

bkSpecto Ultrasound System



LEGAL MANUFACTURER

BK Medical Aps
Mileparken 34
DK-2730 Herlev
Denmark
Tel.:+45 4452 8100/Fax:+45 4452 8199
www.bkmedical.com
Email: info@bkmedical.com

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Contents

- Chapter 1 Before You Begin 15**

- Chapter 2 Getting Started 17**
 - The bkSpecto System 17
 - Before You Start 18
 - Height Adjustment 18
 - Turning System On and Off 18
 - Connecting Transducers 19
 - Creating a User 19
 - Starting an Exam 20
 - Monitor and Touch Screen Display 22
 - Basic Touchscreen Buttons 24
 - Mode Button Backlight 26
 - User Preferences 26
 - Audio Feedback 29
 - Documents 30
 - Measurements and Image Data 30

- Chapter 3 Controls on the Touchscreen 31**
 - 2D Controls 31
 - Color Controls 33
 - PW Doppler Controls 34
 - M-Mode Controls 36
 - CW Doppler 37
 - Elastography Controls 38
 - Power Mode Controls 39
 - 3D Controls 40
 - 3D Rev. Mode 42

- Chapter 4 Working with the Image 45**
 - Selecting the Imaging Plane 45
 - Freezing the Image 45
 - Partial Freeze and the Dual View Button 45
 - Split Screen 46
 - Simultaneous Imaging 46
 - Linked Dual 46
 - Labels, Bodymarks and Arrows 47
 - Labels 47
 - Bodymarks 48
 - Arrows 50
 - Cine 51
 - Using Cine 51
 - Using Cine in Doppler Mode 52
 - Video Display 52

Chapter 5	Making Measurements	53
	Measurements and Calculations	53
	Making a Measurement – General Procedure	54
	2D and Color Mode Measuring Tools	55
	Doppler Mode Measuring Tools.....	60
Chapter 6	Documentation	63
	What are Documents?	63
	HIPAA Compliance.....	63
	Saving Documents – Capturing Images and Video Clips	63
	Capturing Images	63
	Reviewing Documents.....	64
	The Document Browser	64
	The Review Window	64
	Viewing and Editing Video Clips	65
	Viewing Exported Documents on the System	65
	Viewing Exported Documents on an External Computer	66
	Exporting Data.....	66
	HIPAA Compliance and Exporting Data	66
	Exporting documents	66
	Patient List	67
	Deleting Documents or Exams from the System	68
	Pausing and Later Resuming an Examination	68
	Password Protection of Patient Data	69
	Hard Disk Quota.....	69
	Reports.....	69
	Creating a Report.....	70
	Editing a Report	71
	Preview the Report	71
	Printing a Report.....	71
	Saving a Report as Images	71
	Printing Documents or Images on the Monitor.....	71
	Printing Thumbnail Images	72
	Printing Images Displayed on the Monitor.....	72
Chapter 7	Imaging Modes	73
	Imaging Modes	73
	Adjusting the Thermal Index Limit.....	73
	2D (B-Mode).....	74
	Focus.....	74
	Gain	74
	Auto Gain.....	75
	Zoom.....	76
	Depth	76
	Grayscale Map	77
	Combination Modes	77
	Tissue Harmonic Imaging (True Echo Harmonics – TEH)	77
	Needle Enhancement.....	78
	Activate Needle Enhancement	79

Color Mode and Power Mode	80
Color Submodes	80
Color Coding of Flow	80
Independent D-Mode/C-Mode Steering	81
Color Box	81
Color Scales	81
Elastography	81
Color Box	82
Color Map	82
Quality Indicator	83
Strain Ratio Measurement	83
Diameter Comparison Measurement	83
Doppler Mode – Spectral Doppler	84
Turning Doppler Mode On or Off	84
Adjusting the Doppler Mode Image	85
Doppler Indicator	85
Independent D-Mode/C-Mode Steering	86
Audio Volume	86
Doppler Trace (Automatic Curve Tracing)	86
Auto	86
Gain	87
Scale	87
Smooth	87
Wall Filter	87
Invert	88
Baseline	88
Sweep Speed	88
M-Mode	88
The M-Mode Image	89
M-Mode Line	89
M-Mode Image Ruler	90
Saving a Preset	90
Default Exam Types and Presets	90

Chapter 8 Continuous Wave Doppler Mode 91

Overview	91
Adjusting the Thermal Index Limit	91
Adjusting MI	91
Turning CW Doppler Mode On or Off	91
CW Doppler Line	92
Audio Volume	92
Adjusting the Doppler Mode Image	92
Doppler Trace (Automatic Curve Tracing)	92
Auto	93
Gain	93
Scale	93
Smooth	94
Wall Filter	94
Invert	94

	Baseline	94
	Sweep Speed.....	94
Chapter 9	Exam Types	95
	Before You Begin	95
	If You Perform a Puncture Procedure	95
	What Is an Exam Type?	95
	Presets.....	95
	Measurements	96
	Doppler Measurements	97
	Reduction	98
	RI and PI (Resistance Index and Pulsatility Index)	99
	Real-Time Measurements.....	100
	Calculations.....	100
Chapter 10	Abdominal Exam Type	101
	Contents	101
	Setting up the Patient – Patient ID	101
	Diagnostic Presets	101
	Imaging Controls.....	102
	2D (B-mode).....	102
	Biopsy	103
	Annotations – Labels, Bodymarks and Arrows.....	103
	Labels	103
	Bodymarks	105
	Arrows	106
	Measurements and Calculations	107
	Calculation of Kidney Volume.....	107
	Using Reports	107
	Capturing and Documenting Images.....	108
	Cine Review	108
	Capturing Images	108
	Copying and Exporting.....	108
	Printing Images.....	108
	Customization Example.....	109
	Saving a New Preset.....	109
	Default Exam Types and Presets	109
	Where to Find More Information	110
Chapter 11	Brachytherapy Exam Type	111
	Contents	111
	Setting up the Patient – Patient ID	111
	Diagnostic Presets	112
	Imaging Controls.....	112
	2D (B-mode).....	112
	To Change Transducer Planes	113
	Annotations – Labels, Bodymarks and Arrows.....	113
	Labels	113
	Bodymarks	115

Arrows	116
Measurements and Calculations	117
Calculating Volumes	117
Performing a Biopsy or Puncture Procedure (including Brachytherapy).	118
Using Reports	120
Capturing and Documenting Images	120
Cine Review	120
Capturing Images	120
Copying and Archiving	121
Printing Images.	121
Customization Example.	121
Saving a New Preset.	121
Default Exam Types and Presets	122
Where to Find More Information	122

Chapter 12 Colorectal Exam Type 123

Contents	123
Setting up the Patient – Patient ID	123
Presets	123
Imaging Controls.	124
2D (B-mode).	124
Split Screen.	124
Color Mode (CFM).	124
Doppler Mode.	125
Annotations – Labels, Bodymarks and Arrows.	125
Labels	125
Bodymarks	127
Arrows	128
Measurements and Calculations	128
Using Reports	128
Capturing and Documenting Images	129
Cine Review	129
Capturing Images	129
Copying and Archiving	129
Printing Images.	130
Customization Example.	130
Saving a New Preset.	130
Default Exam Types and Presets	131
Where to Find More Information	131

Chapter 13 MSK and Nerve Exam Type 133

Contents	133
Setting up the Patient – Patient ID	133
Presets	133
Imaging Controls.	134
2D (B-mode).	134
M-Mode	135
Color Mode (CFM).	135
Power Doppler Mode	135

Doppler Mode	136
CW Doppler Mode	136
Volume Flow	136
Biopsy	136
Annotations – Labels, Bodymarks and Arrows.	137
Labels	137
Bodymarks	138
Arrows	139
Measurements and Calculations	140
Cardiac LV Protocol (Left Ventricular Protocol).	140
HR (Heart Rate)	141
Cardiac Output	141
FATE (Focus Assessed Transthoracic Echocardiography)	141
FATE Measurements	142
Using Reports	143
Capturing and Documenting Images	143
Cine Review	143
Capturing Images	143
Copying and Archiving	144
Printing Images.	144
Customization Example.	144
Saving a New Preset.	144
Default Exam Types and Presets	145
Where to Find More Information	145

Chapter 14 OB and Gyn Exam Types 147

Contents	147
Setting up the Patient – Patient ID	147
Diagnostic Presets	148
Gestational Age and Expected Date of Confinement.	149
Imaging Controls.	149
2D (B-mode).	149
Color Mode (CFM).	149
Doppler Mode.	149
Biopsy	150
Annotations – Labels, Bodymarks and Arrows.	150
Labels	150
Bodymarks	152
Arrows	153
Measurements and Calculations	153
Calculation Methods - GYN.	153
Calculation Methods - OB	155
Obstetrics Reports.	155
Using Reports	157
Capturing and Documenting Images	157
Cine Review	157
Capturing Images	157
Copying and Archiving	158
Printing Images.	158

Customization Example.	158
Saving a New Preset.	158
Default Exam Types and Presets	159
Where to Find More Information	159
Chapter 15 Pelvic Floor Exam Type	161
Contents.	161
Setting up the Patient – Patient ID	161
Presets	161
Imaging Controls.	162
2D (B-mode).	162
Split Screen.	162
Color Mode (CFM).	162
Doppler Mode.	163
Annotations – Labels, Bodymarks and Arrows.	163
Labels	163
Bodymarks	165
Arrows	166
Measurements and Calculations	166
Using Reports	166
Capturing and Documenting Images.	167
Cine Review	167
Capturing Images	167
Copying and Archiving	167
Printing Images.	168
Customization Example.	168
Saving a New Preset.	168
Default Exam Types and Presets	169
Where to Find More Information	169
Chapter 16 Small Parts Exam Type	171
Contents.	171
Setting up the Patient – Patient ID	171
Presets	171
Imaging Controls.	172
2D (B-mode).	172
Split Screen.	172
Color Mode (CFM).	172
Doppler Mode.	173
Volume Flow	173
Biopsy	173
Annotations – Labels, Bodymarks and Arrows.	174
Labels	174
Bodymarks	176
Arrows	177
Measurements and Calculations	177
Calculation of Breast Lesion Volume	178
Using Reports	178
Capturing and Documenting Images.	178

	Cine Review	178
	Capturing Images	178
	Copying and Archiving	179
	Printing Images.	179
	Customization Example.	179
	Saving a New Preset.	179
	Default Exam Types and Presets	180
	Where to Find More Information	180
Chapter 17	Prostate Exam Type	181
	Contents	181
	Setting up the Patient – Patient ID	181
	Diagnostic Presets	181
	Imaging Controls.	182
	2D (B-mode).	182
	To Change Transducer Planes	183
	Biopsy	183
	Annotations – Labels, Bodymarks and Arrows.	184
	Labels	184
	Bodymarks	185
	Arrows	186
	Measurements and Calculations	187
	Calculation of Prostate Volume	187
	Using Reports	188
	Capturing and Documenting Images.	188
	Cine Review	188
	Capturing Images	188
	Copying and Archiving	189
	Printing Images.	189
	Customization Example.	189
	Saving a New Preset.	189
	Default Exam Types and Presets	190
	Where to Find More Information	190
Chapter 18	Vascular Exam Type	191
	Contents.	191
	Setting up the Patient – Patient ID	191
	Diagnostic Presets	191
	Imaging Controls.	192
	2D (B-mode).	192
	Split Screen.	192
	Color Mode (CFM).	192
	Doppler Mode.	193
	Volume Flow	193
	Vector Flow Imaging (VFI).	193
	Using VFI.	195
	Arrow Flow Indicators for VFI	196
	Streamlined VFI Workflow	196
	Determining Peak Systolic Velocity.	196

	Determining Average Volume Flow	197
	Outline of VFI Workflow	198
	Biopsy	199
	Annotations – Labels, Bodymarks and Arrows	199
	Labels	199
	Bodymarks	200
	Arrows	202
	Measurements and Calculations	202
	Using Reports	203
	Capturing and Documenting Images	203
	Cine Review	203
	Capturing Images	203
	Copying and Archiving	204
	Printing Images	204
	Customization Example	204
	Saving a New Preset	204
	Default Exam Types and Presets	205
	Where to Find More Information	205
Chapter 19	3D Imaging	207
	Introduction to 3D Ultrasound	207
	3D License	207
	Controlling Transducer Movement	207
	360° built-in 3D-imaging	208
	Untracked Freehand Acquisition	208
	3D Imaging Overview	208
	Preparations	208
	Adjusting the Image Capture Settings	209
	ROI (3D Region of Interest)	209
	3D Capture Settings	209
	Acquisition	210
	Viewing a 3D Data Set	210
	Enhancing a 3D View	211
	3D Layout Options	211
	Working with the 3D Image	211
	Manipulating the Volume	211
	Annotating a 3D View	213
	The 6 3D Views	214
	Cube View	214
	Render View	215
	MIP View	217
	Transparency View	217
	4-Up View	218
	6-Up View	218
Chapter 20	DICOM	219
	DICOM on the System	219
	New Patient Information from a DICOM Worklist	219
	Saving or Printing to a DICOM Network	219

	Filenames of Documents Exported in DICOM Format	219
	Exporting to a PACS	220
	Reports	220
	Deleting a Document	221
Appendix A	Glossary	223
Appendix B	Measurement and Calculation Abbreviations	229
Appendix C	Setting Up and Customizing Your System.	257
	System Window.	258
	Header Tab	258
	Display Tab.	259
	Patient Data Tab	260
	LocalizationTab	260
	Video Out Tab	261
	Preset Window.	261
	Available Tab	261
	Default Tab.	261
	Manage Tab	262
	Measure & Calc Window	262
	General Tab	262
	Calc List Tab	263
	Default Calc Tab.	264
	Results Tab.	264
	Preferences Tab	265
	OB/Gyn Window.	265
	Preferences tab	265
	Authors tab	266
	Labeling Window	266
	Labels Tab	266
	Default Labels Tab	267
	Bodymarks Tab.	267
	Default Bodymarks Tab	268
	Needle Guide Tab.	268
	Configure Layout Window	274
	Store/Network Window.	275
	Store/Clip Tab.	275
	Printers Tab.	276
	DICOM/PACS Tab.	277
	Wi-Fi Tab	277
	Network Drive	278
	Security Window.	278
	General Tab	278
	User Manager Tab	279
	Audit Logs	282
	3D/4D	282
	Service Window	282
	General Tab	282

License Tab.....	283
About Tab.....	283
TP Licenses Tab.....	284
OEM setup	284

Index

285

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Chapter 1

Before You Begin

This is the advanced user guide for the bkSpecto Ultrasound System.

The *bkSpecto User Guide* includes an overview of all the documentation available for the system, including different user guides.

NOTE: *You must read the Safety chapter in the bkSpecto User Guide before working with the system.*

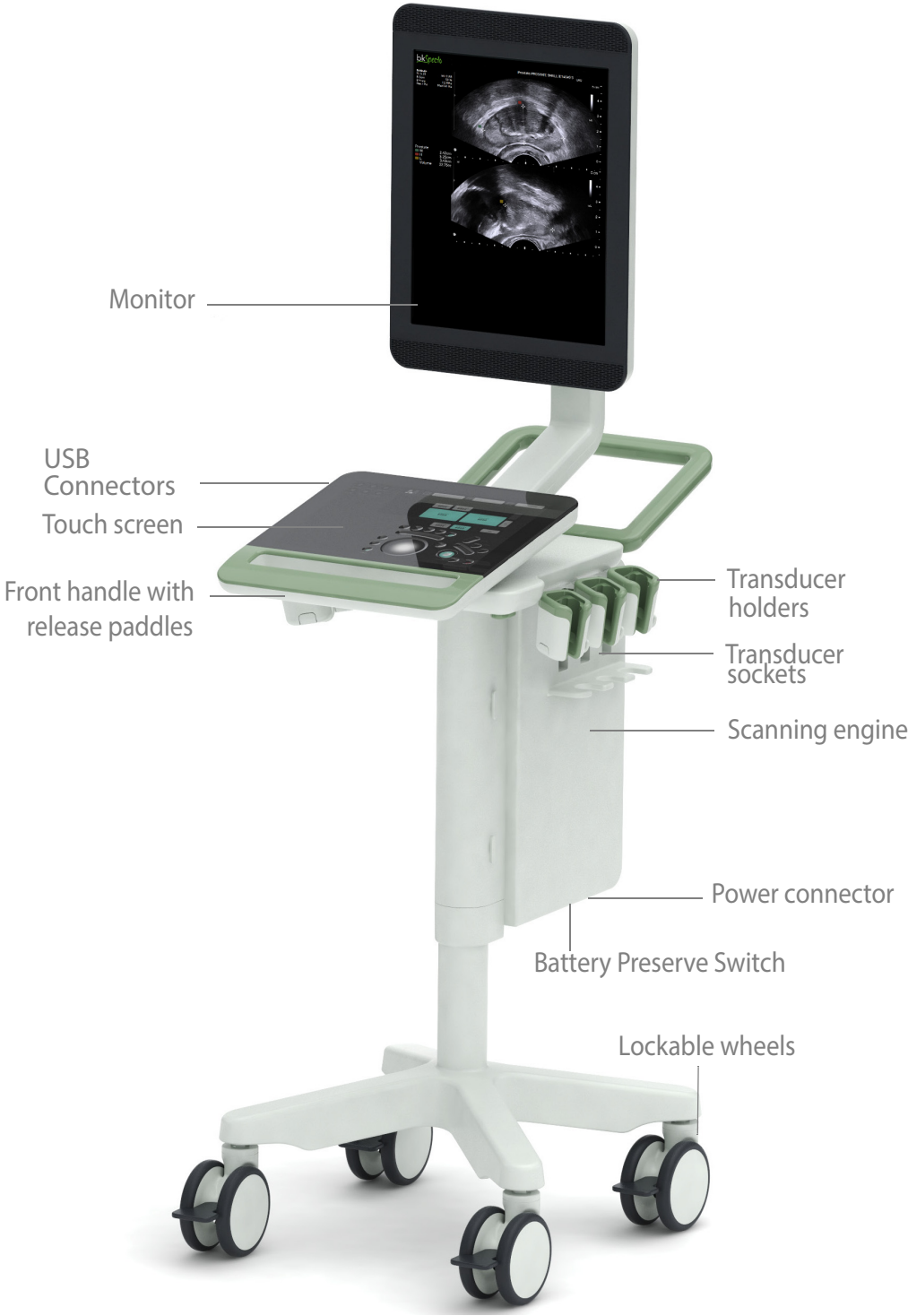
This guide takes you deeper into the functionality and potential of the bkSpecto Ultrasound Systems.

NOTE: *Some of the functionality and options described in this guide may not be available with your version of the system.*

Questions About the System	Where to Find the Answers
What are the various parts of the monitor display?	"Getting Started" on page 17
Is there an alphabetical list of all the controls on the system?	"Controls on the Touchscreen" on page 31
How do you make measurements and calculations for an image, and what measurement tools are available?	"Making Measurements" on page 53
How do you manage the images, clips, 3D data sets, and reports that are made on the system?	"Documentation" on page 63
What imaging modes are available on the bkSpecto?	"Imaging Modes" on page 73 and "3D Imaging" on page 207
What is an examination type, and how does it help with imaging?	"Exam Types" on page 95
How does DICOM [®] work with the bkSpecto?	"DICOM" on page 219
What do various abbreviations mean?	"Glossary" on page 223
Can the bkSpecto be customized and how?	"Setting Up and Customizing Your System" on page 257.

Chapter 2 Getting Started



The bkSpecto System



Before You Start

Before you turn on the system, make sure that the installation has been approved by a qualified electrician or by hospital safety personnel. Plug the power cord into a grounded wall outlet and make sure that you can get to it easily when you need to turn off/unplug the system.

Height Adjustment

The paddles underneath the keyboard let you adjust the height and the angle of the system. Lift the right paddle to adjust the height , and the left paddle  to turn the system so you can operate it without the wheels getting in your way.

Turning System On and Off

When you turn the system on or off, you must give the system enough time to save and recover open files and unsaved data. Otherwise, a serious system failure may occur that requires technical support.

The system has two power buttons, one on the monitor and one on the scanning engine:

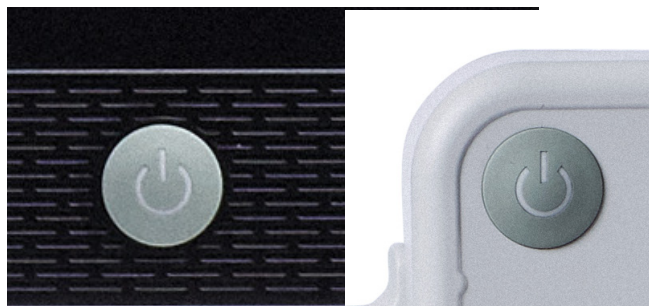


Figure 2-1. The power button on the monitor and on the scanning engine, respectively.

This switch helps you to preserve the battery when the system is stored or otherwise not in use for a period.

To turn the system on:

Press the power button *once*, then wait until startup screen disappears.

To turn the system off:

Make sure system is running. Press the power button *once*.

Note that if you purchase the battery version of bkSpecto, it also has a **Battery Preserve Switch** located underneath the scanning engine:



Figure 2-2. Battery Preserve Switch. See location at “The bkSpecto System”.

This switch is described in the **Battery Support** section of the *bkSpecto User Guide*.

Connecting Transducers



Figure 2-3. Transducer sockets.

To connect:

- 1** Insert transducer plug into socket with locking lever to the right.
- 2** Turn locking lever on socket to the left.

To disconnect:

- 1** Freeze image.
- 2** Turn locking lever on socket to the right.
- 3** Remove plug from socket.

Creating a User

Only system administrators can create new users. See “Security Window” on page 278.

Starting an Exam

The first 3 steps for imaging are:

- 1 Enter the patient information.
- 2 Select a transducer.
- 3 Select an exam type and a preset.

Do as follows:

- 1 Tap the **Patient** button on the touch screen.
- 2 Enter patient information. The **Patient ID** is filled in automatically with a date/timestamp, but you can change this to a relevant ID. If dots appear below the bottom fields, you can swipe to see more fields.

The screenshot shows the 'Patient' window interface. On the left is a vertical sidebar with buttons: PATIENT (highlighted in green), TRANSDUCER, PRESET, REVIEW, REPORT, END EXAM, and PAUSE EXAM. The main area is titled 'PATIENT DETAILS' and contains several input fields: PATIENT ID (20191029154939), LAST NAME, FIRST NAME, MI, DOB (MM/DD/YYYY), AGE, GENDER (dropdown), OPERATOR, EXAM TYPE (Abdomen), COMMENT, ACCESSION NUMBER, REFERRING PHYSICIAN, PREV EXAM DATE (MM/DD/YYYY), ADMITTING DIAGNOSIS, HEIGHT (CM), and WEIGHT (KG). At the bottom, there is a 'Store images of patient details' toggle, and buttons for CLEAR, NEXT, CLOSE, and START EXAM.

Figure 2-4. Patient window.

- 3 If you select **Store Images of Patient Details**, an image of the patient details will be stored in the document browser and the review window.
- 4 Tap **Next** to select transducer. All connected transducers will be displayed in the **Transducer** window.

The screenshot shows the 'Transducer' window interface. On the left is a vertical sidebar with buttons: PATIENT, TRANSDUCER (highlighted in green), PRESET, REVIEW, REPORT, END EXAM, and PAUSE EXAM. The main area is titled 'TRANSDUCER' and contains the text 'Select the desired transducer'. Below this are three transducer images: E10C4, 6C2 (highlighted in green), and 8L2. At the bottom, there are buttons for PREVIOUS, NEXT, CLOSE, and START EXAM.

Figure 2-5. Transducer window.

- 5 Tap **Next** to select **Exam Type** and **Preset** in the **Preset** window.

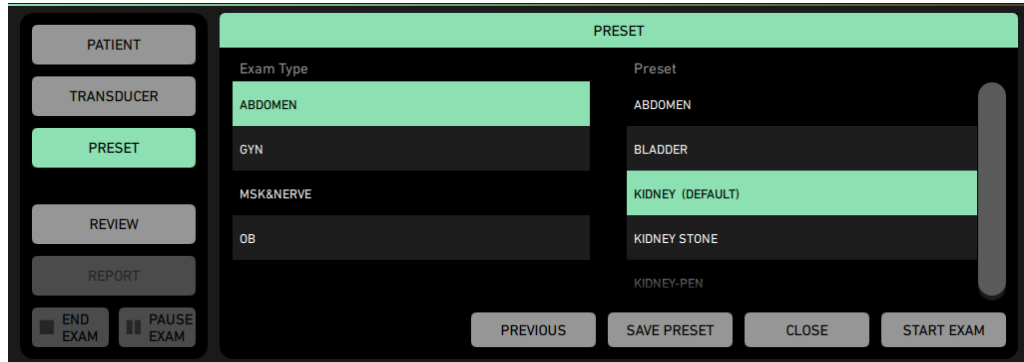


Figure 2-6. Preset window.

6 Tap **Start Exam** to start the exam.

You can also start the exam immediately after entering **Patient Details**. Tap **Start Exam** and select transducer using the transducer control button. The system will use the default exam type and preset.

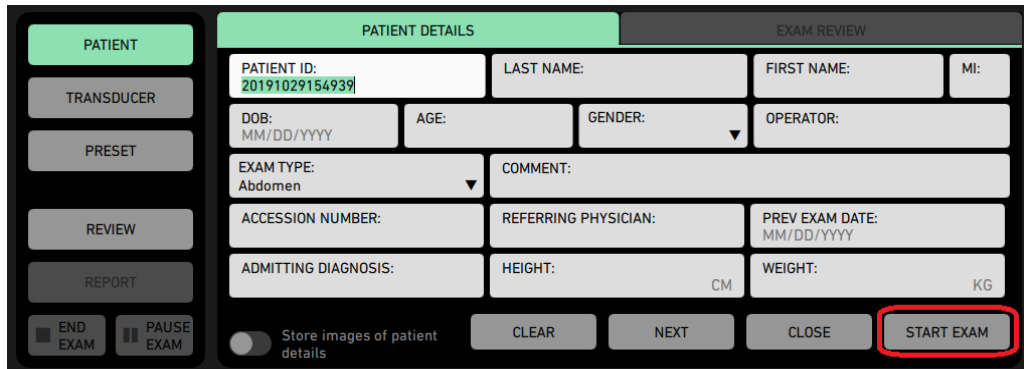


Figure 2-7. Start Exam

The exam ends when you tap **End Exam**:

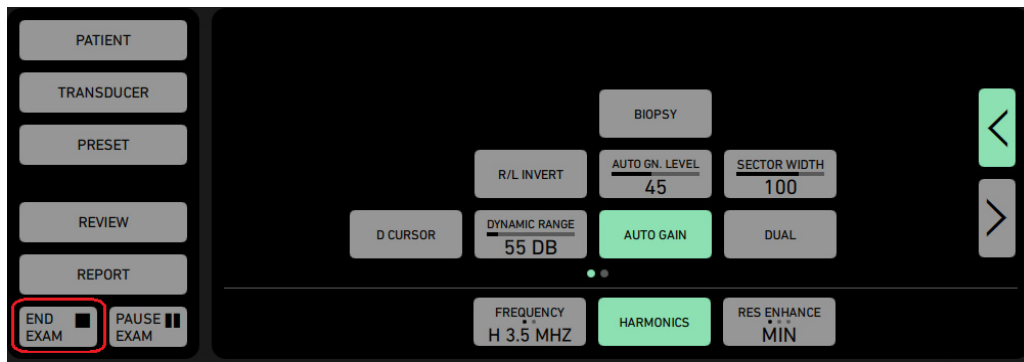


Figure 2-8. End Exam.

Monitor and Touch Screen Display



Figure 2-9. Monitor (clinical display).

- 1 Patient
- 2 Hospital name (logo)
- 3 Exam type/transducer
- 4 Image data
- 5 Measurement data
- 6 Battery and storage indicators, Snowflake icon to show that image is frozen
- 7 Document Browser
- 8 Wi-Fi Indicator

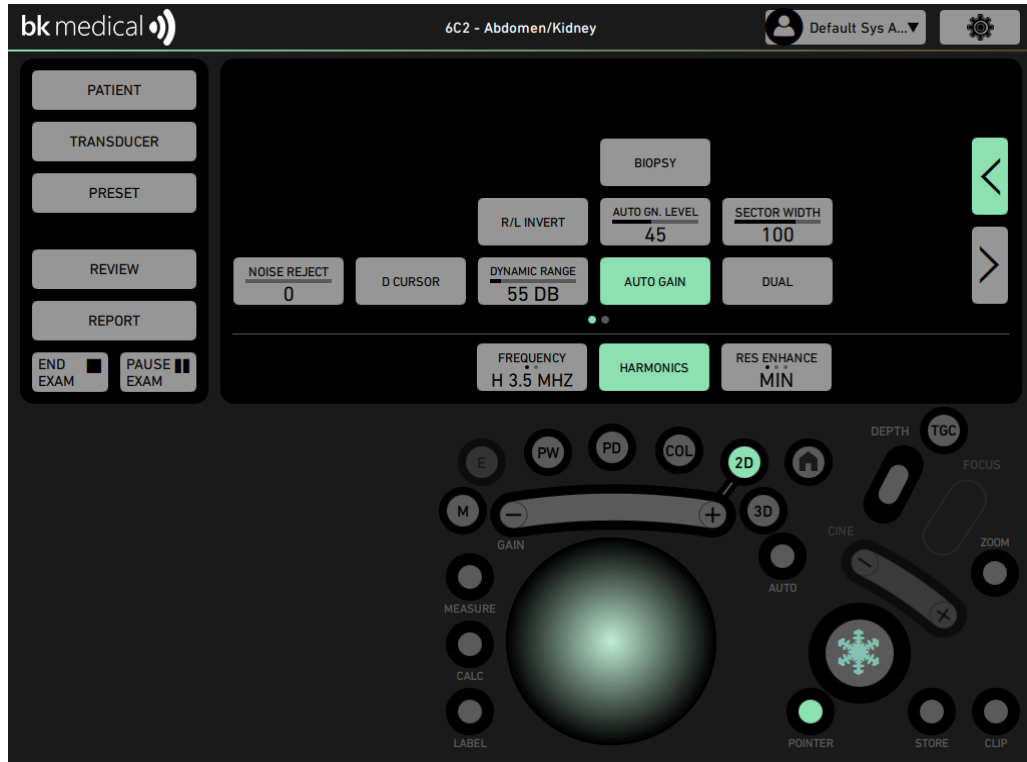
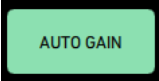
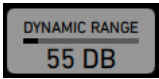
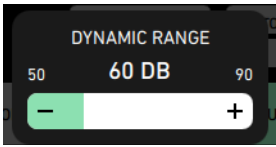

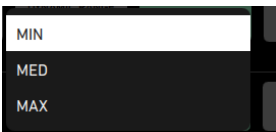


Figure 2-10. Touchscreen.

There are three types of parameter buttons:

Toggle buttons that are selected/deselected by a tap, e.g. Auto Gain .		
Scale buttons marked by a slider that you hold and slide to adjust parameters, e.g. Dynamic Range .		
Buttons with dropdown menus to select from. These are marked by a number of dots related to the number of menu items, e.g. Res Enhance .		

Basic Touchscreen Buttons

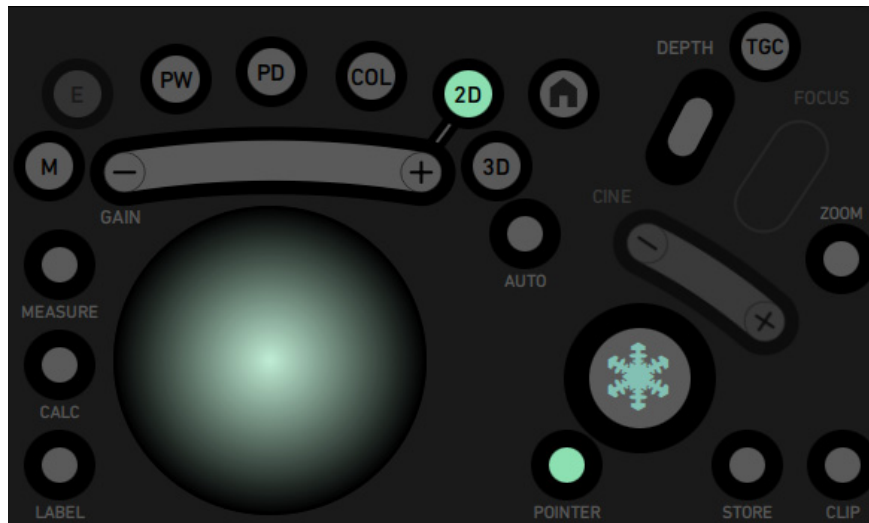




Figure 2-11. The basic touchscreen buttons

Button	Functionality
M	Turn on M-mode. Tap to turn off.
E	Turn on Elastography. Tap to turn off. This mode button is only available with transducers supporting Elastography.
3D	Turn on 3D imaging. Tap to turn off.
PW	Turn on Pulsed Wave Doppler. Tap to turn off.
COL	Turn on Color mode. Tap to turn off.
2D	Turn on 2D imaging. Double-tap the 2D button to exit all modes and return to 2D mode only.
PD	Turn on Power Doppler. Tap to turn off.
Home 	Tap the Home button to return to default settings for the current exam type.
TGC	Displays the TGC sliders.
Depth	Flick the bar to adjust image depth. Flick backward to increase depth and forward to decrease it. Tap either end to increase/decrease incrementally.
Focus	Flick the bar to adjust focus. Tap either end to adjust incrementally.
Gain	The Gain bar is located underneath the mode buttons. Slide this bar to adjust Gain.
Cine bar	Slide the Cine bar to scroll forwards and backwards. Tap either end to move one image at a time.
Optimize	Resets the TCG and optimizes Doppler.
Dual View 	Toggles between the two images in dual mode. Only appears when dual mode is active.
Trackpad	Positions the pointer, measurement calipers and labels.
Measure	Generic measurements. Tap the trackpad once to place each caliper.
Calc	Specific measurements for the individual presets. Tap the trackpad once to place each caliper.
Label	Opens the Keyboard region with virtual keyboard, labels, bodymarks and arrows to label the clinical images.
Clear	Clears a measurement or a calculation. Only appears when Measure or Calc is active.
Back Trace	Erases backwards on a freehand drawing. Only appears when a freehand trace is active.
Print	Only appears when a printer is attached.
Freeze	Freezes/unfreezes live imaging. A snowflake icon and the word FROZEN are displayed on the monitor when the image is frozen.
Pointer	Displays a pointer on the monitor. Use the trackpad to move the pointer.

Button	Functionality
Store	Tap Store to save an image. When the image is stored, it will be displayed as a thumbnail at the bottom of the monitor.
Clip	Tap Clip to record a video clip. After recording, it will be displayed as a thumbnail at the bottom of the monitor.

Table 2-1. Basic Touchscreen Buttons explained.

The buttons and window elements are highlighted in green when selected.

Mode Button Backlight

The mode buttons are backlit according to their state:





	Mode selected. Note the white line from the mode button to the Gain bar.
	Mode button enabled, but not selected. This mode is part of a combination mode.
	Mode not selected.
	Mode not available.

Table 2-2. Mode button backlight

User Preferences

When you tap your user name on the touchscreen, a dropdown menu is displayed:

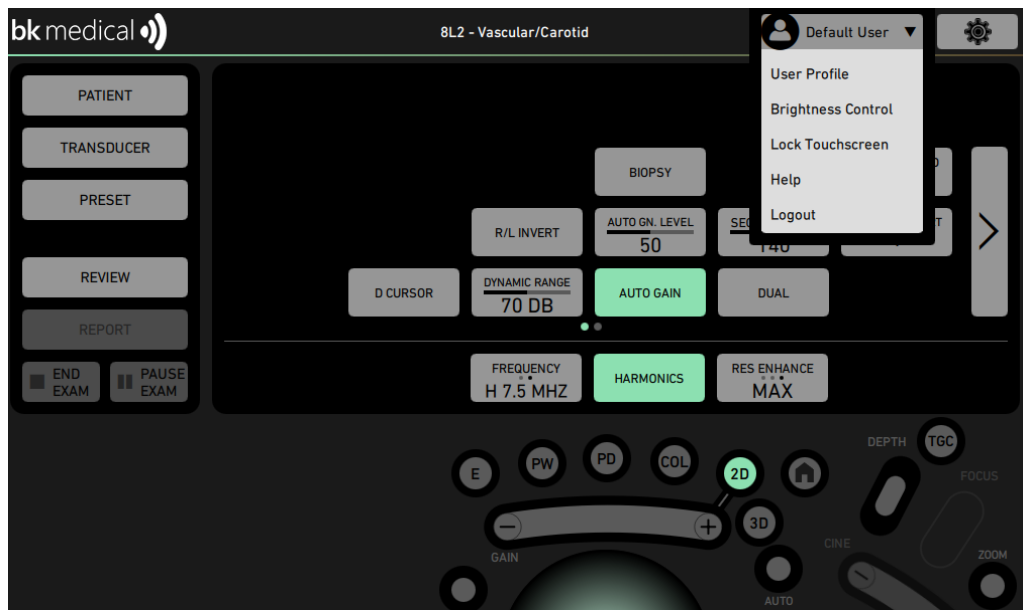


Figure 2-12. User preferences dropdown menu.

User Profile

Select **User Profile**.

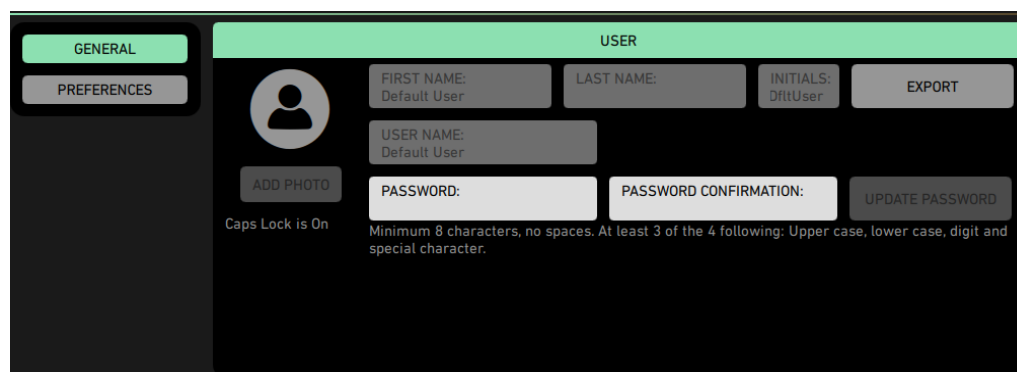


Figure 2-13. User Profile, General.

On the **User** tab, you can add/update your photo and create a password for your account.

Tap **Preferences**.

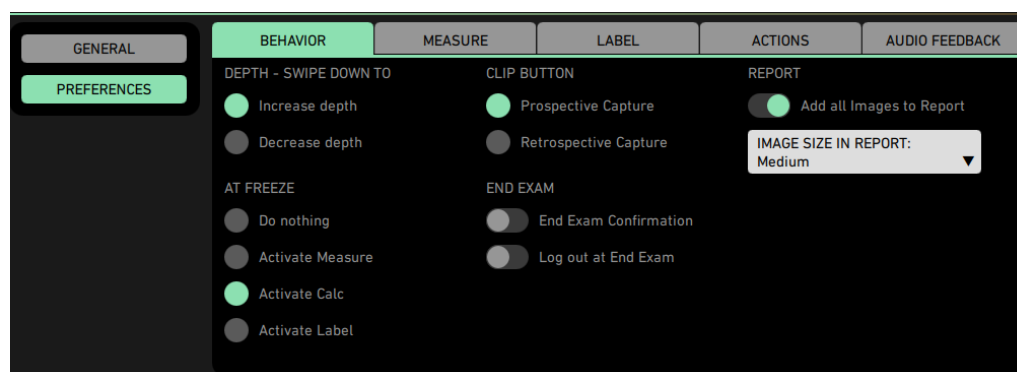


Figure 2-14. User Preferences, Behavior tab

On the **Behavior** tab, you can:

- Select sliding direction on the **Depth** bar.
- Select system reaction **At Freeze**.
- Decide if the **Clip Button** should record a prospective or retrospective video clip.
- Decide if you want to receive a confirmation or be logged out at the end of the exam.
- Select if all images from the current exam should automatically be added to the **Report**, and select default size of these images.



Figure 2-15. User Preferences, Measure tab.

On the **Measure** tab, you can:

- Decide how the system should react on measurement completion.

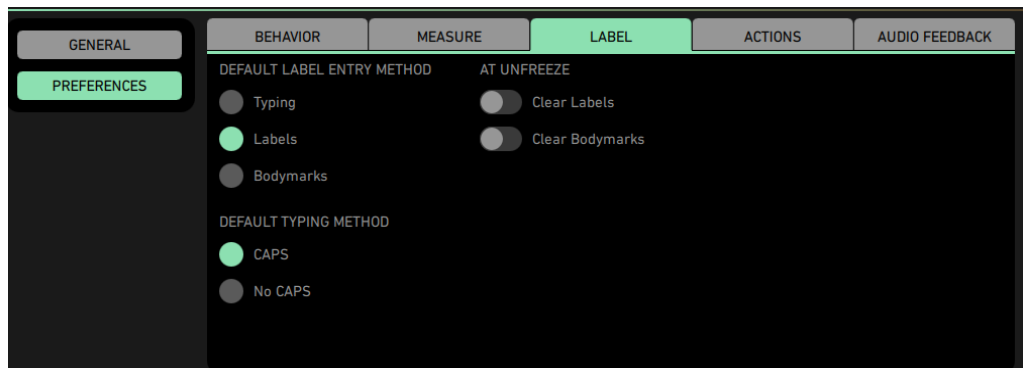


Figure 2-16. User Preferences, Label tab.

On the **Label** tab, you can:

- Select which tab in the input area should be active, when you tap **Label**.
- Decide whether typed in labels should appear in **Caps** or not.
- Select if labels or bodymarks should be cleared at Unfreeze.

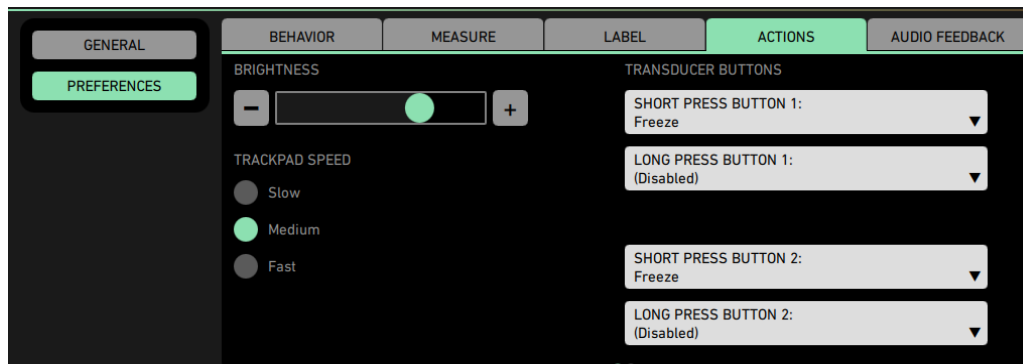


Figure 2-17. User Preferences, Actions tab.

On the **Actions** tab, you can:

- Set the touchscreen **Brightness**.
- Select **Trackpad Speed**.
- Select functions for the transducer buttons on the dropdown menus.
- Swipe to select options for **Foot Pedals**.

Audio Feedback



Figure 2-18. User Preferences, Audio Feedback tab.

On the **Audio Feedback** tab, you can:

- Set **Audio Volume**.
- Use the toggle buttons to select if you want to hear a sound when you
 - tap the touchscreen,
 - capture an image,
 - capture a clip,
 - use a context button (known in this user guide as scale buttons and buttons with dropdown menus), or
 - slide a bar.

Brightness Control

Tap **Brightness Control** to adjust touchscreen brightness.

Lock Touchscreen

Tap **Lock Touchscreen** when you want to wipe off the glass keyboard. A button will be displayed telling you to touch and hold it for 3 seconds to unlock the touchscreen again. A countdown will show.

Help

Tap **Help** to see a version of this User Guide on the monitor.

Logout

Tap **Logout** to log out from the system.

Documents

For information about using the Documents, see Chapter 6, “Documentation” on page 63.

Measurements and Image Data

For information about making and using measurements on the system, see Chapter 5, “Making Measurements” on page 53.

For information about working with the image, see Chapter 4, “Working with the Image” on page 45.

Review

After acquiring the image and making measurements, tap **Review** for archiving, copying, reviewing or deleting the images and reports you made.

Chapter 3

Controls on the Touchscreen

This chapter contains a list of the buttons in the context area of the touchscreen in alphabetical order. Some buttons only appear when the system has been set up to display them. See “Configure Layout Window” in Appendix C, “Setting Up and Customizing Your System” on page 257. Not all of the buttons in the list can be configured by the user.

The basic monitor buttons are listed in Table 2-1, “Basic Touchscreen Buttons explained.,” on page 26.

2D Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
2D Filter	Speckle reduction algorithm. 2D Filter can be set at 5 different levels ranging from subtle speckle reduction (level 1) to strong reduction (level 5). The default level is 3, level 0 turns 2D Filter off.
Anatomical Pos	Anatomical position for 20R3. Use the scale button to set the actual insertion depth of the transducer.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Auto Gain	Auto gain makes it possible to have the same brightness across different patients and body parts.
Auto Gn. Level	Displays the level for Auto Gain.
Auto Mode	Defines the way Auto Gain is adjusted.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
Compounding	Reduces speckle and optimizes the ultrasound image.
Crystal Pos	Crystal position for 20R3. The default position is 0 when the crystal is at the tip of the transducer. Use the scale button to change the crystal position.
D Cursor	Doppler cursor.
Depth	Displays tissue depth of the image.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.

Touchscreen Control	Function
Dynamic Range	Adjust contrast. Lower dynamic range = higher contrast. Higher dynamic range = lower contrast.
Edge	Edge enhancement. Emphasize contours in image so that edges stand out more clearly.
Frequency	Select imaging frequency. The current imaging frequency is displayed on the button.
Harmonics	Tissue harmonic imaging on and off. When you turn it off, imaging resumes with the frequency, gain, dynamic range, etc. that you were using previously.
Image Size	The size of the image on the monitor.
Linked Dual	Automatically transfers the parameters from screen A to screen B (and vice versa).
Live Dual	Simultaneous imaging.
Map	Grayscale map
MI Limit	Sets the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Enhance	Activates the Needle Enhancement function for best needle visibility.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
Needle Str	Adjusts the visibility of the needle. This button is only visible if you have selected Needle Enhance.
Noise Reject	Reduces noise in the image by removing the darker gray colors.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Sector Width	Allows you to expand and reduce the sector width.
Steer	Change the angle of the Doppler line.
SV Size	Resize the Doppler gate.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
Tint	Sets the tint of the image. The current value is displayed on the button.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.

Color Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Auto Scale	Automatic Scale/PRF adjustment.
Baseline	Repositions the baseline (offsets the Doppler Color scale) to help with aliasing problems.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
Color Mode	Sets the color mode. The current value is displayed on the button.
D Cursor	Doppler cursor.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Frequency	Select imaging frequency. The current imaging frequency is displayed on the button.
Hide Color	Removes color from the image.
Image Size	The size of the image on the monitor in %.
Invert	Invert color coding of flow information so that flow towards the transducer appears blue and flow away from the transducer appears red.
Live Dual	Simultaneous imaging.
Map	Color map.
MI Limit	Set the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
Persistence	Sets persistence level of the image.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Scale	Vary the PRF (pulse repetition frequency) to select the range of Doppler velocities (frequencies) that are displayed in the spectrum and/or color-coded.
Smoothing	Softens the colors.
Steer	Change the angle of the Doppler line.

Touchscreen Control	Function
SV Size	Resize the Doppler gate.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
Tissue Priority	Adjusts the priority given to color (flow information). High tissue priority gives color in more areas; low tissue priority reduces the number of areas that are colored.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
VFI Arrow Size	Sets the size of the VFI arrows. The current value is displayed on the button.
VFI Grid Size	Sets the size of the VFI grid. The current value is displayed on the button.
Wall Filter	Adjust the wall filter. The current value is displayed on the button.

PW Doppler Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Assist	Enables assist functionality: vessel outline, assisted steering, assisted angle correction, and assisted caliper placement for volume flow.
Auto Scale	Automatic Scale/PRF adjustment.
Auto Vol Flow	Measures volume flow in ml/min. Opens the Doppler gate to span the entire vessel, setting calipers to measure the diameter of the vessel.
Baseline	Reposition the Doppler mode baseline to help with aliasing problems. The frequency axis is updated to match the spectrum.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
D Cursor	Doppler cursor.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Frequency	Select imaging frequency. The current imaging frequency is displayed on the button.
Full Size	Maximize the size of the image.
Image Size	The size of the image on the monitor in %.

Touchscreen Control	Function
Invert	Inverts the spectrum on the monitor.
Layout	Sets the layout for a Doppler (split) screen: top/bottom or side by side
Layout Size	Select large, medium or small for the Doppler spectrum.
Live Dual	Simultaneous imaging.
Map	Color/Grayscale Map.
MI Limit	Set the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
Noise Limit	Reduces noise in the Doppler curve.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Scale	Vary the PRF (pulse repetition frequency) to select the range of Doppler velocities (frequencies) that are displayed in the spectrum and/or color-coded.
Smoothing	Softens the colors.
Steer	Change the angle of the Doppler line.
SV Size	Resize the Doppler gate.
Sweep Speed	Sets the number of cycles of the spectrum displayed on the full time axis. The current value is displayed on the button.
Sync Steer	Synchronizes the steering of box and gate.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
Trace	Activate automatic Doppler curve tracing and specify the type: Peak, Mean+Peak, or Mean.
Triplex	2D/Color image and Doppler spectrum both active.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Vessel Detect	Adjusts vessel outline. The current value is displayed on the button.
VFI Update	Places the Doppler gate at the highest velocity in the vessel.
Volume	Adjust the volume of the audio signal in Doppler mode.
Wall Filter	Turn the wall filter on and set the cut-off frequency.

M-Mode Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Full Size	Maximize the size of the image.
Image Size	The size of the image on the monitor in %.
Layout	Sets the layout for an M-mode (split) screen: top/bottom or side by side
Layout Size	Select large, medium or small for the M spectrum.
Live Dual	Simultaneous imaging.
M Sync Gain	Synchronizes Gain in relation to 2D image.
MI Limit	Set the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Steer	Change the angle of the M-mode line.
Sweep Speed	Sets the number of cycles of the spectrum displayed on the full time axis. The current value is displayed on the button.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.

CW Doppler

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Baseline	Reposition the Doppler mode baseline to help with aliasing problems. The frequency axis is updated to match the spectrum.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
D Cursor	Doppler cursor.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Frequency	Select imaging frequency. The current imaging frequency is displayed on the button.
Full Size	Maximize the size of the image.
Image Size	The size of the image on the monitor.
Invert	Inverts the spectrum on the monitor.
Layout	Sets the layout for a Doppler (split) screen: top/bottom or side by side
Layout Size	Select large, medium or small for the Doppler spectrum.
Live Dual	Simultaneous imaging.
Map	Color map
MI Limit	Sets the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
Noise Limit	Reduces noise in the Doppler curve.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Scale	Vary the PRF (pulse repetition frequency) to select the range of Doppler velocities (frequencies) that are displayed in the spectrum and/or color-coded.
Smoothing	Softens the colors.
Steer	Change the angle of the Doppler line.

Touchscreen Control	Function
SV Size	Resize the Doppler gate.
Sweep Speed	Sets the number of cycles of the spectrum displayed on the full time axis. The current value is displayed on the button.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
Trace	Activate automatic Doppler curve tracing and specify the type: Peak, Mean+Peak, or Mean.
Triplex	2D/Color image and Doppler spectrum both active.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Volume	Adjust the volume of the audio signal in Doppler mode.
Wall Filter	Turn the wall filter on and set the cut-off frequency.

Elastography Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Dynamic Range	Adjust contrast. Lower dynamic range = higher contrast. Higher dynamic range = lower contrast.
E Reject	Increase visibility of cysts.
Enhance	Enhances the mode.
Frequency	Select imaging frequency. The current imaging frequency is displayed on the button.
Image Size	The size of the image on the monitor in %.
Live Dual	Simultaneous imaging.
Map	Color map.
MI Limit	Sets the Mechanical Index Limit. The current value is displayed on the button.

Touchscreen Control	Function
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
Opacity	Overlay of 2D and elastography.
Persistence	Set persistence level of the image.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Resolution	Change the elastography resolution.
Steer	Change the angle of the Doppler line.
SV Size	Resize the Doppler gate.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.

Power Mode Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
Color Mode	Sets the color mode. The current value is displayed on the button.
D Cursor	Doppler cursor.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Frequency	Select imaging frequency. The current imaging frequency is displayed on the button.
Hide Color	Removes color from the image.
Image Size	The size of the image on the monitor in %.

Touchscreen Control	Function
Invert	Inverts the spectrum on the monitor.
Live Dual	Simultaneous imaging.
Map	Color map.
MI Limit	Sets the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
Persistence	Sets persistence level of the image.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Scale	Vary the PRF (pulse repetition frequency) to select the range of Doppler velocities (frequencies) that are displayed in the spectrum and/or color-coded.
Smoothing	Softens the colors.
Steer	Change the angle of the Doppler line.
SV Size	Resize the Doppler gate.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
Tissue Priority	Adjusts the priority given to color (flow information). High tissue priority gives color in more areas; low tissue priority reduces the number of areas that are colored.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
VFI Arrow Size	Sets the size of the VFI arrows. The current value is displayed on the button.
VFI Grid Size	Sets the size of the VFI grid. The current value is displayed on the button.
Wall Filter	Turn the wall filter on and set the cut-off frequency.

3D Controls

Touchscreen Control	Function
0/60 Degree	Angle correction line in Doppler mode, fixed intervals -60, 0, 60.
3D Acquire	Acquires a 3D volume. A progress circle appears during acquisition.
3D Direction	Sets the 3D direction L-R or R-L.

Touchscreen Control	Function
3D Distance	Sets the distance the transducer will travel to acquire the 3D volume in mm. The current value is displayed on the button.
3D Spacing	Sets spacing between frames in mm. The current value is displayed on the button.
3D Sweep Mode	Move the transducer freely to acquire a 3D image - set Untracked Linear or Untracked Fan.
Acquire Time	Set duration of a 3D data acquisition. The current value is displayed on the button. Image quality increases with an increased acquire time.
Angle Correct	Angle correction line in Doppler mode, 1 degree increments from -89 to 89.
Biopsy	Displays a puncture line or brachy matrix.
Cine Play	Shows the Cine sequence, that you have selected using the trim buttons.
Cine Trim End	Places the end marker on the Cine sequence.
Cine Trim Start	Places the start marker on the Cine sequence.
Dual	Activates/deactivates split screen.
Dual Layout	Displays split screen either side by side or top/bottom.
Image Size	The size of the image on the monitor in %.
Live Dual	Simultaneous imaging.
MI Limit	Sets the Mechanical Index Limit. The current value is displayed on the button.
Motion Comp	Algorithm to compensate for movement.
Needle Guide	Displays the needle guide(s) available for the selected transducer.
R/L Invert	Inverts the image orientation right/left. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.
Res Enhance	Adjusts the balance between resolution and frame rate, e.g. Min gives 1 focus point and a high frame rate.
Steer	Change the angle of the Doppler line.
Stitch	Set the stitch angle of the transducer.
SV Size	Resize the Doppler gate.
TI Limit	Sets the Tissue Index Limit. The current value is displayed on the button.
TI Type	Select Tissue index type. The current value is displayed on the button.
U/D Invert	Inverts the image orientation up/down. The circle with the bk logo on the monitor corresponds to the logo on the transducer tip.

3D Rev. Mode

Touchscreen Control	Function
3D Animate	Activates/deactivates rotation of the 3D volume.
3D Brightness	Set the brightness of the 3D volume. The current value is displayed on the button.
3D Contrast	Set the dynamic range of the 3D volume. The current value is displayed on the button.
3D Filter	Set threshold so pixels not as bright as threshold are not displayed. Can help eliminate noise in 3D volumes.
3D Hue	Set a color hue for the 3D volume.
3D Label	Type a label for the 3D volume. Use the trackpad to place it and tap to set the label.
3D Luminance	Controls the brightness of structures within the volume.
3D Opacity	Sets the opacity of the 3D volume, allowing visualization of structures beneath the surface.
3D Sculpture	Turns sculpting of the 3D cube on and off.
3D Thickness	Sets thickness in photo and non-photo mode in 3D.
3D View	Select how the 3D volume is displayed. The current value is displayed on the button.
3D Zoom	Zoom 3D Volume.
Animation Span	Sets the extent of the rotation of a 3D volume.
Animation Speed	Sets the speed of the rotation of a 3D volume
Arrow	Displays an arrow on the 3D volume.
Clear Labels	Delete any labels that you have typed on the 3D volume.
Clear Meas.	Delete any measurements you have made on the 3D volume.
Clear Sculpture	Clears 3D sculpting.
Default View	Restores the acquired image, removing any changes.
HWL	Measure volume by HWL.
Measure Angle	Measure angle in 3D.
Measure Area	Measure Area in 3D.
Measure Dist.	Measure distance in 3D.
New Volume	Returns to the Review window.
Next	Steps forward through images in the volume
Orientation	Displays or hides orientation markers in 3D volumes.
Photorealistic	Adjusts the photorealistic characteristics of the 3D volume.
Prev	Steps backward through images in the volume.
Redo Label	Restore the most recent label that has been undone.

