



LOGIQ Fortis™ Getting Started Guide







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Connecting a probe

1. Turn latch horizontal for unlock position
2. Slide connector straight into port, cord side up. Turn latch vertical to lock. Image of probe will appear on TP after connected

Modality worklist

1. Select Patient icon on touch panel (26)
2. Select Worklist from the column on the left of the monitor
3. When the new window opens, select Query to refresh the worklist
4. Highlight the desired patient from the names in the top window using the pointer and press set (right trackball key) (20). Select “Transfer”
5. Confirm you have the correct patient selected, select scan category (ABD,OB, etc.) from the tabs
6. Exit the patient entry page by pressing Scan or select desired probe on the touch panel

Selecting probe and model/preset

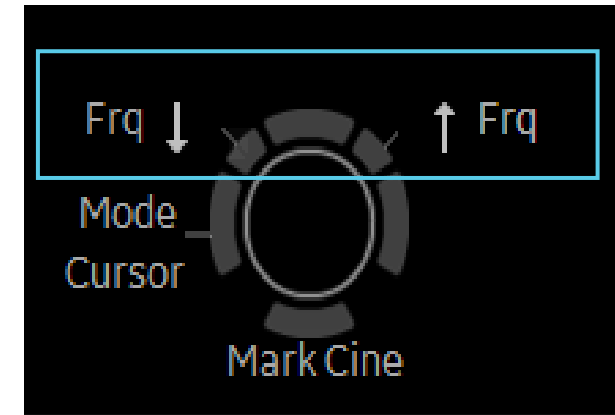
1. Push the desired probe icon (25) to change from one transducer to another at any time
2. Select type of exam you would like to perform. For ex. Abd, Renal, etc.

Activating modes

1. B-Mode (7) is always active. To adjust the overall B-Mode brightness, turn the B-Mode button. Push down on B-Mode button to exit all modes
2. To activate B-Flow, select the B-Flow (8) button on console. To adjust brightness for B-Flow, turn the B-Mode button
3. Color Flow (10) – Push the CF button to activate color doppler
4. Push PDI/TVI (11) to activate power doppler
5. When using a cardiac probe and model, pushing the PDI/TVI button will activate TVI
6. M-Mode (14) – Push the M button to activate M-Mode. Turn M-Mode button to adjust overall M-Mode gain

Trackball keys (20)

Trackball key functions change depending on which mode is activated. The trackball icon on the lower right of the monitor displays functions as modes change. Use this icon for guidance for functionality.



To configure the “Frq” keys, press Utility, System on Touch Panel, then User configurable key to choose the User Defined Trackball Set Key.

Note: Use the CF button to adjust the overall gain when in Color doppler, PDI, TVI, and Color M-Mode.



Print keys (2) programmable

1. Press P1 to store images to hard drive
2. Press P2 to print images on the thermal printer when one is present
3. Press Mark Cine then P1 to store a cine clip



Note: Print destinations can be programmed by a GE representative upon install of the system

Measurements (Generic)

1. Press “Measure” key (15), a caliper will appear on the screen
2. Use the trackball to move the caliper to the appropriate location, press “Set” either the left or right trackball key (20), a second caliper will appear

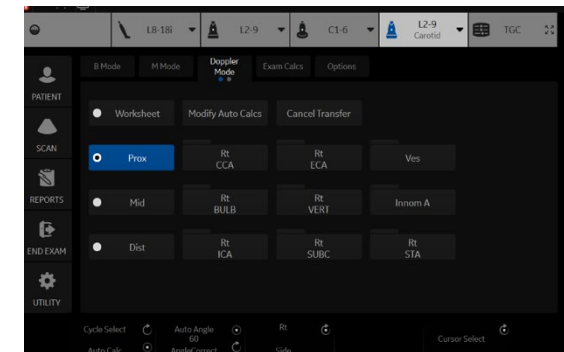


3. Place the second caliper in the appropriate location and press the “Set” right or left trackball key
4. Measurement window appears on the screen and will display the distance between the two points. To activate 2nd set of calipers, push top trackball key. Additional measurements options available on upper trackball key
5. To remove measurement, select clear (18) button while the measure key is backlit green

6. When timeline is displayed on the screen select measure and select appropriate waveform for velocity measurement



7. Pre-programmed measurements for each mode can be found on the touch panel when the measure key is active. These can be programmed per type of exam by your GE representative





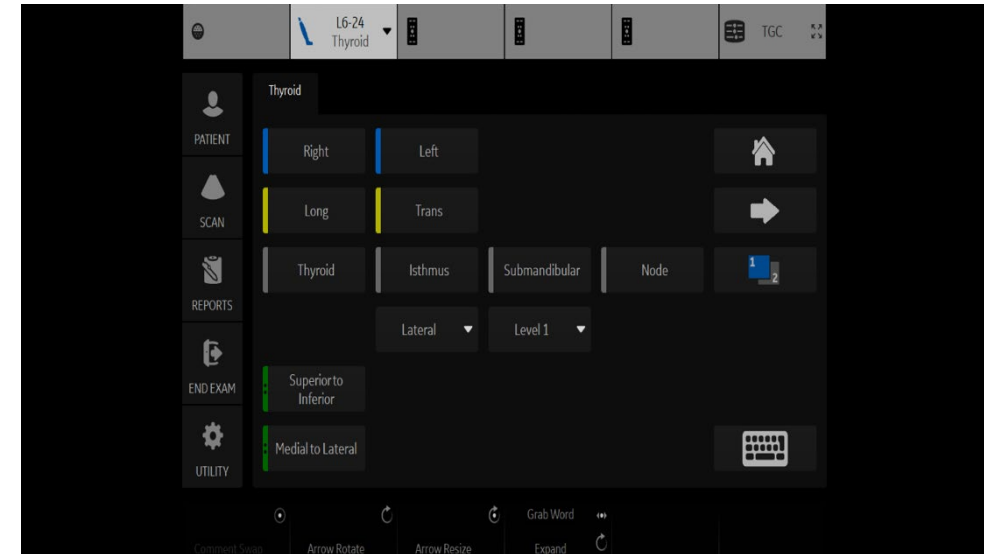
Annotating an image

1. Using digital or pop-out keyboard to annotate

- To add text to an image, type on A/N keyboard while text color is green. While green, the text can be moved to another part of the image with the trackball
- Push the right trackball key to set the comment. Text color will change from green to yellow after comment is set
- To edit or move a set text, move cursor to text, select right trackball key. Text will turn green and can be moved to desired location
- To display the digital keyboard when pushing the ABC button, Utility-System-General, check the box “Display Keyboard with Comment Button”

2. Using touch panel to annotate

- Select ABC (17) comment button
- Touch panel will display annotations. Select comment as needed
- Annotations are laid out on Touch panel with designated colors. Each color represents a set of comments which will replace each other. For ex. Select CCA then select ICA. Text will change to ICA since they are the same color code
- If annotation is designated as white in color, these annotations do not replace each other. Dots represent groupings for color blind users
- To customize comments, go to Utility, Comments on Touch Panel. Under Libraries, select the desired Library to edit comments. Up to 6 columns/ 5 rows. Each number followed by a word represents the color associated to that group i.e., 1 is blue group. Words within each group will replace each other. Small list will replace up to 12



To select the comment cursor “home” position, move the cursor to the desired position. Push and hold the Home icon on the touch panel. The message “Set new home position” will be displayed on the bottom of the monitor.

