Volume 2

Operation Manual

ACCUVIX A30

SAMSUNG

SAMSUNG MEDISON

ACCUVIX A30

Diagnostic Ultrasound System

Operation Manual

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Table of Contents – Volume 2

Chapter 6 Image Managements

Cine / Loop 6-3

Annotation 6-7
- Typing Text 6-9
- Entering Indicator 6-13
- Entering BodyMarker 6-14

Saving, Playing and Transferring Images 6-16
- Saving Images 6-16
- Playing Images 6-17
- Transferring Images 6-18

Printing and Recording Images 6-19
- Printing Images 6-19
- Recording Images 6-19

SONOVIEW 6-20
- Exam Mode 6-21
- Compare Mode 6-23
- Exam Tool 6-25

Chapter 7 Utilities

System Settings 7-3
- General 7-4
- Display 7-9
- Annotation 7-12
- Peripherals 7-18
- User Defined Keys 7-20
- Miscellaneous 7-23
- Options 7-29
- DICOM Setup (Optional) 7-31
- Auto Calc. 7-46
- About 7-47

Measure Setup 7-48
Measure Menu 7-49
General 7-52
Obstetrics 7-62
Cardiac 7-72
Vascular 7-74
Urology 7-76
Fetal Heart 7-78

Utility 7-79
Post Curve 7-80
ECG 7-85
Histogram 7-87
Biopsy 7-89
ADVR 7-92
Help 7-102
Storage Manager 7-102
Power Management 7-104

Chapter 8 Maintenance

Operating Environment 8-3

System Maintenance 8-4
Cleaning and disinfecting 8-4
Cleaning Air Filters 8-6
Accuracy Check 8-7

Data Maintenance 8-8
User Settings Backup 8-8
Patient Information Backup 8-8
Software 8-8

Chapter 9 Probes

Probes 9-3
Ultrasound Transmission Gel 9-11
Sheaths 9-12
Probe Precautions 9-13
Cleaning and Disinfecting the Probe 9-14

Biopsy 9-23
Biopsy Kit Components 9-23
Using the Biopsy Kit 9-24
Cleaning and Disinfecting the Biopsy Kit 9-26
Assembling the Biopsy Kit 9-28

Reference Manual

Samsung Medison is providing an additional Accuvix A30 Reference Manual (English version).

Chapter 6

Image Managements

▣ *Cine / Loop* *6-3*

▣ *Annotation* *6-7*

Typing Text 6-9
Entering Indicator 6-13
Entering BodyMarker 6-14

▣ *Saving, Playing and Transferring Images* *6-16*

Saving Images 6-16
Playing Images 6-17
Transferring Images 6-18

▣ *Printing and Recording Images* *6-19*

Printing Images 6-19
Recording Images 6-19

▣ *SONOVIEW* *6-20*

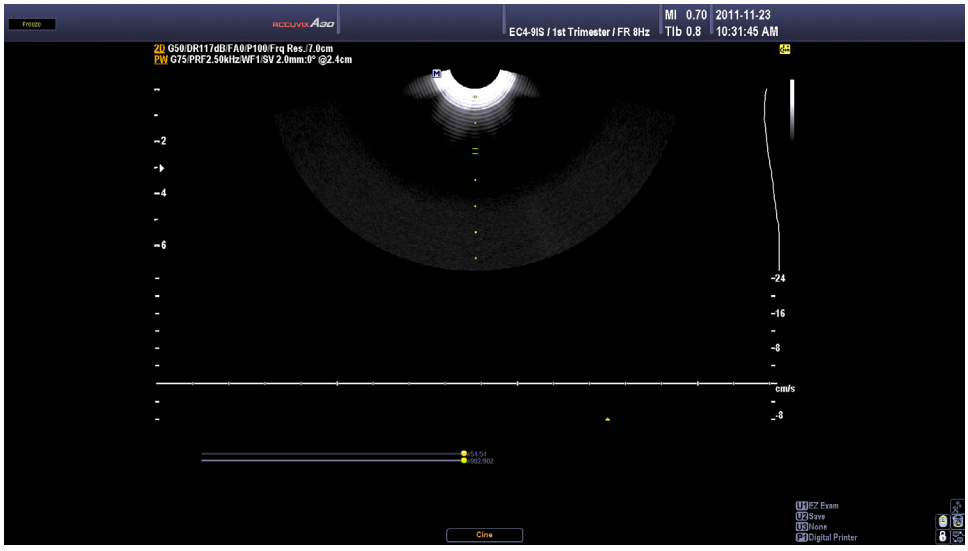
Exam Mode 6-21
Compare Mode 6-23
Exam Tool 6-25

Cine / Loop

Images are automatically saved in the memory during scanning. The saved images can be useful when a patient is diagnosed and reviewed.

The saved images can be in Cine or Loop, depending on the diagnosis mode.

- Cine: Images that are saved in all modes other than M Mode and Spectral Mode.
- Loop: Images that are saved in M Mode and Spectral Mode.



[Figure 6.1 Cine / Loop]

NOTE: The following functions are not supported in Cine images: Probe Change, Application Change, and Preset Change.

Starting and Finishing Image Review

During scanning, press the **Freeze** button on the control panel. This stops the scan and switches the unit to the image review mode screen.

Press the **Freeze** button again to return to the scan mode.

How to Review Images

Move the cursor to the Cine or Loop bar in the user information area to review an image. You can search through saved images by moving the cursor with the trackball. The total number of saved images and the number of the current image being reviewed are shown next to the bar.

Select Cine / Loop

Select an image to play by tapping **Cine/Loop** on the touch screen. This option only appears when both **Cine** and **Loop** are available, such as in M Mode or Spectral Doppler Mode. Select **Cine** or **Loop** by tapping the button on the touch screen or by pressing the **Change** button on the control panel.

The touch screen menu is changed when images are reviewed.

[Figure 6.2 Reviewing Images – Touch Screen]

Trim First

Tap the **Trim First** and use the dial-button on the touch screen. You can specify the first frame in the range in which the Cine or Loop will be saved. After specifying the position of the first frame by rotating the dial-button or using the Trackball, tap the dial-button to save it.

Trim Last

Tap the **Trim Last** and use the dial-button on the touch screen. You can specify the last frame in the range in which the Cine or Loop will be saved. After specifying the position of the last frame by rotating the dial-button or using the Trackball, tap the dial-button to save it.

Cine Speed

Tap the **Cine Speed** and use the dial-button on the touch screen. You can adjust the automatic playback speed for Cine or Loop by rotating the dial-button. The allowable range for adjustment is 50-200% in increments/decrements of 50%.

Cine Save

- Live Mode: Press the Save button on the control panel.
- Freeze State: Tap the **Cine Save** button on the touch screen. You can save the specified image area by tapping the dial-button.

The saved image appears in the thumbnail list on the screen, and can be reloaded or replayed in scan mode or SONOVIEW.

You can select Cine or Loop.

Cine Play

Tap the **Cine Play** button on the touch screen. You can stop or resume playback of an image by tapping the same button.

Image Preview in Multi-Image Mode

Only the images in an active area can be reviewed. To review images in another area, change the active area by using the **Dual** or **Quad** button on the touch screen. Alternatively, after pressing **Pointer** on the control panel, place the cursor in the area to activate, and then press the **Set** button on the control panel.

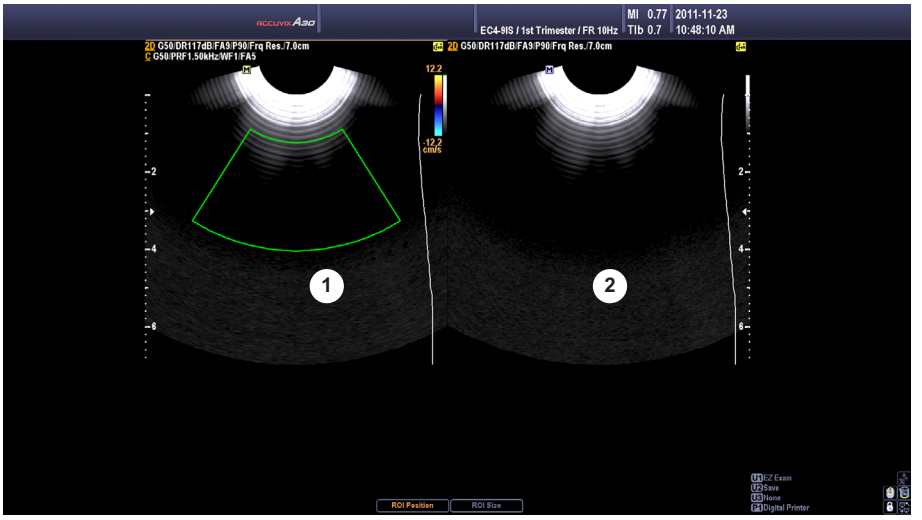
Tips!

Multi-Image Mode Screen Layout

In Multi-Image Mode, recent Cine images are displayed on the screen by default.

▶ Dual Mode

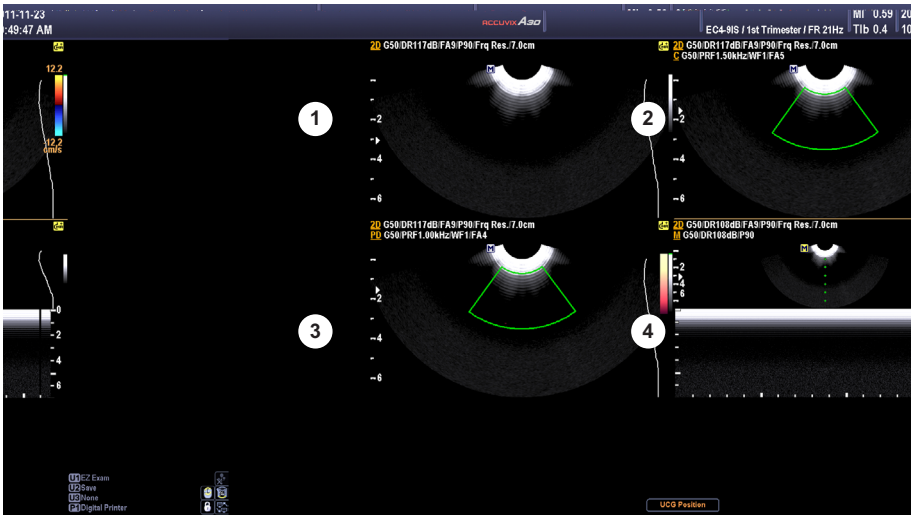
Tap on the touch screen's **Dual** button to display the current Cine image and the most recent Cine image in the order of ❶ → ❷.



[Figure 6.3 Dual mode]

▶ Quad Mode

Tap on the touch screen's **Quad** button to display the current Cine image and the three most recent Cine images in the order of ❶ → ❷ → ❸ → ❹.



[Figure 6.4 Quad mode]

Exam Mode Screen

Exams for each patient ID are displayed by date in a tree on the left side of the screen. The numbers in parentheses represent the numbers of the saved images. To show or hide exams, use the Trackball and the **Set** button to select a desired ID.

Selecting Exam

Use the trackball and the **Set** button to select a desired exam from the list on the left side of the screen. The selected exam will be marked on the list in yellow. The saved image will also be displayed on screen.

Reviewing the current exam

Click **Current Exam**. The current exam and its images are displayed on the screen. This button is only enabled when the patient ID is registered.

Reviewing exams performed within the last 24 hours

Click **Continue Exam**. The exams and their images for the last 24 hours are displayed. The first performance date of the exam appears in the feedback area.

You can place measurements, annotations, and BodyMarkers on the loaded exam screen. In addition, you can update the exam with new image scans.

Reviewing exams performed prior to the last 24 hours

Click **Review Exam**. The exams that were performed prior to the last 24 hours, and their images, are displayed. The first performance date of the exam appears in the feedback area.

You can place measurements, annotations, and BodyMarkers on the loaded exam screen. However, you cannot update the exam with new image scans.

Image Scroll

The image of the previous or next page is displayed on the screen. Click **Image Scroll** on the touch screen and rotate the dial-button. Rotating the dial-button to the left displays the previous page image, while rotating it to the right displays the next page image.

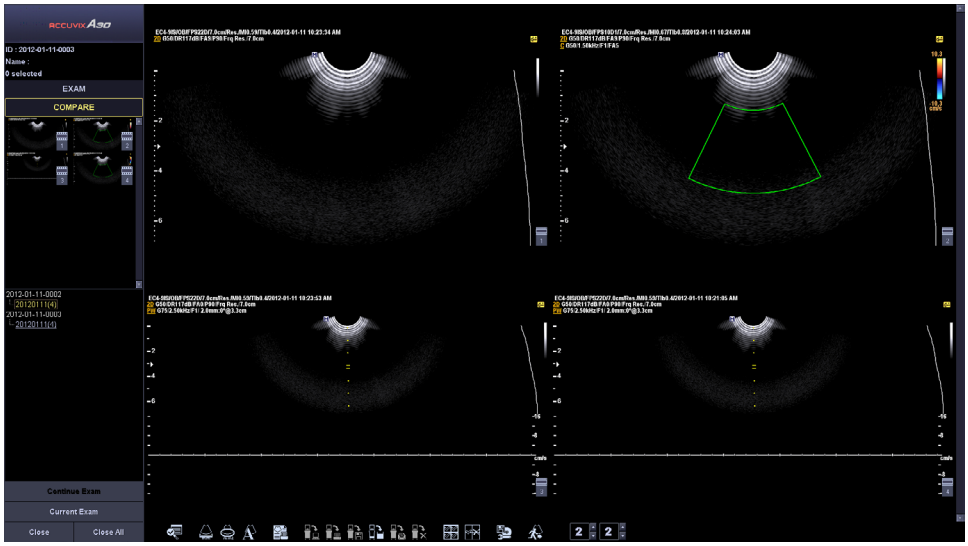
However, this button may not be used when the number of exams saved is less than the number of images that appear on a page under the current layout.

Closing Exam Review

Click **Close** on the touch screen. To close all exams in the list, click the **Close All** button.

Compare Mode

Click **Compare** in the upper left corner of the screen. The button will appear in yellow. In Compare Mode, you can select the images relating to an exam to compare and review them.



[Figure 6.14 Compare Mode]

[Figure 6.15 Compare Mode – Touch Screen]

Compare Mode Screen

As in Exam Mode, exams for each ID appear on the screen In addition, images for the selected exam are displayed in a thumbnail format.

Searching Exam

As in Exam Mode, click the **Exam Search** icon.

Select an image

Use the Trackball and the **Set** button to select an image from the thumbnail list. The selected image is highlighted in yellow in the list. Select a location on the screen where the image will be displayed, and then the selected image will appear.

NOTE: Only scan data can be retrieved into the image area.

Thumb Scroll

The image of the previous or next page is displayed on the thumbnail list.

To do this, use the **Thumb Scroll** dial-button on the touch screen. Rotating the dial-button to the left displays the previous page's images in the thumbnail list. Rotating it to the right displays the next page's images in the thumbnail list.

Exam Tool

Use the icon or the dial-button on the touch screen. Placing the cursor near an icon displays the icon's name.

A: Exam Search
B: Distance Caliper
C: Ellipse Caliper
D: Text Annotate
E: Print Image
F: Send Image to DICOM Storage
G: Send Image to DICOM Print
H: Export Image
I: DICOM Flush
J: Send E-mail
K: Delete Image
L: Select All Images
M: Deselect All Images
N: Device
O: Exit
P: Layout

[Figure 6.16 Exam Tools]

Layouts

You can adjust the number of images displayed on the screen. Click **Layout** and use the dial-button or tap the appropriate button on the touch screen. A maximum of 16 images (4 X 4) can be compared at the same time.

The numbers shown in the layout section indicate the column and row of an image to display on the screen. You can change the numbers shown in the layout section to configure various layouts.

Displaying in Full Screen

Place the cursor on an image and press the **Set** button twice, and then the image will be displayed in full screen.

Selecting Multiple Images

While holding down the **Ctrl** key, use the Trackball and the **Set** button to select an image. The selected image is highlighted in yellow.

Selecting All Images

Click the **Select All Images** icon on the screen. All images saved for the current exam are selected and highlighted in yellow.

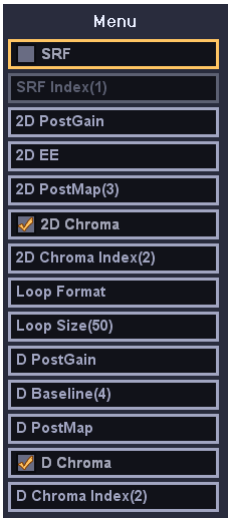
Deselecting All Images

Click the **Deselect All Images** icon on the screen. All images are deselected and no longer highlighted.

Menu

Click the button located at the lower left corner of an image, and the post-processing menu will appear. Use the menu to adjust the image for diagnosis. The image is not saved with the post-processing effects.

NOTE: Cine images cannot be only played in any layout with an image grid greater than 2 x 2.



[Figure 6.17 Post Processing Menu]

Reviewing 3D Images

If the saved image is 3D, the 3D Indicator appears at the bottom of the image. Click **3D** and the *3D View* screen will appear, allowing you to review the image.

Reviewing Cine

If the saved image is Cine, the playback and search scroll bar appears at the bottom of the image. You can play, pause, stop or search forward/backward with the scroll bar.

[Figure 6.18 Cine Scroll Bar]

NOTE: Cine images cannot be played in any layout with an image grid greater than 2 x 2.

Searching Exam

Click the **Exam Search** icon on the screen. *Patient Information's* **search** tab screen is shown. Search the information stored in the system for patient information.

For more information, refer to 'Chapter 3. Starting Diagnosis'.

Distance

Click the **Distance Caliper** icon on the screen. You can measure the distance between two points on an image. Measurement results are not saved.

1. Place the cursor over an image and press the **Set** button. The image will be resized to its original size.
2. Measure the desired distance. Measurement-taking methods are identical to those described in 'Chapter 5. Measurements and Calculations'.
3. Press the **Exit** button on the control panel, and then Click the **Distance Caliper** icon again to finish measurement.

Measurement of Circumference and Area

Click the **Ellipse Caliper** icon on the screen. You can measure the circumference and area of the desired area in an image. Measurement results are not saved.

1. Place the cursor over an image and press the **Set** button. The image will be resized to its original size.
2. Measure the circumference and area of the desired area. For measurement instructions, refer to the 'Basic Measurements' section in 'Chapter 5. Measurements and Calculations'.
3. Press the **Exit** button on the control panel and then Click **Ellipse Caliper** icon again to finish measurement.

Typing Text

Click the **Text Annotation** icon on the screen. You can enter text into an image.

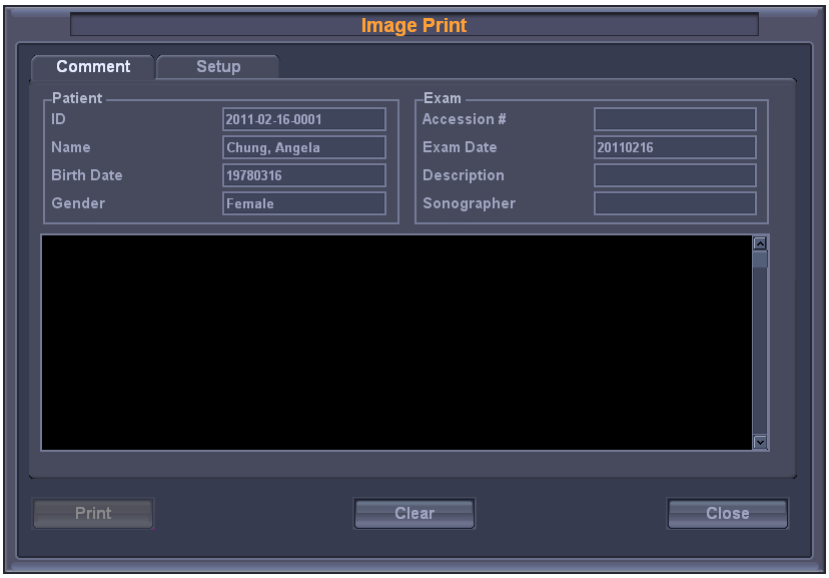
1. Place the cursor over an image and press the **Set** button. The image will be resized to its original size.
2. Position the cursor on the desired area and enter text.
   - ▶ Font Color: Change the font color.
   - ▶ Font Size: Change the font size.
   - ▶ Language: Select a language.

NOTE: This button only appears on the screen if the product supports Asian patient names.

3. Press the **Set** button to confirm the text.
4. Press the **Exit** button on the control panel and then Click the **Text Annotation** icon again to finish measurement.

Printing Image

1. Click the **Print Image** icon on the screen. The *Image Print* window will appear.
2. Open the **Setup** and **Comment** tabs and configure the options.
   ▶ To delete any entries made in the **Comment** tab, click **Clear**.
3. Press the **Print** button to print the image. Click **Close** to cancel.



[Figure 6.19 Image Print]

Transferring Images via DICOM

Transfer the selected image and measurement data via DICOM. The icon is only enabled when an image is selected. The icon is disabled in a system where DICOM is not enabled.

1. After selecting an image, Click the **Send Image to DICOM Storage** icon on the screen. The *DICOM Storage* window will appear.
2. Click the **Transfer** button to transfer the selected image to the DICOM server. Click **Close** to cancel.

[Figure 6.20 DICOM Storage]

Printing via DICOM

You can print the selected images via DICOM. The icon is only enabled when an image is selected. The icon is disabled in a system where DICOM is not enabled.

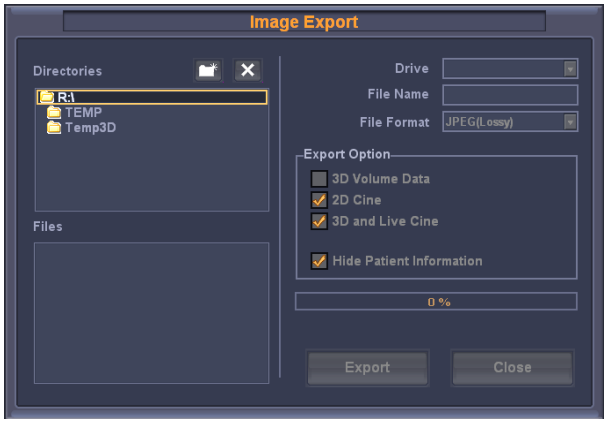
1. After selecting an image, Click the **Send Image to DICOM Print** icon on the screen. The *DICOM Printer* window will be displayed.
2. Click the **Transfer** button to transfer the selected image to the DICOM server and print it. Click **Close** to cancel.

[Figure 6.21 DICOM Printer]

Transferring Images

NOTE: Image transfer will not be performed if there are spaces in the file or directory name.

1. Click the **Export Image** icon on the screen. The *Image Export* window will be displayed.
2. Specify the various parameters, such as directory, drive, filename and file format.
3. Click the **Export** button to start a transfer. Click **Close** to cancel.



[Figure 6.22 Image Export]

DICOM Flush

Click the **DICOM Flush** icon. This transfers all images that have been stored locally up to that point to the DICOM Storage server.

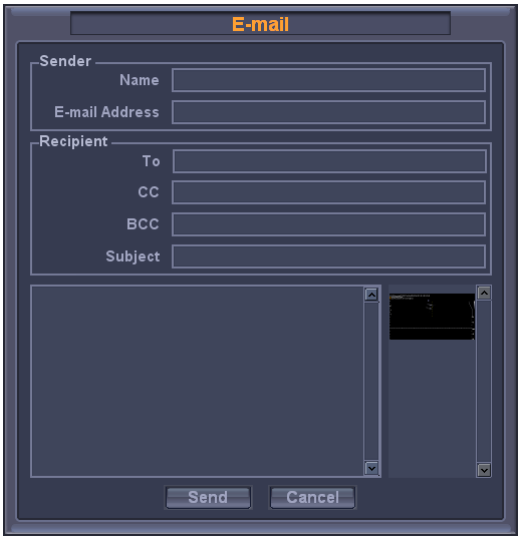
Sending in E-mail

1. Click the **Send E-mail** icon. The *E-mail* window will appear.
2. Specify the various parameters, such as sender and recipient.
3. Check the images that you want to attach from the thumbnail list, and then enter the body text.
4. Click the **Send** button to transfer the selected image. Click **Cancel** to cancel.

NOTE:

When e-mail cannot be transferred, even though the mail server is working properly, please check the following:

- The connection of the LAN cable
- Settings from **Utility** > **Setup** > **Miscellaneous** > **E-mail**
- Whether or not ICMP (ping) is open for the corresponding Mail Server. If ICMP (ping) is closed, the E-mail function may not work properly.



[Figure 6.23 E-mail]

Deleting Images

Click the **Delete Image** icon. Press **OK** to delete the selected image. Please note that images for the current patient under diagnosis cannot be deleted.

Storage Manager

Click the **Device** icon. The *Storage Manager* window will appear. For more information about Storage Manager, refer to 'Chapter 7. Utilities'.

Closing SONOVIEW

Click the **Exit** icon on the screen. Alternatively, you can press the **SONOVIEW** button or the **Exit** button on the control panel to close SONOVIEW.

Chapter 7

Utilities

▣ ***System Settings*** ***7-3***

General 7-4
Display 7-9
Annotation 7-12
Peripherals 7-18
User Defined Keys 7-20
Miscellaneous 7-23
Options 7-29
DICOM Setup (Optional) 7-31
Auto Calc 7-46
About 7-47

▣ ***Measure Setup*** ***7-48***

Measure Menu 7-49
General 7-52
Obstetrics 7-62
Cardiac 7-72
Vascular 7-74
Urology 7-76
Fetal Heart 7-78

Chapter 7

▣ ***Utility*** ***7-79***

Post Curve 7-80
ECG 7-85
Histogram 7-87
Biopsy 7-89
ADVR 7-92
Help 7-102
Storage Manager 7-102
Power Management 7-104

System Settings

This mode is used for system settings. It does not affect image output. The setup may be modified depending on specific needs or preferences.

1. Tap the **Utility** > **Setup** buttons on the touch screen.
2. The *Settings* screen will appear. Select a tab that has items to specify.

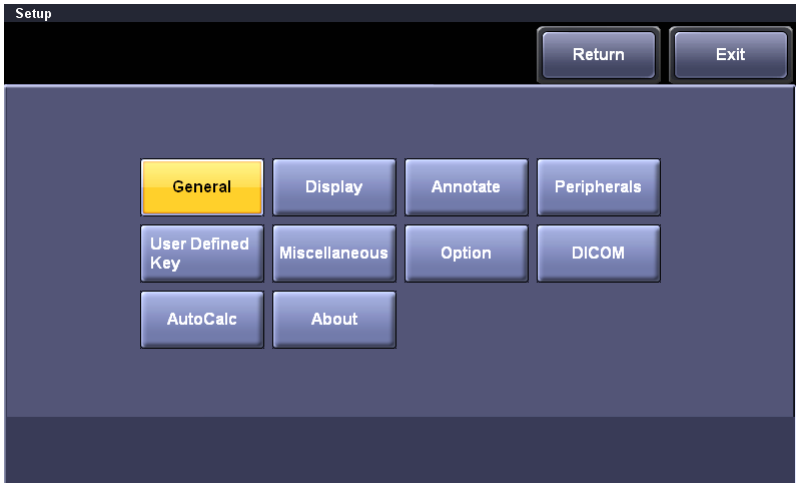
Tips!

