



Analogic Ultrasound

Extended
User Manual

SonixTouch Ultrasound System





Ultrasonix Medical Corporation

SonixTouch Ultrasound System Extended User Manual

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION	1-1
1.1 AUDIENCE	1-1
1.1.1 Prescription Device	1-1
1.2 CONVENTIONS	1-1
1.3 UPDATES.....	1-2
1.4 VOLTAGE DISCLAIMER	1-2
1.5 CONNECTIVITY DISCLAIMER	1-2
1.6 PRIVACY DISCLAIMER.....	1-2
1.7 GENERAL DISCLAIMER.....	1-3
1.8 LICENSE AGREEMENT.....	1-3
1.9 WARRANTY REGISTRATION	1-3
1.10 TRADEMARKS AND PATENTS.....	1-4
CHAPTER 2: Sonix INTRODUCTION	2-1
2.1 SYSTEM COMPONENTS	2-1
2.2 OPERATOR CONSOLE.....	2-3
2.3 CONSOLE TILT ANGLE ADJUSTMENT.....	2-5
2.4 SYSTEM CASE	2-5
2.5 POWER PANEL	2-6
2.5.1 Powering the System	2-7
2.5.2 Powering the System ON/OFF	2-7
2.6 BACK CONNECTIVITY PANEL	2-8
2.7 CONSOLE CONNECTIVITY	2-8
2.8 UPS	2-9
2.8.1 UPS Use Model	2-9
2.9 ECG CONNECTORS	2-10
2.10 SonixGPS	2-10
2.11 BARCODE READER	2-10
2.12 WIRELESS ADAPTER	2-11
2.13 FOOTSWITCH (DUAL OR TRIPLE).....	2-11
CHAPTER 3: GETTING STARTED	3-1
3.1 TURNING ON SYSTEM	3-1
3.2 CONNECTING TRANSDUCERS	3-2
3.3 QSonix FEATURE	3-3
3.3.1 Quick Exam Start-Up	3-3
3.3.1.1 Quick Exam Start-Up (with Force Operator Login).....	3-7
3.3.2 Documentation Access	3-10
3.4 REMOTE SUPPORT	3-11
3.5 TOUCH SCREEN LAYOUT	3-12
3.5.1 Main Touch Screen	3-12
3.5.2 Touch Screen Button Editing.....	3-16
3.5.2.1 Editing Touch Screen Button Order	3-18
3.5.2.2 Editing Imaging Parameter Button Size.....	3-20
3.5.3 Main Touch Screen – Frozen	3-21
3.5.4 Data Entry Touch Screens	3-23
3.5.5 TGC Settings	3-25

CHAPTER 4: PATIENT MANAGEMENT	4-1
4.1 ENTERING PATIENT DATA.....	4-1
4.1.1 Patient Information.....	4-4
4.1.2 Application Information	4-6
4.1.2.1 OB Previous Exam (Fetal Trending).....	4-9
4.1.3 Exam Information	4-12
4.2 SELECTING AN APPLICATION–TRANSDUCER–PRESET COMBINATION.....	4-14
4.3 BEGINNING AN EXAM FOR A NEW PATIENT	4-15
4.4 BEGINNING AN EXAM WITH NO PATIENT SELECTED.....	4-16
4.5 ENDING AN EXAM.....	4-19
4.6 EXAM IMPORT/EXPORT	4-20
4.7 STORAGE/DATABASE TABS	4-24
4.7.1 Patients	4-24
4.7.1.1 Manipulating the Patients Database.....	4-25
4.7.2 DICOM Worklist	4-27
4.7.2.1 Manipulating the DICOM Worklist Database	4-28
4.7.3 Hide.....	4-30
4.8 USER-DEFINED PRESETS FOR NON-3D/4D FORMATS.....	4-31
CHAPTER 5: IMAGING	5-1
5.1 BASIC 2D IMAGING	5-1
5.1.1 Clarity (Speckle Reduction).....	5-4
5.1.2 Spatial Compound Imaging	5-4
5.1.2.1 SonixShine	5-5
5.1.3 2D Zoom Imaging	5-6
5.1.4 Dual Imaging Format	5-7
5.1.5 Quad Imaging Format	5-8
5.1.6 Brachytherapy and the BPC8-4/10 Transducer	5-9
5.1.7 M-Mode Imaging	5-10
5.1.7.1 Anatomic M-Mode Imaging.....	5-11
5.1.7.2 Color M-Mode Imaging	5-11
5.2 COLOR/POWER DOPPLER	5-12
5.2.1 Color Doppler Imaging Mode	5-13
5.2.2 Power Doppler Imaging Mode	5-13
5.2.3 Tissue Doppler Imaging (TDI).....	5-14
5.2.4 Color Flow Imaging	5-14
5.2.5 Power Flow Imaging	5-14
5.2.6 Simultaneous 2D/Color	5-14
5.3 PULSED AND CONTINUOUS WAVE DOPPLER (PW AND CW) AND TRIPLEX	5-15
5.3.1 PW Imaging Mode	5-17
5.3.2 CW Imaging Mode	5-18
5.3.3 Triplex Imaging Mode.....	5-19
5.4 AUTO-GAIN/B	5-20
5.5 ELASTOGRAPHY	5-21
5.6 SonixGPS	5-23
5.7 PANORAMIC IMAGING	5-24
5.8 SonixDVR RECORDING	5-26
5.9 2D CINE OPTIONS	5-27
5.9.1 2D Cine Frame Indicators	5-27
5.9.2 2D Cine Options.....	5-29
5.9.3 Cine Clip Storage	5-30
5.9.4 Raw Cine Manipulation	5-31
5.9.5 Stored Thumbnail Review	5-31
5.10 FREEHAND 3D IMAGING (ALL NON-4D SONIX TRANSDUCERS).....	5-32

5.11 STANDARD AND ADVANCED 3D/4D IMAGING	5-35
5.11.1 3D/4D Touch Screen Layout	5-37
5.11.1.1 4D Cine Options	5-39
5.11.2 3D/4D LCD Display Layout	5-41
5.11.2.1 3D/4D Display Mode (LCD Display and Touch Screen Options)	5-43
5.11.2.2 3D/4D Render Mode (LCD Display Options Only)	5-48
5.11.2.3 3D/4D User Mode (LCD Display Options Only)	5-50
5.11.2.4 Advanced 3D/4D Multislice Mode (LCD Display and Touch Screen Options)	5-52
5.11.2.5 3D/4D Sculpt (Touch Screen Options Only)	5-56
5.11.3 Additional 3D/4D LCD Display Details	5-57
5.11.4 3D/4D Image Acquisition	5-58
5.11.4.1 3D Imaging	5-59
5.11.4.2 4D Imaging	5-60
5.11.5 Optimization of Acquired Images	5-61
5.11.6 Spline Editing of 3D/4D Images	5-63
5.11.7 Repositioning the ROI Box	5-66
5.11.8 Repositioning the MPR Plane Intersection Point	5-67
5.11.9 3D/4D Presets	5-68
5.11.9.1 Selecting a Default 3D/4D User (Preset)	5-68
5.11.9.2 User-Defined 3D/4D Presets	5-69
5.11.9.3 Loading 3D/4D Presets	5-70
5.11.9.4 Resetting Factory Defaults	5-71
CHAPTER 6: CLINICAL ANALYSIS.....	6-1
6.1 GENERIC 2D MEASUREMENTS	6-3
6.1.1 2D Linear Measurement	6-3
6.1.2 Area or Circumference Measurement	6-5
6.1.2.1 Ellipse Method Area or Circumference Measurement	6-5
6.1.2.2 Continual Method Area or Circumference Measurement	6-5
6.1.2.3 Point by Point Area or Circumference Measurement	6-6
6.1.2.4 Cross Area or Circumference Measurement	6-7
6.1.3 Volume Calculation	6-8
6.1.4 Percent Diameter Reduction Calculation (% Diam Red)	6-9
6.1.5 Percent Area Reduction Calculation (% Area Red)	6-10
6.1.5.1 Ellipse/Ellipse Method of Area Reduction Calculation	6-10
6.1.5.2 Ellipse/Trace Method of Percent Area Reduction Calculation	6-11
6.1.5.3 Trace/Trace Method of Percent Area Reduction Calculation	6-12
6.2 M-MODE MEASUREMENTS	6-13
6.2.1 M-Mode Heart Rate Measurement	6-13
6.2.2 M-Mode Slope Measurement (Time, Distance and Slope)	6-13
6.2.3 M-Mode Distance Measurement	6-14
6.3 PW/CW DOPPLER MEASUREMENTS	6-15
6.3.1 Velocity Measurements	6-15
6.3.2 Doppler Manual Trace Measurement	6-16
6.3.2.1 Doppler Manual Trace Measurement – Continual Method	6-16
6.3.2.2 Doppler Manual Trace Measurement – Point by Point Method	6-17
6.3.3 Doppler Auto-Trace Measurement (Spectrum Range)	6-18
6.3.4 Doppler Heart Rate Measurement	6-18
6.4 ELASTOGRAPHY MEASUREMENTS	6-19
6.5 CAROTID INTIMA-MEDIA THICKNESS (IMT) MEASUREMENT	6-20
6.6 CAPTURE PROTOCOLS	6-22
6.6.1 Gated Capture	6-22
6.6.2 Auto-Labeling an Exam	6-24
6.7 MEASURE LIVE	6-25

6.8 PSA/PSAD MEASUREMENT/CALCULATION	6-26
6.8.1 PSAD Calculation Disclaimer	6-26
6.9 3D/4D MEASUREMENTS	6-28
6.10 OB-SPECIFIC MEASUREMENTS/CALCULATIONS	6-28
6.11 FERTILITY-SPECIFIC MEASUREMENTS/CALCULATIONS	6-29
6.11.1 Auto-Follicle	6-30
6.11.1.1 Auto-Follicle Disclaimer	6-30
6.11.1.2 Auto-Follicle Measurements	6-30
6.12 REPORTS AND WORKSHEETS	6-35
6.12.1 Accessing Reports/Worksheets	6-35
6.12.2 Enhanced Report Printing	6-38
6.12.2.1 Printed Report Format	6-38
6.12.3 Obstetrics Report	6-41
6.12.4 Cardiac Reports	6-42
6.12.5 Vascular Reports	6-43
6.12.6 Graf Classification	6-44
6.12.7 Billing and QA Review Report/Worksheet Options	6-44
CHAPTER 7: TEXT, ANNOTATIONS AND PICTOGRAMS.....	7-1
7.1 TEXT AND ANNOTATIONS.....	7-2
7.1.1 Set Text Home Position	7-3
7.1.2 Annotations (Keyboard Text)	7-3
7.1.3 Application-Specific Annotations	7-4
7.1.4 Deleting Text/Annotations	7-4
7.1.5 Text Arrows	7-5
7.2 PICTOGRAMS.....	7-6
CHAPTER 8: SYSTEM SETUP	8-1
8.1 USER SETTINGS	8-5
8.1.1 SonixLive Setup	8-5
8.1.1.1 Configuring the Ultrasound System for SonixLive	8-5
8.1.1.2 Installing the SonixLive Viewer Software	8-6
8.1.1.3 Configuring the Remote PC for SonixLive Viewing	8-7
8.1.1.4 Viewing a Remote Ultrasound Exam SonixLive	8-8
8.1.2 Remote Support	8-9
8.1.3 Chat Support	8-10
8.2 ADMINISTRATOR SETTINGS	8-11
8.2.1 Presets	8-12
8.2.1.1 Show/Hide Imaging Presets	8-14
8.2.2 Presets – Annotations	8-15
8.2.2.1 Modify Annotations	8-16
8.2.3 Presets – Pictograms	8-17
8.2.3.1 Modify the Pictograms Attached to Presets	8-18
8.2.4 Presets – Measurements	8-19
8.2.4.1 Modify the Available Touch Screen Measurements Packages	8-20
8.2.5 Presets – Protocols	8-21
8.2.6 Annotations	8-22
8.2.6.1 Text Arrow Customization	8-23
8.2.7 Measurements	8-24
8.2.7.1 Managing Worksheet Settings	8-28
8.2.7.2 Show/Hide Applications, Measurement Packages and Measurements	8-29
8.2.7.3 Managing Custom Measurements	8-33
8.2.7.4 Reordering Measurements	8-41
8.2.7.5 Managing Author Settings	8-42
8.2.7.6 Managing OB Tables	8-44

8.2.8 Training Tutorials	8-47
8.2.8.1 Manipulating Training Tutorials.....	8-48
8.2.9 SonixGPS	8-51
8.2.10 Biopsy Guide..	8-52
8.2.11 System Settings	8-53
8.2.11.1 Password Protection.....	8-57
8.2.11.2 Export/Import User Data.....	8-58
8.2.11.3 Reset User Data Settings to Factory Defaults.....	8-60
8.2.12 Network.....	8-61
8.2.12.1 Ethernet (LAN) Network Configuration.....	8-63
8.2.12.2 Dialup Network Configuration	8-65
8.2.12.3 Wireless Configuration	8-66
8.2.12.4 Chat Support	8-68
8.2.12.5 Remote Support	8-68
8.2.13 DICOM Configuration.....	8-69
8.2.13.1 DICOM Storage Settings	8-71
8.2.13.2 DICOM Print Settings	8-79
8.2.13.3 DICOM Worklist Settings.....	8-84
8.2.14 Custom Keys.....	8-86
8.2.15 Peripherals.....	8-89
8.2.15.1 Paper Printer	8-90
8.2.15.2 LCD Display.....	8-92
8.2.15.3 VCR/Photo	8-93
8.2.15.4 Footswitch	8-94
8.2.15.5 Brightness/Contrast.....	8-96
8.2.15.6 Touch Screen	8-97
8.2.16 Display Settings	8-100
8.2.17 Patient Settings.....	8-102
8.2.17.1 EMR Settings	8-107
8.2.18 Status Bar	8-108
8.2.19 Capture Settings	8-111
8.2.20 Imaging Modes	8-118
8.2.21 Documentation Settings	8-120
8.2.22 Software Update	8-122
8.2.22.1 Enhanced Report Printing	8-123
8.2.23 Licensing.....	8-125
8.3 SERVICE MENU	8-128
CHAPTER 9: IMAGE STORAGE, REVIEW, TRANSFER AND PRINT	9-1
9.1 IMAGE STORAGE	9-1
9.2 IMAGE REVIEW.....	9-2
9.2.1 Deleting Image(s)/Exam(s)	9-9
9.3 IMAGE TRANSFER.....	9-10
CHAPTER 10: CONNECTIVITY, PERIPHERALS AND SOFTWARE	10-1
10.1 BACK CONNECTIVITY PANEL	10-1
10.2 CONSOLE CONNECTIVITY	10-3
10.3 ULTRASONIX-APPROVED DEVICES	10-4
10.3.1 Connecting an External Television to the System.....	10-4
10.3.1.1 Method 1: Via the TV's HDMI or DVI Input.....	10-5
10.3.1.2 Method 2: Via the TV's PC IN Connector	10-6
10.4 PERIPHERAL RECEPTACLE	10-7

10.5 UPS	10-8
10.5.1 UPS Circuit Breakers	10-8
10.5.1.1 Determining Whether the UPS Breakers are ON or OFF	10-9
10.5.1.2 Turning OFF/Resetting the UPS Breakers	10-9
10.5.1.3 Turning ON the UPS Breakers	10-9
10.5.2 Battery Recharge Issues.....	10-10
10.5.3 UPS Sleep/Standy Mode	10-12
10.6 ECG CONNECTION	10-13
10.7 SONIXGPS	10-14
10.8 BARCODE READER	10-14
10.8.1 Connecting the Barcode Reader.....	10-14
10.9 WIRELESS ADAPTER	10-15
10.10 CONNECTING THE USB FOOTSWITCH (DUAL OR TRIPLE).....	10-15
10.11 USB PRINTER MOUNTING KIT.....	10-16
10.12 PERIPHERAL TRAY	10-17
10.12.1 USB Printer Mounted on the Peripheral Tray.....	10-18
10.13 TRANSDUCER HOLDERS AND CABLE HOOKS	10-20
10.14 SOFTWARE.....	10-21
10.14.1 Anti-Virus Protection	10-21
10.14.2 Protocols	10-21
10.14.2.1 Protocol Selection.....	10-22

APPENDIX A: SAFETY **A-1**

A.1 SAFETY	A-1
A.1.1 ALARA Principle and Output Displays	A-1
A.2 BASIC PRECAUTIONS	A-2
A.2.1 Modifications	A-2
A.2.2 Damage	A-2
A.2.3 Cleaning/Disinfection/Sterilization.....	A-2
A.2.4 Handling/Storage	A-2
A.2.5 General Usage.....	A-3
A.3 UPS PRECAUTIONS	A-4
A.4 ECG SAFETY	A-4
A.4.1 ECG Module (All Part Numbers).....	A-4
A.4.2 ECG Cables	A-5
A.4.2.1 Biocompatibility.....	A-5
A.5 SONIXGPS PRECAUTIONS	A-5
A.6 SYMBOL DEFINITIONS	A-6
A.7 ELECTRICAL SAFETY REQUIREMENTS	A-7
A.7.1 System	A-7
A.7.2 Additional Hardware.....	A-7
A.8 EMC (ELECTROMAGNETIC COMPATIBILITY) REQUIREMENTS	A-8
A.8.1 System	A-8
A.8.2 Additional Hardware.....	A-8
A.9 ENVIRONMENTAL CONDITIONS	A-9
A.9.1 System	A-9
A.9.2 Additional Hardware.....	A-9
A.10 LIMITING TRANSDUCER SURFACE HEATING	A-10
A.11 LATEX	A-10

APPENDIX B: SYSTEM SPECIFICATIONS **B-1**

APPENDIX C: TRANSDUCER SPECIFICATIONS	C-1
C.1 TRANSDUCER DISCLAIMER	C-1
C.2 MEASUREMENT ACCURACY	C-1
C.3 ACOUSTIC OUTPUT RECORDING TABLES	C-6
C.4 ULTRASOUND INDICATIONS FOR USE TABLES	C-59
APPENDIX D: MAINTENANCE AND CLEANING	D-1
D.1 TRANSDUCERS	D-1
D.1.1 Guidelines	D-1
D.1.2 Ultrasound Coupling Gels	D-1
D.1.3 General Transducer Maintenance	D-2
D.1.3.1 Inspection and Testing	D-2
D.1.3.2 Storing and Packaging	D-2
D.1.4 General Transducer Cleaning/Disinfecting Recommendations and Warnings	D-3
D.1.5 Cleaning/Disinfecting Non-Invasive Transducers	D-4
D.1.5.1 Cleaning Non-Invasive Transducers	D-5
D.1.5.2 Disinfecting Non-Invasive Transducers	D-5
D.1.6 Cleaning/Disinfecting Endocavity Transducers	D-6
D.1.7 Sterilization	D-7
D.2 SHIPPING TRANSDUCERS FOR SERVICE	D-8
D.3 RECOMMENDED FREQUENCY OF HIGH-LEVEL MAINTENANCE PROCEDURES	D-8
D.4 CLEANING SYSTEM COMPONENTS	D-9
D.4.1 LCD Display and Cabinet	D-9
D.4.1.1 LCD Display Cabinet	D-9
D.4.1.2 LCD Display Screen	D-9
D.4.2 Touch Screen	D-10
D.4.3 Operator Console	D-10
D.4.4 Power Cord	D-10
D.4.5 Barcode Reader	D-11
D.4.6 Wireless Adapter (When Connected Externally)	D-11
D.4.7 SonixGPS Components	D-11
D.4.8 Transducer Holders and Cable Hooks	D-12
D.4.9 Footswitch (Dual and Triple)	D-12
D.4.10 Peripheral Tray and Basket	D-12
D.4.11 System Filter	D-13
APPENDIX E: MODE ACTION AND IMAGING PARAMETER OPTIONS	E-1
APPENDIX F: OB AND CARDIAC AUTHORS	F-1
APPENDIX G: REFERENCES	G-1
G.1 OB	G-1
G.1.1 OB Gestational Age	G-2
G.1.2 OB Growth Analysis	G-5
G.2 CARDIAC	G-7
G.3 FLOW MEDIATED DILATION (FMD)	G-8
G.4 INTIMA-MEDIA THICKNESS (IMT)	G-9
APPENDIX H: GLOSSARY	H-1

CHAPTER 1: INTRODUCTION

1.1 AUDIENCE

This user manual is a reference for operators using a SonixTouch ultrasound system. It is designed for a reader familiar with ultrasound imaging techniques; it does not provide training in sonography or clinical practices. Before using the system the operator must have ultrasound training.

Note: This is not a service manual. The SonixTouch Service Manual is available for qualified service personnel.

1.1.1 Prescription Device



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

1.2 CONVENTIONS

The following conventions are used in this manual:

- cross-references for such things as tables, page numbers, sections and chapters are in blue, bold face, non-italic type (e.g., [Chapter 2: SONIX Introduction](#)) and are active hyperlinks in digital PDF (Portable Document Format) files
- words that are ***bold italic*** refer to items on the LCD display and touch screen
- icons are used to represent operator console buttons.
- "Press" and "Turn" indicate the actions required to activate the operator console buttons and dials
- "Tap" indicates the action required to activate a touch screen item
- "Tap and drag" indicates an optional touch screen action

Note: To drag an item (e.g., during touch screen editing, [3.5.2](#)), simply tap and drag a finger as required. Take care not to lift your finger off the touch screen before the drag action is complete.

- "Select" directs the operator to choose an item(s) from onscreen pages, menus, dialogs, etc., using the console trackball and onscreen cursor or tapping the touch screen to make the selection
- a **Warning** describes precautions necessary to prevent injury or loss of life
- a **Caution** describes precautions necessary to protect the Sonix system and its associated products
- a **Note** contains helpful information and hidden functionality
- items marked **IMPORTANT** contain vital information that must be understood and followed, but which will not endanger either people or equipment
- bulleted lists present information in list format, but do not imply a sequence
- when operating instructions must be performed in a specific order, the steps are numbered
- instructions separated by ">" indicate that multiple items must be selected (e.g., "Select **Administrator** > **Status Bar**" indicates that the user must first select the "**Administrator**" option, then when the next dialog is presented, select the "**Status Bar**" option).

1.3 UPDATES

Updated user manuals will be available for all future Sonix ultrasound system updates.

1.4 VOLTAGE DISCLAIMER

The system voltage setting is configured in the factory.

It is the user's responsibility to ensure the system is used only under the electrical conditions dictated by Ultrasonix Medical Corp. Failure to comply with these conditions may result in damage to the system which is not covered by the Ultrasonix warranty.



Caution: For users running the 100V–120V system, always ensure the utility supply voltage is 100V–120V @ 50/60 Hz.

For users running the 200V–240V system, always ensure the utility supply voltage is 200V–240V @ 50/60 Hz.

1.5 CONNECTIVITY DISCLAIMER



Caution: System networking options are intended for use inside your organization's firewall. Organizations that elect to configure/use the networking functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision.

1.6 PRIVACY DISCLAIMER

To protect patient data, Ultrasonix strongly recommends regular patient/image file back-up and purging of older patient files stored on the system. Refer to [Chapter 9: Image Storage, Review, Transfer and Print](#) for details on transferring patient data.

IMPORTANT: The contents of the system hard drive may include Personal Health Information that must be protected as dictated by local or state laws (for example, Federal Privacy Act or the Health Insurance Portability & Accountability Act (HIPAA)). In order to ensure regulatory compliance, Ultrasonix will not remove the system hard drive — and the patient data it contains — from the customer site.

In the event the hard drive must be removed from the system, it will be returned to the customer. Final disposition of the hard drive and its data will remain the customer's responsibility.

1.7 GENERAL DISCLAIMER

Certain licensed features, hardware options and transducers may not be certified in all markets. Consult your local Ultrasonix Authorized Distributor or Sales Representative to determine availability in your area.

1.8 LICENSE AGREEMENT

Portions of the Sonix computer programs have been patented by Ultrasonix Medical Corporation (Ultrasonix) or are patent pending, and are licensed under the following software license agreement:

Ultrasonix, or its suppliers, retain(s) ownership of and title to any computer program supplied with the Equipment and to the trade secrets embodied in such computer programs. Subject to the Buyer's acceptance and fulfillment of the obligations in this paragraph, Ultrasonix grants the Buyer a personal, non-transferable, perpetual, non-exclusive license to use any computer program supplied with the Equipment that is necessary to operate the Equipment solely on the medium in which such program is delivered for the purpose of operating the Equipment in accordance with the instructions set forth in the operator's manuals supplied with the Equipment and for no other purpose whatsoever. Buyer may not reverse – assemble, reverse – compile or otherwise reverse – engineer such computer programs nor may Buyer make a copy of such program or apply any techniques to derive the trade secrets embodied therein. In the event of a failure by Buyer to comply with the terms of this license, the license granted by this paragraph shall terminate. Further, because unauthorized use of such computer programs will leave Ultrasonix without an adequate remedy at law, Buyer agrees that injunctive or other equitable relief will be appropriate to restrain such use, threatened or actual. Buyer further agrees that (i) any of the Ultrasonix suppliers of software is a direct and intended beneficiary of this end-user sublicense and may enforce it directly against Buyer with respect to software supplied by such supplier, and (ii) NO SUPPLIER OF ULTRASONIX SHALL BE LIABLE TO BUYER FOR ANY GENERAL, SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL INCIDENTAL OR OTHER DAMAGES ARISING OUT OF THE SUBLICENSE OF THE COMPUTER PROGRAMS SUPPLIED WITH THE EQUIPMENT.

1.9 WARRANTY REGISTRATION

To protect your investment, ensure the warranty registration card included with your system has been completed and returned to Ultrasonix (using the envelope provided) or register online at www.ultrasonix.com/register.

Note: Warranty registration will ensure uninterrupted Technical Support and system updates.

1.10 TRADEMARKS AND PATENTS

The following are trademarks of Ultrasonix Medical Corporation: SonixTouch™, SonixTablet™, SonixGPS™, SonixShine™, SonixCam™, SonixDVR™, SonixLive™ and SonixHub™.

Ultrasonix Sonix systems are protected under US Patents 6,216,029 - 6,325,759 - 6,558,326 - 6,911,008 - 7,274,325 - 8,088,070 - D654,178.

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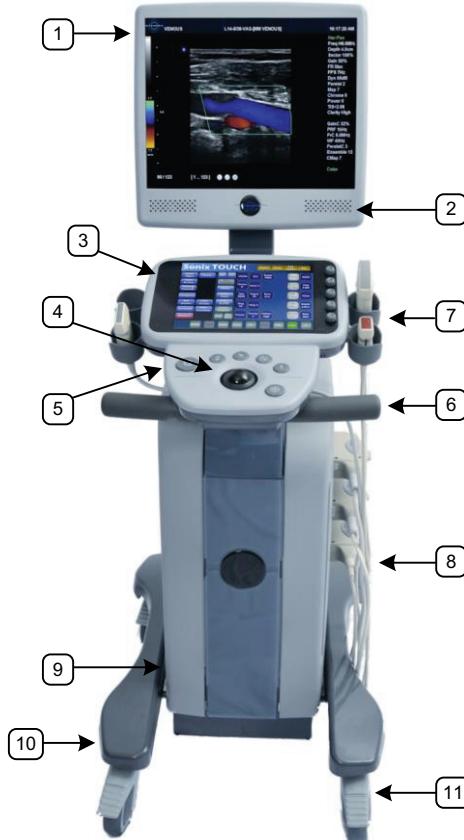
CHAPTER 2: Sonix INTRODUCTION

Congratulations on your purchase of the Ultrasonix Sonix Ultrasound system. The Sonix is a high quality, easy to use diagnostic ultrasound system that is stable, highly mobile and designed to be convenient and comfortable to operate.

The various system components, including the LCD display, operator console with touch screen, cart, and transducers, may be configured to better support system use.

2.1 SYSTEM COMPONENTS

Figure 2-1: SonixTouch System Components



Note: The front wheels on the system lock completely (i.e., when locked, no movement is allowed in any direction), while the rear wheels lock directionally.

Table 2-1: System Components

-
- 1** LCD Display
 - 2** Speakers
 - 3** Touch Screen
 - 4** Operator Console
 - 5** Side Connectivity Panel (USB ports)
 - 6** Front Pull Handles
 - 7** Transducer Holders
 - 8** System Case with Three Transducer Ports
 - 9** Optional Uninterruptible Power Supply (UPS) with External Breaker Access
 - 10** Foot Rest
 - 11** Wheel Base with Four Locking Wheels
-

2.2 OPERATOR CONSOLE

The operator console comprises a panel with patient management, system setup and ultrasound imaging controls: trackball, buttons, dials, and touch screen. These operator controls enable Sonix functions (e.g., changing imaging modes and adjusting parameters such as **Time Gain Compensation (TGC)**, **Depth**, etc.).

Figure 2-2: Operator Console



-
- **Note:** Many features are licensed options and may not be active on all systems. Refer to [8.2.23 Licensing](#) to determine what features are active and [Appendix B: System Specifications](#) for details on available options.
-

Table 2-2: Operator Console Controls

Item	Icon	System Control	Functionality
1		Power Button	<p>System ON/OFF button, located on the console support beneath the touch screen. Refer to 8.2.11 System Settings to configure Shutdown Options.</p> <p>Refer to 2.5.2 Powering the System ON/OFF for the exact location of the power button.</p>
2		Trackball	Used to position mouse cursor, onscreen arrow graphic, flashing text cursor, arrow cursor, calipers, etc.
3	Q	QSONIX Button	<p>Provides access to:</p> <ul style="list-style-type: none"> Quick exam start-up Remote Support Protocol selection.
4	2	2 Button (Custom Key 2)	<p>One of three programmable buttons (8.2.14) used to:</p> <ul style="list-style-type: none"> auto-store/print images or Cine loops to a configured printer, archive, etc. access certain functions such as Exam Review and Measurement Packages.
5		SELECT Button	Provides a wide variety of functions depending on the imaging state (e.g., selects/sets measurements, selects onscreen menu items, etc.) as well as "Left Click" mouse button functionality.
6		UPDATE Button	Provides a wide variety of functions depending on the imaging state (e.g., toggles between image fields on Dual/Quad image, toggles between 2D and Doppler Trace image fields, toggles the active caliper, etc) as well as "Right Click" mouse button functionality.
7	1	1 Button (Custom Key 1)	<p>One of three programmable buttons (8.2.14) used to:</p> <ul style="list-style-type: none"> auto-store/print images or Cine loops to a configured printer, archive, etc. access certain functions such as Exam Review and Measurement Packages.
8		FREEZE Button	<p>Pause/resume a live image.</p> <p>Additionally, using Custom Key settings (8.2.14), the console  button can be configured to move directly to Measure.</p>
9		Touch Screen Dials	Five dials that control touch screen options which change depending on the imaging mode/state. Once the touch screen option is tapped, turn the associated dial to make the relevant adjustments.
10		Touch Screen	Displays selectable options. Touch screen buttons may change depending on the chosen imaging mode/state or action.

2.3 CONSOLE TILT ANGLE ADJUSTMENT

The tilt angle on the console is easily adjusted up or down.

To Adjust the Console Tilt Angle:

1. Unlock the console tilt angle adjustment lever by pushing it toward the rear of the system (following the direction of the arrow in the image below).



2. Lift or lower the console to the desired position and hold it in position.
3. Lock the console tilt angle adjustment lever by pulling it back toward the front of the system to its original position.

Note: For details on the exact range available refer to *Tilt Angle, Adjustable Console under Physical Characteristics* in Appendix B.

2.4 SYSTEM CASE

The system case contains the system PC and the (optional) UPS. Three transducer ports are located on the right side.

Refer to the relevant Service Manual for complete details about the contents of the system case.



Warnings:

Do not simultaneously touch the patient and the:

- transducer ports
- Back Connectivity Panel connectors.

Do not allow the patient to come in contact with any part of the SonixTouch system case or touch screen.

2.5 POWER PANEL

The Power Panel is located on the back lower portion of the system case. It includes the power cord, main power switch and fuse.

Figure 2-3: System Power Panel

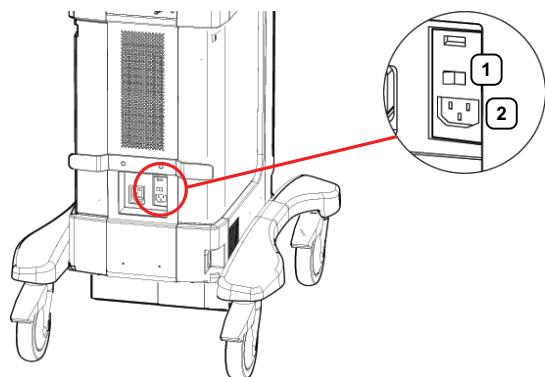


Table 2-3: System Power Panel

1 Main Power Switch

2 Power Cord (to Wall Outlet) Receptacle



Caution: DO NOT turn off the main power switch when the system is turned on. Turn off the system using the console **POWER** button, then turn off the main power switch. Failure to follow the correct procedure may result in loss of patient data and/or hard drive failure.

Note: If the system does not power up, ensure the power cord is plugged in and the main power switch on the system case power panel is turned to the ON position. The Main Power switch is not required for regular power shut downs and should remain in the ON position.

2.5.1 Powering the System

Before turning the system on, connect the power cord.

To Connect the Power Cord:

1. Connect the power cord to a wall outlet (hospital-grade electrical outlet recommended).

2.5.2 Powering the System ON/OFF

After initial installation, it is important to correctly power the system ON/OFF. Failure to follow proper shutdown procedures may result in data corruptions and/or hard drive failure.

Properly powering OFF any system will protect the integrity of patient data. Properly powering OFF a system with a UPS will put it into Sleep Mode, enabling the system to be unplugged from the wall without depleting the battery while the system remains powered off.

Properly powering ON a system with a UPS will wake it from Sleep Mode and ensure the UPS is functioning correctly.



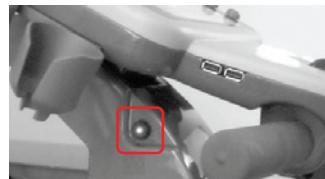
Caution: NEVER shutdown the system by simply unplugging it from the wall:

- even if the battery is fully depleted (applies only to systems with a UPS)
- regardless of whether the system was configured with or without a UPS.

Either of these actions may result in data corruptions and/or hard drive failure.

To Power the System ON:

1. Ensure the power cord is connected.
2. Press and hold the console **POWER** button for one second.



Note: For systems running with a UPS, powering ON correctly will wake the UPS from Sleep Mode and ensure it is functioning correctly.

To Power the System OFF:

1. Press the console **POWER** button.
2. If **Shutdown Options** have been configured to request confirmation, select **Yes** when presented with the message ***Do you really want to shutdown the system?***.



Caution: Failure to properly shut down any system may result in data corruptions and/or hard drive failure.

Notes:

If **Shutdown Options** have not been configured to request confirmation, the system will simply shut down.

During shutdown, a UPS-configured system will enter Sleep Mode to protect the charged battery.

2.6 BACK CONNECTIVITY PANEL

The Back Connectivity Panel is located on the back of the system case. Refer to [10.1](#) for connectivity details.

2.7 CONSOLE CONNECTIVITY

The system is equipped with two USB ports at the front of the console. Refer to [10.2 Console Connectivity](#) for details.

2.8 UPS

The system is delivered with an optional UPS running on a lithium ion battery. The UPS, located below the modulo, helps to ensure that no data is lost when the system is temporarily unplugged and moved around. Refer to section [10.5 UPS](#) for more details.

Refer to [10.5.1](#) for UPS circuit breaker shutdown procedures.



Warnings:

NEVER let liquid from any source enter the UPS. Failure to do this may result in accidental **shorts, shocks or electrocutions.**

DO NOT attempt to service this product yourself. Attempting to open the UPS may cause exposure to lethal voltages within the unit even when it is apparently not operating and the input wiring is disconnected from the electrical source. Should the UPS require maintenance or replacement, only qualified Ultrasonix Service Technicians may perform service as detailed in the Service Manual.

Use only the UPS battery recommended and supplied by Ultrasonix Medical Corporation.

For UPS and battery service issues, contact Ultrasonix Technical Support.

If the battery is removed from the system, it is the responsibility of the customer to dispose of it in accordance with all local regulations and laws.

2.8.1 UPS Use Model

The UPS is intended to facilitate system portability, i.e., a properly charged UPS can help protect against the loss of data while the machine is temporarily unplugged and moved to a new location. Unless the system was powered down before being unplugged, make sure that it is reconnected to a power outlet within a few minutes.

When the system is running on battery power it cannot be left unplugged for long periods. For details on battery usage limitations and recharge alerts, refer to [Table 10-5](#) and [Table 10-6](#), respectively.

Note: When left powered on and unplugged, the rechargeable UPS battery will maintain a charge for a limited time only. Leaving the machine plugged in while unattended will prevent automated shutdown and prolong battery life.

If the battery has been completely depleted, always fully recharge before attempting to run on battery power only.

While Ultrasonix recommends following this UPS Use Model, it is possible to power the system solely on UPS battery power for as long as 60–90 minutes. UPS battery run-time will vary depending on a variety of factors including battery age.

As an added precaution, always shut down the system properly ([2.5.2 Powering the System ON/OFF](#)). If, at this point, the system is left unplugged for a prolonged period, it will automatically protect battery integrity using sleep/standby mode. Refer to [10.5.3](#) to restart the system from this state.

2.9 ECG CONNECTORS

On systems ordered with the optional **ECG** package, the **ECG** cable connector is positioned on the right side of the system (directly opposite the power switch). Refer to [10.6](#) for details on connecting the **ECG** cables to the system and [A.4](#) for safety details.

Note: Refer to [Accessories—Third Party](#) in Appendix B for the recommended **ECG** electrode.

2.10 SonixGPS

When ordered with the **SonixGPS (Guidance Positioning System)** license, the system is delivered with the **SonixGPS** hardware attached to the system case.



Warning: This user manual does not include a comprehensive discussion of the SonixGPS option. For complete details on using SonixGPS, read and follow all instructions and warnings in the most recent SonixGPS User Manual.

2.11 BARCODE READER

An optional pre-configured, barcode reader is available. This allows the operator to scan certain patient data for quick and reliable data entry. The results of the scan are entered directly into the fields on the **QSonix Input Patient Information dialog** and the **Exam Management** page—providing the cursor is present in the relevant field when the barcode is scanned.

Refer to [10.8 Barcode Reader](#) for details on connecting the barcode reader to the various hardware platforms.



Warnings:

USE OF CONTROLS or adjustments or performance of procedures other than those specified in the manufacturer's User's Guide (delivered with system) may result in hazardous laser light exposure.

NEVER attempt to look at the laser beam, even if the barcode reader appears to be non-functional.

NEVER point the laser beam in anyone's eyes.

USE OF OPTICAL instruments with the laser equipment will increase eye hazard.

UNDER NO CIRCUMSTANCES should users or technicians attempt to open or service the laser scanner. Attempting to open the barcode reader may cause exposure to hazardous laser light. Should the barcode reader require maintenance or replacement, contact Ultrasonix Technical Support.

2.12 WIRELESS ADAPTER

In addition to the standard, hard-wired network connection, the system supports an optional, factory-installed wireless adapter ([8.2.12.3 Wireless Configuration](#)).



Caution: System networking options are intended for use inside your organization's firewall. Organizations that elect to configure/use the networking functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision.



Caution: For details on FCC regulations as they apply to the wireless adapter, please refer to the manufacturer's User Guide included with the system.

2.13 FOOTSWITCH (DUAL OR TRIPLE)

The system supports an optional, (dual or triple) USB **Footswitch** ([8.2.15.4 Footswitch](#)).

Refer to [10.10 Connecting the USB Footswitch \(Dual or Triple\)](#) for details on connecting the **Footswitch** to the various hardware platforms.



Warning: Footswitch is rated IPX1 only. Do not expose to liquids.

CHAPTER 3: GETTING STARTED

This chapter provides a quick, step-by-step guide through the basic operation of the Sonix Ultrasound System as well as details on general touch screen layout.

3.1 TURNING ON SYSTEM

To Turn on the System:

1. Ensure the power cord is connected ([2.5.1](#)).
2. Press and hold the console **POWER** button for one second. Refer to [2.5.2 Powering the System ON/OFF](#) to view the button's exact location.



Caution: *DO NOT use main power switch for regular power shut downs. Refer to [2.5.2](#) for instructions on correctly powering the system OFF. Failure to follow the correct procedure may result in loss of patient data and/or hard drive failure.*

Note: *If the system does not power up, ensure the Main Power switch on the back of the system case is turned to the ON position ("—"). Refer to [Figure 2-3](#) for main power switch location.*

3.2 CONNECTING TRANSDUCERS

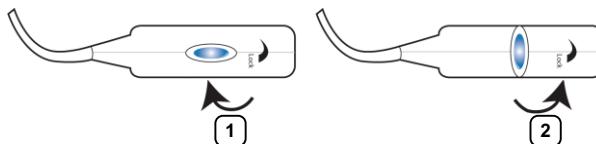
The connection ports for the Ultrasonix transducers are located on the side of the system case ([Figure 2-1](#)).

Note: To ensure proper function, insert:

- the SA4-2/24 transducer into the second or third transducer connection port
 - 4D transducers into the upper-most transducer connection port.
- Only one 4D transducer can be connected at a time .*

To Connect/Disconnect a Transducer:

1. Turn the latch counter-clockwise to the Open or Unlock position (2).



2. Insert the transducer connector into the connection port with the transducer identification label (e.g., L14-5/38) facing up.
3. Ensure the connector is properly seated and turn the latch clockwise to lock it in place (1).
4. Turn the latch counter-clockwise to unlock (open) and remove the transducer.

Note: When a new exam is initiated, the transducer used in the most recent exam will still be selected if it is still connected. If it's no longer connected, the system will default to the first available transducer. This default transducer selection is not affected even if the system is turned off between exams.

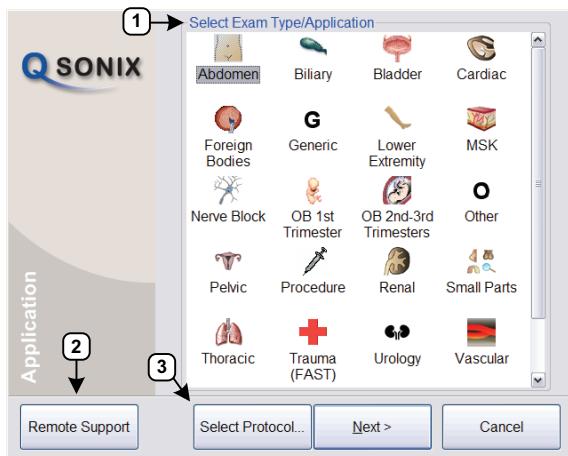
3.3 QSonix FEATURE

The **Q** button provides the following basic functions:

- Quick Exam Start-up (1)
- **Remote Support** Access (2)
- **Protocol** Selection (3) (refer to [10.14](#))

The **Q** button can also be configured to **Reload Presets** during an exam. Refer to [8.2.14 Custom Keys](#) for details.

Figure 3-1: QSonix



3.3.1 Quick Exam Start-Up

The Quick Exam Start-up feature provides a series of dialogs which guide the user through the steps required to begin an exam. Once the **Q** button is selected, users have the choice to navigate through the Quick Exam Start-up using the touch screen or with the trackball and ↵ button on the LCD display:

1. Select the **Exam Type/Application**.
2. Select the transducer.
3. Select the **Imaging Preset**.
4. Enter basic **Patient Information**.
5. Begin the exam.

To Begin the Quick Exam Start-up:

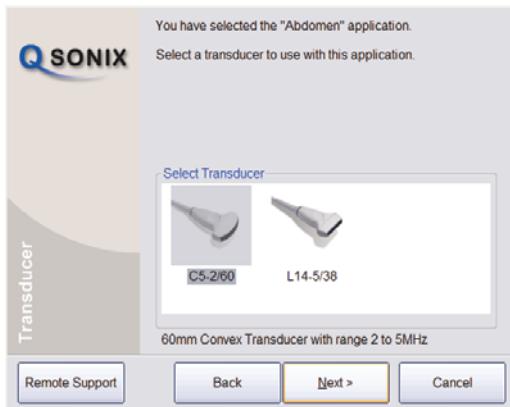
Note: If Force Operator Login (Table 8-38) has been selected, follow the instructions in To Begin the Quick Exam Start-up (with Force Operator Login):.

1. Press the console **Q** button.
2. Select the desired **Exam Type/Application** and the system will automatically move to the next page.



Note: QSonix selections can also be made on the LCD display using the trackball and  button.

3. Select the desired transducer and the system will automatically move to the next page.

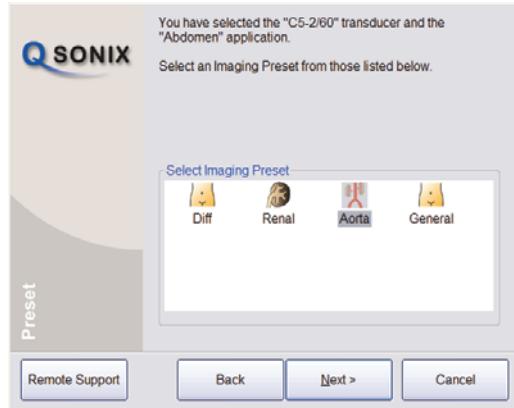


Note: Only transducers currently connected to the system and applicable to the previously selected **Exam Type/Application** will be available. If the selected **Application** is not compatible with the currently connected transducers, the system will prompt for a different transducer.

Users can also select **Back** and select a different **Application**.

If a 4D transducer is selected, the system will skip directly to **step 4**.

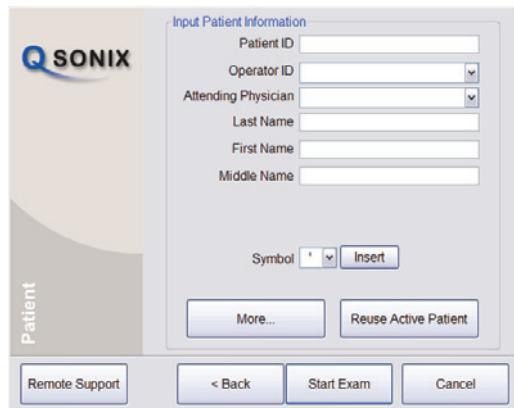
4. Select the desired ***Imaging Preset*** and the system will automatically move to the next page.



Note: User-defined Presets will be included here.

If a Preset has been hidden, it will not be available for selection from QSonix. Refer to [8.2.1.1 Show/Hide Imaging Presets](#) for details.

5. Use the touch screen keyboard to enter data in the ***Input Patient Information*** fields. Tap the keyboard ***Tab*** key to move through the data fields.



Notes:

If additional patient information is required select **More...** to open the full **Exam Management** data entry page. This will also enable the **Operator** to find and load (if they exist on the system) previous exams for the patient.

Refer to [Chapter 4: Patient Management](#) for complete details on **Exam Management** data entry and manipulation.

Insert (Symbol) enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).

Reuse Active Patient allows **Operators** to change **Applications** while continuing to scan the current patient (i.e., the data acquired after switching to a different **Application** continues to be saved to the same patient but under a new exam).

If an exam is begun without selecting a Patient, it can be assigned to a Patient before the exam ends. Refer to [4.4 Beginning an Exam with no Patient Selected](#) for details.

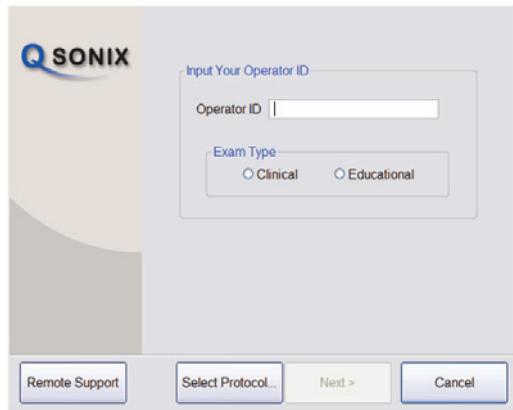
6. Select **Start Exam** to begin imaging.

3.3.1.1 Quick Exam Start-Up (with Force Operator Login)

To Begin the Quick Exam Start-up (with Force Operator Login):

Note: If Force Operator Login (Table 8-38) was not selected, follow the instructions in [To Begin the Quick Exam Start-up](#).

1. Press the console **Q** button.
2. Enter an **Operator ID**.

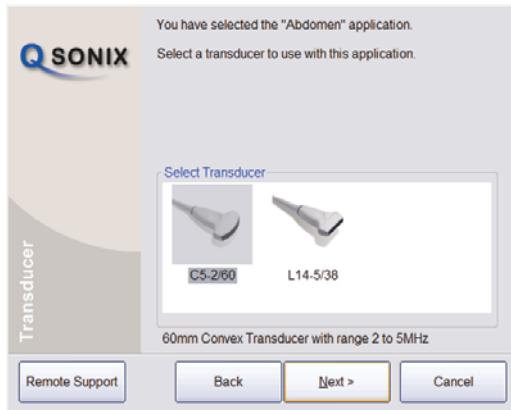


Note: The **Operator ID** must be an exact match to an **Operator ID** entered in [Operators...](#) under [EMR System Settings...](#) (Table 8-38).

3. Select an **Exam Type: Clinical** or **Educational**.
4. Tap the desired **Exam Type/Application** and the system will automatically move to the next page.



5. Tap the desired transducer and the system will automatically move to the next page.

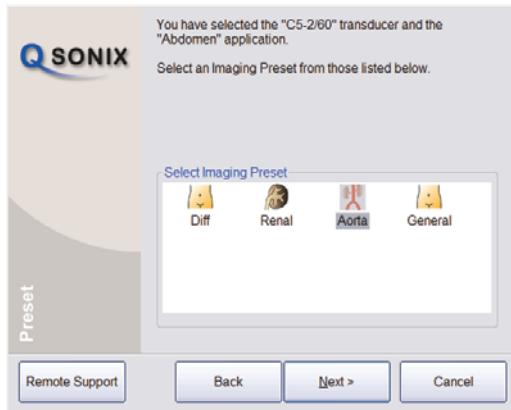


Note: Only transducers currently connected to the system *and* applicable to the previously-selected **Exam Type/Application** will be available. If the selected **Application** is not compatible with the currently connected transducers, the system will prompt for a different transducer.

Users can also tap **Back** and select a different **Application**.

If a 4D transducer is selected, the system will skip directly to step 5, below.

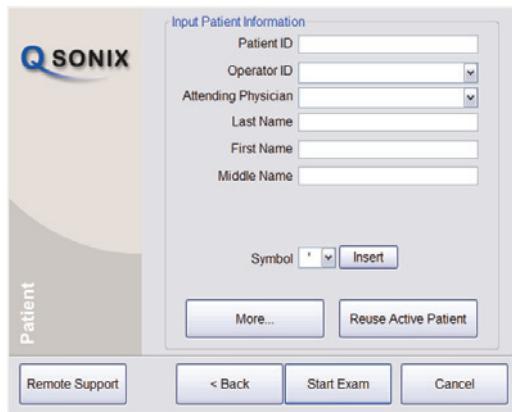
6. Tap the desired **Imaging Preset** and the system will automatically move to the next page.



Note: User-defined **Presets** will be included here.

If a **Preset** has been hidden, it will not be available for selection from **QSonix**. Refer to [8.2.1.1 Show/Hide Imaging Presets](#) for details.

7. Use the touch screen keyboard to enter data in the ***Input Patient Information*** fields. Tap the keyboard the ***Tab*** key to move through the data fields.



Notes:

The **Operator ID** field is auto-filled with the entry made in **step 2**. It cannot be edited. To enter a new **Operator ID**, exit then reenter **QSonix** and begin the quick exam start-up procedure again.

If additional patient information is required select **More...** to open the full **Exam Management** data entry page. This will also enable the **Operator** to find and load (if they exist on the system) previous exams for the patient.

Refer to **Chapter 4: Patient Management** for complete details on **Exam Management** data entry and manipulation.

Insert (Symbol) enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).

Reuse Active Patient allows **Operators** to change **Applications** while continuing to scan the current patient (i.e., the data acquired after switching to a different **Application** continues to be saved to the same patient but under a new exam).

If an exam is begun without selecting a Patient, it can be assigned to a Patient before the exam ends. Refer to **4.4 Beginning an Exam with no Patient Selected** for details.

8. Tap **Start Exam** to begin imaging.

3.3.2 Documentation Access

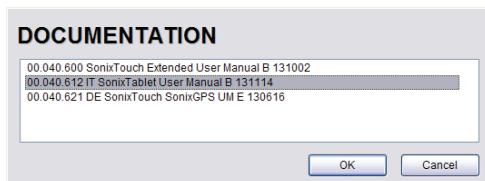
Operators can access PDF documentation via the **Menu** button. This includes a cross-referenced version of the **User Manual**.

Note: It is not possible to view a PDF when a Sonix dialog (e.g., **Exam Management**) or Windows dialog (e.g., **Date and Time Properties**) is open.

To Access a PDF:

Note: PDFs must be loaded before they can be accessed. Refer to [8.2.21 Documentation Settings](#) for details on adding/deleting documents.

1. Ensure the main touch screen is visible and that all dialogs are closed.
2. Tap the touch screen **Menu** button.
3. Select **Documentation**.
4. From the list presented, select the relevant PDF.

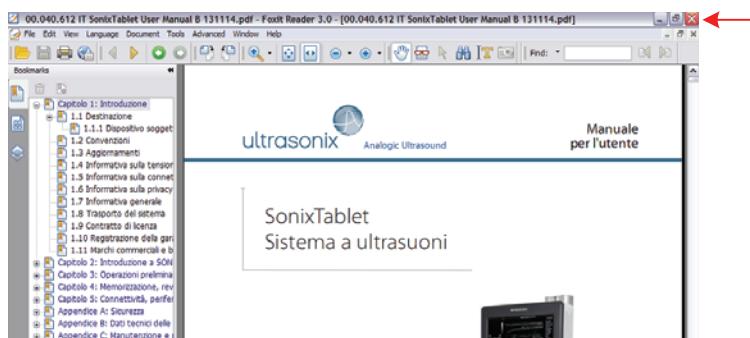


Note: If only one PDF document has been added, it will be opened automatically.

5. Select **OK** and the document will open in a PDF viewer.

To Close the PDF:

1. Select the "X" in the upper right corner of the PDF viewer window.



3.4 REMOTE SUPPORT

Remote Support allows Ultrasonix Technical Support to view and control a system for diagnostic purposes.

In order to use **Remote Support**, the **Network** must be configured ([8.2.12 Network](#)) and a **PIN (Personal Identification Number)** must be obtained from Ultrasonix Technical Support.

Note: The **PIN** is valid for 20 minutes only, so be sure to use it right away.

To Access Remote Support:

Note: Remote Support can also be accessed from the **Menu** button. Refer to [8.1.2](#) for details.

1. Tap the touch screen **Menu** button.
2. Select the **Remote Support...** button.



Note: If **Remote Support** does not appear to be available, contact your IT Department and have them check to make sure the network connection is active and the **Remote Support** option has been configured for use.

3. Enter the **PIN (Personal Identification Number)** provided by Ultrasonix Technical Support.
-
- Note:** The **PIN** is valid for 20 minutes only, so be sure to use it right away.
-
4. When prompted, select **Download > Run > Run** in order to install the required programs.
 5. The system can now be remotely controlled.

3.5 TOUCH SCREEN LAYOUT

For demonstration purposes, this manual utilizes screen shots from the **General** software **Protocol** as **General** has the most comprehensive set of options available. Refer to [10.14](#) for more details on other software options.

Although **B-Mode** will always be the first touch screen presented after initialization, the touch screens for all modes are presented in the same format.

Note: The options available in sections 2 and 3 ([Figure 3-2](#)) will vary from mode to mode.

Once an image is frozen, some of the mode-specific touch screen options may be altered, for example **Cine** options will be available.

3.5.1 Main Touch Screen

Figure 3-2: Layout of Main Touch Screen (B-Mode Example)



Note: Availability of the various mode buttons (section 1, in [Figure 3-2](#)) depends on a combination of licensed options and currently connected transducers. For demonstration purposes, all mode buttons are lit (and therefore available) in this image.

Table 3-1: Main Touch Screen Buttons

	<p>Allow the Operator to change between the various Imaging Modes. The active mode is highlighted in green.</p> <p>Mode Selection Buttons are toggle buttons. For example, when Color and PW are both selected, tap Color to deselect it and remain in PW only. When a single mode is selected (e.g., M), tapping that button again will select the default system mode: B.</p> <p>Additionally, Operators can always tap B to exit the current mode and return to B-Mode.</p> <p>Note: An <i>Imaging Mode</i> must be licensed and have a relevant transducer connected to the system in order to be accessible. Modes that are not accessible (for either reason) will have the selection button grayed out).</p>
1 Mode Selection Buttons	<p>Enable the application of certain actions to an image (e.g., Invert).</p> <p>Mode Action Buttons are toggle buttons. For example, tap Biopsy to view the Biopsy Guides on the LCD display. Tap it again to remove them.</p> <p>When active, a Mode Action Button will be a graduated green color. The exception to this is Layout—which always remains blue as it is tapped to toggle through the various Layout options.</p> <p>Note: The actions available are mode and/or transducer-specific.</p>
2 Mode Action Buttons	<p>Enable adjustments to be made to the available imaging parameters for the selected mode.</p> <p>Note: Most parameters are mode-specific, although some (such as Steer) are transducer-dependant.</p>
3 Imaging Parameter Buttons	<p>Turn/press the relevant touch screen dial to adjust an active imaging parameter.</p> <p>If an imaging parameter button is a pale gray/white color, that particular parameter is currently active (e.g., Zoom, Figure 3-2). Turn/press the dial directly to the right of the active button to make adjustments.</p> <p>Note: To adjust an imaging parameter that is not currently active, tap the desired imaging parameter button then turn/press the dial directly to its right (e.g., Clarity, Figure 3-2).</p>

	System buttons control a variety of system options:	
	Note: These options are not mode-specific.	
4	Report/Worksheet	Available only if a patient has been selected. Tap to open the Report/Worksheet for the current Patient . Note: Worksheets (6.12) are only available for the EMED , Anesthesia and Endocrinology Protocols . They are also Application-specific. Report/Worksheet is a toggle button.
	Menu	Controls User and Administrative level system functionality (Chapter 8: System Setup).
	End Exam	Exits the current exam. Note: This button is only available if an Exam is currently active.
	TGC	Accesses TGC settings. To configure, simply tap the TGC button to access the TGC configuration box. Drag a finger along the TGC line in a manner that represents where the line should be (refer to 3.5.5 for more details). Alternatively, tap one of the pre-configured TGC settings and use it as is, or as a base for editing a personalized TGC setting. Note: TGC is a toggle button. Additionally, if it not used within three seconds, it will automatically toggle off. Ultrasonix recommends a center position (default) for TGC settings.
	Patient/exam buttons control a variety of Patient/Exam options:	
	Note: These options are not mode-specific.	
5	Exam Mgmt	Opens the Exam Management page. Note: Refer to Chapter 4 for more details on the Exam Management page.
	Presets...	Allows the Operator to select an Application , Transducer and Imaging Preset all from the same screen. Note: Always select Imaging Preset last as this option will move the system to imaging.
	Exam Review	Opens the current patient's images, as well as all other archived exams/images for that patient. Note: This button is only available if an Exam is currently active. This option is also accessible via the Review button on the Exam Management page (Refer to Chapter 9 for more details.)

6	Training Tutorials	Select to access Training Tutorials relevant to the currently selected Application .
7	Image Notation Buttons <i>Pictograms</i> <i>Text Arrows</i> <i>Clear Arrows</i> <i>Annotations</i> <i>Clear Annotations</i>	Enable the addition of Arrows , Pictograms and/or Annotations/Text to an image. Note: These options are not mode-specific.
8	Measure Button	Tap Measure to access the Measurement Packages touch screen for the selected mode. If there is no Application -specific Measurement Package for the current Application–Transducer–Preset selection, generic measurements are provided.

3.5.2 Touch Screen Button Editing

If desired, content and positioning of touch screen buttons can be edited to suit the requirements of each institution. Imaging parameter buttons can also be resized.

Figure 3-3: Accessing Touch Screen Editing

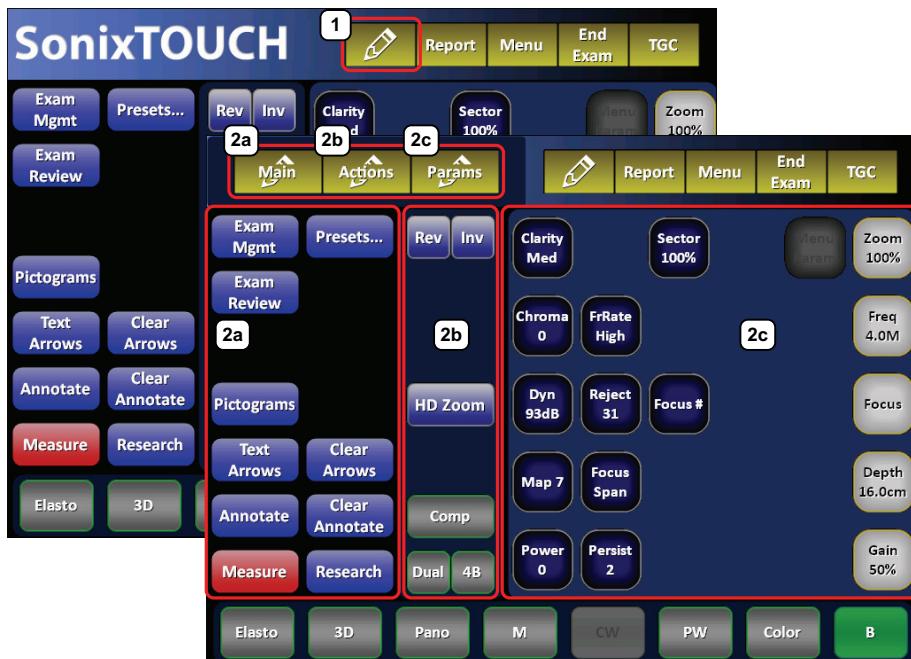


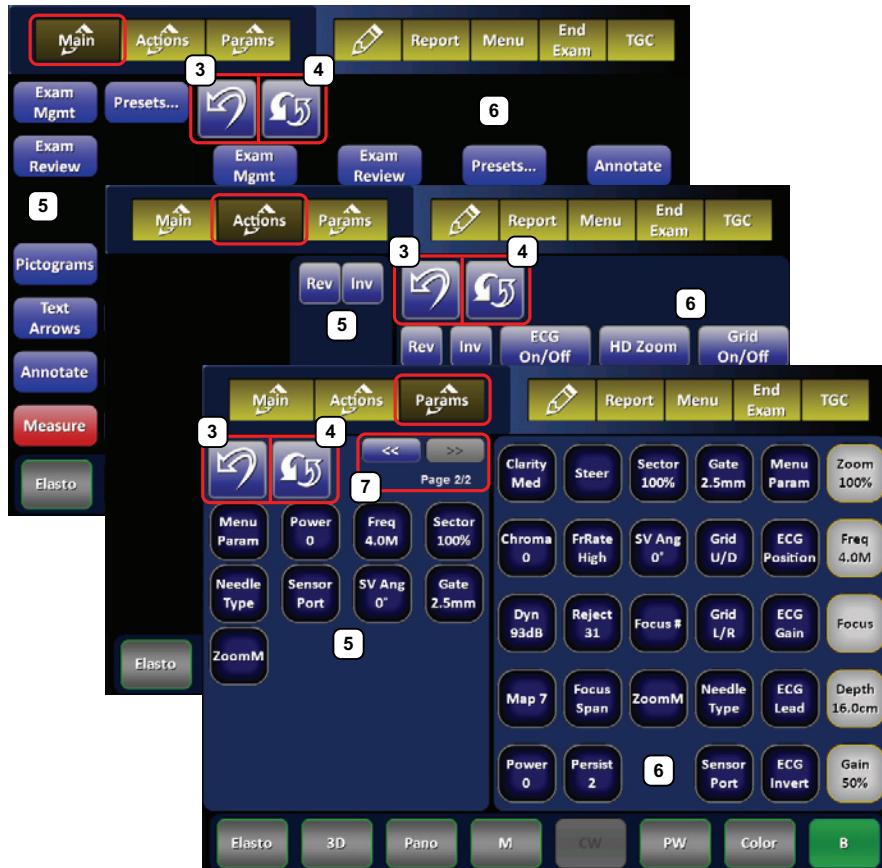
Table 3-2: Touch Screen Editing Buttons (1)

	Button	System Control	Functionality
1		EDIT Button	<p>Tap to access touch screen button editing.</p> <p>Note: Before tapping , be sure to select the relevant Mode as well as the desired Application–Transducer–Preset combination.</p>
2a 2b 2c	Main Actions Params	Edit Selection Buttons	<p>Tap Main, Actions or Params to edit the corresponding buttons on the touch screen.</p> <p>Note: These three buttons correspond to the following items from Figure 3-2/Table 3-1:</p> <ul style="list-style-type: none"> • Main: items 5, 6, 7, and 8 • Actions: item 2 • Params: item 3.

Note: The  button is only available if **Enable Customization** is selected (Table 8-17).

Once customization is complete, Ultrasonix recommends removing the  button from the main touch screen (deselect **Enable Customization** in 8.2.11 System Settings).

Figure 3-4: Touch Screen Editing Buttons (2)



3.5.2.1 Editing Touch Screen Button Order

Table 3-3: Touch Screen Editing Buttons (2)

	Icon	System Control	Functionality
3		UNDO Button	Tap to undo <u>all</u> changes made in the current editing session.
4		RESTORE FACTORY Button	Tap to restore buttons to factory defaults.
5		Touch Screen Buttons	Displays currently visible touch screen buttons.
6		Touch Screen Options	Displays all available touch screen button options.
7		Page Selector Buttons	Tap to move through the available pages of touch screen options.

Figure 3-5: Tap and Drag Button Positioning



To Edit Touch Screen Button Order:

1. Ensure the  button is available on the main touch screen (select **Enable Customization** in [8.2.11 System Settings](#)).
2. Tap the touch screen  button.
3. Tap the desired option: **Main, Actions, Params**.
4. Tap and drag any option to the desired position on the relevant section of the touch screen:
 - add to available buttons (tap and drag the button from the main list to the relevant section/position on the touch screen (e.g., [Figure 3-5](#))
 - remove buttons (tap and drag the button from its current placement back to the available options)
 - reorder available buttons (tap and drag the touch screen button to a new touch screen position)

Note: When applicable, use the Page Selector buttons to access additional options.

5. Tap  to undo all changes made in the current editing session.
6. Tap  to restore buttons to factory defaults.

Note: Once customization is complete, Ultrasonix recommends removing the  button from the main touch screen (deselect **Enable Customization** in [8.2.11 System Settings](#)).

3.5.2.2 Editing Imaging Parameter Button Size

Figure 3-6: Editing Imaging Parameter Button Size



To Edit Imaging Parameter Touch Screen Button Size:

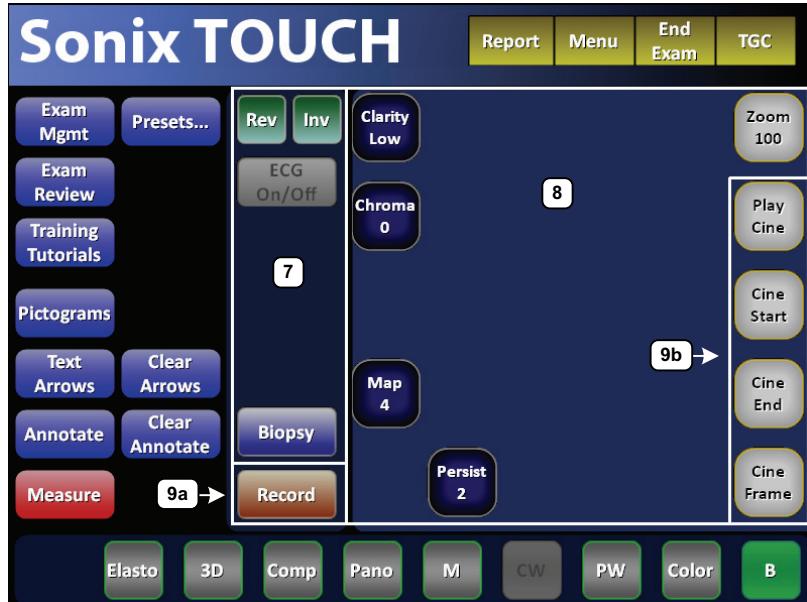
1. Ensure the  button is available on the main touch screen (select [Enable Customization](#) in [8.2.11 System Settings](#)).
2. Tap the touch screen  button.
3. Tap **Params**.
4. Edit the button order/content to ensure there is at least one blank space beside the button to be increased in size.
5. Tap the desired button and turn the associated dial to change the button size:
 - clockwise to increase
 - counter-clockwise to decrease
6. Tap  to undo *all* changes made in the current editing session.
7. Tap  to restore buttons to factory defaults.

Note: Once customization is complete, Ultrasonix recommends removing the  button from the main touch screen (deselect [Enable Customization](#) in [8.2.11 System Settings](#)).

3.5.3 Main Touch Screen – Frozen

Once an image has been acquired and frozen, the touch screen will be updated. While many buttons stay the same, some are removed and others are added so that only relevant buttons remain.

Figure 3-7: Layout of Main Touch Screen – Frozen (B-Mode Example)



Note: For details on the other touch screen buttons, refer to [Table 3-1](#).

Table 3-4: Main Touch Screen – Frozen (B-Mode)

1	Mode Selection Buttons	No change.
2	Mode Action Buttons	May change, depending on the imaging mode (e.g., HD Zoom is no longer available).
3	Imaging Parameter Buttons	May change, depending on the imaging mode (e.g., imaging parameters have been limited to five options, down from the original 16 (Figure 3-2)).
9a (Cine) Record Button		Available only when an image has been frozen. Note: Refer to 5.9 for details on Cine .

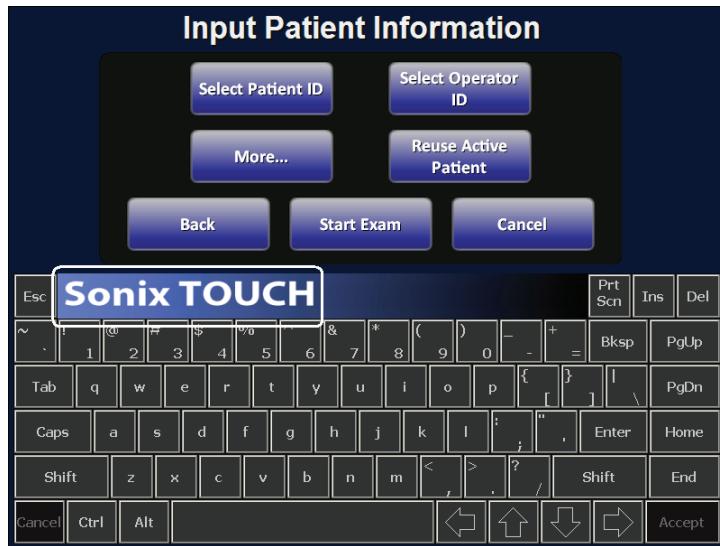
9b (Cine) Action Buttons	<p>Available only when an image has been frozen: Play Cine, Cine Start, Cine End and Cine Frame. These buttons can also be used in conjunction with the associated touch screen dials.</p> <p>Note: If a Cine Action Button is a pale gray/white color, (e.g., Cine Frame, Figure 3-7), that parameter is currently active. Turn the dial directly to the right of this parameter in order to make adjustments.</p> <p>To adjust a Cine Action Button that is not currently active, tap the button then <u>press</u> the dial directly to its right to toggle it and/or <u>turn</u> the dial to make the required adjustment.</p> <p>Play Cine, Cine Start and Cine End can be toggled (press dial) as well as turned.</p> <p>Refer to 5.9 for details on Cine.</p>
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3.5.4 Data Entry Touch Screens

There are two types of data entry touch screens. The most common has the SonixTouch logo across the top of the keyboard ([Figure 3-8](#)). This touch screen appears whenever data can be typed into fields visible on the LCD display (e.g., the **Input Patient Information** dialog ([step 5](#) of [Quick Exam Start-Up](#)) or [8.2.11 System Settings](#)).

Note: Fields that will accept data entry via the keyboard will also accept data scanned with the barcode reader. Simply ensure that the cursor is located in the required field then scan the relevant barcode.

Figure 3-8: Example Data Entry Touch Screen 1



The second type of data entry touch screen ([Figure 3-9](#)) has the standard SonixTouch logo and System buttons across the top with a data entry bar above the keyboard. This is found only on relevant pages of the **Worksheet** option (i.e., on **Worksheet** pages wherever data can be entered from the keyboard). During data entry, the text will be typed into the data entry bar and will only be transferred to the **Worksheet** when the keyboard **Accept** button is tapped.

Notes:

Tap **Enter** to force a line break and **Cancel** to exit the keyboard without accepting any of the newly typed text.

Tap **Accept** to transfer the data entry bar contents to the **Worksheet**.

Use the **Arrow** keys (bottom right) to move around in the text (whether or not the text has been accepted) adding new text where and as required. Tap **Bksp** as many times as necessary to delete new and/or previously accepted text.

Figure 3-9: Example Data Entry Touch Screen

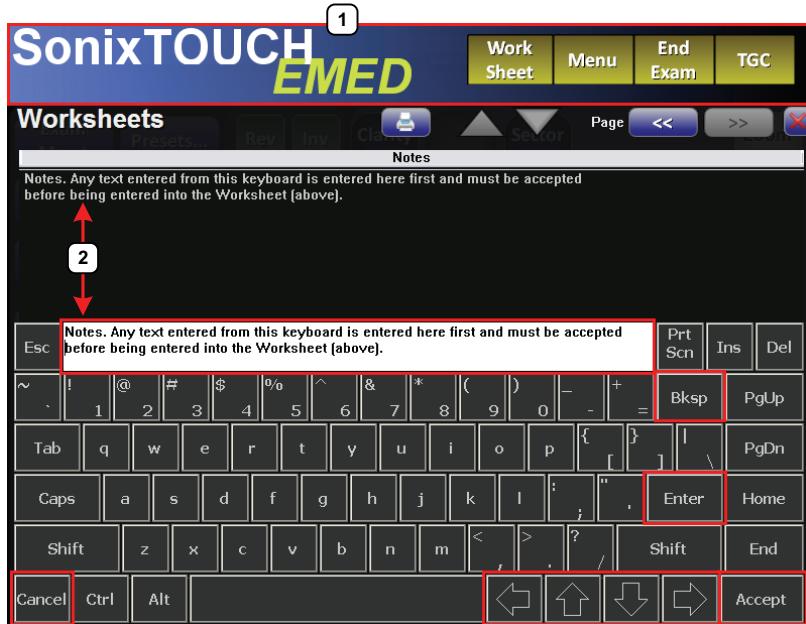


Table 3-5: Data Entry Touch Screen

1 Logo with system buttons

2 Data Entry bar

3.5.5 TGC Settings

The **TGC** configuration box is accessed by tapping the **TGC** button.

To edit, gently drag a finger along the **TGC** line in a manner that represents where the line should be. If necessary, tap a particular spot within the **TGC** configuration box to move that portion of the line.

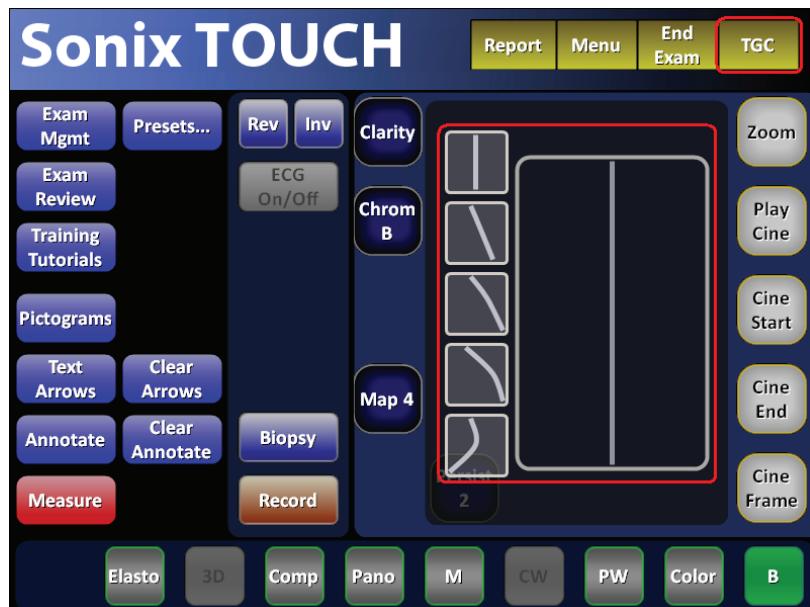
Alternatively, tap one of the pre-configured **TGC** settings and use it as is, or as a base for editing a personalized **TGC** setting.

Once accessed, the **TGC** configuration box must be edited right away, otherwise it will auto-close after five seconds.

Note: *TGC settings are saved to user-defined Presets (4.8).*

Ultrasonix recommends a center position (default) for TGC settings.

Figure 3-10: TGC Settings



CHAPTER 4: PATIENT MANAGEMENT

Exam Management functionality allows users to enter patient/exam-related data into the system. Entering patient-specific data automatically creates a unique file in which the patient/exam data is stored.

4.1 ENTERING PATIENT DATA

The **Exam Management** page is sectioned into **Patient Information**, **Application Information** and **Exam Information** data entry areas. If applicable, data can be accessed via the storage/database tabs at the bottom right side of the page (**Patient** and **Worklist**).

Figure 4-1: Exam Management Page

Table 4-1: Exam Management Page Options

	Saves the changes made to the Exam Management page and returns to imaging.
OK	Note: If a unique Patient ID is not entered manually the system will create one automatically (e.g., {C9B3F82B-BE52-4C79-8C45-28375D69F8C9}).
Cancel	Cancels any changes made to the Exam Management page and returns to live imaging. Cancel will not undo the End Exam function.
End Exam	Ends the current exam session, clears the Patient , Application and Exam data fields and prints/clears the printer queue (e.g., if printer image sheet is set for 2x2 and only two images were saved, ending the exam signals the system that no more images are coming to fill up the sheet and sends the image sheet to the printer). All measurements visible on the LCD display are cleared. Note: Before ending an exam, ensure the active image has been saved/printed using the console 1 or 2 button (8.2.14 Custom Keys) in order to be able to recall it via the Review button on the Exam Management page or the Exam Review button on the touch screen.
Clear	Clears the Patient and Exam data fields. Clear will also "end" the current exam if one is open, however, it does not delete the file.
Search Worklist	Enables a DICOM or ERM Worklist search.
Insert (Symbol)	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).
Import/Export	Use to Export data to an alternate storage device. Deleting the exported data from the local drive is optional. If the data was deleted during the Export phase, it can be reinstalled at a later date using the Import option.
Review	Opens the Exam Review page for the current patient or patient(s) selected from Patient file storage.
Delete	Removes the currently selected patient(s) from Patient file storage.
Update Worklist	Updates a DICOM or ERM Worklist search. Note: This button will only be available if the system is configured for DICOM (8.2.13.3 DICOM Worklist Settings). In order to actually update Worklist data, the system must also have an active connection to a DICOM server.
Tabs	<ul style="list-style-type: none"> • Patients: list of Patients/Exams currently available on the system • DICOM <ul style="list-style-type: none"> • Worklist: if enabled in DICOM • Store Queue: if enabled in DICOM • Print Queue: if enabled in DICOM • Hide: hides data to preserve privacy. <p>Note: Refer to 4.7 Storage/Database Tabs for more details.</p>

Figure 4-2: Exam Management Page Touch Screen

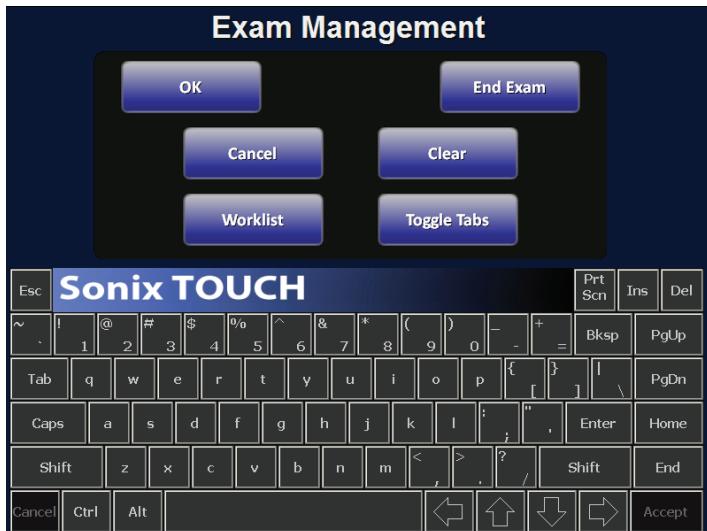


Table 4-2: Exam Management Touch Screen Controls (tap to activate)

OK	Saves the changes made to the Exam Management page and returns to imaging.
End Exam	Note: If a unique Patient ID is not entered manually the system will create one automatically (e.g., {C9B3F82B-BE52-4C79-8C45-28375D69F8C9}).
Cancel	Ends the current exam session, clears the Patient , Application and Exam data fields and prints/clears the printer queue (e.g., if printer image sheet is set for 2x2 and only two images were saved, ending the exam signals the system that no more images are coming to fill up the sheet and sends the image sheet to the printer). All measurements visible on the LCD display are cleared.
Clear	Note: Before ending an exam, ensure the active image has been saved/printed using the console 1 or 2 button (8.2.14 Custom Keys) in order to be able to recall it via the Review button on the Exam Management page or the Exam Review button on the touch screen.
Worklist	Cancels any changes made to the Exam Management page and returns to live imaging. Cancel will not undo the End Exam function.
Toggle Tabs	Clears the Patient and Exam data fields. Clear will also "end" the current exam if one is open, however, it does not delete the file.
OK	Enables a DICOM or ERM Worklist search.
Accept	Toggles between the available Storage/Database tabs. Refer to 4.7 for more details.

To Access the Exam Management Page:

1. Tap the touch screen **Exam Mgmt** button.

4.1.1 Patient Information

Figure 4-3: Data Fields for Patient Information



Patient Information					
Patient ID	<input type="text"/>	DOB (mm/dd/yyyy)	<input type="text"/>	Age	<input type="text"/> y <input type="text"/> m
Last Name	<input type="text"/>	Sex	<input type="button" value="Unknown"/>		
First Name	<input type="text"/>	Accession #	<input type="text"/>		
Middle Name	<input type="text"/>	Insurance #	<input type="text"/>		

Table 4-3: Patient Information Fields

Patient ID	Enter the Patient Identifier using letters and/or numbers. The system automatically creates a unique Patient ID if one is not entered manually (e.g., {C9B3F82B-BE52-4C79-8C45-28375D69F8C9}). Note: The Patient ID cannot be changed after the patient file has been created (i.e., an exam has begun).
Last Name First Name Middle Name	Enter the patient's Last, First and Middle Names —any of which can be modified at any point during the exam.
DOB (Date Of Birth)	Enter the patient's Date of Birth in the required format (e.g., mm/dd/yyyy) which is controlled through the Regional Settings options selected in 8.2.11 System Settings . Note: A DOB entry will auto-populate the Age field.
Age	Rather than entering a specific DOB , enter the patient's actual Age . Note: The Age field will auto-populate if a DOB is entered.
Sex	Select the patient's gender: Female , Male , Other or Unknown .
Accession #	Enter the exam's Accession Number . Note: This field auto-populates when the DICOM Worklist is used.
Insurance #	Enter the patient's Insurance Number .

Notes:

During imaging, if **Patient ID**, **Name**, **LMP**, etc. are not displayed at the top of the image screen, the system may be setup to hide this patient data. For details, refer to **General Options (Table 8-38)** in [8.2.17 Patient Settings](#).

All these fields can be completed using the barcode reader. Simply ensure the cursor is in the required field and scan the relevant barcode.

To Enter Patient Information Manually:

1. Tap the touch screen **Exam Mgmt** button.
2. Use the keyboard, trackball and console  button to enter the patient information as required.



Patient Information

Patient ID	DOB (mm/dd/yyyy)	mm/dd/yyyy	Age	<input type="text"/>	y	<input type="text"/>
Last Name	Sex	Unknown 				
First Name	Accession #					
Middle Name	Insurance #					

Note: The **Tab** key may be used to move through the various data fields and the **Enter** key to make drop-down menu selections.

To Enter Patient Information with the Barcode Reader:

1. Tap the touch screen **Exam Mgmt** button.
2. With the cursor in the **Patient ID** field, scan the relevant patient barcode with the barcode reader.
3. Continue entering the patient/exam data as required.

Note: Fields that will accept data entry via the keyboard will also accept data scanned with the barcode reader. Simply ensure that the cursor is located in the required field then scan the relevant barcode.

4.1.2 Application Information

Use this section of the **Exam Management** page to select the appropriate **Application** in order to enter **application-specific data** (e.g., for **Abdomen**, enter **Height** and **Weight**).

Note: The **Application** selected here is not tied to an **Imaging Preset** or **Exam Type/Application**.

Table 4-4: Application Information Fields

Abdomen

Biliary

Breast Imaging

Foreign Bodies

Generic

Lower Extremity

MSK

Nerve Block

Procedure

Renal

Small Parts

Thoracic

Trauma (FAST)

Urology

Vascular

Vascular Access

Application	Height	metric	m	cm
Abdomen	Weight	metric	kg	g
	BSA	0.00m ²		

- **Height** and **Weight** have both metric and imperial measurement options
- **BSA (Body Surface Area)** is calculated and displayed when **Height/Weight** is entered.

Application	Height	metric	m	cm	HR	bpm
Cardiac	Weight	metric	kg	g		
	BSA	0.00m ²				

- **Height** and **Weight** have both metric and imperial measurement options
- **BSA (Body Surface Area)** is calculated and displayed when **Height/Weight** is entered
- **HR (Heart Rate) bpm (beats per minute)** can be entered manually for use in **Cardiac** calculations during imaging.

Note: If no **HR** is entered, then it must be measured during imaging in order to be able to perform many of the different **Cardiac** calculations. Refer to [6.12.4 Cardiac Reports](#) for more details.



- **GA Calc(ulator)** auto-calculates **GA (Gestational Age)** and **EDD (Estimated Date of Delivery)** based on the option selected:
 - **LMP (Last Menstrual Period)**
 - **Oocyte Retrieval**
 - **Day 3 Transfer**
 - **Day 5 Transfer.**
- **GA** auto-calculates **EDD**

Note: presented on the Patient Information Bar during When either **OB** option is selected as the **Application**, **GA** will automatically be presented on the Patient Information Bar during imaging.

OB 1st Trimester
OB 2nd–3rd
Trimester

- **EDD** auto-calculates **GA**

Note: **LMP** or **GA** will display at the top of the image field in the selected Windows date format (e.g., mm/dd/yyyy). Both **weeks (w)** and **days (d)** are used to auto-calculate **EDD**. If the **GA** and **EDD** are entered manually, they will override the **LMP** field entry.

- **Gravida**, **Para** and **Aborta** fields
- **Fetus #** defaults to 1. Enter up to 8 for multiple gestations

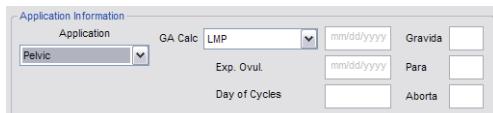


Warning: In order to record measurements on multiple—but separate—fetuses, enter a **Fetus #** between 2 and 8 (i.e., to activate the **Fetus** toggle button in **OB Measurement Packages** and **Reports** (where 1 = A, 2 = B, etc.)).

- **BBT (Basal Body Temperature)** can be entered in $^{\circ}\text{C}$ (Celsius) or $^{\circ}\text{F}$ (Fahrenheit)

Note: **BBT** is only available if it was selected in [8.2.17 Patient Settings](#).

- **Previous Exam** enables the entry of previous **OB** exam data for **Fetal Trending** (refer to [4.1.2.1 OB Previous Exam \(Fetal Trending\)](#) for details).



Pelvic

- **GA Calc(ulator):**
 - **LMP**
 - **Oocyte Retrieval**
 - **Day 3 Transfer**
 - **Day 5 Transfer.**
- **Exp. Ovul. (Expected Date of Ovulation)**
- **Day of Cycles**
- **Gravida**, **Para** and **Aborta** fields.

Note: When **Pelvic** is selected as the **Application**, **LMP** will automatically be presented on the Patient Information Bar during imaging.



The screenshot shows the 'Application Information' section with the following fields:

- Application:** Urology (selected from a dropdown menu)
- Height:** imperial (dropdown menu), ft [empty], in [empty]
- Weight:** imperial (dropdown menu), lbs [empty], oz [empty]
- BSA:** 0.00m²
- PSA:** ng/ml

- Urology**
- **Height** and **Weight** have both metric and imperial measurement options
 - **BSA (Body Surface Area)** is calculated and displayed when **Height/Weight** is entered.
 - **PSA (Prostate-Specific Antigen)** is used in the **PSA Density (PSAD)** calculation.

Note: Ensure the **PSA** test result is entered in the form **ng/ml**, or **nanograms per milliliters**.

To Enter Application-Specific Data:

1. Tap the touch screen **Exam Mgmt** button.
2. Tab to the **Application** drop-down menu on the right side of the **Application Information** section.
3. Select the desired **Application** from the drop-down menu.



Warnings:

In order to record measurements on multiple—but separate—fetuses, enter a **Fetus #** between 2 and 8 (i.e., to activate the **Fetus** toggle button in **OB Measurement Packages** and **Reports** (where **1 = A**, **2 = B**, etc.)).

In addition to entering the correct **Fetus #** on the **Exam Management** page, be sure to label each **Fetus** using the **Annotate** button.

Notes:

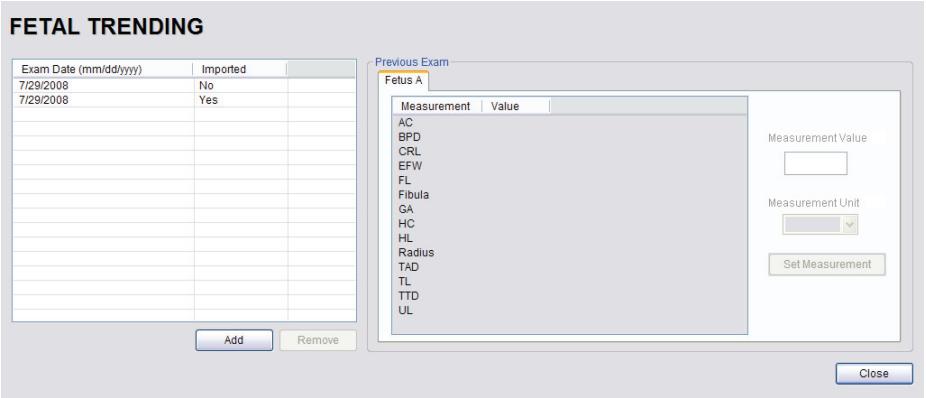
The **Application**-related data entry fields to the right of the **Application Information** section change with the selection of the various **Applications** (refer to **Table 4-4** to view examples of the various options available).

Once the cursor is placed in a data entry field, the **Tab** key (on the touch screen keyboard) may be used to move through the various data fields and the **Enter** key may be used to toggle through drop-down menu selections.

4.1.2.1 OB Previous Exam (Fetal Trending)

Previous Exam allows users to manually enter data from previous OB exams in order to track **Fetal Trending** details for up to three **Fetuses**.

Figure 4-4: Previous Exam (Fetal Trending)



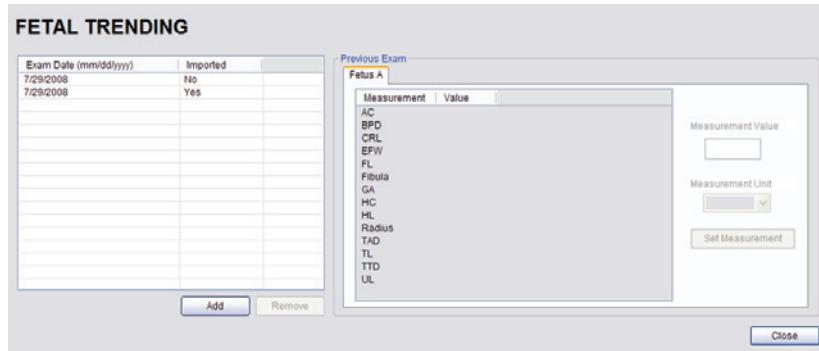
The screenshot shows the 'FETAL TRENDING' interface. On the left, a table lists previous exams with columns for 'Exam Date (mm/dd/yyyy)' and 'Imported'. The first row has '7/29/2008' and 'No'. The second row has '7/29/2008' and 'Yes'. Below this table are 'Add' and 'Remove' buttons. To the right, a detailed view for 'Fetus A' is shown. It includes a table for 'Measurement' and 'Value' with rows for AC, BPD, CRL, EFW, FL, Fibula, GA, HC, HL, Radius, TAD, TL, TTD, and UL. To the right of this table are fields for 'Measurement Value' (with a text input box), 'Measurement Unit' (with a dropdown menu), and a 'Set Measurement' button. At the bottom right is a 'Close' button.

Table 4-5: Previous Exam (Fetal Trending)

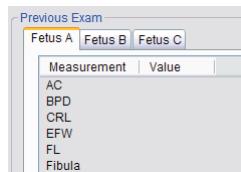
Exam Date (mm/dd/yyyy)	Indicates the date of the exam, if the exam is on the system or the date of the exam for which data was manually entered.
Imported	Yes or No indicates whether or not exam data is being read from the system (Imported = No) or has been entered manually (Imported = Yes).
Add	Select to manually enter Previous Exam data.
Remove	Select to remove Previous Exam data. <i>Note: This option is only available for Imported data. Exams that exist on the system cannot be removed from the Fetal Trending page.</i>
Previous Exam	Selects the Fetus for which the exam data is applicable. <i>Note: The number of Fetus tabs will correspond exactly to the Fetus # entered on the Exam Management page, e.g., if the Fetus # is "2" only the Fetus A and Fetus B tabs will be available.</i>
	Measurement Lists the type of Measurement for which data will be entered.
	Value Lists the Value of the entered Measurement .
Previous Exam	Measurement Value data entry field. <i>Note: Measurements can be edited while the exam remains active. Once it has been closed, the exam would have to be deleted and the data re-entered in order to make any edits.</i>
	Measurement Unit Shows the relevant Measurement Unit , e.g., days , cm or g (grams) .
	Set Measurement Accepts the Measurement once it has been entered.

To Enter Previous OB Exam Data for Fetal Trending:

1. Tap the touch screen **Exam Mgmt** button.
2. Select a **Patient** from the **Patient Database**.
3. Select **Previous Exam** from the **Application Information** data entry section to access the **Fetal Trending** page.



4. If required, select the relevant **Fetus** tab (**Fetus A**, **Fetus B** or **Fetus C**).



Note: The number of **Fetus** tabs will correspond exactly to the **Fetus #** entered on the **Exam Management** page, e.g., if the **Fetus #** is "2" only the **Fetus A** and **Fetus B** tabs will be available.

5. Select the **Add** button to access the **Exam Date** selector.



Note: The system will only allow the addition of one exam per date.

6. Select the relevant date for the ***Previous Exam***.

Note: The current date is always enclosed in a red box.

To change the current month, uses the arrow selectors on either side of the calendar header.

7. Select **OK** to accept the changes or **Cancel** to exit without saving.

Note: The newly added exam date will be highlighted under **Exam Date (mm/dd/yyyy)** on the left hand side of the **Fetal Trending** page.

8. Under **Previous Exam**, highlight the desire **Measurement** and enter the relevant data in the **Measurement Value** data entry field.

Exam Date (mm/dd/yyyy)	Imported
7/29/2008	No
7/2/2008	Yes
<input type="button" value="Add"/> <input type="button" value="Remove"/>	

FETAL TRENDING

Previous Exam	
Fetus A	
Measurement	Value
AC	
BD	
CRL	
EFW	
FL	
Fibula	
GA	
HC	
HL	
Radius	
TAD	
TL	
TTD	
UL	

9. Select the ***Set Measurement*** button.
 10. Continue adding ***Measurements*** in the same manner until all data has been entered for the current ***Fetus***.
 11. Repeats step 4 to 10 for any additional ***Fetus(es)***.
 12. Select ***Close*** to accept the data and return to the ***Exam Management*** page.
 13. The data entered is plotted on the growth graphs as part of the OB report package.

4.1.3 Exam Information

Figure 4-5: Exam Information Fields

Exam Information			
Attending Physician	<input type="text"/>	Custom 1	<input type="text"/>
Referring Physician	<input type="text"/>	Custom 2	<input type="text"/>
Operator ID	<input type="text"/> ALC	Custom 3	<input type="text"/>
Clinical Indication	<input type="text"/>	Custom 4	<input type="text"/>

Table 4-6: Exam Information Fields

Attending Physician	Enter name of the Attending Physician manually or select from drop-down menu of previously entered and currently active physician names.
Referring Physician	Enter name of the Referring Physician manually or select from drop-down menu of previously entered and currently active physician names. Referring Physician auto-populates when the patient is selected from DICOM Worklist .
Operator ID	Enter name or initials of the Operator or select from drop-down menu of previously entered and currently active Operator IDs . Operator ID appears at the top of the screen during imaging.
Clinical Indication	Enter Clinical Indication manually or select from drop-down menu of previously entered and currently active Clinical Indications . Clinical Indication auto-populates when the patient is selected from DICOM Worklist , but can be modified.
Custom Label 1, 2, 3, 4	Enter user-defined data manually or select from drop-down menu of previously entered and currently active data.

Notes:

Refer to [8.2.17 Patient Settings](#) for details on adding, editing and maintaining data for these fields.

Attending Physicians and Operator IDs can also be added via [3.3.1 Quick Exam Start-Up](#).

All these fields can be completed using the barcode reader. Simply ensure the cursor is in the required field and scan the relevant barcode.

To Enter Exam Information Manually:

1. Tap the touch screen **Exam Mgmt** button.
2. Enter **Exam Information** as required. Once entered, the text is available for recall from the drop-down menu.

Note: Use the **Tab** or **Enter** key to move around the **Exam Information** fields. Drop-down menu selections can be made with the trackball and  button.

To Enter Exam Information with the Barcode Reader:

1. Tap the touch screen **Exam Mgmt** button.
2. With the cursor in the **Attending Physician** field, scan the relevant patient barcode with the barcode reader.
3. Continue entering the patient/exam data as required.

Note: Fields that will accept data entry via the keyboard will also accept data scanned with the barcode reader. Simply ensure that the cursor is located in the required field then scan the relevant barcode.