Touchscreen Control	Function
Redo Measure	Restore the most recent measurement that has been undone.
Rotation	Sets the 3D volume to rotate horizontally or vertically.
Sculpt. Depth	Sculpture Depth. Sets the penetration of the sculpting tool.
Sculpt. Display	Sculpture Display. Displays the result of the sculpting.
Sculpt. Method	Sculpture Method. Select between cutting a hole inside the volume, cutting away the outside of the volume or using the shave tool.
Stitchline	Turns stitchline on and off.
Store Volume	Stores the most recent changes to the volume.
Undo Label	Remove the most recent label from the 3D volume.
Undo Measure	Remove the most recent measurement from the 3D volume.
Undo Sculpture	Remove the most recent sculpture of the 3D volume.
Volume	Draw planimetry on each image to create a volume.
Wireframe	Turns the wireframe around the 3D volume on or off.

Chapter 4

Working with the Image

You can work with an image (measuring, resizing, etc.) using the touchscreen.

Selecting the Imaging Plane

If you are using a transducer with more than one plane, you can select the imaging plane (**T** for transverse, **S** for sagittal, or **E** for endfire). The current imaging plane (**T**, **S**, or **E**) is displayed at the top of the monitor next to the transducer name.

To select the imaging plane:

- Press the appropriate button on the transducer. For details, see the user guide for the transducer.

or

- Tap **T**, **S**, or **E** on the touch screen.

NOTE: *When you change image orientation U/D, you may need to adjust the TGC settings for the B-mode image. See “TGC” on page 75.*

Freezing the Image


When you tap **Freeze**, all images on the monitor are frozen. A snowflake with the word FROZEN appears on the monitor. If you tap **Freeze** again, the image returns to its previous state.

NOTE: *Some functions are not available when the image is frozen and some are available **only** when the image is frozen. If a control you want to use is missing, try freezing or unfreezing the image.*

Partial Freeze and the Dual View Button

You can only do a partial freeze when you are imaging in Doppler mode as well as one or more 2D modes (B-mode, color, and power) – duplex or triplex imaging. In partial freeze, *either* the Doppler image *or* the 2D-mode image is frozen. You can toggle between the two images in a partial freeze.

To start partial freeze:

- Tap the dual view  button.

The partial freeze state starts with all 2D-modes frozen and Doppler mode imaging.

While the partial freeze is active, tap the dual view button to toggle the display between the 2 states, which are

- Doppler mode frozen; 2D-modes imaging.
- 2D-modes frozen; Doppler mode imaging.

To unfreeze both views:

- Tap the **Triplex** button..

Split Screen

You can split the screen horizontally or vertically to display 2 views side by side or one over the other.

- If you are using a single-plane transducer, the 2 views contain the same imaging view.
- If you are using a biplane transducer, each view displays the image from one imaging plane.
- If simultaneous imaging is turned on, both views can be imaging.

To split the screen or remove a split:

- 1 Tap **Dual**.
- 2 Tap **Dual Layout** and select **Side By Side** or **Top/Bottom**.

To select one of the views:

- Tap the dual view button  to toggle between the views.

Simultaneous Imaging

The 2 views in a split screen can both be imaging simultaneously; in this case, freezing and unfreezing affect both images.

To turn simultaneous imaging on and off:

- Tap **Live Dual**.


NOTE: *In simultaneous split-screen imaging, only one of the views can contain Color or Power mode. Therefore, if one view has 2D+Color or 2D+Power, the other view contains only a 2D image.*

You can save a simultaneous split setup (which image is in which part of the monitor) as part of a preset.

Linked Dual

Linked Dual is enabled as a default setting on all Exam Types. During split screen imaging, the Linked Dual function automatically transfers the parameters from screen A to screen B (and vice versa). Color and power mode can be in only one screen.

To use Linked Dual:

- 1 Adjust the image parameters in screen A, then tap **Linked Dual** and the  button to transfer the parameters to screen B.
- 2 Use the same method to transfer the parameters from screen B to screen A.

To disable Linked Dual:

- Tap **Linked Dual**.

NOTE: The functionality of the **Linked Dual** button can be saved as part of a preset.

NOTE: In **Linked Dual** imaging, only one of the views can contain **Color** or **Power** mode. Therefore, if one view has **2D+Color** or **2D+Power**, the other view contains only a **2D** image.

Labels, Bodymarks and Arrows

In addition to annotating an image during an examination, you can add annotations (labels, bodymarks and arrows) to stored images and to individual frames of stored clips from the same type of ultrasound system.

NOTE: Labels change color when being manipulated. When the cursor hovers over them, they are orange. They are green when you are able to move them. When in position, and the cursor is not nearby, they are white.

Labels

Labels provide a practical way to identify or explain an image. You can:

- Place text labels anywhere on the ultrasound image.
- Add more than one label to an image.
- Type labels directly on the image or select a pre-defined label. When you type, pre-defined labels are suggested to you on top of the keyboard.
- Add an arrow to denote a specific area of interest.

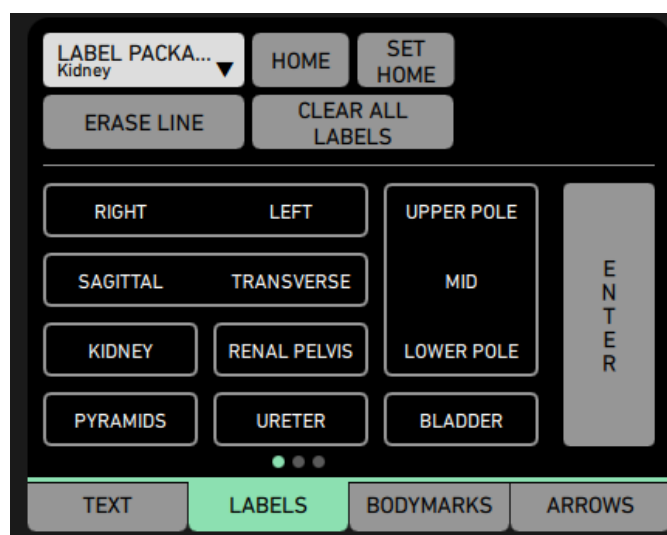


Figure 4-1. Label selector.

To select a label:

- 1 Tap the **Label** button.

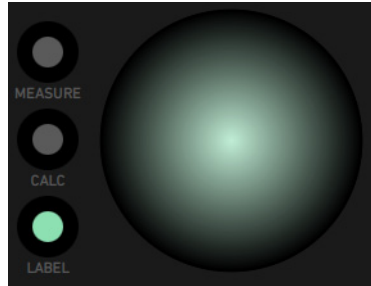


Figure 4-2. The **Label** button next to the trackpad.

- 2 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 3 Swipe the label selector to see all labels.
- 4 Select the label by tapping it.
- 5 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see Fig 4-1.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

Bodymarks are small bitmaps depicting parts of the body. You can place a bodymark anywhere on the ultrasound image.

An imaging plane indicator (transducer) is placed on the bodymark to show the imaging position.



Figure 4-3. Bodymark with imaging plane indicator:

The imaging plane indicator consists of a long bar and a small square. The orientation of the bar indicates the orientation of the transducer on the body, and the square indicates the part of the transducer that corresponds to the upper left of the image on the monitor.

Using Bodymarks

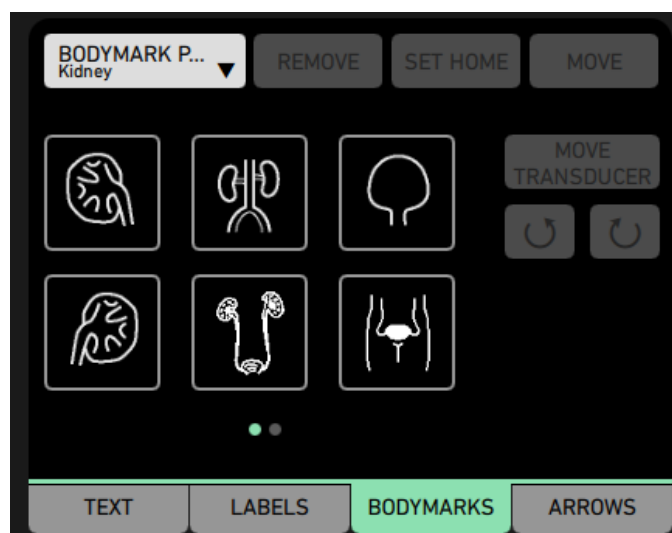


Figure 4-4. Bodymark selector.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator (transducer) is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

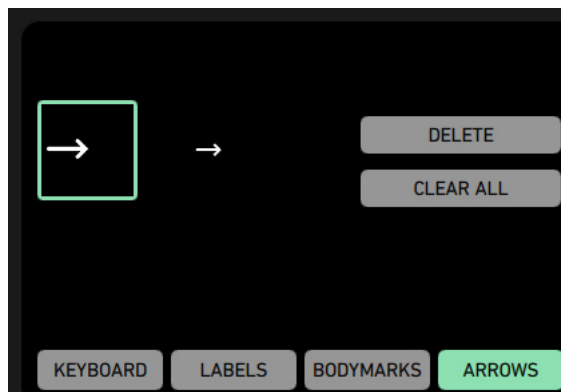


Figure 4-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Cine

Cine (image review) lets you review a series of the most recently recorded 2D, 2D+Color mode, or 2D+Doppler mode images.

Freeze the image and slide the Cine bar to scroll backward or forward through the series.

Images are constantly being saved and stored for review. When storage capacity is reached, the oldest images are discarded as new ones are stored. The number of images that can be stored for review varies, depending on such factors as image resolution and size.

Images in a clip must be comparable. Therefore, changing certain parameters that affect the image will cause already-stored images to be discarded. If this happens, there will not be a full set of images to be reviewed until the storage has had time to fill again.

You can change some of the settings for the **Cine** function.

Using Cine

To use the Cine function:

- Freeze the image, and slide the cine bar to scroll through the frames. Cine frame numbers appear on the bottom center of the monitor.



Figure 4-6. Cine frame numbers, indicating that frame no. 133 of 448 is being displayed.

*Note that if you have selected **Activate Calc at Freeze** in the **User Preferences**, you will have to tap **Calc** to use the cine bar.*

Cine Trim

You can set start and stop markers to indicate the range of images to be displayed in **Cine Play**.

- Freeze the image and scroll back through the frames using the cine bar.
- Select where you want the start marker and tap **Cine Trim Start**.
- Select where you want the stop marker and tap **Cine Trim End**.
- Tap **Cine Play** to see your selected frames.

The current frame and the total number of frames are displayed on the monitor. The start and end frame numbers are displayed on the touchscreen Cine buttons. After the newest image has been displayed, **Cine Play** will begin to play the loop again.



Figure 4-7. Touchscreen buttons for trimming cine.

Using Cine in Doppler Mode

When cine is activated while imaging in Doppler mode, a vertical cine cursor is displayed overlaying the Doppler image.

The 2D image displayed is always the one that corresponds to the position of the Doppler cursor. The image (frame) number in the **Frame** indicator corresponds to the B-mode image.

To make measurements on a cine image or save it:

- 1 When the desired image is displayed, tap **Measure**.
- 2 Make measurements on the image or save it in the usual way.

NOTE: *When you move a cine image after you make a measurement, the measurement result and markers disappear (because the underlying image is different).*

Video Display

The image can be displayed on an auxiliary video monitor. You can select the video output mode (including OFF). See more about video setup in the System window “Video Out Tab” on page 261.

Chapter 5

Making Measurements

Measurements and Calculations

Each Exam Type contains the measuring tools that you need for the calculations contained in the package. You use these tools to measure different aspects of the ultrasound image (and thus the underlying tissue); these measurements are used for various calculations.

You have two options for making measurements, **Measure** and **Calc**. Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

You can make measurements on stored images from the same type of ultrasound system. The images must be in DICOM format, not .bmp. For information about the format of stored images, see “HIPAA Compliance and Exporting Data” on page 66. You cannot make measurements on video clips.

For calculation formulas and information about the accuracy of different types of measurements, see “Clinical Measurements: Ranges and Accuracies” in the *bkSpecto User Guide* and the Technical Data (BZ2100).

To view the list of measurements:

- Tap **Measure**.
The parameter area shows the available measurements for the selected preset and imaging mode(s).

Making a Measurement – General Procedure

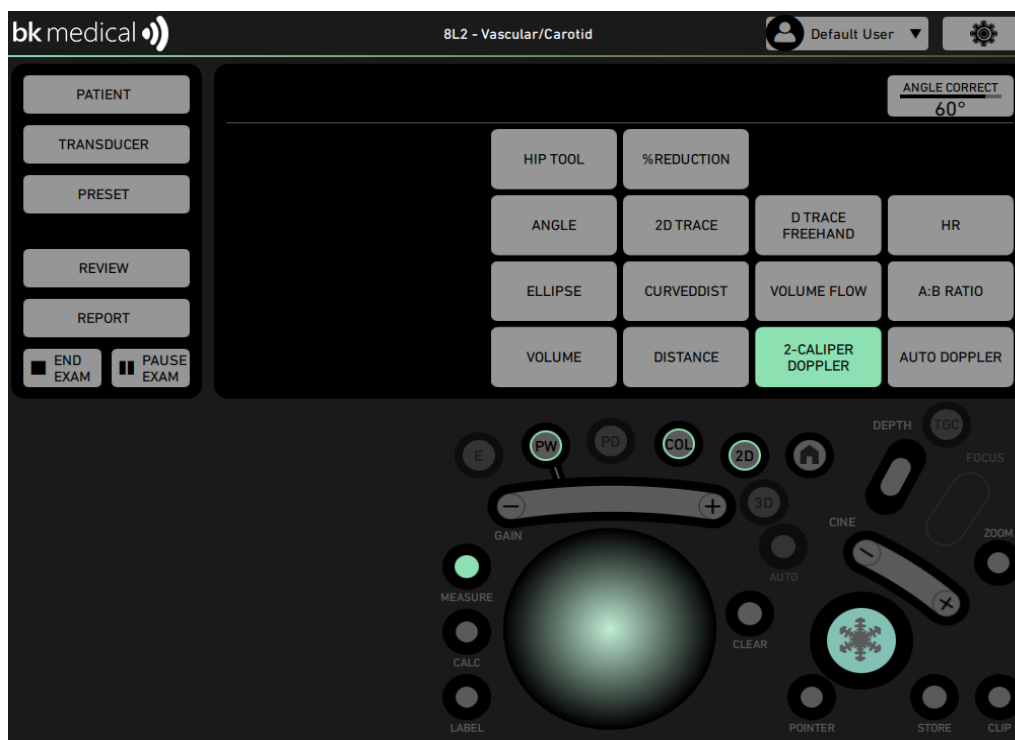


Figure 5-1. Touchscreen when measurement is active for 2D, PW and Color modes.

The following sections contain detailed descriptions for using the various measuring tools.

NOTE: *The image will be frozen when you tap measure to make measurements.*

To make a measurement:

- 1 Tap the name of the measurement.
A caliper appears on the image.
- 2 Drag the caliper to the position you want and tap.
If the measurement requires 2 calipers, another one appears.
- 3 Drag the second caliper to the position you want and tap.
- 4 Repeat this until you have positioned all the calipers for the measurement.

NOTE: *The look of the calipers themselves and of any lines that connect them depend on what you are measuring.*

What the Measurements Indicate

- **Results** – The results of the measurement are displayed (continuously updated) on the monitor.
- **Depth** – While you are positioning the first caliper for a distance measurement in a 2D or Color mode image, the displayed measurement is the depth of the caliper (distance from the caliper to the transducer surface along the scan line). When a second caliper is positioned, the depth is replaced by the appropriate measurement result.

Clearing a Measurement

To clear a measurement

- Tap **Clear**.

2D and Color Mode Measuring Tools

This section describes how to make the following types of measurements:

- Distance
- Angle
- Hip tool
- Circle
- Ellipse
- Freehand drawing of shapes

Distance Measuring Tool

Two calipers can be positioned to measure a distance, for example, the length or width of a structure. When the first caliper is positioned, a second one appears for you to position.

NOTE: *Tapping Measure starts a distance measurement.*

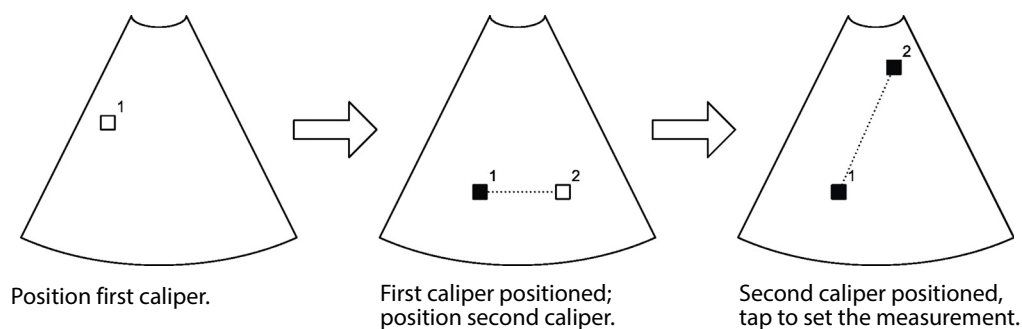


Figure 5-2. Positioning 2 calipers on a B-mode or Color mode image.

NOTE: *The small numbers (1 and 2) shown in Fig 5-2 indicate the order in which the calipers appear. The numbers do not appear like this on the monitor.*

To move a caliper after they have all been positioned:

- 1 Use the pointer to tap any caliper and move it to change the length or orientation of the line.
- 2 Tap again to set the measurement.

To move the entire measurement after positioning:

- 1 Tap the line and drag it to the new position
- 2 Tap again to set the measurement.

Angle Measuring Tool

On a 2D or Color mode image, you can measure angles.

To measure an angle:

1 Tap Angle.

A caliper appears.

2 Position the caliper and tap.

A second caliper appears, with a line connecting the two calipers.

3 Position caliper 2 to change the angle of the line. Tap to place the second caliper.

A third caliper appears.

4 Position caliper 3 and tap.

A fourth caliper appears, with a line connecting it to caliper 3.

5 Position caliper 4 to change the angle of the line. Tap to place the fourth caliper.

Angle **alpha** between the two lines is indicated on the image, and the size of the angle appears as a measurement to the left of the image.

To change the angle measurement after all the lines are positioned:

1 Use the pointer to tap any caliper and move it to change the length or orientation of one of the lines.

2 Tap again to set the measurement.

Hip Tool Measuring Tool

The hip tool measuring tool works slightly different from the other measuring tools, but in general as the angle tool described above. There are, however, three lines and thereby two angles to measure.

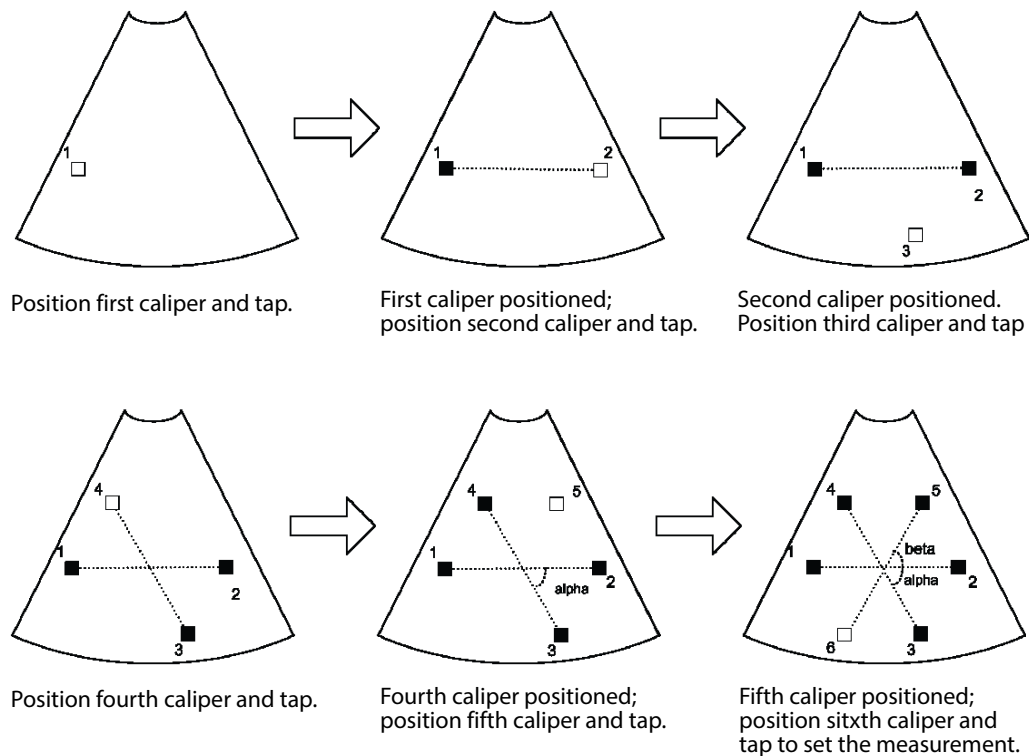


Figure 5-3. Using the Hip Tool to measure two angles.

To use the Hip Tool:

- 1 Tap **HipTool**.
A caliper appears.
- 2 Position the caliper and tap.
A second caliper appears, with a line connecting the two calipers.
- 3 Position caliper 2 to change the angle of the line. Tap to place the second caliper.
A third caliper appears.
- 4 Position caliper 3 and tap.
A fourth caliper appears, with a line connecting it to caliper 3.
- 5 Position caliper 4 to change the angle of the line. Tap to place the fourth caliper.
Angle **alpha** between the two lines is indicated on the image, and the size of the angle appears as a measurement to the left of the image.
Caliper 5 appears.
- 6 Position caliper 5 and tap. Caliper 6 appears, with a line connecting it to caliper 5.
- 7 Position caliper 6 to change the angle of the line. Tap to place the sixth caliper.
Angle **beta** between the first and last lines is indicated on the image, and the size of the angle appears as a measurement to the left of the image.

If you just tap and do not move any calipers, the default angles are 60°.

To change the hip tool measurement after all the lines are positioned:

- 1 Use the pointer to tap any caliper and move it to change the length or orientation of any of the lines.
- 2 Tap again to set the measurement.

Circle Measuring Tool

On a 2D or Color mode image, you can position 2 calipers to measure a circle. Use the **Ellipse** measure. Position the calipers in the usual way. As you move the second caliper, the circle is continuously redrawn on the monitor.

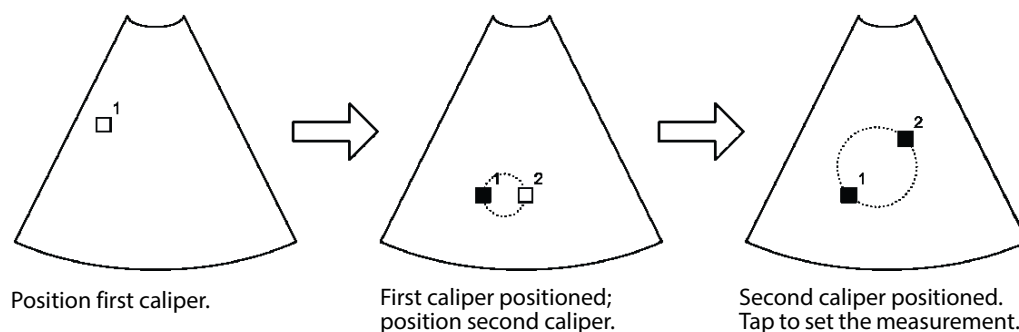


Figure 5-4. Using the circle measuring tool.

To move the entire circle without changing its size:

- 1 Tap inside or on the circle.
The circle turns green and a symbol (a plus sign with arrows) appears as shown in the center image of Fig 5-5. This symbol means you can move the circle.

- 2 Drag it.
- 3 Tap again to set the circle.

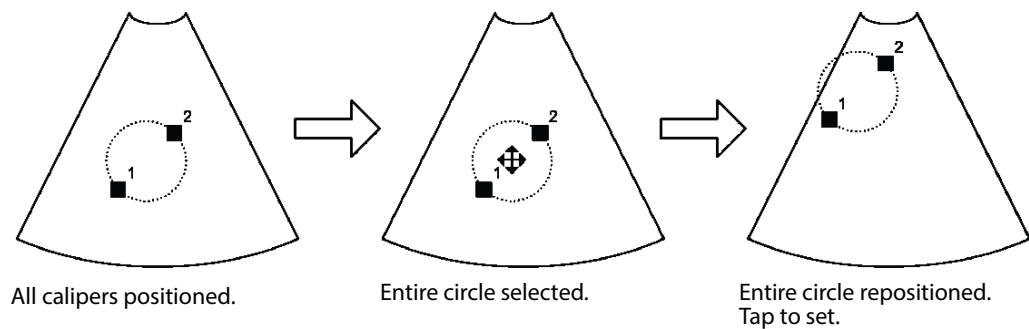


Figure 5-5. Moving an entire circle without changing its size.

Ellipse Measuring Tool

On a 2D or Color mode image, you can use three calipers to measure an ellipse. Position the calipers in the usual way.

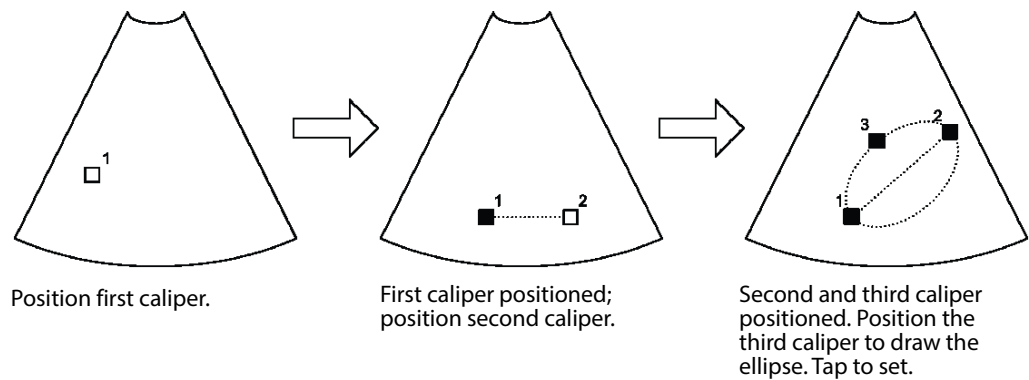
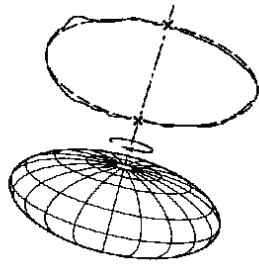


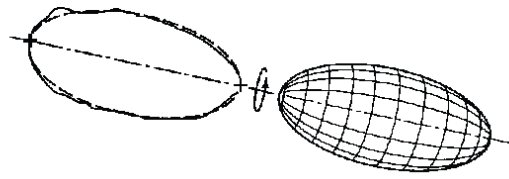
Figure 5-6. Drawing an ellipse.

The first 2 calipers determine a line that is used as the axis of rotation if you use the ellipse to measure volume. A circle will be drawn on the monitor. Use the trackpad to move the third caliper and widen or lengthen the circle into an ellipse.

NOTE: The axis of rotation critically affects the calculated volume. Consider the basic shape of the structure of interest and make sure to place the 2 calipers so that they define the correct axis of rotation. See Fig 5-7.



Using the shorter distance as axis of rotation results in an estimated volume of the shape shown here.



Using the longer distance as axis of rotation results in an estimated volume of the shape shown here.

Figure 5-7. The effect of the rotation axis on volume determination.

The third caliper is always equidistant from the first 2. Moving it makes the ellipse broader or narrower. As you move the third caliper, the ellipse is continuously redrawn on the monitor.

After the calipers have been set, you can move any of them using the pointer by tapping and dragging to a new position.

To move the entire ellipse without changing its size or orientation:

- 1 Using the pointer, tap inside or on the ellipse.
The ellipse turns green and a symbol (a plus sign with arrows) appears as shown in the center image of Fig 5-8. This symbol means you can move the ellipse.
- 2 Drag it.
- 3 Tap again to set the ellipse.

Not all of the ellipse has to lie within the ultrasound image.

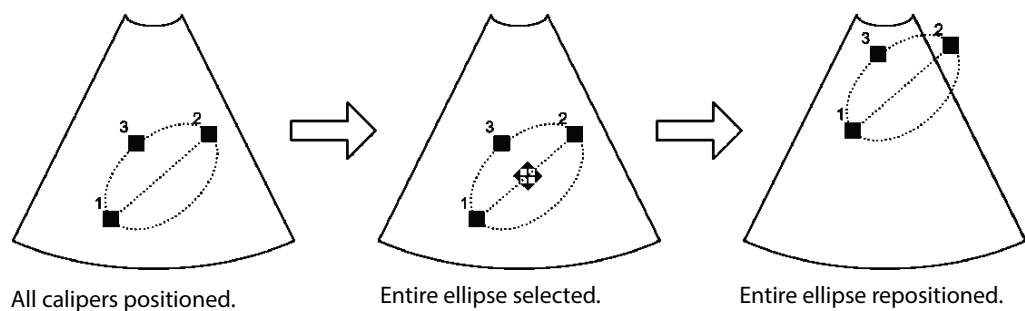


Figure 5-8. Moving an ellipse.

Freehand Drawing on a 2D or Color Mode Image

On a 2D or Color mode image, you can draw a closed shape freehand.

To draw freehand:

- 1 Tap **2D Trace**.
A caliper appears.
- 2 Drag it to where you want to start drawing. Tap.
The caliper changes into a drawing cursor.

- 3 Drag it to draw the shape you want.

To delete backward from the cursor, tap **Back Trace**. The cursor is automatically moved back.

- 4 When you have finished drawing, tap the trackpad.

The shape is automatically closed by a straight line from the drawing caliper to the first caliper (starting point).

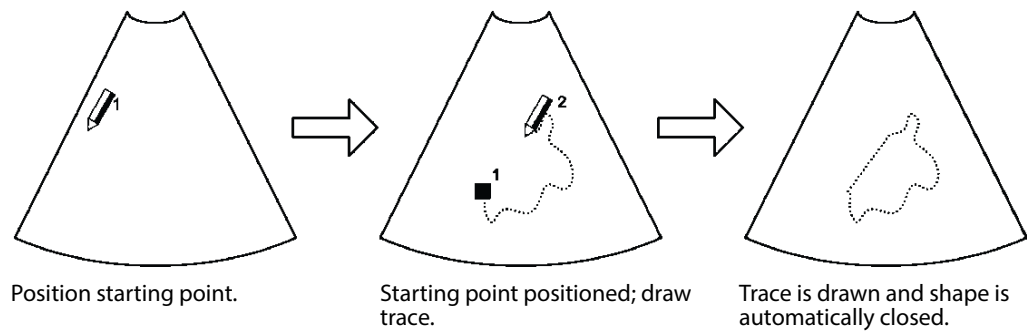


Figure 5-9. Drawing a freehand shape.

You can move the shape to any location in the view:

- 1 Using the pointer, tap inside or on the shape.

The shape turns green and a symbol (a plus sign with arrows) appears as shown in the center image of Fig 5-10. This symbol means you can move the shape.

- 2 Drag it.
- 3 Tap again to set the shape.

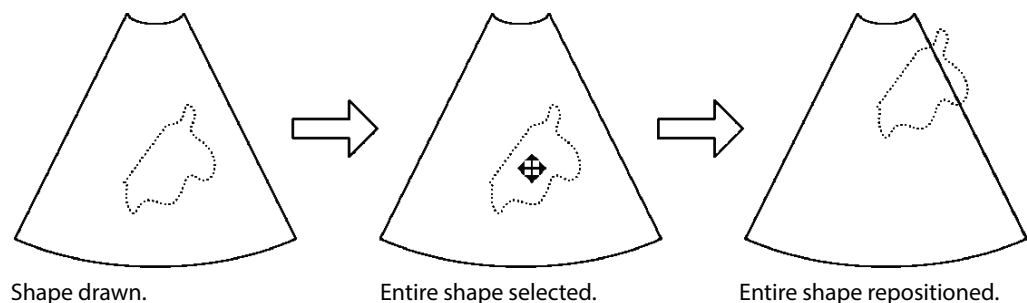


Figure 5-10. Moving a shape you have drawn freehand.

Doppler Mode Measuring Tools

Making measurements on a Doppler mode image is different from measuring on a 2D or Color mode image because the Doppler mode image has *time* as a dimension. To avoid getting a negative result, successive calipers must be positioned to the right, not the left, of any already-positioned calipers.

Note that the **Angle Correct** button is available when you tap **Measure** or **Calc** in Doppler mode.

Positioning 2 Point Calipers on a Doppler Mode Image

While you are positioning a caliper, 2 cursor lines are displayed. One is horizontal and one vertical, intersecting at the caliper position.

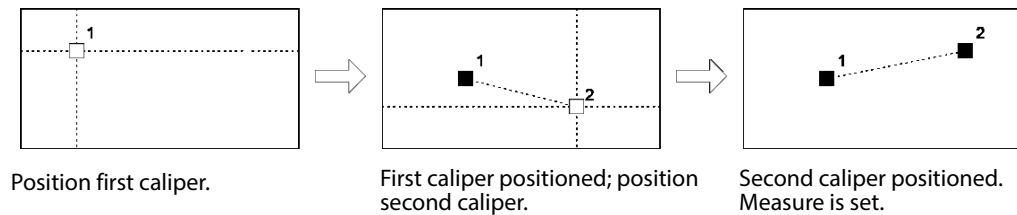


Figure 5-11. Positioning 2 point calipers on a Doppler mode image.

After you position the calipers, you can move one of them by using the pointer and tapping and dragging it. Tap again if you want to reposition the second caliper and tap when you are done positioning.

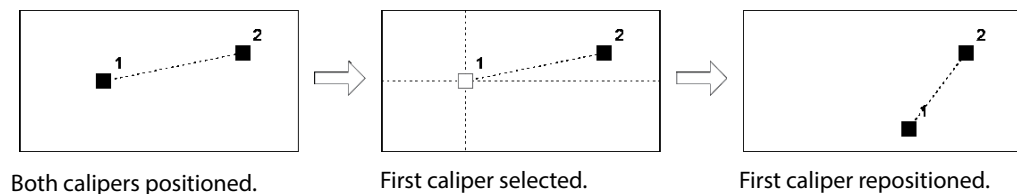


Figure 5-12. Moving a caliper you have placed on a Doppler mode image.

You can position the calipers anywhere in the Doppler mode image.

The appearance of the calipers and whether they are connected by a dotted line depends on what you are measuring.

Positioning 1 Point Caliper on a Doppler Mode Image

If you are measuring something that needs only one caliper, position the caliper in the same way as for 2 calipers.

Positioning 2 Vertical Line Calipers on a Doppler Mode Image

Two vertical line calipers can be positioned on a Doppler mode image to measure intervals.

To position the vertical calipers:

- 1 Tap the **HR** measure button.
A line caliper appears on the image.
- 2 Drag this to the position you want. Tap.
Another line caliper appears.
- 3 Drag it to the correct position and tap.

The measurement is set.

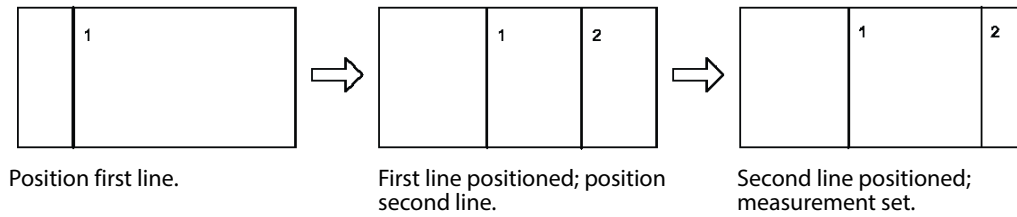


Figure 5-13. Positioning vertical calipers on a Doppler mode image.

After you have positioned the lines, you can move them to a new position:

- Use the pointer to tap any of the lines and move it to change the position.

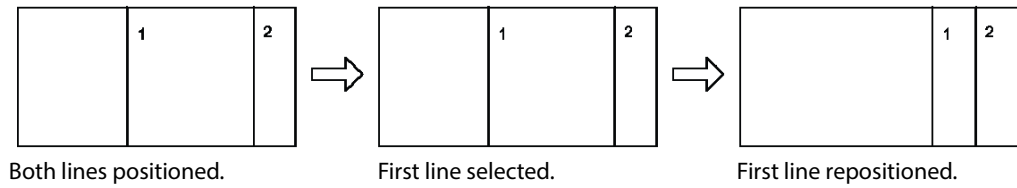


Figure 5-14. Moving a vertical line caliper you have placed on a Doppler mode image.

Drawing an Outline Curve on a Doppler Mode Image

On a Doppler mode image, you can draw an outline curve freehand.

To draw freehand:

- 1 Tap the **Doppler Trace** measure button:
A caliper appears.
- 2 Drag it to where you want to start drawing. Tap.
A drawing cursor appears where you tapped.
- 3 Drag the drawing cursor to draw the shape you want. (You can only drag to the right; you cannot drag to the left.)
To delete backward from the cursor, tap **Back Trace**. The cursor is automatically moved back.
- 4 When you have finished drawing, tap to set the doppler trace.

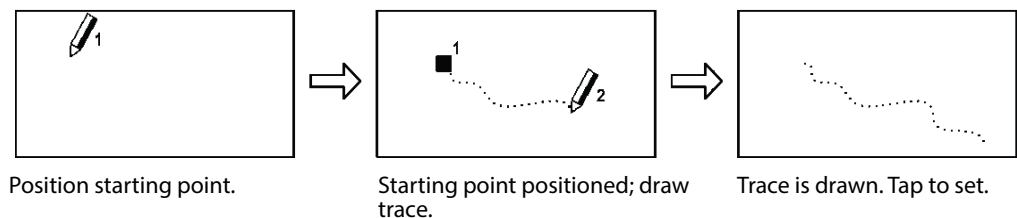


Figure 5-15. Drawing a freehand curve on a Doppler image.

Chapter 6

Documentation

What are Documents?

This chapter describes ways to save, view and delete documents.

There are four different types of documents:

- Images (2D and 3D)
- Clips
- 3D data sets
- Reports

In this chapter, the term “document” refers to all of these types of documents unless a particular type is specified.

HIPAA Compliance

HIPAA (the American Health Insurance Portability and Accountability Act of 1996) sets standards for handling patient data and medical records in a way that ensures the privacy and security of all health-care related data. Each hospital or office must set up procedures to make sure that all information that identifies an individual remains confidential and safe. Always follow the procedures that have been established for your workplace.

Information relating to HIPAA compliance can be found in the various parts of this chapter:

- “HIPAA Compliance and Exporting Data” on page 66
- “Deleting Documents or Exams from the System” on page 68
- “Password Protection of Patient Data” on page 69

Saving Documents – Capturing Images and Video Clips

You must have a patient ID entered in order to capture images and clips. Normally, the Patient ID field will be populated with a date/timestamp, but you can enter a specific ID before you start the exam if you want to.

Capturing Images

When you have started the exam, tap **Store** to capture an image and **Clip** to capture a clip. While a clip is being captured, a progress wheel is displayed in the document browser. If you tap **Store** or **Clip** and an exam is not running, the system returns you to the **Patient Details** where you can start the exam by tapping **Start Exam**.

Reviewing Documents

The Document Browser

Use the document browser at the bottom of the monitor to review images and clips from the current exam.

The document browser contains numbered thumbnails of the available documents. If the browser contains more images than can be displayed on the monitor, arrows appear at each end of the line of thumbnails.

To view a document:

- 1 Use the pointer to point at the document in the browser.
- 2 Tap the trackpad.

A green frame with a 'Close' label appears on the selection and the document is displayed on the monitor.

- 3 Tap the document again to close it.

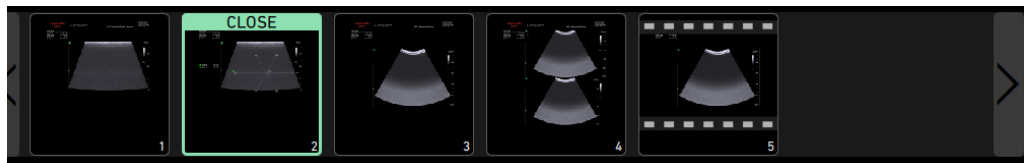


Figure 6-1. The document browser

The Review Window

Use the **Review** window to review and manage images and other documents stored in the patient list. For saved exams, open the documents on the **Patient List** by double-tapping the examination you want to view.

To change the order of the saved images in the active exam:

- 1 Tap **Change Order**.
- 2 Tap and drag the image to where you want it.

The image changes position in the **Review** window and the document browser (when the image is not frozen).

To join video clips:

- 1 Tap **Select Multiple**.
- 2 Tap the video clips you want to join.
- 3 Tap **Join Clips**.

The system displays a message to indicate that the clips are being joined, and the new video clip is added at the end.

You can view the documents on the monitor or you can export or delete them. Select a document to view or one or more documents to export or delete.

In the same way, you can also review examinations from a **CD/DVD** or a **USB**.

Viewing and Editing Video Clips

When you view a video clip, edit buttons are displayed on the touchscreen so you can edit it.

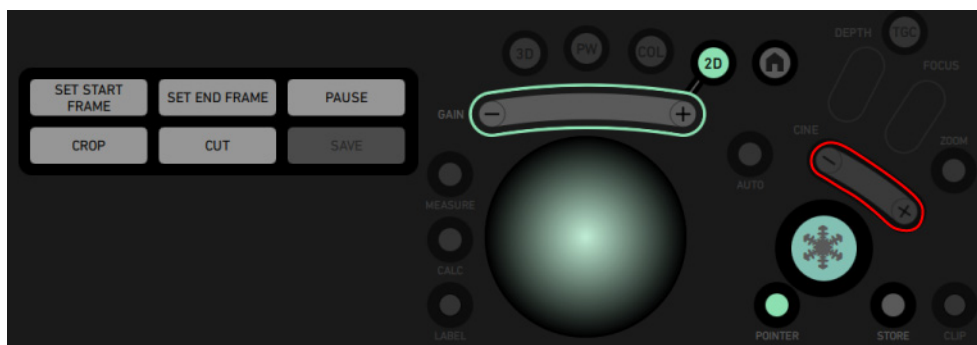


Figure 6-2. Video editing buttons.

To edit a video clip:

- 1 Tap **Pause** to pause the video. The button changes text to **Play**.
- 2 Use the **Cine** bar to scroll through the frames to find your preferred start frame.
- 3 Tap **Set Start Frame**. The button changes text to **Reset Start Frame** for ease of editing.
- 4 Use the **Cine** bar to scroll through to your preferred end frame.
- 5 Tap **Set End Frame**. The button changes text to **Reset End Frame** for ease of editing.
- 6 Tap **Crop** to remove the parts of the clip that are outside the start- and end frames, or tap **Cut** to remove the part of the clip that is inside the start and end frames.
- 7 When you are done, tap **Save**. The video clip you have edited will not be overwritten, but your edited clip will be added to the clips in the Document Browser and the **Review window**.

Viewing Exported Documents on the System

Documents that have been exported to external storage media can be viewed on an ultrasound system.

To view externally stored documents:

- 1 Use a network drive or insert a USB or a CD/DVD drive with a storage device into the USB connector on the left side of the keyboard.
- 2 In the **Review** window, tap the **USB**, **CD/DVD** or **Network Drive** tab.
A list of the folders on the external storage device appears.
- 3 Tap the folder you want to view.

The Review window displays the documents in the selected folder.

Viewing Exported Documents on an External Computer

Formats of Exported Documents

Copied Images Images copied to a network drive, CD or USB storage device are stored in DICOM or PNG format. In PNG format, they are labeled with a code that specifies the date and time the image was captured. For example, 12022003-1234_20171117_134202_0000.png would be the label on an image of patient 12022003-1234 that was captured on November 17, 2017 at 1.42.02 PM. (13:42:02). The label on a DICOM file is the same except that the file extension is .dcm.

Copied Video Clips Video clips can be copied in AVI, MPEG or DICOM format.

Stored Images and Video Clips Stored images and video clips are stored in DICOM format.

Viewing Images on a Computer

NOTE: *DICOM format requires a DICOM viewer on your computer.*

Copied images have been exported in DICOM or PNG format. You select the file you want to view.

Viewing Video Clips on a Computer

If the video clip has been exported in DICOM format, you can view it with a DICOM viewer. Otherwise, you can use a media player on your computer.

Exporting Data

HIPAA Compliance and Exporting Data

To preserve patient confidentiality when you copy patient data, select the option to copy images and other documents to a network drive, CD or USB storage device *without the identifying patient information*: **De-identify Patient Data**.

Exporting documents

You can copy documents associated with a patient to a CD/DVD, USB storage device, PACS or a network drive from the **Review** window. When you tap **Export**, you can select where to export data to, image format, clip format and whether you want to export the documents without identifying the patient information.

To copy an examination:

- 1 Tap **Patient list**.
- 2 Tap the patient, whose examination you want to copy.
- 3 Tap **Export**.
- 4 Select the destination, format and patient data identification and tap **Export** again. **De-identify Patient Data** is recommended for patient security.

- 5 The data is copied to the selected destination.

To copy documents from an examination:

- 1 Tap **Patient list**.
- 2 Tap the patient, whose documents you want to copy.
- 3 Select one or several documents (use the **Select Multiple** button).
- 4 Tap **Export**.
- 5 Select the destination, format and patient data identification and tap **Export** again. **De-identify Patient Data** is recommended for patient security.
- 6 The data is copied to the selected destination.

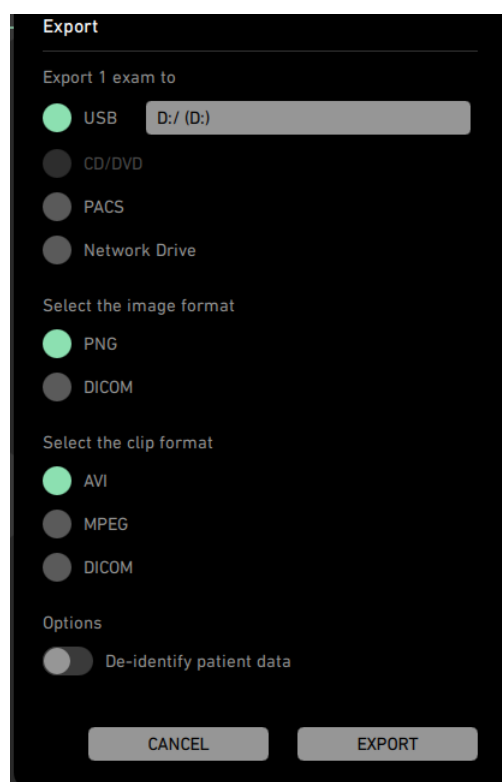


Figure 6-3. Export options

You can make more than one copy of a document.

NOTE: Do not delete documents from the local patient list system until you have verified that they have been exported successfully to the selected destination.

Patient List

The **Patient List** contains patient IDs, names, and other information about patients in the patient database, including the date of the last examination.

When you capture an image or save a document during an examination, it is saved directly into the patient list. The document browser is automatically updated to show the saved documents from the current examination.

You can search through the patient list using the search field above the list.

You can sort the listed patients according to the information in one of the columns by tapping the column heading. For example, if you tap the **Last Name** column, the listed patients will be sorted alphabetically by last name.

To see documents from a particular examination, double-tap the row containing the examination. To continue a previous exam, tap the relevant row and select **Append Exam**.

From the **Patient List** you can also export (see “Exporting documents” above) and delete exams. You can select more than one by tapping the **Select Multiple** or **Select All** buttons.

NOTE: *The patient archiving system can be password-protected. See “Password Protection of Patient Data” on page 69.*

Deleting Documents or Exams from the System

You can delete documents and patient records from the system.

NOTE: *You cannot delete a document that is in a queue to be sent to a DICOM device.*

To delete one or more documents from the system:

- 1 Double-tap the examination on the **Patient List**.
- 2 Select one or several documents (use the **Select Multiple** button).
- 3 Tap **Delete** and confirm that you want to delete the documents.
The selected documents are deleted.

To delete all documents associated with an examination:

- 1 Double-tap to open the examination on the **Patient List**.
- 2 Tap **Select All**.
- 3 Tap **Delete** and confirm that you want to delete the documents.
The documents associated with the selected examination are deleted.

NOTE: *The examination record itself is never deleted (unless you delete the patient).*

To delete an exam:

- 1 Tap the exam on the **Patient List**.
- 2 Tap **Delete**.
You are asked to confirm that you want to delete the exam.
- 3 Tap **Delete** again.
All local documents for the exam are deleted.

To delete the entire Patient List:

See “General Tab” on page 282 in the Setup and Customizing section.

Pausing and Later Resuming an Examination

It is possible to pause an exam (for example, while you examine a different patient) and then resume the exam with the first patient.

To pause an examination:

- Tap **Pause Exam**.

To resume a paused examination:

- 1 Tap **Patient** to open the **Patient** window.
- 2 Tap **Paused Exams**.
- 3 Select the exam you want to resume and tap **Resume Exam**.

Password Protection of Patient Data

To help comply with HIPAA standards, the patient database on the system can be password-protected with a user-specific ID (username) and password.

If the database on the system is password-protected, when you turn on the system, a login window appears:

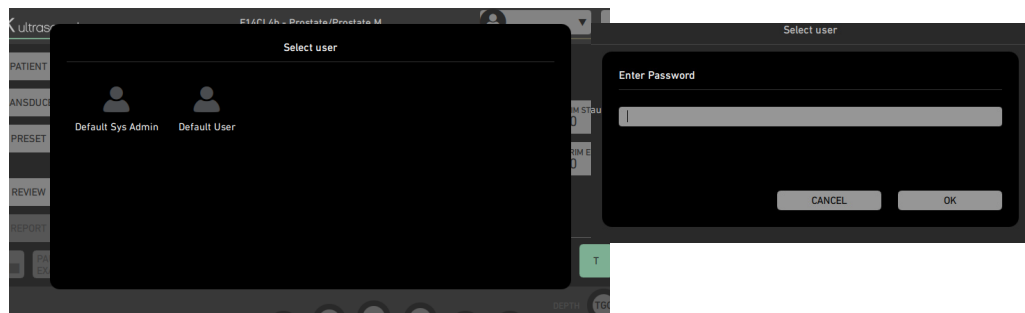


Figure 6-4. The Select User and Login window.

Select user, enter password and click **OK**.

Hard Disk Quota

The system hard disk does not have unlimited storage capacity.

The system checks the space on the hard disk each time you enter a new patient ID. If the hard disk is getting full, you will be notified:

- when there is less than 2 GB available space on the hard disk.
- when there is less than 1.5 GB available on the hard disk.
- when there is less than 1 GB available on the hard disk. At this point, you will not be allowed to save any more information to the hard disk.

To clear space on the hard disk, you must delete some documents. You can export them to a network drive, USB, CD/DVD, or PACS (if you have DICOM installed) before you delete them from the hard disk. See “Exporting documents” on page 66.

Reports

Reports are defined for each Preset. A report contains information about the patient and the measurements you have made. You can add assessment, images, patient history and comments to a report.

You can save a report to the patient database and view, save or export it in the same way as you view or save other documents. See above for more information.

Creating a Report

To create a report:

- In the Exam Management area, tap **Report**. The **Report** window is displayed.

The contents of the report will vary, depending on the Preset and the measurements you have made.

If the finished report has more than one page, swipe to navigate through the pages.

Patient comments are included in a report. You can also add additional remarks.

Adding Measurements to a Report

- Tap **Measurements** to see the measurements you have saved for this patient. Measurements are automatically added to the report.

Assessment

- Tap **Assessment** and use the toggle buttons to note your assessments. You have the possibility to **Check All**, and then un-check the toggle buttons for non-relevant assessments.

Adding Images to a Report

Stored images are automatically added to the report, but you can select which images you want to include.

- 1 Tap **Images**.
- 2 Select the images you want to include in the report.
- 3 Tap **Preview**.

Now, only your selected images are added to the report. In the preview, you can select **Image Size**.

Note that a maximum of 25 images can be attached to a report. A notification will tell you when you have reached this number.

Adding Patient History

- 1 Tap **Patient**.
- 2 Use the keyboard to type your notes into the fields, and use the dropdown menus for additional info.

*Note that you only get individual pages under Patient, if you have made calculations in these areas. E.g., you will not see the page **Kidney Patient History** if you have made no calculations of the kidneys.*

Adding Additional Comments

- 1 Tap **Comments**.

- 2 Add any additional comments to your assessment.

Editing a Report

You can edit a report before you save it.

To delete or edit a measurement in a report:

- 1 On the **Measurements** tab, scroll or slide till you reach the measurements taken.
- 2 Tap the measurement you want to edit.
- 3 Use the keyboard to edit or delete the measurement.

The measurement is updated. In this way, you can edit all information in the report on the individual tabs until you end the exam.

Preview the Report

- 1 In the **Report** window, tap **Preview**. The first page is displayed on the monitor and the touchscreen.
- 2 Tap the arrows under the report to see additional pages.

Tap **Close** when you are done.

Printing a Report

To print a report:

- 1 Tap **Preview**.
- 2 Tap **Print**.

The current page of the report is printed on the report printer (See “Printers Tab” on page 276). If the report has more than one page, click **Next Page** or **Previous Page** to view other pages of the report and print them.

NOTE: *Reports can be saved as documents or captured as images but cannot be printed directly from the thumbnails. In either case, open the thumbnail to print from the monitor.*

Saving a Report as Images

To save the report as images:

- Tap **Store Report Image** on the report. The report is stored as DICOM images, and you can see and print them by tapping **Review**.

Printing Documents or Images on the Monitor

You can print documents on a local printer or, if DICOM is installed on your system, send them to be printed on a DICOM printer. You can also set up an office printer on a network.

You cannot use an office printer directly with the USB connector on the system. The only printers you can connect directly to the system are ones listed as approved in the Product Data information. See also the Safety chapter in the *bkSpecto User Guide*.

Printing Thumbnail Images

To open a thumbnail image and then print it:

- 1 Use the pointer to tap the thumbnail in the Document Browser. The image is displayed on the monitor.
- 2 Tap the **Print** button (bottom right) on the touchscreen.

Or, if you are printing from the **Patient List**:

- 1 Tap **Review**.
- 2 Tap **Patient List**.
- 3 Double-tap the exam you want to print images from.
- 4 Select the image you want to print.
- 5 Tap the **Print** button (bottom right) on the touchscreen.

To set a different printer as default for the **Print** button:

See Settings for Store/Network “Printers Tab” on page 276.

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom right) on the touchscreen.

Chapter 7

Imaging Modes

Imaging Modes

The bkSpecto has various imaging modes:

- 2D (B-mode) gives real-time 2D information about the anatomical structure of soft tissues. Includes tissue harmonic imaging.
- Color mode (CFM, color flow mapping, color Doppler) ultrasound displays color-coded, real-time information about direction and velocity of flow in tissue.
- Power mode (power Doppler) ultrasound displays information about the number of particles moving, rather than their velocity.
- Doppler mode (spectral Doppler mode) imaging displays information about the spectrum of flow velocities as a function of time.
- Continuous Wave Doppler (CW Doppler) imaging is used to detect very high velocities in cardiac/echocardiography.
- M-mode (motion mode) ultrasound is produced by slowly sweeping one line of a B-mode image across the monitor. The M-mode image illustrates a time series of images along this line.

NOTE: *You cannot change imaging modes when the image is frozen.*

Adjusting the Thermal Index Limit

Before you use the system, check that the TI settings are appropriate. The current TI tissue type and limit are displayed in the top left corner of the monitor.

The absolute TI limit for each tissue type is set by the factory to conform to FDA guidelines and international standards (AIUM/NEMA and IEC) (see the acoustic output section in the *bkSpecto User Guide*), but you may want to set a lower TI limit for some purposes. There are 2 types of settings you can vary:

- Tissue type (TIS – soft tissue, TIC – cranial, TIB – bone)
- TI limit (not exceeding the factory-set limits)

To select tissue type:

- Tap **TI Type** and select **TIB**, **TIC**, or **TIS**:

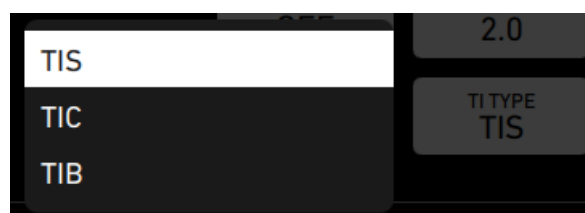


Figure 7-1. TI Type button.

To adjust the TI limit:

- Touch and slide the **TI** scale button to adjust the limit.

2D (B-Mode)

Focus

The ultrasound image is focused sharply within a selected zone.

The **Focus** indicator to the left of the image shows the extent (range) of the focal region as well as the point of best focus.

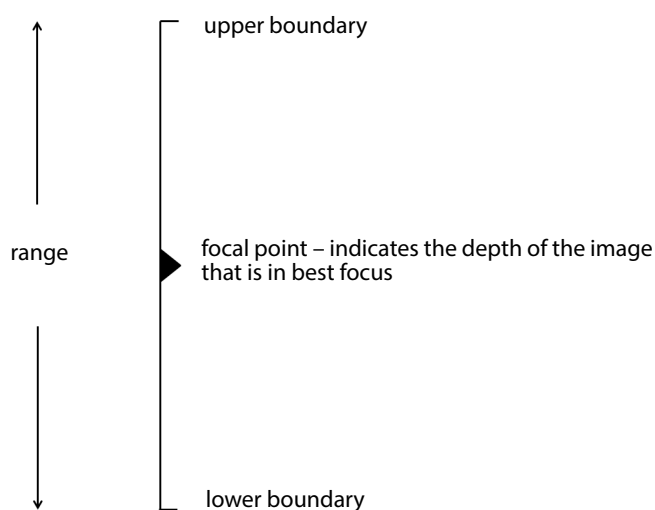


Figure 7-2. The Focus indicator.

The focal point triangle indicates the depth of the image that is in best focus – the focal point.

You can adjust the position of the area in best focus.

To adjust focus position:

Flick the **Focus** bar to move the focus up or down on the image.

Tru-Focus

Selected transducers are equipped with Tru-Focus. This focus enhancement gives you full focus in the entire depth of the image. With Tru-Focus, it is not possible to further adjust the focus position.