Selecting a tab

You can select a desired tab in either one of two ways. Select the method that suits you.

- Use the trackball and the **Set** button to select a tab.
- Tap a corresponding button on the touch screen.

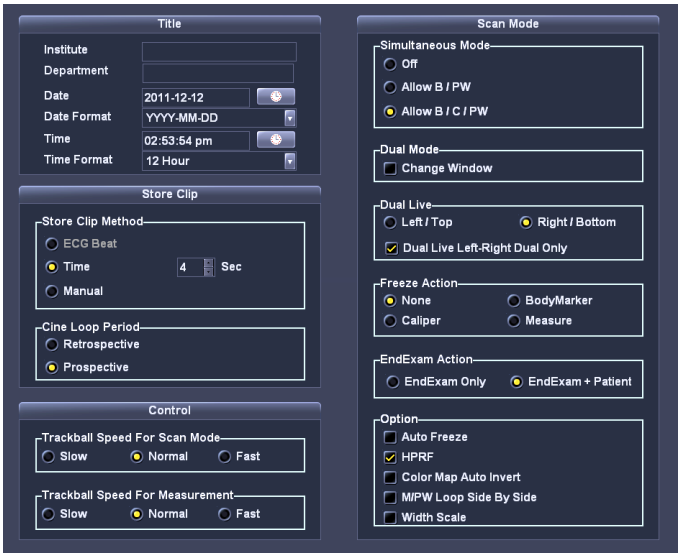
3. Specify settings for each item.
4. Save and close the settings. Click the **Close** button on the monitor screen or the **Exit** button on the touch screen or the control panel to switch to Scan Mode. Tap **Return** on the touch screen to go back to the Utility menu.



[Figure 7.1 Setup – Touch Screen]

General

Select the General tab on the *Setup* screen. Or tap **General** on the touch screen. You can specify general settings such as title settings.



[Figure 7.2 Setup – General]

Titles

You can specify the information that is displayed in the title area on the screen.

Institution

Enter the name of the hospital/institution where the product is installed.

NOTE: You cannot input the following characters: #, [, ", :, ?, |, \, "

Department

Enter details about the medical institution or the organization. This information is used to identify information transferred via DICOM.

Date

The current date is displayed. To change the date, click .

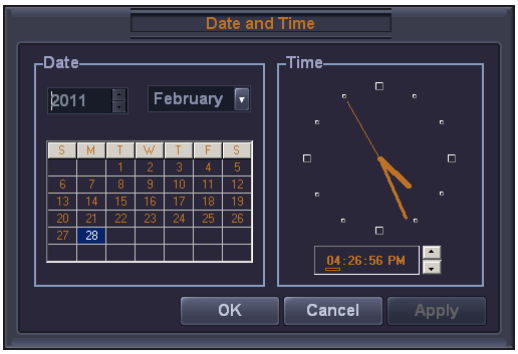
NOTE:

- You cannot change the date and time when a patient ID has been registered. To change the date and time, you should finish the current diagnosis by pressing the **End Exam** button on the control panel.
- You can select a year from 2006 to 2027.

Tips!

How to set the date and time

1. Click next to the Date (or Time) field.
2. Set the date and time by using the trackball and the **Set** button on the control panel.
3. If it is properly set, click **Apply** to apply changes. Click **OK** to close the *Date & Time* window. To cancel, click **Cancel** or press the **Exit** button on the control panel.



[Figure 7.3 Date & Time]

Date Format

Specify the date format. Select a desired date format by clicking the **combo** button. The date format that you specify will be applied to various date fields in Patient Information.

Time

The current time is displayed.

Time Format

Specify the time format. Select a desired time format (12 Hour or 24 Hour) by pressing the **combo** button.

Store Clip

Store Clip Method

Specify the method and range in which an image is acquired and saved.

You can select ECG Beat, Time or Manual. Note that ECG Beat can be selected only when ECG is on.

- ECG Beat: Specify the heart beat as 1 – 8 beats.
- Time: Specify it as 1 – 50 seconds.
- Manual: Save images automatically for 50 seconds after tapping pressing the **Store Clip** button.

Cine Loop Period

- Prospective: When the **Store Clip** button is pressed during scanning, the subsequent images are saved.
- Retrospective: When the **Store Clip** button is pressed during scanning, the previous images are saved.

NOTE: To configure the **Store Clip** button, go to **Utility** > **Setup** > **User Defined Key** > **User Key 2, 3**.

Control

Trackball Speed for Scan Mode

Specify the trackball speed as Slow, Normal, or Fast.

Trackball Speed for Measurements

Specify the trackball speed as Slow, Normal, or Fast. Slower speeds allow more precise measurements.

Scan Mode

Simultaneous Mode

You can decide whether to enable Simultaneous Mode in Spectral Doppler Mode, using the following three options:

- **Off**: Select this if you do not wish to use Simultaneous Mode.
- **Allow B/PW**: Select this if you do not wish to use Simultaneous Mode in 2D/C/PW Modes, but do wish to use it in 2D/PW Mode.
- **Allow B/C/PW**: Select this if you wish to use Simultaneous Mode for both 2D/PW Mode and for 2D/C/PW Modes.

Dual Mode

Select whether to activate the Change window in Dual Mode.

Dual Live

Select the position of the Color Doppler Mode in Dual Live Mode.

- Left/Top: Color Doppler Mode is located in the left or upper part of the screen.
- Right/Bottom: Color Doppler Mode is located in the right or lower part of the screen.
- Dual Live Left-Right Dual Only: The **Top-Bottom** Dual button disappears when you check this checkbox.

Freeze Action

Select a function to execute when the **Freeze** button on the control panel is pressed. Available options are BodyMarker, Caliper, Measure and None.

End Exam Action

- End Exam Only: Pressing the **End Exam** button on the control panel exits Exam Mode and switches to the B Mode *Scan* screen.
- End Exam + Patient: Pressing the **End Exam** button on the control panel switches to the *Patient Information* screen.

Options

You can specify more than one item. Select an item with the trackball or the **Set** button to check or uncheck it.

- **Auto Freeze**: The Scan Mode is frozen automatically when the product is not used for 10 minutes.

NOTE: In Live 3D Mode, Auto Freeze is activated when the product is not used for 20 minutes.

- **HPRF**: Select whether to activate HPRF (High Pulse Repetition Frequency), which is supported in PW Spectral Doppler Mode. Check the checkbox to use the HPRF function.
- **Color Map Auto Invert**: Check this checkbox to automatically highlight the Color Map. This is only applied when you change Steer in 2D/C/D Mode, C Mode, or DPDI Mode in PD Mode.
- **M/PW Loop Side by Side**: Add Loop Side by Side display in M Mode or Power Spectral Doppler Mode.
- **Width Rescale**: Automatically fit the image size to the screen size, when the depth of a 2D image is adjusted. This function can be used only with a Linear Probe.

Display

Select the Display tab in the *Setup* screen. Or tap Display on the touch screen. Specify display-related options.

[Figure 7.4 Setup – Display]

Display

Options

You can specify more than one item. Select an item with the trackball or the **Set** button to check or uncheck it.

- Name + Age: Select whether to display the name and age underneath the patient ID.
- Name + Birthday: Select whether to display the name and date of birth underneath the patient ID.

NOTE: "Name + Age" and "Name + Birthday" cannot be used simultaneously.

- TGC Line: This sets whether to display the TGC line. When TGC Line is Off, the TGC line appears when you set the TGC line, and then disappears after three seconds.
- Image Info: This sets whether to display image information. When the image information interferes with an image and is turned off, it will not be displayed.
- Display Blank: Select whether to display the screen saver. When this is On, you can set the screen saver activation time to a period of between 1 and 30 minutes.

▶ TI (Thermal Index) Display: Specify the TI to display on the screen as TIs (Soft tissue Thermal Index), TIb (Bone Thermal Index) or TIc (Cranial bone Thermal Index).

■ Doppler Axis

Select the units of measurement for the axis scale in Spectral Doppler Mode.

▶ Velocity: Specify the Doppler axis scale unit as cm/s (m/s).

▶ Frequency: Specify the Doppler axis scale unit as kHz.

■ LMP / GA Display

Specify how the LMP, GA and EDD entered in the *Patient Information* screen will be displayed on the monitor screen. Select two from LMP, GA and EDD.

▶ Information Bar (Replace ID): Replace the ID in the title area.

▶ Information Bar (Replace Name): Replace the patient name in the title area.

▶ Information Bar (Replace App.): Replace the application in the title area.

▶ Measure Result: The measurement results are displayed after measurement.

▶ None: None of the options are displayed on the screen.

Font

■ Font

Specify the target for which you want to set the font. Choose from Document Font and Measure Result Font.

■ Font Name

Select the font type to use.

■ Font Size

Select the font size to use.

■ Font Color

Select the font color to use.

Preview

The *Preview* window displays the font you selected.

Default

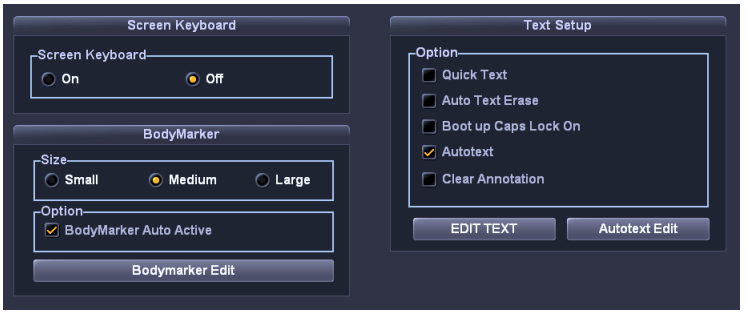
This sets the system's default fonts. The default settings are as follows:

	Document Font	Measure Result Font
Font Name	Helvetica	Verdana
Font Size	11	11
Font Color	White	Yellow

NOTE: Certain fonts may not appear correctly on the screen.

Annotation

Select the Annotate tab in the *Setup* screen. Or tap **Annotate** on the touch screen. Specify display-related options.



[Figure 7.5 Setup – Annotation]

Screen Keyboard

Screen Keyboard

You can directly enter patient information by using the on-screen keyboard on the *Patient Information* screen. Setting the screen keyboard to On (see Figure 7.5 above) enables screen keyboard support.

NOTE: When you enter a birth date or age, the numerical on-screen keyboard is activated.

BodyMarker

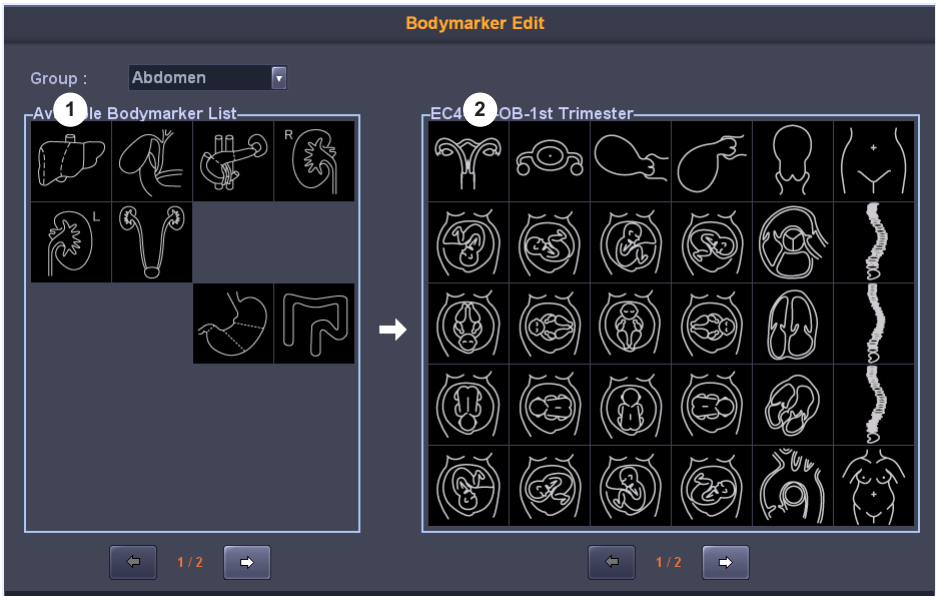
Size

Set the BodyMarker size (Small, Medium, or Large).

Option

- BodyMarker Auto Active: Set whether to activate BodyMarker Mode automatically when changing an active image region.

▶ BodyMarker Edit



[Figure 7.6 BodyMarker Edit]

❶ BodyMarker list: The list varies depending on the group selected from **Group**. **Current page/ Total pages** is displayed below the list. If the total pages are two or more, you can move to other pages by using ⇨ or ⇦.

❷ BodyMarker list of probes or presets currently being used. **Current page/Total pages** is displayed below the list. If the total pages are two or more, you can move to other pages by using ⇨ or ⇦.

NOTE: You can add or save between 1 and 100 BodyMarkers in each list.

▶ Adding a BodyMarker

Select and double-click a BodyMarker in the list on the left (❶). The selected BodyMarker is added to the list on the right (❷). The right list cannot have duplicated BodyMarkers. If this occurs, a warning message will pop-up.

▶ Removing a BodyMarker

Select and double-click a BodyMarker in the list (❷) on the right.

▶ Saving and Canceling the BodyMarker list

Click **Save** to save the list. Click **Close** to cancel.

▶ Resetting the BodyMarker list

Click **Reset**. The BodyMarker list is reset to the system defaults.

Text Setup

Select whether to use Quick Text, Auto Text Erase, Boot up Caps Lock on, Auto Text, Edit Text, Auto Text Edit, or Clear Annotation.

■ Quick Text

If the checkbox is selected, the Quick Text function is enabled. Quick Text switches the system to the Text Input Mode immediately after a character key on the Alphanumeric Keyboard is pressed.

NOTE:

▶ The Quick Text checkbox is checked by system default.

▶ You can enter text even if you don't select Quick Text.
To switch to Text Mode, tap **Annotation** on the touch screen.

■ Auto Text Erase

If this checkbox is checked, whole sections of text can be deleted at once by pressing the **Freeze** button after inputting text.

■ Boot up Caps Lock On

If this checkbox is checked, Boot up Caps Lock On is turned on. This means that when text is entered, it is entered in capital letters.

Autotext

If an abbreviation is entered, the system retrieves and enters a full word automatically. When this option is selected, you can enter text more easily and quickly. For example, if you input "AC", the system will search for the full word and display it on the screen as "Abdominal Circumference".

To enable Auto Text, check the Auto Text checkbox by using the trackball. Otherwise, uncheck the checkbox.

If this option is selected, an abbreviation list appears on the screen when text is entered.

[Figure 7.7 Abbreviation list]

The system has a built-in abbreviation list for this function. You can add a new abbreviation or edit the existing abbreviations as desired.

Tips!

Editing the Abbreviation List

To enable the abbreviation list stored in the system, click the **Autotext Edit** button.
The system will switch to the *Auto Text Edit* screen.

To save the changes and finish editing, click the **Close** button.

▶ **Modify Word**

1. Use the trackball and the **Set** button to select a word to modify from the list. An abbreviation for the selected word and its full version are displayed under Abbreviation and Full Word at the bottom of the screen.
2. Modify words in the Abbreviation and Full Word fields. The abbreviation list is updated in real time.

▶ **Add Word**

1. Click the **New** button.
2. Enter words to add in the Abbreviation and Full Word fields at the bottom of the screen. The entered words are added to the abbreviation list.

▶ Delete Word

1. Use the trackball and the **Set** button to select a word to delete from the list. An abbreviation for the selected word and its full version are displayed under Abbreviation and Full Word at the bottom of the screen.
2. Click the **Delete** button. The following warning message will appear:
3. To delete the selected word, click **OK.** The selected word will be deleted from the abbreviation list. Click **Cancel** to cancel.

▶ Specify Word Input Delays

Specify the time taken by the system to automatically convert an abbreviation into a full word and display it on the screen. In the Auto Text Delay Time field at the bottom of the screen, enter the input delay time as a value from 0.1 – 5 seconds.

[Figure 7.8 Auto Text Editing]

■ Clear Annotation

Check this checkbox to delete the entered annotation when you change the mode.

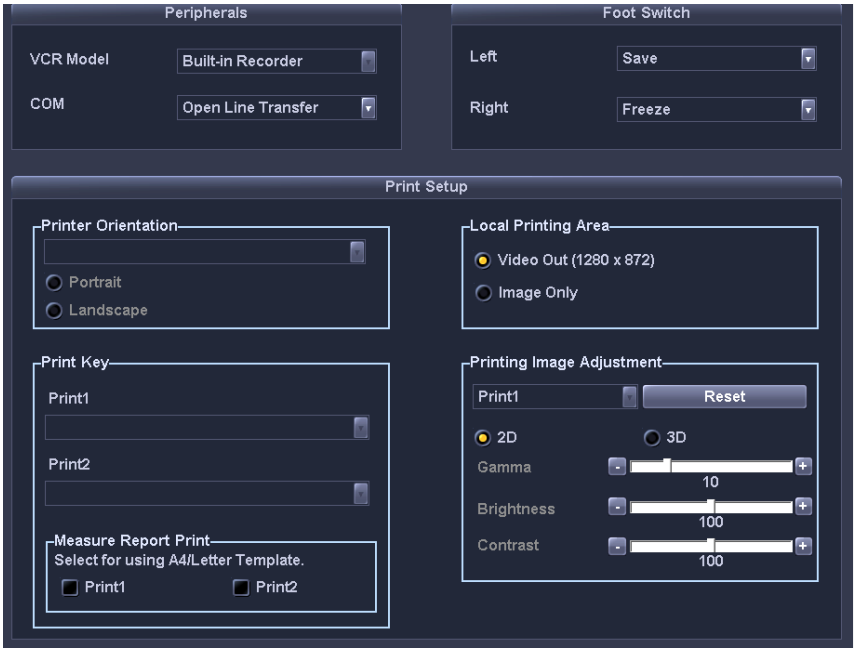
Edit Text

Select an application to modify and edit the corresponding text page.

[Figure 7.9 Edit Text]

Peripherals

Select the Peripherals tab in the *Setup* screen. Or tap **Peripherals** on the touch screen. You can configure keys, buttons and the peripheral devices connected to the product.



[Figure 7.10 Setup – Peripherals]

Peripherals

VCR Model

Set as Built-in Recorder. The user cannot change this setting.

COM

Configure a device to connect to a serial port. Choose between **Open Line Transfer** and **Reserved**. If you select **Reserve**, the **COM** port will not be used.

Select Open Line Transfer, connect the device, and reboot the system.

Foot Switch

Set the function of the left and right pedals of the foot switch. Configurable functions are: Freeze, Update, Record, Print, Save, Store Clip, and Volume Start, EZ-Exam.

Print Setup

Printer Orientation

NOTE: This option is available only for an Echo printer that uses roll paper.

Set the type and page orientation of the Echo printer.

- Printer Settings: Select the printer to use by using the combo button.
- Portrait: When printed, the long side of the page is vertical.
- Landscape: When printed, the long side of the page is horizontal.

Print Key

Set which type of printer to use when **Print 1** or **Print 2** button is pressed on the control panel.

Measure Report print

Select the checkbox to set the printer to use for printing the measurement report.

Local Printing Area

Set the area that will be printed.

- Video Out (1280 x 872): Print part of the monitor screen, containing the image area.
- Image Only: Print only the image area.

Printing Image Adjustment

Adjust the print quality of images. Select the image type and adjust Gamma, Brightness, and Contrast.

NOTE: This is only supported by some digital printers.

User Defined Keys

Select the User Defined Key tab on the *Setup* screen. Or tap User Defined Key on the touch screen. You can set the function of the keys and buttons on the product.

[Figure 7.11 Setup – User Defined key]

Set/Exit Key Setup

Set/Exit Key Switch

Set the functions of the buttons to the left and right of the trackball on the control panel.

- Set/Exit: The left button is set to **Set** and the right button is set to **Exit**.
- Exit/Set: The left button is set to **Exit** and the right button is set to **Set**.

Function Setup

Selects functions for **Zoom**, **Focus** and **Depth** dial-buttons on the control panel.

Zoom In

Selects the direction in which to rotate **Zoom** dial to zoom in on an image.

- Clockwise: Rotating the dial-button clockwise zooms in on an image.
- Counterclockwise: Rotating the dial-button counter-clockwise zooms in on an image.

Focus Up

Selects the direction in which to rotate **Focus** dial to adjust the focus depth.

- Clockwise: Rotate the dial-button clockwise to increase the focus depth.
- Counterclockwise: Rotate the dial-button counter-clockwise to increase the focus depth.

Depth Up

Selects the direction in which to rotate **Depth** dial to adjust the scanning depth.

- Clockwise: Rotate the dial-button clockwise to increase depth.
- Counterclockwise: Rotate the dial-button counter-clockwise to increase depth.

Save Key Setup

Save Key

- Image Save: Performs Image Save; does not perform Store Clip.
- Store Clip: Performs Store Clip; does not perform Image Save.
- Image Save/Store Clip: Saves the image in Freeze state; sets the Store Clip function in Live mode.

User Key Setup

User Key

Set the functions of the **User 1**, **User 2**, and **User 3** buttons on the control panel. The functions that can be set are shown below.

User 1	None, Gain, Frequency, Power, Angle, EZ Exam
User 2 / User 3	None, TDI Mode, TDW Mode, Store Clip, Save, Record, Print 2, M Line, Dual, Quad, Dual Live, Change Window, Probe Change, Application Change, Biopsy, Annotation, BodyMarker, Simultaneous, EFW Measure, EFW Result, BPD, HC, AC, FL, APTD, TTD, FTA, GS, CRL, Volume Save

ADVR Recording Method

Recording To

Select a media type for real-time recording. You may select either DVD or USB.

Zoom Box Setup

Zoom Box Reference Position

Select the position of the Zoom Box Reference. You may select either Image or Zoom Box.

Printer Key

Printer Key

▶ Print Only: Only prints the image.

▶ Print + Image Save: Prints and saves the image.

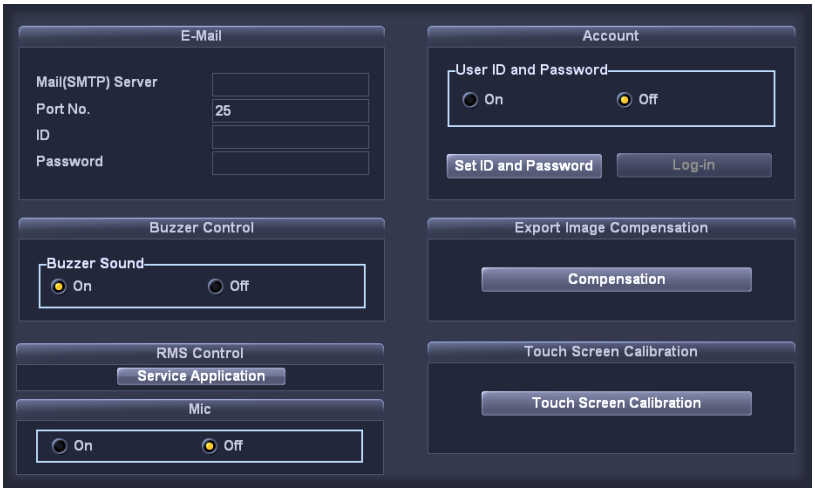
Indicator Select

Indicator Location Select

Selects which button to use for entering indicators. To enter indicators with the Pointer button on the control panel, select 'Control panel'.

Miscellaneous

Select the Miscellaneous tab on the *Setup* screen. Or tap **Miscellaneous** on the touch screen. You can set E-mail, Text, Network Status, etc.



[Figure 7.12 Setup – Miscellaneous]

E-mail

You can specify a server through which you will send and receive e-mails.

Mail (SMTP) Server

Specify the e-mail server.

Port No.

Enter a port number.

ID

Enter an ID for the e-mail server.

Password

Enter a password for the e-mail server.

Buzzer Control

Generate a buzzer sound when a button or dial-button is used.

Buzzer Sound

Set this to **On** or **Off** using the trackball. When this is set to on, the buzzer sounds each time a button or dial-button is used.

RMS controller

Tips!

Service Application

This is the application for RMS; it is divided into Log, Service, Transfer, Diagnostics, and Utility tabs. When the application is first run, the user may only view the Log and Service tabs.

Log

The various logs generated by the equipment, pertaining to the frequency of use of the equipment, errors, system information, etc., may be viewed.

- DICOM: A separate log pertaining to DICOM is also kept; logs pertaining to DICOM transmission may not be viewed at present.
- Diagnostics: You may view the Error Log which is generated when performing a hardware diagnosis.
- Error: Information is provided on errors that have occurred in the equipment; you may select Error Image to view the circumstances in which the errors occurred.
- Utilization: Specific utilization information such as Application, Probe, and Preset may be viewed.

Service

Provides a Remote Desktop feature, which allows a remote connection to a Service Engineer. The user may click on a Service Engineer found on the screen to select that engineer. If the user cannot find a Service Engineer upon logging on, the user may press the **Refresh** button to refresh the screen and find a Service Engineer who has logged on.

Transfer

Shows how to remotely download the log data and other information saved on the device.

Diagnostics

- PC Status: Display the CPU usage, temperature, and other status information for the system.
- Self Diagnostics: Run diagnostics of the system hardware. This will be performed after shutting down the system.
- Check the system's test pattern.

Utility

This step is the preparation for starting the remote service; you may inspect, upgrade, or control the system from this tab.

- Control Panel: Press this button to go to the control panel.
- Virtual Key: Control the system and the touch panel by using this button.
- Upgrade: Provides a version upgrade function by using an RMS software file. Alternatively, provides a remote software upgrade function through theRMSserver.

Mic

Set this to **On** or **Off** using the trackball. MIC is set to "Off" by default.

Account

Register a user ID and password.

■ User ID and Password

Set the user account (log-in) function. If the account is registered and set to On (see Figure 7.12), it can be used for the following areas:

- ▶ Blank Image (Screen Saver).
- ▶ Accessing Patient Mode in SONOVIEW.
- ▶ Search window for Patient Mode in SONOVIEW.

■ Set ID and Password

This is the exclusive administrator function for approval and management of accounts. It enables you to activate the account list.

- ▶ Add: Fill out the User ID, Password, and Name fields. Then click the Add button to create a new ID.
- ▶ Modify: Save the changes.
- ▶ Delete: Delete the selected ID.
- ▶ Close: Close the settings.