4.2 SELECTING AN APPLICATION–TRANSDUCER–PRESET COMBINATION

Imaging Presets specific to each **Application** are available with each of the system transducers. The **Applications** and **Presets** vary depending on the transducer type. Additional user-defined **Imaging Presets** (4.8) may be created and stored with the factory installed or default **Presets**. Due to space limitations, **Applications** and **Presets** may continue on to another page. Use the page selector buttons to move forward and back through the available options.

Refer to **C.4 Ultrasound Indications For Use Tables** for **Clinical Application** details on each transducer type.

Note: Always tap the **Preset** last as the system automatically moves to imaging after **Preset** selection.

Refer to **8.2.15.4 Footswitch** to configure one button tranducer access.

To Select/Change an Application–Transducer–Preset Combination:

1. Tap the touch screen **Presets...** button.

Note: The currently selected **Application–Transducer–Preset** combination is highlighted.

2. Tap the desired **Transducer**.



3. Tap the desired **Application**.

Note: If the connected transducers do not support the selected **Application**, a message to that effect will be presented (e.g., "The connected transducers do not support the **Cardiac Application**.").

4. Tap the desired **Imaging Preset** and the system will move to live imaging.

Note: If an **Imaging Preset** has been hidden, it will not be available for selection from the touch screen (or QSonix). This option applies to both default and user-defined **Imaging Presets**. Refer to **8.2.1.1 Show/Hide Imaging Presets** for more details.

4.3 BEGINNING AN EXAM FOR A NEW PATIENT

Note: Refer to [4.7.1.1](#) for details on beginning an exam with an existing patient.

To Begin an Exam for a New Patient (Manual Entry):

1. Tap the touch screen **Exam Mgmt** button.

Note: The text cursor defaults to the **Patient ID** field unless a current exam is open. To end the current exam session, select the **End Exam** button near the top right corner of the page.

2. Enter **Patient Information** as required.

Note: The **Patient ID** cannot be edited once the exam is underway.

3. Under **Application Information**, select the appropriate **Application** in order to access the **Application**-specific data fields (e.g., for **Cardiac**, complete the **Height** and **Weight** fields).
4. Enter **Exam Information** as required.
5. To save the changes and move to live imaging, select **OK** on the **Exam Management** page or tap **OK** on the touch screen.

Note: The **Patient ID**, **Name** and **Operator ID** details appear at the top of the image field during an exam. When applicable, **GA** will also be displayed.

If the above-listed fields are relevant to the imaging session but are not displayed, the system may be configured to hide patient data. Refer to [General Options \(Table 8-38\)](#) for details.

To Begin an Exam for a New Patient (Barcode Reader):

1. Tap the touch screen **Exam Mgmt** button.
2. With the cursor in the **Patient ID** field, scan the relevant patient barcode with the barcode reader.
3. Continue entering the patient/exam data as required.

Note: Fields that will accept data entry via the keyboard will also accept data scanned with the barcode reader. Simply ensure that the cursor is located in the required field then scan the relevant barcode.

4.4 BEGINNING AN EXAM WITH NO PATIENT SELECTED

It is possible to begin an exam without first entering any patient data on either the **Exam Management** page or via **QSonix**. With an unassigned exam, if a measurement is taken or an image is saved, **Operators** will be required to assign or discard the data before being permitted to end the exam.

Note: If no data was saved, the exam cannot be assigned to a Patient.

Before attempting to begin an exam with no Patient assigned, ensure that **Enable Unassigned Exam** has been selected in the **Patient Settings** dialog (under **General Options** in **Table 8-38**).



Warning: Exams that are assigned to a Patient after images have been saved do not include identifying Patient data (such as **Patient ID** or **Name**).

Organizations that elect to configure/use the **Enable Unassigned Exam** functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision.

There are three methods to assign data to a Patient. On the touch screen, tap:

- **End Exam:** After assigning a Patient the exam will end.
- **Exam Mgmt:** After assigning a Patient the **Operator** has the option of continuing the exam.

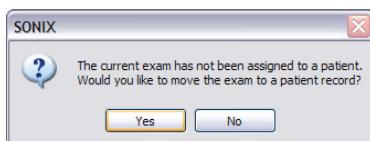
Note: If the **Operator** continues with the exam, all subsequent data saved to the exam will include identifying Patient data (such as **Patient ID**).

On the console, press:

- **Q:** After assigning a Patient the **Operator** can continue imaging.

To Assign an Exam to a Patient after Tapping End Exam:

1. Ensure **Enable Unassigned Exam** was selected in the **Patient Settings** dialog (under **General Options** in **Table 8-38**).
2. Ensure no Patient is currently selected.
3. Begin an exam and ensure that at least one measurement is taken or one image is saved.
4. Ensure the system is at the main touch screen (e.g., if the touch screen is at **Measurement Packages**, tap the **Close** button to return to the main touch screen).
5. Tap the touch screen **End Exam** button and select **Yes** to assign the exam to a Patient or **No** to discard the data.



6. If **Yes** was selected in step 5, the **Assign Exam** page will be presented.

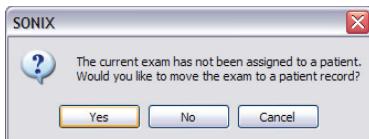
7. Enter the relevant data for a new patient or select an existing one.

Note: The **Assign Exam** page contains all the same fields and options as the **Exam Management** page (4.1).

8. Tap **OK** to exit.

To Assign an Exam to a Patient after Tapping Exam Mgmt:

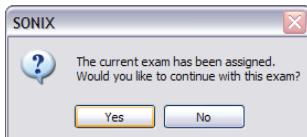
1. Ensure **Enable Unassigned Exam** was selected in the **Patient Settings** dialog (under **General Options** in Table 8-38).
2. Ensure no **Patient** is currently selected.
3. Begin an exam and ensure that at least one measurement is taken or one image is saved.
4. Ensure the system is at the main touch screen (e.g., if the touch screen is at **Measurement Packages**, tap the **Close** button to return to the main touch screen).
5. Tap the touch screen **Exam Mgmt** button and select **Yes** to assign the exam to a Patient, **No** to discard the data and move to the **Exam Management** page or **Cancel** to return to imaging.



6. If **Yes** was selected in step 5, the **Assign Exam** page will be presented.
7. Enter the relevant data for a new patient or select an existing one.

Note: The **Assign Exam** page contains all the same fields and options as the **Exam Management** page (4.1).

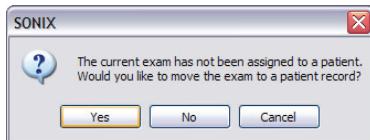
8. Select **OK** to exit.
9. When prompted, select **Yes** to continue imaging or **No** to end the exam.



Note: If the **Operator** continues with the exam, all subsequent data saved to the exam will include identifying Patient data (such as **Patient ID**).

To Assign an Exam to a Patient after Pressing Q:

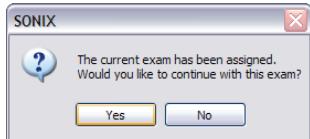
1. Ensure **Enable Unassigned Exam** was selected in the **Patient Settings** dialog (under **General Options** in **Table 8-38**).
2. Ensure no **Patient** is currently selected.
3. Begin an exam and ensure that at least one measurement is taken or one image is saved.
4. Ensure the system is at the main touch screen (e.g., if the touch screen is at **Measurement Packages**, tap the **Close** button to return to the main touch screen).
5. Press the console **Q** button and select **Yes** to assign the exam to a Patient, **No** to discard the data and enter **QSonix** or **Cancel** to return to imaging.



6. If **Yes** was selected in **step 5**, the **Assign Exam** page will be presented.
7. Enter the relevant data for a new patient or select an existing one.

Note: The **Assign Exam** page contains all the same fields and options as the **Exam Management** page (4.1).

8. Select **OK** to exit.
9. When prompted, select **Yes** to continue imaging or **No** to end the exam.



Note: If the **Operator** continues with the exam, all subsequent data saved to the exam will include identifying Patient data (such as **Patient ID**).

4.5 ENDING AN EXAM

To End the Current Exam Session:

1. Tap the touch screen **Exam Mgmt** button.
2. Tap **End Exam** on the touch screen or select **End Exam** from the **Exam Management** page.

Note: **End Exam** ends the current exam session, clears the **Patient** and **Exam** data fields and clears the printer queue (i.e., if printer image sheet is set for **2x2** and only two images were saved, **End Exam** signals the system that no more images are coming to fill up the sheet).

*Before ending an exam, ensure the active image has been saved/printed using the **console 1** or **2** button ([8.2.14 Custom Keys](#)) in order to be able to recall it via the **Review** button on the **Exam Management** page or the **Exam Review** button on the touch screen.*

4.6 EXAM IMPORT/EXPORT

Exam Import/Export enables data to be copied to and from the system, allowing users to make backups that can be imported again at a later date.

Note: The data to be backed up can be configured using either **Date** or **Patient-specific criteria**.

When first entering the **Exam Import/Export** page, the default action will always be **Export**. In order to import patient data, simply select any **Source** other than **Local Patient Data** and the button will change from **Export** to **Import**.

Figure 4-6: Exam Import/Export

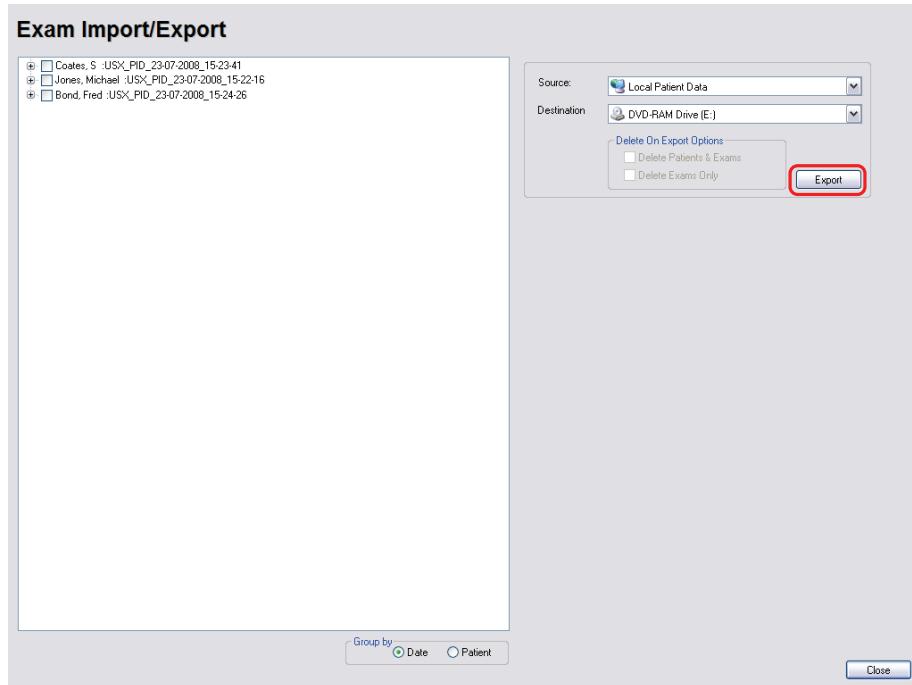


Table 4-7: Exam Import/Export

	When importing, select a Source location.				
Source	<p>Note: Only currently available Sources will be presented. If the required data is not accessible, ensure the correct media has been connected to the system.</p> <p>For Export, the <u>Source</u> must be Local Patient Data.</p> <p>For Import, the <u>Destination</u> must be Local Patient Data.</p>				
Destination	<p>When exporting, select a Destination for the Patient/Exam data.</p> <p>Note: Only currently available Destination locations will be presented.</p>				
Delete On Export Options	<p>Enables users to decide which exams—if any—to auto-delete after the Exam Export is complete.</p> <table border="1"> <tr> <td>Delete Patient and Exams</td><td>Select to delete both the Patients and Exams selected for Export. The deletion will auto-complete after the Export is finished.</td></tr> <tr> <td>Delete Exams Only</td><td>Select to delete only the Exams selected for Export. The deletion will auto-complete after the Export is finished.</td></tr> </table> <p>Note: Once exported, deleted Patients and Exams can be imported at a later date using the Exam Import function.</p>	Delete Patient and Exams	Select to delete both the Patients and Exams selected for Export . The deletion will auto-complete after the Export is finished.	Delete Exams Only	Select to delete only the Exams selected for Export . The deletion will auto-complete after the Export is finished.
Delete Patient and Exams	Select to delete both the Patients and Exams selected for Export . The deletion will auto-complete after the Export is finished.				
Delete Exams Only	Select to delete only the Exams selected for Export . The deletion will auto-complete after the Export is finished.				
Group by	<table border="1"> <tr> <td>Date</td><td>Groups the available Exams by Date.</td></tr> <tr> <td>Patient</td><td>Groups the available Exams by Patient.</td></tr> </table> <p>Note: This is the default setting.</p>	Date	Groups the available Exams by Date .	Patient	Groups the available Exams by Patient .
Date	Groups the available Exams by Date .				
Patient	Groups the available Exams by Patient .				

To Access Exam Import/Export:

1. Tap the touch screen **Exam Mgmt** button.
2. Select the **Import/Export** button.

To Export Exam Data:

1. Tap the touch screen **Exam Mgmt** button.
2. Select the **Import/Export** button.
3. If desired, change the **Group by** option from **Patient** to **Date**.
4. Select the desired **Patients** and/or **Exams**.



5. From the **Source** drop-down menu, select **Local Patient Data**.

Note: **Local Patient Data** is the only **Source** for exporting data.

6. From the **Destination** drop-down menu, select the **Export Destination**.

Note: The **Delete On Export Options** will not be available for selection until a valid **Destination** location is selected.

To create a backup without removing the data from the system, leave both **Delete On Export Options** unselected.

7. Select the **Export** button to begin the backup.
8. When the **Export** is complete, the following message will be presented.



Note: If **Delete On Export Options** were selected, the data will be deleted before the **Export process is complete** message is presented.

To Import Exam Data:

1. Tap the touch screen **Exam Mgmt** button.
2. Select the **Import/Export** button.
3. From the **Source** drop-down menu, select the **Source** of the data to be imported.



Note: The following actions will auto-complete once the data **Source** is changed from **Local Patient Data**:

- **Destination** drop-down menu will change to **Local Patient Data**
 - **Export** button will change to **Import**.
-

4. From the list presented on the left hand side of the **Exam Import/Export** page, select the data to be imported.
5. Select the **Import** button to begin the procedure.
6. When the **Import** is complete, the following message will be presented.



Note: If the data selected for **Import** is already available on the system, it will not be imported, i.e., it will not overwrite the existing data.

4.7 STORAGE/DATABASE TABS

To the bottom right of the ***Exam Management*** page is a series of up to three vertical ***Storage*** tabs. These tabs can be accessed with the trackball and  button or use the ***Exam Management*** touch screen ***Toggle Tabs*** button to move to the appropriate database.

Table 4-8: Storage/Database Tabs

Patients	Select to display a list of patients stored in local memory.
DICOM	Select to display the patient list recently retrieved from the DICOM or EMR Worklist server.
	Worklist <i>Note: This tab is available only when the system is configured for DICOM (8.2.13) or EMR (8.2.17.1).</i>
	Store Queue Select to display the current DICOM Storage Queue . <i>Note: This tab is available only if DICOM is licensed and a Storage Server has been configured (8.2.13.1).</i>
Print Queue	Select to display the current DICOM Print Queue . <i>Note: This tab is available only if DICOM is licensed and a Print Server has been configured (8.2.13.2).</i>
Hide	Select to blank out patient data on the Exam Management page. This feature provides data privacy.

4.7.1 Patients

Using data entered in [4.1.1 Patient Information](#), the system maintains and displays a database containing patient details.

Figure 4-7: Patients Database

Patient ID	Last Name	First Name	Middle Name	Birthdate	Sex	Last Exam	Images
PID_20-10-2010_02...	Smith	J		12/15/1981	F	10/20/2010	0

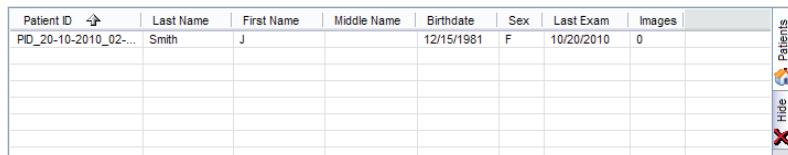
Table 4-9: Patients Database

(Patient) ID	Patient Identifier as entered in the Patient Information section.
Last Name	Patient's Last , First and Middle Names as entered in the Patient Information section.
First Name	
Middle Name	
Birthdate	Patient's Birthdate as entered in the Patient Information section.
Sex	Patient's Sex as entered in the Patient Information section.
Insurance (#)	Patient's Insurance Number (if applicable) as entered in the Patient Information section.
Last Exam	Date of the Last Exam performed on the patient (if applicable).
(Number of) Images	Total number of Images stored for the patient's most recent exam.

4.7.1.1 Manipulating the Patients Database

To Manually Select a Previously Stored Patient from the Patients Database:

1. Tap the touch screen **Exam Mgmt** button.
2. Select the **Patients** tab near the bottom of the **Exam Management** page to display a list of locally stored (on the system hard drive) patients or use the **Exam Management** touch screen **Toggle Tabs** button to move to the appropriate database.



Patient ID	Last Name	First Name	Middle Name	Birthdate	Sex	Last Exam	Images	Actions
PID_20-10-2010_02...	Smith	J		12/15/1981	F	10/20/2010	0	

3. Select a patient and auto-populate the data fields.
4. Modify patient and exam data fields as required.

Note: The **(Patient) ID** cannot be modified.

5. Select **OK** to save the data and move to live imaging.

Note: When a new exam is initiated, the transducer used in the most recent exam will still be selected if it is still connected. If it's no longer connected, the system will default to the first available transducer. This default transducer selection is not affected even if the system is turned off between exams.

To Search the Patients Database for a Previously Stored Patient:

1. Tap the touch screen **Exam Mgmt** button.
 2. Select the **Patients** tab near the bottom of the **Exam Management** page to display a list of locally stored (on the system hard drive) patients or use the **Exam Management** touch screen **Toggle Tabs** button to move to the appropriate database.
 3. Select the **Field Header** of the data to searched (e.g., **Last Name**).
 4. Use the keyboard to enter the patient search data (**Patient ID** or **Name**, etc.).
- Note:** The **Patients Database** narrows the list of patients to those that match entered search criteria.
-
5. When the list has been narrowed sufficiently (e.g., to one **Patient ID** or all patients with the desired **Last Name**), select the desired patient.

To Change the Layout of the Patient Data Columns:

1. Tap the touch screen **Exam Mgmt** button.
2. Position the arrow cursor over the **Field Header** to be moved.

Patient ID	Last Name	First Name	Middle Name	Birthdate	Sex	Last Exam	Images
PID_20-10-2010_02...	Smith	J		12/15/1981	F	10/20/2010	0



Patients





3. Hold down the  button and simultaneously use the trackball to drag the column to the desired location.

Note: To change the order of the list (e.g., from numerical by **Patient ID** number to alphabetical by **Last Name**), position the cursor over the relevant **Field Header** and press . To reverse the order press  again.

4.7.2 DICOM Worklist

The system must be configured for **DICOM Worklist** and connected to a **DICOM** server in order for the **Worklist** database feature to function. For setup instructions, refer to [8.2.13 DICOM Configuration](#).

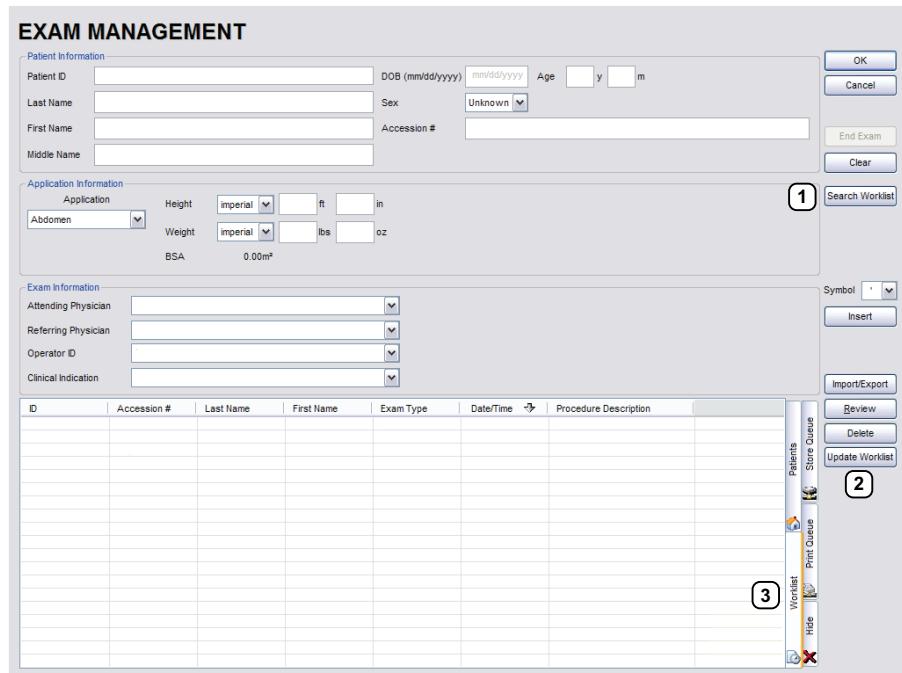
Note: The data in the fields available on the actual search page are dependant upon the data entered into **DICOM: Patient ID, Last Name, First Name, Accession #, Start Date (mm/dd/yyyy), End Date (mm/dd/yyyy), Exam Type, Procedure ID, Station AE Title, Station Location and Modality Type.**

After completing a **DICOM Worklist** search with a new, manually entered **Modality**, the new **Modality** type will be saved to the **Modality** drop-down list. Additionally, the most recently used **Modality** will be automatically selected for use in the next **DICOM Worklist** search.

The six default **DICOM Modality Types** are: **All, CT, MR, RF, US and XA**.

Device configuration for **Modality Performed Procedure Steps (MPPS)** is handled through the same **AE Configuration** as the **DICOM Worklist**. All functionality is invisible to the user, except when testing a **DICOM Worklist Device** ([8.2.13.3](#)).

Figure 4-8: Exam Management Page (DICOM Worklist)

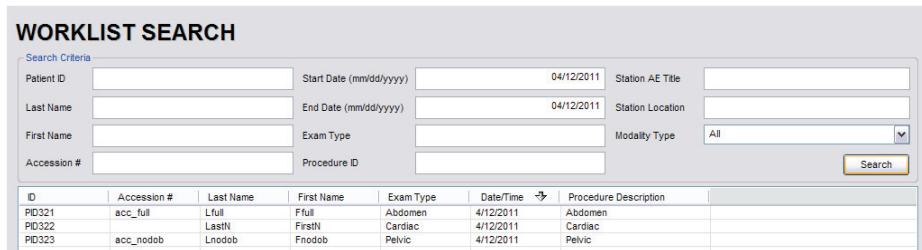


The screenshot shows the 'EXAM MANAGEMENT' interface. It includes sections for 'Patient Information', 'Application Information', and 'Exam Information'. On the right, there is a vertical toolbar with buttons for 'OK', 'Cancel', 'End Exam', 'Clear', 'Search Worklist', 'Insert', 'Import/Export', 'Review', 'Delete', 'Update Worklist', and a context menu with options like 'Patients', 'Worklist', 'Print Queue', 'Store Queue', 'Hide', and 'Exit'. A large grid at the bottom displays patient data with columns for ID, Accession #, Last Name, First Name, Exam Type, Date/Time, and Procedure Description.

Table 4-10: Exam Management Page (DICOM Worklist)

-
- 1 **Search Worklist** button
 - 2 **Update Worklist** button
 - 3 **Worklist** tab
-

Figure 4-9: DICOM Worklist Search



The screenshot shows the 'WORKLIST SEARCH' interface. At the top, there is a 'Search Criteria' section with fields for Patient ID, Start Date, Station AE Title, Last Name, End Date, Station Location, First Name, Exam Type, Modality Type, Accession #, and Procedure ID. Below this is a 'Search' button. A results table follows, displaying columns for ID, Accession #, Last Name, First Name, Exam Type, Date/Time, and Procedure Description. The table contains three entries:

ID	Accession #	Last Name	First Name	Exam Type	Date/Time	Procedure Description
PID321	acc_full	Lfull	Pfull	Abdomen	4/12/2011	Abdomen
PID322		LastN	FirstN	Cardiac	4/12/2011	Cardiac
PID323	acc_nodob	Lnodob	Fnodob	Pelvic	4/12/2011	Pelvic

4.7.2.1 Manipulating the DICOM Worklist Database

To Perform a DICOM Worklist Search:

1. Tap the touch screen **Exam Mgmt** button.
2. Select **Search Worklist**.
3. When the **Worklist Search** page appears on the screen enter the patient **Search Criteria** data (**Patient ID** or **Name**, etc.).



The screenshot shows the 'WORKLIST SEARCH' interface. At the top, there is a 'Search Criteria' section with fields for Patient ID, Start Date, Station AE Title, Last Name, End Date, Station Location, First Name, Exam Type, Modality Type, Accession #, and Procedure ID. Below this is a 'Search' button. A results table follows, displaying columns for ID, Accession #, Last Name, First Name, Exam Type, Date/Time, and Procedure Description. The table contains three entries:

ID	Accession #	Last Name	First Name	Exam Type	Date/Time	Procedure Description
PID321	acc_full	Lfull	Pfull	Abdomen	4/12/2011	Abdomen
PID322		LastN	FirstN	Cardiac	4/12/2011	Cardiac
PID323	acc_nodob	Lnodob	Fnodob	Pelvic	4/12/2011	Pelvic

Note: *Worklist* text fields can be searched with wildcards, e.g., entering **SMI*** in the **Last Name** field will find all names beginning with **SMI**.

-
4. Select **Search** to update the **Worklist** with the results of the advanced search.

Notes:

The parameters from the last search will be retained for the duration of the current (computer-defined) date.

Worklist Search results are limited to a maximum of 100 records. Any result list longer than 100 records will be truncated.

To Select a Patient from the DICOM Worklist:

1. Tap the touch screen **Exam Mgmt** button.
2. Select the **Worklist** tab to display the **DICOM Worklist** database or use the **Exam Management** touch screen **Toggle Tabs** button to move to the appropriate database.
3. If the desired patient is not available on the list, select **Update Worklist** to refresh the data.

Note: Updates will be based upon the last search performed.

4. Select the desired patient and the patient data fields will auto-populate.
5. Modify patient and exam data fields as required.

Note: The **Patient ID** cannot be modified.

*Modifications to auto-populated **Worklist** fields (**Name** and **Accession #**) are not recommended.*

6. Select **OK** to save the data, create a patient in the **Patient** database and move to live imaging.

Note: The patient file is automatically deleted at the end of the exam if no images or measurements are stored to the system for this patient.

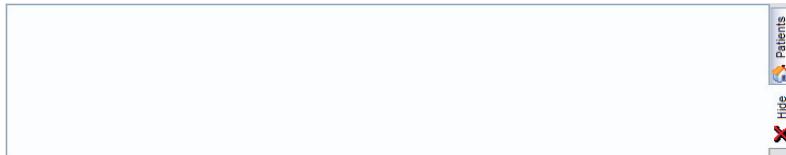
Note: When a new exam is initiated, the transducer used in the most recent exam will still be selected if it is still connected. If it's no longer connected, the system will default to the first available transducer. This default transducer selection is not affected even if the system is turned off between exams.

4.7.3 Hide

Selecting the **Hide** tab will instantly blank all patient data visible in the **Patients** or **Worklist** database. This is very useful when an **Operator** needs to quickly protect the privacy of patient data that would otherwise be visible to anyone within viewing distance.

To reveal patient data, simply select another database tab or use the **Exam Management** touch screen **Toggle Tabs** button to move to the appropriate database.

Figure 4-10: Hide Tab



4.8 USER-DEFINED PRESETS FOR NON-3D/4D FORMATS

User-defined **Presets** may be created and saved to the selected **Application**. They are presented for selection along with factory defaults when selecting **Transducer**, **Application** and **Preset**. Refer to [8.2.1 Presets](#) for more details on user-defined **Presets**.

Note: When saving user-defined **Presets** in **Compound** or **B-Mode**, the actual mode is also saved as part of the **Preset**.

In addition to standard **Presets**, the system also allows users to create and save user-defined **3D/4D Presets**. Refer to [5.11.9 3D/4D Presets](#) for details.

During imaging, a user-defined **Preset** name is shown on the LCD display in square brackets (e.g., [User-Defined Preset]).

Note: When configuring a user-defined **Preset** for **M**, **PW** or **Triplex** mode, be sure to move to the desired **Layout** as this setting will be saved with the **Preset**. Refer to sections [5.1.7](#), [5.3](#) and [5.3.3](#) for more details.

TGC settings ([3.5.5](#)) are saved to user-defined **Presets** as well.

To Save User-Defined Presets:

1. Tap the touch screen **Presets...** button.
2. Select an appropriate **Application–Transducer–Preset** combination where the **Preset** is similar to the required user-defined **Preset**.



3. Once the system moves to live imaging, adjust the imaging parameters (e.g., **Depth**, **Dynamic Range**, **Gain**, **Sector Size**, etc.) and **TGC** settings.
4. Tap the **Presets...** button again.
5. Tap **Save Preset....**

6. When the **Save Preset** dialog is presented, chose the appropriate **Application** under which the new **Preset** will be stored from the **Select Application** drop-down menu.



Note: If a user-defined **Preset** with the same name already exists, the system will present a message requiring the user to overwrite (**Yes**), save with a new name (**No**) or exit without saving (**Cancel**).

7. Use the touch screen keyboard to enter a **Preset Name**.
8. Tap **Enter** to save the **Preset**.
9. The user-defined **Preset** will now be available on the **Imaging Presets** page under the selected **Application**.

Note: Refer to [8.2.1 Presets](#) for more details on **Imaging Presets**,

CHAPTER 5: IMAGING

The **General Protocol** has a series of mode selection buttons across the bottom of the main touch screen ([Figure 3-2](#)). Any mode that is not already active is a purchasable option controlled through [8.2.23 Licensing](#). Talk to your sales representative or call Ultrasonix Technical support for details on purchasing/activating additional imaging modes.

Refer to [3.5 Touch Screen Layout](#) for details on **General** touch screen buttons.

Note: *ECG functionality is only available if:*

- the **ECG** option has been licensed
- the SA4 transducer is connected
- **Cardiac** has been selected as the active **Application**.

Refer to [Accessories—Third Party](#) in Appendix B for the recommended **ECG** electrode.

Note: Refer to [3.5.5](#) for details on configuring **Time Gain Compensation** settings.

SonixTouch supports a licensed **Precalinal** application which includes **Imaging Presets** for mice, rabbits and rats.

5.1 BASIC 2D IMAGING

2D or **B-Mode** is the system's default imaging mode. Any time a user toggles out of an imaging mode (other than the combined mode of **Color/PW**) the system will default back to **B-Mode**.

The system's broadband transducers provide a range of imaging **Frequencies**:

- **Harmonics**: artifact reduction (not available with all transducers)
- **Resolution**: highest frequency
- **General**: standard imaging frequency
- **Penetration**: lowest frequency
- **EPI**: greater penetration and improved contrast resolution for the technically difficult patient.

Note: *EPI is a licensed option available for use with the C5-2/60 curved array transducer.*

Figure 5-1: 2D/B-Mode Field Locations During Imaging

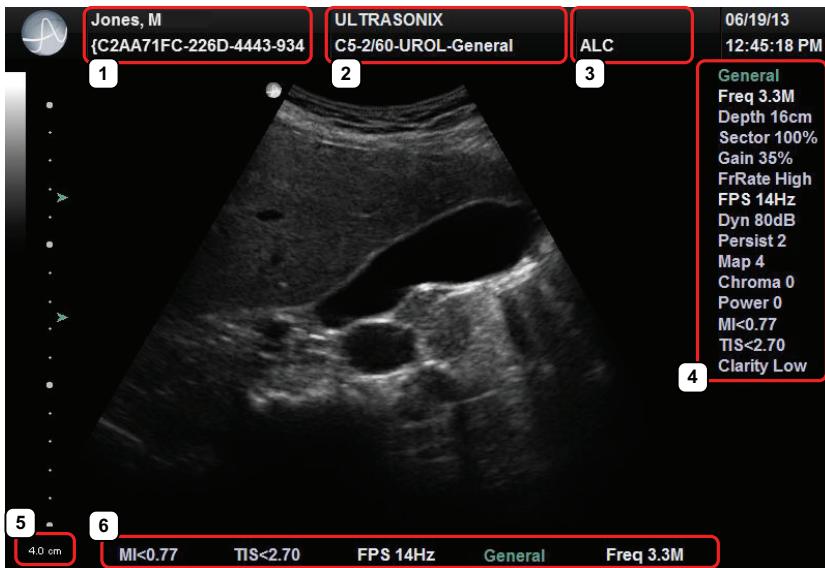
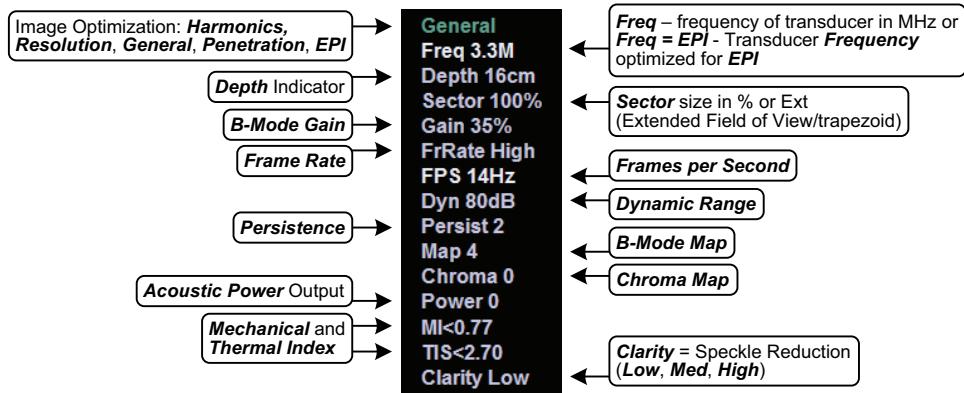


Table 5-1: 2D/B-Mode Field Locations During Imaging

1	<ul style="list-style-type: none"> 1: Patient Name and ID 2: Institution Name and Transducer–Application–Preset 3: GA (for OB), LMP (for Pelvic) and Operator ID.
2 <i>Patient/Exam Information</i>	<i>Note:</i> Refer to Chapter 4 and Chapter 8 for more details on Patient/Exam Information .
3	
4 2D/B-Mode Imaging Refer to Figure 5-2 and Appendix E for details.	
<i>Note:</i> If items 5 and 6 exist, then item 4 will not be visible. Refer to Parameters in Table 8-37 for more details.	
5 Depth	When Parameters is set to Subset , a Depth value will be placed under the Depth markers.
6 2D/B-Mode Imaging	When Parameters is set to Subset , only five imaging parameters will be displayed: MI , Parameter Subset TI , FPS , Resolution and Freq .

Figure 5-2: 2D/B-Mode Onscreen Imaging Parameters



Note: Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

To Select/Adjust Touch Screen 2D Imaging Parameters:

1. Tap the touch screen **B** button.
2. Tap the desired imaging parameter on the touch screen, e.g., **Persist(ence)**.
3. Turn the associated touch screen dial to adjust the imaging parameter (e.g., turn dial left to decrease **Persistence** or right to increase **Persistence**).

To Adjust the Imaging Frequency (Image Optimization):

1. Tap the **Freq** imaging parameter button.
2. Turn the associated touch screen dial to increase/decrease the **2D** imaging transmit frequency.

5.1.1 Clarity (Speckle Reduction)

Clarity imaging mode enhances the **2D** image by performing adaptive filtering of the image. It provides improved visibility of real structures with various levels of speckle reduction.

To Adjust the Clarity (Speckle Reduction) Imaging Mode:

1. Tap the touch screen **B** button.
2. Tap the touch screen **Clarity** button.
3. Turn the associated touch screen dial to adjust the level of speckle reduction.

5.1.2 Spatial Compound Imaging

Compound imaging parameters **Med** and **High** are available with all linear and curved array transducers.

Note: Refer to [Table E-2](#) for **Compound** imaging parameters.

To Activate Spatial Compound Imaging:

1. Tap the touch screen **Comp** button.

Note: **Spatial Compound** imaging is available as an option with some transducers, but is not available during **Color** imaging.

If another mode(s) is selected while in **Compound** imaging (e.g., **Color Mode**), when exiting that mode(s), the **Operator** will be returned to **Compound** imaging.

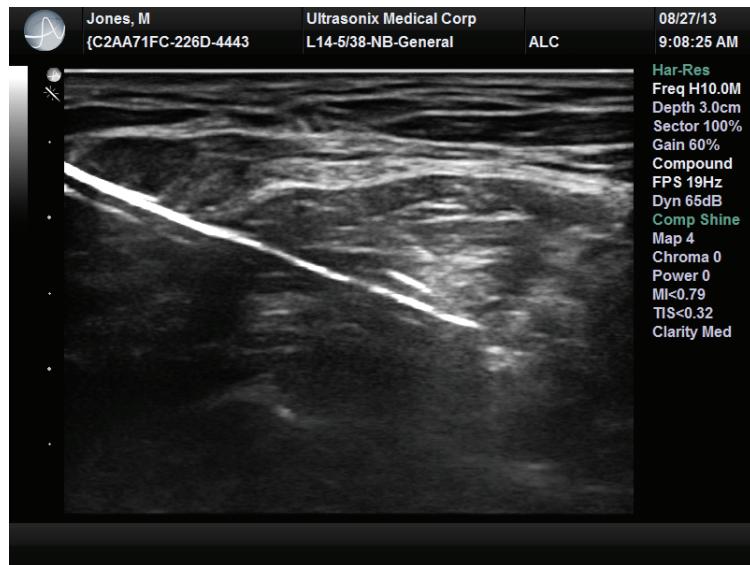
5.1.2.1 SonixShine

In combination with ***Spatial Compounding***, **SonixShine** offers enhanced, in-plane needle visibility.

Note: Refer to [Table E-1](#) for Mode Action details on **SonixShine** and [Table E-2](#) for **Compound** imaging parameters (including **Shine Side**).

SonixShine is available only with the L9-4/38, L14-5/38 and L14-5/38 GPS transducers.

Figure 5-3: SonixShine Imaging



To Activate SonixShine while in Spatial Compound Imaging:

1. With an active **Compound** image, tap the touch screen **SonixShine** button.

Note: The **Comp** imaging parameter button will be set to **Shine**. If **Comp** is reset to **Med** or **High**, the system will exit **SonixShine** but will remain in **Spatial Compound** imaging.

SonixShine is available only with the following transducers: L9-4/38, L14-5/38 and L14-5/38 GPS.

5.1.3 2D Zoom Imaging

To Activate the Zoom Feature:

1. On a live or frozen image, tap the touch screen **Zoom** button.
2. Turn the associated touch screen dial up or down to obtain the desired level of magnification.
3. Use the trackball to reposition the magnified **FOV**.

Note: Repositioning of the **Zoom FOV** is only possible after the image has been magnified to a size that is larger than the image field.

5.1.4 Dual Imaging Format

Refer to **Split Imaging** (**Table 8-44**) for details on configuring the default active image (**Left Side** or **Right Side**) and the **Auto-Switch on Start** setting.

Figure 5-4: Dual Imaging

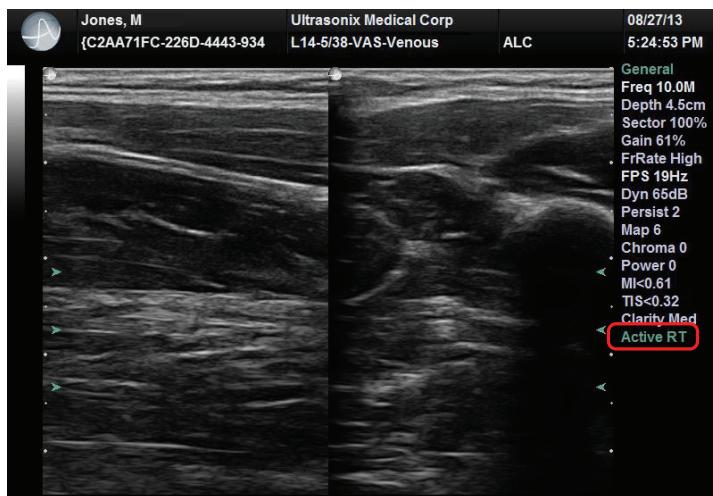


Table 5-2: Dual Imaging

	Indicates Active image:
Active Image	<ul style="list-style-type: none"> • Active LT: left • Active RT: right

To Activate Dual Imaging:

1. With an active **B-Mode** image, tap the touch screen **Dual** button.
 2. When a live image appears on the left side of the LCD display (**Active LT**), press  to freeze the **Active LT** image and unfreeze (i.e., make active) the **Active RT** image in one step.
- Note:** As an alternative, press  to freeze the right image. Pressing  will then toggle between the frozen images. Press  again at any time to activate the current image.
3. Press  to toggle back and forth between the dual images, freezing the inactive image and unfreezing the newly active image.
 4. Tap **Dual** to exit **Dual** imaging.

Note: **Color Doppler** is available during **Dual** but not **Quad** imaging.

5.1.5 Quad Imaging Format

Figure 5-5: Quad Image

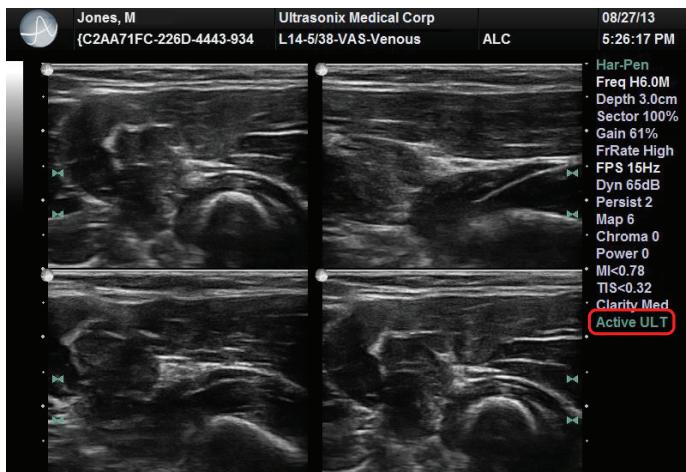


Table 5-3: Quad Imaging

	Indicates Active quadrant:
Active Image	<ul style="list-style-type: none"> • Active ULT: upper left • Active URT: upper right • Active BLT: bottom left • Active BRT: bottom right.

To Activate the Quad Imaging Format:

1. With an active **B-Mode** image, tap the touch screen **Quad** button.
2. When a live image appears on the upper left side of the LCD display (**Active ULT**), press to freeze the **Active ULT** image and unfreeze (i.e., make active) the upper right (**URT**) quadrant in one step.

Note: As an alternative, press to freeze the active image. Press to move to the next quadrant which will also contain a frozen image. Press to activate it or to move to the next quadrant.

3. Press again to freeze the current image and move to the next quadrant.

Note: toggles through the images sequentially: **ULT, URT, BLT, BRT**.

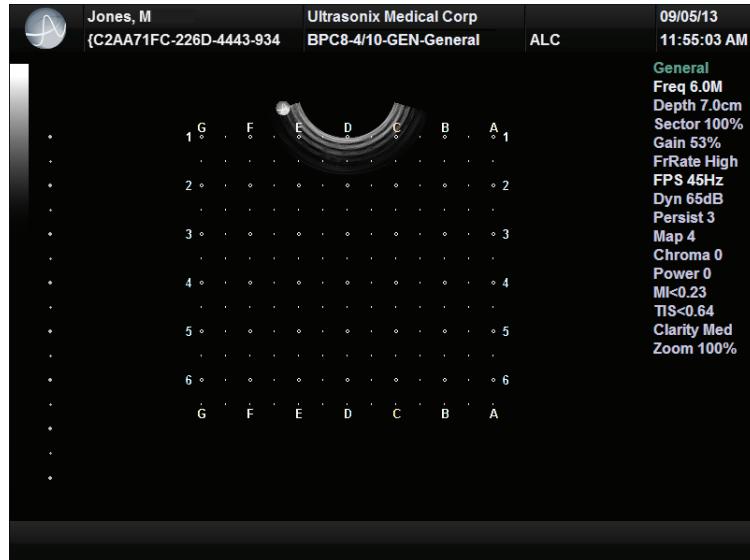
4. Continue pressing to move through the four images as required. Depending on the method selected above— only or and —the images will be active or frozen, respectively.
5. Tap **Quad** to exit **Quad** imaging (e.g., when in **B-Mode**, tap **B-Mode**).

Note: **Color Doppler** is available during **Dual** but not **Quad** imaging.

5.1.6 Brachytherapy and the BPC8-4/10 Transducer

When the BPC8-4/10 transducer is active and **B-Mode** has been selected, users will be presented with additional Mode Action and Imaging Parameter buttons. These options enable the use of the grid created for **Brachytherapy**.

Figure 5-6: Brachytherapy Grid Enabled on the Imaging Screen



Note: Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

5.1.7 M-Mode Imaging

When first entering **M-Mode**, all factory supplied **Imaging Presets** will default to the maximum **Zoom** setting.

Note: This will not affect user-defined Presets.

Note: Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

To Activate M-Mode Imaging:

1. Tap the touch screen **M** button.
 2. A live full screen **2D** image appears with an **M-Mode** cursor.
-
- Note:** Refer to [Layout in Table](#) and [8.2.20 Imaging Modes](#) to customize the **M-Mode** display settings and screen layouts.
-
3. Press .
 4. Tap **M** to exit **M-Mode** and return to **2D** imaging.

To Select/Adjust Touch Screen M-Mode Imaging Parameters:

1. Tap the touch screen **M** button.
2. Press the console .
3. On the touch screen, tap the desired imaging parameter button to make any required adjustments. (e.g., **MapM** or **ChromaM**).
4. Turn the associated touch screen dial to adjust the imaging parameter.

5.1.7.1 Anatomic M-Mode Imaging

To Activate Anatomic M-Mode Imaging:

1. Tap the touch screen **M** button.
2. A live full screen **2D** image appears with an **M-Mode** cursor.

Note: Refer to **Layout in Table** and **8.2.20 Imaging Modes** to customize the **M-Mode** display settings and screen layouts.

3. Press the console  button.
4. Tap the touch screen **Anatomic** button.
5. Tap **M** to exit **M-Mode** and return to **2D** imaging.

To Select/Adjust Touch Screen Anatomic M-Mode Imaging Parameters:

1. Tap the touch screen **M** button.
2. Press the console  button.
3. Tap the touch screen **Anatomic** button.
4. On the touch screen, tap the desired imaging parameter button to make any required adjustments. (e.g., **MapM** or **ChromaM**).
5. Turn the associated touch screen dial to adjust the imaging parameter.

5.1.7.2 Color M-Mode Imaging

To Activate Color M-Mode Imaging:

1. Tap the touch screen **M** button.
2. A live full screen **2D** image appears with an **M-Mode** cursor.

Note: Refer to **Layout in Table E-1** and **8.2.20 Imaging Modes** to customize the **M-Mode** display settings and screen layouts.

3. Press the console  button.
4. Tap the touch screen **Color** button.
5. Tap **M** to exit **M-Mode** and return to **2D** imaging.

To Select/Adjust Touch Screen Color M-Mode Imaging Parameters:

1. Tap the touch screen **M** button.
2. Press the console  button.
3. On the touch screen, tap the desired imaging parameter button to make any required adjustments. (e.g., **MapM** or **ChromaM**).
4. Turn the associated touch screen dial to adjust the imaging parameter.

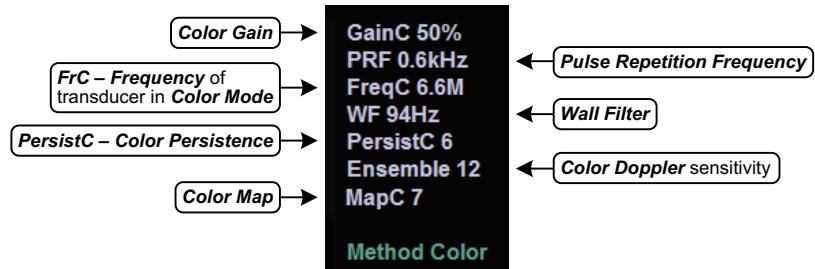
5.2 COLOR/POWER DOPPLER

Color Doppler is used to detect blood flow and determine flow direction. **Power Doppler** is more sensitive to low flow rate in small vessels, but offers no directional information. **Color Power Doppler** is **Power Doppler** with a red/blue color map providing directional flow information.

Figure 5-7: Color Doppler Image



Figure 5-8: Color Doppler Imaging Parameters



Note: Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

5.2.1 Color Doppler Imaging Mode

To Activate Color Doppler Imaging Mode:

1. Tap the touch screen **Color** mode button.
2. Use the trackball to position the **Color** ROI box to the area of interest or to resize the **Color** ROI box.

Note: Use the  button to toggle control of the trackball for **Color** ROI box positioning, **Color** ROI box resizing and **PW** cursor/Gate positioning.

The **Color** ROI box moves with the **PW** cursor.

3. Tap **Color** to exit **Color Doppler** imaging.

To Select/Adjust Touch Screen Color Imaging Parameters:

1. Tap the touch screen **Color** mode button.
2. On the touch screen, tap the desired imaging parameter button to make any required adjustments. (e.g., **PersistC**).
3. Turn the associated touch screen dial to adjust the imaging parameter (e.g., turn dial left to decrease the amount of **Persistence**/turn dial right to increase the amount of **Persistence**).

5.2.2 Power Doppler Imaging Mode

To Activate Power Doppler Imaging Mode (Method 1):

1. Tap the touch screen **Color** mode button.
2. Tap the **Power Doppler** mode action button to activate **Color Power Doppler** imaging.
3. Use the trackball to position the **Color Power** ROI box to the area of interest or to resize the **Color Power** ROI box.

Note: Use the  button to toggle control of the trackball for **Color** ROI box positioning, **Color** ROI box resizing and **PW** cursor/Gate positioning.

The **Color** ROI box moves with the **PW** cursor.

4. Tap **Power Doppler** to exit **Color Doppler** imaging.

To Activate Power Doppler Imaging Mode (Method 2):

1. Tap the touch screen **Color** mode button.
2. Tap the touch screen **Method** button and turn the associated dial to cycle through the options: **Color**, **Power** and **TDI (Tissue Doppler Imaging)**.

5.2.3 Tissue Doppler Imaging (TDI)

To Activate Tissue Doppler Imaging:

1. Tap the touch screen **Color** mode button.
2. Tap the touch screen **Method** button and turn the associated dial to cycle through the options: **Color**, **Power** and **TDI**.

5.2.4 Color Flow Imaging

To Activate Color Flow Imaging:

1. Tap the touch screen **Color** mode button.
2. Tap the touch screen **Method** button and turn the associated dial to cycle through the options: **Color**, **Power**, **TDI**, **Color Flow** and **Power Flow**.

5.2.5 Power Flow Imaging

1. Tap the touch screen **Color** mode button.
2. Tap the touch screen **Method** button and turn the associated dial to cycle through the options: **Color**, **Power**, **TDI**, **Color Flow** and **Power Flow**.

5.2.6 Simultaneous 2D/Color

To Activate Split Screen with Simultaneous Live 2D/Color and Live 2D:

1. Tap the touch screen **Color** mode button.
2. Tap the **Sim 2D/C** mode action button.

Note: The live, **2D** image with **Color** is displayed on the left side of the image field and the same live, **2D** image without **Color** is simultaneously displayed on the right side of the image field. Freezing the image will freeze both sides simultaneously.

Cine review will review both sides simultaneously.

3. Use the trackball to position the **Simultaneous 2D/Color** ROI box to the area of interest or to resize the **Simultaneous 2D/Color** ROI box.

Note: Use the  button to toggle control of the trackball for **Color** ROI box positioning, **Color** ROI box resizing and **PW** cursor/Gate positioning.

The **Color** ROI box moves with the **PW** cursor.

4. Tap **Sim 2D/C** to exit **Simultaneous 2D/Color** imaging.

5.3 PULSED AND CONTINUOUS WAVE DOPPLER (PW AND CW) AND TRIPLEX

Notes:

Triplex is not available:

- when **Cardiac** is selected as the **Application**
- in **CW**.

The **Triplex** touch screen button is not available when using the **VAS-SOCD** and **VAS-TCD** Presets with the SA4-2/24 transducer.

To ensure proper function, insert the SA4-2/24 transducer into the second or third transducer connection port.

ECG functionality is a licensed option that is intended for use with the **Cardiac Application**.

ECG functionality is only available if:

- the **ECG** option has been licensed
- the SA4 transducer is connected
- **Cardiac** has been selected as the active **Application**.

Figure 5-9: PW Doppler Imaging (Combined with Triplex)

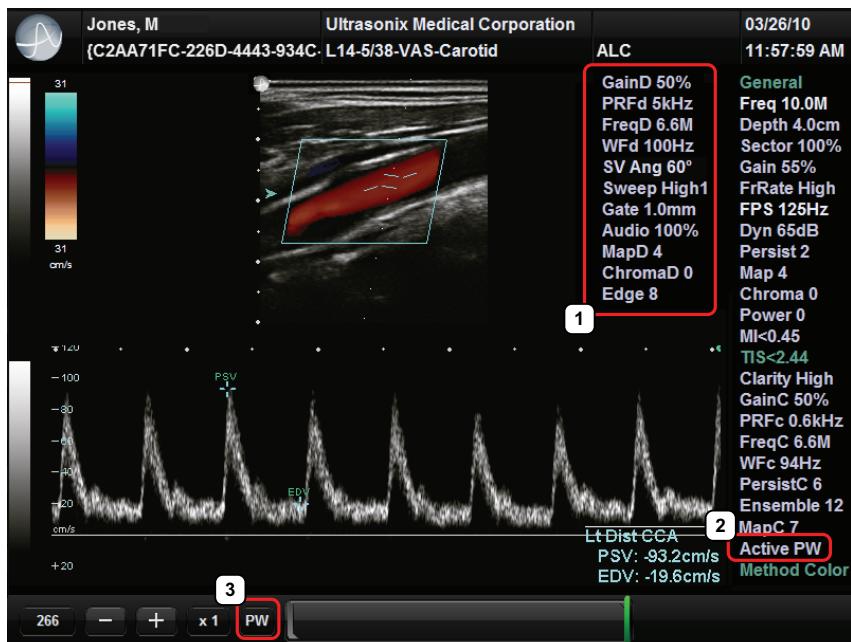
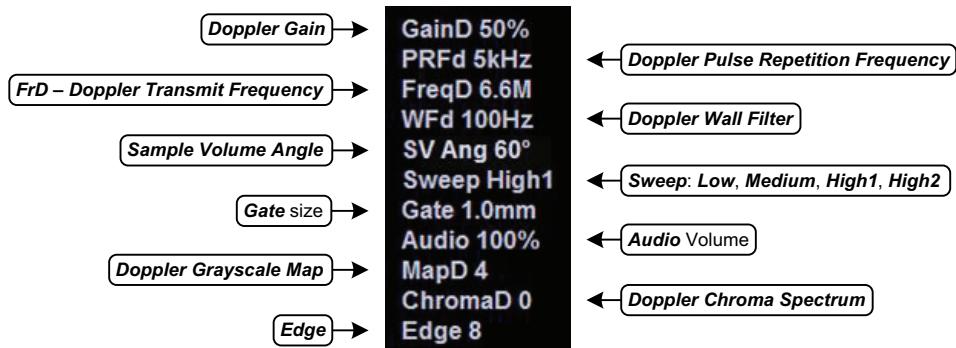


Table 5-4: PW Doppler Imaging (Combined with Triplex)

1 PW Doppler Imaging Parameters Refer to [Figure 5-10](#) and [Appendix E](#) for details.

2 Cine Frame Mode	Indicates Cine frames actively available for each imaging mode: <ul style="list-style-type: none"> • PW (Doppler Trace) • PW (Doppler Trace) • B (2D with and without Color). Press  to toggle control between modes.
--------------------------	--

3 Active Imaging Mode	Indicates active imaging mode(s) when unfrozen: <ul style="list-style-type: none"> • Active PW (Doppler Trace) • Active CW (Doppler Trace) • Active B (B-Mode or 2D) • Active B/PW (Simultaneous 2D and Doppler Trace) • Active B/C (2D with Color) • Triplex. Press  to toggle control between modes.
------------------------------	--

Figure 5-10: PW/CW Doppler Imaging Parameters


Note: Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

5.3.1 PW Imaging Mode

To Activate PW Doppler Imaging Mode:

1. Tap the touch screen **PW** mode button.

Note: Refer to **Layout in Table** and **8.2.20 Imaging Modes** to customize the **Doppler** display settings and screen layouts.

2. Use the trackball to position the **Doppler** cursor/**Gate** to the area of interest.
3. Press the console  button to display a live **Doppler Trace** and a frozen **2D** image/cursor.
4. Press  to toggle back and forth between **PW Trace** and **2D**/cursor.
5. Tap **B** to exit **PW** imaging mode.

To Select/Adjust Touch Screen PW Doppler Imaging Parameters:

1. Tap the touch screen **PW Doppler** button.
2. Press the console  button.
3. Tap the desired selection (e.g., **Chroma**).
4. Turn the associated touch screen dial to adjust the imaging parameter (e.g., turn dial left to decrease setting/turn dial right to increase setting).

5.3.2 CW Imaging Mode

To Activate CW Doppler Imaging Mode:

1. Tap the touch screen **CW** mode button.

Note: Refer to [Layout in Table](#) and [8.2.20 Imaging Modes](#) to customize the **Doppler** display settings and screen layouts.

2. Use the trackball to position the **Doppler** cursor in the area of interest.

Note: Use the **PW** button/dial to control the **CW Gain**.

3. Press the console  button to display a live **Doppler Trace** on the bottom of the image field and a frozen **2D** image/cursor on the top of the image field.
4. Press  to toggle between **CW Trace** and **2D** cursor both in live or frozen imaging states.
5. Tap **CW** to return to full screen **2D/CW** cursor.
6. Tap **B-Mode** to exit **CW** imaging mode.

To Select/Adjust Touch Screen CW Doppler Imaging Parameters:

1. Tap the touch screen **CW Doppler** button.
2. Press the console  button.
3. Tap the desired selection (e.g., **GainD**).
4. Turn the associated touch screen dial to adjust the imaging parameter (e.g., turn dial left to decrease setting/turn dial right to increase setting).

5.3.3 Triplex Imaging Mode

Triplex imaging mode combines live **2D/Color Doppler** with live **PW Doppler** imaging, allowing the user to image with **2D/Color** and **PW Doppler** modes simultaneously.



Caution: *Triplex* imaging may diminish the quality of the **2D/Color** image and may cause **Doppler** artifacts.

Notes:

Triplex is not available when **Cardiac** is selected as the **Application**.

Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

To Activate Triplex Imaging Mode:

Note: *Triplex* is not available when **Cardiac** is selected as the **Application**.

1. Activate **Color** and **Pulsed Doppler** imaging modes.
2. Press the console  button.
3. Tap the touch screen **Triplex** button.

Note: Once **Triplex** is active, press the console  button to toggle through **Active PW**, **Active B/C** and **Triplex** imaging modes.

4. If required, tap **Layout** to move to the appropriate **Split Imaging** selection.

Note: Refer to **Layout** in [Table E-1](#) and [8.2.20 Imaging Modes](#) to customize the display settings and screen layouts.

5. Tap **Triplex** again to return to **Duplex** imaging.

5.4 AUTO-GAIN/B

Auto-Gain/B automatically optimizes image brightness for the following modes:

- **B**
- **Dual/Quad**
- **Compound (Spatial Compounding)**
- **Color**
- **PW Doppler**
- **Triplex.**

To Initiate Auto-B Functionality:

1. With an active image in any of the supported modes, tap the touch screen **Gain** button.
2. Press the associated dial to initiate the **Auto-Gain/B** function.

5.5 ELASTOGRAPHY

Elastography is used to measure tissue stiffness.

Note: Elastography is supported on all transducers.

Figure 5-11: Elastography Imaging

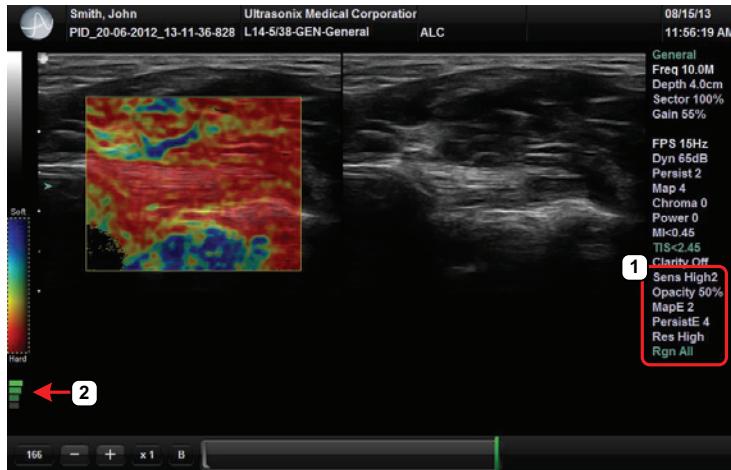


Figure 5-12: Elastography Imaging Parameters

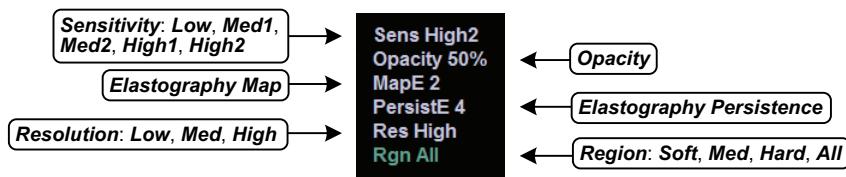


Table 5-5: Elastography Imaging

1	Elastography Imaging Parameters	Refer to Figure 5-12 and Appendix E for details.
2	Compression/Deformation Feedback Indicator	Tracks the amount of compression/deformation being applied to the tissue. Compression/deformation is defined as insufficient, acceptable or too much. Refer to Figure 5-13 and Table 5-6 for Feedback Indicator examples.

Figure 5-13: Compression/Deformation Feedback Indicator

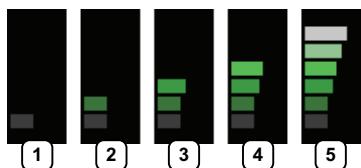


Table 5-6: Compression/Deformation Feedback Indicator

1 and 5 Not acceptable (too little or too much pressure).

Acceptable.
2 to 4

***Note:* Acceptable has a wide range.**

Table 5-7: Strain Ratio

Soft then Hard Measurement	Strain Ratio value is less than one.
Hard then Soft Measurement	Strain Ratio value is greater than one.

***Note:* Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.**

To Activate Elastography Imaging Mode:

1. Ensure a transducer is both connected to the system and currently active.
-
- Note:* To select the transducer, tap the touch screen **Presets...** button.**
2. Tap the touch screen **Elasto** button.

5.6 SonixGPS



Warning: This user manual does not include a comprehensive discussion of the SonixGPS option. For complete details on using SonixGPS, read and follow all instructions and warnings in the most recent SonixGPS User Manual.

SonixGPS enables **Operators** to plan, then view the needle route as it enters the patient. Spatial positioning of the needle—with respect to the ultrasound image—is updated in real-time.



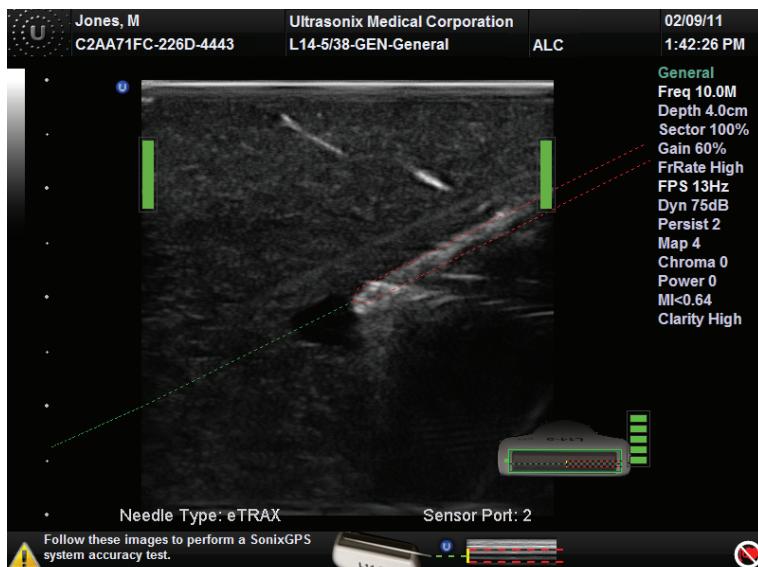
Warnings:

SonixGPS is a guidance system. It is intended to be used only as an aid for qualified, experienced medical personnel in order to verify the correct needle path. Metallic interference, needle deflection, as well as various other factors, will affect the accuracy of tracking the needle.

Before attempting to use the SonixGPS option, carefully read and follow all warnings, precautions and directions detailed in this manual. In addition to helping ensure safe operation, this will aid the Operator in achieving optimal operating conditions.

When used under optimal operating conditions by an experienced medical professional, **SonixGPS** can achieve an accuracy rating as high as ± 2 mm.

Figure 5-14: SonixGPS Imaging



Warning: Some SonixGPS components may interfere with nearby electrical systems or anyone relying on life-sustaining equipment, such as a pacemaker or defibrillator.



5.7 PANORAMIC IMAGING

Panoramic imaging enables the user to generate a panoramic view of the **2D** ultrasound image field, which is much wider than the typical transducer field of view.

Panoramic images are composed of several standard ultrasound images acquired as the transducer is moved along the anatomical area of interest in a direction parallel to the transducer array. The resulting compound or composite image displays a large cross section of the area of interest which can then be viewed, measured, labeled and archived.

Figure 5-15: Panoramic Image



Warning: Measurements performed on an acquired **Panoramic** image may be inaccurate as the accuracy of the geometric re-composition is very user-dependent. Measurements performed on an acquired **Panoramic** image should be used for informational purposes only.

Note: Refer to [Appendix E](#) for details on touch screen Mode Action and Imaging Parameters buttons.

To Activate the Panoramic (Pano) Imaging Mode:

Note: The **Pano** ROI box can only be *vertically* resized and/or repositioned.

1. Tap the touch screen **Pano** button during live **2D** imaging.
2. A progress bar with the message **Loading Panoramic Tables...** will be presented onscreen.

Note: This may take a few seconds. The **Panoramic** feature is ready to use when a white **Pano** ROI box appears on the **2D** image and **Pano Ready** appears in the lower left corner of the image field.

3. Use the trackball to vertically position the **Pano** ROI box.

Note: The edge of the **Pano** ROI box will be marked with a solid line.

4. Press ↘ to set it.

Note: The edge of the **Pano** ROI box will change to dotted line.

5. Use the trackball to vertically resize the **Pano** ROI box.

Note: To switch back and forth between positioning (solid line) and resizing (dotted line) the **Pano** ROI box, press the ↘ button.

6. To begin acquiring a **Panoramic** image, position the left side of the anatomical area of interest within the **Pano** ROI box.
7. Press the console ⚡ button or tap **Pano Start/Stop** on the touch screen to begin the **Panoramic** acquisition.
8. Move the transducer along a path parallel to the transducer array in the area of interest. For best results move the transducer at a slow and steady pace.
9. When a suitable **Pano** image is acquired, press ⚡ or ⚡ or tap **Pano Start/Stop** on the touch screen.
10. The generated **Panoramic** image appears in the image field.
11. Tap **Pano Exit** to exit **Panoramic** imaging mode and return to **2D** imaging.



Warning: Measurements performed on an acquired **Panoramic** image may be inaccurate as the accuracy of the geometric re-composition is very user-dependent. **Measurements** performed on an acquired **Panoramic** image should be used for informational purposes only.

5.8 SonixDVR RECORDING

Once configured, a **SonixDVR Recording** can be made of any imaging session.

Note: A physical recording device is not required.

Once configured and activated a red recording icon (REC) will flash at the bottom right of the imaging screen and an **MPG** video will be created. All system actions initiated during the recording session will be captured in the **MPG**.

Each time a **SonixDVR Recording** is started/stopped, a message will be displayed in the bottom left of the imaging screen.

Note: A **SonixDVR Recording** cannot be transferred via **DICOM**. Use the **Image Transfer** process (9.3) to export these files.

There are two ways to create a **SonixDVR** recording:

- via **Custom Keys** (8.2.14), so an **Operator** can start/stop a recording at will
- automatically, via **Capture Settings** (8.2.19), so a recording starts every time a new exam is initiated.

5.9 2D CINE OPTIONS

The **Cine** option is programmed to record at the displayed, **B-Mode Frame Rate** unless the **B-Mode Frame Rate** is set to less than 30 Hz. When this occurs, the **Cine** recording speed will default to 30 Hz.

Note: This does not apply to spectrum modes such **M-Mode** and **PW**. When in spectrum modes, the **Cine** recording speed will default to 30 Hz.

5.9.1 2D Cine Frame Indicators

Figure 5-16: 2D Cine Frame Indicators

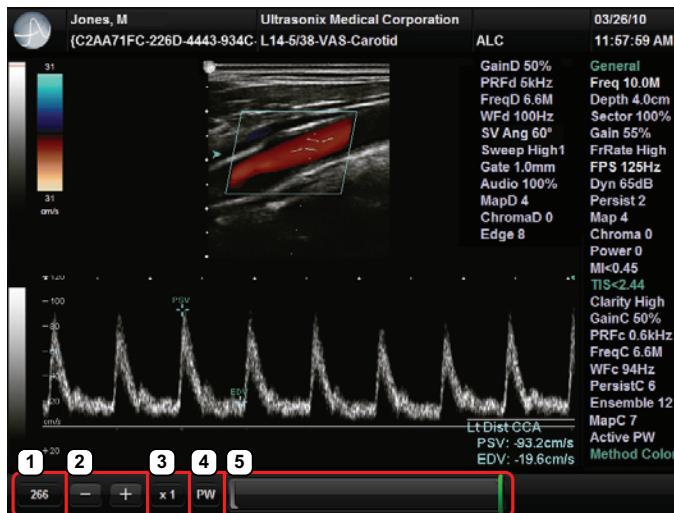


Table 5-8: 2D Cine Frame Indicators

1 Cine Frame	Marks the current Cine frame (number coincides with green marker in 5).
2 Cine Advance/Reverse	Advances (+) or reverses (-) the Cine loop , one frame at a time.
3 Cine Play Speed	Activates Cine Play Speed (1/8, 1/4, 1/2, Full (1) or Double (2)).
4 Active Imaging Cine	Marks the Active imaging Cine . Refer to Table 5-4 for more details.

5 Cine Loop Slider

Allows the **Operator** to select the:

- start frame
- end frame
- single (current) frame.

Cine loop start and end markers are gray, while the **green** marker denotes the current **Cine** frame (item 1 lists the corresponding frame number).

Use the trackball and cursor to drag the start and/or end markers to define **Cine loop** limits.

Once defined, the **Cine loop** can be saved using **Custom Keys** (8.2.14).

Note: When an image is frozen, the slider will always be set with the start/end markers to the far left/right with the **green** marker at the end of the loop (far right).

Note: Use the trackball and cursor to change any of the settings.

5.9.2 2D Cine Options

For details on **4D Cine** options, refer to [Table 5-13](#).

Figure 5-17: 2D Cine Touch Screen Options

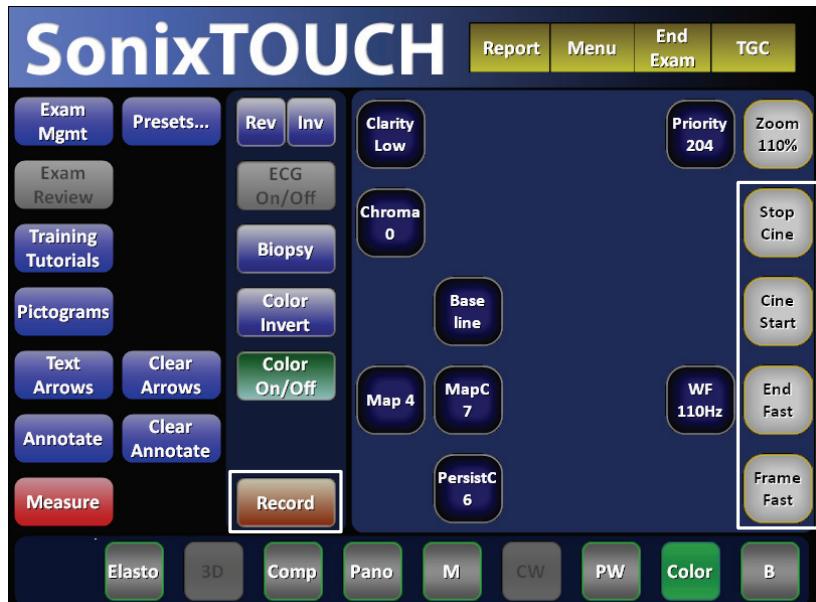


Table 5-9: Cine Mode Action Buttons (tap to activate)

Record	Tap to store the selected Cine frames to the system or press the appropriate Custom Key button (8.2.14).
---------------	--

Table 5-10: Cine Imaging Parameters (tap to activate, dial/press to adjust/trigger)

Play Cine	Tap to activate, then turn the associated dial to select the Cine Play Speed ($\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, Full (1) or Double (2)).
Stop Cine	Press the associated dial to trigger the Play/Stop actions.
Cine Start	Tap to activate, then press the associated dial to select the desired option (e.g., Cine Start or Start Fast).
Start Fast	When creating a Cine clip from a Cine loop :
Cine End	<ul style="list-style-type: none"> • Cine Start/Cine End selects the start/end frame of the clip, moving one frame at a time.
End Fast	<ul style="list-style-type: none"> • Start Fast/End Fast selects the start/end frame of the clip, moving 10 frames at a time.
	Turn the associated dial to advance one frame (Start) or 10 frames (Start Fast) at a time.
Cine Frame	Tap to activate, then press the associated dial to select the desired option (e.g., Cine Frame or Frame Fast).
Frame Fast	<ul style="list-style-type: none"> • Cine Frame selects the currently displayed frame and moves one frame at a time. • Frame Fast selects the currently displayed frame and moves 10 frames at a time.
	Turn the associated dial to trigger the action.

Notes:

*Changes made to **Depth**, **Gain**, etc., will reset the number of frames available for review or storage.*

***Cine loop** storage is a retrospective acquisition.*

5.9.3 Cine Clip Storage

To Store a 2D or 2D/Color Cine Clip:

1. Ensure a suitable image is visible on the LCD display.
2. Press the console  button.
3. The image field will freeze and the touch screen will refresh with the **Cine** controls displayed.

Note: Refer to [5.11 Standard and Advanced 3D/4D Imaging](#) for details on capturing a **3D/4D image**.

To Select/Adjust Touch Screen Cine Controls:

1. Tap the touch screen **Cine** tab.
2. Tap desired selection (e.g., **Cine Start**).
3. Use the touch screen dial beside the column containing the desired selection to make the adjustment to the **Cine** clip.

5.9.4 Raw Cine Manipulation

Once saved, a raw **Cine loop** can be edited as if it the exam was still currently active. Any frozen editing option available to an **Operator** during an exam will also be available to manipulate the saved raw **Cine** data (e.g., **Measurements**, imaging parameter changes, etc.).

To save raw **Cine** data for future manipulation, configure a **Custom Key** with the **Record Raw Cine** option ([8.2.14](#)).

To access a raw **Cine loop**, open an exiting Patient/exam using the **Exam Management** page **Review** button or via **Exam Review** ([Chapter 9](#)).

A raw **Cine loop** thumbnail will be marked with the word **RAW**.

Note: While there is no time limit on the ability to edit raw **Cine** data, once a **Software Update** is performed ([8.2.22](#)), previously existing raw **Cine loops** will cease to be available for manipulation (i.e., raw **Cine loops** can only be saved and edited with the same software version).

5.9.5 Stored Thumbnail Review

The **Stored Thumbnail Review** is displayed at the bottom of the LCD display.

Note: **Cine loops** can also be accessed via **Exam Review** ([Chapter 9](#)).

To Review a Thumbnail Image/Cine Clip During an Exam:

1. Move the trackball arrow over the desired thumbnail and press the console  button.

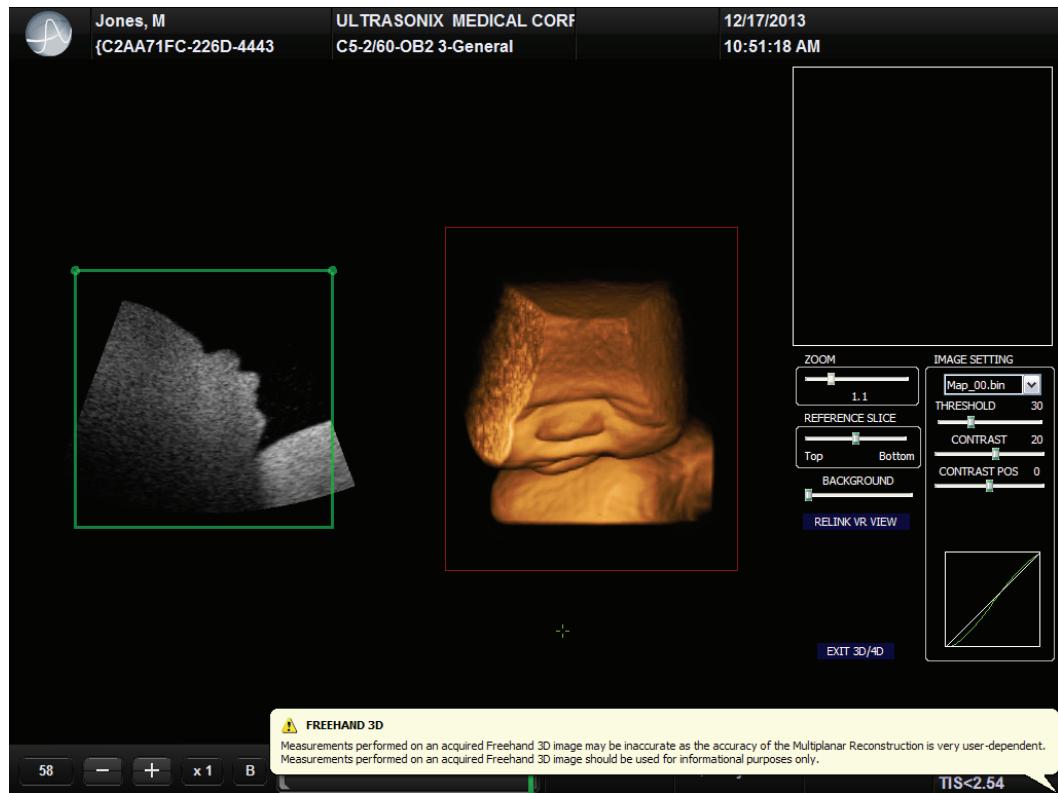
Note: Once the trackball arrow is over a thumbnail, a red  will be presented in the top right hand corner. Select the  and press  to delete the thumbnail.

2. Press  again to return to imaging mode.

5.10 FREEHAND 3D IMAGING (ALL NON-4D SONIX TRANSDUCERS)

Freehand 3D is designed to enable users to determine the type of imaging (**Parallel** or **Fan**) after an image is acquired.

Figure 5-18: Freehand 3D



Warning: Measurements performed on an acquired **Freehand 3D** image may be inaccurate as the accuracy of the **Multiplanar Reconstruction** is very user-dependent. Measurements performed on an acquired **Freehand 3D** image should be used for informational purposes only.

Figure 5-19: Freehand 3D Configuration Options

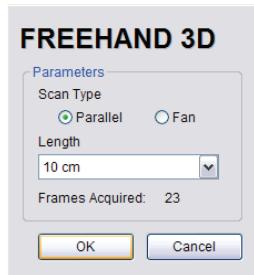


Table 5-11: Freehand 3D Configuration Options

Scan Type	Parallel	Select Parallel as the Scan Type to measure the Length of a linear path in centimeters.
	Fan	Select Fan as the Scan Type to measure a pivot Angle in degrees.
Length/Angle		When Scan Type = Parallel , the Length selection range is 1 cm to 25 cm, with adjustments available in 1 cm increments. When Scan Type = Fan , the Angle selection range is 5° to 90°, with adjustments available in 5° increments.
Frames Acquired		Lists the number of Frames Acquired during imaging. These Frames are used to form the Freehand 3D image.

To Acquire a Freehand 3D Image:

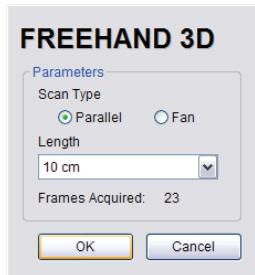
1. Tap the touch screen **Presets...** button and select the appropriate **Application-Transducer-Preset** combination.

Note: The **Imaging Preset** selected at this point will provide underlying **2D/B-Mode** imaging parameters. Once the image is acquired and the system moves to **3D** imaging, the **2D/B-Mode** imaging parameters cannot be changed.

If desired, a user-defined **Preset** can be created in order to optimize the **2D/B-Mode** imaging parameters used to acquire a **Freehand 3D** image.

2. Tap the touch screen **3D** button.
3. Position the transducer to one side of the anatomical area of interest.
4. Press the console  button to begin the acquisition.
5. Move the transducer over the area of interest in either a **Parallel** or **Fan** motion.
6. Press  or  to complete the acquisition.

7. Select the **Freehand 3D Scan Type**.



Note: The **Scan Type** selected should match the motion used to acquire the image: **Parallel** or **Fan**.

8. Select the appropriate **Length** or **Angle** setting from the drop-down menu.
9. Select **OK** to complete the configuration.
10. The acquired image will be rendered to the **3D/4D** LCD display in the **A|VR** format.

Note: Use **Standard 3D/4D** imaging options to optimize the **Freehand 3D Volume** (refer to **5.11.1** for details).

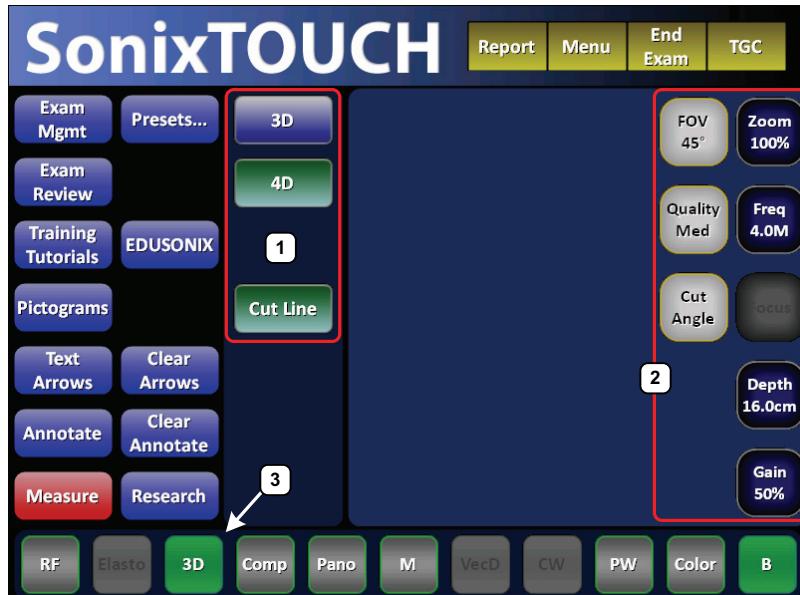
11. Tap  to exit **Freehand 3D**.

5.11 STANDARD AND ADVANCED 3D/4D IMAGING

Standard or Advanced 3D/4D Imaging are only available to customers who have purchased the relevant license and transducer(s) for this option.

Note: Only **Standard 3D** imaging options will be available to **Operators** using **Freehand 3D**.

Figure 5-20: 3D/4D Touch Screen Buttons

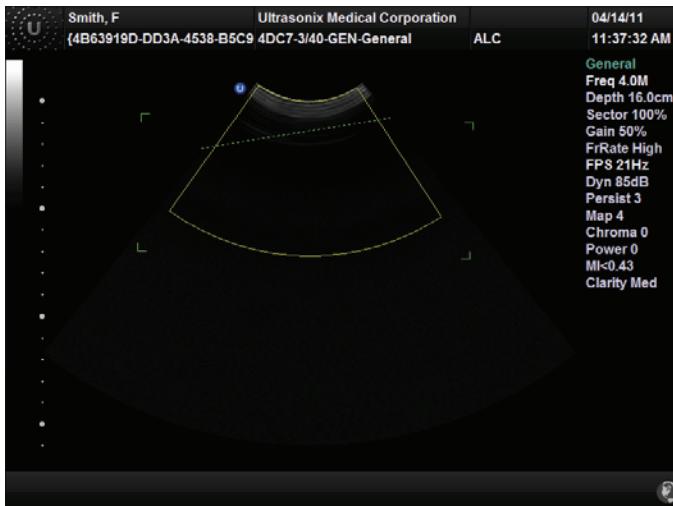


Note: The **3D** mode selection button is only available if a **4D** transducer has been connected (3.2) and selected (via the touch screens **Presets...** button).

Table 5-12: 3D/4D Touch Screen Buttons

1	Mode Action Buttons	
2	Imaging Parameter buttons	Refer to Appendix E for details on the specific buttons, including FOV , Quality and Cut Line .
3	Mode Selection Button	

Figure 5-21: 3D/4D Imaging Screen with Cut Line Toggled On



To Enter Standard or Advanced 3D/4D Imaging:

1. Ensure a **4D** transducer is connected to the system.

Note: The **4D** transducer must be inserted into the upper most transducer connection port to ensure proper function.

Only one **4D** transducer can be connected at a time.

Refer to [3.2 Connecting Transducers](#) for connection details.

2. Ensure a patient is active.

Note: Refer to [4.3 Beginning an Exam for a New Patient](#) for details on entering data for a new patient or [4.7.1.1](#) to select an existing patient.

3. Tap the touch screen **Presets...** button.

Note: If desired, users can select either **OB 1st Trimester** or **OB 2nd–3rd Trimester** as the **Application** then the factory installed **OB4D Preset**.

While this will not affect the actual **3D/4D Presets** available in **3D** mode, it will configure the underlying **2D** imaging parameters.

As an alternative, users can also create their own user-defined **2D Preset** ([4.8](#)) to configure the underlying **2D** imaging parameters.

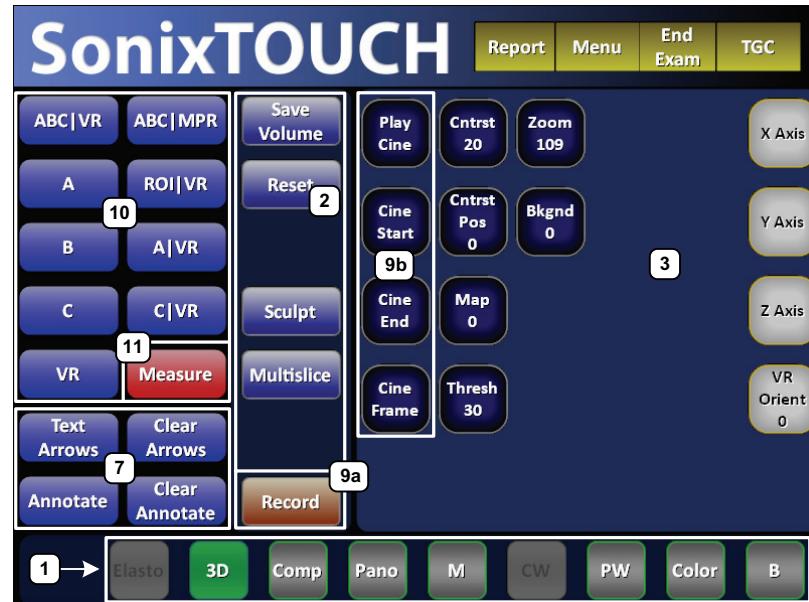
4. From the touch screen list of available transducers, tap the appropriate **4D** transducer.
5. Set the **FOV**, **Quality** and **Cut Line** as required.
6. Tap the touch screen **3D** mode selection button.
7. Tap the relevant touch screen mode action button: **3D** or **4D**.
8. Use the trackball and console  button to position and adjust the size of the ROI.
9. Press the console  button to begin imaging.

5.11.1 3D/4D Touch Screen Layout

Other than **Cine** options, **3D** imaging options are identical to **4D** options once the 4D image has been frozen. For details on **3D/4D** image acquisition, refer to [5.11.4](#).

Note: Many touch screen options are also available from the LCD display.

Figure 5-22: 3D and Frozen 4D Touch Screen Layout



Note: Where applicable, the numbering corresponds to [Figure 3-2](#), [Figure 3-7](#), [Table 3-1](#) and [Table 3-4](#). Refer to these sections for more details on general touch screen layout.

Multislice is not available with **Freehand 3D** or **Standard 3D/4D**.

Table 5-13: 3D (or Frozen 4D) Touch Screen Controls (tap to activate, dial/press to adjust)

1	Mode Selection Buttons	Allow the Operator to change between the various Imaging Modes . The active mode (3D) is highlighted in green.
2	Mode Action Buttons	Enable the application of certain actions to an image (e.g., Sculpt...). Note: Only Reset is available during the acquisition of a 4D image. Multislice and Save Volume are not available with Freehand 3D or Standard 3D .

		Enable adjustments to be made to the available imaging parameters. Turn/press the relevant touch screen dial to adjust the active imaging parameter. If an imaging parameter button is a pale gray/white color, that particular parameter is currently active (e.g., VR Orient). Turn/press the dial directly to the right of the active button to make adjustments.
3	Imaging Parameter Buttons	<p>Note: To adjust an imaging parameter that is <i>not</i> currently active, tap the desired imaging parameter button then turn/press the dial directly to its right (e.g., Zoom).</p> <p><i>Imaging parameter availability is based on image type (3D or 4D) and the state of image acquisition. For example, FOV (Field of View) and Quality are only available during 4D image acquisition, not once the acquired 4D image has been frozen).</i></p>
7	Image Notation Buttons	<p>Annotations Clear Annotations Text Arrows</p> <p>Enable the addition of Arrows and/or Annotations/Text to an image.</p> <p>Note: These options are not mode-specific.</p>
9a	(Cine) Record Button	<p>Available only when an image has been frozen.</p> <p>Note: Cine is not available with Freehand 3D or Standard 3D.</p>
9b	(Cine) Action Buttons	<p>Available only when a 4D image has been frozen. These buttons can also be used in conjunction with the touch screen dial directly to their right.</p> <p>Use Cine Start and Cine End to mark the beginning and end of the Cine loop.</p> <p>Cine Frame toggles between Frame by Frame and continuous Cine loop viewing.</p> <p>Note: If a Cine action button is a pale gray/white color, that parameter is currently active. Turn the dial directly to the right of this parameter in order to make adjustments.</p> <p>To adjust a Cine action button that is not currently active, tap the button then press the dial directly to its right to toggle it and/or turn the dial to make the required adjustment.</p> <p>The Cine buttons can be toggled (press dial) as well as turned.</p> <p>Refer to 5.9 for more details on Cine.</p>
10	Display Mode Options	<p>ABC VR ABC MPR ROI VR A VR C VR A B C VR</p> <p>Touch screen layout defaults to Display Mode options. Refer to Table 5-16 for details on these options.</p> <p>To access Sculpt... and Multislice touch screen layouts, refer to item 2, above.</p> <p>Note: Display Mode options are also available from the LCD display. For details, refer to 5.11.2.1.</p>
11	Measure	Tap to access 3D/4D Measurement Packages .

5.11.1.1 4D Cine Options

Figure 5-23: 4D Cine Options



Table 5-14: 4D Cine Options (tap to activate, dial/press to adjust)

	Tap to save the Volume data. This allows Operators to reopen the 3D image (and manipulate its settings) during the exam, as long as it remains the Current exam. It can also be reopened later using the Review option on the Exam Management page.
Save Volume	Images that have been saved using the Save Volume option will be marked with a 3D box icon. 
	Note: To access the 3D version of the image press the console  button and select the relevant patient/exam from the Patients tab. Select OK to review the exam session. Select the appropriate image from the thumbnails at the bottom of the exam screen and configure the 3D image as desired.
	<i>This option is not available for Freehand 3D.</i>
Play/Stop Cine	Tap to start or stop the Cine loop .
Record	Tap to Record a Cine loop .
Cine Start/Start Fast Cine End/End Fast Cine Frame	Tap to activate, then press the associated dial to select the desired option (e.g., Cine Start or Start Fast). When creating a Cine clip from a Cine loop : <ul style="list-style-type: none"> • Cine Start/Cine End selects the start/end frame of the clip, moving one frame at a time. • Start Fast/End Fast selects the start/end frame of the clip, moving 10 frames at a time. Turn the associated dial to advance one frame (Start) or 10 frames (Start Fast) at a time. Note: If a Cine action button is a pale gray/white color, that parameter is currently active. Turn the dial directly to the right of this parameter in order to make adjustments. <i>To adjust a Cine action button that is not currently active, tap the button then press the dial directly to its right to toggle it and/or turn the dial to make the required adjustment.</i> <i>The Cine buttons can be toggled (press dial) as well as turned.</i>

To Store a 4D Cine:

1. Ensure a suitable image is visible on the LCD display.
2. Press the console  button.
3. The image field will freeze and the touch screen will refresh with the **Cine** controls displayed.

Note: Refer to [5.11 Standard and Advanced 3D/4D Imaging](#) for details on capturing a **3D/4D image**.

.Once an image has been frozen, the following **Cine** controls discussed in [Table 5-14](#) are available on the touch screen.

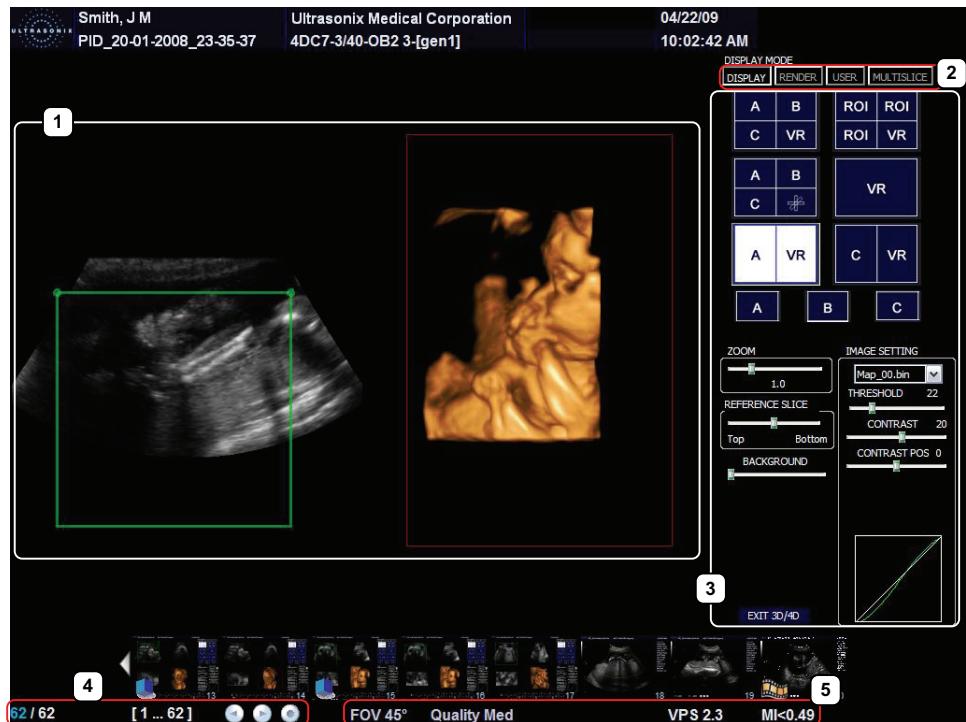
5.11.2 3D/4D LCD Display Layout

The LCD display is divided into two major sections:

- imaging on the left
- editing functionality on the right.

Note: On the LCD display, use the trackball, cursor and  button to change **Display Mode** options. To move a slider to a new position, position the mouse arrow over the slider, press the console  button then use the trackball to move the slider.

Figure 5-24: 3D/4D Display Mode LCD Display



Note: Multislice is not available with Freehand 3D or Standard 3D/4D.

Table 5-15: 3D/4D LCD Display Options

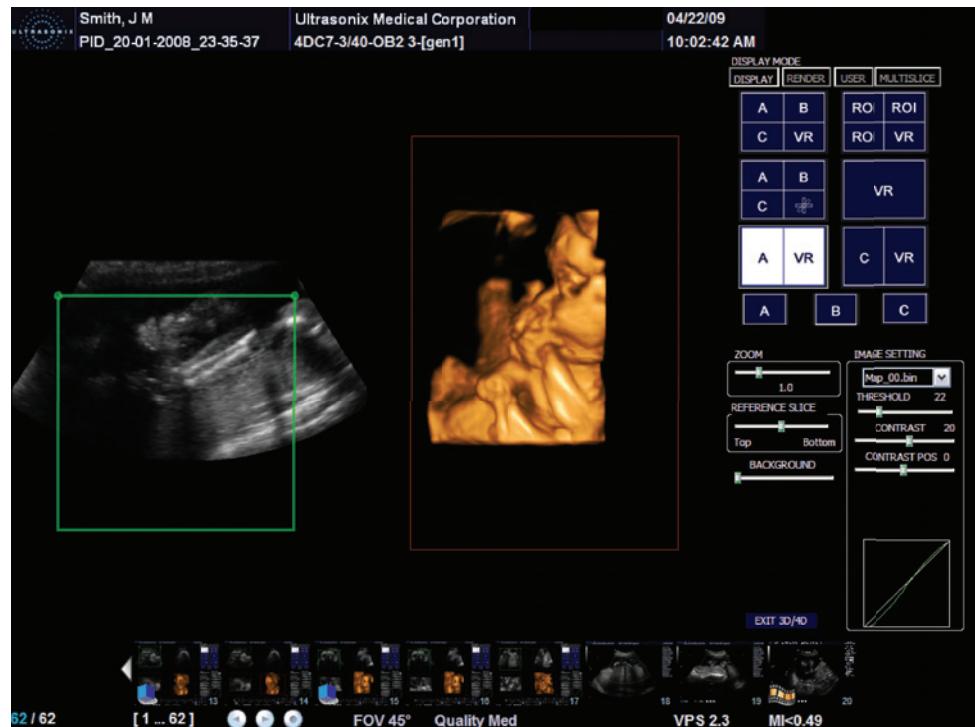
1	<i>Imaging</i>	Displays the selected image format.
2	<i>Mode Selection Buttons</i>	Allow the Operator to change between the various 3D/4D modes: Display , Render , User and Multislice . Note: Display and Multislice options are also available from the touch screen.
3	<i>Mode Options and Imaging Parameters</i>	Enable the application of certain actions to an image. For example, in Display Mode , the Operator can select image presentation (A B C VR) as well as edit imaging parameters (Zoom , Map , Threshold , etc) to adjust the image as desired.
4	<i>Cine Frame Indicators</i>	Available only after a 4D image has been frozen. Refer to 5.11.4.2 for details.
5	<i>Additional LCD Display Details</i>	Refer to 5.11.3 for details.

