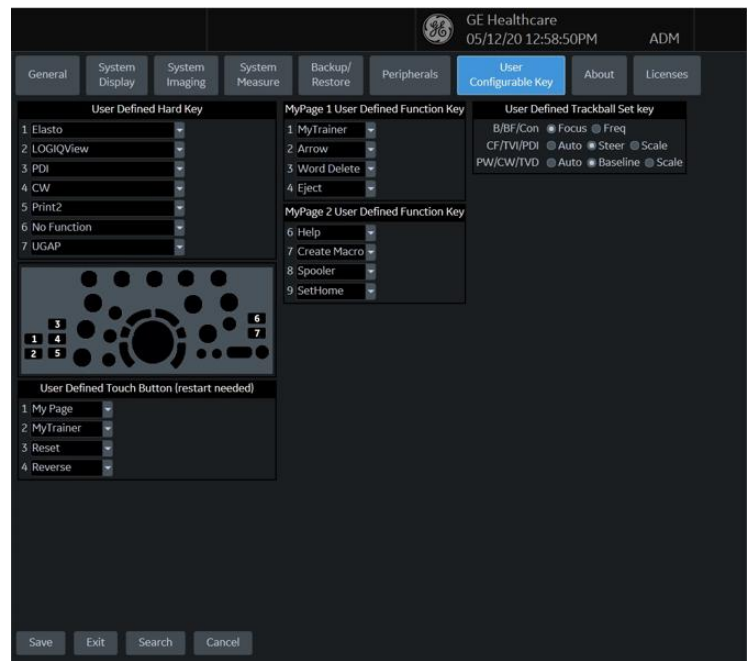


Figure 3-9. User Configurable Key Preset Menu

System/User Configurable Key (continued)



Figure 3-10. Programmable Operator Panel Controls

Table 3-34: User Configurable Keys

Preset Parameter	Description
1-7 User Defined Hard Key	The following functionality is available: Table 10-32 User Defined Hard Key
8 - User Defined Touch Button	The following functionality is available : Table 10-33: User Defined Touch Buttons
9 - User Defined Trackball Set Key	Specify which controls you want to be used on the Trackball: • B/B-Flow/Contrast: Focus or Frequency • CF/TVI/PDI: AUto or Steer or Scale • PW/CW/TVD: Auto or Baseline or Scale

System/User Configurable Key (continued)

To move and replace a BT Feature key cap,

1. Insert the flat blade of a screwdriver into the hole on the upper side of the key cap and lift it up to remove it.



Figure 3-11. Remove the key cap

2. Repeat for each key, to match how you have configured the BT Feature keys.
3. Replace the key caps by positioning it and pushing down on the key cap until it clicks into place.

User Defined Hard keys and User Defined Touch Buttons

User Defined Hard keys and User Defined Touch Buttons can be programmed as one of the following functions:

Table 3-35: User Defined Hard Key

Preset Parameter	Description
No Function	No function.
Elasto	You can arrange the order of BT key on the control panel as you have programmed in the Utility page.
LOGIQView	
3D/4D	
Contrast	
LOGIQApps	
B-flow	
UGAP	Turn on/off UGAP mode
Hepatic Assistant	Turn on/off Hepatic Assistant mode
Reverse	Turn on/off Reverse the image.
MarkCine	Turn on/off Mark Cine.
CHI	Turn on/off CHI mode.
Reset	Reset all the parameters.
My Page	Turn on/off MyPage preset.
CF	Turn on/off CF mode
PDI	Turn on/off PDI mode.
CW	Turn on/off CW mode.
B Steer+	Turn on/off B Steer+
Biopsy Kit	Biopsy Guideline Display/change biopsy guide line.
Biplane	Switch screen layout between Single Plane and Bi Plane.
ECG on/off	Turn on/off ECG.
Print2	Assign Print 2
Print3	Assign Print 3.
Print4	Assign Print 4.
Print5	Assign Print 5.
Print6	Assign Print 6.

Table 3-35: User Defined Hard Key

Preset Parameter	Description
Video	Turn on/off Video tab.
Worksheet	Go to Worksheet page.
MyTrainer	Go to My Trainer Plus page.
Active Image	Go to Active Images Screen.
Auto Dop. Calc	Turn on/off Auto Calcs in Doppler mode.
Auto SoS	Adjust Automated Speed of Sound.
Button Probe Enable/ Disable	Enable/Disable Button Probe
Center Line	Turn on/off center line.
Clear Saved Measurements	Clear all measurements in the selected measurement category. Display the Confirmation dialogue before delete data.
Compare Assistant	Turn on/off Compare Assistant.
Full Timeline	Turn on/off full timeline mode.
HDColor	Turn on/off BFHDC mode.
Image Size	Change Image size.
Report	Go to Report page.
Room Profile	Switch room profile setting.
SaveAs	Go to SaveAs Screen.
TIC Analysis / Qanalysis	Turn on/off TIC Analysis / Qanalysis.
TVI	Turn on/off TVI mode.
Toggle Image Display Area	Toggle current display area and extra large area.
Touch Control	Turn on/off Touch Control mode.
Volume Navigation	Turn on/off VN mode.
Worklist	Go to Worklist page.

Table 3-36: User Defined Touch Buttons

Preset Parameter	Description
No Function	No function.
Reverse	Turn on/off Reverse the image.
MarkCine	Turn on/off Mark Cine.
CHI	Turn on/off CHI mode

Table 3-36: User Defined Touch Buttons

Preset Parameter	Description
Reset	Reset all the parameters.
My Page	Turn on/off MyPage preset.
Biopsy Kit	Biopsy Guideline Display/change biopsy guide line.
ECG on/off	Turn on/off ECG.
Print2	Assign Print 2
Print3	Assign Print 3.
Print4	Assign Print 4.
Print5	Assign Print 5.
Print6	Assign Print 6.
Video	Turn on/off Video tab.
Worklist	Go to Worksheet page.
B-flow	Turn on/off B-flow mode.
MyTrainer	Go to My Trainer Plus page.
Touch Control	Turn on/off Touch Control mode.

System/About Preset Menu

The System/About screen lists information about the system software.

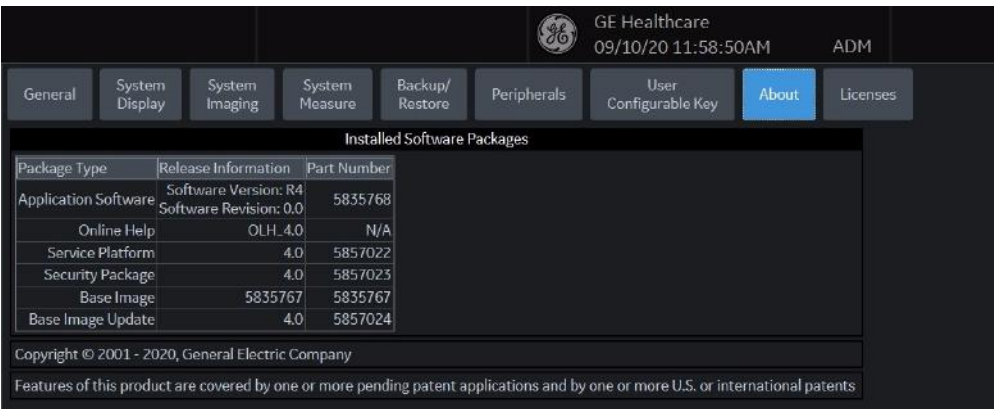


Figure 3-12. System/About Preset Menu

Table 3-37: Software

Preset Parameter	Description
Software Version	The current software version on this system.
System Revision	The current revision of the software version on this system.
Software Part Number	The software part number.
Build View	The software build view.
Build Date	The software build date.

Table 3-38: Patents

Preset Parameter	Description
Patents	Lists system patents.

Table 3-39: System Image

Preset Parameter	Description
Image Part Number	The image part number (ghost part number).
Image Date	The image date (ghost date).

Configuring Connectivity

Overview

You use Connectivity functionality to set up the connection and communication protocols for the ultrasound system. The following page gives an overview of each of the Connectivity functions. Each function is described in detail in the following pages.

About Wireless LAN and DICOM, see Chapter 13.

Connectivity Functions

To set up your institution's connectivity, you must login with administrator privileges.

1. **TCPIP:** allows you to configure the Internet Protocol.
2. **Device.** allows you to set up devices.
3. **Service:** allows you to configure a service (for example, DICOM services such as printers, worklist, and other services such as video print and standard print) from the list of supported services. This means that the user can configure a device with the DICOM service(s) that particular device supports.
4. **Dataflow:** allows you to adjust the settings of the selected dataflow and associated services. Selecting a dataflow customizes the ultrasound system to work according to the services associated with the selected dataflow.
5. **Button:** allows you to assign a pre-configured output service (or a set of output services) to the Print keys on the control panel.
6. **Removable Media:** enables formatting (DICOM, database, or blank formatting) and DICOM verification of removable media.
7. **Miscellaneous:** allows you to set up the patient exam menu options, print and store options, and the order of the columns in the examination list on the Patient menu.
8. **Tricefy:** allows you to archive, collaborate, and share patient images via a cloud-based image viewer.
9. **Koios.** Koios is a Breast Lesion Analysis Option. Koios is integrated with the LOGIQ P8/P9/P10 via DICOM. Koios is configured similar to a DICOM Service. The user can accept/reject analysis results.

Configure these screens from left to right, starting with the TCPIP tab first.

NOTE: *The ultrasound system is pre-configured for many services, with default settings selected. You can change these services and settings as needed.*



CAUTION

You must restart the LOGIQ P8/P9/P10 (shutdown) after making any changes to connectivity settings in the Utility menus. This includes any changes on the TCPIP or dataflow setup screens.

TCP/IP

The left side of the TCP/IP screen displays the Wired Network Configuration; the right side of the screen displays the Wireless Network Configuration.

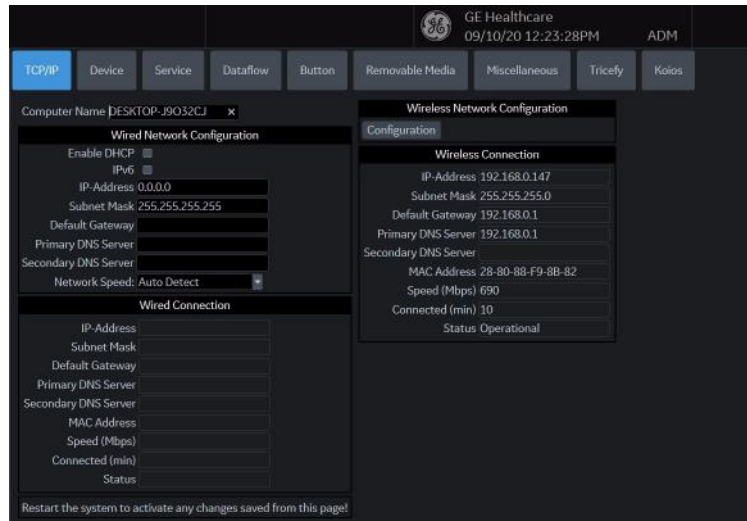


Figure 3-13. TCP/IP Screen

The Wired Network Configuration shows what the LOGIQ P8/P9/P10 local area network settings are configured to, while the Wired Connection section shows the actual network configuration the system is currently using and has recognized. If these two sections do not match, reboot the system and recheck the network settings.

Determine Your Network Settings

Determine the type of network settings you will use and configure:

- IPv4 or IPv6: IPv4 is a 32-bit address, IPv6 is a 128-bit address.
- DHCP (Dynamic Host Configuration Protocol): Enables a server to automatically configure the network settings.
- Static IP: Manually configured network settings.

DHCP

To configure DHCP network connectivity:

1. Select the DHCP check box to enable automatic configuration of your network settings.

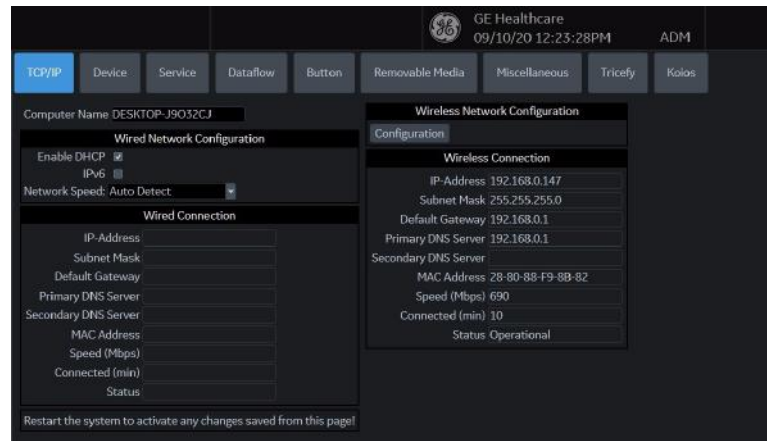


Figure 3-14. DHCP Network Connectivity Menu

2. To use IPv6, check the IPv6 box. If unchecked, the system will use the default IPv4 settings.
3. Press Save at the bottom of the screen to save the automated configuration.
4. Restart the system to activate any saved changes.

Static IP

To configure Static IP network connectivity:

1. Uncheck the Enable DHCP box.
2. To use IPv4, leave the IPv6 box unchecked (IPv4 is the default Static IP configuration).

To use IPv6, check the IPv6 box.

Figure 3-15. IPv4 and IPv6 Static IP Connectivity Menu

3. Type the name of the Ultrasound system in the Computer Name field.
4. Enter the following information in the designated fields:
 - IP-Address (acquire a unique static IP address from the network administrator)
 - Subnet Mask
 - Default Gateway (if applicable)
 - Primary and Secondary DNS addresses (optional)

NOTE: *At least one valid DNS address is needed for Insite remote service connectivity.*

5. Press Save at the bottom of the screen.
6. Restart the system to activate any saved changes.

NOTE: *Per system design, TCP/IP settings do not get restored when restoring backups. The LOGIQ P8/P9/P10 IP address MUST BE unique.*

TCP/IP Preset Menus

Table 3-40: Computer Name

Preset Parameter	Description
Computer Name	Type the unique name for the Ultrasound system (no spaces in name).

Table 3-41: Wired Network Configuration

Preset Parameter	Description
Enable DHCP	Select this box to enable dynamic IP Address selection (unless you use DICOM). When DHCP is enabled, the IP Address, Subnet Mask, Default Gateway, Primary DNS Server and Secondary DNS Server fields are disabled.
IPv6	Select this box to enter IPv6 Static IP settings.
IP-Address	Enter the IP Address of the Ultrasound system. NOTE: IP stands for Internet Protocol. Every device on the network has a unique IP address.
Subnet Mask	Enter the subnet mask address. NOTE: The Subnet Mask is an IP address filter that eliminates communication/messages from network devices of no interest to your system.
Default Gateway	Enter the default gateway address (optional).
Primary DNS Server	Enter the IP address for the Primary DNS server (optional - - at least one valid DNS address is needed for Insite remote service connectivity).
Secondary DNS Server	Enter the IP address for the Secondary DNS server (optional). (Do not configure Secondary DNS server only; if only one DNS IP address is being used, enter it in the Primary DNS Server field.)
Network Speed	Select the network speed (Auto Detect, 10Mbps/Half/Full Duplex, or 100 Mbps/Half/Full Duplex, and 1000Mbps/Auto-negotiate).

Table 3-42: Wired Connection

Preset Parameter	Description
IP-Address	The IP Address of the Ultrasound system. NOTE: IP stands for Internet Protocol. Every device on the network has a unique IP address.
Subnet Mask	The Subnet Mask is an IP address filter that eliminates communication/messages from network devices of no interest to your system.
Default Gateway	The default gateway address (optional).
MAC Address	Unique network card address.
Speed (Mbps)	Actual network speed in Megabits per second.
Connected (min)	The number of minutes the system has been connected to the network.

Table 3-42: Wired Connection

Preset Parameter	Description
Status	Current network status. • Operational: Network adapter has been disabled, for example because of an address conflict. • Unreachable: Network adapter that is not connected. • Disconnected: For LAN adapters: network cable disconnected. For WLAN adapters: no carrier. • Connecting: Network adapter that is in the process of connecting. • Connected: Network adapter that is connected to a remote peer.

Table 3-43: Wireless Network

Preset Parameter	Description
Configuration	Press to view or change the Wireless Networking settings. See Chapter 13 for more information.
IP-Address	The current IP address assigned to the wireless network adapter.
Subnet Mask	The current network mask assigned to the wireless network adapter.
Default Gateway	IP address of the local subnet gateway host.
MAC Address	The Ethernet address assigned to the installed wireless adapter hardware.
Speed (Mbps)	Actual network speed in Megabits per second.
Connected (min)	The number of minutes the system has been connected to the network.
Status	Current network status. • Operational: Network adapter has been disabled, for example because of an address conflict. • Unreachable: Network adapter that is not connected. • Disconnected: For LAN adapters: network cable disconnected. For WLAN adapters: no carrier. • Connecting: Network adapter that is in the process of connecting. • Connected: Network adapter that is connected to a remote peer.

Device

To add a new device,

- 1. Press **Add**.
- 2. Type the device name in the Name field.
- 3. Type the device's IP address in the IP Address field.

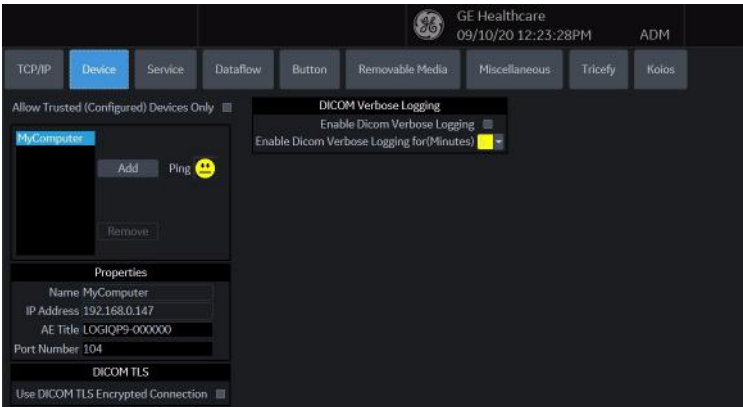


Figure 3-16. Connectivity Device Preset Menu

Table 3-44: Device

Preset Parameter	Description
Add/Remove	Press Add to add a new device; press Remove to delete a device.
Ping	Press Ping to confirm that a device is connected.
Properties: Name	Type the name of the device.
Properties: IP Address	Type the device's IP address. The following IP address cannot be used for device's address, these are reserved for internal use by the system: 192.168.221.1/192.168.221.2
Properties: AE Title	AE Title of the LOGIQ P8/P9/P10. NOTE: Only available for MyComputer.
Properties: Port Number	IP Port Number Used for DICOM, set by default to 104. NOTE: Only available for MyComputer.
DICOM TLS: Use DICOM TLS Encrypted Connection	Check to use DICOM TLS Encrypted Connection
DICOM Verbose Logging: Enable Dicom Verbose Logging	Check to be enable Dicom Verbose Logging
DICOM Verbose Logging: Enable Dicom Verbose Logging for (Minutes)	Coosse duration for Dicom Verbose Logging

Device (continued)

To ping a device,

1. Select the device.
2. Press ***Ping***. If the smiley face smiles, then the connection has been confirmed. If the smiley face frowns, then the connection has not been made. Check the device name and IP address.

Service

For each Device that you added to the system, you need to set up the service(s) that device supports (you must be an administrator to update these screens).

The Services screen has the following sections of information:

1. **Destination Device** - lists information about destination devices. You can select from a list of currently existing devices.
2. **Service Type to Add** - lists information about services for the destination device. You can add services, select from a list of currently existing services, and remove services.
3. **Service Parameters** - lists properties for the service currently selected in the Services section. The name and parameters in this section change, depending on what service is currently selected. In the above figure, this section shows DICOM Print parameters.

Adding a service to a destination device

1. Select the service from the pull-down menu. Press **Add**.
2. Specify the properties for this service. Press **Save**.
3. Verify the service.

Removing a service

1. Select the service. Press **Remove**.
2. Press **Save**.

Changing parameters for a service

There are certain parameters that may need to be set up for each service:

Table 3-45: Service Parameters: Common Service Parameters

Preset Parameter	Description
Name	Free text: give a descriptive name to the device.
AE Title	The Application Entity Title for the service.
Port Number	The port number of the service.
Maximum Retries	Max # – the maximum number of times to try establishing a connection to the service.
Retry Interval (sec)	Specify how often (in seconds) the system should try to establish a connection to the service.
Timeout	The amount of time after which the system will stop trying to establish a connection to the service.

Changing parameters for a service (continued)

Many service parameters are specific to each type of service. The parameters are described on the following pages:

- Standard Print
- Video Capture
- Save As
- USB Quick Save

Standard Print

Table 3-46: Standard Print

Preset Parameter	Description
Printer	Select the printer.
Rows	Specify 1-5.
Columns	Specify 1-5.
Orientation	Specify Landscape/Portrait
Top Margin (mm)	Specify the top margin (0-51mm)
Bottom Margin (mm)	Specify the bottom margin (0-51mm)
Left Margin	Specify the left margin (0-51mm)
Right Margin	Specify the right margin (0-51mm)

Video Capture

Table 3-47: Video Capture

Preset Parameter	Description
Type	Specify Color, BW, or DVD Record/Pause.

Save As

Table 3-48: Save As

Preset Parameter	Description
Destination	Specify destination device, Hard Drive, USB Flash Drive.