■ Log-in

You can set the User Account ID after logging in to the Admin account. Please contact a service engineer for more information on the Admin account.

NOTE:

- ▶ The Admin account cannot be deleted.
- ▶ Once the user account function is activated, you cannot load other exams without logging in.
- ▶ The password must be 6 to 15 characters and composed of at least three of the following:
  - English alphabet upper case
  - English alphabet lower case
  - Numbers
  - Special characters

Export Image Compensation

Configure the post curve settings for the images for which DICOM services will be used. Tap the Compensation button (see Figure 7.12) to display the *Compensation* window.

Adjust **Gamma**, **Brightness**, and **Contrast** by using the slider for each option. Tap **Default** to revert to the system defaults.

Tips!

Compensation

Adjusting the post curve settings for images allows other monitors to display them as closely as possible to the original images, which is convenient in diagnosis.

[Figure 7.13 Image Compensation]

Touch Screen Calibration

Calibrate the touch screen.

Tips!

How to calibrate the touch screen

1. Click **Touch Screen Calibration**. The *Calibration* screen is shown on the touch screen.
2. Tap the blinking X symbol on the touch screen.
   - Tap it for three or four seconds until it stops blinking or you hear a 'beep' sound.
   - Tap 25 more symbols in the same way.
3. After calibrating, a screen where you can save the current coordinates is shown.

CAUTION: Do not power off while the coordinates are being saved.

4. Reboot the system after the ***Save*** screen disappears.

Patient Name Formatting

This function is to display patient names in Asian languages, such as Korean, Chinese, and Japanese.

This setting is initialized when you click **Reset**.

NOTE: This button only appears on the screen in a product that supports Asian patient names.

Name Formatting

Set the order in which patient names are displayed.

- Default: Names are displayed in the order of last name, first name and middle name (E.g. Smith, Robert L.).
- Custom: For **Item**, specify the order of the last name, first name and middle name. For "Separator", specify a symbol, such as a comma, colon or a space, to separate each name.

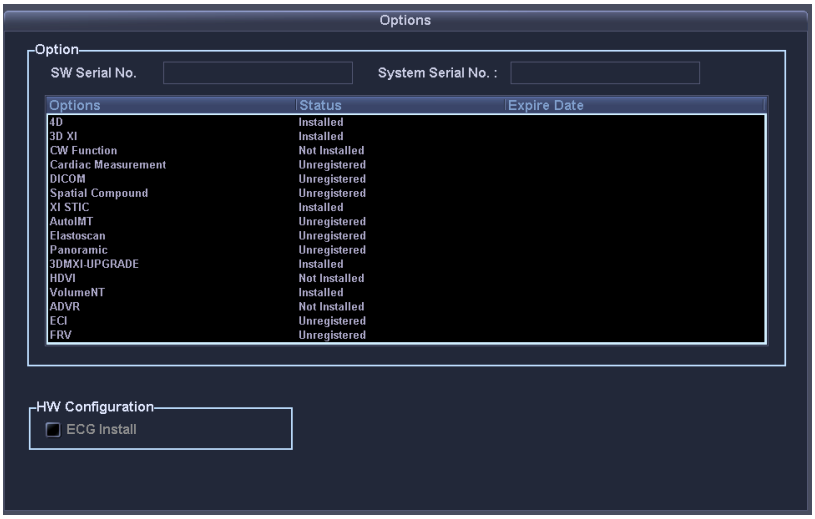
Representation Priority

Patient Information

Specify how patient names are displayed. Select the precedence of Roman, Ideographic and Phonetic letters.

Options

Select the Options tab on the *Setup* screen. Or tap **Options** on the touch screen. You can enable or disable optional software and hardware.



[Figure 7.14 Setup – Options]

* The option of your system may be different from that in the figure above.

Options

The list of optional software is displayed on the screen.

NOTE: To purchase optional software, please contact the software's distributor.

Options

This shows the types of optional software that can be installed on the product.

Statuses

This shows the current status of optional software.

- Lock_Not Installed: No hardware is connected.
- Lock_Unregistered: The software is not registered.
- Lock_Installed: Hardware is installed but not registered.
- Unlock_Permanent: Ready for use without any time limitation.
- Unlock_Restricted: Ready for use for a certain period.
- Lock_Expired: Use of the software is restricted and it cannot be used because a specified period of use has expired.

Hardware Configuration

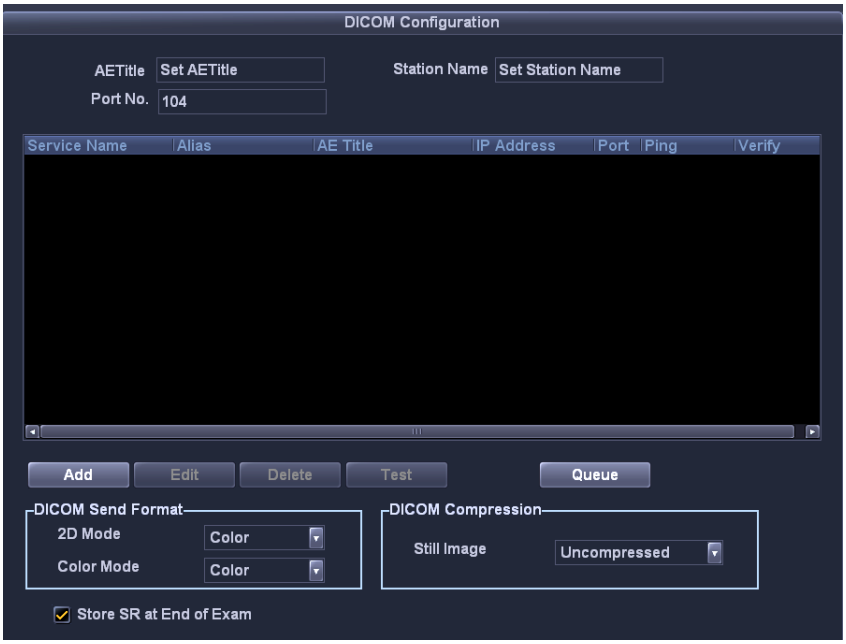
The list of optional hardware is displayed on the screen. Currently, only ECG is supported.

Check the checkbox for hardware that will be used. Reboot the system to complete the settings.

DICOM Setup (Optional)

Select the DICOM tab on the *Setup* screen. Or tap **DICOM** on the touch screen. You can configure the DICOM (Digital Imaging and Communication in Medicine) operations and the DICOM server.

NOTE: For more information, please refer to the server's user manual, or the DICOM Conformance Statement.



[Figure 7.15 Setup – DICOM]

DICOM Configuration

The information on the DICOM server currently used by the system is displayed.

You can change the information, or add or delete a server. The server information is used to identify DICOM for the system within a network. It is also used to transfer data between other DICOM servers.

NOTE: For IP Address, AE Title, and Port No. settings, contact your organization's network administrator.

AE Title

Enter the name of the DICOM AE (Application Entity). The title is used to identify devices that use DICOM within a network.

Station Name

Enter the name of the system. Along with AE Title, it is often used to identify the system in the DICOM network.

Port No.

Enter the port number of the server being used.

DICOM Send Format

Specify the storage format for the 2D or Color Mode images for which the DICOM services will be used. Select either Color or Gray by using the **Combo** button. If you select Gray, images are saved only in grayscale format.

NOTE: The DICOM Send Format settings are applied when an image is saved. For example, when set to Gray, an image is saved as a grayscale image.

DICOM Compression

Select whether to compress the still images for the DICOM service. Select Uncompressed or JPEG Baseline by using the **combo** button. When you select Uncompressed, the images are saved without compression.

NOTE:

The DICOM Compression setting is applied when the image is saved. That is, if JPEG Baseline is set, the image is compressed when it is saved.

Store SR at End of Exam

Select whether to store SR at the end of the exam. When you check this checkbox, SR is automatically stored at the end of the exam; otherwise it is not stored.

Adding DICOM Services

Click **Add** on the screen. A screen is displayed where you can enter a DICOM service to add. After adding a service, click **Save** to save the information. Click **Cancel** to cancel.

Services

Select the type of service to use via DICOM. The supported DICOM servers are Storage, Print, Worklist, PPS, SC and Storage SR.

Alias

Enter the name of the DICOM server.

AE Title

Enter the AE title of the DICOM server. Consult your network administrator before specifying this option.

Transfer Mode

Select a transfer method:

- Batch: Send all saved images when you press the **End Exam** button.
- Send As You Go: Send an image whenever you press the **Save** button to save it.
- Manual: Send the selected image in the Exam List or SONOVIEW.

Connection Timeout

The connection will time out if there is no response within the configured time period. You can specify this time period in seconds.

IP Address

Enter the IP address of the server being used. Consult your network administrator before specifying this option.

Port No.

Enter the port number of the server being used. Consult your network administrator before specifying this option.

Retry Interval

Specify how long the system will wait before it retries when transmission fails. You can specify it in seconds.

Maximum Retries

Specify how many times the system will retry when transmission fails.

Storage Server Information

Select STORAGE under **Services**. Configure the Image Storage Service using DICOM.

Storage Options

- Send Cine Loops: Check this checkbox to send Cine Loops.
- Include Pixel Spacing: In addition to the area information used in ultrasonography, the area information used in CT or radiography is included. You can perform measurements in the PACS system, which does not support ultrasonic area information.

NOTE: However, only 2D and 2D Color Mode images are supported. In Dual and Quad Mode, the depths of the included images must be identical.

- Include 3D Volume: Select whether to send 3D volume data together with the 3D images.

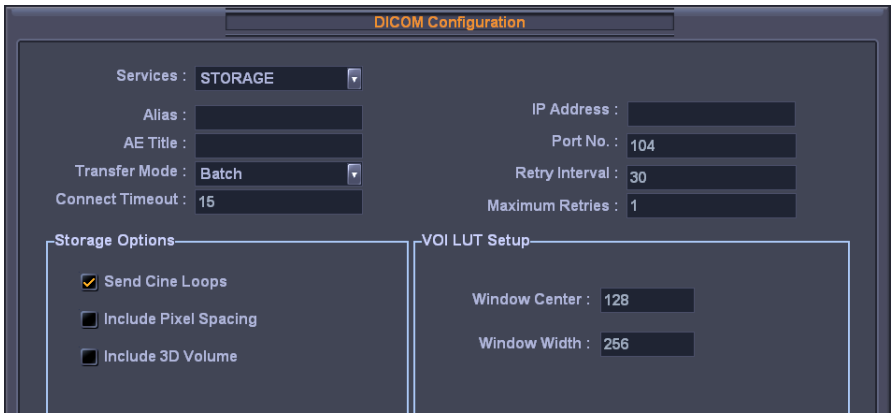
NOTE: Select this only when you use a storage service which supports the 3D volume data of Samsung Medison.

VOI LUT Setup

Configure VOI LUT (Value Of Interest, Look Up Table). When saving, you can adjust the brightness and contrast of a DICOM image. The saved image can be viewed with any PACS device that has DICOM VOI LUT implemented.

- Window Center: Enter a value for the DICOM Tag (0028, 1050) setting. The setting value indicates the brightness of an image that is displayed by the storage service. Relative to 128, a higher value results in a darker image. Note that this function can be used only when it is supported by the storage service.

▶ Window Width: Enter a value for the DICOM Tag (0028, 1051) setting. The setting value indicates the brightness of an image that is displayed by the storage service. Relative to 256, higher values result in lower contrast. Note that this function is available only when it is supported by the storage service.



[Figure 7.16 DICOM Configuration – Storage]

Print Server Information

Select PRINT under **Services**. Configure the Print Service using DICOM.

NOTE:

▶ You can configure a printer connected to the DICOM network only.

▶ Depending on the printer, some of the following functions may not be available. Before configuring a printer, please refer to the printer's user manual, or the DICOM Conformance Statement.

Color

Specify whether to use colors. Select Grayscale or RGB.

Format

Specify the paper layout. Select from 1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5, and 4x6.

Orientation

Specify the paper orientation. Select Landscape or Portrait.

Magnification

When resizing an image to print, specify the interpolation. Select from Replicate, Bilinear, Cubic and None.

Border Density

Specify the border density of an image to print. Select Black or White.

Empty Density

Specify the background color of an image to print. Select Black or White.

Min. Density

Specify the minimum brightness of an image to print. If this option is not specified, the default value is applied.

Max. Density

Specify the maximum brightness of an image to print. If this option is not specified, the default value is applied.

Medium Type

Specify the material type for the print-out. Select from Paper, Clear Film, Blue Film, Mammo Clear Film and Mammo Blue Film.

Film Size

Specify the paper size. Select from 8 inch x 10 inch, 5 inch x 11 inch, 10 inch x 12 inch, 10 inch x 14 inch, 11 inch x 14 inch, 11 inch x 17 inch, 14 inch x 14 inch, 14 inch x 17 inch, 24cm x 24cm, 24cm x 30cm, A4 and A3.

Destination

Specify the paper pathway. Select Magazine or Processor.

Smoothing Type

This option is available only when Magnification is set to CUBIC. Enter a value for the printer which is specified in the DICOM Conformance Statement.

Priority

Specify a priority for the print command. Select from High, Med. and Low.

Copies

Enter the number of copies between 1 and 99.

Configuration Info.

Specify the unique value for a printer. Please refer to the DICOM Conformance Statement for the printer value.

[Figure 7.17 DICOM Configuration – Print]

Worklist Server Information

Select **WORKLIST** under Services. Configure the Modality Worklist Service using DICOM.

■ Show Worklist first when the *Patient Information* screen opens

When you check this checkbox, the Worklist window appears when you press the control panel's **Patient** button. Otherwise, the Study Information window appears.

■ Update Method

Specify the update method for Worklist.

▶ Only on User Request: Update only when asked by the user.

Tips!

To update a Worklist, in the Search tab on the *Patient Information* screen, select Worklist as the Search Source and **click Search**.

▶ On Startup and Every: Update automatically at a specified interval after the system boots and the Worklist is updated.

■ Scheduled Station AE Title

Specify the range of AE Titles to retrieve from the Worklist server in a hospital.

▶ Any: Retrieve the patient list stored in all AE Titles in the server.

▶ This System: Retrieve the patient list specified under the DICOM tab.

▶ Another: Retrieve the patient list stored in the AE Title specified by the user.

NOTE: This option is available only when the Worklist server is enabled.

■ Start Date

Specify the range of dates to search.

▶ Today: Retrieve the patient list for the current date.

▶ Range: Retrieve the patient list for 'n' days before and 'n' days after the current date.

▶ Past Week: Retrieve the patient list for 7 days before the current date.

▶ Past Month: Retrieve the patient list for a month before the current date.

▶ Custom Date: Specify a certain date and retrieve the patient list for that date.

Study Description Priority

Specify the sorting order for when an exam is retrieved from the Worklist server under **Patient Information** > **Patient** > **Description**. The list is sorted in order of high priority to low priority. Select an item that you wish to rearrange, and change its position by using the **Up** and **Dn** buttons.

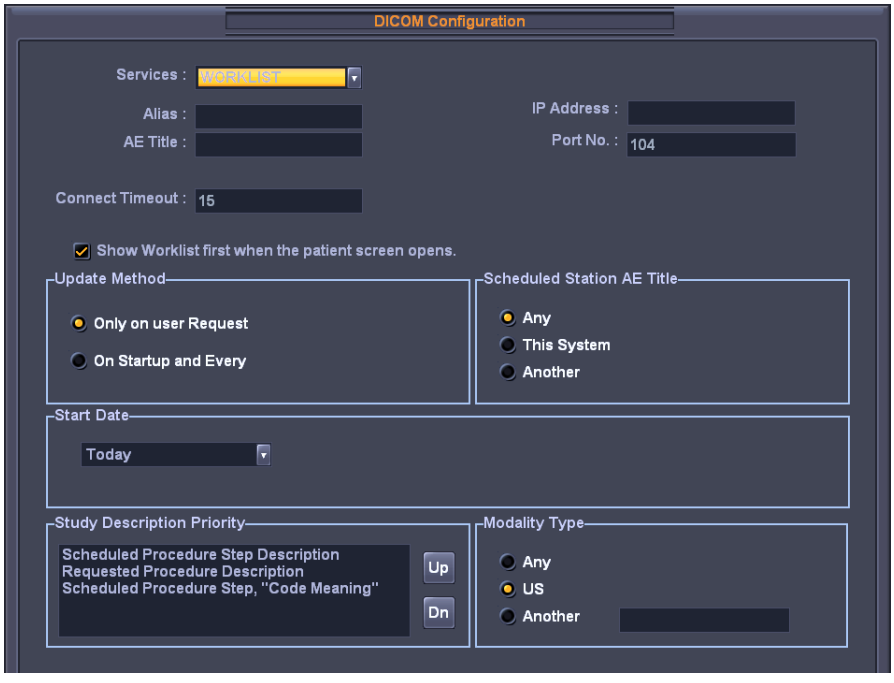
Modality Type

This is used to specify the modality of exams retrieved from the worklist server.

▶ Any: Retrieves all registered worklist exams, regardless of modality.

▶ US: Retrieves Ultrasound exams only.

▶ Another: Allows the user to specify the modality and retrieve matching exams only. Leaving it blank means "Any".

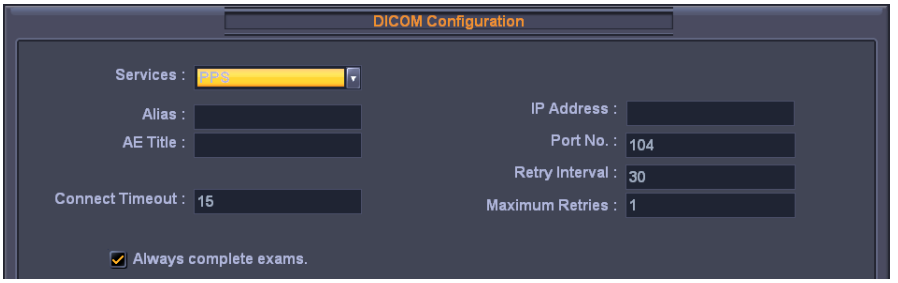


[Figure 7.18 DICOM Configuration – Worklist]

PPS Server Information

Select PPS (Performed Procedure Step) under **Services**. Configure the Modality Performed Procedure Step Service using DICOM.

This can be configured in the same way as for the Storage server.



[Figure 7.19 DICOM Configuration – PPS]

Always Complete Exams

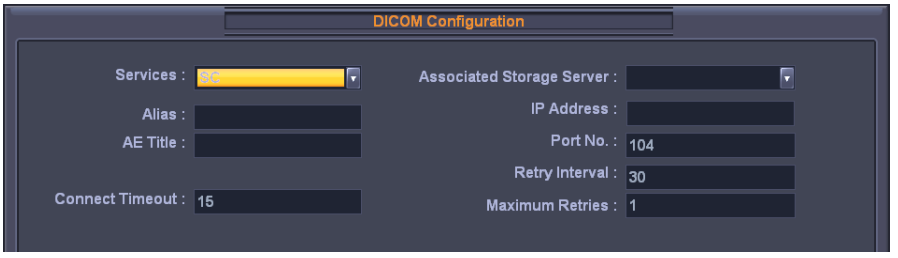
When you check this checkbox, exams are always reported in complete condition. If you click the **Cancel** button without checking this checkbox, the cancel message is sent to the RIS server.

SC Server Information

Select SC (Storage Commitment) under **Services**. Configure the Storage Commitment Service using DICOM. The Storage Commitment Service is used after a diagnosis is finished and all saved images and reports are transferred.

Associated Storage Server

Select an Image Storage server to connect to.

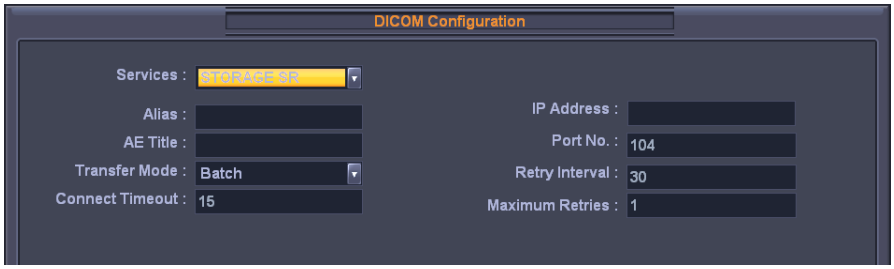


[Figure 7.20 DICOM Configuration – SC]

Storage SR Server Information

Select Storage SR (Storage Structured Report) under **Services**. Configure the Report Storage Service using DICOM.

This can be configured in the same way as for the Storage server.



[Figure 7.21 DICOM Configuration – Storage SR]

Changing DICOM Information

Select a service and click **Edit** on the screen. The information on the selected service will appear.

After changing the information, click **Save** to save the changes. Click **Cancel** to cancel.

Deleting DICOM Services

Select a service and click **Delete** on the screen.

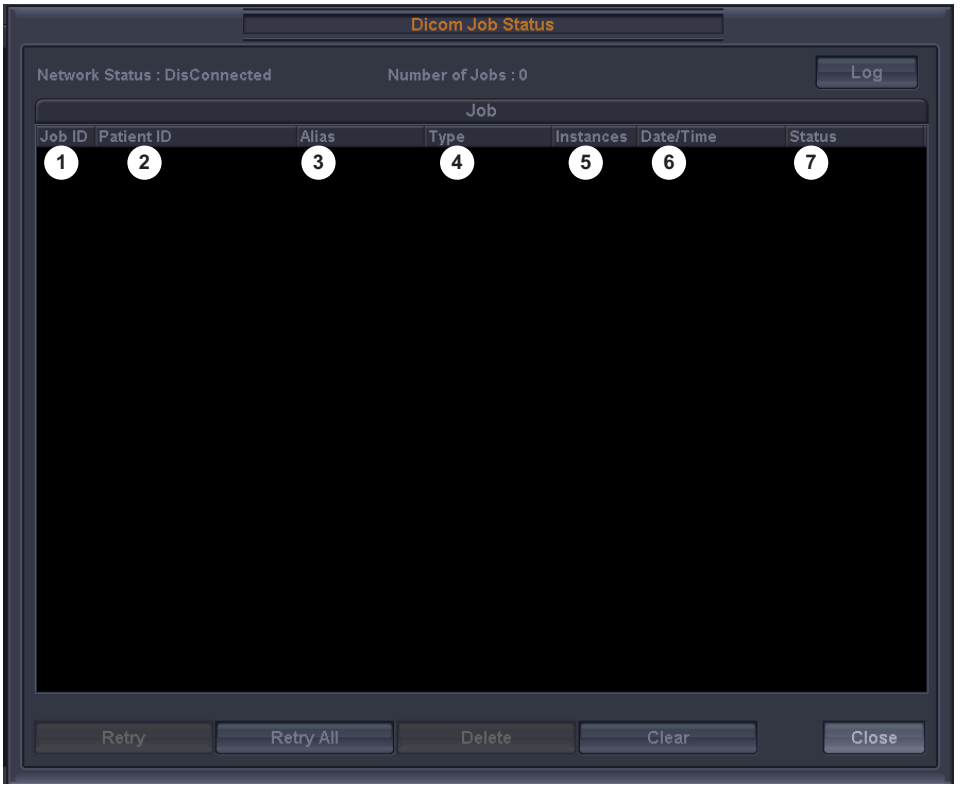
Testing DICOM Servers

Select a service and click **Test** on the screen. The connection with the selected service is tested and the results are shown under the Ping and Verify items. If the result is Normal, it indicates that the connection is functioning as it should do.

Managing DICOM

Click **Queue** on the screen to switch to the *DICOM Job Status* screen. You can review the current job status using the Job ID, Patient ID, etc.

The following describes the elements of the *DICOM Job Status* screen.



[Figure 7.22 Job Status]

❶ Job ID: Displays the job ID.

❷ Patient ID: Displays the patient ID.

❸ Alias: Displays the alias set in the *DICOM Configuration* screen.

❹ Type: Displays the job type. The available job types are Storage, Print, Storage SR, MPPS Start, MPPS End, and Storage CMT.

❺ Instances: Displays the number of instances. What this denotes differs depending on the job type. For 'Storage' and 'Print', it means the number of images. For 'Storage SR', it means the amount of measurement data. For MPPS Start, it is always displayed as 0.

❻ Date/Time: Displays the date and time when the job was created.

❼ Status: Displays the current status of the job.

Status	Description
Fail	The job failed.
Transfer	The job is in progress.
Imperfect	The job has been stopped during execution. It will be switched to the Ready state immediately.
Wait	The job is waiting for execution.
Wait Resp	The job is waiting for a response.
Hold	The job is waiting for a retry. This occurs when the job has failed but the maximum retry count is not yet reached.
Ready	The job is waiting for execution. This occurs when the network is not connected.
Not Ready	The Ready state is not complete. This occurs when MPPS (Modality Performed Procedure Step) End occurs before MPPS Start is completed. Or when a Storage or Print batch job has not completed.

Network Status

Displays the network connection status. When connected, "Connected" is displayed. When disconnected, "Disconnected" is displayed.

Number of Jobs

Displays the number of jobs listed in the *DICOM Job Status* screen.

Log

Displays the *DICOM Log* window.

Retry

Performs the selected job again. This button is enabled only when the status of the selected job is Fail or Wait Resp.

Retry All

Retries all jobs for which the status is Fail.

Delete

Deletes the selected job. This button is enabled only when the status of the selected job is Fail, Imperfect, Wait Resp., or Not Ready.

Clear

Deletes all jobs.

DICOM Log

Click **Log** on the *DICOM Job Status* window to display the *DICOM Log* window. This is used to manage the history of all DICOM services performed on this product.

Log Settings

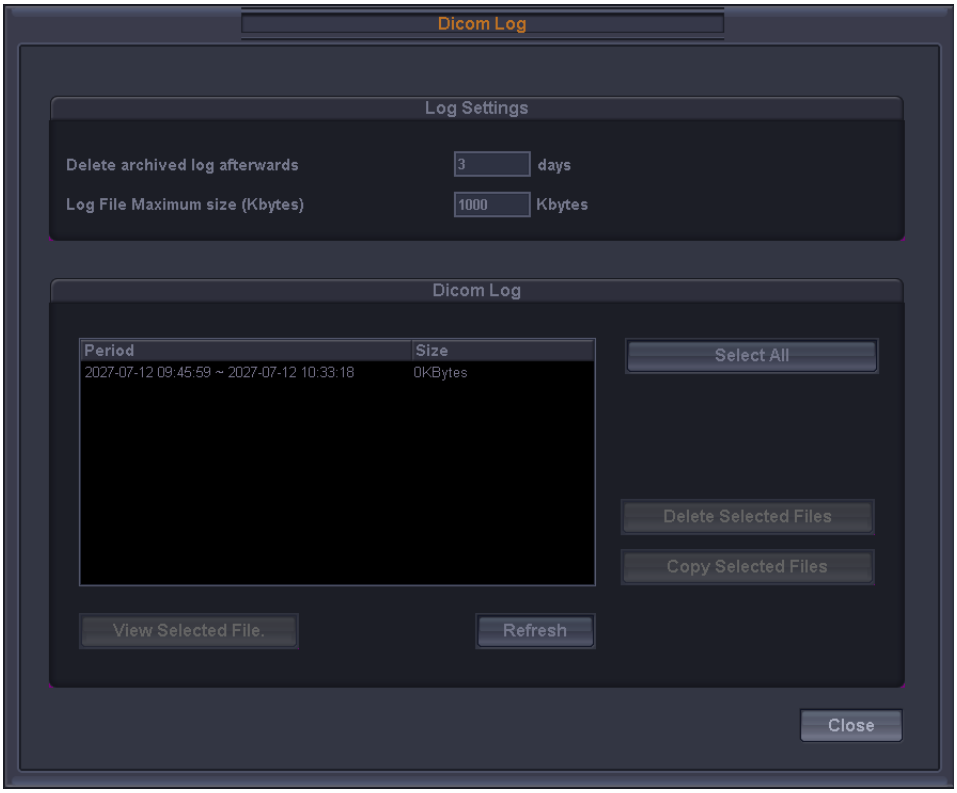
Specify how log files will be managed.