Note: At anytime to remove entire text, measurements and arrows, hold down the clear button (18). Word delete (F10) located on keyboard can be used to remove the last text.

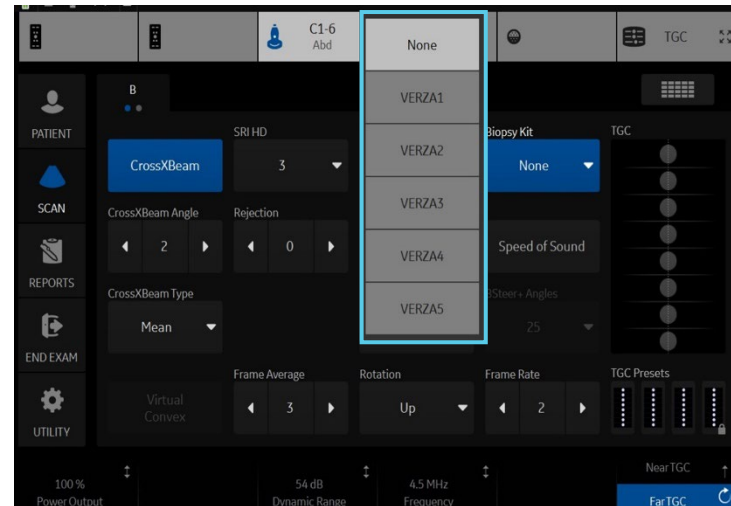


Split screen/Dual View

1. Press “L” on the Dual screen keys (4) to display the image on the left side of the screen
2. Press the “R” on the dual screen keys to display the image on the right side of the screen
3. To toggle between two images, press “L” or “R” dual screen keys or use trackball and set in the desired image
4. Press the “L” and “R” simultaneously to display the same image as live simultaneous side by side images
5. When using Color mode, simultaneous side by side will display color ROI on one side and B-Mode on the other
6. Press and hold “L” down to activate a quad screen. Use the “L” to toggle between the upper and lower images on the left. Use the “R” to toggle between the upper and lower images on the right
7. To return to single image, push down on the B-Mode (7) button

Biopsy Guide

1. Under B-Mode tab on the touch panel, select biopsy kit. The system will display the corresponding type of bracket and appropriate number of the guide



2. Select desired guide. Name and biopsy lines will show up on the screen. Be sure to match the number chosen on the screen with the number on the guide
3. To turn the biopsy guide off, select the “none” form the dropdown list



Note: The IC5-9 has two biopsy guides available, the disposable TR5 and the reusable RU guides. The reusable guide bracket is made of stainless steel. The disposable guide is white plastic and has 5 angle options. Please refer to the instructions found in the biopsy guide kit for cleaning and handling the guides.

B-Mode Optimization



Commonly used parameters	Description
Digital TGC (24)	Use finger to swipe in direction of desired TGC curve. For finer adjustments, use Near TGC/Far TGC control knob below Digital TGC.
CHI Harmonics (Programmable Key 22)	Utilizes Digitally Encoded Ultrasound (DEU) to receive and display harmonic (double) frequencies. Enhances near field resolution. Multiple frequencies area available to help increase penetration.
Frequency	Range is dependent on probe and system. Use higher frequency for thinner/smaller patients, lower frequency for thicker/larger patients. Use lower frequency for deeper structures, higher frequency for more superficial structures.
Dynamic Range	Controls how echo intensities are converted to shades of gray, increasing the adjustable range of contrast. Increase dynamic range for more shades of gray, decrease for more contrast.
Gray Maps	Varies the appearance of the shades of gray from black to white. Choose the gray map prior to making other parameter changes. There is interdependency between the gray maps, gain and dynamic range.
CrossXBeam™ CrossXBeam Angle CrossXBeam Type	<p>CrossXBeam, or compound imaging, combines three or more frames from different steering angles into a single frame. May help reduce speckle and noise in the image. Enhances tissue interfaces and border detection.</p> <p>CrossXBeam Angle allows the user to adjust the angle of send and receive signals.</p> <p>CrossXBeam Type: Mean averages all returning values (normal scanning mode), Hybrid combines a mix of both average and maximum values (center line + Max), Max displays only the maximum returning values (Max only).</p>

B-Mode Optimization *(continued)*

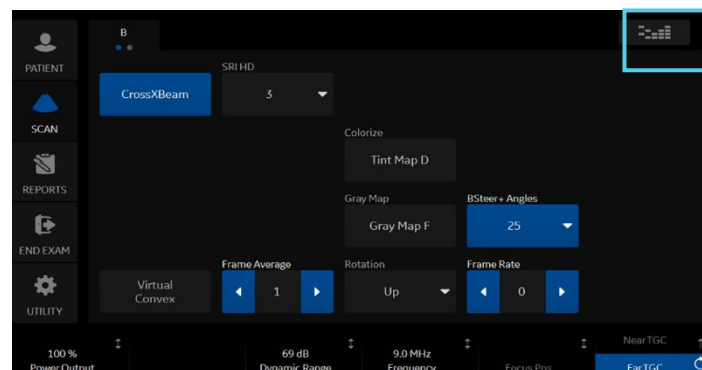


Commonly used parameters	Description
ATO (Auto Tissue Optimization) (5)	ATO analyzes the image data and then optimizes the gray map such that dark areas become darker and bright structures stand out more. For the user this translates into improved contrast resolution and noise suppression.
CTO (Continuous Tissue Optimization) (22)	CTO automatically adjusts B-Mode gain based on the signal and noise levels in the real-time image, reducing the chances of over-gain or under-gain. The gain adjustment is applied over depth and laterally as well as the whole image, resulting in a more uniform and appropriate gain across the entire image.
SRI HD	SRI HD is an image processing algorithm that smooths speckle and enhances edges. This increases contrast resolution, improves border delineation, reduces noise, and smooths speckle while maintaining its natural texture. SRI HD may be used on any probe or in any clinical application.
Advanced Speckle Reduction	The increased processing power available on the LOGIQ Fortis™ applies significantly more sophisticated smoothing and edge enhancement relative to SRI HD. This results in the differentiated imaging performance of Advanced SRI without impacting the high frame rates delivered by the cSound™ architecture. There are two types of Advanced SRI available in OB/GYN applications (Advanced SRI Type 1 and Advanced SRI Type 2).
Speed of Sound	A control to help fine-tune image resolution in applications where tissue have wide ranges of speed of sound such as breast and liver. It changes the speed of sound used by the imageformer for transmit and receive of ultrasound signals. Adjusting the speed of sound can help improve resolution, contrast, and reduce noise.