5.11.2.1 3D/4D Display Mode (LCD Display and Touch Screen Options)

Once a **3D** image has been acquired or a **4D** image has been frozen, the following LCD display and touch screen will be presented.

Note: *Cine controls will be inaccessible (i.e., grayed out) for all 3D images.*

Figure 5-25: 3D/4D Display Mode LCD Display



Note: On the LCD display, use the trackball, cursor and button to change **Display Mode** options. To move a slider to a new position, position the mouse arrow over the slider, press the console button then use the trackball to move the slider. Press again to anchor the slider in the new position.

Figure 5-26: 3D/4D Display Mode Touch Screen



Table 5-16: 3D/4D Display Mode Options (Touch Screen and/or LCD Display)

Displays **A**, **B (Transverse)** and **C (Coronal) Plane** images with a **3D/4D VR (Volume Rendering)** image and allows the repositioning of both the **A**, **B** and **C Plane** ROI boxes and the **MPR Plane** intersection point.

Operators also have the ability to edit the position of the top line of the ROI box (spline editing).

ABC|VR

Note: Refer to the following sections for more details:

[5.11.6 Spline Editing of 3D/4D Images](#)

[5.11.7 Repositioning the ROI Box](#)

[5.11.8 Repositioning the MPR Plane Intersection Point.](#)

Displays **A**, **B** and **C Plane** images with a **3D/4D MPR (Multiplanar Reconstruction)** image and allows the ROI (on the **A**, **B** and **C Planes**) to be repositioned.

Operators also have the ability to edit the position of the top line of the ROI box (spline editing).

ABC|MPR

Note: On the LCD display, **MPR** is replaced with the symbol .

Refer to the following sections for more details:

[5.11.6 Spline Editing of 3D/4D Images](#)

[5.11.7 Repositioning the ROI Box](#)

[5.11.8 Repositioning the MPR Plane Intersection Point.](#)

	<p>Displays the A Plane image and allows the ROI to be repositioned. Operators also have the ability to edit the position of the top line of the ROI box (spline editing).</p>
A	<p>Note: Refer to the following sections for more details:</p> <p>5.11.6 Spline Editing of 3D/4D Images 5.11.7 Repositioning the ROI Box.</p>
	<p>Displays A, B and C Plane images along with a 3D/4D VR image and allows the repositioning of the A, B and C Plane ROI boxes. Tap the touch screen Reset button to return the repositioned ROI to its original state.</p>
ROI VR	<p>Note: Refer to the following sections for more details:</p> <p>5.11.6 Spline Editing of 3D/4D Images 5.11.7 Repositioning the ROI Box.</p>
	<p>Displays the B Plane image and allows the repositioning of the B Plane ROI box. Operators also have the ability to edit the position of the top line of the ROI box (spline editing).</p>
B	<p>Note: Refer to the following sections for more details:</p> <p>5.11.6 Spline Editing of 3D/4D Images 5.11.7 Repositioning the ROI Box.</p>
	<p>Displays side-by-side, split-screen view of the A Plane image with a 3D/4D VR of the image and allows the repositioning of the A Plane ROI box. Operators also have the ability to edit the position of the top line of the ROI box (spline editing).</p>
A VR	<p>Note: Refer to the following sections for more details:</p> <p>5.11.6 Spline Editing of 3D/4D Images 5.11.7 Repositioning the ROI Box.</p>
	<p>Displays the C Plane image and allows the repositioning of the C Plane ROI box. Operators also have the ability to edit the position of the top line of the ROI box (spline editing).</p>
C	<p>Note: Refer to the following sections for more details:</p> <p>5.11.6 Spline Editing of 3D/4D Images 5.11.7 Repositioning the ROI Box.</p>
	<p>Displays side-by-side, split-screen view of the C Plane image with a 3D/4D VR image and allows the repositioning of the C Plane ROI box. Operators also have the ability to edit the position of the top line of the ROI box (spline editing).</p>
C VR	<p>Note: Refer to the following sections for more details:</p> <p>5.11.6 Spline Editing of 3D/4D Images 5.11.7 Repositioning the ROI Box.</p>
VR	<p>Displays only the Volume Rendering of the 3D/4D image.</p>
	<p>Note: On the touch screen, tap to activate. On the LCD display, use the trackball, cursor and ↘ button to change Display Mode options.</p>
	<p>All options in this table are available from both the touch screen and the LCD Display.</p>

Table 5-17: 3D/4D Touch Screen Mode Action Buttons (tap to activate)

	Tap to save the Volume data. This allows Operators to reopen the 3D image (and manipulate its settings) during the exam, as long as it remains the Current exam. It can also be reopened later using the Review option on the Exam Management page. Images that have been saved using the Save Volume option will be marked with a 3D box icon.
Save Volume	Note: To access the 3D version of the image tap the touch screen Exam Mgmt button and select the relevant patient/exam from the Patients tab. Select OK to review the exam session. Select the appropriate image from the thumbnails at the bottom of the exam screen and configure the 3D image as desired. <i>This option is not available for Freehand 3D.</i>
Reset	Returns many settings to their defaults, including settings on the various LCD display menus, imaging parameters, etc.
Sculpt...	Tap to access Sculpt options. Note: Refer to 5.11.2.5 for more details on Sculpt...
Multislice	Tap to access Multislice options from the touch screen. Note: Refer to 5.11.2.4 for more details on Multislice . <i>Multislice is not available with Freehand 3D or Standard 3D/4D.</i>
Measure	Tap to access 3D/4D Measurement Packages .  Warning: Measurements performed on an acquired Freehand 3D image may be inaccurate as the accuracy of the Multiplanar Reconstruction is very user-dependent. Measurements performed on an acquired Freehand 3D image should be used for informational purposes only.

Table 5-18: 3D/4D Imaging Parameters (Touch Screen and LCD Display)

Note: The column to the far left indicates where an option is available:

- **TS:** Touch screen only
- **LCD:** LCD display only
- **TS/LCD:** Both the LCD display and touch screen. Note that changes to a setting from the touch screen will be mirrored on the LCD display.

The touch screen **Reset** button applies to all settings in this table.

TS/LCD	Cntrst/Contrast	Adjusts the Cntrst/Contrast settings of the VR on the LCD display. Initially, Cntrst/Contrast adjustments are based on the center of the image. To change this, change the Cntrst Pos/Contrast Pos setting.
TS/LCD	Cntrst Pos/Contrast Pos(ition)	Adjusts the Cntrst Pos/Contrast Pos of the VR on the LCD display. Once moved from the default center position, Cntrst/Contrast adjustments will be centered on the new Cntrst Pos/Contrast Pos setting.
TS/LCD	Zoom	Adjusts the Zoom setting. The range is 0.5 (50%) to 3.0 (300%) in 0.1 (10%) increments.
TS/LCD	Bkgnd/Background	Adjusts the grayscale coloration of the VR Bkgnd/Background on the LCD display.
TS/LCD	Map	Adjusts the coloration of the VR image using pre-defined color Maps . The range for this setting is 0 to 17, inclusive (for all Presets).
TS/LCD	Thresh/Threshold	Use to suppress image artifacts or noise. This setting has a range of 0 to 100, inclusive, where 0 is no noise suppression and 100 is as much noise suppression as possible. <i>Note: The Dynamic Range of the image will be optimized automatically based on the selected Thresh/Threshold setting.</i>
LCD	Reference Slice	Enables users to choose the position of the Slice to be viewed from the active plane. When in Multislice (5.11.2.4), the Reference Slice will be highlighted within a green box.
TS	X-axis	Rotates the selected image about the X-axis .
TS	Y-axis	Rotates the selected image about the Y-axis .
TS	Z-axis	Rotates the selected image about the Z-axis .
TS	VR Orient	Sets the Orientation of the VR .

Note: Refer to 5.11.1.1 for details on **Cine controls**.

5.11.2.2 3D/4D Render Mode (LCD Display Options Only)

Render Mode enables users to configure image style (grayscale or negative), surface settings (*Smooth*, *X-ray*, etc) and image direction (*Top*, *Bottom*, etc).

Note: Some **Render Mode** options are available only with **Advanced 3D/4D**. Refer to the individual fields in [Table 5-19](#) for details.

Figure 5-27: Render Mode LCD Display Options



Note: On the LCD display, use the trackball, cursor and button to change **Render Mode** options. To move a slider to a new position, position the mouse arrow over the slider, press the console button then use the trackball to move the slider.

Table 5-19: Render Mode LCD Display Options

Algorithm	Surface Smooth	Select to smooth the surface rendering of the image in Advanced 3D/4D . Note: This is the default setting for Advanced 3D/4D and is not available in Freehand 3D .
	Surface	Surface rendering of the VR . Note: This is the default setting for Standard 3D/4D .
	Max	Renders voxels with Maximum intensity along the visualization plane.
	X-ray	Provides X-ray -like representation of the Volume model.
	Smooth Level	Adjusts the amount of smoothing applied to Surface Smooth . The range is 0 to 50 in increments of 10, with a default setting of 7. Note: This setting is not available in Freehand 3D .
	Filter Weight	Adjusts sharpness (as applied to Surface Smooth). The range is 0 to 50 in increments of 10, with a default setting of 12. Note: This setting is not available in Freehand 3D
	Filter Strength	Adjusts contrast (as applied to Surface Smooth). The range is 0 to 50 in increments of 10, with a default setting of 12. Note: This setting is not available in Freehand 3D .
	Filter LP (Low Pass) Cutoff	Adjusts the spatial range of the previous three fields: Smooth Level , Filter Weight and Filter Strength . The range is 0 to 50 in increments of 10, with a default setting of 10. A setting of 50 will result in the smallest available spatial range while 0 will result in the greatest range. Note: This setting is not available in Freehand 3D .
	Rendering Direction	Selects the direction from which the image is rendered: Front , Back , Left , Right , Top or Bottom .
	Zoom	Adjusts the Zoom setting. The range is 0.5 (50%) to 3.0 (300%) in 0.1 (10%) increments.
Image Settings	Reference Slice	Enables users to choose the Slice to be viewed from the active plane.
	Background	Adjusts the grayscale coloration of the VR Bkgnd/Background on the LCD display.
	Map	Adjusts the coloration of the active VR using pre-defined color Maps . The range for this setting is 0 to 17, inclusive (for all Presets).
	Threshold	Use to suppress image artifacts or noise. This setting has a range of 0 to 100, inclusive, where 0 is no noise suppression and 100 is as much noise suppression as possible. Note: The Dynamic Range of the image will be optimized automatically based on the selected Thresh/Threshold setting.
	Contrast	Adjusts the Contrast settings of the active image(s). Initially, Contrast adjustments are based on the center of the image. To change this, change the Contrast Pos setting. To make this adjustment the new default setting, save it to a 3D/4D Preset (refer to 5.11.9 for details on 3D/4D Presets).
Contrast Pos(ition)		Adjusts the Contrast Pos of the VR on the LCD display. Once moved from the default center position, Contrast adjustments will be centered on the new Contrast Pos setting.

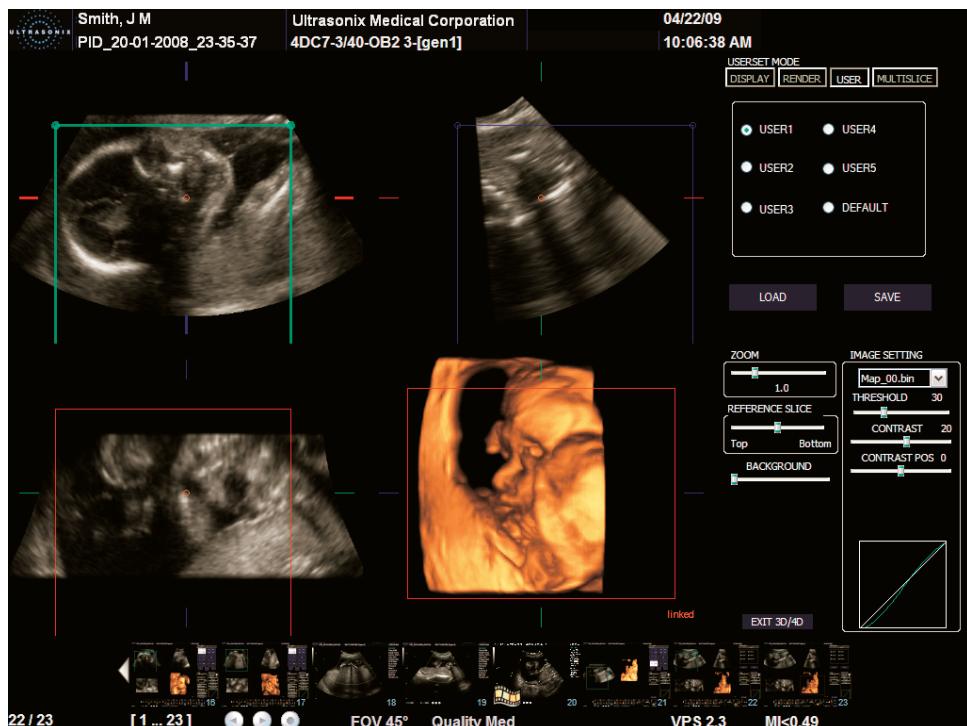
5.11.2.3 3D/4D User Mode (LCD Display Options Only)

User Mode enables the users to:

- return system **Presets** to factory defaults
- create/edit user-defined **Presets**
- select a default **Preset**
- load different **Presets** as required.

Note: There are no **User Mode**-specific touch screen buttons.

Figure 5-28: User Mode LCD Display



Note: On the LCD display, use the trackball, cursor and ↗ button to change **User Mode** options.

To move a slider to a new position, position the mouse arrow over the slider, press the console ↗ button then use the trackball to move the slider.

Table 5-20: 3D/4D User Mode LCD Display Options

User1	
User2	
User3	The five available 3D/4D Presets can be reconfigured but they cannot be renamed.
User4	
User5	
Default	Default Preset for all images after initial acquisition. If desired, users can convert (save) the settings of one of the five User Presets into the Default Preset (5.11.9.1).
Load	Allows users to Load a different Preset as required.
Save	After making changes to one of the three editable Presets (User3 , 4 , or 5), select the Save button to save the edits as a user-defined Preset .
Zoom	Adjusts the Zoom setting. The range is 0.5 (50%) to 3.0 (300%) in 0.1 (10%) increments.
Reference Slice	Enables users to choose the Slice to be viewed from the active plane.
Background	Adjusts the color of the Background on the LCD display.
Image Settings	Map Adjusts the coloration of the active VR using pre-defined color Maps . The range for this setting is 0 to 17, inclusive (for all Presets).
	Threshold Use to suppress image artifacts or noise. This setting has a range of 0 to 100, inclusive, where 0 is no noise suppression and 100 is as much noise suppression as possible. <i>Note: The Dynamic Range of the image will be optimized automatically based on the selected Thresh/Threshold setting.</i>
	Contrast Adjusts the Contrast settings of the active image(s). Initially, Contrast adjustments are based on the center of the image. To change this, change the Contrast Pos setting. To make this adjustment the new default setting, save it to a 3D/4D Preset (refer to 5.11.9 for details on 3D/4D Presets).
	Contrast Pos(ition) Adjusts the Contrast Pos of the VR on the LCD display. Once moved from the default center position, Contrast adjustments will be centered on the new Contrast Pos setting.

5.11.2.4 Advanced 3D/4D Multislice Mode (LCD Display and Touch Screen Options)

Multislice Mode enables users to select detailed views of individual slices of the **A**, **B** or **C Plane**. These slices can be positioned on the **Horizontal**, **Vertical** or at a user-determined **Angle**.

Note: If the **Volume Rendering** is active when **Multislice** is entered, the image will default to the **C Plane**.

Default entry settings show the **Display Mode** active plane as segment 0 (Table 5-31) with the **Slice** diagram focused on the centre of the image.

Note: **Multislice** is not available in **Freehand 3D** or **Standard 3D/4D**.

Figure 5-29: 3D/4D **Multislice** Mode LCD Display Options



Note: On the LCD display, use the trackball, cursor and button to change **Multislice Mode** options. To move a slider to a new position, position the mouse arrow over the slider, press the console button then use the trackball to move the slider.

Figure 5-30: Advanced 3D/4D Multislice Mode Touch Screen Options

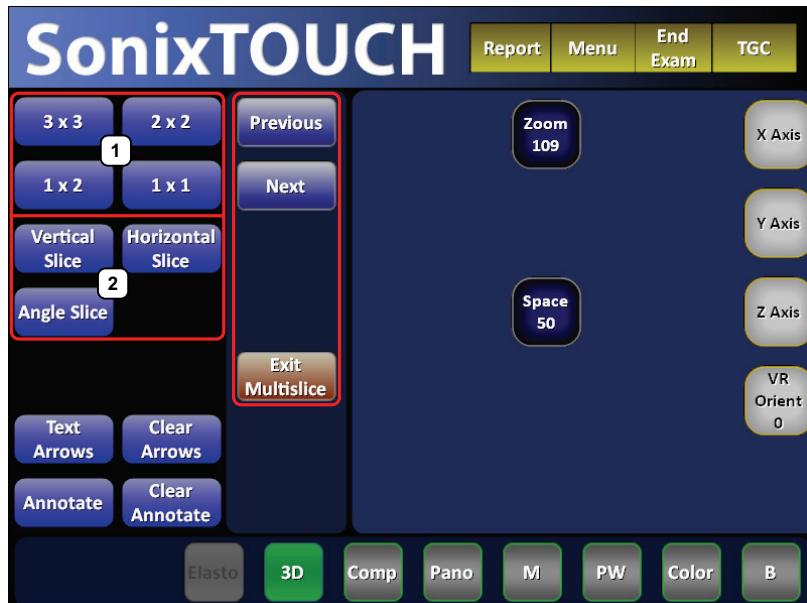


Table 5-21:

1 Layout

2 Slicing

Figure 5-31: Advanced 3D/4D Multislice Layout Segments (3x3, 2x2 and 1x2)

Slice Diagram	-3/xx mm	-2/xx mm	Slice Diagram	0/xx mm	Slice Diagram	0/xx mm
-1/xx mm	-0/xx mm	1/xx mm	1/xx mm	2/xx mm		
2/xx mm	3/xx mm	4/xx mm				

Note: Where **xx mm** refers to the number of millimeters the segment is from the center **Slice** of the image. The center **Slice** will always be labeled **0/0.00 mm**.

The measurement will always be to two decimal places.

Table 5-22: Advanced 3D/4D Multislice Mode Options

Note: The column to the far left indicates where an option is available:

- **TS:** Touch screen only
- **LCD:** LCD display only
- **TS/LCD:** Both the LCD display and touch screen. Note that changes to a setting from the touch screen will be mirrored on the LCD display.

		Note: Refer to Table 5-31 to determine the meaning of the Layout segments and the order in which they are presented.
TS/LCD	Layout	<p>Displays Multislice Mode images in a 3 x 3 Layout. The center Slice (segment 0) is both the active image and the plane that was last selected in Display Mode.</p> <p>The top left segment represents the entire image with the Slice data overlaid. The remaining segments show the actual slice data, including position from the center (-3 to 4) and the distance from the center in millimeters (mm).</p> <p>Note: This is the default setting.</p>
		<p>2 by 2 Displays Multislice Mode images in a 2 x 2 Layout, with the top, right Slice as the active image.</p>
		<p>1 x 2 (Side by Side) Displays Multislice Mode images in a 1 x 2 Layout, with the right hand Slice as the active image.</p>
		<p>1 x 1 (single) Displays the Multislice Mode image as a 1 x 1 image.</p>
TS/LCD	Slicing	<p>Note: Use the trackball to move the cursor into the Slice Diagram and press ↶ to move the center marker.</p>
		<p>Vertical Slice Slices the image vertically.</p>
		<p>Horizontal Slice Slices the image horizontally.</p>
		<p>Allows the Operator to select the Slicing Angle to be applied to the image.</p> <p>Note: To set the Angle, use the trackball to move the cursor into the Slice Diagram and press ↶ to set one end of the Angle caliper. Move the cursor to a second position and press ↶ again.</p>
TS/LCD	Previous	Moves the active image to the Previous Slice in the chosen Layout .
TS/LCD	Next	Moves the active image to the Next Slice in the chosen Layout .
TS	Exit Multislice	Exits Multislice .
TS/LCD	Space	Sets the Spacing between slices. The range for this option is 5% to 200% in 10% increments.
		Note: The actual measurement (in mm) will be displayed under each slice (Table 5-29).

TS/LCD	Zoom	Adjusts the Zoom setting. The range is 0.5 (50%) to 3.0 (300%) in 0.1 (10%) increments.
TS	X-axis	Rotates the selected image about the X-axis .
TS	Y-axis	Rotates the selected image about the Y-axis .
TS	Z-axis	Rotates the selected image about the Z-axis .
TS	VR Orient	Sets the <i>Orientation</i> of the VR .

Note: *Multislice* is not available in **Freehand 3D** or **Standard 3D/4D**.

5.11.2.5 3D/4D Sculpt (Touch Screen Options Only)

Sculpt is used to edit image contents after acquisition.

Figure 5-32: 3D/4D Sculpt Touch Screen Controls



Table 5-23: 3D/4D Sculpt Touch Screen Controls (tap to activate, dial to adjust)

Lasso Inside	Traces a freehand Lasso around the desired area and deletes all items inside the shape.
Lasso Outside	Traces a freehand Lasso around the desired area and deletes all items outside the shape.
Undo All	Undoes all the edits made to an image at any time within the first 24 hours after the image is saved.
Undo Last	Undoes the edits made to an image at any time within the first 24 hours after the image is saved, one at a time, in reverse order.
Exit Sculpt	Exits Sculpt....
X-axis	Rotates the selected image about the X-axis .
Y-axis	Rotates the selected image about the Y-axis .
Z-axis	Rotates the selected image about the Z-axis .

Note: While in **Sculpt**, use the trackball, cursor and  button to change the various **Mode** options available from the LCD display.

5.11.3 Additional 3D/4D LCD Display Details

Once an image has been acquired, the LCD display will have an additional line of information across the bottom of the screen.

Figure 5-33: Additional 3D/4D LCD Display Details

FOV 0°	Quality	VPS 0.7	MI<0.53
--------	---------	---------	---------

Table 5-24: Additional 3D/4D LCD Display Details

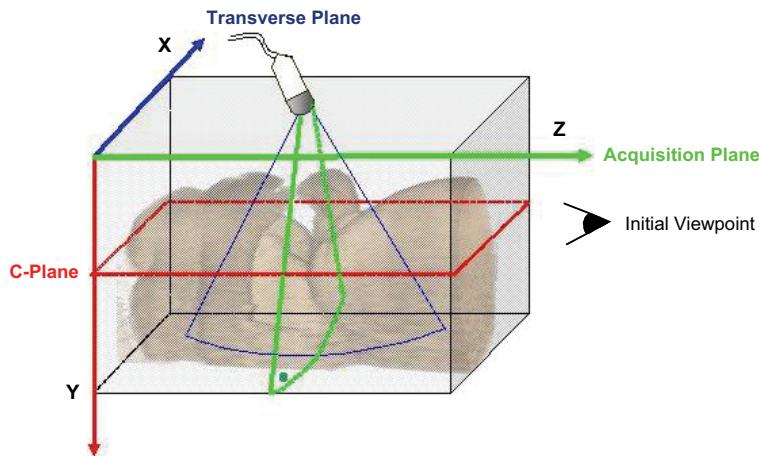
FOV (Field of View)	Adjusts the Field of View (FOV) of the rendered 3D/4D image. This setting ranges from 10° to 70° (in 5° increments). Access this setting after tapping the touch screen 3D mode button (Figure 5-20) and before entering 3D or 4D imaging. <i>Note: FOV is used in conjunction with Quality, to auto-calculate Volumes per Second (VPS).</i>
Quality	Adjusts image Quality: Low, Medium and High . Access this setting after tapping the touch screen 3D mode button (Figure 5-20) and before entering 3D or 4D imaging. <i>Note: FOV is used in conjunction with Quality, to auto-calculate Volumes per Second (VPS).</i>
VPS (Volumes per Second)	VPS is auto-calculated based on the FOV and Quality settings. It cannot be edited.
MI (Mechanical Index)	The MI is displayed for informational purposes only.

5.11.4 3D/4D Image Acquisition

3D and **4D** images are acquired in similar manners, although the final outcome is different. A **3D** acquisition results in a single **Volume** while a **4D** acquisition results in a **Cine loop**.

Once a **3D** or **4D** image has been acquired, the operator has the ability to edit or optimize the image ([5.11.5](#)) using the settings discussed in sections [5.11.2.1](#) to [5.11.2.5](#).

Figure 5-34: Acquisition Diagram



[Figure 5-33](#) demonstrates the various planes and axis of an acquired **3D** image in its original state. Remember that once an image has been edited or optimized ([5.11.5 Optimization of Acquired Images](#)), the positions of the planes shown here will have been altered as well.

For clarity, color is used to highlight the **A**, **B** and **C Planes**.

Figure 5-35: Image Quadrants

Green: Acquisition Plane (A)	Blue: Transverse Plane (B) Perpendicular to the Acquisition Plane
Red: Coronal Plane (C)	Volume Rendering (VR)

5.11.4.1 3D Imaging

To Acquire a 3D Image with an Ultrasonix 4D Transducer:

1. Ensure a **4D** transducer is connected to the system.
2. Ensure a patient is active.

Note: Refer to [4.3 Beginning an Exam for a New Patient](#) for details on entering data for a new patient or [4.7.1.1](#) to select an existing patient.

3. Tap the touch screen **Presets...** button.

Note: If desired, users can select either **OB 1st Trimester** or **OB 2nd–3rd Trimester** as the **Application** then the factory installed **OB4D Preset**.

While this will not affect the actual **3D/4D Presets** available in **4D mode**, it will configure the underlying **2D imaging parameters**.

As an alternative, users can also create their own user-defined **2D Preset** ([4.8](#)) to configure the underlying **2D imaging parameters**.

4. From the touch screen list of available transducers, tap the **4D** transducer.
5. Tap the touch screen **3D** mode selection button.
6. Tap the touch screen **3D** mode action button.
7. Position the transducer over the area of interest.
8. Use the trackball and console  button to position and adjust the size of the ROI.
9. Press the console  button to begin the acquisition the **3D Volume**.

Note: Hold the transducer steady while the image is being acquired.

10. The acquired **3D** rendering will be presented on the LCD display in the default format A|VR.

5.11.4.2 4D Imaging

To Acquire a 4D Image:

1. Ensure a **4D** transducer is connected to the system.

Note: The **4D** transducer must be inserted into the upper most transducer connection port to ensure proper function.

*Only one **4D** transducer can be connected at a time.*

Refer to [3.2 Connecting Transducers](#) for connection details.

2. Ensure a patient is active.

Note: Refer to [4.3 Beginning an Exam for a New Patient](#) for details on entering data for a new patient or [4.7.1.1](#) to select an existing patient.

3. Tap the touch screen **Presets...** button.

Note: If desired, users can select either **OB 1st Trimester** or **OB 2nd–3rd Trimester** as the **Application**, then the factory installed **OB4D Preset**.

*While this will not affect the actual **3D/4D Presets** available in **3D** mode, it will configure the underlying **2D** imaging parameters.*

*As an alternative, users can also create their own user-defined **2D Preset** ([4.8](#)) to configure the underlying **2D** imaging parameters.*

4. From the touch screen list of available transducers, tap the **4D** transducer.
5. Tap the touch screen **3D** mode selection button.
6. Position the transducer over the area of interest.
7. Tap the touch screen **4D** mode action button.
8. Use the trackball and console  button to position and adjust the size of the ROI.
9. Press the console  button to begin the acquisition.
10. Slowly move the transducer over the area of interest.
11. Press the console  or  button to complete the acquisition.
12. The final image of the acquired **4D Cine** file will be presented on the LCD display in the default format **A|VR**.

5.11.5 Optimization of Acquired Images

A **3D or 4D Volume** can only be optimized after it has been acquired. Both the image and its environment can be optimized in several ways, including: **Map**, **Background** and **Threshold**.

For a comprehensive list of options, refer to sections [5.11.2.1](#) to [5.11.2.5](#).

Images saved with the touch screen **Save Volume** option can be accessed for editing during the 24 hours immediately after acquisition.

Select the images from the **3D/4D** LCD display using the trackball and ↘ button or follow the instructions below ([To Select a Saved 3D/4D Volume for Optimization/Editing \(via Exam Mgmt Button\):](#)) or [To Select a Saved 3D/4D Volume for Optimization/Editing \(via Exam Review Button\):](#)).

Note: Once 24 hours have passed, the images can be viewed, but not edited.

Save Volume is not available for **Freehand 3D** images.

When selecting a saved image for optimization, ensure the original **4D** transducer is connected to the system (i.e., if the original image was acquired with the **4DC-7** transducer, ensure the **4DC-7** transducer is connected to the system).

To Select a Saved 3D/4D Volume for Optimization/Editing (via Exam Mgmt Button):

1. Tap the touch screen **Exam Mgmt** button.
2. From the **Exam Management** page, select the relevant patient and select **OK**.

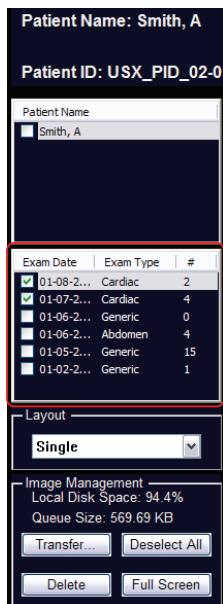


Note: If there are any images less than 24 hours old that were created using the **Save Volume** method, they will be presented as thumbnails with a box icon. Refer to [Table 5-17](#) for more details on **Save Volume**.

3. Select the desired thumbnail to open the image for editing.

To Select a Saved 3D/4D Volume for Optimization/Editing (via Exam Review Button):

1. Ensure the relevant Patient is active.
2. Tap the touch screen **Exam Review** button.
3. Highlight the relevant **Exam** and the associated thumbnails will be displayed onscreen.



Note: If there are any images less than 24 hours old that were created using the **Save Volume** method, they will be presented as thumbnails with a box icon. Refer to [Table 5-17](#) for more details on **Save Volume**.

4. Select on the desired thumbnail to open the image for editing.

5.11.6 Spline Editing of 3D/4D Images

Once an image has been acquired, the user has the ability to edit it by changing the layout of the top of the **A (Acquisition)** and/or **B (Transverse) Planes**, enabling users to remove things from the top of the image (spline editing).

This option is available only on single **Volumes** and can be accessed from **Display**, **Render** and **User Modes**.

Spline editing can be done in two ways, both of which are mirrored across all **Planes** and the **VR**:

- single point redrawing of the top line of the **A** and/or **B Planes**
- multi-point redrawing of the top line of the **A** and/or **B Planes**.

Figure 5-36: Single Point Spline Editing

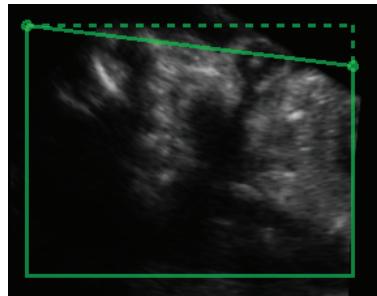
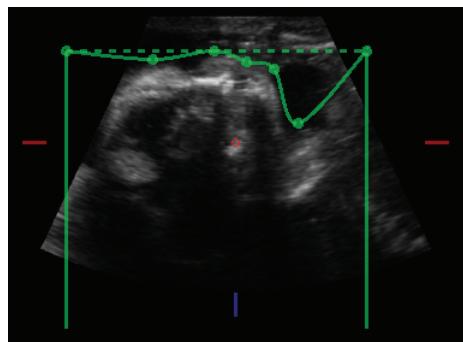
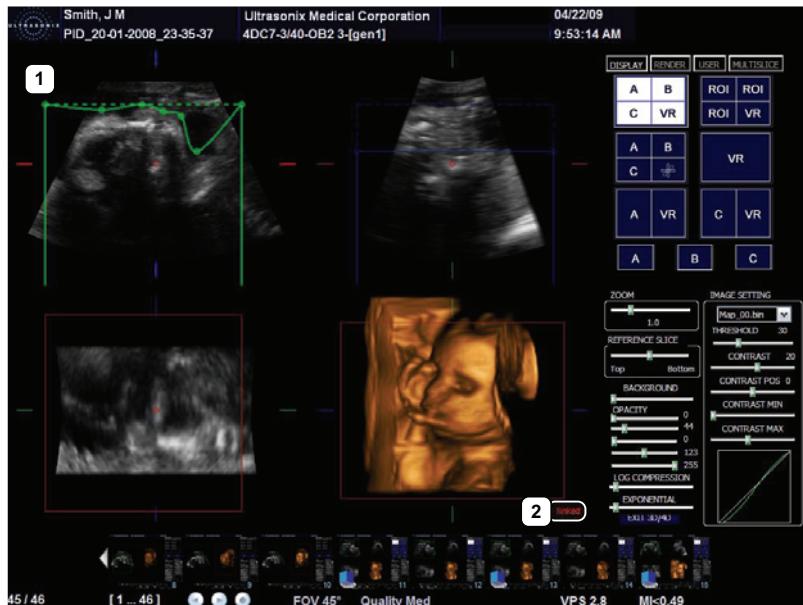


Figure 5-37: Multi-Point Spline Editing



Note: As the touch screen **Reset** button applies to any changes made, be sure to use **Save Volume** or the relevant **Custom Key** option (1 or 2) to print/save relevant images.

Figure 5-38: 3D or Frozen 4D Image with A Plane Spline Editing



Note: The **A Plane ROI** box has been moved. Refer to [5.11.7](#) for details on repositioning the ROI box from the various **Display Modes**.

Table 5-25: 3D or Frozen 4D Image with A Plane Spline Editing

-
- 1 Multi-point spline editing in the **A Plane**.
 - 2 VR marked as **linked**.
-

Depending on the state of the image(s) being displayed, the **VR** will be labeled **linked** or **unlinked**.

A **linked VR** means that at least one **Plane** is visible and is the active image on the LCD display, thus enabling either spline editing or ROI repositioning ([5.11.7](#)).

When **unlinked**, the **VR** is the active image.

To Move the Top Line of a Plane (Single or Multi-Position Spline Editing):

1. With a **3D** or frozen **4D Volume**, select the relevant **Display Mode**: **A|B|C|VR**, **ROI|VR** **A|B|C|MPR**, **A|VR** or **C|VR**.
2. Place the cursor in the **A**, **B** or **C Plane** and press the console  button to activate spline editing for that **Plane**.
3. Move the cursor to the desired place on the top line of the ROI box.

Note: *The cursor will change to a single arrow.*

4. Press  again then move the arrow as required.
5. Press  again to anchor the line in place.
6. Repeat **step 3** to **step 5** as many times as necessary.

Note: *As the touch screen **Reset** button applies to any changes made, be sure to use **Save Volume** or the relevant **Custom Key** option (1 or 2) to print/save relevant images.*

5.11.7 Repositioning the ROI Box

The ROI box can be repositioned from all **Display Modes** except **VR**.

Figure 5-39: A|B|C|VR Image with Repositioned ROI Box



To Reposition the ROI:

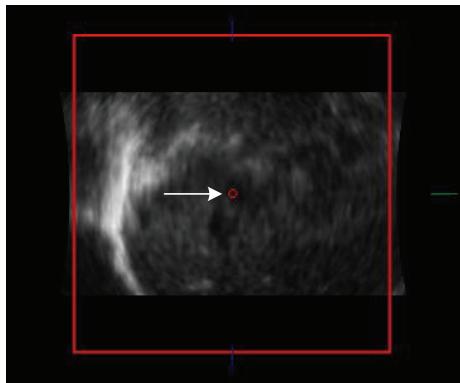
1. With a **3D** or frozen **4D Volume**, select the relevant **Display Mode**.
 2. Place the cursor in the **A, B** or **C Plane** and press the console  button to activate the ROI repositioning cursor.
-
- Note:** The ROI repositioning cursor has four sides, each of which terminates in an arrow.
3. Move the cursor to move the ROI box to the desired position.
 4. Press  again to anchor the ROI box in place.
 5. Repeat **step 2 to step 4** as many times as necessary.
-

Note: As the touch screen **Reset** button applies to any changes made, be sure to use **Save Volume** or the relevant **Custom Key** option (1 or 2) to print/save relevant images.

5.11.8 Repositioning the MPR Plane Intersection Point

The **MPR Plane** intersection point can only be repositioned from **A|B|C|VR** and **A|B|C|MPR**. This is controlled by the presence of a small red circle initially in the center of each **Plane**.

Figure 5-40: Figure 531: MPR Plane Intersection Point



To Reposition the MPR Plane Intersection Point:

1. With a **3D** or frozen **4D Volume**, select the relevant **Display Mode: A|B|C|VR** or **A|B|C|MPR**.
 2. Place the cursor over the red circle in the center of the **A**, **B** or **C Plane** and press the console  button to activate the repositioning cursor.
-
- Note:** Once placed over the red circle, the cursor will change to a cross (+).
3. Move the cursor to move the **MPR Plane** intersection point to the desired position.
 4. Press  again to anchor the **MPR Plane** intersection point in place.
 5. Select **A|B|C|MPR** to check the repositioning.
 6. Repeat **step 2 to step 5** as many times as necessary until the **MPR Plane** intersection point is in the desired place.

Note: As the touch screen **Reset** button applies to any changes made, be sure to use **Save Volume** or the relevant **Custom Key** option (1 or 2) to print/save relevant images.

5.11.9 3D/4D Presets

Standard and **Advanced 3D/4D** are delivered with five Factory-installed **3D/4D Presets**. As well as the **2D Preset**, **OB4D**, for use with the **Applications OB 1st Trimester** or **OB 2nd–3rd Trimester**. This **Preset** is designed to configure the underlying **2D** imaging parameters before the **Operator** enters **3D** or **4D** imaging.

If desired, users can also create their own user-defined **2D Preset(s)** (4.8) to configure the underlying **2D** imaging parameters.

The five **Presets** (**User1** to **User5**) are available through **User Mode** (5.11.2.3) after 3D/4D image acquisition. The **Default Preset** will always be applied to every image immediately after acquisition. If desired, **User1**, **2**, **3**, **4** or **5** can be saved to the **Default Preset**.

Note: For details on reconfiguring the **Default Preset**, refer to 5.11.2.2.

Refer to 5.11.2.3 3D/4D User Mode (LCD Display Options Only) for more details on 3D4D Presets.

5.11.9.1 Selecting a Default 3D/4D User (Preset)

For convenience, Ultrasonix has configured **3D/4D Imaging** to enable the user to select a default **Preset** to be applied to every image immediately after acquisition. If the current **Default Preset** is not appropriate, the user has the option to load a different one (5.11.9.2).

To Configure the Default User Preset on Entry:

1. Ensure an image has been acquired.
2. Select **User Mode** on the LCD display.



3. Select the radio button for the desired **Default User Preset** to be defaulted to upon entry.
4. Select **Load**.
5. Select **Default**.
6. Select **Save**.

5.11.9.2 User-Defined 3D/4D Presets

While all **Presets** have a pre-defined factory setting, they can be edited to suit the needs of each **Operator**.

To Create a User-Defined 3D/4D Preset:

1. Ensure an image has been acquired.
2. Move through the touch screen and LCD display options, making changes as required (refer to [5.11.2.1](#) and [5.11.2.5](#) for details on the available parameters).
3. Select **User Mode** on the LCD display.



4. Select the radio button for the desired **User Preset**.

Note: Ultrasonix does not recommend editing the **Preset** parameters for **Users 1, 2 and 3**.

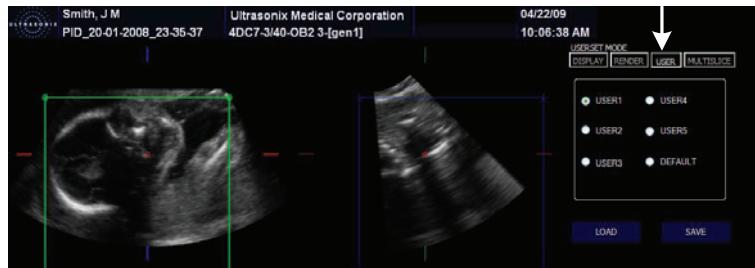
5. To save the parameters of the new **Preset**, select **Save**.

5.11.9.3 Loading 3D/4D Presets

In order to apply the parameters of a **Preset**, it must first be loaded. Simply selecting the radio button next to the desired **User Preset** will not apply that **Preset's** parameters to the current image.

To Load a User Preset:

1. Ensure an image has been acquired.
2. Select **User Mode** on the LCD display.



3. Select the radio button for the desired **User Preset**.
4. Select **Load** to activate the selected **Preset**.

5.11.9.4 Resetting Factory Defaults

If desired, an **Operator** can erase all edits to a given **Preset** by resetting it the factory default configuration.

To Reset a Preset to Factory Defaults:

1. Ensure an image has been acquired.
2. Select **User Mode** on the LCD display.



3. Select the radio button for the desired **User Preset**.
4. Select **Load**.
5. Tap the touch screen **Reset** button.

CHAPTER 6: CLINICAL ANALYSIS

Measurements provide the user with the functionality to perform clinical analysis on an ultrasound image. They range from simple measurements that calculate **Length**, **Circumference**, **Area**, **Volume**, etc., to **Measurement Packages** that use calculation formulas to determine **Fetal Age**, **Heart Rate**, etc.

The reporting feature takes the **Application**-specific measurement values and generates a **Worksheet/Report** that includes patient and facility information, labeled measurement values and calculation results. Some reports contain auto-generated graphs.

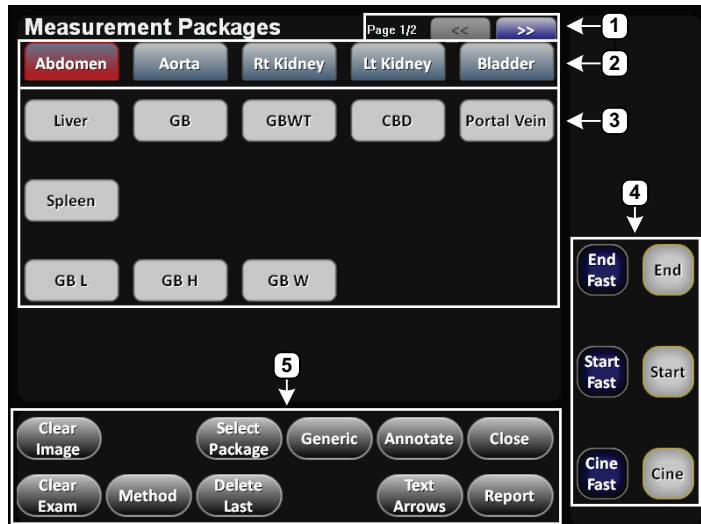
The system provides a wide range of **Application**-specific measurement/calculation packages.

Note: The availability of measurement/calculation packages is dependant upon a combination of licensed options (8.2.23), currently connected transducers and Preset settings (8.2.1).

The measurement/calculation package defaults to the **Exam Type/Application** selected. For example, the **Obstetrical** calculation package is the default when an **OB Application** is selected. To access measurements specific to an alternate **Application**, tap the touch screen **Presets...** button and change the **Application–Transducer–Preset** settings as required.

To access **Measurement Packages**, tap the touch screen **Measure** button.

Figure 6-1: Measurement Packages Touch Screen



Note: This example uses the **Application–Transducer–Preset** combination **Abdomen–L14-5/38–Superficial**.

Table 6-1: Measurement Packages Touch Screen Options

1	Page selector buttons	Use if more than one page of Measurement Package options exists. If there is only one page available, the selectors will be inaccessible (i.e., grayed out).
2	Measurement Packages	These tabs represent the actual Measurement Packages available for the current Application–Transducer–Preset combination.
		Note: If the page selector buttons are active, there are more Measurement Packages available than what is visible on the current touch screen.
3	Measurement Options	The specific measurement options available for the active Measurement Package tab.
4	Cine Controls	Standard Cine control buttons. Refer to 5.9 for details on Cine .
5	Measurement Controls	Measurement touch screen control options. Refer to Table 6-2 for more details.

Table 6-2: Console Measurement Buttons

	Selects, sets and activates calipers, ellipse, etc.
	Toggles between the calipers prior to finalizing (setting) the measurement.

Table 6-3: Measurement Packages Touch Screen Controls (tap to activate, dial to adjust)

Clear Image	Tap to Clear any measurements currently on the image. Note: This will not remove the measurements on the Worksheet/Report .
Auto-Method	Auto-Method is only available if: <ul style="list-style-type: none"> • Auto-Follicle has been licensed (6.11.1 Auto-Follicle) • Pelvic is selected as the Measurements Package (Auto-Method applies only to RtFollicle or LtFollicle).
Clear Exam	Tap to Clear all measurements from both the LCD display and the Worksheet/Report . Note: Confirm this action when the message Clear Exam? Yes No is presented.
Method	Tap to change measurements types, e.g., from B Distance to Curved Distance . The method selected appears in an information bubble on the lower right corner of the LCD display. Tap as many times as necessary to advance to the desired measurement option. Note: Not all measurements have more than one measurement option.
Select Application	Tap to select a different Application .
Delete Last	Tap to delete the last measurement. Tap multiple times to delete multiple measurements in reverse order.
Generic/Calcs	Tap to move to the Generic/General Application/Preset . Note: After tapping Generic , the button name changes to Calcs . This indicates that the system is now using Generic measurements. Tap Calcs to exit Generic measurements and return to standard Measurement Packages . Generic measurements are not written to the Worksheet/Report .

Annotate	Tap to access the Annotations touch screen (7.2 and 7.1.3). When finished, tap Close on the Annotations touch screen and the system will return to Measurement Packages .
Text Arrows	Tap to activate the Text Arrows function (7.1.5). Tap again to exit the Text Arrows function.
Close	Tap to exit the Measurement Packages touch screen.
	Tap to move to the relevant Report (6.12). Tap Exit to return to Measurement Packages .
Report	Note: The touch screen will change to the Report Worksheet touch screen. Tap Exit to return to the measurements touch screen.

6.1 GENERIC 2D MEASUREMENTS

During imaging, measurements are accessible by tapping the touch screen **Measure** button and selecting the desired touch screen tab and measurement.

For the purposes of the following examples, all measurements have been taken using the **Generic** option.

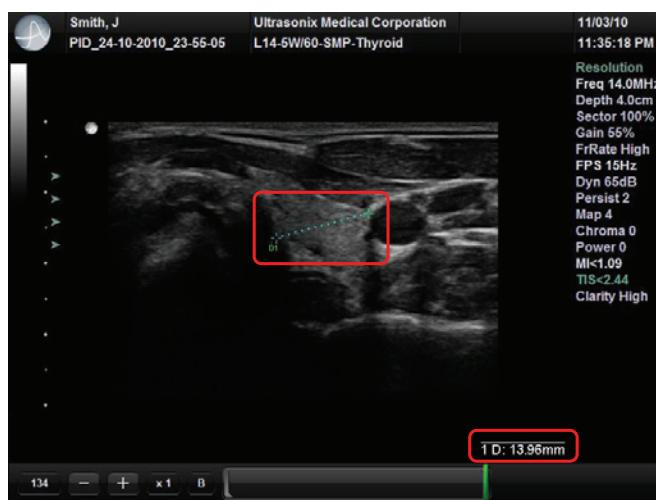
Note: **Generic** measurements are not written to the **Worksheet/Report**.

Once the first version of a measurement has been taken, the relevant touch screen button will be prefaced by (1). If additional versions of that measurement are taken, the number will increment accordingly. Unless the measurement(s) is **Generic**, it will also have been saved to the **Worksheet/Report**.

Note: Onscreen measurement labels are placed at or near the location of the first caliper. In order to avoid overlapping measurement labels, whenever possible, take care not to overlap measurement starting points.

6.1.1 2D Linear Measurement

Figure 6-2: 2D Image with Linear Measurement



To Perform a Linear Measurement:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Distance** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Distance set to 'B Distance'**.
4. Use the trackball to position the first caliper.
5. Press ↘ to set the first caliper and activate the second caliper.
6. Use the trackball to position the second caliper.
Note: Pressing ↘ will toggle control between the calipers enabling either or both to be repositioned.
7. Press ↘ to set the measurement and record it onscreen and (for non-**Generic** measurements) to the **Worksheet/Report**.

To Perform a 2D Curved Distance Measurement:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Distance** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Distance set to 'Curved Distance'**.
4. Use the trackball to position the first caliper.
5. Press ↘ to set the first caliper and activate the second caliper.
6. Use the trackball to trace the caliper to the desired position.
Note: Prior to pressing ↘, use the keyboard BACKSPACE key to delete the line. (Each time the BACKSPACE key is pressed, another dot in the line is erased.) Alternatively, use the ✖ button (located next to the ↘ button).
7. Press ↘ to set the measurement and record it onscreen and (for non-**Generic** measurements) to the **Worksheet/Report**.

6.1.2 Area or Circumference Measurement

There are four **Generic** methods of performing the **Area/Circumference** measurement: **Ellipse**, **Continual**, **Point by Point** and **Cross**.

6.1.2.1 Ellipse Method Area or Circumference Measurement

To Perform an Ellipse Method Area or Circumference Measurement:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
 2. Tap **Generic** then **Area** (under the **General** tab).
 3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area set to 'Ellipse'**.
 4. Use the trackball to position the first caliper.
 5. Press ↘ to set the first caliper and activate the second caliper.
 6. Use the trackball to position the second caliper.
 7. Press ↘ to set the second caliper position and activate the **Ellipse** sides.
 8. Use the trackball to increase/decrease the sides of the **Ellipse**.
-
- Note:** Pressing ↘ will toggle control between the calipers enabling either or both to be repositioned.
9. Press ↘ to set the final caliper position.
 10. The **Area** and **Circumference** values are presented on the bottom right of the LCD display.

6.1.2.2 Continual Method Area or Circumference Measurement

To Perform a Continual Method Area or Circumference Measurement:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Area** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area set to 'Continual'**.
4. Use the trackball to position the first caliper.
5. Press ↘ to set the first caliper.
6. Use the trackball to trace the caliper around the desired area.

Note: If the traced **Area** is not closed (i.e., the caliper start and end positions are not at the same point), the system will automatically fill in the space with a straight line in order to be able to calculate **Area** and **Circumference**.

7. Press ↘ to set the final caliper position.
8. The **Area** and **Circumference** values are presented on the bottom right of the LCD display.

6.1.2.3 Point by Point Area or Circumference Measurement

To Perform a Point by Point Method Area or Circumference Measurement:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Area** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area set to 'Point by Point'**.
4. Use the trackball to position the first caliper.
5. Press ↘ to set the first caliper.
6. Use the trackball to position the second caliper.
7. Press ↘ to set the second caliper.
8. Use the trackball to position the third caliper.

Note: Prior to pressing ↘, use the keyboard **BACKSPACE** key to delete the line. (Each time the **BACKSPACE** key is pressed, another dot in the line is erased.) Alternatively, use the  button (located next to the  button).

9. Press ↘ to set the final caliper.
10. The system will automatically join the first and last caliper positions in order to calculate the **Area** and **Circumference** and display them onscreen.

6.1.2.4 Cross Area or Circumference Measurement

To Perform a Cross Method Area or Circumference Measurement:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Area** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area set to 'Cross'**.
4. Use the trackball to position the first caliper.
5. Press ↘ to set the first caliper.
6. Use the trackball to position the second caliper.
7. Press ↘ to set the second caliper.
8. Use the trackball to position the third caliper.
9. Press ↘ to set the third caliper.
10. Use the trackball to position the fourth caliper.

Note: Prior to pressing ↘, use the keyboard **BACKSPACE** key to delete the line. (Each time the **BACKSPACE** key is pressed, another dot in the line is erased.) Alternatively, use the  button (located next to the  button).

11. Press ↘ to set the final caliper.
12. The **Area** and **Circumference** values are presented on the bottom right of the LCD display.

6.1.3 Volume Calculation

To Perform a Volume Calculation:

Note: *L (Length) measurements can be performed using either linear (**B**) or Curved Distance.*

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then the **Volume** tab to access the **L (Length)**, **H (Height)** and **W (Width)** options.

Note: *By default, the touch screen Length option will be selected for the first measurement, Height will always be second and Width, last.*

3. Tap **Method** as many times as necessary to select the **L** method: '**B Distance**' or '**Curved Distance**'.
4. Use the track ball to position the first caliper.
5. Press ↘ to set the caliper position and activate the second caliper.
6. Use the trackball to position the second caliper.

Note: *Pressing ↗ will toggle control between the calipers enabling either or both to be repositioned.*

7. Press ↘ to set the second caliper position and complete the measurement.
8. Repeat **step 4** through **step 7** until all three linear measurements have been completed. The three measurement values with auto-calculated **Volume** results are presented on the bottom right of the LCD display.

Notes:

All three measurements must be completed to calculate the Volume.

Only the three most recent measurements (L, H, W and their Volume calculation) will be visible onscreen at any one time.

6.1.4 Percent Diameter Reduction Calculation (% Diam Red)

To Perform a % Diameter Reduction:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
 2. Tap **Generic** then **Diam Red** (under the **General** tab).
 3. Use the trackball to position the first caliper of the outer measurement.
 4. Press  to set the caliper position and activate the second caliper of the outer measurement.
 5. Use the trackball to position the second caliper of the outer measurement.
 6. Press  to set the second caliper.
 7. Use the trackball to position the first caliper of the inner measurement.
 8. Press  to set the caliper position and activate the second caliper of the inner measurement.
 9. Use the trackball to position the second caliper of the inner measurement.
-
- Note:** Prior to pressing , use the keyboard **BACKSPACE** key to delete the line. (Each time the **BACKSPACE** key is pressed, another dot in the line is erased.) Alternatively, use the  button (located next to the  button).
-
10. Press  to set the second caliper.
 11. The resulting **% Diameter Reduction** is presented on the bottom right of the LCD display along with the inner (**I**) and outer (**O**) diameter measurements that were used in the calculation.

6.1.5 Percent Area Reduction Calculation (% Area Red)

When combined, the two methods of performing the outer and inner **Area Reduction** measurements—**Ellipse** and **Trace**—result in a total of three options.

Note: The first caliper set is used for the outer measurement of the **Area Reduction** and the second caliper set is used for the inner measurement.

Table 6-4: Percent Area Reduction Calculation Methods

Ellipse/Ellipse	Uses the Ellipse method for both outer and inner measurements.
Ellipse/Trace	Uses the Ellipse method for the outer measurement and the Trace method for the inner measurement.
Trace/Trace	Uses the Trace method for both outer and inner measurements.

6.1.5.1 Ellipse/Ellipse Method of Area Reduction Calculation

To Perform an Ellipse/Ellipse Method Area Reduction:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
 2. Tap **Generic** then **Area Red** (under the **General** tab).
 3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area Red set to 'Area Reduction Ellipse/Ellipse'**.
 4. Use the trackball to position the first caliper of the outer **Ellipse**.
 5. Press ↘ to set the caliper position and activate the second caliper of the outer **Ellipse**.
 6. Use the trackball to position the second caliper.
 7. Press ↘ to set the second caliper position and activate the outer **Ellipse** sides.
 8. Use the trackball to increase/decrease the sides of the outer **Ellipse**.
-
- Note:** Pressing ↗ will toggle control between the calipers enabling either or both to be repositioned.
-
9. Press ↘ to complete the outer measurement.
 10. Use the trackball to position the first caliper of the inner **Ellipse**.
 11. Press ↘ to set the caliper position and activate the second caliper of the inner **Ellipse**.
 12. Use the trackball to position the second caliper.
 13. Press ↘ to set the second caliper position and activate the inner **Ellipse** sides.
 14. Use the trackball to increase/decrease the sides of the inner **Ellipse**.
 15. Press ↘ to complete the inner measurement.
 16. The resulting **% Area Reduction** is presented on the bottom right of the LCD display along with the inner (**I**) and outer (**O**) measurements that were used in the calculation.

6.1.5.2 Ellipse/Trace Method of Percent Area Reduction Calculation

To Perform an Ellipse/Trace Method Area Reduction:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
 2. Tap **Generic** then **Area Red** (under the **General** tab).
 3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area Red set to 'Area Reduction Ellipse/Trace'**.
 4. Use the trackball to position the first caliper of the outer **Ellipse**.
 5. Press  to set the caliper position and activate the second caliper of the outer **Ellipse**.
 6. Use the trackball to position the second caliper.
 7. Press  to set the second caliper position and activate the outer **Ellipse** sides.
 8. Use the trackball to increase/decrease the sides of the outer **Ellipse**.
-
- Note: Pressing  will toggle control between the calipers enabling either or both to be repositioned.*
-
9. Press  to complete the outer measurement.
 10. Use the trackball to position the caliper at the start position of the inner **Trace** measurement.
 11. Press  to set the second caliper.
 12. Use the trackball to trace the caliper around the desired area.
 13. Press  to set the second caliper position.
 14. The resulting **% Area Reduction** is presented on the bottom right of the LCD display along with the inner (**I**) and outer (**O**) measurements that were used in the calculation.

6.1.5.3 Trace/Trace Method of Percent Area Reduction Calculation

To Perform a Trace/Trace Method Area Reduction:

1. With a frozen **2D** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Area Red** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Area Red set to 'Area Reduction Trace/Trace'**.
4. Use the trackball to position the first caliper at the start position of the outer **Trace** measurement.
5. Press  to set the first caliper.
6. Use the trackball to trace the circumference around the desired area.

Note: Prior to pressing , use the keyboard **BACKSPACE** key to delete the line. (Each time the **BACKSPACE** key is pressed, another dot in the line is erased.) Alternatively, use the  button (located next to the  button).

7. Press  to set the **Trace**.
8. Use the trackball to position the second caliper at the start position of the inner **Trace** measurement.
9. Press  to set the second caliper.
10. Use the trackball to trace the circumference the area of interest.
11. Press  to set the second caliper position.
12. The resulting **% Area Reduction** is presented on the bottom right of the LCD display along with the inner (**I**) and outer (**O**) measurements that were used in the calculation.

6.2 M-MODE MEASUREMENTS

For the purposes of the following examples, all measurements have been taken using the **Generic** option.

Note: *Generic measurements are not written to the Worksheet/Report.*

6.2.1 M-Mode Heart Rate Measurement

To Perform an M-Mode Heart Rate Measurement:

1. With a frozen **M-Mode** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **HR** (under the **General** tab).
3. Use the trackball to position the caliper on the **M-Mode Sweep** to the first beat.
4. Press ↘ to set the first cursor and activate a second caliper.
5. Use the trackball to position the second caliper to the next beat.

Note: *The default **Heart Rate** measurement requires one heart beat. Refer to [8.2.7 Measurements](#) to change the number of beats required for the **HR** calculation.*

Pressing ↗ will toggle control between the calipers enabling either or both to be repositioned.

-
6. Press ↘ to set the measurement.
 7. The **Heart Rate** value is presented on the bottom right of the LCD display.

6.2.2 M-Mode Slope Measurement (Time, Distance and Slope)

To Perform an M-Mode Slope Measurement:

1. With a frozen **M-Mode** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Time/Slope** (under the **General** tab).
3. Use the trackball to position the first caliper on the **M-Mode Sweep**.
4. Press ↘ to set the first cursor and activate a second caliper.
5. Use the trackball to position the second caliper to the desired location.
6. Press ↘ to set the measurement.
7. The **Time**, **Distance** and **Slope** values is presented on the bottom right of the LCD display.

6.2.3 M-Mode Distance Measurement

To Perform an M-Mode Distance Measurement:

1. With a frozen **M-Mode** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Distance** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Distance set to 'M Distance'**.
4. Use the trackball to position the first caliper.
5. Press  to set the second caliper.
6. Use the trackball to position the second caliper.

Note: Pressing  will toggle control between the calipers enabling either or both to be repositioned.

7. Press  to set the second caliper.

Note: When using the **Cardiac Measurement Package RV/LV (M)**, both diastolic and systolic **M-Mode Distance** measurements must be completed.

8. The **Distance** value is presented on the bottom right of the LCD display.

6.3 PW/CW DOPPLER MEASUREMENTS

For the purposes of the following examples, all measurements have been taken using the **Generic** option.

Note: *Generic measurements are not written to the Worksheet/Report.*

6.3.1 Velocity Measurements

Velocity measurements can be performed using either a single or double caliper method.

Note: Available/visible measurements/calculations depend upon the selections made in **8.2.1.1 Show/Hide Imaging Presets** and **8.2.7.2 Show/Hide Applications, Measurement Packages and Measurements**.

To Perform a Single Caliper Velocity Measurement:

1. With a frozen **Doppler Trace**, tap the touch screen **Measure** button.
2. Tap **Generic** then **Velocity** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Velocity set to '1 Cal. Velocity'**.
4. Use the trackball to position caliper.
5. Press ↘ to set the caliper.
6. **Velocity** values are presented on the bottom right of the LCD display.

Note: If no measurement is selected from the touch panel, a generic **Velocity** measurement value will be displayed depending on the application selected. For example, for **Vascular**, the **Velocity** will be **cm/sec** but for **Cardiac** it may be **m/sec**.

To Perform a Double Caliper Velocity Measurement:

1. With a frozen **Doppler Trace**, tap the touch screen **Measure** button.
2. Tap **Generic** then **Velocity** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Velocity set to '2 Cal. Velocity'**.
4. Use the trackball to position the caliper to the peak velocity. A **Peak Systolic Velocity (PSV)** value is presented on the LCD display.
5. Press ↘ to set the first caliper and activate a second caliper.
6. Use the trackball to position the second caliper.
7. Press ↘ to set the caliper.
8. An **End Diastolic Velocity (EDV)** value with associated **Resistive Index (RI)** and **Systolic/Diastolic Ratio (SD)** is presented on the bottom right of the LCD display.

6.3.2 Doppler Manual Trace Measurement

Note: Available/visible measurements/calculations depend upon the selections made in [8.2.1.1 Show/Hide Imaging Presets](#) and [8.2.7.2 Show/Hide Applications, Measurement Packages and Measurements](#).

6.3.2.1 Doppler Manual Trace Measurement – Continual Method

Note: To ensure the most accurate results, position the first caliper at the start of the waveform and set the last caliper at end diastole for manual **Doppler Traces**.

To Perform a Manual Doppler Trace, Using the Continual Method:

1. With a frozen **Doppler Trace**, tap the touch screen **Measure** button.
2. Tap **Generic** then **Trace** (under the **General** tab).
3. Tap **Method** as many times as necessary to select **Sonix Calcs—Trace set to 'Spectrum Continual'**.
4. Use the trackball to position the first caliper at the start of the desired **Doppler Waveform**.

Note: Prior to pressing , use the keyboard **BACKSPACE** key to delete the line. (Each time the **BACKSPACE** key is pressed, another dot in the line is erased.) Alternatively, use the  button (located next to the  button).

5. Press  to set the start position.
6. Use the trackball to draw the trace along the desired **Waveform** right up to the point of end diastole.
7. Press  to end and set the **Trace**.
8. The **Trace** values are presented on the LCD display.

6.3.2.2 Doppler Manual Trace Measurement – Point by Point Method

Note: To ensure the most accurate results, position the first caliper at the start of the waveform and set the last caliper at end diastole for manual **Doppler Traces**.

To Perform a Manual Doppler Trace, Using the Point by Point Method:

1. With a frozen **Doppler Trace**, tap the touch screen **Measure** button.
2. Tap **Generic** then **Trace** (under the **General** tab).
3. Tap **Method** as many times as necessary dial to select **Sonix Calcs—Trace set to 'Spectrum Point by Point'**.
4. Use the trackball to position the first caliper at the start of the desired **Doppler Waveform**.

Note: Prior to pressing , use the keyboard **BACKSPACE** key to delete the line. (Each time the **BACKSPACE** key is pressed, another dot in the line is erased.) Alternatively, use the  button (located next to the  button).

5. Press  to set the first caliper and activate the second.
6. Use the trackball to position the next trace position.
7. Press  to set the second caliper and activate the third.
8. Use the trackball to position the third caliper at the last trace position.
9. Press  to end and set the **Trace**.

10. The **Doppler Trace** values are presented on the LCD display.

6.3.3 Doppler Auto-Trace Measurement (Spectrum Range)

To Perform an Auto Doppler Trace (D-Range):

1. With a frozen **Doppler Trace**, tap the touch screen **Measure** button.
 2. Tap **Generic** then **Trace** (under the **General** tab).
 3. Tap **Method** as many times as necessary to select **Sonix Calcs—Trace set to 'Spectrum Range'**.
 4. Use the trackball to position the first caliper.
 5. Press ↘ to set the first caliper and activate the second.
 6. Use the trackball to position the second caliper.
-
- Note:** Pressing ↘ will toggle control between the calipers enabling either or both to be repositioned.
7. Press ↘ to set it.

6.3.4 Doppler Heart Rate Measurement

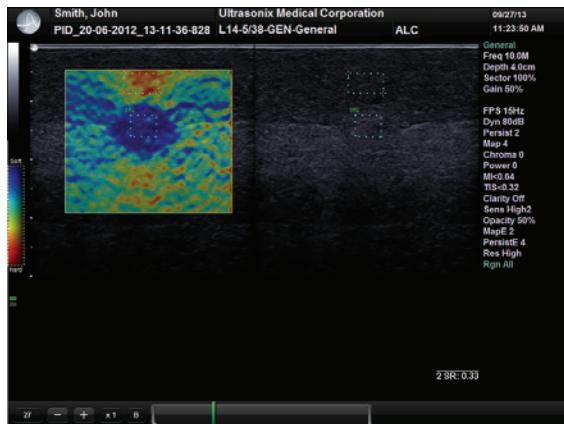
To Perform a Doppler Heart Rate:

1. With a frozen **Doppler Trace**, tap the touch screen **Measure** button.
 2. Tap **Generic** then **HR** (under the **General** tab).
 3. Use the trackball to position the caliper on the **Doppler Trace** to the first beat.
-
- Note:** The default **Heart Rate** measurement requires one heart beat. Refer to [8.2.7 Measurements](#) to change the number of beats required for the **HR** calculation.
4. Press ↘ to set the first caliper and activate the second.
 5. Use the trackball to position the second caliper to the desired next beat.
-
- Note:** Pressing ↘ will toggle control between the calipers enabling either or both to be repositioned.
6. Press ↘ to set the measurement.
 7. The **Heart Rate** value is presented on the bottom right of the LCD display.

6.4 ELASTOGRAPHY MEASUREMENTS

The **Elastography Strain Ratio** measures the relative stiffness of two regions on the image.

Figure 6-3: Strain Ratio Measurement



To Perform an Elastography Strain Ratio Measurement:

Note: The **Strain Ratio** measurement provided is part of the **General Measurement Package** and therefore will not be saved to the **Report**.

1. With a frozen **Elastography** image, tap the touch screen **Measure** button.
2. Tap **Generic** then **Strain Ratio** (under the **General** tab).
3. Use the trackball to position the first caliper of the first **Strain Ratio** box.
4. Press ↘ to set the caliper position and activate the second caliper of the first **Strain Ratio** box.
5. Use the trackball to position the second caliper of the first **Strain Ratio** box.
6. Press ↘ to set the second caliper and complete the first half of the measurement.
7. Use the trackball to position the first caliper of the second **Strain Ratio** box.
8. Press ↘ to set the caliper position and activate the second caliper of the second **Strain Ratio** box.
9. Use the trackball to position the second caliper of the second **Strain Ratio** box.
10. Press ↘ to set the second caliper and complete the measurement.
11. Repeat **step 3** to **step 10** as many times as required.

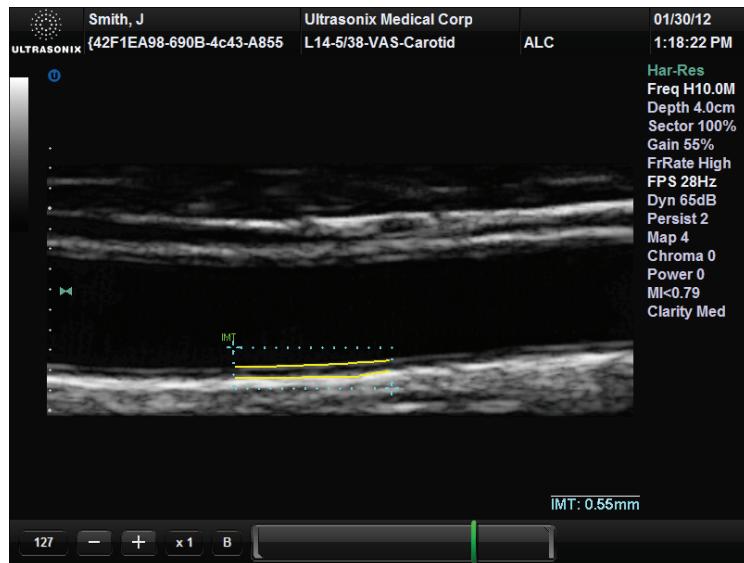
6.5 CAROTID INTIMA-MEDIA THICKNESS (IMT) MEASUREMENT

Using a high-frequency, linear array transducer, the automatic **IMT** measurement provides a quick and complete **IMT** evaluation. Both the near and far vessel walls of the carotid artery can be measured. As with other measurements, precision is related to minimal **B-Mode** imaging pixel size. Using **HD Zoom**, measurement accuracy can be as close as 30 microns (0.03 mm). The resulting measurement is an average of the relevant area selected in the ROI box.

If desired, **IMT** can be configured to use the **Auto-Label** option in **Capture Protocols** (8.2.19 Capture Settings).

Note: **IMT** is a licensed feature. Consult your local Ultrasonix Authorized Distributor or Sales Representative for details.

Figure 6-4: Sample IMT Measurement



To Perform a Carotid IMT Measurement:

1. Ensure an appropriate high-frequency, linear array transducer is connected to the system (e.g., L9-4/38).
2. Tap the touch screen **Presets...** button.
3. Tap a linear **Transducer** (e.g. L9-4/38), the **Vascular Application** and **Carotid Imaging Preset**.

Note: It may be necessary to use the Page Selector buttons in order to access the **Vascular Application**.

4. The system will move to live imaging.
5. With an acceptable image onscreen, tap **HD Zoom** and use the trackball to move the **HD Zoom** ROI box to an appropriate area of the image.
6. Press  to lock the upper left corner of **HD Zoom** ROI box.
7. Use the trackball to adjust both the width and height of **HD Zoom** ROI box.
8. Press  to lock the **HD Zoom** ROI box into its final position.
9. Press  to zoom the image.
10. With an acceptable image onscreen, tap **Measure** to access the **Measurement Packages** touch screen and freeze the image.
11. Tap the **Intima** tab.
12. Tap **IMT**.
13. Tap **Method** as many times as necessary to select **IMT set to 'Near'** or **IMT set to 'Far'**, as required.

Note: The two **IMT Methods** are defined as:

- **Far:** vessel wall furthest from the transducer
 - **Near:** vessel wall closest to the transducer.
-

14. Use the trackball to position the first caliper at the start position of the **IMT** measurement ROI.
15. Press  to set the first caliper.
16. Use the trackball to position the second caliper at the end position of the **IMT** measurement ROI.
17. Press  to set the second caliper and calculate the **IMT** measurement.
18. The resulting **IMT** measurement is presented on the bottom right of the LCD display.

6.6 CAPTURE PROTOCOLS

Capture Protocols has two options: **Gated Capture** and **Auto-Label**:

- **Gated Capture** is for use in cardiovascular exams such as **Flow Mediated Dilation (FMD)**, where users require image capture based on the **ECG R-Wave**

Note: *Capture Protocols* is a licensed option available only on the SonixTouch. To perform **FMD** exams, the system must also be equipped with an ECG module.

- **Auto-Label** can be used in situations where **Label** titles/order are user-defined and auto-applied. This cues the **Operator** as to the next image/measurement to be captured (for example, in **IMT** or **Fetal Biometry** exams). In **B-Mode**, when **Auto-Label** is active, the imaging parameters **Auto-Label** and **Capture Pos Rt/Lt** will be available (refer to **Table E-2** for details).

The full suite of **Capture Protocol** settings are controlled via:

- **Menu > Administrator > Capture Settings > Capture Protocols (8.2.19)**
- **Menu > Administrator > System > Export.../Import... (8.2.11)**
- **Menu > Administrator > Custom Keys > Programmable Action (8.2.14)**.

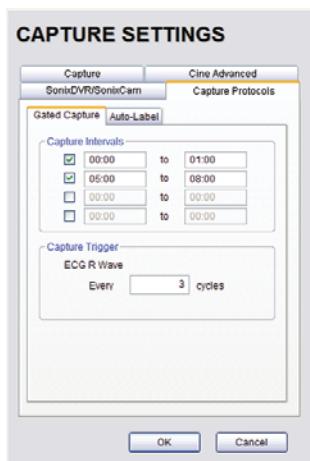
6.6.1 Gated Capture



Warning: The following example is for demonstration purposes only. **Gated Capture** exams should be designed by qualified medical personal using current standards of care.

To Perform a Gated Capture:

1. Select **Menu > Administrator > Capture > Capture Protocols > Gated Capture**.
2. Configure **Capture Intervals** and **Capture Trigger** as required before closing the **Gated Capture** dialog.



3. Select **Menu > Administrator > Custom Keys** and assign **Gated Capture** as the programmable action on either **Custom Key 1** or **2** (8.2.14).

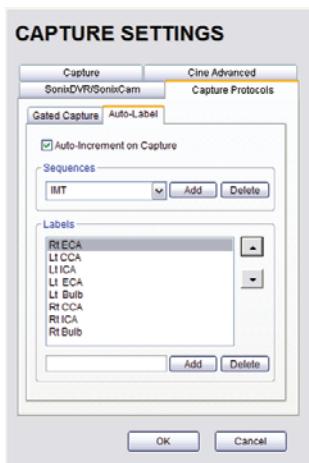
4. Ensure the **ECG** leads are properly connected to the patient.
5. Ensure the **ECG** module is turned on the SonixTouch.
6. Begin the exam, adjusting imaging parameters as required and positioning the patient to obtain a stable **ECG** readout.
7. Press the appropriate **Custom Key** (e.g., **1** or **2**) to begin the **Gated Capture**.
8. Continue imaging until the last **Capture Interval** has ended.
9. The result of the exam will be a **Cine** file with the **R Wave**-triggered frames embedded.

6.6.2 Auto-Labeling an Exam

This example uses **IMT** to demonstrate **Auto-Label**.

To Auto-Label an Exam:

1. Select **Menu > Administrator > Capture > Capture Protocols > Auto-Label**.
2. Configure **Auto-Label** for **IMT** (8.2.19) and ensure that the relevant **Sequence** is chosen before closing the **Auto-Label** dialog.



3. Ensure an appropriate transducer is connected to the system.
4. Tap the touch screen **Presets...** button.
5. Tap the relevant **Transducer**, the **Vascular Application** and the **Carotid Imaging Preset**.

Note: It may be necessary to use the Page Selector buttons in order to access the **Vascular Application**.
6. The system will move to live imaging.
7. Tap **Auto-Label** and press the associated dial to view the first **Label**.
8. If required, tap **Capture Pos Lt/Rt** and turn the associated dial to reposition the **Label** on the imaging screen.
9. Use the transducer to capture an appropriate image based on the onscreen **Label** (e.g., **Lt CCA**).
10. Press the console  button.
11. If required, tap the touch screen **Measure** button and take an appropriate measurement.
12. Depending on the **Custom Key** settings, press the appropriate button to print the image (e.g., **1** or **2**).
13. The **Label** will automatically advance to the next one in the **Sequence**.

6.7 MEASURE LIVE

The **Measure Live** function enables the **Operator** to take a **Distance** measurement on a live image. Because the measurement is never fixed, both calipers are infinitely adjustable.

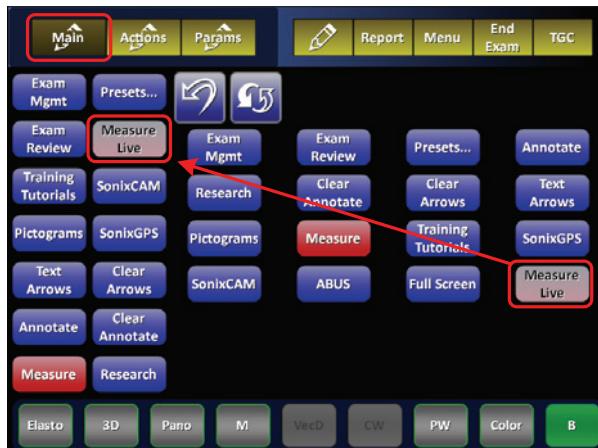


Warning: Measurements performed on a live image may be inaccurate as the image continues to update. Measurements performed on an live image should be used for informational purposes only.

Note: The live measurement data is not saved to the Report.

To access the **Measure Live** button, the **Operator** must edit the **Main** system buttons ([3.5.2 Touch Screen Button Editing](#)). Once the **Measure Live** button is available, simply tap to turn the function on/off.

Figure 6-5: Measure Live Button Configuration



Note: The **Measure Live** calipers will clear whenever:

- **Measure Live** is deselected (i.e., the **Operator** exits the **Measure Live** option)
 - a new **Preset** is selected
 - the **End Exam** button is tapped.
-

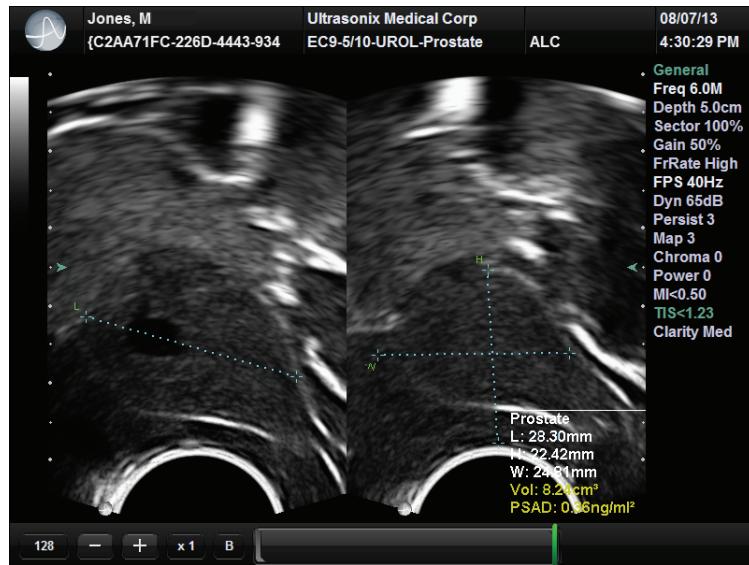
6.8 PSA/PSAD MEASUREMENT/CALCULATION

The **Prostate-Specific Antigen (PSA)** test result is used in combination with a **Prostate Volume** measurement to calculate **PSA Density (PSAD)**.

Note: *PSA test result data must be entered in the Exam Management page (4.1.2). However, once the system rolls over to a new date, the data in the **PSA** field is removed.*

*Each follow-up exam requires the entry of a current **PSA** test result before additional **PSAD** calculations are made.*

Figure 6-6: Sample PSAD Measurement/Calculation



6.8.1 PSAD Calculation Disclaimer

As **PSAD** calculations have not been conclusively linked to accurate clinical diagnoses/outcomes, Ultrasonix does not recommend relying on **PSAD** calculations.

To Perform a PSAD Calculation:

1. Tap the touch screen **Exam Mgmt** button.
2. Create/select the patient (i.e., ensure the **Patient Information** data fields have been completed (4.1.1)).
3. Select the **Urology Application** from the drop-down menu.
4. Complete **Height** and **Weight** as required.
5. Enter the **PSA** test result data.

Note: The **PSA** data must be in the form **ng/ml**, or **nanograms per milliliters**.

6. Complete the **Exam Management** page as required, then select **OK**.
7. Tap the touch screen **Presets...** button.
8. Select the **EC9-5/10 Transducer**, **Urology Application** and **Prostate Preset**.
9. With a frozen **2D** image, tap the touch screen **Measure** button.
10. Tap **Prostate** to access the (**L (Length)**, **H (Height)** and **W (Width)**) options.
11. Tap **L** and use the track ball to position the first caliper.
12. Press ↘ to set the caliper position and activate the second caliper.
13. Use the trackball to position the second caliper.
14. Press ↘ to set the second caliper position and complete the measurement.
15. The system will automatically move to the next measurement in the **Volume** calculation.
16. Use the track ball to position the first caliper.
17. Repeat **step 12** through **step 14** to complete the **Height** measurement.
18. The system will automatically move to the last measurement in the **Volume** calculation.
19. Use the track ball to position the first caliper.
20. Repeat **step 12** through **step 14** to complete the **Width** measurement.
21. The three measurement values with auto-calculated **Volume** and **PSAD** results will be presented on the bottom right of the LCD display.

6.9 3D/4D MEASUREMENTS



Warning: Measurements performed on an acquired **Freehand 3D** image may be inaccurate as the accuracy of the **Multiplanar Reconstruction** is very user-dependent. Measurements performed on an acquired **Freehand 3D** image should be used for informational purposes only.

6.10 OB-SPECIFIC MEASUREMENTS/CALCULATIONS

In the case of multiple fetuses (e.g., twins or triplets), be sure to enter the correct **Fetus #** (**Table 4-4**) on the **Exam Management** page. This will ensure that the **Fetus A/B** button will be active in both **OB Measurement Packages** and **Reports** (where **1 = A, 2 = B**, etc.).



Warning: In addition to entering the correct **Fetus #** on the **Exam Management** page, be sure to label each **Fetus** using the **Annotate** button.

Note: The **Fetus A/B** button will change based on the number of fetuses entered. For example, for eight fetuses, the button would be **Fetus A/H**. Tap this button as many times as necessary to cycle through to the correct **Fetus #**.

Additionally, to ensure that each measurement is labeled correctly (e.g., **A NT, B NT, F BPD**, where **A, B, F**, etc., reflect the **Fetus #** for the measurement), after changing the **Fetus #**, always reselect the relevant measurement.



Warnings:

Various factors may affect the accuracy of **Obstetrical** measurements.

Ensure the system **Date/Time** is configured correctly.

Ensure the desired **Obstetrical** calculation author has been selected for each parameter.

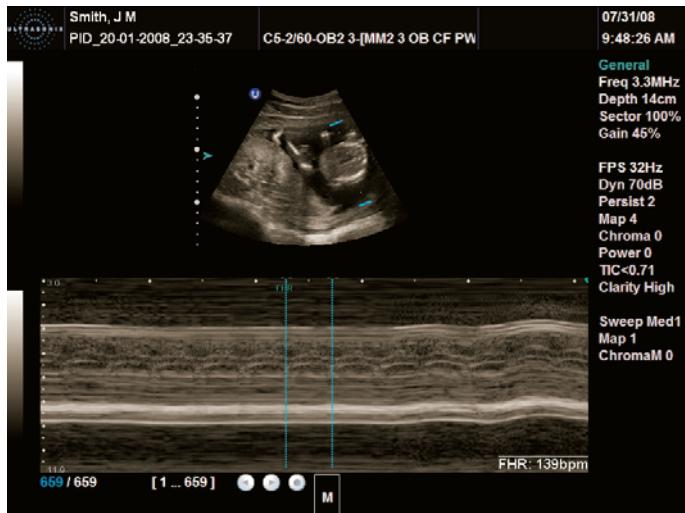
In order to record measurements on multiple—but separate—fetuses, enter a **Fetus #** between 2 and 8 (i.e., to activate the **Fetus** toggle button in **OB Measurement Packages** and **Reports** (where **1 = A, 2 = B**, etc.)).

Notes:

Selection of **OB Doppler** measurements **MCA** (**Middle Cerebral Artery**) and **Umb A** (**Umbilical Artery**) enable a two caliper velocity measurement to be made which displays **PSV, EDV, RI** and **SD ratio** results. To obtain a **PI** (**Pulsatility Index**) measurement for **MCA** or **Umb A**, select **MCA-PI** or **Umb A-PI** to enable a **Doppler Trace** measurement which displays **PSV, EDV, RI, SD** and **PI** results.

Once the first instance of a measurement has been taken, the relevant touch screen button will be prefaced by (1). If additional versions of that measurement are taken, the number will increment accordingly. Unless the measurement(s) is **Generic**, it will be displayed in the **Report Worksheet**.

Figure 6-7: Sample OB-Specific Measurement



6.11 FERTILITY-SPECIFIC MEASUREMENTS/CALCULATIONS

To select the number of follicles to be used in the **Follicle Volume** calculation, refer to **Fertility Cascade #** in [Table 8-10: Measurement Options](#).

Follicle Volumes are calculated as $V=(\text{average of all diameters})^3 * \pi/6$. For example:

- if two diameter measurements (e.g., **D1** and **D2**) are made for a **Follicle** (e.g., **F1**) then: **Volume** of $F1=((D1+D2)/2)^3 * \pi/6$
- if four diameter measurements (e.g., **D1**, **D2**, **D3** and **D4**) are made for a **Follicle** (e.g., **F2**), then: **Volume** of $F2=((D1+D2+D3+D4)/4)^3 * \pi/6$.

6.11.1 Auto-Follicle

6.11.1.1 Auto-Follicle Disclaimer

According to tests performed by Ultrasonix Medical Corporation, the ***Auto-Follicle*** feature is accurate to a follicle diameter measurement of ± 2 mm. However, it is still the ***Operator's*** responsibility to confirm whether the software-determined follicle boundary is acceptable.

6.11.1.2 Auto-Follicle Measurements

To enable/disable the ***Auto-Follicle Measurement Border***, refer to [8.2.7 Measurements](#).

Figure 6-8: Measurement Packages Touch Screen with Auto-Method Button

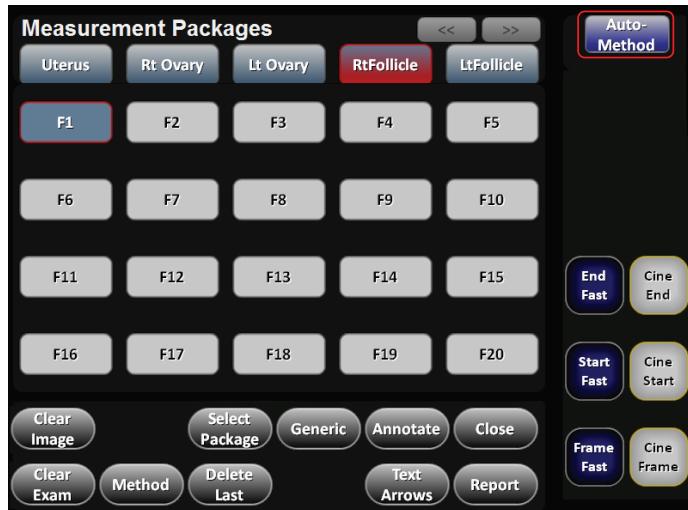


Figure 6-9: Auto-Follicle Method Touch Screen (with Enable Auto-Follicle Border)

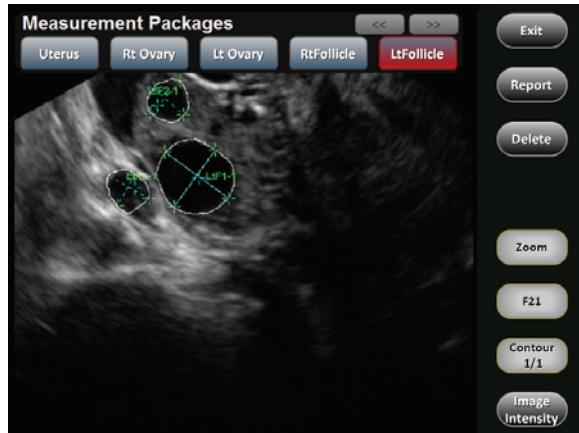


Table 6-5: Auto-Follicle Method Touch Screen Controls (tap to activate/dial to adjust)

Exit	Tap to exit Auto-Follicle measurements.
Report	Tap to access the Report/Worksheet .
Delete	Tap once to delete the most recent Auto-Follicle measurement. Repeating this action will delete each subsequent entry in reverse order.
Zoom/Cine	To delete specific measurements, use the F# dial (see below) to access the desired measurement. Once the measurement to be deleted becomes active, tap the Delete button.
F#	Press the associated dial to toggle between Zoom and Cine . Once the desired function is active, turn the dial to adjust the feature. When active, turn the Cine dial right or left to move backwards or forwards through the Cine loop one frame at a time, until the desired image is reached. When active, turn the Zoom dial to adjust the image in or out.

Note: At the start of each exam, **Zoom** will default to the factory setting.

	<p>Use the F# dial to access the desired measurement. The Contour button will show how many Contour options are available for that specific measurement:</p> <ul style="list-style-type: none"> • 1/1 = the single, available Contour option is displayed • 1/3 = three Contour adjustments are available and the first one is displayed • 2/5 = five Contour adjustments are available and the second one is displayed. <p>Contour</p> <p>Note: If the number is set to 0/0, then the measurement was not taken using Auto-Follicle.</p>
	<p>If more than one Contour option is available, turn the associated dial to cycle through them.</p>

Image Intensity	Tap to access Image Intensity option.
------------------------	--

Figure 6-10: Image Intensity

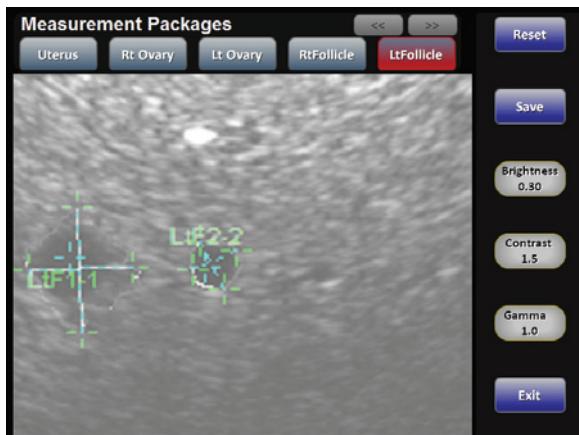


Table 6-6: Auto-Follicle Method Touch Screen Controls (tap to activate/dial to adjust)

Reset	Tap to Reset Image Intensity to factory settings.
Save	Tap to Save any changes made to Image Intensity settings. Note: The saved changes will become the default settings until the next time changes are saved or the Reset button is tapped.
Exit	Tap to return to the Auto-Follicle Method touch screen.
Brightness	Adjusts image Brightness : 0.00 to 2.00, in 0.1 increments.
Contrast	Adjusts image Contrast : 0.0 to 2.0, in 0.1 increments.
Gamma	Adjusts image Gamma : 0.0 to 2.0, in 0.1 increments.

To Access Auto-Follicle Measurements

1. Tap the touch screen **Presets...** button.
2. Select **Pelvic** as the **Application**.
3. Select a relevant transducer that supports the **Pelvic Application** (e.g., EC9-5/10).
4. Select a **Preset**.
5. During imaging, tap **Measure** to access the **Pelvic Measurement Package** touch screen.
6. When the **Pelvic Measurements Package** touch screen is presented, tap **RtFollicle** or **LtFollicle**.
7. Tap **Auto-Method**.

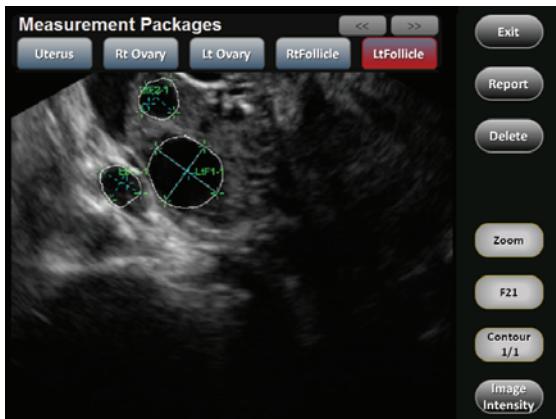
To Move the Touch Screen Image:

1. With the **Auto-Follicle** touch screen active, tap the touch screen anywhere and without lifting up (i.e., tap and hold), drag your finger around the touch screen to move the touch screen image.

Note: This will not have any effect on image position on the LCD display.

To Take Auto-Follicle Measurements:

- After accessing ***Auto-Follicle Measurements*** the image will be presented on both the LCD display and the touch screen.



Note: Detailed measurement data will be presented on the LCD display.



- Use the **F#** dial to access the desired measurement.
- Press the relevant console (**Custom Key**) **1** and **2** button to save the image on the LCD display to the current exam.
- Tap **Exit** to exit ***Auto-Follicle*** measurements.

6.12 REPORTS AND WORKSHEETS

Reports/Worksheets have been created as an electronic documentation tool. Identifying patient/exam information is included in the **Report** header on every page.

Applications are linked to a **Report/Worksheet** that can be viewed/edited during an exam via the touch screen **Report/Worksheet** button.

Note: The touch screen **Worksheet** button is only available for the **EMED**, **Anesthesia** and **Endocrinology Protocols**. All other **Protocols** have a **Report** button.

Files saved to a USB storage device during data transfer will be printed to a PDF in the relevant **Patient** directory under **Patientinfo**. Refer to [9.3](#) for more details.

Reports contain the information from a **Worksheet** but are formatted in a slightly different manner.

Certain aspects (such as measurements) of some **Worksheets** can be edited but only on the same calendar day as they were created. Once the system date rolls past midnight, these fields can no longer be edited. The exception to this is the **Notes** field.

Note: In order for the **Worksheet** to be available for editing, the **Application** used to create the original **Worksheet** must have a custom **Measurement Package**. For details on the **Applications** that qualify, refer to [8.2.7.2 Show/Hide Applications, Measurement Packages and Measurements](#).

Any measurement that is edited will be marked with an asterisk (*).



Warning: Ultrasonix does not endorse user-defined **Measurements** for diagnostic purposes. All user-defined **Measurements** are used at the **Operator's** discretion and risk only.

Note: The touch screen **Report/Worksheet** button is only available if a patient has been selected.

It is not possible to edit **Calculations**.

6.12.1 Accessing Reports/Worksheets

During an exam, when in **Measurement Packages**, press/tap the **Report/Worksheet** button at any time to access the current **Report/Worksheet** on the LCD display. While no information can be typed into the open **Report/Worksheet**, using the trackball and button, certain checkboxes and drop down menu selections can be made. Touch screen options will reflect the fact that a **Report/Worksheet** is now open.

Note: Only four **Report/Worksheet** touch screen buttons are common to all **Applications**: **Print...**, **Print Default**, **Exit** and **Pages**. The other options will only be available when imaging is underway for the relevant **Application**.

Table 6-7: Reporting (Report/Worksheet) Touch Screen Options

Print...	Tap to open the Windows Print dialog. This enables users to configure the print job using the available Print dialog parameters.
Print Default	Tap to send the job to the default printer (if one has been configured).
Exit	Tap to save and close the Report/Worksheet , returning the user to Measurement Packages .
Final Report	Tap to view Final Report layout. Note: This option is available only in Cardiac .
Worksheet	Tap to view the current Worksheet . Edits made to Worksheet Measurements the same calendar day they were taken will be saved and used in final calculations. Note: This option is available only in Cardiac . Any changes to measurements will be auto-calculated within the Worksheet/Report . The actual Calculations cannot be edited. Any measurement that is edited will be marked with an asterisk (*).
Biometrics	Tap to move to the Biometrics page of the Report . Note: This option is available only for OB Applications .
Anatomy	Tap to move to the Anatomy page of the Report . Note: This option is available only for OB Applications .
Pages	Turn the dial directly to the right of Pages to move the Report from page to page.
Graph	Use the Pages button (above) to move to the Graph page of the Report then turn the Graph dial to cycle through the available Graphs .
Fetus A/B to Fetus A/H	Turn the Fetus button dial as many times as necessary to move to the Report for the relevant Fetus (e.g., A , B , C , etc.). Note: This button is only available if Fetus # (Table 4-3) was set to a number other than 1 (options are 1 to 8 which correspond with A to H).
HR	Turn the HR button dial to move to the desired HR for the Cardiac Report . Refer to 6.12.4 Cardiac Reports for details on the HR options.

To Access a Report Worksheet while In Measurement Packages:

1. With a frozen image, tap the touch screen **Measure** button.
2. Tap **Report**.
3. Turn the dial directly to the right of the **Pages** button to move through the pages of the **Report Worksheet**.
4. Use the trackball and  button to make any required checkbox or drop-down menu selections.
5. Tap **Exit** to close the **Report Worksheet** or use the trackball and  button to select the **X** in the upper right corner.

Note: Exiting the **Report Worksheet** will not end the current exam.

To Access a Report Worksheet from the Main Touch Screen:

1. While on the main touch screen (i.e., before entering or after exiting the **Measure** option) tap the touch screen **Report** button.



2. Turn the dial directly to the right of the Pages button to move through the pages of the **Report Worksheet**.
3. Tap the touch screen **Report** button to toggle the **Report Worksheet** closed or use the trackball and ↵ button to select the X in the upper right corner of the LCD display.

Note: Exiting the Report Worksheet will not end the current exam.

To Access an EMED, or Anesthesia or Endocrinology Protocol Worksheet:

1. While on the main touch screen (i.e., before entering or after exiting the **Measure** option) tap the touch screen **Worksheet** button.
2. Use the touch screen options to complete the **Worksheet** as well as move through the various pages.
3. Tap the touch screen **Worksheet** button to toggle the **Worksheet** closed.

Note: Exiting the Report Worksheet will not end the current exam.

6.12.2 Enhanced Report Printing

The *Reporting Update* package offers a superior printed format. To take advantage of the enhanced print format, additional software must be installed. This file can be accessed/installed via **Software Updates** with an Internet connection or from the root of a USB key ([8.2.22](#)).

To Determine if the Enhanced Printing Reporting Software is Installed:

Note: A patient must be selected in order to access the new reporting software.

1. With a frozen image, tap the touch screen **Measure** button.
2. Tap **Reports**.
3. Tap **Print....**
4. If the **Print** dialog is presented, the reporting software must be installed. Follow the instructions in [8.2.22.1](#) to install the reporting software from:
 - **Software Updates** (install *Reporting Update - 240MB (December 7, 2011)*)
 - a USB key.
5. If the **Sonix Report Viewer** opens ([Figure 6-11](#)), the software has been installed. Continue to [6.12.2.1](#).

