# LOGIQ* Series
# Quick Start

imagination at work

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| | | |
|---|---|---|
| 1 Power | 9 B-Flow* | 20 Read/Write Zoom |
| 2 Freeze | 10 CHI | 21 Depth/Steer/Width |
| 3 Print keys | 11 PDI/TVI | 22 Auto Optimize |
| 4 B-Mode | 12 Continuous Wave | 23 A/N keyboard |
| 5 Color Flow | 13 Trackball | 24 Option keys |
| 6 Pulsed Wave | 14 Trackball keys | 25 Touch panel toggles/keys |
| 7 M-Mode | 15 Pointer | 26 Touch panel |
| 8 Dual screen | 16 Clear | 27 TGC pods |
| | 17 Comment | 28 Reverse key |
| | 18 Body Pattern/Ellipse | 29 Programmable keys (LS8 and LS7 only) |
| | 19 Measure | |

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2. Freeze
3. Print keys
4. B-Mode
5. Color Flow
6. Pulsed Wave
7. M-Mode
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## Connecting a probe

1. Turn latch horizontal for unlock position.
2. Slide the connector straight into the port with the cord going upward. Turn latch vertical to lock. Image of the connected probe should appear on touch panel.

## 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). (14) 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 Freeze (2) or select the desired probe on the touch panel.

## Selecting probe and model

1. Push the desired probe icon to change from one transducer to another at any time.
2. When in scan mode, on the touch panel, push the "Model." button to select a model category and preset for the exam.

## Activating modes

1. B-Mode (4) – B-Mode is always active, to adjust the overall B-Mode brightness turn the B-Mode button. Push in on the B-Mode button to exit other modes. Push the B-Flow* (9) button to activate B-Flow if the option is available, turn the B-Mode control to adjust B-Flow overall brightness.
2. Color Flow (5) – Push the CF control to activate color Doppler, turn the control to change the overall color gain. Push PDI/TVI (11) to activate power Doppler, turn the CF control to adjust overall power Doppler gain.

When using a cardiac model and probe, pushing the PDI/TVI button will activate TVI, turn the CF control to adjust overall TVI gain. When using Elastography turning the CF control will adjust transparency.

3. Pulsed Wave (6) – Push the PW button to activate the pulsed wave Doppler, turn the button to adjust overall pulsed wave Doppler gain. Push the CW (12) button to activate continuous wave Doppler if the option is available, turn the PW button to adjust overall continuous wave Doppler gain. Select the Update trackball key to toggle between B-Mode active and PW active.
4. M-Mode (7) – Push the M button to activate M-Mode, turn the button to adjust overall M-Mode. brightness. To use Color M-Mode, activate CF either before or after activating M-Mode.

## Trackball keys (14)

The trackball key functions change dependent upon the mode you are using. The icon on the lower right of the monitor will show the function of the keys as you change modes.

Observe the monitor icon with each mode change for guidance on using the trackball keys.
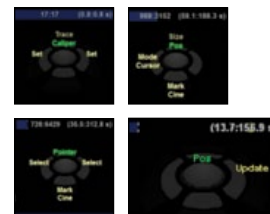


## Print keys (3) programmable

1. Press P1 to store images to the hard drive.
2. Press P2 to print images on the thermal printer when one is present.

## Note:

Print destinations can be programmed by your GE representative upon install of the system.

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## Measurements (Generic)

1. Press "Measure" key (19), a caliper will appear on the screen.

2. Use the trackball to move the caliper to the appropriate location, press either the left or right trackball key (14), a second caliper will appear.



3. Place the second caliper in the appropriate location and press the right or left trackball key.

4. A measurement result window appears on the screen with the distance between the two points. Push top trackball key to activate a second set of calipers. Repeat steps 2-3. Additional measurement options can be found by using the upper trackball key.

5. To remove the measurements, select the "Clear" (16) button while the measure key is backlit green.

6. For Velocity measurements, when Doppler timeline is displayed on the screen, press measure and select the appropriate waveform.