Gain

You can control the overall gain of an imaging mode by sliding the **Gain** bar.



Figure 7-3. The Gain bar is located beneath the mode buttons.

TGC

The TGC (Time Gain Compensation) curve determines variable amplification applied to echoes from different depths in the tissue. The TGC function compensates for attenuation and scattering of the ultrasound beam in the tissue.

When you select a transducer, if all TGC sliders are in the center position, imaging starts using a default TGC curve optimized for the transducer. (The default is either the one set at the factory or one you have set up yourself.)

The **TGC** sliders adjust the relative gain of the image at different tissue depths. Each slider adjusts a specific part (1/8th) of the TGC curve; the topmost control adjusts the top 1/8th of the image.

NOTE: *The sliders operate relative to their center position; when they are all centered, the default TGC is used.*

To adjust the TGC curve:

- 1 Tap **TGC**.
- 2 Slide the **TGC** sliders to the right or left to adjust the TGC curve.

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line. This indicates the modification that is applied to the default TGC curve.

To reset the TGC sliders to their central position:

- Tap the **Reset** button.

By default, the TGC slider window disappears after 3 seconds.

NOTE: *The TGC curve operates on the monitor image, not on the ultrasound echo. Therefore, if you move or resize the image, you may have to readjust the TGC curve.*

NOTE: *With 360° transducers, the top slider adjusts the part of the image that is most central – that is, closest to the transducer.*

Auto Gain

You can also choose to use Auto gain. With Auto gain, a selected preset defines the brightness for this particular type of scan (also depending on the transducer). Auto gain makes it possible to have the same brightness across different patients and body parts.

To activate/deactivate Auto gain:

- Tap the **Auto Gain** parameter button to toggle between on and off:

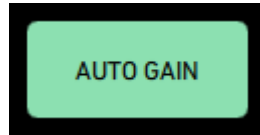


Figure 7-4. The Auto Gain parameter button.

When you activate or deactivate **Auto Gain**, a message pops up bottom center of the monitor informing you of the setting.

It is still possible to adjust the Auto Gain setting. You do this by tapping and sliding the **Auto Gn. Level** button.

The Auto gain level is displayed on the button, and bottom center of the monitor as you slide the button.

Zoom

To zoom in or out on the area you are interested in, adjust the Zoom box and then make the part of the image that is inside the box fill the monitor.

NOTE: *To zoom in on a small part of the image, make the box smaller.*

To use the Zoom box (zoom on different parts of the image):

- 1 Tap **Zoom**. A green zoom box appears on the image.
- 2 Tap the trackpad to activate the zoom box. Now only one corner is green.
- 3 Drag this corner to adjust the size of the zoom box.
- 4 Tap **Zoom** again to zoom in on the image.

To return to the original image:

- Tap **Zoom**.

You can also zoom a frozen image.

Depth

With a full 2D image, you adjust the depth to cut out parts below the part you are interested in. The image always includes the transducer surface, so this key changes the magnification of the image, stretching, or compressing it.

Adjusting the depth of a zoomed image changes the magnification even though the transducer surface is not necessarily visible at the top of the image.

To adjust the depth:

- 1 Flick the **Depth** bar backward to increase depth. You can also tap the near end to increase depth incrementally.
- 2 Flick the **Depth** bar forward to decrease depth. You can also tap the far end to decrease depth incrementally.

Note that you can change the direction for increasing/decreasing Depth in the User Preferences. See page 280.

Grayscale Map

Several gray scales can be used to display a 2D image. Different gray scales may make various aspects of the image clearer.

To adjust the gray scale:

- Touch and slide the **Map** scale button:

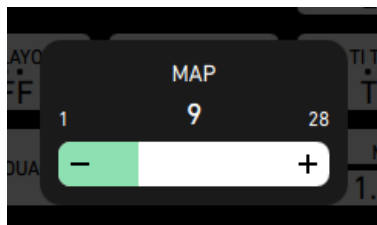



Figure 7-5. Map scale button.

Combination Modes

2D (B-mode) can be used in combination with other modes. (The terms *duplex* and *triplex* imaging refer to combinations of 2 or 3 modes.)

The available combinations are:

- 2D+Color
- 2D+Color+Doppler
- 2D+Power
- 2D+Power+Doppler
- 2D+Doppler
- 2D+3D
- 2D+M
- 2D+CW
- 2D+Elasto
- 3D+Color

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D** or tap Home .

To add another imaging mode:

- Tap the mode button for the additional mode.

To remove an imaging mode from the combination:

- Tap the mode you want to remove.

To return from a combined mode to 2D only:

- Double-tap **2D**.

Tissue Harmonic Imaging (True Echo Harmonics – TEH)

Tissue harmonic imaging can reduce noise and improve the clarity of the ultrasound image.

In normal 2D imaging, the transducer uses essentially the same frequency range for both transmitting and receiving. In harmonic imaging, the image is created by receiving higher frequencies (harmonics) that are multiples of the transmitted frequency (f). Tissue harmonic imaging in the bkSpecto is based on the 2nd harmonic ($2f$) spectrum and pulse inversion.

Using TEH

TEH can be used only with transducers that support harmonic imaging.

Each preset that permits TEH has default settings for overall gain, TGC gain, contour level, and contrast level for tissue harmonic imaging.

Restrictions

- TEH is available only for certain transducers.

Advantages

- Better images with difficult-to-image patients.
- Increased contrast resolution.
- Reduced effect of grating lobes.

To turn TEH on or off:

Make sure that you are imaging in 2D (imaging is not frozen).

- Tap the **Harmonics** parameter button to toggle between on and off.

When you turn harmonic imaging off, 2D imaging resumes with the frequency, gain, dynamic range etc. that you were using previously.

Displayed Frequencies for Tissue Harmonic Imaging

When TEH is turned on, the letter **H** appears next to the displayed frequency, which is the receiving frequency – double the transmitted frequency.

Needle Enhancement

Needle Enhancement uses an adjustment of compounding plus improved focusing to help the user see the needle during interventional procedures. A needle icon indicates where you will get the best visibility.

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

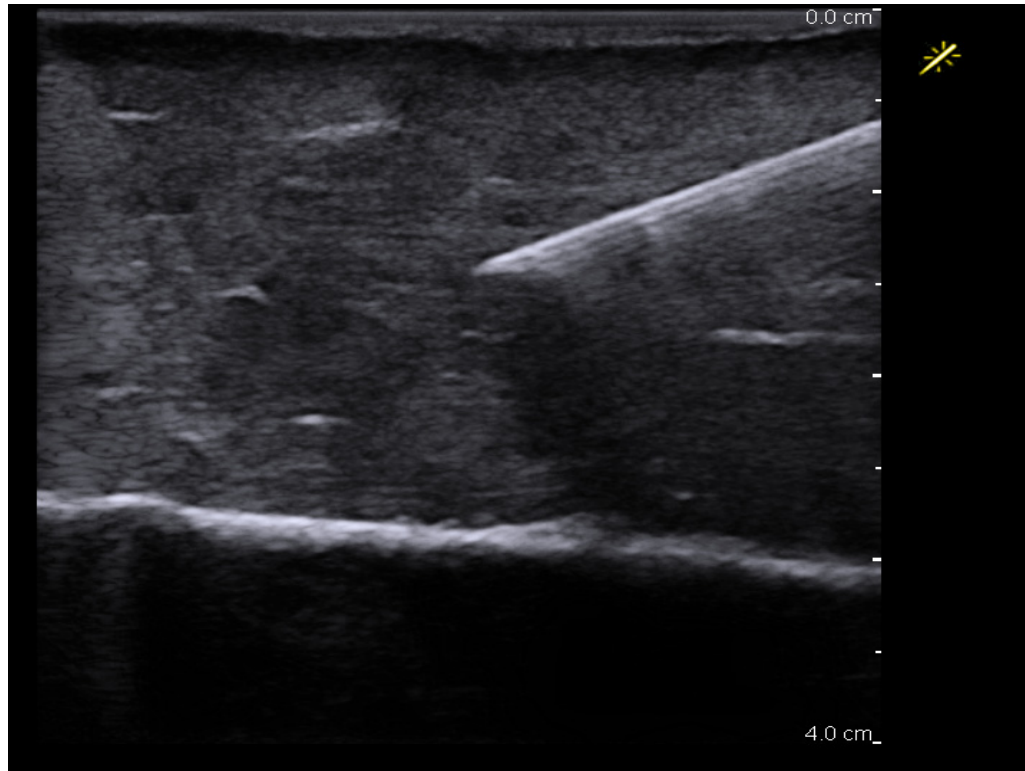


Figure 7-6. Image showing the Needle Enhancement icon and inserted needle.

In 2D, you can access Needle Enhancement on the parameter buttons.

A dropdown displays the 3 options:

- **Left**
- **Off**
- **Right**

Left and **Right** switches sides on the image and **Off** returns you to default 2D image quality.

Activate Needle Enhancement

Do as follows:

- 1 Ensure that **2D** is active.
- 2 Tap **Needle Enhance** to select from which side you enter the needle:

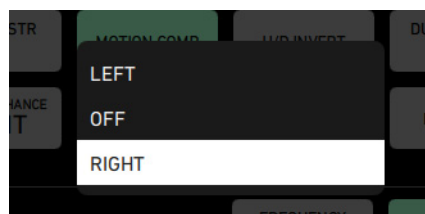


Figure 7-7. Needle Enhance dropdown menu.

NOTE: Make sure that you adjust the icon  to match your needle insertion side.

- 3 If needed, for example in steep needle angles, you can adjust the balance between the needle strength echo and image quality. For this, touch and slide **Needle Str**. Increase the number to increase the needle shaft visibility. Decrease the number to improve image quality over needle visualization.

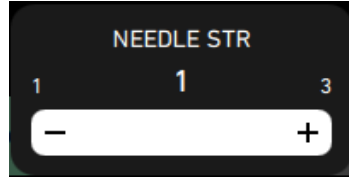


Figure 7-8. Needle strength scale button.

Note that the **Needle Str** scale button will only be active when Needle Enhancement is activated.

Color Mode and Power Mode

Color mode (CFM) ultrasound displays color-coded real-time information about direction and velocity of flow in the tissues.

Power mode displays color-coded information about the amount of flow but not the direction.

Color Submodes

Tap the **Col** mode button to activate color mode. You can then select the submode you want. The view must be imaging when you do this.

Three submodes are available when you tap **Color mode** imaging:

- **Velocity** (standard color mode)
- **VFI** (see “Vector Flow Imaging (VFI)” on page 193)
- **Tru-Color**. Tru-Color is an alternative to normal color mode without the persist function. It has less averaging and is therefore able to maintain a significantly higher temporal resolution. In this way, you can more easily visualize the hemodynamics, including differences between systole and diastole.

Color Coding of Flow

In a Color mode image, the frequencies of the reflected ultrasound waves are measured to show the velocity and direction of the blood flow. The result is displayed in color on the monitor.

Flow Direction	Default Color
Toward the transducer	Red
Away from the transducer	Blue

Table 7-1. Default color coding in Color mode.

It is possible to invert this color-coding or select a different one.

Independent D-Mode/C-Mode Steering

Independent steering of PW Doppler and CFM is possible using the **Sync Steer** button. To enable independent steering, tap **Sync Steer** to deactivate it. Then use the **Steer** scale button to change the angle of the doppler line.

NOTE: *This feature is only available for certain transducers and exam types.*

Color Box

When Color mode or Power mode imaging is turned on, a color box is superimposed on the B-mode image. The color box outlines the area of the tissue in which flow information is available.

You can adjust the position and size of the color box to examine flow in various parts of the B-mode image. The view must be imaging when you do this.

To move the color box:

- Drag it with the trackpad.

To resize the color box:

- 1 Tap the trackpad. The corners of the color box turns white.
- 2 Drag right or down to increase the box in width and height.
- 3 Drag left or up to decrease the box in width and height.
- 4 Tap the trackpad to set the size.

Color Scales

Various color scales can be used to display a Color mode or Power mode image or a Doppler spectrum.

To select the color scale:

- Touch and slide the **Map** scale button to select the color scale you want.

NOTE: *When you image in Color or Power mode, you cannot use the color bar to change the B-mode gray scale because it is used to control the color mapping.*

Elastography

Elastography is a medical imaging mode using manual tissue compression or motion from e.g. patient cardiac movement or respiration, in order to evaluate tissue stiffness. Elastography requires a software license from BK Medical and is available with selected transducers only, see the *bkSpecto Product Data Sheet*.

Before using elastography, you should be adequately trained in ultrasonography.

To activate elastography mode:

- Tap the **E** mode button to toggle between on and off.

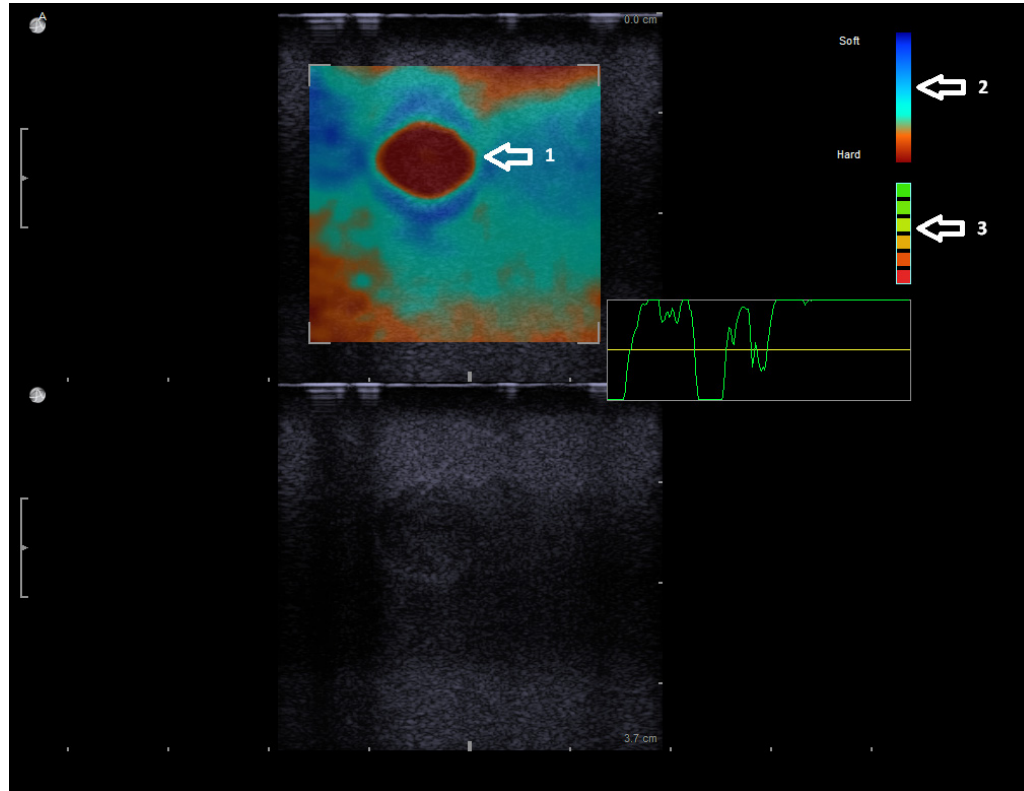


Figure 7-9. Elastography imaging (default horizontal view).

- 1 Region of interest (ROI)
- 2 Color Map
- 3 Quality Indicator

Color Box

When elastography mode imaging is turned on, a color box is superimposed on the B-mode image. The color box outlines the area of the tissue in which information is available.

You can adjust the position and size of the color box to examine various parts of the B-mode image. The view must be imaging when you do this.

To move the color box:

- Drag it with the trackpad.

To resize the color box:

- 1 Tap the trackpad. The corners of the color box turns white.
- 2 Drag right or down to increase the box in width and height.
- 3 Drag left or up to decrease the box in width and height.

Color Map

The color map represents the variants in levels of relative hardness/softness. The default setting depends on the Exam Type/preset. If you touch and slide the **Map** parameter button, you can choose from a set of different color codes.

Quality Indicator

The quality indicator displays the amount of pressure being placed on the transducer. If the green indicator is at the top, transducer compression is at the optimum level, but even if the indicator shows only one square, the image can be useful. A good image is one that can be reproduced.

Strain Ratio Measurement

Strain ratio measurements can be used to quantify the relative stiffness between the region of interest (ROI) and the surrounding tissue. To perform a strain ratio measurement:

- 1 Tap **Measure** and select **Strain Ratio**.
- 2 Tap inside the ROI and then slide the trackpad to create a measurement circle. When the circle is the required diameter, tap again to set the measurement circle on the screen.
- 3 Repeat the measurement process outside the ROI.

The strain ratio appears in the measurement data to the left of the image.

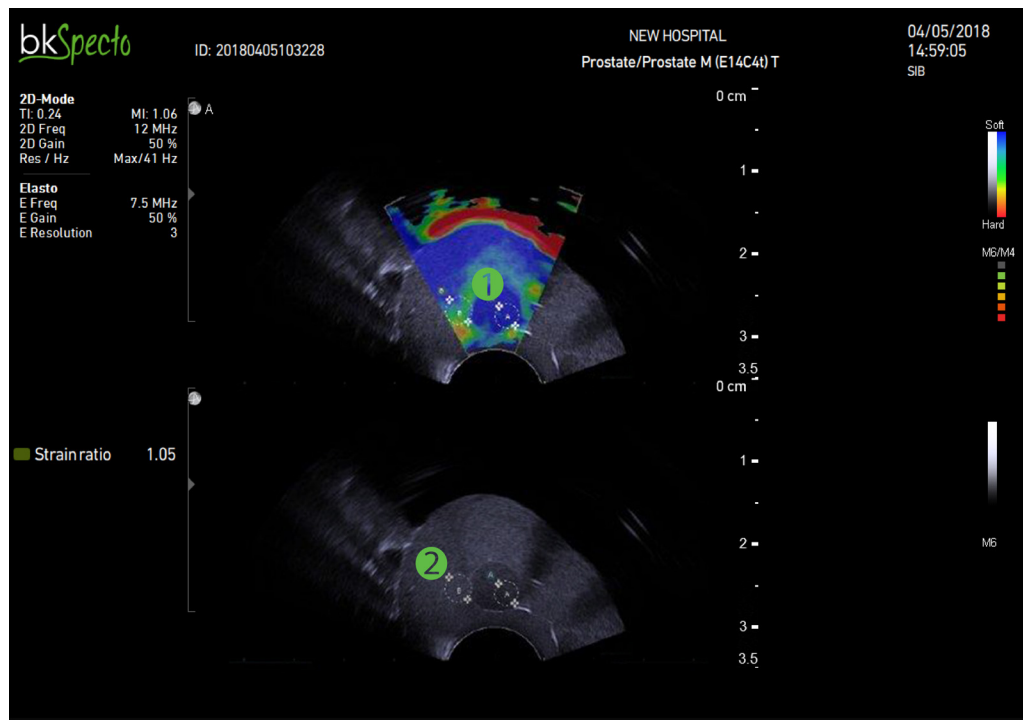


Figure 7-10. A strain ratio measurement.

1. A measurement circle inside the ROI (elastography screen)
2. A measurement circle outside the ROI (2D screen)

Diameter Comparison Measurement

The elastography diameter of an ROI can be compared to the 2D diameter.

- 1 Tap **Measure** and select **E/B Ratio**.

- 2 Tap on the edge of the ROI in the elastography screen and slide the trackpad to the opposite side of the ROI. Tap again to place an E-diameter line.
- 3 Repeat the measurement process in the 2D screen to place a B-diameter line.

The E/B Ratio appears in the measurement data to the left of the image.

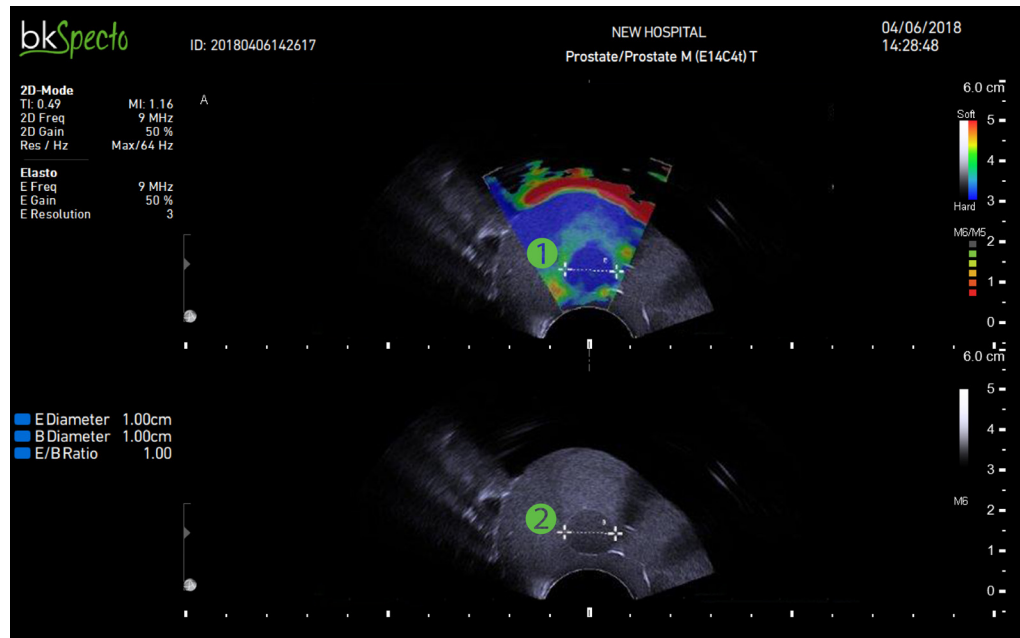


Figure 7-11. A diameter comparison measurement.

1. A diameter line inside the ROI (elastography screen)

2. A diameter line inside the ROI (2D screen)

Doppler Mode – Spectral Doppler

Doppler mode (spectral Doppler mode) imaging displays information about the spectrum of flow velocities as a function of time. It is sometimes called FFT (Fast Fourier Transform) because the information is presented as a frequency spectrum indicating velocity components.

Turning Doppler Mode On or Off

When you turn Doppler mode on, 2D must be imaging.

To turn on Doppler mode:

- Tap **PW**.

The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.

To position the Doppler gate on a 2D image, use the trackpad.

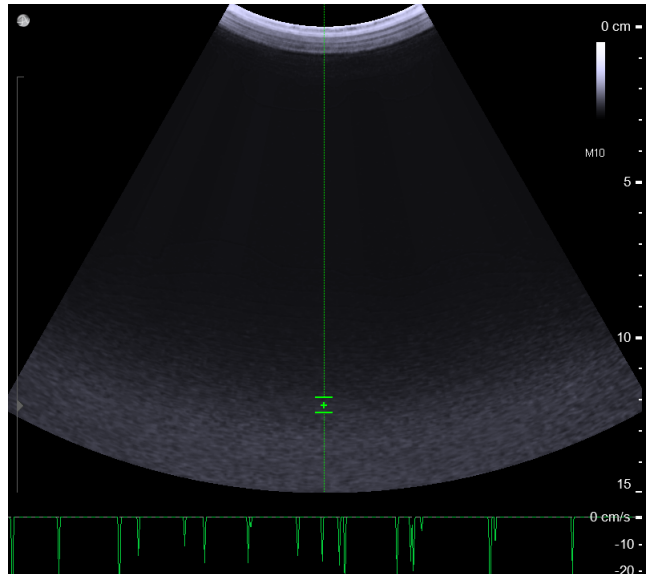


Figure 7-12. The Doppler indicator (line and gate) superimposed on a 2D image.

Fig 7-13 shows information available in Doppler indicators.

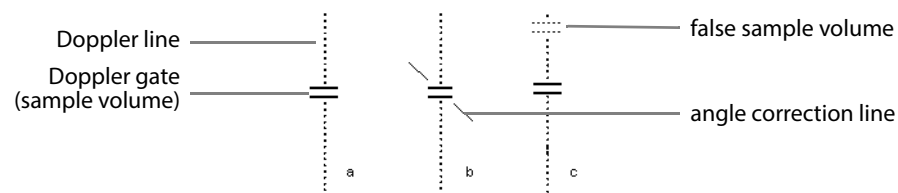


Figure 7-13. Doppler indicators (three examples).

Fig 7-13 (a) The dotted line represents the Doppler line. The lines at right angles to that show the Doppler gate.

Fig 7-13 (b) A diagonal line (relative to the Doppler line) indicates a sample volume with angle correction.

Fig 7-13 (c) The horizontal dotted lines show the false sample volume in HPRF (see page 86).

To turn off Doppler mode:

- Tap **PW**.

Adjusting the Doppler Mode Image

Doppler Indicator

When Doppler mode imaging is turned on, the Doppler indicator is superimposed on the B-mode image.

You can adjust the position and size of the Doppler gate to get information from sample volumes in various parts of the B-mode image. The image must not be frozen when you do this.

To move the Doppler gate:

- Drag the Doppler gate using the trackpad.
The sample volume line moves along with the gate.

To resize the Doppler gate:

- Touch and slide **SV size**.

To adjust the angle:

- Touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

Independent D-Mode/C-Mode Steering

Independent steering of PW Doppler and CFM is possible using the **Sync Steer** button. To enable independent steering, tap **Sync Steer** to deactivate it. Then use the **Steer** scale button to change the angle of the Doppler line.

NOTE: *This feature is only available for certain transducers and exam types.*

Audio Volume

The Doppler signal can be played as an audio signal as well as appearing on the monitor.

To adjust the volume of the audio signal, hold and slide **Volume**.

Doppler Trace (Automatic Curve Tracing)

The system can automatically calculate and display a curve that traces the mean or peak values of the Doppler spectrum. See “Doppler Measurements” on page 97 for a description of the curves. You can also choose to have both the peak and mean curves displayed.

To change which curve is displayed or to turn off the display:

- Tap **Trace** to select **Off**, **Peak**, **Mean+Peak**, or **Mean**.


To measure higher flow speeds (high range setting) in a sample volume placed deep in the tissue, HPRF (high PRF) is automatically used. When HPRF is active, the Doppler line shows the actual sample volume, and false sample volumes (shown dotted). See Fig 7-13 on page 85.

The false sample volumes should always be placed outside a vessel.

Auto

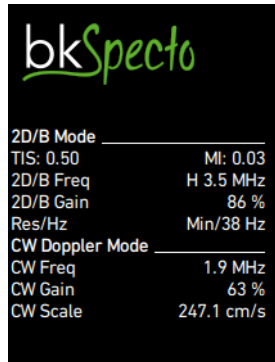
The system can automatically adjust the Baseline and Scale to prevent aliasing and optimize the display of the Doppler spectrum.

To optimize the baseline and scale for the current Doppler spectrum:

- Tap the **Auto** button next to .

Gain

You can control the overall gain of an imaging mode by sliding the **Gain** bar. The current setting is displayed on the monitor next to **CW Gain**.

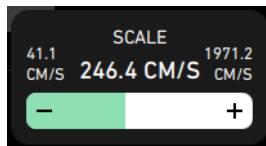


Scale

You can vary the scale of the displayed spectrum.

To adjust the velocity scale:

- Hold and slide the **Scale** button:



The vertical scale is updated to correspond to the new range of velocities.

The current setting is displayed on the monitor next to **CW Scale**.

NOTE: *The wall filter value will be changed automatically when you change the scale.*

Smooth

You can change how smooth the displayed spectrum looks.


To change the smoothness of the spectrum display:

- Hold and slide the **Smoothing** button.

Wall Filter

You can set the cutoff frequency for the wall filter.

To adjust the wall filter:

Hold and slide the **Wall Filter** button (slide the parameter area or tap  to get to the next page).

Invert

You can invert the spectrum on the monitor.

To invert the spectrum or to return to the default:

- Tap **Invert** to toggle between the default and inverted spectrum coding. The frequency axis is inverted to match the spectrum.

Baseline

You can reposition the baseline. The baseline separates forward flow from reversed flow, and moving the axis can help overcome aliasing problems.

To adjust the baseline:

- Hold and slide the **Baseline** button. The frequency axis is updated to match the spectrum.

Sweep Speed

You can adjust the sweep speed to change the number of cycles of the spectrum displayed on the full time axis. The available values range from 2 (slowest) to 12 (fastest).

To select the sweep speed:

- Touch and slide **Sweep Speed** and select the required value. The time axis is updated.

M-Mode

To turn M-mode on:

- Tap **M**.

To turn M-mode off:

- Double-tap **M**.

NOTE: *M-mode is only available for certain Presets.*

M-mode (motion mode) ultrasound is produced by slowly sweeping one line of a 2D image across the monitor. The M-mode image illustrates a time series of images along this line.

M-mode can only be used in combination with 2D. Selecting any other mode will turn off M-mode.

You can return to imaging with 2D alone by double-tapping **2D**.

M-mode uses the same imaging frequency and focus settings as 2D.

NOTE: *Only a single focal zone is possible in M-mode.*

Zooming does not work directly in the M-mode image. When you make changes in the 2D image, they are applied to the M-mode image.

The M-Mode Image

When M-mode is selected, the monitor is divided into two windows (see Fig 7-14). You can adjust how the two windows are displayed. The window with the vertical M-mode line shows the 2D image.

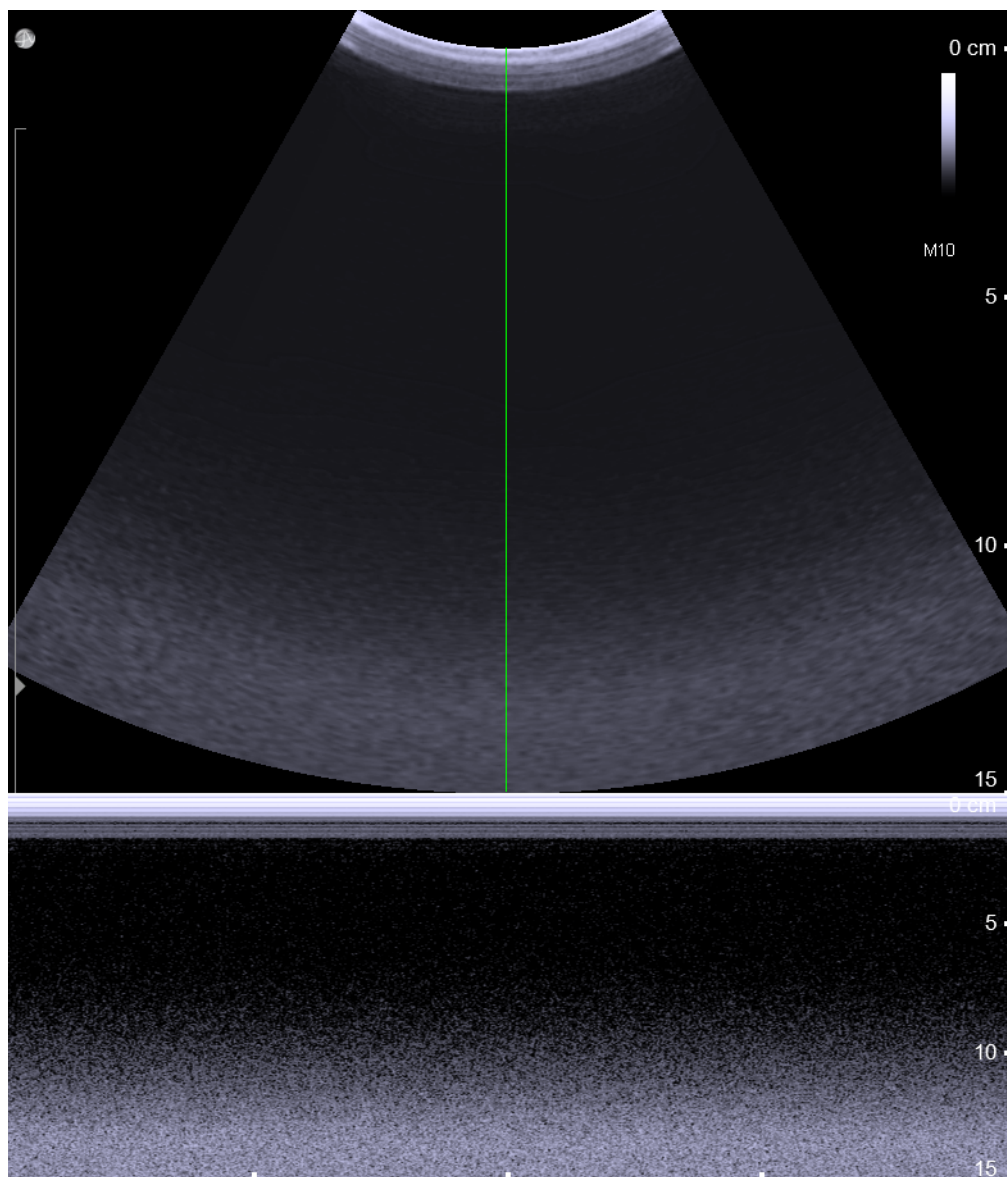


Figure 7-14. M-mode image.

M-Mode Line

The M-mode line (see Fig 7-14) shows the path of the M-mode image in the 2D window. You can adjust the path of the image by moving the M-mode line (drag it using the trackpad).

M-Mode Image Ruler

The M-mode image ruler scales the ruler range of the 2D image to the M-mode image. Any given value will represent the same position on both the M-mode and 2D images.

It is not possible to change the ruler.

Saving a Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.
The **Save Preset** window appears.

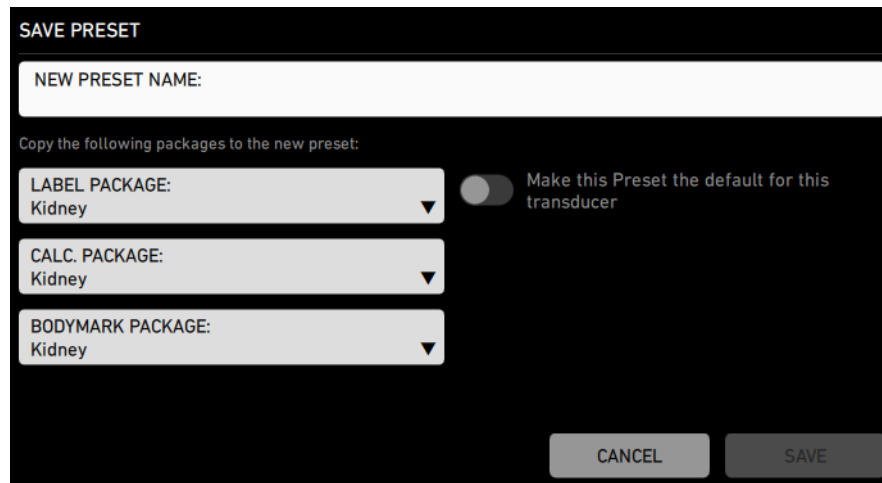


Figure 7-15. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Chapter 8

Continuous Wave Doppler Mode

Overview

In Continuous Wave (CW) Doppler mode, ultrasound is transmitted along a line as a continuous wave and analyzed as it returns. CW Doppler provides greater velocity ranges when measuring high flow regions such as flow through the cardiac valves, especially with stenosis.

Adjusting the Thermal Index Limit

Before you use CW Doppler mode, check that the TI settings are appropriate. The current TI tissue type and limit are displayed just under the bkSpecto logo in the upper left corner of the monitor.

Adjusting MI

You can adjust the maximum allowed MI (mechanical index).

To adjust the MI limit:

- Tap and slide **MI Limit**.

CW Doppler is a low voltage mode, so the MI will always be low.

Turning CW Doppler Mode On or Off

You must turn CW Doppler on and position the CW Doppler line before you turn on the CW spectrum.

To turn on CW Doppler mode:

Make sure that the **Preset** is **Cardiac**, that you are imaging in **2D** and that the image is not frozen.

- Tap the **CW** mode button.

The CW Doppler line appears superimposed on the B-mode image.

Drag the line to the position you want.

To unfreeze the CW Doppler spectrum:

- Tap .

NOTE: *The B-mode image is frozen while the live CW Doppler spectrum is displayed.*

To switch between live B-mode and live CW Doppler mode:

- Tap .

To turn off CW Doppler mode:

- Tap **CW**.

CW Doppler Line

CW Doppler information is acquired along the full length of the CW Doppler line. When CW Doppler is turned on, the CW Doppler line is superimposed on the 2D image.

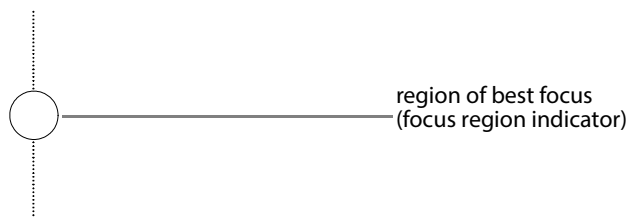


Figure 8-1. CW Doppler line.

The dotted line is the CW Doppler line. The circle indicates the region where the CW Doppler signal is best focused.

When CW Doppler mode imaging is turned on, the CW Doppler line is superimposed on the 2D image.

You can adjust the position of the line to get information from samples in various parts of the 2D image. Place the focus region indicator on the region of interest. The system must be imaging when you do this.

To move the CW Doppler line and focus region indicator:

- Slide the trackpad to the desired position.

Audio Volume

The CW Doppler signal can be played as an audio signal as well as appearing on the monitor.

To adjust the volume of the audio signal, hold and slide **Volume**.

Adjusting the Doppler Mode Image

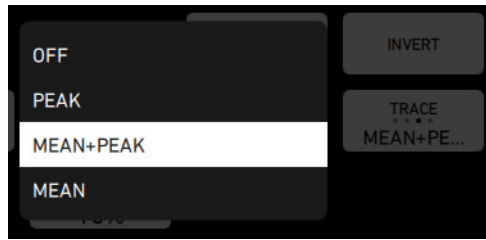
Doppler Trace (Automatic Curve Tracing)

You can have the system automatically calculate and display a curve that traces the mean or peak values of the Doppler spectrum. You can also choose to have both the peak and mean curves displayed.

To change which curve is displayed or to turn off the display:

- 1 Tap **Trace**.

- 2 Select **Off**, **Peak**, **Mean+Peak** or **Mean** on the dropdown menu.




NOTE: A CW Doppler signal is much weaker than a PW Doppler signal. Therefore, automatic curve tracing does not always give good results, and measurements based on the curve will not be accurate. If the automatic curve is not a good fit to the signal, you must manually draw the curve to be used for measurements.

Auto

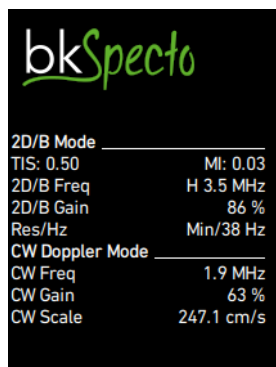
The system can automatically adjust the Baseline and Scale to prevent aliasing and optimize the display of the Doppler spectrum.

To optimize the baseline and scale for the current Doppler spectrum:

- Tap the **Auto** button next to .

Gain

You can control the overall gain of an imaging mode by sliding the **Gain** bar. The current setting is displayed on the monitor next to **CW Gain**.

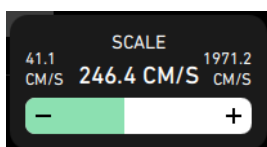


Scale

You can vary the scale of the displayed spectrum.

To adjust the velocity scale:

- Hold and slide the **Scale** button:



The vertical scale is updated to correspond to the new range of velocities.

The current setting is displayed on the monitor next to **CW Scale**.

NOTE: *The wall filter value will be changed automatically when you change the scale.*

Smooth

You can change how smooth the displayed spectrum looks.


To change the smoothness of the spectrum display:

- Hold and slide the **Smoothing** button.

Wall Filter

You can set the cutoff frequency for the wall filter.

To adjust the wall filter:

Hold and slide the **Wall Filter** button (slide the parameter area or tap  to get to the next page).

Invert

You can invert the spectrum on the monitor.

To invert the spectrum or to return to the default:

- Tap **Invert** to toggle between the default and inverted spectrum coding.
The frequency axis is inverted to match the spectrum.

Baseline

You can reposition the baseline. The baseline separates forward flow from reversed flow, and moving the axis can help overcome aliasing problems.

To adjust the baseline:

- Hold and slide the **Baseline** button.
The frequency axis is updated to match the spectrum.

Sweep Speed

You can adjust the sweep speed to change the number of cycles of the spectrum displayed on the full time axis.

To select sweep speed:

Hold and slide the **Baseline** button.
The time axis is updated.

Chapter 9

Exam Types

Before You Begin

The information in this user guide may not correspond to the exam types on your system as Exam Types can be customized.

Before reading about the Exam Types, you should already be familiar with:

- Working with images on the system (Chapter 4, “Working with the Image”).
- Making measurements with the system (Chapter 5, “Making Measurements”).
- Documenting the image and its results (Chapter 6, “Documentation”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

If You Perform a Puncture Procedure

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

What Is an Exam Type?

An Exam Type is a pre-defined configuration for the layout and user interface of the monitor. There are different Exam Types for different types of examinations.

Your choice of Exam Type determines:

- Patient information fields needed for the examination
- Specialized presets
- Layout of buttons on the touchscreen (including which buttons are available)
- Labels and bodymarks
- Reports
- Measuring tools and predefined calculations

Presets

A preset is a pre-defined setup that optimizes the image for a particular type of imaging. It includes suitable settings for gain, frequency, etc.

The Examination Type you can select on the system is a combination of an Exam Type and a preset.

The following Exam Types are available on the system:

- Abdomen
- Brachytherapy
- Colorectal
- GYN
- MSK & Nerve
- OB
- Pelvic Floor
- Prostate
- Small Parts
- Vascular

The information in this chapter applies to all Exam Types. Any additional information that applies to individual exam types is described in the Exam Type chapters.

Measurements

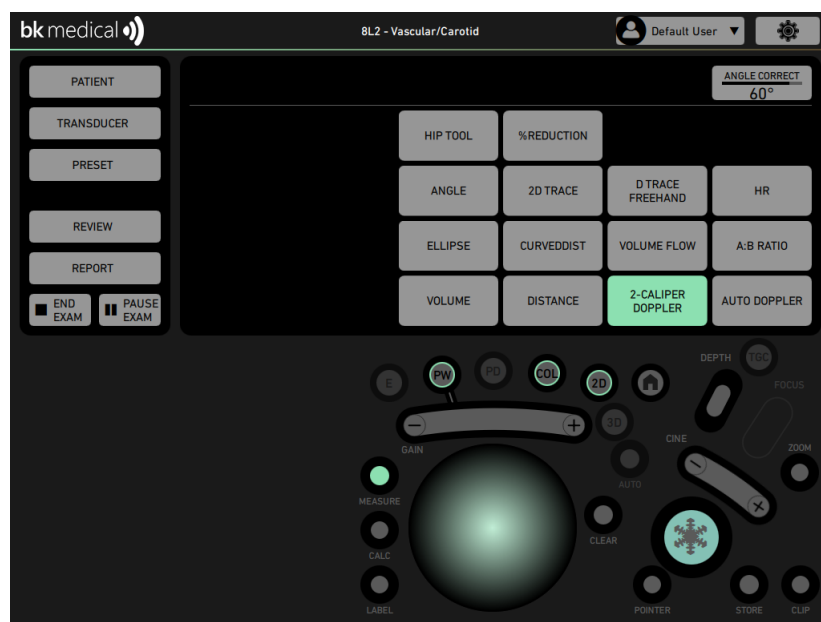


Figure 9-1. Touchscreen showing available measurements.

Each Exam Type contains a set of measurements and calculations that are appropriate for a specific type of examination. Calculations vary according to the specific Preset, but the general instructions for making a measurement are the same.

To make a measurement:

- 1 Tap **Measure**.
- 2 Tap the name of the measurement.
A caliper appears on the image.
- 3 Drag the caliper to the position you want and tap.
If the measurement requires 2 or more calipers, another one appears.
- 4 Drag the second caliper to the position you want and tap.
- 5 Repeat this until you have positioned all the calipers for the measurement.

NOTE: *The look of the calipers themselves and of any lines that connect them depend on what you are measuring.*

After you have positioned all the calipers, the result appears at the left side of the monitor:

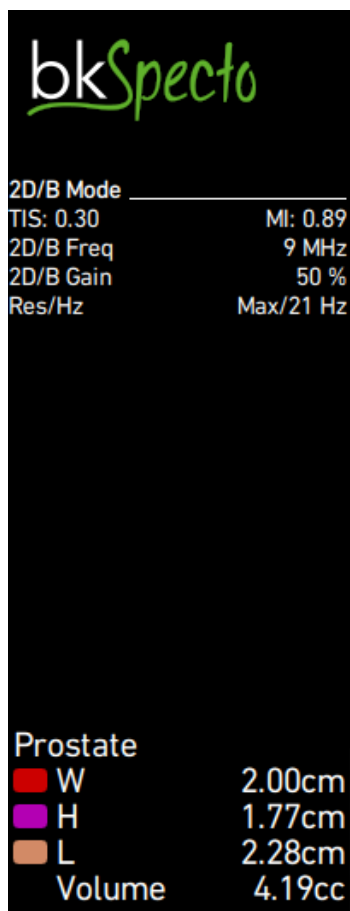


Figure 9-2. Measurement results.

Doppler Measurements

Many Exam Types contain Doppler measurements, as most vascular calculations involve making measurements on a Doppler (FFT) spectrum.

You can fit a curve to the spectrum either automatically (see “Doppler Trace (Automatic Curve Tracing)” on page 86) or manually and then make measurements on the curve.

Two curve types are generally used.

This type of curve	is a trace of...
Peak (Max)	maximum points of the spectrum (those farthest from the baseline).
Mean	mean points of the spectrum.

Table 9-1. Two types of Doppler curves.

Fig 9-3 depicts a Doppler spectrum with two cycles. A cycle starts at the *start systole* (when the heart starts to contract) and ends at the *end diastole* (when the heart is resting and filled with blood). The correct placement of vascular calculation markers is indicated in the figure; their abbreviations are as follows:

- SS** Start systole
- PS** Peak systole
- ES** End systole
- MD** Minimum diastole
- ED** End diastole

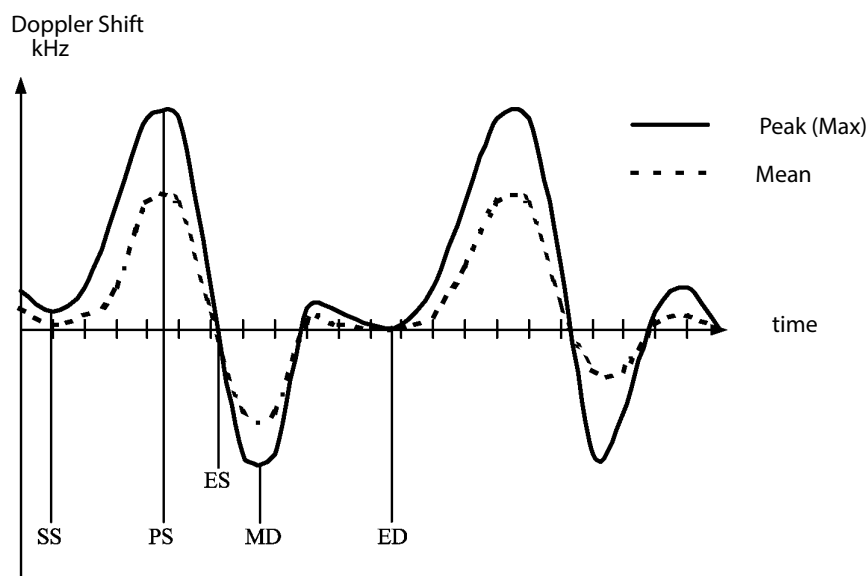


Figure 9-3. Doppler spectrum including vascular calculation markers.

The calculations and the way in which they are presented on the monitor depend on whether the Doppler angle is active or not.

Doppler Angle Active? (Yes/No)	Velocity or Frequency
No	Frequency measured at intersection of marker line and Doppler curve.
Yes	Velocity measured, and frequency parameters replaced by corresponding velocity parameters, (dF by dV, FACC by ACC, F1 and F2 by V1 and V2.)

When the Doppler angle is turned off or altered, the results are recalculated.

Reduction

The **%Reduction** measurement uses the area of the vessel before or after the stenosis and the area of the vessel at the stenosis (residual lumen) to calculate the degree (%) of stenosis. You can base the stenosis calculation on the distance across the vessel or the area of the vessel lumen.

To find the reduction measurement, freeze the image, tap **Measure** and select **%Reduction**. After you select the measurement type, tap on the image to place your measurement points.

Reduction Based on Ellipses

When you use areas to calculate stenosis, make one area measurement to measure each of the following:

- 1 Tap **%Reduction** and measure the total lumen of the vessel.
- 2 Tap to set the measurement. A new caliper is displayed inside the ellipse or circle.
- 3 Measure the residual lumen of the vessel.
- 4 Tap to set the measurement.

The result on the monitor is continuously updated while you position the second ellipse or circle.

RI and PI (Resistance Index and Pulsatility Index)

The resistance index (Pourcelot index) is based on the peak systolic velocity (V_{\max}) and the end-diastolic minimum velocity ED (V_{ed}) in a supply vessel. RI indicates the level of impedance to blood flow; a high RI suggests increased peripheral vascular resistance.

The pulsatility index represents the hemodynamic conditions in a vessel. It is based on the peak systolic velocity (V_{\max}), the maximum velocity at minimum diastole ($V_{\text{min-dia}}$), and the average (V_{mean}) of the peak (max) flow velocity curve. PI describes the elasticity of the vessel combined with the level of peripheral resistance.

The A/B ratio (Stuart index) is calculated as the ratio between PS (V_{ps}) and ED (V_{ed}).

The advantage of using indices rather than absolute velocities is that the indices are independent of the insonation angle.

Index	Formula
A/B ratio	PS/ED
Resistance index	(PS-ED)/PS
Pulsatility index	(PS-MD)/Mean

Table 9-2. Formulas for the main Doppler indices.

The correct placement of markers for measuring RI and PI is indicated in Fig 9-3. “Mean” in the Pulsatility index formula is the averaged max flow velocity.

All main Doppler indices are measured together.

PS, ED, RI, PI, S/D

You can measure the Doppler indices in different ways:

- Automatic – the Doppler curve is drawn automatically and you position markers on it.
- Manual – you draw the Doppler curve manually (freehand).
- Real-time – the system calculates and displays the indices automatically in real time.

To measure the Doppler indices automatically:

- 1 Tap **Measure** and select **Auto Doppler**.
- 2 Position one marker at the *start systolic* (SS) frequency.
- 3 Position the second marker at the *end diastolic* (ED) frequency.

The Ps, Ed, PI, RI and S/D measurements are displayed to the left of the image.

Minimum two cycles must be included between the time cursors, and the calculated index is an average over the cycles.

NOTE: Make sure that the trace appears to be a good fit to the spectrum so that the basis for the automatic calculation is correct.

To measure PI manually:

- 1 Select **Doppler Trace Freehand**.
- 2 Position the marker on the *start systolic* (SS) frequency and tap.
- 3 Draw a curve that traces a line along the whole maximum spectrum through the *peak systolic* (PS) frequency, the *minimum diastolic* (MD), and onto the *end diastolic* (ED) frequency.
- 4 Tap.

The Ps, Ed, PI, RI and S/D measurements are displayed.

If the traced curve covers more than one cycle, the PI is calculated as the average of each cycle.

Real-Time Measurements

The following measurements are displayed when **Trace** is on in real time, so that they are continually updated during imaging:

- PS
- ED
- RI
- PI

Note that it takes a few cycles before the real-time measurements are displayed.

Calculations

The calculation formulas and accuracies, along with the tables and formulas used by the system, are in the *Technical Data (BZ2100)*.

Chapter 10

Abdominal Exam Type

This chapter contains information useful for abdominal imaging.

Important:

- Please see Chapter 2, “Getting Started” for basic controls.
- Read transducer user guides for more information before doing biopsies.
- Read *Care and Cleaning* for sterilization instructions.
- Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Example
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
- 2** Enter data in the **Patient details** window.
- 3** Tap **Start Exam** (below the **Patient details** window).

Diagnostic Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.

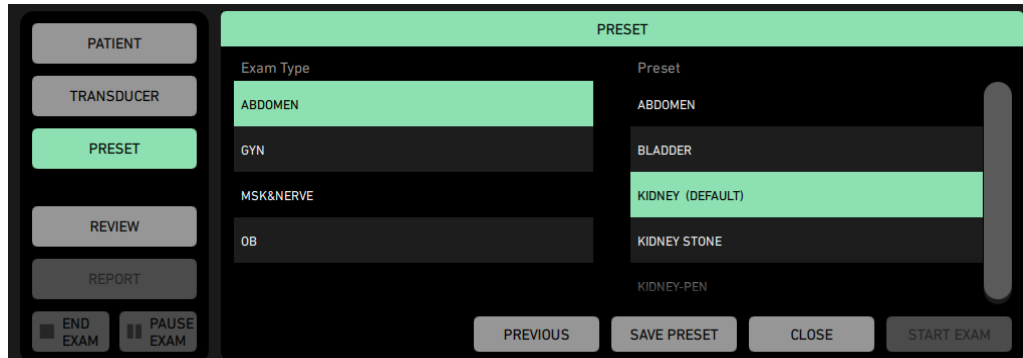


Figure 10-1. Preset window for 6C2.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

Biopsy

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

To display a puncture line on the image for biopsy guidance:

Tap **Biopsy** on the touchscreen.

Remember to check that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** for a dropdown list of needle guides.

For better needle visualization, see “Needle Enhancement” on page 78

NOTE: *If the image depth is set very low (to see tissue close to the transducer with high magnification), the needle tip echo can be outside the displayed image area. To see the needle tip in this case, zoom out so the full needle path is visible or pan the image to the side (to keep the high magnification).*

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

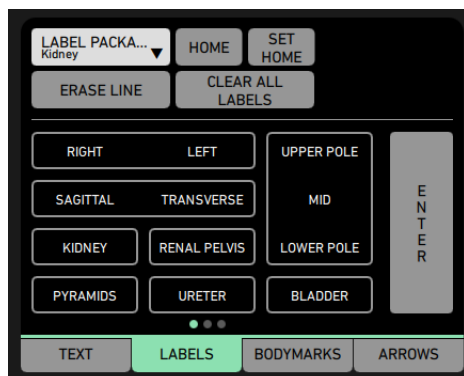


Figure 10-2. Label selector.

To select a label:

Tap the **Label** button.

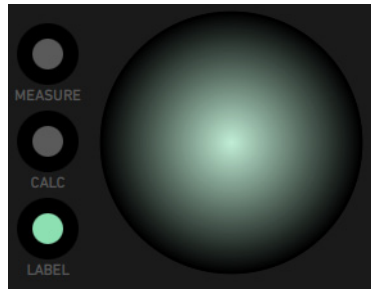


Figure 10-3. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 10-2*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

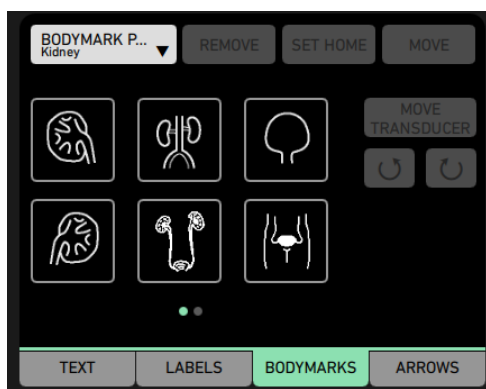


Figure 10-4. Bodymark selector.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

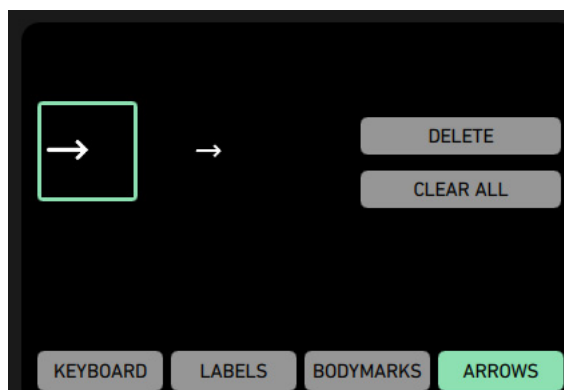


Figure 10-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Calculation of Kidney Volume

To measure kidney volume (length, height and width):

- 1 Tap **Calc**.
- 2 In the **Calc. Package Kidney**, select (e.g.) **Right Kidney**.
- 3 Tap **Rt Kidney V L*H*W**.
The length (L) caliper appears automatically.
- 4 Position the first caliper and tap.
- 5 Position the second caliper and tap.
The height (H) caliper appears automatically.
- 6 Repeat measurement.
The width (W), caliper appears automatically.
- 7 Repeat measurement.
- 8 When you have finished measuring, the volume calculation appears automatically.

To erase measurements:

- Tap the **Clear** button next to the trackpad.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.
- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.

Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Exporting

Copying or Exporting Images and Clips

To copy or export images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.

The **Save Preset** window appears.

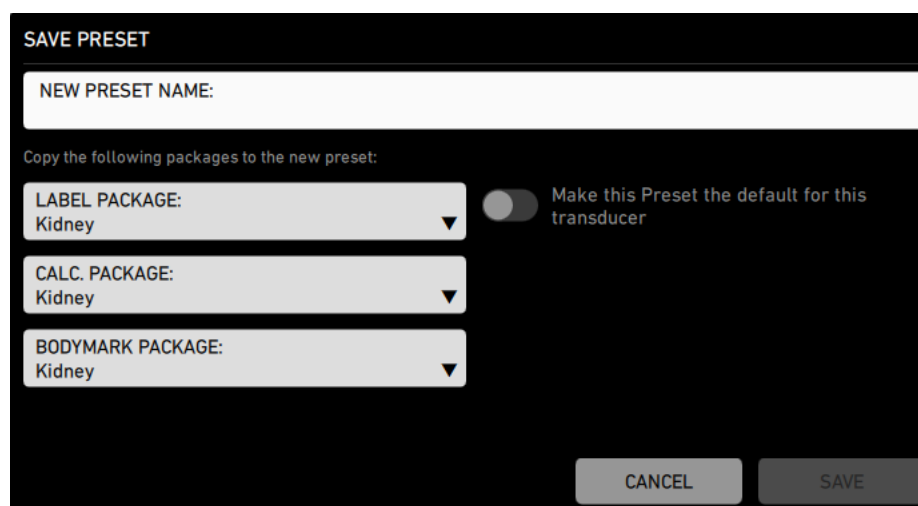


Figure 10-6. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 11

Brachytherapy Exam Type

The Brachytherapy Exam Type is designed for ultrasound-guided brachytherapy and cryotherapy for prostate cancer. This Exam Type helps you measure the volume of the prostate.