- Delete Archived Log Afterwards: Specify how long a log file will be archived. Enter a number of days. If the specified time has elapsed after the log file was created, the file is deleted from the system.
- Log File Maximum Size: Specify the maximum size of a log file that can be archived. Enter a number of kilobytes. A log file that is larger than the specified size is not archived on the system and is deleted immediately.

DICOM Log

Displays a list of log files with their information.

- Select All: Selects all log files.
- Delete Selected Files: Deletes the selected log files.
- Copy Selected Files: Copies the selected log file to external storage media.
- View Selected File: Displays the details of the selected log file on the screen.
- Refresh: Updates the information of a log file.



[Figure 7.23 DICOM Log]

Auto Calc.

Select the Auto Calc. tab on the *Setup* screen. Or tap **Auto Calc.** on the touch screen. The Auto Calc. function calculates specified measurement items automatically with measurement data and is supported in Spectral Doppler Mode.

NOTE: The specified items will appear on the screen only when the **Auto Calc.** button on the touch screen is tapped in Spectral Doppler Mode.

[Figure 7.24 Setup – Auto Calc.]

Auto Calc. Settings

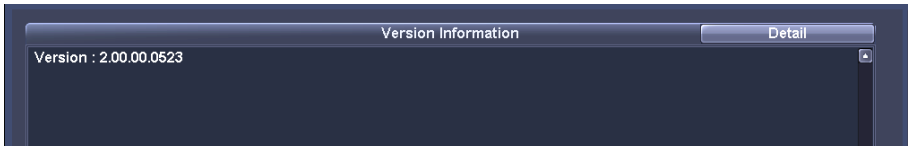
Enable or disable the following items for automatic calculation by checking their checkbox. You can select up to six values.

When the Peak Systolic Velocity and End Diastolic Velocity values are 0, not all results for the items will be displayed on the screen. In addition, the result value for Time Averaged Mean Velocity is displayed only when Mean Trace is 'On'.

About

Select the About tab in the *Setup* screen. Or tap **About** on the touch screen. Information about the system software version will be displayed.

Click **Detail** to view more detailed information on the product version.



[Figure 7.25 Setup – Information]

* The S/W version of your system may be different from that in the figure above.

Measure Setup

Specify various setup options for measurements. The setup may be modified depending on specific needs or preferences.

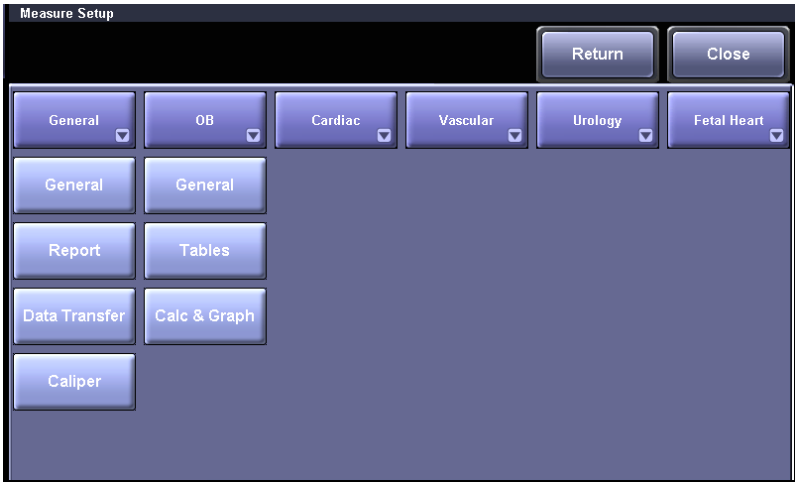
1. Tap **Utility** > **Measure Setup** on the touch screen.
2. When the *Measure Setup* screen appears, select a tab that has items to configure.
3. Specify settings for each item.
4. Save and close the settings. Click the **Close** button on the monitor or tap the **Close** button on the touch screen or press the **Exit** button on the control panel to switch to Scan Mode. Tap **Return** on the touch screen to go back to the Utility menu.

Tips!

Selecting a tab

You can select a desired tab in either one of two ways. Select the method that suits you.

- Use the trackball and the **Set** button to select a tab.
- Tap a corresponding button on the touch screen.



[Figure 7.26 Measure Setup – Touch Screen]

Measure Menu

Tap Utility > Measure Menu on the touch screen. The monitor and the touch screen will switch to Measure Menu screen.

Set the buttons that will appear on the touch screen during measurement. The menus for measurement items and results can be configured as desired.

[Figure 7.27 Touch Menu Design]

Select Calc. Page

Select a calculation page (package) to set. You can also select by rotating the **[1] Page** dial-button on the touch screen. The calculation page consists of OB, Gynecology, Cardiac, Vascular, Fetal Heart, Urology, Abdomen, Small Parts, TCD, Pediatric Hip, and MSK.

Available Menu List

The possible measurement items appear as a menu on the touch screen. Tap "+" to display the sub-measurement items.

After selecting measurement items from the Available Menu list, and the desired position, tap ⇨ on the screen. The selected items are added to the menu on the right.

Touch Menu Design

Measurement Package Settings

- ▶ Prev. Page: Moves to the previous page.
- ▶ Next page: Moves to the next page.

Changing Menu Position

Select a measurement group or item, and change its position using ⇦, ⇨, ⇧, and ⇩.

New Tab

Creates a new tab.

Delete Menu

Deletes the selected measurement item.

Rename Tab

Changes the name of the created tab.

Clear All

Deletes all contents of the selected tab.

Save this Page

Saves the changes made to the current page.

Default Items

Tapping **Default Items** on the screen restores the default settings.

Return

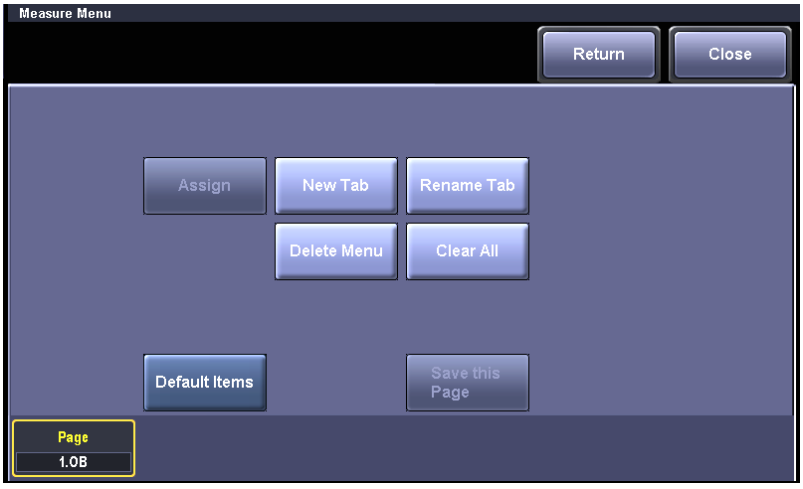
Returns to the step that precedes the current menu.

Close

Finishes editing. When changes have been made, a message appears, asking whether to save them.

NOTE:

- You cannot place sub-measurement items in Group.
- For detailed information on measurement items, refer to 'Chapter 5. Measurements and Calculations'.



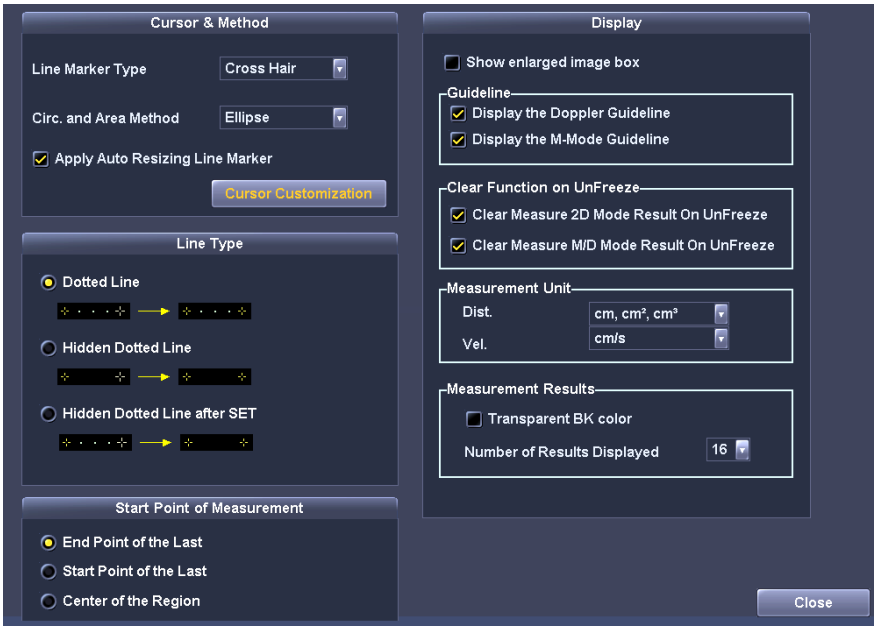
[Figure 7.28 Measure Menu –Touch Screen

General

Select the General tab on the *Measure Setup* screen. Or tap **General** on the touch screen. You can specify basic measurement options.

General Settings

Select the sub-tab General under the General tab. You can specify basic measurement options.



[Figure 7.29 Measure Setup – General – General]

Cursor & Method

Line Marker Type

Specify the shape of the caliper cursor displayed on the screen. Either Cross Hair or Arrow Head can be selected.

Circ. and Area Method

Specify the method for measuring circumference and area. Either Ellipse or Trace can be selected. By default, the selected method appears when the **Caliper** button is pressed. Therefore, you can start measurement more easily by specifying the most commonly used measurement method. For more information on Ellipse and Trace, please refer to the "Circumference and Area Measurement" section in 'Chapter 5. Measurements.'

Apply Auto Marker Cursor Size

Select whether to automatically reduce the marker cursor size when the distance between the start point and the moving point is 50 pixels or less at the time of measurement.

Cursor Customization

Guide

The size of the cursor the user is currently measuring with

Large

The size of the cursor the user has finished measuring with

Small

The size of the cursor among the markers the user has measured that are within 50px of the cursor on the screen

Shape

Cross Hair, X Type, L Type, V Type

Border

Cursor shadowing feature

Center Point

This feature displays a small dot at the center of the marker to help the user see the precise point of measurement.

[Figure 7.30 Cursor Customization]

Line Type

From the following three options, select the line pattern to use when measuring a distance.

Dotted Line

Displays a dotted line.

Hidden Dotted Line

Displays only the start and end points of the line.

Hidden Dotted Line after Set

Displays a dotted line while measuring, then after the line has been finalized with the **Set** button, the dotted line will disappear.

Tips!

Selecting Line Type

If you select Hidden Dotted Line or Hidden Dotted Line after Set, you can keep images from being interfered with by a measurement line.

Start Point of Measurement

Set a location indicated by the cursor. Set a start point for measurement.

- End Point of the Last: The cursor appears at the end point of the last measurement.
- Start Point of the Last: The cursor appears at the start point of the last measurement.
- Center of the Region: The cursor appears in the center of the image region.

Display

Specify items to display during measurement. Check the checkboxes of the items you wish to use.

Show enlarged image box

- Doubles the size of an image and shows it during measurement and displays the current position.
- In Color Doppler mode, you can select between 2D mode image and Color Doppler mode image by pressing the space bar on the keyboard.

Guideline

- Displays the Doppler guideline: Specify whether to display cross lines while items are measured in frozen spectrum. This option can be useful when approximate values are estimated.
- Displays the M Mode guideline: Specify whether to display cross lines while items are measured in the frozen state in M Mode. This option can be useful when approximate values are estimated.

Clear Function on Unfreeze

- Clear Measured 2D Mode Results On Unfreeze: Specify whether to clear measurement results from the screen when switching to Scan Mode after performing measurements in 2D Mode.
- Clear Measured M/D Mode Results On Unfreeze: Specify whether to clear measurement results from the screen when switching to Scan Mode after performing measurements in M Mode and Doppler Mode.

Measurement Units

Specify the measurement units. For a small object, it is more convenient to use 'mm' for Dist. When blood flow is fast, it is better to use 'm/s' for Vel.

- Dist.: Select either a cm or mm scale for the unit of distance, area and volume.
- Vel.: Select either cm/s or m/s for the unit of velocity.

NOTE: Changing measurement units deletes all existing measurement data.

Measurement Results

- Transparent BK color: Sets a transparent background.
- Number of Results Displayed: Specify the number of lines for measurement results that are displayed on the screen. This is applied to the basic measurement results for all applications, except for obstetrics, cardiac, vascular, urology, and fetal heart.

NOTE: Use the Setting tab of each application to set the Number of Measure Results Displayed for obstetrics, cardiac, vascular, urology, and fetal heart.

Report

Select the Report tab under the General tab. Here you can set items related to the measurement report.

Use SonoReport

The format provided by SonoReport is used instead of the report format provided by Samsung Medison.

NOTE: You need a program supplied by SonoReport to use this function. For details, contact the Customer Support Department of Samsung Medison in your region.

[Figure 7.31 Measure Setup – General – Report]

Report Header

Specify header options for reports. You can specify multiple items which will appear in all measurement reports.

Hospital Info.

This is information about the hospitals in which the product is installed. You can select Hospital name, Diag. Physician, Ref. Physician, and Sonographer.

Patient Info.

This is information about the patient. You can select Patient ID, Name, Gender, Heart Rate, Birthday, Age, and BSA.

Other

This information concerns other comments. You can select Description and Accession #.

OB/FH Header Layout

Specify item(s) to display under the header of Obstetrics or Fetal Echo measurement reports. You can specify more than one item.

EFW	Pctl. (EFW)
GA (EFW)	SD (EFW)
Gravida	Aborta
Para	Ectopic

Measurement Results

Measurement Result Type

Specify how measurements listed in a report are calculated.

- ▶ Average: Shows the average of the last three measurement values.
- ▶ Last: Shows the last measurement value.
- ▶ Max: Shows the largest measurement value.
- ▶ Min: Shows the smallest measurement value.

Save Action

Range

- Current Page: Select current page only.
- All Pages: Select all pages.

Color

- Same as preview: Save the colors exactly as they are shown on the monitor.
- Black and White: Save in black and white.

Print Action

OB Trend Graph

- Only Current Page: Print current page only.
- All Pages(1x1): The selected graph is printed in a 1 x 1 format
- All Pages(3x2): The selected graph is printed in a 3 x 2 format.
- Screenshot: Capture the screen to print the graph.

Print

Enter additional information for the header, title and footer to display when printing measurements.

Data Transfer

Select the sub-tab Data Transfer under the General tab. Here you can set the data transfer method, etc.

[Figure 7.32 Measure Setup – General – Data Transfer]

Serial Transfer

Specify the format in which data will be transferred. You can select from a text format and an XML format. This product uses an RS-232C USB serial cable to transfer data. Select the XML format to transfer data with reporting tools such as Astraia, Sonoultra and ViewPoint.

NOTE: Before setting, make sure that **COM** is set to Open Line Transfer under the Peripherals tab on the *Setup* screen.

User Table Backup & Restore

Back up a user-defined table or restore the backed-up table to the system. Click **Backup** or **Restore** and specify the desired options.

DICOM SR Format

- General Report: This is the default format.
- ViewPoint: This is the ViewPoint data format.

Caliper

Select the Caliper sub-tab under the General tab.

Specify whether additional information will be shown along with the basic measurement values, when basic measurements are taken by pressing the control panel's **Caliper** button. If this option is selected, the additional information will also be saved and output along with the measurement results.

If Application is set to Cardiac, the D Velocity, D A/B, D Trace and M Distance items are changed.

NOTE: The Cardiac setting can be used only when the probe preset is Cardiac or Pediatric Cardiology.

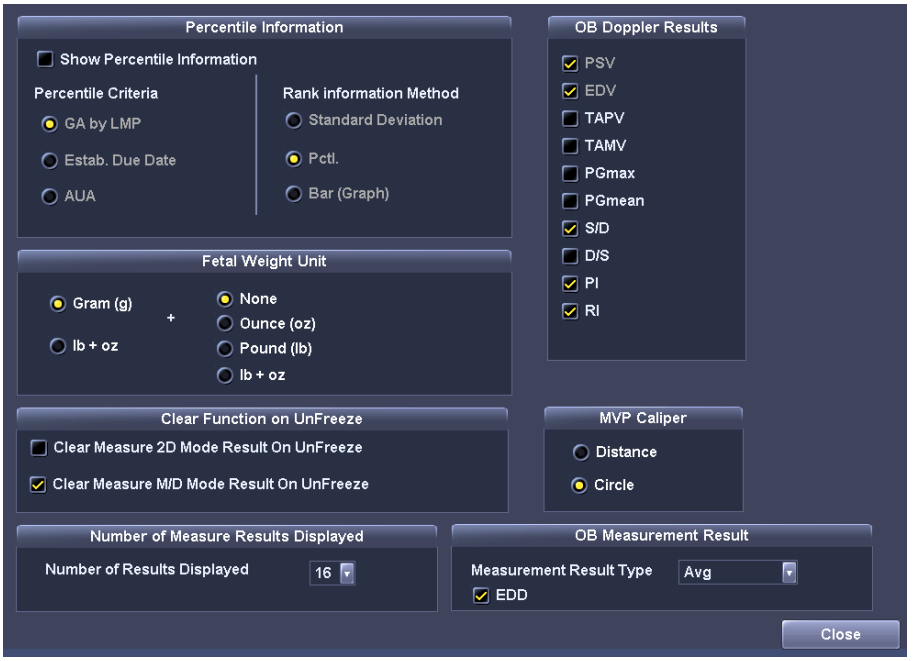
[Figure 7.33 Measure Setup – General – Caliper]

Obstetrics

Select the OB tab on the *Measure Setup* screen. Or tap **OB** on the touch screen. Here you can set items related to obstetrics measurement.

General Settings

Select the sub-tab General under the OB tab. You can specify basic options for obstetrics measurement.



[Figure 7.34 Measure Setup – OB – General]

Percentile Information

Show Percentile Information

Check the checkbox to see the Percentile Information.

Percentile Criteria

Select a value that will be used for percentile calculation.

- GA by LMP: GA is calculated based on the maternal LMP.
- Estab. Due Date: GA is calculated based on the Estab. Due Date that is entered in the Patient Information.
- AUA (Average US GA): GA is calculated using the average value of several ultrasound measurements.

Rank Information Method

Specify how the growth range information will be displayed. The growth range information can be used to observe fetal development and abnormality.

- Standard Deviation: International standard deviation is used to indicate the fetal development. Fetal development and abnormality are observed on the basis of SD = 0, which indicates the standard development.
- Pctl.: Fetal development is indicated in percentile. Fetal development and abnormality are observed on the basis of 50%, which indicates the standard development.
- Bar (Graph): The percentile is shown in a bar graph. This option is available with OB reports only. The green color indicates the normal development range, while the red color indicates an abnormal development range.

Fetal Weight Units

Specify the units for fetal weight measurement. You can select up to two units from grams [g], ounces [oz] and pounds [lb]. The primary and secondary units can be combined to show measurements in various units. The primary unit can be either "grams [g]" or "lb + oz" on the left. The secondary unit can be selected from the units on the right, and can be any unit other than the one selected as the primary unit.

'lb + oz' is a unit combining pounds and ounces, and 'None' indicates that no units are used.

Clear Function on UnFreeze

This function is applied to obstetrics only.

■ Clear Measure 2D Mode Result On UnFreeze

Check the checkbox to delete 2D Mode results when UnFreeze is selected after measurement.

■ Clear Measure M/D Mode Result On UnFreeze

Check the checkbox to delete M or D Mode results when UnFreeze is selected after measurement.

Number of Measure Results Displayed

■ Number of Results Displayed

Set the number of lines in which to display the measurement results on the screen.

OB Doppler Results

Set the display for each item of the Doppler Results to be shown on the screen of the OB package.

PSV : Disabled
EDV: Disabled
TAPV: Enabled
TAMV : Enabled
PGmax: Enabled
PGmean: Enabled
S/D : Enabled
D/S : Enabled
PI: Enabled
RI: Enabled

MVP Caliper

Select a caliper to measure the Maximum Vertical Pocket (MVP).

■ Distance

Measure the MVP by using the straight linear distance.

■ Circle

Measure the MVP by selecting Circle.

OB Measurement Result

Measurement Result Type

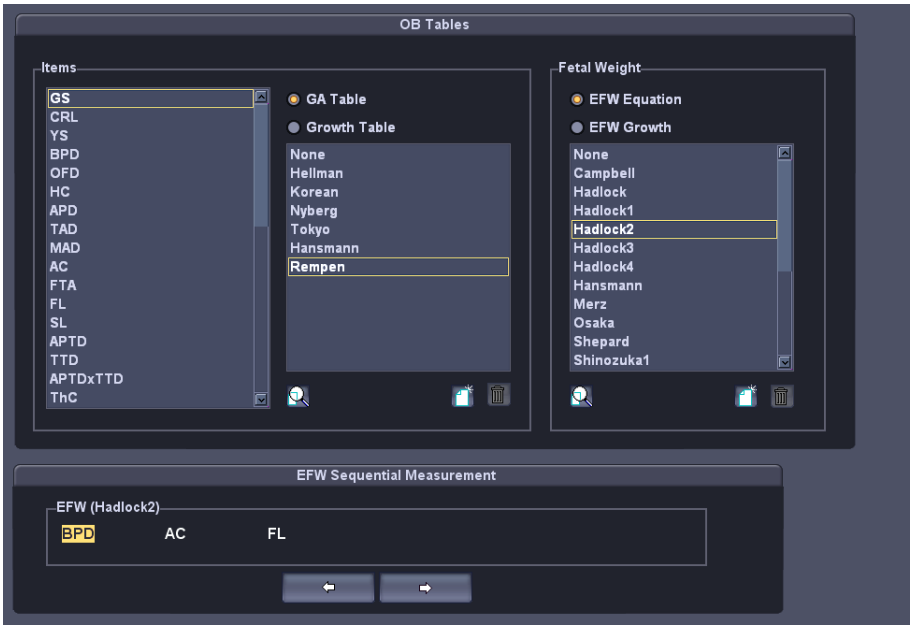
Set a measurement method. Select Avg., Last, Max. or Min. value.

EDD

Select the checkbox to display the estimated date of delivery.

Table Settings

Select the sub-tab Tables under the OB tab. You can specify references such as reference tables and equations that will be used by each measurement item.



[Figure 7.35 Measurement Setup – OB – Tables]

Items

This setting is intended for the measurement of the gestational age (GA) and the fetal size (Growth). Select items in the following order. Select items for the MCA (Mid Cerebral Artery), the PI of the UA (Umbilical Artery), and the AFI of the RI Graph settings by following the steps shown below.

1. Select a measurement item from the list on the left.
2. Select a reference type from the GA table and Growth table.
3. Select a reference from the list on the right.

Fetal Weight

This setting is intended for the measurement of the estimated fetal weight (EFW). Select items in the following order:

- Select the EFW measurement method from EFW equation and EFW growth.
- Select a reference from the list above (See right of Figure Measurement Setup-OB-Tables)

Add a Reference

NOTE:

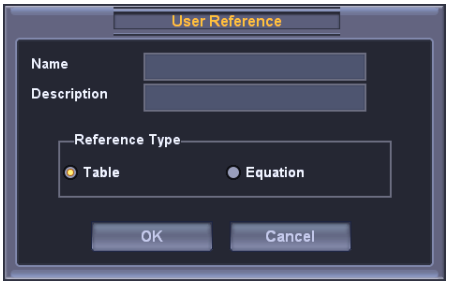
Observe the following directions when adding a table reference. If these conditions are not met, a warning message appears and the reference is not saved.

- Input at least three types of data.
- If there are no Min and Max values, select Value Only for "Table Type."

1. Press . The *User Reference* window will appear.
2. Enter a name and description for a new reference.
3. Specify the reference type as Table or Equation.

NOTE: EFW Equation can only set Equation, and EFW Growth can only set Table as the reference type.

4. Click **OK** to go to the next step. The *Editor* screen will appear. Click **Cancel** to cancel.
5. Enter a reference.
6. Click **Save** to save the information. Click **Cancel** to cancel.
7. Click **OK** to finish. Click **Cancel** to cancel.

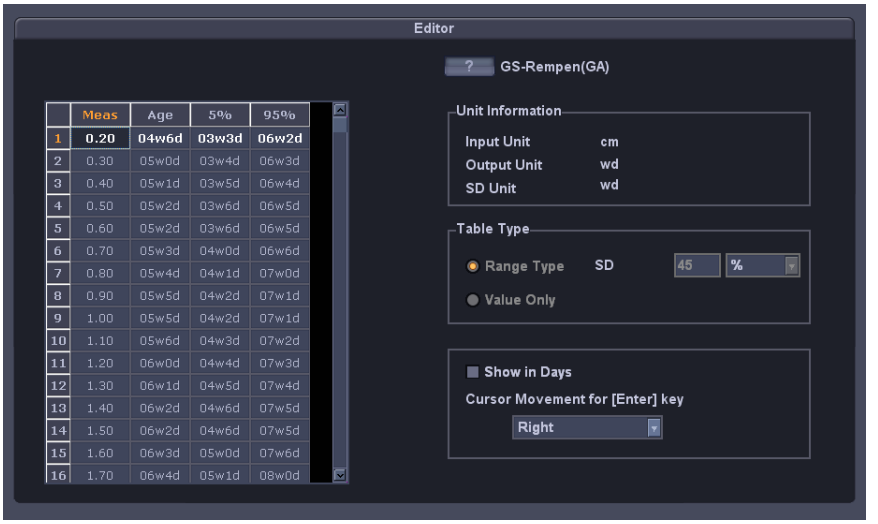


[Figure 7.36 User Reference]

Tips!