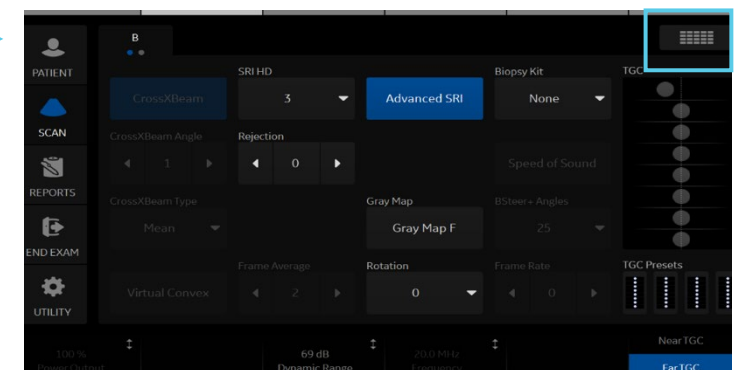
B-Mode Optimization *(continued)*



Commonly used parameters	Description
Rejection	Selects a level below which echoes caused by noise will not be amplified. The higher the rejection the more low-level echoes are eliminated.
Virtual Convex	Changes linear probe images from rectangular shape to convex shape and adds 20% more viewing area. Note: When in Color Mode, you can select “Virtual Convex” on touch panel to display the color in convex.
Frame Average	Helps to optimize line density or spatial resolution. Decrease frame rate for enhanced resolution, such as in Small Parts. Increase frame rate for faster frames such as for Vascular imaging.
Frame Rate	Helps to optimize line density or spatial resolution. Decrease frame rate for enhanced resolution, such as in Small Parts. Increase frame rate for faster frames such as for Vascular imaging.
B-Mode Raw Data (post processing)	On a frozen or recalled image you can adjust the following parameters; Gain, TGC, Auto Optimize, Dynamic Range, Gray Maps, SRI, Rejection, Zoom, Image reverse, Image rotation, as well as Comments and Measurements.



To display ALL touch panel parameters, select quick button on top right corner



B-Mode Optimization *(continued)*



IF	THEN
Image is too soft	<ol style="list-style-type: none"> 1. Decrease SRI-HD 2. Activate Auto Optimize 3. Decrease frame average 4. Decrease dynamic range 5. Change gray map 6. Turn off CrossXBeam™
Image is too grainy	<ol style="list-style-type: none"> 1. Increase SRI-HD 2. Increase dynamic range 3. Increase frequency 4. Increase frame average 5. Activate CrossXBeam 6. Change gray map
Image is too dark	<ol style="list-style-type: none"> 1. Increase overall gain 2. Decrease frequency 3. Change gray map 4. Decrease dynamic range
Image is too noisy	<ol style="list-style-type: none"> 1. Decrease overall gain 2. Activate Harmonics (CHI) 3. Activate Auto Optimize 4. Adjust digital TGC

IF	THEN
Image is not uniform	<ol style="list-style-type: none"> 1. Decrease frame rate 2. Decrease scan area 3. Adjust depth 4. Adjust digital TGC
Image whites are too bright	<ol style="list-style-type: none"> 1. Decrease overall gain 2. Increase dynamic range 3. Increase frequency
Technically difficult patient	<ol style="list-style-type: none"> 1. Select appropriate Model, if abdominal exam select ABD2 2. Lower frequency 3. Turn off Harmonics (CHI) 4. Activate Auto Optimize 5. Lower dynamic range
Frame rates are too slow	<ol style="list-style-type: none"> 1. Increase frame rate 2. Decrease scan area

Color Doppler optimization



Commonly used parameters	Description
Velocity Scale (PRF)	Range of velocities that are assigned a color. Adjust the pulse repetition frequency (PRF) for an enhanced representation of the magnitude of the flow pattern. Increase for higher flow velocity, decrease for lower flow velocity.
Angle Steer	Provides a Doppler angle suitable for linear probe orientation. You can slant the ROI of the Color Flow linear image left or right to get more information without moving the probe.
Frequency	Changes the color parameters to enhance flow in different depths. Use lower color frequency for deeper vessels. Increase color frequency for superficial vessels. Range is dependent on probe and model.
Wall Filter	Filters out low velocity signals and affects low flow sensitivity versus motion artifact. Assists in reducing motion artifacts from motion outside the vessel wall.
Focus Position	Adjust focal zone within the color ROI for the best vessel filling, position focal zone in the middle or lower half of the ROI.
Frame Average	Temporal smoothing filter helps to create a smooth and persistent flow profile.
Line Density	Helps optimize color flow frame rate for sensitivity and spatial resolution. Higher line density will tighten vessel. Lower line density will increase frame rate.
Color Threshold	Percentage of gray scale level where color Doppler is overwritten. Decrease where vessels are large and easily identified, Increase where multiple small vessels need to be visualized.
Flash Suppression	Algorithm to help control motion artifacts.
Radiantflow™	Radiantflow is a rendering technique for Color Flow and Power Doppler Imaging, available on all probes. Radiantflow provides an easy, fast visualization of tiny vessels, displaying as a 3D.



Color Doppler optimization *(continued)*

The table below discusses adjustments that can be made to help in some scanning situations. Not all listed adjustments may be necessary to achieve the desired result.

Flow	Adjust
Color does not fill the vessel	Increase color gain until flashes area seen in the surrounding tissue, then decrease the gain just until the color fills the vessel. If color does not fill the vessel decrease velocity scale (PRF), increase threshold, decrease Wall Filter. Decrease color frequency for penetration when needed.
Color displays mixed directions	Forward flow and reverse flow should be separated by a black transitional line. If there is no line between red and blue, increase the Velocity Scale (PRF).
Color is seen in right and/or left side of vessel, but the middle is blank	The color ROI box is perpendicular to vessel flow. If using a linear probe, change the ROI box angle using the touch panel knob selection "Angle Steer." Note: <i>If vessel is angled in the image, try a straight ROI box.</i>
Color is outside the vessel wall	Decrease color gain until color is within the vessel walls. Increase velocity scale (PRF) just until color is within vessel walls. Increase wall filter. Decrease color threshold.
Color is in superficial vessels, but not in deeper vessels	Decrease color frequency, increase color gain until flashes area seen in the surrounding tissue, then decrease gain just until color fills the deep vessels.
Frame rate is too slow	Decrease Color ROI box size, slightly taller than wider preferable. Decrease color line density.



Print keys are programmed upon install by your GE representative to send to printers, PACS or Network storage devices and the system Internal Hard Drive.

When you want to print/store an image, the P1 is most commonly used for the primary destination and internal hard drive:

1. Push P1 to print/store an image. The images will be visible in a thumbnail view at the bottom or left side of the image screen.
2. To store a Cine loop, push P1 during live scanning (do not push freeze first) or select Mark Cine on bottom track ball key to initiate cine then P1 to end. The Cine loop stored will be a pre-determined length of time specified during system set-up.
3. When the exam is complete, select “End Exam” on the left column of the touch panel. Select “End Current Patient” on the next touch panel screen. A list of patients and their exams currently stored on the system appears on the screen in the patient entry page.