6.12.2.1 Printed Report Format

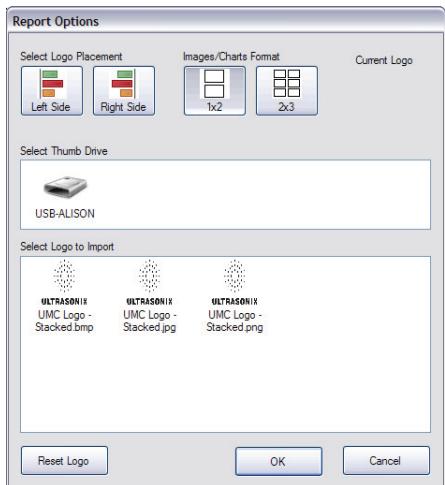
It is not possible to edit the contents of the printed report format.

Figure 6-11: Report Viewer



Table 6-8: Report Viewer

Print...	Tap to open the Windows Print dialog. This enables users to configure the print job using the available Print dialog parameters.
Print Default	Tap to send the job to the default printer (if one has been configured).
Export	Tap to Export a PDF of the report to the root of an external media device such as a USB key. The file will be named with the Date , followed by the Application and the Patient ID , ending in the word "report". <i>Note: The Report naming convention does not use any spaces, (e.g., 2012-01-27_Vascular_{42F1EA98-690B-4c43-A855-AF5B18094885}_report.pdf).</i>
Prev Page	Tap to move back and forth through the various report pages.
Next Page	
Options	Tap to configure formatting options, including: Logo and Logo Placement (Figure 6-12 and Table 6-9).
Exit	Tap to close the Report Viewer .

Figure 6-12: Report Options

Table 6-9: Report Options

Select Logo Placement	Select the desired option for logo placement. Left Side Right Side <i>Note: Select Left Side and Right Side to place a logo on both sides of the Report header.</i>
Images/Charts Format	1x2 2x3 Select the desired option for image/chart placement.
Current Logo	Displays the current logo used in the report.
Select Thumb Drive	Select the thumb drive which contains the new logo to be imported. <i>Note: If only one thumb drive is connected to the system, it will be selected automatically.</i>
Select Logo to Import	Once the relevant thumb drive is selected, all PNG , JPG and BMP images in the root of the drive will be displayed here for selection. <i>Note: For best results, Ultrasonix recommends using a 300 x 300 pixel logo.</i>
Reset Logo	Restores logo to the factory default, however, edits made to the logo placement will not remain intact.
OK	Saves the changes made to the Report Options dialog and returns to the Sonix Report Viewer .
Cancel	Cancels any changes made to the Report Options dialog and returns to the Sonix Report Viewer .

6.12.3 Obstetrics Report

As with other **Reports**, the **OB Report** allows the user to edit/delete measurements, providing the edit/deletion is done on the same calendar day as the measurements were taken.

To Delete Obstetrical Biometry Measurements from a Worksheet/Report:

Note: *Report data can only be edited the same calendar day it was created.*

1. With a frozen **OB** image, tap the touch screen **Measure** button.
2. Tap **Report**.
3. Tap **Pages** and turn the associated dial until the desired page appears.
4. Use the trackball and  button to insert the cursor at the end of the measurement/data to be deleted.



Caution: *In the case of two or more fetuses, ensure the correct fetus is selected prior to deleting the OB parameter measurement.*

Note: *Only some fields are available for editing.*

5. Use the keyboard **Bksp** or **Del** key and delete the relevant data.
6. Repeat **step 3 to step 5** as many times as necessary.
7. Tap **Exit** to close the **Report Worksheet** and return to imaging or use the trackball and  button to select the **X** in the upper right corner.

Figure 6-13: Sample Page from an Obstetrical Report Worksheet

Date of Exam: 11/5/2010 Page 1/6 Exam Type: OB 2nd-3rd Trimesters							
Name Smith, J				Perf. Phys. Dr Fred Jones			
Pat. ID PID_24-10-2010_23-55-05		DOB 12/8/1975		Ref. Phys. Dr Jane Doe			
Indication		Sex F		Operator ALC			
LMP 3/15/2010		GA(LMP) 33w3d		EDD(LMP) 12/20/2010		G	Ab
DOC		GA(AUA)		EDD(AUA)		P	Ec
EFW		Value 39.07g		Range 5.70g		Age 10w2d	
Hadlock AC/BPD/FL/HC		<input type="button" value="▼"/>				Growth Doubtful <input type="button" value="▼"/> <5%	
2D Measurements		AUA	Value	m1	m2	m3	Meth.
BPD (Hadlock)			8.07mm	8.19	8.53	7.50	avg <input checked="" type="checkbox"/>
OFD (HC)			10.27mm	11.19	9.74	9.89	avg <input checked="" type="checkbox"/>
HC (Hadlock)			29.78mm	30.01	28.84	30.48	avg <input checked="" type="checkbox"/>
AC (Hadlock)			27.48mm	28.18	30.13	24.14	avg <input checked="" type="checkbox"/>
FL (Hadlock)			5.83mm	4.70	6.52	6.28	avg <input checked="" type="checkbox"/>
OB Ratios							
FL/BPD		73%		67%-91%		20%	19%-23%
<input type="button" value="Thumbnails"/> <input type="button" value="Select All"/> <input type="button" value="Clear All"/>							

6.12.4 Cardiac Reports

The **HR** data in the header of the **Cardiac Report Worksheet** can be obtained from several sources. The source can also be changed in the **Report Worksheet** at the **Operator's** discretion.

- **No HR:** left blank
- **Exam HR:** derived from the **Cardiac Application Information** entry on the **Exam Management** page (refer to **Cardiac** in **Table 4-4** for more details)
- **Mmt HR:** derived from the actual **PW** measured **HR**
- **ECG HR:** derived from the actual **ECG** measured **HR**.

Note: Refer to [Accessories—Third Party](#) in Appendix B for the recommended ECG electrode.

Figure 6-14: Cardiac Report Worksheet

REPORT WORKSHEET		Date of Exam: 11/5/2010	Page 1/2
		Exam Type: Cardiac	
Name	Smith, J	DOB	12/01/1975
Pat. ID	PID_24-10-2010_23-55-05	Perf. Phys.	Dr Fred Jones
Indication		Ref. Phys.	Dr Jane Doe
CI		Operator	ALC
		BSA	1.61m ²

Figure 6-15: Cardiac Report Touch Screen



Note: Turn the dial next to the **No HR** button in the **Cardiac Report** touch screen to cycle between the available **HR** options.

Figure 6-16: Sample Page from a Final Version of a Cardiac Report Worksheet

FINAL REPORT				Date of Exam: 7/31/2008	Page 1/4
				Exam Type: Cardiac	
Name	Jones, Michael			Perf. Phys.	Dr Smith
Pat. ID	USX_PID_23-07-2008_15-22-16			DOB	3/15/1969
Indication				Ref. Phys.	Dr Frank
				Sex	M
				Operator	ALC
	CI	BSA			2.12m ²
RV/LV [M]					
RVWd	0.74cm	RVWs	0.80cm		
RVDd	1.54cm	RVDs	1.91cm		
IVSd	1.17cm	IVSs	3.20cm		
LVDd	4.74cm	LVDs	3.33cm		
LVPWd	1.23cm	LVPWs	1.54cm		
RV/LV [M] Calculations					
CO(Cube)	3.97L/min	CO(Gibson)	4.02L/min		
CO(Teich)	3.39L/min	EDV(Cube)	106.71ml		
EDV(Gibson)	123.40ml	EDV(Teich)	104.57ml		
EF(Cube)	65.51%	EF(Gibson)	57.29%		
EF(Teich)	56.98%	ESV(Cube)	36.81ml		

6.12.5 Vascular Reports

Figure 6-17: Sample Page from a Vascular Report Worksheet

REPORT WORKSHEET				Date of Exam: 8/22/2008	Page 1/4			
				Exam Type: Vascular				
Name	Jones, Michael			Perf. Phys.	Dr Smith			
Pat. ID	USX_PID_23-07-2008_15-22-16			DOB	3/15/1969			
Indication				Ref. Phys.	Dr Frank			
				Sex	M			
				Operator	ALC			
Measurements	Value	m1	m2	m3	m4	m5	m6	Meth.
Stenosis D - Rt Prox ICA								
D1	1.04cm	1.04						max <input checked="" type="checkbox"/>
D2	0.38cm	0.38						max <input checked="" type="checkbox"/>
%	63.21%	63.21						max <input checked="" type="checkbox"/>
● Rt Carotid - Rt Dist CCA								
PSV	69.6cm/s	69.6						max <input checked="" type="checkbox"/>
EDV	22.3cm/s	22.3						max <input checked="" type="checkbox"/>
● Rt Carotid - Rt Prox ICA								
PSV	79.0cm/s	79.0						max <input checked="" type="checkbox"/>
EDV	29.0cm/s	29.0						max <input checked="" type="checkbox"/>

6.12.6 Graf Classification

MSK Hip Angle measurements include a **Graf** classification entry in the **Report**.

6.12.7 Billing and QA Review Report/Worksheet Options

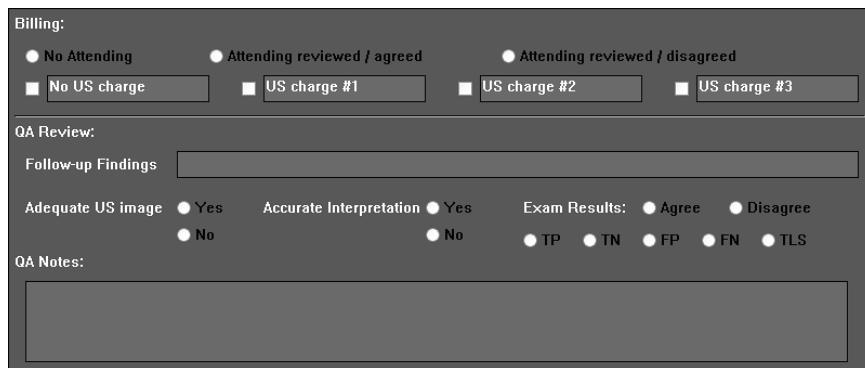
If desired, **Billing** details can be included in the **Billing** section.

Note: Ensure **Enable QA Review** has been selected ([Table 8-10](#)).

Any **Report/Worksheet** opened/created during/prior to this setting being selected will not include the **Billing** and **QA** options.

QA Review enables a **Reviewer** to make note of any **Follow-up Findings**, record their **QA** results, **Agree/Disagree** with the results determined by the **Operator** associated with the exam in question as well as enter any relevant **Notes** they may wish to make.

Figure 6-18: Billing and QA Review



Billing:

- No Attending Attending reviewed / agreed Attending reviewed / disagreed
- No US charge US charge #1 US charge #2 US charge #3

QA Review:

Follow-up Findings

Adequate US image	<input type="radio"/> Yes	Accurate Interpretation	<input type="radio"/> Yes	Exam Results:	<input type="radio"/> Agree	<input type="radio"/> Disagree		
	<input type="radio"/> No		<input type="radio"/> No	<input type="checkbox"/> TP	<input type="checkbox"/> TN	<input type="checkbox"/> FP	<input type="checkbox"/> FN	<input type="checkbox"/> TLS

QA Notes:

Table 6-10: Billing and QA Review Fields

No Attending	Select if no Attending Physician is present during the exam.
Attending Reviewed/ Agreed	Select when an Attending Physician is present during the exam and Agrees with the Operator .
Attending Reviewed/ Disagreed	Select when an Attending Physician is present during the exam and Disagrees with the Operator .
No US Charge US Charge #1 US Charge #2 US Charge #3	The names of these four Ultrasound (US) fields can be edited to reflect billing codes relevant to the Exam Type/Application and/or individual institutions. Note: Ultrasonix recommends "blanking out" any unused billing code fields.



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Follow-up Findings	Enables Reviewers to comment on Follow-up Findings as necessary. Note: This field will accept approximately 75 characters.
Adequate US Image	Accepts a Yes or No answer.
Accurate Interpretation	Accepts a Yes or No answer.
Exam Results	Agree/Disagree Allows Reviewers to Agree/Disagree with the Operator's results.
TP	True Positive
TN	True Negative
FP	False Positive
FN	False Negative
TLS	Technically Limited Study
QA Notes	Enables Reviewers to add whatever comments they feel are necessary. Note: This field will accept approximately 400 characters.

To Access Billing and QA Review Details:

1. Tap the touch screen **Report Worksheet** button.
2. When the **Report Worksheet** opens, tap the touch screen **Report** button.
3. Turn the **Pages** dial to move to the relevant page.

REPORT WORKSHEET				Page 2/2
Name:	Date: 9/18/2009	Patient ID:		
Operator ID:	Attending Physician:			
Notes:				
Billing: <input type="radio"/> No Attending <input checked="" type="radio"/> Attending reviewed / agreed <input type="radio"/> Attending reviewed / disagreed <input checked="" type="checkbox"/> No US charge <input type="checkbox"/> US charge #1 <input type="checkbox"/> US charge #2 <input type="checkbox"/> US charge #3				
QA Review: Follow-up Findings Adequate US image <input checked="" type="radio"/> Yes Accurate Interpretation <input checked="" type="radio"/> Yes Exam Results: <input type="radio"/> Agree <input type="radio"/> Disagree <input type="radio"/> No <input type="radio"/> No <input type="radio"/> TP <input type="radio"/> TN <input type="radio"/> FP <input type="radio"/> FN <input type="radio"/> TLS QA Notes:				

Note: Any **Report Worksheet** opened/created during/prior to this setting being selected will not include the **Billing** and **QA** options.

4. Use the trackball, touch screen keyboard and console ↘ button to complete the **Billing** and **QA Review** fields as required.

CHAPTER 7: TEXT, ANNOTATIONS AND PICTOGRAMS

Text, Annotations and **Pictograms** enable the user to label images prior to image transfer and storage.

Note: *Annotation* and *Pictogram* options are controlled via [8.2.2](#) and [8.2.3](#), respectively. Refer to [8.2.6](#) for details on global *Annotation* settings.

Text, Annotations and **Text Arrows** can also be added to **3D/4D** images.

Figure 7-1: Text, Annotation and Pictogram Buttons on Main Touch Screen

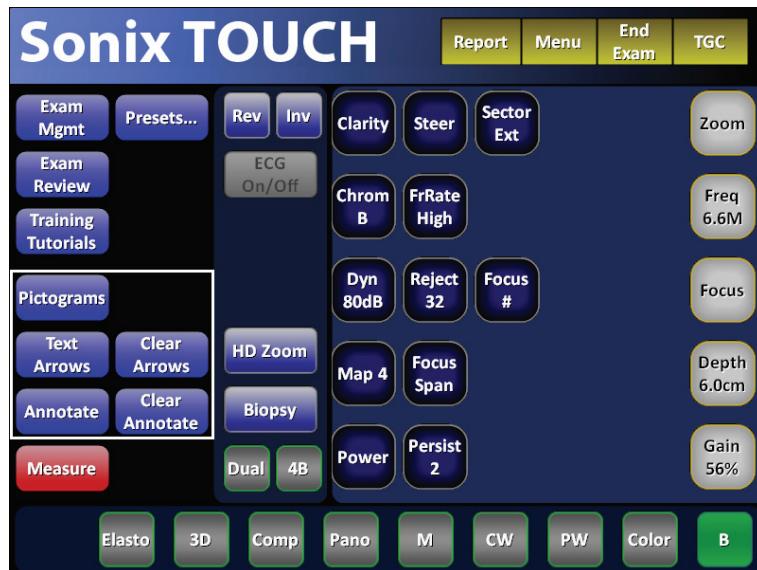


Table 7-1: Text, Annotation and Pictogram Buttons on Main Touch Screen

Pictograms	Tap to access the Pictograms associated with the selected Application/Preset .
Text Arrows	Tap to insert Text Arrows on a frozen image. Tap a second time to delete all Text Arrows on the image.
Clear Text Arrow	Tap to clear the last Text Arrow added to the image. Repeating this action will delete each Text Arrow in reverse order.
Annotations	Tap to access the Annotations associated with the selected Application/Preset .
Clear Annotations	Tap to clear all Annotations added to the image.

7.1 TEXT AND ANNOTATIONS

The system enables users to add ***Text*** or ***Preset Annotations*** to the image field. ***Annotations*** are predefined by ***Application*** but can also be customized by users (8.2.2). A ***Text Arrow*** is available as well as an ***Auto-Complete*** text feature that anticipates the word being entered (8.2.6).

Figure 7-2: Annotations Touch Screen



Table 7-2: Annotations Touch Screen

1 Page Selector Buttons	Annotation page selector buttons for use when there are multiple pages of <i>Application</i>-specific <i>Annotations</i>.
2 Annotation Buttons	Application-specific <i>Annotations</i> controlled via 8.2.2 Presets – Annotations .
3 Home Pos(ition) Buttons	Home Position configuration buttons (common to all <i>Annotations</i> touch screens). Note: Refer to 7.1.1 for details on setting the Home Position .
4 Edit Buttons	Tap Delete Last (or use the keyboard BACKSPACE key) to remove the letter(s) to the left of the Text cursor. Tap Clear to remove all <i>Annotations</i> on the imaging screen. Common to all <i>Annotation</i> touch screens: Delete Last , Clear and Close .
5 Measure Button	Tap to enter Measurement Packages directly from the Annotations touch screen (common to all <i>Annotations</i> touch screens).
6 Touch Screen Keyboard	Use to enter text (common to all <i>Annotation</i> touch screens).

To Access the Annotations Touch Screen:

1. Tap the touch screen **Annotations** button.

7.1.1 Set Text Home Position

The **Home Position** button enables users to automatically reposition the cursor to the previously-defined **Text Home Position**. Once a **Text/Annotation** cursor **Home Position** has been set, it will remain until/unless it is reset.

To Set the Text Home Position:

1. Tap the touch screen **Annotations** button.
2. Use the trackball to position the cursor in the desired **Home Position**.
3. Tap **Set Home** to set the **Home Position**.

4. Tap **Close** to exit **Text/Annotation** mode.

7.1.2 Annotations (Keyboard Text)

Entering **Annotations** can be accomplished with or without the **Auto-Complete** function ([8.2.6 Annotations](#)).

If **Auto-Complete** is disabled, press the **ENTER** key to wrap the **Annotation** to the next line and continue typing.

If **Auto-Complete** is enabled, enter the first few letter(s) of the pre-defined **Annotation** and the rest of the word will be presented in blue. If more than one pre-defined **Annotation** with the same first letters exists, use the **Tab** key to cycle through all **Annotations** beginning with that letter. To set the desired **Annotation**, tap the keyboard **Enter** key.

To Enter Annotation Text:

1. Tap the touch screen **Annotations** button.
2. A **Text** cursor is presented on the imaging screen.
3. Use the trackball to position the **Text** cursor as required.
4. Use the touch screen keyboard to enter the desired text.
5. Tap **Close** to exit **Text/Annotation** mode.

7.1.3 Application-Specific Annotations

To Enter Application-Specific Annotations:

1. Tap the touch screen **Annotations** button.
 2. Once the **Text/Annotation** cursor location is presented on the imaging screen, use the trackball to reposition the cursor as required.
 3. Tap the desired **Annotation** from the selection presented on the touch screen.
-
- Note:** To modify the preset **Annotations**, refer to section 8.2.2 Presets – Annotations.
4. Repeat **step 2** and **step 3** as many times as required.
 5. Tap **Close** to exit **Text/Annotation** mode.

7.1.4 Deleting Text/Annotations

To Delete All Text/Annotations:

1. Tap the touch screen **Clear Annotations** button.

Note: Alternatively, tap **Clear** while in the **Annotations** touch screen.

*To remove only the most recently entered **Annotation**, tap **Delete Last** while in the **Annotations** touch screen. Repeating this action will delete each entry in reverse order.*

7.1.5 Text Arrows

Operators can enter one or multiple **Text Arrows** on a single image.

If required, Operators can also customize the length of the **Text Arrow** (8.2.6.1).

To Enter Text Arrows:

1. Tap the touch screen **Text Arrows** button.
2. When the arrow appears on the image screen, use the trackball to position/rotate it.
3. Press the console  button to place the positioned arrow on the image.
4. Repeat **step 2** and **step 3** as many times as necessary.
5. Archive the image to save it with the arrows visible.

Note: To archive, press the console **1** or **2** button, depending on the system's printing setup (as configured in 8.2.14 Custom Keys).

6. Tap **Text Arrows** again to remove all arrows from the image.

Note: Once the console  button is pressed—either before or after the **Text Arrows** are added—pressing it again (i.e., unfreezing the image) will remove the **Text Arrows** without having to tap **Text Arrows**.

To Enter the Customized Text Arrow:

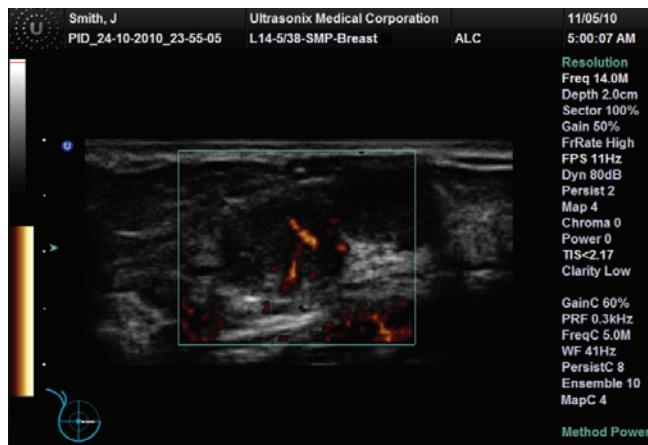
1. Ensure a customized **Text Arrow** has been configured (8.2.6).
2. During imaging, tap the touch screen **Text Arrows** button.
3. When the arrow appears on the image screen, use the trackball to position the tip of the **Text Arrow**.
4. Press  to lock the **Text Arrow** tip in place on the image.
5. Use the trackball to rotate the tail of the **Text Arrow** so it does not block any of the image.
6. Press  to lock the entire **Text Arrow** tip in place on the image.
7. Press  to lock the entire **Text Arrow** tip in place on the image.
8. Repeat **step 2** to **step 7** as many times as necessary.

7.2 PICTOGRAMS

Pictograms are predefined, **Application**-specific icons that enable users to label the imaging feature. Customizing the availability of specific **Pictograms** is controlled through [8.2.3 Presets – Pictograms](#).

To Activate a Pictogram:

1. Tap the touch screen **Pictograms** button.
2. Rotate the associated **Pictogram** dial to move through the various **Pictograms** available.



3. Use the trackball to position the **Pictogram** orientation marker to the desired location on the **Pictogram**.
4. Tap the touch screen **Rotate** button and turn the associated dial to attain the desired position.
5. Press the console  button to set the marker's position and orientation.
6. To adjust the **Pictogram** orientation marker after setting it, move the cursor until it is close to the marker and press  again. Repeat **step 3** to **step 5** to re-set the marker.

Note: To hide the **Pictogram** from view, tap the touch screen **Hide** button.

CHAPTER 8: SYSTEM SETUP

The various features and settings of the system can be customized via one of the three **System Setup** menus: **User**, **Administrator** and **Service**. Menu-level password protection applies as follows:

- **Users Settings**: no password protection
- **Administrator Settings**: optional password protection
- **Service Settings**: always password protected. Only qualified Ultrasonix Medical Corporation service personnel can access this menu.

To access any of the following functions, tap the touch screen **Menu** button.

Figure 8-1: Touch Screen Menu Button



The following tables provide a quick overview of the system's setup menus. Refer to the related sections later in this chapter for details on any particular setup option.

Note: Unlicensed and/or inactive **Menu** options will be inaccessible (i.e., grayed out).

Table 8-1: User Settings Menu

Setup	SonixLive	View live imaging on a remote computer using a LAN connection.
	Administrator	Access the Administrator Settings menu.
Support	Remote Support	Access the Remote Support option. Note: <i>Remote Support</i> is configured via 8.2.12 Network .
	Chat Support	Access the Chat Support option Note: <i>Chat Support</i> is configured via 8.2.12 Network .
	Documentation	View a PDF version of the User Manual on the LCD display.

Note: The software version number is displayed across the bottom of this menu.

Table 8-2: Administrator Settings Menu

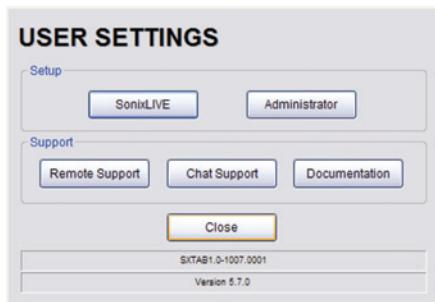
Application Setup	Presets	View and manage Presets with their associated Annotations , Pictograms , Measurements and Imaging Presets .
	Annotations	Toggle on/off the three global Annotation settings. Note: Customization of Preset-specific Annotations is handled through Presets .
	Measurements	Configure measurement Graphics , Measurement and Worksheet settings.
	Training Tutorials	Download, copy or view training materials in a variety of file formats.
	SonixGPS	Select/deselect SonixGPS needle type.
	Biopsy Guide	Configure Single Guideline Biopsy option.
System Setup	System	Configure/customize basic System Settings , such as: Institution Name , Regional options, Shutdown Options , Auto-Freeze , User Data , Master Volume and Admin Password . Reset system to Factory Defaults .
	Network	Configure settings for: Network (LAN (Local Area Network) or dialup), TCP/IP (Transmission Control Protocol/Internet Protocol), E-mail and Chat Support .  Caution: System networking options are intended for use <u>inside</u> your organization's firewall. Organizations that elect to configure/use the networking functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision. Note: Dialup access requires an external USB modem. Talk to your local dealer or Ultrasonix Technical Support for details.
	DICOM	Enable and configure DICOM Storage , Print and Worklist .
	Custom Keys	Set the Store , Print , Archive parameters for the console Custom Key buttons (1 and 2).
	Peripherals	Configure Peripherals : Paper Printer , LCD Display , VCR/Photo , Footswitch , (Image) Brightness/Contrast and Touch Screen settings.
	Display	Configure Appearance options for the LCD display.
	Patient	Customize entry of Patient information using a variety of options, including: show/hide fields, create new fields, allow/disallow editing of specific fields, and selection of gender and application defaults.
	Status Bar	Configure which Status Bar icons are visible on the LCD display.
	Capture	Configure Capture Settings for still images, video output, Cine loop storage, SonixDVR / SonixCam and Cine Advanced . It also controls the settings for Capture Protocols on the SonixTouch.
	Imaging Modes	Configure a variety of Imaging Mode options including Split Imaging and Initial Active Display .
System Maintenance	Documentation	Add/Delete user documentation for viewing on the system Note: All documents must be in PDF format.
	Software Updates	Update system software via the Internet or a USB medium.
	Licensing	View and add License details.
	Service...	Access the Service Mode dialog.

Table 8-3: Service Settings Menu

Service Settings	The system is delivered with this option under Password protection. Note: Only qualified Ultrasonix Medical Corporation service personnel can access this menu.
<p>Note: Use the trackball and ⬅ button to close each menu and exit the menu system, one menu at a time. To exit the entire menu system in one step, press the console Q button.</p> <p>Be sure to save whatever edits are in progress <u>before</u> exiting, otherwise changes may be lost.</p>	

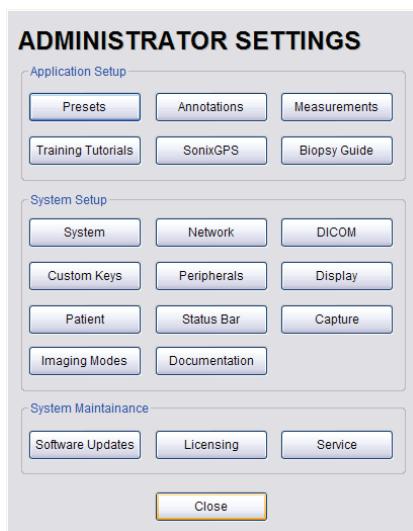
To Access the System Menus:

1. Tap the touch screen **Menu** button and the **User Settings** menu will be presented.



Note: The Software Version number is displayed on the **User Settings** menu.

2. From the **User Settings** menu, select **Administrator** to access **Administrator Settings**.



3. From the **Administrator Settings** menu, select **Service...** to access the **Service Mode** dialog.



Note: To exit the entire menu system in one step, press the console **Q** button.

8.1 USER SETTINGS

8.1.1 SonixLive Setup

SonixLive allows users to view live imaging on a remote computer using a **LAN** connection. When remote viewing is underway, if the **Status Bar** icon has been activated, then the **SonixLive** icon will appear on the imaging screen (refer to [8.2.18 Status Bar](#) for details on the **SonixLive** icon).

SonixLive ultrasound system software is installed automatically. In order to view the ultrasound session from a remote location via a **LAN**, **SonixLive Viewer** software must be downloaded, installed and configured on the relevant computer(s) ([8.1.1.2](#) and [8.1.1.3](#)).

Note: **SonixLive** is a licensed option.

8.1.1.1 Configuring the Ultrasound System for SonixLive

There are two **SonixLive** configuration options on the ultrasound system:

- enabling streaming (mandatory)
- **Status Bar** configuration (optional).

To Enable SonixLive Streaming:

1. Tap the touch screen **Menu** button.
2. Select **SonixLive > Enable streaming**.



3. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Configure SonixLive Status Bar Setting (Optional):

Note: The optional **SonixLive Status Bar** icon is only visible during streaming.

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Status Bar > SonixLive**.



3. Select **OK** to accept the changes or **Cancel** to exit without saving.

8.1.1.2 Installing the SonixLive Viewer Software

In order to install the **SonixLive Viewer**, the software must be downloaded from the Ultrasonix website:

- web address: <http://www.ultrasonix.com/support/resources>
- file name: *sonix_live_viewer_6.0.3_(00.036.270).zip*.

Note: If Internet access is not available, contact Ultrasonix Technical Support to obtain a copy of the file.

To Install the SonixLive Viewer:

1. Download a copy of the **SonixLive Viewer** (web address and software file name specified above).
2. Create a **SonixLive Viewer** folder and copy in *sonix_live_viewer_6.0.3_(00.036.270).zip*.
3. Unzip *sonix_live_viewer_6.0.3_(00.036.270).zip*.
4. If desired, create a **SonixLive Viewer** desktop shortcut for the program file *sonix_live_viewer.exe*.

Note: A **SonixLive Viewer** desktop shortcut makes it easier to access the program.

8.1.1.3 Configuring the Remote PC for SonixLive Viewing

The **SonixLive Viewer** must be installed on a remote PC(s) accessible on the same LAN as the ultrasound system.

Figure 8-2: SonixLive Viewer

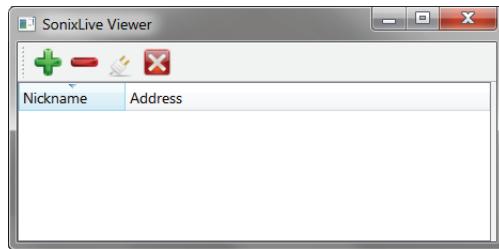


Table 8-4: SonixLive Viewer Icons

Icon	Definition	Icon	Definition
	Add an ultrasound system.		Delete an ultrasound system.
	Connect/disconnect an ultrasound system.		Exit SonixLive Viewer software.

To Configure the SonixLive Viewer:

1. Start the **SonixLive Viewer**.
2. Select to add an ultrasound system.
3. Enter an identifying **Nickname** for the system.
4. Enter the system **IP Address**.

Note: Find the system **IP Address** at **Menu > Administrator > Network**.

5. Repeat **step 2 to step 4** as many times as necessary.

8.1.1.4 Viewing a Remote Ultrasound Exam SonixLive

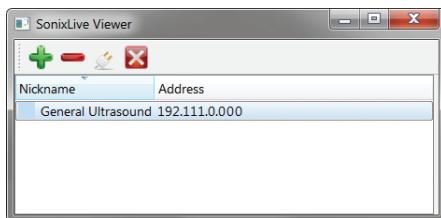
Once configured, **SonixLive** enables remote viewing of ultrasound exams.

Figure 8-3: SonixLive Viewer



To Remotely View an Ultrasound Exam with the SonixLive Viewer:

1. Open the **SonixLive Viewer**.
2. Select the desired ultrasound system.



3. Select  to access the ultrasound system.
4. The current exam on the selected ultrasound system will be presented on the remote PC (excluding patient data) (**Figure 8-3**).

Note: The SonixLive viewing screen will remain blank if:

- the image is frozen
 - a Sonix dialog (e.g., **Exam Management**) or Windows dialog (e.g., **Date and Time Properties**) is open.
-

8.1.2 Remote Support

Remote Support is a licensed option that allows a member of the Ultrasonix Technical Support to view and control the system for diagnostic purposes.

In order to use **Remote Support**, the **Network** must be configured ([8.2.12 Network](#)) and a **PIN** (**Personal Identification Number**) must be obtained from Ultrasonix Technical Support.

Note: The **PIN** is valid for 20 minutes only, so be sure to use it right away.

Remote Support can also be accessed from **QSonix**. Refer to [3.4](#) for details.

To Access Remote Support:

1. Tap the touch screen **Menu** button.
2. Select **Remote Support**.



Note: If **Remote Support** does not appear to be available, contact your IT Department and have them check to make sure the network connection is active and the **Remote Support** option has been configured for use.

3. Enter the **PIN** (**Personal Identification Number**) provided by Ultrasonix Technical Support.
-
- Note:** The **PIN** is valid for 20 minutes only, so be sure to use it right away.
-
4. When prompted, select **Download > Run > Run** in order to install the required programs.
 5. The system can now be remotely controlled.

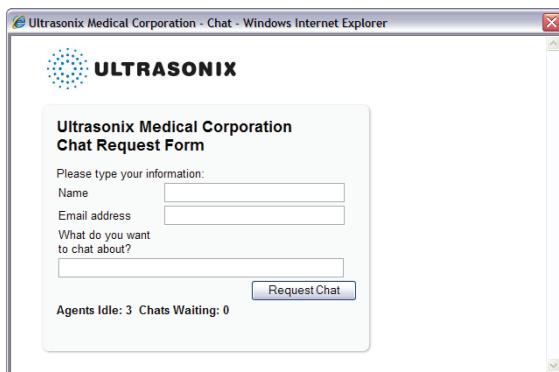
8.1.3 Chat Support

Chat Support enables a real-time discussion with a member of the Ultrasonix Technical Support team. In order to use **Chat Support**, it must first be configured in [8.2.12 Network](#).

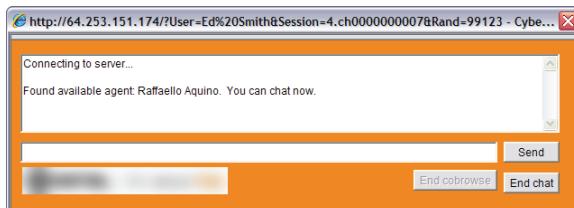
Note: If **Chat Support** is not available, contact the IT Department and have them check to ensure the network connection is active and that **Chat Support** has been configured for use ([8.2.12.4](#)).

To Access Live Chat Support:

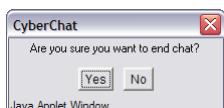
1. Tap the touch screen **Menu** button.
2. Select **Chat Support....**



3. If an **Agent** is logged on, use the keyboard to complete the **Chat Request Form**.
4. Select **Request Chat**, then wait while the system connects to the server.
5. When the message **Found available Agent:...** is presented, use the keyboard to enter the inquiry in the **Send** line.



6. Select **Send** to post the message.
7. Select **End Chat** when the chat is complete.
8. Select **Yes** to continue.



8.2 ADMINISTRATOR SETTINGS

Administrator Settings allow the system administrator to configure high level **Application** and **System** settings as well as perform certain **System Maintenance** functions.

Typically, the **System** parameters are set during initial installation and only require limited access and adjustment. By default, **Administrator Settings** are not delivered with an active **Password**, however, at their discretion, each institution has the option to apply **Password** protection (8.2.11.1).



Warning: Application parameters should be configured by a qualified medical practitioner.

Figure 8-4: Administrator Settings Menu



To Access Administrator Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator** to access the **Administrator Settings** menu.

8.2.1 Presets

Presets Setup enables users to manage factory default and user-defined **Imaging Presets**.

Each **Preset** can be selected/deselected via the **Presets Setup** options. Refer to [8.2.1.1 Show/Hide Imaging Presets](#) for details on hiding **Presets**.

Notes:

Only the active transducer tree will be expanded upon entry to **Presets Setup**.

3D/4D Presets are controlled from within **3D/4D Mode**. Refer to [5.11.9](#) for details.

Figure 8-5: Presets Setup

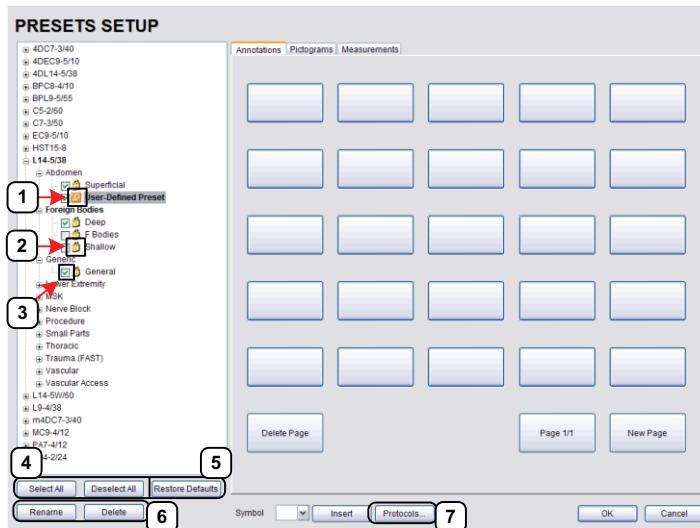


Table 8-5: Presets Setup

1	Key Icon	Denotes a user-defined Preset , which cannot be locked.
2	Lock Icon	Denotes a default (factory) Preset , which cannot be edited or deleted.
3	Preset Checkbox	Enables Preset selection/deselection. Deselected Presets are not available during imaging.
4	Select All Deselect All	Enables selection/deselection of all Presets in one step. Note: Not applicable to Annotations , Pictograms or Measurements
5	Restore Defaults	Note: Restore Defaults restores <i>all</i> Presets Setup changes to factory settings.
6	Rename and Delete	Note: Rename and Delete are only available if a user-defined Preset has been selected.
7	Protocols...	Enables configuration of available Protocols .

Default settings are locked (as indicated by the lock icon adjacent to the **Preset** name). Additional user-definable aspects of the default settings are available through the three tabs on the **Presets Setup** page: **Annotations**, **Pictograms** and **Measurements**.

User-defined **Presets** are marked with a key icon. These cannot be locked.

The left hand menu displays all currently available **Presets**, both default and user-defined. Each **Application** is delivered with at least one default **Preset**.

To Access the Presets Setup Page:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.

To Rename a Previously Created User-Defined Preset:

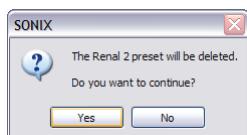
1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. Select the user-defined **Preset** to be renamed.
4. Select the **Rename** button.
5. Type a new, unique name in the **Rename Preset** dialog box.



6. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Delete a User-Defined Imaging Preset:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. Select the user-defined **Preset** to be deleted.
4. Select the **Delete** button.
5. Select **Yes** to confirm the deletion or **No** to cancel the operation.



Note: The message will specify the name of the user-defined **Preset** selected for deletion.

8.2.1.1 Show/Hide Imaging Presets

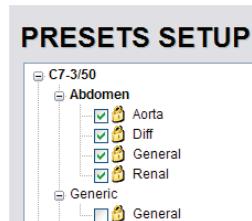
Preset availability can be controlled using its associated checkbox. When selected, as indicated by the presence of the green checkmark, the **Preset** will be available from both the touch screen and **QSonix** (providing the applicable transducer is connected).

To hide **Presets** on the touch screen and in **QSonix**, all versions of that **Preset** must be deselected (i.e., deselect every Preset of the same name under every Application for every transducer).

Note: The show/hide function applies to both default and user-defined **Presets**.

To Show/Hide Imaging Presets:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. Select/deselect the relevant checkboxes.



Note: Deselecting **General** under **C5-2/60-Abdomen** will only hide the **General Preset** when **Abdomen** is selected for the **C5-2/60** transducer.

Deselecting **General** under **Abdomen** for all applicable transducers will hide that **Preset** from view on both the touch screen and in **QSonix**.

4. Select **OK** to accept the changes or **Cancel** to exit without saving.

8.2.2 Presets – Annotations

The ability to manipulate the text of a specific **Annotation** attached to either a user-defined or default **Presets** is handled through the **Annotations** tab on the **Presets Setup** page. **Annotation** text appears by **Application** on the console touch screen.

Note: Refer to [8.2.6](#) for details on global **Annotation** settings.

Figure 8-6: Presets Setup – Annotations

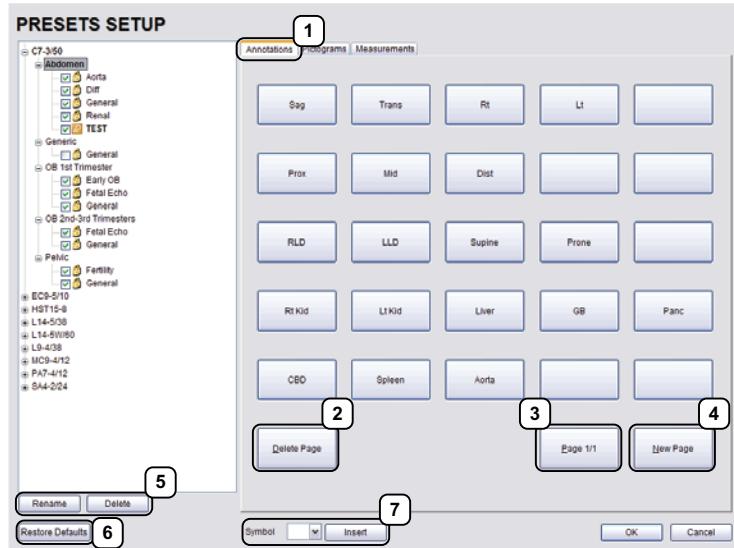


Table 8-6: Presets Setup – Annotations

1 Annotations Tab	Accesses Annotation options.
2 Delete Page	Deletes the currently displayed page of Annotations .
3 Page Selector	Enables Operator to page through available Annotations .
4 New Page	Enables Operator to add a new, blank page of Annotations .
5 Rename and Delete	Note: <i>Rename and Delete are only available if a user-defined Preset has been selected.</i>
6 Restore Defaults	Note: <i>Restore Defaults restores all Presets Setup changes to their factory settings.</i>
7 Insert (Symbol)	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).

Note: The order in which **Annotations** are presented is matched on the touch screen during **Text entry** ([7.1 Text and Annotations](#)).

8.2.2.1 Modify Annotations

Changes can only be made to the **Annotations** of one **Exam Type/Application** at a time. Additionally, the system allows users to define/change the **Home Position** for the **Annotation** cursor. Once set, whenever the **Home Position** touch screen button is tapped, the **Text** cursor will move directly to that spot.

Note: Refer to [7.1.1 Set Text Home Position](#) to define the **Text/Annotation** cursor **Home Position**.

To Modify a Preset's Annotations:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. Highlight the relevant **Preset** from the left hand menu.
4. Select the relevant **Annotation** space on the right hand side of the LCD display.
5. Use the touch screen keyboard to type in the new **Annotation**.

Note: If multiple pages of **Annotations** are required, select the **New Page** button as often as necessary to create the desired number of **Annotation** spaces.

Alternatively, if multiple pages already exist, move through them using the onscreen page selection button, making changes as required.

6. Tap **Enter** to accept the changes or **Esc** to delete the entry.

8.2.3 Presets – Pictograms

The ability to attach/detach specific **Pictograms** to both user-defined and default **Presets** is handled via the **Pictograms** tab in **Presets Setup**. Re-ordering the sequence in which they will appear on the touch screen during a scanning session is managed here as well.

Figure 8-7: Presets Setup – Pictograms

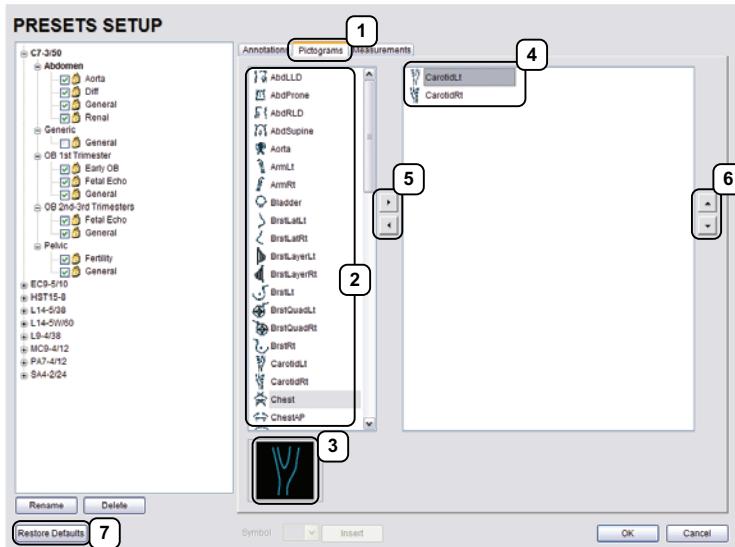


Table 8-7: Presets Setup – Pictograms

1	Pictograms Tab	Accesses Pictogram options.
2	List of available Pictograms	Lists available Pictograms .
3	Pictogram	Previews selected Pictogram .
4	User-defined List of Pictograms	Previews user-defined Pictogram options.
5	Pictogram Selectors	Moves selected items to/from the user-defined list of Pictograms .
6	Pictogram Order Selectors	Moves selected items up/down in the user-defined list of Pictograms .
7	Restore Defaults	<i>Note: Restore Defaults restores all Presets Setup changes to their factory settings.</i>

8.2.3.1 Modify the Pictograms Attached to Presets

To Add Pictograms to an Imaging Preset:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. On the **Presets Setups** page, select the **Pictograms** tab.
4. Highlight the relevant **Preset** in the left hand column.
5. From the list of available **Pictograms**, highlight the relevant **Pictogram**.
6. Use the right facing selector button to move the item to the list of selected **Pictograms**.
7. Repeat **step 5** and **step 6** as many times as required.
8. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Delete Pictograms from an Imaging Preset:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. On the **Presets Setups** page, select the **Pictograms** tab.
4. Highlight the relevant **Preset** in the left hand column.
5. Highlight the relevant **Pictogram** in the list of selected **Pictograms**.
6. Use the left facing selector button to delete the item from the list of selected **Pictograms**.
7. Repeat **step 5** and **step 6** as many times as required.
8. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Reorder Selected Pictograms Attached to an Imaging Preset:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. On the **Presets Setups** page, select the **Pictograms** tab.
4. Highlight the relevant **Preset** in the left hand column.
5. Highlight the relevant **Pictogram** in the list of selected **Pictograms**.
6. Use the order (up/down) selector buttons to move the item to another place in the list of selected **Pictograms**.
7. Repeat **step 5** and **step 6** as many times as required.
8. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.4 Presets – Measurements

Based on **Exam Type**, **Presets – Measurements** allows users to select/deselect the available touch screen **Measurement Package** options. It also enables users to edit the default imaging **Measurement Package** for a specific **Exam Type**.

Figure 8-8: Presets – Measurements

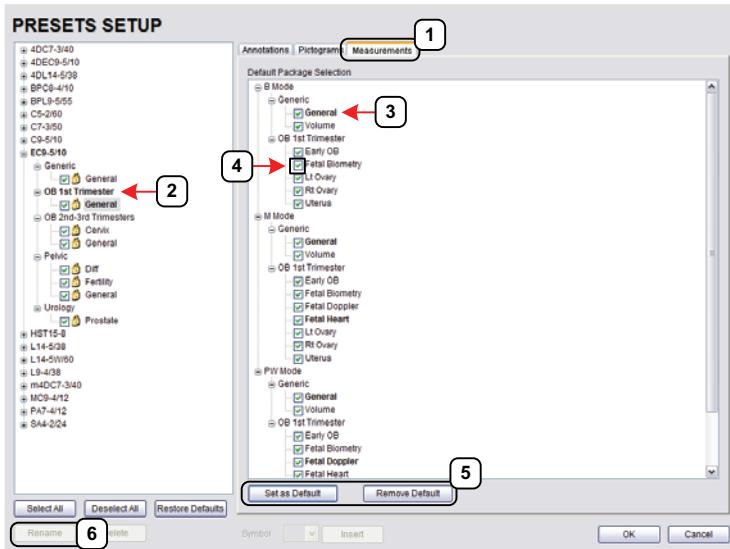


Table 8-8: Presets – Measurements

1	Measurements Tab	Accesses Measurement options.
2	Exam Type	Transducer-specific Exam Type .
3	Measurement Package	Default Measurement Package labels (bold face type).
4	Measurement Package Checkbox	Enables Measurement Package selection/deselection. Deselected Measurement Packages are not available during imaging.
		Set or remove default status of Measurement Packages .
5	Set as Default/Remove Default	Note: <i>Remove Default</i> is especially useful when changing imaging modes during the measurement portion of an ultrasound exam as the Measurement Package will remain at the selected Measurement Package option rather than returning to a default setting.
6	Restore Defaults	Note: <i>Restore Defaults</i> restores <u>all</u> Presets Setup changes to their factory settings.

8.2.4.1 Modify the Available Touch Screen Measurements Packages

To Edit the List of Measurements Packages Available on the Touch Screen:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. On the **Presets Setups** page, select the **Measurements** tab.
4. Highlight the relevant **Exam Type** in the left hand column.
5. From the available **Default Package Selection** list, select/deselect the checkbox for the relevant **Measurements Package**.
6. Repeat **step 4** and **step 5** as many times as required.
7. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Edit the Default Touch Screen Measurements Package:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. On the **Presets Setups** page, select the **Measurements** tab.
4. Highlight the relevant **Exam Type** in the left hand column.
5. From the available **Default Package Selection** list, highlight the desired **Measurements Package**.
6. Select the **Set as Default Package** button.
7. Repeat **step 5** and **step 6** as many times as required.

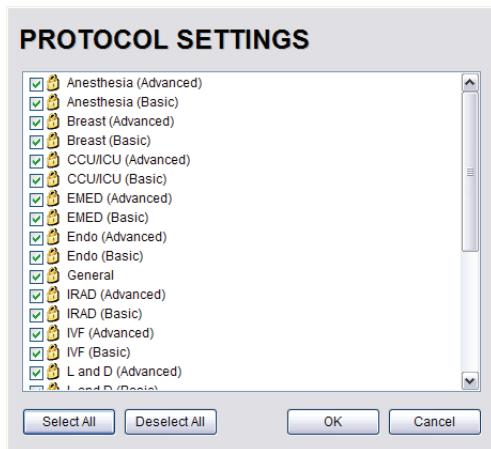
Note: There can be only one default **Measurements Package** for each **Exam Type**.

8. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.5 Presets – Protocols

Systems purchased with more than one (optional) **Protocol** can be set to present only the desired **Protocol** subset.

Figure 8-9: Presets – Protocols



To Edit the List of Available Protocols:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Presets**.
3. On the **Presets Setups** page, select the **Protocols...** button.
4. Select/deselect the desired Protocols.
5. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.6 Annotations

There are five global **Annotation** settings available.

Figure 8-10: (Global) Annotations Settings

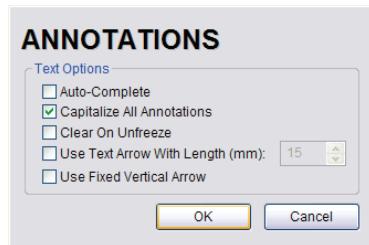


Table 8-9: (Global) Annotation Settings

Auto-Complete	Select to automatically fill in a word when the first letter(s) is entered on the LCD display.
Capitalize All Annotations	If more than one Preset begins with the same letter use the Tab key to move through the list or continue typing the Preset name. When enough of the name has been completed in order to jump to the correct entry, the desired Preset name will appear onscreen and can be selected.
Clear on Unfreeze	Select to automatically clear the Annotations from the image field with unFREEZE. If this option is not selected, the text will remain on the image field until the user deletes it.
Use Text Arrow with Length (mm)	Select to override the standard system Text Arrow . This enables the user to define the Text Arrow length in mm. The range is 5–30 mm with a default setting of 15 mm.
Use Fixed Vertical Arrow	Select to override the standard system Text Arrow with an arrow that is always in a vertical position. When selected, this arrow will use the length setting from the previous field (Use Text Arrow with Length (mm)).

To Access the Global Annotation Settings Dialog:

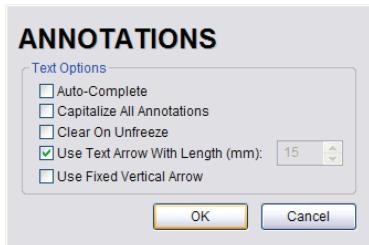
1. Tap the touch screen **Menu** button.
2. Select **Administrator > Annotations**.

Note: Refer to [8.2.2 Presets – Annotations](#) for details on configuring **Preset-specific Annotations**.

8.2.6.1 Text Arrow Customization

To Customize the Text Arrow:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Annotations**.
3. Select **Use Text Arrow with Length (mm)**.



4. Enter the appropriate **Length** in millimeters.
5. Select **OK** to accept the setting and exit or **Cancel** to exit without saving.

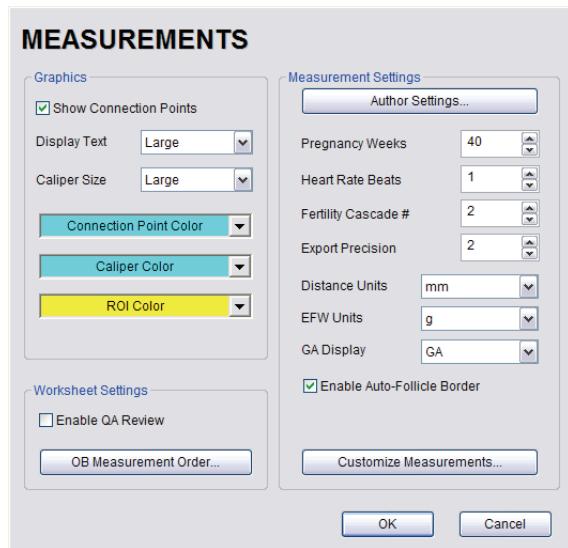
8.2.7 Measurements

The **Measurements** dialog enables users to customize the onscreen appearance of calipers, caliper labels and certain display details of the measurement/calculation packages. When the touch screen **Measure** button is pressed, **Measurements** are available on the touch screen based on clinical **Application**.

Users are also able to create customized **Measurement Packages** ([8.2.7.3 Managing Custom Measurements](#)).

Note: It is not possible to edit factory-installed **Measurement Packages**.

Figure 8-11: Measurements Settings



Warning: Ultrasonix does not endorse user-defined **Measurements**, **Calculations** and **Tables** for diagnostic purposes. All user-defined **Measurements**, **Calculations** and **Tables** are used at the **Operator's** discretion and risk only.

Table 8-10: Measurement Options

Graphics	Show Connection Points	Select to display the connection points (dotted line) between the linear calipers.
	Display Text	Allows the selection of one of three measurement label font size options: Small , Medium and Large .
	Caliper Size	Allows the selection of one of three caliper size options: Small , Medium and Large .
	Connection Point Color	Allows the selection of the color of the caliper connection points (dots) between the linear calipers. The default is turquoise.
	Caliper Color	Allows the selection of the color of the caliper end points. The default is turquoise.
	 Caution: Some caliper sizes/colors, font sizes or dot colors may not appear clearly on the image screen, stored image or printed/recoded image. To ensure clear visualization of the caliper, label font and connection points, Ultrasonix recommends setting the caliper graphics to at least Medium .	Note: To ensure the caliper modifications have been activated, switch imaging modes after exiting the Setup menus.
Worksheet Settings	Worksheet Settings apply to the Report Worksheet .	
	Enable QA Review	Appends editable Billing and QA Review fields to all Reports . Note: Any Report/Worksheet opened/created during/prior to this setting being selected will <u>not</u> include the Billing and QA options.
	OB Measurement Order...	Allows user to change the order in which OB Measurements are presented on the touch screen, in a Worksheet (onscreen) and in a Report (printed). OB Measurements available for reordering are: BPD , OFD , HC , AC , FL , HL , GS , CRL , NT , YS , CxLength , UL , TL , TTD , CEREB , APTD , FTA , FHR , Umb A , Umb A-PI , MCA and MCA-PI . Note: Refer to Appendix H: Glossary for details on these acronyms.
	Author Settings...	Refer to Appendix F for a complete list of Author Settings . Note: It is not possible to create user-defined Cardiac tables, nor can factory default tables be modified or deleted.
Measurement Settings	Pregnancy Weeks	Defines the number of weeks used to calculate the EDD based on LMP . Range: 35–45 weeks.
	Heart Rate Beats	Number of beats used to measure the HR and FHR on an M-Mode and Doppler Trace . Range: 1–7 beats.
	Fertility Cascade #	Defines the number of times the user must repeat a follicle measurement before the system automatically moves to the next follicle. Range: 1–3 measurements.
	Export Precision	Sets the decimal placement for some types of third party reporting packages. Range: 0–6. The default is 2 decimal places.

Measurement Settings – cont'd	<p>Distance Units Unit used to display Distance calculation: Use default, µm, cm, in, m or mm.</p> <p> Caution: <i>Changing Distance Units during an exam will result in anomalous measurement labeling.</i></p> <hr/> <p>Note: Use default will use the default set on a per measurement basis in Customize Measurements....</p> <hr/> <p>EFW Units Unit used to display EFW calculation: g, kg, lbs, lbs-oz or oz.</p> <hr/> <p>GA Display Operators have the option of configuring the system to present either the EDD, GA or GA & EDD onscreen along with OB measurement data.</p> <hr/> <p>Note: This applies only when taking measurements during an OB exam,</p> <hr/> <p>Enable Auto-Follicle Border Draws a border around the edges of an Auto-Follicle measurement. By default, this setting is disabled. Refer to 6.11.1 Auto-Follicle for complete details.</p> <hr/> <p>Note: <i>Auto-Follicle is only available on the SonixTouch and will only be accessible if the Auto-Follicle package has been licensed.</i></p> <hr/> <p>Customize Measurements... Enables the user to make the following changes to measurements:</p> <ul style="list-style-type: none"> • create custom Measurement Packages and Measurements • re-order Measurements • show/hide Applications, Measurement Packages and Measurements for the Display/Touch Screen, Worksheet or Report. <hr/> <p>Note: <i>A Measurement must be performed in order to appear on the Worksheet or Report.</i></p> <hr/> <p> Warning: Ultrasonix does not endorse user-defined Measurements, Calculations and Tables for diagnostic purposes. All user-defined Measurements, Calculations and Tables are used at the Operator's discretion and risk only.</p>
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To Access Measurement Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements**.

To Configure Measurement Graphics:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements**.
3. Configure the **Graphics** settings as required
4. Select **OK** to accept the settings and exit or **Cancel** to exit without saving.

To Configure Basic Measurement Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements**.
3. Configure **Measurement Settings** as required.
4. Select **OK** to accept the settings and exit or **Cancel** to exit without saving.

Note: Refer to [8.2.7.3](#) for details on **Customizing Measurements**.

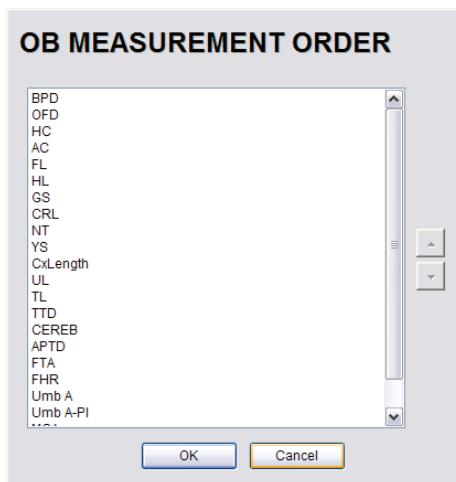
8.2.7.1 Managing Worksheet Settings

To Enable QA Review Details in Reports/Worksheets:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements**.
3. Under **Worksheet Settings**, select the **Enable QA Review** checkbox.

To Configure OB Measurement Order:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > OB Measurement Order....**
3. Select an **OB Measurement**.
4. Select the up or down selector button to move the **OB Measurement** to the desired position.



5. Repeat **step 3** and **step 4** as often as necessary to re-order the **OB Measurements** as required.
6. Select **OK** to accept the settings and exit or **Cancel** to exit without saving.

8.2.7.2 Show/Hide Applications, Measurement Packages and Measurements

The manner in which the show/hide options are applied have consequences for the availability of **Applications**, **Measurement Packages** and **Measurement** and/or the way in which **Measurement** data is saved:

- hiding an **Application** ensures that the **Application** cannot be accessed/viewed from within the measurement function (i.e., it will not be visible—and therefore not selectable—on the LCD display or the touch screen)
- hiding a **Measurement Package** ensures the **Measurement Package** cannot be used (i.e., it will not be visible—and therefore not selectable—on the LCD display or the touch screen)
- leaving a **Measurement** available on the LCD display and touch screen and selecting only **Visible in Report** ensures it can be used but cannot be viewed on the **Worksheet** during the exam. It will, however, be printed on the **Report**
- leaving a **Measurement** available on the LCD display and touch screen and selecting only **Visible in Worksheet** ensures it can be used and viewed on **the Worksheet** during the exam. It will not, however, be printed on the **Report**.

Note: The last two options apply only to **Measurements**, not **Measurement Packages**.

Show/hide options apply to both factory-installed and customized measurements.

Figure 8-12: Customize Measurements

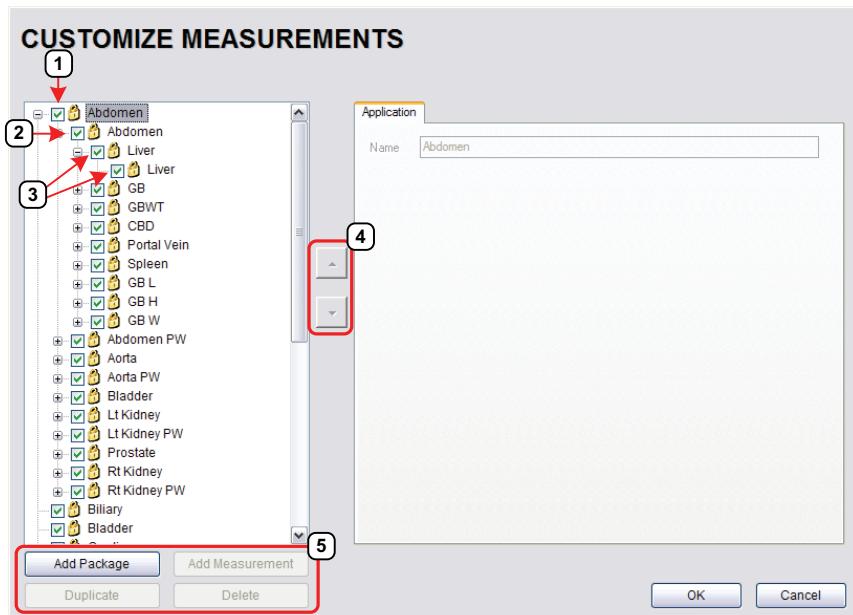


Table 8-11: Customize Measurements
1 Application Checkbox

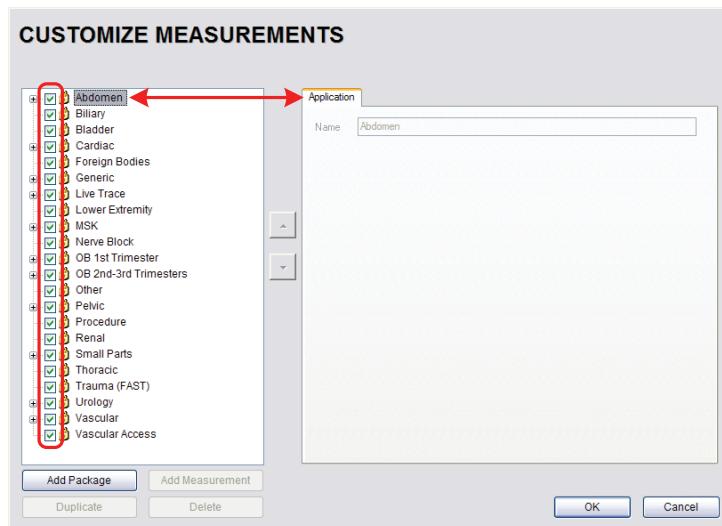
2 Measurement Package Checkbox

3 Measurement Checkboxes

4 Measurement Selectors

5 Action Buttons
To Show/Hide Applications:

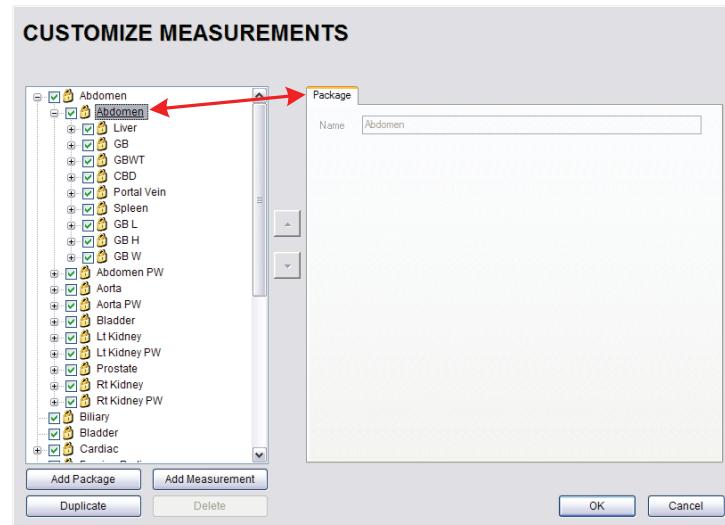
1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. To show/hide an **Application** on the LCD display and touch screen (within the measurement function) select/deselect the **Application** checkbox.



4. Repeat **step 3** as many times as required.
5. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Show/Hide Measurement Packages:

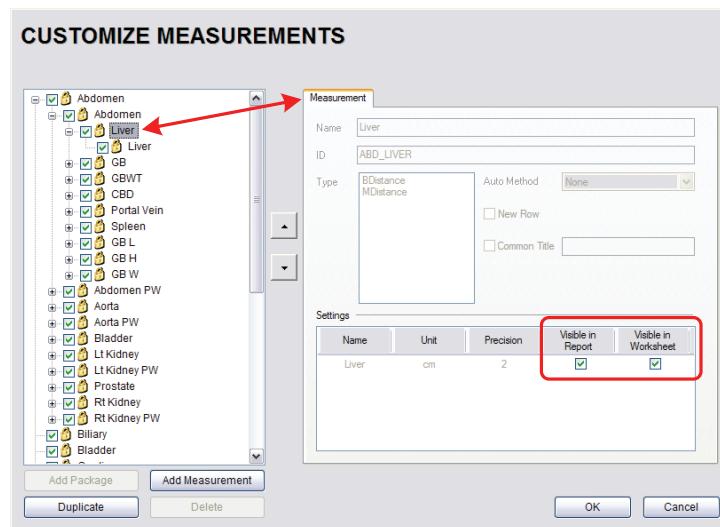
1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) sign (e.g., select the plus (+) sign next to **Abdomen**).
4. To show/hide a **Measurement Package** on the LCD display and touch screen select/deselect the relevant **Measurement Package** checkbox.



5. Repeat **step 3** and **step 4** as many times as required.
6. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Show/Hide Measurements:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) sign (e.g., select the plus (+) sign next to **Abdomen**).



4. Select a measurement from within the **Measurement Package** and the **Visible in Report** and **Visible in Worksheet** options will be presented on the right side of the dialog.
5. Select the appropriate checkbox(es): **Visible in Report** and/or **Visible in Worksheet**.

Name	Unit	Precision	Visible in Report	Visible in Worksheet
Liver	cm	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Additional options will be available for user-created Measurements. Refer to [8.2.7.3 Managing Custom Measurements](#) for more details.

6. Repeat **step 3 to step 5** as many times as required.
7. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.7.3 Managing Custom Measurements

Use **Customize Measurements...** to add/edit/delete user-defined (custom) measurements and **Measurement Packages**.

Figure 8-13: Customize Measurements

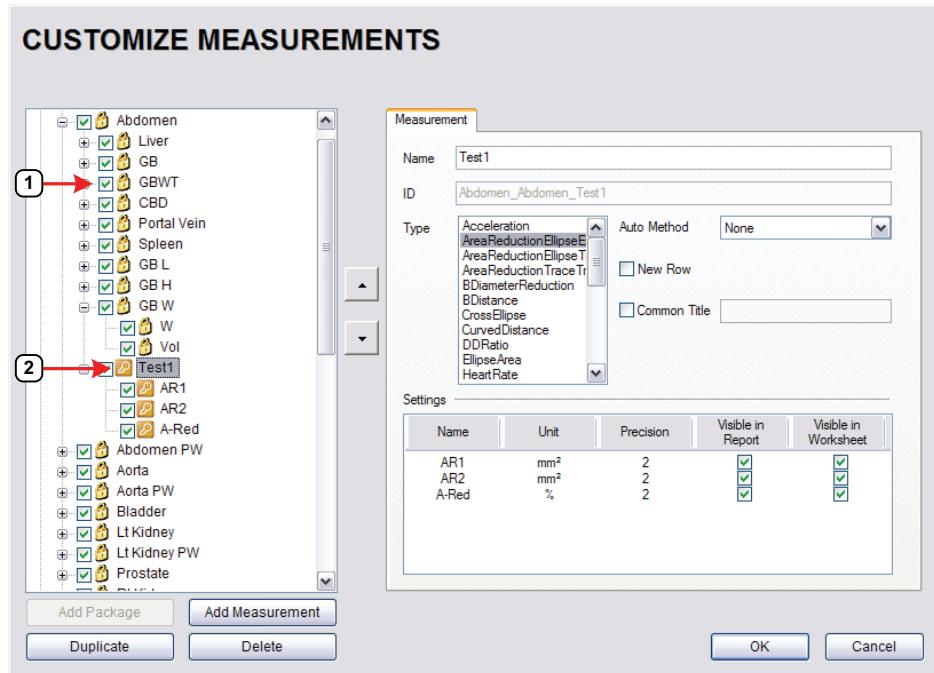


Table 8-12:

1 Lock Icon

2 Key Icon

Default or factory-installed **Measurement Packages** and **Measurements** are locked (as indicated by the associated lock icon) and cannot be edited or deleted.

Customized **Measurements** are marked with a key icon indicating that are user-created and can be edited or deleted.



Warning: Ultrasonix does not endorse user-defined **Measurements**, **Calculations** and **Tables** for diagnostic purposes. All user-defined **Measurements**, **Calculations** and **Tables** are used at the **Operator's** discretion and risk only.

Note: As it is not possible to edit/delete default **Measurement Packages**, follow the instructions in [8.2.7.2](#) to hide any unwanted packages from view/use.

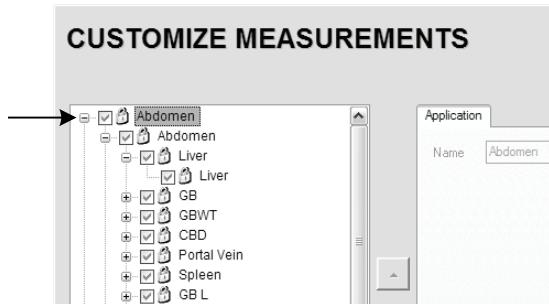
Table 8-13: Customize Measurement Options

	The Name of the custom measurement.
Name	Note: Place the cursor in this field and use the touch screen keyboard to enter a new Name .
ID	This is not an editable field. Data in this field is auto-populated and is for information purposes only.
Type	<p>Acceleration AreaReductionEllipseEllipse AreaReductionEllipseTrace AreaReductionTraceTrace BDiameterReduction BDistance CrossEllipse CurvedDistance DDRatio EllipseArea HeartRate HipAngle MDiameterReduction MDistance Pisa PointsArea PointsSpectrum RectArea RTSA SimpsonsTrace SpectrumRange Time TimeSlope TraceArea TraceAreaSolid TraceSpectrum Velocity1 Velocity2</p> <p>Selecting a pre-defined measurement Type will populate the Type attributes—which can be edited within pre-determined parameters.</p> <p>Once a Type has been selected, any attempt to change that Type for the specified measurement will result in an overwrite confirmation message.</p>

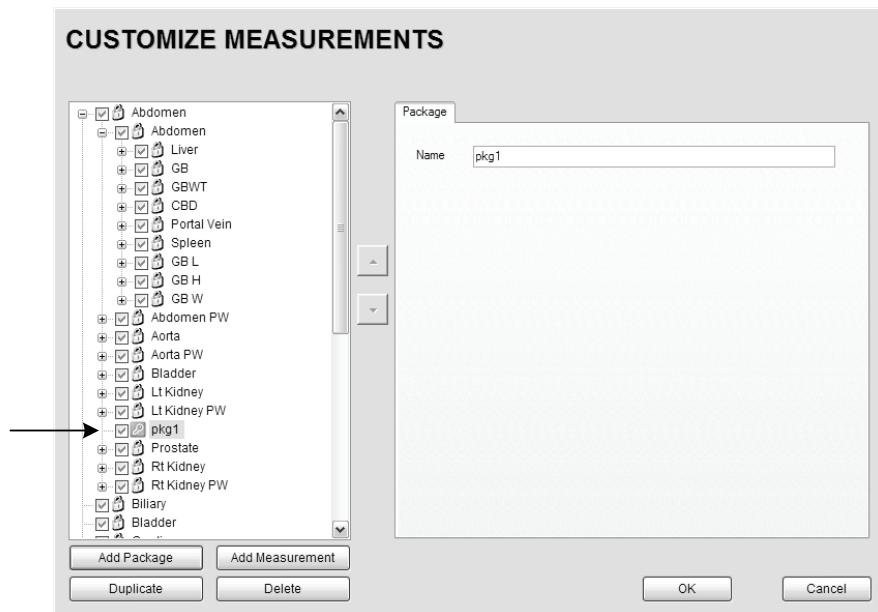
Auto-Method	Auto-Method refers to manner in which the system automatically cycles through measurements.
	None There is no pre-selected measurement/caliper auto-selection method.
	Next Measurement When measuring something that requires multiple measurements to create the final measurement (e.g., L , H , W to capture a Volume measurement) this method will automatically move to the next required measurement as each measurement is completed.
	Repeat Measurement Use to keep taking the selected measurement over and over until a new measurement is manually selected on the touch screen.
	Place Caliper for Next Mmt Use to force the system to move sequentially through the measurement options once the first measurement is taken. The first caliper for each sequential measurement will be placed automatically.
	Note: This option is for Cardiac only.
New Row	Forces the measurement to wrap to a New Row on the Measurement Packages touch screen.
Common Title	To group a series of measurement together, give each of the relevant measurements a Common Title . For example, under Abdomen , Abdomen , the three measurements GB L , GB H and GB W , each have the Common Title , GB Vol indicating that these three separate measurements actually form a single measurement: GB Volume .
Settings	Name Options available for the Type chosen (above). If desired, rename the measurement.
	Unit Measurement options available for the Type/Name chosen. Note: The Unit option is dependant upon the combination of the Type and Name . For example, In and Out Unit options for BDiameterReduction are cm , m , mm , in , ft and µm . But the D-Red Unit options for the same Type are % and ratio .
	Precision Defines the number of decimal places included in a given measurement result.
	Visible in Report Determines whether or not a measurement will be included in a Report . Refer to 8.2.7.2 for more details.
	Visible in Worksheet Determines whether or not a measurement will be included in a Worksheet . Refer to 8.2.7.2 for more details.

To Add a Custom Measurement Package:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) sign (e.g., select the plus (+) sign next to **Abdomen**).



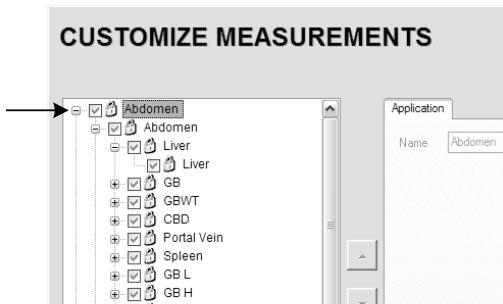
4. Select the **Add Package** button and **pkg1** will be added (alphabetically) to the list of **Measurement Packages**.



To Add a Custom Measurement:

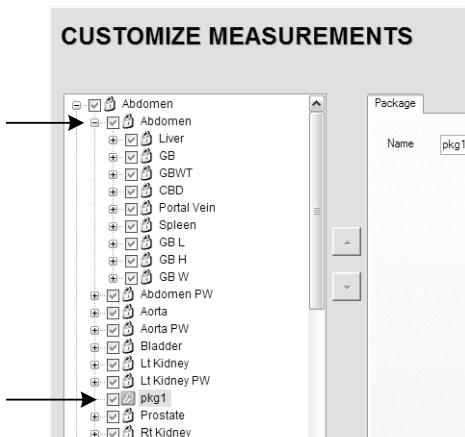
Note: Measurements can be added to both custom and default Measurement Packages.

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) sign (e.g., select the plus (+) sign next to **Abdomen**).



Note: If the custom Measurement is to be added a custom Measurement Package, ensure that package has been created.

4. Ensure the relevant **Measurement Package** is selected (e.g., **Abdomen** or **pkg1**).

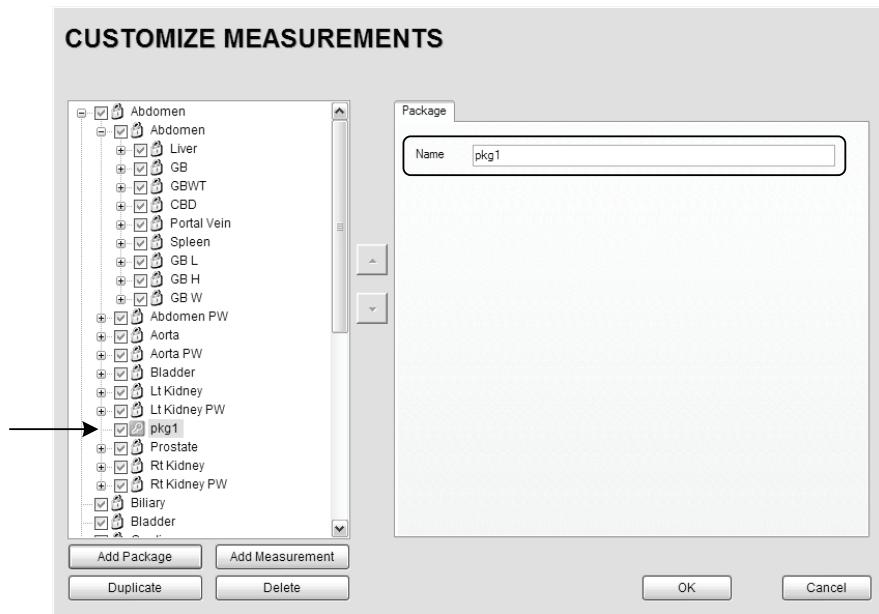


Note: If **pkg1** is selected, the custom Measurement will be created one level below **pkg1**. If **Abdomen** is selected, the custom Measurement will be created at the same level as **Abdomen**.

5. Select the **Add Measurements** button and mmt1 will be added.

To Rename a Custom Measurement Package or Measurement:

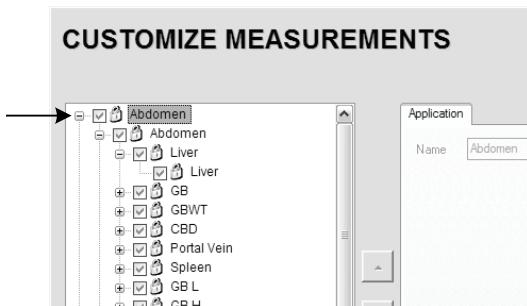
1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Select the custom **Measurement Package** or **Measurement**.
4. Place the cursor in the **Name** field on the right hand side of the dialog.



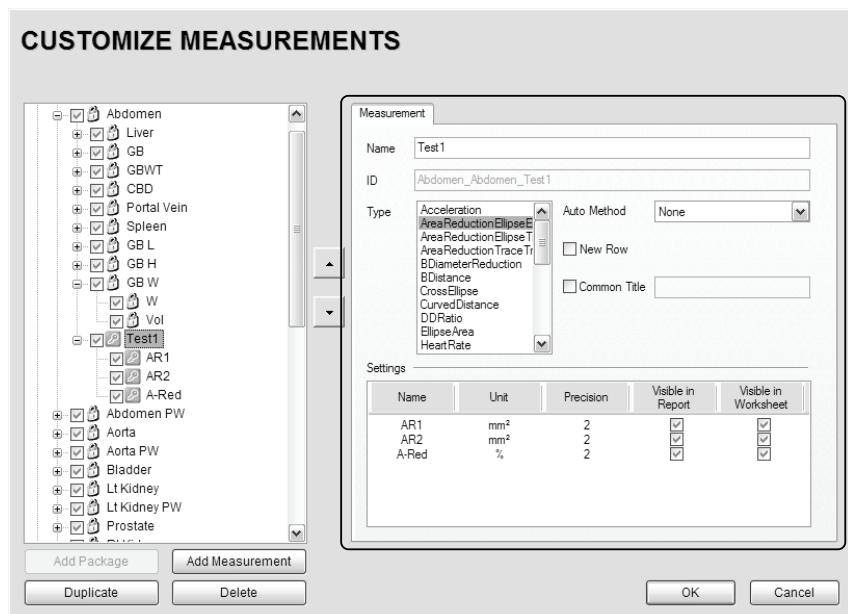
5. Use the touch screen keyboard to erase and type in a new **Measurement Package** or **Measurement Name**.

To Edit a Custom Measurement:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) sign (e.g., select the plus (+) sign next to **Abdomen**).



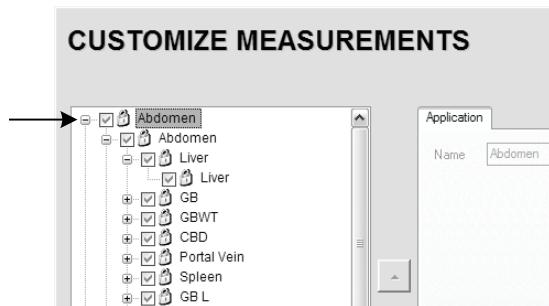
4. Select the custom **Measurement** to be edited.
5. Make the appropriate changes in the **Measurement** tab on the right hand side of the dialog.



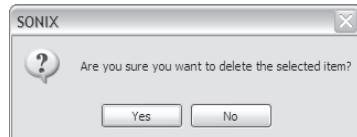
6. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Delete a Custom Measurement Package or Measurement:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) sign (e.g., select the plus (+) sign next to **Abdomen**).

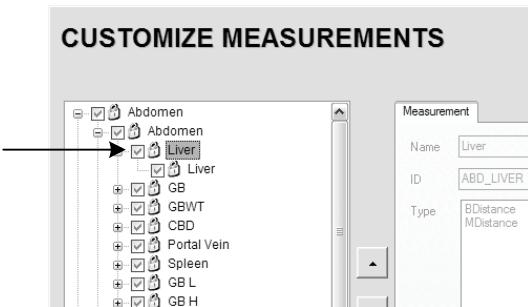


4. Select the custom **Measurement Package** or **Measurement** to be deleted.
5. Select the **Delete** button.
6. Select **Yes** to confirm the deletion or **No** to cancel the operation.



8.2.7.4 Reordering Measurements

Figure 8-14: Measurement Packages

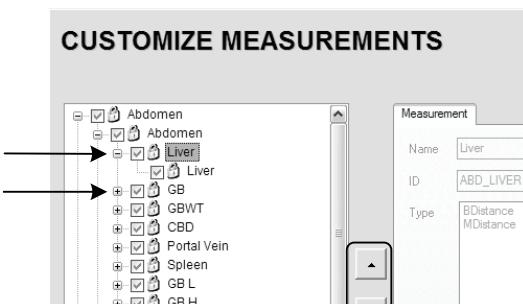


Note: Only **Measurement Packages** at the level marked in **Figure 8-14** can be reordered.

The reorder option applies to both custom and default **Measurement Packages**.

To Reorder Measurements:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Customize Measurements....**
3. Expand the relevant **Application** tree by selecting the appropriate plus (+) signs (e.g., select the plus (+) sign next to **Abdomen**).

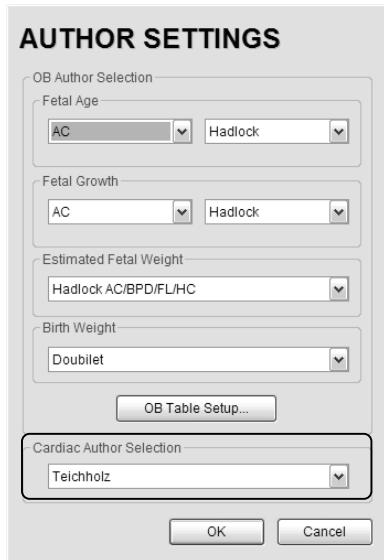


4. Highlight the relevant **Measurement** in the left hand column.
5. Use the (up/down) selector buttons to move the item to another place in the list.
6. Repeat **step 4** and **step 5** as many times as required.
7. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.7.5 Managing Author Settings

To Select the Cardiac Author:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Author Settings....**



3. Select the **Cardiac Author** from the drop-down menu.

Note: Refer to [Table F-6 in Appendix F](#) for a complete list of **Cardiac Author Settings**.

4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Select OB Authors:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Author Settings....**



3. Select author/measurement options for **Fetal Age** and **Fetal Growth** from the drop-down menus.
4. Select **Estimated Fetal Weight** and **Birth Weight** authors from the drop-down menus.
5. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.



Warning: Various factors may affect the accuracy of **Obstetrical** measurements. Ensure:

- system **Date and Time** are configured correctly.
- desired **Obstetrical** calculation author has been selected for each parameter.

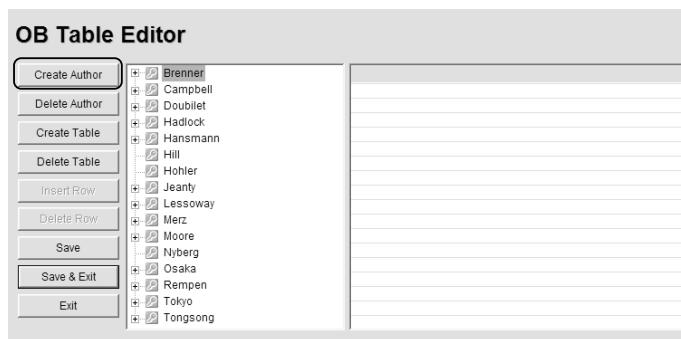
8.2.7.6 Managing OB Tables



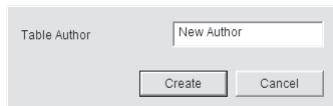
Warning: Ultrasonix does not endorse user-defined **Measurements**, **Calculations** and **Tables** for diagnostic purposes. All user-defined **Measurements**, **Calculations** and **Tables** are used at the **Operator's discretion and risk only.**

To Create New Obstetrical Calculation Authors and Look-up Tables:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Author Settings... > OB Table Setup....**
3. Select **Create Author**.



4. Enter a new **Table Author** and select **Create** to save the name to the author list.

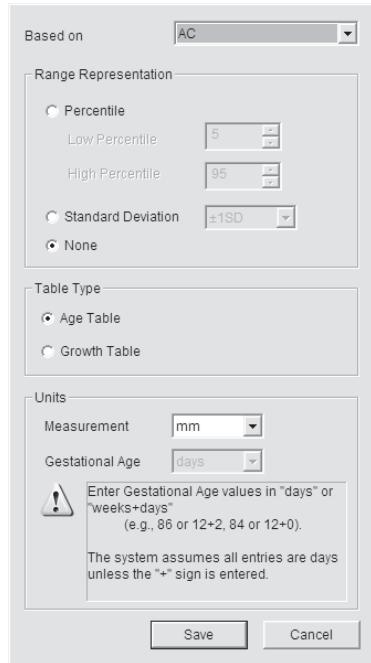


5. Highlight the newly created author and select **Create Table**.



Note: Default **Tables** are locked (as indicated by the lock icon adjacent to the **Table** name) and cannot be edited/deleted. User-created **Tables** are marked with a key icon and can be edited/deleted.

- From the **Based on** drop-down menu, select the desired parameter (**BPD**, **HC**, etc.).



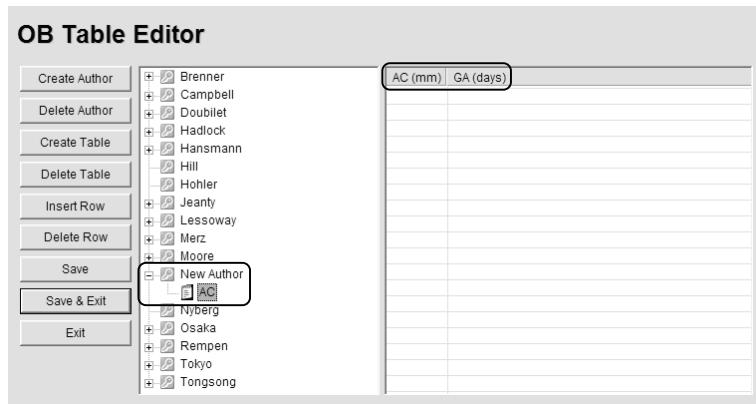
- Select the desired table **Range Representation**: **Percentile**, **Standard Deviation** or **None**.
- Select the desired **Table Type**: **Age Table** or **Growth Table**.
- From the **Measurement** drop-down menu, select the desired unit: **cm**, **cm²**, **g**, **mm**, **mm²** or **ratio**.

Note: AC and HC are assumed to be Circumference measurements.

- Select **Save** to accept the changes and return to the **OB Table Editor** or **Cancel** to exit without saving.

To Enter Data into a New OB Table:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Author Settings... > OB Table Setup....**
3. Select the newly created **Table** (listed under the user-defined author).



Note: The right hand section of the screen will show the columns for the previously-defined **Table** parameters. For example, this **Table** was configured as follows:

Based on = AC, Range Representation = None, Table Type = Age Table and Measurement = mm.

-
4. Enter **Table** data as required. Use **Insert Row** and **Delete Row** buttons to simplify this process.



Warning: When entering **Gestational Age** values, use **days** or **weeks+days**:

e.g., 86 (days) = 12+2 (or 12 weeks + 2 days), 84 (days) = 12+0 (or 12 weeks).

The system assumes all entries are in days unless a plus (+) sign is entered, in which case the number is assumed to be in weeks and is converted to the equivalent number of days.

-
5. Select the **Save & Exit** button to save any newly entered/edited data and exit the page, **Save** to save any newly entered/edited data but remain in the **OB Table Editor** or **Exit** to cancel any newly entered/edited data and exit the page.

8.2.8 Training Tutorials

This option enables organizations to load and view a variety of different video, audio or PowerPoint files on the system in order to provide training to their staff.

The training files may be provided by Ultrasonix, but they can also be created by each organization, as long as they are created in one of the accepted digital formats.

Figure 8-15: Training Tutorials Dialog

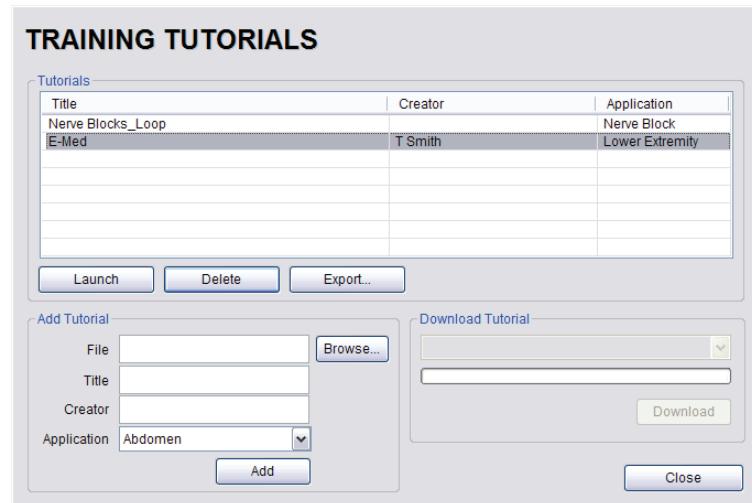


Table 8-14: Supported Training Tutorial File Formats

Video	AVI, MPG, MPEG and WMV.
Audio	MP3 and WMA.
Microsoft® PowerPoint®	PPT.
	Note: Video files embedded in PowerPoint presentations are not supported.
Adobe® Flash®	SWF.
SonixCam	Compressed AVI .

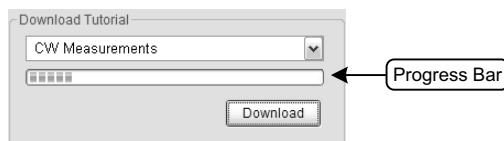
Table 8-15: Training Tutorial Options

Tutorials	The Tutorials section lists files that are currently available for viewing.
Title	Lists the Titles of the available Tutorials .
Creator	Lists the Creator of the specific Title .
Application	Lists the Exam Type/Application associated with the specific Title .
Launch	Plays the selected Title .
Delete	Deletes the selected Title .
Export...	Exports the selected Title .
Add Tutorial	<p>Add Tutorial options enable organizations to add user-created Tutorials.</p> <p>File Displays the name of the File selected with the Browse button.</p> <p>Title Enter a descriptive Title that will immediately reveal the Tutorial's purpose.</p> <p>Creator Enter the name of the File's Creator. This might be an individual, an outside company or the name of the host organization.</p> <p>Application Select an Application which best describes the clinical relevance of the Tutorial.</p> <p>Browse... Enables the user to browse the available drives for a Tutorial file.</p> <p>Add Adds the selected Tutorial.</p>
Download	Launches the Download sequence for the selected Title .

8.2.8.1 Manipulating Training Tutorials

To Download a Training Tutorial from the Network:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Training Tutorials**.
3. Select a file from the drop-down menu in the **Download Tutorial** section of the dialog.



4. Select the **Download** button.
5. Follow the status of the progress bar to see how far along the download is.
6. When the download is complete, the **Title** will be added to the list of available **Tutorials**.

To Add a Training Tutorial from External Media:

Note: External media includes USB devices such as a key, drive or CD/DVD reader/writer. When using this type of media, ensure that the relevant item is loaded into the appropriate device before attempting the download.

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Training Tutorials > Browse....**



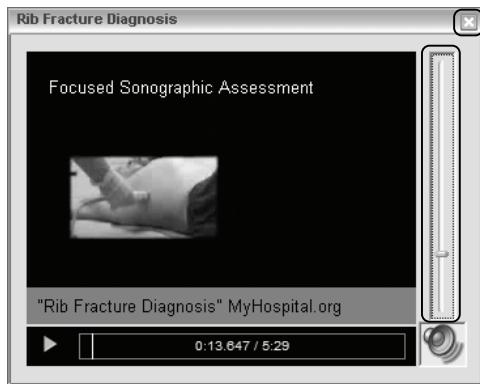
3. From the dialog presented, find and select the relevant (file) **Type** and **File** name to be added.
4. Enter a **Title** and **Creator** in the fields provided.
5. Select a clinically relevant **Application** type from the drop-down menu.
6. Select the **Add** button.
7. Once the addition is complete, the **Title** will be added to the list of available **Tutorials**.

Note: As a precaution, test each file to ensure it displays properly.

To Launch a Training Tutorial:

Note: If any **Training Tutorials** exist for the currently selected **Application**, then the primary viewing method is via the **Training Tutorials** button on the main touch screen.

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Training Tutorials**.
3. Highlight a **Title** from the list of **Tutorials**.
4. Select the **Launch** button and the tutorial will be presented on the LCD display.



5. Select the red **X** in the top right corner of the **Tutorial** screen to stop/exit the tutorial.

Notes:

If the presentation is in PPT format, press the **Q** button to exit.

For files with an audio component, the volume can be adjusted with the audio slide on the right hand side of the tutorial screen. **Master Volume** control is adjusted from the **System Settings** dialog (8.2.11).

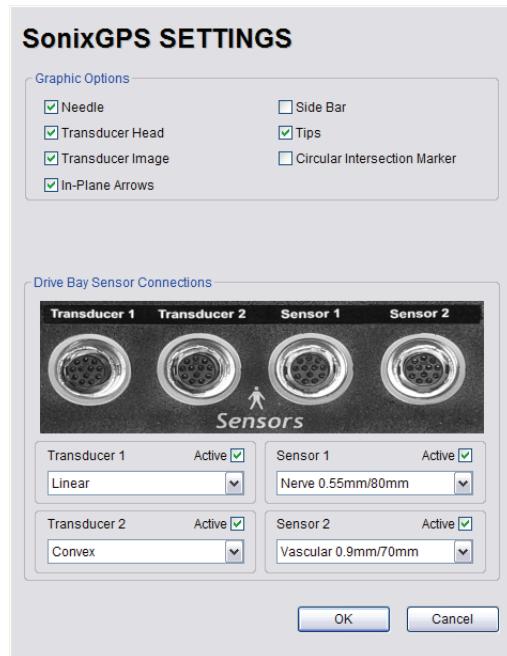
8.2.9 SonixGPS

Use this option to select the appropriate needle to be used with the **SonixGPS** option.



Warning: This user manual does not include a comprehensive discussion of the SonixGPS option. For complete details on using SonixGPS, read and follow all instructions and warnings in the most recent SonixGPS User Manual.

Figure 8-16: SonixGPS Settings



8.2.10 Biopsy Guide

Users can configure the system with the **Single Guideline Biopsy** option.

Figure 8-17: Biopsy

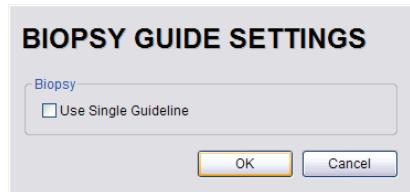


Table 8-16: Biopsy

Use Single Guideline	Select to default to a single Biopsy guideline. When left unselected, the system will use the double line guides.
-----------------------------	--

To Configure the Biopsy Guide Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Biopsy Guide**.
3. Select/deselect the checkbox for **Use Single Guideline**.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.11 System Settings

System Settings are used to configure the **Institution Name**, **Regional** parameters, **Shutdown Options**, **Auto-Freeze**, **Auto-Shutdown**, **User Data** settings and **Admin Password**.