Add Reference Table

Clicking the **Question Mark** button shows the sources of the references. Clicking the question mark button a second time hides the sources again.



[Figure 7.37 User Table]

Unit Information

The unit of the selected reference, such as Input, Output, SD, etc., is displayed.

Table Type

Select the table type for the selected reference. For the Growth Table, SD (Standard Deviation) is displayed.

- Range Type: Set the Min. and Max. values of the selected reference and display them in a table. The SD value varies according to the range selected by the user.
- Value Type: Only the measurement values entered by the user are displayed, regardless of the range of Min., Max., and SD.

Misc.

- Show In Days: When the checkbox is selected, the table unit is changed from wd (week-day) to d (day).
- Cursor Movement for the Enter key: Specify the direction of cursor movement when the Enter key on the alphanumeric keyboard is pressed while a table is being edited. Select from Right, Down and Edit.

Tips!

Add Reference Equation

If a reference appears in an equation, the following should be entered:

Equation

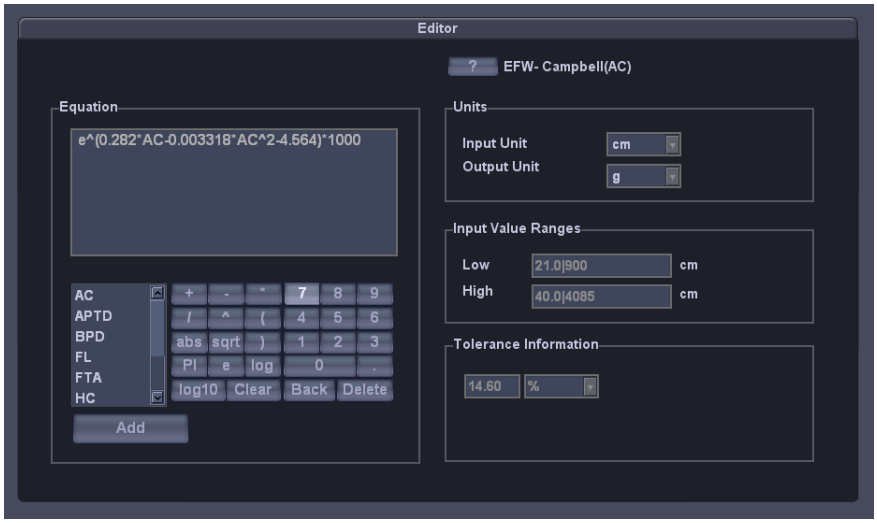
Enter a reference equation. Use the measurement calculator shown in the lower right corner.

Input Value Ranges

Enter the minimum (Low) and maximum (High) ranges for the selected reference.

Tolerance Information

Select the tolerance from w or d.



[Figure 7.38 User Equation]

View & Modify References

1. Under Selection, select a preset to delete.
2. Press and the *Editor* screen will appear.
3. View or modify a reference.

■ EFW Sequential Measurement

NOTE:

- This setting is necessary when you set "EFW Measure" for User Key 1 or User Key 2 in **Utility** > **Setup** > **User Defined key** > **User Key Setup**. The setting is applied when you measure EFW using the **User 1** or **User 2** button.
- You can also set EFW measure in Touch Menu Designer. For details, see "Touch Menu Designer" in this chapter.

Specify the order of measurement items when measuring EFW using the **User 1** or **User 2** button. Change the order of the measurement items using the **arrow** buttons.

Calc. & Graph

Select the sub-tab Calc. & Graph under the OB tab. You can specify settings for calculation and graphs.

[Figure 7.39 Measure Setup – OB – Calc. & Graph]

Auto Calculations

Specify an item that will be calculated automatically. For example, if the MAD checkbox is selected as shown above, when APD and TAD are measured, the measurements are used to calculate MAD automatically and display the result on the screen. The results of automatic calculation may affect GA and EDD information.

Ratio Calculations

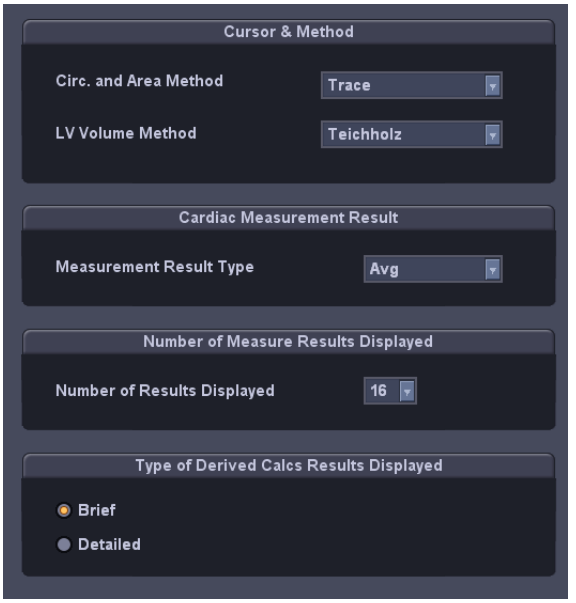
Specify a measurement item for which a ratio will be calculated. For example, if the FL/BPD checkbox is selected, when FL and BPD are measured, the ratio between them is calculated and displayed on the screen. This ratio also appears in a report.

Trend Graph

Specify whether to include a graph for a certain item or ratio in an obstetrics report. Press and the *Editor* screen for the selected graph will appear.

Cardiac

Select the Cardiac tab on the *Measure Setup* screen. Or tap **Cardiac** on the touch screen. You can specify settings for cardiac measurement.



[Figure 7.40 Measure Setup – Cardiac]

Cursor & Method

Circ. and Area method

Specify how the circumference and area are measured in a 2D cardiac image. Either Ellipse or Trace can be selected.

LV Volume Method

Specify how the volume of the left ventricle is measured. Teichholz, Cubed or Gibson can be selected. For more information on calculation formulae, please refer to the reference manual.

Cardiac Measurement Results

Measurement Result Type

Set a measurement method. Select Avg., Last, Max., or Min. value.

Number of Measure Results Displayed

Number of Results Displayed

Specify the number of lines for measurement results that are displayed on the screen.

Type of Derived Calc. Results Displayed

Set a display method for measurement results. Select **Brief** for a brief display and **Detailed** for a detailed display.

Vascular

Select the Vascular tab on the *Measure Setup* screen. Or tap **Vascular** on the touch screen. You can specify settings for vascular measurement.

[Figure 7.41 Measure Setup – Vascular]

A/B Ratio

Specify each individual peak velocity for which a ratio between A and B will be calculated.

ICA/CCA Ratio

Specify each individual measurement item that will be used for the ICA/CCA ratio.

Doppler Results

Set the Doppler measurement items that will be displayed with the measurement results.

Vascular Measurement Result

Measurement Result Type

Set a measurement method. Select Avg., Last, Max., or Min. value.

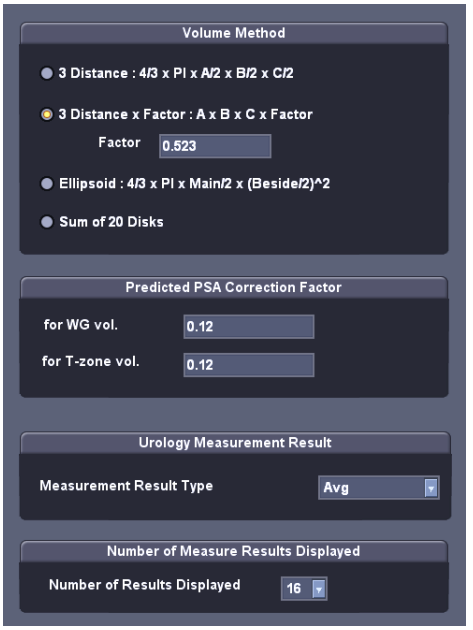
Number of Measure Results Displayed

Number of Results Displayed

Specify the number of lines for measurement results that are displayed on the screen.

Urology

Select the Urology tab on the *Measure Setup* screen. Or tap **Urology** on the touch screen. You can specify settings for urology measurement.



[Figure 7.42 Measure Setup – Urology]

Volume Method

Specify an equation that will be used for volume calculation.

- 3 Distances: The volume is calculated using three diameters in the longitudinal and transverse planes (4/3 x p x A/2 x B/2 x C/2).
- 3 Distances x Factor: The volume is calculated using three diameters in the longitudinal and transversal planes, and a factor (F) value entered by the user. (A x B x C x Factor).
- Ellipsoid: The volume is calculated using the length of the Main and Beside axes. (4/3 x π x Main/2 x (Beside/2)^2).
- Sum of 20 Disks: The volume is calculated by adding together the areas in the 20 parallel planes. (d/20 x (A1 + A2 + ... A20), d: the sum of the distances between disks).

NOTE: 3 Distances x Factor: A = 1st Dia. ; B = 2nd Dia. ; C = 3rd Dia.
The factor value is set to "0.523" by default. When the value needs to be changed, a value between 0 and 1 (0 < factor <= 1) is recommended.

Predicted PSA Correction Factor

Specify the predicted PSA correction factor for the measurement of the WG and T-Zone volume. The default value is 0.12.

Urology Measurement Results

Measurement Result Type

Set a measurement method. Select Avg., Last, Max., or Min. value.

Number of Measure Results Displayed

Number of Results Displayed

Set the number of lines in which to display the measurement results on the screen.

Fetal Heart

Select the Fetal Heart tab on the *Measurement Setup* screen. Or tap **Fetal Heart** on the touch screen. Here you can set items related to fetal heart measurement.

Cursor & Method

Circ. and Area Method

Specify how the circumference and area are measured in a 2D fetal cardiac image. Either Ellipse or Trace can be selected.

LV Volume Method

Specify how the volume of the left ventricle is measured. Teichholz, Cubed or Gibson can be selected. For more information on calculation formulae, please refer to the reference manual.

FH Measurement Results

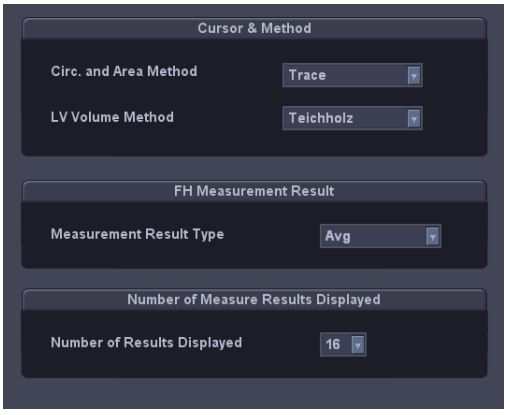
Measurement Result Type

Set a measurement method. Select Avg., Last, Max., or Min. value.

Number of Measure Results Displayed

Number of Results Displayed

Specify the number of lines for measurement results that are displayed on the screen.



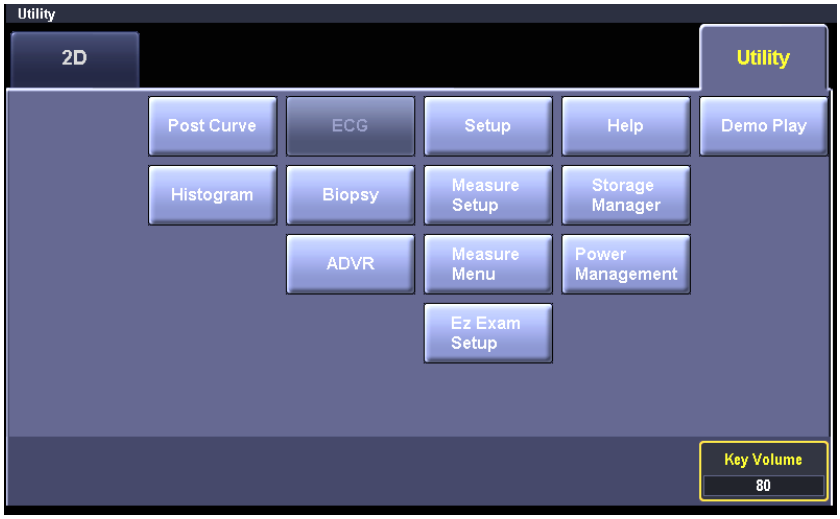
[Figure 7.43 Measure Setup – Fetal Heart]

Utility

This menu is for system settings and for using ECG, Biopsy, and Histogram.

You can use the Utility menu as follows:

1. Tap **Utility** on the touch screen. The *Utility* screen appears.
2. Tap a button to select the desired item.
3. Tap **Return** to return to the *Utility* screen after using it. To exit the *Utility* screen and switch to Scan Mode, tap **Exit** on the touch screen or press the **Exit** button on the control panel.



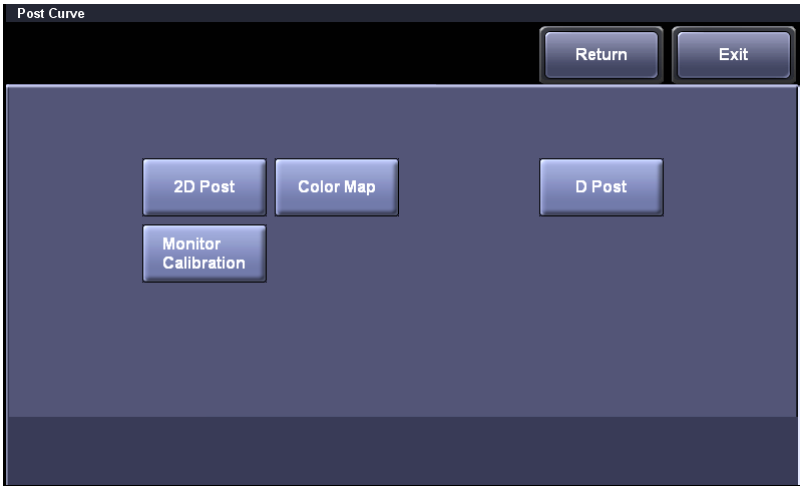
[Figure 7.44 Utility – Touch Screen]

Key Volume

Set the volume of the touch screen button. Make a selection between 0-100 using the dial-button on the touch screen. If the volume is set to 0, the button makes no sound when tapped.

Post Curve

Tap **Post Curve** on the touch screen. The *Post Curve* screen appears. Here you can set various post maps and gamma values.



[Figure 7.45 Post Curve – Touch Screen]

2D Post

Select a 2D Post.

[Figure 7.46 2D Post – Touch Screen]

Chroma Map

Tap **Chroma Map** on the touch screen and set to On or Off. When you select On, you can change the colors of images on the screen according to your choice.

Use dial-button **[1]** to select one from Type 1-13 or User 1-3. When you set Curve as the User type, the **Chroma Map Edit** button on the touch screen is enabled.

Chroma Map Edit

You can set the Chroma colors of your choice. You can also set the Chroma colors in each diagnosis mode menu. This is enabled only for the User type.

Adjust the color using Red, Green, and Blue. You can select a value between 0 and 255.

When you change the settings, **Chroma Map Save** is enabled. Tap **Chroma Map Save** to save the settings.

Chroma Map Save

Saves the settings changed in Chroma Map Edit.

Return

Returns to the previous step of the current menu, after the current Post Map setting has been completed.

Gamma

Use the dial-button on the touch screen to set brightness and contrast (Off, Weak, Medium, or Hard).

- ▶ Off: Gamma Off
- ▶ Weak: Bright contrast
- ▶ Medium: Medium contrast
- ▶ Hard: Dark contrast

Color Map

Select a Color Map.

Tag

Press the **Tag** button on the touch screen to turn it on/off. When turned on, a random color is applied to a certain area of an image.

Tag Width

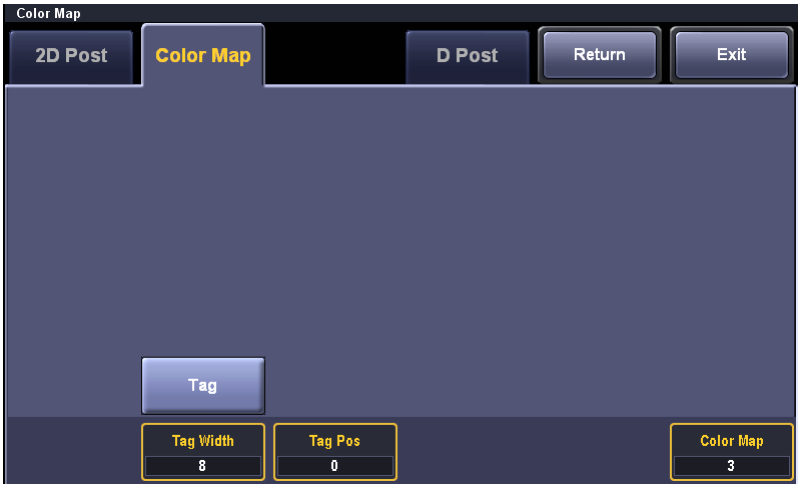
Use the dial-button on the touch screen to select the range of tags, from between 8 and 256. The **Tag Width** affects the **Tag Pos.**.

Tag Pos.

Use the dial-button on the touch screen to select the position of tags, from between 0 and 248. The **Tag Pos.** affects the **Tag Width**.

Color Map

Use the dial-button on the touch screen to select the type of color map. 14 types of post curve are supported.



[Figure 7.47 Color Map – Touch Screen]

M Post

Select M Post. The settings can be specified in the same way as for 2D Post.

D Post

Select D Post. The editing method is identical to 2D Post.

Monitor Calibration

Tap Monitor Calibration.

[Figure 7.48 Monitor Calibration – Touch Screen]

Brightness

Set the brightness of the screen. Select a value between 0 and 100 by using the dial-button on the touch screen.

Contrast

Set the contrast of the screen. Select a value between 0 and 100 by using the dial-button on the touch screen.

Curve

Specify the focus curve. Select one from Type 1 to 5 or User 1 to 3 by using the dial-button. You can edit the user type focus curves according to your preferences by using **Edit**.

Edit

When you set Curve as User, the **Edit** button on the touch screen is enabled. Tapping **Edit** on the touch screen shows the screen and menu for setting a curve.

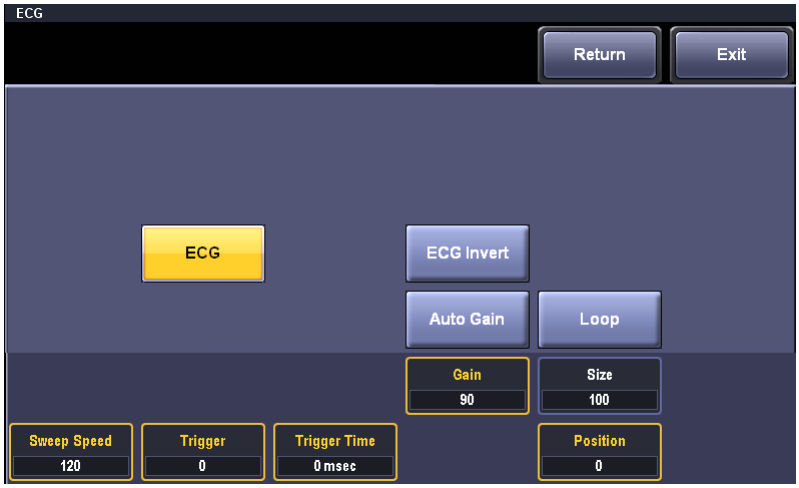
- **Insert**: Inserts a point to the curve. The new point is added in the middle, between the currently selected point and the next point.
- **Delete**: Deletes the currently selected point.
- **Save**: Saves the current curve.
- **Picker Pos.**: Selects a point in the curve. Select the position of the point using the dial-button.
- **Color**: Select your choice of Red, Green or Blue for the color of the point on the curve.

Default

Restores factory default settings.

ECG

Select the ECG. The ECG (echocardiogram) function allows viewing of the cardiac pulsation.



[Figure 7.49 ECG – Touch Screen]

NOTE: The ECG shows an image of the heart beat and appears in the menu for the Cardiac or Vascular application only.

In a Multi Image Mode such as Dual or Quad, ECG Cine can be used for each image.

Starting and Terminating ECG

Tap **ECG** on the touch screen.

ECG Setup

ECG Invert

Inverts ECG. Set this to On or Off by tapping the button on the touch screen.

Auto Gain

Tap **Auto Gain** on the touch screen to automatically set the gain value of ECG.

2D/Loop

Sets the area for using ECG. Select 2D or Loop by tapping the button on the touch screen. You can use ECG in the 2D area when you select 2D, or in the Loop area of Spectral Doppler Mode when you select Loop.

Sweep Speed

Sets the ECG speed. Select 60Hz, 120Hz, 180Hz, 240Hz, 300Hz, or 360Hz by using the dial-button on the touch screen.

Trigger

Sets the trigger interval. Turn it off or select a value from 1 – 5 by using the dial-button on the touch screen.

Trigger Time

Sets the time to initiate a trigger. Select a value from 0 – 1000 msec by using the dial-button on the touch screen.

Gain

Sets the ECG gain value. Select a value from 10 – 100 by using the dial-button on the touch screen.

Size

Sets the ECG size. Select a value from 50 – 200 by using the dial-button on the touch screen.

Position

Sets the ECG position. Select a value from 0 – 90 by using the dial-button on the touch screen. The ECG moves toward the top as the value increases.

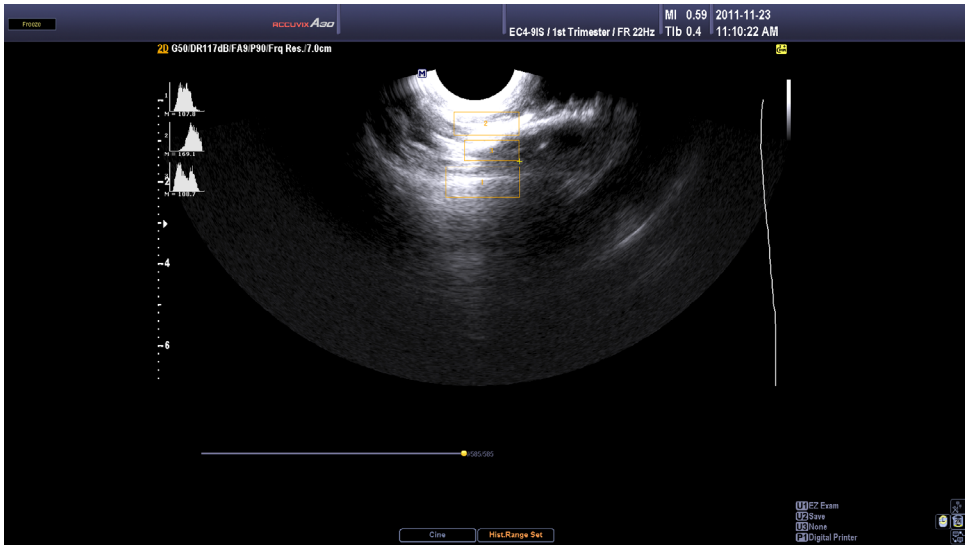
CAUTION:

- If the ECG is less then 30Hz, the Heart Rate (HR) is not displayed.
- In CW Mode, when ECG is active, the error ratio of the Heart Rate (HR) should be within 2%.

Histogram

A histogram is a type of graph representing the distribution of echoes.

1. Tap **Histogram** on the touch screen. The touch screen displays a histogram.
2. Specify an area that the histogram is to cover. Use the trackball and the **Set** button to specify area 1, 2 and 3.
3. Histogram 1, 2 and 3 will appear on the screen.



[Figure 7.50 Histogram]

Histogram Settings

Specify the position or type of a histogram.

Move Hist. 1, 2, 3

After selecting a histogram to move by pressing the button on the touch screen, move it by using the trackball and the **Set** button.

Rectangle, Ellipse

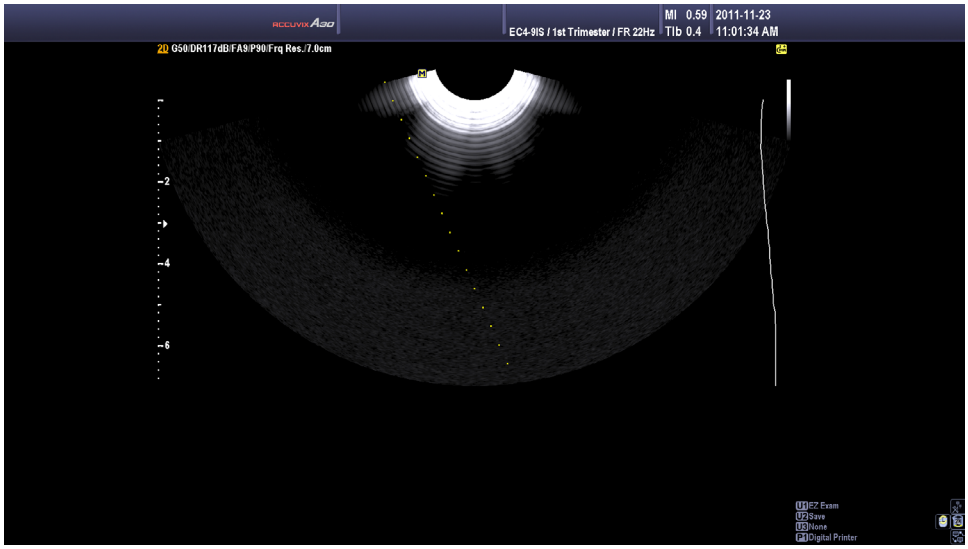
Set the histogram shape by pressing the **Rectangle** or **Ellipse** button on the touch screen.

[Figure 7.51 Histogram – Touch Screen]

Biopsy

Tap **Biopsy** on the touch screen.

NOTE: Before performing a biopsy, you should specify the Biopsy Guide Line.



[Figure 7.52 Biopsy]

Editing the Biopsy Guide Line

NOTE:

- Note that the Biopsy Guide Line cannot be edited when the Trapezoidal function is in use for the Linear Probe.
- If the system is rebooted, the Biopsy Guide Line settings are restored to the default.

1. Tap **Edit.**: A warning message appears.
2. Tap **OK**: The screen allowing you to set the guide line appears.
3. Set the Biopsy Guide Line by using the trackball and the **Set** button.
4. Tap **Save** on the touch screen to save the settings. A confirmation message appears.
   - Tap **Edit** to set the Biopsy Guide Line again.
5. Tap **OK** to apply the set Biopsy Guide Line. Tap **Cancel** to cancel saving.

Support for Multiple Guide Lines

When you do a biopsy with a specific probe, the **User** button appears on the touch screen. This allows you to preset two or more Biopsy Guide Lines.

How to set the User Guide Line

1. Select the Biopsy Guide Line you want to set by using the **User** button on the touch screen.
2. Tap **Edit.** A warning message appears.
3. Tap **Save** on the touch screen to save the settings. A confirmation message appears.
   - Tap **Edit** to set the Biopsy Guide Line again.
4. Tap **OK** to apply the set Biopsy Guide Line. Tap **Cancel** to cancel saving.