NOTE: *If you have the VariSeed or Live Image Transfer licenses activated, the image size is locked by default for the Brachytherapy exam type.*

NOTE: *Before you perform any puncture procedure, including brachytherapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.*

For information about calculating PSAD see Chapter 17, “Prostate Exam Type”.

Important:

- Please see Chapter 2, “Getting Started” for basic controls.
- Read transducer user guides for more information before doing biopsies.
- Read *Care and Cleaning* for sterilization instructions.
- Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- User Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1 Tap **Patient** on the touchscreen.
- 2 Enter data in the **Patient details** window.
- 3 Tap **Start Exam** (below the **Patient details** window).

NOTE: *It is recommended to enter the PSA (Prostate Specific Antigen) before you image.*

The **Patient** window for this Exam Type contains a PSA field for PSA Score parameters:

Parameter	Range allowed
PSA	0 – 1000

Table 11-1. Brachy parameter in the Patient window.

Diagnostic Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.



Figure 11-1. Preset window for E14CL4b

- Prostate L = 6 Mhz,
- Prostate M = 9 Mhz,
- Prostate S = 12 Mhz.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

To Change Transducer Planes

If you are using a transducer with more than one plane, you can change the imaging plane (**T** for transverse, **S** for sagittal, or **E** for endfire). The current imaging plane (**T**, **S**, or **E**) is displayed at the top of the monitor next to the transducer name.

To select the imaging plane:

- Press the appropriate button on the transducer. For details, see the user guide for the transducer.

or

- Tap **T**, **S**, or **E** on the touch screen.

NOTE: When you change image orientation U/D, you may need to adjust the TGC settings for the B-mode image. See “TGC” on page 75.

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

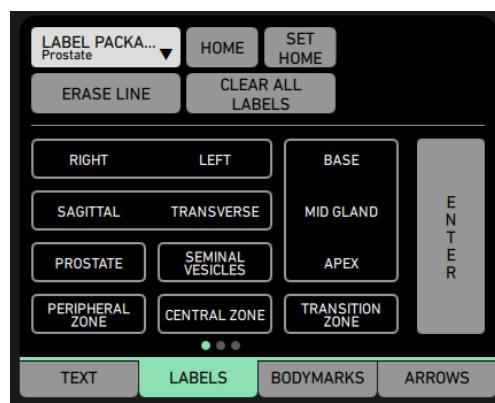


Figure 11-2. Label selector.

To select a label:

Tap the **Label** button.

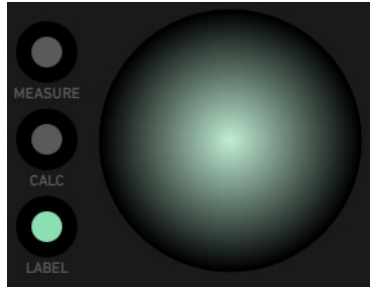


Figure 11-3. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 11-2*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

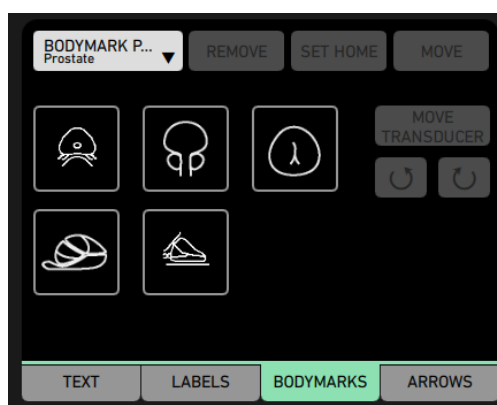


Figure 11-4. Bodymark selector.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

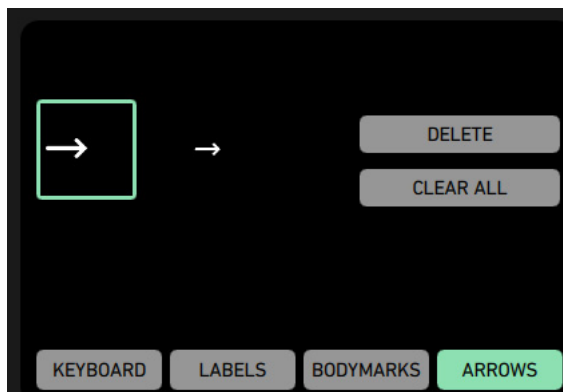


Figure 11-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Calculating Volumes

Organ volumes can be calculated in several ways. For the formulas used for each of these calculations, and information about their accuracy, see the *Technical Data (BZ2100)*.

NOTE: A volume calculation based on a measured ellipse is critically dependent on the axis of rotation that you choose. See page 58.

Planimetry (Contouring)

For this method, you record several parallel B-mode images that cover the organ to be measured. On each image, you draw a curve that traces the outline of the structure, thereby creating a set of parallel section measurements of the structure.

These parallel sections (the outline measurements) are used to estimate the volume of the structure based on several equally spaced slices.

The accuracy of this method depends on starting the measurements in the correct place. Start at one end of the organ, where the image shows an area of as close to 0 as possible. After each step, trace the outline of the structure on the image. The system calculates the volume of the structure between the starting point and each new image (see Fig 11-6). This is continued until the whole organ has been covered and a total volume obtained.

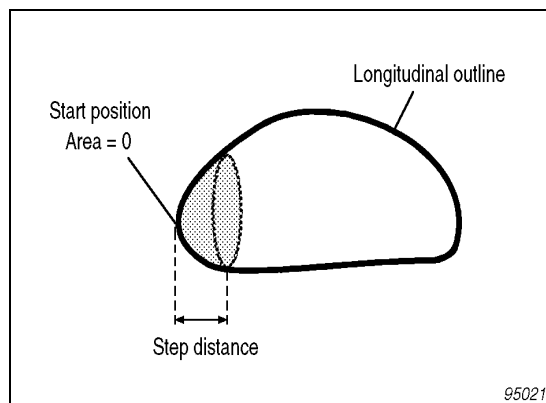


Figure 11-6. Longitudinal outline of organ showing the start position for planimetry.

Different stepping units to control the spacing between the sections are available for use with different transducers.

To use this method to calculate the volume of a particular organ, use the Planimetry (Ellipse) or Planimetry (Freehand) measurements in the submenu for that organ volume. The planimetry method is only available for the prostate and adenoma.

To make a planimetry calculation:

- 1 Record a 2D image at the far end of the organ.
- 2 Move the transducer back one step.
- 3 Freeze the image.
- 4 In **Calc**, tap **Planimetry Freehand**.
- 5 Draw to outline the prostate.
- 6 Draw an outline around any other structures of interest, such as the rectal wall or urethra.
- 7 Unfreeze the image.
- 8 Repeat steps 2 through 6 until you have covered the entire organ. The step numbers and measurements will be registered on the monitor.
The prostate volume is displayed (updated after each measurement is drawn) at the bottom of the data area to the left of the image.
- 9 Tap to set the measurement.

PSAD measurements:

The PSAD (Prostate Specific Antigen Density) will be calculated after the PSA has been entered and prostate volume has been measured.

To erase measurements:

- Tap the **Clear** button next to the trackpad.

Performing a Biopsy or Puncture Procedure (including Brachytherapy)

NOTE: *It is important to verify that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** to select the proper needle guide.*

When you use a transducer (such as the E14CL4b for brachytherapy, a brachytherapy needle guide matrix (brachy matrix) is superimposed on the image.

To superimpose a brachy matrix on an ultrasound image:

- Tap **Biopsy**.
The default brachy matrix appears.

To set a different brachy matrix to be the default:

- After you have selected the brachy matrix you want (and made any other setup changes you want), save your settings as a new preset. Specify that you want the new setup to be your default. See “Saving a New Preset” on page 189.

To select a different needle guide or brachy matrix:

- Tap the **Needle Guide** button and select the new needle guide number or brachy matrix name.

To remove the brachy matrix from the monitor:

- Tap **Biopsy**.

Programmable Needle Guide

If you are using a programmable needle guide, you can change the setup to move it to the left or right or in or out.

Brachy Ruler with Sagittal Plane Imaging

You can set up the system so that a brachy ruler is displayed when you image in the sagittal plane with the E14CL4b transducer, in situations where a brachy matrix appears in the transverse imaging view.

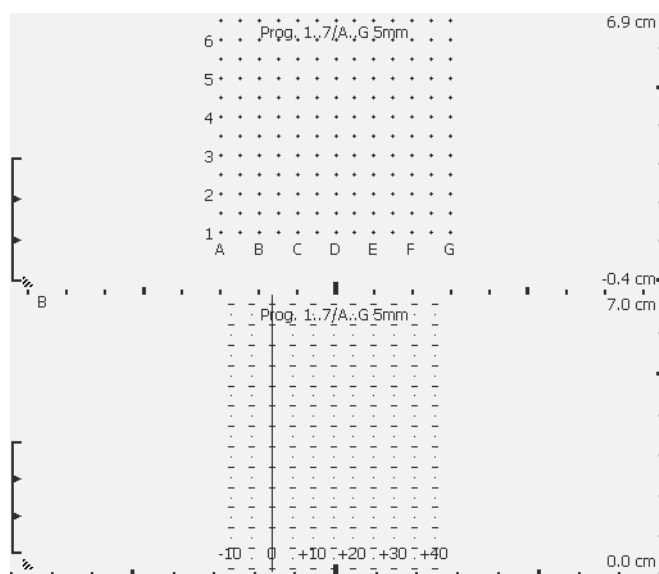


Figure 11-7. A split-screen view with transverse brachy matrix above and sagittal brachy ruler below. Ruler has vertical line to mark 0.

The sagittal brachy ruler is sometimes displayed with a 2-dimensional grid, to make it easier for you to see the horizontal position of the needle no matter where it is in the vertical direction.

To move the ruler to the left or right:

- 1 Open the Needle Guide setting as described in “Needle Guide Tab” on page 268.
- 2 Use the pointer to tap on the dropdown menu for **Move left/right**.
- 3 Select your preferred value and check **Display ruler on sagittal views**.

The vertical line disappears and the ruler markers appear in their new positions.

NOTE: By checking **Display vertical line with sagittal ruler**, you can set up the system so that a vertical 0 line is always visible, along with the markers as shown in Fig 11-7.

User-Definable Brachy Matrix and Ruler

You can also define your own brachy matrix and ruler. See “Needle Guide Tab” on page 268 in the Setup and Customizing chapter.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.
- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.
Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.
The **Save Preset** window appears.

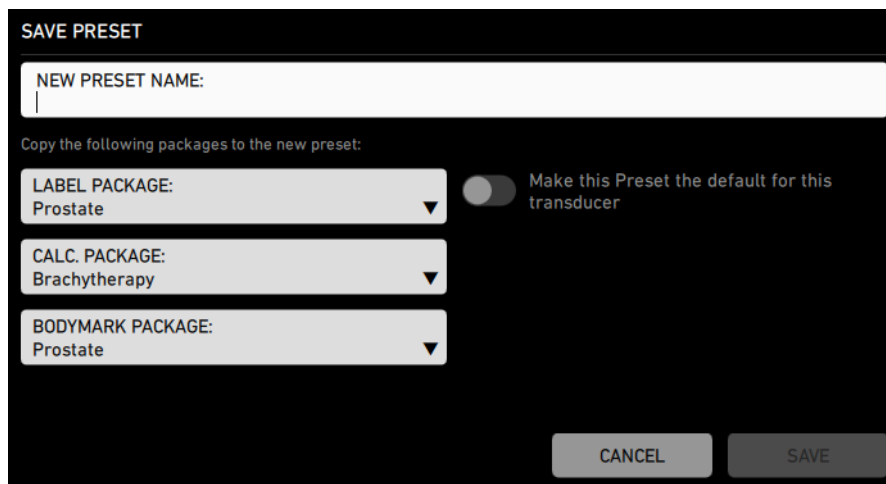


Figure 11-8. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 12

Colorectal Exam Type

This chapter contains information useful for basic imaging of Colorectal.

Important:

Please see Chapter 2, “Getting Started” for basic controls.

See Chapter 19, “3D Imaging” for using 3D.

Read transducer user guides for more information.

Read *Care and Cleaning* for sterilization instructions.

Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
- 2** Enter data in the **Patient details** window.
- 3** Tap **Start Exam** (below the **Patient details** window).

Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.

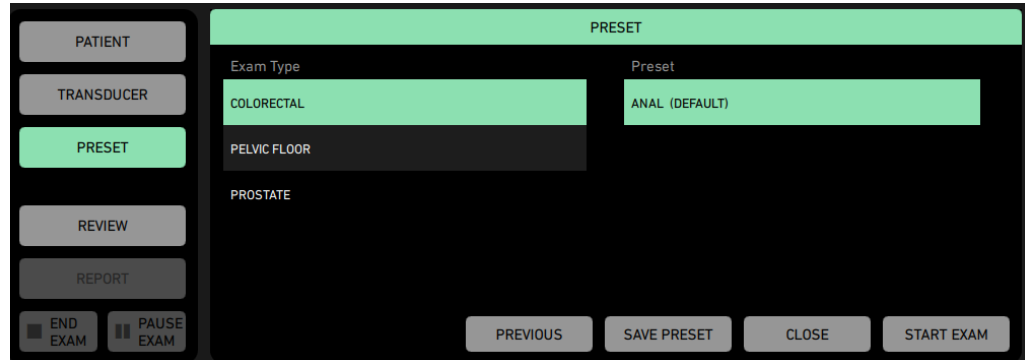


Figure 12-1. Preset window for 20R3.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).
The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

Color Mode (CFM)

To use Color mode:

- 1 Tap the **Col** mode button on the touchscreen.

The color box is activated (green color) and can be moved with the trackpad.

- 2 To resize color box, tap it and use the trackpad to increase/decrease size.
- 3 Tap the trackpad to set the size.

Scale:

- Use the **Scale** button to change the PRF.

Doppler Mode

When you turn Doppler mode on, 2D must be imaging.

To use Doppler mode:

- 1 Tap **PW**. The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.
- 2 To position the Doppler gate on a 2D image, use the trackpad.
- 3 To resize the Doppler gate, touch and slide **SV size**.
- 4 To adjust the angle, touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

When using a 3D transducer in **2D**, this is also the case.

NOTE: *When using 3D transducers in 3D, see “Annotating a 3D View” on page 213*

Labels

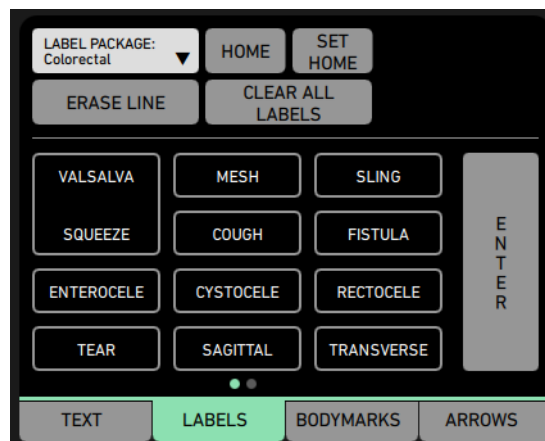


Figure 12-2. Label selector for Colorectal

To select a label:

Tap the **Label** button.

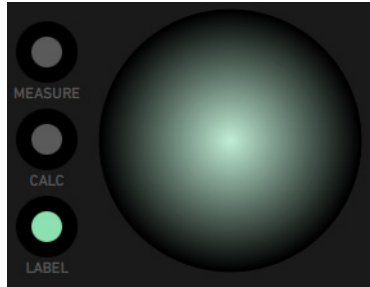


Figure 12-3. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 12-2*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

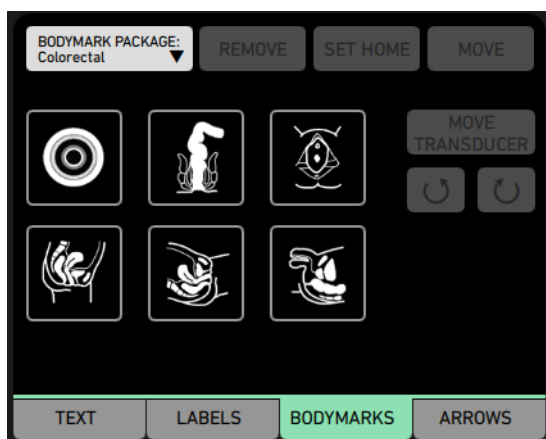


Figure 12-4. Bodymark selector for Colorectal.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

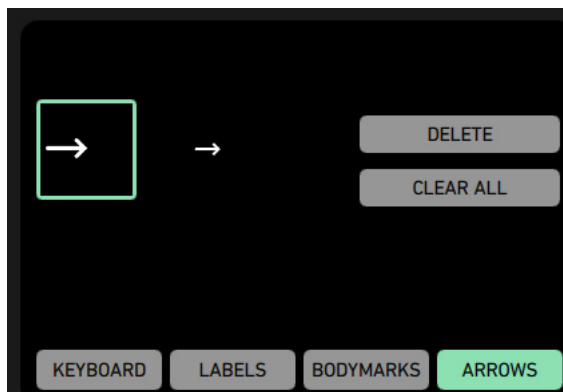


Figure 12-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the 3D measuring tools, see Chapter 19, “3D Imaging” on page 207

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.

- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.
Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.

The **Save Preset** window appears.

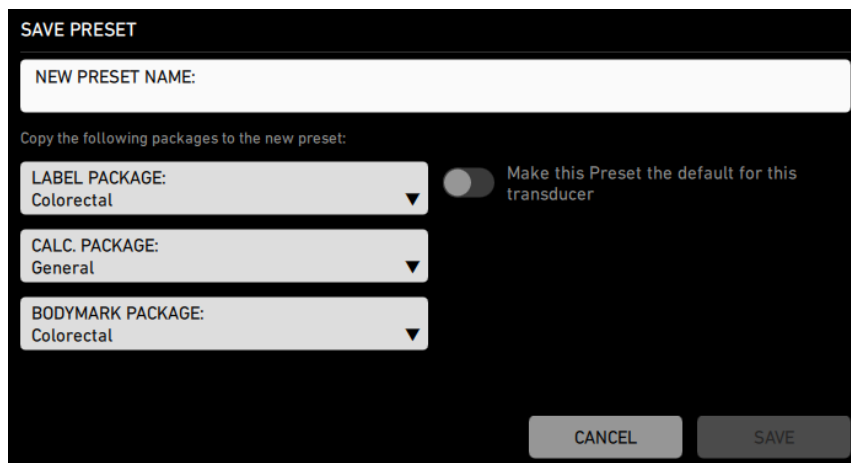


Figure 12-6. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 13

MSK and Nerve Exam Type

This chapter contains information useful for basic musculoskeletal, nerve and cardiac imaging.

Important:

Please see Chapter 2, “Getting Started” for basic controls.

Read transducer user guides for more information before doing biopsies.

Read *Care and Cleaning* for sterilization instructions.

Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
- 2** Enter data in the **Patient details** window.
- 3** Tap **Start Exam** (below the **Patient details** window).

Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.



Figure 13-1. Preset window for X18L5s.

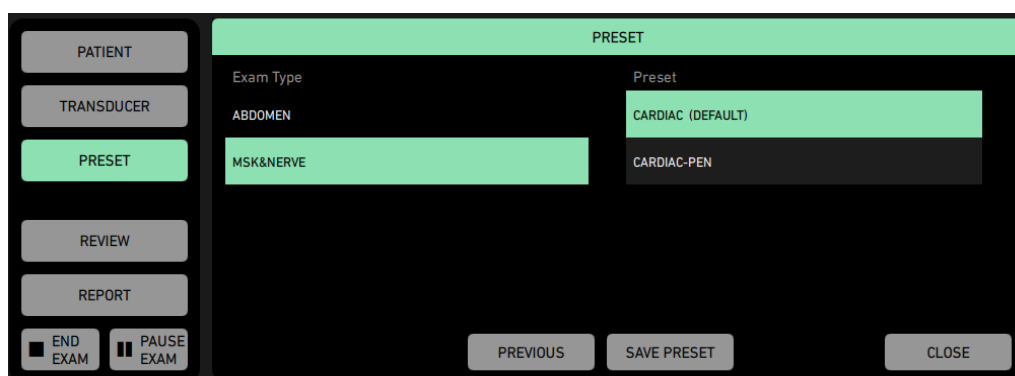


Figure 13-2. Preset window for 5P1e.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

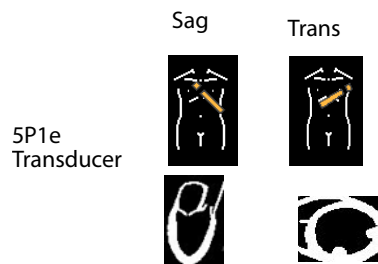
- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Transducer Orientation

5P1e Transducer

- Sag – Transducer mark to right shoulder
- Trans – Mark to left shoulder



Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

M-Mode

When you turn M-mode on, 2D must be imaging.

To use M-mode:

- Tap **M**. The green M-mode line is active and can be moved with the trackpad.
- Adjust sweep speed by holding and tapping the **Sweep Speed** button.

Color Mode (CFM)

To use Color mode:

- 1 Tap the **Col** mode button on the touchscreen.
The color box is activated (green color) and can be moved with the trackpad.
- 2 To resize color box, tap it and use the trackpad to increase/decrease size.
- 3 Tap the trackpad to set the size.

Scale:

- Use the **Scale** button to change the PRF.

Power Doppler Mode

To use Power Doppler mode:

- 1 Tap the **PD** mode button on the touchscreen.
The ROI (Region of Interest) box is activated (green color) and can be moved with the trackpad.

- 2 Tap the trackpad to set the position.

Doppler Mode

When you turn Doppler mode on, 2D must be imaging.

To use Doppler mode:

- 1 Tap **PW**. The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.
- 2 To position the Doppler gate on a 2D image, use the trackpad.
- 3 To resize the Doppler gate, touch and slide **SV size**.
- 4 To adjust the angle, touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

CW Doppler Mode

To use CW Doppler mode:

- 1 Tap **CW**. The CW Doppler indicator, including both the CW Doppler line and the focus region indicator, appears superimposed on the 2D image and the CW Doppler spectrum appears.
- 2 To position the focus region indicator on a 2D image, use the trackpad.

See also “Continuous Wave Doppler Mode” on page 91.

Volume Flow

To use Volume Flow:

- 1 In PW Doppler, tap **Measure**.
- 2 Select **Volume Flow**.
Calipers appear to measure the diameter of the vessel. When you have done this, vertical calipers appear on the Doppler spectral trace.
- 3 Place the first one at the beginning of a cardiac cycle and then place the second one farther along the spectral trace to include at least two cardiac cycles.
Volume flow rate appears in ml/min.

Biopsy

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

To display a puncture line on the image for biopsy guidance:

Tap **Biopsy** on the touchscreen.

Remember to check that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** for a drop down list of needle guides.

For better needle visualization, see “Needle Enhancement” on page 78

NOTE: *If the image depth is set very low (to see tissue close to the transducer with high magnification), the needle tip echo can be outside the displayed image area. To see the needle tip in this case, zoom out so the full needle path is visible or pan the image to the side (to keep the high magnification).*

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

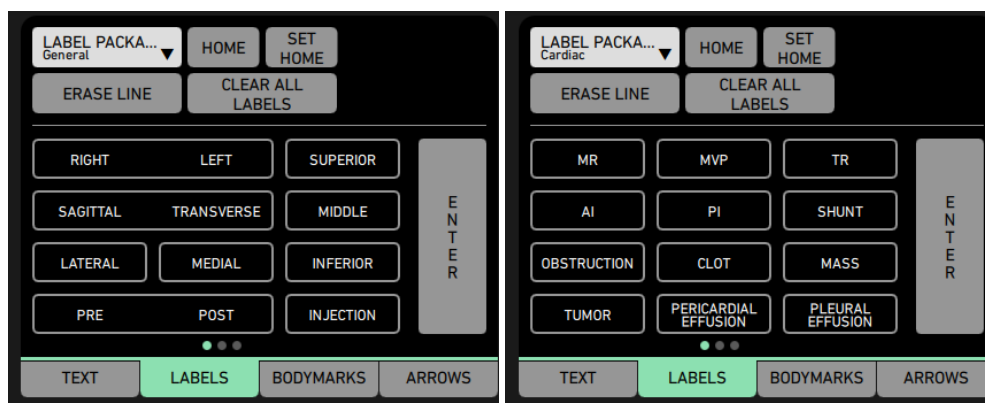


Figure 13-3. Label selectors for MSK and Cardiac.

To select a label:

Tap the **Label** button.

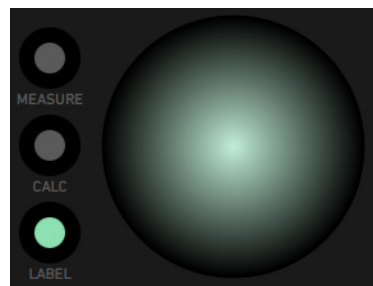


Figure 13-4. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 13-3*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

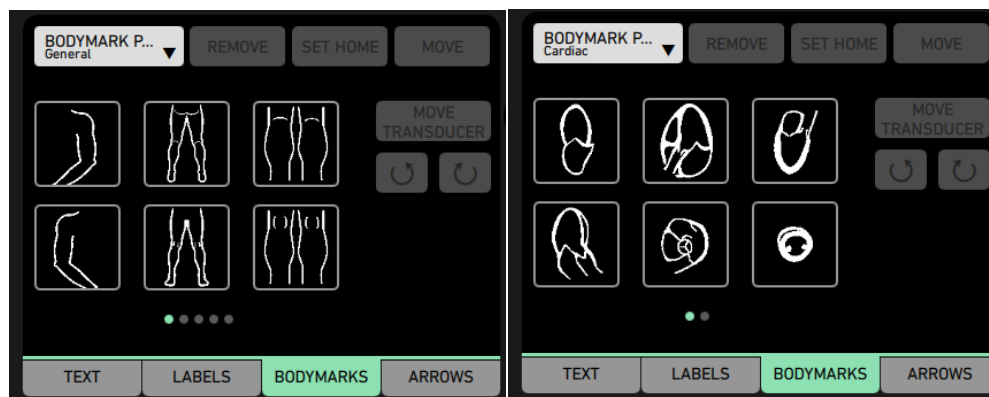


Figure 13-5. Bodymark selector for MSK and Cardiac.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plane indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

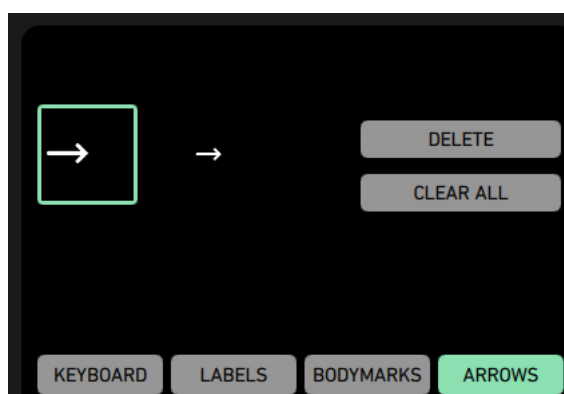


Figure 13-6. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.

- 3** Drag the arrow to the position you want, and tap again.
- 4** You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Cardiac LV Protocol (Left Ventricular Protocol)

2D Mode/M-Mode

- 1** Freeze the image and tap **Calc**.
- 2** Tap **LV Protocol/LV Protocol (M-Mode)**.
- 3** Measure the following in diastole:
 - IVS d (Interventricular Septum)
 - LVD d (Left Ventricular Diameter)
 - LVPW d (Left Ventricular Posterior Wall)
- 4** Then measure the following in systole:
 - IVS s (Interventricular Septum in systole)
 - LVD s (Left Ventricular Diameter in systole)
 - LVPW s (Left Ventricular Posterior Wall in systole)

These calculations are displayed on the monitor:

- EdV (End Diastolic Volume)
- EsV (End Systolic Volume)
- LVM (Left Ventricular Mass)
- FS (Fractional Shortening)
- EF (Ejection Fraction)
- SV (Stroke Volume)

LV	
■ IVSd	8.83mm
■ LVDd	51.94mm
■ LVPWd	12.22mm
■ LVM	207.47g
■ EdV	129.14ml
■ IVSs	13.57mm
■ LVDs	38.42mm
■ LVPWs	18.32mm
■ EsV	63.59ml
EF	50.76%
SV	65.55ml
FS	26.03%

Figure 13-7. Measurement Data for LV Protocol.

HR (Heart Rate)

M-Mode/Doppler Mode

- 1 Freeze the image and tap **Measure**.
- 2 Tap **HR**.
A line caliper appears on the image.
- 3 Drag this to the position you want. Tap.
Another line caliper appears.
- 4 Drag it to the end of the defined number of HR cycles and tap.

The heart rate is displayed on the monitor.

Cardiac Output

Doppler Mode

- 1 Freeze the image and tap **Calc**.
- 2 Tap **CO Protocol**.
- 3 Measure LVOT diameter. The measurement is displayed on the monitor.
- 4 Trace the VTI. **LVOTVTI** is displayed on the monitor.
- 5 Measure HR over two cycles.
HR, CO and **SV** are displayed on the monitor:

■ LVOTDs	37.03mm
■ LVOTVTI	16.60cm
HR	57b/min
CO	10.26l/min
SV	178.77ml

Figure 13-8. Measurement Data for Cardiac Output.

FATE (Focus Assessed Transthoracic Echocardiography)

FATE is a form of specialized cardiac imaging for emergency medicine use, developed in Denmark. FATE calculations are available for **M-mode** only.

FATE Measurements

MSS (Mitral Septal Separation)

MSS is used as an M-mode echocardiographic indicator of normal or abnormal left ventricular ejection fraction.

Parasternal Long Axis View - M-Mode line through RV, IVS, MV end point

To measure:

- 1 Freeze the image and tap **Calc**.
- 2 On the **Group** dropdown, select **FATE**.
- 3 Measure the distance between MV end point and IVS in systole. The **MSS** measurement is displayed on the monitor.

MAPSE Mitral Annular Plane Systolic Excursion

MAPSE is assessed with M-mode in apical four-chamber view, placing the M-mode beam on the lateral mitral annulus. Measurement takes place from the end of the diastole, until maximal expansion in systole.

To measure MAPSE:

- 1 Freeze the image and tap **Calc**.
 - 2 On the **Group** dropdown, select **FATE**.
 - 3 Tap **MAPSE**.
 - 4 Place the cross at the highest systolic excursion and tap.
 - 5 Place the next cross at the lowest diastolic excursion and tap.
- The vertical distance is now measured between the two crosses.

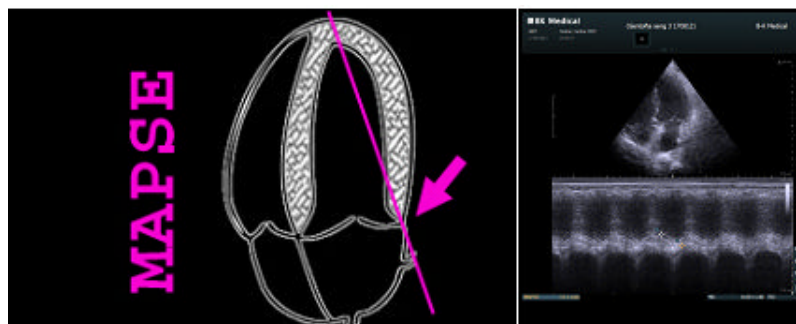


Figure 13-9. Measuring MAPSE using FATE.

TAPSE Tricuspid annular Plane Systolic Excursion

TAPSE can be assessed with M-mode, in the apical four-chamber view, placing the M-mode beam on the lateral Tricuspid annulus, measuring the distance of tricuspid annular movement between end diastole to end systole.

To measure TAPSE:

- 1 Freeze the image and tap **Calc**.

- 2 On the **Group** dropdown, select **FATE**.
- 3 Tap **TAPSE**.
- 4 Place the cross at the highest systolic excursion and tap.
- 5 Place the next cross at the lowest diastolic excursion and tap.
The vertical distance is now measured between the two crosses.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.
- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.
Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.

Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**. The **Save Preset** window appears.

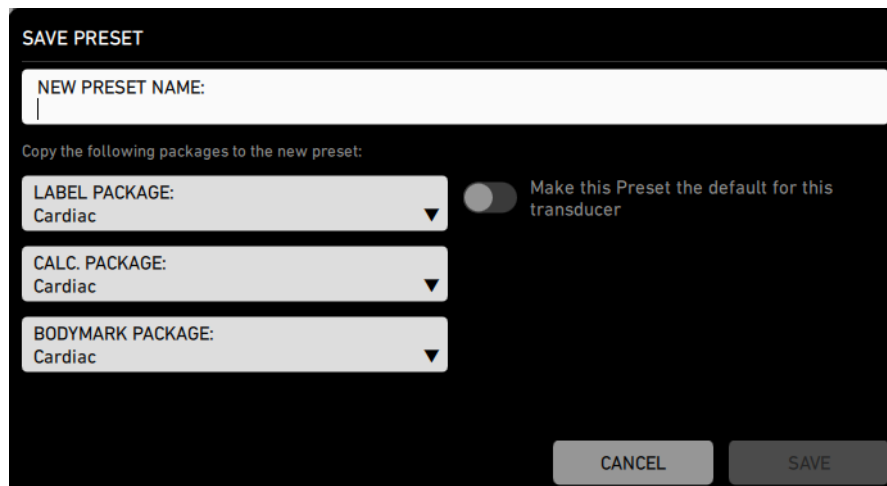


Figure 13-10. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 14

OB and Gyn Exam Types

The OB and Gyn Exam Types are designed for use in obstetrical and gynecological ultrasound applications.

Important:

Please see Chapter 2, “Getting Started” for basic controls.

Read transducer user guides for more information before doing biopsies.

Read *Care and Cleaning* for sterilization instructions.

Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1 Tap **Patient** on the touchscreen.
- 2 Enter data in the **Patient details** window. Typing in the **LMP** (last menstrual period) for the exam type **OB** will calculate the expected date of confinement

PATIENT		PATIENT DETAILS		EXAM REVIEW	
PATIENT ID: 20191030142004	LAST NAME:	FIRST NAME:	MI:		
DOB: MM/DD/YYYY	AGE:	GENDER: ▼	OPERATOR:		
EXAM TYPE: OB ▼	COMMENT:				
ACCESSION NUMBER:	REFERRING PHYSICIAN:	PREV EXAM DATE: MM/DD/YYYY			
LMP: MM/DD/YYYY	EDC: MM/DD/YYYY	GA:			
END EXAM	PAUSE EXAM	NEXT	CANCEL	CLOSE	

Figure 14-1. Patient details with LMP.

- 3 If it is already known that there is more than one fetus, swipe the last two lines to add the number of fetuses:

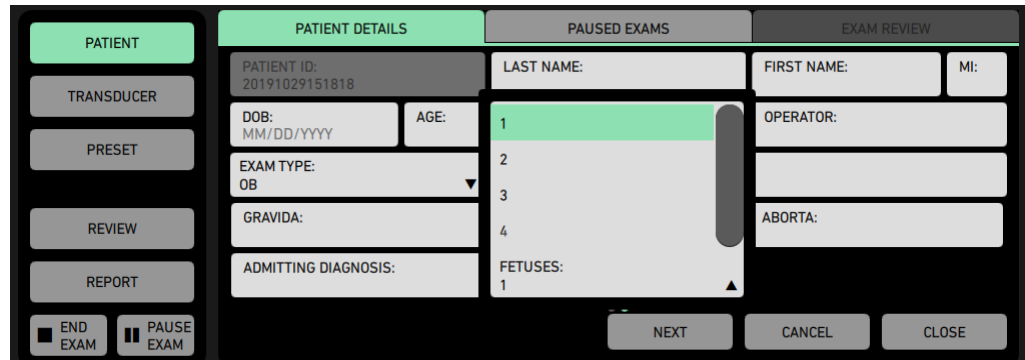


Figure 14-2. Patient Details with *Fetuses* dropdown.

- 4 Tap **Start Exam**.

Diagnostic Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.



Figure 14-3. GYN Presets for E10C4.

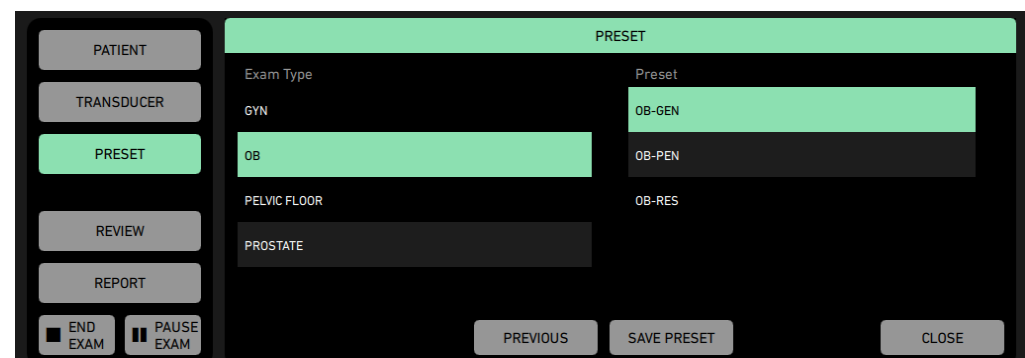


Figure 14-4. OB Presets for E10C4

Gestational Age and Expected Date of Confinement

You can calculate the gestational age (GA) and expected date of confinement (EDC) from measurements on the ultrasound image, or from clinical parameters such as date of last menstrual period. You can also use the results of an earlier examination.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Color Mode (CFM)

To use Color mode:

- 1 Tap the **Col** mode button on the touchscreen.
The color box is activated (green color) and can be moved with the trackpad.
- 2 To resize color box, tap it and use the trackpad to increase/decrease size.
- 3 Tap the trackpad to set the size.

Scale:

- Use the **Scale** button to change the PRF.

Doppler Mode

When you turn Doppler mode on, 2D must be imaging.

To use Doppler mode:

- 1 Tap **PW**. The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.
- 2 To position the Doppler gate on a 2D image, use the trackpad.
- 3 To resize the Doppler gate, touch and slide **SV size**.
- 4 To adjust the angle, touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

Biopsy

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

To display a puncture line on the image for biopsy guidance:

Tap **Biopsy** on the touchscreen.

Remember to check that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** for a drop down list of needle guides.

For better needle visualization, see “Needle Enhancement” on page 78

NOTE: *If the image depth is set very low (to see tissue close to the transducer with high magnification), the needle tip echo can be outside the displayed image area. To see the needle tip in this case, zoom out so the full needle path is visible or pan the image to the side (to keep the high magnification).*

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

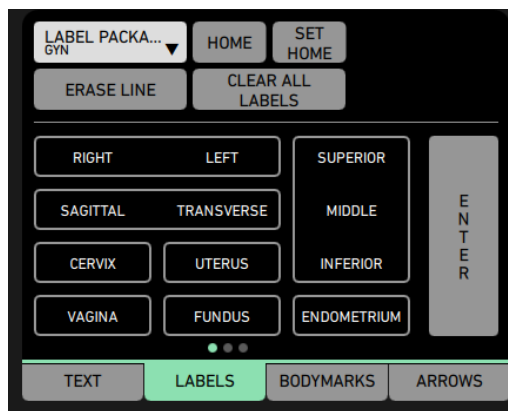


Figure 14-5. Label selector.

To select a label:

Tap the **Label** button.

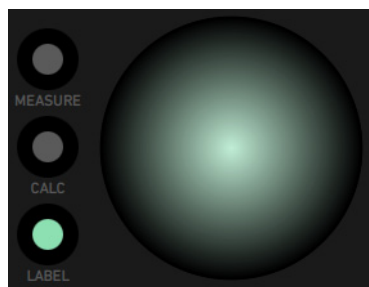


Figure 14-6. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 14-5*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

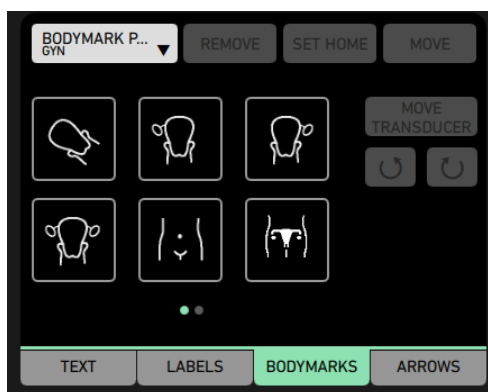


Figure 14-7. Bodymark selector.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

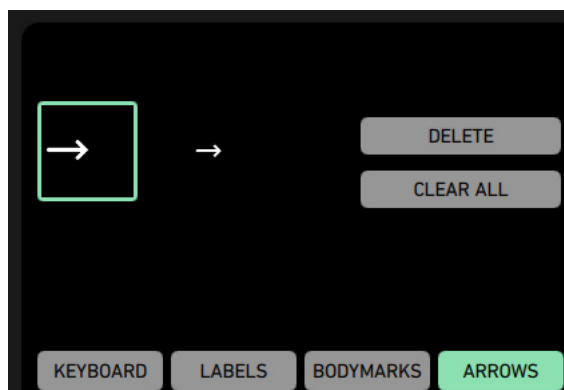


Figure 14-8. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Nuchal Translucency

Nuchal translucency measurements require special training. See the caution in the measurements section of the Safety chapter in the *bkSpecto User Guide*.

Calculation Methods - GYN

Follicle Diameter Measurements

By default, you can calculate the average diameter of a follicle using two diameters.

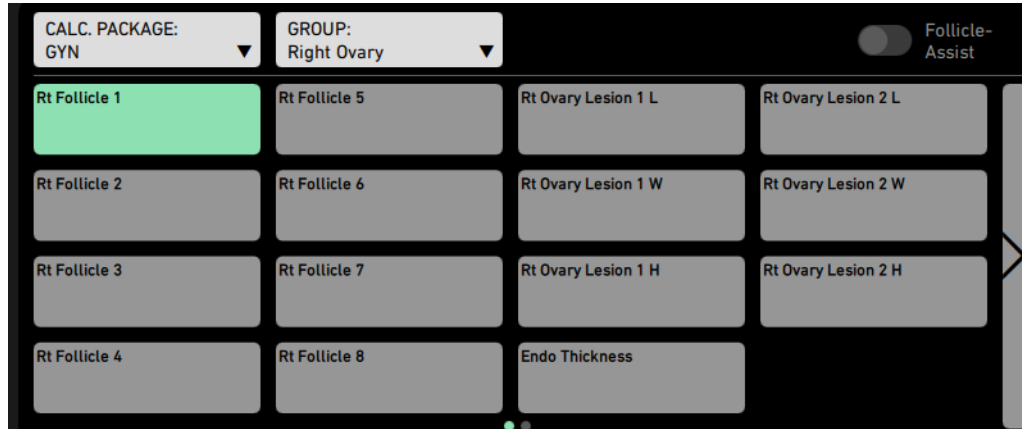


Figure 14-9. Ovary calculations.

To make a follicle calculation:

- 1 Tap **Calc.**
- 2 In the **GYN** calculation package, select **Right** (or **Left**) **Ovary** on the **Group** dropdown menu.
- 3 Tap **Rt Follicle 1** (2,3..)
A caliper appears on the image.
- 4 Drag the caliper to the widest distance of the follicle and tap. Another caliper appears.
- 5 Drag the second caliper to the narrowest distance of the follicle and tap.

The system calculates the average diameter and displays it in the measurement data on the monitor.

When you make a manual follicle calculation, the average diameter is displayed after Dist a and b.

Follicle-Assist

The Follicle-Assist calculation automatically sets two diameter measurements and calculates the average diameter of the follicle. You can adjust the calipers of these distance measurements as needed.



Figure 14-10. Follicle-Assist calculations.

To make a Follicle-Assist calculation:

- 1 Tap Calc.
- 2 In the GYN calculation package, select **Right** (or **Left**) **Ovary** on the **Group** dropdown menu.
- 3 Tap **Follicle-Assist** and select a measurement.
- 4 Place the cursor in the center of a follicle and tap.

The system measures the widest diameter, then measures the diameter in a 90 degree angle to the first, and calculates the average diameter.

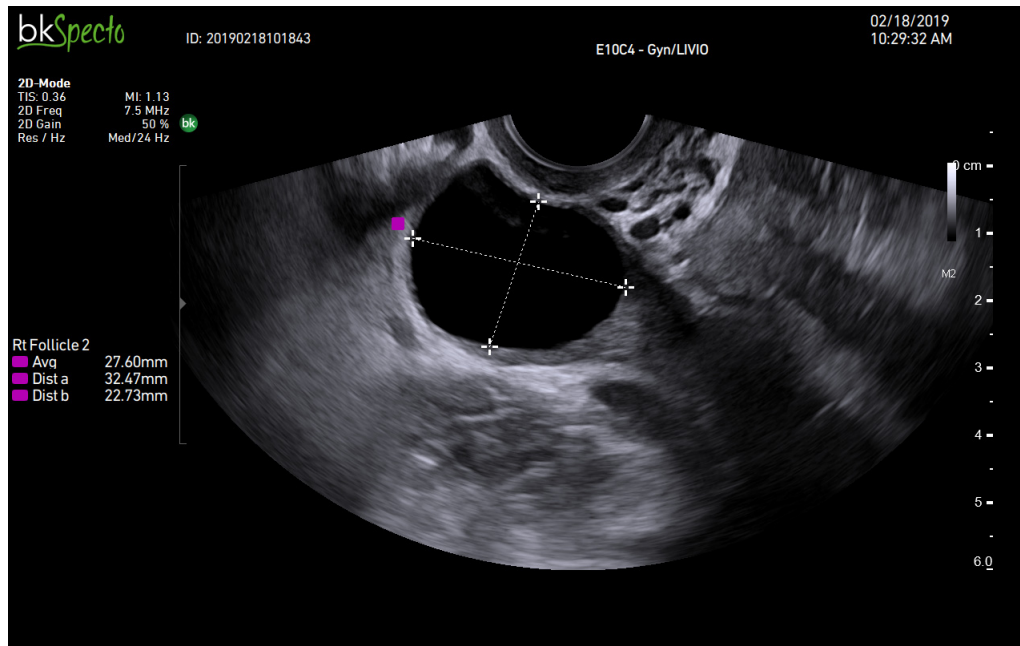


Figure 14-11. Follicle-Assist calculation. When you use the Follicle-Assist option, the average diameter is displayed before Dist a and b.

Calculation Methods - OB

General Information

This Exam Type contains measuring tools that can be used to calculate gestational age (GA), fetal weight (FW), and expected date of confinement (EDC). The calculations are based on measurements of the ultrasound image such as biparietal diameter (BPD) or abdominal circumference (AC).

Unless otherwise noted, in this chapter GA is expressed in days, FW in grams (g) and distances are in millimeters (mm).

Obstetrics Reports

Obstetrics reports contains the results of clinical calculations of GA and EDC, as well as calculations based on measurements of the ultrasound image. For more information about editing, printing and saving reports, see “Using Reports” on page 157.

Curves in Reports

The report will include reference curves for the current calculations. The ultrasound measured and calculated GA is displayed as an 'x' placed within the three curves according to its relation to the clinical calculation. In the report below, there is only a discrepancy of 1 day between the clinical and the ultrasound calculation, so the 'x' is placed on the center curve. With a higher discrepancy between the calculations, the 'x' will be placed further away from the center curve.

NEW HOSPITAL					
Patient Details					
Name:	Patient ID:	Study Date:			
DOE, JANE	20190306144612	03/06/2019			
DOB:					
03/22/1989					
Age:					
29 years					
Exam Details					
# Fetuses:	LMP:				
1	11/10/2018				
OB Summary					
Clinical Age	16w4d	EDC	08/17/2019	LMP	11/10/2018
US Age	16w5d	US EDC	08/16/2019		
OB Measurements					
<u>Label</u>	<u>Value</u>	<u>GA</u>	<u>+/-</u>	<u>Growth</u>	
BPD:	3.48 cm	16w5d	+/- 1w1d		
		Hadlock		Hadlock	
OB Graphs					

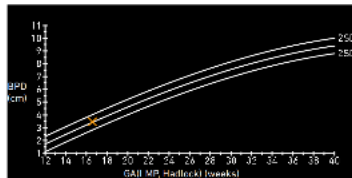


Figure 14-12. OB report with curve showing the calculated GA.

Measuring Several Fetuses

If there is more than one fetus, and this has not been entered in the **Patient Details**, you can select the number of fetuses on the **Fetuses** dropdown menu. When measuring, select which fetus you are measuring (A, B...) on the **Fetus** dropdown menu.

NOTE: When you have selected e.g. Fetus A, make certain that you are measuring on the correct fetus.

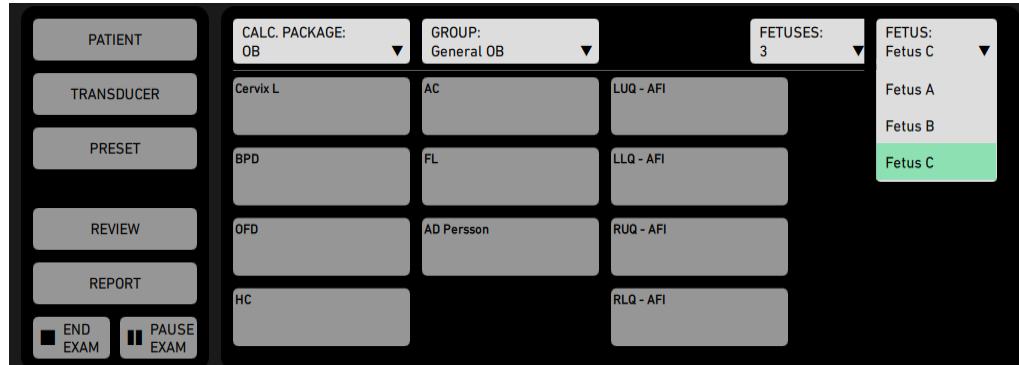


Figure 14-13. Measuring several fetuses.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.
- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.

Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.
The **Save Preset** window appears.

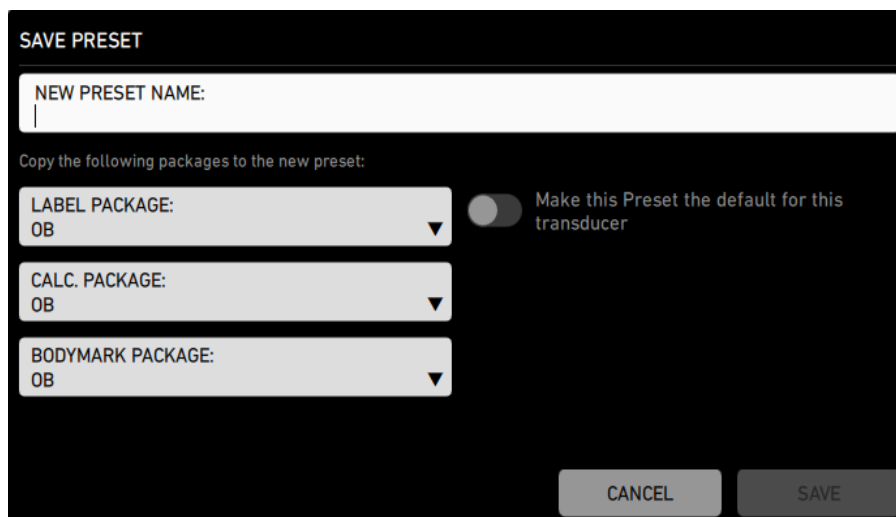


Figure 14-14. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 15

Pelvic Floor Exam Type

This chapter contains information useful for basic imaging of Pelvic Floor.

Important:

Please see Chapter 2, “Getting Started” for basic controls.

See Chapter 19, “3D Imaging” for using 3D.

Read transducer user guides for more information.

Read *Care and Cleaning* for sterilization instructions.

Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
- 2** Enter data in the **Patient details** window.
- 3** Tap **Start Exam** (below the **Patient details** window).

Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.

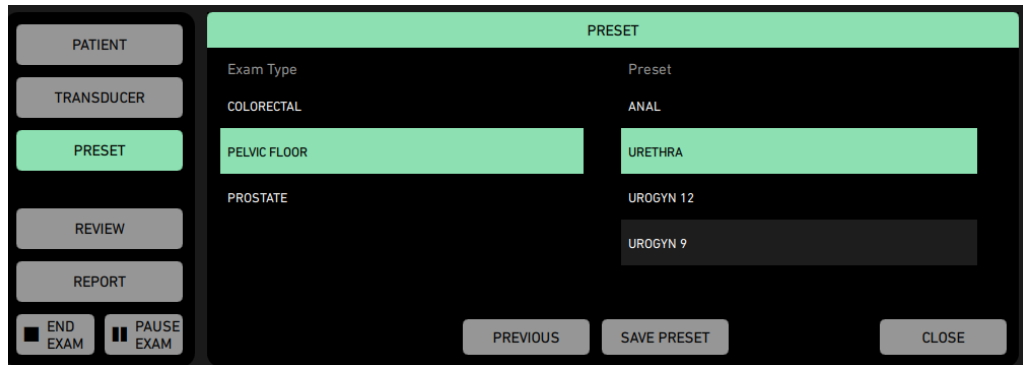


Figure 15-1. Preset window for X14L4.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

Color Mode (CFM)

To use Color mode:

- 1 Tap the **Col** mode button on the touchscreen.

The color box is activated (green color) and can be moved with the trackpad.

- 2 To resize color box, tap it and use the trackpad to increase/decrease size.
- 3 Tap the trackpad to set the size.

Scale:

- Use the **Scale** button to change the PRF.

Doppler Mode

When you turn Doppler mode on, 2D must be imaging.

To use Doppler mode:

- 1 Tap **PW**. The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.
- 2 To position the Doppler gate on a 2D image, use the trackpad.
- 3 To resize the Doppler gate, touch and slide **SV size**.
- 4 To adjust the angle, touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

When using a 3D transducer in **2D**, this is also the case.

NOTE: *When using 3D transducers in 3D, see “Annotating a 3D View” on page 213*

Labels

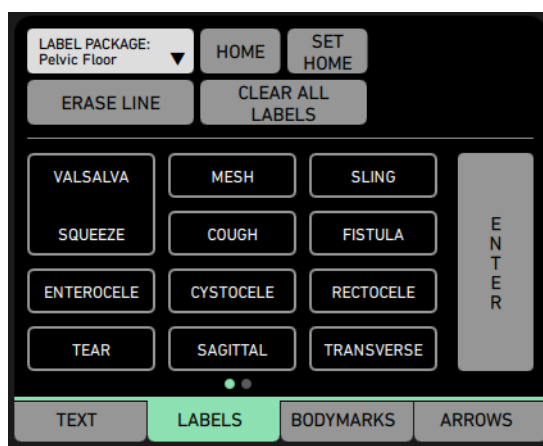


Figure 15-2. Label selector for Pelvic Floor.

To select a label:

Tap the **Label** button.

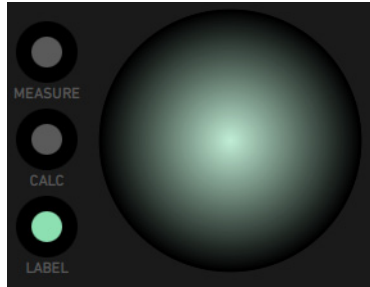


Figure 15-3. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 15-2*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

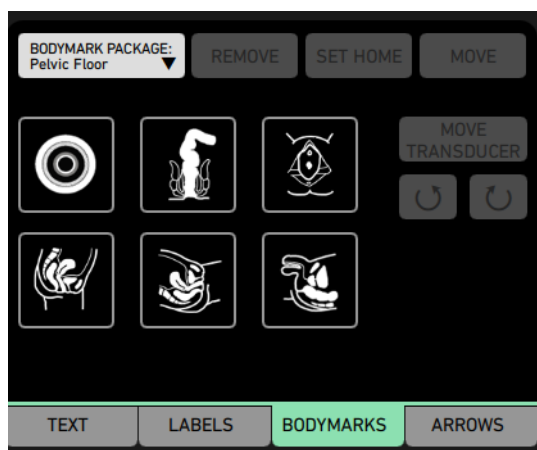


Figure 15-4. Bodymark selector for Pelvic Floor.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

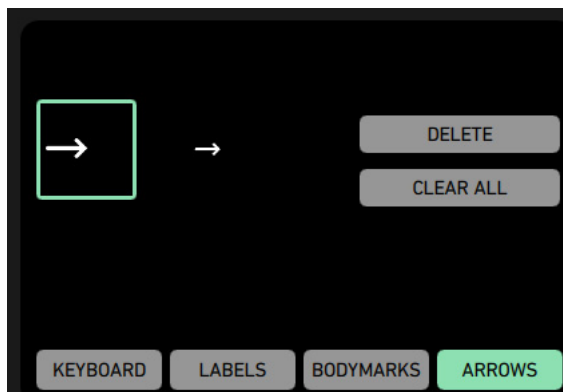


Figure 15-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the 3D measuring tools, see Chapter 19, “3D Imaging” on page 207

For detailed instructions about using the 2D measuring tools, see “Making Measurements” on page 53.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.

- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.
Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.

The **Save Preset** window appears.