USB Quick Save

USB Quick Save provides the ability to easily send images to a USB memory stick or Network Storage. See ‘USB Quick Save’ on page 15-47 for more information.

E-mail to MMS

NOTE: You can attach up to 10 images to an e-mail.

To use the E-mail service, the SMTP (Simple Mail Transfer Protocol) settings and user account are needed from your E-mail service provider.

- SMTP server name (Outgoing Messages) e.g., smtp.gmail.com
- SMTP authentication (Outgoing Messages) e.g., SSL
- SMTP port (Outgoing Messages) e.g., 465

NOTE: The LOGIQ P8/P9/P10 only supports the E-mail Send service; receiving E-mail is not supported. To receive E-mails, the same E-mail account needs to be installed on an Office-PC.

NOTE: Some E-mail servers allow less secure applications to access your account. If your account cannot gain access to the E-mail server from the LOGIQ P8/P9/P10, please contact the server administrator and configure access to your account to allow a less secure application. In case of Google gmail, please refer to the Accounts Help at <https://support.google.com/accounts/answer/6010255?hl=en>.

Setting up the Email to MMS

1. Enter IP Address and Name of SMTP server to add an Email connection device in Device Tab.
2. Press Verify icon and Press Add button if the ping test is executed successfully.
3. Move to Service Tab, select “Email to MMS” in Service menu and Press “Add” button.
4. Enter your Account name or Email Address in the Identity group. As an option, you can enter a different reply to address and a signature text.
5. To verify E-mail configuration, click on Verify icon. The test message will be sent to the entered E-mail address followed by a message box.
6. To save your configuration, select the Save button.

Figure 3-17. Email to MMS

Table 3-49: Network Storage Service

Preset Parameter	Description
SMTP Server	Free text: give a descriptive name to the email server.
Server Connection	Options: • IP Address: Try connecting via IP address. • Server Name: Try connecting via SMTP server name. Select server connection method to access mail server.
Server Port	The port number of the email server.

Table 3-49: Network Storage Service (Continued)

Preset Parameter	Description
Connection security	Options: • None • SSLTTLs • STARTTTLs If your SMTP server requires SSL or STAR connection, select the proper option.
Authentication method	Enter user account and password for SMTP authentication. If your server doesn't require User authentication, uncheck the box and do not enter anything. Leave the User Name and Password fields blank.
User Name	Email Account User Name.
Password	Email Account Password.
Email Address	Enter To (receiver) Email Address for sending test message (Mandatory). Note: It will be used for From (sender) Email Address.
Subject	Free text: give a subject to test E-mail.
Message	Free text: give a body text message to test email.
Enable MMS	Enable MMS with E-mail service.
Domain Name for MMS	Domain Server Name for the 3rd party provider to MMS message.

MMS Configuration

The MMS phone number is mapped into the recipient E-mail address of the MMS service provider.

NOTE: *The LOGIQ P8/P9/P10 does not support MMS service. The LOGIQ P8/P9/P10 only supports patient phone number combined with MMS domain name when sending an email ("Phone number@DomainName").*

NOTE: *To use the MMS function, you need to contract with a 3rd party provider that offers E-mail to MMS service (e.g. SMSglobal). Contact a service provider!*

1. If it is desired to also use MMS, select "Enable MMS" in the Email Service Properties.
2. Enter 3rd party Domain Name.

NOTE: *Captured images will be sent to your E-mail account with "Phone number@DomainName".*

3. Store your configuration by selecting "Save" button.

Send Email

The user can send selected images from the Active Image page via "Send To".

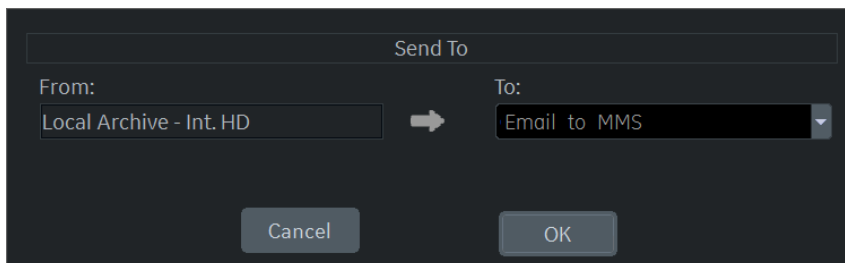


Figure 3-18. Batch Send to E-mail

E-mails contain JPEGs for still image and WMV for Cine loops.

NOTE: *Exam send function is not supported for E-mail to MMS. You can only send selected images from the Active Image screen.*

How to enter Patient's E-mail address and Phone number in the Patient screen

To show and allow entering the patient's E-mail address, enable the "Use Email to MMS" option on the Connectivity -> Miscellaneous screen.

**How to enter Patient's E-mail address and Phone number in the Patient screen
(continued)**

1. Press the "Details" button on the Patient screen. The Patient's E-mail address and Phone number controls appear.
2. Enter patient information and Comment. The content of the Comments will be used for the body text of the email. The subject of the E-mail will be automatically generated using the Patient Name and Exam Date information.
3. Select Register to save the patient's email configuration.

Setting up a Printer

Use Standard Print for digital peripherals. These are printers with either a USB interface or Ethernet interface (Sony UP-D25MD, for example).

On the Utility --> Connectivity --> Button page, select the Print key in the upper, left-hand corner of the display. In the middle portion of the page, under Available Input/Outputs, select the printer you want to configure. Next, press the two right arrows (>>) in the upper, right-hand corner of the page to move this printer into the Printflow View.

You can also configure the Standard Print button that appears on the Active Images screen.

Example: For instance a video capture device, on the Utility --> Connectivity --> Service page, in the Service Type to Add box, and press Add. In the properties box on the upper, right-hand side, select the type of device and in the Properties box in the lower, left-hand side, type in a unique descriptive name for this device.

Dataflow



CAUTION

DO NOT rename the factory default dataflow.

A dataflow is a set of pre-configured services. When you select a dataflow, the ultrasound system automatically works according to the services associated with the dataflow. The Dataflow tab allows you to select and review information about dataflows. You can also create, change, and remove dataflows.

Set up dataflows for the services.

NOTE: You must be logged on as Administrator to use the Dataflow tab.

NOTE: Services added to the Dataflow View will receive images immediately if Direct Store is checked; or at the end of the exam if Direct Store is not checked.



Figure 3-19. Dataflow Preset Menu

Table 3-50: Dataflow

Preset Parameter	Description
Name	Select the dataflow from the list.
Direct Store	Select to store data directly to archive (no buffer storage).
Hidden	Select so that this dataflow does not appear as a Dataflow on the Patient menu.
Default Dataflow	Select to use this dataflow as the default dataflow when you start the system.

Key Object Selection: Image Deletion Notification

Image Deletion Notification is available ONLY for the Direct Store Workflow and only generated when there are images deleted during the exam. This lets the reader at the PACS system know which images have been deleted. An indicator is placed on deleted images with a reason, "Rejected for Quality Reasons," for example.

Button

You can assign print buttons via the Utility --> Connectivity --> Button page.

Assigning print buttons. First select the print button to configure on the upper, left corner of the page. Then select the device you want to add in the middle part of the pages. Then click on the right arrow in the top right corner of the page.

NOTE: *You can configure each print key to multiple output devices/dataflows.*

NOTE: *Only attach one DICOM service per print key (e.g., PACS and DICOM printer). Multiple DICOM devices should be configured via a dataflow.*

NOTE: *When using a print key to send an image directly to a DICOM device, this causes a single DICOM association per image. Most devices (all known printers) work fine with this. However, some storage devices, such as ALI, Kodak Access, and Cemax, assume that the end of each association is the end of the exam and can result in a new folder for each image. In the Utility menu, select a single association or open PR for the desired DICOM storage device.*

Button (continued)

Table 3-51: Print Button

Parameter	Description
Physical Print Buttons • Print 1-6 • PrintScreenAutoSweep • PrintScreen	
M&A only (no images)	Configures the system to send a DICOM structured report only; no image is generated or sent.
Still Images	• Format: Ultrasound Image, Secondary Capture (Image, Video, Screen) • Compression: None, Rle, Jpeg, Jpeg2000 • Quality: Lossless, 99, 98, 97, ... 50 (Displays when JPEG/JPEG2000 is the selected Compression)
Clips/Volume	• Clips: Add Multiframe Data: Checkbox • Compression: None, Rle, Jpeg, Jpeg2000 • Quality: Lossless, 99, 98, 97, ... 50 • Volume File Format*: 1-Standard DICOM (Default), 2-Standard DICOM with Raw Data; 3-Enhanced DICOM, 2&3 (2 files) *Easy3D replace format 3 with format 2
Note: The default Compression for Clips/Volumes is JPEG85. It is strongly recommended to keep the Compression set to JPEG85.	
Advanced	• VNav Data: V Nav View (Default), Ultrasound Only, or VNav & Ultrasound (2 files) • Compare Assistant: Comparison view (Default), New image, Both Comparison & New (2 files) • Scan Assistant Advance: On, Off, Use program (system uses setting from the Scan Assistant program which allows a user to configure two print keys identically except that one advances Scan Assistant and the other does not.) On =advances to the next step when that print key is pressed independently of the program setting. Off = does not advance to the next step when the print key is pressed independently of the program setting. Press "Application/Print Controls/Live Store" to hyperlink to the Application Print Controls utility page.
Active Images Page: Standard Print	

Removable Media

The Removable Media tab allows you to:

- Verify the DICOM directory on removable media.
- Verify the free space of the media.
- Verify that the media is finalized or unfinalized.
- Verify that the media is formatted or unformatted.
- Format removable media (rewritable CD/DVD)

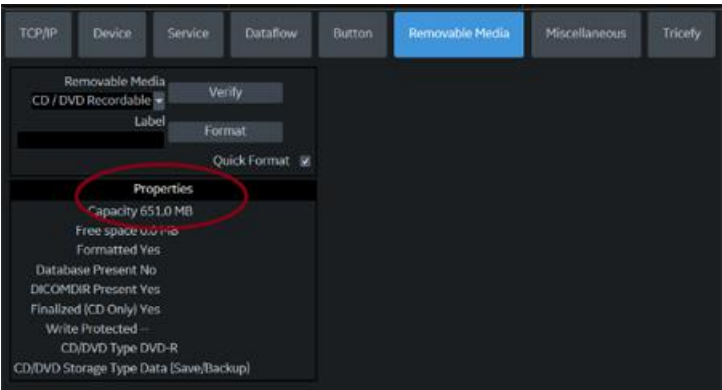


Figure 3-20. Removable Media Preset Menu

Table 3-52: Tools

Preset Parameter	Description
Removable Media	Select the removable media to format or verify.
Label	Type a label for a new removable media (free text).
Verify	• Select to verify DICOM directory on removable DICOM disk. • Verify the free space of the media. • Verify that the media is finalized or unfinalized. • Verify that the media is formatted or unformatted.
Format	Select to format removable media.
Quick Format	To format the media quickly, check this box. If you uncheck this box, the media is formatted with a full format. New media should always be formatted with a full format.

The bottom of the screen lists properties of the selected media.

Formatting removable media

1. Select the removable media from the Media list.
2. Type a name for the removable media in the Label field.

NOTE: Do not use the following characters for labelling:

*\ / : ; . , * < > | + = [] &*

3. Select **Format**. Confirm **OK** or **Cancel**.
4. An information window confirms when the format has been completed. Select **OK** to exit.

Verifying removable media

1. Select the removable media from the Media list.
2. Select **Verify**.

Miscellaneous

The Miscellaneous tab allows you to configure tools related to patient management and print and store options. You can specify default system functionality, such as whether patient ID is required when you archive data, or if you want the system to automatically search the archive for a patient when you enter patient data.

Table 3-53: Patient/Exam Menu Options

Preset Parameter	Description
Use birthdate	In the Patient information window, enter either the patient age or the birth date: When selected, enter birth date, then the age is calculated. When cleared, enter age (birth date field not available).
Auto search for patient	In the Search/Create Patient window: When selected, the system automatically searches through the selected patient archive, while the user enters patient information. When cleared, the automatic search tool is turned off. If you are trying to keep the past patient data confidential, DO NOT use this feature.
Automatic generation of patient ID	In the Search/Create Patient window: When selected, the Patient ID is not required when entering a new patient in the archive. The system automatically generates an ID number. When cleared, the Patient ID is required when entering a new patient in the archive.
Auto Archiving patient data	Archives patient data automatically.
After [End Current Patient], go to:	Select Worklist screen or Patient screen.
Keep Search String	Search string is kept rather than cleared.
Worklist Auto Query	Automatically queries the worklist server.
Show BBT	Show BBT field on the OB patient screen to input the basal body temperature.
Double Click on Patient List to Start	Select Review or New Exam to display each time you double click on the patient name in the patient list on the Patient menu.
Detail Mode	Select to display Detail Mode, rather than Exam View, when you select the patient name in the patient list on the Patient menu. You can also type comments while in Detail Mode.
Export to USB HDD: Create DICOMDIR	Create DICOMDIR is a DICOM file format which contains how the directory and DICOM files structured for diagnostic portable media behave. It is important for portability between the LOGIQ P8/P9/P10 to PACS. If you want to save exams to the USB Hard drive and look at it on the PACS, the DICOMDIR is a must.
Export to Network storage: Create DICOMDIR	
Automatic Disable Patient Data	Select to automatically disable patient data. If selected, locks the patient name, date of birth and gender (like Patient ID). The Factory Default for this preset is unchecked.

Table 3-53: Patient/Exam Menu Options (Continued)

Preset Parameter	Description
Remember Cursor Position on the Transfer Screen	To set a default cursor location on the Data Transfer screen: 1. Select the "Remember cursor position in the Transfer screen" preset and press Save. 2. On the Data Transfer screen, move the cursor to the desired field. 3. Exit out of the Data Transfer screen. When returning to the Data Transfer screen, the cursor location is in the position your selected.
Quick New Patient Entry	Select to store new patient automatically by pressing the Patient key.
User Email to MMS	To show and allow entering the patient's E-mail address in the patient information.
User Simple MPEGVue	Select to transfer the captured images to PC format (JPEG, WMV).
Use Pet Name	To show and allow entering the pet's name in the patient information.

Table 3-54: Patient/Exam Message Options

Preset Parameter	Description
Request acknowledge of End Exam action	When selected, the user is asked to confirm action when ending an examination.
Warn Image Store without Patient	Select to receive a warning when you press the Print key without an active patient.
Warn Register to No Archive	Select to receive a warning when you register a patient to the "No Archive" data flow. Select a different data flow for permanent storage of patient data.
Warn image store to Read Only dataflow	The system posts a warning message if you attempt to store images to a read-only Dataflow.

Table 3-55: Print and Store Options

Preset Parameter	Description
P[1-6] Key Sound	Select None, Click, Chimes, Ding, Ding-Dong, or Whoosh.
Store Dual as Dicom Only	Select to always store dual images as a DICOM (secondary capture) store, rather than Raw DICOM.
Dual When Color Support is Mixed	Dataflow Mixed is not available. While transferring dual images to the PACS, send black and white images as gray; send color images as color. Set up 2 services (one gray and one color), set up 2 dataflows, and set up 2 buttons. Each button needs to be tied to a different service. Select if you want to keep the user preset for Color Photometric Interpretation while in Dual mode.
Enable Smart Capture Area	Check box to select.
Store 2D Loop with Timeline Data	Check box to select.
Patient List Print-Font Size	Select font size.

Table 3-55: Print and Store Options

Preset Parameter	Description
Add Titlebar Information to Multiframe Loops	Adds a title bar information to the multiframe loops.
Add Scan Parameter Information to Multiframe Loops	Adds scan parameter information to the multiframe loops.
Image Order Scheme	Select to Direct Store images in Acquisition Order, Scan Assistant Order, or Off. • Off. The clipboard on the Ultrasound system shows the image in the order it was acquired. Therefore, re-stored images appear where you'd expect. However, on the PACS system, images appear in arrival order or in image number order. • Acquisition Order. From the Ultrasound system perspective, the same as "Off." But on the PACS system (if based on image number order), images are displayed consistently with the way they are stored on the Ultrasound system. • Scan Assistant Order. You can define the storage order (reading order) via Scan Assistant Creator. Therefore, based on the order defined in Scan Assistant, images are re-ordered and displayed in this manner both on the Clipboard and on the PACS system.
Send Images via Wireless	When connected to the network via Wireless LAN and this box is checked, then images will be sent to the DICOM device over the Wireless LAN. If not checked, images spooled in the Spooler will be sent when the system is connected to the wired network.
Allow press and hold print key to replace an image	When an image is recalled and the user stores it locally on the system using press and hold the Print key, the currently recalled image is deleted from the exam and the newly stored image is saved. Or when you store the image without annotations, type the annotation and press and hold the Print key, the system replaces previously stored image with the new image.

Table 3-56: Other ID Options

Preset Parameter	Description
Enable Other ID	Not selected is the Default. If selected, allow entering Other ID, such as Citizen Service Number, Burger Service Number (BSN), National Health System (NHS) number, along with patient ID information on the Patient Screen.
Validation Format	If the Enable Other ID preset is selected, the system validates the format of "Other ID" when an ID is entered. Choose: NHS Number *** ** ****, Letters and Numbers, Numbers, or Any (no restriction)

Table 3-57: LOGIQ Apps

Function	Description
Unpair Bluetooth Devices	Un-paired from all trusted Bluetooth devices.

Examination list
window column
configuration

You can create new columns, remove columns, and select the information to display in a column.

1. Move the **Trackball** to highlight a column.
2. Press **Set**.
3. Use the arrows (<< or >>) to reposition column headings.

Tricefy Activation

Tricefy is a cloud-based image viewer and a platform to archive, collaborate, and share. The corresponding DICOM destinations can be used via the Print keys. An internet connection is necessary for uploading data to Tricefy. The Wireless LAN Option is required.

As soon as the Tricefy option is enabled, relevant Tricefy items are displayed.

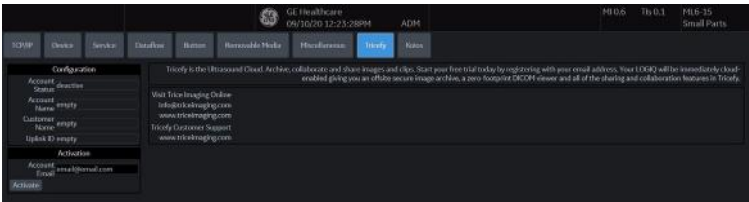


Figure 3-21. Tricefy Preset Menu

Table 3-58: Configuration

Preset Parameter	Description
Account Status	[TBD]
Account Name	Name for the account.
Customer Name	Customer's name.
Uplink ID	Uplink ID.

Table 3-59: Activation

Preset Parameter	Description
Account Email	Account email
Activate	Press to activate the Tricefy option.

Barcode

Overview

The Barcode Scanner supports 1D and 2D encoding symbologies. The protocols supported are shown as below:

Table 3-60: Protocols supported by Barcode Scanner

Category	Protocol
1D	Code 128, Code 93, Interleaved 2 of 5
2D	PDF417, Data Matrix

Barcode Scanner

Select Barcode Scanner in the drop-down list.

NOTE: *Reboot is required after the device is selected or changed.*

Input Mode

Off

Enter the Patient ID using the keyboard.

Patient ID

Scan the Barcode as the Patient ID or enter the Patient ID using the keyboard instead of the barcode.

Complexation

Scan the Barcode to input the Patient demographics or enter the Patient demographics using the keyboard instead of the barcode.

To enter the Patient demographics using the keyboard instead of the barcode, select Cancel.

1. Enter a string in the Input Data field by scanning from a barcode or typing with the keyboard.
2. Scan a sample barcode. The following items can be included in the barcode:
 - Patient ID
 - First Name, Last Name, Middle Name
 - Birth Year, Birth Month, Birthday

NOTE:

The length of BirthYear equals to 4, BirthMonth equals to 2 and BirthDay equals to 2, and they should always be provided together.

- Gender

Complexation (continued)

- 3. Configure the Start and End position for each item.

NOTE: If the barcode does not contain the information of any item, configure the Start and End position as “0”.

For example, if the scanned barcode is “000001LastNameFirstName191990101F”, the configuration and results display as the following:

Barcode

Input Mode

Patient

● Patient ID

● Complexatio

● Off

Dicom Worklist

● Patient ID

● Accession #

● Off

Barcode Scanner

None

Input Data

0001LastNameFirstNameMiddleName19901010F

Complexation

Patient ID

1

2

00

Other ID

3

4

01

Last Name

5

12

LastName

First Name

13

21

FirstName

Middle Name

22

31

MiddleName

Birth Year

32

35

1990

Birth Month

36

37

10

Birth Day

38

39

10

Gender

40

40

F

Male

M

Female

F

Save

Exit

Cancel

Figure 3-22. Barcode Configuration Page Example

Cloud Reporting

Instead of storing and processing patient data on a local device, the user can store and access the patient data on a remote server which is outsourced to another company. The user can edit and print the report on the remote server. The patient data can be stored on the outsourced server through DICOM. Contact the Cloud Reporting vendor for DICOM service properties, such as IP Address, AE Title, Port number and URL address for Q-Path E.