Figure 8-18: System Settings



Table 8-17: System Settings Configuration Options

Institution Name	Enter the Institution Name using the keyboard. The text entered here appears at the top of the image field.
Insert (Symbol)	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).

Regional	Language Settings	Interface Language	Select the desired language for the user interface.	
		Keyboard Layout	Select the desired keyboard language. During imaging, tap Shift+Del to toggle access between English and the non-English Keyboard Layout language. Note: There is no correlation between Interface Languages and Keyboard Layout . For example, when English is used as the Interface Language , it is possible to select Turkish or Korean as the language for Keyboard Layout . Additionally, because Keyboard Layout selections are controlled by Windows rather than Ultrasonix, there are many more Keyboard Layouts to choose from than there are Interface Languages .	
		Internal Settings...	Select country-specific parameters, including Date and Time formats and Number display modes.	
Shutdown Options	Date/Time...	Configure the actual Date and Time (based on the Date/Time format selected in Internal Settings...).		
	Confirm Shutdown	Forces the system to request confirmation when powering down.		
System Configuration	About	Contains (non-editable) system information, for example, Software Version and ECG Part Number (when applicable). Note: For systems configured with an ECG , refer to A.4 ECG Safety for details on the relevance of the ECG Part Number .		
		Enable	Enables Auto-Freeze , which deactivates any transducer that is connected but not currently in use.	
Auto-Freeze	Wait (minutes)	Once Auto-Freeze is enabled, Wait controls the number of minutes a stationary transducer will remain active before Auto-Freeze is triggered. Deactivating/freezing transducer usage will help to prolong its life span.		
		Select a setting of 5 to 120 minutes. The default is Auto-Freeze Enabled , with a 10 minute Wait time. Note: To reactivate (or unfreeze) the transducer/imaging session, simply press the console  button.		
Touch Screen	Enable Customization	Enable/disable an Operator's ability to customize touch screen settings.		
User Data	Export... Import...	Refer to Figure 8-19 and Table 8-18 for details on exporting and importing User Data .		
		Restore Factory	Resets the system to the default settings installed during manufacturing.	
Master Volume		Controls the master setting for Sonix audio volume.		
Admin Password		Creates/removes a global, administration level Password in order to protect Administrator Settings configuration.		

Figure 8-19: Exporting/Importing User Data Options

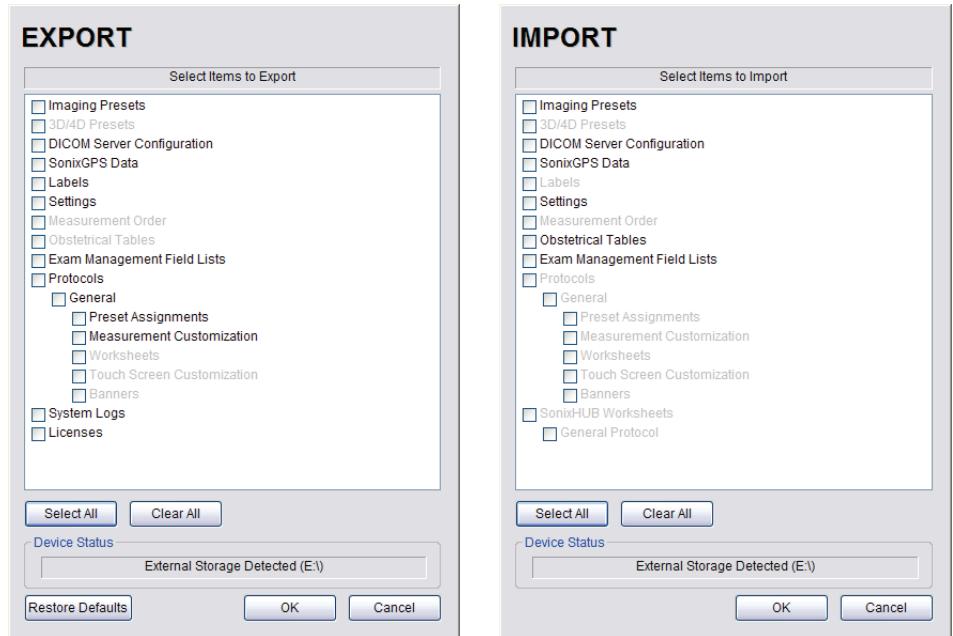


Table 8-18: Exporting/Importing User Data Options

Exports/imports user-configured data to/from an external storage device (e.g., USB medium).

Note: The **Export** function can also be used to reset all but three **User Data** options (**Settings**, **System Logs** and **Licenses**) to their factory defaults.

The system can only import data that has been previously exported from a compatible Sonix system.



Caution: Ultrasonix does *not* recommend importing user-defined **Presets** created with a previous software version as they may not be compatible for use with a more recent software update.

Imaging Presets	Exports/imports all user-defined Imaging Preset data.
3D/4D Presets	Exports/imports all user-defined 3D/4D Preset data.
DICOM Server Configuration	Exports/imports DICOM configuration data.
SonixGPS Data	Exports/imports SonixGPS configuration data.
Labels	Exports/imports all Labels as entered in the Capture Settings Auto-Label dialog (8.2.19). (Available only on the SonixTouch).
Settings	Exports/imports all user-defined Settings that are not explicitly specified in any other Export option (e.g., DICOM , Network , Peripherals , Patient , ECG HR Precedence , etc).
Measurement Order	Exports/imports the Measurement Order data defined under Worksheet Settings on the Measurements dialog.

Obstetrical Tables	Exports/imports all user-defined OB Tables .																		
Exam Management Field Lists	Exports/imports all user-defined Exam Management page data (e.g, Attending Physician, Operator ID , etc).																		
Protocols	<p>Protocols refer to the various specialized applications that can be purchased for use on the Sonix Touch (e.g., EMED, Anesthesia and General). All other products have only the default General Protocol.</p> <p>Exporting/importing settings must be done for each separate Protocol.</p> <p>Note: Only active Protocols (i.e., Protocols that have been licensed and installed) with changes to default Preset, Measurement and Worksheet settings will be available for Export.</p> <p>Only active Protocols with <u>previously exported</u> Preset, Measurement and Worksheet settings will be available for Import.</p>																		
Protocols (Protocol Name)	<table border="1"> <tr> <td>Preset Assignments</td><td>Exports/imports all Preset data as configured under Menu > Administrator > Presets (e.g., Annotations and Pictograms).</td></tr> <tr> <td></td><td>Note: Presets are Protocol-specific.</td></tr> <tr> <td>Measurement Customization</td><td>Exports/imports settings defined under Customize Measurements... on the Measurements dialog.</td></tr> <tr> <td></td><td>Note: Measurement Customization is Protocol-specific.</td></tr> <tr> <td>Worksheets</td><td>Exports/imports Worksheet settings.</td></tr> <tr> <td></td><td>Note: Worksheets are only available for the EMED, Anesthesia and Endocrinology Protocols.</td></tr> <tr> <td>Touch Screen Customization</td><td>Exports/imports customized touch screen settings (e.g., Favorites).</td></tr> <tr> <td></td><td>Note: Available only on SonixTouch and SonixTablet.</td></tr> <tr> <td>Banners</td><td>Not available in this release.</td></tr> </table>	Preset Assignments	Exports/imports all Preset data as configured under Menu > Administrator > Presets (e.g., Annotations and Pictograms).		Note: Presets are Protocol -specific.	Measurement Customization	Exports/imports settings defined under Customize Measurements... on the Measurements dialog.		Note: Measurement Customization is Protocol -specific.	Worksheets	Exports/imports Worksheet settings.		Note: Worksheets are only available for the EMED, Anesthesia and Endocrinology Protocols .	Touch Screen Customization	Exports/imports customized touch screen settings (e.g., Favorites).		Note: Available only on SonixTouch and SonixTablet.	Banners	Not available in this release.
Preset Assignments	Exports/imports all Preset data as configured under Menu > Administrator > Presets (e.g., Annotations and Pictograms).																		
	Note: Presets are Protocol -specific.																		
Measurement Customization	Exports/imports settings defined under Customize Measurements... on the Measurements dialog.																		
	Note: Measurement Customization is Protocol -specific.																		
Worksheets	Exports/imports Worksheet settings.																		
	Note: Worksheets are only available for the EMED, Anesthesia and Endocrinology Protocols .																		
Touch Screen Customization	Exports/imports customized touch screen settings (e.g., Favorites).																		
	Note: Available only on SonixTouch and SonixTablet.																		
Banners	Not available in this release.																		
System Logs	Exports/imports copies of all current System Logs .																		
	Note: These cannot be imported.																		
Licenses	Copies existing license settings into licenses.key.																		
	Note: To re-import licensing details, refer to 8.2.23 .																		
SonixHub Worksheets	Available only for new Worksheet formats created with SonixHub .																		
	Note: SonixHub Worksheets are Protocol -specific.																		
Restore Defaults	Resets the system to the default settings installed during manufacturing.																		

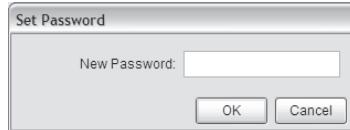
To Access System Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > System**.

8.2.11.1 Password Protection

To Password Protect Administrator Settings Access:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > System > Admin Password....**
3. Enter a **Password** when prompted by the dialog.

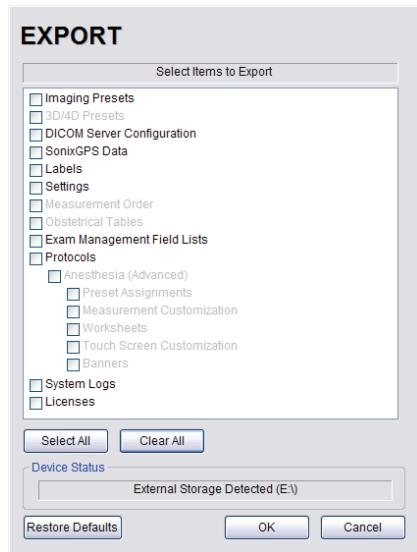


4. Select **OK** to accept the **Password** and exit or **Cancel** to exit without saving.

8.2.11.2 Export/Import User Data

To Export User Data:

1. Connect the external USB storage device on which the **Export** will be saved.
2. Tap the touch screen **Menu** button.
3. Select **Administrator > System > Export....**
4. Select the item(s) to be exported.



Note: Use **Select All** to select all items at one time and **Clear All** to clear all checkboxes.

Only active **Protocols** with changes to default **Presets**, **Measurement** and **Worksheet** settings will be available for **Export**.

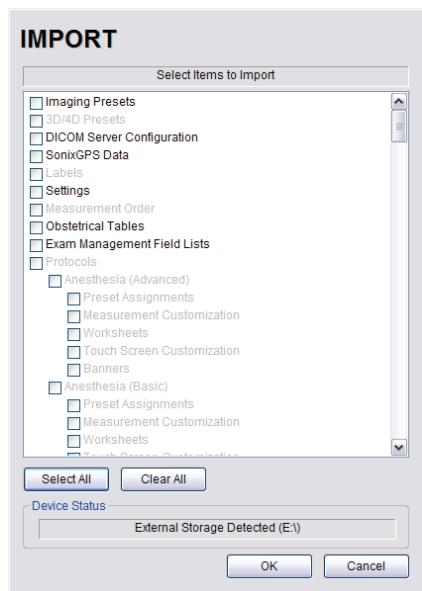
5. Select **OK** to begin the export process or **Cancel** to exit without exporting.
6. If **OK** is selected in the previous step, a completion dialog will be presented when the export process has finished (this will take approximately 15–45 seconds).

To Import User Data:



Caution: Ultrasonix does not recommend importing user-defined **Presets** created with a previous software version as they may not be compatible for use with a more recent software update.

1. Plug the previously-created removable disk (e.g., USB key) into one of the USB ports at the front of the console.
2. Tap the touch screen **Menu** button.
3. Select **Administrator > System > Import....**
4. Select the item(s) to be imported.



Note: Use **Select All** to select all items at one time and **Clear All** to clear all checkboxes.

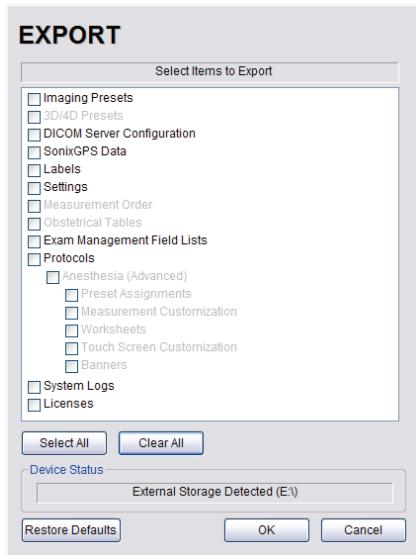
Only active **Protocols** with changes to default **Presets**, **Measurement** and **Worksheet** settings will be available for **Import**.

5. Select **OK** to begin the import process or **Cancel** to exit without importing.

8.2.11.3 Reset User Data Settings to Factory Defaults

To Reset User Data:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > System > Export....**
3. Select the relevant item(s).



Note: Factory defaults will be restored to all selected options (except **Settings**, **System Logs** and **Licenses**).

4. Select **Restore Defaults**.

8.2.12 Network

The **Network** setup dialog allows users to configure the system's network, either through a hard-wired LAN or Dialup connection.

Note: A dialup connection requires a third-party, USB modem. Contact your dealer or Ultrasonix Technical Support to learn more about this option.

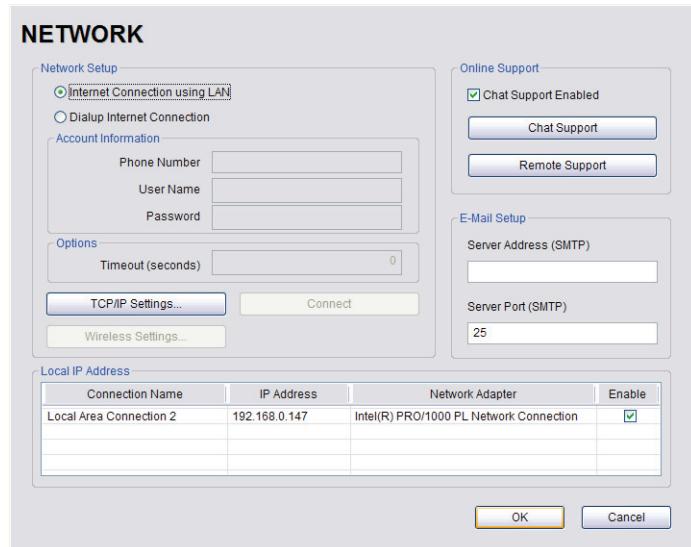
Remote Support is a licensed option that allows a member of the Ultrasonix Technical Support to view and control the system for diagnostic purposes. Ultrasonix Technical Support will help configure this option should it ever be required.

Chat Support enables a real-time discussion with a member of the Ultrasonix Technical Support team.



Caution: System networking options are intended for use inside your organization's firewall. Organizations that elect to configure/use the networking functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision.

Figure 8-20: Network Dialog



Note: A network connection is required to use any of the following: **DICOM**, **Chat Support**, **Remote Support** and **SonixLive**.

Table 8-19: Network Settings

Network Setup	Internet Connection Using LAN	
	OR	Select Internet Connection type: LAN or Dialup .
	Dialup Internet Connection	
	Account Information	Phone Number If Dialup was selected in the previous step, enter the telephone number for the Internet Service Provider (ISP) .
	User Name	Enter the User Name for the Dialup ISP account.
	Password	Enter the Password that will protect the Dialup connection to the Internet.
	Timeout (Seconds)	Enter the Timeout limitation (in number of seconds). Note: If the system fails to connect within the prescribed time limit, it will stop trying.
	Connect	Select to Connect using the Dialup settings.
	TCP/IP Settings...	Select to configure TCP/IP Settings . Refer to 8.2.12.1 Ethernet (LAN) Network Configuration for details.
	Wireless Settings...	Select to configure Wireless Settings . Refer to 8.2.12.3 Wireless Configuration for details.
Online Support	Chat Support Enabled	Select this checkbox to enable Chat Support .
	Chat Support	Select to access Chat Support (8.1.3 Chat Support) .
	Remote Support	After receiving a PIN (Personal Identification Number) from Ultrasonix, use this option to connect to the Internet. This will allow an Ultrasonix Support technician to remotely access the system to resolve any issues that may have arisen.
Local IP Address	Connection Name	When a Network connection(s) is available, the data associated with Connection Name , IP Address and Network Adapter will autocomplete.
	IP Address	Note: If the system is not connected to a network, the IP Address (in the Network dialog) will contain only zeroes (e.g. 000.000.0.000).
	Network Adapter	If more than one LAN connection is available, highlight the relevant connection before selecting the TCP/IP button. If a specific LAN connection is not selected, the TCP/IP button will always present the data from the first LAN connection in the list. Note: The same is true for multiple Wireless connections and the Wireless button.
		When using SonixLive , the video recipient must be advised of the system's Local IP Address .
		Note: When using SonixLive (8.1.1) , this Local IP Address can be accessed temporarily by selecting the SonixLive icon (8.2.18) on the LCD display.
	Enable	Select the relevant checkbox(es) to enable Chat Support for the desired Network connection.

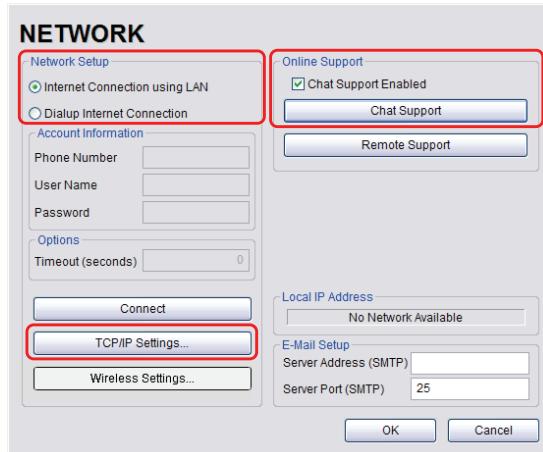
E-Mail Setup	Server Address Enter the Outgoing (SMTP) Server Address here.
	Server Port Enter the Outgoing Server Port number here.

Note: Ultrasonix recommends that **Network** connections be configured using the settings provided by your IT Department.

8.2.12.1 Ethernet (LAN) Network Configuration

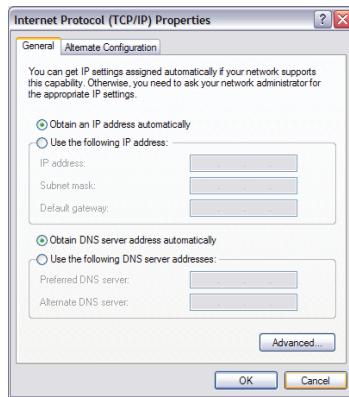
To Configure an Ethernet (LAN) Connection (If Available):

1. Connect an RJ45 cable to the LAN port located on the Back Connectivity Panel.
2. Tap the touch screen **Menu** button.
3. Select **Administrator > Network > Internet Connection using LAN**.



4. Under **Chat Support**, ensure the **Chat Support Enabled** checkbox has been selected.
5. Select **TCP/IP Settings....**

6. Under **General**, select **Obtain an IP address automatically** or **Use the following IP address** and enter the assigned static **IP address**, **Subnet mask**, and **Default gateway**.



7. Select **OK** and exit the **Menu** system.

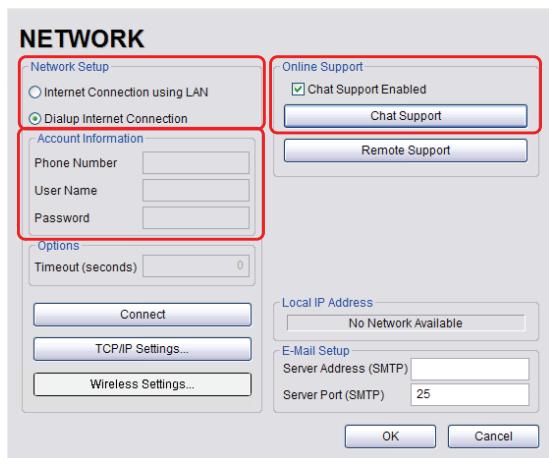
Note: *It may be necessary to restart in order for the changes to take affect.*

8.2.12.2 Dialup Network Configuration

Note: A dialup connection requires a third-party, USB modem. Contact your dealer or Ultrasonix Technical Support to learn more about this option.

To Configure a Dial-up Connection (If Available):

1. Connect the modem's USB connector to connection point 7.
2. Connect the other end of the modem to a telephone jack in the wall.
3. Tap the touch screen **Menu** button.
4. Select **Administrator > Network > Dialup Internet Connection**.
5. Under **Chat Support**, ensure the **Chat Support Enabled** checkbox has been selected.
6. Complete the **Account Information** and **Options** sections: **Phone Number**, **Username**, **Password** and **Timeout**.



7. Select **OK** and exit the **Menu** system.

Note: While the system is dialing out, the current dialing status to the ISP will be displayed.

8.2.12.3 Wireless Configuration

Wireless is only available as a factory-installed option.

Figure 8-21: Network Configuration Page (Wireless)

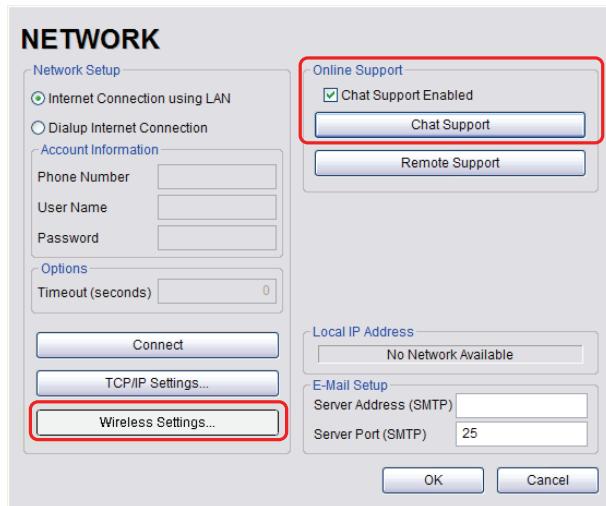


Figure 8-22: Wireless Network Connection Setup

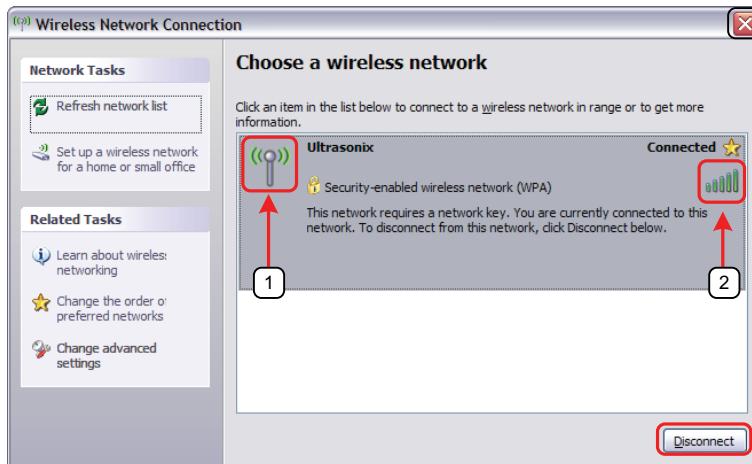


Table 8-20: Wireless Network Connection Setup

-
- | | |
|----------|------------------------------------|
| 1 | Security Indicator |
| 2 | Wireless Signal Strength Indicator |
-

Notes:

Wireless Network Connection options are controlled by MS Windows, not Ultrasonix.

Once a secured, wireless network is in place, it will be necessary to obtain the institution's **Network Key** (from the IT department) in order to log in.

To Configure a Wireless Connection (If Available)

Notes:

When more than one wireless network is available, consult the IT department to determine which one is relevant for system operations.

Do not select the **Chat Support Enabled** checkbox unless an Internet connection is available.

1. Tap the touch screen **Menu** button.
 2. Select **Administrator > Network > Wireless Settings....**
 3. Complete the wireless connection following the onscreen directions in the **Wireless Network Connection** dialog.
 4. Under **Chat Support**, ensure the **Chat Support Enabled** check box has been selected.
-

Note: Do not select the **Chat Support Enabled** checkbox unless an Internet connection is available.

5. Select **OK** and exit the menu system.

8.2.12.4 Chat Support

Chat Support enables a real-time discussion with a member of the Ultrasonix Technical Support team. To access **Chat Support**, refer to [8.1.3](#).

Note: A network connection is required for **Chat Support**.

8.2.12.5 Remote Support

Remote Support is a licensed option that allows a member of the Ultrasonix Technical Support to view and control the Sonix for diagnostic purposes.

Note: A network connection is required for **Remote Support**.

To access **Remote Support**, refer to [8.1.2](#) or [3.4](#).

8.2.13 DICOM Configuration

The system uses the **Digital Imaging and Communications in Medicine (DICOM)** standard to share medical information with other digital imaging systems. The system, by means of the **DICOM** protocol, communicates with **Storage**, **Print** and **Modality Worklist Service Class Providers**.

Note: **DICOM Structured Reporting** is supported. Refer to [Table 8-22](#) for **Structured Reporting** data transfer options.

Refer to [8.2.12 Network](#) to configure the system for network connectivity.

Note: When using a hard-wired network connection, ensure the network is connected via a CAT5 cable at the back of the system. (Check with the local IT Department to ensure that the jack from the wall is live.)

When using a wireless network connection, ensure the wireless network is configured properly and that the system has a live wireless connection.

Figure 8-23: DICOM Configuration



Note: **Global Settings** for the Local Host apply to **DICOM Storage**, **Print** and **Worklist**.

Table 8-21: DICOM Configuration – Global Settings

<i>Local Host</i>	Station Name	General DICOM Station Name .			
	AE Title	AE (Application Entity) Title of the Sonix system.			
	IP Address	Unique identifier of the Sonix system (informational only).			
	Storage Commitment AE	<table border="1"> <tr> <td>Port</td> <td>Port issues Storage Commitment requests (N-Action).</td> </tr> <tr> <td>Listening Port</td> <td>Listening Port receives incoming Storage Commitment responses (N-Event).</td> </tr> </table>	Port	Port issues Storage Commitment requests (N-Action).	Listening Port
Port	Port issues Storage Commitment requests (N-Action).				
Listening Port	Listening Port receives incoming Storage Commitment responses (N-Event).				
<i>Settings</i>	Storage... Print... Worklist...	Use to access specific DICOM Storage , Print and Worklist settings.			

To Configure the Global DICOM Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > DICOM**.
3. Configure the global settings as required.

8.2.13.1 DICOM Storage Settings

The **DICOM Storage Settings** dialog offers basic and advanced settings for configuring the system for **DICOM** image storage.

To Configure the DICOM Storage Setting:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > DICOM > Storage**.
3. An onscreen dialog with four tabs will be presented: **AE Configuration**, **Global Storage Settings**, **Brightness/Contrast** and **SonixHub Settings**.
4. Create/select a **Device Name**. Edit the **Application Entity (AE)** settings for the selected **Device**.
5. Repeat **step 4** as many times as required.
6. Configure settings as required.

*Note: In addition to the four tabbed settings options, select the **Settings...** button to access **Storage Settings**.*

The **DICOM Storage AE Configuration** dialog enables configuration of **AE** properties.

Figure 8-24: DICOM Storage Settings – AE Configuration

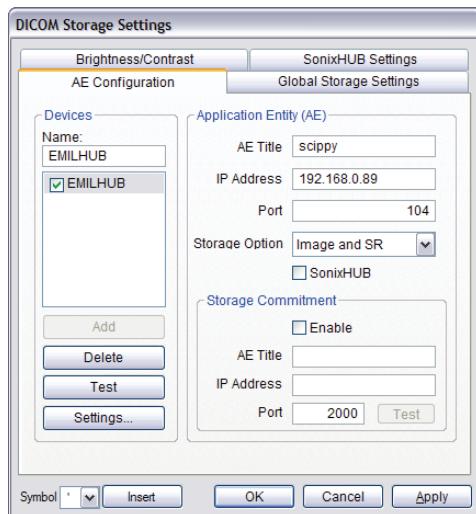


Table 8-22: DICOM Storage Settings – AE Configuration

Devices	Use the Devices option to add as many DICOM Storage Servers as required.	
	Note: If more than one DICOM Storage Server is configured, during data transfer the Operator has the option of selecting which Storage Server(s) will receive the data (9.3).	
	Name	Enter/select the Name of an AE Storage Device and populate the four AE fields: Structured Report Only , AE Title , IP Address and Port .
	Add	Select to Add the new AE Storage Device .
	Delete	Select to Delete the selected AE Storage Device .
	Test	Select to send verification request to DICOM Storage Device (ping to verify connection).
	Settings...	Select to access Storage Settings (Figure 8-25 and Table 8-23).

Application Entity (AE)	<i>Note:</i> The data entered/edited in the following fields is specific to the selected Device Name.	
	AE Title	AE Title of the Storage SCP .
	IP Address	Unique identifier of Storage SCP .
	Port	Listening Port of the Storage SCP .
	Storage Options	Select the Storage Option to be used during data transfer (Chapter 9). <ul style="list-style-type: none"> • Image and SR: transfers both Images and Structured Report • Image: transfers only Images • SR (Structured Report): transfers only the Structured Report.
	SonixHub	Select to enable/disable SonixHub .
	<i>Note:</i> This setting is only available if SonixHub is licensed.	
	Enable	Select to enable Storage Commitment functionality.
	AE Title	AE Title of the Storage Commitment SCP .
	IP Address	Unique identifier of Storage Commitment SCP .
	Port	Listening Port of the Storage Commitment SCP .
	Test	Select to send verification request to DICOM Storage Commitment Device (ping to verify connection).
Insert (Symbol)	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).	

The **DICOM Storage Settings** dialog specifies how images are stored.

Figure 8-25: DICOM Storage Settings – Storage Settings

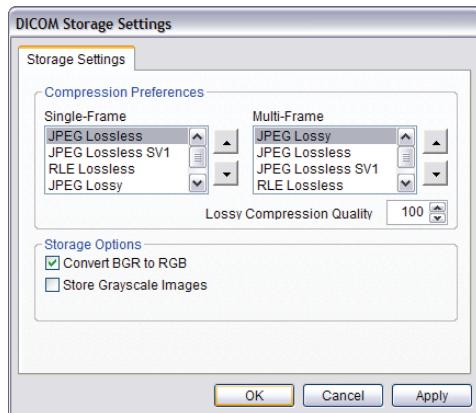


Table 8-23: DICOM Storage Settings – Storage Settings

Compression Preferences	Single-Frame	JPEG Lossless JPEG Lossless SV1 Set DICOM image format storage order for single frame images. RLE Lossless JPEG Lossy No Compression	<i>Note: Refer to the DICOM Standard for details on image formats.</i>
	Multi-Frame	JPEG Lossy JPEG Lossless Set DICOM image format storage order for Cine loops . JPEG Lossless SV1 RLE Lossless	
		No Compression	
		Lossy Compression Quality Select the quality (1–100%) of image compression.	
	Storage Options	Convert BGR to RGB Select to swap the color components of the image pixel data—the blue colors are swapped with the red colors. Store Grayscale Images Select to store images in grayscale format.	
		Insert (Symbol) Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).	

The **DICOM Global Storage Settings** dialog specifies global image storage parameters.

Figure 8-26: DICOM Storage Settings – Global Storage Settings

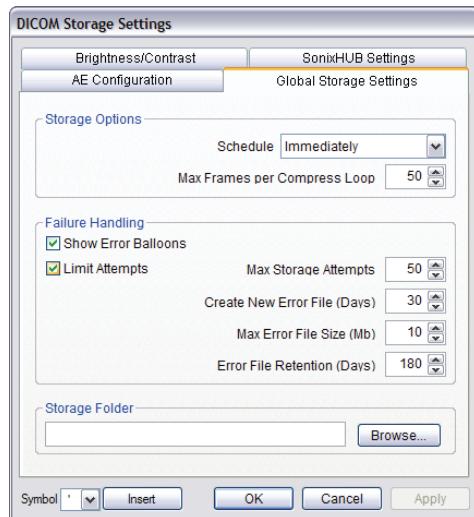


Table 8-24: DICOM Storage Settings – Global Storage Settings

Storage Options	Schedule	Select an auto-transfer setting: End of Exam, Immediate, On Idle .
	Max Frames per Compress Loop	Maximum number of frames compressed at one time: 10–300. The default is 50. Note: Once all frames in a given file are compressed, the completed file will be transferred. Compression type is based on the Multi-Frame format selected in the Storage Settings dialog.

	Show Error Balloons	Select to enable the display of DICOM Storage error messages (e.g., <i>Failed to connect to DICOM</i>).
Failure Handling		Select to configure error handling after a failed DICOM storage attempt.
	Note: If Limit Attempts is not selected, the following four options will be grayed out.	
	Max Storage Attempts	Select the maximum number of times the system will retry after a failed storage attempt: 1–1000. The default is 50. Note: Failure may occur during DICOM file creation or DICOM file transfer. The retry setting applies to both failure types.
	Create New Error File (Days)	Select the length of time (in days) that initiates the creation of a new error file: 1–90. The default is 30 days. Note: When a new file is created, the existing file is saved, renamed and stored for 180 days. This setting works in conjunction with Max Error File Size (Mb) . A new file is created based on whichever limit is reached first.
	Max Error File Size (Mb)	Select the file size (in Mb) that initiates the creation of a new error file: 1–50. The default is 10 Mb. Note: When a new file is created, the existing file is saved, renamed and stored for 180 days. This setting works in conjunction with Create New Error File (Days) . A new file is created based on whichever limit is reached first.
	Error File Retention (Days)	Select the length of time (in days) that each error file will be retained: 30–180. The default is 180 days.
	Storage Folder	Select the location (local or remote) where the images will be stored. Note: If a value is specified, the AE Configuration and Storage Commitment dialogs are disabled—images can not be stored to an SCP.
	Insert (Symbol)	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).

The **DICOM Storage Brightness/Contrast** dialog changes the **Brightness** and **Contrast** settings. These settings are applied to the images that are sent to the **SCP**, not the images stored locally.

The effects of these settings can be seen in the **Before** and **After** images.

Figure 8-27: DICOM Storage Settings – Brightness/Contrast

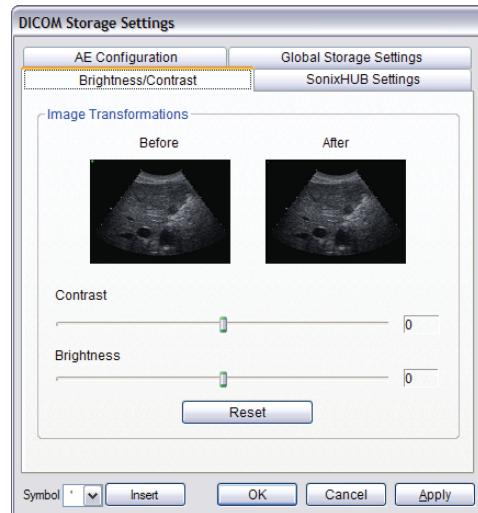


Table 8-25: DICOM Storage Settings – Brightness/Contrast

Contrast	Adjusts the level of Contrast applied to the images.
Brightness	Adjusts the level of Brightness applied to the images.
Reset	Resets the values of DICOM Storage Brightness and Contrast back to zero. <i>Note: To adjust the Brightness/Contrast settings, position the trackball arrow over the Brightness or Contrast slider. Press and hold the  button while moving the trackball left or right to the desired position.</i>

The **DICOM SonixHub Settings** dialog specifies **SonixHub** parameters.

Note: These settings are only available if **SonixHub** is licensed.

Figure 8-28: DICOM Storage Settings – SonixHub Settings

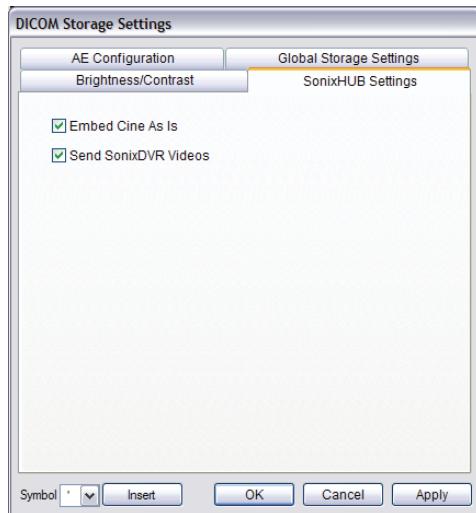


Table 8-26: DICOM Storage Settings – Global Storage Settings

Embed Cine As Is	Select to send Cine files in AVI format. When deselected, Cine files will be sent in DICOM format.
Send SonixDVR Videos	Select/deselect in order to include/exclude SonixDVR videos in the SonixHub transfer.

8.2.13.2 DICOM Print Settings

DICOM Print Settings offer basic and advanced settings for configuring the system for **DICOM Print**.

To Configure DICOM Print Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > DICOM > Print**.
3. An onscreen dialog with two tabs will be presented: **AE Configuration** and **Brightness/Contrast**.
4. Create/select a **Device Name**. Edit the **Application Entity (AE)** settings for the selected **Device**.
5. Repeat **step 4** as many times as required.
6. Configure **Brightness/Contrast** as required.

*Note: In addition to the two tabbed settings options, select the **Settings...** button to access **Print Settings** and **Advanced Print Settings**.*

The **DICOM Print AE Configuration** dialog enables configuration of **AE** properties.

Figure 8-29: DICOM Print Settings – AE Configuration

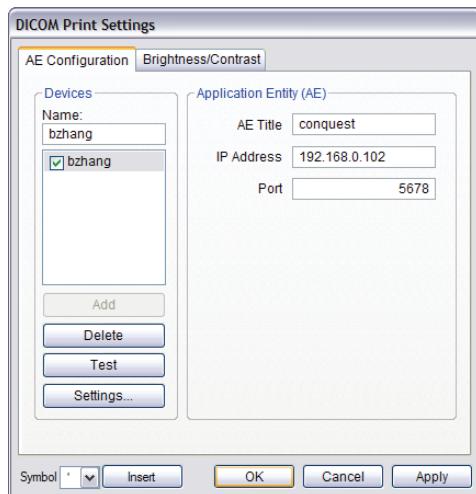


Table 8-27: DICOM Print Settings – AE Configuration

Devices	Use the Devices option to add as many DICOM Print Servers as required.	
	Note: If more than one DICOM Print Server is configured, during data transfer the Operator has the option of selecting which Print Server(s) will receive the data (9.3).	
	Name	Enter/select the Name of an AE Print Device and populate the three AE fields: AE Title , IP Address and Port .
	Add	Select to Add the new AE Print Device .
	Delete	Select to Delete the selected AE Print Device .
	Test	Select to send verification request to DICOM Print Device (ping to verify connection).
Application Entity (AE)	Settings... Select to access Print Settings (Figure 8-30 and Table 8-28) and Advanced Print Settings (Figure 8-31 and Table 8-29).	
	Note: The data entered/edited for the next three fields is specific to the selected Device Name .	
	AE Title	AE Title of the Print SCP .
	IP Address	Unique identifier of Print SCP .
Insert (Symbol)	Port Listening Port of the Print SCP .	
	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).	

The **DICOM Print Settings** dialog enables configuration of general print properties.

Figure 8-30: DICOM Print Settings – Print Settings

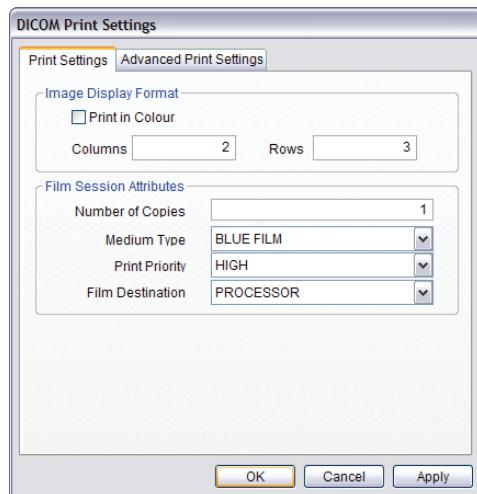


Table 8-28: DICOM Print Settings – Print Settings

<i>Image Density Format</i>	<i>Print in Color</i>	Select to print images in color. Deselect to print grayscale (default).
	<i>Columns</i>	Select the number of Columns per page.
<i>Film Session Attributes</i>	<i>Rows</i>	Select the number of Rows per page.
	<i>Number of Copies</i>	Select the Number of Copies of each page to be printed.
	<i>Medium Type</i>	Select the type of medium on which the images will be printed: Paper , Clear Film or Blue Film .
	<i>Print Priority</i>	Select the print job priority: High , Medium or Low .
	<i>Film Destination</i>	Select the location to which the print job will be sent: Processor or Magazine .

The **Advanced Print Settings** dialog enables configuration of advanced printing options.

Figure 8-31: DICOM Print Settings – Advanced Print Settings

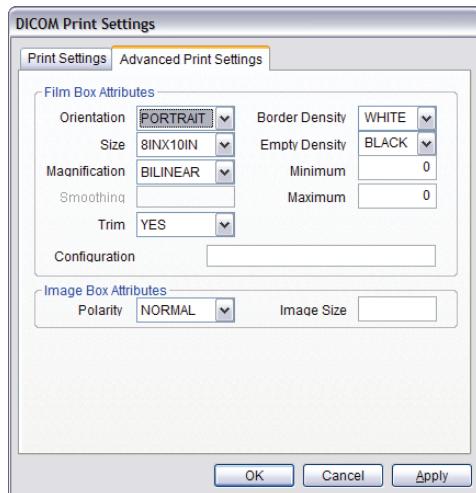


Table 8-29: DICOM Print Settings – Advanced Print Settings

Film Box Attributes	Orientation	Select the Orientation of the print page: Portrait or Landscape .
	Size	Select the Size of the print page.
	Magnification	Select the method of Magnification : Replicate , Bilinear , Cubic or None .
	Smoothing	Select the Smoothing . Note: This option is printer-specific and only available if Cubic Magnification is selected in the previous field.
	Trim	Select Yes or No to use a border (Trim) on each page.
	Configuration	Enter printer-specific Configuration information.
	Border Density	Select the Border Density : Black or White .
	Empty Density	Select the Empty Density : Black or White .
	Minimum Density	Enter the minimum image density in hundredths of OD (Optical Density) .
Image Box Attributes	Maximum Density	Enter the maximum image density in hundredths of OD .
	Polarity	Select the Polarity : Normal or Reverse.
	Image Size	Enter the printer-specific Image Size in mm.
Insert (Symbol)		Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).

The **DICOM Print Brightness/Contrast** dialog changes the **Brightness** and **Contrast** settings. These settings are applied to the images that are sent to the **SCP**, not to the images stored locally.

The effect of these settings can be seen in the **Before** and **After** images.

Figure 8-32: DICOM Print Settings – Brightness/Contrast

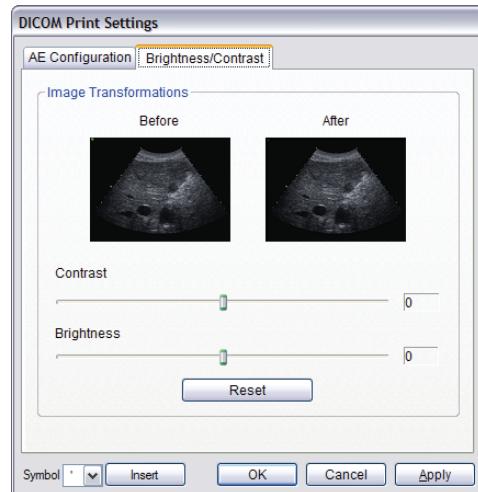


Table 8-30: DICOM Print Settings – Brightness/Contrast

Contrast	Adjusts the level of Contrast applied to the images.
Brightness	Adjusts the level of Brightness applied to the images.
Reset	Resets the values of DICOM Print Brightness and Contrast back to zero.
Reset	Note: To adjust the Brightness/Contrast settings, position the trackball arrow over the Brightness or Contrast slider. Press and hold the  button while moving the trackball left or right to the desired position.

8.2.13.3 DICOM Worklist Settings

DICOM Worklist Settings offer advanced settings for configuring the **DICOM Worklist SCU**.

Note: All **Modality Performed Procedure Steps (MPPS)** functionality is invisible to the user, except when testing a **DICOM Worklist Device**.

MPPS will be accepted or rejected based on the **DICOM Server's** settings.

Figure 8-33: DICOM Worklist Device Test Results



To Configure DICOM Worklist Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > DICOM > Worklist**.
3. Create/select a **Device Name**. Edit the **Application Entity (AE)** settings for the selected **Device**.
4. Repeat **step 3** as many times as required.
5. Configure the dialog as required.

The **DICOM Worklist AE Configuration** dialog enables configuration of **AE** properties.

Figure 8-34: DICOM Worklist Settings – AE Configuration

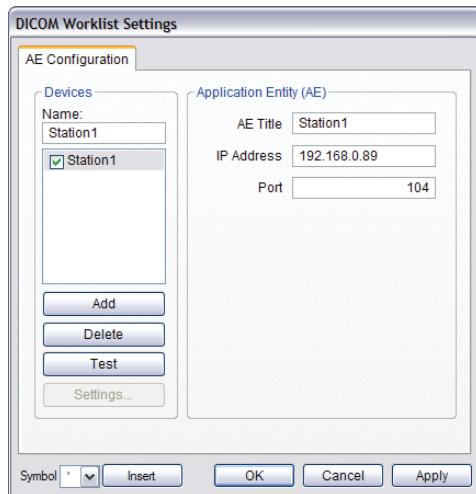


Table 8-31: DICOM Worklist Settings – AE Configuration

Devices	Use the Devices option to add as many DICOM Worklist Servers as required.	
	Name	Enter/select the Name of an AE Worklist Device and populate the three AE fields: AE Title , IP Address and Port .
	Add	Select to Add the new AE Worklist Device .
	Delete	Select to Delete the selected AE Worklist Device .
	Test	Select to send verification request to DICOM Worklist Device (ping to verify connection).
	Settings...	Not available in this release.
Application Entity (AE)	<i>Note: The data entered/edited for the next three fields is specific to the selected Device Name.</i>	
	AE Title	AE Title of the Worklist SCP .
	IP Address	Unique identifier of Worklist SCP .
	Port	Listening Port of the Worklist SCP .
Insert (Symbol)	Enables the insertion of text symbol(s) not available on the keyboard (e.g., punctuation, symbols and letters from other languages).	

8.2.14 Custom Keys

QCustom Keys allow users to control the actions of several console and touch screen buttons: **1**, **2**,  and **Q**.

The **Custom Key** setup dialog has a tab that corresponds to each of the **Custom Key** console or touch screen buttons. Once configured, pressing/tapping one of these buttons will produce the defined action.

Figure 8-35: Custom Keys (1 and 2)

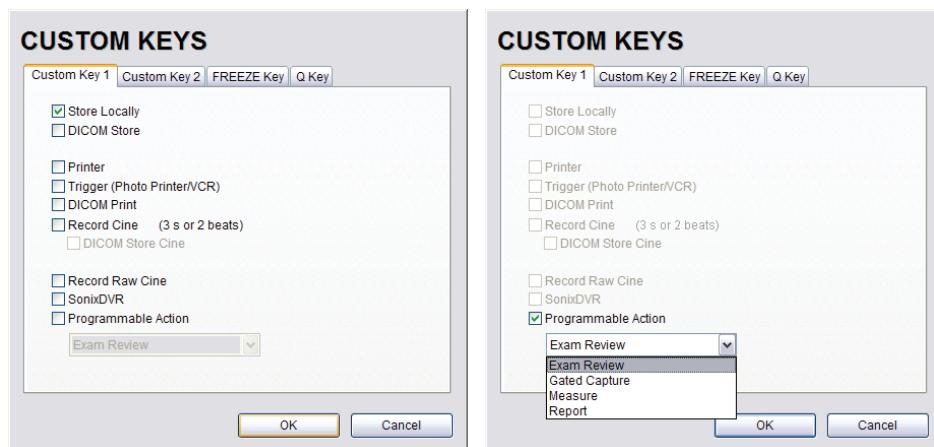
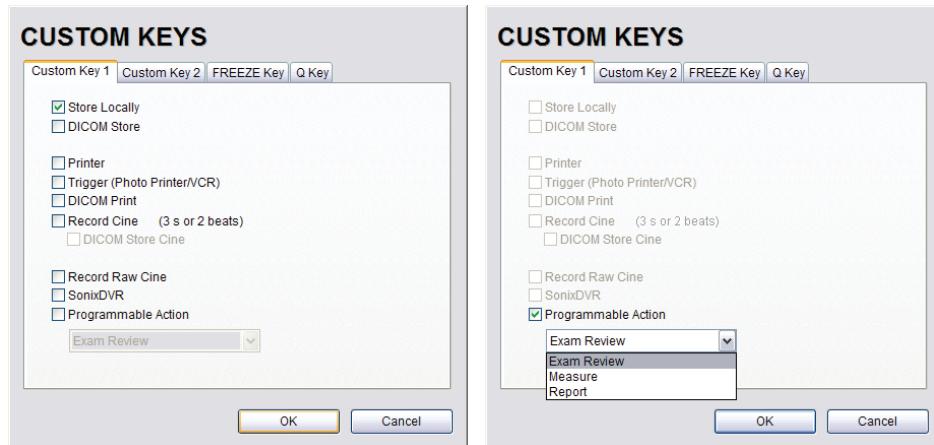


Table 8-32: Custom Key Settings (1 and 2)

	This setting is always selected by default and can only be deselected (or reselected) if all options except Trigger are deselected.
Store Locally	When selected, regardless of other settings, images will always be saved to the system's local storage. Note: Access locally stored images through the Exam Management page or the touch screen Exam Review button
DICOM Store	Sends images to a DICOM archive. Refer to 8.2.13 DICOM Configuration for more setup details.
Printer	Sends output to a Paper Printer . Refer to 8.2.15 Peripherals for details on printer setup.
Trigger (Photo Printer/VCR)	Sends a Trigger signal to attached video printers (e.g., Thermal Printer). Note: To select Store Locally (above), all other options must be deselected.
DICOM Print	Sends images to a DICOM printer. Refer to 8.2.13 DICOM Configuration for more setup details.
Record Cine	Enables the system to be configured to record a Cine loop . Loop duration is configured through 8.2.19 Capture Settings .
DICOM Store Cine	Enables the user to send animated DICOM to a DICOM archive (8.2.13 DICOM Configuration).
Record Raw Cine	Saves Cine loops in raw format, enabling future manipulation (5.9.4 Raw Cine Manipulation).
SonixDVR	Enables SonixDVR recording (i.e., a physical recording device is <u>not</u> required). Note: SonixDVR Recordings cannot be transferred via DICOM . Use the Image Transfer process (9.3) to export these files.
Programmable Action	Enables the user to configure the Custom Key(s) to one of five specific actions—unrelated to printing.
	Exam Review Toggles access between imaging and Exam Review page. Pressing the relevant console Custom Key will trigger the timer for Gated Capture .
	Gated Capture Note: Gated Capture is available only if: <ul style="list-style-type: none"> • Capture Protocols is licensed (8.2.19) • the system is equipped with an ECG module.
	Measure Activates Measurement Packages touch screen (i.e., achieves the same result as tapping the Measure button on the main touch screen).
	Report Toggles access between imaging and current Report (i.e., achieves the same result as tapping the Report button on the Measurement Packages touch screen).

Figure 8-36: Custom Key Settings (FREEZE and Q Keys)

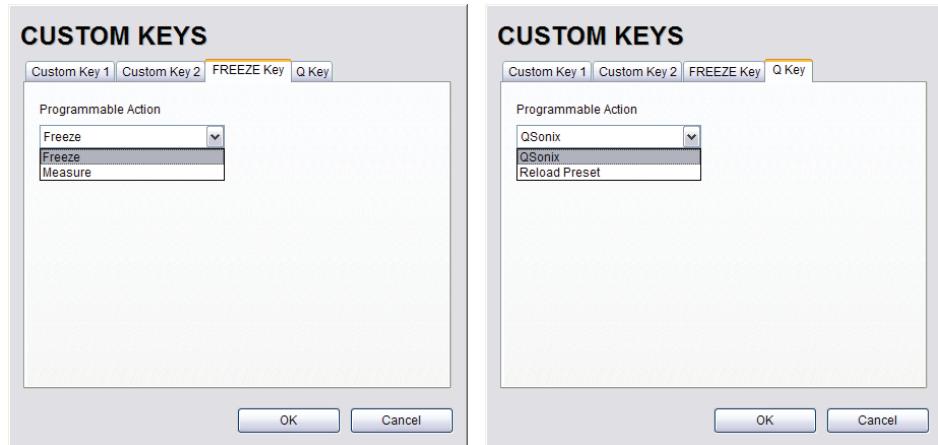


Table 8-33: Custom Key Settings (FREEZE and Q Keys)

FREEZE Key	Programmable Action	Enables the user to customize the action of the  button.
	Freeze	Toggles access between live and frozen imaging. This setting is the system default.
Q Key	Programmable Action	Enables the user to customize the action of the  button.
	QSonix	Initiates the QSonix option. This setting is the system default.
	Programmable Action	Selecting Reload Preset enables the Operator to reset the current Preset to its default settings, effectively "erasing" any changes made to imaging parameters during the current exam.
	Reload Preset	Note: The QSonix option will not be available if Reload Preset is selected as the Q Key action.

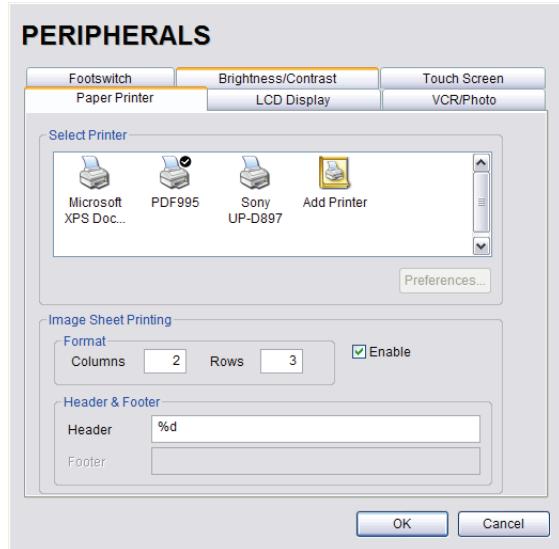
To Configure Custom Keys:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Custom Keys**.
3. Select the desired **Custom Key** tab.
4. Configure the individual **Custom Key** options as required.
5. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.15 Peripherals

The **Peripherals** setup dialogs enable software configuration for the various peripherals that are approved for connection to the system. For installation details of the specific connections involved, refer to [Chapter 10: Connectivity, Peripherals and Software](#).

Figure 8-37: Peripherals



To Access the Peripherals Dialog:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals**.
3. Select the relevant **Peripherals** dialog tab.

8.2.15.1 Paper Printer

The **Paper Printer** dialog is used to configure a laser or inkjet paper printer connected to the system. If the printer is connected via a parallel or USB port, the system will recognize the printer and subsequently list it as a recognized printer in the **Select Printer** section of the dialog.



Warning: Before connecting a **Paper Printer**, refer to [10.3 Ultrasonix-Approved Devices](#).

Figure 8-38: Peripherals – Paper Printer

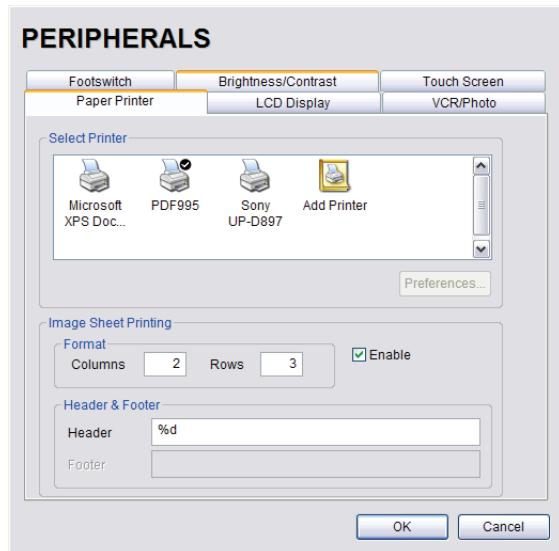


Table 8-34: Paper Printer Settings

Select Printer		Select a Paper Printer from the options presented.
Preferences		Select this button to configure Preferences for the selected printer.
Image Sheet Printing	Format	Columns Select the number of print Columns .
		Rows Select the number of print Rows .
		Enable Select to allow Image Sheet Printing .
	Header & Footer	Header Enter text to be printed in each Header .
		Footer <i>Note: This field is always disabled.</i>

To Configure the System for a Paper Printer:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals**.
3. Select the **Paper Printer** tab.
4. Select the printer from the list of recognized printers. For multiple printers, press the console  button and select **Set as Default Printer** from the onscreen menu.

Note: The selected printer can be a network or a local printer and can be configured for specific formats by selecting **Preferences**.

5. To select/deselect **Image Sheet Printing** (e.g., **2x3** image sheets), select/deselect the **Enable** box.
6. Enter the number of **Columns** and **Rows** desired in the text boxes provided.
7. To add an optional **Header** to the image sheet (or to supply special commands, as required), enter the desired text in the space provided.

Note: To configure the console **1** or **2** button to send images to the default printer, refer to [8.2.14 Custom Keys](#).

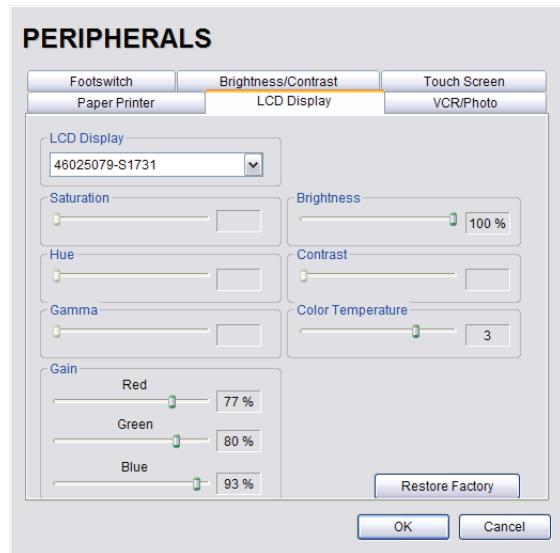
To send partial print pages (e.g., 3 images remaining on a 4 image/sheet format) at the end of an exam, tap the touch screen **End Exam** button.

8.2.15.2 LCD Display

Adjust the following LCD display settings as required: **Saturation, Hue, Gamma, Brightness, Contrast, Color Mode** and **Gain (Red, Green and Blue)**.

Note: Select the **Restore Factory** button to reconfigure **LCD Display** to factory settings.

Figure 8-39: Peripherals – LCD Display



To Adjust the LCD Display Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals**.
3. Select the **LCD Display** tab.
4. Position the trackball arrow over the desired setting slider.
5. Press and hold the **◀** button while moving the trackball to the desired position.
6. Repeat **step 4** and **step 5** as many times as required.
7. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.15.3 VCR/Photo

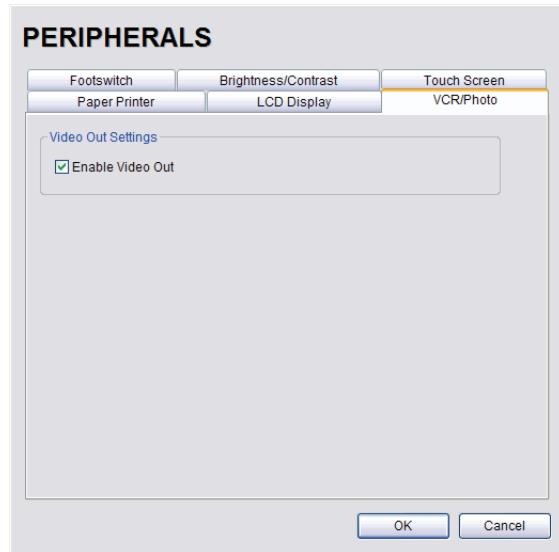
Output video includes only the image area (or full screen when a dialog such as the **Exam Management** page or **Image Review** pages are displayed on the screen). The output video does not include the thumbnail images.

Use the **VCR/Photo** dialog to enable/disable the live output video (**Video Out**).

Note: To create a **SonixDVR Recording** of an exam session, refer to [8.2.14 Custom Keys](#) and/or [8.2.19 Capture Settings](#).

A physical recording device is not required for **SonixDVR Recording**. However, the option must be configured in [8.2.14 Custom Keys](#) before an exam session can be recorded to an **MPG** file.

Figure 8-40: Peripherals – VCR/Photo



To Enable VCR/Photo Functionality:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals**.
3. Select the **VCR/Photo** tab.
4. Select/deselect **Enable Video Out** as required.
5. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.15.4 Footswitch

The **Footswitch** dialog allows the user to configure the desired operation for as many as three footswitches. There are ten options: **None**, **Print**, **Freeze**, **Quick Cine Record**, **Exam Management**, **Measurement**, **Exam Review**, **SonixDVR**, **Next Transducer** and **Transducer 1, 2, or 3**.

Note: The numbered transducer options corresponds to the equivalent transducer connector (e.g., the option for **Footswitch #2** is **Transducer 2**. When **Transducer 2** is selected and the pedal for **Footswitch #2** is pressed, the system will switch to whichever transducer is connected to the second transducer port.

Figure 8-41: Peripherals – Footswitch

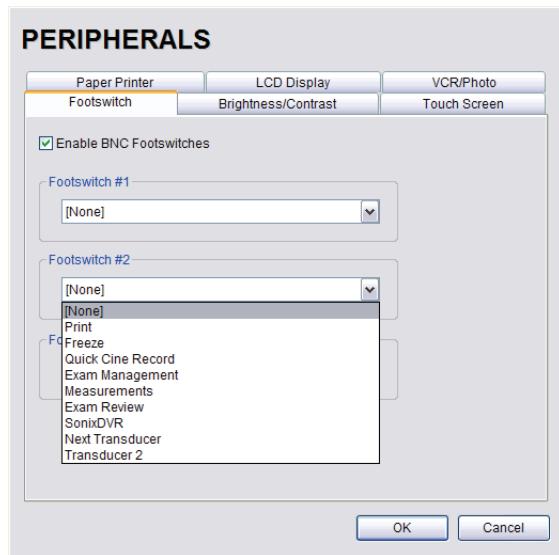


Table 8-35: Footswitch Options

Enable BNC Footswitches	Ensure an Ultrasonix-approved Footswitch has been connected (10.3), then select checkbox to enable Footswitch operation.
Footswitch #1, #2, #3	<p>None Print Freeze Quick Cine Record Exam Management Measurements Exam Review SonixDVR Next Transducer Transducer 1, 2, 3</p> <p>Select the action to be performed when a specific footswitch is pressed.</p> <p>Note: The numbered transducer option corresponds to the equivalent transducer connector (e.g., the option for Footswitch #2 is Transducer 2. When Transducer 2 is selected and the pedal for Footswitch #2 is pressed, the system will switch to whichever transducer is connected to the second transducer port.)</p>

To Configure the Footswitch Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals**.
3. Configure the **Footswitch** options as required.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.15.5 Brightness/Contrast

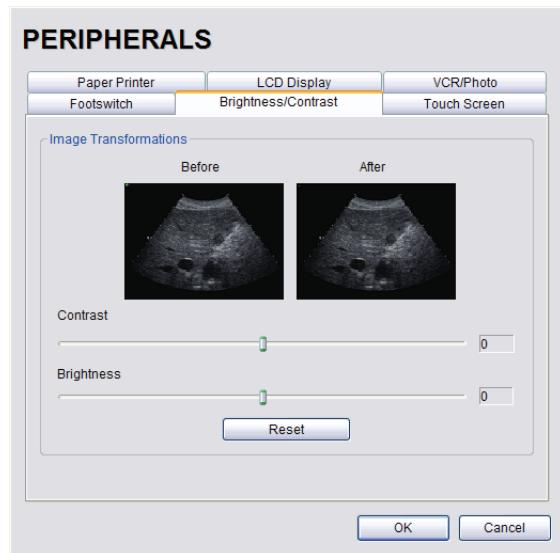
The **Brightness/Contrast** dialog allows users to change the **Brightness/Contrast** of images transferred to peripherals to ensure optimum quality.

Note: The **Brightness/Contrast** values set on this tab are not applied to the image on the screen or images stored to the system.

The effects of the **Brightness/Contrast** settings are seen in the **Before** and **After** images.

Note: Select the **Reset** button to restore **Brightness/Contrast** settings to factory defaults.

Figure 8-42: Peripherals – Brightness/Contrast



To Adjust the Brightness/Contrast Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals**.
3. Select the **Brightness/Contrast** tab.
4. Position the trackball arrow over the **Brightness** or **Contrast** slider.
5. Press and hold the  button while moving the trackball to the desired position.
6. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.15.6 Touch Screen

The **Touch Screen** dialog allows users to change the **Brightness/Contrast** of images transferred to peripherals to ensure optimum quality. The effects of the **Brightness/Contrast** settings are seen in the **Before** and **After** images.

Note: The **Brightness/Contrast** values set on this tab are not applied to the image on the screen or images stored to the system.

This option can also be used to calibrate the **Touch Screen**.



Caution: The touch screen is very robust so this will not need to be performed often. When it is, take care to follow the touch screen prompts and tap the places indicated with a quick, light touch.

Figure 8-43: Peripherals – Touch Screen

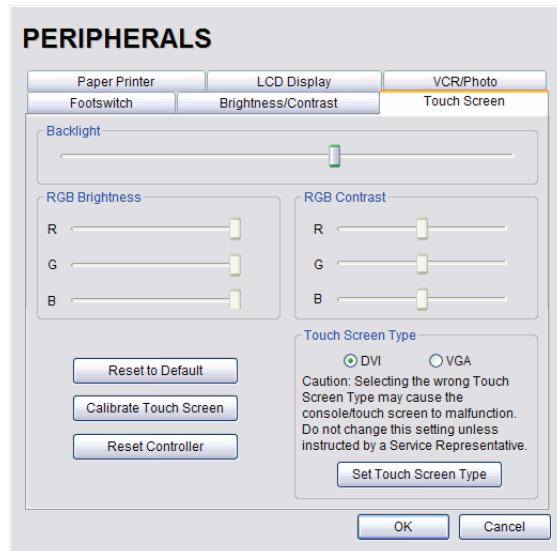


Table 8-36: Touch Screen Settings

Backlight	Adjusts the Backlight intensity.
RGB Brightness	Adjusts the Brightness intensity of the Red , Green and Blue spectrums.
RGB Contrast	Adjusts the Contrast intensity of the Red , Green and Blue spectrums.
Reset to Default	Restores all settings to the factory defaults.
Calibrate Touch Screen	Recalibrates the touch screen.
Reset Controller	Not available in this release.
Touch Screen Type	<p> Caution: Selecting the wrong Touch Screen Type may cause the console/touch screen to malfunction. Do not change this setting unless instructed by a Service Representative.</p>
DVI or VGA	Selects the relevant Touch Screen Type .
Set Touch Screen Type	Press to implement any change made to the Touch Screen Type .

To Adjust the Touch Screen Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals > Touch Screen**.
3. Position the trackball arrow over any of the sliders.
4. Press and hold the  button while moving the trackball to the desired position.
5. Select **Reset to Default** to restore factory settings.
6. If instructed by an Ultrasonix Service Representative, select the **Touch Screen Type**.



Caution: Selecting the wrong **Touch Screen Type** may cause the console/touch screen to malfunction.

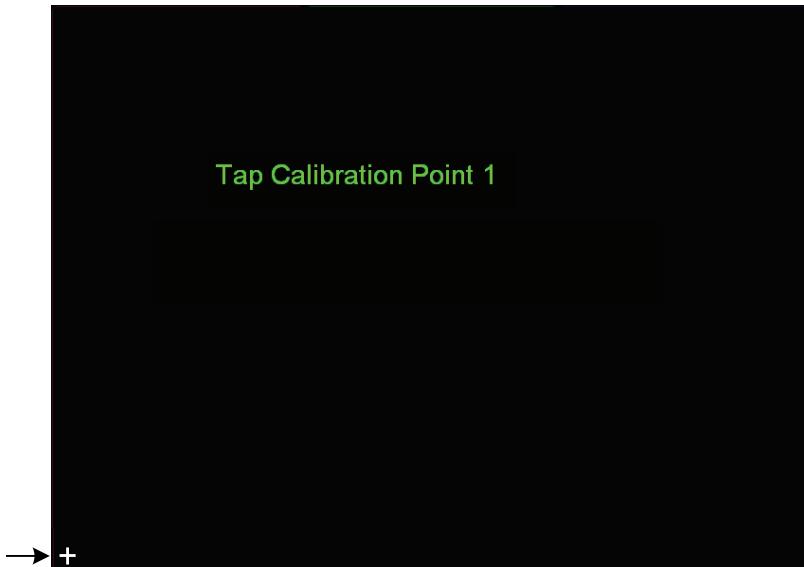
Do not change this setting unless instructed by a Service Representative.

7. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Calibrate the Touch Screen:

Note: The touch screen is very robust so this will not need to be performed often.

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Peripherals > Touch Screen**.
3. Select **Calibrate** and follow the touch screen prompts.



Note: Tap the places indicated with a quick, light touch.

4. Once the calibration is complete, select **OK** to exit.

8.2.16 Display Settings

Display Settings allows users to configure the various LCD display options.

Figure 8-44: Display Settings

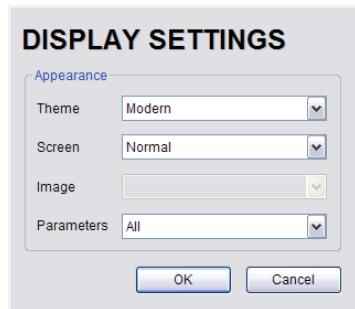


Table 8-37: Display Settings

Appearance	Theme	Classic Modern	Configure the basic settings for the LCD display using either Modern or Classic features.
	Screen	Normal Full	<p>Configure imaging Layout.</p> <p>Note: Users can also access the Full and Normal Screen toggle button by dragging the Full Screen Mode Action button to Favorites when editing the Favorites touch screen button options.</p> <p>Note: When set to Full, Ultrasonix recommends working with minimized buttons as much as possible (Figure 3-4: System Control Buttons (Maximized and Minimized)).</p> <p>Users can also access the Full and Normal Screen toggle button by dragging the Full Screen Mode Action button to Favorites when editing the Favorites touch screen button options.</p>
	Image	Right Left	Not available on this platform.
	Parameters	All Subset	<p>Configures the system to display All available or a specific Subset of imaging parameters: Subset consists of: MI/TI (or MI and TI when applicable), FPS, Resolution and Freq (refer to Table E-1 for imaging parameter details).</p> <p>Note: When Subset is selected, a Depth value will be placed under the Depth markers.</p>

To Configure Display Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Display**.
3. Configure **Display Settings** as required.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.17 Patient Settings

Patient Settings allows users to configure options for the **Exam Management** page, the onscreen display of patient data and **EMR Systems**.

The following configuration options are available with the **EMR System EHealthConx**:

- **Operators** must be selected from a predetermined list (see also [3.3.1 Quick Exam Start-Up](#))
- **Worksheets** must be reviewed prior to ending an exam
- **FTP** transfers are automatically initiated once an exam is ended ([8.2.18 Status Bar](#)).

Figure 8-45: Patient Settings

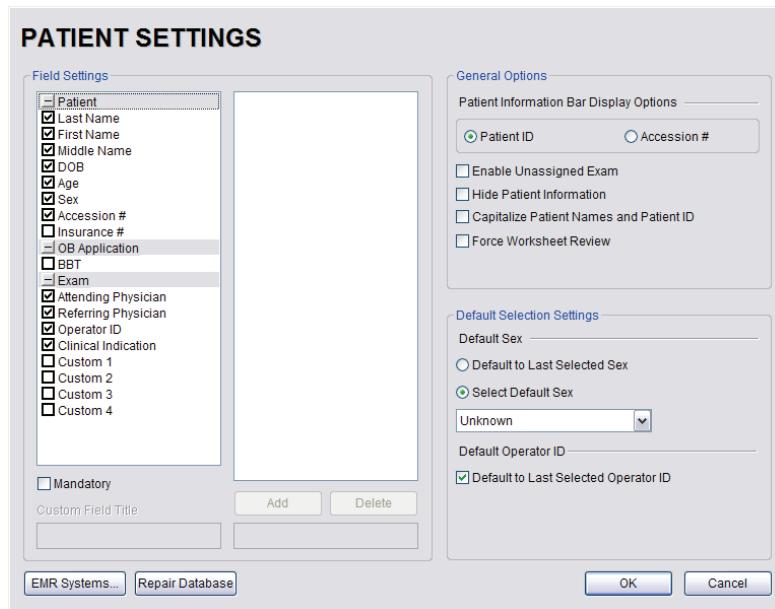


Figure 8-46: EMR System Settings and Operators

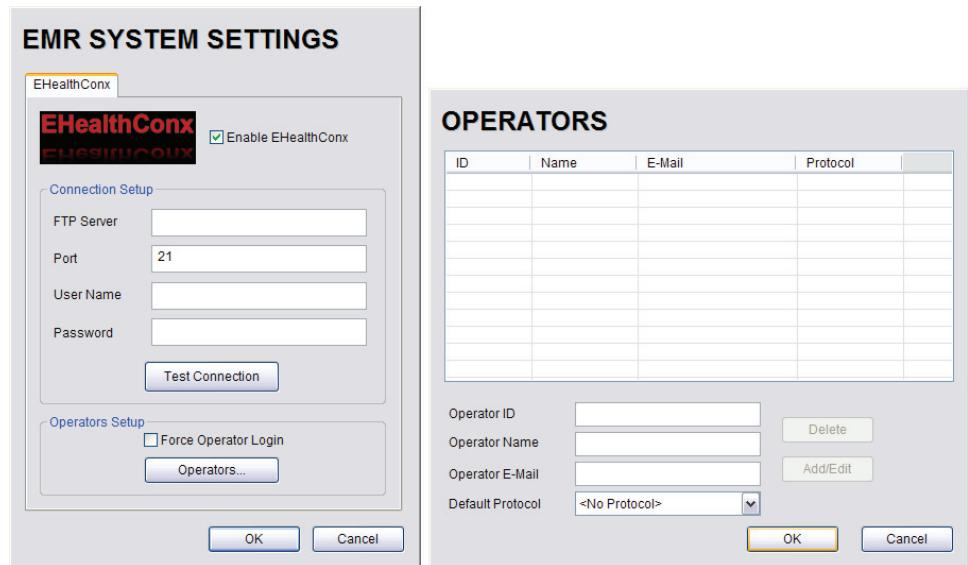


Table 8-38: Patient Settings

Field Settings	<p>Select/deselect the Field Setting data entry fields as required. Selected fields will appear on the Exam Management page and, where applicable, in the relevant databases (as described in 4.7 Storage/Database Tabs).</p> <p>Last Name First Name Middle Name DOB Age Sex Accession # Insurance #</p> <p>BBT</p> <p>Note: Users are able to add/edit/delete data in the following fields. Deleting data does not affect existing patients. Once deleted, the data can be added again at a later date either here or on the Exam Management page (4.1.3).</p>
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Field Settings, cont'd	Attending Physician Referring Physician Operator ID Clinical Indication	When selected, these fields will be available under Exam Information (4.1.3).
	Custom 1, 2, 3, 4	Use these four user-defined data entry fields to create the desired label in the Field Title text entry box (e.g., Nationality). The customized label appears as one of the data entry fields under Exam Information (4.1.3).
	Mandatory	Forces Operators to complete specific Patient data fields. If an Operator tries to begin an exam using either the Exam Management page or QSonix before all Mandatory fields have been completed, an Input Required message will be presented.
General Options control the ability to include/exclude or display/hide certain fields in the Patient Bar on the imaging screen.		
Patient Information Bar Display Options	Patient ID OR Accession #	The selected option (Patient ID or Accession #) will be displayed in the Patient Information Bar along the top of the LCD display during an exam.
General Options	<p>Select/deselect to enable/disable the ability to begin an exam <u>without</u> selecting a patient. Refer to 4.4 for more details.</p> <p> Warning: Exams that are assigned to a Patient <u>after</u> images have been saved do not include identifying Patient data (such as Patient ID or Name). Organizations that elect to configure/use the Enable Unassigned Exam functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision.</p>	
Enable Unassigned Exam		
Hide Patient Information	Select/deselect to display/hide the Patient Information during an exam.	
Capitalize Patient Names and Patient ID	Select to capitalize all letters in a patient's name or identification number.	
Force Worksheet Review	Forces Operators to review the Worksheet before they are allowed to end an exam.	

Default Selection Settings	Default Sex Default to last selected sex OR Select default sex	<p>When Default to last selected sex is chosen, opening a fresh Exam Management page will result in the Sex field being populated with the same gender that was selected in the last Exam Management page.</p> <p>When Select default sex is chosen, the user must select a specific Sex from the drop-down menu. The Sex selected will then become the default and be automatically entered in the Sex field of every new patient record that is created. There are four choices available: Female, Male, Other and Unknown.</p>																																
	Default Operator ID	<p>When Default to last selected Operator ID is chosen, opening a fresh Exam Management page will result in the Operator ID field being populated with the same Operator that was selected in the last Exam Management page.</p> <p>Note: This option is especially useful if the same Operator will be using the system for an extended period of time.</p>																																
EMR System Settings...	EHealthConx	<p>Selecting an EMR (Electronic Medical Record) System setting enables that EMR System. It will also enable the configuration/control of Operator IDs.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td data-bbox="502 782 546 1008" rowspan="4" style="vertical-align: top; padding: 5px;"> Connection Setup </td><td data-bbox="546 782 775 817">Enable EHealthConx</td><td data-bbox="775 782 1340 817">Select/deselect to enable/disable EHealthConx.</td></tr> <tr> <td data-bbox="546 817 775 852">FTP Server</td><td data-bbox="775 817 1340 852">Enter the relevant data as provided by EHealthConx.</td></tr> <tr> <td data-bbox="546 852 775 886">Port</td><td data-bbox="775 852 1340 886"></td></tr> <tr> <td data-bbox="546 886 775 921">User Name</td><td data-bbox="775 886 1340 921" style="padding-left: 20px;">Note: If desired, the FTP (File Transfer Protocol) transfer status icon can be configured to appear on the LCD display during file transfer (8.2.18 Status Bar).</td></tr> <tr> <td data-bbox="502 921 546 1008" rowspan="3" style="vertical-align: top; padding: 5px;"> Operators Setup </td><td data-bbox="546 956 775 991">Password</td><td data-bbox="775 956 1340 991"></td></tr> <tr> <td data-bbox="546 991 775 1026">Test Connection</td><td data-bbox="775 991 1340 1026">After entering the Connection Setup data, select this button to test the FTP connection.</td></tr> <tr> <td data-bbox="546 1026 775 1182" rowspan="3" style="vertical-align: top; padding: 5px;"> Note: Operator IDs entered here are specific to EHealthConx, but they will also: <ul style="list-style-type: none"> • be used in Quick Exam Start-up (3.3.1) if Force Operator Login was enabled • form part of the list of Operator IDs available from Exam Information (4.1.3). </td><td data-bbox="775 1182 775 1234"></td><td data-bbox="775 1182 1340 1234" style="padding-left: 20px;">Select to force Operators to log in when using QSonix (3.3.1.1).</td></tr> <tr> <td data-bbox="546 1234 775 1321" rowspan="2" style="vertical-align: top; padding: 5px;"> Force Operator Login </td><td data-bbox="775 1234 1340 1321" rowspan="2" style="vertical-align: top; padding: 5px;"> Note: The Operator ID must have already been entered here using the Operators... option (i.e., they cannot be added during the QSonix process). </td><td data-bbox="775 1321 775 1356"></td></tr> <tr> <td data-bbox="775 1356 775 1460" rowspan="2" style="vertical-align: top; padding: 5px;"> Operators... </td><td data-bbox="775 1356 775 1460" rowspan="2" style="vertical-align: top; padding: 5px;"> Operator ID Operator Name Operator E-Mail Default Protocol </td><td data-bbox="775 1356 1340 1460" rowspan="2" style="vertical-align: top; padding: 5px;"> Enter the relevant data in each field. Note: The Operator E-Mail address must be valid as it is used by EHealthConx to identify the Operator involved in each specific exam. </td></tr> <tr> <td data-bbox="359 1460 474 1460"></td><td data-bbox="474 1460 546 1460"></td><td data-bbox="546 1460 1340 1460"></td></tr> <tr> <td data-bbox="359 1460 474 1530" style="text-align: center;"> Repair Database </td><td data-bbox="474 1460 546 1530" style="text-align: center;">  </td><td data-bbox="546 1460 1340 1530"> Performs basic database file compression which can improve system performance. </td></tr> <tr> <td data-bbox="359 1530 474 1627"></td><td data-bbox="474 1530 546 1627"></td><td data-bbox="546 1530 1340 1627"> Caution: This operation is best performed by or under the supervision of a Service Representative. </td></tr> </table>	Connection Setup	Enable EHealthConx	Select/deselect to enable/disable EHealthConx .	FTP Server	Enter the relevant data as provided by EHealthConx .	Port		User Name	Note: If desired, the FTP (File Transfer Protocol) transfer status icon can be configured to appear on the LCD display during file transfer (8.2.18 Status Bar).	Operators Setup	Password		Test Connection	After entering the Connection Setup data, select this button to test the FTP connection.	Note: Operator IDs entered here are specific to EHealthConx , but they will also: <ul style="list-style-type: none"> • be used in Quick Exam Start-up (3.3.1) if Force Operator Login was enabled • form part of the list of Operator IDs available from Exam Information (4.1.3). 		Select to force Operators to log in when using QSonix (3.3.1.1).	Force Operator Login	Note: The Operator ID must have already been entered here using the Operators... option (i.e., they cannot be added during the QSonix process).		Operators...	Operator ID Operator Name Operator E-Mail Default Protocol	Enter the relevant data in each field. Note: The Operator E-Mail address must be valid as it is used by EHealthConx to identify the Operator involved in each specific exam.				Repair Database		Performs basic database file compression which can improve system performance.			Caution: This operation is best performed by or under the supervision of a Service Representative.
Connection Setup	Enable EHealthConx	Select/deselect to enable/disable EHealthConx .																																
	FTP Server	Enter the relevant data as provided by EHealthConx .																																
	Port																																	
	User Name	Note: If desired, the FTP (File Transfer Protocol) transfer status icon can be configured to appear on the LCD display during file transfer (8.2.18 Status Bar).																																
Operators Setup	Password																																	
	Test Connection	After entering the Connection Setup data, select this button to test the FTP connection.																																
	Note: Operator IDs entered here are specific to EHealthConx , but they will also: <ul style="list-style-type: none"> • be used in Quick Exam Start-up (3.3.1) if Force Operator Login was enabled • form part of the list of Operator IDs available from Exam Information (4.1.3). 		Select to force Operators to log in when using QSonix (3.3.1.1).																															
Force Operator Login		Note: The Operator ID must have already been entered here using the Operators... option (i.e., they cannot be added during the QSonix process).																																
			Operators...	Operator ID Operator Name Operator E-Mail Default Protocol	Enter the relevant data in each field. Note: The Operator E-Mail address must be valid as it is used by EHealthConx to identify the Operator involved in each specific exam.																													
Repair Database		Performs basic database file compression which can improve system performance.																																
		Caution: This operation is best performed by or under the supervision of a Service Representative.																																
SonixTouch Extended User Manual	00.040.600, Revision C	Chapter 8: System Setup																																

To Access the Patient Settings Dialog:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Patient**.

To Configure Patient Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Patient**.
3. Configure **Patient Settings** as required.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

To Create Mandatory Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Patient**.
3. Select the desired **Field Setting** (e.g., **Last Name**).
4. Select the **Mandatory** checkbox.
5. Repeat **step 3** and **step 4** as required.
6. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.17.1 EMR Settings

To Configure EMR System Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Patient > EMR Systems,,,**.
3. Select **Enable EHealthConx** and configure the **Connection Setup** options as required.

*Note: Ultrasonix recommends that **Connection Setup** options be configured using the settings provided by your IT Department.*

4. Select **Operators....**.
5. Enter the required data in each field and select the **Add/Edit** button.
6. Repeat **step 5** as many times as required.
7. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.18 Status Bar

When **Status** indicators are enabled, the system will present the relevant icons at the bottom right of the LCD display. Read the definitions carefully as not all icons will always be visible—even if the relevant option has been activated.

By default, all **Status Bar** options are unselected.

Figure 8-47: Status Bar



Table 8-39: Status Bar – Displayed Indicators

DICOM Store status	Indicates the system is connected to a DICOM Storage server. This icon will be visible for only a short period of time. When an Operator accesses the DICOM Storage server, the icon will be presented while the operation is underway.
   Active Success Failure	Note: A Network connection must exist in order to have access to a DICOM network.
DICOM Print status	Indicates the system is connected to a DICOM Print device. This icon will be visible for only a short period of time. When the DICOM Print device is in use, the icon will be presented while the job is printing.
   Active Success Failure	Note: A Network connection must exist in order to have access to a DICOM network.
DICOM Worklist status	Indicates the system is connected to a DICOM Worklist server. This icon will be visible only when the DICOM Worklist server is being accessed.
	Note: A Network connection must exist in order to have access to a DICOM network.



ultrasonix

Network connection

Connected



Not Connected

Indicates whether or not a hard-wired network connection is available.

Power status

Connected



Not Connected

Specifies whether or not the system is connected to AC power.

Battery level

≥80%



≤79%



≤59%



≤39%



≤19%

Displays the approximate amount of **Battery** power remaining.

Note: Ultrasonix recommends selecting this option so Operators will always be aware of the battery power level.

Over time, the level will rise when the system is connected to an AC power source or fall when it is running solely off the UPS battery.

Cine recording

When **Cine Recording** is underway, this icon will be visible during the recording process.

CD/DVD Burning

Indicates that a CD or DVD is being burned.

Note: The system does not have a built-in CD/DVD player/burner. Refer to System Specifications for details on the recommended USB CD/DVD player/burner.

SonixLive

Connected



Not Connected

When **SonixLive** is activated, the **Connected** icon will be visible on the LCD Display.

Wireless signal strength

100%



75%



50%



25%



0%

Denotes the strength of the wireless signal (%).

Note: If a wireless network is not available and active, the relevant icon will not be presented—even if this option is enabled.

Hard Drive Space

Displays the approximate amount of remaining **Hard Drive Space** to the nearest 1%.

Refer to **4.6 Exam Import/Export** for details on backing up/deleting Patient Data.

Note: The **Low Hard Drive Space** warning is displayed when remaining **Hard Drive Space** falls below 30 Gb, even if the option was not selected in the **Status Bar** dialog.



Low Hard Drive Space

The patient data hard disk is almost full.

Please refer to the User Manual for instructions on exporting patient data.

FTP transfer status	If an EMR System is configured, this icon will be visible when the FTP connection is live (refer to EMR System Settings... in Table 8-38 for more detail).
 Connected	 Not Connected
Select All	Enables the selection of all options in one step.
Deselect All	Enables the deselection of all options in one step.

To Access Status Bar Indicators:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Status Bar**.

To Configure Status Bar Indicators:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Status Bar**.
3. Select/deselect **Displayed Indicators** as required.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.19 Capture Settings

Capture Settings allows the user to configure basic settings for **Capture**, **SonixDVR/SonixCam** and **Cine Advanced**. It also controls the settings for **Capture Protocols** on the SonixTouch.

Figure 8-48: Capture Settings – Capture

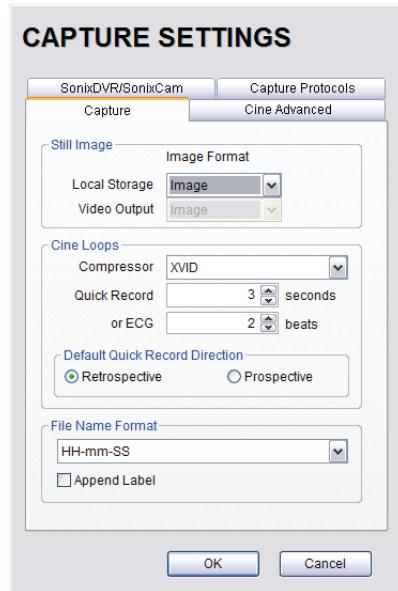


Table 8-40: Capture Settings – Capture

Still Image	Local Storage	Select between Full Screen and Image for still image storage. Note: <i>Image includes image field, imaging parameters and patient data bar. Thumbnail images are not included.</i> <i>Full screen includes the entire display, including thumbnails.</i>
	Video Output	Not available in this release.

	Compressor	Select the AVI movie Compressor type. XVID is the default.				
		 Caution: This setting should not be changed without a thorough understanding of Compressor types .				
	Quick Record Time	Select the Quick Record Time (1 to 30 seconds) for post recording (retrospective acquisition). Refer to 8.2.14 Custom Keys to configure the console 1 or 2 button for Quick Record . Quick Record is only available for 2D or 2D/Color imaging. Note: Selecting a longer record time may slow down system performance.				
	Cine Loops or ECG (number of (heart) beats)	Cine capture length during an ECG is based on the number heart beats selected here. Refer to 8.2.14 Custom Keys to configure the console 1 or 2 button. The default setting is 2 beats . Note: Refer to Accessories—Third Party in Appendix B for the recommended ECG electrode.				
	Default Quick Record Direction	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Retrospective</td> <td style="padding: 5px;">Select to record history, i.e., the previous X seconds, where X is the number of seconds selected in Quick Record Time.</td> </tr> <tr> <td style="padding: 5px;">Prospective</td> <td style="padding: 5px;">Select to record the next X seconds, where X is the number of seconds selected in Quick Record Time.</td> </tr> </table>	Retrospective	Select to record history, i.e., the previous X seconds, where X is the number of seconds selected in Quick Record Time .	Prospective	Select to record the next X seconds, where X is the number of seconds selected in Quick Record Time .
Retrospective	Select to record history, i.e., the previous X seconds, where X is the number of seconds selected in Quick Record Time .					
Prospective	Select to record the next X seconds, where X is the number of seconds selected in Quick Record Time .					
	File Name Format	Select a File Name Format from the drop-down menu: <ul style="list-style-type: none"> • HH-mm-SS (hour-minute-second) • ID_HH-mm-SS (Patient ID_hour-minute-second) • ID_MM-DD-YYYY_HH-mm-SS (Patient ID_Month-Day-Year_hour-minute-second) • Label (per the Labels entered in the Auto-Label dialog). Note: Labels are configured in the Capture Protocols dialog, Auto-Label (Table 8-43) and are available only on the SonixTouch.				
	Append Label	Select to append the Label name to the end of the File Name Format selected. If the Label name contains spaces, those spaces will be maintained in the file name. Note: Labels are configured in the Capture Protocols dialog, Auto-Label (Table 8-43) and are available only on the SonixTouch. If Label is selected as the File Name Format , selecting Append Label will be ignored.				

Figure 8-49: Capture Settings – Cine Advanced

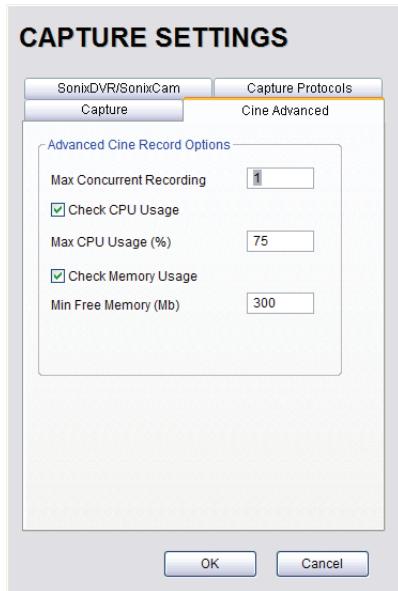


Table 8-41: Capture Settings – Cine Advanced

Advanced Cine Recording Options	Note: <i>Advanced Cine Recording Options</i> maximize system performance. If a setting range is exceeded, a message will be presented with details on the allowable range for the relevant field.	
	Max Concurrent Recording	Enter the maximum number of Cine recordings to be handled concurrently: 1–10. The default is 1.
	Check CPU Usage	Select to activate this setting.
	Max CPU Usage (%)	Enter the maximum percentage of CPU usage allowable when processing Cine recordings: 20–100%. The default is 75%.
	Check Memory Usage	Select to activate this setting.
	Min Free Memory (Mb)	Enter the minimum amount of memory (in Mb) required to process Cine recordings: 100–1000. The default is 300 Mb. If the required memory is not available, Cine processing will not proceed.
	Note: During imaging, if any option exceeds its limit, an error message will be presented:	
	Cine Acquisition  There are not enough available system resources to record the cine.	

Figure 8-50: Capture Settings – SonixDVR/SonixCam

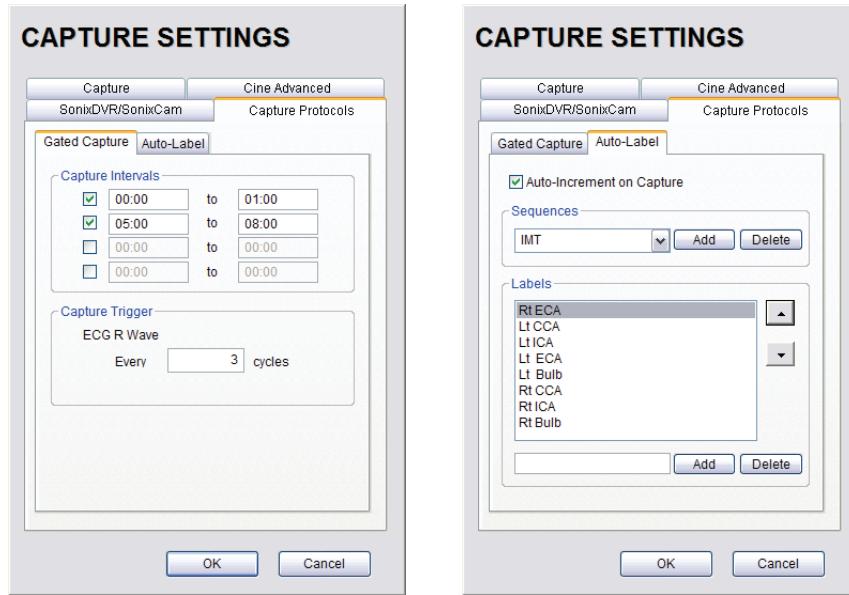


Note: To protect patient privacy during recording sessions, select the **Hide Patient Information** option in **Patient Settings**.

Table 8-42: Capture Settings – SonixDVR/SonixCam

SonixDVR Options	<p>Note: Refer to 5.8 SonixDVR Recording for more details on this option.</p> <p>If SonixCam and/or SonixLive are already running, do not use SonixDVR until they have been shut down.</p>	
	Capture Method	<i>dshow://</i> <i>screen://</i>
SonixDVR Options	Audio Input	<p>None Default Microsoft® LifeCam Cinema™ Realtek HD Audio Input</p> <p>Select Audio Input method: None, Default, Microsoft LifeCam Cinema or Realtek HD Audio Input.</p> <p>Note: For optimal performance, Ultrasonix recommends setting SonixDVR Audio Input to None. <i>Microsoft LifeCam Cinema</i> is only available if SonixCam is licensed (and connected).</p>
SonixDVR Options	<p>Record Full Exam</p> <p>If Record Full Exam is selected, set the maximum record time for each exam: 1, 5, 10, 20, 30, 40, 50 or 60 minutes.</p> <p>Once the Length Limit is reached, the exam will automatically stop recording and save an MPG file to the current Patient/Exam.</p> <p>Note: If the Length Limit is reached before the exam is finished, the recording will end (after being saved to the Patient/Exam). If additional recording is required, start an MPG using the Custom Key configured for SonixDVR.</p>	
	<p>Length Limit</p> <p>Note: If SonixCam is running, SonixDVR and/or SonixLive cannot be used.</p>	
SonixDVR Options	<p>Camera</p> <p>Select Camera type: USB Video Device (physical camera device) or UScreenCapture (video filter).</p> <p>Note: USB Video Device is only available if SonixCam is licensed (and connected).</p>	
	Audio Input	<p>None Default Microsoft® LifeCam Cinema™ Realtek HD Audio Input</p> <p>Select Audio Input method: None, Default, Microsoft LifeCam Cinema or Realtek HD Audio Input.</p> <p>Note: For optimal performance, Ultrasonix recommends setting Audio Input to Microsoft LifeCam Cinema—which is the default for the hardware supplied as part of the SonixCam option. <i>Microsoft LifeCam Cinema</i> is only available if SonixCam is licensed (and connected).</p>

Figure 8-51: Capture Settings – Capture Protocols



Note: *Capture Protocols* is a licensed option available only on the SonixTouch. To perform FMD exams, the system must also be equipped with an **ECG** module.

Table 8-43: Capture Settings – Capture Protocols Options

<i>Capture Protocols</i>	Gated Capture	
	<p>Gated Capture is used in cardiovascular exams such as Flow Mediated Dilation (FMD), where users require image capture based on the ECG R-Wave.</p> <p>Note: To perform FMD exams, the system must also be equipped with an ECG module.</p>	
	<input type="checkbox"/> Capture Intervals	<p>00:00 to 00:00 00:00 to 00:00 00:00 to 00:00 00:00 to 00:00</p> <p>Select the checkboxes and enter the relevant time periods in minutes and seconds.</p>
	<p>Note: To turn off the Intervals, simply deselect the checkbox - without erasing the time settings.</p>	
	<input type="checkbox"/> Capture Trigger	<p>ECG R Wave: Every x cycles</p> <p>Select a Capture Trigger cycle number (based on the ECG R Wave cycle), where x is the R Wave. For example, entering 5 will set the trigger to capture the image every 5th R Wave: range 1–60.</p>
	Auto-Label	
	<p>Label titles/order are user-defined and auto-applied. This cues the Operator on the next image. It can be used, for example, in IMT exams.</p>	
	<p>Sequences</p> <p>Enter a Sequence title that represents the type of imaging to be marked with the accompanying Labels (e.g., IMT, Fetal Biometry, etc).</p>	
<p>Auto-Increment on Capture</p>		<p>Select to auto-increment the Labels after each image capture.</p>
<p>Labels</p>		<p>Using the text insertion box, type in a Label name and select Add to include it to the list of Labels.</p> <p>Note: Enter the Labels in exam order.</p>

To Configure Capture Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Capture**.
3. Configure the **Capture**, **Cine Advanced**, **SonixDVR/SonixCam** and **Capture Protocol** dialogs as required.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.

8.2.20 Imaging Modes

The **Imaging Modes** dialog allows the configuration of a variety of **Imaging Mode** options.