Starting and Finishing a Biopsy

1. Tap the **Biopsy On/Off** button. A warning message will appear.
2. Tap **OK** and the Biopsy Guide Line will appear on the screen.
   - If the Biopsy Guide Line displayed is not correct, tap the **Edit** button to edit it.
   - When using a probe which supports multiple guide lines, you can tap the **User** button to choose a preset guideline.
3. Insert a needle along the Guide Line. And then perform the biopsy as desired.
4. When finished, press the **Biopsy On/Off** button again. The biopsy is complete.

[Figure 7.53 Biopsy – Touch Screen]

ADVR

Tab **ADVR** on the touch screen. The touch screen changes into the *ADVR* screen.

CAUTION: Check the capacity of the media before recording.

Record

Records images in DVD format.

Record

Press button ❶ to start recording preparations. Recording will automatically begin once ready. The time it takes to begin recording will vary depending on the type of the DVD used.

CAUTION: Please be careful not to remove a USB flash drive during recording because it may cause errors.

Record Stop

Press button ❷ to stop recording.

Close Session

Press button ❸ to close the current recording session. To play back recorded images, you must stop recording and press **Close Session** first.

Record Mode

Tap on the touch screen or use the dial-button to select Append or Overwrite.

- ▶ Append: Records in continuation of the current recording.
- ▶ Overwrite: Overwrites the current recording and starts a new recording.

Play

Play back recorded images.

Play:

Press button ❹ to start playback.

Pause

Press button ❺ to pause playback.

Stop

Press button ❻ to stop playback.

Rewind

Press button ❼ to rewind.

Fast Forward

Press button ❽ to fast forward.

Speed

Used to configure rewind and fast forward speed. Tap on the touch screen or use the dial-button to select from x4, x8.

Menu

Tap the **Menu** button on the touch screen to select a track.

Eject Tray

Tap on the touch screen button to eject the media tray.

Close Tray

Tap on the touch screen button to close the media tray.

Volume

Used to adjust the volume. Tap on the touch screen or use the dial-button and select a value between 0 and 100.

[Figure 7.54 ADVR – Touch Screen]

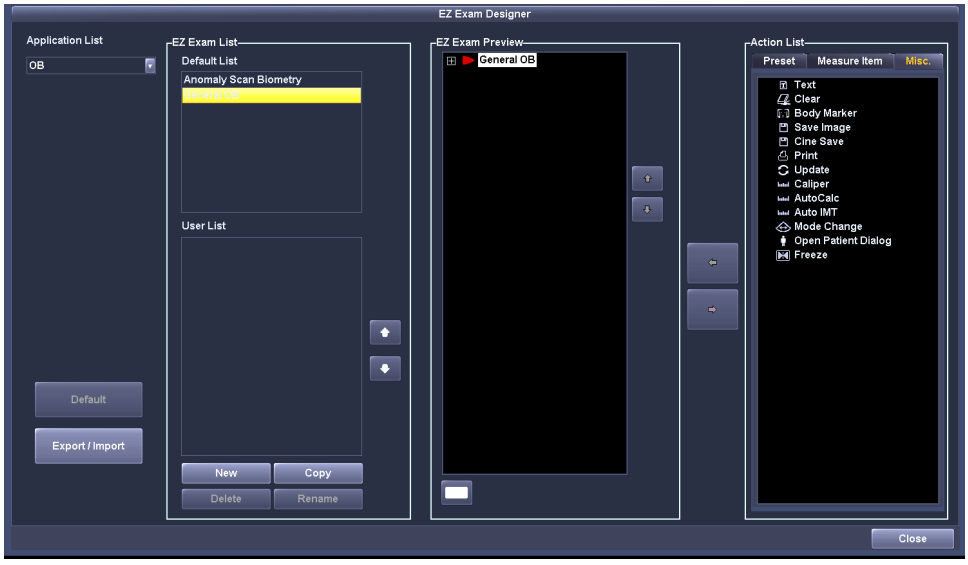
NOTE:

- For more information on the recommended media, refer to 'Peripheral Devices' in 'Chapter 2 Introduction'.
- The following media are only warranted: Mitsubishi+RW, Imation+RW, HP+RW, Melody+RW
- Recorded media cannot be backed up or exported via ADVR. Backed up or exported media cannot be also recorded via ADVR.
- In Setup > User Defined Key > ADVR Recording Method > Recording To, you may select the Media Type for real-time recording between DVD and USB.

Ez Exam Setup

Tap **Ez Exam Setup** on the touch screen. The *Ez Exam Setup* window is shown on the monitor and the touch screen.

Ez Exam Setup allows you to specify exam items and their order. This feature streamlines the diagnosis process.



[Figure 7.55 Manual – Ez Exam Setup]

Application List

A list of available applications is shown. If previously configured EZ Exams are available, they will be shown in the EZ Exam List when an application is selected.

Default

Resets the selected application's exams. All exams contained in the EZ Exam List's User List are removed.

EZ Exam List

Displays the EZ Exam list.

Default List

Displays basic EZ Exams supported by The Product. Available only for Gynecology, Vascular, and Small Parts.

You cannot remove, rename, or add new EZ Exams, in the Default List.

User List

Displays a list of user-defined EZ Exams.

You can rename, remove, copy, and add new EZ Exams in the User List.

Add EZ Exam

Click **New** on the monitor or the touch screen. Once the *New Tab* window appears, enter a name and press **OK**. Press **Cancel** to cancel.

Copy EZ Exam

Select the EZ Exam you wish to copy and click **Copy** on the monitor or the touch screen. Once the *Copy Tab* window appears, enter a name and press **OK**. Press **Cancel** to cancel.

Rename EZ Exam

Select the EZ Exam you wish to rename and click **Rename** on the monitor or the touch screen. Once the *Copy Tab* window appears, enter a name and press **OK**. Press **Cancel** to cancel.

Delete EZ Exam

Select the EZ Exam you wish to delete and click **Delete** on the monitor or the touch screen. Once the *Warning* window appears, press **OK**. Press **Cancel** to cancel.

Reorder EZ Exam

Select the EZ Exam that you wish to reorder and then click or on the monitor.

EZ Exam Preview

Displays the selected EZ Exam's group and details. Groups associated with the EZ Exam are displayed as . To view the group's details, tap .

Add Group

Adds a new group. Click the monitor's button or tap the touch screen's **Add Group** button. Once the *New Group* window appears, enter a name and tap **OK**. Press **Cancel** to cancel.

NOTE: You can add groups to EZ Exams included in the User List only.

Edit Settings

This is used to change the properties of items selected in the Action List's Misc. tab.

- Text: Used to select the text that you wish to enter on the screen. Select Text and tap **Edit Settings** on the touch screen to display the *Text* window. Enter text and tap **OK**. Tap **Cancel** to **cancel**.
- BodyMarker: Used to set the BodyMarker on the screen. Select a BodyMarker and tap **Edit Settings** on the touch screen to load the *BodyMarker* window. Set the BodyMarker and tap **Exit**.
- Caliper: Used to set up the basic measurements to use. Select a caliper and tap **Edit Settings** on the touch screen to load the *Caliper Selection* window. Select the measurements you wish to use and tap **OK**. Press **Cancel** to cancel.
- Mode Change: Used to select the diagnosis mode to use. Select Mode Change and tap **Edit Settings** on the touch screen to display the *Mode Selection* window. Select the items you wish to use and tap **OK**. Tap **Cancel** to cancel.

Edit Name

This is used to change a group's name. Select a group and tap **Edit Name** on the touch screen. Once the *Edit MacroName* window appears, enter a name and press **OK**. Press **Cancel** to cancel.

Reorder

Select a group or item that you wish to reorder and then click or on the monitor.

Action List

This displays details that can be added to the selected EZ Exam. Select a tab and then the details. To view the sub-items, tap .

Add

Select an item from the Action List and tap . The selected item is added to the EZ Exam and shown in the EZ Exam Preview. Up to 40 items can be added to a single group.

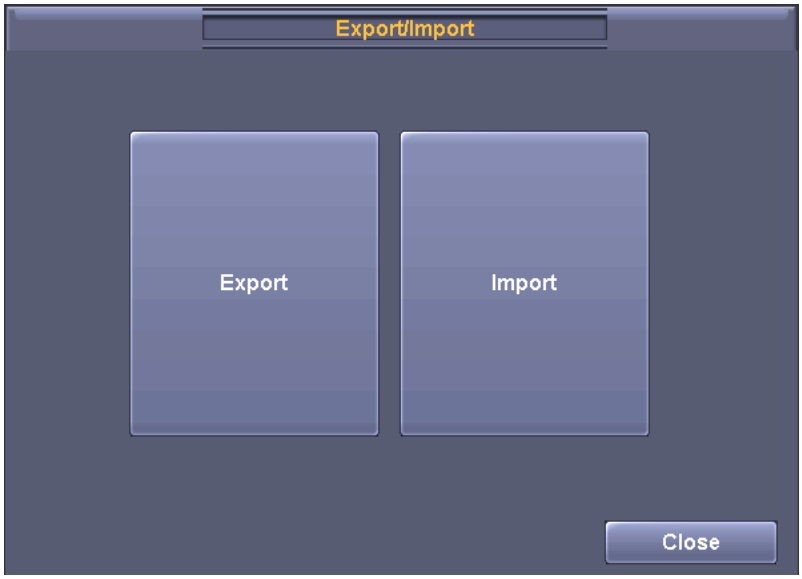
Remove

Select an item from EZ Exam Preview and then tap . The selected item is removed from the EZ Exam.

[Figure 7.56 Ez Exam Setup – Touch Screen]

Export/Import

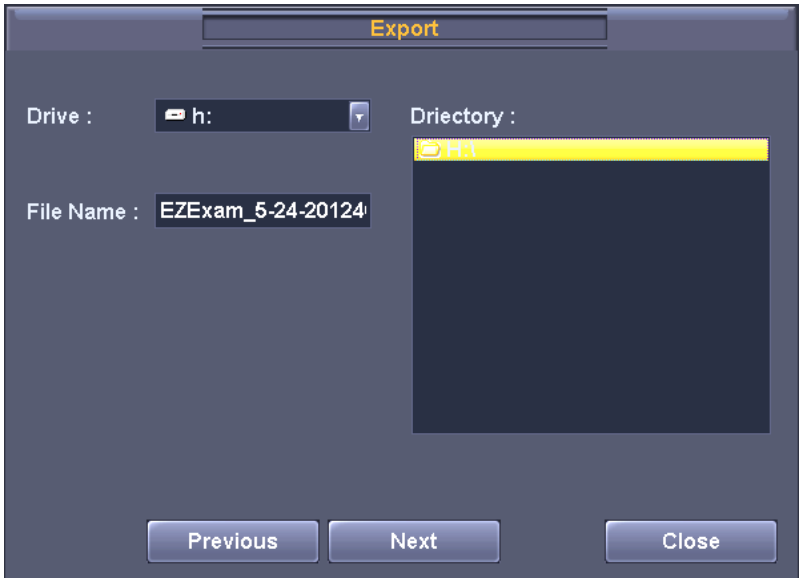
Share the EZ-Exam protocol saved on the system with another system, or import a protocol from another system.



[Figure 7.57 Ez Exam Setup-Export/Import]

Export

1. Enter EZ-Exam Setup, select **Export / Import**, and press the **Export** button.
2. In the Drive window, select the drive for the USB device you want to export to.
3. Press the **Next** button, and the Export Complete message will be displayed.
4. Press the **Close** button to complete the setup.

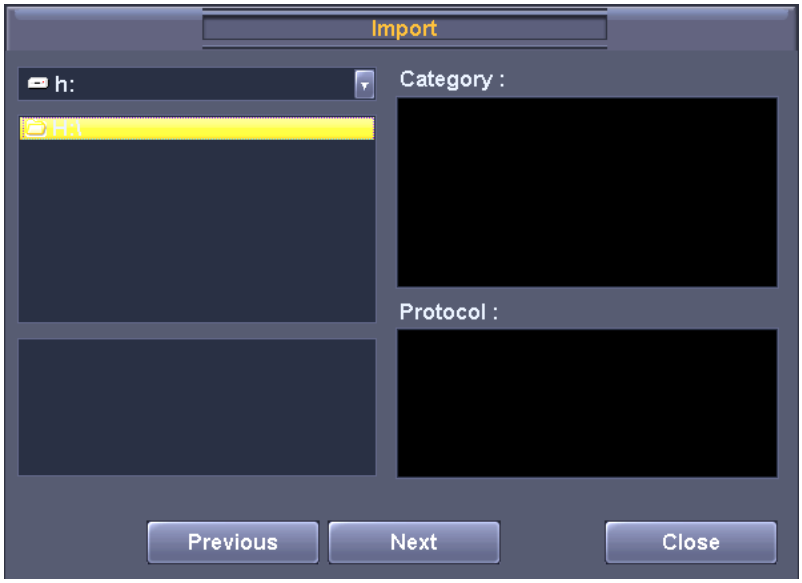


[Figure 7.58 Ez Exam Setup-Export/Import-Export]

Import

1. Enter EZ-Exam Setup, select **Export/Import**, and press the **Import** button.
2. In the Drive window, select the drive for the USB device you want to import from.
3. Press the **Next** button to move to the Category & Protocol selection screen. To cancel the import, press the **Cancel** button.
4. Place check marks next to the applications you want to import. To select an application's item, place a check mark on the relevant tab.
5. Press the **Close** button to complete the setup.

NOTE: When importing, up to five tabs may be included per each application of EZ-Exam. If more than five are included, only five will be imported; a warning message will be displayed, and the remaining tabs will not be processed.



[Figure 7.59 Ez Exam Setup-Export/Import-Import]

Help

Tap **Help** on the touch screen. The electronic manual appears on the monitor screen.

Storage Manager

Tap **Storage Manager** on the touch screen. All disk drives mounted in the system will be shown. The drive type, available space, and total space for each drive are displayed.

Storage Manager is a program that lets you manage various storage devices connected to the system. You can remove, format or update a drive, if you check the checkbox in front of the drive's symbol.

NOTE: You may not remove, format or update a drive mounted within the system itself.

Tap **Exit** on the touch screen, or press the **Exit** button on the control panel, to exit Storage Manager.

■ Refresh

Updates the display on the touch screen to show the drives currently connected to the system.

NOTE: When using Storage Manager, you should tap **Refresh** to update the information.

■ Eject/Remove

Disconnects the selected drive.

NOTE: Before unplugging a USB Flash memory drive, make sure to disconnect it by using the **Eject/Remove** button.

■ Format

Initializes the selected drive. In the *Format* window, you can initialize various settings. Tap **Start** to start initialization. Tap **Close** to cancel.

NOTE: In the case of DVD+RW or DVD-RW, their free space might be displayed as '0 bytes' after formatting. This is a Windows™ error and,there is no problem with using those storage mediums.

[Figure 7.60 Storage Manager]

Power Management

Tap **Power Management** on the touch screen. The touch screen changes into the *Power Management* screen.

TI Display

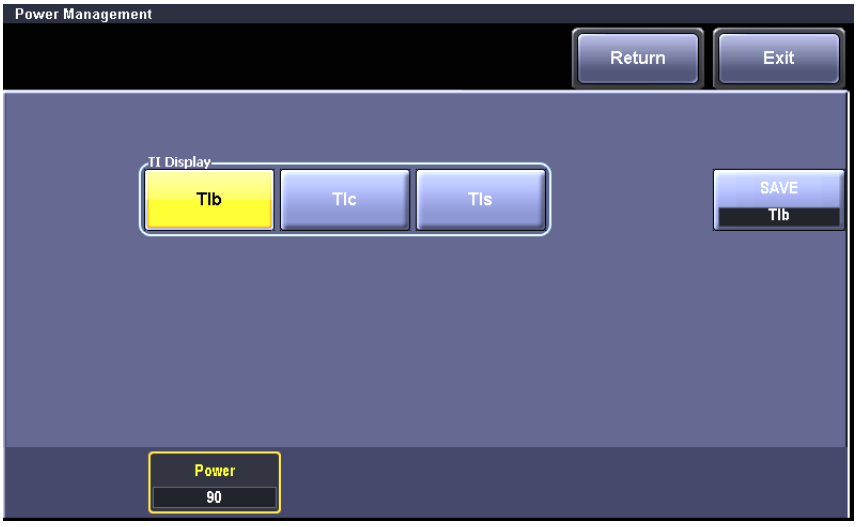
Specify the TI to display on the screen as TIs (Soft tissue Thermal Index), TIb (Bone Thermal Index) or TIc (Cranial bone Thermal Index).

Save

Save the changes by tapping the corresponding button on the touch screen.

Power

Select ultrasound power between 10 – 100 by using the touch screen buttons or the dial button.



[Figure 7.61 Power Management]

Chapter 8

Maintenance

▣ *Operating Environment* *8-3*

▣ *System Maintenance* *8-4*

Cleaning and disinfecting 8-4
Cleaning Air Filters 8-6
Accuracy Check 8-7

▣ *Data Maintenance* *8-8*

User Settings Backup 8-8
Patient Information Backup 8-8
Software 8-8

Operating Environment

When installing the console, please consider the following:

CAUTION: Placing the system near generators, X-ray machines or broadcast cables may result in screen noise and abnormal visual images. Sharing the power source with other electrical devices may also cause noise.

- Optimal conditions for the system are temperatures of 10 ~ 35°C and humidity of 30 ~ 75%.
- Avoid excess humidity.
- Avoid direct sunlight.
- Avoid places with extreme temperature variations.
- Avoid heat sources.
- Avoid dusty and unventilated areas.
- Avoid places where the system is likely to be exposed to vibration or impacts.
- Avoid places where the system is likely to be exposed to chemical substances or gases.

System Maintenance

Cleaning and disinfecting

Using inappropriate detergent or disinfectant may damage the product. Please read the following carefully.

WARNING:

- Turn off the system and disconnect the power cord from the wall outlet before cleaning and disinfecting, otherwise, there is a risk of electric shock or fire.
- Always use protective eyewear and gloves when cleaning and disinfecting the product.

Cleaning

CAUTION:

- Do not use a spray directly on the product exterior. It may cause cracks in the product or cause the color to deteriorate.
- Do not use chemical substances such as wax, benzene, alcohol, thinner, mosquito repellant, deodorant, lubricant or detergent.

Console

Use a soft cloth lightly dampened with a mild soap or detergent solution to clean the exterior surfaces of the system.

Cleaning Monitor

Wipe the LCD surface with a soft dry cloth. When the LCD panel has dirt on it, wipe it two to three times or more in one direction.

NOTE: For information on cleaning and disinfecting the probe, please refer to 'Chapter 9. Probes'.

Disinfecting

CAUTION: Use only recommended disinfectants on system surfaces.

A disinfectant qualified by the FDA 510(k) process is recommended. The following disinfectants are recommended because of both their biological effectiveness (as qualified through the FDA 510(k) process) and their chemical compatibility with Samsung Medison ultrasound products.

Solutions	Country	Type	Active ingredient	FDA 510(k)
Cidex	USA	Liquid	Gluteraldehyde	K934434
Cidex Plus	USA	Liquid	Gluteraldehyde	K923744

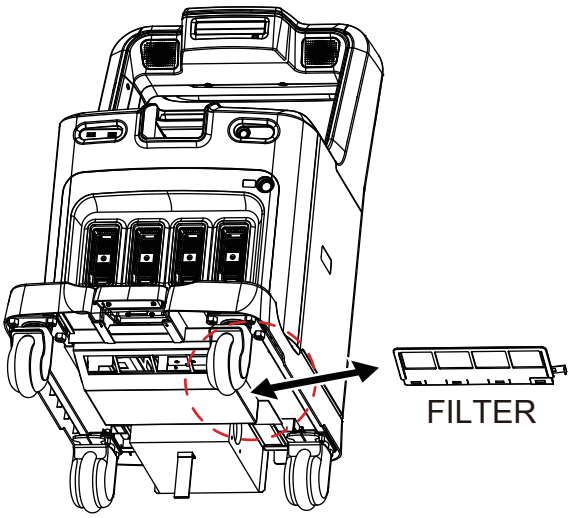
1. Turn off the system and disconnect the power cord from the wall outlet.
2. Mix the disinfectant solution that is compatible with your system to the solution strength specified on the instruction label.
3. Wipe the system surfaces with the disinfectant solution, following the disinfectant's instructions for wipe durations, solution strength, and disinfectant contact duration.
4. Air dry or towel dry with a sterile cloth according to the instructions on the disinfectant's label.

Cleaning Air Filters

The air filters minimize the intake of dust. Clean the air filter to ensure that a clogged filter does not cause the system to overheat and reduce the reliability and the system performance.

It is recommended that the air filters be cleaned once every three months.

CAUTION: Be sure to lock the brakes on the front wheels before cleaning the air filters to avoid injury by any unexpected movement of the product.



[Figure 8.1 Air filter cleaning]

1. Pull out the filter under the front of the console and take it away from the product.
2. Shake the filter to remove the dust and wash it in a mild, soapy solution.
3. Afterwards, dry the filter with a cloth, then air dry it in the shade.
4. Slide the filter back into the product.

NOTE: Allow the wet filter to dry thoroughly before reinstalling it. A wet filter can cause the system to malfunction.

Accuracy Check

NOTE: The user must ensure that safety inspections are performed every 2 years according to the requirements of safety standard EN 60601-1. Only trained persons are allowed to perform these safety inspections.

The product's maintenance status may affect the measurements obtained when using the product. The product should be maintained in an optimal state to ensure reliable measurements.

To ensure optimal operation of the product, perform an accuracy check every year. The equations and table related to measurement accuracy are included in "Chapter 5. Measurements" in this manual.

Data Maintenance

CAUTION: You may lose information files on user settings or patients, because of physical shocks to the product or internal errors. Therefore, you should back-up on a regular basis.

User Settings Backup

Always keep a backup copy of all information related to the user settings in case of data loss. Clients cannot back-up the user settings of the product. Please contact the servicing department to attain support for back-up.

Patient Information Backup

The SonoView program can be used for backing up patients' basic information and scanned images. The data is saved in the system by default, and the user can also choose to save the data to a specific location. If the system needs to be reinstalled because of product failure, etc., the Samsung Medison customer support staff will restore the basic information and scanned images that are saved in the system. For a more detailed description, see "Chapter 6. Image Management".

Software

The product software may be updated to enhance performance. You cannot modify the software on your own; a service representative will help you with any software modifications.

CAUTION: Minor software updates may be carried out without prior notice from the manufacturer.

If errors occur in the operating system (Windows™), or you desire to upgrade the operating system, please follow the instructions of the operating system manufacturer.

Chapter 9

Probes

▣ ***Probes*** ***9-3***

Ultrasound Transmission Gel 9-11
Sheaths 9-12
Probe Precautions 9-13
Cleaning and Disinfecting the Probe 9-14

▣ ***Biopsy*** ***9-23***

Biopsy Kit Components 9-23
Using the Biopsy Kit 9-24
Cleaning and Disinfecting the Biopsy Kit 9-26
Assembling the Biopsy Kit 9-28

Probes

The probe is a device that sends and receives ultrasound for acquiring image data. It is also called a Transducer or Scanhead.

The system limits patient contact temperature to 43°C, and acoustic output values to their respective U.S. FDA limits. A power protection fuse circuit protects against overcurrent conditions. If the power monitor protection circuit senses an overcurrent condition, then the drive current to the probe is shut off immediately, preventing overheating of the probe surfaces and limiting acoustic output.

Probe List

The ultrasound image scanner uses probes to obtain graphic data of the human body and then displays it on the screen. Always use application-specific probes in order to obtain the best quality images. It is also important to use a preset that is best suited to the particular organ being scanned.

Probe Application and Presets

The types of probes, applications, and presets available with this product are as follows:

Probe	Application	Presets
L4-7	Small Parts	Bowel, Breast, Testicle, Thyroid
	Vascular	Arterial, Carotid, Venous
	Abdomen	General
	MSK	General
L5-13IS	Small Parts	Bowel, Breast, Testicle, Thyroid
	Vascular	Arterial, Carotid, Venous
	MSK	Shoulder/Knee, Hand/Foot, Elbow/Wrist
L5-13/50	Small Parts	Bowel, Breast, Testicle, Thyroid
	Vascular	Arterial, Carotid, Venous
	MSK	Shoulder/Knee, Hand/Foot, Elbow/Wrist
L7-16IS	Small Parts	Breast, Testicle, Thyroid
	Vascular	Superficial, Carotid
	MSK	Shoulder/Knee, Hand/Foot, Elbow/Wrist

Probe	Application	Presets
LS6-15	MSK	General, Superficial
C1-4	Abdomen	Aorta, General, Renal
	OB	1st Trimester, 2nd Trimester, 3rd Trimester, Fetal Echo
	Gynecology	General, Adnexa
	Contrast	Perfusion
C2-6IC	Abdomen	Aorta, General, Renal
	OB	1st Trimester, 2nd Trimester, 3rd Trimester, Fetal Echo
	Gynecology	General, Adnexa
CF4-9	Pediatric	Abdomen, NeoHead
	Vascular	Carotid, Arterial, Venous
SC1-6	Abdomen	Aorta, General, Renal, Penetration
	OB	1st Trimester, 2nd Trimester, 3rd Trimester, Fetal Echo
	Gynecology	General, Adnexa
	Contrast	Perfusion
EC4-9IS	OB	1st Trimester
	Gynecology	General, Adnexa
	Urology	Prostate
VR5-9	OB	1st Trimester
	Gynecology	General, Adnexa
	Urology	Prostate
P2-4BA	Abdomen	Aorta, General, Renal
	Cardiac	Aortic Arch, Adult Echo, Ped Echo
	TCD	General
V2-6	Abdomen	Aorta, General, Renal
	OB	1st Trimester, 2nd Trimester, 3rd Trimester, Fetal Echo
	Gynecology	General, Adnexa
V4-8	Abdomen	Aorta, General, Renal
	OB	1st Trimester, 2nd Trimester, 3rd Trimester, Fetal Echo
	Gynecology	General, Adnexa

Probe	Application	Presets
V5-9	OB	1st Trimester
	Gynecology	General, Adnexa
	Urology	Prostate
CW2.0	Cardiac	Adult Echo
CW4.0	Cardiac	Adult Echo, Ped Echo
CW6.0	Cardiac	Ped Echo
	Vascular	Arterial, Venoous

NOTE:

- In addition to the optimized presets that come with the system, you create and use custom usersets.
- Refer to "Chapter 3. Starting Diagnosis" for how to set the probe and its preset.