There is currently one vendor for Cloud Reporting:

- Q-Path by Telexy

To review and edit the stored patient data on Cloud Reporting:

1. Press Utility -> Connectivity -> Miscellaneous -> Cloud Reporting.
2. Check the box for "Enable Cloud Reporting".
3. Select destination as "Q-Path E".
4. Select one protocol type. There are two options: http://, https://.
 - Q-Path Application URL is required to access Q-Path server. Contact the Telexy vendor for the URL

Cloud Reporting (continued)

5. Enter Username and Password.
 - Q-Path Application URL is required to access Q-Path server. Contact the Telexy vendor for the URL



Cloud Reporting

Enable Cloud Reporting ☒

Destination Q-Path E ▼

Q-Path Application URL https:// ▼ ge-qpath.telexy.com

Username ge

Password ●●●●●●

Figure 3-23. Input User information

6. Press Utility key on the touch panel and then select System. Go to User Configuration Key to assign Cloud Reporting button to User Defined Hard Key.
 - The Cloud Reporting button displays on User Defined Key If the Enable Cloud Reporting option is checked.

Cloud Reporting (continued)

7. Assign the Cloud Reporting button on User Defined Hard Key or MyPage User Defined Function Key.
8. Press Patient key on the touch panel and open the patient you sent to the Q-Path.

NOTE: *To view the patient in the Web browser, you need to send the exam to the DICOM server of Q-Path. See 'DICOM Image Storage' on page 16-140 in Basic User Manual for more information.*

9. Press the button you assigned to enter the website to edit the current patient exam.
10. The system opens the webpage for cloud Reporting of the selected destination.
 - If Q-Path server requires authentication or the login information is wrong, you may need input correct Username and Password.

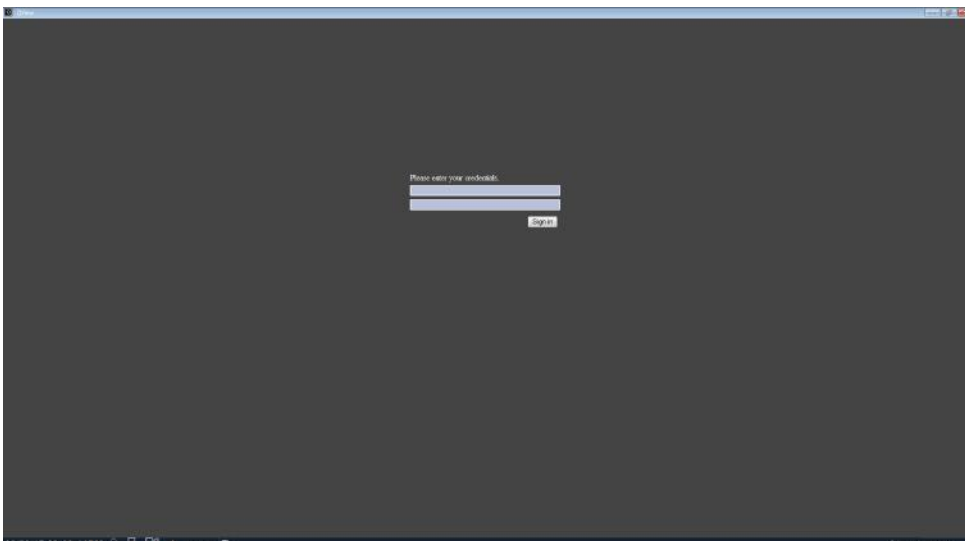


Figure 3-24. Example - Q-Path E WebPage - Login

Cloud Reporting (continued)

- You can review and edit the patient data on the Webpage via custom browser.

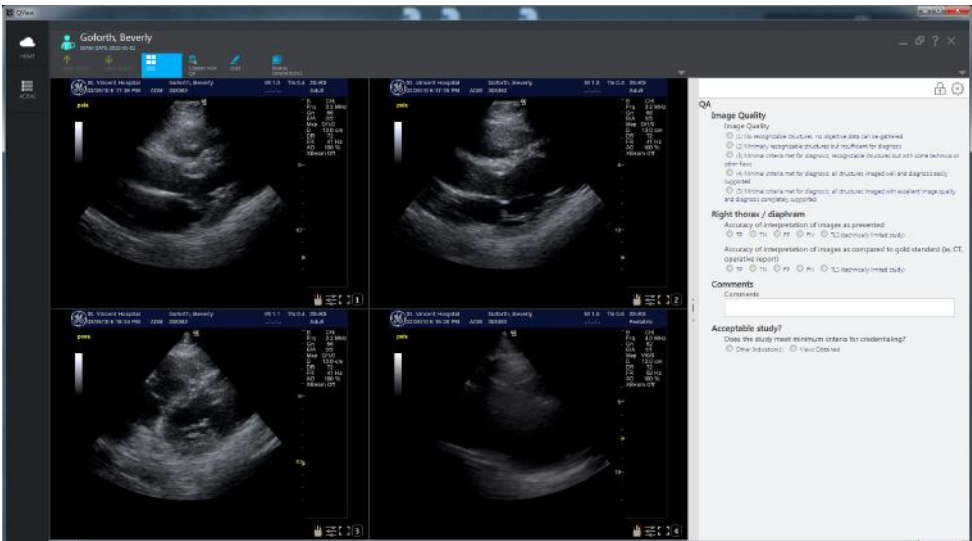


Figure 3-25. Example - Q-Path E Webpage

NOTE: Refer to the instruction from “Help” or “?” on the webpage or consult the DICOM server vendor about how to manage the patient data on the webpage.

Table 3-61: Cloud Reporting

Preset Parameter	Description
Enable Cloud Reporting	Select to enable Cloud Reporting. The Cloud Reporting button appears in Patient screen. Press the Cloud Reporting button to enter the website to edit and print the report.
Destination	Select the destination of Cloud Reporting.

Koios (not available in all countries)

Koios is a Breast Lesion Analysis Option. Koios is integrated with the LOGIQ P8/P9/P10 via DICOM. Koios is configured similar to a DICOM Service. The user can accept/reject analysis results.

To activate Koios,

1. Access the Utility --> Connectivity --> Koios Configuration page.

NOTE: *The Koios Configuration page will only appear if the option activation code is present. If there is no option activation code, the Koios tab will not display.*

2. Type in the IP address of the Koios Server.
3. Select the **Activate** button.

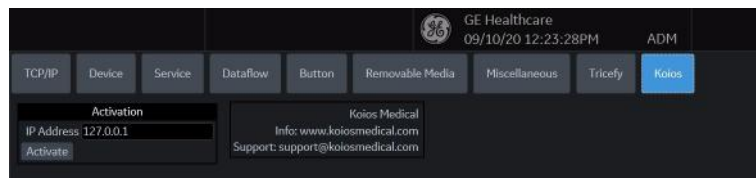


Figure 3-26. Activate Koios

4. You will receive notification upon successfully connecting to the Koios Server (The activation was successful. Your system is connected to Koios). Confirm (Save Changes? --> Ok) that you want to save the changes on this Configuration page.
5. Confirm that the connection was successful by pinging the Koios Server via the Utility --> Connectivity --> Device page.

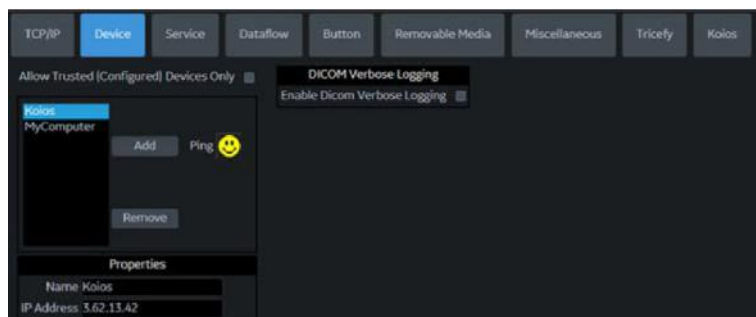


Figure 3-27. Ping the Koios Server

Koios (not available in all countries) (continued)

6. Confirm that the Koios Assessment service is running by pinging the Koios Assessment service via the Utility --> Connectivity --> Service page.

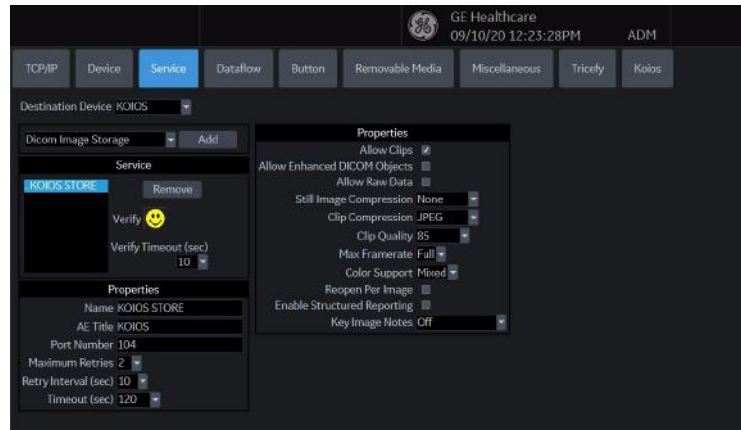


Figure 3-28. Ping the Koios Assessment Service

Electronic Documentation

Documentation Distribution

Documentation is being provided via:

- Electronic media. You can view user documentation (all languages) on a PC or on the Ultrasound Scanner via the Customer Documentation media, which includes:
 - Basic User Manual (translated)
 - Advanced Reference Manual (English and French)
 - User Guide (translated)
 - Release Notes and Workarounds (translated, optional)
 - Basic Service Manual (English only)
 - Privacy and Security Manual (translated)

Using Online Help Via F1

Online Help is available via the F1 key. After pressing F1, Help appears. The Help screen is divided into three sections: navigational tools on the top, left portion of the screen (Hide, Back, Forward), help book navigational tools on the left portion of the screen (Contents, Index, Search, Favorites), and the content portion on the right side of the screen where help topics are displayed.

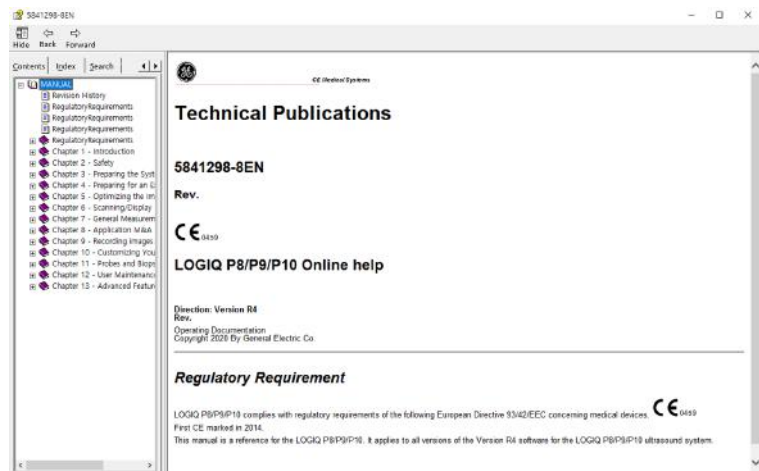


Figure 3-29. Opening Help Screen

Navigating through the Help Book

Online Help is organized like a manual, with individual chapters, sections, and pages. Click on the plus (+) sign next to MANUAL to open up the book. Click on the plus sign next to the chapter you want to view to open up that chapter. Click on the plus sign next to the chapter you want to view to open up that section. Open up the page to view that page's information.

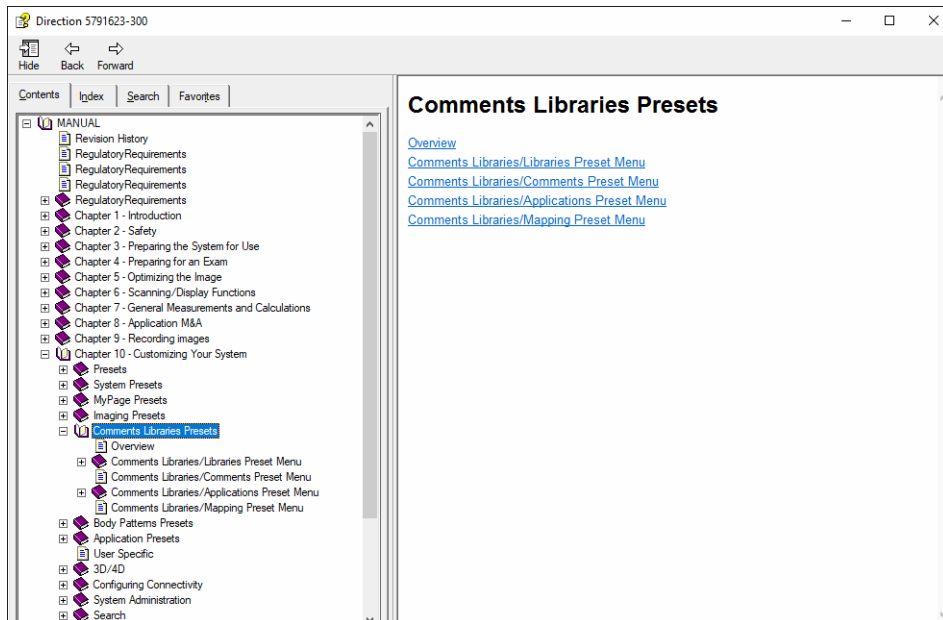


Figure 3-30. Sample Help Topic

The blue, underlined text links you to related topics. Click on the link to move to the new topic.

Links

After you click on a blue, underlined portion of text, the screen updates with this link's content. To go back to the previous screen, press Back. To return to the link, press Forward.

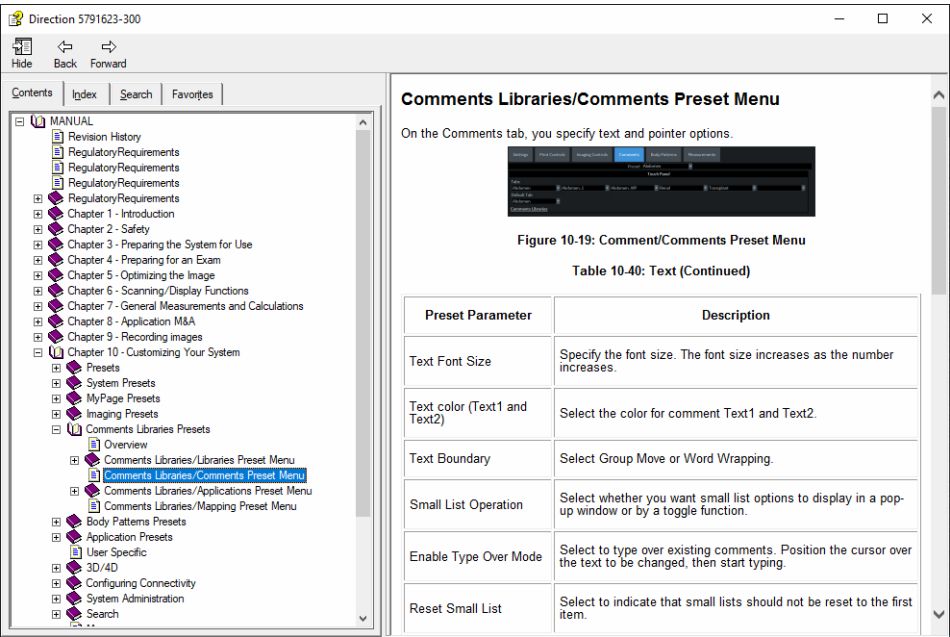


Figure 3-31. Topic Link

Searching for a Topic

To search for a specific topic, click on the Search tab in the left portion of the screen. Type in the topic name in the *Type in the keyword to find:* field. Topics with the word or phrase you typed appear in the *Select Topic to display:* area. Either double click on the topic you want to view or highlight the topic and press the Display button to view this topics.

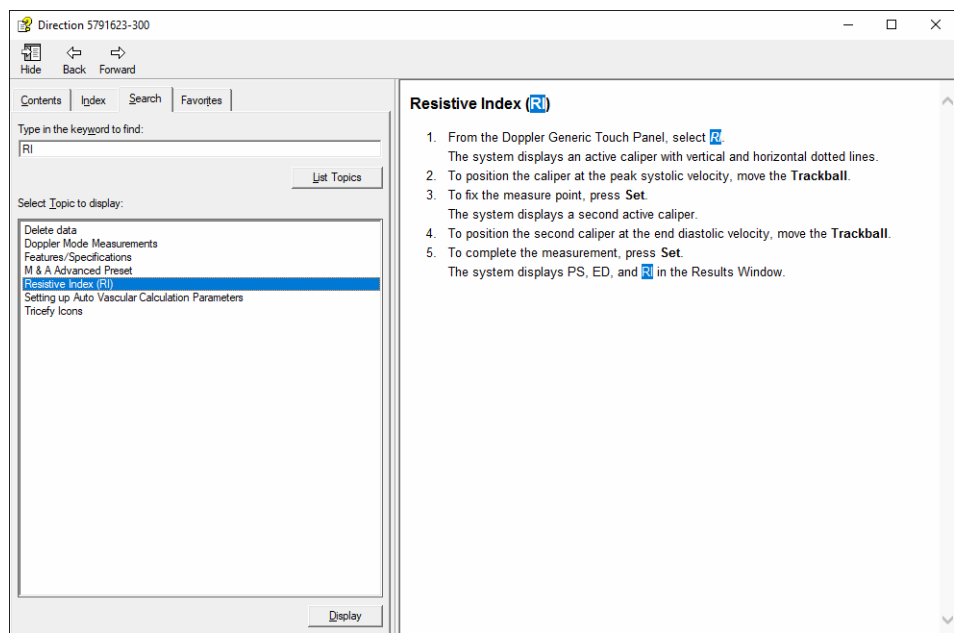


Figure 3-32. Search Results

Saving Favorite Topics

You may find that there are topics you need to refer to often. In this case, it's a good idea to save these topics as Favorites. To save a topic as a favorite, press the Favorites tab, highlight the topic in the Topics window, and press the Add button. You can view this topic quickly by going to the Favorites help tab.

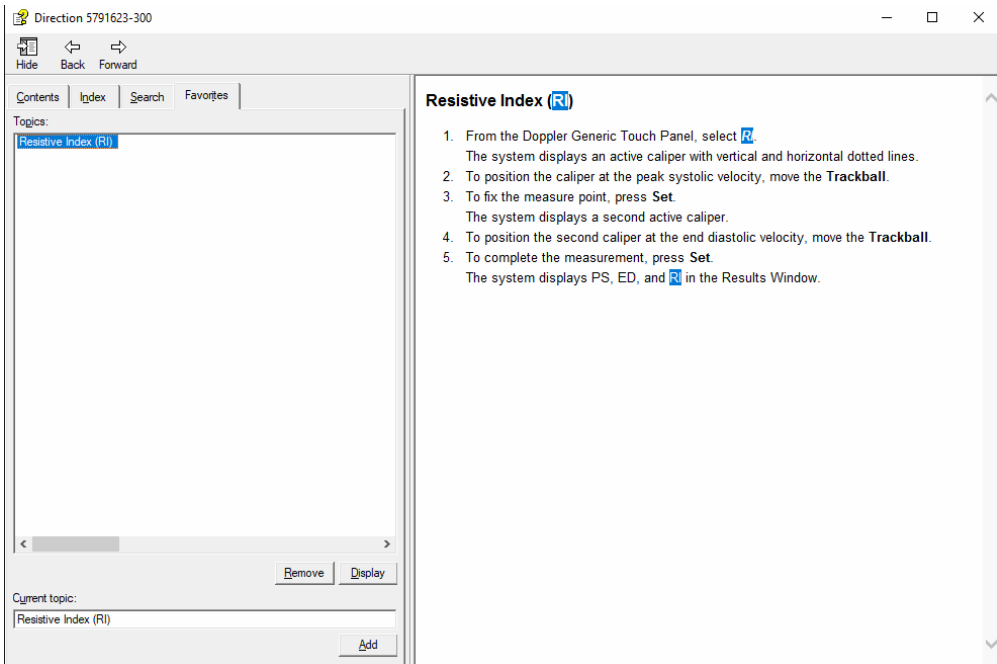


Figure 3-33. Adding Favorites

Using the Index

Or, you can look for topics by using the Index. Press the Index tab, then use the scroll bar to look up a topic.

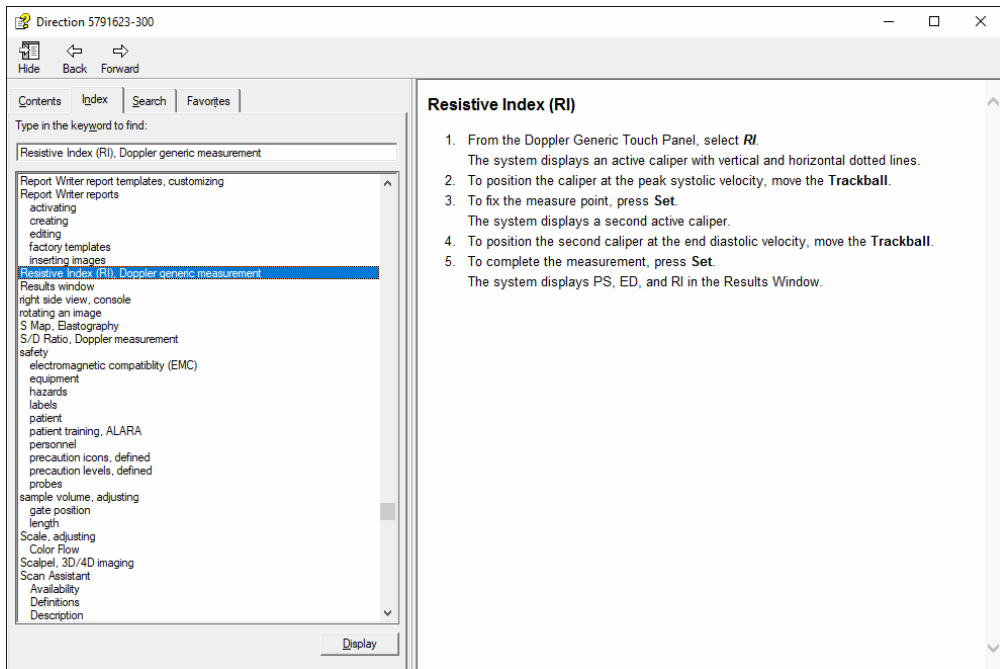


Figure 3-34. Index

Other Help Features

To hide the left side of the screen, press the Hide icon at the upper, left-hand portion of the screen. To view the left side of the screen again, press the Show icon at the upper, left-hand portion of the screen.