To send to a PACS or Printer that is not the “Default” destination:

1. From the Patient entry page, highlight the patient's name and set to open the studies. If there is more than one exam, highlight the exams needed.
2. Select “Send To” from the bottom right corner of the page.
3. Select the destination form the “To” drop down menu and then select OK.

Once an exam has been closed, if there is a need to add additional images to the exam, these steps will reopen a closed exam:

1. From the patient entry page, select the patient from the list on the bottom of the screen.
2. Select “Resume” at the bottom of the screen.
3. Select “Save and Exit” from patient screen or push the “Freeze” button. The prior images will be visible in the thumbnail views, add images and repeat the “End Exam” process.



The system hard drive capacity and free space is available on the patient entry page. Move the trackball pointer over the pie icon in the lower left column. A message with the total capacity and the available free space will appear briefly. The color of the pie will change as the hard drive fills.

To review a closed exam from the internal hard drive:

1. From the patient entry page, double click the patient's name from the list on the bottom of the screen.
2. Highlight the desired exam from the list, or if just one, highlight the exam.
3. Select "Save and Exit" or push the "Freeze" key. The images will appear in the thumbnail display at the bottom or left side of screen.
4. Select any image from the thumbnails to bring into full screen view and use the "Body Pattern" toggle to scroll through images.
5. Select the "Active Images" icon from the lower right menus to view the exam in a multi-image format.

To start a patient who has a previous exam on the hard drive:

1. From the patient entry page, begin typing in the patient ID.
2. Once the ID has been entered the text will turn red, indicating there is a patient with this ID.
3. Highlight the patient ID from the list at the bottom of the page and select "New Exam" from the options on the touch panel.
4. Select "Save and Exit" or press "Freeze" to begin the exam.

To delete patients from the internal hard drive:

Note: Patients or exams do not automatically delete from the internal hard drive.

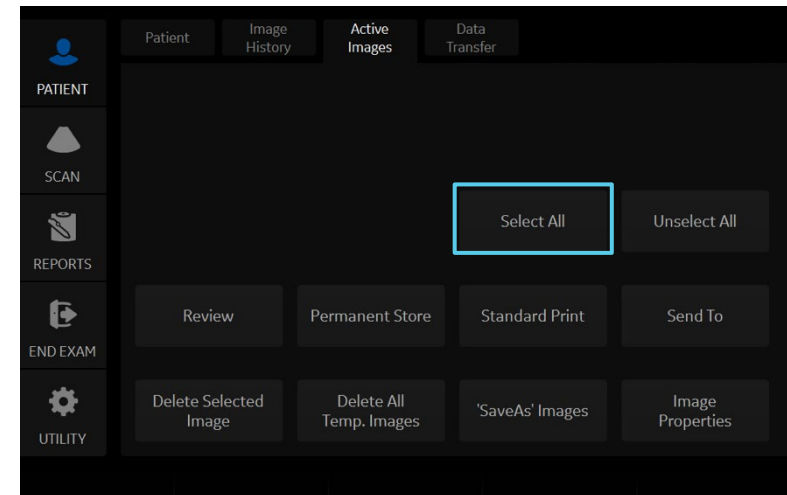
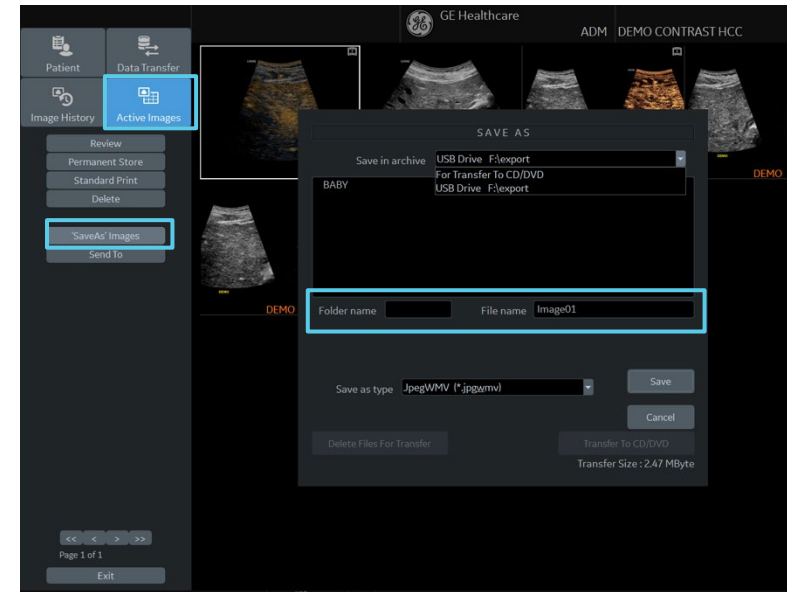
1. In the patient entry page, select the operator drop down menu, choose ADM. The user must have admin rights to delete patients from the hard drive.
2. In the list of patient names, highlight the patient's name to be deleted.
3. Select "Delete" in the menu at the bottom of the list. A message box will appear to confirm the action, select OK.



Image management *(continued)*

To save images to CD/DVD or USB drive in PC format (Jpeg):

1. Insert a CD-R or DVD-R into the CD/DVD burner or insert a USB stick into the USB port.
2. Highlight the patient from the list of names on the hard drive. Select “Active Images” from the upper left corner of the screen.
3. Select the individual images you want to save or alternatively select “Select All” from the touch panel.
4. Select “Save As” images from the touch panel or left side of screen.
5. A window box will appear. From the drop down “Save in Archive” menu select either “For Transfer to CD/DVD” or USB.
6. Allocate a ‘Folder Name’ to the selected saved images.
7. From the drop down “Save As Type” menu, select JPEG AND WMV. This will save still images as JPEG and Cine loops as WMV files.
8. Select “Save”. The image is saved to a temporary directory. If using a USB drive, skip to step 10 to eject; there is no “finalize” procedure
9. Once all the desired images are saved/converted, select “Save As” images again, the select Transfer to CD/DVD to transfer the images to the media.
10. Push the “F3” (Eject) button on the A/N keyboard. A new message box will appear; if ejecting a CD/DVD the message will have a choice to “finalize”. The disc must be finalized for the images to be opened on a computer.



Back-up and restore presets



Note: It is recommended to do this with the assistance of a GE Service or GE Applications representative

To back-up presets: Insert CD-R or DVD-R into the disk drive

1. Select Utility > System > from the touch panel.
2. Use the trackball pointer to select “Backup/Restore” tab on the monitor.
3. Select check box “User Defined Configuration” under the Backup column on the left.
4. Select CD/DVD from the dropdown menu under “Media.”
5. Select “Backup” to save presets to CD/DVD.
6. Press “F3” (Eject) to eject and finalize the CD/DVD preset disk.
7. Label and store the CD/DVD in a secure location, in case a service call results in the need to restore presets.