Figure 8-52: Imaging Modes and Color Settings

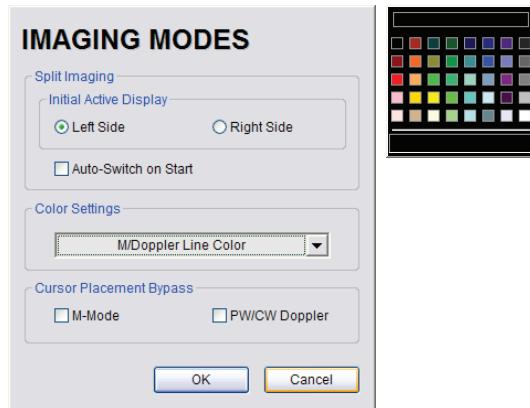


Table 8-44: Imaging Modes

Split Imaging	Initial Active Display	Left Side	When scanning in B-Mode , selecting Left Side will ensure the left image is the active image when the console Dual/Quad button is pressed. Left Side is the default setting.
		Right Side	When scanning in B-Mode , selecting Right Side will ensure the right image is the active image when the console Dual/Quad button is pressed.
	Auto-Switch on Start		Selecting this option will ensure that the selected side is active after the console Dual/Quad button is pressed, but then that image will immediately freeze and the active image will move to the opposite side. For example, if Left Side is set as Initial Active Display and Auto-Switch on Start is selected, after pressing the console Dual/Quad button, the Left Side image will be presented as active, then immediately freeze and active imaging will move to the Right Side .
Color Settings	M/Doppler Color Line		Select/edit the M-Mode line color.
	Cursor Placement Bypass		Not available in this release.

To Configure Imaging Modes:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Imaging Modes**.
3. Configure settings as required.
4. Select **OK** to accept the changes and exit or **Cancel** to exit without saving.
5. If **OK** is selected in **step 4**, a message will be presented.
6. Select **OK** to continue.

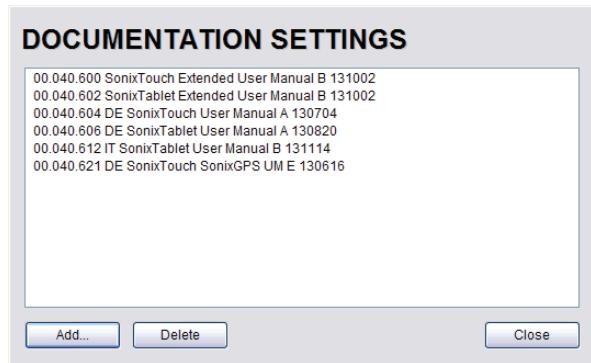
8.2.21 Documentation Settings

This option enables users to **Add/Delete** user documentation for viewing on the system.

Note: All documents must be in PDF format.

Refer to [3.3.2](#) for details on accessing the PDFs.

Figure 8-53: Documentation Settings



Note: To view documentation (in PDF format only) on the system, refer to [3.3.2 Documentation Access](#).

To Add a (PDF) Document:

1. Ensure the appropriate media containing the relevant **User Manual** PDF(s) is connected to the system (e.g., a USB key).
2. Tap the touch screen **Menu** button.
3. Select **Administrator > Documentation**.



4. Select **Add....**

5. Select the **Documentation Location** from the drop-down menu.



6. Select the relevant PDF from the **Available Documentation** drop-down menu.



7. Select **OK** and the system will copy the PDF to the system.



Note: This may take a few moments, depending on the size of the PDF.

8. Repeat **step 4** to **step 7** as many times as required.

To Delete a (PDF) Document:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Documentation**.
3. Highlight the PDF to be deleted.



4. Select **Delete**.
5. When prompted, select **Yes** to delete the PDF or **No** to exit without deleting it.



8.2.22 Software Update

This option allows users to install software updates via the Internet or with a USB key.

Note: Access to **Software Update** is available only with a valid warranty license.

Figure 8-54: Software Updates

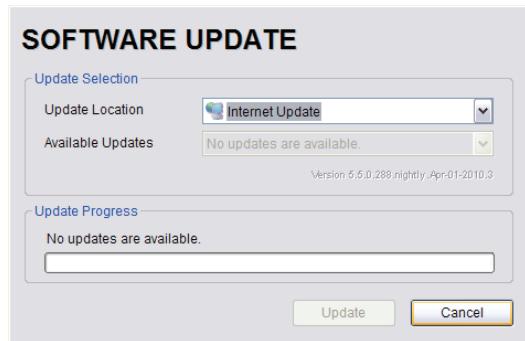


Table 8-45: Software Updates

Update Selection	Update Location	<p>Internet Update</p> <p>If the system is connected to the Internet, an automatic search for available software updates occurs. If successful, the Available Updates drop-down menu auto-populates with the software revisions available for download. The most recent revision is automatically selected but older software revisions may also be available.</p> <p>Internet Driver Update</p> <p>Enables Operators to install/update Ultrasonix-approved software drivers.</p> <p>Note: The system must be connected to the Internet.</p> <p>Removable Disk</p> <p>If a removable disk (e.g., USB key or thumb drive) containing the update has been inserted in a USB port on the Front or Back Connectivity Panel, it will be available for selection from the Available Updates drop-down menu.</p> <p>Available Updates</p> <p>Select to choose the appropriate update. Options in this drop-down menu are limited by the selection made in the Update Location drop-down menu.</p> <p>Update Progress</p> <p>Lets the user know when the update is complete or Ready.</p>
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To Perform a Software Update:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Software Updates**.
3. Select an **Update Location** from the drop-down menu.

Note: In order to be available in the **Update Location** drop-down menu, the USB key must be inserted prior to selecting the **Software Update** option from the **Administrator Settings** menu.

4. Select **Update** to begin the update process or **Cancel** to exit without updating.

Note: The **Update Progress** bar displays the download progress. Upon completion, the **Software Update** will be auto-installed and the system will restart automatically.

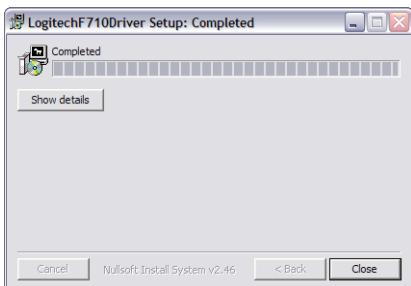
8.2.22.1 Enhanced Report Printing

To Perform a Software Driver Update via the Internet:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Software Updates**.
3. Select **Internet Driver Update** from the **Update Location** drop-down menu.
4. Select **Update** to begin the update process or **Cancel** to exit without updating.

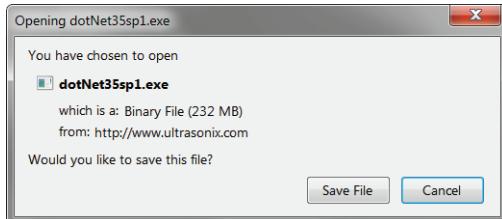
Note: The **Update Progress** bar displays the download progress. Upon completion, the driver will auto-install.

5. When prompted, select **Close** to complete the driver update.



To Download the Report Printing Software Driver from the Internet:

1. Insert a USB key into a USB connection on any Internet-connected PC.
2. Open a web browser and go to <http://www.ultrasonix.com/updates/sonixdrivers/dotNet35sp1.exe>.
3. When prompted, select **Save File** and save *dotNet35sp1.exe* to the root of the USB key.

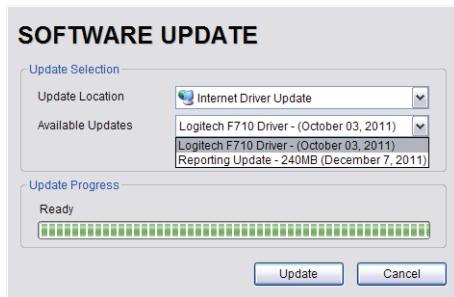


To Perform a Software Driver Update from a USB Key:

1. Create/obtain a USB key with the relevant driver file copied into the root directory.
2. Tap the touch screen **Menu** button.
3. Select **Administrator > Software Updates**.
4. Select the relevant USB key from the **Update Location** drop-down menu.
5. Select the relevant driver file (*dotNet35sp1.exe*) from the **Available Updates** drop-down menu.
6. Select **Update** to begin the update process or **Cancel** to exit without updating.

Note: The **Update Progress** bar displays the download progress. Upon completion, the driver will auto-install.

7. When prompted, select **Close** to complete the driver update.



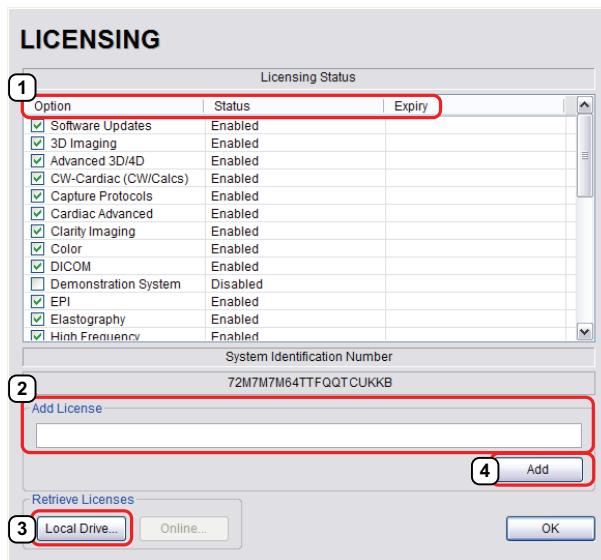
8.2.23 Licensing

Licensing displays the **Options** available on the Sonix system. **Status** and **Expiry** dates (when applicable) of enabled features are also displayed.

Ultrasonix recommends including the *license.key* file in a regular backup, using the **Export** option under **8.2.11 System Settings**.

When the system is powered up, if there are 30 days or less remaining until any license expires, a warning message will be presented (**Figure 8-56**).

Figure 8-55: Licensing



Note: Options that are not licensed at the time of purchase will not be visible in the **Licensing** dialog. To **Enable** a new Option, call your local dealer or Ultrasonix Technical Support.

Figure 8-56: License Expiration Reminder



Table 8-46: Licensing Status

Enabled	License is Enabled and has more than 30 days remaining.
	License is Enabled and will expire in less than 30 days.
Enabled (with Expiry Date)	<p>Note: The exact numbers of days remaining will be listed, e.g., Expires in 27 days.</p> <p>When the system is powered up, if there are 30 days or less remaining until any license expires, a warning message will presented (Figure 8-56).</p>
1	License was Enabled but is now Expired .
Expired	<p>Note: To restore an Expired license, call your local dealer or Ultrasonix Technical Support.</p>
Disabled	<p>Operator has deselected a licensed Option.</p> <p>Note: To Enable the Option, check it then select OK to save and exit.</p>
2 Add License Text Box	When license.key is received in an electronic format that lends itself to the standard copy and paste method, do not select Show Key Separations . Simply copy and paste license.key into Add License .
3 Local Drive... Button	If license.key is available on the local hard drive, select Local Drive... and choose the appropriate file (*.key) to import/enable the new license.
4 Add License Button	Select to add the license.

To Access the Licensing Dialog:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Licensing**.

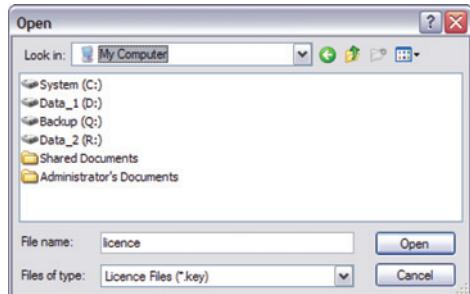
To Enter a New Licensing Key:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Licensing**.
3. Enter the new license key in the **Add License** text box.
4. Select **Add** to add the new license key.
5. Check to ensure the new license has been added then select **Close** to exit the **Licensing** dialog.

To Re-Import License.key:

Note: This process presumes the license.key file is stored on a USB device.

1. Insert the USB device with license.key file into one of the system's USB drives.
2. Tap the touch screen **Menu** button.
3. Select **Administrator > Licensing**.
4. Select **Local Drive**.
5. Under the **Look in** drop-down menu, select the relevant drive/device and locate *license.key*.



6. Select **Open** to re-import *license.key*.

Note: If there are any problems, clear all menus, return to the **Licensing** dialog and contact Ultrasonix Technical Support for assistance.

8.3 SERVICE MENU

Access to **Service** is password protected and restricted to certified, Ultrasonix Service representatives.

CHAPTER 9: IMAGE STORAGE, REVIEW, TRANSFER AND PRINT

The system includes a (local) patient/exam management system with image storage, review, transfer and print which can be accessed from:

- the **Exam Management** page via the **Review** button. This allows the **Operator** to select one or multiple patients and their associated exam(s)
- a **Custom Key**, providing that **Custom Key** was configured to access the **Exam Review** page ([8.2.14](#))
- the **Exam Review** button on the main touch screen, which offers access only to the current Patient and their associated exam(s).

Note: *The Exam Review button will not be accessible if there is no active patient (i.e., if an exam is not underway).*

9.1 IMAGE STORAGE

Each time a new patient is entered into the system, a local file is created for that patient. All saved images and **Cine** clips are stored in the patient file and organized by exam date and type. This image/**Cine** data may be retrieved at any time and transferred to a printer, **DICOM** archive, etc.

Hard drive capacity for patient data storage is at least 160 gigabytes. Depending on the number/type of images involved, the system can store more than 50,000 exams.

Note: *Ultrasonix recommends regular patient/image file back-up and purging of older patient files stored on the system.*

9.2 IMAGE REVIEW

Figure 9-1: Main Touch Screen



Note: Tap the touch screen **Exam Review** button to access the **Exam Review** page for the current Patient.

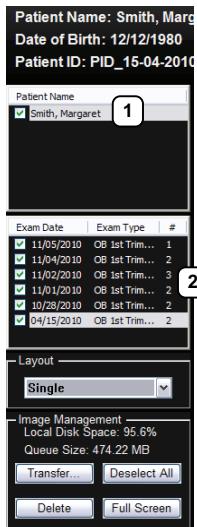
Alternatively, tap **Exam Mgmt** to access the **Exam Management** page in order to review exams for different/multiple Patients.

Figure 9-2: Exam Management

Patient ID	PD_20-10-2010_02-35-35	DOB (mmddyyyy)	12/15/1981	Age	28 y	m																								
Last Name	Smith	Sex	Female																											
First Name	J	Accession #																												
Middle Name																														
Application Information																														
Application	Height	metric	1 m	60 cm																										
Generic	Weight	metric	56 kg	004 g																										
	BSA	1.03m ²																												
Exam Information																														
Reporting Physician	Dr Fred Jones																													
Referring Physician	Dr Alice Doe																													
Operator ID	ALC																													
Clinical Indication																														
<table border="1"> <thead> <tr> <th>Patient ID</th> <th>Last Name</th> <th>First Name</th> <th>Middle Name</th> <th>Birthdate</th> <th>Sex</th> <th>Last Exam</th> <th>Images</th> </tr> </thead> <tbody> <tr> <td>PD_20-10-2010_02-35-35</td> <td>Smith</td> <td>J</td> <td></td> <td>12/15/1981</td> <td>F</td> <td>10/20/2010</td> <td>0</td> </tr> <tr> <td colspan="8"></td> </tr> </tbody> </table>							Patient ID	Last Name	First Name	Middle Name	Birthdate	Sex	Last Exam	Images	PD_20-10-2010_02-35-35	Smith	J		12/15/1981	F	10/20/2010	0								
Patient ID	Last Name	First Name	Middle Name	Birthdate	Sex	Last Exam	Images																							
PD_20-10-2010_02-35-35	Smith	J		12/15/1981	F	10/20/2010	0																							

Note: Select **Review** to access **Exam Review** page (review current or selected Patient(s) image files).

Figure 9-3: Sample Exam Review Page (Methods 1, 2 and 3)



Note: For methods 1, 2 and 3, images for the current exam will be presented first, but all exams for the current Patient will be available for review.

Table 9-1: Sample Exam Review Page (Methods 1, 2 and 3)

-
- 1 Current Patient.
2 Multiple exams for the current Patient.
-

To Access the Exam Review Page (Method 1 – Current Patient):

- 1 During an exam, press the console **1** or **2** button (whichever was configured to access **Exam Review**) to view the images for the current exam.

Note: Refer to [8.2.14](#) for details on configuring a **Custom Key** to access **Exam Review**.

To Access the Exam Review Page (Method 2 – Current Patient):

- 1 During a patient exam, tap the touch screen **Exam Mgmt** button.
- 2 On the **Exam Management** page, select **Review** to view the current exam images.

To Access the Exam Review Page (Method 3 – Current Patient):

- 1 During a patient exam, tap the touch screen **Exam Review** button.

Figure 9-4: Sample Exam Review Page (Method 4 – with Multiple Patients)

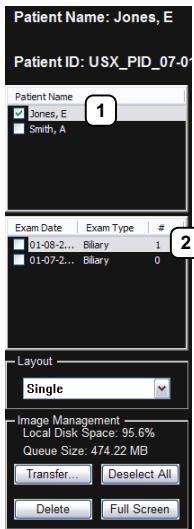


Table 9-2: Sample Exam Review Page (Method 4 – with Multiple Patients)

1 First Patient.

2 Multiple exams for the first Patient.

To Access the Exam Review Page (Method 4 – with Multiple Patients):

1. Tap the touch screen **Exam Mgmt** button.
2. Select the **Patient** tab.
3. Select the desired Patient(s) from the **Patient** database.

Note: To select multiple Patients at the same time use the trackball and  button in conjunction with the **SHIFT** or **CTRL** touch screen keyboard buttons to highlight the relevant Patients.

To select all Patients at the same time, tap the touch screen **Select All** button.

4. Select **Review** and the **Image Review** page will be presented with the exam files for the selected Patient(s).

Figure 9-5: Exam Review Page



Table 9-3: Exam Review Page

- **1** Patient data for currently displayed image file.

2 Check Patient and Exam file(s) for image transfer or deletion.

3

4 Check to select individual images for image transfer or deletion.

5 White arrow indicates more images. The trackball arrow cursor triggers scrolling of thumbnails both to the right and left.

Table 9-4: Exam Review Page

Patient Name	Patient(s) selected from the Exam Management page.
	Displays the exam files/images for the Patient selected (above). The number of images and Cine clips stored appears in the far right column of this section.
Exam Date/Exam Type	By default, if only one patient file is listed under Patient Name , the system will display the images from that patient's most recent exam. If multiple Patients Names are listed, select each of the patients individually to access a list the exam dates for that patient.
	Sets up the image display area: Single, 2x2, 3x3, 4x4, 5x5, 6x6 .
Layout	Note: The default Layout is Single . However, if the default Layout is changed (e.g., to 2x2), the next time Exam Review is entered the system will default to the last Layout selection (in this example, 2x2).
Image Management	Local Disk Space: % Lists the amount of available space on the system (where % equals the amount of free space available).
	Queue Size: x Kb Lists the size of selected items (where x equals the total number of kilobytes in the queue).
	Transfer... Transfers items to the selected destination.
	Deselect All Deselects All selected patients/exams.
	Delete Deletes the selected items from the system hard drive.
	Full Screen Displays the selected image on a Full Screen . Note: Use the trackball and mouse to select the arrow keys in the top right corner and cycle through the available Review images (Figure 9-6: Full Screen Image Review) Move the cursor off the arrow keys and press the console  button to exit Full Screen and return to the Exam Review page.

Note: Stored **Cine** clips are identified by a small movie symbol on the lower right of the image thumbnail. Once selected, the movie will replay in the **Review** window. 

Stored **MPG** files (**SonixDVR Recordings**) are identified by a small **REC** symbol on the lower left of the image thumbnail. Once selected, the **MPG** will replay on the **Review** page. 

Raw **Cine loops** ([5.9.4](#)) are labelled with the icon **RAW**. 

The image thumbnails on the bottom of the screen represent all the available images for the exam under review. To scroll through the thumbnails, use the trackball to move the cursor over to the right or left side of the thumbnails.

Figure 9-6: Full Screen Image Review



Table 9-5: Exam Review Touch Screen Controls (tap to activate)

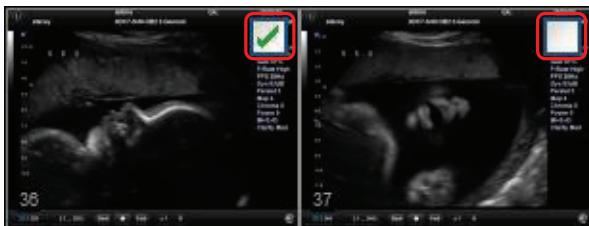
Select All	Tap to Select All patients/patient files/images for image transfer or deletion.
Deselect All	Tap to Deselect All patients/patient files/images marked for image transfer or deletion.
Report	Tap to view the Report Worksheet .
Add Patient	Tap to add the next patient to the queue (selected via checkboxes).
Add Exam	Tap to add the next exam to the queue (selected via checkboxes).
Add Image	Tap to add the next image to the queue (selected via checkboxes).
Transfer...	Tap to initiate image transfer and display the Select Storage Destination page.
Delete...	Tap to Delete the patient(s), patient exam file(s) and/or image(s) selected via checkboxes.
Exit	Tap to Exit the Exam Review page.

Table 9-6: Exam Review Touch Screen Controls (tap to activate, dial to adjust)

Image	Tap Image then use the associated touch screen dial to select the image(s) displayed. Dial right to select the next image available. Dial left to select the previous image.
Thumbnail	Tap Thumbnail then use the associated touch screen dial to move through the thumbnail images. Dial right to select the next thumbnail. Dial left to select the previous thumbnail.
Layout	Tap Layout then use the associated touch screen dial to change the display Layout : (Single , 2x2 , 3x3 , etc.).
Exam	Tap Exam then use the associated touch screen dial to page through the list of available exams. Press  to select the highlighted exam file.
Patient	Tap Patient then use the associated touch screen dial to page through the list of available patients. Press  to select highlighted patient.

Table 9-7: Cine Review Touch Screen Controls (tap to activate, dial to adjust)

FrmByFrm	Use to select currently displayed frame, one frame at a time.
Speed	Use to select Cine review play speed: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, Full (1/1) or Double (2/2).

Figure 9-7: Image Selection/Deselection


9.2.1 Deleting Image(s)/Exam(s)

To Delete Individual Images:

1. Select the desired patient and exam date to display the images.
2. To select the desired image(s), use the trackball and  button to place a mark in the associated checkbox(es) (**Figure 9-7**).
3. Tap the touch screen **Delete...** button or select **Delete** from the menu on the LCD display.

Note: Select **Deselect All** to reset the screen and deselect the patient(s), exam(s) and image(s).

To Delete a Complete Exam:

1. Select the desired **Patient** and **Exam Date**.



2. Tap the touch screen **Delete...** button or select **Delete** from the menu on the LCD display.

Note: Select **Deselect All** to reset the screen and deselect the patient(s), exam(s) and image(s).

9.3 IMAGE TRANSFER

The image management system enables users to transfer stored images and **Cine** clips to a storage medium: **DICOM** archive or **Printer** or USB medium, etc.

Files saved to a USB storage device (e.g., **[E:]\ (Removable Device)**) during data transfer will be printed to a PDF in the relevant **Patient** directory under **Patientinfo**.

Notes:

To select an entire exam, select the checkbox for the desired exam.

To select all exams for a patient, select the checkbox for the desired patient.

To select only the desired image(s) open each exam and select the individual checkbox(es) for the desired image(s).

Figure 9-8: Storage Destination Dialog

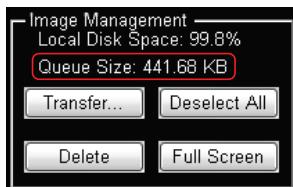


Table 9-8: Storage Destination Options

Storage Destination	All available storage options will be listed here, including all printers currently attached to the system, either locally or via the network: DICOM archive or Printer or USB medium. Note: A removable USB device must be connected to the system in order to have it appear in the list of Storage Destinations .
Include All Patient Data	Creates a backup of images, reports (PDFs) and Cine files (database and measurement data are not included). If multiple patients are selected with this option, all images will generally be exported in one file.
Hide Patient ID	Removes Patient information (Patient Name and ID) from the image, rendering the data anonymous.
Folder Name	Images written to a removable USB device will be written into the Folder Name entered here. The default is UltrasonixExam . Note: This field is only available if the selected Storage Destination will create a digital copy of the file e.g., a removable USB device.
Storage Options	Enables the selection of five different image formats. Note: Selecting anything other than the default (PNG) will extend the image transfer time as PNG images will have to be converted to the new format. Bitmap and DICOM images in particular will take significantly more time to transfer.
Image Format	<p>PNG Portable Network Graphics image format. This is the default selection. The average PNG image size is 100Kb.</p> <p>JPEG Joint Photographic Experts Group image format.</p> <p>Bitmap (BMP) Converting the image to a Bitmap (BMP) increases the image size as follows: <ul style="list-style-type: none"> • 800 x 600 Bitmap image = approximately 2Mb • 1024 x 768 Bitmap image = approximately 3Mb. </p> <p>GIF Graphics Interchange File or Format image.</p> <p>DICOM DICOM image format.</p> <p>DICOMDIR DICOMDIR image format. Note: DICOMDIR enables users to copy images to an alternate media if—for whatever reason—it is not possible to transfer the images directly to the DICOM server. They can then be copied to the DICOM server at a later date.</p> <p>DICOMDIR Profile Select the appropriate DICOMDIR Profile (DICOMDIR Profiles are defined in the DICOM Standard.)</p> <p>Displays the file transfer progress. Note: If multiple DICOM Storage or Print Servers have been configured (8.2.13.1 and 8.2.13.2) and DICOM Storage Server(s) or DICOM Print Server(s) is selected as the transfer medium, after selecting Send the Operator will be able to select the specific Server (or set of Servers) to which the data will be transferred.</p>
Save Settings	Select to save the transfer settings as the default for future use.
Send	Select to complete the image transfer.
Close	Select to clear the dialog and exit without transferring the images.

To Transfer Patient Exams:

1. Select the desired **Patient(s)**, **Exam Date** and/or images.



Note: The amount of space required is listed under **Image Management** as **Queue Size**.

Select **Deselect All** to reset the screen and deselect the patient(s), exam(s) and image(s).

2. Select **Transfer....**
3. Select the desired **Storage Destination**.



Note: All connected Ultrasonix-approved digital storage peripherals will appear in the list of **Storage Destinations**.

If a **DICOM Storage or Print Server** is connected, it will also be available for selection.

Files saved to a USB storage device (e.g., [E:] (Removable Device)) during data transfer will be printed to a PDF in the relevant **Patient** directory under **Patientinfo**.

4. If required, select **Include All Patient Data** and/or **Hide Patient ID**.
5. If required, change the default **Folder Name (UltrasonixExam)** using the console keyboard.

Note: This field is only available if the selected **Storage Destination** will create a digital copy of the file (e.g., a removable USB device).

6. Select the desired ***Image Format (Default (PNG), JPEG, Bitmap (BMP) or GIF)***.



Note: Selecting anything other than the default (**PNG**) will extend the image transfer time as **PNG** images will have to be converted to the new format. **Bitmap** and **DICOM** images in particular will take significantly more time to transfer.

7. If desired, select **Save Settings** to save the current transfer settings as the default.
8. Select **Send** to transfer the files and/or images or **Close** to exit without transferring.

Notes:

If multiple **DICOM Storage** or **Print Servers** have been configured (8.2.13.1 and 8.2.13.2) and **DICOM Storage Server(s)** or **DICOM Print Server(s)** is selected as the transfer medium, after selecting **Send** the Operator will be able to select the specific **Server** (or set of **Servers**) to which the data will be transferred.

The original files will remain unchanged on the local hard drive.

The **Update Progress** bar displays the transfer progress.

CHAPTER 10: CONNECTIVITY, PERIPHERALS AND SOFTWARE

The system includes a wide range of connectivity features that allow the user to simultaneously connect a variety of peripherals. Refer to [8.2.15 Peripherals](#) and the relevant Service Manual for further details on peripheral connectivity.



Warnings:

Do not simultaneously touch the patient and the:

- transducer ports
- Back Connectivity Panel connectors.

Do not allow the patient to come in contact with any part of the SonixTouch system case or touch screen.

10.1 BACK CONNECTIVITY PANEL

The Back Connectivity Panel can be accessed from the rear of the system. The connectors are routed internally to the System Case Connectivity Panel which enables easy configuration.

Figure 10-1: SonixTouch Back Connectivity Panel (A)

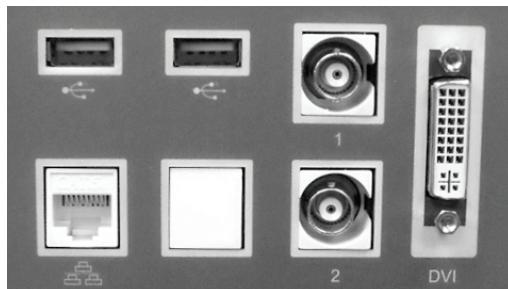


Figure 10-2: SonixTouch Back Connectivity Panel (B)

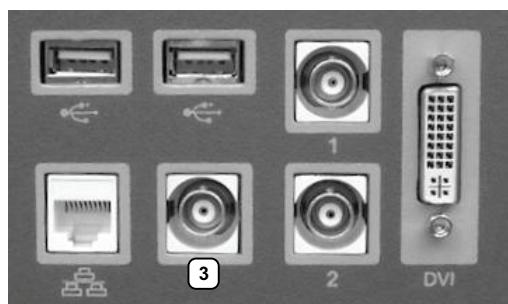


Table 10-1: Back Connectivity Panels (A and B)

	 USB (x2)	Use to connect Ultrasonix-approved USB devices (e.g., printer, barcode reader, memory stick, etc.).
	 LAN	Use to connect the system to a network. This port supports 10Mb/100Mb.
		Connected to the console 1 button, use to connect an Ultrasonix-approved peripheral (including a Footswitch).
1	BNC (Input) Connector	<p>Note: The device connected to this BNC is controlled by the settings configured for the console (Custom) 1 button (refer to 8.2.14 to configure Custom Keys or to Chapter 8 in the most recent User Manual). If this connection is configured for use with an analog (B&W) printer, then it is an Output connection and a Footswitch cannot be used.</p>
2	BNC (Output) Connector	<p>Connected to the console 2 button, use to connect an Ultrasonix-approved peripheral.</p> <p>Note: The device connected here is controlled by the settings configured for Custom Key 2 (8.2.14).</p>
(3)	BNC (Output) Connector (Back Connectivity Panel B only)	<p>Use to connect a non-USB Black & White (B&W) printer.</p> <p>If this connector is used, it will be controlled by the console (Custom) 1 button and BNC (Input) Connector (1) above, will be disabled.</p> <p>Note: If this connector is in use a Footswitch cannot be connected.</p> <p>This connector on Back Connectivity Panel B may or may not be labeled with the number 3.</p>
DVI	DVI Connector	<p>Use to connect a second (DVI-compatible) LCD display or television.</p> <p> Caution: DO NOT plug the extra (DVI-compatible) LCD display into the peripheral receptacle (Figure 10-4).</p> <p>For details on connecting an external TV, refer to 10.3.1.</p>

10.2 CONSOLE CONNECTIVITY

The system provides two USB ports at the left side of the operator console. The USB ports can be used to connect Ultrasonix-approved USB devices such as a USB thumb drive.

Figure 10-3: Console Connectivity



10.3 ULTRASONIX-APPROVED DEVICES

The following peripherals have been approved for use with the system:

- SONY USB printer
- USB media (memory stick, external hard drive, etc.)
- dual or triple footswitch
- barcode reader
- extra (DVI-compatible) LCD display.



Warning: *It is the Operator's responsibility to ensure that any peripheral device placed within the patient environment* – including printers and external displays – conforms to the following:*

Accessory equipment connected to the analog and digital interfaces must be certified according to their respective IEC standards (e.g., IEC 60950 for data processing equipment and IEC 60601-1 for medical equipment). Furthermore, all configurations shall comply with the system standard IEC 60601-1. Any person who connects additional equipment to the signal input part or signal output part configures a medical system and is therefore responsible for ensuring that the system complies with the requirements of the system standard IEC 60601-1-1. If in doubt, consult Ultrasonix Technical Support.

**The patient environment is defined as a 1.5 m (4.9') radius from the edge of the patient platform (i.e., from the outer edge of the chair/bed on which the patient is situated in order to perform the ultrasound).*

10.3.1 Connecting an External Television to the System

The two methods by which an external TV can be connected to the system are:

- via the TV's HDMI (High Definition Multimedia Interface) or DVI input
- via the TV's PC IN connector, providing this connection is either DVI or HDMI.



Caution: *When connecting an external TV, be sure to follow all instructions carefully.*

Note: *While a selection of televisions were tested against the following instructions, Ultrasonix cannot guarantee that all TVs will function as an external monitor.*

10.3.1.1 Method 1: Via the TV's HDMI or DVI Input

Search the TV manufacturer's user guide to determine whether or not the TV's **HDMI** or **DVI Input** will accept the required signal format.

Table 10-2: Required Signal Format

Format	Resolution	V. Frequency
XGA	1024 x 768	60 Hz

Determine the type of connector available on the TV in order to source the correct cable:

- DVI connection > DVI to DVI cable
- HDMI connection > HDMI to DVI cable.

To Connect the TV via the DVI Input:

1. With both the TV and the system powered off, connect one end of the DVI cable to **DVI** on the system's Back Connectivity Panel.
2. Connect the other end of the DVI cable to **DVI Input** on the TV.
3. Ensure the TV is plugged in.
4. Power on the TV.
5. Power on the system.
6. If necessary, once there is an image on the TV, configure the TV aspect ratio setting to **4:3** (not **16:9**).

To Connect the TV via the HDMI Input:

1. With both the TV and the system powered off, connect the DVI end of the cable to **DVI** on the system's Back Connectivity Panel.
2. Connect the HDMI end of the cable to **HDMI Input** on the TV.
3. Ensure the TV is plugged in.
4. Power on the TV.
5. Power on the system.
6. If necessary, once there is an image on the TV, configure the TV aspect ratio setting to **4:3** (not **16:9**).

10.3.1.2 Method 2: Via the TV's PC IN Connector

Search the TV manufacturer's user guide to determine whether or not the TV's **PC IN** connector will accept the required signal format.

Table 10-3: Required Signal Format

Format	Resolution	V. Frequency
XGA	1024 x 768	60 Hz

Determine the type of connector required by the TV's **PC IN** connector in order to source the correct cable:

- DVI connection > DVI to DVI cable
- HDMI connection > HDMI to DVI cable.

To Connect the TV via PC IN with a DVI Cable:

1. With both the TV and the system powered off, connect one end of the DVI cable to **DVI** on the system's Back Connectivity Panel.
2. Connect the other end of the DVI cable to **PC In** on the TV.
3. Ensure the TV is plugged in.
4. Power on the TV.
5. Power on the system.
6. If necessary, once there is an image on the TV, configure the TV aspect ratio setting to **4:3** (not **16:9**).

To Connect the TV via PC IN with an HDMI to DVI Cable:

1. With both the TV and the system powered off, connect the DVI end of the cable to **DVI** on the system's Back Connectivity Panel.
2. Connect the HDMI end of the cable to **PC In** on the TV.
3. Ensure the TV is plugged in.
4. Power on the TV.
5. Power on the system.
6. If necessary, once there is an image on the TV, configure the TV aspect ratio setting to **4:3** (not **16:9**).

10.4 PERIPHERAL RECEPTACLE

The system is delivered with one peripheral receptacle that is to be used only with Ultrasonix-approved peripheral devices. The connector is clearly labeled ***Only Ultrasonix-approved peripheral devices may be connected to this power receptacle*** and is to be used to connect only Ultrasonix-approved, third-party peripherals to the system.

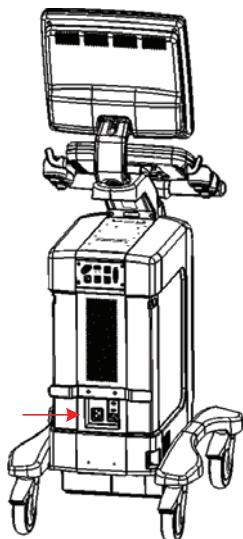


Warning: It is the Operator's responsibility to ensure that any peripheral device placed within the patient environment* – including printers and external displays – conforms to the following:

Accessory equipment connected to the analog and digital interfaces must be certified according to their respective IEC standards (e.g., IEC 60950 for data processing equipment and IEC 60601–1 for medical equipment). Furthermore, all configurations shall comply with the system standard IEC 60601–1. Any person who connects additional equipment to the signal input part or signal output part configures a medical system and is therefore responsible for ensuring that the system complies with the requirements of the system standard IEC 60601–1–1. If in doubt, consult Ultrasonix Technical Support.

**The patient environment is defined as a 1.5 m (4.9') radius from the edge of the patient platform (i.e., from the outer edge of the chair/bed on which the patient is situated in order to perform the ultrasound).*

Figure 10-4: Peripheral Receptacle Location



10.5 UPS

When the system arrives with the optional UPS installed, the UPS battery will be turned off and may be completely drained of power. During installation, the technician will ensure that the system—and therefore the UPS—is left plugged in, allowing it to completely charge the battery. This will take approximately 6 hours.

10.5.1 UPS Circuit Breakers

Access to the UPS circuit breakers is provided via the left side shroud.



Caution: The UPS circuit breakers are designed to shut down power to the system only as a last resort. Improper use of the UPS circuit breakers may result in loss of patient data and/or hard drive failure and **may not be covered by the Ultrasonix warranty.**

Figure 10-5: Breaker Types and Locations



Table 10-4: Breaker Types and Locations

- | | |
|---|------------------|
| 1 | Battery Breaker |
| 2 | AC Input Breaker |
| 3 | System front |

10.5.1.1 Determining Whether the UPS Breakers are ON or OFF

To determine whether the breakers are ON or OFF without removing the side shroud, check to see if there is a visible white marking at the top of each breaker. If there is, the breaker is OFF.

If only the Battery Breaker is off, the system will still run as long as it is plugged into a wall outlet. If both breakers are off, the system will not power on.

Figure 10-6: Breaker Position OFF



10.5.1.2 Turning OFF/Resetting the UPS Breakers

To Turn OFF the UPS Breakers:

1. Ensure the system is powered down and the power cord is disconnected from any power source.



Caution: Unless a breaker has been tripped, it is important to turn OFF the breakers in the order specified.

A tripped breaker will be in a central position, rather than ON or OFF. Determine which breaker has been tripped and turn it off first, then turn off the remaining breaker.

2. Turn **2: AC Input Breaker** to the OFF position.

Note: Refer to [Figure 10-5](#) and [Table 10-4](#) to determine the location of each breaker.

3. Turn **1: Battery Breaker** to the OFF position.

10.5.1.3 Turning ON the UPS Breakers

To Turn ON the UPS Breakers:

1. Plug in the system.
2. Turn **1: Battery Breaker** to the ON position.



Caution: It is important to turn the breakers ON in the order specified.

3. Turn **2: AC Input Breaker** to the ON position.

10.5.2 Battery Recharge Issues

As a data safety measure, Ultrasonix has configured the UPS alert system to ensure an optimal warning time for UPS battery recharging.



Warnings:

NEVER let liquid from any source enter the UPS. Failure to do this may result in accidental shorts, shocks or electrocutions.

DO NOT attempt to service this product yourself. Attempting to open the UPS may cause exposure to lethal voltages within the unit even when it is apparently not operating and the input wiring is disconnected from the electrical source. Should the UPS require maintenance or replacement, only qualified Ultrasonix Service Technicians may perform service as detailed in the Service Manual.

Use only the UPS battery recommended and supplied by Ultrasonix Medical Corporation.

For UPS and battery service issues, contact Ultrasonix Technical Support.

If the battery is removed from the system, it is the responsibility of the customer to dispose of it in accordance with all local regulations and laws.



Caution: In order to effectively protect exam data for the current patient, pay particular attention to the details in **Table 10-5** and **Table 10-6**, respectively.

As an additional aid, refer to **8.2.18 Status Bar** for details on configuring the **Status Bar** so that **Power status** and **Battery level** icons are always visible on the LCD display.

Table 10-5: Battery Usage Limitations

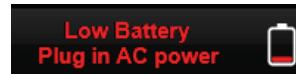
Scanning Time Limit (Active and Frozen Imaging)	<p>Ultrasonix does not recommend leaving the system unplugged even when imaging is frozen.</p> <p>Caution: The system should only be unplugged (without shutting down) for the few moments it takes to move it to a new location. Ignoring these instructions may result in data loss and battery failure.</p>
Recharge Time	<p>To fully charge the battery, Ultrasonix recommends keeping the system plugged in continuously for 6 hours.</p> <p>Note: If required, the system can continue to be used while the battery is charging. However, if the system is unplugged and moved during the recharge cycle, it may require more than 6 hours to fully charge.</p>

Table 10-6: Battery Recharge Alerts

Note: The **Battery level** icon will only be visible if it has been enabled (8.2.18).

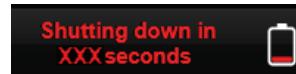
While unplugged, if the battery charge falls below a predetermined level, the system will emit an audible alarm and present the following message on the **Status Bar** (bottom right of the LCD display). Both the message and the alarm will continue so long as the system remains unplugged.

Alert Level 2



Caution: To protect patient data and prolong battery life, connect the system to an AC power source immediately.

If **Alert Level 2** is ignored (i.e., if the system is not connected to an AC power source), after a predetermined time the tone of the audible alarm will alter and a 120 second (two minute) countdown **Status Bar** will be presented.



If the counter reaches zero (0) before the system is plugged into an AC power outlet, the system will automatically shutdown.

Before restarting the system, connect the power cord to an AC outlet. If the system is not plugged in before it is turned on, it will simply shut itself down again.

Alert Level 1



Caution: Ignoring these instructions may result in data loss and battery failure.

To fully charge the battery after an **Alert Level 1** automated shutdown, leave the system plugged in continuously for 6 hours. If the charging cycle must be interrupted, Ultrasonix recommends leaving the system plugged in for a minimum of one hour before unplugging it. Once the system has been moved, it should be reconnected to a power source immediately and allowed to continue charging for the full 6 hours.

Failure to follow these recommendations may result in premature battery failure which is not covered by the system warranty.

Note: Battery Recharge Alerts are pre-programmed and cannot be edited or deleted by the user.

10.5.3 UPS Sleep/Standy Mode

The UPS sleep/standby mode helps to preserve battery integrity.

There are two circumstances under which the UPS will automatically enter sleep/standby mode that will require the user to intervene. If:

- an **Alert Level 1** is ignored, the system is not plugged in to recharge but instead is allowed to countdown the 120 seconds and automatically shut itself down
- the system is powered off and left unplugged for more than 12 hours.

Proper use of the system, as discussed in [2.8.1 UPS Use Model](#) will ensure that neither of these circumstances ever applies.

To Wake the UPS from Sleep/Standy Mode:

1. Plug the system in to a power outlet that is known to be working.
2. Press the console **POWER** button for approximately 1 second (a clicking sound may be heard).

Note: If the system fails to boot, contact your internal service provider or Ultrasonix Technical Support.

3. Once the system boots correctly, leave it plugged in and recharging for an uninterrupted period of approximately 6 hours.

Note: If desired, the system can be powered off and left plugged in to recharge or it can be used—without being unplugged—during the recharging period.

10.6 ECG CONNECTION

For Safety information and Leakage Current details, refer to [A.4](#).

Note: *ECG functionality is a licensed option.*

Refer to [Accessories–Third Party](#) in Appendix B for the recommended **ECG electrode**.

Figure 10-7: ECG Leads



Figure 10-8: System with ECG Leads Connected



10.7 SonixGPS

The system is delivered with the optional **SonixGPS** attached to the system case.



Warning: This user manual does not include a comprehensive discussion of the SonixGPS option. For complete details on using SonixGPS, read and follow all instructions and warnings in the most recent SonixGPS User Manual.

10.8 BARCODE READER

A barcode reader is available as an option with the system.

Figure 10-9: Barcode Reader



Warnings:

USE OF CONTROLS or adjustments or performance of procedures other than those specified in the manufacturer's User's Guide (delivered with system) may result in hazardous laser light exposure.

NEVER attempt to look at the laser beam, even if the barcode reader appears to be non-functional.

NEVER point the laser beam in anyone's eyes.

USE OF OPTICAL instruments with the laser equipment will increase eye hazard.

UNDER NO CIRCUMSTANCES should users or technicians attempt to open or service the laser scanner. Attempting to open the barcode reader may cause exposure to hazardous laser light. Should the barcode reader require maintenance or replacement, contact Ultrasonix Technical Support.



Caution: Do not apply ultrasound gel to the barcode reader.



10.8.1 Connecting the Barcode Reader

Plug the barcode reader's USB connector into one of the USB ports on the console (10.2). To keep it handy, store the barcode reader in one of the transducer holders.

10.9 WIRELESS ADAPTER

Wireless is available only as a pre-installed option.



Caution: System networking options are intended for use inside your organization's firewall. Organizations that elect to configure/use the networking functionality provided by Ultrasonix are assuming all liabilities and risks associated with that decision.



Caution: For details on FCC regulations as they apply to the wireless adapter, please refer to the manufacturer's User Guide included with the system.

10.10 CONNECTING THE USB FOOTSWITCH (DUAL OR TRIPLE)

Connect the USB footswitch to the Back Connectivity Panel ([10.1](#)) and configure it via [8.2.15.4 Footswitch](#).



Warning: Footswitch is rated IPX1 only. Do not expose to liquids.

Figure 10-10: Dual and Triple USB Footswitches

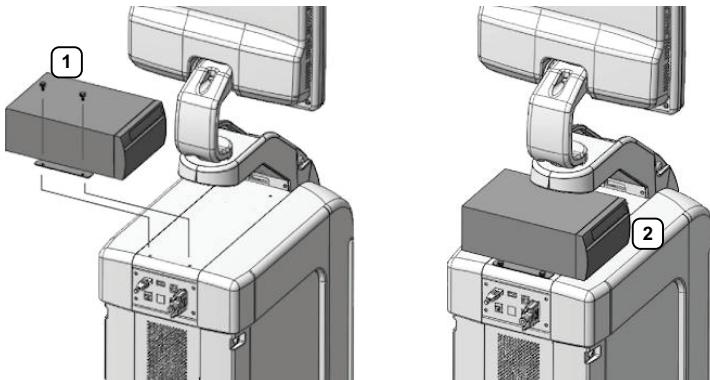


10.11 USB PRINTER MOUNTING KIT

Clients wishing to use a USB printer without the peripheral tray have the option of mounting it directly to the system. The printer will be delivered with the mounting plate already attached.

To Mount the USB Printer Directly to the System:

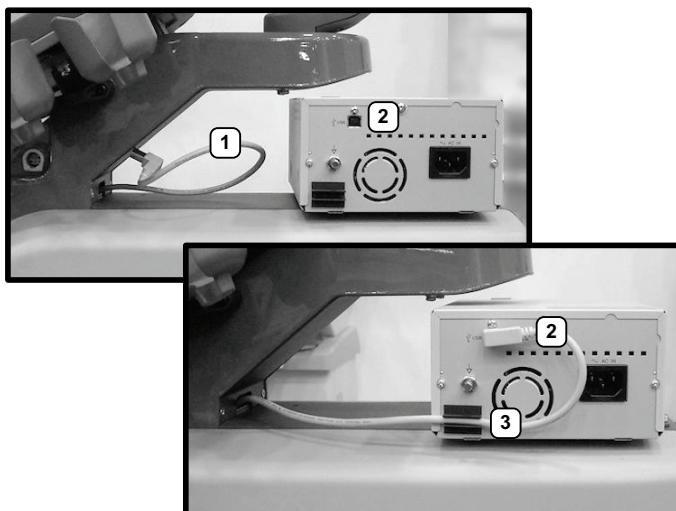
1. Using the two supplied thumbscrews (1), attach the printer mounting plate to the system.



Note: Ensure the printer front (2) faces in the correct direction.

If the system order included a USB printer, it will be delivered with the appropriate USB cable already installed.

2. Plug the USB cable extending from the system's cable chase (1) into the USB connector on the printer (2).



3. To minimize cable clutter, press the USB cable into the cable retaining clip (3).

10.12 PERIPHERAL TRAY

If the system order included the peripheral tray it will come pre-installed—with the exception of the peripheral tray basket. The basket will have to be installed after delivery.

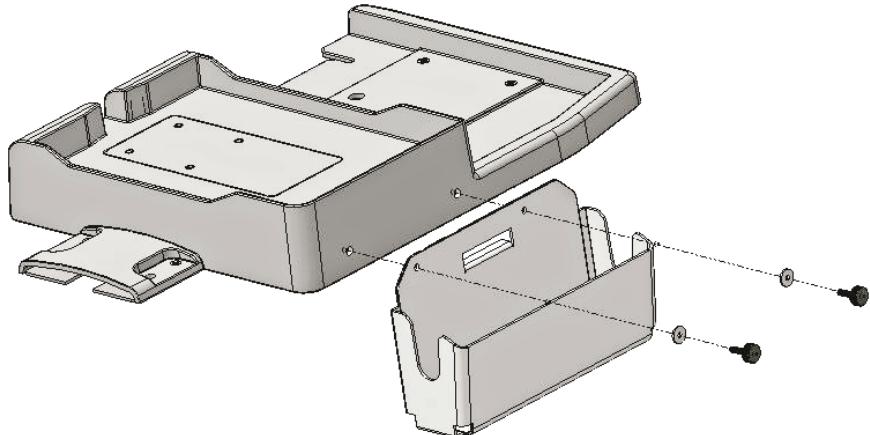
Note: For best results, Ultrasonix recommends removing the peripheral tray basket before cleaning ([D.4.10](#)). This will allow the operator to clean all the various curves and folds in a more effective manner.

If a USB printer has also been installed, it should be removed as well ([10.12.1](#)).

*The peripheral tray is not available for systems that have **SonixGPS** installed.*

To Attach the Peripheral Tray Basket to the Peripheral Tray

1. Using the two sets of supplied nylon washers and thumbscrews, attach the peripheral tray basket to the peripheral tray *while the tray is attached to the system*.



10.12.1 USB Printer Mounted on the Peripheral Tray

If the system order included the peripheral tray and a USB printer, the printer will have to be installed after delivery.

Note: For best results, Ultrasonix recommends removing the USB printer before cleaning (D.4.10) the peripheral tray. This will allow the operator to clean all the various curves and folds in a more effective manner.

Figure 10-11: USB Printer Mounted on the Peripheral Tray

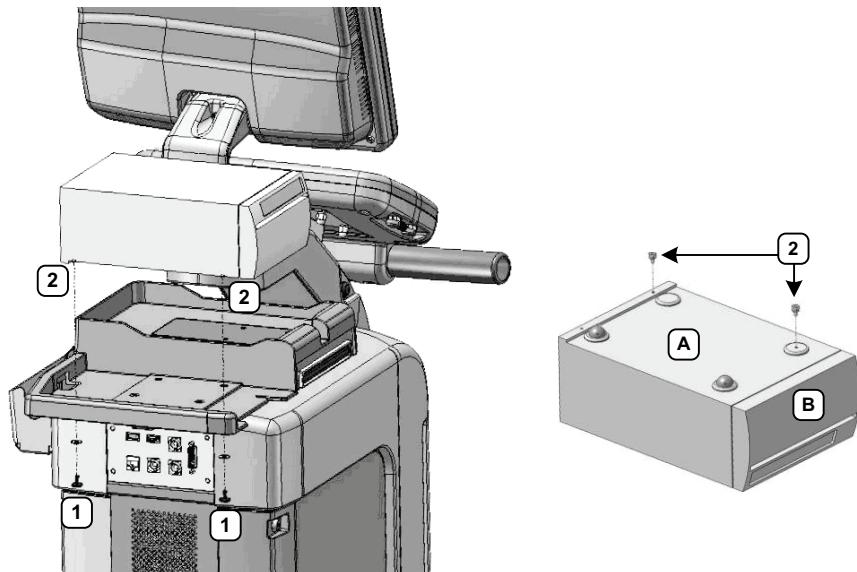
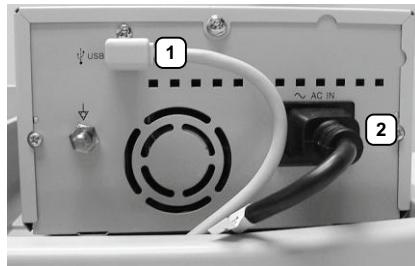


Table 10-7: USB Printer Mounted on the Peripheral Tray

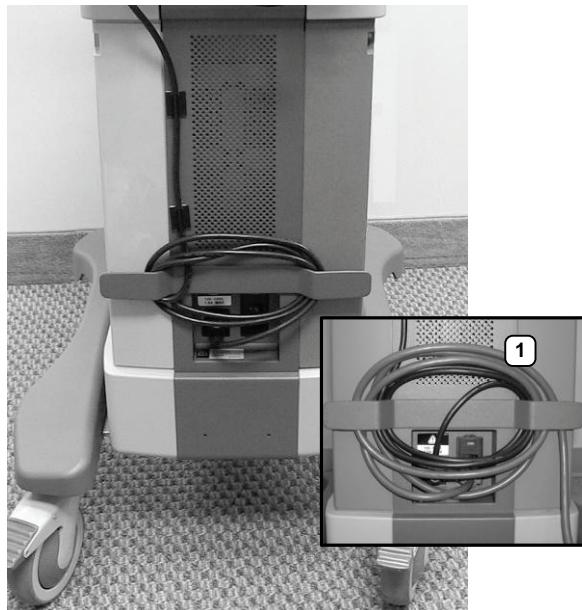
- | | |
|----------|--------------------|
| 1 | Thumbscrews |
| 2 | Threaded Standoffs |
| A | Printer bottom |
| B | Printer front |

To Attach the Peripheral Tray Basket to the Peripheral Tray

1. From underneath the back of the peripheral tray, fasten the two thumbscrews (1) through the holes provided into the two "threaded standoffs" (2) (already attached to the base of the USB printer).
-
- Note:** Refer to [Figure 10-11](#) and [Table 10-7](#) for a detailed view of the installation.
2. The USB (1) and Power cable (2) are pre-installed and will only need to be connected.



3. To help prevent cable clutter, the power cable is held in place with self-adhesive cable clips with enough slack to connect it to the system. If desired, during use, excess slack in the system power cable can also be secured (1).



Note: The system will arrive with the power cable already connected as shown above (1).

10.13 TRANSDUCER HOLDERS AND CABLE HOOKS

The transducer holders and cable hooks are connected with one simple thumbscrew that is hand-tightened. No tools are required to remove them.

Note: For best results, Ultrasonix recommends removing the transducer holders and cable hooks before cleaning (D.4.8). This will allow the operator to clean all the various curves and folds in a more effective manner.

Figure 10-12: Transducer Holders and Cable Hooks

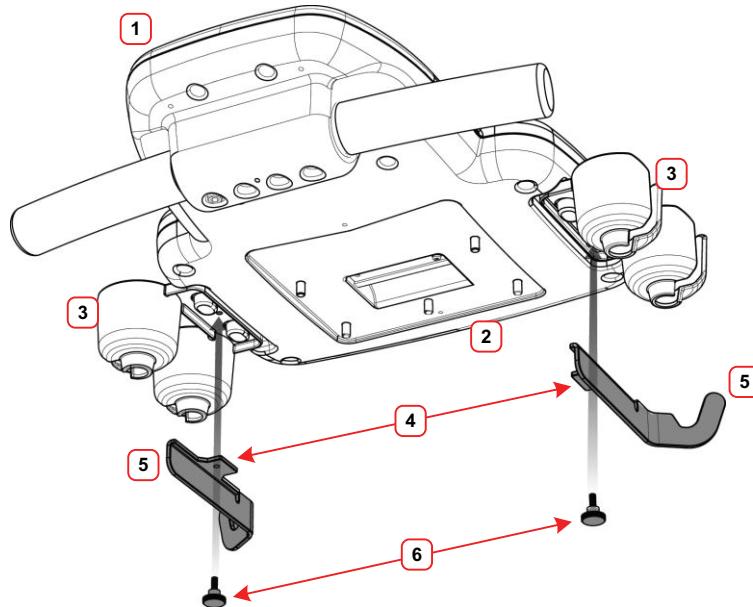
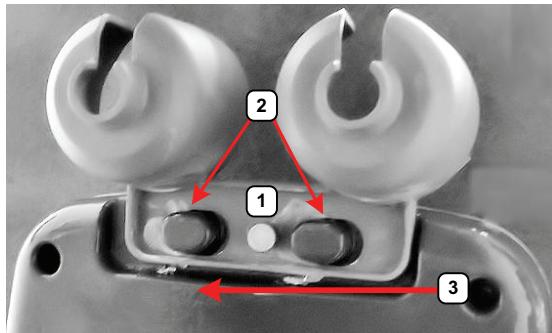


Table 10-8: Transducer Holders and Cable Hooks

- | | |
|---|---|
| 1 | Console Front |
| 2 | Console Rear |
| 3 | Transducer Holders |
| 4 | Connecting Flange for Thumbscrew (faces inward) |
| 5 | Cable Hooks (hook faces rear) |
| 6 | Thumbscrews (for Cable Hooks) |

To Remove Transducer Holders and Cable Hooks:

1. Remove all transducers from the transducer holders.
2. Undo the thumbscrew (1) holding the transducer holder and cable hooks to the console.



3. Remove the cable hook.
4. The transducer holder is held in place by two tapered mounting flanges (2). Pushing the holder toward the back of the console (3) will loosen it from these flanges, allowing it to be pulled down and removed.

Note: View from underneath the console.

10.14 SOFTWARE

10.14.1 Anti-Virus Protection

Sonix software includes a 12 month subscription to anti-virus software that is delivered pre-installed and activated.



Caution: Anti-virus updates will only be available to users with systems connected to the Internet.

Users wishing to run their own anti-virus software—or those who do not want to run anti-virus software at all—must disable/uninstall the existing software. Contact your IT department or Ultrasonix Technical Support for more details.

10.14.2 Protocols

SonixTouch **Protocols** refer to the various specialized applications that can be purchased for use on the system (e.g., **Emergency Medicine (EMED)**, **Anesthesia** and **General**).

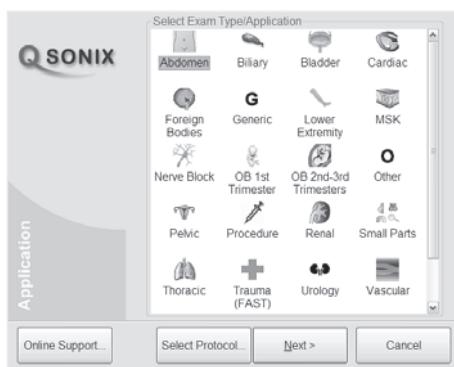
10.14.2.1 Protocol Selection

If more than one **Protocol** was purchased, the system enables users to select the **Protocol** most relevant to their circumstances. Additionally, there may both a **Basic** and **Advanced** version of the **Protocol** (e.g., **EMED**). **Basic** is always a subset of **Advanced** so to access all available options for a specific **Protocol**, select the **Advanced** version.

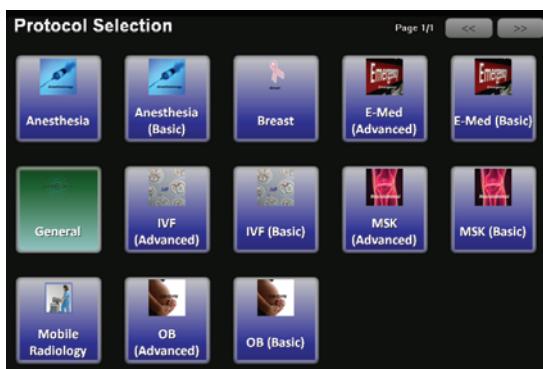
To set **Protocol** selection to a specific **Protocol** subset, refer to [8.2.5 Presets – Protocols](#) for details.

To Change SonixTouch Protocols:

1. Press the console **Q** button.
2. Tap **Select Protocol...**



3. Tap the desired selection and the system will present the message **Loading new layouts. Please wait...** before moving to the relevant **Protocol**.



APPENDIX A: SAFETY

A.1 SAFETY

This section contains important information about the safe use of the Sonix ultrasound system. Much of the information is required by various regulatory agencies and should be read prior to using the Sonix ultrasound system.

A.1.1 ALARA Principle and Output Displays

The Acoustic Power Output Display for the Sonix ultrasound system meets FDA requirements and the guidance standards set out by AIUM and NEMA: *Standard for Real-Time Display of Thermal and Mechanical Acoustic Output Indices on Diagnostic Ultrasound Equipment*.

The Sonix system provides real-time **Mechanical Index (MI)** and **Thermal Index (TI)** acoustic power output display values depending on the transducer and imaging mode.

- **MI: Mechanical Index (2D imaging)**
- **TIB: Thermal Index – Bone**
- **TIC: Thermal Index – Cranial**
- **TIS: Thermal Index – Soft Tissue.**

To Change the Index Value Displayed:

1. Tap the touch screen **Acoustic Power** button.
2. Toggle through the **MI**, **TIS**, **TIC** and **TIB** values available depending on the imaging mode.

Note: The **MI** and **TI** values are displayed to the right of the image field and are updated as changes—which affect the acoustic power output—are made to the system.

The ALARA principle, provided by AIUM in *Ultrasound Medical Safety – Implementing ALARA*, guides the ultrasound user on the prudent use of diagnostic ultrasound. Display of the acoustic power output value enables the ultrasound user to better implement the ALARA principle. The ultrasound user can determine the right balance of ultrasound exposure benefits to risks by using acoustic power output levels that are As Low As Reasonably Achievable (ALARA). Without compromising diagnostic quality, patient ultrasound exposure should be kept to a minimum while using the lowest output power possible.

A.2 BASIC PRECAUTIONS

A.2.1 Modifications

Do not modify this equipment without the authorization of the manufacturer.

A.2.2 Damage

Failure to repair/replace damaged parts may result in degraded image quality and therefore may impact diagnostic interpretations.

A.2.3 Cleaning/Disinfection/Sterilization

Keep the system clean. Carefully follow the procedures described later in this manual for cleaning the system, transducers and cooling fans.

A.2.4 Handling/Storage

DO NOT operate the Sonix Ultrasound System in the presence of flammable anesthetics.

NEVER allow water or other liquids onto the keyboard, operator console or interior of the system case.

ALWAYS handle transducers with care. Dropping the transducer or allowing it to strike a hard surface can damage the transducer elements and the acoustic lens. Such a collision can also crack the transducer housing and destroy its electrical safety features.

ALWAYS turn off the system before cleaning or changing fuses.

To avoid the risk of electrical shock and fire hazard, inspect the power supply, AC power cord and plug on a regular basis. Ensure they are not damaged.

To avoid the risk of electrical shock, before using the transducer, inspect the transducer face, housing and cable. DO NOT use the transducer if the transducer or cable is damaged.

Follow local governing ordinances and recycling plans regarding disposal or recycling of device components.

DO NOT remove panels or covers from the system.

ALWAYS power the system from a grounded outlet.

A.2.5 General Usage

The device is not intended for ophthalmic use or any use causing the acoustic beam to pass through the eye.

The device is not intended for any application in which the transducer might come in direct contact with brain tissue or the central nervous system.

ALWAYS FREEZE (⌘) the system when not imaging to prevent the transducer from overheating or use the **Auto-Freeze** function to ensure the system freezes after a specified period of inactivity ([8.2.11 System Settings](#)).

Ensure the LCD display and operator console are secure during imaging or when the system is left unattended.

ALWAYS choose the appropriate transducer and parameters for the type of clinical application.

When scanning subjects, always work to use As Low As Reasonably Achievable (ALARA) acoustic scanning energies. Refer to [A.1.1 ALARA Principle and Output Displays](#) before using the system. Do not use more than the minimum energy necessary to conduct an ultrasound exam. This is especially necessary where fetal and cephalic scans are being conducted.

Ultrasonix does not recommend the use of transducer covers/sheaths containing natural rubber latex and talc as these ingredients are known to cause an allergic reaction in some individuals. Refer to *21 CFR 801.437* user labeling for more details on latex use.

DO NOT use transcranial (**TCD**) **Presets** for anything other than transcranial imaging.

Where any transducer (including, but not limited to, an intracavity transducer) is used in a clinical application of a semi-critical nature (including, but not limited to, intraoperative, transrectal, transvaginal, transesophageal, etc.), ensure the transducer is covered with the appropriate STERILE transducer cover/sheath which has received regulatory clearance for use.



Warning: *The Sonix ultrasound system may produce physiological effects of ultrasound which may cause danger to the patient and operator.*



Cautions:

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure to ultrasonic energy.

Contact Ultrasonix if repairs are needed on the system. Repairs and component maintenance must be carried out by Ultrasonix authorized personnel only.

A.3 UPS PRECAUTIONS

Refer to [10.5.1](#) for UPS circuit breaker shutdown procedures.



Warnings:

NEVER let liquid from any source enter the UPS. Failure to do this may result in accidental **shorts, shocks or electrocutions.**

DO NOT attempt to service this product yourself. Attempting to open the UPS may cause exposure to lethal voltages within the unit even when it is apparently not operating and the input wiring is disconnected from the electrical source. Should the UPS require maintenance or replacement, only qualified Ultrasonix Service Technicians may perform service as detailed in the Service Manual.

Use only the UPS battery recommended and supplied by Ultrasonix Medical Corporation.

For UPS and battery service issues, contact Ultrasonix Technical Support.

If the battery is removed from the system, it is the responsibility of the customer to dispose of it in accordance with all local regulations and laws.

A.4 ECG SAFETY

When speaking with Ultrasonix Technical Support, it may be necessary to determine the part number for the **ECG** module.

To Find the ECG Module Part Number:

1. Tap the touch screen **Menu** button
2. Select **Administrator > System > About**.

Note: The **About** box will list the **ECG Part Number**.

A.4.1 ECG Module (All Part Numbers)

Table A-1: Leakage Current

Description	Details
Leakage Current	<500 micro amp at 230 V/ 60 Hz

A.4.2 ECG Cables

Table A-2: Applied Standards

Standard Name	Standard Number
Standard (Medical Electrical Equipment)	EN60601-1
Particular Requirements for the safety of ECG Equipment	EN60601-2-27

Table A-3: Replacement ECG Cables

ECG Module Part Number	ECG Cable Part Number
00.032.083	00.032.084
00.032.183	00.008.315

Note: To determine which **ECG Module** is installed, use the instructions listed above: [To Find the ECG Module Part Number](#):

Table A-4: Color Coding Standards

ECG Cable Color Coding Standards
IEC/EU
AAMI/AHA/US

A.4.2.1 Biocompatibility

All patient contact materials are Latex-free and have been tested according to ISO 10993–5 and ISO 10993–10.

Note: Refer to [Accessories—Third Party](#) in Appendix B for the recommended **ECG electrode**.

A.5 SONIXGPS PRECAUTIONS



Warning: This user manual does not include a comprehensive discussion of the SonixGPS option. For complete details on using SonixGPS, read and follow all instructions and warnings in the most recent SonixGPS User Manual.

A.6 SYMBOL DEFINITIONS

Table A-5: System Symbols

Symbol	Location	Meaning
	On serial plate that indicates the serial number and electrical rating.	Alternating current.
	On transducers and inputs of ECG leads.	Patient applied part meets the isolation requirements for type BF applied part.
	On SonixGPS transmitter and the LCD display during SonixGPS imaging.	Warning: To prohibit entry of a person wearing a pacemaker into an area where the operation of the pacemaker may be negatively influenced or the pacemaker damaged.
	On footswitch (dual or triple).	Indicates compliance with UL 60601-1 and CSA Std C22.2 No. 601.1 standards for medical use.
	On System Label (rear of system) and/or warning/caution labels.	Warning: Dangerous voltage. Electric shock hazard. Do not remove cover or back. Refer servicing to qualified service personnel.
	General warning sign located in a variety of places, including: System Label (rear of system), User Manual and Service Manual.	Warning: Consult accompanying documents. The accompanying explanation will describe a precaution(s) necessary to prevent injury or loss of life.
	On System Label (rear of system) and/or warning/caution labels.	Follow instructions for use.
	On System Label (rear of system).	This product has been tested and meets IEC 60601-1 standards for safety and/or performance, including the applicable standards written or administered by the <i>American National Standards Institute (ANSI)</i> , <i>Underwriters Laboratories (UL)</i> , <i>Canadian Standards Association (CSA)</i> , <i>National Sanitation Foundation (NSF)</i> and others.
	When applicable, the CE Mark is located in a variety of places, including: System Label (rear of system), User Manual and Service Manual.	When affixed to the product, the CE Label testifies to its compliance with Council Directive 93/42/EEC concerning medical devices.
	On System Label (rear of system).	<i>Waste Electrical and Electronic Equipment (WEEE)</i> symbol indicates this device must not be disposed of as unsorted municipal waste. It must be disposed of in accordance with all local laws and regulations. Contact Ultrasonix Technical Support for more information on the decommissioning of this equipment.

A.7 ELECTRICAL SAFETY REQUIREMENTS

A.7.1 System

The SonixTouch Ultrasound System is classified in accordance with the IEC 60601–1, the standard for Medical Electrical Equipment as follows.

Table A-6: System Electrical Safety

Standard	IEC 60601–1
Type of protection against electrical shock	Class I
Degree of protection against electrical shock	Type BF
Degree of protection against ingress of water	Ordinary



Warning: Accessory equipment connected to the analog and digital interfaces must be certified according to their respective IEC standards (e.g., IEC 60950 for data processing equipment and IEC 60601–1 for medical equipment). Furthermore, all configurations shall comply with the system standard IEC 60601–1. Any person who connects additional equipment to the signal input part or signal output part configures a medical system and is therefore responsible for ensuring that the system complies with the requirements of the system standard IEC 60601–1–1. If in doubt, consult Ultrasonix Technical Support.

A.7.2 Additional Hardware

Table A-7: SonixGPS Components Electrical Safety

Standard	EN60601–1
Type of protection against electrical shock	Class I
Degree of protection against electrical shock	Type B Applied Part
Unsuitable for use in the presence of flammable gas	Not AP/APG

Table A-8: Barcode Reader Electrical Safety

UL (Underwriter's Laboratory)	UL listed for US and Canada UL 60950 C22.2 No. 60950
Laser Class	CDRH and IEC Laser Class 1 – In accordance with IEC 60825–1:1993 + A1:1997 + A22001 Class 1

A.8 EMC (ELECTROMAGNETIC COMPATIBILITY) REQUIREMENTS

A.8.1 System

The SonixTouch Ultrasound System has special precautions regarding EMC. Always install and use according to the EMC information provided in the relevant Service Manual.

Portable and mobile RF communications equipment can affect the Sonix Ultrasound System.

Transducer cables must be raised above the ground during scanning.



Warning: *The use of accessories, transducers and cables other than those specified by Ultrasonix may result in increased emissions or decreased immunity of the system.*

A.8.2 Additional Hardware

Table A-9: SonixGPS Components

Electromagnetic Compatibility	Class B: FCC Part 15 ICES-003 European Union Directive 89/336/EEC
Operation is subject to these conditions	1. This device may not cause harmful interference, and 2. This device must accept any interference received, including interference that may cause undesired operation.

Table A-10: Barcode Reader

Electromagnetic Compatibility	Class B: FCC Part 15 ICES-003 European Union Directive 89/336/EEC
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Table A-11: Footswitch (Dual or Triple)

Electromagnetic Compatibility	Class B: FCC Part 15 and Industry Canada European Union: En 55022, En 61000-3-1/3, EN 60601-1-2
-------------------------------	--

A.9 ENVIRONMENTAL CONDITIONS

A.9.1 System

Table A-12: System Operating Environment

Operational Temperature	50° to 104° F (10° to 40° C)
Operational Humidity	30 to 75% relative humidity
Shipping/Storage Conditions	+5° to +122° F (-15° to +50° C)
Shipping/Storage Humidity	10% to 90% (non-condensing)
Shipping/Storage Pressure (kilopascal)	50 kPa to 106 kPa (kilopascal)



Warning: Operate in an indoor environment only, free from moisture, flammable liquids, gases, corrosive substances, strong electrical or magnetic fields and equipment that generates high frequency waves.

Ultrasonix cannot guarantee the proper performance of the system if used in the above-listed conditions.

A.9.2 Additional Hardware

Table A-13: Barcode Reader

Operating Temperature	32° to 104° F (0° to 40° C)
Storage Temperature	-40° to 140° F (-40° to 60° C)
Humidity	5% to 95% relative humidity, non-condensing
Light Levels	Up to 4842 Lux (449.8 foot-candles)
Shock	Designed to withstand 1.5 m (5') drops
Contaminants	Sealed to resist airborne particulate contaminants
Ventilation	None required

Table A-14: Wireless

Operating Temperature	32° to 104° F (0° to 40° C)
Storage Temperature	-4° to 158° F (-20° to 70° C)
Humidity	80% maximum, non-condensing

Note: For more details on the wireless adapter and other peripherals, refer to the manufacturer's User's Guides included with the system.

A.10 LIMITING TRANSDUCER SURFACE HEATING

Ultrasound transducer assemblies are tested in normal conditions, such that when applied to a patient, the patient contact surface temperature does not exceed 43°C (refer to [Table A-15](#)). This maximum represents a safety factor of two, relative to the threshold for thermally induced chronic damage to the kidney, one of the most sensitive mammalian tissues. This limit is only applicable for long term (more than 10 minutes) contact with healthy skin of an adult. Special consideration should be taken for an application on children. The influence of drugs and the condition of the patient are also factors that should be considered in the risk-benefit analysis.

With respect to further unforeseeable developments, the safety of long-term transducer use (more than 41°C) inside the body is currently not well investigated. It is assumed that the safe use of temperatures higher than 41°C on children, inside the body and on patients with possibly risky conditions should also be based on clinical experience.

In order to aid the risk-benefit analysis, the transducers in the table below have maximum temperatures that have been found to be greater than 41°C. The ALARA principle should be applied to keep patient ultrasound exposure to a minimum without compromising diagnostic image quality.

Table A-15: Temperature Calculations

Transducer Type	Calculation
External	Temperature = 33°C + Test Temperature Rise
Internal	Temperature = 37°C + Test Temperature Rise

Table A-16: Transducers with Max Temperature Calculations Greater than 41°C

Transducer	Temp	Transducer	Temp
SA4-2/24	42.8°C	L9-4/38	42.5°C
PA7-4/12	41.1°C	L14-5/38	42.7°C
EC9-5/10	42.9°C	L14-5W/60	41.8°C
C5-2/60	42.1°C	HST15-8/20	42.0°C
C7-3/50	42.3°C	4DEC9-5/10	42.8°C
C9-5/10	42.8°C	4DL14-5/38	42.3°C

A.11 LATEX

Ultrasonix does not recommend the use of transducer covers containing natural rubber latex and talc as these ingredients are known to cause an allergic reaction in some individuals. Refer to 21 CFR 801.437 user labeling for more details on latex use.

APPENDIX B: SYSTEM SPECIFICATIONS

Notes:

Talk to your Ultrasonix dealer for details on standard and optional features.

Ultrasonix Medical Corporation reserves the right to alter system specifications at any time.

✓ – Standard ♦ – Optional Ø – Not Available

Table B-1: System Specifications

	TAB	TCH	MDP	SP	OP
CLINICAL APPLICATIONS					
Abdominal	✓	✓	✓	✓	✓
Biliary	✓	✓	✓	✓	✓
Bladder	✓	✓	✓	✓	✓
Cardiac	♦	♦	✓	✓	♦
<i>Note: Access to Cardiac is controlled through licensing. If CW is not licensed and active, then the Cardiac Application is not available.</i>					
Foreign Bodies	✓	✓	✓	✓	✓
Generic	✓	✓	✓	✓	✓
Lower Extremities	✓	✓	✓	✓	✓
Musculoskeletal (MSK)	✓	✓	✓	✓	✓
Nerve Block	✓	✓	✓	✓	✓
OB 1st Trimester ¹	✓	✓	✓	✓	✓
OB 2nd–3rd Trimester ¹	✓	✓	✓	✓	✓
Other	✓	✓	✓	✓	✓
Pelvic	✓	✓	✓	✓	✓
Procedure	✓	✓	✓	✓	✓
Renal	✓	✓	✓	✓	✓
Small Parts	✓	✓	✓	✓	✓
Thoracic	✓	✓	✓	✓	✓
Trauma (FAST)	✓	✓	✓	✓	✓
Urology	✓	✓	✓	✓	✓
Vascular	✓	✓	✓	✓	✓
Vascular Access	✓	✓	✓	✓	✓
MEASUREMENTS AND ANALYSIS					
Obstetrical calculation and report package	✓	✓	✓	✓	✓
Abdominal calculation and report package	✓	✓	✓	✓	✓
Gyn/Fertility calculation and report package	✓	✓	✓	✓	✓
Cardiac calculation and report package	♦	♦	✓	✓	♦
<i>Note: Access to Cardiac calculations is controlled through licensing. If CW is not licensed and active, the Cardiac Application—and therefore the Cardiac calculation and report package—is not available.</i>					
Vascular calculation and report package	✓	✓	✓	✓	✓
Auto-Follicle calculation and report package	♦	♦	Ø	Ø	Ø

	TAB	TCH	MDP	SP	OP
BROADBAND TRANSDUCERS²					
SA4-2/24 broadband (2–3 MHz), 24 mm, 84/90.55" (2.13 m/2.30 m) cable, phased array	♦	♦	♦	♦	♦
PA7-4/12 broadband (7–4 MHz), 12 mm, 90.55 (2.30 m) cable, phased array	♦	♦	♦	♦	♦
MC9-4/12 broadband (4–9 MHz), 12 mm radius, 75" (1.90 m) cable, microconvex	♦	♦	♦	♦	♦
EC9-5/10 and EC9-5/10 GPS broadband (5–9 MHz), 10 mm radius, 75" (1.90 m) cable, endocavity microconvex array	♦	♦	♦	♦	♦
C5-2/60 and C5-2/60 GPS broadband (2–5 MHz), 60 mm radius, 75" (1.90 m) cable, curved array	♦	♦	♦	♦	♦
C7-3/50 (3–7 MHz), 50 mm, 90.5" (2.30 m) cable, curved array	♦	♦	♦	♦	♦
C9-5/10 broadband (9–5 MHz), 10 mm radius, 75" (1.90 m) cable, microconvex	♦	♦	♦	♦	♦
BPC8-4/10 (4–8 MHz), 10 mm, 86.6" (2.20 m) cable, endocavity microconvex array	♦	♦	♦	♦	♦
BPL9-5/55 (5–9 MHz), 55 mm, 86.6" (2.20 m) cable, endocavity linear array	♦	♦	♦	♦	♦
L9-4/38 broadband (4–9 MHz), 38 mm, 75" (1.90 m) cable, linear array	♦	♦	♦	♦	♦
L14-5/38 and L14-5/38 GPS broadband (5–14 MHz), 38 mm, 75" (1.90 m) cable, linear array	♦	♦	♦	♦	♦
L14-5W/60 broadband (5–14 MHz), 60 mm, 75" (1.90 m) cable, wide linear array	♦	♦	♦	♦	♦
L40-8/12 broadband (8–40 MHz), 12 mm, 86.6" (2.2 m) cable, high frequency linear array	♦	♦	♦	♦	♦
HST15-8/20 broadband (10 MHz) 20 mm, 75" (1.90 m) cable, hockey stick linear array	♦	♦	♦	♦	♦
4DC7-3/40 broadband (3–7 MHz), 40 mm radius, 75" (1.90 m) cable, 4D motor-driven electronic curved array	∅	♦	♦	♦	♦
4DEC9-5/10 broadband (5–9 MHz), 10 mm radius, 75" (1.90 m) cable, 4D motor-driven electronic endocavity microconvex array	∅	♦	♦	♦	♦
4DL14-5/38 broadband (5–14 MHz), 38 mm, 78.74" (2m) cable, 4D motor-driven electronic linear array	∅	♦	♦	♦	♦
PRESETS					
Default presets	√	√	√	√	√
User-defined presets	√	√	√	√	√
PHYSICAL CHARACTERISTICS					
Footprint: 53.5 cm x 71 cm (21" x 28") 53.5 cm x 91.5 cm (21" x 36")	∅ ∅	√ ∅	∅ √	∅ √	∅ √
System Size: 45 cm wide x 17 cm deep x 41 cm high (17.7" x 6.9" x 16.1")	√	∅	∅	∅	∅
Weight, with UPS: 88.5 kg (195 lbs) 102 kg (225 lbs)	∅ ∅	√ ∅	∅ √	∅ √	∅ ∅
Weight, without UPS: 63.6 kg (140 lbs) 77 kg (170 lbs)	∅ ∅	√ ∅	∅ √	∅ √	∅ √
System Weight: 15 kg (33 lbs)	√	∅	∅	∅	∅
Power Pack Size: 10.4 cm wide x 40 cm long x 5.8 cm high (4.1" x 15.75" x 2.3")	♦	∅	∅	∅	∅
Power Pack Weight: 2.7 kg (5.95 lbs)	♦	∅	∅	∅	∅
Battery Module Size: 15 cm wide x 51 cm long x 8.2 cm high (5.9" x 20" x 3.25")	♦	∅	∅	∅	∅
Battery Module Weight: 7 kg (15.4 lbs)	♦	∅	∅	∅	∅
Height, System (Measured from top of LCD display to floor): Static Position: 137 cm (54") Highest Position: 152.5 cm (60") Lowest Position: 137 cm (54")	∅ ∅ ∅	√ ∅ ∅	∅ √ √	∅ √ √	∅ √ √
Height, Transport Mode (LCD display folded flat over console): 108 cm (42.5")	∅	√	√	√	√
Tilt, Console (Measured from trackball position to floor): Highest Position: 97.2 cm (38.3") Lowest Position: 78.5 cm (30.9")	∅	√	∅	∅	∅
Tilt/Lift, Console (Combination of tilt and lift, measured from trackball position to floor): Highest Position: 100 cm (39.5") Lowest Position: 82 cm (32.25")	∅	∅	√	√	√
Tilt Angle, Console (Measured by degrees (°) off horizontal position): 0–40° down 0–10° down	∅ ∅	√ √	∅ √	∅ √	∅ √
Swivel Range, Console (Measured by degrees (°) off center position): ± 45°	∅	∅	√	√	√
Tilt Angle, LCD Display (Measured by degrees (°) from the "Transport Mode position): 0 to 115°	∅	√	√	√	√

	TAB	TCH	MDP	SP	OP
Swivel Range, LCD Display (Measured by degrees (°) off center position): ± 90°	∅	✓	✓	✓	✓
Tablet Cart: Tall: 51.5 cm wide x 51.5 cm long x 164 cm high (20.25" x 20.25" x 64.5") Standard: 51.5 cm wide x 51.5 cm long x 125 cm high (20.25" x 20.25" x 49.25")	♦ ♦	∅ ∅	∅ ∅	∅ ∅	∅ ∅
Tablet Height Range from Floor: Tall: 120 cm - 160 cm (47.25" x 63") Standard: 76 cm - 116 cm (30" x 45.7")	♦ ♦	∅ ∅	∅ ∅	∅ ∅	∅ ∅
Tablet Cart Mounting Bracket (Both Sizes): Tilt angle (Measured by degrees (°) off horizontal position): -7° to +15° Swivel Range (Measured by degrees (°) off center position): ± 40°	✓ ✓	∅ ∅	∅ ∅	∅ ∅	∅ ∅
TFT (Active Matrix) LCD display: 17" 19" with SAW (Surface Acoustic Wave) touch screen	∅ ✓	✓ ∅	✓ ∅	✓ ∅	✓ ∅
Touch Screen: 10.4" LCD display with resistive touch screen 8.4" LCD display with resistive touch screen	∅ ∅	✓ ∅	∅ ✓	∅ ✓	∅ ✓
Rear Pull Handles (non-GPS configuration)	∅	♦	✓	✓	✓
Transducer connectors	2	3	3	3	3
USER INTERFACE³					
QSonix Quick Exam Start-up Remote Support Access ⁴ Protocol Selection (e.g., EMED, Anesthesia, IVF, etc.)	✓	✓	✓	✓	✓
Universal language option	♦	♦	♦	♦	♦
Touch Screen Controls Imaging Parameters (Maps, Persistence, Dynamic Range, PRF, etc.) Mode Actions (Reverse, Invert, Biopsy, Layout, etc.) Cine	✓	✓	✓	✓	✓
Easy-to-use Interface	✓	✓	✓	✓	✓
User-programmable Custom Keys	✓	✓	✓	✓	✓
Text, Annotations, Pictograms, Arrows	✓	✓	✓	✓	✓
CINE MEMORY					
Up to seven minutes of data (Transducer/sector size dependant)	✓	✓	✓	✓	✓
Total available memory: >8,000 fr	✓	✓	✓	✓	✓
REMOTE SUPPORT⁴					
Real-time live chat support	✓	✓	✓	✓	✓
Ultrasonix remote system diagnostic capability	✓	✓	✓	✓	✓
1-Step Software upgrades (CD-ROM or Internet)	✓	✓	✓	✓	✓

	TAB	TCH	MDP	SP	OP
STORAGE AND CONNECTIVITY					
DICOM service classes (Print/Store/Worklist)	♦	♦	♦	♦	♦
Patient data hard drive storage (at least 160 Gb)	✓	✓	✓	✓	✓
Still image storage (PNG, JPEG, BMP, GIF)	✓	✓	✓	✓	✓
Cine loop storage & trim (AVI)	✓	✓	✓	✓	✓
USB ports	Ø	✓	Ø	Ø	Ø
2 on Console, 2 on Back Connectivity Panel	Ø	Ø	✓	✓	✓
2 on Console, 3 on Back Connectivity Panel	Ø	Ø	Ø	Ø	Ø
6 on Side Connectivity Panel	✓	Ø	Ø	Ø	Ø
2 on Console front	Ø	Ø	Ø	Ø	Ø
Built-in Firewall	✓	✓	✓	✓	✓
2 Programmable BNCs for Input/Output	Ø	✓	✓	✓	✓
DVI (Digital video) output	Ø	✓	✓	✓	✓
USB printer output	✓	✓	✓	✓	✓
Hard-wired Network (LAN) connection	✓	✓	✓	✓	✓
Wireless Network connection	♦	♦	♦	♦	Ø
SonixLive (Streaming video) ⁴	♦	♦	♦	♦	♦
PERIPHERALS					
USB printer with direct-to-system mounting kit	♦ Ø	♦ ✓	♦ ✓	♦ ✓	♦ ✓
Peripheral Tray, with optional: CD/DVD R/W drive USB Printer	Ø Ø Ø	♦ ♦ ♦	✓ ♦ ♦	♦ ♦ ♦	♦ ♦ ♦
UPS (Uninterruptible Power Supply)	Ø	♦	♦	♦	Ø
Battery Module	♦	Ø	Ø	Ø	Ø
ECG Hardware	♦	♦	♦	Ø	Ø
Barcode Reader (Pre-programmed to support the following barcode symbologies: UPC, EAN, Interleaved 2 of 5, Codabar, Code 3 of 9, Code 93, Code 128)	♦	♦	♦	♦	Ø
Wireless Adapter (802.11a/b/g/n compatible)	♦	♦	♦	♦	Ø
SonixGPS Hardware	♦	♦	♦	♦	♦
USB footswitches (Kinesis, Savant™ Elite™): Triple: (Manufacturer's Part Number: FS30A) (UXID: 00.032.242) Dual: (Manufacturer's Part Number: FS20A) (UXID: 00.032.243)	♦ ♦	♦ ♦	♦ ♦	♦ ♦	♦ ♦
Hand-held Stylus with Tether (UXID: 00.032.321)	✓	Ø	Ø	Ø	Ø
ACCESSORIES—ULTRASONIX MEDICAL CORPORATION					
SonixGPS Needle Kits and Accessories:					
SonixGPS Vascular Access Starter Kit (contains 1x 00.024.451 and 2x 00.037.041) (UXID 00.037.050) SonixGPS 0.9 mm Needle Sensor (non-sterile, reusable) (UXID 00.024.451)					
SonixGPS Vascular Access Needle Kit (Single use, Sterile Pack of 10, Ga 17 x 70 mm L) (UXID 00.037.041)	♦	♦	♦	♦	♦
SonixGPS Nerve Block Starter Kit (contains 1x 00.024.452, 2x 00.037.055) (UXID 00.037.051) SonixGPS 0.55 mm Needle Sensor (non-sterile, reusable) (UXID 00.024.452)	♦	♦	♦	♦	♦
SonixGPS Nerve Block Needle Kit (Single use, Sterile Pack of 10, Ga 19 x 80 mm L) (UXID 00.037.055) SonixGPS Sensor Cord Clips (Single use, non-sterile Pack of 10) (UXID 00.024.500)					
ACCESSORIES—THIRD PARTY					
SonixGPS™ Needle Kits and Accessories:					
eTRAX™ Needle Starter Kit, Manufactured by CIVCO, Part Number 610-1055 (UXID: 00.037.034) Civco eTRAX™ Needle Kit, Manufactured by CIVCO, (Pack of 10), 16GA x 17.7cm (7") and 7.6 tapered to 3.8 x 147cm (3" tapered to 1.5" x 58") CIV-Flex needle cover, Part Number 610-1057 (UXID: 00.037.039)	♦	♦	♦	♦	♦
Blue Phantom, Branched 4-Vessel Ultrasound Training Block Model, Part Number BPBV110 (UXID: 00.032.185)					
Endocavity Transducer Cover/Sheath, Manufactured by CIVCO (Pack of 24), Part Number 610-637 (E8385JC, UA0071) (Sterile 8.9 x 91.5cm (3.5" x 36") telescopically-folded CIV-Flex cover).	♦	♦	♦	♦	♦
Recommended ECG Electrode: Kendall Medi-Trace 200 and 230 Foam Electrode	Ø	♦	♦	Ø	Ø

	TAB	TCH	MDP	SP	OP
Biopsy Start Kits SA4-2/24, Manufactured by CIVCO, Part Number: 667-069 EC9-5/10, Manufactured by Protek, Part Number: 7544 and CIVCO, Part Number: 610-986 C5-2/60, Manufactured by CIVCO, Part Number: 684-003 C5-2/60 and C7-3/50, Manufactured by Protek, Part Number: 7462 L14-5W/60, Manufactured by CIVCO, Part Number: 684-004 L9-4/38, Manufactured by Protek, Part Number: 7157 and CIVCO, Part Number: 684-005 L14-5/38, Manufactured by Protek, Part Number: 7157 and CIVCO, Part Number: 684-005 4DEC-5/10, Manufactured by CIVCO, Part Number: 610-666	♦	♦	♦	♦	♦

- 1 Ultrasonix Medical Corporation is not responsible for misdiagnosis from customized measurements.
- 2 Certain transducers may not be available in all markets. Consult your local Ultrasonix Authorized Distributor or Sales Representative to determine availability in your area.
- 3 Specific User Interface options are dependant upon licensed features.
- 4 Where available. Requires Internet connection and ISP.

APPENDIX C: TRANSDUCER SPECIFICATIONS

C.1 TRANSDUCER DISCLAIMER

Certain transducers may not be available in all markets. Consult your local Ultrasonix Authorized Distributor or Sales Representative to determine availability in your area.