To size the Help window, position and hold down the cursor at the corner of the screen while moving the Trackball.

To move the Help window to the Touch Panel display, position and hold down the cursor at the very top of the Help window while moving the Trackball to the Touch Panel display.

Exiting Online Help

To exit Online Help, press the 'X' in the upper, right-hand corner of the Online Help window.

Electronic media

Accessing Documentation Via a Windows PC

To view user documentation on a Windows PC,

1. Insert the media into the media drive.
2. Open the media drive on your desktop.
3. Double click on the 'gedocumentation.html' document.
4. Select the item you want to view (click on the blue, underlined link in the File Name column).

To close the window, click on the 'X' in the upper, right-hand corner of the browser window.

NOTE: *If your PC does not have Adobe Reader, a free download is available on the Adobe website at <http://www.adobe.com>.*

Updating Documentation on the Ultrasound Scanner Via the USB

The latest version of the Online Help is located on the USB Flash drive. To update to the latest version,

1. Power down the LOGIQ P8/P9/P10 and insert the eIFU USB Flash Drive into a rear USB port.

NOTE: *Ensure that the system is USB Device Enabled (check setting on System Admin Utility Page).*

2. Power on the LOGIQ P8/P9/P10 and follow the screen prompts.
 - a. Select Install SW... on the Start Application screen.
 - b. Select OK on the first StartLoader screen.
 - c. Select the package and then select Install on the second StartLoader screen; software installation will begin.
 - d. As you verify each feature works correctly, select "Passed.". If all features work correctly and "Passed" is selected for all features, the signature field is enabled at the bottom of the New Software Verification Checklist. Type your signature (minimum of three characters) and press OK. The system is now ready for use.

3. Remove the USB Flash Drive.

NOTE: *You can search through a document, use hyperlinks in the Table of Contents and Index to locate topics, and navigate via bookmarks.*

NOTE: *In addition to viewing documentation on the Ultrasound system, the Documentation media can be read on any PC.*

To exit, press the 'X' in the upper, right-hand corner of the documentation window.

Viewing Online Help in a Language Different from the System Language

On the Utility --> System --> Online Help Language page, select the language you wish to view Online Help.

If the translated Online Help is not available, you will be directed to select a different language.

Translated Online Help files can be updated via the eIFU USB Flash Drive. Please contact your Applications/Field Service Representative to order an updated eIFU Kit.

Contact Information

Contacting GE Ultrasound

For additional information or assistance, please contact your local distributor or the appropriate support resource listed on the following pages:

INTERNET

<http://www.gehealthcare.com>

http://www3.gehealthcare.com/en/Products/Categories/Ultrasound/Ultrasound_Probes

Clinical Questions

For information in the United States, Canada, Mexico and parts of the Caribbean, call the Customer Answer Center.

TEL: (1) 800-682-5327 or (1) 262-524-5698

In other locations, contact your local Applications, Sales, or Service Representative.

Service Questions

For service in the United States, call GE CARES.

TEL: (1) 800-437-1171

In other locations, contact your local Service Representative.

Information Requests

To request technical product information in the United States, call GE.

TEL: (1) 800-643-6439

In other locations, contact your local Applications, Sales, or Service Representative.

Placing an Order

To order accessories, supplies, or service parts in the United States, call the GE Technologies Contact Center.

TEL: (1) 800-558-5102

In other locations, contact your local Applications, Sales, or Service Representative.

Contacting GE Ultrasound (continued)

Table 3-62: Americas

AMERICAS		
ARGENTINA	GE Healthcare Argentina Nicolas de Vedia 3616 piso 5 Buenos Aires - 1307	TEL: (+54) 11-5298-2200
BRAZIL	GE Healthcare do Brasil Comércio e Serviços para Equipamentos Médico- Hospitalares Ltda Av. Magalhães de Castro, 4800, Andar 11 Conj. 111 e 112, Andar 12 Conj. 121 e 122, Torre 3 - Cidade Jardim - CEP: 05676-120 - São Paulo/SP - Brasil C.N.P.J.: 00.029.372/0001-40.	TEL: 3067-8010 FAX: (011) 3067-8280 Registro ANVISA No: 80071260351
CANADA	GE Ultrasound 9900 Innovation Drive Wauwatosa, WI 53226	TEL: (1) 800-668-0732 Customer Answer Center TEL: (1) 262-524-5698
LATIN & SOUTH AMERICA	GE Ultrasound 9900 Innovation Drive Wauwatosa, WI 53226	TEL: (1) 262-524-5300 Customer Answer Center TEL: (1) 262-524-5698
MEXICO	GE Sistemas Medicos de Mexico S.A. de C.V. Rio Lerma #302, 1° y 2° Pisos Colonia Cuauhtemoc 06500-Mexico, D.F.	TEL: (5) 228-9600 FAX: (5) 211-4631
USA	GE Ultrasound 9900 Innovation Drive Wauwatosa, WI 53226	TEL: (1) 800-437-1171 FAX: (1) 414-721-3865

Table 3-63: Asia

ASIA		
ASIA PACIFIC JAPAN	GE Healthcare Asia Pacific 4-7-127, Asahigaoka Hinoshi, Tokyo 191-8503, Japan	TEL: +81 42 585 5111
AUSTRALIA	32 Phillip Street Parramatta 2150 Sydney, Australia	TEL: 1300 722 229
CHINA	GE Healthcare - Asia No. 1, Yongchang North Road Beijing Economic & Technology Development Area Beijing 100176, China	TEL: (8610) 5806 8888 FAX: (8610) 6787 1162 Service: 4008108188 (24h)

Table 3-63: Asia (Continued)

ASIA		
INDIA	Wipro GE Healthcare Pvt Ltd No. 4, Kadugodi Industrial Area Sadaramangala, Whitefield Bangalore, 560067	TEL: +(91) 1-800-425-8025
KOREA	15F, 416 Hangang Dae ro, Chung-gu Seoul 04637, Korea	TEL: +82 2 6201 3114
NEW ZEALAND	8 Tangihua Street Auckland 1010 New Zealand	TEL: 0800 434 325
SINGAPORE	ASEAN 1 Maritime Square #13-01 HarbourFront Center Singapore 099253	TEL: +65 6291 8528

Table 3-64: Europe

EUROPE		
AUSTRIA	General Electric Austria GmbH & Co OG EURO PLAZA, Gebäude E Technologiestrasse 10 A-1120 Vienna	TEL: (+43) 1 97272 0 FAX: (+43) 1 97272 2222
BELGIUM & LUXEMBURG	GE Healthcare BVBA/SPRL Kouterveldstraat 20 1831 DIEGEM	TEL: (+32) 2 719 7204 FAX: (+32) 2 719 7205
CZECH REPUBLIC	GE Medical Systems Česká Republika, s.r.o Vyskocilova 1422/1a 140 28 Praha 4	TEL: (+420) 224 446 162 FAX: (+420) 224 446 161
DENMARK	GE Healthcare Park Allè 295 DK-2605 Brøndby, Denmark	TEL: (+45) 43 295 400 FAX: (+45) 43 295 399
ESTONIA & FINLAND	GE Healthcare Finland Oy Kuortaneenkatu 2, 000510 Helsinki P.O.Box 330, 00031 GE Finland	TEL: (+358) 10 39 48 220 FAX: (+358) 10 39 48 221
FRANCE	GE Medical Systems SCS Division Ultrasound 24 Avenue de l'Europe - CS20529 78457 Vélizy Villacoublay Cedex	TEL: (+33) 1 34 49 52 70 FAX: (+33) 13 44 95 202
GERMANY	GE Healthcare GmbH Beethovenstrasse 239 42655 Solingen	TEL: (+49) 212-28 02-0 FAX: (+49) 212-28 02-380

Table 3-64: Europe (Continued)

EUROPE		
GREECE	GE Healthcare 8-10 Sorou Str. Marousi Athens 15125 Hellas	TEL: (+30) 210 8930600 FAX: (+30) 210 9625931
HUNGARY	GE Hungary Zft. Division, Akron u. 2. Budaörs 2040 Hungary	TEL: (+36) 23 410 314 FAX: (+36) 23 410 390
IRELAND	NORTHERN IRELAND GE Healthcare Victoria Business Park 9, Westbank Road Belfast BT3 9JL.	TEL: (+44) 028 90229900
	REPUBLIC OF IRELAND GE Healthcare 3050 Lake Drive Citywest Business Campus Dublin 24	TEL: 1800 460 550 FAX: (+353) 1 686 5327
ITALY	GE Medical Systems Italia spa Via Galeno, 36, 20126 Milano	TEL: (+39) 02 2600 1111 FAX: (+39) 02 2600 1417
LUXEMBORG	See Belgium.	
NETHERLANDS	GE Healthcare De Wel 18 B, 3871 MV Hoevelaken PO Box 22, 3870 CA Hoevelaken	TEL: (+31) 33 254 1290 FAX: (+31) 33 254 1292
NORWAY	GE Vingmed Ultrasound AS Sandakerveien 100C 0484 Oslo, Norway	TEL: (+47) 23 18 50 50 FAX: (+47) 23 18 60 35
	GE Vingmed Ultrasound Strandpromenaden 45 P.O. Box 141, 3191 Horten	TEL: (+47) 33 02 11 16
POLAND	GE Medical Systems Polska Sp. z o.o., ul. Woloska 9 02-583 Warszawa, Poland	TEL: (+48) 22 330 83 00 FAX: (+48) 22 330 83 83
PORTUGAL	General Electric Portuguesa SA Avenida do Forte 6 - 6A Edificio Ramazzotti 2790-072 CARNAXIDE	TEL: (+351) 21 425 1300 FAX: (+351) 21 425 1343
RUSSIA	GE Healthcare Presnenskaya nab. 10 Block C, 12 floor 123317 Moscow, Russia	TEL: (+7) 4957 396931 FAX: (+7) 4957 396932
SPAIN	GE Healthcare España C/ Gobelás 35-37 28023 Madrid	TEL: (+34) 91 663 2500 FAX: (+34) 91 663 2501

Table 3-64: Europe (Continued)

EUROPE		
SWEDEN	GE Healthcare Sverige AB FE 314, 182 82 Stockholm Besöksadr: Vendeavagen 89 Danderyd, Sverige	TEL: (+46) 08 559 500 10 FAX: (+46) 08 559 500 15 Service Center (+46) 020-120 14 36
SWITZERLAND	GE Medical Systems (Schweiz) AG Europastrasse 31 8152 Glattbrugg	TEL: (+41) 1 809 92 92 FAX: (+41) 1 809 92 22
TURKEY	GE Healthcare Türkiye Istanbul Office Levent Ofis Esentepe Mah. Harman Sok. No:8 Sisli-Istanbul	TEL: +90 212 398 07 00 FAX: +90 212 284 67 00
UNITED ARAB EMIRATES (UAE)	GE Healthcare Dubai Internet City, Building No. 18 First Floor, Dubai - UAE	TEL: (+971) 4 429 6101 or 4 429 6161 FAX: (+971) 4 429 6201
UNITED KINGDOM	GE Medical Systems Ultrasound Pollards Wood Nightingales Lane Chalfont St Giles Buckinghamshire HP8 4SP	TEL: (+44) 1494 544000 FAX: (+44) 1707 289742
For all other European countries not listed, please contact your local GE distributor or the appropriate support resource listed on www.gehealthcare.com .		

Contacting GE Ultrasound (continued)

Manufacturer



GE Ultrasound Korea, Ltd.
9, Sunhwan-ro 214beon-gil, Jungwon-gu, Seongnam-si,
Gyeonggi-do,
KOREA

System Data

Features/Specifications

Table 3-65: Physical Attributes

<u>Dimensions and Weight</u> • Height: 1,345mm (Minimum), 1,595mm (Max.) • Height (with HD Display): 1,390mm (Minimum), 1,640mm (Max.) • Width : 545mm (23.8 inch monitor), 565mm (23.8 inch HD Display), 430mm (Operator Panel) • Depth: Max 740mm • Weight: 67 kg (148 lb.) (69 kg with HD Display (152 lb.)) <u>Console Design</u> • 4 active probe ports • 1 non imaging, CW pencil probe port (Option) • Integrated SSD • Integrated DVD-RW Multi Drive (Option) • On-board storage of BW thermal printer • Integrated speakers • Locking mechanism that provides rolling lock and caster swivel lock • Integrated cable management • Front handle • Rear handle (Option) • Gel holder • Easily removable air filters <u>Electrical Power</u> • Voltage: 100V - 240V AC • Frequency: 50/60 Hz • Power: Consumption maximum of 500 VA with peripherals • Power cord: Type SJT, SJE, SJO or SJTO, 14AWG, 3-Conductor, VW-1, 125 V or 250 V, 10 A, max 3.0 m long; One end with Hospital Grade Type, NEMA 5-15P or 6-15P. Other end with appliance coupler.	<u>Operator Panel</u> • Operating keyboard adjustable in two dimensions of Height and Rotation • Backlit alphanumeric keyboard (Option) • Ergonomic hard key layout • Interactive back-lighting • Integrated recording keys for remote control of up to 6 peripheral or DICOM devices • Gel warmer (Option) <u>Touch panel</u> • Wide 10.4 in High Resolution, Color, Touch, LCD screen • Interactive dynamic software menu • Brightness adjustment • User-configurable layout • Probe light <u>LCD Monitor</u> • 23.8inch bezel-less LCD LED backlight monitor • 23.8inch HD Display (option) • LCD translation (independent of console): 500 mm horizontal (end to end), 150 mm vertical (end to end), 90° Swivel • Fold-down and lock mechanism for transportation • Brightness & contrast adjustment • Resolution: 1920 x 1080 • Horizontal/Vertical viewing angle of +/- 178°
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Table 3-66: System Overview

<u>Applications</u> • Abdominal • Obstetrical • Gynecological • Breast • Small Parts • Vascular • Transcranial • Transrectal • Transvaginal • Pediatric and Neonatal • Musculoskeletal • Urological • Cardiac • Intraoperative (Not for China) • Peripheral vascular • Transesophageal (Not for China) <u>Scanning Methods</u> • Electronic Sector • Electronic Convex • Electronic Linear • Mechanical Volume Sweep <u>Operating Modes</u> • B-Mode • M-Mode • Color Flow Mode (CFM) • M-Color Flow Mode • Power Doppler Imaging (PDI) • PW Doppler Mode • CW Doppler Mode (Option) • Volume Mode (Easy 3D, Advanced 3D, 4D, STIC, Omiview, HDLive) • Anatomical-M Mode • Curved Anatomical M-Mode • B-Flow/B-Flow Color (Option) • Extended Field of View (LOGIQView, Option) • TVI Mode (Option) • Coded Contrast Imaging (LP9 Only, Option) • B-Steer + (Option) • Coded Harmonic Imaging • M-Color Flow mode • Offline scanning mode (Power Assistant Option) • Strain Elastography (Option) • Shear Wave Elastography (Option) • UGAP (Option)	<u>Display Modes</u> • Simultaneous Capability • B or CrossXBeam / PW • B or CrossXBeam / CFM or PDI • B / M • B or CrossXBeam + CFM or PDI / PW (Real-time Triplex Mode) • B / CW (option) • Selectable Alternating Modes • B or CrossXBeam / PW • B or CrossXBeam + CFM(PDI) / PW • B / CW (option) • Colorized Image • B mode • M mode • Doppler mode • Time line Display • Independent Dual B or CrossXBeam PW Display • CW Display • 2 Display Formats (Top / Bottom, Side / Side selectable Format) • Selectable Size Formats (Full format, Switchable after freeze, Vert 1/3 B, Vert 1/2 B, Vert 2/3 B, Horiz 1/2 B, Horiz 1/4 B) • 2 Timeline Methods (Scrolling, Moving Bar) • Virtual Convex • Multi-image (split/quad screen) • Live and/or frozen • B or CrossXBeam + B or CrossXBeam CFM or PDI • PW/M • Zoom: Write/Read • Simultaneous Bi-plane for Urology application • BE9CS-RS <u>Transducer Types</u> • Sector Phased Array • Linear Array • Convex Array • Micro convex Array • Matrix Array (LP9 Only) • Single CW (Pencil) Probes • Volume probe (4D)
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Table 3-66: System Overview (Continued)

<u>Standard Features</u> • Advanced user interface with high resolution 10.4 inch wide touch screen • Automatic Optimization • CrossXBeam • Speckle Reduction Imaging (SRI-HD) • Fine Angle Steer • Coded Harmonic Imaging • Virtual Convex • Patient information database • Image Archive on integrated CD/DVD and hard disk drive • Real-time automatic Doppler calcs • OB Calcs • Fetal Trending • Multi gestational Calcs • Hip Dysplasia Calcs • Gynecological Calcs • Vascular Calcs • Urological Calcs • Renal Calcs • Cardiac Calcs • inSite ExC Capability • On-board electronic documentation • Raw Data Analysis • MPEGVue • Key Macro • Network Storage • Quick Save • Quick Patient Entry • Email2MMS • Easy 3D <u>Options</u> • Auto EF • Cardiac Strain • Auto IMT • B-Flow/B-Flow Color • Breast Measure Assistant • Breast Productivity Package • B Steer+ • Coded Contrast Imaging (CEUS, HRes) • Compare Assistant • CW Doppler • DICOM 3.0 connectivity • Digital Video Recording Software (Software DVR) • Elastography Quantification • LOGIQView • OB Measure Assistant • Offline scanning • Power Assistant • Standard Battery • Extended Battery	• Quantitative Flow Analysis • Real-Time 4D • Automated Volume Calculation (VOCAL II) • Tomographic Ultrasound Imaging • Volume Contrast Imaging (VCI) Static • OmniView • STIC • HDLive • Report Writer • Scan Assistant • Shear Wave Elastography • Strain Elastography • Stress Echo • Thyroid Productivity Package • Tissue Velocity Imaging (TVI) • LOGIQApps • Bluetooth • Wireless LAN • Gel warmer • DVDCabinet: High/Low Drive • Koios Breast Lesion Decision Support • Thyroid Productivity Package • UGAP • Hepatic Assistant <u>Peripheral Options</u> • Integrated options for • Digital B/W thermal printer • Digital color thermal printer • Digital A6 color thermal printer • External USB Printer connection • HDMI output available for compatible device • S-Video output available for compatible device • Composite Video output available for compatible device • Wireless LAN • Printing using Bluetooth connectivity (Inkjet printer option) • Printer installation kit • Footswitch with programmable functionality • Isolation Transformer • Isolated USB connector • EMI filter (PWR supply noise filter) • Drawer • Small Probe Holder (Probe Holder Adapter for Small Probe) • Probe cable hanger • ECG + AHA/IEC Cables • Power Assistant • Extended battery life • Battery Pack (for Power Assistant/Extended battery life)
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Table 3-67: System Parameters

<u>Controls Available on Freeze or Recall</u> • Automatic Optimization • SRI-HD • CrossXBeam - Display non-compounded and compounded image simultaneously in split screen • 3D reconstruction from a stored CINE loop • B/M/CrossXBeam Mode (Gray Map; TGC, Colorized B and M; Frame Average [Loops only]; Dynamic Range) • Anatomical M-Mode • Max Read Zoom to 20x • Base Line Shift • Sweep Speed • PW-Mode (Gray Map; Post Gain; Baseline Shift; Sweep Speed; Invert Spectral Waveform; Compression; Rejection, Colorized Spectrum; Display Format; Doppler Audio; Angle Correct; Quick Angle Correct, Auto Angle Correct) • Color Flow (Overall Gain [Loops and Stills]; Color Map; Transparency Map; Frame Averaging [Loops only]; Flash Suppression, CFM Display Threshold; Spectral Invert for Color/Doppler) • Anatomical M-Mode on CINE Loop • 4D (Gray Map, Colorize; Post Gain; Change display between single, dual, quad sectional or rendered) <u>Controls Available While "Live"</u> • Write zoom • B/M-Mode (Gain; TGC; Dynamic Range; Acoustic Output; Transmission Focus Position; Transmission Focus Number; Line Density Control; Sweep Speed for M-Mode; # of Angles for CrossXBeam) • PW-Mode (Gain; Dynamic Range; Acoustic Output; Transmission Frequency; PRF; Wall Filter; Spectral Averaging; Sample Volume Gate for PW-Mode Length and Depth; Velocity Scale) • Color Flow (CFM Gain; CFM Velocity Range; Acoustic Output; Wall Echo Filter; Packet Size; Frame Rate Control; CFM Spatial Filter; CFM Frame Averaging; CFM Line Resolution; Frequency/Velocity Baseline Shift)	<u>Scanning Parameters</u> • Displayed Imaging Depth: 0 - 48 cm • Minimum Depth of Field: 0 - 1 cm (Zoom) (probe dependent) • Maximum Depth of Field: 0 - 48 cm (probe dependent) • Continuous Dynamic Receive Focus / Continuous Dynamic Receive Aperture • Adjustable Dynamic Range • Adjustable Field of View [FOV] • Image Reverse: Right/ Left • Image Rotation: 0°, 90°, 180°, 270° <u>Image Storage</u> • On-board database of patient information from past exams • Storage Formats: • DICOM - compressed/ uncompressed, single/multiframe, with/ without Raw Data • Export JPEG, JPEG2000, WMV MPEG 4 and AVI formats • Storage Devices: • USB Flash Device: 64MB to 4GB (for exporting individual images/clips) • CD-R storage: 700MB • DVD storage: -R (4.7GB) • Hard Drive Image Storage: ~350GB • Compare old images with current exam • Reload of archived data sets <u>CINE Memory/Image Memory</u> • 776 MB of CINE Memory • Selectable CINE Sequence for CINE Review • Prospective CINE Mark • Measurements/Calculations & Annotations on CINE Playback • Scrolling timeline memory • Dual Image CINE Display • Quad Image CINE Display • CINE Gauge and CINE Image Number Display • CINE Review Loop • CINE Review Speed
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Table 3-68: Measurements and Calculations