To restore presets: Insert the “preset CD/DVD” into the disk drive

1. Select Utility > System from the touch panel.
2. Use the trackball pointer to select “Backup/Restore” tab on the monitor.
3. Select CD/DVD from the dropdown menu under “Media.”
4. Select “User Defined Configuration” from the RESTORE field in the upper right column, which restores ALL the imaging parameters including your DICOM®/Connectivity settings. **Note:** *If you have multiple systems ensure your preset disk is specific to the system you are restoring to.*
5. Alternatively, under “Detailed Restore of User Defined,” select the desired fields you wish to restore on the system i.e., Imaging Presets.
6. Select “Restore.” The system will automatically shut down and re-boot to restore the presets.

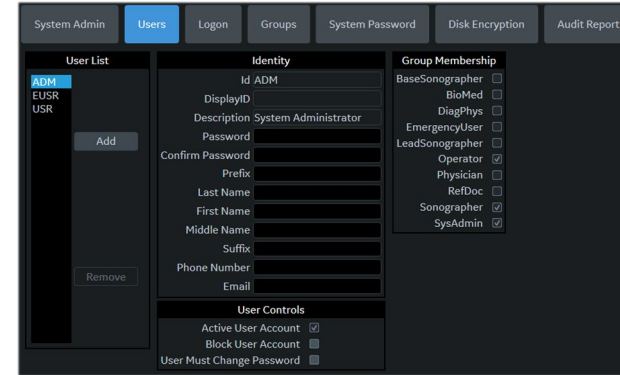


Adding new user initials

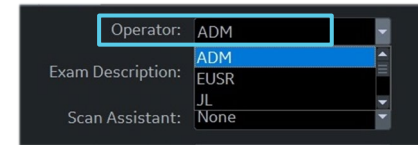
Select Utility > Admin > Users

- Select “Add” and enter user details
- ENSURE that you DO NOT include the following characters in a user’s ID: slash (/), dash (-), asterisk (*), question mark (?), an underscore (_), ampersand (&), lower case letters or blank spaces. DO NOT set up users with the same initials or ID. The system will overwrite the first user ID if a second is created with the same initials
- Display ID, type in the short form ID (typically initials) of the user for display on the title bar when storing images. This is limited to 5 characters
- Enter password using the defined policies
- **Note:** *If a password is created the user will be required to enter the password when logging on*
- The system administrator can specify whether the users account is active, blocked or requires a password change. If needed, select the check box “user must change password.” The user will be prompted to change their password on the next logon
- Select the Group Membership for the new user. Multiple groups can be selected if needed. The user will need Operator access rights to appear on the dropdown list of operators

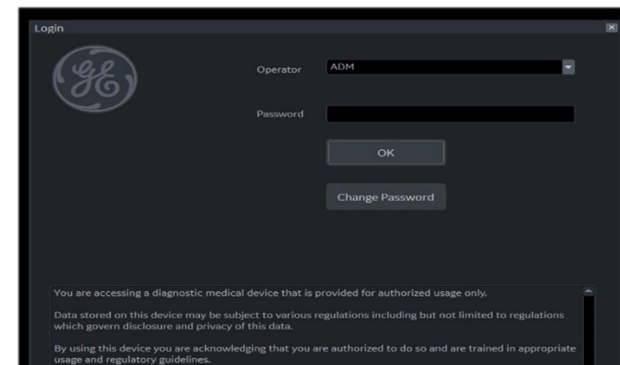
Note: *The system Admin can remove a user from the list. Select the user ID from the list and select “Remove.” The user and password will become inactive. If the user and password need to be removed permanently, select the user and password and select “Remove.” A pop-up dialog will appear to confirm the complete removal of the user account.*



When the user selects their ID from the list in the “operator” field in the patient entry page, the logon window will pop up.



Enter Operator Id then the password and select “Ok”
***Note:** *The user can change their password at anytime
 The user will have access according to the rights in their assigned group.*



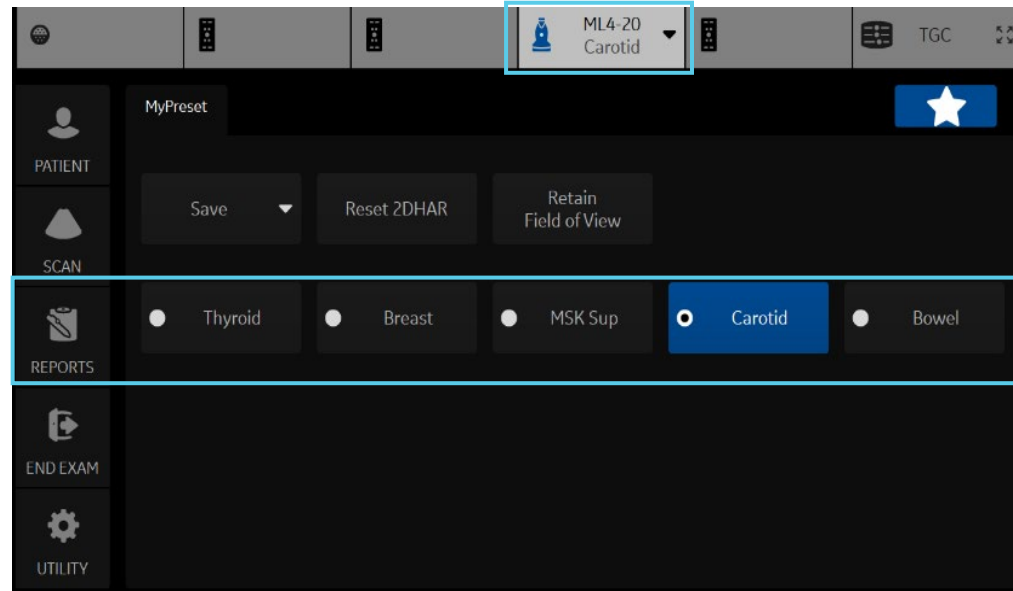


EZ Imaging

This feature includes **MyPreset**, **EZ Touch Panel** and **Quick Patient Change**.

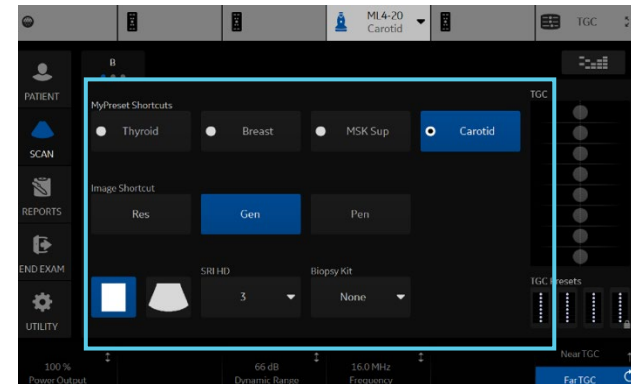
MyPreset:

MyPreset allows you to configure the models available on the touch panel according to the Probe or Category.