Function list

The probe- and application-specific functions of this product are as follows:

Probe	Application	Har	PI	SCI	DMR+	Q Scan	ECG	Elasto Scan	Biopsy
L4-7	Small Parts	O	X	O	O	O	O	X	O
	Vascular	O	X	O	O	O	O	X	O
	Abdomen	O	X	O	O	O	O	X	O
	MSK	O	X	O	O	O	O	X	O
L5-13IS	Small Parts	O	X	O	O	O	O	X (Except Breast, Thyroid)	O
	Vascular	O	X	O	O	O	O	X	O
	MSK	O	X	O	O	O	O	X	O
L5-13/50	Small Parts	O	X	O	O	O	O	X (Except Breast, Thyroid)	O
	Vascular	O	X	O	O	O	O	X	
	MSK	O	X	O	O	O	O	X	

Probe	Application	Har	PI	SCI	DMR+	Q Scan	ECG	Elasto Scan	Biopsy
L7-16IS	Small Parts	O	X	O	O	O	O	X	O
	Vascular	O	X	O	O	O	O	X	O
	MSK	O	X	O	O	O	O	X	O
LS6-15	MSK	O	X	O	O	O	O	X	X
C1-4	Abdomen	O	O	X	O	O	X	X	O
	OB	O	O	X	O	O	X	X	O
	Gynecology	O	O	X	O	O	X	X	O
	Contrast	O	O	X	O	O	X	X	O
C2-6IC	Abdomen	O	O	X	O	O	X	X	O
	OB	O	O	X	O	O	X	X	O
	Gynecology	O	O	X	O	O	X	X	O
CF4-9	Pediatric	X	X	X	O	O	X	X	X
	Vascular	X	X	X	O	O	X	X	X
SC1-6	Abdomen	O	O	X	O	O	X	X	O
	OB	O	O	X	O	O	X	X	O
	Gynecology	O	O	X	O	O	X	X	O
	Contrast	O	O	X	O	O	X	X	O
EC4-9IS	OB	O	X	X	O	O	X	X	O
	Gynecology	O	X	X	O	O	X	O	O
	Urology	O	X	X	O	O	X	O	O
VR5-9	OB	O	X	X	O	O	X	X	O
	Gynecology	O	X	X	O	O	X	O	O
	Urology	O	X	X	O	O	X	O	O
P2-4BA	Abdomen	O	O	X	O	O	X	X	X
	Cardiac	O	O	X	O	O	O	X	X
	TCD	O	O	X	O	O	X	X	X
V2-6	Abdomen	O	O	X	O	O	X	X	O
	OB	O	O	X	O	O	X	X	O
	Gynecology	O	O	X	O	O	X	X	O

Probe	Application	Har	PI	SCI	DMR+	Q Scan	ECG	Elasto Scan	Biopsy
V4-8	Abdomen	O	O	X	O	O	X	X	O
	OB	O	O	X	O	O	X	X	O
	Gynecology	O	O	X	O	O	X	X	O
V5-9	OB	O	X	X	O	O	X	X	O
	Gynecology	O	X	X	O	O	X	X	O
	Urology	O	X	X	O	O	X	X	O
CW2.0	Cardiac	X	X	X	X	X	O	X	X
CW4.0	Cardiac	X	X	X	X	X	O	X	X
CW6.0	Cardiac	X	X	X	X	X	O	X	X
	Vascular	X	X	X	X	X	O	X	X

Probe	Application	CM	TDI	PD	DPDI	TDW	CW
L4-7	Small Parts	X	X	O	O	X	X
	Vascular	X	X	O	O	X	X
	Abdomen	X	X	O	O	X	X
	MSK	X	X	O	O	X	X
L5-13IS	Small Parts	X	X	O	O	X	X
	Vascular	X	X	O	O	X	X
	MSK	X	X	O	O	X	X
L5-13/50	Small Parts	X	X	O	O	X	X
	Vascular	X	X	O	O	X	X
	MSK	X	X	O	O	X	X
L7-16IS	Small Parts	X	X	O	O	X	X
	Vascular	X	X	O	O	X	X
	MSK	X	X	O	O	X	X
LS6-15	MSK	X	X	O	O	X	X
C1-4	Abdomen	X	X	O	O	X	X
	OB	X (Except Fetal Echo)	X	O (Except Fetal Echo)	O	X	X
	Gynecology	X	X	O	O	X	X
	Contrast	X	X	O	O	X	X
C2-6IC	Abdomen	X	X	O	O	X	X
	OB	X (Except Fetal Echo)	X	O (Except Fetal Echo)	O	X	X
	Gynecology	X	X	O	O	X	X
CF4-9	Pediatric	X	X	O	O	X	X
	Vascular	X	X	O	O	X	X
SC1-6	Abdomen	X	X	O	O	X	X
	OB	X (Except Fetal Echo)	X	X (Except Fetal Echo)	O	X	X
	Gynecology	X	X	O	O	X	X
	Contrast	X	X	O	O	X	X

Probe	Application	CM	TDI	PD	DPDI	TDW	CW
EC4-9IS	Gynecology	X	X	O	O	X	X
	Contrast	X	X	O	O	X	X
	Urology	X	X	O	O	X	X
VR5-9	OB	O	X	O	O	X	X
	Gynecology	X	X	O	O	X	X
	Urology	X	X	O	O	X	X
P2-4BA	Abdomen	X	X	O	O	X	O
	Cardiac	O	O	X	X	O	O
	TCD	X	X	O	O	X	O
V2-6	Abdomen	X	X	O	O	X	X
	OB	X (Except Fetal Echo)	X	O (Except Fetal Echo)	O	X	X
	Gynecology	X	X	O	O	X	X
V4-8	Abdomen	X	X	O	O	X	X
	OB	X (Except Fetal Echo)	X	O (Except Fetal Echo)	O	X	X
	Gynecology	X	X	O	O	X	X
V5-9	OB	O	X	O	O	X	X
	Gynecology	X	X	O	O	X	X
	Urology	X	X	O	O	X	X
CW2.0	Cardiac	X	X	X	X	X	O
CW4.0	Cardiac	X	X	X	X	X	O
CW6.0	Cardiac	X	X	X	X	X	O
	Vascular	X	X	X	X	X	O

NOTE: The symbols used in the table have the following meanings:

Har: Harmonic imaging
PI: Pulse Inversion
SCI: Spatial Compound Imaging
Q Scan: Quick Scan
ECG: Electro Cardio Graph Imaging
CM: Color M
TDI: Tissue Doppler
PD: Power Doppler
DPDI: Directional Power Doppler Imaging
TDW: Tissue Doppler Wave
CW: Continuous Wave

Thermal Index (TI) Tables

The TI values displayed on the screen title bar can change depending on the probes and applications. There are body organ (TIs), bone (TIb), and cranial bone thermal (TIc) indexes, depending on the body part. This product has been designed to automatically display the thermal index based on the probe and application being used. The TI values are as follows:

Probe	Application										
	Abdomen	Obstetrics	Gynecology	Cardiac	Vascular	Urology	MSK	Pediatric	Small Parts	Contrast Agent	TCD
L4-7	TIs				TIs		TIs		TIs		
L5-13IS					TIs		TIs		TIs		
L5-13/50					TIs		TIs		TIs		
L7-16IS					TIs		TIs		TIs		
LS6-15							TIs				
C1-4	TIs	TIb	TIs								TIs
C2-6IC	TIs	TIb	TIs								
CF4-9					TIs			TIs			
SC1-6	TIs	TIb	TIs							TIs	
EC4-9IS		TIb	TIs			TIs					
VR5-9		TIb	TIs			TIs					
P2-4BA	TIs			TIs							TIs
V2-6	TIs	TIb	TIs								
V4-8	TIs	TIb	TIs								
V5-9		TIb	TIs			TIs					
CW2.0				TIs							
CW4.0				TIs							
CW6.0				TIs	TIs						

Ultrasound Transmission Gel

Using an inappropriate ultrasound gel may damage the probe. For proper transmission of the acoustic beam, only use ultrasound transmission gel approved by Samsung Medison.

WARNING:

- Do not use mineral oil, oil-based solutions, or other unapproved materials, as they may cause damage to the probe.
- Do not use gels that contain any of the following agents:
  - Acetone
  - Methanol
  - Denatured Ethyl Alcohol
  - Mineral Oil
  - Iodine
  - Lanolin
  - Any lotions or gels containing perfume

Sheaths

Sheaths are recommended for clinical applications of an invasive nature, including intraoperative, transrectal, transvaginal, and biopsy procedures.

Samsung Medison does not supply sheaths, so you should purchase appropriate supplies from your regular supplier.

WARNING:

- Always keep sheaths in a sterile state.
- Sheaths are disposable. Do not reuse them.
- If sheaths are torn or soiled after use, clean and disinfect the probe.
- In neurosurgical applications, a disinfected probe must be used with sterile gel and a sterile pyrogen-free sheath.
- If the sterile sheath becomes compromised during neurosurgical applications involving a patient with Creutzfeldt-Jakob disease, the probe cannot be successfully sterilized by any disinfection method.
- Some sheaths contain natural rubber latex and talc, which can cause allergic reactions in some individuals. Please refer to the FDA Medical Alert released on March 29, 1991.

Installing the Sheath

1. Put on sterile gloves. Unpack the sheath and fill it with acoustic coupling gel.
2. Insert the probe into the sheath and pull the latex tip to cover the probe completely. If possible, cover the probe cable as well.
3. Ensure that there are no air bubbles within the ultrasound gel. If necessary, secure the sheath to the probe and the probe cable.
4. Dispose of the sheath after use.

Probe Precautions

CAUTION:

- Do not apply mechanical shocks to the probe.
- Do not place the probe cable on the floor where the cable can be run over by equipment wheels, etc. Do not apply excessive force to bend or pull the cable.
- Do not immerse the probe into any inappropriate substances such as alcohol, bleach, ammonium chloride, and hydrogen peroxide.
- Do not expose the probe to temperatures of 50°C or higher.

The probe can easily be damaged by improper use or by coming into contact with certain chemical substances. Always follow the instructions in the user manual to inspect the probe cable, case and lens before and after each use.

Check for cracks, broken parts, leaks and sharp edges. If there is any damage, immediately stop using the probe and contact Samsung Medison servicing department. Using damaged probes may result in electric shocks and other hazards to the patients and/or users.

Use and Infection Control of the Probe

WARNING: No neurosurgical treatments or examinations should be carried out on a patient with Creutzfeldt-Jakob disease (critical brain disease caused by virus). If the probe has been used on such a patient, it cannot be sterilized by any method whatsoever.

CAUTION: Sufficient washing and disinfecting must be carried out to prevent infection. This is the responsibility of the user who manages and maintains the disinfection procedures for the equipment. Always use legally approved detergents.

The ultrasonographic image scanner uses ultrasound, and it makes direct contact with the patient when in use. Depending on the types of examinations, such contact can be made to a wide variety of locations, including the ordinary skin or the location of blood transfusion during surgery.

The most effective method to prevent infection among patients is to use each probe only once. However, probes may need to be reused, as they are complex in design and expensive. Consequently, the safety instructions must be followed carefully in order to minimize the risk of infection among patients.

Electric Shocks

The probe uses electrical energy. If it touches conductive materials, there are risks of electric shocks to the patient or the user.

WARNING:

- Have the system regularly inspected by Samsung Medison technicians for electric leaks.
- Do not immerse the probe into liquid.
- Do not drop the probe or apply mechanical shocks.
- Inspect the housing, strain relief, lens and seal for damage, and check for any functional problem before and after each use.
- Do not apply excessive force to twist, pull or bend the probe cable.
- The power protection fuse protects the probe and the product from excess current. If the power monitoring protection circuit detects excess current, it immediately shuts off the current to the probe in order to prevent the probe surface from overheating and to restrict the ultrasound power output.
- The temperature of the product for making contact with patients is limited under 43°C. The ultrasound power output (AP&I) is in compliance with US FDA standards.

Cleaning and Disinfecting the Probe

WARNING:

- Always use protective eyewear and gloves when cleaning and disinfecting probes.
- Inspect the housing, strain relief, lens and seal for damage, and check for any functional problem after cleaning and disinfecting the probe.

Use of unsuitable cleaning or sterilizing agents can damage the probe.

Information of Detergent, Disinfectant, and Ultrasound Gel

Use an appropriate substance in accordance with the following tables. All probes are tested under IPX 7 Criteria.

Names	Disinfectants																
	T-Spray II	T-Spray	Sani-Cloth HB	Sani-Cloth Plus	Sani-Cloth Active	Septiwipes	Cleanisept Wipes	Ster-Bac Blu	Transeptic Spray	Incidin Foam	Super Sani-Cloth	Sani-Cloth Germicidal	Asepti-Wipes	Asepti-Wipes II	CaviWipes	MetriWipes	Cidex 2%
Type	S	S	W	W	W	W	W	L	S	S	W	W	W	W	W	W	L
Active Ingredient	Quaternary Ammonium (N-Alkyl)								IPA								NA
L4-7	◆	◆	◎					▣	▲								▣
L5-13IS		●							●		●						
L5-13/50	●		●														●
L7-16IS		●							●		●						
LS6-15		●	●														●
C1-4	◆	◆	◎					▣	▲								▣
C2-6IC	●	●	●														
CF4-9	◆	◆	◎					▣	▲								▣
SC1-6		●															●
EC4-9IS	●	●	●														
VR5-9	◆	◆	◎					▣	▲	■							▣
P2-4BA	●	●	●	●													●
V2-6	◆	◆	◎			▲	▲	▣									▣
V4-8	◆	◆	◎			▲	▲	▣									▣
V5-9	◆	◆	◎		▲	▲	▲	▣	▲	■		▲	▲			▲	▣
CW2.0	●	●	●														
CW4.0																	●
CW6.0	◆	◆	◎					▣	▲								▣

Names	Disinfectants															
	Cidex OPA [2,3]	Cidex Plus [2]	Metricide [2]	Omnicide(28)	Omnicide 14NS	Omnicide - FG2	Nuclean	Wavicide-01 [3]	Sekusept Extra	Salvanios pH 7	Salvanios pH10	Steranios 2%	Surfaces Hautes	Sekusept Plus	Milton	Bleach 5.25%
Type	L	L	L	L	L	L	L	L	L	L	L	L	S	L	L	L
Active Ingredient	Glutaraldehyde													Nonionic surfactant	Sodium Hypochlorite	
L4-7	▲	◇	▣					▣								
L5-13IS	●	●													●	
L5-13/50	●	●				●	●	●								
L7-16IS	●	●													●	
LS6-15	●	●				●	x	x							●	
C1-4	▲	◇	▣					▣								
C2-6IC	★	●	●	●				●	●						★	
CF4-9	▲	◇	▣					▣								
SC1-6	●	●													●	
EC4-9IS	★	●													●	
VR5-9	▲	◇	▣					▣								
P2-4BA	●	●	●	●	●			●			●	●			●	
V2-6	▲		▣					▣								
V4-8	▲		▣					▣								
V5-9	▲	◇	▣					▣						◎		
CW2.0	★	●						●							●	
CW4.0	●									●		●				
CW6.0	▲	◇	▣					▣								

Names	Disinfectants								Cleaner					
	Virkon	Sporox	Sporox II	Gigasept	Gigasept AF [3]	Gigasept FF	Hibitane	PeraSafe	Enzol	Alkazyme	Cidezyme	Klenzyme	Isopropyl alcohol(70%)	Isopropyl alcohol(80%)
Type	L	L	L	L	L	L	L	P			L	L	L	L
Active Ingredient	NA	Hydrogen Peroxide		Succindialdehyde, formaldehyde		Bersteinsaure	Chlorhexidine gluconate solution	Peracetic Acid	Dodecylphenolethoxylate, Sodium Xylene Sulfonate	NA	Proteolytic Enzymes		Alcohol	
L4-7					◎	◎	◎	▲						
L5-13IS	●		●											
L5-13/50											●	●	●	
L7-16IS	●		●											
LS6-15		●									●	●	●	
C1-4					◎	◎	◎	▲						
C2-6IC	x		x		x	★			●			●	x	
CF4-9					◎	◎	◎	▲						
SC1-6			●										●	
EC4-9IS	●		x		x	●	●		●			●	x	
VR5-9					◎	◎	◎	▲						
P2-4BA									●			●	●	
V2-6						◎		▲						
V4-8						◎		▲						
V5-9				◎	◎	◎		▲				◐		
CW2.0	●		x		x	●			●			●	x	
CW4.0										●		●		
CW6.0					◎	◎	◎	▲						

Names	Cleaner			Gel							
	Ethanol 75%	Metrizyme	McKesson	Natural Image	Aquasonics 100 [3]	GE Ultrasound Contact Gel	Clear Image	Kendall	Scan	Wavelength	Sonogel
Type	L	L	L	G	G	G	G	G	G	G	G
Active Ingredient	Alcohol	Propylene Glycol	PCMX (Chloroxylenol)	Ammonium Chlorides	NA						
L4-7					●				●		●
L5-13IS					●						
L5-13/50		●	●		●						
L7-16IS					●						
LS6-15		●	●		●						
C1-4					●				●		●
C2-6IC		●			●						
CF4-9					●				●		●
SC1-6		●			●				●		
EC4-9IS		●			●						
VR5-9					●						
P2-4BA		●			●						
V2-6					●	●			●		●
V4-8					●	●			●		●
V5-9					●	●			●		●
CW2.0		●			●						
CW4.0					●						
CW6.0					●				●		●

Tips!

Symbols

The symbols used in the table have the following meanings.

(1)	Compatible but no EPA Registration
(2)	FDA 510(k) qualified
(3)	Has CE mark
(4)	Discontinued
(5)	Under Development
S	Spray
W	Wipe
L	Liquid
P	Powder
G	Gel
x	Not compatible(DO NOT USE)
●	Compatible
★	Staining my occur on housing parts; however, the acustic performance and image quality are not affected.
■	Must not be used for longer than 5 minutes.
◐	Must not be used for longer than 10 minutes.
▲	Must not be used for longer than 15 minutes.
◆	Must not be used for longer than 20 minutes.
◇	Must not be used for longer than 25 minutes.
◎	Must not be used for longer than 30 minutes.
▣	Must not be used for longer than 50 minutes.
Blank	Untested (DO NOT USE)

The following table includes information about the manufacturers (or Distributors) of Detergents, Disinfectants, and Ultrasound Gels.

Product	Manufacturer or Distributor	Telephone number
Aquasonics	Parker Co.	+1-800-631-8888(USA)
Cidex	CIVCO Co.	+1-800-445-6741(USA) +1-319-656-4447(Worldwide)
Enzol	CIVCO Co.	+1-800-445-6741(USA) +1-319-656-4447(Worldwide)
Glgasept AF	S&M(Schulke&Mayr) Co.	+44-114-254-3500(UK)
Gigasept FF	S&M(Schulke&Mayr) Co.	+44-114-254-3500(UK)
Isopropyl alcohol (70%)	Local drugstore	None
Klenzyme	Steris Co.	+1-800-548-4873(USA)
Metricide	CIVCO Co.	+1-800-445-6741(USA) +1-319-656-4447(Worldwide)
Metrizyme	Metrex Research Corp.	+1-800-841-1428(USA)
Milton	Procter & Gamble Australia Pty. Ltd.	+61-1800-028-280(Australia)
Nuclean	National Diagnostics Co.	+1-800-526-3867(USA) +44(0)-148-264-6020(UK)
Omnicide	Cottrell Ltd.	+1-800-843-3343(USA)
Sani-cloth	PDI/Nice-Pak Products Co.	+1-914-365-1602(USA)
Sekusept Extra	Henkel Hygiene GmbH.	+49-0211-797-0(Germany)
Sporox II	Sultan Chemist Inc.	+1-800-637-8582(USA)
T-Spray	CIVCO Co.	+1-800-445-6741(USA) +1-319-656-4447(Worldwide)
Virkon	Antec International LTD.	+1-403-286-1771(USA)
Wavicide	Wave Energy System Inc.	+1-800-252-1125(USA)

Cleaning

Cleaning is an important procedure that is carried out before disinfecting the probe. The probe must be cleaned after each use.

CAUTION:

- Do not use a surgical brush when cleaning probes. Even the use of soft brushes can damage the probe.
- During cleaning and disinfection, keep the parts of the probe that must remain dry higher than the other parts, until all parts are dry.

1. Disconnect the probe from the system.
2. Remove any biopsy adapters or biopsy needle guides. (Biopsy adapters are re-usable and can be disinfected).
3. Discard sheaths. (Sheaths are single-use items).
4. Use a soft cloth lightly dampened with mild soap or compatible cleaning solution to remove any particulate matter and bodily fluids that remain on the probe or cable.
5. To remove remaining particulates, rinse with water up to the immersion point.
6. Wipe with a dry cloth.
7. If necessary, wipe first with a water-dampened cloth to remove soap residue, and then wipe again with a dry cloth.

Disinfection

A 10^{-6} reduction in pathogens should be reached following the disinfection procedures in this Manual and using the following Samsung Medison recommended solutions.

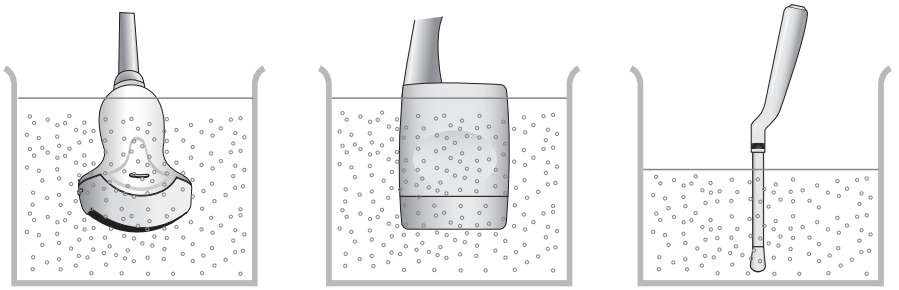
WARNING:

- If a pre-mixed solution is used, be sure to observe the solution expiration date.
- The type of tissue it will contact during use dictates the level of disinfection required for a device. Ensure that the solution strength and duration of contact are appropriate for disinfection.

CAUTION:

- Using a non-recommended disinfectant or not following the recommended disinfection method can damage and/or discolor the probe, and will void the probe warranty.
- Do not immerse probes for longer than one hour, unless they are sterilizable.
- Only sterilize probes by using liquid solutions. Avoid using autoclave, gas (EtO), or other non-Samsung Medison-approved methods.

1. Follow the instructions on the disinfectant label for storage, use and disposal of the disinfectant.
2. Mix the disinfectant compatible with your probe according to the instructions for solution strength provided on the disinfectant's label.
3. Immerse the probe into the disinfectant as shown in the illustration below.
4. Using the instructions provided on the disinfectant's label, rinse the probe after the immersion process is complete.
5. Air dry the probe, or towel it dry with a clean cloth.



[Figure 9.1 Disinfection]

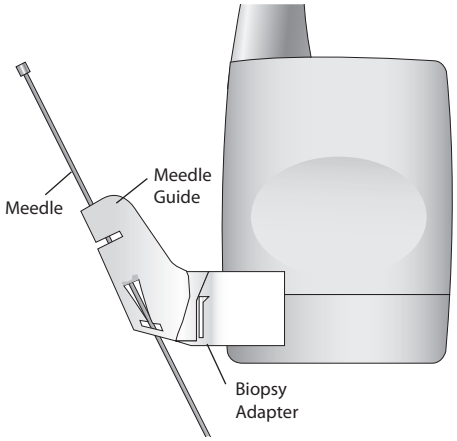
Biopsy

A biopsy is an examination method that surgically extracts tissue from the patient for examination. The probe and the biopsy kit are used together when conducting a biopsy with the ultrasonographic image scanner.

The ultrasound system shows the needle, which penetrates through the skin surface and veins, along with the examination location, minimizing the risk to the patient.

Biopsy Kit Components

The biopsy kit consists of the adapter, needle guide and needle. The components vary depending on the probe type. The components and accessories can be purchased from Samsung Medison.



[Figure 9.2 Biopsy Kit Components]

- Adapter: Secures the needle guide to the probe tightly.
- Needle Guide: Guides the angle (direction) of the needle so that it can reach the examination location accurately. It also secures the needle so that the needle is not loose.
- Needle: This is the needle that is inserted into the patient's body.
- Sheath: Prevents the probe and adapter from getting soiled by any unwanted substances during the examination (blood and other bodily fluids).
- Ultrasound Gel: The space between the probe and the sheath is filled with the ultrasound gel to obtain images of the best quality.

Using the Biopsy Kit

WARNING:

- Verify the condition of the biopsy needle before use. Do not use a bent biopsy needle.
- The biopsy needle may bend during tissue penetration. The precise location of the needle must be checked by monitoring the echo generated from the needle.
- Never use the biopsy kit to biopsy prostate tissue.

Before Using Biopsy Kit

WARNING:

- Do not attempt to use the biopsy until you read the instructions for installing the sheath and verifying alignment of the needle guide.
- Always ensure that the probe and the needle guide are secured on both the left and the right.
- Do not use in IVF, CVS, or PUBS procedures.

Ultrasonographic scanning using the biopsy kit must be conducted by medical doctors or experienced medical staff with appropriate qualifications. Always, without fail, verify all safety procedures and disinfection.

Other brands may not properly fit Samsung Medison probes. Use only Samsung Medison-approved biopsy kits. Improper installation may result in patient discomfort.

Inspect all components. Ensure that the biopsy kit you are using is the correct one for the probe, the system, and system software.

Biopsy Procedure

The system generates a needle guideline through the displayed real-time ultrasound images to indicate the anticipated path of the needle. You can use this guideline to ensure that the needle or instrument is following the correct path.

1. Ready the patient according to the procedure appropriate for the examination objectives.
2. Install the sheath and the biopsy kit.
3. Set the system controls for the biopsy procedure. If necessary, apply acoustic gel to the patient.
4. Begin scanning the patient. Adjust the patient so that the location for examination fits into the needle guideline on the screen.

5. Install the needle into the needle guide for use. Perform the puncture by sliding the needle through the groove in the guide until the needle intercepts the target. To keep the needle securely in the needle guide, press down on the top of the biopsy adapter with your index finger.
6. When the examination location is reached, take the needle out of the needle guide.
7. Detach the needle guide, adapter and sheath from the probe.
8. Dispose of the components that are not designed for reuse.

Needle Guide Alignment

WARNING:

- The needle used for this alignment verification must not be used for the actual procedure. Always use a new, sterile needle for each biopsy procedure.
- To assist in accurate projection of the needle, use a straight, new needle for each alignment procedure.

Alignment of the needle guide displayed on the system is for the purpose of verifying whether the needle and the needle guide are properly installed. This must be done prior to the biopsy examination. Contact Samsung Medison servicing department for service.

Reverberation or other tissue artifacts may produce false needle images, which can cause confusion. Ensure that the needle path is along the guideline, and that you are not using a false needle image to locate the needle.

1. Attach the biopsy kit.
2. Set the system depth for the procedure to be performed and select the Biopsy menu.
3. Immerse the probe into the water bath, and insert the needle into the needle guide.
4. Confirm that the needle image is on the needle guidelines. If so, the needle guide is properly aligned.
5. If the needle image is out of the needle guideline, check the needle guide or the probe adapter.