<u>B-Mode</u> • Depth and Distance • Circumference and Area (Ellipse/Trace) • Volume (Ellipsoid) • Angle between 2 Lines • % Stenosis (Area or Diameter) <u>M-Mode</u> • M Depth and Distance • Time • Slope • Heart Rate <u>Doppler Measurements/Calculations</u> • Velocity • Time • A/B Ratio (Velocities/Frequency Ratio) • PS (Peak Systole) • ED (End Diastole) • PS/ED (PS/ED Ratio) • ED/PS (ED/PS Ratio) • AT (Acceleration Time) • Accel (Acceleration) • TAMAX (Time Averaged Maximum Velocity) • Volume Flow [TAMEAN and Vessel Area] • Heart Rate • PI (Pulsatility Index) • RI (Resistivity Index) <u>Vascular Measurements/Calculations</u> • Carotid, Vertebral, Subclavian Measurements, Auto IMT • Summary Reports <u>Obstetrics Measurements/Calculations</u> • Gestational Age Calculation • EFW Calculation • Calculations and Ratios • Measurements/Calculations • Fetal Graphical Trending • Growth Percentiles • Multi-Gestational Calculation • Fetal Qualitative Description (Anatomical Survey) • Fetal Environmental Description (Biophysical profile) • Programmable OB Tables • Over 20 selectable OB Calcs • Expanded Worksheets	<u>Obstetrics Measurements/Calculations</u> • Gestational Age Calculation • EFW Calculation • Calculations and Ratios • Measurements/Calculations • Fetal Graphical Trending • Growth Percentiles • Multi-Gestational Calculation • Fetal Qualitative Description (Anatomical Survey) • Fetal Environmental Description (Biophysical profile) • Programmable OB Tables • Over 20 selectable OB Calcs • Expanded Worksheets <u>Gynecology Measurements/Calculations</u> • Right/Left Ovary Length, Width, Height • Uterus Length, Width, Height • Cervix Length, Trace • Ovarian Volume • ENDO (Endometrial thickness) • Ovarian/Uterine RI • Summary Report <u>Urology Calculation</u> • Bladder, Prostate, Renal, Generic Volume Measurements • Post-Void Bladder Volume <u>Cardiology Measurements/Calculations</u> • Cardiology Measurements and Calculations • Summary Worksheet • Summary Report
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Table 3-69: Probes

• C1-5-RS [Applications: Abdomen(incl. Pleural), Vascular(No transcranial), OB/GYN, Urology] • C2-7-D [Applications: Abdomen(incl. Pleural)] • 8C-RS [Applications: Pediatrics, Neonatal] • 10C-D [Applications: Neonatal, Pediatric, Vascular(No transcranial)] • E8C-RS [Applications: OB/GYN, Urology, Transvaginal, Transrectal] • E8CS-RS [Applications: OB/GYN(Transvaginal), Urology(Transrectal)] • IC9-RS [Applications: OB/GYN, Urology(Transvaginal, Transrectal)] • BE9CS-RS [Applications: Urology(Transrectal)] • ML6-15-RS [Applications: Abdomen(incl. Pleural), Small Parts, Vascular(No transcranial), Pediatric, Neonatal, Musculoskeletal, Breast] • L3-12-RS [Applications: Abdomen(incl. Pleural), Vascular(No transcranial), Small Parts, Pediatric, Neonatal, OB, Breast, Musculoskeletal] • L4-12t-RS [Applications: Abdomen(incl. Pleural), Small Parts, Vascular(No transcranial), Pediatric, Neonatal, Musculoskeletal, Breast] • 12L-RS [Applications: Abdomen(incl. Pleural), Small Parts, Vascular(No transcranial), Pediatric, Neonatal, Musculoskeletal, Breast] • L6-12-RS [Applications: Abdomen(incl. Pleural), Vascular(No transcranial), Small Parts, Pediatric, Neonatal, Breast] • 9L-RS [Applications: Abdomen(incl. Pleural), Small Parts, Vascular(No transcranial), Pediatric, Neonatal, OB, Breast, Musculoskeletal]	• L8-18i-RS [Applications: Small Parts, Vascular(No transcranial), Peripheral Vascular, Neonatal, Pediatrics, Intraoperative(Not for China), Musculoskeletal] • 3Sc-RS [Applications: Cardiac, Abdomen(incl. Pleural), Transcranial] • 6S-RS [Applications: Abdomen(incl. Pleural), Cardiac, Pediatrics, Neonatal, OB] • 12S-RS [Applications: Abdomen(incl. Pleural), Pediatrics, Neonatal] • RAB2-6-RS [Applications: Abdomen, OB/GYN, Urology] • RIC5-9A-RS [Applications: OB/GYN(Transvaginal), Urology(Transrectal)] • P8D [Applications: Cardiac, Vascular(No transcranial)] • P6D [Applications: Cardiac, Vascular(No transcranial)] • P2D [Applications: Cardiac, Vascular(No transcranial)] • L3-9i-RS* [Applications: Small Parts, Vascular, Musculoskeletal, Neonatal, Intraoperative(Not for China)] • L10-22-RS* [Applications: Small Parts, Musculoskeletal, Neonatal] • 6Tc-RS [Applications: Cardiac(Transesophageal)] • C1-6-D* [Applications: Abdomen(incl. Pleural), OB, Gynecology, Vascular(No transcranial), Urology] • C3-10-D** [Applications: Abdomen(incl. Pleural), Neonatal, Pediatric, Vascular(No transcranial)] • M5Sc-RS** [Applications: Cardiac, Transcranial, Abdomen(incl. Pleural)]
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*LOGIQ P10/P9 only

**LOGIQ P10 only

Table 3-70: Biopsy Guides

• Single-Angle, disposable with a reusable bracket • Multi-Angle, disposable with a reusable bracket	• Single-Angle, disposable with a disposable bracket
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Table 3-71: Inputs and Outputs Signal

• USB 2.0 x 5 ports, USB 3.0 x 2 ports • HDMI connector	• Ethernet 1000/100/10BaseT • Audio Line Out (1.5mm pin jack)
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Table 3-72: Physiological Input Panel (Option)

• Physiological Input • ECG 2 lead • Dual R-Trigger • Pre-settable ECG R Delay Time • Pre-settable ECG Position • Adjustable ECG Gain Control	• Automatic Heart Rate Display
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Clinical Measurement Accuracy

Basic Measurements

The following information is intended to provide guidance to the user in determining the amount of variation or measurement error that should be considered when performing clinical measurements with this equipment. Error can be contributed by equipment limitations and improper user technique. Be sure to follow all measurement instructions and develop uniform measurement techniques among all users to minimize the potential operator error. Also, in order to detect possible equipment malfunctions that could affect measurement accuracy, a quality assurance (QA) plan should be established for the equipment that includes routine accuracy checks with tissue mimicking phantoms.

Please be advised that all distance and Doppler related measurements through tissue are dependent upon the propagation velocity of sound within the tissue. The propagation velocity usually varies with the type of tissue, but an average velocity for soft tissue is assumed. This equipment is designed for, and the accuracy statements listed on are based on, an assumed average velocity of 1540 m/s. The percent accuracy when stated applies to the measurement obtained (not the full scale range). Where the accuracy is stated as a percent with a fixed value, the expected inaccuracy is the greater of the two.

Basic Measurements (continued)

Table 3-73: System Measurements and Accuracies

Measurement	Units	Useful Range	Accuracy	Limitations or Conditions
Depth	mm	Full Screen	$\pm\text{max}$ (5% or 1 mm)	
Angle	degree	Full Screen	$\pm\text{max}$ (10% or 1deg)	
Distance:				
Axial	mm	Full Screen	$\pm\text{max}$ (5% or 1 mm)	
Lateral	mm	Full Screen	$\pm\text{max}$ (5% or 2 mm)	Linear Probes
Lateral	mm	Full Screen	$\pm\text{max}$ (5% or 4 mm)	Convex Probes
Lateral	mm	Full Screen	$\pm\text{max}$ (5% or 4 mm)	Sector Probes
Circumference:				
Trace	mm	Full Screen	$\pm\text{max}$ (10% or 1 mm)	
Ellipse	mm	Full Screen	$\pm\text{max}$ (5% or 1 mm)	
Area:				
Trace	mm ²	Full Screen	$\pm\text{max}$ (5% or 1 mm ²)	
Ellipse	mm ²	Full Screen	$\pm\text{max}$ (5% or 1 mm ²)	
3D Volume Accuracy	cm ³	Full Screen	$\pm\text{max}$ (10% or 1.0 cm ³)	
Time	s	Timeline Display	$\pm\text{max}$ (5% or 10 ms)	M mode, PWD mode, CWD mode, TVD mode
Slope	mm/s	Timeline Display	$\pm\text{max}$ (5% or 1 mm/s)	M-Mode
Doppler SV Position	mm	Full Screen	± 2 mm	PWD mode, TVD mode
Velocity	cm/s	Timeline Display	$\pm\text{max}$ (10% or 1cm/s)	PWD mode, CWD mode, TVD mode

Table 3-73: System Measurements and Accuracies

Measurement	Units	Useful Range	Accuracy	Limitations or Conditions
Doppler Angle Correction	cm/s	From 0-60° From 60-80°	±max (5% or 1deg) ±12%	PWD mode, CWD mode, TVD mode

Clinical Calculation Accuracy

Estimate the overall inaccuracy of a combined measurement and calculation by including the stated inaccuracy from the basic measurement accuracy statements.



CAUTION

Diagnostic errors may result from the inappropriate use of clinical calculations. Review the referenced source of the stated formula or method to become familiar with the intended uses and possible limitations of the calculation.

Calculation formulas and databases are provided as a tool to assist the user, but should not be considered an undisputed database, in making a clinical diagnosis. The user is encouraged to research the literature and judge the equipment capabilities on an ongoing basis in order to assess its utility as a clinical tool.

System Care and Maintenance

Overview

The user must ensure that safety inspections are performed at least every 12 months according to the requirements of the patient safety standard IEC 60601-1 (1988). Refer to the Service manual, Chapter 10. Only trained persons are allowed to perform the safety inspections mentioned above. Technical descriptions are available on request. To ensure that the unit constantly operates at maximum efficiency we recommend that the following procedures be observed as part of the customer's internal routine maintenance program.

Contact the local Service Representative for parts or periodic maintenance inspections.

Expected Service Life Description

The expected service life for the LOGIQ P8/P9/P10 system and probes is identified in this table:

Table 3-74: Expected Service Life

Equipment / Accessory	Expected Service Life
LOGIQ P8/P9/P10 system	The expected service life for the LOGIQ P8/P9/P10 is at least seven (7) years from the manufacturing date under the provision of regular maintenance by authorized service personnel.
LOGIQ P8/P9/P10 Probes	The expected service life for the LOGIQ P8/P9/P10 probes meets or exceeds five (5) years from the date the probe is placed in service, under the provision that the customer follows the care instructions provided on the Probe Care Card / Accompanying LOGIQ P8/P9/P10 Instructions for Use.

Inspecting the System



CAUTION

To avoid electrical shock hazard, do not remove panels or covers from console. This servicing must be performed by qualified service personnel. Failure to do so could cause serious injury.

Maintenance Schedule

Monthly Maintenance

Examine the following on a monthly basis (or whenever there is a reason to assume that any issue may have occurred):

- Connectors on cables for any mechanical defects.
- Entire length of electrical and power cables for cuts or abrasions.
- Equipment for loose or missing hardware.
- Control panel and keyboard for defects.
- Casters for proper locking operation.
- Trackball movement

If the trackball is dusty, please clean it. See 'Trackball' on *page 3-117 for more information*.

Weekly Maintenance

The system requires weekly care and maintenance to function safely and properly. Clean the following:

- System Cabinet
- Monitor
- Operator control panel
- Touch Panel
- Probe holder

If the probe holder is dusty, please clean it.

- Gel warmer

If the gel warmer is dusty, please clean it. 'Gel warmer' on *page 3-118*

- Footswitch
- Air filter

If the air filter is dusty, please clean it. See 'Cleaning the air filter' on *page 3-119 for more information*.

NOTE: *Frequency of the cleaning is depend on environment.*

Failure to perform required maintenance may result in unnecessary service calls.

Appropriate Cleaning Agents

Table 3-75: Appropriate Cleaning Agents

Components		Probe holder	User interface *	Touch Panel	Monitor display	Hou- sing	Probes	Air Filter	Peri- pherals (e.g. Printers ...)
When to clean		See 'Maintenance Schedule' on <i>page 3-111 for more information.</i>							Clean according to the instructions for the peripheral manufacturer
How to clean		Wipe gently with a damp, non-abrasive cloth					See 'Cleaning and disinfecting probes' on page 11-21 for more information.	Clean with a vacuum cleaner from the outside	
Cleaning Agent	OXIVIR TB WIPES	X	X	X	-	X			
	Acryl-Des Wipes	X	X	X	X	X			
	Alcohol (Isopropyl) 70%	X	X	X	X	X			
	CAVIWIPES 1	X	X	X	X	X			
	Cleanisept Wipes	X	X	X	X	X			
	Clinell Clorox Wipes	X	X	X	X	X			
	Clinell Universal Sanitizing Wipes	X	X	X	X	X			
	Clorox Healthcare™ Bleach Germicidal Wipes	X	X	X	X	X			
	Distel	X	X	X	X	X			
	Mikrobac® Tissues	X	X	X	X	X			
	Mikrozid® Sensitive Wipes	X	X	X	X	X			
	PDI Easy Screen Cleaning®	X	X	X	X	X			

Table 3-76: Appropriate Cleaning Agents

Component		Probe holder	User Interface *	Touch Panel	Monitor display	Housings	Probes	Air Filter	Peripherals (e.g. Printers ...)
Cleaning Agent	Protex Ultra Disinfectant Wipes	X	X	X	X	X	See 'Cleaning and disinfecting probes' on page 11-21 for more information.	Clean with a vacuum cleaner from the outside	Clean according to the instructions for the peripheral manufacturer
	Sani-Cloth® Bleach	X	X	X	X	X			
	Sani-Cloth® HB	X	X	X	X	X			
	Sani-Cloth® Plus	X	X	X	X	X			
	Sani-Cloth® Prime	X	X	X	X	X			
	Septiwipes	X	X	X	X	X			
	Sodium Hypochlorite 5.25% (Bleach) Diluted 10:1	X	X	X	X	X			
	Sono Ultrasound Wipes	X	X	X	X	X			
	Super Sani-Cloth®	X	X	X	X	X			
	Trophon Companion Cleaning Wipes	X	X	X	X	X			

X : can be used on the component of the ultrasound console

- : do not use on component of the ultrasound console

NOTE: * Effective cleaning for parts with narrow gaps and holes (e.g. Keyboard, trackball...) is not possible. For more information, visit to <http://cleaning.gehealthcare.com/>. GE verified that the above listed agents are chemically compatible with the product. No statement on the cleaning or disinfection effectivity of the individual agents can be done by GE.

Cleaning the system

Prior to cleaning any part of the system:

1. Turn off the system power. If possible, disconnect the power cord. See 'Power Off' on page 3-36 for more information.

System Cabinet

To clean the system cabinet:

1. Moisten a soft, non-abrasive folded cloth with a mild, general purpose, non-abrasive soap and water solution.

NOTE: *The cloth should be damp, not dripping wet.*

2. Wipe down the top, front, back, and both sides of the system cabinet.

NOTE: *Do not spray any liquid directly into the unit.*

LCD Monitor and Touch Panel

NOTE: *Never use thinner, benzene, alcohol (ethanol or methanol), abrasive cleaners, or other strong solvents, as these may cause damage to the cabinet or LCD panel.*

NOTE: *DO NOT scratch or press on the panel with any sharp objects, such as pencils or pens, as this may result in damage to the panel.*

To clean the LCD panel and the Touch Panel:

- The surface can be cleaned with a dry and soft cloth, such as cloths for cleaning glasses.
- If necessary, stubborn stains can be removed by moistening part of a cloth with water to enhance its cleaning power.

Operator Control Panel

To clean the operator control panel:

1. Moisten a soft, non-abrasive folded cloth with a mild, general purpose, non-abrasive soap and water solution.
2. Wipe down operator control panel.
3. Use a cotton swab to clean around keys or controls. Use a toothpick to remove solids from between keys and controls.

NOTE: *When cleaning the operator control panel, make sure not to spill or spray any liquid on the controls, into the system cabinet, or in the probe connection receptacle.*

NOTE: *In case of SARS, use bleach, alcohol, or Cidex in a normal diluted form for cleaning/disinfecting the operator panel.*

NOTE: *DO NOT use T-spray or Sani Wipes on the control panel.*



CAUTION

Before cleaning the control panel, make sure the key cap is firmly in place.

NOTE: *The cloth should be damp, not dripping wet.*

Footswitch

To clean the footswitch:

1. Moisten a soft, non-abrasive folded cloth with a mild, general purpose, non-abrasive soap and water solution.
2. Wipe the external surfaces of the unit then dry with a soft, clean, cloth.

Trackball

1. Power off the system.
2. Rotate the retainer counterclockwise until it can be removed from the keyboard.

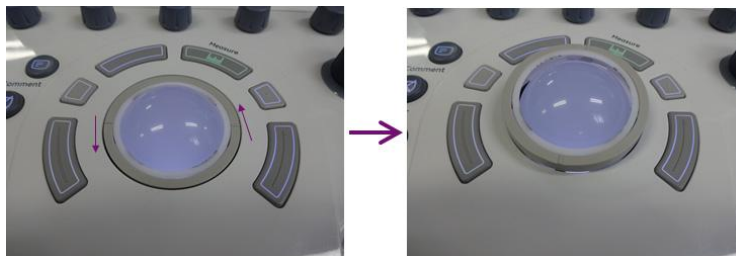


Figure 3-35. Remove the retainer

3. Separate the trackball and the retainer. Wipe off any oil or dust from the trackball, retainer and the trackball housing using a cleaner or cotton swab.
4. Assemble the trackball and retainer, then put it into the housing and rotate it clockwise until its notches are set in position.



CAUTION

When cleaning, make sure not to spill or spray any liquid into the trackball housing (keyboard or system).

Probe holder

1. Remove the holder.



Figure 3-36. Remove the holder

2. Wash the holder with mild soap in lukewarm water. Scrub it using a soft sponge, gauze, or cloth to remove all visible residue from the surface. Prolonged soaking or scrubbing with a soft bristle brush (such as a toothbrush) may be necessary if material has dried onto the surface.
3. Rinse the holder with enough water.
4. Dry with a soft cloth and put it back.

Gel warmer

NOTE: *Gel Warmer is expected to be cleaned when dust or other debris cumulates.*

1. Remove the screw-on lid of the bottom.



Figure 3-37. Gel warmer cap

2. Wipe inside of the gel warmer with soft cloth.
3. Wash the cap with mild soap in lukewarm water. Rinse the cap with enough water.
4. Dry with a soft cloth and put it back.

Cleaning the air filter

Clean the system's air filters to ensure that a clogged filter does not cause the system to overheat and reduce system performance and reliability. It is recommended the filters be cleaned every two weeks, but the requirements will vary due to your system use.



CAUTION

Be sure to lock the wheels before cleaning the air filters to avoid injury by any unexpected movement of the system.

DO NOT operate the unit without the air filters in place.

Allow the air filters to dry thoroughly before re-installing them on the unit.