EZ Touch Panel:

EZ Touch Panel allows the operator quick access to change model, flow modes and Doppler modes without searching through multiple pages or many different parameters



Quick Patient Change:

This workflow is for operators who need a quick way to start a new patient, save data and reset the system for next patient without returning to the patient demographic page.





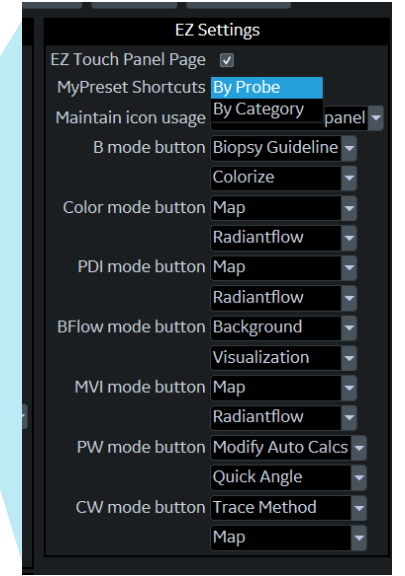
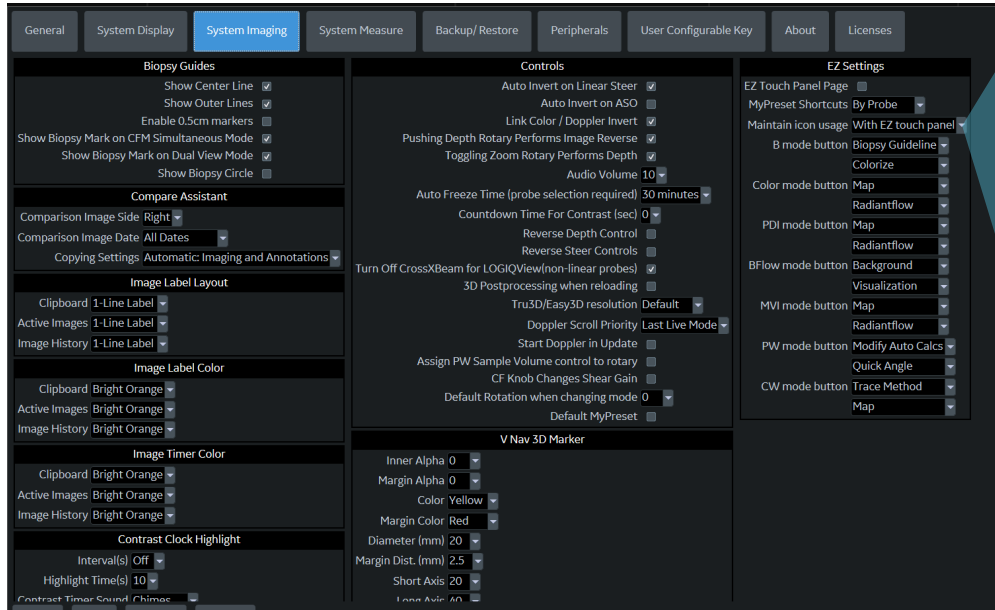
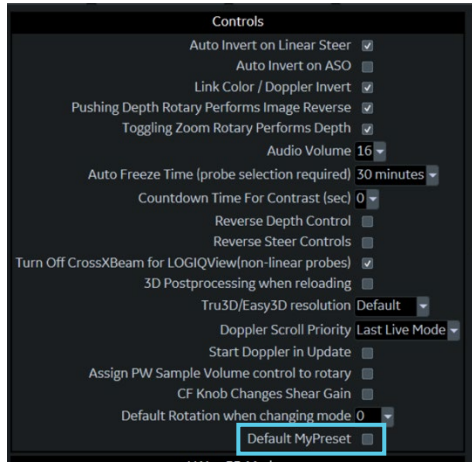
EZ Imaging – MyPreset

To activate MyPreset:

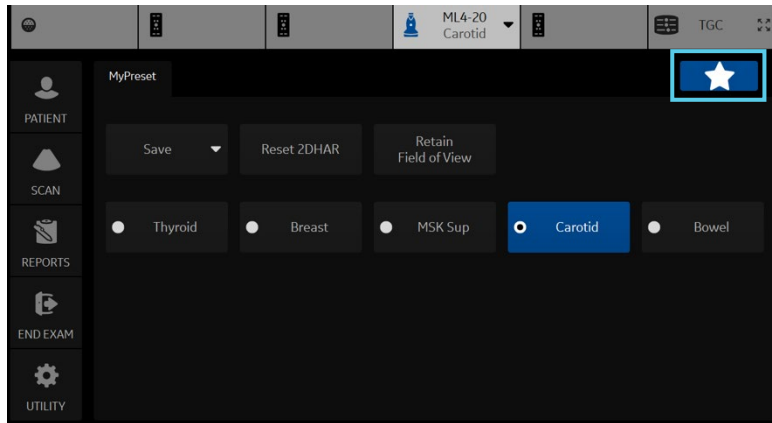
Go to Utility > System > System Imaging
Under controls, check the Default MyPreset

Activate EZ Touch Panel:

1. Check “Easy Touch Panel Page” – Utility > System > System Imaging > EZ settings
2. Select “By Probe” or “By Category” in MyPreset shortcuts