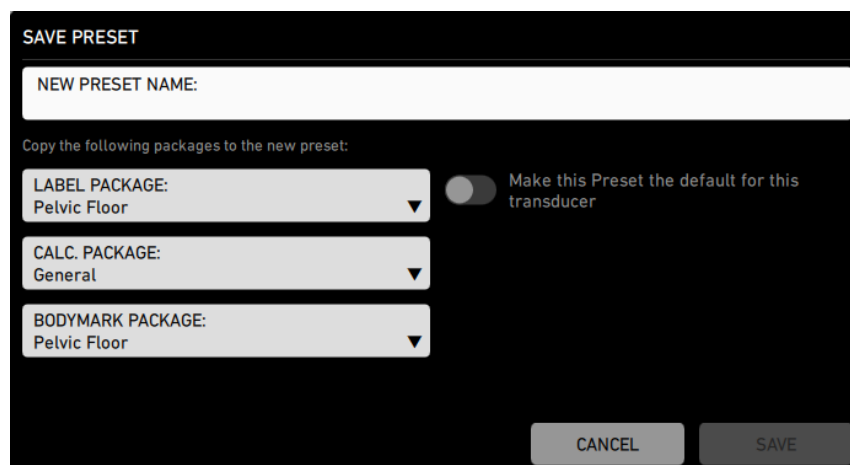


Figure 15-6. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

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- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 16

Small Parts Exam Type

This chapter contains information useful for basic imaging of Small Parts, including Breast, Penile, Testis and Thyroid.

Important:

Please see Chapter 2, “Getting Started” for basic controls.

Read transducer user guides for more information before doing biopsies.

Read *Care and Cleaning* for sterilization instructions.

Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
- 2** Enter data in the **Patient details** window.
- 3** Tap **Start Exam** (below the **Patient details** window).

Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.

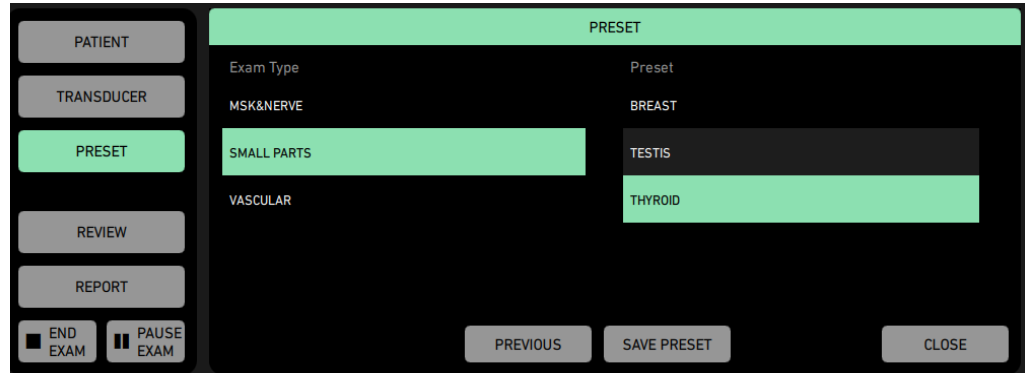


Figure 16-1. Preset window for 8L2.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

Color Mode (CFM)

To use Color mode:

- 1 Tap the **Col** mode button on the touchscreen.

The color box is activated (green color) and can be moved with the trackpad.

- 2 To resize color box, tap it and use the trackpad to increase/decrease size.
- 3 Tap the trackpad to set the size.

Scale:

- Use the **Scale** button to change the PRF.

Doppler Mode

When you turn Doppler mode on, 2D must be imaging.

To use Doppler mode:

- 1 Tap **PW**. The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.
- 2 To position the Doppler gate on a 2D image, use the trackpad.
- 3 To resize the Doppler gate, touch and slide **SV size**.
- 4 To adjust the angle, touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

Volume Flow

To use Volume Flow:

- 1 In PW Doppler, tap **Measure**.
- 2 Select **Volume Flow**.
Calipers appear to measure the diameter of the vessel. When you have done this, vertical calipers appear on the Doppler spectral trace.
- 3 Place the first one at the beginning of a cardiac cycle and then place the second one farther along the spectral trace to include at least two cardiac cycles.
Volume flow rate appears in ml/min.

Biopsy

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

To display a puncture line on the image for biopsy guidance:

Tap **Biopsy** on the touchscreen.

Remember to check that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** for a drop down list of needle guides.

For better needle visualization, see “Needle Enhancement” on page 78

NOTE: *If the image depth is set very low (to see tissue close to the transducer with high magnification), the needle tip echo can be outside the displayed image area. To see the needle tip in this case, zoom out so the full needle path is visible or pan the image to the side (to keep the high magnification).*

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

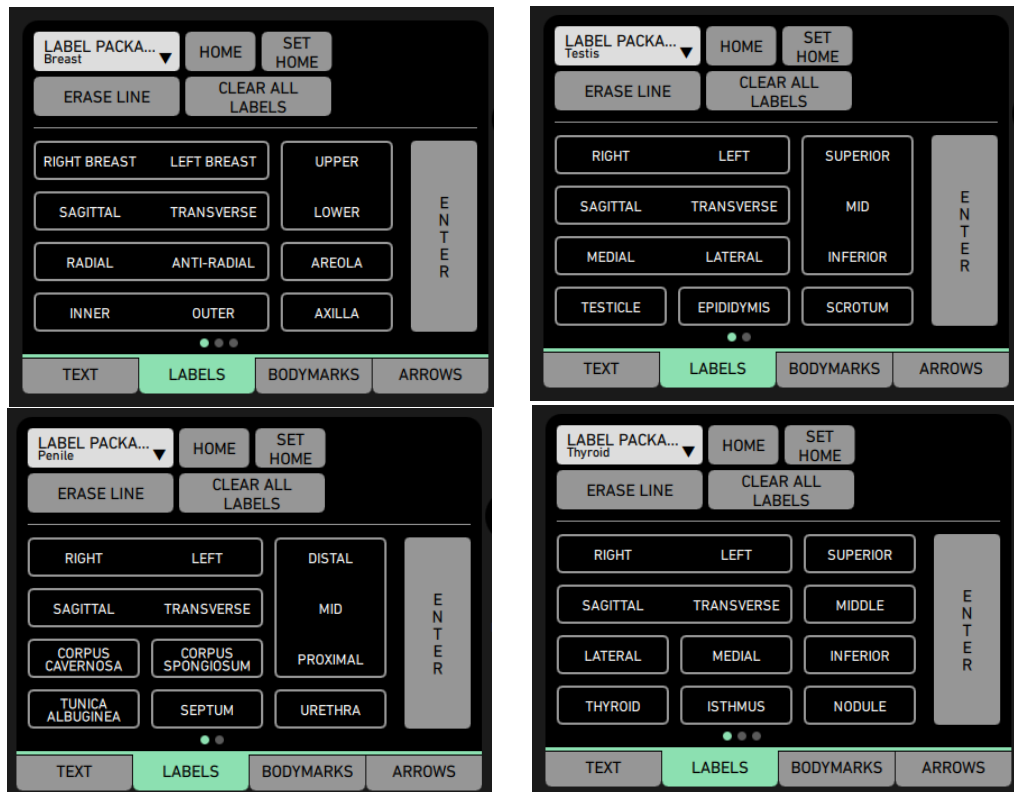


Figure 16-2. Label selector for Breast, Testis, Penile and Thyroid, respectively.

To select a label:

Tap the **Label** button.

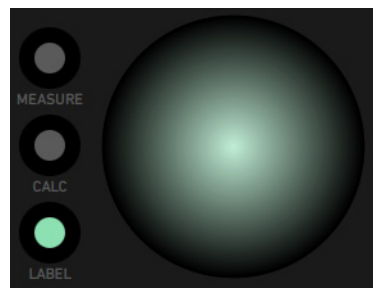


Figure 16-3. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.

- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 16-2*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

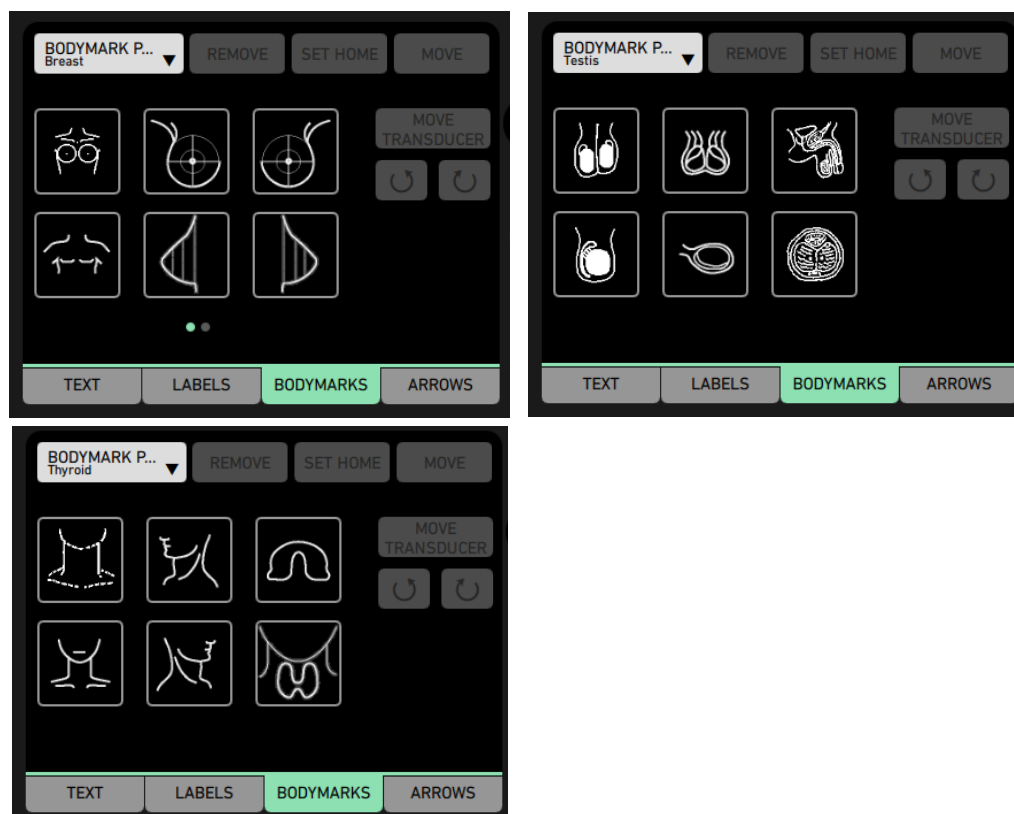


Figure 16-4. Bodymark selector for Breast, Testis/Penile and Thyroid respectively.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plane indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

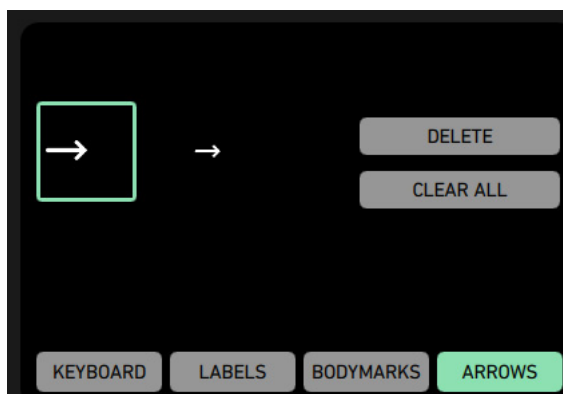


Figure 16-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Calculation of Breast Lesion Volume

To measure lesion volume (width, height and length):

- 1 Freeze the image and tap **Calc**.
- 2 On the **Group** dropdown, select **Right** or **Left** (this procedure uses **Left**).
- 3 Tap **Lt Lesion V W*H*L**.
The width (W) caliper appears automatically.
- 4 Position the first caliper and tap.
- 5 Position the second caliper and tap.
The height (H) caliper appears automatically.
- 6 Repeat measurement.
Length (L), the last set of measurements, appear automatically.
- 7 Repeat measurement. When you have finished measuring, the volume calculation appears on the monitor.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.
- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.

Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.
The **Save Preset** window appears.

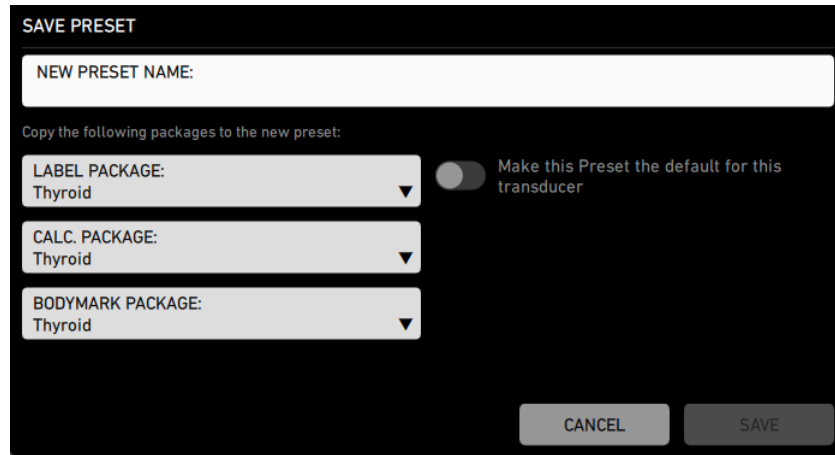


Figure 16-6. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 17

Prostate Exam Type

This chapter contains information useful for prostate imaging.

Important:

- Please see Chapter 2, “Getting Started” for basic controls.
- Read transducer user guides for more information before doing biopsies.
- Read *Care and Cleaning* for sterilization instructions.
- Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Presets
- Imaging Controls
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Example
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
 - 2** Enter data in the **Patient details** window.
 - 3** Tap **Start Exam** (below the **Patient details** window).
- **NOTE:** *It is recommended to enter the PSA (Prostate Specific Antigen) before you image.*

Diagnostic Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.



Figure 17-1. Preset window for E14C4t.

- Prostate L = 6 Mhz,
- Prostate M = 9 Mhz,
- Prostate S = 12 Mhz.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).

The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

To Change Transducer Planes

If you are using a transducer with more than one plane, you can change the imaging plane (**T** for transverse, **S** for sagittal, or **E** for endfire). The current imaging plane (**T**, **S**, or **E**) is displayed at the top of the monitor next to the transducer name.

To select the imaging plane:

- Press the appropriate button on the transducer. For details, see the user guide for the transducer.

or

- Tap **T**, **S**, or **E** on the touch screen.

NOTE: *When you change image orientation U/D, you may need to adjust the TGC settings for the B-mode image. See “TGC” on page 75.*

Biopsy

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

To display a puncture line on the image for biopsy guidance:

Tap **Biopsy** on the touchscreen.

Remember to check that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** for a drop down list of needle guides.

For better needle visualization, see “Needle Enhancement” on page 78

NOTE: *If the image depth is set very low (to see tissue close to the transducer with high magnification), the needle tip echo can be outside the displayed image area. To see the needle tip in this case, zoom out so the full needle path is visible or pan the image to the side (to keep the high magnification).*

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

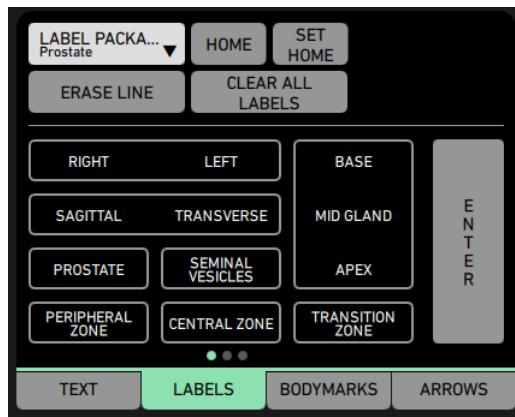


Figure 17-2. Label selector.

To select a label:

Tap the **Label** button.

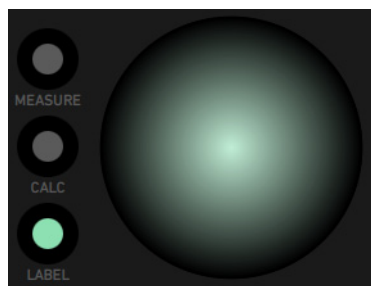


Figure 17-3. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see Fig 17-2.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.

- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want. Note that you can only edit your own labels.

Bodymarks

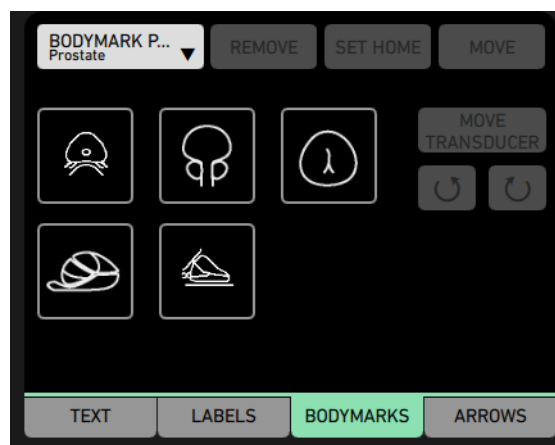


Figure 17-4. Bodymark selector.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

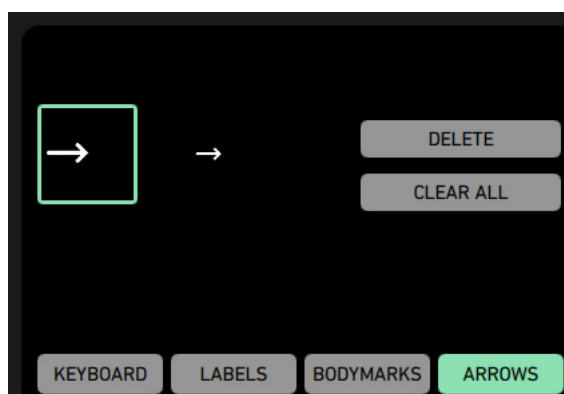


Figure 17-5. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Calculation of Prostate Volume

To measure prostate volume (width, height and length):

- 1 Tap **Calc.**
- 2 Tap **Prostate V W*H*L.**
The width (W) caliper appears automatically.
- 3 Position the first caliper and tap.
- 4 Position the second caliper and tap.
The height (H) caliper appears automatically.
- 5 Repeat measurement.
Length (L), the last set of measurements, appears automatically.
- 6 Repeat measurement.
- 7 When you have finished measuring, the volume calculation appears automatically.

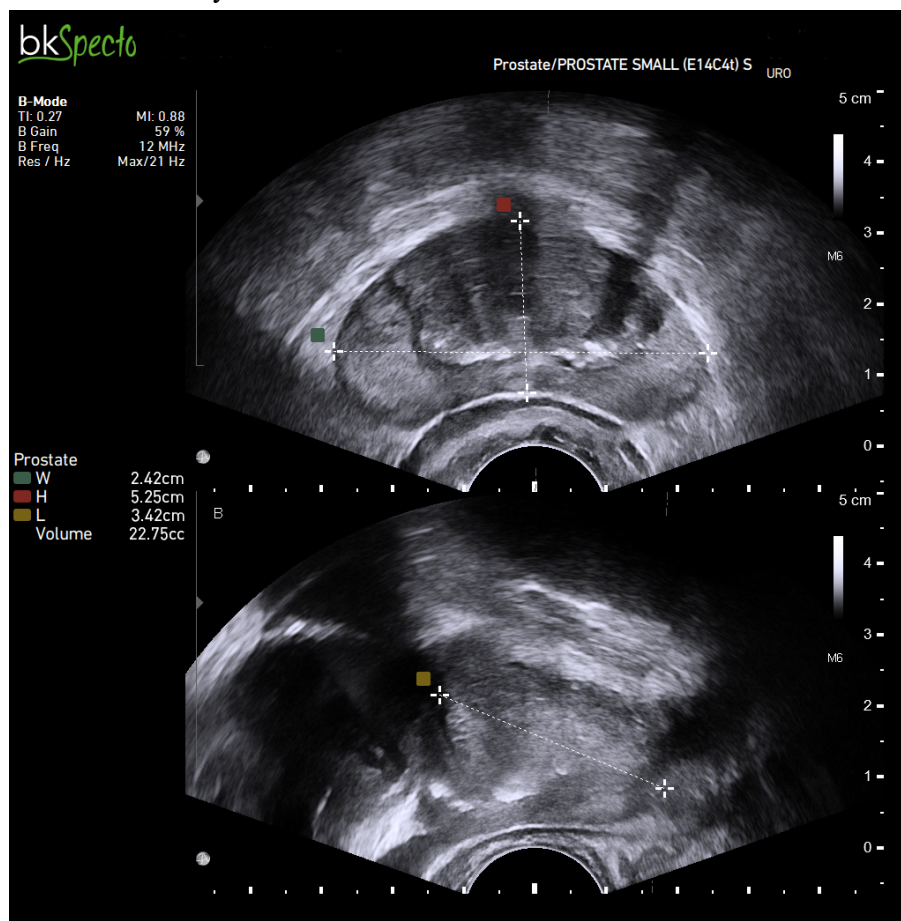


Figure 17-6. Prostate volume in split screen view.

PSAD measurements:

The PSAD (Prostate Specific Antigen Density) will be calculated after the PSA has been entered and prostate volume has been measured.

To erase measurements:

- Tap the **Clear** button next to the trackpad.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1** Tap **Images** in the **Report** window.
- 2** Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3** Comments put in **Patient** and **Comments** appear in the report.
- 4** Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5** Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1** Freeze image.
- 2** Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1** Freeze the image.
- 2** Tap **Store**.
Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1** Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2** Tap **Clip** again to stop recording.

Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

To print an image displayed on the monitor:

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.
The **Save Preset** window appears.

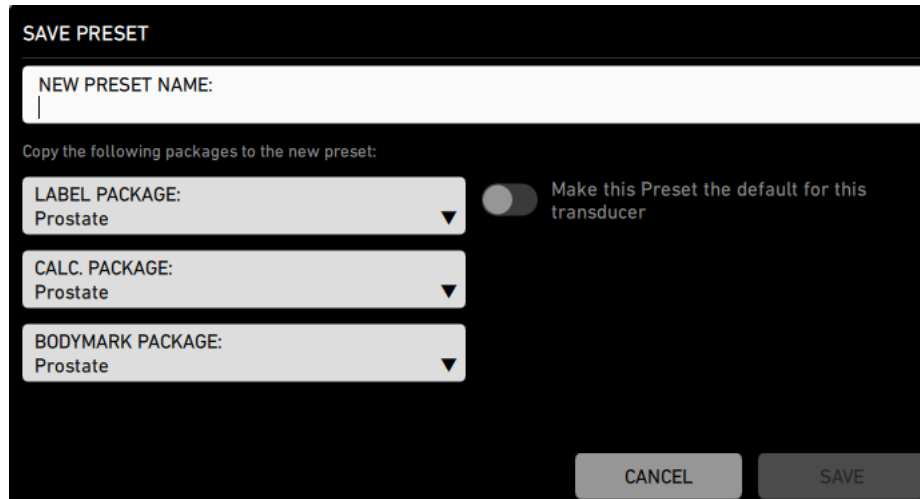


Figure 17-7. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 18

Vascular Exam Type

This chapter contains information useful for basic Vascular Imaging including:

- Peripheral arteries
- Peripheral veins

Important:

Please see Chapter 2, “Getting Started” for basic controls.

Read transducer user guides for more information before doing biopsies.

Read *Care and Cleaning* for sterilization instructions.

Read *bkSpecto User Guide* before system use.

Contents

- Setting up the Patient – Patient ID
- Preset
- Imaging Controls
- VFI (Vector Flow Imaging)
- Annotations – Labels and Bodymarks
- Measurements and Calculations
- Using Reports
- Capturing and Documenting Images
- Customization Examples
- Links to Additional Information

Setting up the Patient – Patient ID

You must have a patient ID in order to save images.

- 1** Tap **Patient** on the touchscreen.
- 2** Enter data in the **Patient details** window.
- 3** Tap **Start Exam** (below the **Patient details** window).

Diagnostic Presets

Once you have selected your transducer, tap **Preset** and select the appropriate **Exam Type** and **Preset**. These will vary with each transducer.

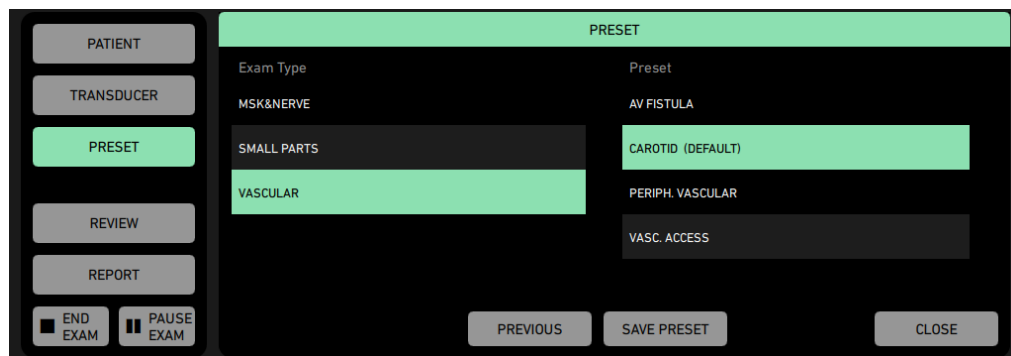


Figure 18-1. Preset window for 8L2.

Imaging Controls

2D (B-mode)

Imaging starts in 2D.

To return to imaging with 2D alone after you have been using it in combination with other modes, double-tap **2D**.

Overall Gain:

- Adjust gain by sliding the gain bar on the touchscreen (when the image is not frozen).

Different gain at different image depths: adjusting the TGC curve:

- Tap **TGC** and move the **TGC** sliders on the touchscreen to the right or left to adjust the TGC curve (differential gain).
The shape of the TGC curve is temporarily displayed to the right of the image as a curved vertical line.

Split Screen

Linked Dual is enabled as a default setting for all Exam Types. During split screen imaging, the Linked Dual function automatically transfers screen-A image parameters to screen-B (and vice versa). Color and power mode can be in only one screen.

To use split screen:

- 1 Tap **Dual**.
- 2 Image in screen-A.
- 3 Use the dual view button  to transfer the parameters from screen-A.
- 4 To go back to full screen, tap **Dual** again.

Color Mode (CFM)

To use Color mode:

- 1 Tap the **Col** mode button on the touchscreen.

- The color box is activated (green color) and can be moved with the trackpad.
- 2 To resize color box, tap it and use the trackpad to increase/decrease size.
 - 3 Tap the trackpad to set the size.

Scale:

- Use the **Scale** button to change the PRF.

Doppler Mode

When you turn Doppler mode on, 2D must be imaging.

To use Doppler mode:

- 1 Tap **PW**. The Doppler indicator, including both the Doppler line and the Doppler gate, appears superimposed on the 2D image and the Doppler spectrum appears.
- 2 To position the Doppler gate on a 2D image, use the trackpad.
- 3 To resize the Doppler gate, touch and slide **SV size**.
- 4 To adjust the angle, touch and slide **Angle Correct**.

In Doppler mode, this control will also be available when measuring.

Volume Flow

To use Volume Flow:

- 1 In PW Doppler, tap **Measure**.
- 2 Select **Volume Flow**.
Calipers appear to measure the diameter of the vessel. When you have done this, vertical calipers appear on the Doppler spectral trace.
- 3 Place the first one at the beginning of a cardiac cycle and then place the second one farther along the spectral trace to include at least two cardiac cycles.
Volume flow rate appears in ml/min.

Vector Flow Imaging (VFI)

Vector Flow Imaging is available as an option on the bkSpecto ultrasound system.

NOTE: *Before you use VFI, make sure that you have read the warnings in the VFI section of the Safety chapter in the bkSpecto User Guide.*

Normally, color imaging shows only axial flows. Vector Flow Imaging is a technology that uses ultrasound pulses in both axial and lateral directions. The measured signals are therefore sensitive to both axial and transverse motion.

VFI requires a software license from BK Medical and is available with selected transducers only. See the *bkSpecto Product Data Sheet*.

NOTE: *The recommended max depth of using VFI is between 15 and 20 mm. Lower frequency equals higher depth.*

VFI can be useful for visualizing the following with high sensitivity:

- Flow when the transducer is perpendicular to the vessel – flow visualization that is independent of imaging angle.
- Carotid and other vessels with high or complex flow.

Vector Flow Imaging can be used in the velocity range of 10 cm/s to 315 cm/s with the corresponding PRF.

Using auto-correlation estimators, both the axial and transverse velocity components are determined and used to make an estimate of 2D blood velocity that does not depend on the image angle.

This method makes it easier to achieve a sufficient image angle and makes it possible to visualize complex flow patterns.

The maximum velocity that can be observed depends on the PRF. Higher velocities can be seen when the PRF is higher.

The direction and velocity of the flow are indicated on the image with color and also by arrows.

Color Flow Indicators for VFI – Color Map

The color map is the default color flow indicator for interpreting the color. The color map outlines the maximum flow velocity by color. Tap and hold **Map** to choose between 3 different VFI color options.

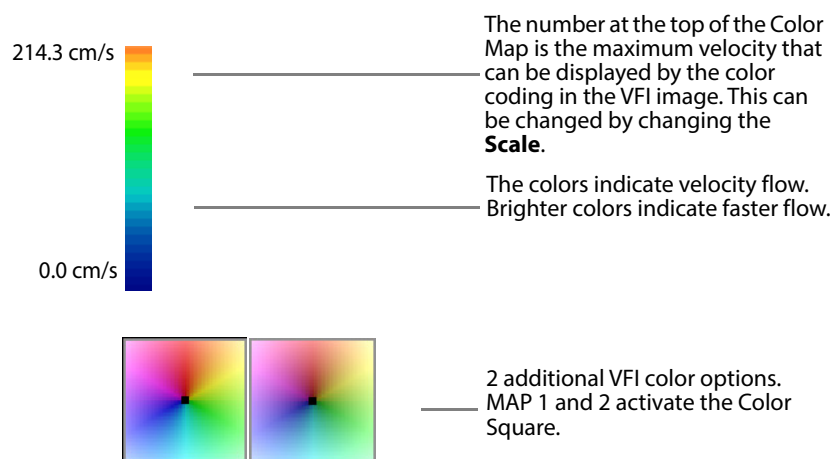


Figure 18-2. Explanation of the Color Map for Vector Flow Imaging.

Saturation/Brightness = Speed

Colors located nearer the top of the color map (less saturated colors) indicate faster flow.

Color Flow Indicators for VFI – The Color Square

The Color Square is an alternative to the Color Map for interpreting color. If you choose this color indicator, flow direction and velocity are mapped by color.

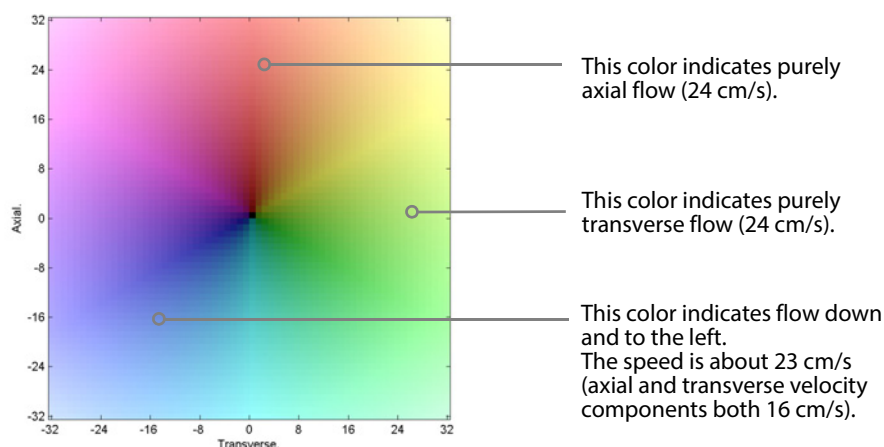


Figure 18-3. Explanation of the Color Square for Vector Flow Imaging. The values are only for illustrative purposes, as the color information is intended to be qualitative rather than quantitative.

Saturation/Brightness = Speed

The center of the square is black. Black indicates zero flow.

Colors located farther from the center (less saturated colors) indicate faster flow.

Color (Hue) = Direction

The color (hue) indicates the flow direction. For example, yellow indicates flow up and to the right.

Using VFI

VFI is activated by selecting the VFI color submenu. VFI is available with selected transducers only. See the *bkSpecto Product Data Sheet*.

To activate VFI:

- 1 Tap **Color mode** and select **VFI**.
- 2 Swipe to the next page in the parameter area.
- 3 Tap **VFI Grid Size** and **VFI Arrow Size** and select size on the dropdown menu.

Steering of the color box is not possible when you use VFI.

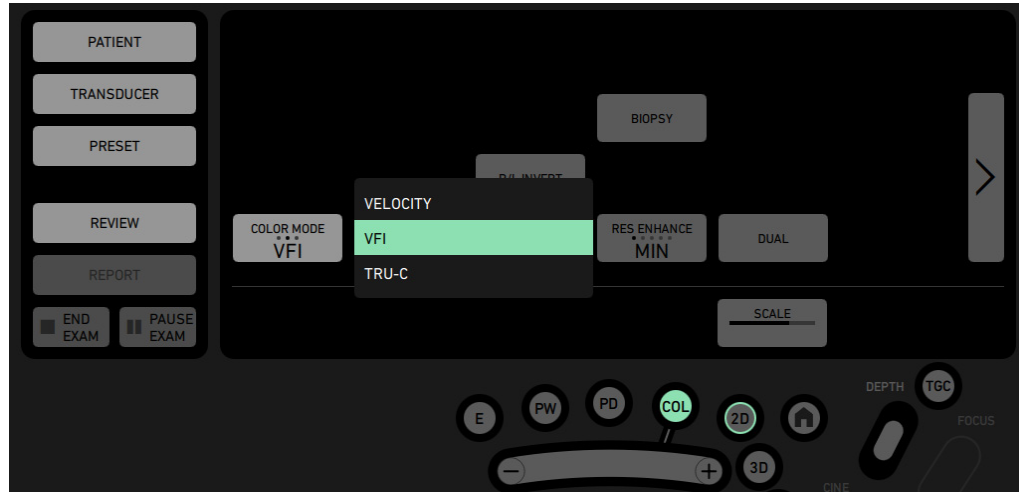


Figure 18-4. Selecting VFI submode.

Arrow Flow Indicators for VFI

Direction and relative velocity are also indicated by arrows superimposed on the flow part of the image. Longer arrows indicate higher velocity.

Arrow Size (VFI)

Use **Arrow Size (VFI)** to adjust the space between the arrows and the size of the arrows in VFI mode. You can choose 4 different size settings (the default setting is Large).

Streamlined VFI Workflow

You can use VFI to ease the workload when determining peak systolic velocity or calculating volume flow rate.

In **2D+VFI+PW** mode, VFI can assist the user with:

- Doppler gate placement
- Vessel outline
- Angle correction
- Doppler steering
- Inverting the Doppler spectrum (when needed)
- Selecting the appropriate Scale/PRF (Pulse Repetition Frequency)
- Adaptively adjusting Doppler sample volume size (PW gate)
- Volume Flow Measurement

Determining Peak Systolic Velocity

To determine the peak systolic velocity:

- 1 Find the artery and add Color mode by tapping **Col**.

- 2 On the **Color Mode** dropdown menu, select **VFI**. You will see the arrows showing the direction of the flow.
- 3 Add Doppler mode by tapping **PW**.
- 4 Tap **Assist**. Thin lines along the edges of the vessel show the vessel outline, and steering is adjusted so the angle correction follows the vessel.
- 5 Tap **VFI Update** to place the Doppler gate at the highest velocity in the vessel.
- 6 **PS** is displayed on the monitor:

PS	113.46cm/s
ED	16.37cm/s
PI	2.44
RI	0.86

Determining Average Volume Flow

To determine average volume flow:

- 1 With the settings listed above, tap **Auto Vol Flow**.
The Doppler gate opens to span the entire vessel, and calipers are set to measure the diameter of the vessel.
- 2 **VF** is displayed in ml/minute on the monitor, along with the **VF Area** and the **VF Dia** (Diameter):

PS	116.82cm/s
ED	29.52cm/s
PI	1.91
RI	0.75
VF	452.27ml/min
VF Area	0.36cm ²
VF Dia	6.79mm

Note that if you are measuring volume flow through the portal vein, you must do so in a zoomed image.

Outline of VFI Workflow

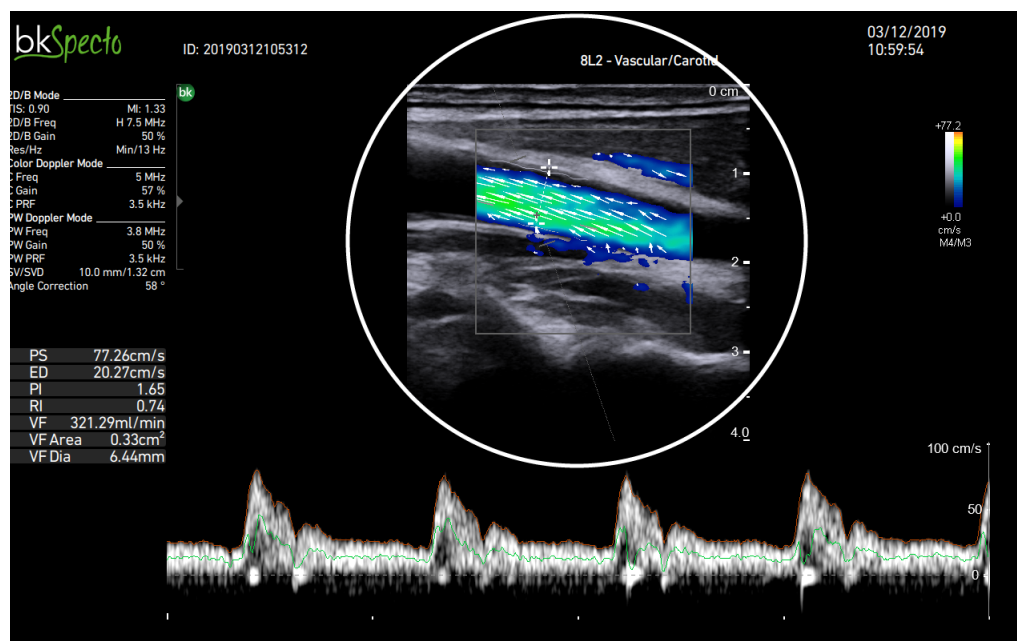


Figure 18-5. Outline of VFI workflow with 8L2 transducer

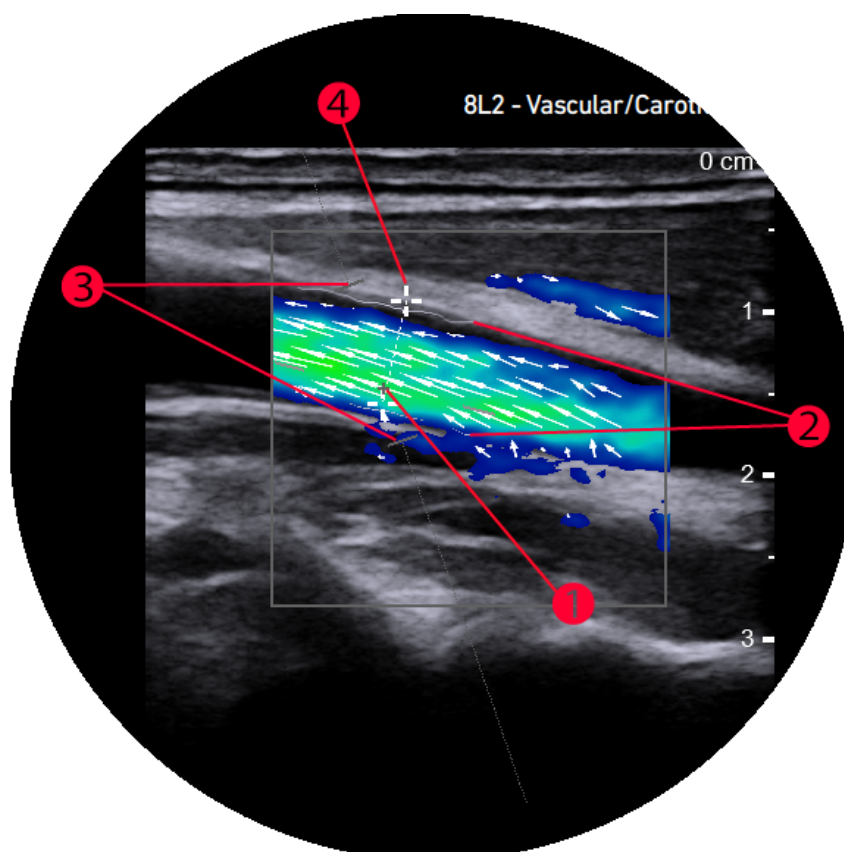


Figure 18-6. Zoomed VFI workflow

- | | |
|---|--------------------------------------|
| 1 POI (highest velocity in vessel) | 3 Doppler gates |
| 2 Vessel outline | 4 Calipers to measure vessel. |

Biopsy

Before you perform any puncture procedure, including therapy, make sure you have read the warnings in the Puncture and Brachytherapy section of the Safety chapter in the bkSpecto User Guide.

To display a puncture line on the image for biopsy guidance:

Tap **Biopsy** on the touchscreen.

Remember to check that you are using the correct needle guide. The number of the guide is displayed on the monitor. Make sure the number corresponds to the guide you are using. If it doesn't, tap **Needle Guide** for a drop down list of needle guides.

For better needle visualization, see “Needle Enhancement” on page 78

NOTE: *If the image depth is set very low (to see tissue close to the transducer with high magnification), the needle tip echo can be outside the displayed image area. To see the needle tip in this case, zoom out so the full needle path is visible or pan the image to the side (to keep the high magnification).*

Annotations – Labels, Bodymarks and Arrows

Labels, bodymarks and arrows are activated when you tap **Label**.

Labels

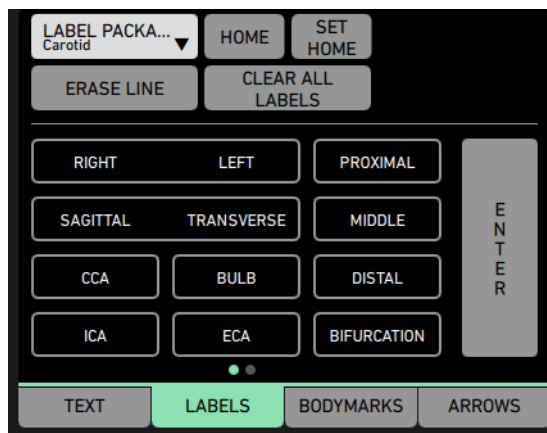


Figure 18-7. Label selector.

To select a label:

Tap the **Label** button.

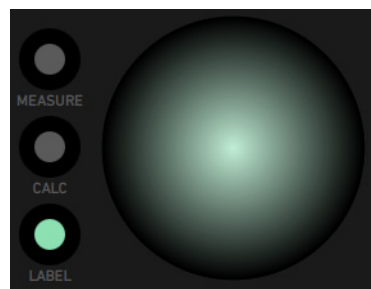


Figure 18-8. The **Label** button next to the trackpad.

- 1 From the dropdown menu, select the relevant application. The displayed labels will reflect the selected application.
- 2 Swipe the label selector to see all labels.
- 3 Select the label by tapping it.
- 4 Use the trackpad to move the label and then tap when it is in the correct position.

*You can select where labels show up on the screen per default. Tap **Set Home** when you have placed your label. The next label you tap will show up in the same place.*

Linked labels:

Opposed labels are linked. This means that if you have selected **Right** and afterwards tap **Left**, the label name will change to left. Linked labels are located on the same background, see *Fig 18-7*.

Type and edit your own labels on screen:

- 1 Tap **Keyboard** in the input region.
- 2 Type the text you want for the label.
You can move the label while you are typing it.
- 3 Tap to accept the label text and position.

To move a label that you have already positioned:

- Tap it and drag it to the new position. Tap again when the label is where you want it.

To remove a label:

- 1 Tap the label you want to remove. The label turns green.
- 2 Tap **Erase Line** in the input area.

To remove all labels from an image:

- Tap **Clear All** in the input area.

To edit a label on the image:

- Tap the label on the image and type the changes you want.
Note that you can only edit your own labels.

Bodymarks

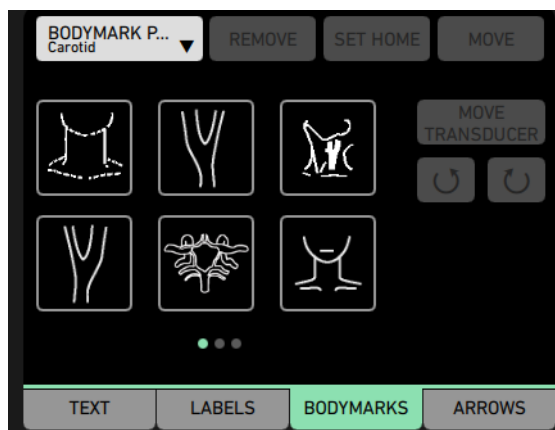


Figure 18-9. Bodymark selector.

To place a bodymark on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Bodymarks** button. From the dropdown menu, select the relevant application. The displayed bodymarks will reflect the selected application.
- 3 Select the bodymark you want. (If you don't see the one you want, swipe the input region to see more bodymarks.) The bodymark appears on the monitor with a highlighted imaging plane indicator.
- 4 Drag the imaging plane indicator to position it; and use the directional buttons to rotate it.

To move a bodymark:

- 1 Tap the **Move** button. A green frame appears around the bodymark.
- 2 Drag it to the position you want, and tap again.

To replace a bodymark:

To replace an existing bodymark with a different one, tap the new bodymark.

To remove a bodymark from the monitor:



- Tap the **Delete** button.

Unless you delete it or replace it with a new one, a bodymark will remain on the monitor until you change Preset or begin to image a new patient.

Adjusting the Imaging Plane Indicator

To adjust the imaging plane indicator:

When you place a bodymark on the image, the imaging plane indicator is green and can be adjusted as follows:

- 1 Drag the imaging plan indicator with the trackpad.
- 2 Rotate left or right by pressing  or  buttons.
- 3 Tap again when the imaging plane indicator is the way you want it.

The imaging plane indicator turns orange and can now only be adjusted with the arrows.

If you decide to move the indicator, tap **Move Transducer** in the input region. The indicator turns green again.

Arrows

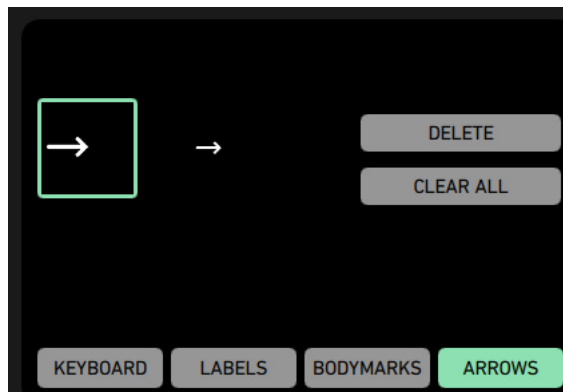


Figure 18-10. Arrow selector

You can place arrows on the image to mark areas of special concern.

To place an arrow on the image:

- 1 Tap the **Label** button.
- 2 Tap the **Arrows** button and select the arrow you want. The arrow appears highlighted on the monitor.
- 3 Drag the arrow to the position you want, and tap again.
- 4 You can add another arrow by selecting it.

To delete an arrow, tap **Delete**. To delete all arrows from the image, tap **Clear all**.

Measurements and Calculations

Measurements are generic measurements that you can do on any region of interest. Calculations are predefined measurements intended for measuring organs or ROIs within a particular preset.

For detailed instructions about using the measuring tools, see “Making Measurements” on page 53.

Doppler Measurements

Leg Veins (Peripheral Vascular preset)

- 1 In Doppler mode, freeze the image with the Doppler spectrum.
- 2 On the **Group** menu, select **Valve Closure Time**.
- 3 Select measurement, for example **Lt CFV VCT**.
- 4 Place first caliper at beginning of reflux and tap.
- 5 Place second caliper at end of reflux and tap.
Valve closure time is displayed.

Leg Arteries (Peripheral vascular preset)

- 1 In Doppler mode, freeze the image with the Doppler spectrum.
- 2 On the **Group** menu, select **LE Arterial Doppler**.
- 3 Select measurement, for example **Lt Common IA**.

- 4 Place cursor at peak systole and tap.
Peak systolic velocity (PS) is displayed.

Using Reports

Making and printing a report:

When you have finished making measurements and selecting assessments, add any images you want in the report:

- 1 Tap **Images** in the **Report** window.
- 2 Tap and hold the images in the Input Region until they shrink and drag them into the image frames in the **Report** window.
- 3 Comments put in **Patient** and **Comments** appear in the report.
- 4 Tap **Print** to print the report on the report printer (see “Printers Tab” on page 276) before saving it.
- 5 Tap **Store Report Image** to save the report.

Capturing and Documenting Images

Cine Review

To use cine review:

- 1 Freeze image.
- 2 Use the cine bar to scroll back through imaging.

Capturing Images

Capturing Frozen Images

Saving (capturing) images to system hard disk:

- 1 Freeze the image.
- 2 Tap **Store**.
Thumbnail of saved image appears in the document browser at the bottom of the monitor.

Capturing Clips (Unfrozen Images)

To capture clips:

- 1 Tap **Clip** to start recording.
The **Clip** button is highlighted during recording.
- 2 Tap **Clip** again to stop recording.
Thumbnail of image appears at the bottom of the monitor. (Thumbnails of clips show film reel markings top and bottom.)

Copying and Archiving

Copying or Archiving Images and Clips

To copy or archive images and clips:

- 1 In the **Review** window, select thumbnail images. Use the buttons **Select Multiple** and **Select All** if required.
- 2 Tap **Export** and select where to export the images.

Printing Images

Printing Images Displayed on the Monitor

- Tap the **Print** button (bottom left) on the touchscreen.

Printing from Thumbnail Images

You must open the images in order to print them.

To open a thumbnail image and then print it:

- 1 Tap **Review**.
- 2 Select the image you want to print.
- 3 Tap the **Print** button (bottom left) on the touchscreen.

To set a different printer as default for the Print button:

See Settings for Store/Network “Printers Tab” on page 276.

Customization Example

Saving a New Preset

When you have changed the setup, you can save it as a new preset.

To save a preset:

- 1 Tap the **Preset** button in the Exam Management area.
- 2 Tap **Save Preset**.
The **Save Preset** window appears.

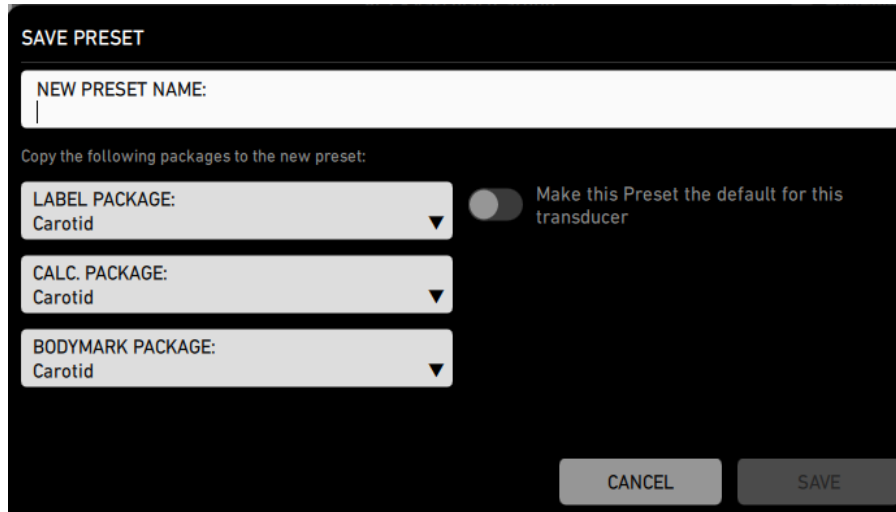


Figure 18-11. The Save Preset window.

- 3 Enter a name for the preset and select the options you want from the dropdown menus.
- 4 Tap **Save**.

Default Exam Types and Presets

You can change the default Exam Type and preset for a transducer. When creating a new preset as in “Saving a New Preset” above, tap the toggle button **Make this Preset the default for this transducer**.

Where to Find More Information

For more information about different topics, you may want to refer to the following chapters:

- Layout of controls on the monitor and how to use them (Chapter 2, “Getting Started”).
- Names of screen controls and what they do (Chapter 3, “Controls on the Touchscreen”).
- Working with images (Chapter 4, “Working with the Image”).
- Making measurements (Chapter 5, “Making Measurements”).
- Documenting the image and results (Chapter 6, “Documentation”).
- Using different imaging modes (Chapter 7, “Imaging Modes”).
- List of all measurement abbreviations with full name (Appendix B, “Measurement and Calculation Abbreviations”).
- Setting up and Customizing the System (including creating custom keys on the keyboard) (Appendix C, “Setting Up and Customizing Your System”).

The tables and formulas that the system uses for calculations are in the *Technical Data (BZ2100)*.

Chapter 19

3D Imaging

Introduction to 3D Ultrasound

The basic concept of 3D ultrasound is to collect a data set of 2D ultrasound images (black & white or color) while tracking and storing the location of each individual 2D image. The data set is then reconstructed into a single 3D volume that can be displayed on the monitor and manipulated. The reconstructed 3D volume can be rotated, sliced, rendered, or displayed in multiplane cross-sections.

Before you perform any 3D imaging, make sure you have read the warnings in the 3D section of the Safety chapter in the bkSpecto User Guide.

Imaging Modes

On bkSpecto, you can use 3D with 2D, Color mode, or Power mode imaging. However, you cannot use 3D with the following modes and functions:

- Doppler mode (spectral PW Doppler)
- 2D Tint

NOTE: *Turning on one of these modes or functions while you are using 3D will turn off 3D. If you are already using one of these modes, turning on 3D will turn the mode or function off, and turning off 3D will not turn it on again.*

NOTE: *Acquiring a 3D volume with some color maps may result in faulty colors for some pixels. To avoid this, the system selects a default pure grayscale instead.*

Making measurements on a 3D cube is not the same as making measurements on a 2D image, as described in Chapter 5, “Making Measurements”.

3D License

The 3D function of the bkSpecto can be purchased as an option. For more information, see the *bkSpecto Product Data Sheet* that accompanies this user guide.

To run the 3D software, you must have a license from BK Medical. For information about activating the 3D option, see “License Tab” on page 283.

Controlling Transducer Movement

The 2D images in the data set are imaged with the transducer in different positions.

The transducer can be moved in the following way:

- With 360° built-in 3D-imaging.
- Untracked freehand (see warnings in the *bkSpecto User Guide*).

360° built-in 3D-imaging

Transducers 20R3 (9052) and X14L4 (9038) have built-in movers for 3D acquisition. For information about setting up and attaching these transducers, see their respective User Guides.

Untracked Freehand Acquisition

Untracked linear and fan acquisitions (freely moving the transducer while you acquire a 3D data set) are allowed with any transducer. However, certain combinations of motion and transducer will not produce a sensible 3D volume.

Imaging Direction

You must select the imaging direction that you plan to move the transducer in **3D Direction**. The **3D View** you choose gives the system information about how to reconstruct the 3D volume. If there is a mismatch, the resulting volume can be mirrored.

After you acquire the image, you must check the reconstructed volume to make sure that it is a correct representation of the data.

Measurements Not Accurate

If you start to make a measurement on a 3D data set acquired using the untracked freehand method, a warning appears in red on the monitor to remind you that the measurement will not be accurate.

3D Imaging Overview

The 3D imaging process has the following steps:

- Preparations – see page 208
- Adjust settings – see page 209
- Acquisition – see page 210
- Viewing – see page 210
- Working with the 3D image – see page 211

Preparations

Before you start the 3D image acquisition:

- 1 Check all the connections.
- 2 Choose the preset you want.
- 3 Optimize the 2D image.

NOTE: *You cannot turn on 3D if the image is frozen.*

NOTE: *You cannot acquire 3D data sets unless you have entered a patient ID. If you have not entered a valid patient ID, you will be prompted to do so. The default patient ID is the current time and date.*

Adjusting the Image Capture Settings

ROI (3D Region of Interest)

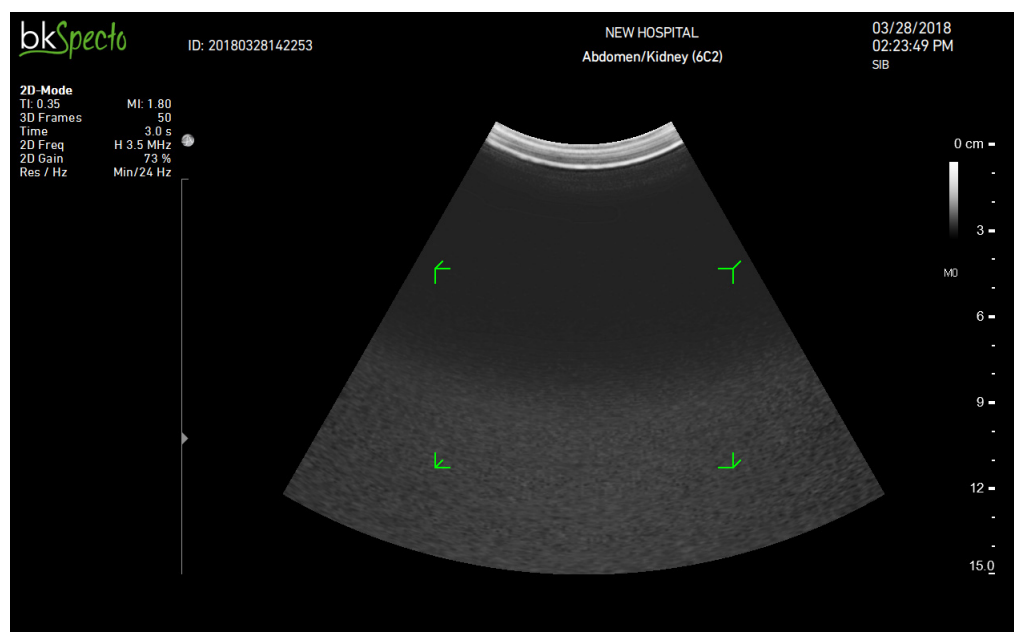


Figure 19-1. The 3D Region of Interest.