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

## Annotating and image

1. To add text to an image, begin typing on the A/N keyboard (23) while the text color is green, the text can be moved using the trackball to any location in the image.

2. Push the "Comment" (17) button, a cursor will appear on the screen. Pre-set annotations will appear on the touch panel and can be selected by tapping the word or words on the touch panel.



3. While the text color is green, use the trackball to move the text to the desired location on the image. Push the right trackball key to set the text, the color will change from green to yellow.



4. To edit or move set text, move the comment cursor over the text, push the right trackball key. The text color will turn green and the text can be changed or moved.

5. To remove text from an image, select the "Clear" button when the "Comment button is backlit green.

6. To remove all measurements, text and arrows from an image, hold the "Clear" (16) button down for 3 seconds.

7. To select the comment cursor "Home" position, move the cursor to the desired position. Simultaneously push the F7 on the A/N keyboard and the right or left trackball key.

## Split Screen/Dual View

1. Press "L" on the Dual screen keys (8) 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 the 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 live as 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 on the right.

7. To return to single image, push down on the B-Mode button.

## Biopsy Guide

1. On B-Mode tab on the touch panel, tap the page arrow to move to page 2.



2. Tap the "Biopsy Kit" on the touch panel and view the drop down list of options, select the appropriate number corresponding to the number on the guide.

3. To turn the biopsy guide off, select the "None" from the drop down list.

## Note:

The IC5-9-D 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 a 5˚ angle. Please refer to the instructions found in the biopsy guide kit for cleaning and handling the guides.

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## B-Mode Optimization

| Most commonly used parameters | Description |
|---|---|
| Focus | Focus is the area where the sound beam is concentrated to better enhance detail in the image. Place the Focal Zone at or below the area of most interest. You can add additional focal zones. The frame rate will be affected by the number of focal zones used. |
| 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. |
| Auto Optimize (22) | Optimizes contrast resolution by changing the gray scale to match the image data. |
| Speckle Reduction (SRI) | An adaptive algorithm to help reduce the unwanted effects of speckle in the image. Image speckle usually appears as grainy texture in otherwise uniform areas of tissue. SRI may be used on any probe or in any clinical application. |
| CrossXBeam* | 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. |
| Harmonics (CHI) | Utilizes Digitally Encoded Ultrasound (DEU). Enhances near field resolution. Multiple frequencies are available to help increase penetration. |
| 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. |
| 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. |
| Line Density | Help optimize frame rate or spatial resolution. Increase line density for enhanced resolution, such as in Small Parts. Decrease line density for faster frame rates such as for vascular imaging. Use in combination with Focal Zone to help improve resolution and frame rate. |
| Frame Average | A temporal filter that averages image frames together, using more pixels to make up one image. Present a smoother, softer image. |





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## B-Mode Optimization (con't)

| IF | THEN |
|---|---|
| **Image is too soft** | 1. Decrease SRI-HD.<br>2. Activate Auto Optimize.<br>3. Decrease Frame Average.<br>4. Decrease Dynamic Range.<br>5. Change Gray Map.<br>6. Turn off CrossXBeam.* |
| **Image is too grainy** | 1. Increase SRI-HD.<br>2. Increase Dynamic Range.<br>3. Increase Frequency.<br>4. Increase Frame Average.<br>5. Activate CrossXBeam.<br>6. Change Gray Map. |
| **Image is too dark** | 1. Increase overall gain.<br>2. Decrease frequency.<br>3. Change Gray Map.<br>4. Decrease Dynamic Range. |
| **Image is too noisy** | 1. Decrease overall gain.<br>2. Activate Harmonics (CHI).<br>3. Activate Auto Optimize.<br>4. Adjust TGC pods. |