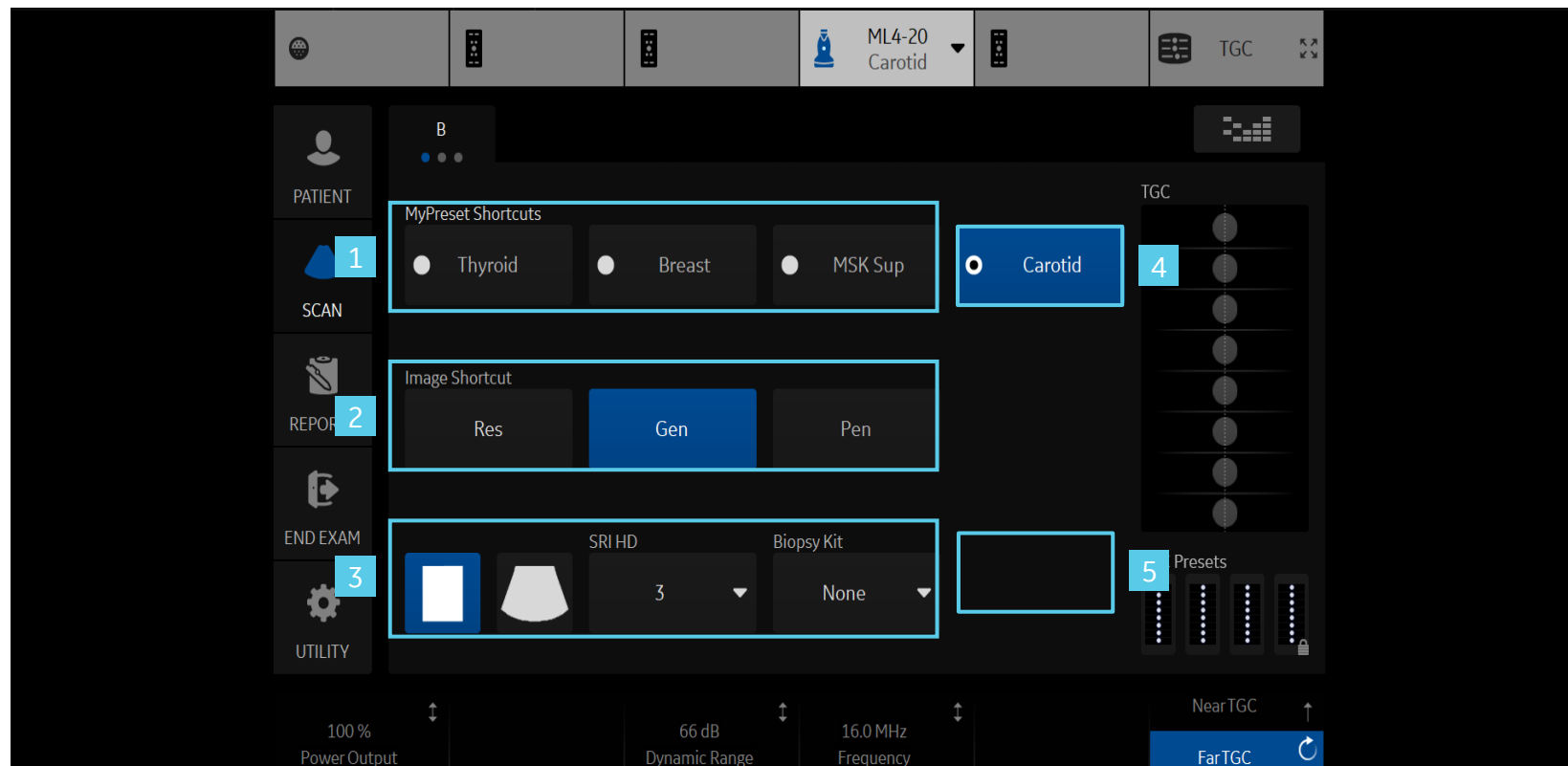


Select star on touch panel to switch between MyPreset and conventional tab





EZ Touch Panel in B-Mode



1. Models can be quickly changed on the touch panel.
2. Shortcuts available to quickly change the frequency using Gen, Pen. and Res
3. Essential presets (Non-configurable)
4. The last used or current model is displayed in the 4th position
5. A desired additional preset can be assigned to the 5th position



EZ Imaging with Flow Modes



1. Change flow models quickly
2. Color and Power Doppler Flow shortcuts
3. Essential controls available on the touch panel
4. A desired additional essential control can be assigned to the 4th position



EZ Imaging with Pulsed Wave or Continuous Wave activated



1. Change Doppler technologies quickly on the touch panel (if CW and PW are both supported)
2. Essential controls (Non-configurable)
3. A desired additional essential control can be assigned to the 3rd position



EZ Touch Panel imaging icons



PW/CW invert: Select to invert PW or CW Waveform



Color Invert: Select to Invert the Color Doppler



Simultaneous display: Select to show a live image in both color and B-Mode



Virtual Convex: Select for an extended field of view with linear probes



Reverse: Select to reverse the image orientation

EZ Touch Panel icons are only available when EZ Touch Panel is checked in the utility pages



Cleanability

Cleaning the trackball

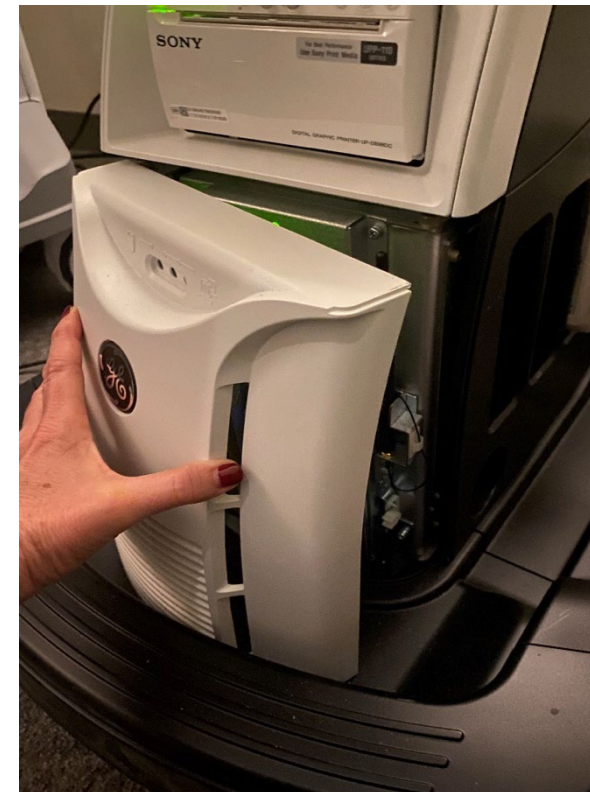


1. Twist and remove the trackball prior to cleaning the trackball and the trackball housing (1-3)
2. Clean the trackball and the trackball housing with a dry soft cloth (4-6)
3. After cleaning the trackball, replace and twist the trackball into the trackball housing (7-8)

Cleaning filters

Clean the system's air filters to ensure 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.

Remove the front cover of the cabinet to access the filter.