Cleaning

1. Pull the front cover of cabinet with hand and pull out the air filter.

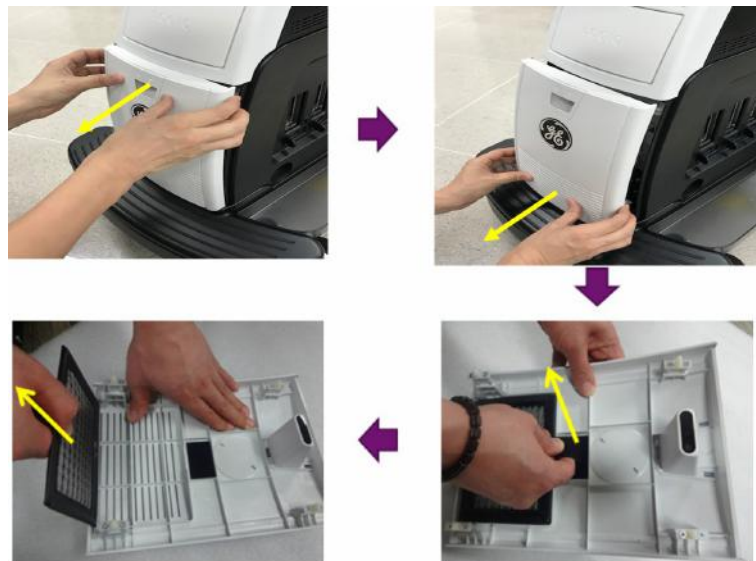


Figure 3-38. Air filter location

Cleaning (continued)

2. Pull out the filter.

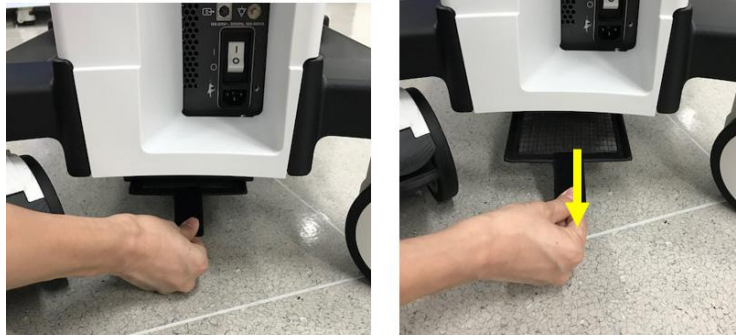


Figure 3-39. Air filter location

3. Dust the filter with a vacuum cleaner and/or wash it with a mild soapy solution.
If washed, rinse and dry the filter before re-installation.
4. Put back the air filter and the front cover.

Probe Cleaning

Refer to Chapter 17, the Probes Chapter, for probe cleaning and disinfecting instructions.



CAUTION

NEVER use any cleaner or disinfectant containing alcohol.

When cleaning/disinfecting probes using a spray cleaner/disinfectant, DO NOT spray the probe while the probe is set in its probe holder on the Ultrasound system. Overspray can damage the TGC controls.



Figure 3-40. DO NOT Spray a Probe While in its Holder

Probe Cleaning (continued)

If you use a spray cleaner, spray **AWAY** from the Ultrasound system.



Figure 3-41. Spray Probes **AWAY** from the Ultrasound System

If you are cleaning/disinfecting probes while they are on the Ultrasound system, use a wipe cleaner/disinfectant instead.



Figure 3-42. Using a Wipe to Clean/Disinfect a Probe

Prevention of static electricity interference

Interference from static electricity can damage electronic components in the system. The following measures help to reduce the likelihood of electrostatic discharge:

- Wipe the alphanumeric keyboard and monitor with lint-free tissue or a soft cloth dampened with anti-static spray on a monthly basis.
- Spray carpets with anti-static spray because constant walking on carpets in or near the scanning room may be a source of static electricity.

Disposal

Table 3-77: WEEE symbol

	Rear of the system Probe connector
---	---------------------------------------

Disposal of Old Electrical & Electronic Equipment (applicable in the European Union and other European countries with separate collection systems). This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Battery Replacement and Disposal

Battery replacement every two years is recommended. Contact a local Service Representative for the replacement of the battery.

Power Assistant uses a Lithium Ion battery. Used battery will require to discard as chemical waste. Please contact your local authority for the directions

NOTE: *WHEN REMOVING A DEFECTIVE BATTERY, ENSURE THAT IT IS DISPOSED OF IN ACCORDANCE WITH LOCAL REGULATIONS. ALTERNATIVELY, FORWARD IT TO GE MEDICAL SYSTEMS FOR PROPER DISPOSAL.*

Troubleshooting

Refer to the LOGIQ P8/P9/P10 Service Manual if other messages appear on the monitor display.

Table 3-78: Error message and workaround

	The system has detected the lower air filter requires cleaning. Please clean the lower filter. 1. Shutdown the system. 2. Clean the air filter according to 'Cleaning the air filter' on <i>page 3-119</i>.
	System temperature is too high. System will shut down. 1. Shutdown the system. 2. Clean the air filter according to 'Cleaning the air filter' on <i>page 3-119</i>.
	System voltage fault. System will shut down. 1. Select OK and reboot the system. 2. If the same message appears after reboot, shut down the system and turn off the breaker. Then turn on the system according to 'Power On' on <i>page 3-31</i>.
	System Error. Please reboot the system. 1. Select OK and reboot the system. 2. If the same message appears after reboot, shut down the system and turn off the breaker. Then turn on the system according to 'Power On' on <i>page 3-31</i>.

Assistance

Supplies/Accessories



CAUTION

DO NOT connect any probes or accessories without approval by GE.



CAUTION

Use only GE approved internal equipment when replacing an internal peripheral.

The user or the operator should never install/replace the internal peripheral. Service representatives authorized by GEHC will install/replace the internal peripheral.

Not all features or products described in this document may be available or cleared for sale in all markets. Contact the distributor, GE affiliate or sales representative for approved peripherals. For HCATs, contact your sales person. For 2million/5million number part numbers, these are service replacement part numbers that may be either new or refurbished. To order these, contact CARES in the US, or call service in Europe and Asia.

The following supplies/accessories have been verified to be compatible with the system:

Peripherals

Table 3-79: Peripherals and Accessories

Accessory
Sony B/W Printer Model UP-D898
Sony Color Printer Model UP-D25MD
DVR
UVC
Digital expert

ECG Accessories

Table 3-80: ECG Accessories

Accessory
ECG module
ECG cable - AHA typee
ECG cable - IEC type
External ECG Cable

Console

Table 3-81: Console Accessories

Accessory
Footswitch
Endocavity Probe Holder
Optional Probe Holder
Side Tray
Low cabinet
Mid cabinet
High cabinet
Side cabinet
Greek Keyboard
Russian Keyboard
English keyboard
French keyboard
German keyboard
Norwegian/Danish Keyboard
Swedish Keyboard
Power Cord - US
Power Cord - Argentina
Power Cord - Italy
Power Cord - UK-Ireland
Power Cord - Switzerland
Power Cord - Denmark
Power Cord - Israel
Power Cord - Japan
Power Cord - China
Power Cord - Australia
Power Cord - India
Power Cord - Taiwan
Power Cord - South Africa
Power Cord - Brazil

Probes

Table 3-82: Probes and Accessories

Probe	Biopsy Guide
C1-5-RS	Multi Angle, Disposable with a Reusable Bracket
E8C-RS	Single Angle, Disposable with a Plastic Bracket or Reusable with a Stainless Steel Bracket
L8-18i-RS	Not Available
9L-RS	Multi Angle, Disposable with a Reusable Bracket
P8D	Not Available
12L-RS	Multi Angle, Disposable with a Reusable Bracket Infinite-angle (in plane biopsy kit), Disposable with a Reusable Bracket Transverse Bracket (off plane biopsy kit), Disposable with a Reusable Bracket
ML6-15-RS	Multi Angle, Disposable with a Reusable Bracket
3Sc-RS	Multi Angle, Disposable with a Reusable Bracket
RAB2-6-RS	Single Angle, Disposable with a Reusable Bracket, Single angle reusable
8C-RS	Not Available
6S-RS	Not Available
L6-12-RS	Multi Angle, Disposable with a Reusable Bracket
RIC5-9A-RS	Single Angle, Disposable with a Plastic Bracket or Reusable with a Stainless Steel Bracket
BE9CS-RS	Single Angle, Disposable with a Plastic Bracket or Reusable with a Stainless Steel Bracket
E8CS-RS	Single Angle, Disposable with a Plastic Bracket or Reusable with a Stainless Steel Bracket
L4-12t-RS	Multi Angle, Disposable with a Reusable Bracket Infinite-angle (in plane biopsy kit), Disposable with a Reusable Bracket Transverse Bracket (off plane biopsy kit), Disposable with a Reusable Bracket
L10-22-RS	Not Available
L3-9i-RS	Not Available
12S-RS	Not Available
P6D	Not Available
L3-12-RS	Multi Angle Bracket

Table 3-82: Probes and Accessories (Continued)

Probe	Biopsy Guide
6Tc-RS	Not Available
P2D	Not Available
IC9-RS	Reusable, Disposable Bracket
C1-6-D	Multi-Angle, Disposable with a Reusable Bracket
C2-7-D	Multi-Angle, Disposable with a Reusable Bracket Multi-Angle, Reusable with a Stainless Steel Bracket
C3-10-D	Not Available
10C-D	Not Available
M5Sc-RS	Multi-Angle, Disposable with a Reusable Bracket

Options

Table 3-83: Options

Accessory
LOGIQView
Contrast Enhanced Ultrasound*
Scan Assistant
DICOM 3.0 connectivity
Report Writer
Real time 4D
4D with VCI
VOCAL II (Volume Calculation)
Tomographic Ultrasound Imaging
Continuous Wave (CW)
Tissue Velocity Imaging (TVI)
Elastography
Elastography Quantification (Not available in the USA)
Advanced 3D
B-Flow
Auto IMT
Flow Quantification
Stress Echo
B Steer+
ECG
SW DVR
Footswitch
Auto EF
Advanced 3D
Volume Contrast Imaging (VCI)
STIC
Omniview
HD Live
Wireless Lan (WLAN)

Table 3-83: Options (Continued)

Accessory
LOGIQ Apps
Bluetooth
Compare Assistant
Breast Productivity Package
Thyroid Productivity Package
OB Measure Assistant
Breast Measure Assistant
Video Scan Converter
Automated Function Imaging
Shear Wave Elastography
KOIOS SW
Ultrasound Guided Attenuation Parameter (UGAP)
*The LOGIQ P8/P9/P10 is designed for compatibility with commercially available Ultrasound contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is cleared for use. Contrast-related product features are enabled only on systems for delivery to an authorized country or region of use.

Chapter 4

Safety

Describes the safety and regulatory information pertinent for operating this ultrasound system.

Owner Responsibility

Owner requirements

It is the responsibility of the owner to ensure that anyone operating the system reads and understands this section of the manual. However, there is no representation that the act of reading this manual renders the reader qualified to operate, inspect, test, align, calibrate, troubleshoot, repair or modify the system. The owner should make certain that only properly trained, fully-qualified service personnel undertake the installation, maintenance, troubleshooting, calibration and repair of the equipment.

The owner of the ultrasound unit should ensure that only properly trained, fully qualified personnel are authorized to operate the system. Before authorizing anyone to operate the system, it should be verified that the person has read, and fully understands, the operating instructions contained in this manual. It is advisable to maintain a list of authorized operators.

Should the system fail to operate correctly, or if the unit does not respond to the commands described in this manual, the operator should contact the nearest field GE Ultrasound Service Office.

For information about specific requirements and regulations applicable to the use of electronic medical equipment, consult the local, state and federal agencies.



For USA only:

Federal law restricts this device to use by, or on the orders of, a physician.

Safety Precautions

Precaution Levels

Various levels of safety precautions may be found on the equipment and different levels of concern are identified by one of the following flag words and icons which precede the precautionary statement.



Indicates that a specific hazard is known to exist which through inappropriate conditions or actions may cause:

- Severe personal injury
- Substantial property damage.



Indicates that a potential hazard may exist which through inappropriate conditions or actions will or can cause:

- Minor injury
- Property damage.

NOTE: *Indicates precautions or recommendations that should be used in the operation of the ultrasound system, specifically:*

- *Maintaining an optimum system environment*
- *Using this Manual*
- *Notes to emphasize or clarify a point.*

Hazard Symbols

Icon Description

Potential hazards are indicated by the following icons:

Table 4-1: Potential Hazards

Icon	Potential Hazard	Usage	Source
	Biological Hazard Describes precautions necessary to prevent the risk of disease transmission or infections. • Patient/user infection due to contaminated equipment.	• Cleaning and care instructions • Sheath and glove guidelines	ISO 7000 No. 0659
	Electrical Hazard Describes precautions necessary to prevent the risk of injury through electric hazards. • Electrical micro-shock to patient, e.g., ventricular	• Probes • ECG, if applicable • Connections to back panel	
	Moving Hazard Describes precautions necessary to prevent the risk of injury through moving or tipping hazard! • Console, accessories or optional storage devices that can fall on patient, user, or others. • Collision with persons or objects may result in injury while maneuvering or during system transport. • Injury to user from moving the console.	• Moving • Using brakes • Transporting	
	Acoustic Output Hazard • Patient injury or tissue damage from ultrasound radiation.	• ALARA, the use of Power Output following the 'as low as reasonably achievable' principle	
	Explosion Hazard Describes precautions necessary to prevent the risk of injury through explosion hazard! • Risk of explosion if used in the presence of flammable anesthetics.	• Flammable anesthetic	
	Fire and Smoke Hazard • Patient/user injury or adverse reaction from fire or smoke. • Patient/user injury from explosion and fire.	• Replacing fuses • Outlet guidelines	

Important Safety Considerations

The following topic headings (Patient Safety, and Equipment and Personnel Safety) are intended to make the equipment user aware of particular hazards associated with the use of this equipment and the extent to which injury can occur if precautions are not observed. Additional precautions may be provided throughout the manual.



Improper use can result in serious injury. The use of the system outside the described conditions or intended use, and disregarding safety related information is considered abnormal use. The user must be thoroughly familiar with the instructions and potential hazards involving ultrasound examination before attempting to use the device. Training assistance is available from GE if needed.

Disregarding information on safety is considered abnormal use.



The use of the system outside the described conditions or intended use, and disregarding safety related information is considered as abnormal use. The manufacturer is not liable for damage caused by abnormal use of the device.

Patient Safety



WARNING

The concerns listed can seriously affect the safety of patients undergoing a diagnostic ultrasound examination.

Patient identification

Always include proper identification with all patient data and verify the accuracy of the patient's name and ID numbers when entering such data. Make sure correct patient ID is provided on all recorded data and hard copy prints. Identification errors could result in an incorrect diagnosis.

The ultrasound system is not meant to be long term storage for patient data or images. The customers are responsible for the data on the system and a regular backup is highly recommended.

It is advisable to back up system data prior to any service repairs to the hard drive. It is always possible during system failure and repair to lose patient data. GE will not be held responsible for the loss of this data.

Diagnostic information

The images and calculations provided by the system are intended for use by competent users, as a diagnostic tool. They are explicitly not to be regarded as the sole, irrefutable basis for clinical diagnosis. Users are encouraged to study the literature and reach their own professional conclusions regarding the clinical utility of the system.

The user should be aware of the product specifications and of the system accuracy and stability limitations. These limitations must be considered before making any decision based on quantitative values. If in doubt, the nearest GE Ultrasound Service Office should be consulted.

Equipment malfunction or incorrect settings can result in measurement errors or failure to detect details within the image. The equipment user must become thoroughly familiar with the equipment operation in order to optimize its performance and recognize possible malfunctions. Applications training is available through the local GE representative. Added confidence in the equipment operation can be gained by establishing a quality assurance program.



CAUTION

The system provides calculations (e.g. estimated fetal weight) and charts based on published scientific literature. The selection of the appropriate chart and clinical interpretation of calculations and charts is the sole responsibility of the user. The user should consider contraindications for the use of a calculation or chart as described in the scientific literature. The diagnosis, decision for further examination, and medical treatment must be performed by qualified personnel following good clinical practice.



CAUTION

Features that facilitate measurements such as SonoAVC™, VOCAL or SonoNT must be used with extreme care. The measurement results are a suggestion of the system, if in doubt verify with manual measurement methods.

The user is responsible for the diagnostic interpretation of the measurement results.



CAUTION

Be certain to ensure privacy data of patient information.

Mechanical hazards

The use of damaged probes can result in injury or increased risk of infection. Inspect probes often for sharp, pointed, or rough surface damage that could cause injury or tear protective barriers.

Never use excessive force when manipulating intracavity probes. Become familiar with all instructions and precautions provided with special purpose probes.



A damaged probe can also increase the risk of electric shock if conductive solutions come in contact with internal live parts. Inspect probes often for cracks or openings in the housing and holes in and around the acoustic lens or other damage that could allow liquid entry. Become familiar with the probe's use and care precautions outlined in *Probes and Biopsy*.

ALARA



Ultrasound can produce harmful effects in tissue and potentially result in patient injury. Always minimize exposure time and keep ultrasound levels low when there is no medical benefit. Use the principle of ALARA (As Low As Reasonably Achievable), increasing output only when needed to obtain diagnostic image quality. Observe the acoustic output display and be familiar with all controls affecting the output level. See the *Bioeffects* section of the *Acoustic Output* chapter in the *Advanced Reference Manual* for more information.

Training

It is recommended that all users receive proper training in applications before performing them in a clinical setting. Please contact the local GE representative for training assistance.

ALARA training is provided in the Medical Ultrasound Safety booklet shipped in the eDOCs kit. The ALARA education program for the clinical end-user covers basic ultrasound principles, possible biological effects, the derivation and meaning of the indices, ALARA principles, and examples of specific applications of the ALARA principle.

Equipment and Personnel Safety

The concerns listed below can seriously affect the safety of equipment and personnel during a diagnostic ultrasound examination.

Do not use this equipment if a safety problem is known to exist. Have the unit repaired and performance verified by qualified service personnel before returning to use.

Related Hazards



This equipment contains dangerous voltages that are capable of serious injury or death.

If any defects are observed or malfunctions occur, stop operating the equipment and perform the proper action for the patient. Inform a qualified service person and contact a Service Representative for information.

There are no user serviceable components inside the console. Refer all servicing to qualified service personnel only.

Ensure that unauthorized personnel do not tamper with the unit.



To avoid injury:

- Do not remove protective covers. No user serviceable parts are inside. Refer servicing to qualified service personnel.
- To assure adequate grounding, connect the attachment plug to a reliable (hospital grade) grounding outlet (having equalization conductor ⚡).
- Never use any adaptor or converter of a three-prong-to-two-prong type to connect with a mains power plug. The protective earth connection will loosen.
- Do not place liquids on or above the console. Spilled liquid may contact live parts and increase the risk of shock.
- Plug any peripherals into the AC power outlet.



The system must be supplied from an adequately rated electrical circuit. The capacity of the supply circuit must be as specified.

Related Hazards (continued)



Explosion
Hazard

Never operate the equipment in the presence of flammable or explosive liquids, vapors or gases. Malfunctions in the unit, or sparks generated by fan motors, can electrically ignite these substances. Operators should be aware of the following points to prevent such explosion hazards.

- If flammable substances are detected in the environment, do not plug in or turn on the system.
- If flammable substances are detected after the system has been turned on, do not attempt to turn off the unit, or to unplug it.
- If flammable substances are detected, evacuate and ventilate the area before turning off the unit.



CAUTION

This equipment provides no special means of protection from high frequency (HF) burns that may result from using an electrosurgical unit (ESU). To reduce the risk of HF burns, avoid contact between the patient and ultrasound transducer while operating the ESU. Where contact cannot be avoided, as in the case of TEE monitoring during surgery, make sure the transducer is not located between the ESU active and dispersive electrodes and keep the ESU cables away from the transducer cable.



CAUTION

To avoid skin burns in surgical use, do not place ECG electrodes in the current path between the Electrosurgical Unit (ESU) active and dispersive electrodes. Keep ESU cables away from ECG leads.



CAUTION

DO NOT touch the patient and any of the connectors on the ultrasound unit simultaneously, including ultrasound probe connectors.

DO NOT touch the conducting parts of the USB, Ethernet, Video, Audio cables when connecting equipment to the unit.



CAUTION

DO NOT load non-system software on the system computer.

Related Hazards (continued)



Biological Hazard

For patient and personnel safety, be aware of biological hazards while performing invasive procedures. To avoid the risk of disease transmission:

- Use protective barriers (gloves and probe sheaths) whenever possible. Follow sterile procedures when appropriate.
- Thoroughly clean probes and reusable accessories after each patient examination and disinfect or sterilize as needed. Refer to *Probes and Biopsy* for probe use and care instructions.
- Follow all infection control policies established by your office, department or institution as they apply to personnel and equipment.



CAUTION

Pacemaker hazard

The possibility of the system interfering with pacemakers is minimal. However, as this system generates high frequency electrical signals, the operator should be aware of the potential hazard this could cause.



CAUTION

Be cautious to avoid contacting with the needle tip in biopsy procedure.

Moving Hazard



CAUTION

Take extra care when moving the system.

The equipment weighs approximately 67 kg (148 lbs) (69 kg with HD Display (152 lbs)). To avoid possible injury and equipment damage when transporting from one area of use to another:

- Be sure the pathway is clear.
- Limit movement to a slow careful walk.
- Use two or more persons to move the equipment on inclines or long distance.

Allergic reactions to latex-containing medical devices



CAUTION

Due to reports of severe allergic reactions to medical devices containing latex (natural rubber), the FDA advises health-care professionals to identify latex-sensitive patients, and be prepared to treat allergic reactions promptly. Latex is a component of many medical devices, including surgical and examination gloves, catheters, incubation tubes, anesthesia masks and dental dams. Patient reaction to latex has ranged from contact urticaria, to systemic anaphylaxis.

For more details regarding allergic reaction to latex, refer to FDA Medical Alert MDA91-1, March 29.

Transesophageal probe safety



CAUTION

Never use excessive force when manipulating the transesophageal probe. The detailed operator manual enclosed with the transesophageal probe must be read carefully.