| IF | THEN |
|---|---|
| **Image is not uniform** | 1. Increase number of Focal Zones.<br>2. Decrease scan area.<br>3. Move Focal Zones up or down.<br>4. Adjust TGC pods. |
| **Image whites are too bright** | 1. Increase number of Focal Zones.<br>2. Decrease scan area.<br>3. Move Focal Zones up or down. |
| **Technically difficult patient** | 1. Select appropriate Model, if abdominal exam select ABD2.<br>2. Lower frequency.<br>3. Activate Auto Optimize.<br>4. Turn off Harmonics.<br>5. Lower Dynamic Range. |
| **Frame rates are too slow** | 1. Decrease scan area.<br>2. Decrease Focal Zone number.<br>3. Decrease Line Density.<br>4. Decrease CrossXBeam number. |

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## Color Doppler Optimization

| Most 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 color parameters to enhance flow in different depths. Use lower frequency for deeper vessels. Increase frequency for slow flow or superficial vessels. Range is dependent on probe and model. |
| Wall Filter | Filters out low velocity signals affects low flow sensitivity versus motion artifact. Assists in reducing motion artifacts from motion outside the vessel. |
| 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 flow profile. |
| Line Density | Helps optimize color flow frame rate for sensitivity and spatial resolution. 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. |

## Color Doppler Optimization (con't)

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 are 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), 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 ROI is perpendicular to vessel flow. If using a linear probe, change the ROI angle using the touch panel selection "Angle Steer." Note: if vessel is angled in the image, try a straight ROI box. |
| 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. Increase Flash Suppression. |
| Color is in superficial vessels, but not in deeper vessels | Decrease color frequency, increase color gain until flashes are 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. Decrease Line Density. |

# Image Management

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 and image. The images will be visible in a thumbnail view at the bottom of the image screen.

2. To store a Cine loop, push P1 during live scanning (do not push freeze first). The Cine loop stored will be a pre-determined length of time determined 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, double click on the patient name. (If there is more than one exam, highlight the exam needed).

2. Select "Send To" from the bottom right corner of the page.

3. Select the "To" drop down menu, select the destination and 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. Push the "Freeze" button. The prior images will be visible in the thumbnail views, add images and repeat the "End Exam" process.

**To review a closed exam:**

1. From the patient entry page, double click the patient 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. Push the "Freeze" key. The images will appear in the thumbnail display at the bottom of the screen.

4. Select any image from the thumbnails to bring into full screen view.

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 in the list at the bottom of the page and select New Exam from the options on the touch panel.

4. Press Freeze to begin the exam.

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 delete patients from the internal hard drive:**

1. In the patient entry page, select the operator drop down menu, choose ADM. In the pop up message, leave the password blank and select OK.

2. In the list of patient names, highlight the patient 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.

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

**Save images to CD/DVD or USB drive in PC format:**



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 in 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

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, 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



**To Back-up presets: Insert CD-R or DVD-R into the DVD drive.**

1. Select Utility > System > from the touch panel

2. Use trackball pointer to select Backup/Restore tab on the monitor

3. Select check box, User Defined Configuration under Backup column on the left

4. Select CD/DVD from the drop down menu under "Media"

5. Select "Backup" to save presets to CD/DVD

6. Press F3 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:

**Note:**

**It is recommended to do this with the assistance of GE Service or GE Applications support.**

1. Insert the "preset CD/DVD" into the disk drive

2. Select Utility > System from the touch panel

3. Use the trackball pointer to select Backup/Restore tab on the monitor

4. Select CD/DVD from the drop down menu under "Media"

5. 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**

6. Alternatively select the desired fields you wish to restore on the system from the Detailed Restore of User Defined area

7. Select "Restore." The system will automatically shut down to restore the presets.



To add new users initials:

1. Select Utilities > Admin from the touch panel

2. Select "Users" tab from the top of the screen. Select Add from the User List.

3. Add the initials of the new user in the ID field. Do not forget to check the Admin Rights box if you want users to have hard drive delete capabilities and access to the utility menus.

4. Select "Save" in the bottom left corner of the screen

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