When you tap **3D**, 3D ROI markers (see Fig 19-1) appear in the image area to indicate the area that will be captured in the 3D data set.

NOTE: You cannot tap **Zoom** to activate the 3D ROI box. The **Zoom** button continues to work in the normal way for the 2D image.

To move the 3D ROI box to a different part of the image, drag it with the trackpad.

To resize the box (increase or decrease the area covered by the 3D acquisition), tap the trackpad. Now only one corner is green. Drag this corner to adjust the size of the box.

3D Capture Settings

You can set various 3D capture settings using the **3D** buttons:

- **3D Spacing** sets the spacing between frames in mm.
- **3D Distance** sets the distance the transducer will travel to acquire the 3D volume.
- **3D Direction** sets the direction to **L-R** (left to right) or **R-L** (right to left).
- **3D Sweep Mode** sets the freehand sweep mode to **Untracked Linear** or **Untracked Fan**.
- **Time** sets the duration of the recording.

Imaging Direction

Untracked freehand

Before you acquire an untracked freehand data set, it is essential to select the appropriate imaging direction so that the 3D volume will be reconstructed correctly. Be especially careful if you have changed the orientation (right/left or left/right) of the 2D image (changed its orientation). In this case, the system will not make any automatic adjustments of orientation before 3D acquisition. The effect of a flipped 2D image on the resulting 3D volume can be confusing, so we recommend that you do *not* change the default orientation of the 2D image before acquiring a 3D data set. You must select the imaging direction to match the direction that the transducer will move during acquisition.

NOTE: *If the patient is not lying on his or her back, be very careful when you choose the imaging direction because the directions are defined relative to a patient lying face-up.*

Acquisition

To start a 3D acquisition:

- 1 Select **Acquire Time**. Note that image quality is dependent on the time spent on the acquisition.
- 2 Tap **3D Acquire**.

A progress circle appears during acquisition, and a pop-up on the touchscreen allows you to stop the progressing acquisition.

3D review buttons appear when you have acquired the 3D volume.

After you have acquired a 3D data set, it is displayed as a volume on the monitor. You can select various ways of viewing the volume, and you can use various tools and settings to enhance the image.

Viewing a 3D Data Set

When viewing a 3D data set, there are different buttons for enhancing the 3D view. These are described in detail later in this chapter.

Enhancing a 3D View

When a 3D view is displayed, you can use different buttons to enhance the appearance of the 3D volume and make it easier to see the structures you are interested in:

- **3D Brightness**
- **3D Contrast**
- **3D Zoom**
- **3D Opacity**
- **3D Luminance**
- **3D Hue**
- **Photorealistic**

Presets

After you have set **Brightness**, **Contrast**, and **Zoom**, and any other **3D** settings, you can save your settings as a **Preset**. Do as follows:

- 1 Tap **Preset**.
- 2 Select **Save Preset**.
- 3 Type in a name for your preset.
- 4 Keep or change the Label, Calc and Bodymark packages.
- 5 Decide if the preset should be the default for this transducer.
- 6 Tap **Save**.

3D Layout Options

When you view the acquired volume, you can change the layout of the monitor using the following buttons:

- **Orientation** – Turns the orientation marker on and off. The orientation marker is positioned on the first frame in the volume.
- **Wireframe** – Shows or hides the wire frame on the volume.
- **Measure Dist.** (only in Cube view) – Shows or hides the measurement lines or boundaries on the volume, the **Measurement** menu (on the right side of the monitor), and **Measurement** results (on the left side of the monitor).

Working with the 3D Image


Manipulating the Volume

You can use the trackpad to manipulate the volume in various ways. The form of the cursor is different, depending on what you are doing.

Rotating



To rotate a volume in any direction:

- 1 Point outside the volume.
The cursor looks like this: 
- 2 Tap and use the trackpad to drag the cursor and rotate the volume.
- 3 Tap to end rotating.


You can also rotate the intersecting planes view in the 4-Up and 6-Up views.

Moving a Plane In and Out of the Volume

You can move a selected plane in and out of the volume to “slice” the volume so that a plane inside the original volume is displayed as a face of the transformed volume. This new face is called a “cut plane”. The cut plane can be parallel to a one of the original faces of the volume or at an angle (tilted) relative to the axes of the volume.



To slice the volume:


- 1 Move the cursor onto one of the volume faces.
The cursor looks like this: 
- 2 Tap and use the trackpad to drag the cursor to move the plane through the volume until the cut face you want is visible.
- 3 To restore parts of the volume that you have sliced away, drag the cut plane back through the volume.
- 4 Tap to end slicing.

Tilting a Plane

You can tilt a plane to see views that are not parallel to one of the original faces of the volume. (This often creates additional planes.)



To tilt a plane:

- 1 Tap the edge of a plane to select it.
The cursor looks like this , and the wire frame around the plane becomes red.
- 2 Use the trackpad to drag the cursor to tilt the cut plane.
You can then move the tilted cut plane in and out (slice) as described before.
- 3 Tap to end tilting.

Animating the Volume

To make the volume rotate automatically:

- Tap **3D Animate**.
The volume rotates.

To stop the rotation, tap **3D Animate** again.

You can select how to rotate the volume using the following buttons:

- **Animation Speed**
- **Animation Span** – the extent of the rotation
- **Rotation** – horizontal or vertical.

Annotating a 3D View

As with 2D images, you can annotate a 3D view with a label or arrow. You cannot use a bodymark.

You can add as many labels or arrows to a 3D view as you want. When you have finished, you can save the annotated image as a view that you name. You can save the image both as a 2D snapshot and as a 3D cube.

To add a label to a 3D view:

1 Tap 3D Label.

A writing cursor appears, and the keyboard is displayed on the touchscreen.

2 Move the cursor to where you want the label.

3 Type the label.

4 Tap. (You can drag the label to reposition it before you tap; however, after you tap, you cannot edit the label, only delete it.)

You can add additional labels.

5 When you have added all the labels you want, tap 3D Label again.

6 Tap Store Volume.

To add an arrow to a 3D view:

1 Tap Arrow.

The cursor appears on the 3D volume with an arrow.

2 Drag the arrow to change its direction and place it where you want it. Tap.

An arrow is placed on the image.

3 A new arrow appears at the cursor. Repeat the process above.

4 When you have added all the arrows you want, tap Arrow again.

5 A window appears for you to name the view with the annotation. You can update the current view to include the annotation, or you can give it a new name.

NOTE: *After you have positioned an annotation on the image and tapped, you cannot edit the annotation or move it. You can only delete it. To delete an annotation, tap **Undo Label**. The most recent annotation is deleted. You can tap **Undo Label** several times to remove more than one annotation. You can also click **Clear Labels** to remove them all.*

The 6 3D Views

There are 6 different ways you can view the 3D data set:

- **Cube**
- **Render**
- **4-up**
- **MIP**
- **6-up**
- **Transp.**

Cube View

This is a texture-mapped representation of the volume. It is the default view.

Making Measurements in a Cube View

In a Cube view, you can measure the height, length, width and volume of a pathology, if you have used a system-controlled positioning device to acquire the data set. You cannot make accurate measurements on data sets acquired using untracked freehand.

NOTE: *Making measurements on a 3D cube is not the same as making measurements on a 2D image, as described in Chapter 5, “Making Measurements”. After you have tapped to position a point to make a 3D measurement, you cannot move the point. You can only complete the measurement (if it requires more points) and then delete the measurement and make a new one.*

To make a 3D distance measurement:

- 1 Tap **Measure Dist.**
- 2 Tap to position the points of the measurement.
The measurement is displayed underneath the 3D volume.

Measuring Volumes

To make an HWL measurement

- 1 Tap **HWL**.
- 2 Make a measurement of the height of the pathology.
The measurement is displayed underneath the 3D volume with the number of the measurement and **H** (e.g. 1-H).
- 3 Tap **HWL** again and measure the width of the pathology. The measurement is displayed underneath the 3D volume with the number of the measurement and **W** (e.g. 1-W)
- 4 Tap **HWL** again and measure the length of the pathology. The measurement is displayed underneath the 3D volume with the number of the measurement and **L**, along with the volume of the pathology displayed with **HWL**.

To make a Planimetry measurement

You can also measure a volume by drawing polygons around the area of interest on slices taken throughout the Cube.

- 1 Tap **Volume**.
- 2 Draw a polygon around the area of interest by tapping points on the perimeter. When you have come to the last point, double-tap to set the area.
- 3 Tap **Next** to move through the volume by the chosen step size or **Prev** to go to the previous step.
- 4 Outline the area of interest in the new slice.
- 5 Repeat steps 2, 3, and 4 for each slice until the area of interest is no longer visible (the volume measurement is completed).
The system updates the accumulated volume (in cm³) as each polygon is completed.
- 6 Tap **Volume** again to finish the volume measurement.

Deleting Measurements

To delete a measurement:

- Tap **Undo Measurement**. The most recent measurement is deleted.

You can undo several times to remove more than one measurement. You can also **Redo Measurement** if you have used the **Undo Measurement** button.

To delete all measurements:

- Tap **Clear Measurements**.

NOTE: For information about accuracy of measurements on acquired and reconstructed planes, see the *bkSpecto User Guide*.

Render View

Rendering dramatically improves 3D visualization. It is useful for looking in detail at soft tissues such as fistulas and abscess cavities. In this view, for gray scale volumes only, you can use sculpting tools to remove obstructing portions of the volume so you can better see the areas of interest.

Render Settings

You can change the way a Render view looks by using the buttons available:

- **Photorealistic** – Adjusts the photorealistic parameter used in the rendering. This can only be used on gray scale volumes.
- **3D Opacity** – Specifies the transparency (opacity) of a structure.
- **3D Thickness** – Determines how far you can look into the volume.
- **3D Filter** – Sets a threshold so that pixels that are not as bright as the threshold are not displayed.

Sculpting Tool

The Sculpting tool let you remove unwanted data from a Render view. The Sculpting tool can only be used on gray scale volumes – when there is no color in the volume.


There are two sculpting tools:

- The cutting tool (which you can use to cut away the outside of the volume or to cut a hole inside the volume)
- The shaving tool


To use the sculpting tool:

- 1 Tap **3D Sculpture**.
- 2 Tap **Sculpt. Method** to select **Inside**, **Outside** or **Shave**.
- 3 If you select **Inside**, you can adjust how deep you want to cut. Tap **Sculpt. Depth** and move the slider to adjust the percentage that is removed when you move the cutting tool.
- 4 Use the different tools as described below.
- 5 To turn off the sculpting tools, tap **3D Sculpture**.


To use the cutting tool (inside):

- 1 Tap on one plane of the volume.
- 2 Drag the  to draw a closed curve on the volume plane.
- 3 Tap again when you are done.
If you have selected 100% **Depth**, a hole appears extending through the volume.

To use the cutting tool (outside):

- 1 Tap on one plane of the volume.
- 2 Drag the  to draw a closed curve on the volume plane.
- 3 Tap again when you are done.
The area outside the curve disappears.

To use the shaving tool:

- 1 Tap on one plane of the volume.
- 2 Move the  cursor over the area to be shaved.
The more you move the cursor over the surface, the more surface is removed.
- 3 Tap again when you are done.

Displaying Sculpture Results

Tap **Sculpt. Display** to toggle between a view showing the result of sculpting and the unsculpted view.

MIP View

Maximum Intensity Projection (MIP) emphasizes the pixels with the highest intensity in the volume. If the highest intensities are mapped to the highest blood flow velocities, this mode accentuates and reveals the peak velocity regions of a volume. It is useful for:

- Looking at maximum flow jets
- Visualizing skeletal structures beneath tissue
- Looking at vascularization

Transparency View

Transparency rendering (which is only possible when you have acquired the 3D volume using Color or Power mode) lets you adjust the relative transparencies of the color and the gray scale parts of the volume. This can allow hidden features to become visible.

Render Settings

You can change the way a Transparency view looks by adjusting the render settings using the 3D buttons. See “Render Settings” on page 215.

4-Up View

This view has three orthogonal plane views and a view showing the positions of these intersecting planes within the volume. The planes can be moved by adjusting them in the intersecting view.

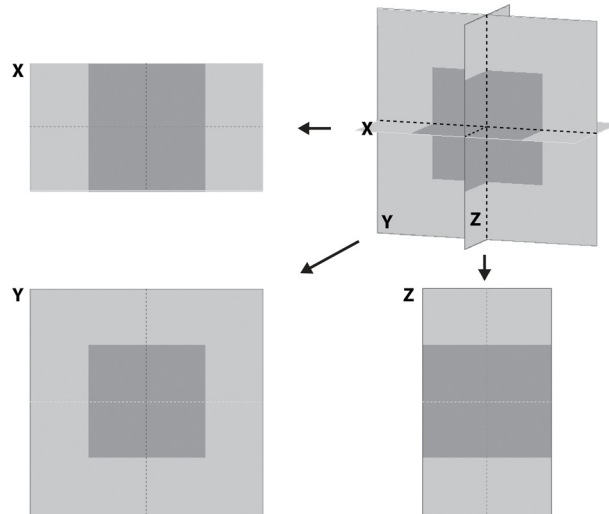


Figure 19-2. The 3D 4-Up View window.

Move the **XYZ** planes in the intersecting view to see the different planes, **X**, **Y** and **Z**, respectively.

6-Up View

In addition to the views in the 4-Up view, this view contains a Cube view and a sixth view, which is the view most recently displayed (MIP, Render, Transparency, or Cube).

Chapter 20

DICOM

DICOM on the System

DICOM is not installed as a default on the system. When it is installed, it is set up specially to match your DICOM system and procedures.

NOTE: *Changing the DICOM setup can cause your system to not work properly. For example, you may be unable to print to a DICOM printer. All changes to the DICOM setup should be made by qualified service personnel only. Do not try to change the DICOM setup yourself.*

New Patient Information from a DICOM Worklist

The system may be set up so that you can retrieve a worklist of patients and then select a patient from the worklist.

Depending on how your DICOM system is set up, the worklist may appear as soon as you open the **Patient** window. If the worklist is blank, you can retrieve the information.

To retrieve a worklist:

- 1 Use the dropdown window in the upper right corner to select the dates you want the list to include.
- 2 Tap **Update**.

The worklist appears in the window. If there are more patients than can fit in the window, you can scroll down to see the rest of the list.

To select a patient from the worklist:

- 1 Double-tap the row that contains the patient.
Now that patient is shown in the fields next to the worklist.
- 2 If required, enter additional information in the fields in the window.

NOTE: *You cannot delete a document from the system that is in a queue to be sent to a DICOM device.*

Saving or Printing to a DICOM Network

Filenames of Documents Exported in DICOM Format

The filename of an exported document specifies the date and time the image was captured.

For example, 2D_20181022_135426_FV12345.dcm would be the label on an 2D image of patient FV12345 that was captured on October 22, 2018 at 1:54:26 P.M. (13:54:26).

Exporting to a PACS

If you have DICOM installed on your system, you can export images and clips to a PACS.

To archive all documents for a patient or examination or individual documents:

- 1 Tap to select the patient, the examination, or the individual documents you want to export.
- 2 Tap **Export**, and select the **PACS system you want to archive to**.

Reports

It is possible to export DICOM Structured Reports.

Queue

When you export to a (PACS), the information is copied and put into a queue to be transferred to the PACS. When the PACS is available, the information is transmitted.

NOTE: *If you have an accidental power failure while information is being transferred to the PACS, transfer may fail. Documents and information may not be stored in the PACS even though they appear to have been transferred successfully from the system.*

DICOM Status

A DICOM status indicator appears by the display values to the right of the image. It has a colored light next to it.

Status Indicator Color	Meaning
Green	No unsent documents. The LED disappears after 5 seconds.
Yellow	A document is being sent or waiting to be sent.
Red	A document was not sent successfully.

Table 20-1. DICOM status indicators.

If you tap the DICOM status indicator, the **DICOM Status** window appears.

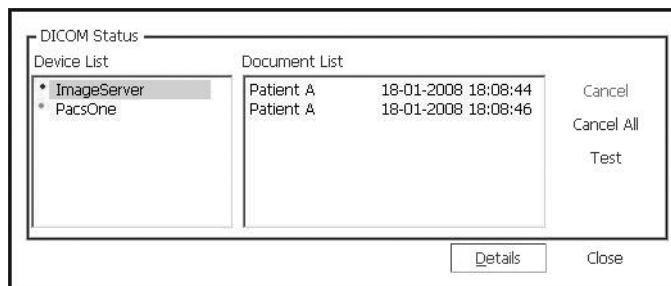


Figure 20-1. The DICOM status window.

The colors of the status indicator next to a device in the **Device List** are the same as described in Table 20-1. If a device has a red or yellow indicator, you can tap the device name to see a list of unsent documents displayed in the **Document List**.

You have the following options:

- **Cancel** – cancels the selected document.
- **Clear All** – clear all pending documents or jobs for the selected device.
- **Test** – tests the connection to the selected device (PING + C-ECHO).
- **Details** – see log of DICOM transactions - this is useful for a service technician.
- **Close** – closes the window and does nothing else.

To update the transaction log, tap **Update**.

NOTE: *You can also open the **DICOM Status** window from the **DICOM Setup** window. See “DICOM/PACS Tab” on page 277.*

Deleting a Document

NOTE: *You cannot delete a document from the system that is in a queue to be sent to a DICOM device.*

Appendix A

Glossary

This glossary contains explanations of terms and abbreviations that appear in the user guide or on the monitor. Measurements are listed in Appendix B, “Measurement and Calculation Abbreviations”.

Term	Explanation
2D Filter	With 2D Filter, an automatic speckle suppression algorithm continuously analyzes the ultrasound image for irregularities and adjusts the smoothness to be applied. This reduces speckle and optimizes the ultrasound image. 2D Filter supports all array transducers (mechanical transducers are not supported).
A/B	Stuart index. PS/ED.
AIUM	American Institute of Ultrasound in Medicine.
ALARA	As Low As Reasonably Achievable. Refers to the principle of keeping ultrasound exposure as low as possible.
aliasing	Detection of a false flow in the opposite direction from the real flow. This can occur when the PRF used for the Doppler signal detection is not high enough compared to the flow speed. The problem only exists with pulsed wave Doppler detection.
array transducer	A transducer that consists of a set of transducer elements, each capable of transmitting and receiving ultrasound.
Auto (Cardiac measurement)	PS, ED, RI, PS/ED
B/A	ED/PS
baseline	The baseline separates forward flow from reversed flow in Doppler imaging. Moving the axis can help overcome aliasing problems.
bodymark	A small drawing positioned on the image to help identify it in documentation.
catalog	A list of available items, as in a bodymark catalog or label catalog.
CFM	Color flow mapping. See Color mode.
cine	A function that lets you review a series of previously acquired images.
color box	When Color mode or Power mode imaging is turned on, the color box is superimposed on the 2D image. The color box outlines the area of the tissue in which flow information is available.
color Doppler	See Color mode.

Term	Explanation
Color mode (CFM)	<p>Color-Flow Mapping (CFM). Real-time signal that represents the speed of flowing material in each sample volume within the Color mode image area. The Color mode signal is in principle independent of the amount of flowing material. The Color mode is normally superimposed on a 2D image that shows the anatomical surroundings.</p> <p>Flow directions towards and away from the transducer are represented as different colors in Color mode (e.g. towards = red, away = blue).</p> <p>The Color mode signal (flow speed) is represented by different values in the color mapping (relative measure) for each sample volume in Color mode.</p> <p>No color means either:</p> <ul style="list-style-type: none"> • No flow in the sample volume (very low flow speed) or • Amount of reflection from flowing material (which might have a high flow speed) is below threshold set by the Color mode gain. <p>The Color mode signal (flow speed) is dependent on the angle of the ultrasound beam relative to the flow direction.</p>
color priority	<p>When color information is superimposed on a 2D image, color can appear outside vessels, making it appear that the flow is not restricted to the vessel. To minimize this effect, you can adjust the color priority. Make the color priority lower to have less color outside the vessels. NOTE: High color priority gives color in more areas; low color priority reduces the number of areas that are colored.</p>
combination mode	<p>Simultaneous imaging in more than one mode, for example, 2D+Color or 2D+Color+Doppler.</p>
Compounding	<p>Compounding is a result of combining images made at up to 5 different angles into one compound image. This reduces speckle and optimizes the ultrasound image. NOTE: In certain cases compounding can remove or suppress some image artifacts such as shadowing (from e.g. kidney stones or cyst edges), which may be used to identify certain characteristics of the imaged anatomy.</p>
CW Doppler	<p>Continuous Wave Doppler. In Continuous Wave (CW) Doppler mode, ultrasound is transmitted along a line as a continuous wave and analyzed as it returns.</p>
DecT	<p>Flow Deceleration Time.</p>

Term	Explanation
depth	With a full 2D image, you adjust the depth to cut out parts below the part you are interested in. The image always includes the transducer surface, so changing depth changes the magnification of the image, stretching, or compressing it. NOTE: To adjust the depth of the image without changing the magnification, use Panning. When the image is panned, the top of the image does not necessarily still correspond to the transducer surface. Adjusting the depth of a zoomed image changes the magnification even though the transducer surface is not necessarily visible at the top of the image.
Doppler mode	(Spectral) Doppler mode. This mode displays information about the spectrum of flow velocities as a function of time. It is sometimes called FFT (Fast Fourier Transform) because the information is presented as a frequency spectrum indicating velocity components.
duplex	Simultaneous imaging in 2 modes. See combination mode.
dynamic range	The number of steps (gray scale change) between black and white.
EDC	Expected date of confinement.
EMC	Electromagnetic compatibility.
ESD	Electrostatic discharge.
Exam Type	An application package containing presets, measuring tools and calculation formulas.
F1, F2	Frequency at position of marker 1 or 2 (when you make a measurement).
FOI	Field of interest. The area within the 2D image where resolution and focus are maximal.
freeze	Stop updating the image so an unchanging image is displayed.
gain	The overall amplification that is applied to ultrasound echoes from all depths.
HIPAA	Health Insurance Portability and Accountability Act of 1996. American law that sets rules for how patient accounts, billing and medical records must be handled.
IEC	International Electrotechnical Commission.
image review	See cine.
label	Text positioned on the image to label it. See page 47.
LC	Length of cycle.

Term	Explanation
line density	Line density is a measure of how closely spaced the image lines are in the ultrasound image. Increasing the line density decreases the frame rate so that you get finer resolution but a slower refresh rate (frame rate).
MIP	Maximum Intensity Projection (3D imaging). See page 217.
NEMA	Association of Electrical and Medical Imaging Equipment Manufacturers (National Electrical Manufacturer's Association)
PACS	Picture Archiving and Communications System (DICOM).
PE	Previous examination.
persistence	Persistence is the amount of time over which 2D image frames are averaged on the monitor. High persistence increases the contrast in the image, but tissue movement will blur a high-persistence image.
PG	Pressure Gradient
phased array	A technique to control the image area by using time delays on an array transducer.
PI	Pulsatility index.
planimetry	Measuring the surface area and perimeter of an object by tracing its boundaries.
POI	Point of interest.
Power Doppler	See Power mode.
Power mode	Power mode (power Doppler) ultrasound displays information about the number of particles moving, rather than their velocity. The signal strength (related to the square of the velocity) increases as the number of flowing particles increases. Thus the amplitude of the signal indicates the amount of blood present and flowing within a sample volume.
power supply cord	The cord that connects the system to the wall outlet or power supply.
PRF	Pulse repetition frequency.
PSA	Prostate-specific antigen.
PSAD	PSA density: PSA divided by prostate volume.
pulse repetition frequency	The rate at which pulses of ultrasound waves are transmitted and received in PW (pulsed-wave) Doppler imaging.

Term	Explanation
PW Doppler	Pulsed wave Doppler. PW Doppler is the primary Doppler mode. In PW Doppler, short bursts (pulses) of ultrasound waves are transmitted at regular intervals and analyzed as they return. The received signals are detected and sent to amplifiers for audio output as well as displayed on the monitor for a visual presentation of the frequency components (spectrum).
Range (of velocities)	You can vary the PRF (pulse repetition frequency) to select the range of Doppler velocities (frequencies) that are color-coded and displayed. Restricting the range allows you to see velocity differences (within the range) in more detail.
Shots per estimate	One way to improve the accuracy of the color-coded velocity information is to increase the number of pulses transmitted in each waveform packet (shots per estimate) at the expense of decreasing the frame rate.
spectral Doppler	See Doppler mode.
SS	Start systole.
steering	You can steer the Doppler beam of a linear transducer to vary the beam angle. This can be useful for examining flow in blood vessels parallel to the transducer surface.
ON/standby button	The switch on the back of the system used for turning the system on and off each day.
TAM	Time Average Mean.
TAMX	Time Average Max.
T-area	Transverse Area.
TEH	True echo harmonics. BK Medical's trademarked term for its pulse inversion tissue harmonic imaging system.
TGC	Time gain control. The TGC curve determines variable amplification applied to echoes from different depths in the tissue. The TGC function compensates for attenuation and scattering of the ultrasound beam in the tissue.
TI	Thermal index. The estimated rise in tissue temperature (in °C) caused by the power emitted by the transducer.
TIB	Thermal index in bone at focal point.
TIC	Thermal index, cranial – bone at surface.
TIS	Thermal index in soft tissue.
triplex	Simultaneous imaging in 3 modes. See combination mode.
voxel	A three-dimensional pixel. A volume pixel .

Term	Explanation
wall filter	A wall filter is used to eliminate low-frequency artifacts (such as Doppler shifts arising from respiratory and cardiac motion or movement of blood vessel walls) in Color, Power and Doppler modes. The wall filter cuts off all frequencies below its cutoff frequency. You can adjust the cut-off frequency.
width	For some transducers, you can increase the width of the image area beyond normal full width. With linear transducer arrays, this is sometimes referred to as Trapezoidal View. You can also narrow the image width to increase frame rate.

Appendix B

Measurement and Calculation Abbreviations

Measurement/Calculation	Explanation
%Reduction	General % reduction tool (using distance tool)
%Reduction	General % reduction tool (using 2 ellipses) to measure stenosis.
2-Caliper Doppler	General 2 Caliper Velocity Tool
2D Trace	General Freehand Tool
A:B Ratio	General A:B Ratio Velocity Tool
AC	Abdominal Circumference
AD Persson	Abdominal Diameter Persson
Angle	General 1 Angle tool
Ao Dist	Aorta Distal
Ao Dist AP	Aorta Distal AP
Ao Dist Ed	Aorta Distal End Diastole
Ao Dist Ps	Aorta Distal Peak Systole
Ao Dist W	Aorta Distal W
Ao Mid	Aorta Mid
Ao Mid AP	Aorta Mid AP
Ao Prox	Aorta Proximal
Ao Prox AP	Aorta Proximal AP
Ao Prox Ed	Aorta Proximal End Diastole
Ao Prox Ps	Aorta Proximal Peak Systole
Ao Prox W	Aorta Proximal W
AODd	Aortic Root Diameter Diastole
APD	Anteroposterior Diameter
ATD	Abdominal Transverse Diameter
Auto	Auto Doppler Calculations (PS, ED, RI, PS/ED)
Average Ultrasound Age	Average Ultrasound Age
Binoc D	Binocular Distance
Bladder	Bladder Outline

Measurement/Calculation	Explanation
BPD	Biparietal Diameter
CBD	Common Duct
Celiac A	Celiac Artery
Celiac A Ed	Celiac Artery End Diastole
Celiac A Ps	Celiac Artery Peak Systole
Cerebellum	Cerebellum
Cervix L	Cervical Length
Cist Mag	Cisterna Magna
Clav	Clavicle
CO Protocol	Cardiac Output Protocol
CO SI	Cardiac Output Stroke Volume Index
CRL	Crown Rump Length
Curved Distance	General Open Freehand Tool
CX Length	Cervical Length
D1	Diameter 1
D2	Diameter 2
Dist LRA	Left Kidney Distance LRA
Dist LRA Ed	Left Kidney Distance LRA End Diastole
Dist LRA Ps	Left Kidney Distance LRA Peak Systole
Dist RRA	Right Kidney Distance RRA
Dist RRA Ed	Right Kidney Distance RRA End Diastole
Dist RRA Ps	Right Kidney Distance RRA Peak Systole
Distal IVC	Distal IVC
Distal IVC Ed	Distal IVC End Diastole
Distal IVC Ps	Distal IVC Peak Systole
Distance	General Distance Tool
Doppler Trace	General Doppler Trace Tool
Dorsal Vn Dia	Dorsal Vein Diameter Flaccid/Post Injection
D Trace Freehand	Doppler Freehand Trace Tool
E/B Ratio	E/B Ratio
Ed	End Diastole
Ellipse	Ellipse (various organs)

Measurement/Calculation	Explanation
Endo Thickness	Endo Thickness
Fibroid 1..5 H	Fibroid 1,2,3,4,5 Height
Fibroid 1..5 L	Fibroid 1,2,3,4,5 Length
Fibroid1..5 W	Fibroid 1,2,3,4,5 Width
Fibula	Fibula
FL	Femur Length
Foot	Foot
GB Wall	Gall Bladder Wall
GS	Gestational Sac
GS Dist	Gestational Sac Distance
HC	Head Circumference
HC - BPD + OFD	Head Circumference - Biparietal Diameter + Occipito-frontal Diameter
Heart Rate	Heart Rate
Height	Height
Hepatic A	Main Hepatic Artery
Hepatic A Ed	Main Hepatic Artery End Diastole
Hepatic A Ps	Main Hepatic Artery Peak Systole
Hip Tool	General 2 Angle Tool
HR	Heart Rate (Doppler/M-mode)
Humerus	Humerus
Innom A	Innominate Artery
Innom A (Dia)	Innominate Artery Diameter
Innom A (Dpt)	Innominate Artery Depth
Innom A Ed	Innominate Artery End Diastole
Innom A Ps	Innominate Artery Peak Systole
Isthmus	Isthmus
IVC	Inferior Vena Cava
LADs	Left Atrium Diameter Systole
LADs/AODd	Left Atrium Diameter Systole/Aortic Root Diameter Diastole
Lat Vent	Lateral Ventricular
Length	Length
LHV	Left Hepatic Vein

Measurement/Calculation	Explanation
LHV Ed	Left Hepatic Vein End Diastole
LHV Ps	Left Hepatic Vein Peak Systole
Liver L	Liver Length
LLQ - AFI	Left Lower Quadrant Amniotic Fluid Index
LPV	Left Portal Vein
LPV Ed	Left Portal Vein End Diastole
LPV Ps	Left Portal Vein Peak Systole
Lt AC Bas V (Dia)	Left Antecubital Basilic Vein Diameter
Lt AC Bas V (Dpt)	Left Antecubital Basilic Vein Depth
Lt AC Ceph V (Dia)	Left Antecubital Cephalic Vein Diameter
Lt AC Ceph V (Dpt)	Left Antecubital Cephalic Vein Depth
Lt Accessory RA	Left Accessory Renal Artery
Lt Ant Bas V (Dia)	Left Anterior Basilic Vein Diameter
Lt Ant Bas V (Dpt)	Left Anterior Basilic Vein Depth
Lt Ant Ceph V (Dia)	Left Anterior Cephalic Vein Diameter
Lt Ant Ceph V (Dpt)	Left Anterior Cephalic Vein Depth
Lt Arcuate RA	Left Arcuate Renal Artery
Lt ATV VCT	Left Anterior Tibial Vein Valve Closure Time
Lt Axill A	Left Axillary Artery
Lt Axill A (Dia)	Left Axillary Artery Diameter
Lt Axill A (Dpt)	Left Axillary Artery Depth
Lt Axill A Ed	Left Axillary Artery End Diastole
Lt Axill A Ps	Left Axillary Artery Peak Systole
Lt Axill V (Dia)	Left Axillary Vein Diameter
Lt Axill V (Dpt)	Left Axillary Vein Depth
Lt Bulb	Left Bulb
Lt Bulb Ed	Left Bulb End Diastole
Lt Bulb Ps	Left Bulb Peak Systole
Lt CAV Auto	Left Cavernosal Artery Flaccid/Post Injection Auto
Lt CAV Ed	Left Cavernosal Artery Flaccid/Post Injection End Diastole
Lt CAV Manual	Left Cavernosal Artery Flaccid/Post Injection Manual
Lt CAV Ps	Left Cavernosal Artery Flaccid/Post Injection Peak Systole

Measurement/Calculation	Explanation
Lt CFA	Left Common Femoral Artery
Lt CFA (Dia)	Left Common Femoral Artery Diameter
Lt CFA (Dpt)	Left Common Femoral Artery Depth
Lt CFA Ed	Left Common Femoral Artery End Diastole
Lt CFA Ps	Left Common Femoral Artery Peak Systole
Lt CFV (Dia)	Left Common Femoral Vein Diameter
Lt CFV (Dpt)	Left Common Femoral Vein Depth
Lt CFV VCT	Left Common Femoral Vein Valve Closure Time
Lt CFV/GSV Jct (Dia)	Left Common Femoral Vein/Greater Saphenous Vein Junction Diameter
Lt CFV/GSV Jct (Dpt)	Left Common Femoral Vein/Greater Saphenous Vein Junction Depth
Lt Common IA	Left Common Iliac Artery
Lt Common IA (Dia)	Left Common Iliac Artery Diameter
Lt Common IA (Dpt)	Left Common Iliac Artery Depth
Lt Common IA Ed	Left Common Iliac Artery End Diastole
Lt Common IA Ps	Left Common Iliac Artery Peak Systole
Lt Common IV VCT	Left Common Iliac Vein Valve Closure Time
Lt Corp Lut	Left Corpus Luteum
Lt Dist ATA	Left Distal Anterior Tibial Artery
Lt Dist ATA (Dia)	Left Distal Anterior Tibial Artery Diameter
Lt Dist ATA (Dpt)	Left Distal Anterior Tibial Artery Depth
Lt Dist ATA Ed	Left Distal Anterior Tibial Artery End Diastole
Lt Dist ATA Ps	Left Distal Anterior Tibial Artery Peak Systole
Lt Dist Bas V (Dia)	Left Distal Basilic Vein Diameter
Lt Dist Bas V (Dpt)	Left Distal Basilic Vein Depth
Lt Dist Brach A	Left Distal Brachial Artery
Lt Dist Brach A (Dia)	Left Distal Brachial Artery Diameter
Lt Dist Brach A (Dpt)	Left Distal Brachial Artery Depth
Lt Dist Brach A Ed	Left Distal Brachial Artery End Diastole
Lt Dist Brach A Ps	Left Distal Brachial Artery Peak Systole
Lt Dist CCA	Left Distal Common Carotid Artery
Lt Dist CCA Ed	Left Distal Common Carotid Artery End Diastole

Measurement/Calculation	Explanation
Lt Dist CCA Ps	Left Distal Common Carotid Artery Peak Systole
Lt Dist Ceph V LA (Dia)	Left Distal Cephalic Vein Lower Arm Diameter
Lt Dist Ceph V LA (Dpt)	Left Distal Cephalic Vein Lower Arm Depth
Lt Dist FV VCT	Left Distal Femoral Vein Valve Closure Time
Lt Dist ICA	Left Distal Internal Carotid Artery
Lt Dist ICA Ed	Left Distal Internal Carotid Artery End Diastole
Lt Dist ICA Ps	Left Distal Internal Carotid Artery Peak Systole
Lt Dist Pero A	Left Distal Peroneal Artery
Lt Dist Pero A (Dia)	Left Distal Peroneal Artery Diameter
Lt Dist Pero A (Dpt)	Left Distal Peroneal Artery Depth
Lt Dist Pero A (Ed)	Left Distal Peroneal Artery End Diastole
Lt Dist Pero A (Ps)	Left Distal Peroneal Artery Peak Systole
Lt Dist Pero V VCT	Left Distal Peroneal Vein Valve Closure Time
Lt Dist Pop A	Left Distal Popliteal Artery
Lt Dist Pop A (Dia)	Left Distal Popliteal Artery Diameter
Lt Dist Pop A (Dpt)	Left Distal Popliteal Artery Depth
Lt Dist Pop A Ed	Left Distal Popliteal Artery End Diastole
Lt Dist Pop A Ps	Left Distal Popliteal Artery Peak Systole
Lt Dist PTA	Left Distal Posterior Tibial Artery
Lt Dist PTA (Dia)	Left Distal Posterior Tibial Artery Diameter
Lt Dist PTA (Dpt)	Left Distal Posterior Tibial Artery Depth
Lt Dist PTA Ed	Left Distal Posterior Tibial Artery End Diastole
Lt Dist PTA Ps	Left Distal Posterior Tibial Artery Peak Systole
Lt Dist PTV VCT	Left Distal Posterior Tibial Vein Valve Closure Time
Lt Dist Rad A	Left Distal Radial Artery
Lt Dist Rad A (Dia)	Left Distal Radial Artery Diameter
Lt Dist Rad A (Dpt)	Left Distal Radial Artery Depth
Lt Dist Rad A Ed	Left Distal Radial Artery End Diastole
Lt Dist Rad A Ps	Left Distal Radial Artery Peak Systole
Lt Dist SFA	Left Distal Superficial Femoral Artery
Lt Dist SFA (Dia)	Left Distal Superficial Femoral Artery Diameter
Lt Dist SFA (Dpt)	Left Distal Superficial Femoral Artery Depth

Measurement/Calculation	Explanation
Lt Dist SFA Ed	Left Distal Superficial Femoral Artery End Diastole
Lt Dist SFA Ps	Left Distal Superficial Femoral Artery Peak Systole
Lt Dist SSA (Dia)	Left Distal Small Saphenous Vein Diameter
Lt Dist SSA (Dpt)	Left Distal Small Saphenous Vein Depth
Lt Dist Subcl A	Left Dist Subclavian Artery
Lt Dist Subcl A Ed	Left Dist Subclavian Artery End Diastole
Lt Dist Subcl A Ps	Left Dist Subclavian Artery Peak Systole
Lt Dist Subclav A (Dia)	Left Dist Subclavian Artery Diameter
Lt Dist Subclav A (Dpt)	Left Dist Subclavian Artery Depth
Lt Dist Uln A	Left Distal Ulnar Artery
Lt Dist Uln A (Dia)	Left Distal Ulnar Artery Diameter
Lt Dist Uln A (Dpt)	Left Distal Ulnar Artery Depth
Lt Dist Uln A Ed	Left Distal Ulnar Artery End Diastole
Lt Dist Uln A Ps	Left Distal Ulnar Artery Peak Systole
Lt Dor Pedis A	Left Dorsalis Pedis Artery
Lt Dor Pedis A (Dia)	Left Dorsalis Pedis Artery Diameter
Lt Dor Pedis A (Dpt)	Left Dorsalis Pedis Artery Depth
Lt Dor Pedis A Ed	Left Dorsalis Pedis Artery End Diastole
Lt Dor Pedis A Ps	Left Dorsalis Pedis Artery Peak Systole
Lt ECA	Left External Carotid Artery
Lt ECA Ed	Left External Carotid Artery End Diastole
Lt ECA Ps	Left External Carotid Artery Peak Systole
Lt Epid H	Left Epid Height
Lt Epid L	Left Epid Length
Lt Epid V	Left Epid Volume
Lt Epid W	Left Epid Width
Lt External IV VCT	Left External Iliac Vein Valve Closure Time
Lt Fem V (Dia)	Left Femoral Vein Diameter
Lt Fem V (Dpt)	Left Femoral Vein Depth
Lt Follicle 1..15	Left Follicle 1, 2, 3,..15. Auto, 1-3 distances or Volume (W*H*L), depending on your preferences in the setup.
Lt GNV VCT	Left Gastrocnemius Vein Valve Closure Time

Measurement/Calculation	Explanation
Lt GSV Dist Calf (Dia)	Left Greater Saphenous Vein Distal Calf Diameter
Lt GSV Dist Calf (Dpt)	Left Greater Saphenous Vein Distal Calf Depth
Lt GSV Dist Thigh (Dia)	Left Greater Saphenous Vein Distal Thigh Diameter
Lt GSV Dist Thigh (Dpt)	Left Greater Saphenous Vein Distal Thigh Depth
Lt GSV Knee (Dia)	Left Greater Saphenous Vein at Knee Diameter
Lt GSV Knee (Dpt)	Left Greater Saphenous Vein at Knee Depth
Lt GSV Mid Calf (Dia)	Left Greater Saphenous Vein Mid Calf Diameter
Lt GSV Mid Calf (Dpt)	Left Greater Saphenous Vein Mid Calf Depth
Lt GSV Mid Thigh (Dia)	Left Greater Saphenous Vein Mid Thigh Diameter
Lt GSV Mid Thigh (Dpt)	Left Greater Saphenous Vein Mid Thigh Depth
Lt GSV Prox Calf (Dia)	Left Greater Saphenous Vein Proximal Calf Diameter
Lt GSV Prox Calf (Dpt)	Left Greater Saphenous Vein Proximal Calf Depth
Lt GSV Prox Thigh (Dia)	Left Greater Saphenous Vein Proximal Thigh Diameter
Lt GSV Prox Thigh (Dpt)	Left Greater Saphenous Vein Proximal Thigh Depth
Lt GSV VCT	Left Great Saphenous Vein Valve Closure Time
Lt GSV-Calf VCT	Left Great Saphenous Vein of Calf Valve Closure Time
Lt GSV-Thigh VCT	Left Great Saphenous Vein of Thigh Valve Closure Time
Lt Iliac A	Left Iliac Artery
Lt Iliac A AP	Left Iliac Artery AP
Lt Iliac A Ed	Left Iliac Artery End Diastole
Lt Iliac A Ps	Left Iliac Artery Peak Systole
Lt Iliac A W	Left Iliac Artery W
Lt INF Segmental RA	Left Inferior Segmental Renal Artery
Lt Interlobar RA	Left Interlobar Renal Artery
Lt Interlobular RA	Left Interlobular Renal Artery
Lt Kidney H	Left Kidney Height
Lt Kidney L	Left Kidney Length
Lt Kidney V	Left Kidney Volume
Lt Kidney W	Left Kidney Width
Lt Kidney V L*H*W	Left Kidney Volume Length * Height * Width
Lt Lesion 1..8 H	Left Lesion 1,2,3..8 Height
Lt Lesion 1..8 L	Left Lesion 1,2,3..8 Length

Measurement/Calculation	Explanation
Lt Lesion 1..8 V W*H*L	Left Lesion 1,2,3..8 Volume Width * Height * Length
Lt Lesion 1..8 W	Left Lesion 1,2,3..8 Width
Lt Lobe H	Left Lobe Height
Lt Lobe L	Left Lobe Length
Lt Lobe V W*H*L	Left Lobe Volume Width * Height * Length
Lt Lobe W	Left Lobe Width
Lt LSV VCT	Left Lesser Saphenous Vein Valve Closure Time
Lt Mid ATA	Left Mid Anterior Tibial Artery
Lt Mid ATA (Dia)	Left Mid Anterior Tibial Artery Diameter
Lt Mid ATA (Dpt)	Left Mid Anterior Tibial Artery Depth
Lt Mid ATA Ed	Left Mid Anterior Tibial Artery End Diastole
Lt Mid ATA Ps	Left Mid Anterior Tibial Artery Peak Systole
Lt Mid Bas V (Dia)	Left Mid Basilic Vein Diameter
Lt Mid Bas V (Dpt)	Left Mid Basilic Vein Depth
Lt Mid Brach A	Left Mid Brachial Artery
Lt Mid Brach A (Dia)	Left Mid Brachial Artery Diameter
Lt Mid Brach A (Dpt)	Left Mid Brachial Artery (Depth)
Lt Mid Brach A Ed	Left Mid Brachial Artery End Diastole
Lt Mid Brach A Ps	Left Mid Brachial Artery Peak Systole
Lt Mid CCA	Left Mid Common Carotid Artery
Lt Mid CCA Ed	Left Mid Common Carotid Artery End Diastole
Lt Mid CCA Ps	Left Mid Common Carotid Artery Peak Systole
Lt Mid Pero A	Left Mid Peroneal Artery
Lt Mid Pero A (Dia)	Left Mid Peroneal Artery Diameter
Lt Mid Pero A (Dpt)	Left Mid Peroneal Artery Depth
Lt Mid Pero A Ed	Left Mid Peroneal Artery End Diastole
Lt Mid Pero A Ps	Left Mid Peroneal Artery Peak Systole
Lt Mid Pero V VCT	Left Mid Peroneal Vein Valve Closure Time
Lt Mid PTA	Left Mid Posterior Tibial Artery
Lt Mid PTA (Dia)	Left Mid Posterior Tibial Artery Diameter
Lt Mid PTA (Dpt)	Left Mid Posterior Tibial Artery Depth
Lt Mid PTA Ed	Left Mid Posterior Tibial Artery End Diastole

Measurement/Calculation	Explanation
Lt Mid PTA Ps	Left Mid Posterior Tibial Artery Peak Systole
Lt Mid PTV VCT	Left Mid Posterior Tibial Vein Valve Closure Time
Lt Mid Rad A	Left Mid Radial Artery
Lt Mid Rad A (Dia)	Left Mid Radial Artery Diameter
Lt Mid Rad A (Dpt)	Left Mid Radial Artery Depth
Lt Mid Rad A Ed	Left Mid Radial Artery End Diastole
Lt Mid Rad A Ps	Left Mid Radial Artery Peak Systole
Lt MID Segmental RA	Left MID Segmental Renal Artery
Lt Mid SFA	Left Mid Superficial Femoral Artery
Lt Mid SFA (Dia)	Left Mid Superficial Femoral Artery Diameter
Lt Mid SFA (Dpt)	Left Mid Superficial Femoral Artery Depth
Lt Mid SFA Ed	Left Mid Superficial Femoral Artery End Diastole
Lt Mid SFA Ps	Left Mid Superficial Femoral Artery Peak Systole
Lt Mid SSV (Dia)	Left Mid Small Saphenous Vein Diameter
Lt Mid SSV (Dpt)	Left Mid Small Saphenous Vein Depth
Lt Mid Subcl A	Left Mid Subclavian Artery
Lt Mid Subcl A Ed	Left Mid Subclavian Artery End Diastole
Lt Mid Subcl A Ps	Left Mid Subclavian Artery Peak Systole
Lt Mid Subclav A (Dia)	Left Mid Subclavian Artery Diameter
Lt Mid Subclav A (Dpt)	Left Mid Subclavian Artery Depth
Lt Mid Uln A	Left Mid Ulnar Artery
Lt Mid Uln A (Dia)	Left Mid Ulnar Artery Diameter
Lt Mid Uln A (Dpt)	Left Mid Ulnar Artery Depth
Lt Mid Uln A Ed	Left Mid Ulnar Artery End Diastole
Lt Mid Uln A Ps	Left Mid Ulnar Artery Peak Systole
Lt Nodule 1..5 H	Left Nodule 1,2,3,4,5 Height
Lt Nodule 1..5 L	Left Nodule 1,2,3,4,5 Length
Lt Nodule 1..5 V W*H*L	Left Nodule 1,2,3,4,5 Volume Width * Height * Length
Lt Nodule 1..5 W	Left Nodule 1,2,3,4,5 Width
Lt Ovarian A	Left Maternal Ovarian Artery
Lt Ovarian A Ed	Left Maternal Ovarian Artery End Diastole
Lt Ovarian A Ps	Left Maternal Ovarian Artery Peak Systole

Measurement/Calculation	Explanation
Lt Ovary H	Left Ovary Height
Lt Ovary L	Left Ovary Length
Lt Ovary V L*H*W	Left Ovary Volume Width * Height * Length
Lt Ovary W	Left Ovary Width
Lt Ovary Lesion 1..5 H	Left Ovary Lesion 1,2,3,4,5 Height
Lt Ovary Lesion 1..5 L	Left Ovary Lesion 1,2,3,4,5 Length
Lt Ovary Lesion 1..5 W	Left Ovary Lesion 1,2,3,4,5 Width
Lt Perf-Boyd VCT	Left Boyd's Perforating Vein Valve Closure Time
Lt Perf-Cockett VCT	Left Cockett's Perforating Vein Valve Closure Time
Lt Perf-Hunterian VCT	Left Hunterian Perforating Vein Valve Closure Time
Lt PFA	Left Profunda Artery
Lt PFA (Dia)	Left Profunda Artery Diameter
Lt PFA (Dpt)	Left Profunda Artery Depth
Lt PFA Ed	Left Profunda Artery End Diastole
Lt PFA Ps	Left Profunda Artery Peak Systole
Lt PFV VCT	Left Profunda Femoral Vein Valve Closure Time
Lt Pop V VCT	Left Popliteal Vein Valve Closure Time
Lt Prox ATA	Left Proximal Anterior Tibial Artery
Lt Prox ATA (Dia)	Left Proximal Anterior Tibial Artery Diameter
Lt Prox ATA (Dpt)	Left Proximal Anterior Tibial Artery Depth
Lt Prox ATA Ed	Left Proximal Anterior Tibial Artery End Diastole
Lt Prox ATA Ps	Left Proximal Anterior Tibial Artery Peak Systole
Lt Prox Bas V (Dia)	Left Proximal Basilic Vein Diameter
Lt Prox Bas V (Dpt)	Left Proximal Basilic Vein Depth
Lt Prox Brach A	Left Proximal Brachial Artery
Lt Prox Brach A (Dia)	Left Proximal Brachial Artery Diameter
Lt Prox Brach A (Dpt)	Left Proximal Brachial Artery Depth
Lt Prox Brach A Ed	Left Proximal Brachial Artery End Diastole
Lt Prox Brach A Ps	Left Proximal Brachial Artery Peak Systole
Lt Prox CCA	Left Proximal Common Carotid Artery
Lt Prox CCA Ed	Left Proximal Common Carotid Artery End Diastole
Lt Prox CCA Ps	Left Proximal Common Carotid Artery Peak Systole

Measurement/Calculation	Explanation
Lt Prox Ceph V LA (Dia)	Left Proximal Cephalic Vein Lower Arm Diameter
Lt Prox Ceph V LA (Dpt)	Left Proximal Cephalic Vein Lower Arm Depth
Lt Prox Ceph V UA (Dia)	Left Proximal Cephalic Vein Upper Arm Diameter
Lt Prox Ceph V UA (Dpt)	Left Proximal Cephalic Vein Upper Arm Depth
Lt Prox FV VCT	Left Proximal Femoral Vein Valve Closure Time
Lt Prox ICA	Left Proximal Internal Carotid Artery
Lt Prox ICA Ed	Left Proximal Internal Carotid Artery End Diastole
Lt Prox ICA Ps	Left Proximal Internal Carotid Artery Peak Systole
Lt Prox Pero A	Left Proximal Peroneal Artery
Lt Prox Pero A (Dia)	Left Proximal Peroneal Artery Diameter
Lt Prox Pero A (Dpt)	Left Proximal Peroneal Artery Depth
Lt Prox Pero A Ed	Left Proximal Peroneal Artery End Diastole
Lt Prox Pero A Ps	Left Proximal Peroneal Artery Peak Systole
Lt Prox Pero V VCT	Left Proximal Peroneal Vein Valve Closure Time
Lt Prox Pop A	Left Proximal Popliteal Artery
Lt Prox Pop A (Dia)	Left Proximal Popliteal Artery Diameter
Lt Prox Pop A (Dpt)	Left Proximal Popliteal Artery Depth
Lt Prox Pop A Ed	Left Proximal Popliteal Artery End Diastole
Lt Prox Pop A Ps	Left Proximal Popliteal Artery Peak Systole
Lt Prox PTA	Left Proximal Posterior Tibial Artery
Lt Prox PTA (Dia)	Left Proximal Posterior Tibial Artery Diameter
Lt Prox PTA (Dpt)	Left Proximal Posterior Tibial Artery Depth
Lt Prox PTA Ed	Left Proximal Posterior Tibial Artery End Diastole
Lt Prox PTA Ps	Left Proximal Posterior Tibial Artery Peak Systole
Lt Prox PTV VCT	Left Proximal Posterior Tibial Vein Valve Closure Time
Lt Prox Rad A	Left Proximal Radial Artery
Lt Prox Rad A (Dia)	Left Proximal Radial Artery Diameter
Lt Prox Rad A (Dpt)	Left Proximal Radial Artery Depth
Lt Prox Rad A Ed	Left Proximal Radial Artery End Diastole
Lt Prox Rad A Ps	Left Proximal Radial Artery Peak Systole
Lt Prox SFA	Left Proximal Superficial Femoral Artery
Lt Prox SFA (Dia)	Left Proximal Superficial Femoral Artery Diameter

Measurement/Calculation	Explanation
Lt Prox SFA (Dpt)	Left Proximal Superficial Femoral Artery Depth
Lt Prox SFA Ed	Left Proximal Superficial Femoral Artery End Diastole
Lt Prox SFA Ps	Left Proximal Superficial Femoral Artery Peak Systole
Lt Prox SSV (Dia)	Left Proximal Small Saphenous Vein Diameter
Lt Prox SSV (Dpt)	Left Proximal Small Saphenous Vein Depth
Lt Prox Subcl A	Left Prox Subclavian Artery
Lt Prox Subcl A Ed	Left Prox Subclavian Artery End Diastole
Lt Prox Subcl A Ps	Left Prox Subclavian Artery Peak Systolic
Lt Prox Subclav A (Dia)	Left Prox Subclavian Artery Diameter
Lt Prox Subclav A (Dpt)	Left Prox Subclavian Artery Depth
Lt Prox Uln A	Left Proximal Ulnar Artery
Lt Prox Uln A (Dia)	Left Proximal Ulnar Artery Diameter
Lt Prox Uln A (Dpt)	Left Proximal Ulnar Artery Depth
Lt Prox Uln A Ed	Left Proximal Ulnar Artery End Diastole
Lt Prox Uln A Ps	Left Proximal Ulnar Artery Peak Systole
Lt Rad A	Left Radial Artery
Lt Rad A (Dia)	Left Radial Artery Diameter
Lt Rad A (Dpt)	Left Radial Artery Depth
Lt Rad A Ed	Left Radial Artery End Diastole
Lt Rad A Ps	Left Radial Artery Peak Systole
Lt Renal Hilum	Left Renal Hilum
Lt SFJ VCT	Left Saphenofemoral Junction Valve Closure Time
Lt Skin Thickness	Left Testicle Skin Thickness
Lt SLV VCT	Left Soleal Vein Valve Closure Time
Lt SSV/Pop Jct (Dia)	Left Small Saphenous Vein/Popliteal Junction Diameter
Lt SSV/Pop Jct (Dpt)	Left Small Saphenous Vein/Popliteal Junction Depth
Lt Subclav A	Left Subclavian Artery
Lt Subclav A (Dia)	Left Subclavian Artery Diameter
Lt Subclav A (Dpt)	Left Subclavian Artery Depth
Lt Subclav A Ed	Left Subclavian Artery End Diastole
Lt Subclav A Ps	Left Subclavian Artery Peak Systole
Lt SUP Segmental RA	Left Superior Segmental Renal Artery

Measurement/Calculation	Explanation
Lt Testicle H	Left Testicle Height
Lt Testicle L	Left Testicle Length
Lt Testicle V	Left Testicle Volume
Lt Testicle W	Left Testicle Width
Lt Uln A	Left Ulnar Artery
Lt Uln A (Dia)	Left Ulnar Artery Diameter
Lt Uln A (Dpt)	Left Ulnar Artery Depth
Lt Uln A Ed	Left Ulnar Artery End Diastole
Lt Uln A Ps	Left Ulnar Artery Peak Systole
Lt Uterine A	Left Maternal Uterine Artery
Lt Vertebral A	Left Vertebral Artery
Lt Vertebral A Ed	Left Vertebral Artery End Diastole
Lt Vertebral A Ps	Left Vertebral Artery Peak Systole
LUQ - AFI	Left Upper Quadrant Amniotic Fluid Index
LV Protocol	Left Ventricle Protocol
LV Single Plane	Left Ventricle Single Plane
LVd	Left Ventricle Diastole
LVd Single Plane	Left Ventricle Diastole Single Plane
LVOT VTI	Velocity Time Integral Left Ventricle Outflow Tract
LVOTDs	Left Ventricular Outflow Tract Diameter, systole
LVs	Left Ventricle Systole
LVs Single Plane	Left Ventricle Systole Single Plane
M Distance	General M-mode Distance Tool
MAPSE	Mitral Annular Plane Systolic Excursion
MHV	Middle Hepatic Vein
MHV Ed	Middle Hepatic Vein End Diastole
MVH Ps	Middle Hepatic Vein Peak Systole
Mid LRA	Left Kidney Mid LRA
Mid LRA Ed	Left Kidney Mid LRA
Mid LRA Ps	Left Kidney Mid LRA
Mid RRA	Right Kidney Mid RRA
Mid RRA Ed	Right Kidney Mid RRA End Diastole

Measurement/Calculation	Explanation
Mid RRA Ps	Right Kidney Mid RRA Peak Systole
MPV	Main Portal Vein
MPV Ed	Main Portal Vein End Diastole
MPV Ps	Main Portal Vein Peak Systole
MSS	Mitral Septal Separation
Nuc Translucency	Nuchal Translucency
Nuchal Thick	Nuchal Fold Thickness
OFD	Occipito-frontal Diameter
Planimetry (Freehand)	Prostate Volume
Post Void BI Ellipse	Post Void Bladder Ellipse
Post Void BI H	Post Void Bladder Height
Post Void BI L	Post Void Bladder Length
Post Void BI V Ellipse	Post Void Bladder Volume Ellipse
Post Void BI V W*H*L	Post Void Bladder Volume Width*Height*Length
Post Void BI W	Post Void Bladder Width
Pre Void BI Ellipse	Pre Void Bladder Ellipse
Pre Void BI H	Pre Void Bladder Height
Pre Void BI L	Pre Void Bladder Length
Pre Void BI V Ellipse	Pre Void Bladder Volume Ellipse
Pre Void BI V W*H*L	Pre Void Bladder Width*Height*Length
Pre Void BI W	Pre Void Bladder Width
Prostate Ellipse	Prostate Ellipse
Prostate H	Prostate Height
Prostate L	Prostate Length
Prostate V Ellipse	Prostate Volume Ellipse
Prostate V W*H*L	Prostate Volume Width*Height*Length
Prostate W	Prostate Width
Prox IVC Ed	Proximal IVC End Diastole
Prox IVC Ps	Proximal IVC Peak Systole
Prox IVC	Proximal IVC
Prox LRA	Left Kidney Proximal LRA
Prox LRA Ed	Left Kidney Proximal LRA End Diastole