Classifications

Type of protection against electric shock

Class I (*1) & Internally powered ME (*4)

Degree of protection against electric shock

Type BF Applied part (*2) (for Probes marked with BF symbol)

Type CF (Defibrillation-proof CF) Applied part (*3) (for ECG marked with CF symbol)

Continuous Operation

System is Ordinary Equipment (IPX0)

Footswitch is IPX8

Probe head (immersible portion) and cable are IPX7

NOTE: *Probe connector is not waterproof.*

***1. Class I Equipment**

EQUIPMENT in which protection against electric shock does not rely on BASIC INSULATION only, but includes an earth ground. This additional safety precaution prevents exposed metal parts from becoming LIVE in the event of an insulation failure.

***2. Type BF Applied Part**

TYPE BF APPLIED PART providing a specified degree of protection against electric shock, with particular regard to allowable LEAKAGE CURRENT.

***3. Type CF (Defibrillation-proof CF) Applied part**

TYPE CF APPLIED PART providing a degree of protection higher than that for Type BF Applied Part against electric shock particularly regarding allowable LEAKAGE CURRENTS.

***4. Internally powered**

Term referring to electrical equipment that is able to operate from an INTERNAL ELECTRICAL POWER SOURCE

Table 4-2: Type BF Equipment

	Normal Mode	Single fault condition
Patient leakage current	Less than 100 microA	Less than 500 microA

Table 4-3: Type CF Equipment

	Normal Mode	Single fault condition
Patient leakage current	Less than 10 microA	Less than 50 microA

EMC (Electromagnetic Compatibility)

NOTE: *This equipment generates, uses and can radiate radio frequency energy. The equipment may cause radio frequency interference to other medical and non-medical devices and radio communications. To provide reasonable protection against such interference, this product complies with emissions limits for a Group 1, Class A Medical Devices Directive as stated in IEC/EN 60601-1-2. However, there is no guarantee that interference will not occur in a particular installation.*

NOTE: *If this equipment is found to cause interference (which may be determined by turning the equipment on and off), the user (or qualified service personnel) should attempt to correct the problem by one or more of the following measure(s):*

- *reorient or relocate the affected device(s)*
- *increase the separation between the equipment and the affected device*
- *power the equipment from a source different from that of the affected device*
- *consult the point of purchase or service representative for further suggestions.*

NOTE: *The manufacturer is not responsible for any interference caused by using other than recommended interconnect cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the users' authority to operate the equipment.*

NOTE: *To comply with the regulations on electromagnetic interference for a Class A FCC Device, all interconnect cables to peripheral devices must be shielded and properly grounded. Use of cables not properly shielded and grounded may result in the equipment causing radio frequency interference in violation of the FCC regulations.*

EMC (Electromagnetic Compatibility) (continued)

NOTE: *Do not use devices which intentionally transmit RF Signals (cellular phones, transceivers, or radio controlled products) other than those supplied by GE (wireless microphone, broadband over power lines, for example) in the vicinity of the equipment as it may cause performance outside the published specifications. Keep the power to these type devices turned off when near this equipment.*

The medical staff in charge of this equipment is required to instruct technicians, patients, and other people who maybe around this equipment to fully comply with the above requirement.



Portable RF communication equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the LOGIQ P8/P9/P10 including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.



Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. In such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.



Do not operate the system in the vicinity of a heat source, of strong electric or magnetic fields (e.g. close to a transformer), or near instruments generating high-frequency signals, such as HF surgical equipment or magnetic resonance imaging equipment or similar. These can affect the ultrasound images adversely.



Typically an ESD/EMC event results in an intermittent ultrasound image degradation for the time the ESD/EMC event is present. In rare cases the ultrasound system might show an error message that can be confirmed by the operator. In other cases the ultrasound system might stop to operate and require a re-boot to re-establish the functionality.

EMC Performance

All types of electronic equipment may characteristically cause electromagnetic interference with other equipment, either transmitted through air or connecting cables. The term EMC (Electromagnetic Compatibility) indicates the capability of equipment to curb electromagnetic influence from other equipment and at the same time not affect other equipment with similar electromagnetic radiation from itself.

Proper installation following the service manual is required in order to achieve the full EMC performance of the product.

The product must be installed as stipulated in 4.2, Notice upon Installation of Product.

In case of issues related to EMC, please call your service personnel.

The manufacturer is not responsible for any interference caused by using other than recommended interconnect cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the users' authority to operate the equipment.

EMC Performance (continued)



CAUTION

Do not use devices which intentionally transmit RF signals (cellular phones, transceivers, or radio controlled products), other than those supplied by GE (wireless microphone, broadband over power lines, for example) unless intended for use with this system, in the vicinity of this equipment as it may cause performance outside the published specifications.

Keep power to these devices turned off when near this equipment.

Medical staff in charge of this equipment is required to instruct technicians, patients and other people who may be around this equipment to fully comply with the above regulation.

Portable and mobile radio communications equipment (e.g. two-way radio, cellular/cordless telephones, wireless computer networks) should be used no closer to any part of this system, including cables, than determined according to the following method:

Table 4-4: Portable and mobile radio communications equipment distance requirements

Frequency Range:	150 kHz - 80 MHz	80 MHz - 800 MHz	800 MHz - 2.5 GHz
Calculation Method:	$d = [3.5/V_1]$ square root of P	$d = [3.5/E_1]$ square root of P	$d = [7/E_1]$ square root of P
Where: d= separation distance in meters, P = rated power of the transmitter, V_1 =compliance value for conducted RF, E_1 = compliance value for radiated RF			
If the maximum transmitter power in watts is rated	The separation distance in meters should be		
5	2.6	2.6	5.2
20	5.2	5.2	10.5
100	12.0	12.0	24.0

EMC Performance (continued)

Notice upon Installation of Product

Separation distance and effect from fixed radio communications equipment: field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast transmitter cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the ultrasound system is used exceeds the applicable RF compliance level as stated in the immunity declaration, the ultrasound system should be observed to verify normal operation. If abnormal operation is observed, additional measures may be necessary, such as re-orienting or relocating the ultrasound system or using an RF shielded examination room may be necessary.

1. Use either power supply cords provided by GE or ones designated by GE. Products equipped with a power source plug should be plugged into the fixed power socket which has the protective grounding conductor. Never use any adaptor or converter to connect with a power source plug (e.g. three-prong-to-two-prong converter).
2. Locate the equipment as far away as possible from other electronic equipment.
3. Be sure to use only the cables provided by or designated by GE. Connect these cables following the installation procedures (e.g. wire power cables separately from signal cables).
4. Lay out the main equipment and other peripherals following the installation procedures described in the Option Installation manuals.

General Notice

1. Designation of Peripheral Equipment Connectable to This Product.

The equipment indicated in the Supplies/Accessories section can be hooked up to the product without compromising its EMC performance.

Avoid using equipment not designated in the list. Failure to comply with this instruction may result in poor EMC performance of the product.

2. Notice against User Modification

The user should never modify this product. User modifications may cause degradation in EMC performance.

Modification of the product includes changes in:

- a. Cables (length, material, wiring, etc.)
 - b. System installation/layout
 - c. System configuration/components
 - d. Securing system parts (cover open/close, cover screwing)
3. Operate the system with all covers closed. If a cover is opened for some reason, be sure to shut it before starting/resuming operation.
 4. Operating the system with any cover open may affect EMC performance.



WARNING

Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

Table 4-5: Main Power Cable

No	Type	Cable Construction / Manufacturer	Max. Length (m)	Type of Cable
1	AC cable	H05VV-F 3G1.0mm2 Manufactured by VOLEX / FELLER	4	Non-Shielded
2	AC cable	RVV 3G1.0mm2 Manufactured by VOLEX / FELLER	4	Non-Shielded
3	AC cable	VCTF 3GG2.00mm2 Manufactured by VOLEX / FELLER	4	Non-Shielded

Table 4-5: Main Power Cable

No	Type	Cable Construction / Manufacturer	Max. Length (m)	Type of Cable
4	AC cable	SJT 3/14AWG Manufactured by VOLEX / FELLER	4	Non-Shielded

Table 4-6: External Interface Cable (Patient Cable without Probes)

No	Type	Parts No. / Manufacturer	Max. Length (m)	Type of Cable
1	ECG Cable	Multi-Link ECG Care Cable_AHA Type Manufactured by Vyair Medical Oy	3.6	Shielded
2	ECG Cable	Multi-Link ECG Care Cable_IEC Type Manufactured by Vyair Medical Oy	3.6	Shielded

Table 4-7: List of all cables and maximum length of cables

No	Type	Model name	Max. Length (m)	Type of Cable	Remark
1	Convex array probe	C1-5-RS Manufactured by GE Healthcare	2.2	Shielded	
2		IC9-RS Manufactured by GE Healthcare	2.2	Shielded	
3		8C-RS Manufactured by GE Healthcare	1.6	Shielded	
4		E8C-RS Manufactured by GE Healthcare	2.15	Shielded	
5		E8Cs-RS Manufactured by GE Healthcare	2.1	Shielded	
6		BE9CS-RS Manufactured by GE Healthcare	2.1	Shielded	
7		C1-6-D Manufactured by GE Healthcare	2.2	Shielded	LP9/LP10 only
8		C3-10-D Manufactured by GE Healthcare	2.0	Shielded	LP10 only

Table 4-7: List of all cables and maximum length of cables

No	Type	Model name	Max. Length (m)	Type of Cable	Remark
9		C2-7-D Manufactured by Humanscan Co.,Ltd	2.2	Shielded	
10		10C-D Manufactured by Ueda Japan Radio Co., Ltd	2.2	Shielded	
11	Linear array probe	9L-RS Manufactured by GE Healthcare	1.95	Shielded	
12		12L-RS Manufactured by GE Healthcare	1.95	Shielded	
13		ML6-15-RS Manufactured by GE Healthcare	2.25	Shielded	
14		L8-18i-RS Manufactured by GE Healthcare	2.1	Shielded	
15		L6-12-RS Manufactured by GE Healthcare	2	Shielded	
16		L4-12t-RS Manufactured by GE Healthcare	1.95	Shielded	
17		L10-22-RS Manufactured by GE Healthcare	1.85	Shielded	LP9/LP10 only
18		L3-9i-RS Manufactured by GE Healthcare	3.05	Shielded	LP9/LP10 only
19		L3-12-RS Manufactured by GE Healthcare	2.2	Shielded	

Table 4-7: List of all cables and maximum length of cables

No	Type	Model name	Max. Length (m)	Type of Cable	Remark
20	Sector phased array probe	3Sc-RS Manufactured by GE Healthcare	1.95	Shielded	
21		12S-RS Manufactured by PDI, Phoenix	2.15	Shielded	
22		6S-RS Manufactured by Parallel Design SAS	2.1	Shielded	
23		M5Sc-RS Manufactured by GE Healthcare	2.2	Shielded	LP10 only
24	volume convex array probe	RIC5-9A-RS Manufactured by GE Healthcare	2.4	Shielded	
25		RAB2-6-RS Manufactured by GE Healthcare	2.1	Shielded	
26	Pencil probe	P2D Manufactured by Humanscan Co., Ltd	1.9	Shielded	
27		P6D Manufactured by Humanscan Co., Ltd	1.9	Shielded	
28		P8D Manufactured by Humanscan Co., Ltd	1.9	Shielded	
29	Tee probe	6Tc-RS Manufactured by GE Healthcare	2.1	Shielded	

Table 4-8: Accessories for LOGIQ P8/P9/P10 R4

No	Type	Parts No. / Manufacturer	Max. Length (m)	Type of Cable
1	Foot Switch	Foot Switch FSU-3000G Manufactured by WHANAM Electronics	2.9	Shielded
2	USB Isolator	Isolator UH401 Manufactured by B&B Electronics	0.9	Shielded
3	USB Barcode scanner	1900GHD-2USB Manufactured by Honeywell	2.7	Shielded

Peripheral Update for EC countries

The following is intended to provide the users in EC countries with updated information concerning the connection of the LOGIQ P8/P9/P10 to image recording and other devices or communication networks.

Peripherals used in the patient environment

The LOGIQ P8/P9/P10 has been verified for overall safety, compatibility and compliance with the following image recording devices:

- SONY B/W Printer UP-D898
- SONY Color Printer UP-D25MD

The LOGIQ P8/P9/P10 has also been verified for compatibility, and compliance for connection to a local area network (LAN) via the rear panel Ethernet connection, provided the LAN components are IEC/EN 60950 or IEC/EN 62368-1 compliant.

The LOGIQ P8/P9/P10 may also be used safely while connected to devices other than those recommended above if the devices and their specifications, installation, and interconnection with the system conform to the requirements of IEC/EN 60601-1.

Peripheral Update for EC countries (continued)

Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC/EN standards (i.e., IEC/EN 60950 or IEC/EN 62368-1 for data processing equipment and IEC/EN 60601-1 for medical equipment). Furthermore, all complete configurations shall comply with the valid version of the system standard IEC/EN 60601-1. Everyone who connects additional equipment to the signal input part or signal output part of the LOGIQ P8/P9/P10 system configures a medical system, and is therefore responsible to ensure that the system complies with the requirements of the valid version of IEC/EN 60601-1. If in doubt, consult the technical service department or your local GE representative.

General precautions for installing an alternate off-board, remote device or a network would include:

1. The added device must have appropriate safety standard conformance and CE Marking.
2. The total power consumption of the added devices, which connect to the LOGIQ P8/P9/P10 and are used simultaneously, must be less than or equal to the rated supply of the LOGIQ P8/P9/P10.
3. There must be adequate heat dissipation and ventilation to prevent overheating of the device.
4. There must be adequate mechanical mounting of the device and stability of the combination.
5. Risk and leakage current of the combination must comply with IEC/EN 60601-1.
6. Electromagnetic emissions and immunity of the combination must conform to IEC/EN 60601-1-2.

General precautions for installing an alternate off-board, remote device or a network would include:

1. The added device(s) must have appropriate safety standard conformance and CE Marking.
2. The added device(s) must be used for their intended purpose having a compatible interface.
3. Signal or mains isolation devices and additional protective earth may be needed to assure compliance with IEC/EN 60601-1.

Peripheral Update for EC countries (continued)

Peripheral used in the non-patient environment

The LOGIQ P8/P9/P10 has also been verified for compatibility, and compliance for connection to a USB HDD/USB memory via the system USB port, provided the USB HDD/USB memory are IEC/EN 60950 or IEC/EN 62368-1 compliant.



CAUTION

The connection of equipment or transmission networks other than as specified in the user instructions can result in an electric shock hazard or equipment malfunction. Substitute or alternate equipment and connections requires verification of compatibility and conformity to IEC/EN 60601-1 by the installer. Equipment modifications and possible resulting malfunctions and electromagnetic interference are the responsibility of the owner.

Declaration of Emissions

This system is suitable for use in the following environment. The user must assure that it is used only in the electromagnetic environment as specified.

Table 4-9: Declaration of Emissions

Guidance and manufacturer’s declaration - electromagnetic emissions		
The system is intended for use in the electromagnetic environment specified below. The user of the system should assure that it is used in such an environment.		
Emission Type	Compliance	Electromagnetic Environment
CISPR 11/EN55011 Conducted and radiated RF EMISSIONS	Group 1	This system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
	Class A	This system is suitable for use in all establishments, other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded: 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.
Harmonic Emissions IEC/EN 61000-3-2	Class A	
Voltage Fluctuations/Flicker Emissions IEC/EN 61000-3-3	Complies	
NOTE The EMISSION characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.		

Declaration of Immunity

This system is suitable for use in the following environment. The user must assure that the system is used according to the specified guidance and only in the electromagnetic environment listed.

Declaration of Immunity (continued)

Table 4-10: Declaration of Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of this system should assure that it is used in such an environment.			
Immunity Type	Equipment Capability	Regulatory Acceptable Level	Electromagnetic environment - guidance
IEC/EN 61000-4-2 ELECTROSTATIC DISCHARGE (ESD)	$\pm 6, \pm 8$ kV contact $\pm 2, \pm 4, \pm 8, \pm 15$ kV air	Edition 3 ± 6 kV contact $\pm 2, \pm 4, \pm 8$ kV air Edition 4 ± 8 kV contact $\pm 2, \pm 4, \pm 8, \pm 15$ kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
IEC/EN 61000-4-4 Electrical fast transients / bursts	± 2 kV for power supply lines 5 kHz and 100 kHz repetition frequency ± 1 kV for input/output lines 5 kHz and 100 kHz repetition frequency	Edition 3 ± 2 kV for power supply lines 5kHz repetition frequency ± 1 kV for input/output lines 5kHz repetition frequency Edition 4 ± 2 kV for power supply lines 100 kHz repetition frequency ± 1 kV for input/output lines 100kHz repetition frequency	Main power quality should be that of a typical commercial and/or hospital environment.
IEC/EN 61000-4-5 Surge Immunity	± 0.5 kV, ± 1 kV line to line ± 0.5 kV, ± 1 kV, ± 2 kV Line to earth	Edition 3 and 4 ± 0.5 kV, ± 1 kV line to line ± 0.5 kV, ± 1 kV, ± 2 kV Line to earth	Main power quality should be that of a typical commercial and/or hospital environment.
IEC/EN 61000-4-8 Power frequency magnetic field	3 A/m, 50/60Hz 30 A/m, 50/60Hz	Edition 3 3A/m, 50/60Hz Edition 4 30A/m, 50/60Hz	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial and/or ospital environment.

Table 4-10: Declaration of Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of this system should assure that it is used in such an environment.			
Immunity Type	Equipment Capability	Regulatory Acceptable Level	Electromagnetic environment - guidance
IEC/EN 61000-4-11 Voltage dips and interruptions	< 5%U_T (> 95% dip) for 0.5 cycle; 40%U_T (60% dip) for 5 cycles; 70%U_T (30% dip) for 25 cycles; < 5%U_T (>95% dip) for 5 sec 0% U_T; 0.5 cycle, Phase: 0,45,90,135,180,225,270,315 degree 0% U_T; 1 cycle, Phase: 0 degree 70% U_T; 25/30 cycle, Phase: 0 degree 0% U_T; 250/300 cycle *Applicable deviations standard IEC 60601-2-37 (202.6.2.7)	Edition 3 < 5%U_T (> 95% dip) for 0.5 cycle; 40%U_T (60% dip) for 5 cycles; 70%U_T (30% dip) for 25 cycles; < 5%U_T (>95% dip) for 5 sec Edition 4 0% U_T; 0.5 cycle, Phase: 0,45,90,135,180,225,270,315 degree 0% U_T; 1 cycle, Phase: 0 degree 70% U_T; 25/30 cycle, Phase: 0 degree 0% U_T; 250/300 cycle	Mains power quality should be that of a typical commercial and/or hospital environment. If the user requires continued operation during power mains interruptions, it is recommended that the system be powered from a UPS or a battery option.
NOTE: UT is the a.c. mains voltage prior to application of the test level			

Table 4-10: Declaration of Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of this system should assure that it is used in such an environment.			
Immunity Type	Equipment Capability	Regulatory Acceptable Level	Electromagnetic environment - guidance
IEC/EN 61000-4-6 Conducted RF	3 Vrms at 0.15MHz - 80 MHz, 80% AM at 1 kHz 6 Vrm in ISM bands between 0.15 MHz - 80 MHz 80 % AM at 1kHz	Edition 3 3 Vrms at 0.15MHz - 80 MHz, 80% AM at 1 kHz Edition 4 3 Vrms at 0.15MHz - 80 MHz 80 % AM at 1kHz	Portable and mobile RF communications equipment should be used no closer to any part of this system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance
IEC/EN 61000-4-3 Radiated RF EM fields	3V/m 80MHz - 2.7GHz 80 % AM at 1 kHz	Edition 3 3V/m, 80 MHz - 2.5 GHz, 80% AM 1 kHz Edition 4 3V/m, 80MHz - 2.7GHz 80% AM at 1kHz	$d = \left[\frac{3.5}{f_1} \right] \sqrt{P}$ $d = \left[\frac{3.5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[\frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, a) should be less than the compliance level in each frequency range. b) Interference may occur in the vicinity of equipment marked with the following symbol: 

Table 4-10: Declaration of Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of this system should assure that it is used in such an environment.			
Immunity Type	Equipment Capability	Regulatory Acceptable Level	Electromagnetic environment - guidance
IEC/EN 61000-4-3 Proximity fields from RF wireless communications equipment	385 MHz: 27 V/m, PM at 18 Hz 450 MHz: 28 V/m, FM at ± 5 kHz deviation 1 kHz sine or PM at 18 Hz 710 MHz: 9 V/m, PM at 217 Hz 745 MHz: 9 V/m, PM at 217 Hz 780 MHz: 9 V/m, PM at 217 Hz 810 MHz: 28 V/m, PM at 18 Hz 870 MHz: 28 V/m, PM at 18 Hz 930 MHz: 28 V/m, PM at 18 Hz 1720 MHz: 28 V/m, PM at 217 Hz 1845 MHz: 28 V/m, PM at 217 Hz 1970 MHz: 28 V/m, PM at 217 Hz 2450 MHz: 28 V/m, PM at 217 Hz 5240 MHz: 9 V/m, PM at 217 Hz 5500 MHz: 9 V/m, PM at 217 Hz 5785 MHz: 9 V/m, PM at 217 Hz 50 % Duty cycle	385 MHz: 27 V/m, PM at 18 Hz 450 MHz: 28 V/m, FM at ± 5 kHz deviation 1 kHz sine or PM at 18 Hz 710 MHz: 9 V/m, PM at 217 Hz 745 MHz: 9 V/m, PM at 217 Hz 780 MHz: 9 V/m, PM at 217 Hz 810 MHz: 28 V/m, PM at 18 Hz 870 MHz: 28 V/m, PM at 18 Hz 930 MHz: 28 V/m, PM at 18 Hz 1720 MHz: 28 V/m, PM at 217 Hz 1845 MHz: 28 V/m, PM at 217 Hz 1970 MHz: 28 V/m, PM at 217 Hz 2450 MHz: 28 V/m, PM at 217 Hz 5240 MHz: 9 V/m, PM at 217 Hz 5500 MHz: 9 V/m, PM at 217 Hz 5785 MHz: 9 V/m, PM at 217 Hz 50 % Duty cycle	Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the system, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result. Minimum separation distances for higher IMMUNITY TEST LEVELS shall be calculated using the following equation: $E = \frac{6}{d} \sqrt{P}$ Where P is the maximum power in W, d is the minimum separation distance in m, and E is the IMMUNITY TEST LEVEL in V/m.