C.2 MEASUREMENT ACCURACY

Table C-1: Measurement Accuracy Test Results

Probe	Relative Error	Range		Test Method
		Min	Max	
2D MEASUREMENT TEST				
Axial Distance	SA4-2/24 ^^	± 0.4%	0.12 mm	359.86 mm Multipurpose Phantom*
	PA7-4/12	± 0.05%	0.03 mm	239.09 mm Multipurpose Phantom*
	MC9-4/12 ^	± 1.0%	0.1 mm	120.0 mm Multipurpose Phantom*
	EC9-5/10 and EC9-5/10 GPS ^	± 0.3%	0.1 mm	120.0 mm Multipurpose Phantom*
	C5-2/60 and C5-2/60 GPS	± 0.7%	0.13 mm	322.37 mm Multipurpose Phantom*
	C7-3/50	± 0.5%	0.03 mm	127.32 mm Multipurpose Phantom*
	C9-5/10	± 0.5%	0.02 mm	120.22 mm Multipurpose Phantom*
	BPC8-4/10	± 0.41%	0.03 mm	127.32 mm Multipurpose Phantom*
	BPL9-5/55	± 0.25%	0.03 mm	89.98 mm Multipurpose Phantom*
	L9-4/38 ^	± 0.05%	0.06 mm	94.36 mm Multipurpose Phantom*
	L14-5/38 ^ and L14-5/38 GPS	± 0.3%	0.1 mm	90.0 mm Multipurpose Phantom*
	L14-5W/60	± 0.3%	0.1 mm	104.7 mm Multipurpose Phantom*
	L40-8/12	± 0.50%	0.02 mm	34.97 mm Multipurpose Phantom****
	HST15-8/20 ^	± 0.45%	0.05 mm	99.63 mm Multipurpose Phantom*
	4DC7-3/40	± 0.15%	0.03 mm	240.07 mm Multipurpose Phantom***
	4DEC9-5/10	± 0.11%	0.03 mm	159.99 mm Multipurpose Phantom*
4DL14-5/38		± 0.64%	0.04 mm	90.82 mm Multipurpose Phantom****
Max. Value Among Probes		± 1.57%	0.13 mm	359.86 mm

	Probe	Relative Error	Min	Max	Range Test Method
Lateral Distance	SA4-2/24 #	± 0.7%	0.12 mm	502.32 mm	Multipurpose Phantom*
	PA7-4/12	± 1.10%	0.03 mm	310.58 mm	Multipurpose Phantom*
	MC9-4/12 §	± 0.67%	0.1 mm	200.01 mm	Multipurpose Phantom*
	EC9-5/10 and EC9-5/10 GPS §	± 0.67%	0.1 mm	189.15 mm	Multipurpose Phantom*
	C5-2/60 and C5-2/60 GPS	± 0.78%	0.13 mm	431.96 mm	Multipurpose Phantom*
	C7-3/50	± 0.1%	0.03 mm	198.75 mm	Multipurpose Phantom*
	C9-5/10	± 0.19%	0.02 mm	200.01 mm	Multipurpose Phantom*
	BPC8-4/10	± 0.4%	0.03 mm	198.75 mm	Multipurpose Phantom*
	BPL9-5/55	± 0.25%	0.03 mm	54.78 mm	Multipurpose Phantom*
	L9-4/38 \$	± 0.2%	0.07 mm	36.08 mm	Multipurpose Phantom*
	L14-5/38 § and L14-5/38 GPS	± 0.3%	0.1 mm	37.6 mm	Multipurpose Phantom*
	L14-5W/60	± 0.2%	0.1 mm	90.5 mm	Multipurpose Phantom*
	L40-8/12	± 0.72%	0.05 mm	12.7 mm	Multipurpose Phantom****
	HST15-8/20 §	± 0.26%	0.05 mm	132.91 mm	Multipurpose Phantom*
	4DC7-3/40	± 0.45%	0.03 mm	345.62 mm	Multipurpose Phantom****
	4DEC9-5/10	± 0.99%	0.03 mm	258.80 mm	Multipurpose Phantom*
	4DL14-5/38	± 0.39%	0.06 mm	125.88 mm	Multipurpose Phantom****
	Max. Value Among Probes	± 1.10%	0.13 mm	502.32 mm	
Area	SA4-2/24 &	± 3.5%	0.01 cm ²	1005.97 cm ²	Multipurpose Phantom*
	PA7-4/12	± 8.79%	0.01 cm ²	667.cm ²	Multipurpose Phantom*
	MC9-4/12 \$	± 2.0%	0.01 cm ²	173.79 cm ²	Multipurpose Phantom*
	EC9-5/10 and EC9-5/10 GPS	± 4.98%	0.01 cm ²	188.78 cm ²	Specific Target 1**
	C5-2/60 & and C5-2/60 GPS	± 2.03%	0.01 cm ²	224.00 cm ²	Multipurpose Phantom*
	C7-3/50	± 3.69%	0.01 cm ²	267.83 cm ²	Multipurpose Phantom*
	C9-5/10	± 3.7%	0.01 cm ²	190.78 cm ²	Multipurpose Phantom*
	BPC8-4/10	± 3.44%	0.01 cm ²	196.37 cm ²	Multipurpose Phantom*
	BPL9-5/55	± 3.53%	0.01 cm ²	38.97 cm ²	Multipurpose Phantom*
	L9-4/38 \$	± 0.1%	0.01 cm ²	26.13 cm ²	Multipurpose Phantom*
	L14-5/38 § and L14-5/38 GPS	± 4.29%	0.01 cm ²	27.00 cm ²	Multipurpose Phantom*
	L14-5W/60	± 0.65%	0.01 cm ²	58.53 cm ²	Multipurpose Phantom*
	L40-8/12	± 4.31%	0.01 cm ²	2.94 cm ²	Multipurpose Phantom****
	HST15-8/20 \$	± 2.0%	0.01 cm ²	18.13 cm ²	Multipurpose Phantom*
	4DC7-3/40	± 1.01%	0.01 cm ²	689.67 cm ²	Multipurpose Phantom*
	4DEC9-5/10	± 3.54%	0.01 cm ²	323.40 cm ²	Multipurpose Phantom*
	4DL14-5/38	± 1.51%	0.01 cm ²	26.64 cm ²	Multipurpose Phantom****
	Max. Value Among Probes	± 8.79%	0.01 cm ²	1005.97 cm ²	

	Probe	Relative Error	Min	Max	Range	Test Method
Volume	SA4-2/24	± 3.61%	0.01 cm ³	47651.86 cm ³	Specific Target 2***	
	PA7-4/12	± 6.35%	0.01 cm ³	8802.97 cm ³	Specific Target 2***	
	MC9-4/12 ****	± 2.56%	0.01 cm ³	1618.10 cm ³	Specific Target 1**	
	EC9-5/10 and EC9-5/10 GPS	± 3.29%	0.01 cm ³	2245.85 cm ³	Specific Target 1**	
	C5-2/60 and C5-2/60 GPS	± 1.37%	0.01 cm ³	3770.00 cm ³	Specific Target 1**	
	C7-3/50	± 0.06%	0.01 cm ³	36127.28 cm ³	Specific Target 4 ⁺	
	C9-5/10	± 2.33%	0.01 cm ²	2517.92 cm ²	Specific Target 3*****	
	BPC8-4/10	± 2.01%	0.01 cm ³	2511.18 cm ³	Specific Target 4 ⁺	
	BPL9-5/55	± 1.95%	0.01 cm ³	137.992 cm ³	Specific Target 4 ⁺	
	L9-4/38	± 0.5%	0.01 cm ³	60.88 cm ³	Specific Target 1**	
	L14-5/38 and L14-5/38 GPS	± 1.07%	0.01 cm ³	64.00 cm ³	Specific Target 1**	
	L14-5W/60	± 0.37%	0.01 cm ³	532.74 cm ³	Specific Target 1**	
	L40-8/12	± 3.53%	0.01 cm ³	2.49 cm ³	Specific Target **	
	HST15-8/20	± 0.68%	0.01 cm ³	110.14 cm ³	Specific Target 1**	
	4DC7-3/40	± 3.04%	0.01 cm ³	15192.74 cm ³	3D Phantom****	
	4DEC9-5/10	± 0.07%	0.01 cm ³	5476.83 cm ³	Multipurpose Phantom*	
	4DL14-5/38	± 4.56%	0.01 cm ³	162.75 cm ³	Multipurpose Phantom****	
	Max. Value Among Probes	± 6.35%	0.01 cm ³	47651.86 cm ³		
M-MODE TEST						
Distance	SA4-2/24 ^^	± 0.87%	0.04 mm	299.29 mm	Multipurpose Phantom*	
	PA7-4/12	± 0.3%	0.22 mm	238.13 mm	Multipurpose Phantom*	
	MC9-4/12 ^	± 1.20%	0.1 mm	118.23 mm	Multipurpose Phantom*	
	EC9-5/10 and EC9-5/10 GPS ^	± 1.0%	0.04 mm	119.5 mm	Multipurpose Phantom*	
	C5-2/60 ^^ and C5-2/60 GPS	± 0.7%	0.1 mm	237.1 mm	Multipurpose Phantom*	
	C7-3/50	± 0.02%	0.22 mm	237.08 mm	Multipurpose Phantom*	
	C9-5/10	± 0.25%	0.04 mm	119.59 mm	Multipurpose Phantom*	
	BPC8-4/10	± 0.2%	0.04 mm	118.23 mm	Multipurpose Phantom*	
	BPL9-5/55	± 0.65%	0.04 mm	118.23 mm	Multipurpose Phantom*	
	L9-4/38 ^	± 0.52%	0.04 mm	99.07 mm	Multipurpose Phantom*	
	L14-5/38 ^ and L14-5/38 GPS	± 1.2%	0.1 mm	88.9 mm	Multipurpose Phantom*	
	L14-5W/60	± 1.8%	0.1 mm	88.3 mm	Multipurpose Phantom*	
	L40-8/12	± 0.26%	0.05 mm	24.7 mm	Multipurpose Phantom****	
	HST15-8/20 ^	± 1.1%	0.1 mm	84.12 mm	Multipurpose Phantom*	
	4DC7-3/40	± 0.3%	0.22 mm	237.08 mm	Multipurpose Phantom*	
	4DEC9-5/10	± 0.36%	0.04 mm	159.46 mm	Multipurpose Phantom*	
	4DL14-5/38	± 0.2%	0.04 mm	88.67 mm	Multipurpose Phantom****	
	Max. Value Among Probes	± 1.8%	0.22 mm	240.41 mm		

			Range		
	Probe	Relative Error	Min	Max	Test Method
Heart Rate	SA4-2/24	± 3.60%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	PA7-4/12	± 4.2%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	MC9-4/12	± 0.3%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	EC9-5/10 and EC9-5/10 GPS	± 1.4%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	C5-2/60 and C5-2/60 GPS	± 0.83%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	C7-3/50	± 0.54%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	C9-5/10	± 1.82%	8 BPM	60000 BPM	Multipurpose Phantom*
	BPC8-4/10	± 1.68%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	BPL9-5/55	± 1.00%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	L9-4/38	± 0.98%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	L14-5/38 and L14-5/38 GPS	± 0.40%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	L14-5W/60	± 2.14%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	L40-8/12	± 0.67%	8 BPM	60000 BPM	Doppler Phantom****
	HST15-8/20	± 1.67%	8 BPM	60000 BPM	Ultrasonix Test Equipment
	4DC7-3/40	± 1.00%	8 BPM	60000 BPM	Multipurpose Phantom*
	4DEC9-5/10	± 0.71%	8 BPM	60000 BPM	Multipurpose Phantom*
	4DL14-5/38	± 3.33%	8 BPM	60000 BPM	Doppler Phantom****
	Max. Value Among Probes	± 4.2%	8 BPM	60000 BPM	
PW MODE TEST					
Velocity Calipers	SA4-2/24	± 7.90%	0 cm/s	408.87 cm/s	Doppler Phantom****
	PA7-4/12	± 3.89%	0.18 cm/s	119.47 cm/s	Doppler Phantom****
	MC9-4/12	± 5.76%	0 cm/s	591.23 cm/s	Doppler Phantom****
	EC9-5/10 and EC9-5/10 GPS	± 1.26%	0 cm/s	223.38 cm/s	Doppler Phantom****
	C5-2/60 and C5-2/60 GPS	± 6.05%	0 cm/s	591.23 cm/s	Doppler Phantom****
	C7-3/50	± 7.06%	0.18 cm/s	519.24 cm/s	Doppler Phantom****
	C9-5/10	± 6.25%	0.204cm/s	134.02 cm/s	Doppler Phantom****
	BPC8-4/10	± 8.23%	0.06 cm/s	302.63 cm/s	Doppler Phantom****
	BPL9-5/55	± 5.36%	0.06 cm/s	151.89 cm/s	Doppler Phantom****
	L9-4/38	± 4.05%	0.2 cm/s	865.95 cm/s	Doppler Phantom****
	L14-5/38 and L14-5/38 GPS	± 7.23%	0 cm/s	472.18 cm/s	Doppler Phantom****
	L14-5W/60	± 3.54%	0.23 cm/s	689.19 cm/s	Doppler Phantom****
	L40-8/12	± 3.49%	0.02 cm/s	408.24 cm/s	Doppler Phantom****
	HST15-8/20	± 9.67%	0 cm/s	591.23 cm/s	Doppler Phantom****
	4DC7-3/40	± 2.32%	0.28 cm/s	754.93 cm/s	Multipurpose Phantom*
	4DEC9-5/10	± 5.55%	0.01 cm/s	365.08 cm/s	Multipurpose Phantom*
	4DL14-5/38	± 6.91%	0.05 cm/s	700.45 cm/s	Doppler Phantom****
	Max. Value Among Probes	± 9.67%	0.28 cm/s	865.95 cm/s	

	Probe	Relative Error	Min	Max	Test Method
Heart Rate	SA4-2/24	± 4.33%	8 BPM	15000 BPM	Doppler Phantom****
	PA7-4/12	± 2.67%	8 BPM	15000 BPM	Doppler Phantom****
	MC9-4/12	± 4.67%	8 BPM	15000 BPM	Doppler Phantom****
	EC9-5/10 and EC9-5/10 GPS	± 4.67%	8 BPM	15000 BPM	Doppler Phantom****
	C5-2/60 and C5-2/60 GPS	± 4.67%	8 BPM	15000 BPM	Doppler Phantom****
	C7-3/50	± 4.67%	8 BPM	15000 BPM	Doppler Phantom****
	C9-5/10	± 5.3%	8 BPM	15000 BPM	Doppler Phantom****
	BPC8-4/10	± 4.33%	8 BPM	15000 BPM	Doppler Phantom****
	BPL9-5/55	± 3.33%	8 BPM	15000 BPM	Doppler Phantom****
	L9-4/38	± 3.67%	8 BPM	15000 BPM	Doppler Phantom****
	L14-5/38 and L14-5/38 GPS	± 5.0%	0 BPM	15000 BPM	Doppler Phantom****
	L14-5W/60	± 3.67%	0 BPM	15000 BPM	Doppler Phantom****
	L40-8/12	± 1%	8 BPM	15000 BPM	Doppler Phantom****
	HST15-8/20	± 4.67%	8 BPM	15000 BPM	Doppler Phantom****
	4DC7-3/40	± 4.00%	0 BPM	15000 BPM	Multipurpose Phantom*
	4DEC9-5/10	± 4.33%	8 BPM	15000 BPM	Multipurpose Phantom*
	4DL14-5/38	± 1.67%	8 BPM	15000 BPM	Doppler Phantom****
	Max. Value Among Probes	± 5.3%	8 BPM	15000 BPM	
CW MODE TEST					
Velocity Calipers	SA4-2/24	± 5.37%	0 cm/s	1507.75 cm/s	Doppler Phantom****
	PA7-4/12	± 4.24%	0.26 cm/s	938.2 cm/s	Doppler Phantom****
Heart Rate	SA4-2/24	± 6.7%	8 BPM	15000 BPM	Doppler Phantom****
	PA7-4/12	± 1.00%	8 BPM	15000 BPM	Doppler Phantom****

* Gammex RMI 403GS S/N 802260-3036-3.

** A ball with a diameter of 6.2 cm.

*** A ball with a diameter of 3.8 cm.

**** Doppler String Phantom Mark 4 SN: MK4-395; JJ&A Instruments.

***** A ball with a diameter of 2.1 cm.

+ A ball with a diameter of 3.1 cm.

++ A ball with a diameter of 0.7 cm.

+++ Gammex Precision Multipurpose Phantom SN: 802263-3649-1.

++++ Optimal Ultrasound Phantom SN: RD00162.

+++++ 3D Ultrasound Calibration Phantom.

++++++ A ball with a diameter of 3.2 cm.

§ Horizontal Pins were located at a depth of 2 cm in the Multipurpose Phantom.

Horizontal Pins were located at a depth of 12 cm in the Multipurpose Phantom.

^ Pin targets were located between a depth of 2 to 4 cm in the Multipurpose Phantom.

^& Pin targets were located between a depth of 6 to 8 cm in the Multipurpose Phantom.

\$ Cyst was located at a depth of 3 cm in the Multipurpose Phantom.

& Cyst was located at a depth of 6 cm in the Multipurpose Phantom.

Table C-2: Field Definitions

Field	Definition
Max. Value Among Probes	Maximum error or range among all probes (except in the lower range where the minimum values were used) was chosen for presentation.

C.3 ACOUSTIC OUTPUT RECORDING TABLES

Below are copies of the **Acoustic Output Reporting Tables for Track 3** for all transducers and all modes (provide data where global maximum displayed index exceeds 1.0).

The following notes apply to **ALL** Acoustic Output Reporting Tables for **ALL** transducers/modes:

- a) This index is not required for this operating mode; see section 4.1.3.1 of the *Standard for real-time display of thermal and mechanical acoustic output indices on diagnostic ultrasound equipment* (AIUM/NEMA 1998b)
- b) This probe is not intended for trans-cranial or neonatal cephalic uses
- c) This formulation for TIS is less than that for an alternate formulation in this mode
- # No data are reported for this operating condition since the global maximum index value is not reported for the reason listed.

Table C-3: Transducer Model SA4-2/24 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC
			scan	non-scan		
Global Maximum Index Value		1.37	(a)	(a)	(a)	(a)
Assoc. Acoustic Param.	Pr ₃	[MPa]	1.93			
	W _o	[mW]		(a)	(a)	(a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)	
	Z ₁	[cm]			(a)	
	Z _{sp}	[cm]			(a)	
	z _{sp}	[cm]	4.58			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	2.00	(a)	(a)	(a)
	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)
		Y [cm]		(a)	(a)	(a)
Other Information	PD	[usec]	0.58			
	PRF	[Hz]	31.553			
	p _r @PII _{max}	[MPa]	2.65			
	d _{eq} @PII _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		(a)	(a)	(a)
		FL _y [cm]		(a)	(a)	(a)
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.08			
	Control 1 Depth		800	[mm]		
	Control 2 Focus		46	[mm]		
	Control 3 Gate		-	[mm]		
	Control 4 Preset		ABD-Aorta (SA4-2/20mm) - HarRes			

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 44.0766$$

Table C-4: Transducer Model SA4-2/24 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
				A _{aprt} ≤1	A _{aprt} >1	
Assoc. Acoustic Param.	Global Maximum Index Value	1.01	3.13	(c)	(c)	(a) 4.77
	Pr ₃ [MPa]	1.75				
	W ₀ [mW]		219.13	(c)		(a) 324.69
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)] [mW]				(c)	
	Z ₁ [cm]				(c)	
	Z _{bp} [cm]				(c)	
	zsp [cm]	4.02				(a)
	d _{eq} (z _{sp}) [cm]					(a)
Other Information	f _c [MHz]	3.00	3.00	(c)	(c)	(a) 3.00
	Dim of A _{aprt}	X [cm]	1.63	(c)	(c)	(a) 1.63
		Y [cm]	1.40	(c)	(c)	(a) 1.40
	PD [μsec]	1.26				
	PRF [Hz]	15.282				
	p _r @PII _{max} [MPa]	2.65				
	d _{eq} @PPI _{max} [cm]					(a)
	Focal Length	FL _X [cm]	5.60	(c)	(c)	5.60
		FL _Y [cm]	5.60	(c)	(c)	5.60
Operating Control Conditions	I _{PA,3} @MI _{max} [W/cm ²]	0.09				
	Control 1 Depth	800 [mm]				
	Control 2 Focus	56 [mm]				
	Control 3 Gate	- [mm]				
	Control 4 Preset	CAR-Diff (SA4-2/20mm) - Pen				

 ISPTA.3 [mW/cm²] = 115.098

Table C-5: Transducer Model SA4-2/24 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
				A _{aprt} ≤1	A _{aprt} >1	
Assoc. Acoustic Param.	Global Maximum Index Value	1.37	0.46	(a)	(a)	(a) 1.29
	Pr ₃ [MPa]	1.93				
	W ₀ [mW]		48.51	(a)		(a) 88.10
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)] [mW]				(a)	
	Z ₁ [cm]				(a)	
	Z _{bp} [cm]				(a)	
	zsp [cm]	4.58				(a)
	d _{eq} (z _{sp}) [cm]					(a)
Other Information	f _c [MHz]	2.00	2.00	(a)	(a)	(a) 2.00
	Dim of A _{aprt}	X [cm]	1.63	(a)	(a)	(a) 1.63
		Y [cm]	1.40	(a)	(a)	(a) 1.40
	PD [μsec]	0.58				
	PRF [Hz]	65				
	p _r @PPI _{max} [MPa]	2.65				
	d _{eq} @PPI _{max} [cm]					(a)
	Focal Length	FL _X [cm]	4.60	(a)	(a)	4.60
		FL _Y [cm]	4.60	(a)	(a)	4.60
Operating Control Conditions	I _{PA,3} @MI _{max} [W/cm ²]	0.16				
	Control 1 Depth	800 [mm]				
	Control 2 Focus	46 [mm]				
	Control 3 Gate	- [mm]				
	Control 4 Preset	ABD-Aorta (SA4-2/20mm) - HarRes				

 ISPTA.3 [mW/cm²] = 90.7986

Table C-6: Transducer Model SA4-2/24 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.29	(a)	1.44	0.2986	1.02
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.41				
	W ₀ [mW]		(a)	151.60		151.60
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				31.35	
	Z ₁ [cm]				4.41	
	Z _{bp} [cm]				1.84	
	zsp [cm]	4.41				4.41
	d _{eq} (z _{sp}) [cm]					0.29
	f _c [MHz]	2.00	(a)	2.00	2.00	2.00
	Dim of A _{aprt}		(a)	0.84	0.84	0.84
	X [cm]		(a)	1.40	1.40	1.40
	Y [cm]		(a)	1.40	1.40	1.40
Other Information	PD [usec]	7.19				
	PRF [Hz]	6700				
	p _r @PII _{max} [MPa]	0.55				
	d _{eq} @PII _{max} [cm]				0.25	
	Focal Length		FL _x [cm]	(a)	6.00	6.00
			FL _y [cm]	(a)	6.00	6.00
	I _{PA,3} @MI _{max} [W/cm ²]	6.52				
Operating Control Conditions						
	Control 1 Depth	80	[mm]			
	Control 2 Focus	60	[mm]			
	Control 3 Gate	40	[mm]			
	Control 4 Preset	GEN-General-GEN				

 ISPTA.3 [mW/cm²] = 313.84

Table C-7: Transducer Model SA4-2/24 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.29	2.53	3.07	0.2986	1.09
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.41				
	W ₀ [mW]		266.00	322.41		322.41
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				175.35	
	Z ₁ [cm]				4.41	
	Z _{bp} [cm]				1.84	
	zsp [cm]	4.41				4.41
	d _{eq} (z _{sp}) [cm]					0.13
	f _c [MHz]	2.00	2.00	2.00	2.00	2.00
	Dim of A _{aprt}		0.84	0.84	0.84	0.84
	X [cm]		1.40	1.40	1.40	1.40
	Y [cm]					
Other Information	PD [usec]	7.19				
	PRF [Hz]	6700				
	p _r @PII _{max} [MPa]	0.55				
	d _{eq} @PII _{max} [cm]				0.11	
	Focal Length		FL _x [cm]	6.00	6.00	6.00
			FL _y [cm]	6.00	6.00	6.00
	I _{PA,3} @MI _{max} [W/cm ²]	6.52				
Operating Control Conditions						
	Control 1 Depth	80	[mm]			
	Control 2 Focus	60	[mm]			
	Control 3 Gate	40	[mm]			
	Control 4 Preset	GEN-General-GEN				

 ISPTA.3 [mW/cm²] = 337.76

Table C-8: Transducer Model SA4-2/24 (Operating Mode: CW Doppler)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.05	0.20	0.24	0.0305	0.14	0.62
Assoc. Acoustic Param.	Pr.3	[MPa]	0.07				
	W ₀	[mW]		21.41	25.56		25.56
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			13.64		
	Z ₁	[cm]			4.55		
	Z _{bp}	[cm]			1.55		
	zsp	[cm]	4.55			4.55	
	d _{eq} (z _{sp})	[cm]				0.52	
	f _c	[MHz]	2.00	2.00	2.00	2.00	2.00
Other Information	Dim of A _{aprt}	X [cm]		0.60	0.60	0.60	0.60
		Y [cm]		1.40	1.40	1.40	1.40
	PD	[μsec]	0.00				
	PRF	[Hz]	25000				
	p _r @PII _{max}	[MPa]	0.09				
Operating Control Conditions	d _{eq} @PII _{max}	[cm]				0.45	
	Focal Length	FL _X [cm]		4.00	4.00	4.00	4.00
		FL _Y [cm]		4.00	4.00	4.00	4.00
	I _{PA,3} @MI _{max}	[W/cm ²]	11.79				
	Control 1 Depth	50	[mm]				
Control Conditions	Control 2 Focus	40	[mm]				
	Control 3 Gate	0	[mm]				
	Control 4 Preset	CAR-Diff-General					

 ISPTA.3 [mW/cm²] = 119.265

Table C-9: Transducer Model SA4-2/2 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.29	2.56	3.09	0.30	1.09	4.39
Assoc. Acoustic Param.	Pr.3	[MPa]	0.41				
	W ₀	[mW]		268.50	324.90		324.90
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			3.70		
	Z ₁	[cm]			4.41		
	Z _{bp}	[cm]			2.77		
	zsp	[cm]	4.41			4.41	
	d _{eq} (z _{sp})	[cm]				14.24	
	f _c	[MHz]	2.00	2.00	2.00	2.00	2.00
Other Information	Dim of A _{aprt}	X [cm]		1.92	1.92	1.92	1.92
		Y [cm]		1.40	1.40	1.40	1.40
	PD	[μsec]	7.19				
	FPS	[Hz]	11.00				
	PRFd	[Hz]	3900				
Operating Control Conditions	p _r @PII _{max}	[MPa]	0.55				
	d _{eq} @PII _{max}	[cm]				9.08	
	Focal Length	FL _X [cm]		6.00	6.00	6.00	6.00
		FL _Y [cm]		6.00	6.00	6.00	6.00
	I _{PA,3} @MI _{max}	[W/cm ²]	66.54				
Control 1 Depth		80	[mm]				
Control Conditions	Control 2 Focus	60	[mm]				
	Control 3 Gate	40	[mm]				
	Control 4 Preset	GEN-General-GEN					

 ISPTA.3 [mW/cm²] = 232.79

Table C-10: Transducer Model PA7-4/12 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.50	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.03				
	W _o	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{PA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	3.20			2.50	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.20	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)	
			Y [cm]	(a)	(a)	(a)	
Other Information	PD	[usec]	0.77				
	PRF	[Hz]	30				
	p _r @PII _{max}	[MPa]	1.63				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _x [cm]		(a)	(a)	(a)	
		FL _y [cm]		(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.01				
Operating Control Conditions	Control 1 Depth		90	[mm]			
	Control 2 Focus		55	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 31.6907

Table C-11: Transducer Model PA7-4/12 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.60	0.00	(a)	(a)	(a) 0.01	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.55				
	W _o	[mW]		0.01	(a)	(a) 0.92	
	min of [W ₃ (z ₁) : I _{PA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	2.00			2.50	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.58	6.58	(a)	(a) 6.58	
	Dim of A _{aprt}		X [cm]	2.56	(a)	6.40 (a) 2.56	
			Y [cm]	1.40	(a)	1.20 (a) 1.40	
Other Information	PD	[usec]	2.70				
	PRF	[Hz]	0				
	p _r @PII _{max}	[MPa]	2.44				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _x [cm]		7.00	(a)	(a) 7.00	
		FL _y [cm]		7.00	(a)	(a) 7.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00				
Operating Control Conditions	Control 1 Depth		90	[mm]			
	Control 2 Focus		70	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 10.12121

Table C-12: Transducer Model PA7-4/12 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
				A _{aprt} ≤1	A _{aprt} >1	
Assoc. Acoustic Param.	Global Maximum Index Value	0.50	0.00	(a)	(a)	(a)
	Pr ₃ [MPa]	1.03				7.31E=06
	W ₀ [mW]		0.03	(a)		(a)
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)] [mW]				(c)	
	Z ₁ [cm]				(c)	
	Z _{bp} [cm]				(a)	
	z _{sp} [cm]	3.20				2.50
	d _{eq} (z _{sp}) [cm]					(a)
Other Information	f _c [MHz]	4.20	4.20	(a)	(a)	(a)
	Dim of A _{aprt}		X [cm]	2.56	(a)	2.56
			Y [cm]	1.40	(a)	1.40
	PD [μsec]	0.77				
	PRF [Hz]	50				
	p _r @PII _{max} [MPa]	1.63				
	d _{eq} @PPI _{max} [cm]					(a)
	Focal Length		FL _X [cm]	5.50	(a)	5.50
			FL _Y [cm]	5.50	(a)	5.50
Operating Control Conditions	I _{PA,3} @MI _{max} [W/cm ²]	0.01				
	Control 1 Depth	90	[mm]			
	Control 2 Focus	55	[mm]			
	Control 3 Gate	-	[mm]			
	Control 4 Preset	GEN-GEN				

 ISPTA.3 [mW/cm²] = 52.81783

Table C-13: Transducer Model PA7-4/12 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
				A _{aprt} ≤1	A _{aprt} >1	
Assoc. Acoustic Param.	Global Maximum Index Value	0.29	(a)	1.91	0.7634	0.12
	Pr ₃ [MPa]	0.76				
	W ₀ [mW]		(a)	60.35		60.35
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)] [mW]				20.95	
	Z ₁ [cm]				2.30	
	Z _{bp} [cm]				3.20	
	z _{sp} [cm]	2.30				2.50
	d _{eq} (z _{sp}) [cm]					5.36
Other Information	f _c [MHz]	6.66	(a)	6.66	6.66	6.66
	Dim of A _{aprt}		X [cm]	(a)	2.56	2.56
			Y [cm]	(a)	1.40	1.40
	PD [μsec]	2.14				
	PRF [Hz]	5000				
	p _r @PPI _{max} [MPa]	1.29				
	d _{eq} @PPI _{max} [cm]					0.79
	Focal Length		FL _X [cm]	(a)	4.50	4.50
			FL _Y [cm]	(a)	4.50	4.50
Operating Control Conditions	I _{PA,3} @MI _{max} [W/cm ²]	0.43				
	Control 1 Depth	90	[mm]			
	Control 2 Focus	45	[mm]			
	Control 3 Gate	10	[mm]			
	Control 4 Preset	GEN-GEN				

 ISPTA.3 [mW/cm²] = 431.4567

Table C-14: Transducer Model PA7-4/12 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.29	0.00	2.26	0.7634	0.00	
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.76					
	W ₀ [mW]		0.01	71.20		71.20	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				24.72		
	Z ₁ [cm]				2.30		
	Z _{bp} [cm]				3.20		
	zsp [cm]	2.30				2.50	
	d _{eq} (z _{sp}) [cm]					5.82	
	f _c [MHz]	6.66	6.66	6.66	6.66	6.66	
Other Information	Dim of A _{aprt}	X [cm]	2.56	2.56	2.56	2.56	
		Y [cm]	1.40	1.40	1.40	1.40	
	I _{PA,3} @MI _{max} [W/cm ²]	0.45					
Operating Control Conditions	Control 1 Depth	90	[mm]				
	Control 2 Focus	45	[mm]				
	Control 3 Gate	10	[mm]				
	Control 4 Preset	GEN-GEN					

 ISPTA.3 [mW/cm²] = 445.1894

Table C-15: Transducer Model PA7-4/12 (Operating Mode: CW Doppler)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.05	2.00E-05	2.45E-05	1.73E-05	1.27E-04	
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.09					
	W ₀ [mW]		1.67E-03	2.05E-03		2.05E-03	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				1.33E-03		
	Z ₁ [cm]				2.50		
	Z _{bp} [cm]				2.12		
	zsp [cm]	2.50				2.50	
	d _{eq} (z _{sp}) [cm]					0.10	
	f _c [MHz]	2.51	2.51	2.51	2.51	2.51	
Other Information	Dim of A _{aprt}	X [cm]	1.12	1.12	1.12	1.12	
		Y [cm]	1.40	1.40	1.40	1.40	
	I _{PA,3} @MI _{max} [W/cm ²]	0.08					
Operating Control Conditions	Control 1 Depth	90					
	Control 2 Focus	50	[mm]				
	Control 3 Gate	-	[mm]				
	Control 4 Preset	GEN-GEN					

 ISPTA.3 [mW/cm²] = 77.35337

Table C-16: Transducer Model PA7-4/12 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS			TIB	TIC		
			scan	non-scan					
				$A_{aprt} \leq 1$	$A_{aprt} > 1$				
Global Maximum Index Value		0.11	0.00	1.37	0.3776158	0.00	0.50		
Assoc. Acoustic Param.	Pr.3	[MPa]	0.29						
	W ₀	[mW]		0.04	43.05		43.05		
	min of [W ₃ (z ₁) : I _{TIA,3} (z ₁)]	[mW]			4.91				
	Z ₁	[cm]			3.92				
	Z _{bp}	[cm]			3.20				
	zsp	[cm]	3.92			2.50			
	d _{eq} (z _{sp})	[cm]				4.53			
	f _c	[MHz]	6.66	6.66	6.66	6.66	6.66		
	Dim of A _{aprt}		X [cm]	2.56	2.56	2.56	2.56		
			Y [cm]	1.40	1.40	1.40	1.40		
Other Information	PD	[μsec]	2.37						
	FPS	[Hz]	9						
	PRFd	[Hz]	3333						
	p _r @PII _{max}	[MPa]	0.72						
	d _{eq} @PII _{max}	[cm]				2.51			
	Focal Length		FL _x [cm]	5.50	5.50	5.50	5.50		
			FL _y [cm]	5.50	5.50	5.50	5.50		
Operating Control Conditions	I _{PA,3} @MI _{max}		[W/cm ²]	0.02					
	Control 1 Depth		90	[mm]					
	Control 2 Focus		45	[mm]					
	Control 3 Gate		10	[mm]					
Control 4 Preset		GEN-GEN							

 ISPTA.3 [mW/cm²] = 93.13

Table C-17: Transducer Model MC9-4/12 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.26	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.65					
	W ₀ [mW]		(a)	(a)		(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(a)		
	Z ₁ [cm]				(a)		
	Z _{bp} [cm]				(a)		
	zsp [cm]	4.36				(a)	
	d _{eq} (z _{sp}) [cm]					(a)	
	f _c [MHz]	6.00	(a)	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm] (a)	(a)	(a)	(a)	
			Y [cm] (a)	(a)	(a)	(a)	
Other Information	PD [usec]	0.46					
	PRF [Hz]	20					
	p _r @PII _{max} [MPa]	1.59					
	d _{eq} @PII _{max} [cm]					(a)	
	Focal Length		FL _X [cm] (a)	(a)	(a)	(a)	
			FL _Y [cm] (a)	(a)	(a)	(a)	
	I _{PA,3} @MI _{max} [W/cm ²]	0.01					
Operating Control Conditions							
	Control 1 Depth		70 [mm]				
	Control 2 Focus		40 [mm]				
	Control 3 Gate		- [mm]				
	Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 3.94

Table C-18: Transducer Model MC9-4/12 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.21	0.00	(a)	(a)	(a) 2.50	
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.50					
	W ₀ [mW]		0.06	(a)		(a) 133.51	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(a)		
	Z ₁ [cm]				(a)		
	Z _{bp} [cm]				(a)		
	zsp [cm]	4.48				(a)	
	d _{eq} (z _{sp}) [cm]					(a)	
	f _c [MHz]	6.00	6.00	(a)	(a)	(a) 6.00	
	Dim of A _{aprt}		X [cm] 2.79	(a)	(a)	(a) 2.79	
			Y [cm] 0.50	(a)	(a)	(a) 0.50	
Other Information	PD [usec]	0.79					
	PRF [Hz]	3300					
	p _r @PII _{max} [MPa]	1.27					
	d _{eq} @PII _{max} [cm]					(a)	
	Focal Length		FL _X [cm] 5.00	(a)	(a)	5.00	
			FL _Y [cm] 5.00	(a)	(a)	5.00	
	I _{PA,3} @MI _{max} [W/cm ²]	0.00					
Operating Control Conditions							
	Control 1 Depth		70 [mm]				
	Control 2 Focus		50 [mm]				
	Control 3 Gate		- [mm]				
	Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 12.69

Table C-19: Transducer Model MC9-4/12 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
	Global Maximum Index Value	0.26	0.00	(a)	(a)	(a)
Assoc. Acoustic Param.	Pr.3	[MPa]	0.65			1.21
	W ₀	[mW]		0.03	(a)	64.67
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)	
	Z ₁	[cm]			(a)	
	Z _{bp}	[cm]			(a)	
	zsp	[cm]	4.36			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	6.00	6.00	(a)	(a)
Other Information	Dim of A _{aprt}	X [cm]		2.79	(a)	(a)
		Y [cm]		0.50	(a)	0.50
	PD	[μsec]	0.46			
	PRF	[Hz]	42			
	p _r @PII _{max}	[MPa]	1.59			
Operating Control Conditions	d _{eq} @PPI _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)
		FL _Y [cm]		3.00	(a)	(a)
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00			
Control 1 Depth		70	[mm]			
Control 2 Focus		40	[mm]			
Control 3 Gate		-	[mm]			
Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 8.27

Table C-20: Transducer Model MC9-4/12 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
	Global Maximum Index Value	0.19	0.00	0.50	0.35	0.96
Assoc. Acoustic Param.	Pr.3	[MPa]	0.46			
	W ₀	[mW]		0.00	17.63	17.63
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			4.34	
	Z ₁	[cm]			3.38	
	Z _{bp}	[cm]			2.00	
	zsp	[cm]	3.38			3.38
	d _{eq} (z _{sp})	[cm]				2.72
	f _c	[MHz]	6.00	6.00	6.00	6.00
Other Information	Dim of A _{aprt}	X [cm]		2.79	2.79	2.79
		Y [cm]		0.50	0.50	0.50
	PD	[μsec]	2.15			
	PRF	[Hz]	6700			
	p _r @PPI _{max}	[MPa]	0.92			
Operating Control Conditions	d _{eq} @PPI _{max}	[cm]				0.92
	Focal Length	FL _X [cm]		3.00	3.00	3.00
		FL _Y [cm]		3.00	3.00	3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.22			
Control 1 Depth		70	[mm]			
Control 2 Focus		50	[mm]			
Control 3 Gate		20	[mm]			
Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 218.89

Table C-21: Transducer Model MC9-4/12 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.19	0.00	1.01	0.35	0.02
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.46				
	W ₀ [mW]		0.01	35.42		35.42
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				8.73	
	Z ₁ [cm]					3.38
	Z _{bp} [cm]				2.00	
	zsp [cm]	3.38				3.38
	d _{eq} (z _{sp}) [cm]					3.86
	f _c [MHz]	6.00	6.00	6.00	6.00	6.00
	Dim of A _{aprt}	X [cm] Y [cm]	2.79 0.50	2.79 0.50	2.79 0.50	2.79 0.50
Other Information	PD [usec]	2.15				
	PRF [Hz]	6700				
	p _r @PII _{max} [MPa]	0.92				
	d _{eq} @PII _{max} [cm]					1.31
	Focal Length	F _{LX} [cm] F _{LY} [cm]	3.00 3.00	3.00 3.00	3.00 3.00	3.00 3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.22				
Operating Control Conditions	Control 1 Depth	70 [mm]				
	Control 2 Focus	50 [mm]				
	Control 3 Gate	20 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 221.06

Table C-22: Transducer Model MC9-4/12 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.10	0.01	3.38	0.48	0.07
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.24				
	W ₀ [mW]		0.19	118.23		118.23
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				11.31	
	Z ₁ [cm]					4.10
	Z _{bp} [cm]				2.00	
	zsp [cm]	4.10				4.10
	d _{eq} (z _{sp}) [cm]					6.54
	f _c [MHz]	6.00	6.00	6.00	6.00	6.00
	Dim of A _{aprt}	X [cm] Y [cm]	2.79 0.50	2.79 0.50	2.79 0.50	2.79 0.50
Other Information	PD [usec]	3.00				
	FPS [Hz]	7				
	PRFd [Hz]	3333				
	p _r @PII _{max} [MPa]	0.55				
	d _{eq} @PII _{max} [cm]					2.39
	Focal Length	F _{LX} [cm] F _{LY} [cm]	3.00 3.00	3.00 3.00	3.00 3.00	3.00 3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.03				
Operating Control Conditions	Control 1 Depth	70 [mm]				
	Control 2 Focus	50 [mm]				
	Control 3 Gate	2.1 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 121.34

Table C-23: Transducer Model EC9-5/10 and EC9-5/10 GPS (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.67	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.45				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]				(a)	
	Z ₁	[cm]				(a)	
	Z _{bp}	[cm]				(a)	
	zsp	[cm]	2.17			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.75	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[μsec]	0.22				
	PRF	[Hz]	40				
	p _r @PII _{max}	[MPa]	2.07				
	d _{eq} @PPI _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	167.53				
	Control 1 Depth		30	[mm]			
	Control 2 Focus		30	[mm]			
	Control 3 Gate		0	[mm]			
	Control 4 Preset	GEN-General-PEN					

 ISPTA.3 [mW/cm²] = 12.46

Table C-24: Transducer Model EC9-5/10 and EC9-5/10 GPS (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.58	0.27	(a)	(a)	(a) 0.27	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.28				
	W ₀	[mW]		11.60	(a)	(a) 15.35	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]				(a)	
	Z ₁	[cm]				(a)	
	Z _{bp}	[cm]				(a)	
	zsp	[cm]	2.33				
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.95	4.95	(a)	(a) 4.95	
Other Information	Dim of A _{aprt}	X [cm]		2.62	(a)	(a) 2.62	
		Y [cm]		0.60	(a)	(a) 0.60	
	PD	[μsec]	0.73				
	PRF	[Hz]	20				
	p _r @PPI _{max}	[MPa]	1.91				
	d _{eq} @PPI _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		3.00	(a)	(a) 2.70	
		FL _Y [cm]		2.70	(a)	(a) 2.70	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	85.97				
	Control 1 Depth		50	[mm]			
	Control 2 Focus		30	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	GEN-General-GEN					

 ISPTA.3 [mW/cm²] = 86.84

Table C-25: Transducer Model EC9-5/10 and EC9-5/10 GPS (Operating Mode: M)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				A _{aprt} ≤1	A _{aprt} >1		
Global Maximum Index Value		0.67	0.45	(c)	(c)	0.28	
Assoc. Acoustic Param.	Pr ₃ [MPa]	1.45					
	W ₀ [mW]		19.92	(a)		(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(c)		
	Z ₁ [cm]				(c)		
	Z _{bp} [cm]				(a)		
	zsp [cm]	2.17				(a)	
	d _{eq} (z _{sp}) [cm]					(a)	
	f _c [MHz]	4.75	4.75	(a)	(a)	(a) 4.75	
	Dim of A _{aprt}	X [cm] Y [cm]	2.62 0.60	(a) (a)	(a) (a)	2.62 0.60	
Other Information	PD [usec]	0.22					
	PRF [Hz]	83					
	p _r @PII _{max} [MPa]	2.07					
	d _{eq} @PII _{max} [cm]					(a)	
	Focal Length	FL _X [cm] FL _Y [cm]	3.00 3.00	(a) (a)	(a) (a)	3.00 3.00	
	I _{PA,3} @MI _{max} [W/cm ²]	167.53					
Operating Control Conditions	Control 1 Depth		30 [mm]				
	Control 2 Focus		30 [mm]				
	Control 3 Gate		0 [mm]				
	Control 4 Preset		GEN-General-PEN				

 ISPTA.3 [mW/cm²] = 25.85

Table C-26: Transducer Model EC9-5/10 and EC9-5/10 GPS (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				A _{aprt} ≤1	A _{aprt} >1		
Global Maximum Index Value		0.30	(c)	0.71	(c)	1.79	
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.76					
	W ₀ [mW]		(c)	22.29		22.29	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(c)		
	Z ₁ [cm]				(c)		
	Z _{bp} [cm]				(c)		
	zsp [cm]	2.54				2.54	
	d _{eq} (z _{sp}) [cm]					3.24	
	f _c [MHz]	6.67	(c)	6.67	(c)	6.67	
	Dim of A _{aprt}	X [cm] Y [cm]		(c) (c)	(c) (c)	0.57 0.57	
Other Information	PD [usec]	1.33					
	PRF [Hz]	6666.667					
	p _r @PII _{max} [MPa]	1.37					
	d _{eq} @PII _{max} [cm]					0.28-	
	Focal Length	FL _X [cm] FL _Y [cm]		(c) (c)	(c) (c)	6.67 6.67	
	I _{PA,3} @MI _{max} [W/cm ²]	0.26					
Operating Control Conditions	Control 1 Depth		700 [mm]				
	Control 2 Focus		27 [mm]				
	Control 3 Gate		20.00 [mm]				
	Control 4 Preset		GEN-General (EC9-5/10mm) - Pen				

 ISPTA.3 [mW/cm²] = 347.0193

Table C-27: Transducer Model EC9-5/10 and EC9-5/10 GPS (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.36	0.54	0.69	0.186068	0.35
Assoc. Acoustic Param.	Pr.3	[MPa]	0.81			
	W _o	[mW]		22.57	29.17	29.17
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			15.43	
	Z ₁	[cm]			1.85	
	Z _{bp}	[cm]			0.99	
	zsp	[cm]	1.85			1.85
	d _{eq} (z _{sp})	[cm]				0.10
	f _c	[MHz]	4.99	4.99	4.99	4.99
	Dim of A _{aprt}	X [cm]		0.57	0.57	0.57
		Y [cm]		0.60	(c)	0.60
Other Information	PD	[μsec]	1.69			
	PRF	[Hz]	6700			
	p _r @PII _{max}	[MPa]	1.12			
	d _{eq} @PII _{max}	[cm]				0.04
	Focal Length	FL _X [cm]		2.00	2.00	2.00
		FL _Y [cm]		2.00	2.00	2.00
	I _{PA,3} @MI _{max}	[W/cm ²]	25.48			
Operating Control Conditions	Control 1 Depth		40	[mm]		
	Control 2 Focus		20	[mm]		
	Control 3 Gate		40	[mm]		
	Control 4 Preset		GEN-General-General			

 ISPTA.3 [mW/cm²] = 298.45

Table C-28: Transducer Model EC9-5/10 and EC9-5/10 GPS (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.36	0.63	0.82	0.19	0.35
Assoc. Acoustic Param.	Pr.3	[MPa]	0.81			
	W _o	[mW]		26.37	34.30	34.30
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			4.03	
	Z ₁	[cm]			1.85	
	Z _{bp}	[cm]			2.12	
	zsp	[cm]	1.85			1.85
	d _{eq} (z _{sp})	[cm]				4.59
	f _c	[MHz]	5.00	5.00	5.00	5.00
	Dim of A _{aprt}	X [cm]		2.62	2.62	2.62
		Y [cm]		0.60	(c)	0.60
Other Information	PD	[μsec]	1.69			
	FPS	[Hz]	8.00			
	PRFd	[Hz]	4700			
	p _r @PII _{max}	[MPa]	1.12			
	d _{eq} @PII _{max}	[cm]				2.81
	Focal Length	FL _X [cm]		2.00	2.00	2.00
		FL _Y [cm]		2.00	2.00	2.00
	I _{PA,3} @MI _{max}	[W/cm ²]	85.97			
Operating Control Conditions	Control 1 Depth		40	[mm]		
	Control 2 Focus		20	[mm]		
	Control 3 Gate		40	[mm]		
	Control 4 Preset		GEN-General-General			

 ISPTA.3 [mW/cm²] = 237.11

Table C-29: Transducer Model C5-2/60 and C5-2/60 GPS (Operating Mode: B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.93	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.48				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.56			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	2.50	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)	
			Y [cm]	(a)	(a)	(a)	
Other Information	PD	[usec]	0.71				
	PRF	[Hz]	41				
	p _r @PII _{max}	[MPa]	2.19				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length		FL _X [cm]	(a)	(a)	(a)	
			FL _Y [cm]	(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.02				
Operating Control Conditions	Control 1 Depth		80	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 67.11

Table C-30: Transducer Model C5-2/60 and C5-2/60 GPS (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.83	0.00	(a)	(a)	(a) 0.05	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.31				
	W ₀	[mW]		0.06	(a)	(a) 5.84	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.20			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	2.50	2.50	(a)	(a) 2.50	
	Dim of A _{aprt}		X [cm]	6.40	(a)	(a) 6.40	
			Y [cm]	1.20	(a)	(a) 1.20	
Other Information	PD	[usec]	1.07				
	PRF	[Hz]	6700				
	p _r @PII _{max}	[MPa]	1.88				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length		FL _X [cm]	3.00	(a)	(a) 3.00	
			FL _Y [cm]	3.00	(a)	(a) 3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00				
Operating Control Conditions	Control 1 Depth		80	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 17.83

Table C-31: Transducer Model C5-2/60 and C5-2/60 GPS (Operating Mode: M)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.93	0.00	(a)	(a)	0.21	0.00
Assoc. Acoustic Param.	Pr.3	[MPa]	1.48				
	W ₀	[mW]		0.15	(a)	(a)	(a)
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]				(c)	
	Z ₁	[cm]				(c)	
	Z _{bp}	[cm]				(a)	
	zsp	[cm]	4.56				(a)
	d _{eq} (z _{sp})	[cm]					(a)
	f _c	[MHz]	2.50	2.50	(a)	(a)	2.50
Other Information	Dim of A _{aprt}	X [cm]		6.40	(a)	(a)	6.40
		Y [cm]		1.20	(a)	(a)	1.20
	PD	[μsec]	0.71				
	PRF	[Hz]	41				
	p _r @PII _{max}	[MPa]	2.19				
	d _{eq} @PPI _{max}	[cm]					(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)	3.00
		FL _Y [cm]		3.00	(a)	(a)	3.00
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.02				
	Control 1 Depth		80	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 67.11

Table C-32: Transducer Model C5-2/60 and C5-2/60 GPS (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.30	(a)	1.82	1.29	2.13	1.22
Assoc. Acoustic Param.	Pr.3	[MPa]	0.48				
	W ₀	[mW]		(a)	152.91		152.91
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]				10.15	
	Z ₁	[cm]				2.81	
	Z _{bp}	[cm]				4.69	
	zsp	[cm]	2.81				2.81
	d _{eq} (z _{sp})	[cm]					10.07
	f _c	[MHz]	2.50	(a)	2.50	2.50	2.50
Other Information	Dim of A _{aprt}	X [cm]		(a)	6.40	6.40	6.40
		Y [cm]		(a)	1.20	1.20	1.20
	PD	[μsec]	5.89				
	PRF	[Hz]	12500				
	p _r @PPI _{max}	[MPa]	0.61				
	d _{eq} @PPI _{max}	[cm]					3.88
	Focal Length	FL _X [cm]		(a)	4.00	4.00	
		FL _Y [cm]		(a)	4.00	4.00	2.50
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.16				
	Control 1 Depth		80	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 633.22

Table C-33: Transducer Model C5-2/60 and C5-2/60 GPS (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.30	0.00	3.87	1.29	0.12	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.48				
	W ₀	[mW]		0.12	325.36		
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			10.15		
	Z ₁	[cm]			2.81		
	Z _{bp}	[cm]			4.69		
	zsp	[cm]	2.81			2.81	
	d _{eq} (z _{sp})	[cm]				14.70	
	f _c	[MHz]	2.50	2.50	2.50	2.50	
	Dim of A _{aprt}	X [cm]		6.40	6.40	6.40	
		Y [cm]		1.20	1.20	1.20	
Other Information	PD	[usec]	5.89				
	PRF	[Hz]	12500				
	p _r @PII _{max}	[MPa]	0.61				
	d _{eq} @PII _{max}	[cm]				5.66	
	Focal Length	FL _x [cm]		3.00	3.00	3.00	
		FL _y [cm]		3.00	3.00	3.00	
	I _{P,A,3} @MI _{max}	[W/cm ²]	0.16				
Operating Control Conditions	Control 1 Depth		80	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 654.59

Table C-34: Transducer Model C5-2/60 and C5-2/60 GPS (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.53	0.00	1.67	0.09	0.12	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.83				
	W ₀	[mW]		0.10	140.14		
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			11.71		
	Z ₁	[cm]			3.74		
	Z _{bp}	[cm]			4.69		
	zsp	[cm]	3.74			3.74	
	d _{eq} (z _{sp})	[cm]				9.27	
	f _c	[MHz]	2.50	2.50	2.50	2.50	
	Dim of A _{aprt}	X [cm]		6.40	6.40	6.40	
		Y [cm]		1.20	1.20	1.20	
Other Information	PD	[usec]	2.46				
	FPS	[Hz]	8				
	PRFd	[Hz]	3333				
	p _r @PII _{max}	[MPa]	1.15				
	d _{eq} @PII _{max}	[cm]				3.32	
	Focal Length	FL _x [cm]		3.00	3.00	3.00	
		FL _y [cm]		3.00	3.00	3.00	
	I _{P,A,3} @MI _{max}	[W/cm ²]	0.07				
Operating Control Conditions	Control 1 Depth		80	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 280.66

Table C-35: Transducer Model C7-3/50 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.80	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.44				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.12			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	3.25	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[μsec]	0.00				
	PRF	[Hz]	25				
	p _r @PII _{max}	[MPa]	2.28				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.02				
	Control 1 Depth		90 [mm]				
	Control 2 Focus		50 [mm]				
	Control 3 Gate		- [mm]				
	Control 4 Preset	GEN-GEN					

$$ISPTA.3 [\text{mW/cm}^2] = 62.9816$$

Table C-36: Transducer Model C7-3/50 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.45	0.00	(a)	(a)	(a) 0.02	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.94				
	W ₀	[mW]		0.02	(a)	(a) 3.03	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	5.10			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.39	4.39	(a)	(a) 4.39	
Other Information	Dim of A _{aprt}	X [cm]		6.40	(a)	(a) 6.40	
		Y [cm]		1.20	(a)	(a) 1.20	
	PD	[μsec]	-2.81				
	PRF	[Hz]	6700				
	p _r @PII _{max}	[MPa]	2.03				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		3.00	(a)	(a) 3.00	
		FL _Y [cm]		3.00	(a)	(a) 3.00	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth		90 [mm]				
	Control 2 Focus		60 [mm]				
	Control 3 Gate		- [mm]				
	Control 4 Preset	GEN-GEN					

$$ISPTA.3 [\text{mW/cm}^2] = 13.3715$$

Table C-37: Transducer Model C7-3/50 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.80	0.00	(a)	(a)	0.03
Assoc. Acoustic Param.	Pr ₃ [MPa]	1.44				
	W ₀ [mW]		0.09	(a)		(a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]				(c)	
	Z ₁ [cm]				(c)	
	Z _{bp} [cm]				(a)	
	zsp	[cm]	4.12			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c [MHz]	3.25	3.25	(a)	(a)	(a) 3.25
	Dim of A _{aprt}	X [cm]	6.40	(a)	(a)	(a) 6.40
		Y [cm]	1.20	(a)	(a)	1.20
Other Information	PD	[usec]	0.00			
	PRF	[Hz]	41			
	p _r @PII _{max}	[MPa]	2.28			
	d _{eq} @PII _{max}	[cm]				(a)
	Focal Length	FL _x [cm]	3.00	(a)	(a)	3.00
		FL _y [cm]	3.00	(a)	(a)	3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.03			
Operating Control Conditions	Control 1 Depth	90	[mm]			
	Control 2 Focus	50	[mm]			
	Control 3 Gate	-	[mm]			
	Control 4 Preset	GEN-GEN				

 ISPTA.3 [mW/cm²] = 103.29

Table C-38: Transducer Model C7-3/50 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.34	(a)	3.13	2.145	3.84 1.44
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.65				
	W ₀ [mW]		(a)	180.27		180.27 180.27
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]				18.89	
	Z ₁ [cm]				4.88	
	Z _{bp} [cm]				4.69	
	zsp	[cm]	4.88			4.88
	d _{eq} (z _{sp})	[cm]				9.08
	f _c [MHz]	3.64	(a)	3.64	3.64	3.64 3.64
	Dim of A _{aprt}	X [cm]		(a)	6.40	6.40 6.40
		Y [cm]		(a)	1.20	1.20 1.20
Other Information	PD	[usec]	-0.48			
	PRF	[Hz]	5000			
	p _r @PII _{max}	[MPa]	1.19			
	d _{eq} @PII _{max}	[cm]				2.56
	Focal Length	FL _x [cm]		(a)	5.00	5.00 5.00
		FL _y [cm]		(a)	5.00	5.00 5.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.12			
Operating Control Conditions	Control 1 Depth	90	[mm]			
	Control 2 Focus	50	[mm]			
	Control 3 Gate	10	[mm]			
	Control 4 Preset	GEN-GEN				

 ISPTA.3 [mW/cm²] = 470.288

Table C-39: Transducer Model C7-3/50 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.34	0.00	4.64	2.145	0.02	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.65			2.14	
	W ₀	[mW]		0.22	267.20	267.20	
	min of [W ₃ (z ₁) : I _{PA,3} (z ₁)]	[mW]			18.89		
	Z ₁	[cm]			4.88		
	Z _{bp}	[cm]			4.69		
	zsp	[cm]	4.88			4.88	
	d _{eq} (z _{sp})	[cm]				11.06	
	f _c	[MHz]	3.64	3.64	3.64	3.64	
Other Information	Dim of A _{aprt}	X [cm]		6.40	6.40	6.40	
		Y [cm]		1.20	1.20	1.20	
	PD	[μsec]	-0.48				
	PRF	[Hz]	5000				
	p _r @PII _{max}	[MPa]	1.19				
Operating Control Conditions	d _{eq} @PII _{max}	[cm]				3.12	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	
		FL _Y [cm]		3.00	3.00	3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.13				
Control 1 Depth		90	[mm]				
Control 2 Focus		50	[mm]				
Control 3 Gate		10	[mm]				
Control 4 Preset		GEN-GEN					

 ISPTA.3 [mW/cm²] = 513.115

Table C-40: Transducer Model C7-3/50 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.34	0.00	4.64	2.14	0.02	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.65			2.14	
	W ₀	[mW]		0.22	267.20	267.20	
	min of [W ₃ (z ₁) : I _{PA,3} (z ₁)]	[mW]			6.20		
	Z ₁	[cm]			4.88		
	Z _{bp}	[cm]			4.69		
	zsp	[cm]	4.88			4.88	
	d _{eq} (z _{sp})	[cm]				11.06	
	f _c	[MHz]	3.64	3.64	3.64	3.64	
Other Information	Dim of A _{aprt}	X [cm]		6.40	6.40	6.40	
		Y [cm]		1.20	1.20	1.20	
	PD	[μsec]	-0.48				
	FPS	[Hz]	8.00				
	PRFd	[Hz]	3300				
Operating Control Conditions	p _r @PII _{max}	[MPa]	1.19				
	d _{eq} @PII _{max}	[cm]				5.45	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	
		FL _Y [cm]		3.00	3.00	3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.10				
Control 1 Depth		90	[mm]				
Control 2 Focus		50	[mm]				
Control 3 Gate		10	[mm]				
Control 4 Preset		GEN-GEN					

 ISPTA.3 [mW/cm²] = 380.16

Table C-41: Transducer Model C9-5/10 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.77	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.77				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	2.13			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	5.33	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)	
			Y [cm]	(a)	(a)	(a)	
Other Information	PD	[usec]	0.23				
	PRF	[Hz]	97				
	p _r @PII _{max}	[MPa]	2.62				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	102.47				
Operating Control Conditions	Control 1 Depth		30	[mm]			
	Control 2 Focus		25	[mm]			
	Control 3 Gate		0	[mm]			
	Control 4 Preset		GEN-General-RES				

 ISPTA.3 [mW/cm²] = 10.57

Table C-42: Transducer Model C9-5/10 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.66	0.15	(a)	(a)	(a) 0.15	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.48				
	W ₀	[mW]		6.49	(a)	(a) 8.52	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	2.17			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.98	4.98	(a)	(a) 4.98	
	Dim of A _{aprt}		X [cm]	2.62	(a)	(a) 2.62	
			Y [cm]	0.60	(a)	(a) 0.60	
Other Information	PD	[usec]	0.74				
	PRF	[Hz]	22				
	p _r @PII _{max}	[MPa]	2.15				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		2.50	(a)	(a) 2.50	
		FL _Y [cm]		2.50	(a)	(a) 2.50	
	I _{PA,3} @MI _{max}	[W/cm ²]	122.80				
Operating Control Conditions	Control 1 Depth		40	[mm]			
	Control 2 Focus		25	[mm]			
	Control 3 Gate		0	[mm]			
	Control 4 Preset		GEN-General-GEN				

 ISPTA.3 [mW/cm²] = 102.50

Table C-43: Transducer Model C9-5/10 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.77	0.53	(a)	(a)	0.33
Assoc. Acoustic Param.	Pr.3	[MPa]	1.77			
	W ₀	[mW]		20.92	(a)	(a)
	min of [W ₃ (z ₁) : I _{TIA,3} (z ₁)]	[mW]			(c)	
	Z ₁	[cm]			(c)	
	Z _{bp}	[cm]			(a)	
	zsp	[cm]	2.13			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	5.33	5.33	(a)	(a)
	Dim of A _{aprt}		X [cm]	2.62	(a)	(a)
			Y [cm]	0.60	(a)	(a)
Other Information	PD	[μsec]	0.23			
	PRF	[Hz]	83			
	p _r @PII _{max}	[MPa]	2.62			
	d _{eq} @PPI _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		2.50	(a)	(a)
		FL _Y [cm]		2.50	(a)	(a)
	I _{PA,3} @MI _{max}	[W/cm ²]	102.47			
Operating Control Conditions	Control 1 Depth		30	[mm]		
	Control 2 Focus		20	[mm]		
	Control 3 Gate		0	[mm]		
	Control 4 Preset		GEN-General-RES			

 ISPTA.3 [mW/cm²] = 9.05

Table C-44: Transducer Model C9-5/10 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.34	(a)	0.50	0.313	0.37
Assoc. Acoustic Param.	Pr.3	[MPa]	0.89			
	W ₀	[mW]		(a)	15.65	15.65
	min of [W ₃ (z ₁) : I _{TIA,3} (z ₁)]	[mW]			9.89	
	Z ₁	[cm]			2.05	
	Z _{bp}	[cm]			0.99	
	zsp	[cm]	2.05			2.05
	d _{eq} (z _{sp})	[cm]				0.10
	f _c	[MHz]	6.66	(a)	6.66	6.66
	Dim of A _{aprt}		X [cm]	(a)	0.57	0.57
			Y [cm]	(a)	0.60	0.60
Other Information	PD	[μsec]	2.23			
	PRF	[Hz]	6700			
	p _r @PPI _{max}	[MPa]	1.43			
	d _{eq} @PPI _{max}	[cm]				0.03
	Focal Length	FL _X [cm]		(a)	2.00	2.00
		FL _Y [cm]		(a)	2.00	2.00
	I _{PA,3} @MI _{max}	[W/cm ²]	37.64			
Operating Control Conditions	Control 1 Depth		40	[mm]		
	Control 2 Focus		20	[mm]		
	Control 3 Gate		40	[mm]		
	Control 4 Preset		GEN-General-GEN			

 ISPTA.3 [mW/cm²] = 561.14

Table C-45: Transducer Model C9-5/10 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.34	0.72	0.86	0.313	0.32	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.89				
	W ₀	[mW]		22.79	26.95	26.95	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			10.50		
	Z ₁	[cm]			2.05		
	Z _{bp}	[cm]			0.99		
	zsp	[cm]	2.05			2.05	
	d _{eq} (z _{sp})	[cm]				0.10	
	f _c	[MHz]	6.66	6.66	6.66	6.66	
	Dim of A _{aprt}		X [cm]	0.57	0.57	0.57	
			Y [cm]	0.60	0.60	0.60	
Other Information	PD	[usec]	2.23				
	PRF	[Hz]	6700				
	p _r @PII _{max}	[MPa]	1.43				
	d _{eq} @PII _{max}	[cm]				0.04	
	Focal Length	F _{LX} [cm]	2.00	2.00	2.00	2.00	
		F _{LY} [cm]	2.00	2.00	2.00	2.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	37.64				
Operating Control Conditions	Control 1 Depth		40	[mm]			
	Control 2 Focus		20	[mm]			
	Control 3 Gate		40	[mm]			
	Control 4 Preset		GEN-General-GEN				

 ISPTA.3 [mW/cm²] = 563.21

Table C-46: Transducer Model C9-5/10 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.35	0.72	0.85	0.31	0.32	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.89				
	W ₀	[mW]		23.04	27.20	27.20	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			4.55		
	Z ₁	[cm]			2.05		
	Z _{bp}	[cm]			2.12		
	zsp	[cm]	2.05			2.05	
	d _{eq} (z _{sp})	[cm]				3.80	
	f _c	[MHz]	6.60	6.60	6.60	6.60	
	Dim of A _{aprt}		X [cm]	2.62	2.62	2.62	
			Y [cm]	0.60	0.60	0.60	
Other Information	PD	[usec]	2.23				
	FPS	[Hz]	9.00				
	PRFd	[Hz]	5400				
	p _r @PII _{max}	[MPa]	1.43				
	d _{eq} @PII _{max}	[cm]				2.18	
	Focal Length	F _{LX} [cm]	2.00	2.00	2.00	2.00	
		F _{LY} [cm]	2.00	2.00	2.00	2.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	122.80				
Operating Control Conditions	Control 1 Depth		40	[mm]			
	Control 2 Focus		20	[mm]			
	Control 3 Gate		40	[mm]			
	Control 4 Preset		GEN-General-GEN				

 ISPTA.3 [mW/cm²] = 494.19

Table C-47: Transducer Model BPC8-4/10 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.34	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.72				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.47			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.38	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[μsec]	0.00				
	PRF	[Hz]	34				
	p _r @PII _{max}	[MPa]	1.41				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

$$ISPTA.3 [\text{mW/cm}^2] = 12.9753$$

Table C-48: Transducer Model BPC8-4/10 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.44	0.00	(a)	(a)	(a) 0.00	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.69				
	W ₀	[mW]		0.01	(a)	(a) 0.09	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.47			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	2.53	2.53	(a)	(a) 2.53	
Other Information	Dim of A _{aprt}	X [cm]		2.14	(a)	(a) 2.14	
		Y [cm]		1.10	(a)	(a) 1.10	
	PD	[μsec]	1.56				
	PRF	[Hz]	5000				
	p _r @PII _{max}	[MPa]	1.02				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		3.00	(a)	(a) 3.00	
		FL _Y [cm]		3.00	(a)	(a) 3.00	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

$$ISPTA.3 [\text{mW/cm}^2] = 3.255059$$

Table C-49: Transducer Model BPC8-4/10 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.34	0.00	(a)	(a)	0.00	0.00
Assoc. Acoustic Param.	Pr.3	[MPa]	0.72				
	W ₀	[mW]		0.02	(a)		(a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]				(c)	
	Z ₁	[cm]				(c)	
	Z _{bp}	[cm]				(a)	
	zsp	[cm]	4.47				(a)
	d _{eq} (z _{sp})	[cm]					(a)
	f _c	[MHz]	4.38	4.38	(a)	(a)	(a) 4.38
	Dim of A _{aprt}	X [cm]		2.14	(a)	(a)	(a) 2.14
		Y [cm]		1.10	(a)	(a)	1.10
Other Information	PD	[usec]	0.00				
	PRF	[Hz]	55				
	p _r @PII _{max}	[MPa]	1.41				
	d _{eq} @PII _{max}	[cm]					(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)	3.00
		FL _Y [cm]		3.00	(a)	(a)	3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.01				
Operating Control Conditions	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 20.9894

Table C-50: Transducer Model BPC8-4/10 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.23	(a)	1.38	0.366	0.91 0.63	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.60				
	W ₀	[mW]		(a)	43.80	43.80	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			12.60		
	Z ₁	[cm]			2.72		
	Z _{bp}	[cm]			2.60		
	zsp	[cm]	2.72			2.72	
	d _{eq} (z _{sp})	[cm]				4.46	
	f _c	[MHz]	6.63	(a)	6.63	6.63	
	Dim of A _{aprt}	X [cm]		(a)	2.14	2.14	
		Y [cm]		(a)	1.10	1.10	
Other Information	PD	[usec]	1.45				
	PRF	[Hz]	12500				
	p _r @PII _{max}	[MPa]	0.84				
	d _{eq} @PII _{max}	[cm]				1.34	
	Focal Length	FL _X [cm]		(a)	5.00	5.00	
		FL _Y [cm]		(a)	5.00	5.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.26				
Operating Control Conditions	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 130.3774

Table C-51: Transducer Model BPC8-4/10 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.23	0.00	1.74	0.366	0.00	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.60				
	W ₀	[mW]		0.01	54.07	54.07	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			15.56		
	Z ₁	[cm]			2.72		
	Z _{bp}	[cm]			2.60		
	zsp	[cm]	2.72			2.72	
	d _{eq} (z _{sp})	[cm]				4.95	
	f _c	[MHz]	6.63	6.63	6.63	6.63	
Other Information	Dim of A _{aprt}	X [cm]		2.14	2.14	2.14	
		Y [cm]		1.10	1.10	1.10	
	PD	[μsec]	1.45				
	PRF	[Hz]	12500				
	p _r @PII _{max}	[MPa]	0.84				
	d _{eq} @PII _{max}	[cm]				1.48	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	
		FL _Y [cm]		3.00	3.00	3.00	
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.27				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

$$ISPTA.3 [\text{mW/cm}^2] = 135.3385$$

Table C-52: Transducer Model BPC8-4/10 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.09	0.00	0.93	0.0393	0.00	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.24				
	W ₀	[mW]		0.02	29.34	29.34	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			3.76		
	Z ₁	[cm]			4.47		
	Z _{bp}	[cm]			2.60		
	zsp	[cm]	4.47			4.47	
	d _{eq} (z _{sp})	[cm]				2.98	
	f _c	[MHz]	6.65	6.65	6.65	6.65	
Other Information	Dim of A _{aprt}	X [cm]		2.14	2.14	2.14	
		Y [cm]		1.10	1.10	1.10	
	PD	[μsec]	-2.03				
	FPS	[Hz]	6				
	PRFd	[Hz]	3333				
	p _r @PII _{max}	[MPa]	0.66				
	d _{eq} @PII _{max}	[cm]				1.38	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	
		FL _Y [cm]		3.00	3.00	3.00	
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.02				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

$$ISPTA.3 [\text{mW/cm}^2] = 65.12$$

Table C-53: Transducer Model BPL9-5/55 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.42	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.88				
	W _o	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.12			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.38	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)	
			Y [cm]	(a)	(a)	(a)	
Other Information	PD	[usec]	-1.13				
	PRF	[Hz]	38				
	p _r @PII _{max}	[MPa]	1.64				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _x [cm]		(a)	(a)	(a)	
		FL _y [cm]		(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.01				
Operating Control Conditions	Control 1 Depth		60	[mm]			
	Control 2 Focus		45	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 27.6989$$

Table C-54: Transducer Model BPL9-5/55 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.04	0.00	(a)	(a)	(a) 0.00	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.11				
	W _o	[mW]		0.00	(a)	(a) 0.04	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.31			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	8.77	8.77	(a)	(a) 8.77	
	Dim of A _{aprt}		X [cm]	6.00	(a)	(a) 6.00	
			Y [cm]	0.80	(a)	(a) 0.80	
Other Information	PD	[usec]	0.00				
	PRF	[Hz]	6700				
	p _r @PII _{max}	[MPa]	0.42				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _x [cm]		3.00	(a)	(a) 3.00	
		FL _y [cm]		3.00	(a)	(a) 3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00				
Operating Control Conditions	Control 1 Depth		60	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 2.919413$$

Table C-55: Transducer Model BPL9-5/55 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.42	0.00	(a)	(a)	0.00
Assoc. Acoustic Param.	Pr.3	[MPa]	0.88			
	W ₀	[mW]		0.03	(a)	(a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)	
	Z ₁	[cm]			(c)	
	Z _{bp}	[cm]			(a)	
	z _{sp}	[cm]	4.12			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	4.38	4.38	(a)	(a)
Other Information	Dim of A _{aprt}	X [cm]		6.00	(a)	(a)
		Y [cm]		0.80	(a)	(a)
	PD	[μsec]	-1.13			
	PRF	[Hz]	55			
Operating Control Conditions	p _r @PII _{max}	[MPa]	1.64			
	d _{eq} @PPI _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)
		FL _Y [cm]		3.00	(a)	(a)
	I _{PA,3} @MI _{max}	[W/cm ²]	0.01			
		Control 1 Depth	60	[mm]		
		Control 2 Focus	45	[mm]		
		Control 3 Gate	-	[mm]		
		Control 4 Preset	GEN-GEN			

$$\text{ISPTA.3} [\text{mW/cm}^2] = 40.0904$$

Table C-56: Transducer Model BPL9-5/55 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.02	(a)	0.04	0.201	0.01
Assoc. Acoustic Param.	Pr.3	[MPa]	0.05			
	W ₀	[mW]		(a)	12.63	12.63
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			0.01	
	Z ₁	[cm]			3.85	
	Z _{bp}	[cm]			3.71	
	z _{sp}	[cm]	3.85			3.85
	d _{eq} (z _{sp})	[cm]				2.09
	f _c	[MHz]	6.70	(a)	6.70	6.70
Other Information	Dim of A _{aprt}	X [cm]		(a)	6.00	6.00
		Y [cm]		(a)	0.80	0.80
	PD	[μsec]	-5.34			
	PRF	[Hz]	5000			
	p _r @PPI _{max}	[MPa]	0.13			
Operating Control Conditions	Focal Length	FL _X [cm]		(a)	5.50	5.50
		FL _Y [cm]		(a)	5.50	5.50
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00			
	Control 1 Depth	60	[mm]			
	Control 2 Focus	55	[mm]			
		Control 3 Gate	10	[mm]		
		Control 4 Preset	GEN-GEN			

$$\text{ISPTA.3} [\text{mW/cm}^2] = 0.73095$$

Table C-57: Transducer Model BPL9-5/55 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.02	0.00	1.18	0.201	0.00
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.05				
	W ₀ [mW]		0.02	36.99		36.99
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				0.01	
	Z ₁ [cm]				3.85	
	Z _{bp} [cm]				3.71	
	zsp [cm]	3.85				3.85
	d _{eq} (z _{sp}) [cm]					23.58
	f _c [MHz]	6.70	6.70	6.70	6.70	6.70
	Dim of A _{aprt}	X [cm] Y [cm]	6.00 0.80	6.00 0.80	6.00 0.80	6.00 0.80
Other Information	PD [usec]	-5.34				
	PRF [Hz]	5000				
	p _r @PII _{max} [MPa]	0.13				
	d _{eq} @PII _{max} [cm]				36.34	
	Focal Length	F _{LX} [cm] F _{LY} [cm]	3.00 3.00	3.00 3.00	3.00 3.00	3.00 3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.00				
Operating Control Conditions	Control 1 Depth	60 [mm]				
	Control 2 Focus	55 [mm]				
	Control 3 Gate	10 [mm]				
	Control 4 Preset	GEN-GEN				

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 13.1225$$

Table C-58: Transducer Model BPL9-5/55 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.02	0.00	1.18	0.20138	0.00
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.05				
	W ₀ [mW]		0.02	36.99		36.99
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				0.04	
	Z ₁ [cm]				3.85	
	Z _{bp} [cm]				3.71	
	zsp [cm]	3.85				3.85
	d _{eq} (z _{sp}) [cm]					3.85
	f _c [MHz]	6.70	6.70	6.70	6.70	6.70
	Dim of A _{aprt}	X [cm] Y [cm]	6.00 0.80	6.00 0.80	6.00 0.80	6.00 0.80
Other Information	PD [usec]	-5.34				
	FPS [Hz]	5				
	PRFd [Hz]	4000				
	p _r @PII _{max} [MPa]	0.13				
	d _{eq} @PII _{max} [cm]				22.71	
	Focal Length	F _{LX} [cm] F _{LY} [cm]	3.00 3.00	3.00 3.00	3.00 3.00	3.00 3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.00				
Operating Control Conditions	Control 1 Depth	60 [mm]				
	Control 2 Focus	55 [mm]				
	Control 3 Gate	10 [mm]				
	Control 4 Preset	GEN-GEN				

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 4.42$$

Table C-59: Transducer Model L9-4/38 (Operating Mode: B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.60	(a)	(a)	(a)	(a)
Assoc. Acoustic Param.	Pr.3	[MPa]	2.62			
	W ₀	[mW]		(a)	(a)	(a)
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(a)	
	Z ₁	[cm]			(a)	
	Z _{bp}	[cm]			(a)	
	zsp	[cm]	2.79			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	4.77	(a)	(a)	(a)
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)
			Y [cm]	(a)	(a)	(a)
Other Information	PD	[μsec]	1.61			
	PRF	[Hz]	55			
	p _r @PII _{max}	[MPa]	4.14			
	d _{eq} @PPI _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		(a)	(a)	(a)
		FL _Y [cm]		(a)	(a)	(a)
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.56			
	Control 1 Depth		35 [mm]			
	Control 2 Focus		27.5 [mm]			
	Control 3 Gate		- [mm]			
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 98.37

Table C-60: Transducer Model L9-4/38 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.36	0.00	(a)	(a)	(a)
Assoc. Acoustic Param.	Pr.3	[MPa]	0.91			
	W ₀	[mW]		0.00	(a)	(a)
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(a)	
	Z ₁	[cm]			(a)	
	Z _{bp}	[cm]			(a)	
	zsp	[cm]	3.03			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	6.40	6.40	(a)	(a)
	Dim of A _{aprt}		X [cm]	3.84	(a)	(a)
			Y [cm]	0.70	(a)	(a)
Other Information	PD	[μsec]	0.77			
	PRF	[Hz]	6700			
	p _r @PPI _{max}	[MPa]	1.77			
	d _{eq} @PPI _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)
		FL _Y [cm]		3.00	(a)	(a)
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	0.00			
	Control 1 Depth		55 [mm]			
	Control 2 Focus		30 [mm]			
	Control 3 Gate		- [mm]			
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 10.6

Table C-61: Transducer Model L9-4/38 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.60	0.00	(a)	(a)	0.10
Assoc. Acoustic Param.	Pr ₃ [MPa]	2.62				
	W ₀ [mW]		0.01	(a)		(a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]				(c)	
	Z ₁ [cm]				(c)	
	Z _{bp} [cm]				(a)	
	zsp	[cm]	2.79			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c [MHz]	4.77	4.77	(a)	(a)	(a) 4.77
	Dim of A _{aprt}	X [cm] Y [cm]	3.84 0.70	(a) (a)	(a) (a)	3.84 0.70
Other Information	PD	[usec]	1.61			
	PRF	[Hz]	62			
	p _r @PII _{max}	[MPa]	4.14			
	d _{eq} @PII _{max}	[cm]				(a)
	Focal Length	FL _X [cm] FL _Y [cm]	3.00 3.00	(a) (a)	(a) (a)	3.00 3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	1.23			
Operating Control Conditions	Control 1 Depth	35	[mm]			
	Control 2 Focus	27.5	[mm]			
	Control 3 Gate	-	[mm]			
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 110.89

Table C-62: Transducer Model L9-4/38 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.21	(a)	3.25	1.69	5.50
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.37				1.44
	W ₀ [mW]		(a)	106.48		106.48
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]				6.94	
	Z ₁ [cm]				3.41	
	Z _{bp} [cm]				2.77	
	zsp	[cm]	3.41			3.41
	d _{eq} (z _{sp})	[cm]				6.51
	f _c [MHz]	6.40	(a)	6.40	6.40	6.40
	Dim of A _{aprt}	X [cm] Y [cm]		(a)	3.84	3.84
Other Information	PD	[usec]	2.16			
	PRF	[Hz]	6700			
	p _r @PII _{max}	[MPa]	0.79			
	d _{eq} @PII _{max}	[cm]				3.03
	Focal Length	FL _X [cm] FL _Y [cm]		(a)	3.50	3.50
	I _{PA,3} @MI _{max}	[W/cm ²]	0.04			
Operating Control Conditions	Control 1 Depth	55	[mm]			
	Control 2 Focus	35	[mm]			
	Control 3 Gate	10	[mm]			
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 176.99

Table C-63: Transducer Model L9-4/38 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.21	0.00	4.73	1.69	0.04	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.37				
	W ₀	[mW]		0.06	155.24	155.24	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			6.94		
	Z ₁	[cm]			3.41		
	Z _{bp}	[cm]			2.77		
	zsp	[cm]	3.41			3.41	
	d _{eq} (z _{sp})	[cm]				7.86	
	f _c	[MHz]	6.40	6.40	6.40	6.40	
Other Information	Dim of A _{aprt}	X [cm]		3.84	3.84	3.84	
		Y [cm]		0.70	0.70	0.70	
	PD	[μsec]	2.16				
	PRF	[Hz]	6700				
	p _r @PII _{max}	[MPa]	0.79				
Operating Control Conditions	d _{eq} @PII _{max}	[cm]				3.66	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	
		FL _Y [cm]		3.00	3.00	3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.05				
	Control 1 Depth	55 [mm]					
	Control 2 Focus	35 [mm]					
Operating Control Conditions	Control 3 Gate	10 [mm]					
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 210.97

Table C-64: Transducer Model L9-4/38 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.21	0.00	5.40	1.69	0.05	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.37				
	W ₀	[mW]		0.07	177.24	177.24	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			19.90		
	Z ₁	[cm]			3.41		
	Z _{bp}	[cm]			2.77		
	zsp	[cm]	3.41			3.41	
	d _{eq} (z _{sp})	[cm]				8.40	
	f _c	[MHz]	6.40	6.40	6.40	6.40	
Other Information	Dim of A _{aprt}	X [cm]		3.84	3.84	3.84	
		Y [cm]		0.70	0.70	0.70	
	PD	[μsec]	2.16				
	FPS	[Hz]	7				
	PRFd	[Hz]	4000				
Operating Control Conditions	p _r @PII _{max}	[MPa]	0.79				
	d _{eq} @PII _{max}	[cm]				2.31	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	
		FL _Y [cm]		3.00	3.00	3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.06				
Control 1 Depth		55 [mm]					
Control 2 Focus		35 [mm]					
Control 3 Gate		10 [mm]					
Control 4 Preset		GEN-General					

 ISPTA.3 [mW/cm²] = 248.85

Table C-65: Transducer Model L14-5/38 and L14-5/38 GPS (Operating Mode: B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.80	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.99				
	W _o	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	1.95			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.23	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)	
			Y [cm]	(a)	(a)	(a)	
Other Information	PD	[usec]	0.00				
	PRF	[Hz]	29				
	p _r @PII _{max}	[MPa]	3.03				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	F _{LX} [cm]		(a)	(a)	(a)	
		F _{LY} [cm]		(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.03				
Operating Control Conditions	Control 1 Depth		80	[mm]			
	Control 2 Focus		33	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	Gen-Gen (L14-5_38mm) - Pen					

 ISPTA.3 [mW/cm²] = 66.32

Table C-66: Transducer Model L14-5/38 and L14-5/38 GPS (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.43	0.00	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.12				
	W _o	[mW]		0.01	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	2.10			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.66	6.66	(a)	(a)	
	Dim of A _{aprt}		X [cm]	3.84	(a)	(a)	
			Y [cm]	0.70	(a)	(a)	
Other Information	PD	[usec]	2.21				
	PRF	[Hz]	5000				
	p _r @PII _{max}	[MPa]	1.81				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	F _{LX} [cm]		3.00	(a)	(a)	
		F _{LY} [cm]		3.00	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.01				
Operating Control Conditions	Control 1 Depth		80	[mm]			
	Control 2 Focus		33	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	Gen-Gen (L14-5_38mm) - Pen					

 ISPTA.3 [mW/cm²] = 54.12

Table C-67: Transducer Model L14-5/38 and L14-5/38 GPS (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.80	0.00	(a)	(a)	0.00
Assoc. Acoustic Param.	Pr.3	[MPa]	1.99			
	W ₀	[mW]		0.00	(a)	(a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)	
	Z ₁	[cm]			(c)	
	Z _{bp}	[cm]			(a)	
	zsp	[cm]	1.95			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	6.23	6.23	(a)	(a)
	Dim of A _{aprt}	X [cm]		3.84	(a)	(a)
		Y [cm]		0.70	(a)	(a)
Other Information	PD	[μsec]	0.00			
	PRF	[Hz]	33			
	p _r @PII _{max}	[MPa]	3.03			
	d _{eq} @PPI _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)
		FL _Y [cm]		3.00	(a)	(a)
	I _{PA,3} @MI _{max}	[W/cm ²]	0.04			
Operating Control Conditions	Control 1 Depth	80	[mm]			
	Control 2 Focus	33	[mm]			
	Control 3 Gate	-	[mm]			
	Control 4 Preset	Gen-Gen (L14-5 38mm) - Pen				

 ISPTA.3 [mW/cm²] = 75.47

Table C-68: Transducer Model L14-5/38 and L14-5/38 GPS (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.39	(a)	0.59	0.37	0.10
Assoc. Acoustic Param.	Pr.3	[MPa]	1.02			
	W ₀	[mW]		(a)	18.54	18.54
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			6.14	
	Z ₁	[cm]			2.40	
	Z _{bp}	[cm]			2.77	
	zsp	[cm]	2.40			2.40
	d _{eq} (z _{sp})	[cm]				3.00
	f _c	[MHz]	6.67	(a)	6.67	6.67
	Dim of A _{aprt}	X [cm]		(a)	3.84	3.84
		Y [cm]		(a)	0.70	0.70
Other Information	PD	[μsec]	1.93			
	PRF	[Hz]	5000			
	p _r @PPI _{max}	[MPa]	1.77			
	d _{eq} @PPI _{max}	[cm]				0.37
	Focal Length	FL _X [cm]		(a)	3.00	3.00
		FL _Y [cm]		(a)	3.00	3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.16			
Operating Control Conditions	Control 1 Depth	60	[mm]			
	Control 2 Focus	30	[mm]			
	Control 3 Gate	20	[mm]			
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 622.80

Table C-69: Transducer Model L14-5/38 and L14-5/38 GPS (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.39	0.00	0.92	0.37	0.00
Assoc. Acoustic Param.	Pr ₃	[MPa]	1.02			
	W ₀	[mW]		0.02	29.03	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			9.61	
	Z ₁	[cm]			2.40	
	Z _{bp}	[cm]			2.77	
	zsp	[cm]	2.40			2.40
	d _{eq} (z _{sp})	[cm]				3.76
	f _c	[MHz]	6.67	6.67	6.67	6.67
	Dim of A _{aprt}	X [cm]		3.84	3.84	3.84
		Y [cm]		0.70	0.70	0.70
Other Information	PD	[usec]	1.93			
	PRF	[Hz]	5000			
	p _r @PII _{max}	[MPa]	1.77			
	d _{eq} @PII _{max}	[cm]				0.46
	Focal Length	F _{LX} [cm]		3.00	3.00	3.00
		F _{LY} [cm]		3.00	3.00	3.00
	I _{PA,3} @M _{lmax}	[W/cm ²]	0.17			
Operating Control Conditions	Control 1 Depth		60	[mm]		
	Control 2 Focus		30	[mm]		
	Control 3 Gate		20	[mm]		
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 661.68

Table C-70: Transducer Model L14-5/38 and L14-5/38 GPS (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.39	0.00	0.92	0.37	0.00
Assoc. Acoustic Param.	Pr ₃	[MPa]	1.02			
	W ₀	[mW]		0.02	29.03	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			9.61	
	Z ₁	[cm]			2.40	
	Z _{bp}	[cm]			2.77	
	zsp	[cm]	2.40			2.40
	d _{eq} (z _{sp})	[cm]				3.76
	f _c	[MHz]	6.67	6.67	6.67	6.67
	Dim of A _{aprt}	X [cm]		3.84	3.84	3.84
		Y [cm]		0.70	0.70	0.70
Other Information	PD	[usec]	1.93			
	FPS	[Hz]	4.00			
	PRFd	[Hz]	3333			
	p _r @PII _{max}	[MPa]	1.77			
	d _{eq} @PII _{max}	[cm]				0.93
	Focal Length	F _{LX} [cm]		3.00	3.00	3.00
		F _{LY} [cm]		3.00	3.00	3.00
	I _{PA,3} @M _{lmax}	[W/cm ²]	0.13			
Operating Control Conditions	Control 1 Depth		60	[mm]		
	Control 2 Focus		30	[mm]		
	Control 3 Gate		20	[mm]		
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 521.73

Table C-71: Transducer Model L14-5W/60 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.32	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.82				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	3.90			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.60	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[μsec]	0.45				
	PRF	[Hz]	34				
	p _r @PII _{max}	[MPa]	2.00				
	d _{eq} @PPI _{max}	[cm]				(a)	
Operating Control Conditions	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
	I _{P,A,3} @MI _{max}	[W/cm ²]	0.01				
	Control 1 Depth	70	[mm]				
Control 2 Focus		40	[mm]				
Control 3 Gate		-	[mm]				
Control 4 Preset		GEN-General					

 ISPTA.3 [mW/cm²] = 22.76

Table C-72: Transducer Model L14-5W/60 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.16	0.00	(a)	(a)	(a) 0.15	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.41				
	W ₀	[mW]		0.04	(a)	(a) 13.75	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.16			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.60	6.60	(a)	(a) 6.60	
Other Information	Dim of A _{aprt}	X [cm]		5.88	(a)	(a) 5.88	
		Y [cm]		0.70	(a)	(a) 0.70	
	PD	[μsec]	0.79				
	PRF	[Hz]	6700				
	p _r @PPI _{max}	[MPa]	1.05				
	d _{eq} @PPI _{max}	[cm]				(a)	
Operating Control Conditions	Focal Length	FL _X [cm]		3.00	(a)	(a) 3.00	
		FL _Y [cm]		3.00	(a)	(a) 3.00	
	I _{P,A,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth	70	[mm]				
Control 2 Focus		45	[mm]				
Control 3 Gate		-	[mm]				
Control 4 Preset		GEN-General					

 ISPTA.3 [mW/cm²] = 15.67

Table C-73: Transducer Model L14-5W/60 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.32	0.00	(a)	(a)	(a) 0.00
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.82				
	W ₀ [mW]		0.02	(a)		(a) (a)
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]				(c)	
	Z ₁ [cm]				(c)	
	Z _{bp} [cm]				(a)	
	zsp	[cm]	3.90			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c [MHz]	6.60	6.60	(a)	(a)	(a) 6.60
	Dim of A _{aprt}	X [cm] Y [cm]		5.88 0.70	(a) (a)	(a) 5.88 (a) 0.70
Other Information	PD	[usec]	0.45			
	PRF	[Hz]	41			
	p _r @PII _{max}	[MPa]	2.00			
	d _{eq} @PII _{max}	[cm]				(a)
	Focal Length	FL _X [cm] FL _Y [cm]		3.00 3.00	(a) (a)	3.00 3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.01			
Operating Control Conditions	Control 1 Depth	70	[mm]			
	Control 2 Focus	40	[mm]			
	Control 3 Gate	-	[mm]			
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 27.45

Table C-74: Transducer Model L14-5W/60 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.16	(a)	1.12	0.48	0.38 0.39
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.41				
	W ₀ [mW]		(a)	35.70		35.70 35.70
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]				4.52	
	Z ₁ [cm]				3.18	
	Z _{bp} [cm]				3.43	
	zsp	[cm]	3.18			3.18
	d _{eq} (z _{sp})	[cm]				3.82
	f _c [MHz]	6.60	(a)	6.60	6.60	6.60 6.60
	Dim of A _{aprt}	X [cm] Y [cm]		5.88 0.70	5.88 0.70	5.88 0.70
Other Information	PD	[usec]	2.20			
	PRF	[Hz]	6700			
	p _r @PII _{max}	[MPa]	0.84			
	d _{eq} @PII _{max}	[cm]				2.21
	Focal Length	FL _X [cm] FL _Y [cm]		(a) (a)	5.00 5.00	5.00 5.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.03			
Operating Control Conditions	Control 1 Depth	70	[mm]			
	Control 2 Focus	50	[mm]			
	Control 3 Gate	20	[mm]			
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 120.91

Table C-75: Transducer Model L14-5W/60 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.16	0.00	1.94	0.48	0.03
Assoc. Acoustic Param.	Pr.3	[MPa]	0.41			0.67
	W ₀	[mW]		0.00	61.61	61.61
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			4.52	
	Z ₁	[cm]			3.18	
	Z _{bp}	[cm]			3.43	
	zsp	[cm]	3.18			3.18
	d _{eq} (z _{sp})	[cm]				5.02
	f _c	[MHz]	6.60	6.60	6.60	6.60
Other Information	Dim of A _{aprt}		X [cm]	5.88	5.88	5.88
			Y [cm]	0.70	0.70	0.70
	PD	[μsec]	2.20			
	PRF	[Hz]	6700			
	p _r @PII _{max}	[MPa]	0.84			
Operating Control Conditions	d _{eq} @PII _{max}	[cm]				2.90
	Focal Length	FL _X [cm]		3.00	3.00	3.00
		FL _Y [cm]		3.00	3.00	3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.03			
	Control 1 Depth	70 [mm]				
Control Conditions	Control 2 Focus	50 [mm]				
	Control 3 Gate	20 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 133.63

Table C-76: Transducer Model L14-5W/60 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.16	0.00	1.94	0.48	0.03
Assoc. Acoustic Param.	Pr.3	[MPa]	0.41			0.67
	W ₀	[mW]		0.07	61.61	61.61
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			3.25	
	Z ₁	[cm]			3.18	
	Z _{bp}	[cm]			3.43	
	zsp	[cm]	3.18			3.18
	d _{eq} (z _{sp})	[cm]				5.02
	f _c	[MHz]	6.60	6.60	6.60	6.60
Other Information	Dim of A _{aprt}		X [cm]	5.88	5.88	5.88
			Y [cm]	0.70	0.70	0.70
	PD	[μsec]	2.20			
	FPS	[Hz]	6			
	PRFd	[Hz]	3333			
Operating Control Conditions	p _r @PII _{max}	[MPa]	0.84			
	d _{eq} @PII _{max}	[cm]				3.42
	Focal Length	FL _X [cm]		3.00	3.00	3.00
		FL _Y [cm]		3.00	3.00	3.00
	I _{PA,3} @MI _{max}	[W/cm ²]	0.02			
Control Conditions	Control 1 Depth	70 [mm]				
	Control 2 Focus	50 [mm]				
	Control 3 Gate	20 [mm]				
	Control 4 Preset	Penetration				

 ISPTA.3 [mW/cm²] = 83.64

Table C-77: Transducer Model L40-8/12 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.40	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr ₃ [MPa]	1.29					
	W ₀ [mW]		(a)	(a)		(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(a)		
	Z ₁ [cm]				(a)		
	Z _{bp} [cm]				(a)		
	zsp [cm]	1.20				(a)	
	d _{eq} (z _{sp}) [cm]					(a)	
	f _c [MHz]	10.62	(a)	(a)	(a)	(a)	
	Dim of A _{aprt}	X [cm] Y [cm]	(a)	(a)	(a)	(a)	
Other Information	PD [usec]	0.18					
	PRF [Hz]	251					
	p _r @PII _{max} [MPa]	2.00					
	d _{eq} @PII _{max} [cm]					(a)	
	Focal Length	FL _X [cm] FL _Y [cm]	(a)	(a)	(a)	(a)	
	I _{PA,3} @MI _{max} [W/cm ²]	67.95					
Operating Control Conditions	Control 1 Depth		30 [mm]				
	Control 2 Focus		15 [mm]				
	Control 3 Gate		- [mm]				
	Control 4 Preset		GEN-General-PEN				

 ISPTA.3 [mW/cm²] = 94.02

Table C-78: Transducer Model L40-8/12 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.40	0.19	(a)	(a)	(a) 0.26	
Assoc. Acoustic Param.	Pr ₃ [MPa]	1.29					
	W ₀ [mW]		3.69	(a)		(a) 10.50	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(c)		
	Z ₁ [cm]				(c)		
	Z _{bp} [cm]				(a)		
	zsp [cm]	1.20				(a)	
	d _{eq} (z _{sp}) [cm]					(a)	
	f _c [MHz]	10.62	10.62	(a)	(a)	(a) 10.62	
	Dim of A _{aprt}	X [cm] Y [cm]	1.30 0.60	(a)	(a)	(a) 1.30	
Other Information	PD [usec]	0.18					
	PRF [Hz]	23					
	p _r @PII _{max} [MPa]	2.00					
	d _{eq} @PII _{max} [cm]					(a)	
	Focal Length	FL _X [cm] FL _Y [cm]	1.50 1.50	(a)	(a)	1.50 1.50	
	I _{PA,3} @MI _{max} [W/cm ²]	67.95					
Operating Control Conditions	Control 1 Depth		30 [mm]				
	Control 2 Focus		15 [mm]				
	Control 3 Gate		- [mm]				
	Control 4 Preset		GEN-General-PEN				

 ISPTA.3 [mW/cm²] = 144.11

Table C-79: Transducer Model L40-8/12 (Operating Mode: M)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.40	(c)	6.56	(c)	5.35	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.29			3.26	
	W ₀	[mW]		(c)	129.82		
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(c)		
	zsp	[cm]	1.20			1.20	
	d _{eq} (z _{sp})	[cm]				0.10	
	f _c	[MHz]	10.62	(c)	10.62	(c)	
Other Information	Dim of A _{aprt}	X [cm]		(c)	1.30	(c)	
		Y [cm]		(c)	0.60	(c)	
	PD	[μsec]	0.18				
	PRF	[Hz]	83				
	p _r @PII _{max}	[MPa]	2.00				
Operating Control Conditions	d _{eq} @PPI _{max}	[cm]				0.05	
	Focal Length	FL _X [cm]		(c)	1.50	(c)	
		FL _Y [cm]		(c)	(c)	(c)	
	I _{PA,3} @MI _{max}	[W/cm ²]	67.95				
	Control 1 Depth	30	[mm]				
Control 2 Focus		15	[mm]				
Control 3 Gate		-	[mm]				
Control 4 Preset		GEN-General-PEN					

 ISPTA.3 [mW/cm²] = 32.13

Table C-80: Transducer Model L40-8/12 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.27	(a)	0.17	0.1212	0.42	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.86				
	W ₀	[mW]		(a)	3.59		
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)]	[mW]			2.55		
	Z ₁	[cm]			1.00		
	Z _{bp}	[cm]			1.49		
	zsp	[cm]	1.00			1.00	
	d _{eq} (z _{sp})	[cm]				0.10	
	f _c	[MHz]	10.00	(a)	10.00	10.00	
Other Information	Dim of A _{aprt}	X [cm]		(a)	1.30	1.30	
		Y [cm]		(a)	0.60	0.60	
	PD	[μsec]	1.41				
	PRF	[Hz]	5000				
	p _r @PPI _{max}	[MPa]	1.21				
Operating Control Conditions	d _{eq} @PPI _{max}	[cm]				0.01	
	Focal Length	FL _X [cm]		(a)	1.50	1.50	
		FL _Y [cm]		(a)	1.50	1.50	
	I _{PA,3} @MI _{max}	[W/cm ²]	26.40				
	Control 1 Depth	30	[mm]				
Control 2 Focus		15	[mm]				
Control 3 Gate		20	[mm]				
Control 4 Preset		GEN-General-PEN					

 ISPTA.3 [mW/cm²] = 185.61

Table C-81: Transducer Model L40-8/12 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.40	0.39	1.06	2.7074	5.35
Assoc. Acoustic Param.	Pr.3	[MPa]	1.29			
	W ₀	[mW]		7.69	20.90	20.90
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			8.67	
	Z ₁	[cm]			1.20	
	Z _{bp}	[cm]			1.49	
	zsp	[cm]	1.20			1.20
	d _{eq} (z _{sp})	[cm]				0.10
	f _c	[MHz]	10.62	10.62	10.62	10.62
	Dim of A _{aprt}	X [cm]		1.30	1.30	1.30
		Y [cm]	0.60	0.60	0.60	0.60
Other Information	PD	[usec]	0.18			
	PRF	[Hz]	39			
	p _r @PII _{max}	[MPa]	2.80			
	d _{eq} @PII _{max}	[cm]			0.03	
	Focal Length	FL _x [cm]		1.50	1.50	1.50
		FL _y [cm]		1.50	1.50	1.50
	I _{PA,3} @M _{lmax}	[W/cm ²]	67.95			
Operating Control Conditions	Control 1 Depth		30	[mm]		
	Control 2 Focus		15	[mm]		
	Control 3 Gate		20	[mm]		
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 200.22

Table C-82: Transducer Model L40-8/12 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.40	0.40	1.08	2.72	5.40
Assoc. Acoustic Param.	Pr.3	[MPa]	1.29			
	W ₀	[mW]		7.93	21.34	21.34
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			5.89	
	Z ₁	[cm]			1.20	
	Z _{bp}	[cm]			1.49	
	zsp	[cm]	1.20			1.20
	d _{eq} (z _{sp})	[cm]			3.41	
	f _c	[MHz]	10.62	10.62	10.62	10.62
	Dim of A _{aprt}	X [cm]		1.30	1.30	1.30
		Y [cm]	0.60	0.60	0.60	0.60
Other Information	PD	[usec]	0.18			
	FPS	[Hz]	5.00			
	PRFd	[Hz]	5000			
	p _r @PII _{max}	[MPa]	2.00			
	d _{eq} @PII _{max}	[cm]			1.72	
	Focal Length	FL _x [cm]		1.50	1.50	1.50
		FL _y [cm]		1.50	1.50	1.50
Operating Control Conditions	I _{PA,3} @M _{lmax}	[W/cm ²]	67.95			
	Control 1 Depth		3	[mm]		
	Control 2 Focus		1.5	[mm]		
	Control 3 Gate		-	[mm]		
	Control 4 Preset		GEN-General-PEN			

 ISPTA.3 [mW/cm²] = 216.94

Table C-83: Transducer Model HST15-8/20 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.20	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.51				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	3.32			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.60	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[μsec]	0.34				
	PRF	[Hz]	55				
	p _r @PII _{max}	[MPa]	1.10				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth		55	[mm]			
	Control 2 Focus		40	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 5.5

Table C-84: Transducer Model HST15-8/20 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.19	0.00	(a)	(a)	(a) 1.10	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.48				
	W ₀	[mW]		0.03	(a)	(a) 64.75	
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	3.32			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	6.60	6.60	(a)	(a) 6.60	
Other Information	Dim of A _{aprt}	X [cm]		2.85	(a)	(a) 2.85	
		Y [cm]		0.60	(a)	(a) 0.60	
	PD	[μsec]	0.87				
	PRF	[Hz]	10000				
	p _r @PII _{max}	[MPa]	1.03				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		4.20	(a)	(a) 4.20	
		FL _Y [cm]		4.20	(a)	(a) 4.20	
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.01				
	Control 1 Depth		55	[mm]			
	Control 2 Focus		42	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 28.22

Table C-85: Transducer Model HST15-8/20 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
	Global Maximum Index Value	0.42	0.00	(a)	(a)	(a) 0.32
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.51				
	W ₀ [mW]		0.01	(a)		(a) 19.07
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				(a)	
	Z ₁ [cm]				(a)	
	Z _{bp} [cm]				(c)	
	zsp [cm]	3.32				(a)
	d _{eq} (z _{sp}) [cm]					(a)
	f _c [MHz]	6.60	6.60	(a)	(a)	(a) 6.60
	Dim of A _{aprt}	X [cm]	2.85	(a)	(a)	(a) 2.85
		Y [cm]	0.60	(a)	(a)	0.60
Other Information	PD [usec]	0.34				
	PRF [Hz]	63				
	p _r @PII _{max} [MPa]	1.10				
	d _{eq} @PII _{max} [cm]					(a)
	Focal Length	FL _X [cm]	4.00	(a)	(a)	4.00
		FL _Y [cm]	4.00	(a)	(a)	4.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.00				
Operating Control Conditions		Control 1 Depth	55 [mm]			
		Control 2 Focus	40 [mm]			
		Control 3 Gate	- [mm]			
		Control 4 Preset	GEN-General			

 ISPTA.3 [mW/cm²] = 6.3

Table C-86: Transducer Model HST15-8/20 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
	Global Maximum Index Value	0.19	(a)	0.44	0.22	0.86 0.16
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.61				
	W ₀ [mW]		(a)	9.20		9.20 9.20
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				3.45	
	Z ₁ [cm]				1.42	
	Z _{bp} [cm]				2.21	
	zsp [cm]	1.42				1.42
	d _{eq} (z _{sp}) [cm]					2.18
	f _c [MHz]	9.98	(a)	9.98	9.98	9.98 9.98
	Dim of A _{aprt}	X [cm]	(a)	2.85	2.85	2.85 2.85
		Y [cm]	(a)	0.60	0.60	0.60 0.60
Other Information	PD [usec]	1.45				
	PRF [Hz]	12500				
	p _r @PII _{max} [MPa]	0.99				
	d _{eq} @PII _{max} [cm]					0.90
	Focal Length	FL _X [cm]	(a)	4.00	4.00	9.98
		FL _Y [cm]	(a)	4.00	4.00	9.98
	I _{PA,3} @MI _{max} [W/cm ²]	0.28				
Operating Control Conditions		Control 1 Depth	55 [mm]			
		Control 2 Focus	40 [mm]			
		Control 3 Gate	20 [mm]			
		Control 4 Preset	GEN-General			