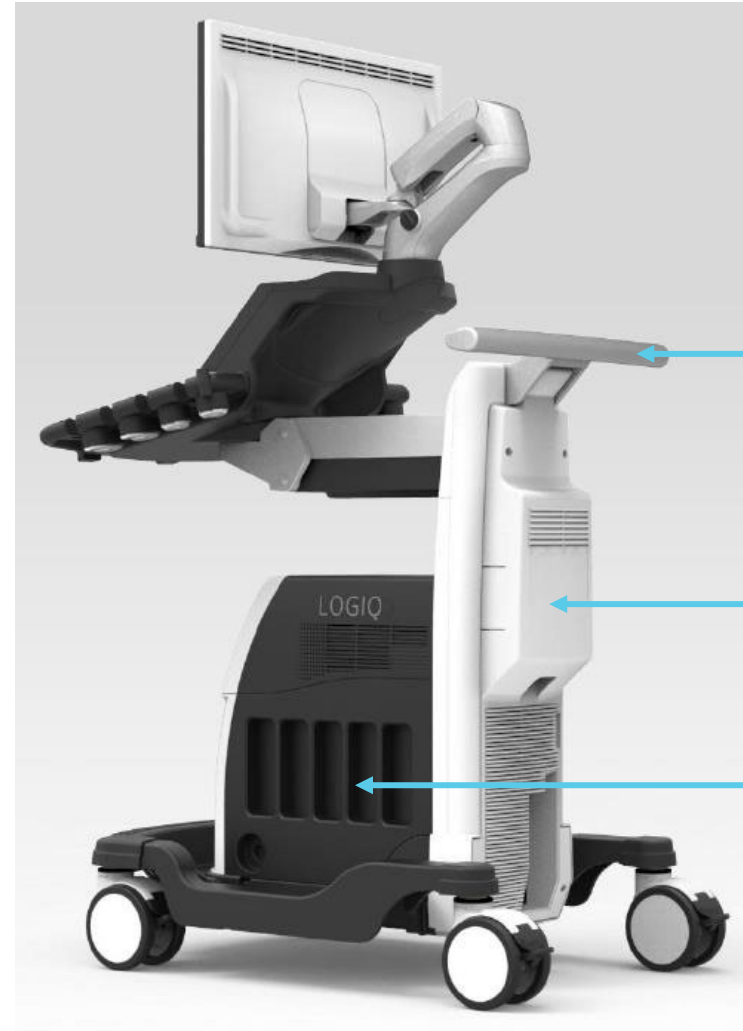
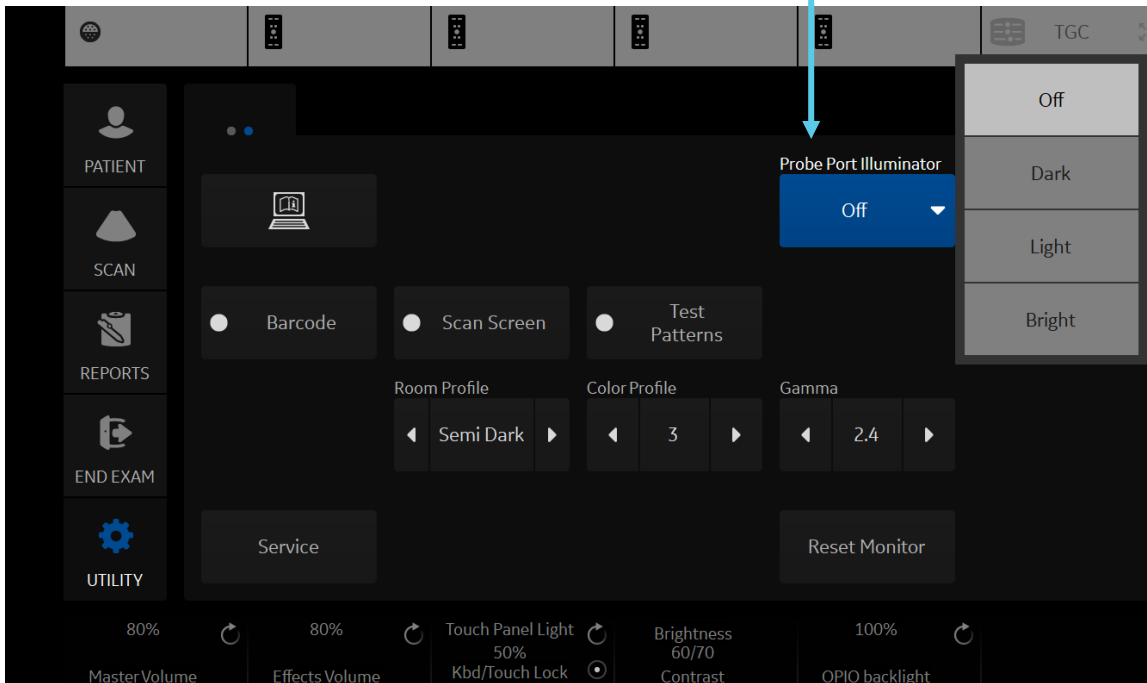


Portability



Touch panel page 2 illuminator settings

- Off
- Dark
- Light
- Bright



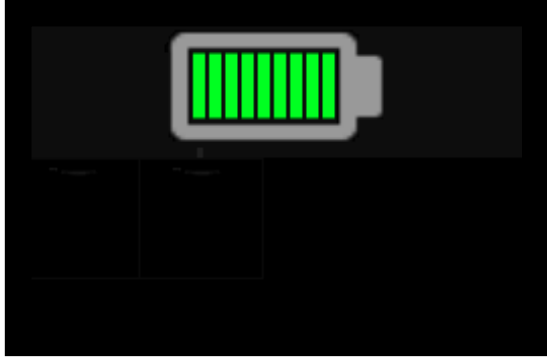
Handle

Integrated battery backpack

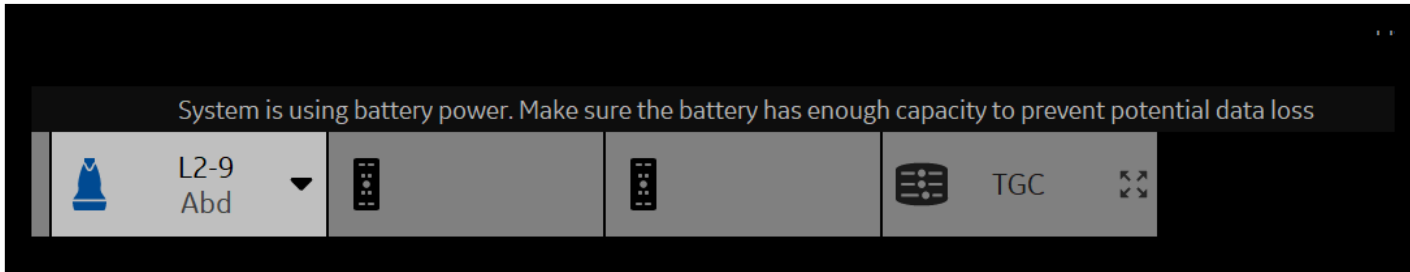
Illuminator 4 active probe ports and one park port



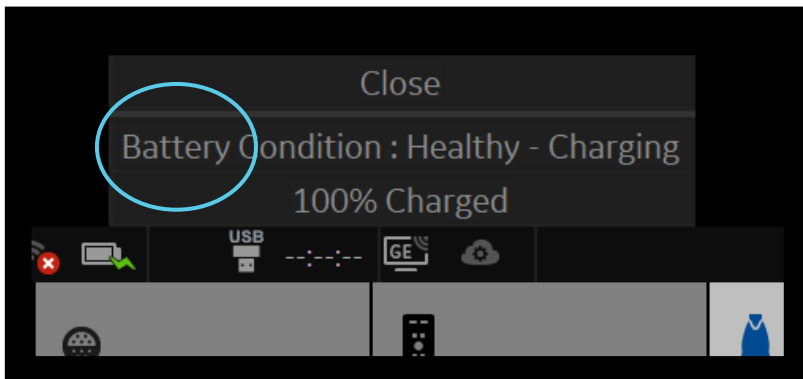
Portability



The Battery Indicator icon at the top left of the monitor indicates the status of the battery.



A message will pop up when-scanning on battery to remind you to check your battery capacity.



To check the percentage of battery life before disconnecting from AC power, click on the battery icon on the bottom left of the monitor.



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