Declaration of Immunity (continued)

Table 4-11: Declaration of Immunity

Immunity Type	Equipment Capability	Regulatory Acceptable Level	EMC Environment and Guidance
NOTE: This guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, and electromagnetic site survey should be considered. If the measured field strength in the location in which this system is used exceeds the applicable RF compliance level above, this system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating this system.			
b) Over the frequency range 150 kHz to 80 MHz field strengths should be less than 3 V/m.			

Declaration of Immunity (continued)

Table 4-12: Test specifications for IEC/EN 61000-4-3 proximity fields from RF wireless communications equipment

Test frequency (MHz)	Band	Service	Modulaion	Maximum power (w)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
385	380-390	TETRA 400	Pulse modulation 18 Hz	1.8	0.3	27
450	430-470	GMRS, 460, FRS 460	FM ± 5 kHz deviation 1 kHz sine	2	0.3	28
710	704-787	LTE Band 13, 17	Pulse modulation 217 Hz	0.2	0.3	9
745						
780						
810	800-960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18Hz	2	0.3	28
870						
930						
1720	1700-1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1,3,4,25; UMTS	Pulse modulation 217Hz	2	0.3	28
1845						
1970						
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217 Hz	2	0.3	28
5240	5100-5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	0.2	0.3	9
5500						
5785						

Essential performance

The essential performance of the ultrasound unit is:

- The ability to display B-mode image as input for diagnosis.
- The ability to display M-mode image as input for diagnosis.
- The ability to display Doppler-mode image as input for diagnosis.
- The ability to display Color Flow-mode image as input for diagnosis.
- The display of acoustic power indexes as an aid for safe use of ultrasound diagnostic (MI, TIS, TIB, TIC).

Patient Environmental Devices

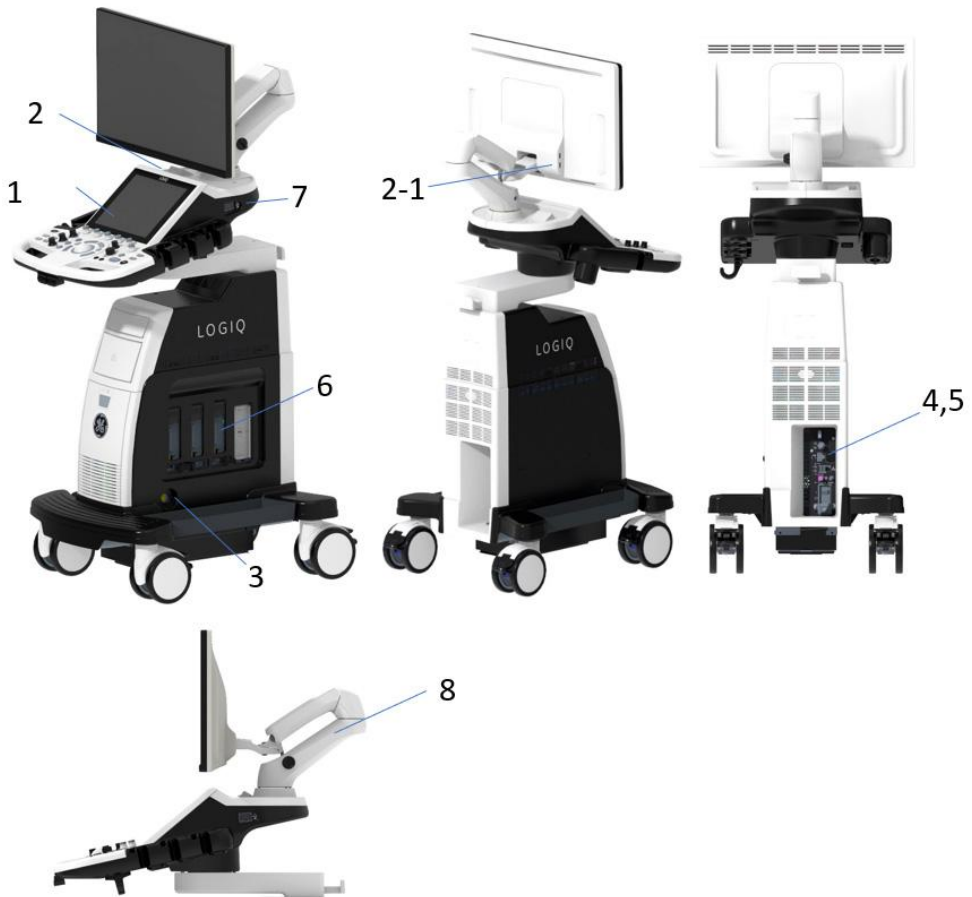


Figure 4-1. Patient Environmental Devices

- | | |
|---|--|
| 1. Power On/Off | 5. Signals I/O Port (USB Ports, Network Connector, Audio In/Out, HDMI) |
| 2. USB Port
2-1 > USB Port (additional option with HD Display) | 6. Imaging probe ports |
| 3. CW pencil probe port | 7. ECG Connector |
| 4. Power In/Out (Signal I/O port, Power line (AC~), Ground line, Power cable with Protective earth) | 8. Articulating arm |



CAUTION

DO NOT place a PC printer and a card reader inside the patient environment.

Acceptable Devices

The Patient Environmental devices shown on the previous page are specified to be suitable for use within the PATIENT ENVIRONMENT.



CAUTION

DO NOT connect any probes or accessories without approval by GE within the PATIENT ENVIRONMENT.

See 'Peripheral Update for EC countries' on *page 4-23 for more information.*

Unapproved Devices



CAUTION

DO NOT use unapproved devices.

If devices are connected without the approval of GE, the warranty will be INVALID.

Any device connected to the LOGIQ P8/P9/P10 must conform to the requirements for IEC or equivalent standards appropriate to devices.

Accessories, Options, Supplies



CAUTION

Unsafe operation or malfunction may result. Use only the accessories, options and supplies approved or recommended in these instructions for use.

Acoustic Output



CAUTION

Allowing the machine to transmit acoustic output when the probe not in use (or in its holder) can cause the transducer to build up heat. Always lower the acoustic power or freeze the image when not in use.

Located on the upper right section of the system display monitor, the acoustic output display provides the operator with real-time indication of acoustic levels being generated by the system. See the *Acoustic Output chapter* in the *Advanced Reference Manual* for more information. This display is based on NEMA/AIUM Standards for Real-time Display of Thermal and Mechanic Acoustic Output Indices on Diagnostic Ultrasound Equipment.

Acoustic Output Display Specifications

The display consists of three parts: Thermal Index (TI), Mechanical Index (MI), and a relative Acoustic Output (AO) value. Although not part of the NEMA/AIUM standard, the AO value informs the user of where the system is operating within the range of available output.

The TI and MI are displayed at all times. The TI display starts at a value of 0.0 and increments in steps of 0.1. The MI display values between 0 and 0.4 increment in steps of 0.01 and for values greater than 0.4, increments in steps of 0.1.

Thermal Index

Depending on the examination and type of tissue involved, the TI parameter will be one of three types:

- **Soft Tissue Thermal Index (TIS).** Used when imaging soft tissue only, it provides an estimate of potential temperature increase in soft tissue.
- **Bone Thermal Index (TIB).** Used when bone is near the focus of the image as in the third trimester OB examination, it provides an estimate of potential temperature increase in the bone or adjacent soft tissue.
- **Cranial Bone Thermal Index (TIC).** Used when bone is near the skin surface as in transcranial examination, it provides an estimate of potential temperature increase in the bone or adjacent soft tissue.

Acoustic Output Display Specifications (continued)

Mechanical Index

MI recognizes the importance of non-thermal processes, cavitation in particular, and the Index is an attempt to indicate the probability that they might occur within the tissue.

Changing the Thermal Index Type

You can select the displayed TI type on Utility -> Imaging -> B-Mode. This preset is application dependent so each application could specify a different TI type.

Controls Affecting Acoustic Output

The potential for producing mechanical bioeffects (MI) or thermal bioeffects (TI) can be influenced by certain controls.

Direct. The Acoustic Output control has the most significant effect on Acoustic Output.

Indirect. Indirect effects may occur when adjusting controls. Controls that can influence MI and TI are detailed under the Bioeffects portion of each control in the Optimizing the Image sections.

Always observe the Acoustic Output display for possible effects.

Best practices while scanning



HINTS

Raise the Acoustic Output only after attempting image optimization with controls that have no effect on Acoustic Output, such as Gain and TGC.

NOTE: *Refer to the Optimizing the Image sections for a complete discussion of each control.*



WARNING

Be sure to have read and understood control explanations for each mode used before attempting to adjust the Acoustic Output control or any control that can effect Acoustic Output.



Acoustic Output Hazard

Use the minimum necessary acoustic output to get the best diagnostic image or measurement during an examination. Begin the exam with the probe that provides an optimum focal depth and penetration.

Acoustic Output Default Levels

In order to assure that an exam does not start at a high output level, the LOGIQ P8/P9/P10 initiates scanning at a reduced default output level. This reduced level is preset programmable and depends upon the exam category and probe selected. It takes effect when the system is powered on or **New Patient** is selected.

To modify acoustic output, adjust the Power Output level on the Touch Panel.

Device Labels

Label Icon Description

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

Table 4-13: Label Icons

Label/Icon	Meaning/Reference Standard	Location
Identification and Rating Plate 	Manufacturer's name and address EN ISO 15223-1:2016 and ISO 7000-3082	Rating Plate
Identification and Rating Plate 	Date of manufacture EN ISO 15223-1:2016 and ISO 7000-2497	Rating Plate
	Serial Number ISO 7000-2498 and EN ISO 15223-1:2016	Rating Plate
	GE Part Number ISO 7000-2493 and EN ISO 15223-1:2016	Rating Plate
Type/Class Label	Used to indicate the degree of safety or protection. IEC 60601-1:2005+A1:2012	Rear of the system

Table 4-13: Label Icons (Continued)

Label/Icon	Meaning/Reference Standard	Location
Rx Only	United States only Prescription Requirement label 21 CFR 801.109 and Alternative to Certain Prescription Device Labeling Requirements Guidance to Industry 1/2/2000 U.S. Food&Drug Administration modified by General Electric for clarity that this is for the USA	Rear of the system
	CE Mark The CE Mark of Conformity indicates this equipment conforms with the Council Directive 93/42/EEC. European Directive 93/42/EEC	Rear of the system
	Authorized European Representative address EN ISO 15223-1:2016	Rear of the system
IP Code (IPX8)	Indicates the degree of protection provided by the enclosure per IEC60529. Can be used in operating room environment. IEC 60601-1:2005+A1:2012 Annex D.3 and IEC 60529	Footswitch
	ECG symbol GE created	Right side of the OPIO
	Type BF Applied Part (man in the box) symbol is in accordance with IEC 60878-02-03. IEC 60601-1:2005+A1:2012 Annex D.1 and IEC 60417-5333	Probe marked Type BF
	Defibrillation-proof CF applied part IEC 60601-1:2005+A1:2012 Annex D.1 and IEC 60417-5336	ECG connector
	Follow instruction for use. IEC 60601-1:2005+A1:2012 Annex D.1 and ISO 7010-M002	Rear of the system Probe connector

Table 4-13: Label Icons (Continued)

Label/Icon	Meaning/Reference Standard	Location
	“General Warning Sign” IEC 60601-1:2005+A1:2012 Annex D and ISO 7010-W001	Rear of the system
	“Warning” - Dangerous voltage” (the lightning flash with arrowhead) is used to indicate electric shock hazards. IEC 60601-1:2005+A1:2012 Annex D.2 and ISO 7010-W012	Internal
	“Mains OFF” indicates the power off position of the mains power breaker. IEC 60601-1:2005+A1:2012 Annex D.1 and IEC 60417-5008	Rear of the system
	“Mains ON” indicates the power on position of the mains power breaker. IEC 60601-1:2005+A1:2012 Annex D.1 and IEC 60417-5007	Rear of the system
	“ON” indicates the power on position of the power switch. CAUTION: This Power Switch DOES NOT ISOLATE Mains Supply. IEC 60601-1:2005+A1:2012 Annex D.1, IEC 60417-5007 and IEC 60417-5009	Operator control panel
	“Protective Earth” indicates the protective earth (grounding) terminal. IEC 60601-1:2005+A1:2012 Annex D.1 and IEC 60417-5019	Internal

Table 4-13: Label Icons (Continued)

Label/Icon	Meaning/Reference Standard	Location
	“Equipotentiality” indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment. Connection of additional protective earth conductors or potential equalization conductors is not necessary in most cases and is only recommended for situations involving multiple equipment in a high-risk patient environment to provide assurance that all equipment is at the same potential and operates within acceptable leakage current limits. An example of a high-risk patient would be a special procedure where the patient has an accessible conductive path to the heart such as exposed cardiac pacing leads. IEC 60601-1:2005+A1:2012 Annex D.1 and IEC 60417-5021	Rear of the system
	This symbol indicates that waste electrical and electronic equipment must not be disposed of 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. WEEE Directive 2012/19/EU	Rear of the system Probe connector

Table 4-13: Label Icons (Continued)

Label/Icon	Meaning/Reference Standard	Location
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "10" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets. China Electronic Industry Standard SJ/T11364-2014	Probe connector
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "20" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets. China Electronic Industry Standard SJ/T11364-2014	Rear of the system

Table 4-13: Label Icons (Continued)

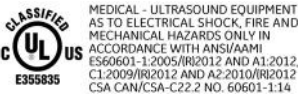
Label/Icon	Meaning/Reference Standard	Location
	Do not use the following devices near this equipment: cellular phone, radio receiver, mobile radio transmitter, radio controlled toy, broadband power lines, etc. Use of these devices near this equipment could cause this equipment to perform outside the published specifications. Keep power to these devices turned off when near this equipment. ISO 7010-P013	Rear of the system
	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display, contain mercury.) A chemical element with the symbol Hg and atomic number 80	Rear of the system
	UL conformity mark according to ANSI/AAMI ES60601-1:2005/(R) 2012 and CAN/CSA C22/2 NO. 601.1:14. ANSI/ AAMI ES60601-1:2005/(R) 2012 and CAN/CSA-C22.2 No. 60601-1:14	Rear of the system
	How to lock Monitor Arm prior to transport GE created	Rear of the system.
	DO NOT place a finger, hand or any object on the joint of the monitor or monitor arm to avoid injury when moving the monitor and monitor arm. GE created	Rear of the LCD monitor.
	DO NOT push the system. Use the handle to push/pull the system, e.g., DO NOT use the LCD. Failure to do so may cause serious injury or system damage. IEC 60601-1:2005+A1:2012 Annex D.2 and ISO 7010-P017	Rear of the system

Table 4-13: Label Icons (Continued)

Label/Icon	Meaning/Reference Standard	Location
	Caution IEC 60601-1:2005+A1:2012 Annex D.1, ISO 7000-0434A and EN ISO 15223-1:2016	Probe connector
	Eurasian Conformity mark; the single conformity mark for circulation of products on the markets of member-states of the Customs Union. This product passed all conformity assessment (approval) procedures that correspond to the requirements of applicable technical regulations of the Customs Union. conformity with the technical regulation	SIDE OF FAN BRKT, Country specific label
	INMETRO Certification: TUV Rheinland Brazil Brazil INMETRO	SIDE OF FAN BRKT, Country specific label
	Non-Ionizing Electromagnetic Radiation IEC 60417-5140 IEC TR 60878-5140	SIDE OF OPIO
	GOST Symbol. Russia Regulatory Country Clearance. National standards of the Russian Federation and CIS countries	Rear Panel

Label/Icon	Meaning/Reference Standard	Location
GE ULTRASOUND KOREA, Ltd. 9, Sunhwon-ro 214beon-gil, Jungwon-gu, SEONGNAM-SI, GYEONGGI-DO, Republic of Korea 100-240V~, 50/60Hz, 500-500VA LOGIQ P8 83 kg 5842858 2020-01 REF LOGIQ P8 R4 S/N 123456789 UDI (01)1000000000000000 (11)000000021000000000 MEDICAL - ULTRASOUND EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1:2005/R12012 AND A1:2012, C1:2009/R12012 AND A2:2010/R12012 CSA CAN/CSA-C22.2 NO. 60601-1:14 GE ULTRASOUND KOREA, Ltd. 9, Sunhwon-ro 214beon-gil, Jungwon-gu, SEONGNAM-SI, GYEONGGI-DO, Republic of Korea 100-240V~, 50/60Hz, 500-500VA LOGIQ P9 83 kg 5842859 2020-01 REF LOGIQ P9 R4 S/N 123456789 UDI (01)1000000000000000 (11)000000021000000000 MEDICAL - ULTRASOUND EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1:2005/R12012 AND A1:2012, C1:2009/R12012 AND A2:2010/R12012 CSA CAN/CSA-C22.2 NO. 60601-1:14 GE ULTRASOUND KOREA, Ltd. 9, Sunhwon-ro 214beon-gil, Jungwon-gu, SEONGNAM-SI, GYEONGGI-DO, Republic of Korea 100-240V~, 50/60Hz, 500-500VA LOGIQ P10 83 kg 5842860 2020-01 REF LOGIQ P10 R4 S/N 123456789 UDI (01)1000000000000000 (11)000000021000000000 MEDICAL - ULTRASOUND EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1:2005/R12012 AND A1:2012, C1:2009/R12012 AND A2:2010/R12012 CSA CAN/CSA-C22.2 NO. 60601-1:14 GE ULTRASOUND KOREA, Ltd. 9, Sunhwon-ro 214beon-gil, Jungwon-gu, SEONGNAM-SI, GYEONGGI-DO, Republic of Korea 100-240V~, 50/60Hz, 500-500VA LOGIQ P10 83 kg 5858143 2020-01 REF LOGIQ P10 R4 HD S/N 123456789 UDI (01)1000000000000000 (11)000000021000000000 MEDICAL - ULTRASOUND EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1:2005/R12012 AND A1:2012, C1:2009/R12012 AND A2:2010/R12012 CSA CAN/CSA-C22.2 NO. 60601-1:14	Every system has a unique marking for identification, the Unique Device Identification (UDI) Label. The UDI label consists of a series of alpha-numeric characters and barcode which uniquely identify the LOGIQ P8/P9/P10 system as a medical device manufactured by General Electric. Scan or enter the UDI information into the patient health record as required by country-specific laws. GE created	Rating Plate
	e-IFU symbol	Rear of the system
	Use two people to transport system on inclines. This label also indicates the system weight. The equipment weights approximately 67kg (148 lbs) (69 kg with HD Display (152 lbs)). To avoid possible injury and equipment damage when transporting from one area of use to another. • Be sure the pathway is clear. • Use two or more persons to move the equipment on inclines or long distance.	Rear of the system

Label location

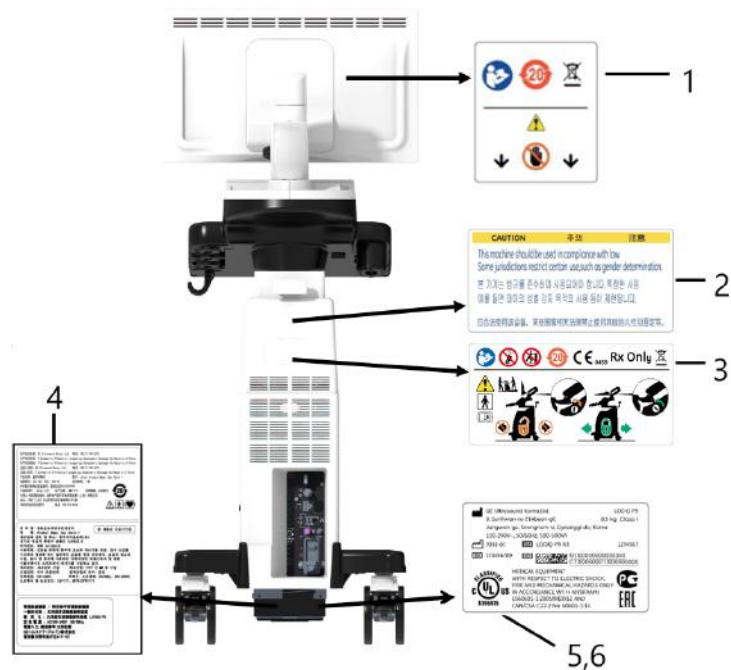


Figure 4-2. Label location

* Required for Asia.

1. LCD Caution Label
2. Gender Caution Label (Only for India, China, Korea)
3. Multi Caution Label
4. LOGIQ P8/P9/P10 Rating Label (Only for China, Korea, Japan)
5. LOGIQ P8/P9/P10 Rating label
6. UL Label

Label on the packing box



Figure 4-3. Package label

This label is printed on the packing box of the system to indicate the humidity, temperature and air pressure condition for the storage and shipment.

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