Measurement/Calculation	Explanation
Prox LRA Ps	Left Kidney Proximal LRA Peak Systole
Prox RRA	Right Kidney Proximal RRA
Prox RRA Ed	Right Kidney Proximal RRA End Diastole
Prox RRA Ps	Right Kidney Proximal RRA Peak Systole
Ps	Peak Systole
PSAD	PSAD
Real-Time	Real-Time
Rectum	Rectum Outline
RHV	Right Hepatic Vein
RHV Ed	Right Hepatic Vein End Diastole
RHV Ps	Right Hepatic Vein Peak Systole
RLQ - AFI	Right Lower Quadrant Amniotic Fluid Index
RPV	Right Portal Vein
RPV Ed	Right Portal Vein End Diastole
RPV Ps	Right Portal Vein Peak Systole
Rt AC Bas V (Dia)	Right Antecubital Basilic Vein Diameter
Rt AC Bas V (Dpt)	Right Antecubital Basilic Vein Depth
Rt AC Ceph V (Dia)	Right Antecubital Cephalic Vein Diameter
Rt AC Ceph V (Dpt)	Right Antecubital Cephalic Vein Depth
Rt Accessory RA	Right Accessory Renal Artery
Rt Ant Bas V (Dia)	Right Anterior Basilic Vein Diameter
Rt Ant Bas V (Dpt)	Right Anterior Basilic Vein Depth
Rt Ant Ceph V (Dia)	Right Anterior Cephalic Vein Diameter
Rt Ant Ceph V (Dpt)	Right Anterior Cephalic Vein Depth
Rt Arcuate RA	Right Arcuate Renal Artery
Rt ATV VCT	Right Anterior Tibial Vein Valve Closure Time
Rt Axill A	Right Axillary Artery
Rt Axill A (Dia)	Right Axillary Artery Diameter
Rt Axill A (Dpt)	Right Axillary Artery Depth
Rt Axill A Ed	Right Axillary Artery End Diastole
Rt Axill A Ps	Right Axillary Artery Peak Systole
Rt Axill V (Dia)	Right Axillary Vein Diameter

Measurement/Calculation	Explanation
Rt Axill V (Dpt)	Right Axillary Vein Depth
Rt Bulb	Right Bulb
Rt Bulb Ed	Right Bulb End Diastole
Rt Bulb Ps	Right Bulb Peak Systole
Rt CAV Auto	Right Cavernosal Artery Flaccid/Post Injection Auto
Rt CAV Ed	Right Cavernosal Artery Flaccid/Post Injection End Diastole
Rt CAV Manual	Right Cavernosal Artery Flaccid/Post Injection Manual
Rt CAV Ps	Right Cavernosal Artery Flaccid/Post Injection Peak Systole
Rt CFA	Right Common Femoral Artery
Rt CFA (Dia)	Right Common Femoral Artery Diameter
Rt CFA (Dpt)	Right Common Femoral Artery Depth
Rt CFA Ed	Right Common Femoral Artery End Diastole
Rt CFA Ps	Right Common Femoral Artery Peak Systole
Rt CFV (Dia)	Right Common Femoral Vein Diameter
Rt CFV (Dpt)	Right Common Femoral Vein Depth
Rt CFV VCT	Right Common Femoral Vein Valve Closure Time
Rt CFV/GSV Jct (Dia)	Right Common Femoral Vein/Greater Saphenous Vein Junction Diameter
Rt CFV/GSV Jct (Dpt)	Right Common Femoral Vein/Greater Saphenous Vein Junction Depth
Rt Common IA	Right Common Iliac Artery
Rt Common IA (Dia)	Right Common Iliac Artery Diameter
Rt Common IA (Dpt)	Right Common Iliac Artery Depth
Rt Common IA	Right Common Iliac Artery
Rt Common IA	Right Common Iliac Artery
Rt Common IV VCT	Right Common Iliac Vein Valve Closure Time
Rt Corp Lut	Right Corpus Luteum
Rt Dist ATA	Right Distal Anterior Tibial Artery
Rt Dist ATA (Dia)	Right Distal Anterior Tibial Artery Diameter
Rt Dist ATA (Dpt)	Right Distal Anterior Tibial Artery Depth
Rt Dist ATA Ed	Right Distal Anterior Tibial Artery End Diastole
Rt Dist ATA Ps	Right Distal Anterior Tibial Artery Peak Systole
Rt Dist Bas V (Dia)	Right Distal Basilic Vein Diameter

Measurement/Calculation	Explanation
Rt Dist Bas V (Dpt)	Right Distal Basilic Vein Depth
Rt Dist Brach A	Right Distal Brachial Artery
Rt Dist Brach A (Dia)	Right Distal Brachial Artery Diameter
Rt Dist Brach A (Dpt)	Right Distal Brachial Artery Depth
Rt Dist Brach A Ed	Right Distal Brachial Artery End Diastole
Rt Dist Brach A Ps	Right Distal Brachial Artery Peak Systole
Rt Dist CCA	Right Distal Common Carotid Artery
Rt Dist CCA Ed	Right Distal Common Carotid Artery End Diastole
Rt Dist CCA Ps	Right Distal Common Carotid Artery Peak Systole
Rt Dist Ceph V LA (Dia)	Right Distal Cephalic Vein Lower Arm Diameter
Rt Dist Ceph V LA (Dpt)	Right Distal Cephalic Vein Lower Arm Depth
Rt Dist FV VCT	Right Distal Femoral Vein Valve Closure Time
Rt Dist ICA	Right Distal Internal Carotid Artery
Rt Dist ICA Ed	Right Distal Internal Carotid Artery End Diastole
Rt Dist ICA Ps	Right Distal Internal Carotid Artery Peak Systole
Rt Dist Pero A	Right Distal Peroneal Artery
Rt Dist Pero A (Dia)	Right Distal Peroneal Artery Diameter
Rt Dist Pero A (Dpt)	Right Distal Peroneal Artery Depth
Rt Dist Pero A (Ed)	Right Distal Peroneal Artery End Diastole
Rt Dist Pero A (Ps)	Right Distal Peroneal Artery Peak Systole
Rt Dist Pero V VCT	Right Distal Peroneal Vein Valve Closure Time
Rt Dist Pop A	Right Distal Popliteal Artery
Rt Dist Pop A (Dia)	Right Distal Popliteal Artery Diameter
Rt Dist Pop A (Dpt)	Right Distal Popliteal Artery Depth
Rt Dist Pop A Ed	Right Distal Popliteal Artery End Diastole
Rt Dist Pop A Ps	Right Distal Popliteal Artery Peak Systole
Rt Dist PTA	Right Distal Posterior Tibial Artery
Rt Dist PTA (Dia)	Right Distal Posterior Tibial Artery Diameter
Rt Dist PTA (Dpt)	Right Distal Posterior Tibial Artery Depth
Rt Dist PTA Ed	Right Distal Posterior Tibial Artery End Diastole
Rt Dist PTA Ps	Right Distal Posterior Tibial Artery Peak Systole
Rt Dist PTV VCT	Right Distal Posterior Tibial Vein Valve Closure Time

Measurement/Calculation	Explanation
Rt Dist Rad A	Right Distal Radial Artery
Rt Dist Rad A (Dia)	Right Distal Radial Artery Diameter
Rt Dist Rad A (Dpt)	Right Distal Radial Artery Depth
Rt Dist Rad A Ed	Right Distal Radial Artery End Diastole
Rt Dist Rad A Ps	Right Distal Radial Artery Peak Systole
Rt Dist SFA	Right Distal Superficial Femoral Artery
Rt Dist SFA (Dia)	Right Distal Superficial Femoral Artery Diameter
Rt Dist SFA (Dpt)	Right Distal Superficial Femoral Artery Depth
Rt Dist SFA Ed	Right Distal Superficial Femoral Artery End Diastole
Rt Dist SFA Ps	Right Distal Superficial Femoral Artery Peak Systole
Rt Dist SSA (Dia)	Right Distal Small Saphenous Vein Diameter
Rt Dist SSA (Dpt)	Right Distal Small Saphenous Vein Depth
Rt Dist Subcl A	Right Dist Subclavian Artery
Rt Dist Subcl A Ed	Right Dist Subclavian Artery End Diastole
Rt Dist Subcl A Ps	Right Dist Subclavian Artery Peak Systole
Rt Dist Subclav A (Dia)	Right Dist Subclavian Artery Diameter
Rt Dist Subclav A (Dpt)	Right Dist Subclavian Artery Depth
Rt Dist Uln A	Right Distal Ulnar Artery
Rt Dist Uln A (Dia)	Right Distal Ulnar Artery Diameter
Rt Dist Uln A (Dpt)	Right Distal Ulnar Artery Depth
Rt Dist Uln A Ed	Right Distal Ulnar Artery End Diastole
Rt Dist Uln A Ps	Right Distal Ulnar Artery Peak Systole
Rt Dor Pedis A	Right Dorsalis Pedis Artery
Rt Dor Pedis A (Dia)	Right Dorsalis Pedis Artery Diameter
Rt Dor Pedis A (Dpt)	Right Dorsalis Pedis Artery Depth
Rt Dor Pedis A Ed	Right Dorsalis Pedis Artery End Diastole
Rt Dor Pedis A Ps	Right Dorsalis Pedis Artery Peak Systole
Rt ECA	Right External Carotid Artery
Rt ECA Ed	Right External Carotid Artery End Diastole
Rt ECA Ps	Right External Carotid Artery Peak Systole
Rt Epid H	Right Epid Height
Rt Epid L	Right Epid Length

Measurement/Calculation	Explanation
Rt Epid V	Right Epid Volume
Rt Epid W	Right Epid Width
Rt External IV VCT	Right External Iliac Vein Valve Closure Time
Rt Fem V (Dia)	Right Femoral Vein Diameter
Rt Fem V (Dpt)	Right Femoral Vein Depth
Rt Follicle 1..15	Right Follicle 1, 2, 3,..15. Auto, 1-3 distances or Volume (W*H*L), depending on your preferences in the setup.
Rt GNV VCT	Right Gastrocnemius Vein Valve Closure Time
Rt GSV Dist Calf (Dia)	Right Greater Saphenous Vein Distal Calf Diameter
Rt GSV Dist Calf (Dpt)	Right Greater Saphenous Vein Distal Calf Depth
Rt GSV Dist Thigh (Dia)	Right Greater Saphenous Vein Distal Thigh Diameter
Rt GSV Dist Thigh (Dpt)	Right Greater Saphenous Vein Distal Thigh Depth
Rt GSV Knee (Dia)	Right Greater Saphenous Vein at Knee Diameter
Rt GSV Knee (Dpt)	Right Greater Saphenous Vein at Knee Depth
Rt GSV Mid Calf (Dia)	Right Greater Saphenous Vein Mid Calf Diameter
Rt GSV Mid Calf (Dpt)	Right Greater Saphenous Vein Mid Calf Depth
Rt GSV Mid Thigh (Dia)	Right Greater Saphenous Vein Mid Thigh Diameter
Rt GSV Mid Thigh (Dpt)	Right Greater Saphenous Vein Mid Thigh Depth
Rt GSV Prox Calf (Dia)	Right Greater Saphenous Vein Proximal Calf Diameter
Rt GSV Prox Calf (Dpt)	Right Greater Saphenous Vein Proximal Calf Depth
Rt GSV Prox Thigh (Dia)	Right Greater Saphenous Vein Proximal Thigh Diameter
Rt GSV Prox Thigh (Dpt)	Right Greater Saphenous Vein Proximal Thigh Depth
Rt GSV VCT	Right Great Saphenous Vein Valve Closure Time
Rt GSV-Calf VCT	Right Great Saphenous Vein of Calf Valve Closure Time
Rt GSV-Thigh VCT	Right Great Saphenous Vein of Thigh Valve Closure Time
Rt Iliac A	Right Iliac Artery
Rt Iliac A AP	Right Iliac Artery AP
Rt Iliac A Ed	Right Iliac Artery End Diastole
Rt Iliac A Ps	Right Iliac Artery Peak Systole
Rt Iliac A W	Right Iliac Artery W
Rt INF Segmental RA	Right Inferior Segmental Renal Artery
Rt Interlobar RA	Right Interlobar Renal Artery

Measurement/Calculation	Explanation
Rt Interlobular RA	Right Interlobular Renal Artery
Rt Kidney H	Right Kidney Height
Rt Kidney L	Right Kidney Length
Rt Kidney V	Right Kidney Volume
Rt Kidney W	Right Kidney Width
Rt Kidney V L*H*W	Right Kidney Volume Length * Height * Width
Rt Lesion 1..8 H	Right Lesion 1,2,3..8 Height
Rt Lesion 1..8 L	Right Lesion 1,2,3..8 Length
Rt Lesion 1..8 V W*H*L	Right Lesion 1,2,3..8 Volume Width * Height * Length
Rt Lesion 1..8 W	Right Lesion 1,2,3..8 Width
Rt Lobe H	Right Lobe Height
Rt Lobe L	Right Lobe Length
Rt Lobe V W*H*L	Right Lobe Volume Width * Height * Length
Rt Lobe W	Right Lobe Width
Rt LSV VCT	Right Lesser Saphenous Vein Valve Closure Time
Rt Mid ATA	Right Mid Anterior Tibial Artery
Rt Mid ATA (Dia)	Right Mid Anterior Tibial Artery Diameter
Rt Mid ATA (Dpt)	Right Mid Anterior Tibial Artery Depth
Rt Mid ATA Ed	Right Mid Anterior Tibial Artery End Diastole
Rt Mid ATA Ps	Right Mid Anterior Tibial Artery Peak Systole
Rt Mid Bas V (Dia)	Right Mid Basilic Vein Diameter
Rt Mid Bas V (Dpt)	Right Mid Basilic Vein Depth
Rt Mid Brach A	Right Mid Brachial Artery
Rt Mid Brach A (Dia)	Right Mid Brachial Artery Diameter
Rt Mid Brach A (Dpt)	Right Mid Brachial Artery (Depth)
Rt Mid Brach A Ed	Right Mid Brachial Artery End Diastole
Rt Mid Brach A Ps	Right Mid Brachial Artery Peak Systole
Rt Mid CCA	Right Mid Common Carotid Artery
Rt Mid CCA Ed	Right Mid Common Carotid Artery End Diastole
Rt Mid CCA Ps	Right Mid Common Carotid Artery Peak Systole
Rt Mid Pero A	Right Mid Peroneal Artery
Rt Mid Pero A (Dia)	Right Mid Peroneal Artery Diameter

Measurement/Calculation	Explanation
Rt Mid Pero A (Dpt)	Right Mid Peroneal Artery Depth
Rt Mid Pero A Ed	Right Mid Peroneal Artery End Diastole
Rt Mid Pero A Ps	Right Mid Peroneal Artery Peak Systole
Rt Mid Pero V VCT	Right Mid Peroneal Vein Valve Closure Time
Rt Mid PTA	Right Mid Posterior Tibial Artery
Rt Mid PTA (Dia)	Right Mid Posterior Tibial Artery Diameter
Rt Mid PTA (Dpt)	Right Mid Posterior Tibial Artery Depth
Rt Mid PTA Ed	Right Mid Posterior Tibial Artery End Diastole
Rt Mid PTA Ps	Right Mid Posterior Tibial Artery Peak Systole
Rt Mid PTV VCT	Right Mid Posterior Tibial Vein Valve Closure Time
Rt Mid Rad A	Right Mid Radial Artery
Rt Mid Rad A (Dia)	Right Mid Radial Artery Diameter
Rt Mid Rad A (Dpt)	Right Mid Radial Artery Depth
Rt Mid Rad A Ed	Right Mid Radial Artery End Diastole
Rt Mid Rad A Ps	Right Mid Radial Artery Peak Systole
Rt MID Segmental RA	Right MID Segmental Renal Artery
Rt Mid SFA	Right Mid Superficial Femoral Artery
Rt Mid SFA (Dia)	Right Mid Superficial Femoral Artery Diameter
Rt Mid SFA (Dpt)	Right Mid Superficial Femoral Artery Depth
Rt Mid SFA Ed	Right Mid Superficial Femoral Artery End Diastole
Rt Mid SFA Ps	Right Mid Superficial Femoral Artery Peak Systole
Rt Mid SSV (Dia)	Right Mid Small Saphenous Vein Diameter
Rt Mid SSV (Dpt)	Right Mid Small Saphenous Vein Depth
Rt Mid Subcl A	Right Mid Subclavian Artery
Rt Mid Subcl A Ed	Right Mid Subclavian Artery End Diastole
Rt Mid Subcl A Ps	Right Mid Subclavian Artery Peak Systole
Rt Mid Subclav A (Dia)	Right Mid Subclavian Artery Diameter
Rt Mid Subclav A (Dpt)	Right Mid Subclavian Artery Depth
Rt Mid Uln A	Right Mid Ulnar Artery
Rt Mid Uln A (Dia)	Right Mid Ulnar Artery Diameter
Rt Mid Uln A (Dpt)	Right Mid Ulnar Artery Depth
Rt Mid Uln A Ed	Right Mid Ulnar Artery End Diastole

Measurement/Calculation	Explanation
Rt Mid Uln A Ps	Right Mid Ulnar Artery Peak Systole
Rt Nodule 1..5 H	Right Nodule 1,2,3,4,5 Height
Rt Nodule 1..5 L	Right Nodule 1,2,3,4,5 Length
Rt Nodule 1..5 V W*H*L	Right Nodule 1,2,3,4,5 Volume Width * Height * Length
Rt Nodule 1..5 W	Right Nodule 1,2,3,4,5 Width
Rt Ovarian A	Right Maternal Ovarian Artery
Rt Ovarian A Ed	Right Maternal Ovarian Artery End Diastole
Rt Ovarian A Ps	Right Maternal Ovarian Artery Peak Systole
Rt Ovary H	Right Ovary Height
Rt Ovary L	Right Ovary Length
Rt Ovary V L*H*W	Right Ovary Volume Width * Height * Length
Rt Ovary W	Right Ovary Width
Rt Ovary Lesion 1..5 H	Right Ovary Lesion 1,2,3,4,5 Height
Rt Ovary Lesion 1..5 L	Right Ovary Lesion 1,2,3,4,5 Length
Rt Ovary Lesion 1..5 W	Right Ovary Lesion 1,2,3,4,5 Width
Rt Perf-Boyd VCT	Right Boyd's Perforating Vein Valve Closure Time
Rt Perf-Cockett VCT	Right Cockett's Perforating Vein Valve Closure Time
Rt Perf-Hunterian VCT	Right Hunterian Perforating Vein Valve Closure Time
Rt PFA	Right Profunda Artery
Rt PFA (Dia)	Right Profunda Artery Diameter
Rt PFA (Dpt)	Right Profunda Artery Depth
Rt PFA Ed	Right Profunda Artery End Diastole
Rt PFA Ps	Right Profunda Artery Peak Systole
Rt PFV VCT	Right Profunda Femoral Vein Valve Closure Time
Rt Pop V VCT	Right Popliteal Vein Valve Closure Time
Rt Prox ATA	Right Proximal Anterior Tibial Artery
Rt Prox ATA (Dia)	Right Proximal Anterior Tibial Artery Diameter
Rt Prox ATA (Dpt)	Right Proximal Anterior Tibial Artery Depth
Rt Prox ATA Ed	Right Proximal Anterior Tibial Artery End Diastole
Rt Prox ATA Ps	Right Proximal Anterior Tibial Artery Peak Systole
Rt Prox Bas V (Dia)	Right Proximal Basilic Vein Diameter
Rt Prox Bas V (Dpt)	Right Proximal Basilic Vein Depth

Measurement/Calculation	Explanation
Rt Prox Brach A	Right Proximal Brachial Artery
Rt Prox Brach A (Dia)	Right Proximal Brachial Artery Diameter
Rt Prox Brach A (Dpt)	Right Proximal Brachial Artery Depth
Rt Prox Brach A Ed	Right Proximal Brachial Artery End Diastole
Rt Prox Brach A Ps	Right Proximal Brachial Artery Peak Systole
Rt Prox CCA	Right Proximal Common Carotid Artery
Rt Prox CCA Ed	Right Proximal Common Carotid Artery End Diastole
Rt Prox CCA Ps	Right Proximal Common Carotid Artery Peak Systole
Rt Prox Ceph V LA (Dia)	Right Proximal Cephalic Vein Lower Arm Diameter
Rt Prox Ceph V LA (Dpt)	Right Proximal Cephalic Vein Lower Arm Depth
Rt Prox Ceph V UA (Dia)	Right Proximal Cephalic Vein Upper Arm Diameter
Rt Prox Ceph V UA (Dpt)	Right Proximal Cephalic Vein Upper Arm Depth
Rt Prox FV VCT	Right Proximal Femoral Vein Valve Closure Time
Rt Prox ICA	Right Proximal Internal Carotid Artery
Rt Prox ICA Ed	Right Proximal Internal Carotid Artery End Diastole
Rt Prox ICA Ps	Right Proximal Internal Carotid Artery Peak Systole
Rt Prox Pero A	Right Proximal Peroneal Artery
Rt Prox Pero A (Dia)	Right Proximal Peroneal Artery Diameter
Rt Prox Pero A (Dpt)	Right Proximal Peroneal Artery Depth
Rt Prox Pero A Ed	Right Proximal Peroneal Artery End Diastole
Rt Prox Pero A Ps	Right Proximal Peroneal Artery Peak Systole
Rt Prox Pero V VCT	Right Proximal Peroneal Vein Valve Closure Time
Rt Prox Pop A	Right Proximal Popliteal Artery
Rt Prox Pop A (Dia)	Right Proximal Popliteal Artery Diameter
Rt Prox Pop A (Dpt)	Right Proximal Popliteal Artery Depth
Rt Prox Pop A Ed	Right Proximal Popliteal Artery End Diastole
Rt Prox Pop A Ps	Right Proximal Popliteal Artery Peak Systole
Rt Prox PTA	Right Proximal Posterior Tibial Artery
Rt Prox PTA (Dia)	Right Proximal Posterior Tibial Artery Diameter
Rt Prox PTA (Dpt)	Right Proximal Posterior Tibial Artery Depth
Rt Prox PTA Ed	Right Proximal Posterior Tibial Artery End Diastole
Rt Prox PTA Ps	Right Proximal Posterior Tibial Artery Peak Systole

Measurement/Calculation	Explanation
Rt Prox PTV VCT	Right Proximal Posterior Tibial Vein Valve Closure Time
Rt Prox Rad A	Right Proximal Radial Artery
Rt Prox Rad A (Dia)	Right Proximal Radial Artery Diameter
Rt Prox Rad A (Dpt)	Right Proximal Radial Artery Depth
Rt Prox Rad A Ed	Right Proximal Radial Artery End Diastole
Rt Prox Rad A Ps	Right Proximal Radial Artery Peak Systole
Rt Prox SFA	Right Proximal Superficial Femoral Artery
Rt Prox SFA (Dia)	Right Proximal Superficial Femoral Artery Diameter
Rt Prox SFA (Dpt)	Right Proximal Superficial Femoral Artery Depth
Rt Prox SFA Ed	Right Proximal Superficial Femoral Artery End Diastole
Rt Prox SFA Ps	Right Proximal Superficial Femoral Artery Peak Systole
Rt Prox SSV (Dia)	Right Proximal Small Saphenous Vein Diameter
Rt Prox SSV (Dpt)	Right Proximal Small Saphenous Vein Depth
Rt Prox Subcl A	Right Prox Subclavian Artery
Rt Prox Subcl A Ed	Right Prox Subclavian Artery End Diastole
Rt Prox Subcl A Ps	Right Prox Subclavian Artery Peak Systolic
Rt Prox Subclav A (Dia)	Right Prox Subclavian Artery Diameter
Rt Prox Subclav A (Dpt)	Right Prox Subclavian Artery Depth
Rt Prox Uln A	Right Proximal Ulnar Artery
Rt Prox Uln A (Dia)	Right Proximal Ulnar Artery Diameter
Rt Prox Uln A (Dpt)	Right Proximal Ulnar Artery Depth
Rt Prox Uln A Ed	Right Proximal Ulnar Artery End Diastole
Rt Prox Uln A Ps	Right Proximal Ulnar Artery Peak Systole
Rt Rad A	Right Radial Artery
Rt Rad A (Dia)	Right Radial Artery Diameter
Rt Rad A (Dpt)	Right Radial Artery Depth
Rt Rad A Ed	Right Radial Artery End Diastole
Rt Rad A Ps	Right Radial Artery Peak Systole
Rt Renal Hilum	Right Renal Hilum
Rt SFJ VCT	Right Saphenofemoral Junction Valve Closure Time
Rt Skin Thickness	Right Testicle Skin Thickness
Rt SLV VCT	Right Soleal Vein Valve Closure Time

Measurement/Calculation	Explanation
Rt SSV/Pop Jct (Dia)	Right Small Saphenous Vein/Popliteal Junction Diameter
Rt SSV/Pop Jct (Dpt)	Right Small Saphenous Vein/Popliteal Junction Depth
Rt Subclav A	Right Subclavian Artery
Rt Subclav A (Dia)	Right Subclavian Artery Diameter
Rt Subclav A (Dpt)	Right Subclavian Artery Depth
Rt Subclav A Ed	Right Subclavian Artery End Diastole
Rt Subclav A Ps	Right Subclavian Artery Peak Systole
Rt SUP Segmental RA	Right Superior Segmental Renal Artery
Rt Testicle H	Right Testicle Height
Rt Testicle L	Right Testicle Length
Rt Testicle V	Right Testicle Volume
Rt Testicle W	Right Testicle Width
Rt Uln A	Right Ulnar Artery
Rt Uln A (Dia)	Right Ulnar Artery Diameter
Rt Uln A (Dpt)	Right Ulnar Artery Depth
Rt Uln A Ed	Right Ulnar Artery End Diastole
Rt Uln A Ps	Right Ulnar Artery Peak Systole
Rt Uterine A	Right Maternal Uterine Artery
Rt Vertebral A	Right Vertebral Artery
Rt Vertebral A Ed	Right Vertebral Artery End Diastole
Rt Vertebral A Ps	Right Vertebral Artery Peak Systole
RUQ - AFI	Right Upper Quadrant Amniotic Fluid Index
RVDd	Right Ventricle Diameter Diastole
RVSP	Right Ventricle Systolic Pressure
Seminal Vesicles	Seminal Vesicles Outline
SI	Stroke Volume Index
SI Single Plane	Stroke Volume Index Single Plane
SMA	Superior Mesenteric A
SMA Ed	Superior Mesenteric A End Diastole
SMA Ps	Superior Mesenteric A Peak Systole
SMV	Sup Mesenteric Vein
SMV Ed	Sup Mesenteric Vein End Systole

Measurement/Calculation	Explanation
SMV Ps	Sup Mesenteric Vein Peak Systole
Spleen H	Spleen Height
Spleen L	Spleen Length
Spleen V L*H*W	Spleen Volume Length * Height * Width
Spleen W	Spleen Width
Splenic A	Splenic Artery
Splenic A Ed	Splenic Artery End Diastole
Splenic A Ps	Splenic Artery Peak Systole
Splenic V	Splenic Vein
Splenic V Ed	Splenic Vein End Diastole
Splenic V Ps	Splenic Vein Peak Systole
Strain Ratio	General Strain Ratio Tool
TAPSE	Tricuspid Annular Plane Systolic Excursion
Tibia	Tibia
Ulna	Ulna
Umb A	Umbilical Artery
Urethra	Urethra Outline
Uterus H	Uterus Height
Uterus L	Uterus Length
Uterus V L*H*W	Uterus Volume Length * Height * Width
Uterus W	Uterus Width
Velocity	Velocity
VF Auto	Volume Flow Auto Doppler
VF Dist	Volume Flow Distance
Volume	General Volume Tool using Ellipse/3 distances
Volume Flow	General Volume Flow Tool
Width	Width
Yolk Sac	Yolk Sac

Appendix C

Setting Up and Customizing Your System

The bkSpecto includes default setups that were created to optimize the ultrasound images and make it easy for you to use the different transducers, Exam Types, and presets. You can customize the system so that it is easy to enter and select exactly the information you need.



Figure C-1. The Settings screen.

In the Settings screen, you can select to customize the following:

- **System** for Header, Display, Patient Data, Localization, and Video Out.
- **Presets** with a list of available presets, default presets and the possibility to manage them.
- **Measure & Calc** for general measurement settings, assignment of calculation packages to presets, results, and preferences.
- **OB/Gyn** for preferred settings in these exam types.
- **Labeling** to assign new labels and bodymarks to presets, and to adjust the position of needle guides.
- **Configure Layout** to configure the button layout for exam type and imaging mode.
- **Store/Network** for storing and clip capture preferences, printer connections, DICOM/PACS connections, Wi-Fi, and network connection.
- **Security** for system administrators only. Select password protection and login/logout preferences. User manager window.
- **3D - 4D**
- **Service** for import/export and restoring settings, system and transducer licenses, system information, and third party licenses.

You can navigate the windows using a scroll bar and swiping. When you can swipe, dots will appear at the bottom center of the window to indicate this.

System Window

Header Tab

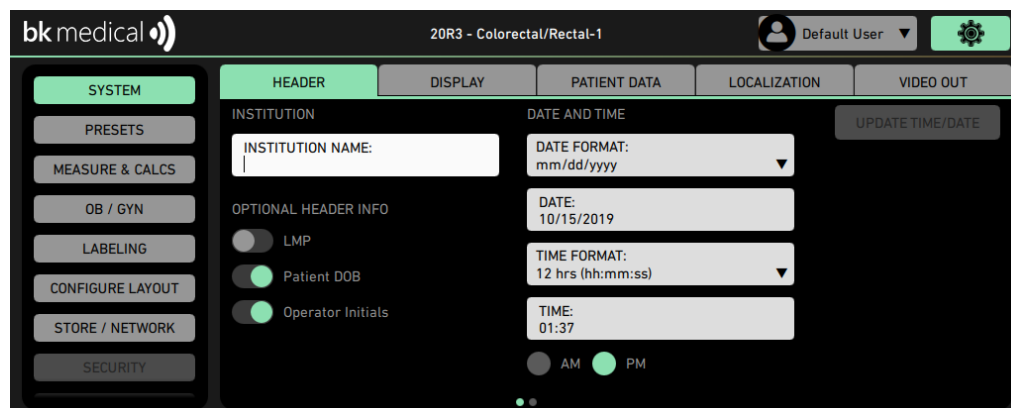


Figure C-2. System Header tab.

Institution information is displayed above the transducer name at the top of the monitor and included in documents archived to a DICOM system. On the **Header** tab, you can:

- Type in your institution name.
- Select date format, date, and time format.
- Decide if you want to add **Optional Header Info**.
- Swipe forward to add a logo for your institution.

Display Tab

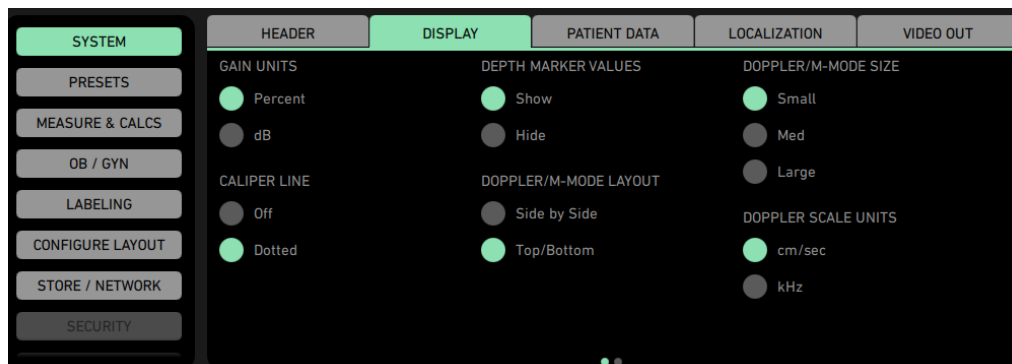


Figure C-3. System Display tab - first view.



Figure C-4. System Display tab - swiped forward.

On the **Display** tab, there are several options for customizing your touchscreen and monitor. Use the radio buttons, slide buttons and dropdown menus to adjust the system to your preferences. **Auto Freeze** activates or deactivates the screensaver. You can set the time before the screensaver is activated in **Auto Freeze Time**.

Patient Data Tab

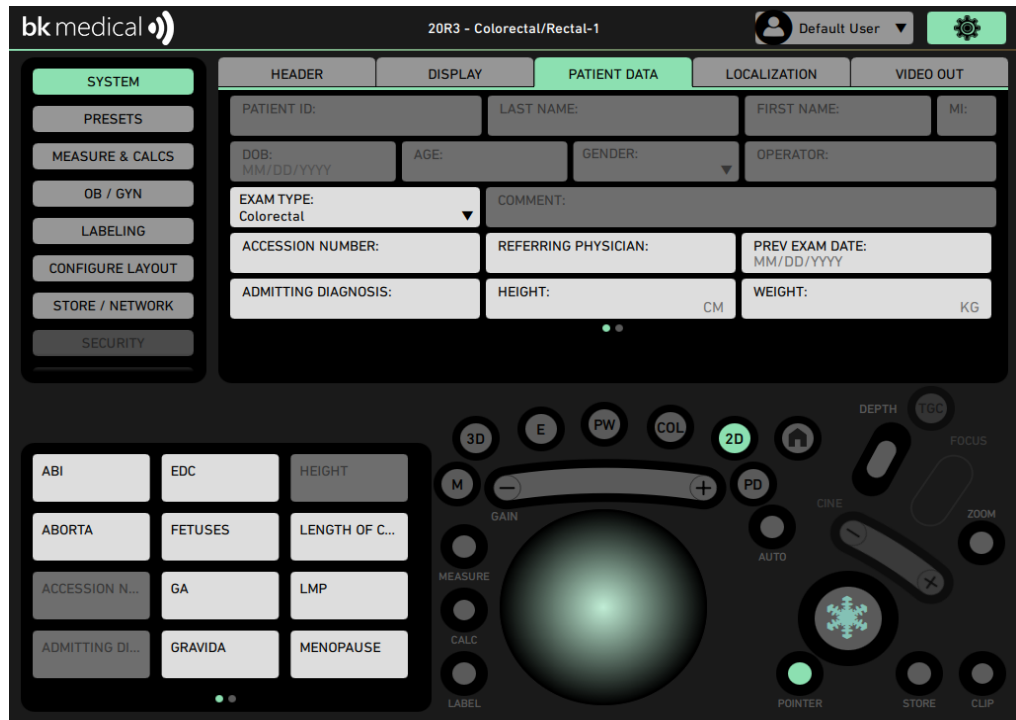


Figure C-5. System Patient Data tab - swipe to display more empty fields.

On the **Patient Data** tab, you can add more fields to the **Patient Details** window.

- 1 Swipe the bottom part of the tab to get to the empty fields marked with +.
- 2 Add a field from the input area by dragging it to the empty field marked with a + below **Exam Type**.

The fields will be displayed next time you tap the **Patient Details** window.

LocalizationTab

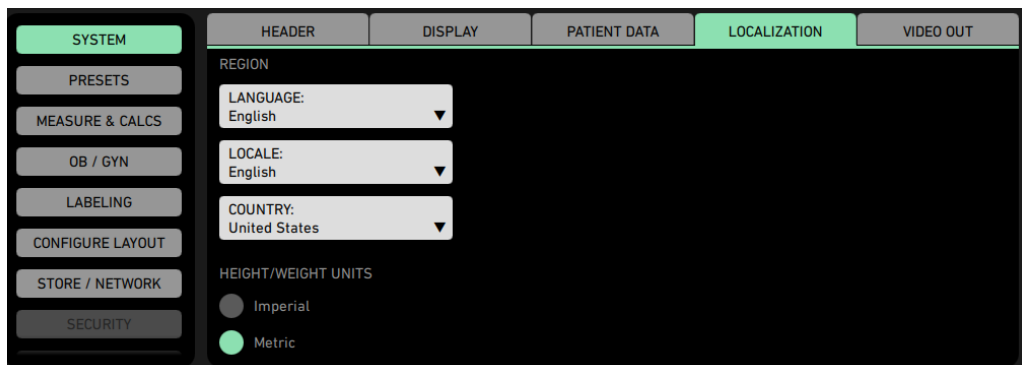


Figure C-6. System Localization tab

On the **Localization** tab, you can adjust language and location settings. Note that changes to these settings requires a restart of the system to take effect.

Video Out Tab

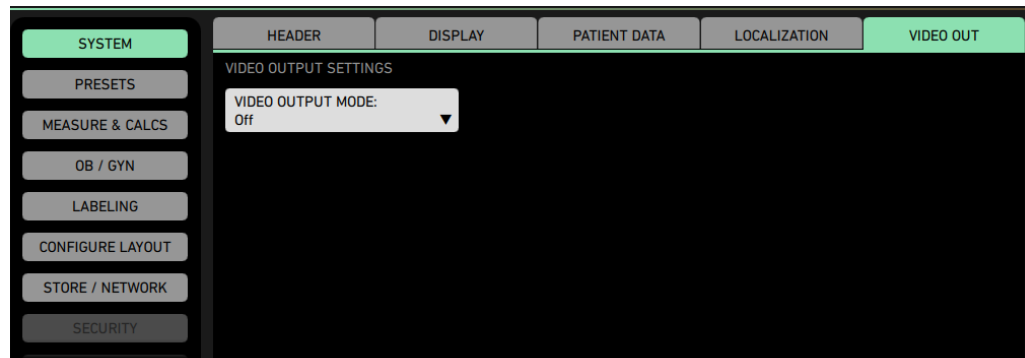


Figure C-7. System Video Out window.

On the **Video Out** tab, you can select **Video Output Settings**.

Preset Window

Available Tab

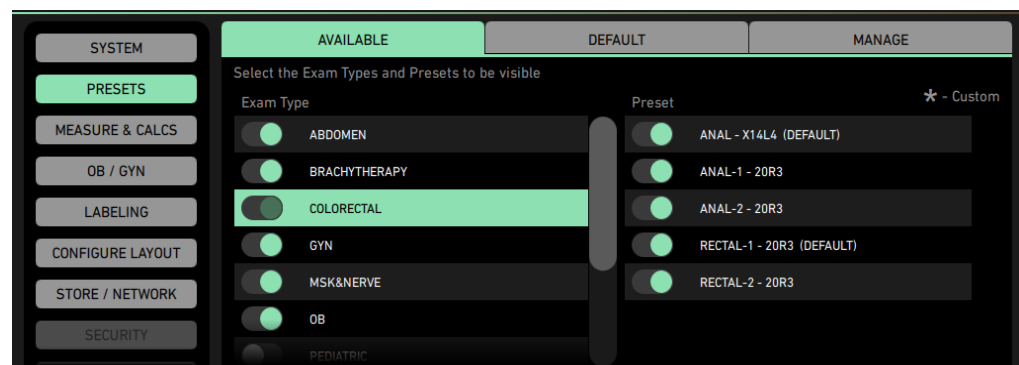


Figure C-8. Available presets.

The **Available** tab shows the presets available for the selected **Exam Type**. Use the toggle buttons to select which **Exam Types** and **Presets** should be visible.

Default Tab

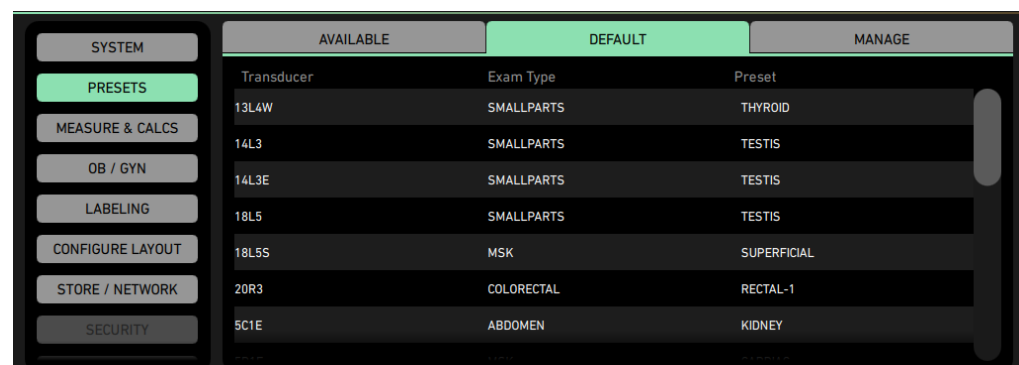


Figure C-9. Default presets.

The **Default** tab shows the default presets for the individual transducers.

Manage Tab

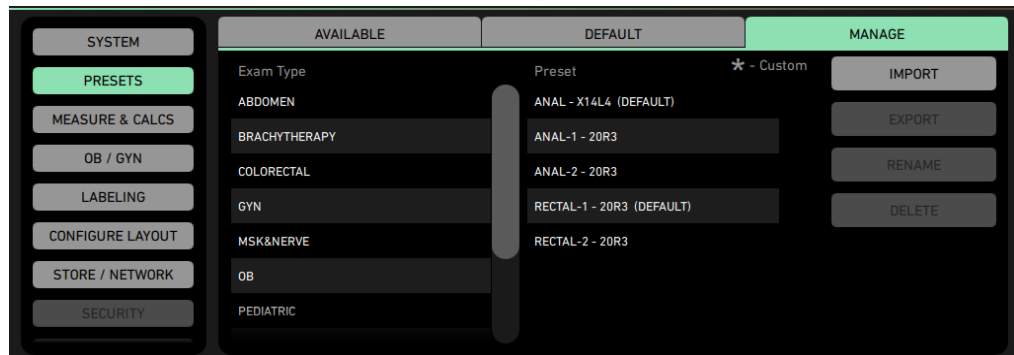


Figure C-10. Manage presets.

On this tab you can import and export, rename, and delete presets.

Measure & Calc Window

General Tab

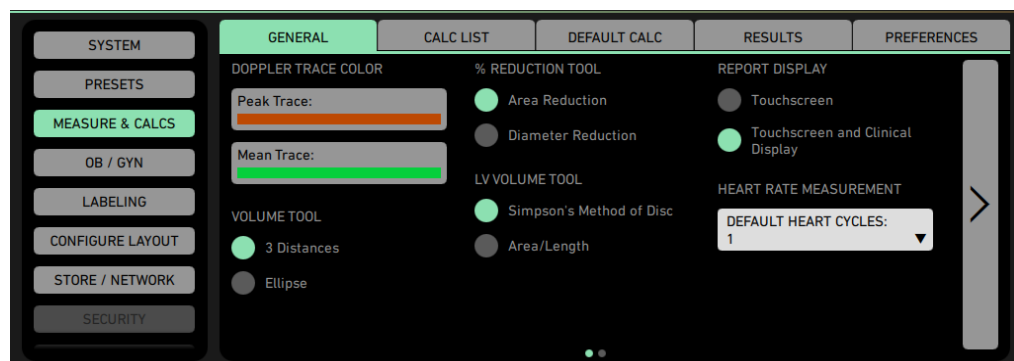


Figure C-11. Measure & Calcs General tab.

On the **General** tab, you can,

- Select **Doppler Trace Color** scheme for Peak Trace and Mean Trace.
- Use the radio buttons to decide the behavior of the **Volume Tool**, the **%Reduction Tool**, the **LV Volume Tool** and how the **Report** should be displayed.
- Set **Default Heart Cycles** on the dropdown menu.
- Swipe to use the radio buttons to adjust **Distance Units**.

Calc List Tab

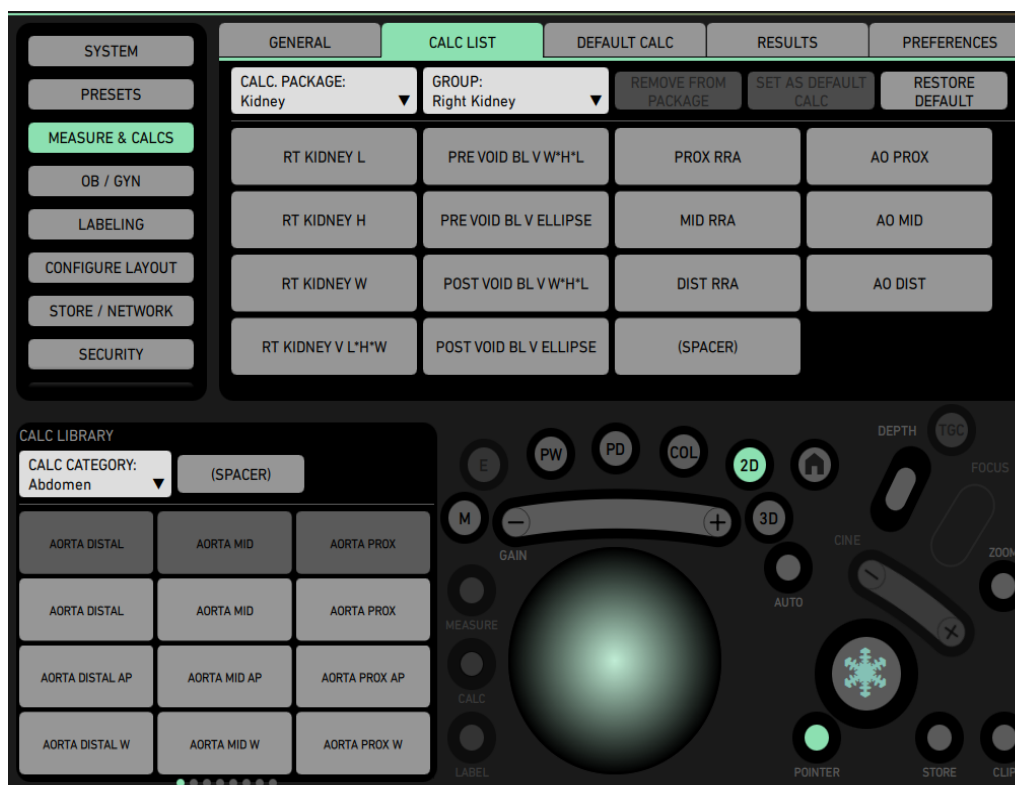


Figure C-12. Measure & Calcs, Calc list tab.

On the **Calc List** tab, you can customize your selected calculation packages to fit your needs, and you can select a default calculation to start whenever you tap **Freeze**.

To add a calculation to this Calc. Package:

- 1 In **Calc Library**, select **Calc Category**.
- 2 Tap the calculation you want to add. It will be added immediately to the right of the existing calculations. If the first page is already full, a new page will be added.
- 3 If you want to add space between the default calculations and the ones you are adding, tap **(Spacer)**. This will result in an empty area on the screen, the size of which is dependent on how many spacers you add.

To remove a calculation from this Calc. Package:

- 1 Tap the calculation you want to remove. It will turn green, and the buttons **Remove from Package** and **Set as Default Calc** will be active.
- 2 Tap **Remove from Package**.

To restore default calculations:

- Tap **Restore Default**.

To set a default calculation to start at Freeze:

- 1 In the **Calc. Package**, select the calculation you want to start every time you tap **Freeze**. The calculation will turn green.

- 2 Tap **Set as Default Calc**. The calculation will have a checkmark added to it, and next time you tap **Freeze**, this calculation will start.

NOTE: You must have selected **Activate Calc on Freeze** on the **Behavior** tab of your **User Preferences** to have the default calculation start when you tap **Freeze**. See “**User Preferences, Behavior tab**” on page 27.

Default Calc Tab

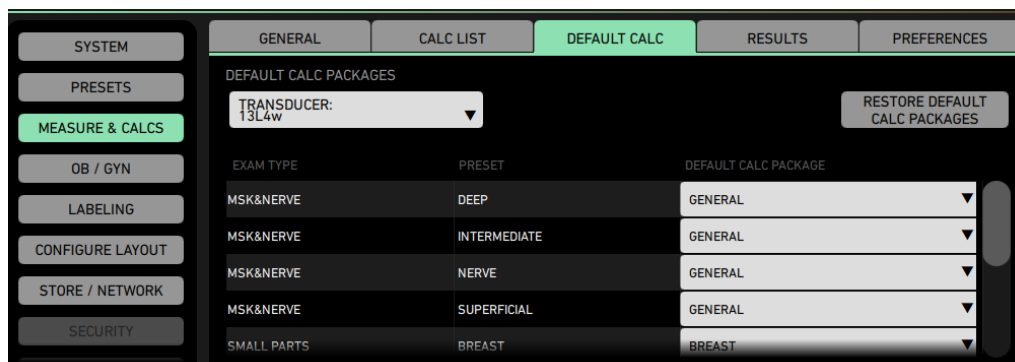


Figure C-13. Measure & Calcs, Default Calc tab

On the **Default Calc** tab, you can see the **Default Calc Packages** for the individual transducers, their exam types and presets.

To change Default Calc Package:

- 1 Select transducer on the dropdown menu.
- 2 Select **Exam Type** and **Preset**.
- 3 On the dropdown menu **Default Calc Package**, select the calculation package you want.

You can restore all defaults by tapping the **Restore Default Calc Packages** button.

Results Tab

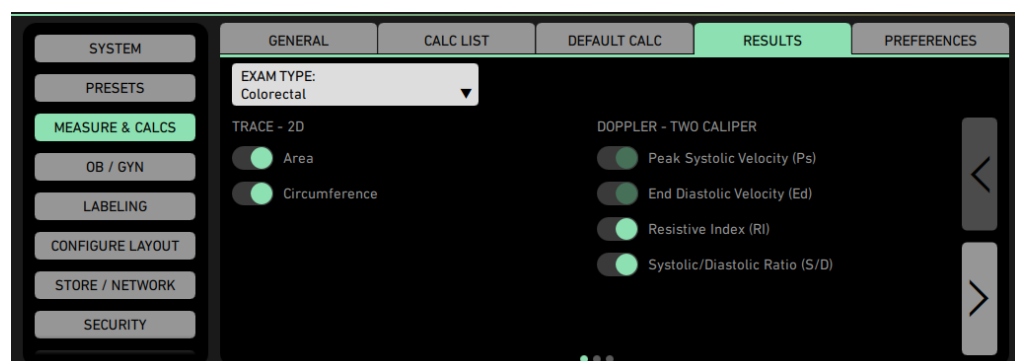


Figure C-14. Measure & Calcs. Results tab.

On the **Results** tab, you can select which results will be displayed when you do the different measurements. Note that you can only change the results when the toggle buttons are highlighted. Use the dropdown to select **Exam Type** and swipe the tab to see all results.

Preferences Tab

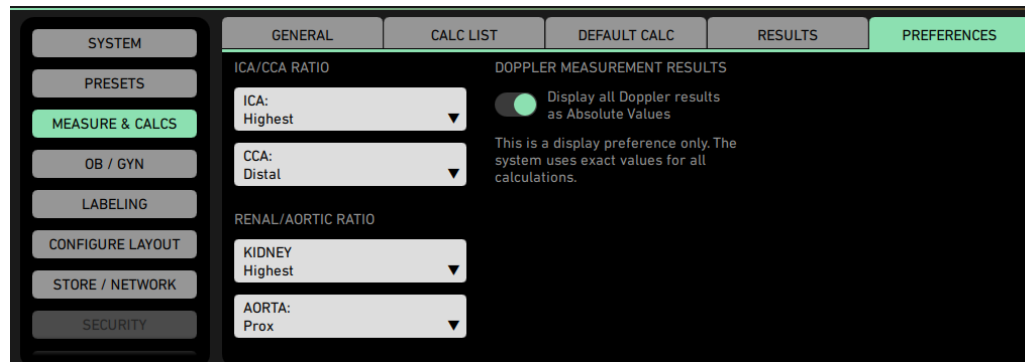


Figure C-15. The Measure & Calcs Preferences tab.

On the **Preferences** tab, you can use the dropdowns to select the **ICA/CCA Ratio**, **Renal/Aortic Ratio** and decide if you want to see all Doppler results on the monitor in absolute values.

OB/Gyn Window

Preferences tab



Figure C-16. The OB/GYN Preferences tab

On the **Preferences** tab, you can use the dropdowns to select your preferred **Measurement Tools** and decide which **Follicle** and **GS** measurement method you want to use.

Authors tab

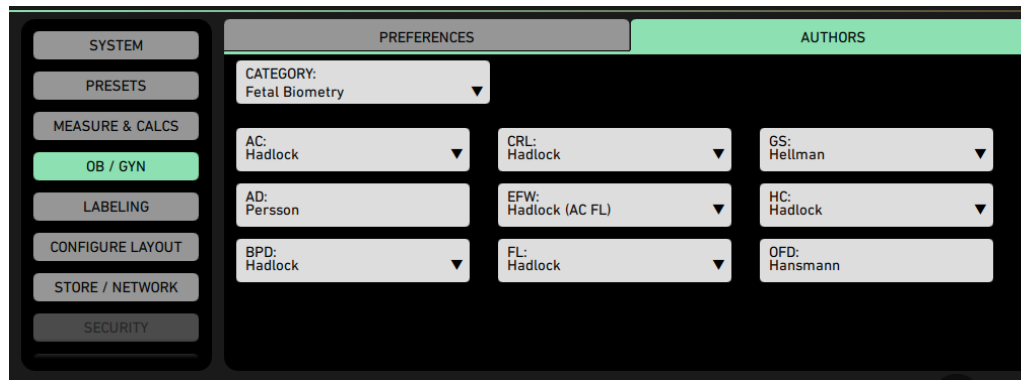


Figure C-17. The OB/GYN Authors tab

On the **Authors** tab, you can use the dropdowns to select between **Fetal Biometry** and **Growth Curves** under **Category**, and then decide which author you prefer for the calculations.

Labeling Window

Labels Tab

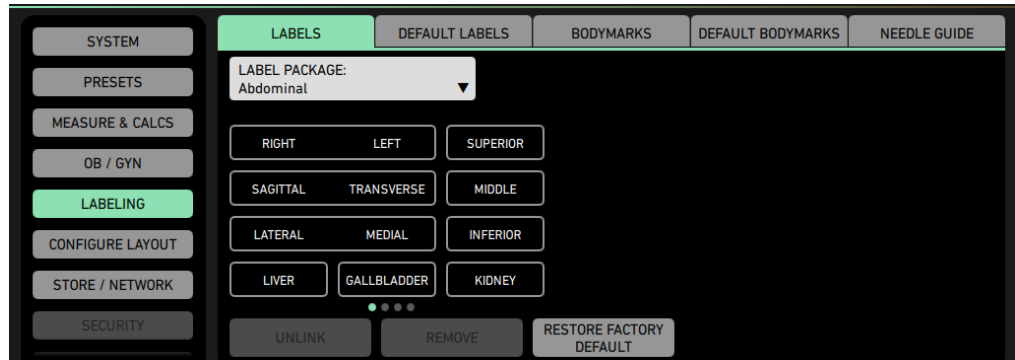


Figure C-18. The Labels tab.

On the **Labels** tab, you can do the following for each **Label Package**:

- Add your own labels. Swipe to the end of the custom labels, tap **+Add** and type in the label using the keyboard.
- Link labels. Press and hold a button and drag onto another button. To remove the link, tap **Unlink**.
- Remove labels you don't need. Tap the label to highlight it and then tap **Remove**.
- To restore factory defaults, tap **Restore Factory Default**. You will be asked to confirm your choice.

Default Labels Tab

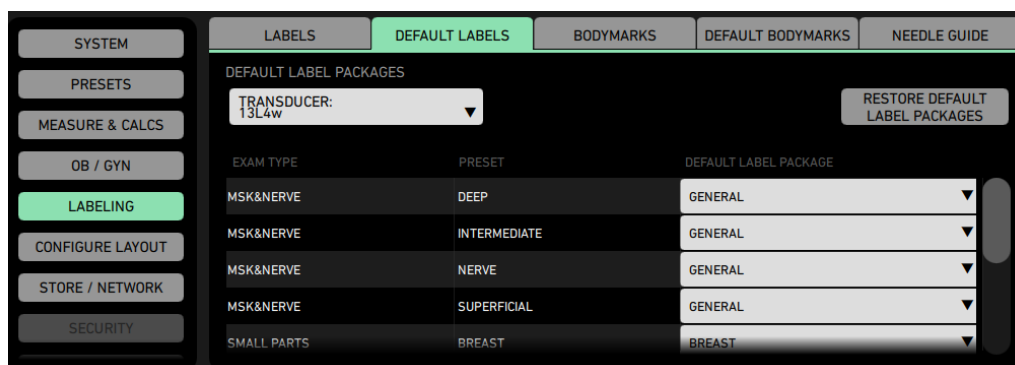


Figure C-19. The Labeling Default Labels tab.

On the **Default Labels** tab, you can see the **Default Label Packages** for the individual transducers, their exam types and presets.

To change Default Label Package:

- 1 Select transducer on the dropdown menu.
- 2 Select **Exam Type** and **Preset**.
- 3 On the dropdown menu **Default Label Package**, select the label package you want.

You can restore all defaults by tapping the **Restore Default Label Packages** button.