Cleaning and Disinfecting the Biopsy Kit

WARNING: Always use protective eyewear and gloves when cleaning and disinfecting the biopsy kit.

Wash and disinfect the biopsy kit to reduce pathogens to the level of 10^{-6}. Some components of the biopsy kit may be disposable. Please read the biopsy kit user manual carefully before use.

Cleaning and disinfecting a stainless steel biopsy kit

Cleaning

1. After use, remove the biopsy kit from the probe.
2. Disassemble the biopsy kit into its component parts, if applicable.
3. Using a small brush and water, scrub each part to remove trapped material from the biopsy kit.
4. Rinse with water to remove remaining particulates.

Disinfection

1. Disinfect the adapter by autoclaving (Steam) or using gas (Ethylene Oxide).
2. After disinfection, follow the proper post-disinfection procedure for the disinfection method used. (Please refer to the disinfection user manual, etc.)
3. Inspect the components for damage such as cracks, rust or breakage. If damage is evident, discontinue use of the biopsy kit and contact Samsung Medison servicing department.

Cleaning and Disinfecting a plastic biopsy kit

Cleaning

1. After use, remove the biopsy kit from the probe.
2. Disassemble the biopsy kit into its component parts, if applicable. Discard the single-use parts. These parts cannot be disinfected.
3. Using a small brush and water, scrub each part to remove trapped material from the reusable components.
4. Rinse with water to remove remaining particulates.

Disinfection

CAUTION: Plastic biopsy kits can only be disinfected by using a chemically compatible cold-disinfectant. Disinfection by autoclaving or by using gas or radiation will cause damage to these parts.

Please refer to the user manual of the disinfectant for storage, use, and disposal of the disinfectant.

1. Check the disinfection duration (generally 10 hours) and temperature of the disinfectant.
2. After disinfection, follow the proper post-disinfection procedure for the disinfection method used.
3. Inspect the components for damage such as cracks, rust or breakage. If damage is evident, discontinue use of the biopsy kit and contact Samsung Medison servicing department.

Assembling the Biopsy Kit

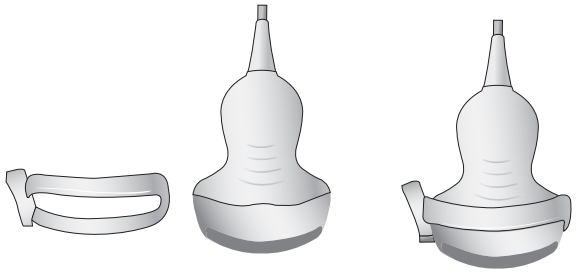
C1-4 Biopsy guide

Biopsy Specifications

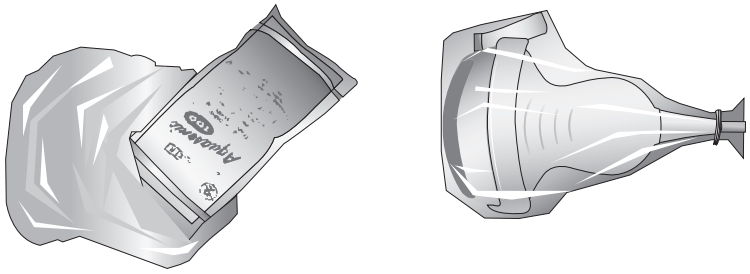
Model name	BP-KIT-044
Component	Biopsy Adapter 1 EA Needle Guide 1 EA Clip 2 EA
Available Gauges	14G, 15G, 16G, 17G, 18G, 19G, 20G, 21G, 22G, 23G

Installation

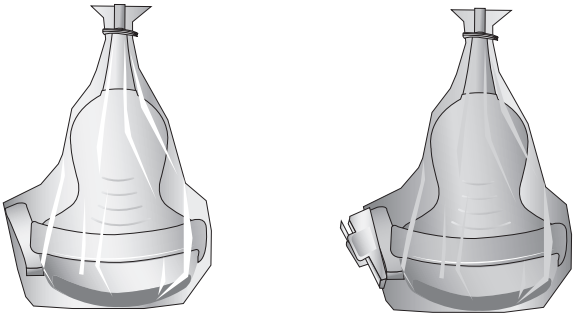
1. Mount the biopsy adapter onto the probe as shown below.



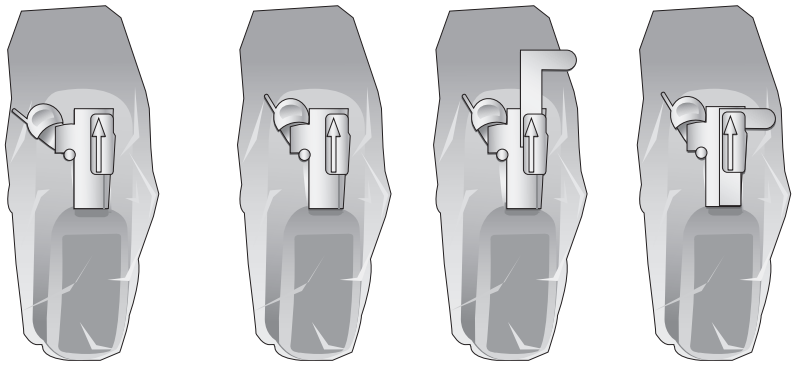
2. Insert gel into probe cover. And cover it.



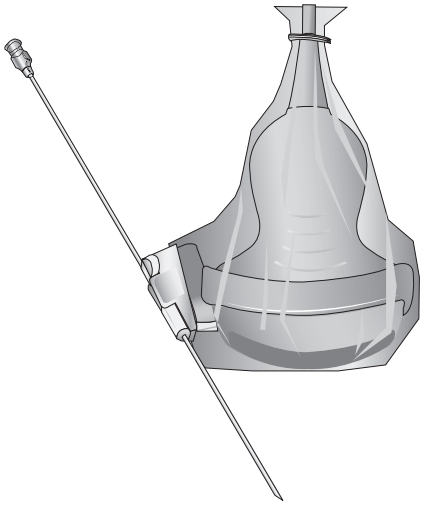
3. Install the needle guide onto the adapter.



4. Installing the Needle Guide Clip.



5. Install the needle into the needle guide.



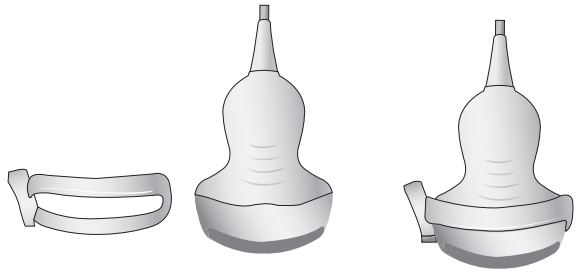
C2-6IC Biopsy guide

Biopsy Specifications

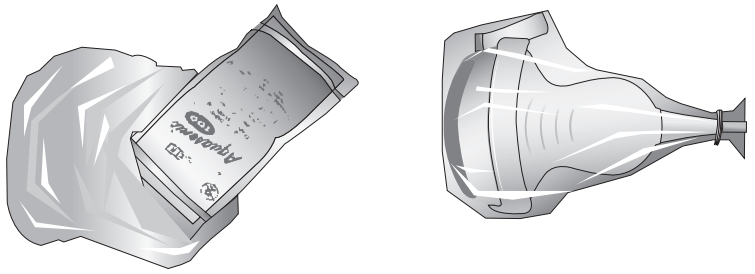
Model name	BP-KIT-009	
Component	Biopsy Adapter Needle Guide Clip	1 EA 1 EA 2 EA
Available Gauges	14G, 15G, 16G, 17G, 18G, 19G, 20G, 21G, 22G, 23G	

Installation

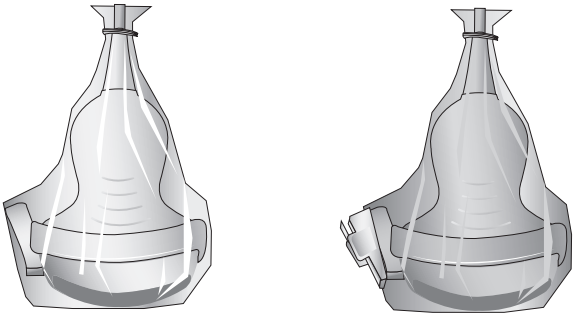
1. Mount the biopsy adapter onto the probe as shown below.



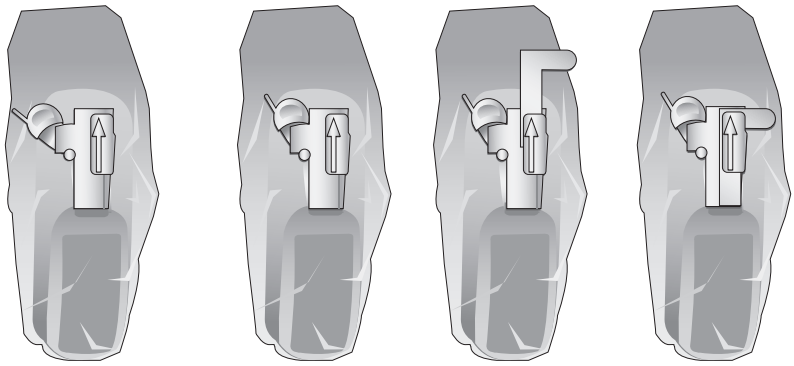
2. Insert gel into probe cover. And cover it.



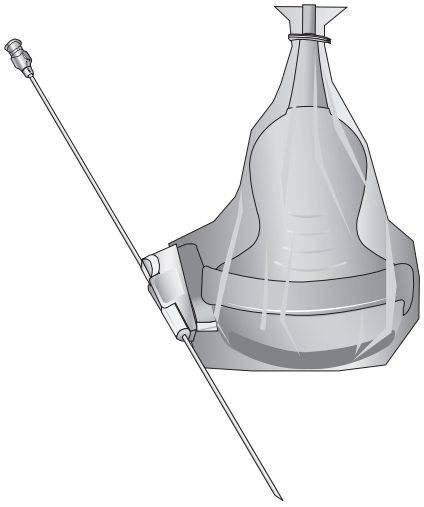
3. Install the needle guide onto the adapter.



4. Installing the Needle Guide Clip.



5. Install the needle into the needle guide.



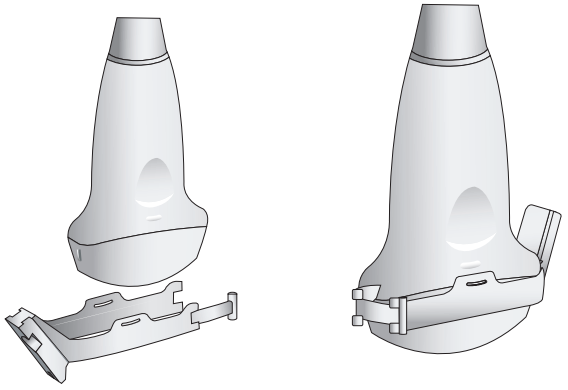
SC1-6 Biopsy Guide

Biopsy Specifications

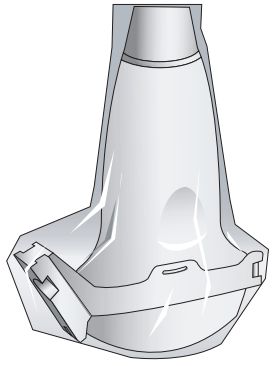
Model name	BP-KIT-052
Components	Biopsy Adapter Needle Guide
Intersection depth	Multi Angle (40mm, 60mm, 80mm)
Available Gauges	16G, 18G, 22G, 25G

Installation

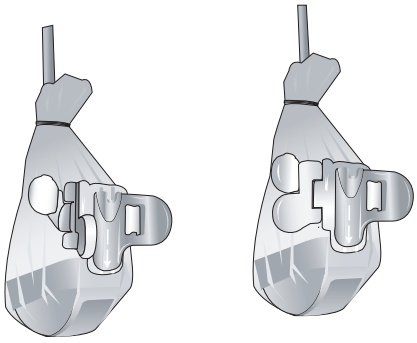
1. Mount the adapter onto the probe.



2. Fill the sheath with the ultrasound gel and place the sheath over the probe, all the way down to the Adapter.



3. Mount the needle guide for the desired gauge onto the adapter.

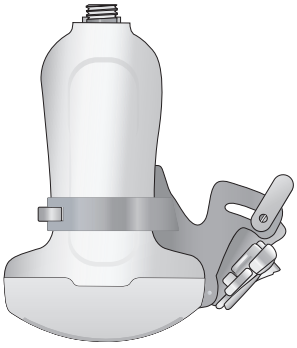


4. Install the needle into the needle guide for use.

Tips!

Using Multi Angle

Use the angle adjuster.



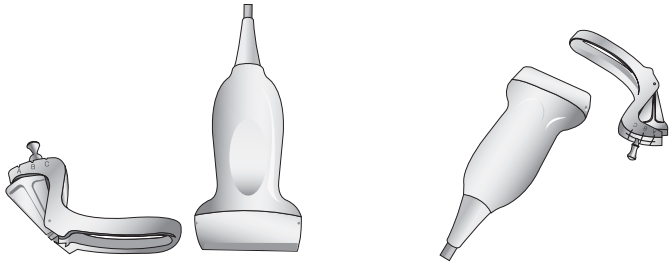
L4-7 Biopsy Guide

Biopsy Specifications

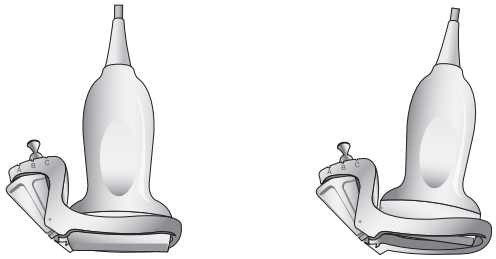
Model name	BP-KIT-043
Component	Biopsy Adapter 1 EA Needle Guide 24 EA Clip 2 EA
Available Gauges	8.5FR, 14G, 15G, 16G, 17G, 18G, 19G, 20G, 21G, 22G, 23G

Installation

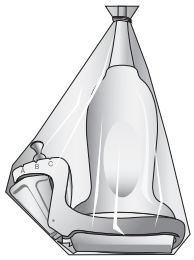
1. Mount the biopsy adapter onto the probe as shown below.



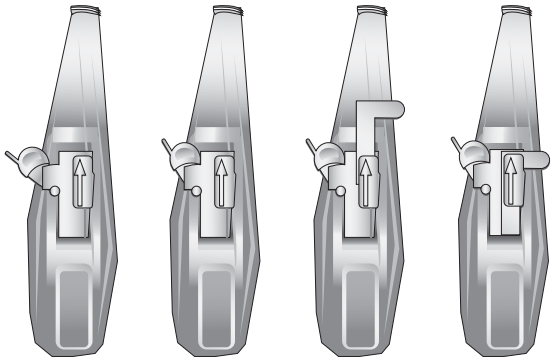
2. Selecting Bracket Angle (& Locking).



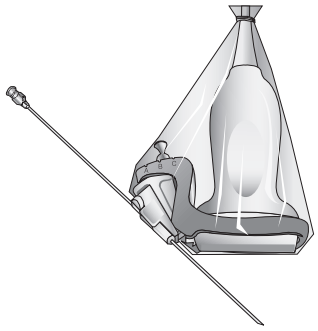
3. Insert gel into probe cover. And cover it.



4. Installing the Needle Guide and Clip.



5. Install the needle into the needle guide.



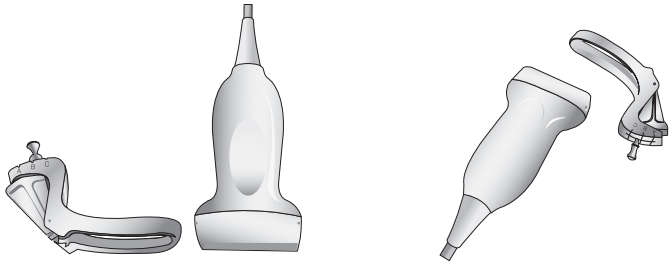
L5-13IS and L7-16IS Biopsy Guide

Biopsy Specifications

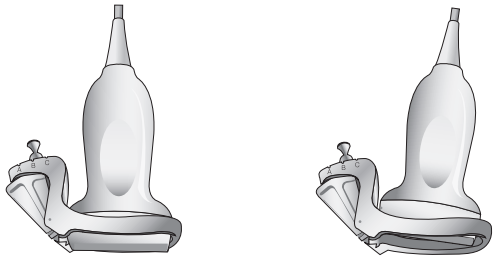
Model name	BP-KIT-012
Component	Biopsy Adapter 1 EA Needle Guide 24 EA Clip 2 EA
Available Gauges	14G, 15G, 16G, 17G, 18G, 19G, 20G, 21G, 22G, 23G

Installation

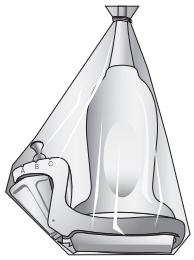
1. Mount the biopsy adapter onto the probe as shown below.



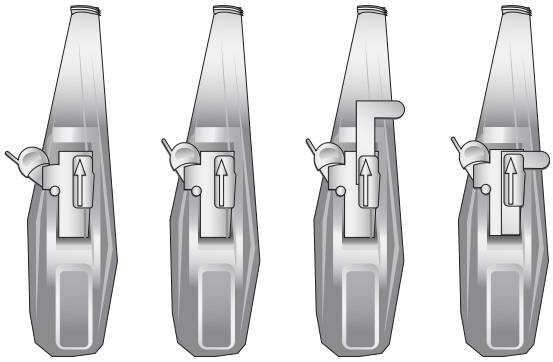
2. Selecting Bracket Angle (& Locking).



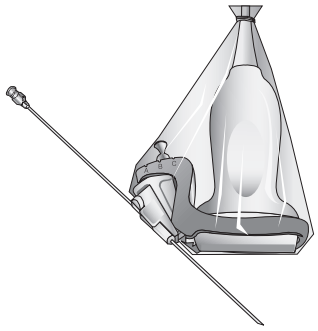
3. Insert gel into probe cover. And cover it.



4. Installing the Needle Guide and Clip.



5. Install the needle into the needle guide.



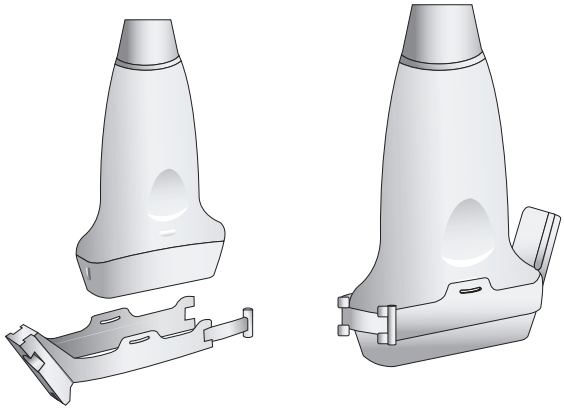
L5-13/50 Biopsy Guide

Biopsy Specifications

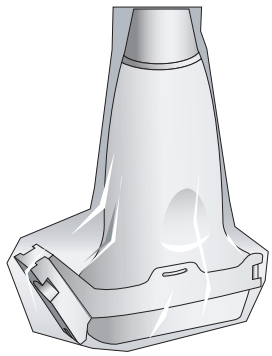
Model name	BP-KIT-053
Components	Biopsy Adapter Needle Guide
Intersection depth	Multi Angel (15mm, 25mm, 40mm)
Available Gauges	16G, 18G, 20G, 22G

Installation

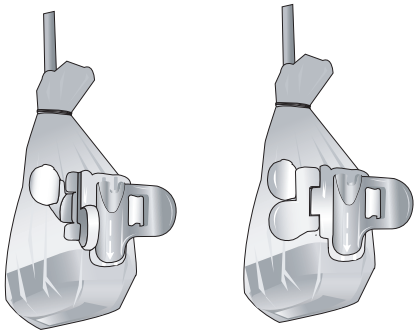
1. Mount the adapter onto the probe.



2. Fill the sheath with the ultrasound gel and place the sheath over the probe, all the way down to the Adapter.



3. Mount the needle guide for the desired gauge onto the adapter.

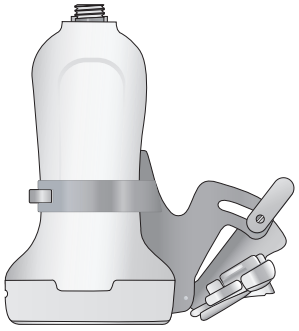


4. Install the needle into the needle guide for use.

Tips!

Using Multi Angle

Use the angle adjuster.



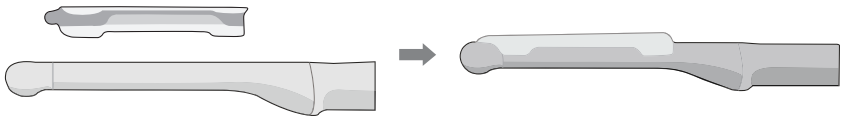
EC4-9IS Biopsy Guide

Biopsy Specifications

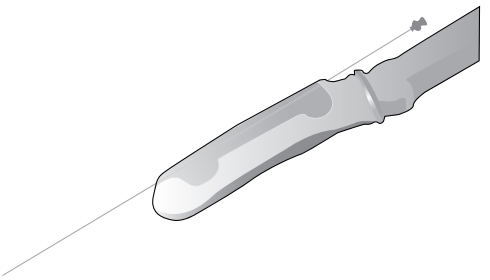
Model name	BP-KIT-003
Component	Biopsy Adapter 1 EA Needle Guide 1 EA
Material	PUR 2160
Available Gauges	17G

Installation

1. Mount the adapter onto the probe



2. Put the kit's cover over the adapter and then mount the needle guide on the adapter.



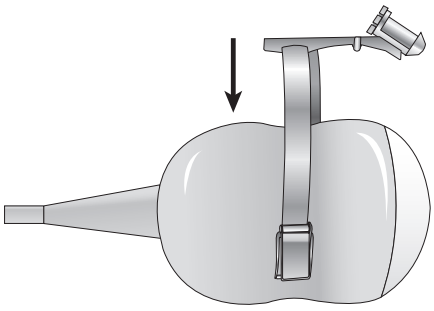
V2-6, V4-8 Biopsy Guide

Biopsy Specifications

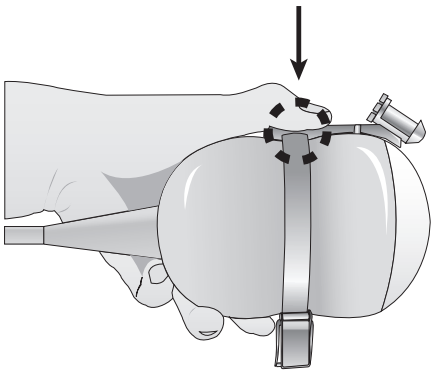
Model name	BP-KIT-028	
Component	Biopsy Adapter	1 EA
Material	Stainless	
Available Gauges	14G, 18G, 21G	

Installation

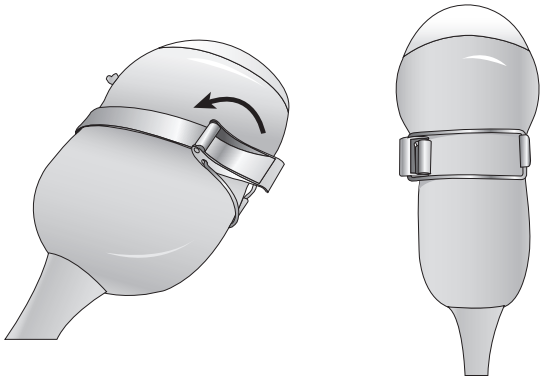
1. Place the biopsy adapter onto the probe.



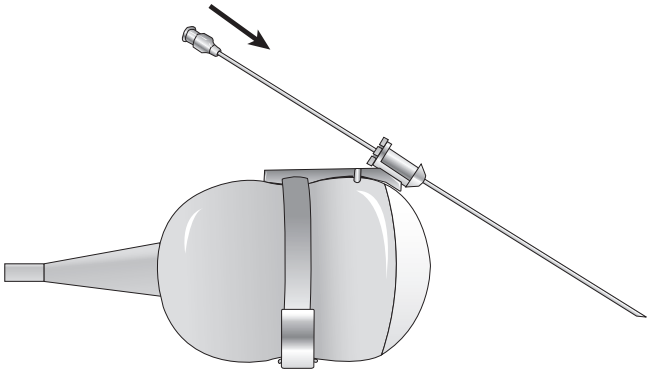
2. Push it forward until the bracket catches in the support (two notches) on the probe housing.



3. Fix the biopsy guide by locking the clip with the level on the opposite side of probe housing.



4. Install the needle into the needle guide for use.



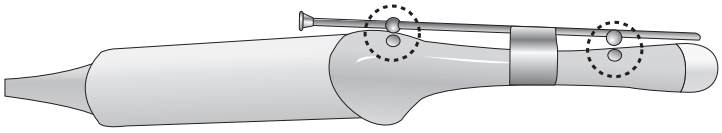
V5-9 Biopsy guide

Biopsy Specifications

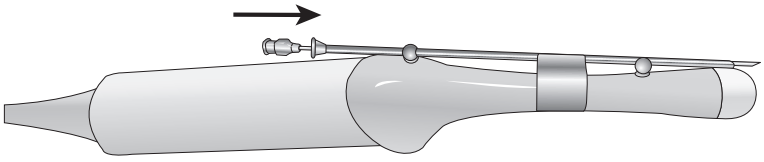
Model name	BP-KIT-029	
Component	Biopsy Adapter	1 EA
Material	Stainless	
Available Gauges	18G	

Installation

1. Place the biopsy adapter onto the probe.



2. Install the needle into the needle guide for use.



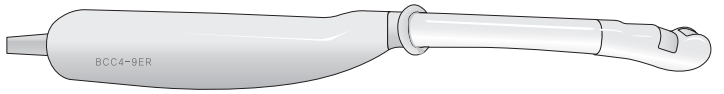
VR5-9 Biopsy guide

Biopsy Specifications

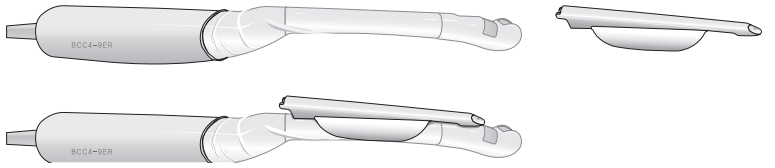
Model name	BP-KIT-041	
Component	Biopsy Adapter	1 EA
Material	ABS	
Available Gauges	16G, 17G, 18G	

Installation

1. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Probe.



2. Mount the adapter onto the probe.



3. Cover the adaptor and probe completely with sheath..

4. Install the needle into the needle guide for use.