 ISPTA.3 [mW/cm²] = 276.03

Table C-87: Transducer Model HST15-8/20 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.19	0.00	0.56	0.22	0.01
Assoc. Acoustic Param.	Pr.3	[MPa]	0.61			
	W ₀	[mW]		0.00	11.82	11.82
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			4.44	
	Z ₁	[cm]			1.42	
	Z _{bp}	[cm]			2.21	
	zsp	[cm]	1.42			1.42
	d _{eq} (z _{sp})	[cm]				2.48
	f _c	[MHz]	9.98	9.98	9.98	9.98
Other Information	Dim of A _{aprt}		X [cm]	2.85	2.85	2.85
			Y [cm]	0.60	0.60	0.60
	PD	[μsec]	1.45			
	PRF	[Hz]	12500			
	p _r @PII _{max}	[MPa]	0.99			
	d _{eq} @PII _{max}	[cm]				1.02
	Focal Length	FL _X [cm]		3.00	3.00	3.00
		FL _Y [cm]		3.00	3.00	3.00
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.28			
	Control 1 Depth	55 [mm]				
	Control 2 Focus	40 [mm]				
	Control 3 Gate	20 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 277.21

Table C-88: Transducer Model HST15-8/20 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.08	0.00	0.62	0.21	0.01
Assoc. Acoustic Param.	Pr.3	[MPa]	0.21			
	W ₀	[mW]		0.08	19.75	19.75
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			1.18	
	Z ₁	[cm]			3.32	
	Z _{bp}	[cm]			2.21	
	zsp	[cm]	3.32			3.32
	d _{eq} (z _{sp})	[cm]				2.80
	f _c	[MHz]	6.60	6.60	6.60	6.60
Other Information	Dim of A _{aprt}		X [cm]	2.85	2.85	2.85
			Y [cm]	0.60	0.60	0.60
	PD	[μsec]	1.39			
	FPS	[Hz]	6			
	PRFd	[Hz]	4000			
	p _r @PII _{max}	[MPa]	0.44			
	d _{eq} @PII _{max}	[cm]				3.16
	Focal Length	FL _X [cm]		3.00	3.00	3.00
		FL _Y [cm]		3.00	3.00	3.00
Operating Control Conditions	I _{PA,3} @MI _{max}	[W/cm ²]	0.01			
	Control 1 Depth	55 [mm]				
	Control 2 Focus	40 [mm]				
	Control 3 Gate	24.5 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 21.51

Table C-89: Transducer Model 4DC7-3/40 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.49	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	1.05				
	W _o	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	3.97			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.50	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[usec]	0.45				
	PRF	[Hz]	37				
	p _r @PII _{max}	[MPa]	1.94				
Operating Control Conditions	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth	90	[mm]				
	Control 2 Focus	40	[mm]				
	Control 3 Gate	-	[mm]				
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 9.47

Table C-90: Transducer Model 4DC7-3/40 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.39	0.00	(a)	(a)	(a) 0.01	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.83				
	W _o	[mW]		0.01	(a)	(a) 0.85	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	5.12			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	4.50	4.50	(a)	(a) 4.50	
Other Information	Dim of A _{aprt}	X [cm]		6.40	(a)	(a) 6.40	
		Y [cm]		1.20	(a)	(a) 1.20	
	PD	[usec]	1.08				
	PRF	[Hz]	5000				
	p _r @PII _{max}	[MPa]	1.84				
Operating Control Conditions	Focal Length	FL _X [cm]		3.00	(a)	(a) 3.00	
		FL _Y [cm]		3.00	(a)	(a) 3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	0.00				
	Control 1 Depth	90	[mm]				
	Control 2 Focus	40	[mm]				
	Control 3 Gate	-	[mm]				
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 1.76

Table C-91: Transducer Model 4DC7-3/40 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
	Global Maximum Index Value	0.49	0.00	(a)	(a)	(a) 0.00
Assoc. Acoustic Param.	Pr.3 [MPa]	1.05				
	W ₀ [mW]		0.03	(a)		(a) (a)
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)] [mW]				(c)	
	Z ₁ [cm]				(c)	
	Z _{bp} [cm]				(a)	
	zsp [cm]	3.97				(a)
	d _{eq} (z _{sp}) [cm]					(a)
	f _c [MHz]	4.50	4.50	(a) (a)	(a)	4.50
Other Information	Dim of A _{aprt}	X [cm]	6.40	(a) (a)	(a)	6.40
		Y [cm]	1.20	(a) (a)	(a)	1.20
	PD [μsec]	0.45				
	PRF [Hz]	41				
	p _r @PII _{max} [MPa]	1.94				
Operating Control Conditions	d _{eq} @PPI _{max} [cm]					(a)
	Focal Length	FL _X [cm]	3.00	(a) (a)		3.00
		FL _Y [cm]	3.00	(a) (a)		3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.00				
Control 1 Depth		90 [mm]				
Control 2 Focus		40 [mm]				
Control 3 Gate		- [mm]				
Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 10.5

Table C-92: Transducer Model 4DC7-3/40 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
	Global Maximum Index Value	0.32	(a)	4.98	2.73	4.03 1.86
Assoc. Acoustic Param.	Pr.3 [MPa]	0.69				
	W ₀ [mW]		(a)	232.23		232.23 232.23
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)] [mW]				6.22	
	Z ₁ [cm]				3.27	
	Z _{bp} [cm]				4.69	
	zsp [cm]	3.27				3.27
	d _{eq} (z _{sp}) [cm]					10.87
	f _c [MHz]	4.50	(a)	4.50	4.50	4.50 4.50
Other Information	Dim of A _{aprt}	X [cm]	(a)	6.40	6.40	6.40 6.40
		Y [cm]	(a)	1.20	1.20	1.20 1.20
	PD [μsec]	4.08				
	PRF [Hz]	6700				
	p _r @PPI _{max} [MPa]	1.15				
Operating Control Conditions	d _{eq} @PPI _{max} [cm]					5.35
	Focal Length	FL _X [cm]	(a)	4.00	4.00	
		FL _Y [cm]	(a)	4.00	4.00	4.50
	I _{PA,3} @MI _{max} [W/cm ²]	0.10				
Control 1 Depth		90 [mm]				
Control 2 Focus		40 [mm]				
Control 3 Gate		10 [mm]				
Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 415.94

Table C-93: Transducer Model 4DC7-3/40 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.32	0.005	5.74	2.73	0.06
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.69				
	W ₀ [mW]		0.22	268.04		268.04
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				6.22	
	Z ₁ [cm]					3.27
	Z _{bp} [cm]					4.69
	zsp [cm]	3.27				3.27
	d _{eq} (z _{sp}) [cm]					11.68
	f _c [MHz]	4.50	4.50	4.50	4.50	4.50
	Dim of A _{aprt}	X [cm] Y [cm]	6.40 1.20	6.40 1.20	6.40 1.20	6.40 1.20
Other Information	PD [usec]	4.08				
	PRF [Hz]	6700				
	p _r @PII _{max} [MPa]	1.15				
	d _{eq} @PII _{max} [cm]				5.74	
	Focal Length	FL _X [cm] FL _Y [cm]	3.00 3.00	3.00 3.00		3.00 3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.11				
Operating Control Conditions	Control 1 Depth	90 [mm]				
	Control 2 Focus	40 [mm]				
	Control 3 Gate	10 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 420.8

Table C-94: Transducer Model 4DC7-3/40 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.32	0.005	5.74	2.73	0.06
Assoc. Acoustic Param.	Pr ₃ [MPa]	0.69				
	W ₀ [mW]		0.23			268.04
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)] [mW]				26.90	
	Z ₁ [cm]					3.27
	Z _{bp} [cm]					4.69
	zsp [cm]	3.27				3.27
	d _{eq} (z _{sp}) [cm]					11.68
	f _c [MHz]	4.50	4.50	4.50	4.50	4.50
	Dim of A _{aprt}	X [cm] Y [cm]	6.40 1.20	6.40 1.20	6.40 1.20	6.40 1.20
Other Information	PD [usec]	4.08				
	FPS [Hz]	7				
	PRFd [Hz]	5000				
	p _r @PII _{max} [MPa]	1.15				
	d _{eq} @PII _{max} [cm]				2.76	
	Focal Length	FL _X [cm] FL _Y [cm]	3.00 3.00	3.00 3.00		3.00 3.00
	I _{PA,3} @MI _{max} [W/cm ²]	0.13				
Operating Control Conditions	Control 1 Depth	90 [mm]				
	Control 2 Focus	40 [mm]				
	Control 3 Gate	10 [mm]				
	Control 4 Preset	GEN-General				

 ISPTA.3 [mW/cm²] = 500.52

Table C-95: Transducer Model 4DEC9-5/10 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		1.35	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	3.02				
	W ₀	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	1.00			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	5.00	(a)	(a)	(a)	
Other Information	Dim of A _{aprt}	X [cm]		(a)	(a)	(a)	
		Y [cm]		(a)	(a)	(a)	
	PD	[μsec]	0.84				
	PRF	[Hz]	59				
	p _r @PII _{max}	[MPa]	3.59				
	d _{eq} @PPI _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		(a)	(a)	(a)	
		FL _Y [cm]		(a)	(a)	(a)	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	215.09				
	Control 1 Depth		50	[mm]			
	Control 2 Focus		45	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 286.96

Table C-96: Transducer Model 4DEC9-5/10 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		1.35	4.19	(a)	(a)	(a) 4.28	
Assoc. Acoustic Param.	Pr.3	[MPa]	3.02				
	W ₀	[mW]		176.01	(a)	(a) 136.49	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	1.00			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	5.00	5.00	(a)	(a) 5.00	
Other Information	Dim of A _{aprt}	X [cm]		1.00	(a)	(a) 1.00	
		Y [cm]		0.50	(a)	(a) 0.50	
	PD	[μsec]	0.84				
	PRF	[Hz]	19				
	p _r @PPI _{max}	[MPa]	3.59				
	d _{eq} @PPI _{max}	[cm]				(a)	
	Focal Length	FL _X [cm]		3.00	(a)	(a) 3.00	
		FL _Y [cm]		3.00	(a)	(a) 3.00	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	215.09				
	Control 1 Depth		50	[mm]			
	Control 2 Focus		20	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset	GEN-General					

 ISPTA.3 [mW/cm²] = 229.42

Table C-97: Transducer Model 4DEC9-5/10 (Operating Mode: M)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		1.35	4.84	(a)	(a)	0.45
Assoc. Acoustic Param.	Pr ₃	[MPa]	3.02			
	W ₀	[mW]		203.36	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)	
	Z ₁	[cm]			(c)	
	Z _{bp}	[cm]			(a)	
	zsp	[cm]	1.00			(a)
	d _{eq} (z _{sp})	[cm]				(a)
	f _c	[MHz]	5.00	5.00	(a)	(a)
	Dim of A _{aprt}		X [cm]	1.00	(a)	(a)
			Y [cm]	0.50	(a)	0.50
Other Information	PD	[usec]	0.84			
	PRF	[Hz]	42			
	p _r @PII _{max}	[MPa]	3.59			
	d _{eq} @PII _{max}	[cm]				(a)
	Focal Length	FL _X [cm]		3.00	(a)	(a)
		FL _Y [cm]		3.00	(a)	(a)
	I _{PA,3} @MI _{max}	[W/cm ²]	215.09			
Operating Control Conditions	Control 1 Depth		50	[mm]		
	Control 2 Focus		45	[mm]		
	Control 3 Gate		-	[mm]		
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 204.28

Table C-98: Transducer Model 4DEC9-5/10 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB	TIC
			scan	non-scan		
Global Maximum Index Value		0.42	(a)	1.35	0.57	1.39
Assoc. Acoustic Param.	Pr ₃	[MPa]	0.93			
	W ₀	[mW]		(a)	56.71	56.71
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			16.41	
	Z ₁	[cm]			1.08	
	Z _{bp}	[cm]			1.20	
	zsp	[cm]	1.08			1.08
	d _{eq} (z _{sp})	[cm]				6.31
	f _c	[MHz]	5.00	(a)	5.00	5.00
	Dim of A _{aprt}		X [cm]	(a)	1.00	1.00
			Y [cm]	(a)	0.50	0.50
Other Information	PD	[usec]	2.46			
	PRF	[Hz]	6700			
	p _r @PII _{max}	[MPa]	1.12			
	d _{eq} @PII _{max}	[cm]				1.91
	Focal Length	FL _X [cm]		(a)	5.50	5.50
		FL _Y [cm]		(a)	5.50	5.50
	I _{PA,3} @MI _{max}	[W/cm ²]	0.11			
Operating Control Conditions	Control 1 Depth		70	[mm]		
	Control 2 Focus		55	[mm]		
	Control 3 Gate		10	[mm]		
	Control 4 Preset		GEN-General			

 ISPTA.3 [mW/cm²] = 438.9

Table C-99: Transducer Model 4DEC9-5/10 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB		TIC
			scan	non-scan	A _{aprt} ≤1	A _{aprt} >1	
Global Maximum Index Value		1.35	4.67	5.50	9.61	0.18	7.24
Assoc. Acoustic Param.	Pr.3	[MPa]	3.02				
	W _o	[mW]		196.30	231.15		231.15
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)]	[mW]			16.87		
	Z ₁	[cm]			1.00		
	Z _{bp}	[cm]			1.20		
	zsp	[cm]	1.00			1.00	
	d _{eq} (z _{sp})	[cm]				12.83	
	f _c	[MHz]	5.00	5.00	5.00	5.00	5.00
	Dim of A _{aprt}	X [cm]		1.00	1.00	1.00	1.00
		Y [cm]		0.50	0.50	0.50	0.50
Other Information	PD	[μsec]	0.84				
	PRF	[Hz]	19				
	p _r @PII _{max}	[MPa]	3.59				
	d _{eq} @PPI _{max}	[cm]				3.83	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	3.00
		FL _Y [cm]		3.00	3.00	3.00	3.00
Operating Control Conditions	I _{P A,3} @MI _{max}	[W/cm ²]	215.09				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		55	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 531.31

Table C-100: Transducer Model 4DEC9-5/10 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB		TIC
			scan	non-scan	A _{aprt} ≤1	A _{aprt} >1	
Global Maximum Index Value		1.35	4.68	5.54	8.63	10.16	7.29
Assoc. Acoustic Param.	Pr.3	[MPa]	3.02				
	W _o	[mW]		196.75	232.72		232.72
	min of [W ₃ (z ₁) : I _{T A,3} (z ₁)]	[mW]			12.65		
	Z ₁	[cm]			1.00		
	Z _{bp}	[cm]			1.20		
	zsp	[cm]	1.00			1.00	
	d _{eq} (z _{sp})	[cm]				12.87	
	f _c	[MHz]	5.00	5.00	5.00	5.00	5.00
	Dim of A _{aprt}	X [cm]		1.00	1.00	1.00	1.00
		Y [cm]		0.50	0.50	0.50	0.50
Other Information	PD	[μsec]	0.84				
	FPS	[Hz]	7				
	PRFd	[Hz]	4000				
	p _r @PPI _{max}	[MPa]	3.59				
	d _{eq} @PPI _{max}	[cm]				4.44	
	Focal Length	FL _X [cm]		3.00	3.00	3.00	3.00
Operating Control Conditions		FL _Y [cm]		3.00	3.00	3.00	3.00
	I _{P A,3} @MI _{max}	[W/cm ²]	215.09				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		55	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 384.61

Table C-101: Transducer Model 4DL14-5/38 (Operating Mode: B)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.35	(a)	(a)	(a)	(a)	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.63				
	W _o	[mW]		(a)	(a)	(a)	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(a)		
	Z ₁	[cm]			(a)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.33			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	3.30	(a)	(a)	(a)	
	Dim of A _{aprt}		X [cm]	(a)	(a)	(a)	
			Y [cm]	(a)	(a)	(a)	
Other Information	PD	[usec]	1.50				
	PRF	[Hz]	68				
	p _r @PII _{max}	[MPa]	1.04				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length		FL _x [cm]	(a)	(a)	(a)	
			FL _y [cm]	(a)	(a)	(a)	
	I _{PA,3} @MI _{max}	[W/cm ²]	12.98				
Operating Control Conditions	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 31.77523$$

Table C-102: Transducer Model 4DL14-5/38 (Operating Mode: Color and Power Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.35	0.02	(a)	(a)	(a) 0.02	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.63				
	W _o	[mW]		1.57	(a)	(a) 1.94	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(a)		
	zsp	[cm]	4.33			(a)	
	d _{eq} (z _{sp})	[cm]				(a)	
	f _c	[MHz]	3.30	3.30	(a)	(a) 3.30	
	Dim of A _{aprt}		X [cm]	6.00	(a)	(a) 6.00	
			Y [cm]	0.80	(a)	(a) 0.80	
Other Information	PD	[usec]	1.50				
	PRF	[Hz]	6				
	p _r @PII _{max}	[MPa]	1.04				
	d _{eq} @PII _{max}	[cm]				(a)	
	Focal Length		FL _x [cm]	3.00	(a)	(a) 3.00	
			FL _y [cm]	3.00	(a)	(a) 3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	12.98				
Operating Control Conditions	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		-	[mm]			
	Control 4 Preset		GEN-GEN				

$$\text{ISPTA.3 [mW/cm}^2\text{]} = 35.76714$$

Table C-103: Transducer Model 4DL14-5/38 (Operating Mode: M)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.35	0.49	(c)	(c)	2.85	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.63			0.01	
	W ₀	[mW]		31.08	(c)	38.02	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			(c)		
	Z ₁	[cm]			(c)		
	Z _{bp}	[cm]			(c)		
	zsp	[cm]	4.33			4.33	
	d _{eq} (z _{sp})	[cm]				3.52	
	f _c	[MHz]	3.30	3.30	(c)	3.30	
Other Information	Dim of A _{aprt}	X [cm]		6.00	(c)	6.00	
		Y [cm]		0.80	(c)	0.80	
	PD	[μsec]	1.50				
	PRF	[Hz]	55				
	p _r @PII _{max}	[MPa]	1.04				
Operating Control Conditions	d _{eq} @PPI _{max}	[cm]				2.15	
	Focal Length	FL _X [cm]		3.00	(c)	3.00	
		FL _Y [cm]		3.00	(c)	3.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	12.98				
	Control 1 Depth	70	[mm]				
	Control 2 Focus	50	[mm]				
Operating Control Conditions	Control 3 Gate	-	[mm]				
	Control 4 Preset	GEN-GEN					

$$ISPTA.3 [\text{mW/cm}^2] = 26.77141$$

Table C-104: Transducer Model 4DL14-5/38 (Operating Mode: PW Doppler)

Index Label		MI	TIS		TIB non-scan	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.13	(a)	0.23	0.054	2.54	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.23				
	W ₀	[mW]		(a)	14.55	14.55	
	min of [W ₃ (z ₁) : I _{TA,3} (z ₁)]	[mW]			0.57		
	Z ₁	[cm]			4.50		
	Z _{bp}	[cm]			3.71		
	zsp	[cm]	4.50			4.50	
	d _{eq} (z _{sp})	[cm]				2.71	
	f _c	[MHz]	3.30	(a)	3.30	3.30	
Other Information	Dim of A _{aprt}	X [cm]		(a)	6.00	6.00	
		Y [cm]		(a)	0.80	0.80	
	PD	[μsec]	4.15				
	PRF	[Hz]	5000				
	p _r @PPI _{max}	[MPa]	0.39				
Operating Control Conditions	d _{eq} @PPI _{max}	[cm]				4.43	
	Focal Length	FL _X [cm]		(a)	5.00	5.00	
		FL _Y [cm]		(a)	5.00	5.00	
	I _{PA,3} @MI _{max}	[W/cm ²]	1.36				
	Control 1 Depth	70	[mm]				
	Control 2 Focus	50	[mm]				
Operating Control Conditions	Control 3 Gate	10	[mm]				
	Control 4 Preset	GEN-GEN					

$$ISPTA.3 [\text{mW/cm}^2] = 28.18728$$

Table C-105: Transducer Model 4DL14-5/38 (Operating Mode: PW+B)

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.35	0.25	0.34	0.1519	2.85	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.63				
	W ₀	[mW]		16.04	21.66	21.66	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			0.59		
	Z ₁	[cm]			4.33		
	Z _{bp}	[cm]			3.71		
	zsp	[cm]	4.33			4.33	
	d _{eq} (z _{sp})	[cm]				3.34	
	f _c	[MHz]	3.30	3.30	3.30	3.30	
	Dim of A _{aprt}		X [cm]	6.00	6.00	6.00	
			Y [cm]	0.80	0.80	0.80	
Other Information	PD	[usec]	1.50				
	PRF	[Hz]	23				
	p _r @PII _{max}	[MPa]	1.04				
	d _{eq} @PII _{max}	[cm]				5.35	
	Focal Length		F _{LX} [cm]	3.00	3.00	3.00	
			F _{LY} [cm]	3.00	3.00	3.00	
	I _{P,A,3} @MI _{max}	[W/cm ²]	1.36				
Operating Control Conditions							
	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-GEN				

 ISPTA.3 [mW/cm²] = 38.93478

Table C-106: Transducer Model 4DL14-5/38 (Operating Mode: Triplex (B/Color/PW))

Index Label		MI	TIS		TIB	TIC	
			scan	non-scan			
				$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		0.35	0.0003	0.34	0.152	2.86	
Assoc. Acoustic Param.	Pr.3	[MPa]	0.63				
	W ₀	[mW]		0.02	21.75	21.75	
	min of [W ₃ (z ₁) : I _{T,A,3} (z ₁)]	[mW]			5.49		
	Z ₁	[cm]			4.33		
	Z _{bp}	[cm]			3.71		
	zsp	[cm]	4.33			4.33	
	d _{eq} (z _{sp})	[cm]				3.35	
	f _c	[MHz]	3.30	3.30	3.30	3.30	
	Dim of A _{aprt}		X [cm]	6.00	6.00	6.00	
			Y [cm]	0.80	0.80	0.80	
Other Information	PD	[usec]	1.50				
	FPS	[Hz]	7				
	PRFd	[Hz]	5000				
	p _r @PII _{max}	[MPa]	1.04				
	d _{eq} @PII _{max}	[cm]				1.75	
	Focal Length		F _{LX} [cm]	3.00	3.00	3.00	
			F _{LY} [cm]	3.00	3.00	3.00	
Operating Control Conditions	I _{P,A,3} @MI _{max}	[W/cm ²]	12.98				
	Control 1 Depth		70	[mm]			
	Control 2 Focus		50	[mm]			
	Control 3 Gate		10	[mm]			
	Control 4 Preset		GEN-General				

 ISPTA.3 [mW/cm²] = 162.35

C.4 ULTRASOUND INDICATIONS FOR USE TABLES

**TABLE C-107: SONIXTOUCH ULTRASOUND SCANNER
DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORMS**

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combine Modes12	Other [Notes]
Ophthalmic								
Fetal	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Abdominal	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Small Organ ²	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8,11]
Neonatal Cephalic	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8,11]
Adult Cephalic	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8,11]
Cardiac	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Transesophageal	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Transrectal	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Transvaginal	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Transurethral								
Transcranial	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Peripheral Vascular	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Laparoscopic								
MSK Conventional	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
MSK Superficial	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,11]
Vascular Access	♦	♦	♦	♦	♦	♦	♦	♦ [3-8,10,11]
Nerve Block	♦	♦	♦	♦	♦	♦	♦	♦ [3-9,11]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-108: SA4-2/24 Phased Array Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	Other [Notes]
Ophthalmic								
Fetal								
Abdominal	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Small Organ ²								
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Cardiac	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Peripheral Vascular								
Laparoscopic								
MSK Conventional								
MSK Superficial								
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM

Table C-109: PAT-4/12 Phased Array Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal								
Abdominal	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Small Organ ²								
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Cardiac	♦	♦	♦	♦ [^]	♦	♦	♦	♦ [3-6,8]
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Peripheral Vascular								
Laparoscopic								
MSK Conventional								
MSK Superficial								
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
 2. Breast, Thyroid, Testicle
 3. Elastography
 4. Panoramic Imaging
 5. Compound Imaging
 6. Freehand 3D Imaging
 7. Live 3D/4D Imaging
 8. Imaging for guidance of biopsy
 9. Imaging for guidance of nerve block injections
 10. Imaging for guidance of central or peripheral lines
 11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
 12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.
- ^ Compatible only with systems with Serial Numbers beginning **SXTCH3.0-4.x**, **MDP3.0-4.x**, **SP3.0-4.x**, **OP3.0-4.x** and/or modulus with Serial Numbers beginning **HRVMOD**.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-110: MC9-4/12 Microconvex Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-6,8,10]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-6,8-9]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM

Table C-111: EC9-5/10 and EC9-5/10 GPS Microconvex Endocavity Radius Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	Other [Notes]
Ophthalmic								
Fetal								
Abdominal								
Intraoperative ¹								
Intraoperative Neurological								
Pediatric								
Small Organ ²								
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal	♦	♦	♦		♦	♦	♦	♦ [3-6,,8,11]
Transvaginal	♦	♦	♦		♦	♦	♦	♦ [3-6,,8,11]
Transurethral								
Transcranial								
Peripheral Vascular								
Laparoscopic								
MSK Conventional								
MSK Superficial								
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-112: C5-2/60 and C5-2/60 GPS Convex Radius Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	Other [Notes]
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

13. Abdominal organs and vascular
14. Breast, Thyroid, Testicle
15. Elastography
16. Panoramic Imaging
17. Compound Imaging
18. Freehand 3D Imaging
19. Live 3D/4D Imaging
20. Imaging for guidance of biopsy
21. Imaging for guidance of nerve block injections
22. Imaging for guidance of central or peripheral lines
23. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
24. BB/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-113: C7-3/50 Convex Radius Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

25. Abdominal organs and vascular
26. Breast, Thyroid, Testicle
27. Elastography
28. Panoramic Imaging
29. Compound Imaging
30. Freehand 3D Imaging
31. Live 3D/4D Imaging
32. Imaging for guidance of biopsy
33. Imaging for guidance of nerve block injections
34. Imaging for guidance of central or peripheral lines
35. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
36. BB/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-114: BPC8-4/10 Microconvex Endocavity Biplane Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	Other [Notes]
Ophthalmic								
Fetal								
Abdominal								
Intraoperative ¹								
Intraoperative Neurological								
Pediatric								
Small Organ ²								
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular								
Laparoscopic								
MSK Conventional								
MSK Superficial								
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-115: BPL9-5/55 Linear Endocavity Biplane Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal								
Abdominal								
Intraoperative ¹								
Intraoperative Neurological								
Pediatric								
Small Organ ²								
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal	♦	♦	♦	♦	♦	♦	♦	♦ [3-6,8]
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular								
Laparoscopic								
MSK Conventional								
MSK Superficial								
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-116: L9-4/38 Linear Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-6,8,10]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-6,8,9]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-117: L14-5/38 and L14-5/38 GPS Linear Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Adult Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8,11]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-6,8,10,11]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-6,8,9,11]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-118: L14-5W/60 Wide Linear Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-6,8,10]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-6,8,9]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM

Table C-119: L40-8/12 Linear Transducer ^

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal								
Abdominal								
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-6,8,10]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-6,8,9]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
 2. Breast, Thyroid, Testicle
 3. Elastography
 4. Panoramic Imaging
 5. Compound Imaging
 6. Freehand 3D Imaging
 7. Live 3D/4D Imaging
 8. Imaging for guidance of biopsy
 9. Imaging for guidance of nerve block injections
 10. Imaging for guidance of central or peripheral lines
 11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
 12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.
- ^ Compatible only with systems with Serial Numbers beginning **SXTCH3.0-4.x**, **MDP3.0-4.x**, **SP3.0-4.x**, **OP3.0-4.x** and/or modulus with Serial Numbers beginning **HRVMOD**.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-120: HST15-8/20 Linear Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal								
Abdominal								
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-6,8]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-6,8,10]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-6,8,9]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-121: 4DC7-3/40 Motorized Convex Radius Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-8]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-8]
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular								
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-8]
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-122: 4DEC9-5/10 Motorized Microconvex Endocavity Radius Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	Other [Notes]
Ophthalmic								
Fetal								
Abdominal								
Intraoperative ¹								
Intraoperative Neurological								
Pediatric								
Small Organ ²								
Neonatal Cephalic								
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal	♦	♦	♦		♦	♦	♦	♦ [3-6,,8,11]
Transvaginal	♦	♦	♦		♦	♦	♦	♦ [3-6,,8,11]
Transurethral								
Transcranial								
Peripheral Vascular								
Laparoscopic								
MSK Conventional								
MSK Superficial								
Vascular Access								
Nerve Block								
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

DIAGNOSTIC ULTRASOUND INDICATIONS FOR USE FORM
Table C-123: 4DL14-5/38 Linear Transducer

Intended use: Diagnostic ultrasound imaging or fluid flow analysis of the human body as follows:

Clinical Application	Mode of Operation							Other [Notes]
	B	M	PW Doppler	CW Doppler	Color Doppler	Power Doppler	Combined Modes ¹²	
Ophthalmic								
Fetal	♦	♦	♦		♦	♦	♦	♦ [3-8]
Abdominal	♦	♦	♦		♦	♦	♦	♦ [3-8]
Intraoperative ¹								
Intraoperative Neurological								
Pediatric	♦	♦	♦		♦	♦	♦	♦ [3-8]
Small Organ ²	♦	♦	♦		♦	♦	♦	♦ [3-8]
Neonatal Cephalic	♦	♦	♦		♦	♦	♦	♦ [3-8]
Adult Cephalic								
Cardiac								
Transesophageal								
Transrectal								
Transvaginal								
Transurethral								
Transcranial								
Peripheral Vascular	♦	♦	♦		♦	♦	♦	♦ [3-8]
Laparoscopic								
MSK Conventional	♦	♦	♦		♦	♦	♦	♦ [3-8]
MSK Superficial	♦	♦	♦		♦	♦	♦	♦ [3-8]
Vascular Access	♦	♦	♦		♦	♦	♦	♦ [3-8,10]
Nerve Block	♦	♦	♦		♦	♦	♦	♦ [3-9]
Other								

♦ = Cleared for use

Notes:

1. Abdominal organs and vascular
2. Breast, Thyroid, Testicle
3. Elastography
4. Panoramic Imaging
5. Compound Imaging
6. Freehand 3D Imaging
7. Live 3D/4D Imaging
8. Imaging for guidance of biopsy
9. Imaging for guidance of nerve block injections
10. Imaging for guidance of central or peripheral lines
11. Volume Navigation/Image Fusion/GPS (available only with the GPS transducer)
12. B/M, B/PW Doppler or CW Doppler, B/C/PW Doppler (Triplex) or CW Doppler (Triplex CW), B/Power Doppler/PW Doppler or CW Doppler, Simultaneous Color Doppler or Power Doppler.

APPENDIX D: MAINTENANCE AND CLEANING

D.1 TRANSDUCERS

Be sure to read and follow all procedures, Warnings and Cautions before using any Ultrasonix ultrasound transducers.

D.1.1 Guidelines

Ultrasonix recommends inspecting the transducers prior to each use:

- Ensure the transducers are always clean before they are used. There must be no ultrasound gel (from previous imaging), any debris, films or unusual odors present.
- Ensure there are no cracks or other damage to the transducers before they are used. Inspect the transducer surfaces for cracks and feel for cracks with finger tips as well.

Where any transducer (including, but not limited to, an intracavity transducer) is used in a clinical application of a semi-critical nature (including, but not limited to, intraoperative, transrectal, transvaginal, transesophageal, etc.), ensure the transducer is covered with the appropriate STERILE transducer cover/sheath which has received regulatory clearance for use. Refer to [Accessories—Third Party](#) in Appendix B for the recommended transducer cover/sheath.

D.1.2 Ultrasound Coupling Gels

The following ultrasound coupling gel is recommended for use with Ultrasonix transducers:

Table D-1: Recommended Ultrasound Coupling Gel

Gel Name	Manufacturer	Address	Telephone/Fax	Internet/E-Mail
Aquasonic 100	Parker Laboratories, Inc.	286 Eldridge Road Fairfield, NJ, 07004 USA	Tel: (800) 631-8888 Fax: (973) 276-9510	www.parkerlabs.com parker@parkerlabs.com



Caution: Failure to use the recommended gel may cause damage and void transducer warranties.

Do not use lotions.

If there are any questions, contact Ultrasonix Medical Corporation.

D.1.3 General Transducer Maintenance



Cautions:

DO NOT drop the transducers.

DO NOT hit the transducers against any surface that can dislodge or damage any of the transducer components.

DO NOT pinch or kink the transducer cable.

DO NOT use a brush to clean the transducer. (Use a soft cloth.)

DO NOT immerse the transducer scan head past the first seam in any liquid.

DO NOT soak the transducer for extended periods of time.

DO NOT rinse or immerse near the strain relief.

DO NOT use coupling gels and cleaning agents that have not been recommended by Ultrasonix.

DO NOT use sterilization or disinfection methods that have not been recommended by Ultrasonix. Severe damage will result. Contact Ultrasonix if you have any doubt about sterilization or disinfection methods. Use of non-recommended cleaning agents may cause damage to the housing and will void transducer warranties.

DO NOT use chemicals such as phenol, benzethonium chloride, pHisoHex, benzoyl peroxide, hydrogen peroxide—commonly found in hospitals or clinics. These chemicals will damage the transducer.

D.1.3.1 Inspection and Testing

Inspect the transducers prior to each use:

- always ensure the transducers are clean before they are used. There must be no ultrasound gel (from previous imaging), debris, films, or unusual odors present
- ensure there are no cracks or other damage to the transducers before they are used. Inspect the transducer surfaces for cracks and feel for cracks with finger tips as well.



Cautions:

DO NOT use transducers if they are found to be cracked, damaged, or broken.

DO NOT use the transducer if the transducer cable insulation is damaged, thereby exposing the wiring.

D.1.3.2 Storing and Packaging

To help avoid contamination, ensure the transducer is clean/disinfected and dry before storing/packing it. Store transducers:

- in one of the transducer holders
- separately, in a protected environment to avoid inadvertent transducer damage
- in the original case (recommended)
- away from direct sunlight, dust and extreme temperatures.

After placing a transducer in its carrying case, wrap the case in bubble wrap and place the wrapped case in a cardboard box.

D.1.4 General Transducer Cleaning/Disinfecting Recommendations and Warnings



Warnings:

Never sterilize the transducer with sterilization techniques such as autoclave, ultraviolet, gamma radiation, gas, steam, or heat sterilization techniques. Severe damage will result using the above sterilization techniques.

Use of precleaning solutions should be restricted to the external transducer face. DO NOT get solution on any other areas or surfaces of the transducer. This includes transducer connectors and contacts.

Some chemicals such as phenol, benzethonium chloride, pHisoHex, benzoyl peroxide, hydrogen peroxide are commonly found in clinic and hospital settings, while others are found in antibacterial skin cleaners or lotions. **Use of these chemicals will cause damage to your transducer.**

Avoid transducer contact with strong solvents such as acetone, freon and other industrial cleansers.

Follow all infection control policies and procedures established by your organization, including safety procedures involving personal protective equipment (such as gloves, protective eyewear and protective clothing)

DO NOT use sterilization or disinfection methods that have not been recommended by Ultrasonix. Severe damage will result. Contact Ultrasonix if you have any doubt about sterilization or disinfection methods.



Warning: Any transducer suspected of being contaminated with **Creutzfeld Jacob disease** material cannot be cleaned, disinfected or sterilized.

Contact Ultrasonix Medical Corporation to obtain instructions on the proper disposal of these transducers.

Remove ultrasound transmission gel with a dry or water-moistened soft cloth. It is recommended that transducers are reprocessed as soon as is reasonably practical following use.



Cautions:

Use only Ultrasonix recommended cleaners/disinfectants/sterilants ([Table D-2](#) and [Table D-3](#)). They have been tested and determined safe to use on Ultrasonix transducers. Failure to follow these instructions may cause damage and will void transducer warranties.

Reprocessing should be completed only by personnel thoroughly trained in proper cleaning/disinfection procedures.

Follow all product/manufacturer label cleaning and safety instructions.

Always verify product expiration dates.

Follow all regulatory and manufacturer instructions on product disposal.

For complete regulatory information and approval status on the products listed here, refer to the relevant EPA, FDA, Health Canada and CE documentation.

Note: Repeated processing has minimal effect on these transducers. End of life is normally determined by wear and damage due to use. Disassembly is not required.

D.1.5 Cleaning/Disinfecting Non-Invasive Transducers

To prevent biological materials (bioburden) from drying on the equipment, always reprocess transducers as soon as is reasonably practical following use.

Table D-2: Non-Invasive Cleaning/Disinfecting Agents

NON-INVASIVE TRANSDUCERS		CLEANING/DISINFECTING AGENTS												
		75% IPA	Alkazyme	Cidex Activated Dialdehyde Solution 14 day	Cidex Plus 28 day	Cidex OPA	Cidzyme	Klenzyme	McKesson Brand	Metrizyme	Milton Disinfecting Liquid	Nuclean	Omnicide – FG2	Steranios 2%
MISCELLANEOUS	SA4-2/24				♦	♦					♦			♦
	PA7-4/12				♦	♦					♦			♦
	MC9-4/12			♦	♦						♦			♦
	HST15-8/20		♦	♦	♦	♦	♦							
	4DC7-3/40		♦	♦	♦	♦	♦							
	PA4-2/20		♦	♦	♦	♦	♦							
	L40-8/12	♦			♦		♦						♦	
GPS	4DL14-5/38	♦			♦		♦						♦	
	C5-2/60 GPS	♦		♦	♦		♦	♦	♦		♦	♦		♦
LINEAR AND CONVEX	L14-5/38 GPS	♦		♦	♦		♦	♦	♦		♦	♦		♦
	C5-2/60	♦			♦	♦	♦	♦	♦	♦	♦		♦	
	C7-3/50	♦			♦	♦	♦	♦	♦	♦	♦		♦	
	C9-5/10	♦			♦	♦	♦	♦	♦	♦	♦		♦	
	L9-4/38	♦			♦	♦	♦	♦	♦	♦	♦		♦	
	L14-5/38	♦			♦	♦	♦	♦	♦	♦	♦		♦	
	L14-5W/60	♦			♦	♦	♦	♦	♦	♦	♦		♦	



Caution: Use only Ultrasonix recommended cleaners/disinfectants ([Table D-2](#)). They have been tested and determined safe to use on Ultrasonix transducers. **Failure to follow these instructions may cause damage and will void transducer warranties.**

D.1.5.1 Cleaning Non-Invasive Transducers

Thorough cleaning is essential for successful disinfection. If a transducer is not properly cleaned, any remaining particles (e.g., blood, bodily fluids, dirt) may protect the microorganisms from the disinfection process, rendering it ineffective. Disinfectants overloaded with soil can become contaminated and may themselves become a source for microorganism transmission.

Before cleaning, always remove covers, accessories and attachments.

To Clean a Transducer:

1. After every patient exam, wipe the ultrasound transmission gel off the transducer.
2. Wipe the transducer and cable with a soft, dry or water-moistened cloth.
3. Following the manufacturer's instructions, clean the transducer with a recommended cleaning/disinfecting agent from [Table D-2](#).
4. Remove any residue with a soft cloth moistened in water then wipe with a clean, dry cloth.



Caution: Do not allow cleaning solutions to air dry on the transducer.

D.1.5.2 Disinfecting Non-Invasive Transducers

Using a disinfecting agent from the list in [Table D-2](#), follow the manufacturer's instructions to disinfect the transducer.

D.1.6 Cleaning/Disinfecting Endocavity Transducers

Endocavity transducers are semi-critical medical devices and must be decontaminated using, at a minimum, High Level Disinfection.

Clean and disinfect transducers prior to the first exam and following each exam thereafter.

Table D-3: Endocavity Cleaning/Disinfecting Agents

ENDOCAVITY TRANSDUCERS	CLEANING/DISINFECTING AGENTS			
	Cidex Activated Dialdehyde Solution 14 day	Cidex Plus 28 day	Cidex OPA	Cidezyme
EC9-5/10	♦	♦	♦	♦
EC9-5/10 GPS	♦	♦	♦	♦
4DEC9-5/10				
BPC8-4/10				
BPL9-5/55	♦	♦	♦	♦



Caution: Use only Ultrasonix recommended cleaners/disinfectants (**Table D-3**). They have been tested and determined safe to use on Ultrasonix transducers. Failure to follow these instructions may cause damage and will void transducer warranties.

To Clean/Disinfect a Transducer:

1. Unplug the transducer.
2. Wash the transducer head and cable with soap and water to remove any protein buildup; however do not rinse or immerse the transducer near the strain relief.
3. Following the manufacturer's instructions, disinfect the transducer with a recommended disinfecting agent from **Table D-3**.

Note: Where any transducer (including, but not limited to, an intracavity transducer) is used in a clinical application of a semi-critical nature (including, but not limited to intraoperative, transrectal, transvaginal, transesophageal, etc.), ensure the transducer is covered with the appropriate STERILE transducer cover/sheath which has received regulatory clearance for use. Refer to **Accessories—Third Party** in Appendix B for the recommended transducer cover/sheath.

4. Wipe with a clean, dry cloth.



Caution: Do not allow cleaning solutions to air dry on the transducer.

D.1.7 Sterilization

Sterilization of transducers is not possible. Follow the instructions for cleaning and disinfection instead:

- Endocavity transducers: **D.1.6**
- Non-invasive transducers: **D.1.5.1** and **D.1.5.2**.

Note: Where transducers (non-critical and semi-critical medical devices/equipment) cannot withstand sterilization, the FDA recognizes the use of a sterile gel and a sterile transducer cover as an acceptable method of infection control for ultrasound transducers.

D.2 SHIPPING TRANSDUCERS FOR SERVICE

It is the customer's responsibility to ensure:

- each transducer is disinfected prior to shipping ([D.1.5](#) and [D.1.6](#))
- the transducer is properly packaged for shipment ([D.1.3.2](#))
- all shipping waybills/paperwork is completed as per the relevant regulations and laws.

D.3 RECOMMENDED FREQUENCY OF HIGH-LEVEL MAINTENANCE PROCEDURES

The frequency of preventive maintenance performed on the system plays a key role in eliminating or extending the periods between downtime due to poor performance or unexpected breakdown. The following table offers recommendations that must be weighed by factors like frequency of use and environmental conditions. In every case, frequent checks of safety-related items are highly recommended.

Note: Additional maintenance procedures (covered in the relevant Service Manuals) must be completed by qualified service personnel.

Table D-4: Maintenance Procedure Frequency

Test/Clean	Frequency Interval	Task
Transducers	Six months	Check for cracks or bent pins (D.1 Transducers).
System Filter	Four months or as required	Check for good air flow without excessive noise. Remove and vacuum (D.4.11 System Filter). Note: Filter cleaning frequency is dependant upon usage location. If the system is used in a high traffic area (such as an Emergency Room) filters may require more frequent cleaning.
System Fans	Six months	Check for good air flow without excessive noise.
Cart	Clean as necessary	The wheels have sealed bearings therefore no lubrication is necessary.

D.4 CLEANING SYSTEM COMPONENTS

Ultrasonix recommends the following cleaning instructions for all external surfaces, including the cart, cables and connectors.



Cautions:

Power off and unplug the system before cleaning.

Do not spill or spray water on the controls, transducer connection receptacle, or transducer ports.

D.4.1 LCD Display and Cabinet



Cautions:

Power off and unplug the system prior to cleaning the LCD display.

DO NOT apply cleaning solutions directly to any surface of the LCD display or cabinet.

D.4.1.1 LCD Display Cabinet

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe down the cabinet:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.1.2 LCD Display Screen



Caution: Computer wipes may be used only if they specifically state they are designed for LCD displays.

Apply a small amount of water to a soft, non-abrasive cloth. Stroke the cloth across the display in one direction, moving from the top of the display to the bottom.

- water
- mild detergent (PH level at or near 7) and water solution.



Cautions:

DO NOT scratch the LCD display.

DO NOT use paper towels to clean the LCD display as they may cause damage and scratches.

NEVER use cleaning products containing any of the following on either the cabinet or the screen:

- | | |
|--|------------|
| • Abrasives | • Benzene |
| • Acetone | • Solvents |
| • Alcohol (Ethanol, Methanol or Isopropyl) | • Wax. |
| • Ammonia | |

D.4.2 Touch Screen



Cautions:

Power off and unplug the system prior to cleaning the touch screen on the operator console.
DO NOT apply the cleaning solution directly to the touch screen.
NEVER use cleaning products that contain Ammonia.
DO NOT scratch the touch screen.
DO NOT use paper towels to clean the console touch screen as they may cause damage and scratches.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth:

- water
- 1% isopropyl alcohol.

D.4.3 Operator Console



Cautions:

Power off and unplug the system prior to cleaning the operator console.
DO NOT apply cleaning solutions directly to the operator console.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.4 Power Cord



Cautions:

Power off and unplug the system prior to cleaning.
DO NOT apply cleaning solutions directly to the power cord.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe the power cord:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.5 Barcode Reader



Warning: Disconnect the barcode reader prior to cleaning.



Caution: DO NOT apply cleaning solutions directly to the barcode reader.

Note: Barcode reader usage should not entail patient contact.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe the barcode reader:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.6 Wireless Adapter (When Connected Externally)



Warning: Disconnect the wireless adapter prior to cleaning.



Caution: DO NOT apply cleaning solutions directly to the wireless adapter.

Note: Wireless adapter usage should not entail patient contact.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe the wireless adapter:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.7 SonixGPS Components



Warning: For details on SonixGPS cleaning and maintenance, refer to the most recent SonixGPS User Manual.

D.4.8 Transducer Holders and Cable Hooks



Cautions:

Power off and unplug the system prior to cleaning.

For best results, Ultrasonix recommends removing the transducer holders and cable hooks before cleaning (10.13). This will allow the operator to clean all the various curves and folds in a more effective manner.

DO NOT apply cleaning solutions directly to the transducer holders and cable hooks.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe off the transducer holders and cable hooks:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.9 Footswitch (Dual and Triple)



Warning: *Disconnect the footswitch prior to cleaning.*



Caution: *DO NOT apply cleaning solutions directly to the footswitch.*

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe off the footswitch:

- water
- 70% isopropyl alcohol.

Note: *Over time, silk-screened graphics may be damaged by the solvent effect of the isopropyl alcohol.*

D.4.10 Peripheral Tray and Basket



Cautions:

Power off and unplug the system prior to cleaning.

For best results, Ultrasonix recommends removing the peripheral tray basket before cleaning (10.12). This will allow the operator to clean all the various curves and folds in a more effective manner.

DO NOT apply cleaning solutions directly to the peripheral tray basket.

Apply a small amount of one of the following recommended cleaning solutions to a soft, non-abrasive cloth and wipe off the peripheral tray and basket:

- water
- mild detergent (PH level at or near 7) and water solution.

D.4.11 System Filter



Cautions:

Power off and unplug the system prior to cleaning.

Vacuum only. DO NOT apply any liquids to the system filter.

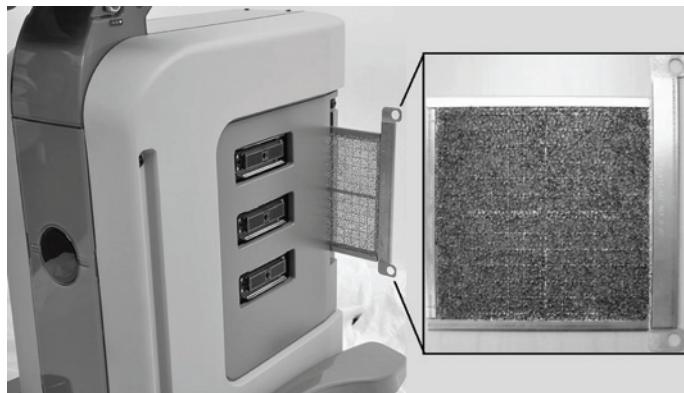
Filter cleaning frequency is dependant upon usage location. If the system is used in a high traffic area (such as an Emergency Room), the filter may require more frequent cleaning.

*Failure to regularly clean the system filter may cause reduced air flow and result in the system overheating. **System failures due to a lack of filter cleaning may not be covered by the Warranty or a Service Contract.***

This filter should be cleaned approximately every three to six months. Periodically, the system will present a cleaning reminder message. Always clean the filter when this reminder is presented.

To Clean the System Filter:

1. Power off and unplug the system.
2. Gently pull on the two aluminum system filter frame handles until the filter is free of its slot on the right side of the system.



Caution: When reinstalling, ensure the filter side faces toward the front of the system and the grid covering the back of the filter faces towards the back.

3. Vacuum thoroughly and reinstall the filter.
4. Plug in and power on the system.

APPENDIX E: MODE ACTION AND IMAGING PARAMETER OPTIONS

The following tables (**Table E-1** and **Table E-2**) describe the available Mode Action and Imaging Parameter buttons for the various platforms and their primary imaging modes.

The specific mix of available Mode Action and Imaging Parameter buttons is dependant upon the combination of:

- mode
- transducer
- licensed options (and its attendant hardware, such as the **SonixGPS**)
- platform (SonixTouch, SonixMDP, SonixSP, SonixOP or SonixTablet)
- frozen/live image.

Note: Only primary imaging modes are included in the following tables. For details on modes that can be applied in combination (e.g., **Color** and **PW**), refer to all relevant primary modes.

Table E-1: Touch Screen Mode Action Buttons (by Imaging Mode)

<i>Imaging Mode</i>		
<i>Mode</i>	<i>Action</i>	<i>Description</i>
3D	Selects 3D imaging. When 3D is selected the 4D transducer will only scan once (i.e., it will make only a single sweep to create a 3D Volume).	•
4B (Quad)	Tap to activate Quad .	
4D	Selects 4D imaging. When 4D is selected the 4D transducer will scan continuously until the console button is pressed or 4D is exited. This will create a Cine loop consisting of the individual 3D Volumes .	
Anatomic	Tap to activate/deactivate Anatomic M-Mode . Note: This is licensed under Cardiac Advanced .	•
	Tap to display Biopsy guidelines.	
Biopsy	Note: This option is only available for the following transducers: C5-2/60, EC9-5/10, L9-4/38, L145-38 and L14-5W/38. To change the onscreen orientation of the Biopsy Guide , refer to 8.2.10 Biopsy Guide . For details on Biopsy use, refer to the instructions included with the Biopsy Starter Kits (Biopsy Starter Kit manufacturers and part numbers are listed under Accessories–Third Party in Appendix B).	• • • •
Color Invert	Tap to Invert the direction of the Color Map .	•
Color On/Off	Tap to select/deselect Color Doppler imaging.	•
Cut Line	Tap to toggle the Cut Line on/off. The Cut Line determines what portion of the ROI will be included in the 3D/4D Volume . Note: By default, the Cut Line is toggled on for the 4DC7-3//40 transducer and off for the 4DEC9-5/10 transducer. <i>Not available during Freehand 3D.</i>	•
Directional Power	Tap to activate Directional Power Doppler .	•
Dual	Tap to activate Dual . Note: Quad imaging is not available in Color mode .	•
ECG On/Off	Tap to turn on/off the ECG machine. Note: This option is only available when Cardiac is selected as the Preset . <i>Refer to Accessories–Third Party in Appendix B for the recommended ECG electrode.</i>	• • • •
Panoramic		•
SonicGPS		•
Elastography		•
Compound		•
Spatial		•
PW/CW		•
M-Mode		•
B-Mode		•

Imaging Mode		
Mode	Action	Description
Grid On/Off	Toggles the Brachytherapy Grid on and off.	Note: To access Brachytherapy , both the BFC8-4/10 transducer and B-Mode must be active.
Grid Save	Saves the adjustments made to the Grid using the Brachytherapy Imaging Parameters.	Note: To access Brachytherapy , both the BFC8-4/10 transducer and B-Mode must be active.
HD Zoom	Tap to activate HD Zoom . Use the trackball to position the ROI.	Note: ↘ enables ROI resizing with the trackball. Press ↗ again to accept the resized ROI and return to ROI repositioning or ↕ to move directly to imaging. Both HD Zoom and Zoom mode action buttons can be applied to an image.
Inv	Tap to Invert the image orientation by 180°.	
Layout	Tap Layout to cycle through to the next Split Imaging display type. The default is 1:1. The four options are, in order: Split 1:1 ½ Imaging Mode – ½ Trace (top/bottom configuration) Large Trace ⅓ Imaging Mode – ⅔ Trace Small Trace ⅔ Imaging Mode – ⅓ Trace Side by Side ½ Imaging Mode – ½ Trace (side by side configuration).	
Overlay	Tap to toggle between the side-by-side Comparative image view and the combined or overlaid image view.	Note: The default view is Comparative .
Measure Live	Tap to take a Distance measurement on a live image.	Note: The Measure Live option must be configured through 3.5.2 Touch Screen Button Editing .
Pano Cancel	Tap to cancel the current Panoramic acquisition.	Note: This is not a toggle button.
Pano Exit	Tap to exit Panoramic imaging.	Note: This is not a toggle button.
Pano Start/Stop	Tap to start or stop the Panoramic acquisition.	
Power Doppler	Tap to activate Power Doppler .	
Rev	Tap to Reverse the image orientation right/left.	
		Panoramic
		SonixGPS
		Elastography
		Spatial Compound
		PW/CW
		Color
		M-Mode
		B-Mode
		Panoramic

Imaging Mode		Mode Action	Description
		Sim 2D/C	Tap to activate/deactivate Simultaneous 2D/Color (side-by-side split screen): <ul style="list-style-type: none"> left side: live 2D/Color right side: live 2D.
		SonixGPS	Tap to activate SonixGPS . Tap to activate SonixShine during Spatial Compound imaging.
		SonixShine	Note: This will also activate Spatial Compound imaging as SonixShine functions as a Spatial Compound imaging parameter (5.1.2 Spatial Compound Imaging). SonixShine is available only with the L9-4/38, L14-5/38 and L14-5/38 GPS linear transducers.
		Trace On/Off	Tap to activate/deactivate live spectral Doppler Trace display with measurement values. Tap to activate/deactivate Triplex imaging mode.
		Triplex	Note: Triplex is only available if both PW and Color have been activated. Once Triplex is active, press the console button to toggle through Active PW, Active B/A, C and Triplex imaging modes.
		Velocity Variance	Enables Operators to see where flows deviate from the sample's mean velocity. Note: There are 15 standard Color Maps but only six when Velocity Variance is selected.
			Panoramic SonixGPS Elastography Spatiotemporal Compound PW/CW Color M-Mode B-Mode

Table E-2: Touch Screen Imaging Parameters (by Imaging Mode) (Tap to activate and/or dial/press to adjust)

		Imaging Mode									
		B-Mode									
		M-Mode									
(Acoustic) Power		Adjusts Acoustic Power (turn) and toggles (press) M1 , T1S , T1C , T1B display if applicable.									
 Warning: Refer to A.1.1 ALARA Principle and Output Displays .											
Audio		Adjusts the Audio setting: 0–100% in 5% increments.									
Auto-Label		Initiates the Auto-Label function: tap to activate/press to initiate, dial to select a specific Label .									
Baseline		Adjusts the Color Doppler Baseline : 0.2–6.7kHz.									
BaselineC		Adjusts the Color Doppler Baseline .									
BaselineD		Adjusts the Doppler Trace Baseline up or down.									
Capture Pos Rt/Lt		Adjusts the Auto-Label position across the bottom of the imaging screen: tap to activate/dial to move the Label .									
Chroma		Adjusts the color Maps overlaying the 2D image: 0–7.									
ChromaD		Adjusts the color Map of the Doppler Trace : 0–7.									
ChromaM		Adjusts the color of the M-Mode Sweep : 0–7.									
Clarity		Adjusts the level of speckle reduction: Off , Low , Med , High , Max .									
Comp (Compound)		Improves contrast, resolution and needle enhancement. The available options are transducer-dependent: <ul style="list-style-type: none"> Shine: L9-4/38, L14-5/38 and L14-5/38 GPS linear transducers Med and High: all linear and curved array transducers. 									
Note: If the Mode Action button SonixShine is selected, the system will auto-activate Comp Shine . If the Mode Action button SonixShine is not selected and Comp is set to Shine , then the system will auto-activate SonixShine .											
Cut Angle		Adjusts the angle of the 3D/4D Cut Line .									
Note: Not available during Freehand 3D .											
Depth		Adjusts the imaging Depth up or down.									
Dyn (Dynamic Range)		Adjusts the overall image contrast resolution in 1 dB increments. Displayed Dynamic Range values from 15dB to 145dB. Complete system Dynamic Range is 302dB.									
Note: An increase in dB increases the level of gray's displayed.											
ECG Gain		Adjusts the size of the ECG Trace .									
Note: If ECG is Off , this option will not be available on the touch screen.											

Imaging Parameter Description		Imaging Mode	B-Mode		M-Mode		Color		PW/CW		Spatial Compound		Elastography		SonixGPS		Panoramic	
ECG Invert	Inverts the ECG Trace .		Note: If ECG is Off , this option will not be available on the touch screen.															
ECG Lead	Adjusts the required ECG Lead display.		Note: If ECG is Off , this option will not be available on the touch screen.															
ECG Position	Adjusts the position of the ECG Trace .		Note: If ECG is Off , this option will not be available on the touch screen.															
ECG R Wave	Turns on/off the ECG R Wave tag.		Note: If ECG is Off , this option will not be available on the touch screen.															
ECG R Thresh(old)	Adjusts the ECG R Threshold in relation to ECG R Wave tagging. Turn the associated dial counter-clockwise to move the R Wave tag to the left or clockwise to move it to the right.		Note: If ECG is Off , this option will not be available on the touch screen.															
Edge	Adjusts spectrum smoothing: 1–12.		Note: If ECG is Off , this option will not be available on the touch screen.															
Ensemble	Adjusts Color Doppler sensitivity: range 6–16.		Note: This adjusts both the FPS and TIS .															
Focus	Adjusts the focal zone position up or down.		Note: Increasing the number of focal zones will reduce the Frame Rate .															
Focus #	Adjusts the number of transmit focal zones on the screen. The maximum number of focal zones varies depending on which transducer is selected.		If desired, enable Auto-Focus by setting the Focus # to 0 (zero).															
Focus Span	Adjusts the distance between focal zones.		Note: There is no Focus Marker when Auto-Focus is active.															
Freq	Adjusts the transducer Frequency , Penetration , General , Resolution , Harmonics and EPI .		Note: Not available in CW .															
FreqC	Adjusts the Frequency of the Color Doppler : 4–6.6MHz.		Note: Adjusts the Frame Rate , Med , High and Max .															
FreqD	Adjusts PW/CW Doppler Frequency: 4.0–6.6MHz.		Note: Adjusts the overall Gain .															
FrRate	Note: Pushing the associated dial initiates the Auto-Gain/B function.		Note: Pushing the associated dial initiates the Auto-Gain/B function.															

Imaging Mode		
Imaging Parameter Description		
GainC	Adjusts the Color Gain : 0–100%, in 2% increments.	
GainD	Adjusts the PW/CW Doppler Gain : 0–100% in 2% increments.	
Gate	Adjusts the PW/CW Sample Volume Gate size from 1.0mm–40.0mm in 0.5mm increments. Note: Not available in CW.	
Grid L/R	Adjusts the Brachytherapy Grid Left and Right .	
	Note: To access Brachytherapy, both the BPC8-4/10 transducer and B-Mode must be active.	
Grid U/D	Adjusts the Brachytherapy Grid Up and Down .	
	Note: To access Brachytherapy, both the BPC8-4/10 transducer and B-Mode must be active.	
Map	Adjusts the grayscale Map : 1–17.	
	Note: If Velocity Variance is active, the MapC range is 1–6, if Directional Power is active, the MapC range is 1–7.	
MapC	Adjusts the Color and Power Maps :	
	<ul style="list-style-type: none"> • Color: 1–15 • Power: 1–8. 	
MapD	Adjusts the grayscale Map of the Doppler Trace : 1–3.	
	Adjusts the Elastography Color Map .	
MapE	MapE is a 1D Map . MapE 2 is a soft threshold 2D Map , while MapE 3 is a hard threshold 2D Map . Additional Maps (4–12) include grayscale.	
MapM	Adjusts the grayscale Map of the M-Mode display: 1–3.	
(Imaging) Method	Toggles between the (Imaging) Method options: Color , Power , TDI (Tissue Doppler Imaging), Color Flow and Power Flow .	
Flow	Adjusts the Elastography image Opacity overlaid on the 2D image: 0–100% in 10% increments.	
Opacity	Note: The lower the setting, the more transparent the Elastography display	
Persist	Adjusts the level of visual smoothing of the 2D image: 0–6.	
PersistC	Adjusts the Color Doppler Persistence : 0–6.	
PersistE	Adjusts the Elastography Persistence : 0–6.	
PRF	Adjusts the PW/CW Doppler Pulse Repetition Frequency up or down.	
PRFc	Adjusts the Color PRF .	
PRFd	Adjusts the Doppler PRF .	
Priority	Adjusts the Color Doppler 2D Priority .	

Imaging Mode		Imaging Parameter Description	
Reject		Eliminates or Rejects noise from the image: 0–100.	
Res		Adjusts the color Resolution in the ROI box: Low , Med(ium) or High . Note: High sharpens the edges of the ROI the most.	
Rgn		Adjusts the visible Elastography Region that is overlaid on the 2D image based on the selected tissue stiffness: Soft , Medium , Hard or All . Note: Region coloration can be adjusted with the Map setting.	
Sector		Adjusts the image Sector size: 50–100% in 5% increments. Note: Extended Field of View (FOV) and trapezoid imaging if available. Use the trackball to move the sector to different positions.	
Sens		Adjusts transducer Sensitivity depending on the level of compression applied during imaging: Low , Med1 , Med2 , High1 or High2 .	
Shine Side		Moves the Shine marker between the top right and top left side of the imaging screen, depending on the desired needle entry position.	
Smooth		Adjusts spectrum smoothing: 1–5.	
SoftC		Enables Color smoothing during Color and Power imaging. The higher the setting the greater the degree of Color smoothing: 1, 3 and 5.	
Steer		Steers the 2D beam on linear transducers.	
SteerC		Steers the Color ROI box right or left on linear transducers.	
SteerD		Steers the Doppler line on linear transducers.	
SV Ang		Adjusts the Sample Volume Angle : -80° to +80°, in 2° increments.	
Sweep		Adjusts the Sweep speed of Doppler Trace (Low , Med , High1 and High2). Note: Not available in CW .	
WF		Adjusts the Wall Filter : 67–3333Hz.	
WFc		Adjusts the Color WF : 20–1000Hz in 20Hz increments.	
WFd		Adjusts the Doppler WF : 40–2000Hz in 40Hz increments.	
Zoom		Adjusts the image in or out. Note: If the image is zoomed to the point where it is larger than the imaging field, use the trackball to pan around the image.	
ZoomM		Adjusts the amount of M-Mode magnification. Use the trackball to reposition ZoomM location.	

APPENDIX F: OB AND CARDIAC AUTHORS

OB and Cardiac Authors are controlled within **Measurements**.

Note: For details on **OB Table Setup...** refer to [8.2.7.6 Managing OB Tables](#).

To Access Author Settings:

1. Tap the touch screen **Menu** button.
2. Select **Administrator > Measurements > Author Settings**.



Table F-1: OB Author Selection – Fetal Age

Parameter	Authors	
AC	BC Women's	Hansmann
	Crequat	Tokyo
	Hadlock	
APAD	Persson	
BDN	Jeanty	Tongsong
BPD	BC Women's	Kurtz
	Crequat	Hansmann
	DSOG	Osaka
	Eik-Nes	Persson
	eSnurra	Robinson
	Hadlock	Selbing-Kjessler
CEREB	Hill	
	BC Women's	Loughna
CRL	DSOG	Osaka
	Hadlock	Persson
	Hansmann	Rempen
	Hobbins	Robinson
	Altman and Chitty	Hansmann
FL	BC Women's	Merz
	Crequat	Osaka
	DSOG	Persson
	eSnurra	Tokyo
	Hadlock	
GS	Hansmann	Nyberg
Fibula	Hellman	
	Rempen	
FTA	Hobbins	
FTA	Osaka	
HC	Altman and Chitty	Hadlock
	BC Women's	Hansmann
	Crequat	
HL	Jeanty	
OFD	Hansmann	
TAD	Crequat	eSnurra
TL	Jeanty	Hobbins
TTD	Hansmann	
UL	Jeanty	

Table F-2: OB Author Selection – Fetal Growth

Parameter	Authors	
AC	BC Women's	Hadlock
	Chitty	Tokyo
	Crequat	
AFI	Moore	
BPD	BC Women's	Kurtz
	Crequat	Osaka
	Eik-Nes	Robinson
	eSnurra	Selbing-Kjessler
	Hadlock	Tokyo
	Hobbins	
CRL	BC Women's	Osaka
	Hadlock	Robinson
	Hobbins	
Fibula	Hobbins	
FL	BC Women's	Hadlock
	Chitty	Jeanty
	Crequat	Osaka
	eSnurra	Tokyo
FTA	Osaka	
HC	BC Women's	Crequat
HL	Chitty	Hadlock
	Jeanty	
TC	BC Women's	
TAD	Crequat	eSnurra
TL	Hobbins	

Table F-3: OB Author Selection – Fetal Growth Ratios

Parameter	Authors
CI (HC)	Hadlock
FL/AC	Hadlock
FL/BPD	Hohler
FL/HC	Hadlock
HC/AC	Campbell

Table F-4: OB Author Selection – Estimated Fetal Weight

Parameter	Authors
AC/BPD/FL	Hadlock
AC/BPD/FL/HC	Hadlock
AC/FL	Hadlock
AC/FL/HC	Hadlock
BPD/AC	Hadlock
BPD/APAD/TAD	DSOG Persson
BPD/APAD/TAD/FL	DSOG Persson
BPD/APTD/TTD/FL	Tokyo
BPD/FTA/FL	Osaka
BPD/TAD	Eik-Nes
BPD/TTD	Hansmann



Warning: Ultrasonix does not endorse user-defined **Measurements**, **Calculations** and **Tables** for diagnostic purposes. All user-defined **Measurements**, **Calculations** and **Tables** are used at the Operator's discretion and risk only.

Table F-6: Cardiac Author Selection

Parameter	Authors
Volume	Cubed Gibson Teichholz

APPENDIX G: REFERENCES

G.1 OB

EFW (Eik_Nes BPD/TAD)

Eik-Nes SH, Grottum P. Estimation of fetal weight by ultrasound measurement. Development of a new formula. *Acta Obstet et Gynecol Scand.*, 1982;61:307 - 312.

EFW (Hadlock AC/BPD/FL) (Estimated Fetal Weight (Hadlock AC/BPD/FL))

Hadlock, F., et al. "Estimated of Fetal Weight with the Use of Head, Body, and Femur Measurements, A Prospective Study." *American Journal of Obstetrics and Gynecology*, 151:13 (February 1, 1985), 333-337.

EFW (Hadlock AC/BPD/FL/HC) (Estimated Fetal Weight (Hadlock AC/BPD/FL/HC))

Hadlock, F., et al. "Estimated of Fetal Weight with the Use of Head, Body, and Femur Measurements, A Prospective Study." *American Journal of Obstetrics and Gynecology*, 151:13 (February 1, 1985), 333-337.

EFW (Hadlock AC/FL) (Estimated Fetal Weight (Hadlock AC/FL))

Hadlock, F., et al. "Estimated of Fetal Weight with the Use of Head, Body, and Femur Measurements, A Prospective Study." *American Journal of Obstetrics and Gynecology*, 151:13 (February 1, 1985), 333-337.

EFW (Hadlock AC/FL/HC) (Estimated Fetal Weight (Hadlock AC/FL/HC))

Hadlock, F., et al. "Estimated of Fetal Weight with the Use of Head, Body, and Femur Measurements, A Prospective Study." *American Journal of Obstetrics and Gynecology*, 151:13 (February 1, 1985), 333-337.

EFW (Hadlock BPD/AC)

Irina Burd, et al. "Is Sonographic Assessment of Fetal Weight Influenced by Formula Selection?" American Institute of Ultrasound in Medicine *J Ultrasound Med.*, 2009; 28, 1019-1024.

EFW (Persson BPD/APAD/TAD)

Persson PH, Weldner BM. Intra-uterine weight curves obtained by ultrasound. *Acta Obstet et Gynecol Scand.*, 1986c;65:169-73.

EFW (DSOG BPD/APAD/TAD)

DSOG (Danish Society of Obstetrics and Gynaecology (<http://www.dsog.dk/files/biometriguidelines.htm>)).

EFW (DSOG BPD/APAD/TAD/FL)

DSOG (Danish Society of Obstetrics and Gynaecology (<http://www.dsog.dk/files/biometriguidelines.htm>)).

EFW (Persson BPD/APAD/TAD/FL)

Persson PH, Weldner BM. Intra-uterine weight curves obtained by ultrasound. *Acta Obstet Gynecol Scand.*, 1986c;65:169-73.

EFW (Hansmann BPD/TTD) (Estimated Fetal Weight (Hansmann BPD/TTD))

Hansmann, M., et al. *Ultrasound Diagnosis in Obstetrics and Gynecology*. New York: Springer-Verlag, (1986), 154.

EFW (Osaka BPD/FTA/FL) (Estimated Fetal Weight (Osaka BPD/FTA/FL))

Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 103-105.

EFW (Tokyo BPD/APTD/TTD/FL) (Estimated Fetal Weight (Tokyo BPD/APTD/TTD/FL))

Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996), 880, Equation 1.

G.1.1 OB Gestational Age

AC (Abdominal Circumference)

Crequet J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.

Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: (1984), 497-501.

Hansmann, M., et al. *Ultrasound Diagnosis in Obstetrics and Gynecology*. New York: Springer-Verlag, (1986), 431.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol. 26, No 9 (1998), 433-453.

Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996), 885.

APAD (Anterior-Posterior Abdominal Diameter)

Persson PH, Obstetisk Ultralyd, 1997;36:92-93 (Swedish Working Group in Gynecology ULTRAARG).

BND (Binocular Distance)

Jeanty P, Cantraine F, Cousaert E, Romero R, Hobbins JC. "The Binocular Distance: A New Way to Estimate Fetal Age." *Journal of Ultrasound in Medicine* 3:241, 1984.

Tongsong T, Wanapirak C, Jesadapornchai S, Tathayathikom E. "Fetal binocular distance as a predictor of menstrual age." *International Journal of Gynecology and Obstetrics* 38:87 1992.

BPD (Biparietal Diameter)

Crequet J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.

DSOG (Danish Society of Obstetrics and Gynaecology) (<http://www.dsog.dk/files/biometriguidelines.htm>) 2007.

Eik-Nes SH, Grottum P. Estimation of fetal weight by ultrasound measurement. Development of a new formula. *Acta Obstet et Gynecol Scand.*, 1982;61:307 - 312.

eSnurra (<http://www.esnurra.com>).

Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: 1984), 497-501.

Hansmann, M., et al. *Ultrasound Diagnosis in Obstetrics and Gynecology*. New York: Springer-Verlag, (1986), 440.

Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.

Kurtz AB, et al: Analysis of biparietal diameter as an accurate indicator of gestational age. *J Clin Ultrasound* 1980;8:319 - 319.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol 26, No 9 (1998), 433-453.

Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 98.

Persson PH, Obstetisk Ultralyd, 1997;36:92-93 (Swedish Working Group in Gynecology ULTRAARG).

Robinson H, Flemming J. British Journal of Obstetrics and Gynaecology. 1975;82:702.

Selbing A, Kjessler B. Conceptual dating by ultrasonic measurement of the fetal biparietal diameter in early pregnancy. *Acta Obstet Gynecol Scand.*, 1985; 64: 593 - 597.

Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996), 885.

Cereb (Cerebellum)

Hill, Lyndon, M., et al. "The Transverse Cerebellar Diameter in Estimating Gestational Age in the Large for Gestational Age Fetus." *Obstetrics and Gynecology*, (June 1990) Vol. 75, No. 6, 981-985 .

CRL (Crown Rump Length)

- DSOG (Danish Society of Obstetrics and Gynaecology) (<http://www.dsog.dk/files/biometriguidelines.htm>) 2007.
- Hadlock, F., et al. "Fetal Crown-Rump Length: Re-evaluation of Relation to Menstrual Age (5-18 weeks) with High-Resolution, Real-Time Ultrasound." *Radiology*, 182: (February 1992), 501-505.
- Hansmann, M., et al. *Ultrasound Diagnosis in Obstetrics and Gynecology*. New York: Springer-Verlag, (1986), 439.
- Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.
- Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol. 26, No 9 (1998), 433-453.
- Pam Loughna, Lyn Chitty, Tony Evans & Trish Chudleigh. "Fetal size and dating: charts recommended for clinical obstetric practice" *Ultrasound* (August 2009), Vol 17, No 3, p161 - 167.
- Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990).
- Persson PH, Obstetrisk Ultralyd, 1997;36:92-93 (Swedish Working Group in Gynecology ULTRAARG).
- Rempen, *German Society for Gynecology and Obstetrics*, March 1991, Issue 15, Vol 1, pp. 23-28.
- Robinson H, Flemming J. *British Journal of Obstetrics and Gynaecology*. 1975;82:702.

EFW (Estimated Fetal Weight)

- Brenner, W.E., et al. "A standard of fetal growth for the United States of America." *American Journal of Obstetrics and Gynecology*, 126: (1976), 555.
- Douillet, Peter M., et al. "Improved Birth Weight Table for Neonates Developed from Gestations Dated by Early Ultrasonography." *Journal of Ultrasound in Medicine*, 16: (1997), 241-149.
- Hadlock, F., et al. "In Utero Analysis of Fetal Growth: A Sonographic Weight Standard." *Radiology*, 181: (1991), 129-133.
- Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 103-105.

Fibula (Fibula Length)

- Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.

FL (Femur Length)

- Altman DG, Chitty LS. "New charts for ultrasound dating of pregnancy". *Ultrasound Obstet Gynecol.*, 1997;10:174 - 191.
- Crequat J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.
- DSOG (Danish Society of Obstetrics and Gynaecology) (<http://www.dsog.dk/files/biometriguidelines.htm>) 2007.
- eSnurra (<http://www.esnurra.com>).
- Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: (1984), 497-501.
- Hansmann, M., et al. *Ultrasound Diagnosis in Obstetrics and Gynecology*. New York: Springer-Verlag, (1986), 431.
- Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol. 26, No 9 (1998), 433-453.
- Merz, *German Society for Gynecology and Obstetrics*, March 1991, Issue 15, Vol. 1, pp. 23-28.
- Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 101-102.
- Persson PH, Weldner BM. Normal range growth curves for fetal biparietal diameter, occipito frontal diameter, mean abdominal diameters and femur length. *Acta Obstet Gynecol Scand.*, 1986b;65:759-61.
- Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996), 886.

FL/AC Ratio (Femur Length/Abdominal Circumference)

- Hadlock, F.P., R.L. Deter, R.B. Harrist, E. Roecker, and S.K. Park. "A Date Independent Predictor of Intrauterine Growth Retardation: Femur Length/Abdominal Circumference Ratio," *American Journal of Roentgenology*, 141: (November 1983), 979-984.

FL/BPD Ratio (Femur Length/Biparietal Diameter)

- Hohler, C.W. & T.A. Quetel. "Comparison of Ultrasound Femur Length and Biparietal Diameter in Late Pregnancy," *American Journal of Obstetrics and Gynecology*, 141:7 (Dec. 1 1981), 759-762.

FTA (Fetal Trunk Area)

- Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 99-100.

GS (Gestational Sac)

- Hansmann, M., et al. Ultrasound Diagnosis in Obstetrics and Gynecology. New York: Springer-Verlag, (1986).
- Hellman LM, Kobayashi M, Fillisti L, et al. Growth and development of the human fetus prior to the 20th week of gestation. Am J Obstet Gynecol., 1969;103:784-800.
- Nyberg, D.A., et al. "Transvaginal Ultrasound." Mosby Yearbook, (1992), 76.
- Rempen, German Society for Gynecology and Obstetrics, March 1991, Issue 15, Vol. 1, pp. 23-28.

HC (Head Circumference)

- Altman DG, Chitty LS. "New charts for ultrasound dating of pregnancy". Ultrasound Obstet Gynecol., 1997;10:174 -191.
- Crequat J, Duyyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" Gynecol Obstet Fertil., 2000 Jun; Vol 28, No 6, 435-45.
- Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." Radiology, 152: (1984), 497-501.
- Hansmann, M., et al. Ultrasound Diagnosis in Obstetrics and Gynecology. New York: Springer-Verlag, (1986), 431.
- Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." Journal of Clinical Ultrasound, Vol. 26, No 9 (1998), 433-453.

HL (Humeral Length)

- Jeanty P, et al. "Estimation of Gestational Age from Measurements of Fetal Long Bones." Journal of Ultrasound Medicine (1984) 3:75-79.

OFD (Occipito-Frontal Diameter)

- Hansmann, M., et al. Ultrasound Diagnosis in Obstetrics and Gynecology. New York: Springer-Verlag, (1986), 431.

TAD (Tranverse Abdominal Diameter)

- Crequat J, Duyyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" Gynecol Obstet Fertil., 2000 Jun; Vol 28, No 6, 435-45.
- eSnurra (<http://www.esnurra.com>).

TL (Tibial Length)

- Hobbins et al. Prenatal Diagnosis of Congenital Anomalies 1988..
- Jeanty, P, et al. "Estimation of Gestational Age from Measurements of Fetal Long Bones." Journal of Ultrasound Medicine (1984) 3:75-79.

TTD (Transverse Trunk Diameter)

- Hansmann, M., et al. Ultrasound Diagnosis in Obstetrics and Gynecology. New York: Springer-Verlag, (1986), 431.

UL (Ulnar Length)

- Jeanty P, et al. "Estimation of Gestational Age from Measurements of Fetal Long Bones." Journal of Ultrasound Medicine (1984) 3:75-79.

G.1.2 OB Growth Analysis

AC (Abdominal Circumference)

Chitty LS, Altman DG, Henderson A, Campbell S. Charts of fetal size: 3. Abdominal measurements. *Br J Obstet Gynaecol.*, 1994;101:125 - 131.

Crequat J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.

Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: (1984), 497-501.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol. 26, No 9 (1998), 433-453.

Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996).

AFI (Amniotic Fluid Index)

Moore, T. R, et al. "The amniotic fluid index in normal human pregnancy." *American Journal of Obstetrics and Gynecology*, (1990) 162: 1168-1173.

BPD (Biparietal Diameter)

Crequat J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.

Eik-Nes SH, Grottum P. Estimation of fetal weight by ultrasound measurement. Development of a new formula. *Acta Obstet et Gynecol Scand.*, 1982;61:307 - 312.

eSnurra (<http://www.esnurra.com>).

Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: (1984), 497-501.

Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.

Kurtz AB, et al: Analysis of biparietal diameter as an accurate indicator of gestational age. *J Clin Ultrasound* 1980;8:319 - 319.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol. 26, No 9 (1998), 433-453.

Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 101-102.

Robinson H, Flemming J. *British Journal of Obstetrics and Gynaecology*. 1975;82:702.

Selbing A, Kjessler B. Conceptual dating by ultrasonic measurement of the fetal biparietal diameter in early pregnancy. *Acta Obstet Gynecol Scand.*, 1985; 64: 593 - 597.

Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996).

CI (HC) (Cephalic Index (Head Circumference))

Hadlock FP, et al., "Estimating Fetal Age: Effects on Head Shape on BPD," *American Journal Roentgen*, 1981; 137:83-85.

CRL (Crown Rump Length)

Hadlock, F., et al. "Fetal Crown-Rump Length: Re-evaluation of Relation to Menstrual Age (5-18 weeks) with High-Resolution, Real-Time Ultrasound." *Radiology*, 182: (February 1992), 501-505.

Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol 26, No 9 (1998), 433-453.

Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990) 96, Table 3-3.

Robinson H, Flemming J. *British Journal of Obstetrics and Gynaecology*. 1975;82:702.

Fibula (Fibula Length)

Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.

FL (Femur Length)

Chitty LS, Altman DG, Henderson A, Campbell S. Charts of fetal size: 4. Femur length. *Br J Obstet Gynaecol.*, 1994;101:132 - 135.

Crequet J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.
eSnurra (<http://www.esnurra.com>).

Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: (1984), 497-501.

Jeanty P., E. et al. "Ultrasonic Evaluation of Fetal Limb Growth." *Radiology* (1982)143: 751-754.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol 26, No 9 (1998), 433-453.

Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990).

Tokyo, Shinozuka, N. FJSUM, et al. "Standard Values of Ultrasonographic Fetal Biometry." *Japanese Journal of Medical Ultrasonics*, 23:12 (1996).

FL/HC Ratio (Femur Length/Head Circumference)

Hadlock, F.P., R.B. Harrist, Y. Shah, & S/K. Park. "The Femur Length/Head Circumference Relation in Obstetric Sonography." *Journal of Ultrasound in Medicine*, 3: (October 1984), 439-442.

FTA (Fetal Trunk Area)

Osaka University. *Ultrasound in Obstetrics and Gynecology*. (July 20, 1990), 99-100.

HC (Head Circumference)

Chitty LS, Altman DG, Henderson A, Campbell S. Charts of fetal size: 2. Head measurements. *Br J Obstet Gynaecol.*, 1994;101:35 - 43.

Crequet J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.

Hadlock, F., et al. "Estimated Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters." *Radiology*, 152: (1984), 497-501.

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol 26, No 9 (1998), 433-453.

HC/AC (Head Circumference/Abdominal Circumference)

Campbell S., Thomas Alison. "Ultrasound Measurements of the Fetal Head to Abdomen Circumference Ratio in the Assessment of Growth Retardation," *British Journal Obstetrics and Gynaecology*, 84: (March 1977), 165-174.

HL (Humeral Length)

Jeanty P., E. et al. "Ultrasonic Evaluation of Fetal Limb Growth." *Radiology* (1982) 143: 751-754.

TAD (Transverse Abdominal Diameter)

Crequet J, Duyme M, Brodaty G. "Biometry 2000. Fetal growth charts by the French College of fetal ultrasonography and the Inserm U 155" *Gynecol Obstet Fertil.*, 2000 Jun; Vol 28, No 6, 435-45.
eSnurra (<http://www.esnurra.com>).

TC (Trunk Circumference)

Lessoway, V A. et al. "Ultrasound Fetal Biometry Charts for a North American Caucasian Population." *Journal of Clinical Ultrasound*, Vol 26, No 9 (1998), 433-453.

TL (Tibia Length)

Hobbins et al. *Prenatal Diagnosis of Congenital Anomalies* 1988.

G.2 CARDIAC

AFI (Amniotic Fluid Index)

Rutherford S., et al., "Four Quadrant Assessment of Amniotic Fluid Volume," Journal of Reproductive Medicine, 1987;32:587-589.

AVA (Aortic Valve Area)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 338.

CO (Cardiac Output)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 337, 337-8, 371.

E/A Ratio

Maron, Barry J., et al., "Noninvasive Assessment of Left Ventricular Diastolic Function by Pulsed Doppler Echocardiography in Patients with Hypertrophic Cardiomyopathy", Journal of the American College of Cardiology, 1987, Vol.10, 733-742.

E/E' Ratio

Oh, Seward, and Jamil Tajik, The Echo Manual: Second Edition. Lippincott Williams & Wilkins, 1999, 55.

EDV (End Diastolic Velocity)

Schiller et al., "Recommendations for Quantitation of the Left Ventricle by Two-Dimensional Echocardiography", Journal of the American Society of Echocardiography, Vol 2, No. 5, Sept-Oct 1989, 362.

EF (Ejection Fraction)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 371.

ESV

Schiller et al., "Recommendations for Quantitation of the Left Ventricle by Two-Dimensional Echocardiography", Journal of the American Society of Echocardiography, Vol 2, No. 5, Sept-Oct 1989, 362.

FS (Fractional Shortening)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 371.

IVS FT (Interventricular Septum FT)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 371.

LV Mass

Oh, Seward, and Jamil Tajik, The Echo Manual: Second Edition. Lippincott Williams & Wilkins, 1999, 41.

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 371.

LVEDV

Belenkie, Israel, et al., "Assessment of Left Ventricular Dimensions and Function by Echocardiography." American Journal of Cardiology, June 1973:31.

Gibson DG, "Estimation of left ventricular size by echocardiography." British Heart Journal, 1973, 35:128.

Teichholz et al, "Problems in Echocardiographic Volume Determinations: Echocardiographic-Angiographic Correlations in the Presence or Absence of Asynergy", American Journal of Cardiology, January 1976, Vol 37, 7 -11.

LVESV

Belenkie, Israel, et al., "Assessment of Left Ventricular Dimensions and Function by Echocardiography." American Journal of Cardiology, June 1973:31.

Gibson DG, "Estimation of left ventricular size by echocardiography." British Heart Journal, 1973, 35:128.

Teichholz et al, "Problems in Echocardiographic Volume Determinations: Echocardiographic-Angiographic Correlations in the Presence or Absence of Asynergy", American Journal of Cardiology, January 1976, Vol 37, 7 -11.

LVOT Area (Left Ventricular Outflow Tract Area)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 338.

LVOT SV (Left Ventricular Outflow Tract SV)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 355.

Myocardial Thick

Schiller et al., Recommendations for Quantitation of the Left Ventricle by Two-Dimensional Echocardiography, Journal of the American Society of Echocardiography, Vol 2, No. 5, Sept-Oct, 1989, 358-367.

PISA ERO

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 352.

Qp/Qs

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 355.

RVOT Area (Right Ventricular Outflow Tract Area)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 355.

RVOT SV (Right Ventricular Outflow Tract SV)

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 355.

RVSP

Reynolds, Terry. The Echocardiographer's Pocket Reference. 3rd ed., School of Cardiac Ultrasound, Arizona Heart Institute, (2007), 333.

SV

Oh, Seward, and Jamil Tajik, The Echo Manual: Second Edition. Lippincott Williams & Wilkins, 1999, 40.

VOL (Volume)

Brunn J., Block U., Ruf G., Bos I., Kunze W.P., Scriba P.C. "Volumetric analysis of thyroid lobes by real-time ultrasound". Deutsche Medizinische Wochenschrift 1981;106:1338-40.

VolFlow (Volume Flow)

Evans, D.H., et. al., Doppler Ultrasound Physics, Instrumentation and Clinical Applications. New York, 1989, Chapter 11, 188-205.

G.3 FLOW MEDIATED DILATION (FMD)

FMD (Flow Mediated Dilatation)

Cunha Filho, Edson Vieira, Carolina Mohr, Breno José Acauan Filho, Giovani Gadonski, Letícia Germany Paula, Ivan Carlos Ferreira Antonello, Carlos Eduardo Poli-de-Figueiredo, Bartira Ercilia Pinheiro-da-Costa, "Flow-Mediated Dilatation in the Differential Diagnosis of Preeclampsia Syndrome." Arquivos Brasileiros de Cardiologia, 94:2 (2010).

Luscher, T.F., S. Taddei, J.C. Kaski, J.W. Jukema, D. Kallend, T. Munzel, J.J. Kastlein, J.E. Deanfield, "Vascular effects and safety of dalteparin in patients with or at risk of coronary heart disease: the dal-vessel randomized clinical trial." European Heart Journal, 33: (2012) 857-865.

Mahmoud, Ahmed M., Jefferson C. Frisbee, Alexandre D'Audiffret, Osama M Mukdadi. "In vivo vascular wall tissue characterization using a strain tensor measuring (STM) technique for flow-mediated vasodilation analyses." Physics in Medicine and Biology, 54:20 (2009) 6217.

Mahmouda, Ahmed M., Phoebe A. Stapleton, Jefferson C. Frisbee, Alexandre D'Audiffret, Osama M. Mukdadi, "Simple fast noninvasive technique for measuring brachial wall mechanics during flow mediated vasodilatation analysis." Medical Imaging 2009: Ultrasonic Imaging and Signal Processing, Proceedings of SPIE, 7265 (2009).

G.4 INTIMA-MEDIA THICKNESS (IMT)

IMT (Intima-Media Thickness)

Salonen, J.T. and R. Salonen. "Ultrasonographically Assessed Carotid Morphology and the Risk of Coronary Heart Disease." *Arteriosclerosis and Thrombosis*, 11: (1991) 1245-1249.

Aminbakhsh, A. and G.B. Mancini. "Carotid Intima-Media Thickness Measurements: What Defines an Abnormality? A Systematic Review." *Clinical and Investigative Medicine*, 22: (1999) 149-57.

O'Leary, D.H. "Intima-Media Thickness: A Tool for Atherosclerosis Imaging and Event Prediction." *The American Journal of Cardiology*, 90: (2002) 18-21.

Haley, Andreana P., Daniel E. Forman, Athena Poppas, Karin F. Hoth, John Gunstad, Angela L. Jefferson, Robert H. Paul, Albert S.H. Ler, Lawrence H. Sweet, Ronald A. Cohen. "Carotid Artery Intima-Media Thickness and Cognition in Cardiovascular Disease", *International Journal of Cardiology*, 121: (2007) 148-154.

APPENDIX H: GLOSSARY

% A Red	Percent Area Reduction	AVA	Aortic Valve Area
% Area Red	Percent Area Reduction	AVI	Audio Video Interleave
% D Red	Percent Diameter Reduction	AVm	Mean Average Velocity
% Diam Red	Percent Diameter Reduction	AVp	Peak Average Velocity
2D	Two Dimensional	B/M-Mode	2D and M-Mode
3D	Three Dimensional	Base	Baseline (i.e., Doppler Baseline)
4D	Four Dimensional (Live 3D)	BBT	Basal Body Temperature
4DC	4D Curved Array Transducer	BGR	Blue Green Red
Abd	Abdomen	Blad Wall	Bladder Wall
AC	Abdominal Circumference	BLT	Bottom Left
AC	Alternating Current (power supply)	BMP	Bitmap
ACC	Acceleration	BNC	Bayonet Neill Concelman
AD	Angio Doppler	BND	Binocular Distance
Admin	Administrative/Administrator	BPD	Biparietal Diameter
AE	Application Entity (DICOM)	BPM	Beats per Minute
AFI	Amniotic Fluid Index	BRT	Bottom Right
AFV	Amniotic Fluid Volume	BSA	Body Surface Area
AIUM	American Institute of Ultrasound in Medicine	Calcs	Calculations
ALARA	As Low As Reasonably Achievable	Card	Cardiology
ANSI	American National Standards Institute	CBD	Command Bile Duct
Ao	Aorta	CCA	Common Carotid Artery
AO/LA	Aorta/Left Atrium	CD	Compact Disc
AoV	Aortic Valve	Cereb	Cerebellum
AP	Anterior Posterior	CEREB	Cerebellum
APAD	Anterior Posterior Abdominal Diameter	CFM	Color Flow Mode
APD	Anterior Posterior Diameter	CI	Cardiac Index
APTD	Anterior Posterior Thorax Diameter	CI	Cephalic Index
AR	Area	CIR	Circumference
Area Red	Area Reduction	cm	centimeters
AT	Acceleration Time	Cntrst Pos	Contrast Position
AUA	Average Ultrasound Age	CO	Cardiac Output
AV	Aortic Valve	COR	Coronal
		CRL	Crown Rump Length

CSA	Canadian Standards Association	FHR	Fetal Heart Rate
CSA	Cross Sectional Area	FL	Femur Length
CW	Continuous Wave	FMD	Flow Mediated Dilation
CWD	Continuous Wave Doppler	FOV	Field Of View
CxLength	Cervix Length	FPS	Frames per second
DCM	DICOM	FR	Frame Rate
DEL	Delete	FrD	Doppler Transmit Frequency
DIAM RED	Diameter Reduction	Freq	Frequency
DICOM	Digital Imaging and Communications in Medicine	Frm	Frame
DISP	Display	FrRate	Frame Rate
DIST	Distal	FS	Fractional Shortening
Dist	Distance	FT	Fractional Thickening
DPD	Directional Power Doppler	FTA	Fetal Trunk Area
DT	Deceleration Time	Fwd	Forward
DVD	Digital Video Device	g	grams
Dyn	Dynamic Range	GA	Gestational Age
EC	Endocavity	Gb	Gigabyte
ECA	External Carotid Artery	GB	Gallbladder
ECG	Electrocardiogram	GBWT	Gallbladder Wall Thickness
EDD	Estimated Date of Delivery	Gen	General
EDV	End Diastolic Velocity	GIF	Graphics Interchange File or Format
EDVPG	EDV Pressure Gradient	GS	Gestational Sac
EF	Ejection Fraction	Gyn	Gynecology
EFW	Estimated Fetal Weight	H	Height
EMR	Electronic Medical Record	HC	Head Circumference
Endom Thick	Endometrial Thickness	HDMI	High Definition Multimedia Interface
EMC	Electromagnetic Compatibility	HIPAA	Health Insurance Portability & Accountability Act
EPI	Extended Pulse Imaging	HL	Humeral Length
EPSS	E Point Septal Separation	HR	Heart Rate
ET	Elapsed Time	Hz	Hertz
EV	Endovaginal	ICA	Internal Carotid Artery
F	Follicle	ICT	Intracavity Transducer
FAST	Focused Assessment with Sonography in Trauma (Trauma (FAST)	IMT	Intima-Media Thickness
FDA	U.S. Food and Drug Administration	in	inches

IP	Internet Protocol	Min	Minimum
ISP	Internet Service Provider	M-M	Motion Mode
IT	Information Technology (e.g., IT Department)	ml	milliliters
IVS	Interventricular Septum	mm	millimeters
IVSd	Interventricular Septum diastole	MPEG	Moving Picture Experts Group
IVSs	Interventricular Septum systole	MPG	Moving Picture (Experts) Group
JPEG	Joint Photographic Experts Group	MPR	Multiplanar Reconstruction
Kb	Kilobyte	Multi	Multiple
kPa	Kilopascal	Msk/MSK	Musculoskeletal
L	Length	MV	Mean Velocity
LA	Long Axis	MV	Mitral Valve
LA	Left Atrium	Myocardial Thick	Myocardial Thickness
LAN	Local Area Network	NEMA	National Electrical Manufacturers Association
LAT	Lateral	NET	Network
LCD	Liquid Crystal Display	NF	Nuchal Fold
LMP	Last Menstrual Period	ng	nanograms
LONG	Longitudinal	NSF	National Sanitation Foundation
LOV	Left Ovary	NT	Nuchal Thickness
LT	Left	NTSC	National Television Standards Committee
LVdd	Left Ventricular Diameter diastole	OB	Obstetrics
LVDs	Left Ventricular Diameter systole	OD	Optical Density
LVET	Left Ventricular Ejection Time	OEM	Original Equipment Manufacturer
LVOT	Left Ventricular Outflow Tract	OFD	Occipital-Frontal Diameter
LVOTd	Left Ventricular Outflow Tract distance	OOD	Outer Orbital Diameter
LVPWd	Left Ventricular Posterior Wall diastole	PA	Phased Array
LVPWs	Left Ventricular Posterior Wall systole	PAL	Phased Alternating Line
Max	Maximum	Pano	Panoramic Imaging Mode
Mb	Megabyte	Params	Parameters
MCA	Middle Cerebral Artery	PDF	Portable Document Format
MCA- PI	Middle Cerebral Artery-Pulsatility Index	Pel	Pelvis
MEAS	Measure	Pen	Penetration
MED	Medial	Persist	Persistence
MGr	Mean Gradient	PGr	Pressure Gradient
MI	Mechanical Index	PHT	Pressure Half Time

PI	Pulsatility Index	RVDs	Right Ventricular Dimension systole
Picto	Pictogram	RVOT	Right Ventricular Outflow Tract
PIN	Personal Identification Number	RVWd	Right Ventricular Wall diastole
PISA	Proximal Isovelocity Surface Area	RVWs	Right Ventricular Wall systole
PNG	Portable Network Graphics	SA	Short Axis
Pos	Position	SAG	Sagittal
POS	Position	SAW	Surface Acoustic Wave
PostV Blad	Post Void Bladder	SCP	Service Class Provider
PreV Blad	Pre Void Bladder	SCU	Service Class User
PRF	Pulse Repetition Frequency	SD	Standard Deviation
PROX	Proximal	SD	Systolic/Diastolic Ratio
PSA	Prostate-Specific Antigen	SDK	Software Development Kit
PSAD	Prostate-Specific Antigen Density	SEL	Select
PSV	Peak Systolic Velocity	Sens	Sensitivity
PSVPG	PSV Pressure Gradient	Simult	Simultaneous
PV	Peak Velocity	SMTP	Simple Mail Transport Protocol
PV	Pulmonary Valve	SonixGPS	Sonix Guidance Positioning System
PW	Pulsed Wave Doppler	SV	Sample Volume
PWD	Power Doppler	SV	Stroke Volume
Q	Quadrant (e.g., AFI)	SV1	Selection Value 1
Qp	Pulmonic Blood Flow	TAD	Transverse Abdominal Diameter
Qs	Systemic Blood Flow	TC	Trunk Circumference
Rad	Radius	TCP	Transfer Control Protocol
Rect	Rectangle	TCP/IP	Transmission Control Protocol/Internet Protocol
Res	Resolution	TFT	Thin Film Technology
RF	Radio Frequency	TGC	Time Gain Compensation
RGB	Red Green Blue	THI	Tissue Harmonic Imaging
Rgn	Region	TI	Thermal Index
RLE	Run Length Encoding	TIB	Thermal Index – Bone
RI	Resistive Index	TIC	Thermal Index – Cranial
ROI	Region of Interest	TIS	Thermal Index – Soft Tissue
ROV	Right Ovary	TL	Tibia Length
RT	Right	TDI	Tissue Doppler Imaging
RTSA	Real Time Spectrum Analysis	TE	Transesophageal
RVDd	Right Ventricular Dimension diastole		

TRANS	Transverse	USB	Universal Serial Bus
Transp	Transparency	VAC	Volts Alternating Current
Trauma (FAST)	Trauma (Focused Assessment with Sonography in Trauma)	VCR	Video Cassette Recorder
TTD	Transverse Trunk Diameter	Vel	Velocity
TV	Tricuspid Valve	Vol	Volume
UI	User Interface	VolFlow	Volume Flow
UL	Ulnar Length	VPS	Volumes per Second
UL	Underwriter's Laboratory	VR	Volume Rendering
ULT	Upper Left	VTI	Velocity Time Integral
Umb A	Umbilical Artery	W	Width
Umb A-PI	Umbilical Artery- Pulsatility Index	WEEE	Waste Electrical and Electronic Equipment
UPS	Uninterruptible Power Supply	WF	Wall Filter
URL	Uniform Resource Locator	WWW	World Wide Web
URT	Upper Right	YS	Yolk Sack
US	Ultrasound		