Bodymarks Tab

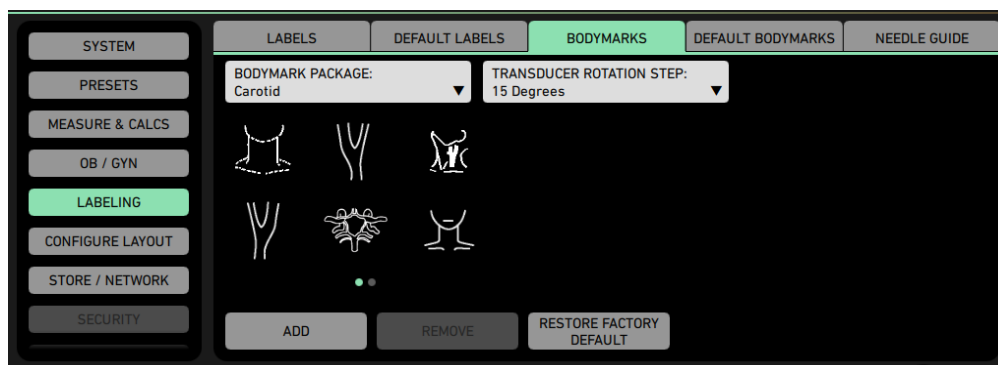


Figure C-20. The Labeling Bodymarks tab.

On the **Bodymarks** tab, you can do the following for each **Bodymark Package**:

- Decide the degree of rotation of the imaging plane indicator on the bodymark on the **Transducer Rotation Step** dropdown. See “Adjusting the Imaging Plane Indicator” on page 50
- Add bodymarks from all categories, if you feel you need more than the default images in your **Bodymark Package**. Tap **Add** to get a selection window with all available bodymarks, select the bodymarks you want to add and tap **Add**.
- Remove bodymarks you don't need. Select the bodymark and tap **Remove**.
- To restore factory defaults, tap **Restore Factory Default**. You will be asked to confirm your choice.

Default Bodymarks Tab

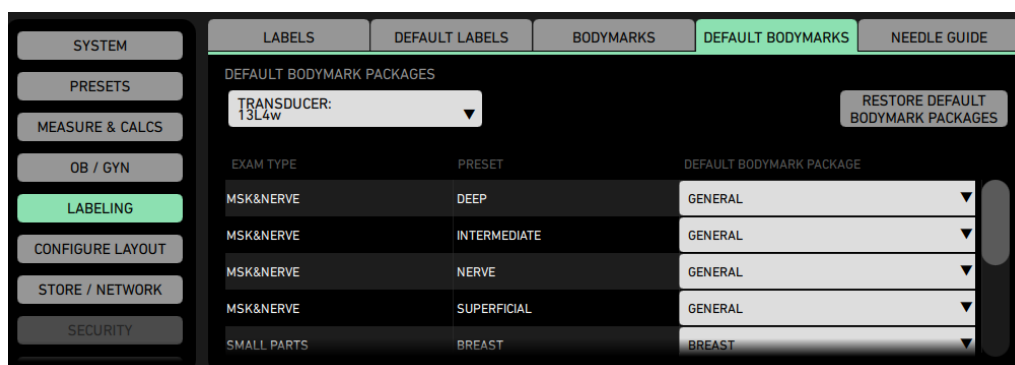


Figure C-21. The Labeling Default Bodymarks tab.

On the **Default Bodymarks** tab, you can see the **Default Bodymark Packages** for the individual transducers, their exam types and presets.

To change Default Bodymark Package:

- 1 Select transducer on the dropdown menu.
- 2 Select **Exam Type** and **Preset**.
- 3 On the dropdown menu **Default Bodymark Package**, select the bodymark package you want.

You can restore all defaults by tapping the **Restore Default Bodymark Packages** button.

Needle Guide Tab

Tapping the **Open Needle Guide** button opens the **Needle Guide** window on the monitor.

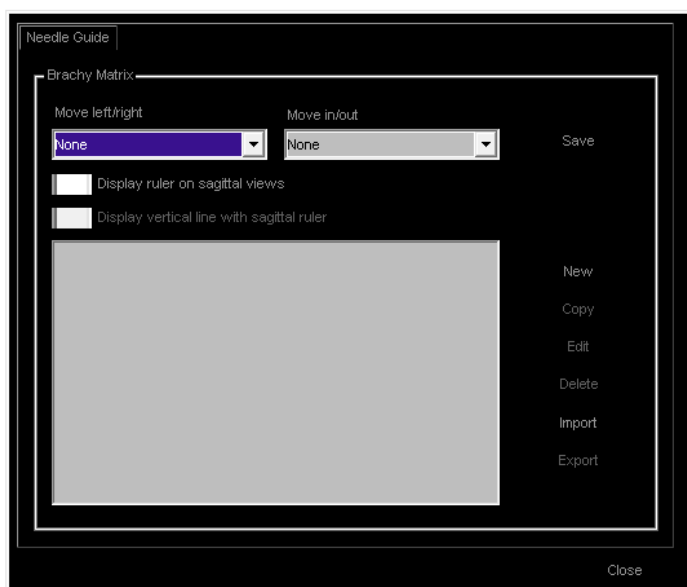


Figure C-22. Needle Guide window on monitor with Brachy Matrix setup.

In the **Brachy Matrix** setup window, you make setup changes to brachy matrices and needle guides. You can:

- Move a programmable brachy matrix or needle guide left, right, in or out.
- Specify that a brachy ruler is displayed on a sagittal view (E14CL4b transducer)
- Define your own brachy matrix and ruler.

To move the offset in either direction:

- Select the offset you want from the dropdown menu and tap **Save**.

Use the trackpad and pointer to navigate the Needle Guide window.

To have a vertical line displayed at the 0 of the brachy ruler:

- Check the **Display ruler on sagittal views** checkbox and tap **Save**.

User-Defined Matrices (including Brachy and Transperineal)

User-defined matrices are listed in the lower part of the **Brachy Matrix Setup** window (Fig C-22).

You have the following options for user-defined matrices:

Option	What it does
New	Opens the User-Defined Matrix Wizard so you can define a new matrix.
Copy	Creates a new user-defined matrix as a copy of the currently selected matrix. The name of the new matrix is the name of the existing matrix plus an index number. You can then edit the copy to create a new user-defined matrix.
Edit	Opens the Measurement Definition Wizard so you can edit the selected user-defined brachy matrix.
Delete	Deletes the selected user-defined matrix. You are asked to confirm the deletion.
Import	Imports a matrix from an external storage device. If the system already has a matrix with the same name as the matrix you want to import, the imported matrix will be renamed to the matrix name plus an index number.
Export	Exports the selected matrices to an external storage device.

Table C-1. Options in the Brachy Matrix Setup window.

Using the User-Defined Matrix Wizard

To define a new matrix or edit an existing user-defined matrix:

- 1** In the **Brachy Matrix Setup** window, tap **New**, or select an existing measurement and tap **Edit**.

The following window appears:

General Matrix Information

Transducer Type: E14CL4b

Matrix Name: MyBrachyMatrix

< Back Next > Cancel

2 Select the transducer that the matrix will be used with, and name the matrix. Tap **Next**.

Transverse Matrix - Dimensions

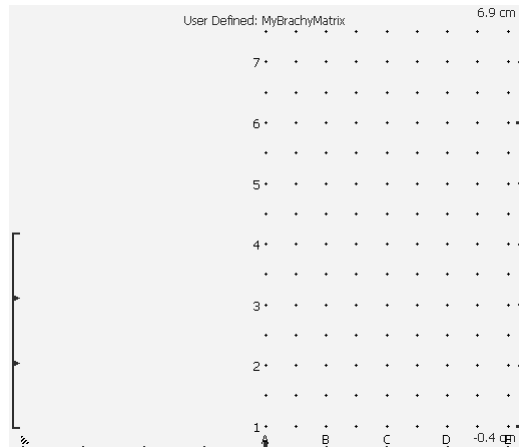
Width in mm	Horizontal holes/cm	Horizontal offset in mm
70	2	0
Height in mm	Vertical holes/cm	Vertical offset in mm
70	2	0

Columns: 15
Rows: 15
Column spacing: 5.00 mm
Row spacing: 5.00 mm

< Back Next > Cancel

3 Enter the width and height of the matrix, the horizontal and vertical spacing between holes (holes per cm), and the horizontal and vertical offset of the matrix.

The system calculates the number of rows and columns and the hole spacing in each direction. Tap **OK** when cautions about this appear on the touchscreen. When the both offsets are 0, the matrix looks like this:



Assuming that the transducer is at the bottom of the image, positive offsets move the matrix to the right or up, negative offsets move it to the left or down.

4 Tap Next.

Row	Column
1	A
2	B
3	C
4	D
5	E
6	F

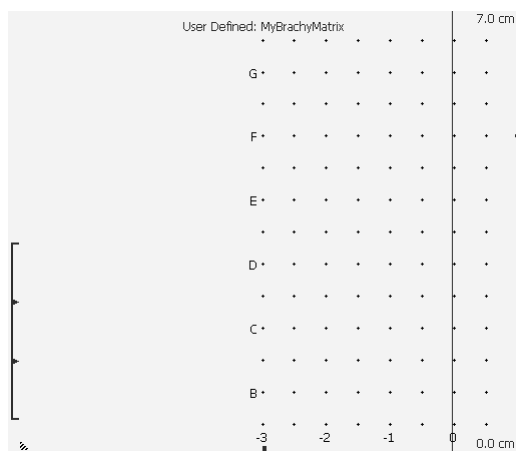
5 Select the symbols (Marker type) and color (tap the box) that will be used for the matrix. If you check **Display labels, you can enter names for the rows and columns. Tap **Next**.**

Width in mm: 70 Horizontal holes/cm: 2 Horizontal offset in mm: 0

Height in mm: 70 Vertical holes/cm: 2 Vertical offset in mm: 0

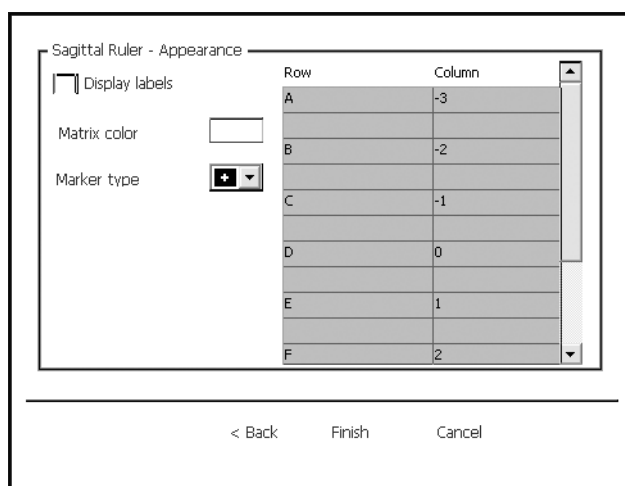
Columns: 15
Rows: 15
Column spacing: 5.00 mm
Row spacing: 5.00 mm

- 6** Enter the width and height of the ruler, the horizontal and vertical spacing between markers (holes/cm) and the horizontal and vertical offset of the ruler. The system calculates the number of rows and columns and the hole spacing in each direction. When the both offsets are 0, the matrix looks like this:



Assuming that the transducer is at the bottom of the image, positive offsets move the matrix to the right or up, negative offsets move it to the left or down.

Tap **Next**.



- 7** Select the symbols (**Marker type**) and color (tap the box) that will be used for the ruler. If you check **Display labels**, you can enter names for the rows and columns.

NOTE: If you want to be able to have a vertical line displayed at the 0 of the brachy ruler (see page 269), you must name one of the columns "0".

- 8** Tap **Finish**.

NOTE: You must disconnect and reconnect the transducer for the changes to take effect.

Matrix Alignment and Calibration

NOTE: The best accuracy that can be expected is a 3 mm deviation.

Check the alignment of a reusable needle guide or transperineal biopsy matrix if you have any reason to suspect that it has been damaged. BK recommends that you check them once a month, or more often in case of heavy use.

To check the alignment of puncture guides and matrices:

- 1 Fill a suitable tank with saline. The concentration of the saline depends on the room temperature. It should be 4% NaCl at 25 °C (77 °F) and 5% NaCl at 20 °C (68 °F).
- 2 Assemble the needle guide (or brachy stepper and grid) and attach it to the transducer.
- 3 Turn on the system and connect the transducer.
- 4 Immerse the transducer tip in the saline.
- 5 Start imaging to produce an image on the monitor.
- 6 Tap **Biopsy** on the control panel to superimpose the puncture line or matrix on the monitor image.
- 7 Insert a needle through the puncture guide or grid.
- 8 Watch the image of the needle tip and measure its deviation from the puncture line or matrix point shown on the monitor.
- 9 Decide whether the accuracy is acceptable.
- 10 If the accuracy is not acceptable, contact your BK service representative.

To calibrate programmable matrices:

- 1 Fill a suitable tank with saline. The concentration of the saline depends on the room temperature. It should be 4% NaCl at 25 °C (77 °F) and 5% NaCl at 20 °C (68 °F).
- 2 Turn on the system and connect the transducer.
- 3 Make sure that the correct transducer type number is displayed the top of the monitor, followed by **T**, indicating that you are imaging in the transverse plane.
- 4 Press **Biopsy** on the control panel to superimpose the matrix on the monitor image.
- 5 Tap **Needle Guide** on the touch screen.
The list of needle guides appears.
- 6 Tap the matrix you want to calibrate.
- 7 Mount the transducer in the holder, by twisting the probe in, and put the transducer pin in the slot on the holder.
- 8 Then put the transducer (mounted in the holder, and with the grid attached) into the saline, making sure that the transducer arrays are fully immersed.
- 9 Verify that there is a image on the monitor, and that the image isn't frozen.
- 10 Insert a needle through hole D4 in the grid.
The needle echo appears on the monitor.
If the echo is superimposed on the dot in the matrix on the monitor, then insert a needle through B4 and F4. If the echo for the needles in these holes are also in the correct position, no further adjustment is required.
- 11 If the needle echo is not in the correct position relative to the matrix on the monitor, open the **Settings**. Tap **Labeling** and select **Needle Guide**.

- 12 Tap the **Needle Guide** button to open the **Needle Guide** window on the monitor.
- 13 Here you will be able to move the template to the right or to the left, and in and out. (In = closer to the transducer/down on the monitor; Out = farther from the transducer/up on the monitor.)
- 14 Whenever you make changes to the matrix, remember to save your settings. Then repeat the process from step 10 to verify that the needle echo is superimposed on the correct dot in the matrix.
- 15 It may be necessary to adjust the stepper as well. Consult the stepper user guide for instructions. After you adjust the stepper, use the earlier steps in this procedure to verify that the matrix is calibrated properly.

Configure Layout Window



Figure C-23. Configure Layout window.

The **Configure Layout** window lets you configure the buttons for each **Exam Type** and mode according to your needs and preferences.

To add buttons in the parameter area, do as follows:

- 1 Select **Exam Type** on the dropdown, and mode on the bar next to it.
- 2 Select which screen you want the buttons to be displayed on (1 or 2) by swiping to that screen.
- 3 Drag the buttons you want from the input area to the empty buttons (marked with a +) in the parameter area. You can move the buttons you use most frequently to the fast button area just above the mode buttons.

- 4 You can also add a mode to an empty mode button above the Gain bar. If you need to add a missing mode, and no empty mode button is available, you can drag an unwanted mode back to the input area.

The fields will be displayed next time you tap the Exam Type/mode you have configured.

To remove buttons from the parameter area:

- Drag the buttons to the input area.

To restore default configuration:

- Tap **Restore Default Configuration**. You will be asked to confirm your choice.

Store/Network Window

Store/Clip Tab

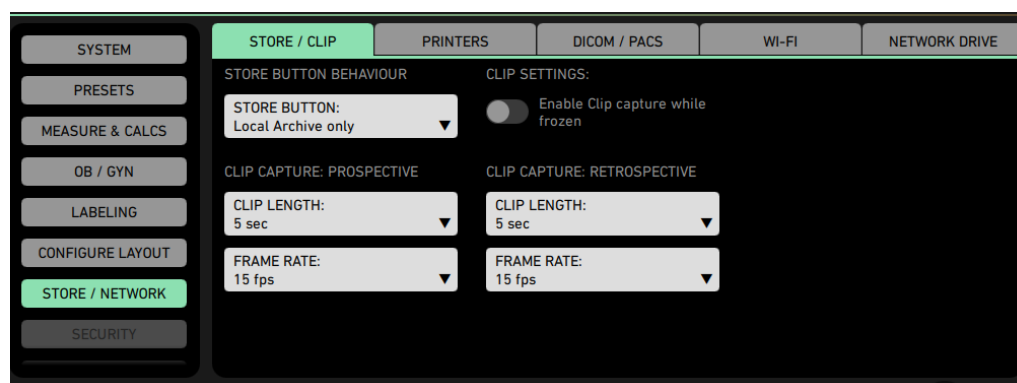


Figure C-24. Store/Clip tab.

On the **Store/Clip** tab, you can select where the images are stored and the clip length and frame rate of prospective and retrospective clips.

Use the **Store Button** dropdown to select where to store images. When storing to the **Local Archive**, you can see all data in the **Patient List**.

In **Clip Settings**, select if you want clip capture to be active when the image is frozen. This is valid for retrospective clips only.

Use the **Clip Length** and **Frame Rate** dropdowns to select these values for prospective captures (recording) or retrospective captures (capturing video clips based on the most recent cine loop).

Printers Tab

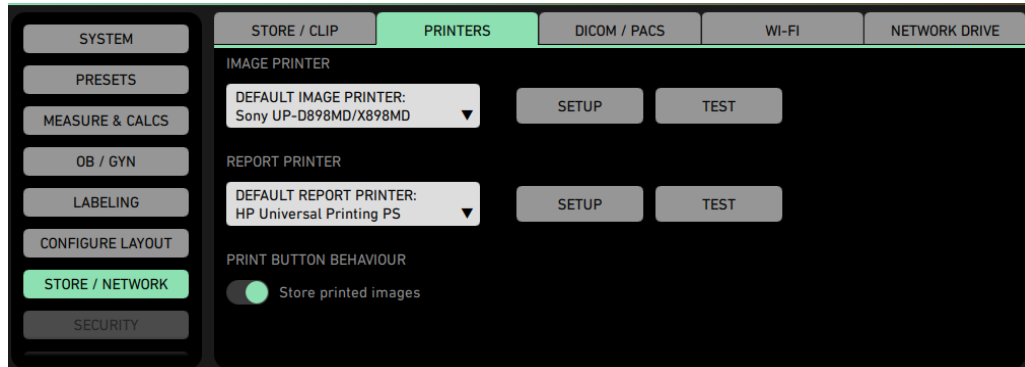


Figure C-25. Printers tab.

On the **Printers** tab, you can select and set up default printers. Use the dropdowns and the **Setup** and **Test** buttons to set up your printer.

To set up the Report Printer:

- 1 Select one of the 3 generic printer drivers and tap **Setup**. The **HP Universal Printing PS** window is displayed on the monitor.

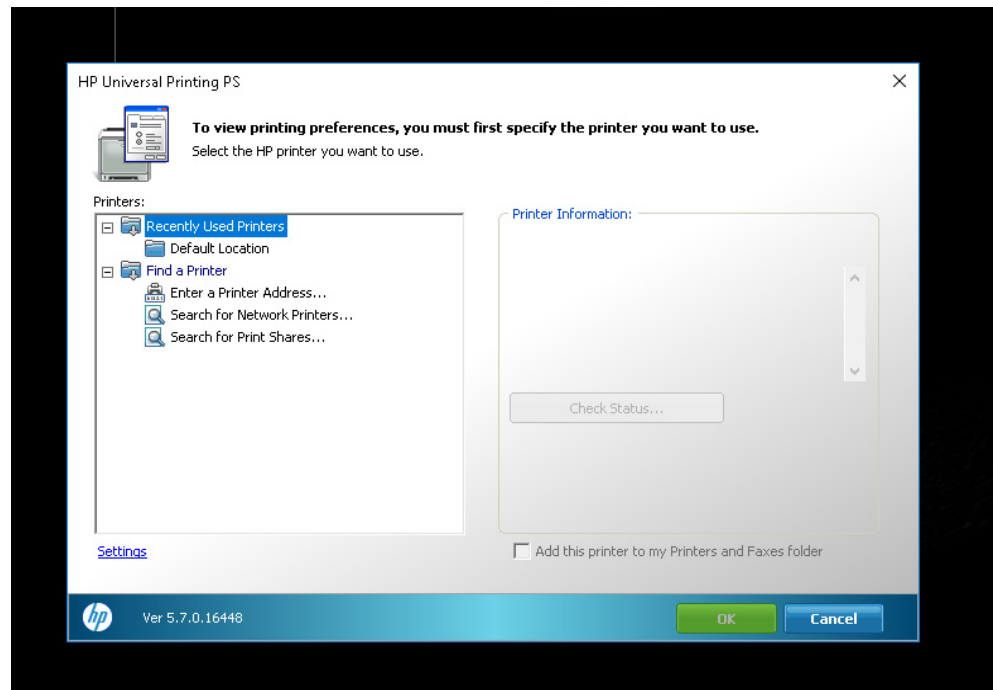


Figure C-26. The Printer Setup window

- 2 Under **Find a Printer**, use the touchpad and pointer to tap **Enter a Printer Address** and type in the IP address of the printer, or
- 3 Tap **Search for Network Printers** to connect to your favorite printer.

Use the toggle button to decide **Print Button Behavior**.

DICOM/PACS Tab

DICOM is not installed on the bkSpecto as a default. You must purchase a DICOM license from BK before a qualified service technician can install DICOM on your system. The *bkSpecto Service Manual* contains instructions for service personnel to use when setting up your DICOM system.

If DICOM is enabled on your system, you access the **DICOM** setup window via the **DICOM/PACS** tab. Tap **Configure DICOM/PACS** to open the **DICOM** window on the monitor.

NOTE: *Changing the DICOM setup can cause your system not to work properly. For example, you may be unable to print to a DICOM printer. All changes to the DICOM setup should be made by qualified service personnel only.*

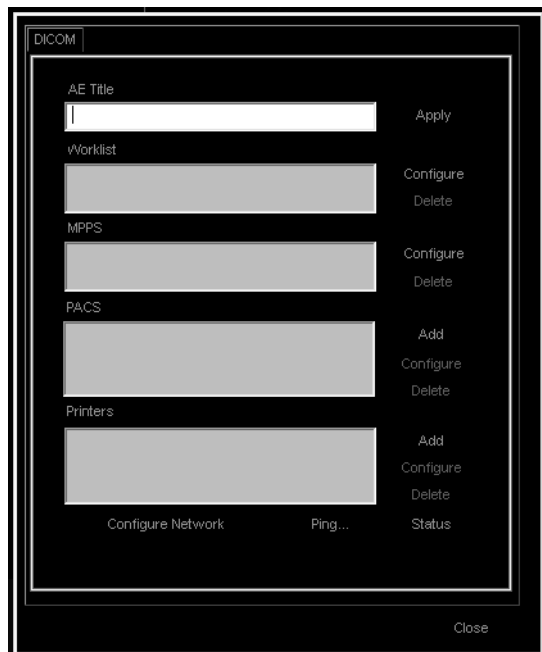


Figure C-27. DICOM window on monitor

You can open the **DICOM Status Window** by clicking **Status**.

Wi-Fi Tab

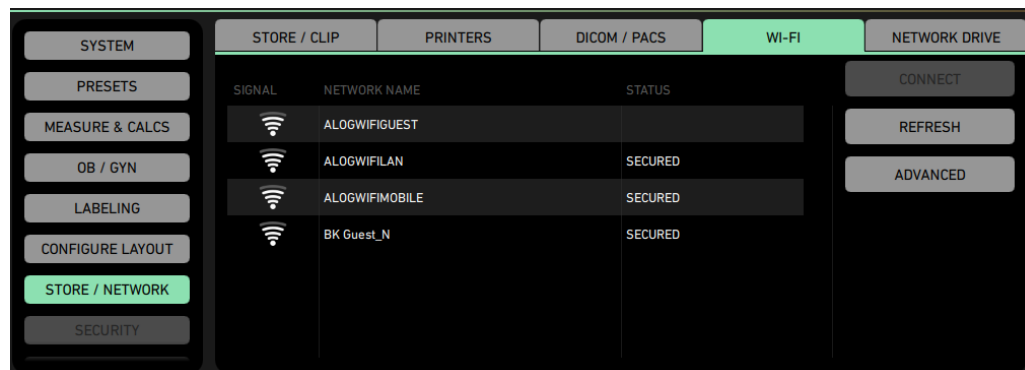


Figure C-28. Wi-Fi tab.

Do as follows to connect to a Wi-Fi network:

- Choose the appropriate network and tap **Connect**. If you cannot find your network on the **Wi-Fi** tab, tap **Refresh**.
- Type in the password and wait for the system to connect.
- For more Wi-Fi configurations, tap **Advanced**. This option is protected by a password.

See also the section on **Wireless Networks** in the *bkSpecto User Guide*.

Network Drive

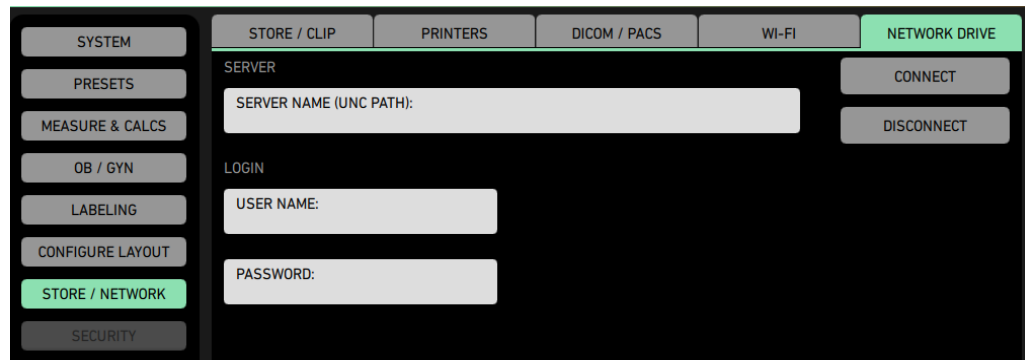


Figure C-29. Store/Network - Network Drive tab

To connect to a network drive, type in the name of your server. Then log in to the server with your user name and password and tap **Connect**.

The *bkSpecto Service Manual* contains instructions for service personnel to use when setting up your network drive.

Security Window

This window is only available to system administrators.

General Tab

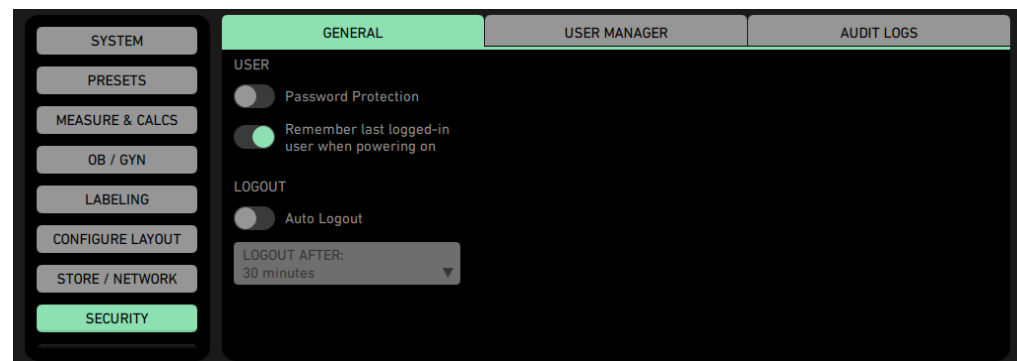


Figure C-30. Security - General tab.

On the **General** tab, you can select if the system must be password-protected, if the system should remember the last logged-in user when starting up, and if the user should be logged out automatically after a specified period.

User Manager Tab

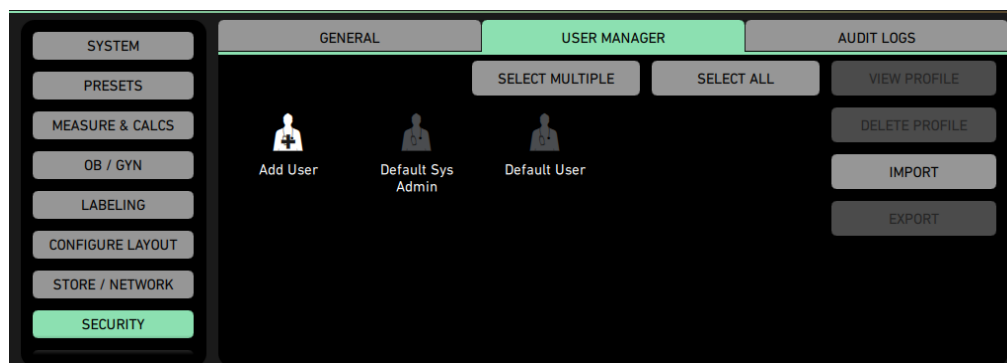


Figure C-31. Security - User Manager tab.

On the **User Manager** tab, you can create and administer users.

To create users:

- 1 Tap the **Add User** icon to add one or several users.
- 2 If relevant, apply the user profile settings of another user from the dropdown menu.
- 3 Fill in all of the columns to identify each user.
- 4 Use the toggle button to select if the users should be allowed to modify their own profiles.
- 5 Tap **Next**
- 6 Tap **Add** to create the users.

For each individual user, you must view and edit the profile in order to select specific settings for this user.

View Profile

To view and edit user profile:

- 1 Select user and tap **View Profile**.
- 2 In the **General** view, add or replace user photo.
- 3 Tap the toggle button to select if **Password required during login** should be activated.
- 4 If a password is required, type in the password according to the instructions on the screen.
- 5 Use the radio buttons to select if the user should have a **Regular Profile** or be a **System Administrator**.
- 6 Tap the toggle button to select if the user should be able to modify the profile. This does not allow the user to change a regular profile into a system administrator.

To edit User Preferences:

- In the **View Profile** window, tap **Preferences**.

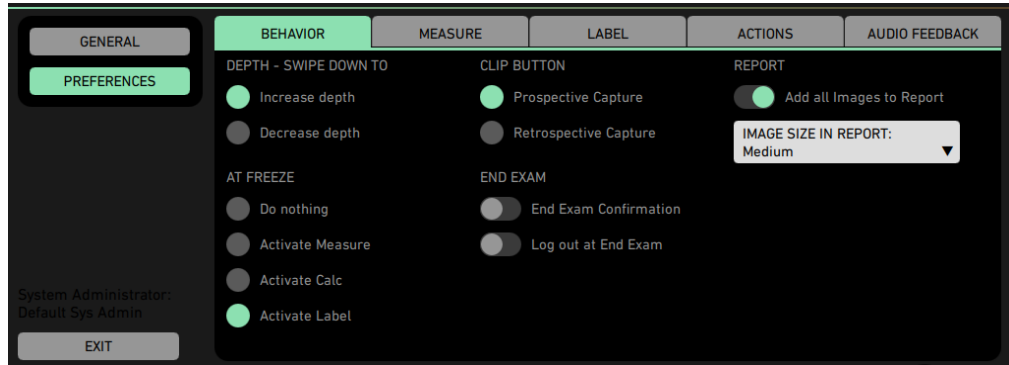


Figure C-32. User Preferences, Behavior tab

On the **Behavior** tab, you can:

- Select sliding direction on the **Depth** bar.
- Select system reaction **At Freeze**.
- Decide if the **Clip Button** should record a prospective or retrospective video clip.
- Decide if the user should receive a confirmation or be logged out at the end of the exam.
- Select if all images from the current exam should automatically be added to the **Report**, and select default size of these images.



Figure C-33. User Preferences, Measure tab.

On the **Measure** tab, you can:

- Decide how the system should react on measurement completion.

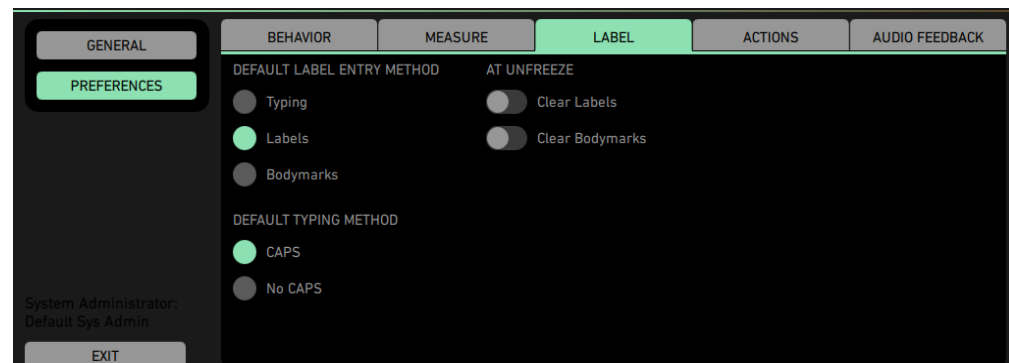


Figure C-34. User Preferences, Label tab.

On the **Label** tab, you can:

- Select which tab in the input area should be active, when the user taps **Label**.
- Decide whether typed in labels should appear in **Caps** or not.
- Select if labels or bodymarks should be cleared at Unfreeze.

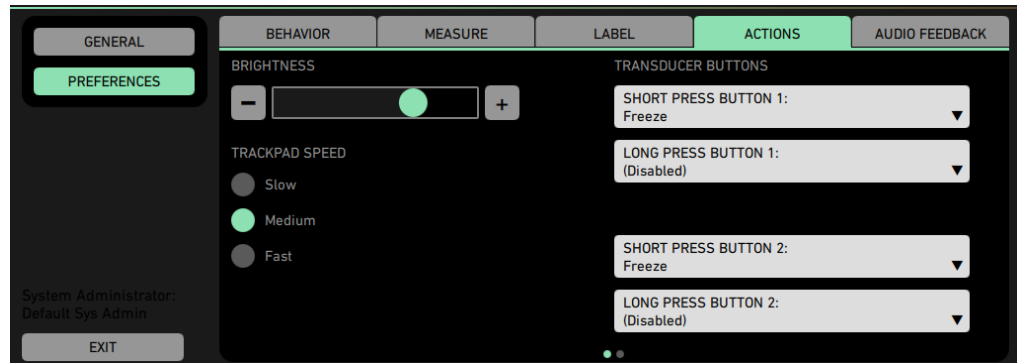


Figure C-35. User Preferences, Actions tab.

On the **Actions** tab, you can:

- Set the touchscreen **Brightness**.
- Select **Trackpad Speed**.
- Select functions for the transducer buttons on the dropdown menus.
- Swipe to select options for **Foot Pedals**.

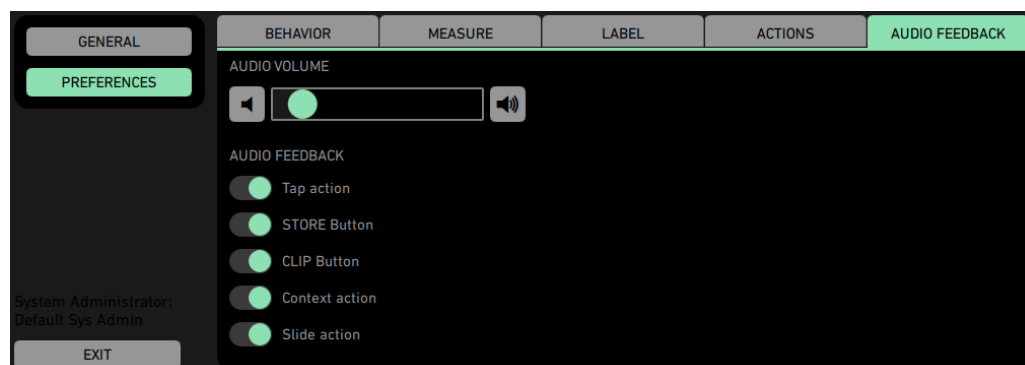


Figure C-36. User Preferences, Audio Feedback tab

On the **Audio Feedback** tab, you can:

- Set **Audio Volume**.
- Use the toggle buttons to select if the user should hear a sound when
 - tapping the touchscreen,
 - capturing an image,
 - capturing a clip,
 - using a context button, or
 - sliding a bar.

Tap **Exit** to exit **User Preferences**.

Audit Logs

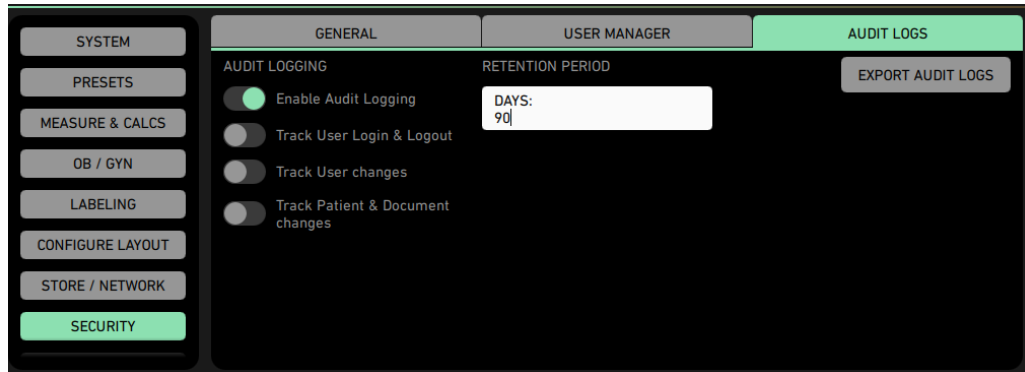


Figure C-37. Security window, Audit Logs.

Audit Logs will provide a log of basic operations on the system.

On the **Audit Logs** tab, you can:

- **Enable Audit Logging** or decide not to log.
- **Track User Login & Logout** to see how many different users are using the system.
- **Track User Changes** to see what changes users make to preferences and setup.
- **Track Patient & Document Changes** to see changes to the patient data.
- To export the audit logs, tap **Export Audit Logs**.

3D/4D

On the **3D/4D General** tab, you can decide whether the system will select the 3D region of interest marker automatically or not.

Service Window

General Tab

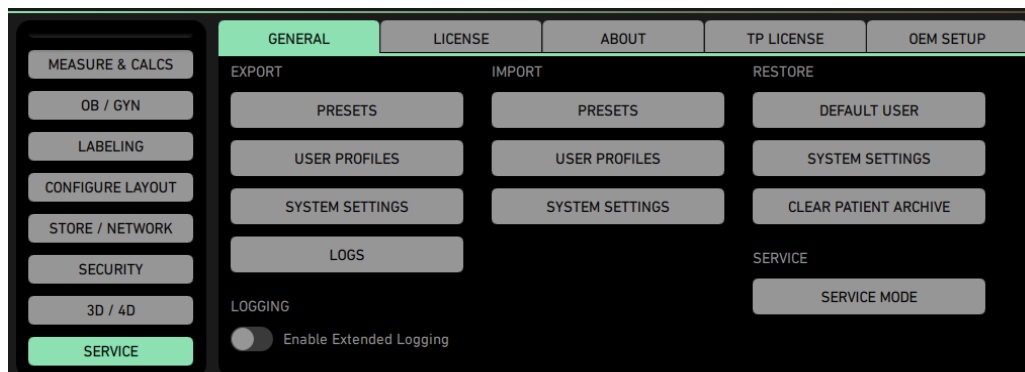


Figure C-38. Service General tab.

On the **General** tab, you can select **Enable Extended Logging**. You can also export and import **Presets**, **User Profiles** and **System Settings**, and export **Logs**. And you can restore the **Default User**, **System Settings** and **Clear the Patient Archive**.

Access **Service Mode** by tapping the button. This mode is password protected.

License Tab

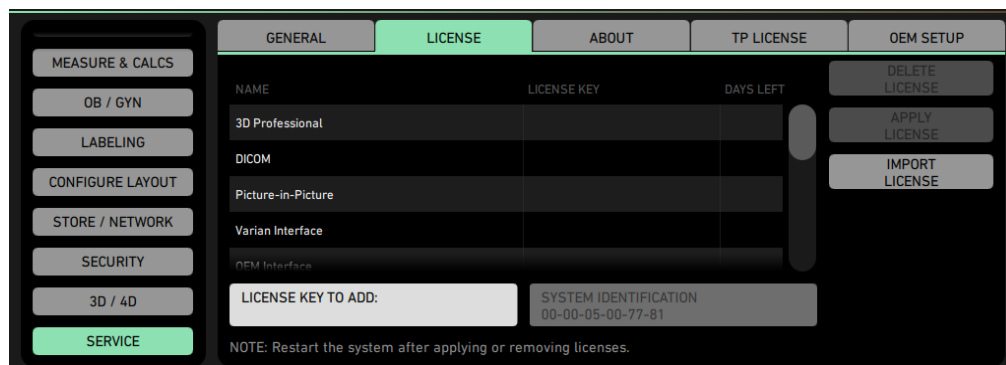


Figure C-39. The Service License tab.

On the **License** tab, you add, delete and import licenses.

To add a license:

- 1 Type in the license in the **License key to add** field.
- 2 Tap **Apply**.
- 3 Restart the system to activate the license.

To delete a license:

- Select the license you want to delete and tap **Delete**.

You must restart the system after any changes to the licenses in order for the changes to take effect.

About Tab

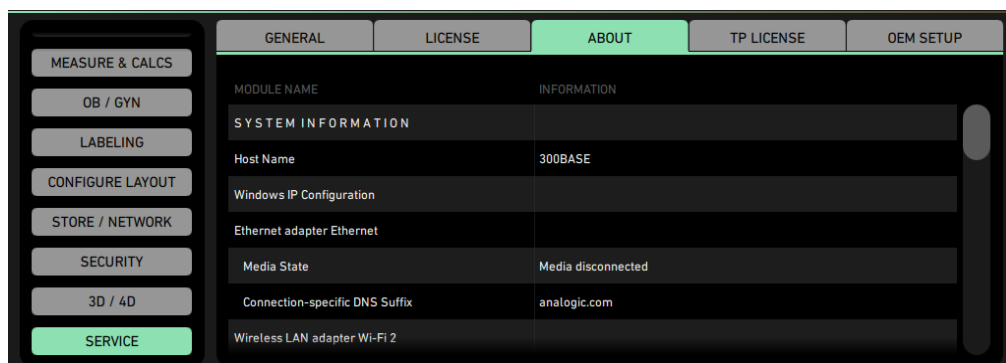


Figure C-40. Service About tab.

On the **About** tab, you will find information about e.g. the version of the installed software, which will be useful if you need service for the system.

TP Licenses Tab

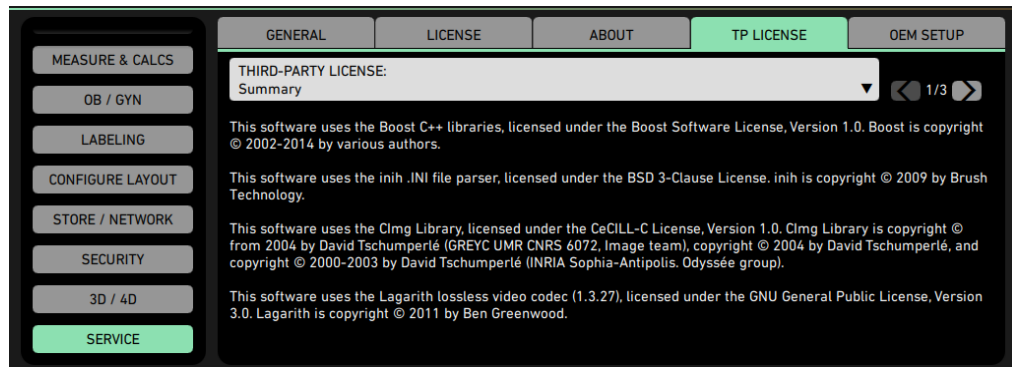


Figure C-41. Service - TP Licenses tab.

On the **TP Licenses** tab, you can see which third party licenses are used for the system installation.

OEM setup

This functionality is only available for service personnel and is protected by a password.

Index

Numerics

- 2D
 - adjusting focus position 74
 - depth 76
 - TGC 75
- 2D filter 223
- 2D images, saving 63
- 3D
 - 4-Up view 218
 - 6-Up view 218
 - accuracy 215
 - animating the volume 212
 - annotations 213
 - arrow 213
 - Brightness 211
 - Contrast 211
 - controlling transducer movement 207
 - Filter (Render setting) 215
 - Hue 211
 - imaging direction explained 210
 - imaging direction with untracked freehand 210
 - imaging modes possible with 207
 - imaging overview 208
 - introduction 207
 - label 213
 - Layout options 211
 - license 207
 - measurement warning 208
 - measurements 214
 - Opacity (Render setting) 215
 - Orientation 211
 - Photorealistic (Render setting) 215
 - Presets 211
 - Render view 215
 - ROI 209
 - ROI markers 209
 - rotating the volume 212
 - slicing the cube 212
 - Span (animation) 213
 - Speed (animation) 213
 - Thickness (Render setting) 215
 - tilting a plane 212
 - ways to view a data set 214
 - Wire Frame 211
 - Zoom 211
- 3D/4D settings 282
- 4-Up view (3D) 218
- 66810
 - Head2
 - License Tab 283
- 6-Up view (3D) 218
- 73821
 - Head2
 - General Tab 282

A

- ALARA principle 223
- aliasing, CW Doppler
 - moving baseline to overcome 88, 94
- aliasing, Doppler
 - definition 223
 - moving baseline to overcome 223
- angle correction line, drawing of 85
- archiving
 - clearing space on hard disk 69
 - password protection 68
 - to a PACS 220
- array transducer 223
- audio volume 92
- Auto (Cardiac measurement) 223
- auto freeze 259
- auto gain 75
- automatic curve tracing
 - CW Doppler 92
 - Doppler mode 86

B

- B/A (measurement) 223
- baseline
 - CW Doppler mode 88, 94
- bodymark
 - definition 48, 223
 - deleting from image 50, 105, 115, 127, 139, 152, 165, 176, 186, 201
 - on archived images and clip frames 47
 - placing on an image 49, 105, 115, 127, 138, 152, 165, 176, 185, 201
- brachy matrix
 - changing the offset 269
 - defining new 269
 - editing user-defined 269
 - in brachytherapy 118
 - options for user-defined 269
 - removing 118
 - superimposing 118
 - user-defined 119
- brachy ruler
 - displaying vertical 0 line 269, 272
 - moving 119
 - picture 119
 - user-defined 119
- brachytherapy 118
 - entering parameters in Patient window 112
 - verify that guide number is correct on monitor 103, 118, 183

C

- capturing clips 129, 167, 179
- capturing images 63
- catalog, definition 223

- cine
 - about 51
 - definition 223
 - effect of changing some parameters 51
 - image storage 51
 - in D-mode 52
 - measurement markers 52
 - measurements 52
 - turning on and off 51
- cine review 157
- color box
 - color mode 81
 - definition 223
- Color Map for VFI (illustration) 194
- color mode
 - about 80
 - color box 81
 - definition 224
- Color Square indicator for VFI 195
- combination mode 77, 224
- Compounding 224
- configure layout window 274
- copying documents
 - format 65, 66
 - selecting format 66
 - without patient ID 66
- cube (3D)
 - rotating 212
 - slicing 212
- CW Doppler 224
- CW Doppler indicator
 - on B-mode image 91
- CW Doppler line
 - about 92
 - picture 92
- CW Doppler mode 87, 94
 - aliasing 88, 94
 - audio volume 92
 - automatic curve tracing 92
 - baseline 88, 94
 - Doppler trace 92
 - gain 93
 - invert 88, 94
 - MI 91
 - sweep speed 94
 - switching between live B-mode and 91
 - TI 91
 - turning off 92
 - turning on 91
 - unfreezing spectrum 91
 - wall filter 87, 94

D

- database, password protection of 69
- dcn file 219
- Dec T (measurement) 224
- deleting
 - documents 68
 - patient records 68

- depth
 - measuring 54
- DICOM
 - changing setup 277
 - filenames 219
 - format for archived images and clips 66
 - format for copied images 66
 - format for copied video clips 66
 - saving or printing to 219
 - setting up 277
 - structured reports 220
- DICOM status indicator 220
- directions 210
- distance, measuring 55
- document
 - caution about deleting 67
 - printing 71
 - saving 63
 - types 63
- document browser
 - and archiving system 67
 - images in 108, 120, 129, 143, 157, 167, 179, 188, 203
- documents
 - copying to a CD or USB storage device 66
 - deleting 68
- Doppler gate
 - moving 86
 - picture 85
 - resizing 86
- Doppler indicator
 - on 2D-mode image 84, 125, 136, 149, 163, 173, 193
 - picture 85
- Doppler line, picture 85
- Doppler mode
 - aliasing 223
 - automatic curve tracing 86
 - definition 225
 - Doppler trace 86
 - gain 87
 - HPRF 86
 - sample volume 85
 - sweep speed 88
 - turning off 85
 - turning on 84, 125, 136, 149, 163, 173, 193
- Doppler spectrum
 - description 97
- Doppler trace
 - CW Doppler mode 92
 - Doppler mode 86
- duplex (definition) 225
- duplex. See combination mode.

E

- ED
 - correct placement of marker 98
 - in A/B (Stuart Index) 99
 - in A/B ratio 99

- in A/B, definition 223
- in B/A, definition 223
- in formula for resistance index 99
- in RI 99
- measuring PI automatically 100
- measuring PI manually 100
- real-time measurements 100
- EDC (measurement) 225
- Elastography 81
 - about 81
 - color box 82
 - color map 82
 - Diameter Comparison Measurement 83
 - quality indicator 83
 - Strain Ratio Measurement 83
- EMC (definition) 225
- ES
 - correct placement of marker 98
- ESD
 - definition 225
- exam
 - pause and resume 68
- Exam Type
 - definition 225
- Examination List
 - sorting 68

F

- F1, F2 (measurement) 225
- FFT spectrum. See Doppler spectrum.
- Filter (3D Render setting) 215
- Focus indicator (picture) 74
- focus position, adjusting (2D) 74
- FOI (field of interest) 225
- format
 - archived documents 66
 - copied documents 66
 - DICOM 66
 - exported documents 65, 66
- freeze, partial 45
- freezing the image 45

G

- gain 74
 - CW Doppler mode 93
 - Doppler mode 87
- gain bar 75
- grayscale map 77

H

- H (on monitor, next to frequency) 78
- hard disk
 - clearing space on 69
 - patient archiving quota 69
- HIPAA
 - about 63
 - compliance 63
 - definition 225
 - password protection of database on system 69

HPRF 86

I

- IEC (definition) 225
- image
 - format of copied 66
 - freezing and unfreezing 45
- image orientation, adjusting 31
- image review. See cine.
- images
 - format 65, 66
- imaging 49, 105, 115, 127, 138, 152, 165, 176, 185, 201
- imaging direction
 - untracked freehand 3D and 210
- imaging plane
 - indicator 49, 50, 105, 115, 127, 138, 139, 152, 165, 176, 177, 185, 186, 201
 - selecting 45, 113, 183
- invert
 - CW Doppler mode 88, 94

L

- label
 - definition 225
 - editing on the image 48, 104, 114, 126, 138, 151, 164, 175, 185, 200
 - moving 48, 104, 114, 126, 138, 151, 164, 175, 185, 200
 - on archived images and clip frames 47
- labeling settings 266
 - bodymarks tab 267
 - default bodymarks tab 268
 - default labels tab 267
 - labels tab 266
- LC (measurement) 225
- Linked Split/Dual 46
- login to system 69

M

- map, grayscale 77
- MD (minimum diastole)
 - correct placement of marker 98
 - in pulsatility index 99
 - measuring PI manually 100
- measure & calc settings 262
 - calc list tab 263
 - default calc tab 264
 - preferences tab 265
 - results tab 264
- measure & calc window
 - general tab 262
- measurements
 - clearing 55
 - depth 54
 - D-mode 60
 - making 54
 - on a cine image 52
 - on archived images 53

- results 54
- measuring tools
 - 2D 55
 - angle 55
 - circle 57
 - color mode 55
 - distance 55
 - Doppler 60
 - Doppler outline curve 62
 - ellipse 58
 - freehand drawing 59
- MI (Mechanical Index)
 - CW Doppler 91
- MIP (definition) 226
- M-mode
 - about 88
 - image ruler 90
 - line 89
 - monitor setup (picture) 89

N

- needle enhancement 78
 - icon 80
- needle guide
 - verify correct number on monitor 103, 118, 136, 150, 173, 183, 199
 - verify that number is correct on monitor 103, 136, 150, 173, 183, 199
- NEMA (definition) 226
- network password 67

O

- ob and gyn
 - capturing clips 158
 - copying or archiving images and clips 158
 - printing from thumbnail images 158
 - printing images on the monitor 158
 - saving preset 158
- ob/gyn settings 265
 - authors tab 266
 - preference tab 265
- obstetrics and gynecology
 - presets 148
- ON/standby button (definition) 227
- Opacity (3D Render setting) 215
- orientation
 - image, changing 31
- orientation of imaging plane 45, 113, 183

P

- PACS
 - archiving to 220
 - definition 226
 - saving to 220
- partial freeze 45
- password protection
 - patient database 69
- Patient Archiving and Communications System. See PACS.

- patient archiving system
 - password protection 68, 69
- patient information
 - from DICOM worklist 219
- Patient List 67
- patient list
 - sorting and rearranging columns 68
- patient record, deleting 68
- pause and resume an examination 68
- PE 226
- persistence, about 226
- phased array 226
- Photorealistic (3D Render setting) 215
- PI
 - definition 226
 - real-time measurement 100
- plane, imaging. See imaging plane.
- planimetry
 - definition 226
 - description 117
 - making a calculation 118
 - starting point for calculation 117
- POI (point of interest) 226
- Power Doppler 226
- power failure during file transfer to PACS 220
- power mode 80
- power supply cord 226
- preset
 - saving 90, 109, 121, 130, 144, 158, 168, 180, 189, 204
- preset settings 261
 - available tab 261
 - default tab 261
 - manage tab 262
- PRF (pulse repetition frequency)
 - and VFI color map (illustration) 194
 - selecting velocity range with 227
- printing
 - images displayed on the monitor 72
 - thumbnail after opening 72
- printing images on the monitor 108, 121, 130, 144, 168, 179, 189, 204
- Pro Package
 - list of 95
- programmable puncture guide 119
- PS
 - correct placement of marker 98
 - real-time measurement 100
- PSA 226
- PSAD
 - definition 226
- pulse repetition frequency 226
- puncture
 - performing 118
 - puncture line 118
- puncture guide
 - verify that number is correct on monitor 118
- PW Doppler 227

R

real-time measurements

PI 100

Render view (3D) 215

report

about 69

changing page 70

creating 70

displaying 70

editing 71

printing 71

saving as image 71

resistance index. See RI.

RI (Resistance Index)

about 100

formula 99

real-time measurement 100

rotation axis

defining 58

effect on volume determination 59

S

sagittal imaging plane 45, 113, 183

sample volume

Doppler mode 85

false 85

false, moving 86

false, with HRPF 85, 86

with angle correction 85

Save Diagnostic Setup window 90, 109, 121, 130,

144, 168, 180, 189, 204

saving

2D images 63

Diagnostic Setups 90, 109, 130, 144, 158, 168,
179, 189, 204

documents 63

presets 121

video clips 63

screensaver 259

sculpting tools (3D) 216

security settings 278

audit logs 282

general tab 278

user manager tab 279

service manual 277

service settings 282

about tab 283

oem setup 284

tp licenses tab 284

simultaneous split-screen imaging 46

spectrum display, changing smoothness of 87, 94

split screen

simultaneous 46

using 46

SS

correct placement of marker 98

definition 227

steering

independent D-mode/C-mode 81, 86

store/network window 275

dicom/pacs 277

network drive 278

printers tab 276

store/clip tab 275

wifi tab 277

sweep speed

CW Doppler mode 94

sweep speed, Doppler mode 88

Sync Steer button 81, 86

system

logging in 69

system settings 258

display tab 259

header tab 258

localization tab 260

patient data tab 260

video out tab 261

T

TAMX (measurement) 227

T-area (measurement) 227

TEH (True Echo Harmonics). See tissue harmonic im-
aging.

TEH, definition 227

TGC

adjusting 75, 102, 112, 124, 134, 149, 162, 172,
182, 192

definition 227

description 75

Thickness (3D Render setting) 215

thumbnail images

printing 108, 121, 130, 144, 158, 168, 179, 189,
204

TI (Thermal Index)

adjusting limit 73, 74

CW Doppler 91

definition 227

TIB 227

TIC 227

TIS 227

tissue harmonic imaging

advantages 78

description 77

using 78

transverse imaging plane 45, 113, 183

trapezoidal view 228

triplex, definition 227

triplex. See combination mode.

True Echo Harmonics. See tissue harmonic imaging.

Tru-Focus 74

V

vascular calculations

correct placement of markers 98

vascular imaging

measurements and calculations 202, ??–203

presets 123, 133, 161, 171, 191

- reports 203
- Vascular Exam Type 191
- Vector Flow Imaging. See VFI.
- VFI
 - about 193
 - angle-independent imaging 194
 - Color Map
 - as color flow indicator 194
 - illustration 194
 - Color Square 195
 - colors 195
 - using 195
 - velocity range affected by PRF 194
- video clips
 - format 65, 66
 - format of copied 66
 - saving 63

- viewing on a computer 66
- viewing
 - exported documents (on external computer) 66
 - exported documents (on system) 65
- voxel, definition 227

W

- wall filter
 - CW Doppler mode 87, 94
- wall filter, definition 228
- worklist
 - patient information from 219
 - retrieving 219
 - selecting a patient from 219

Z

- zoom 76

 BK Medical ApS, Mileparken 34, 2730 Herlev, Denmark. T +45 4452 8100 F +45 4452 8199



BK Medical
8 Centennial Drive
Peabody
MA01960
USA
T + 1 978-326-1300
bkmedical.com

USA
Sales & Service
BK Medical
8 Centennial Drive
Peabody
MA01960
USA
T + 1 978-326-1300
F + 1 978-326-1399
bkmedical.com

Europe and Rest of World
Sales, Service & Design Center
BK Medical
Mileparken 34
2730 Herlev
Denmark
T +45 4452 8100
F +45 4452 8199
bkmedical.com