



Volume 2  
Operation Manual

# SONOACER5



# SONOACER5

**Diagnostic Ultrasound System**

## **Operation Manual**

VERSION 1.02.00

*English*

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### \*\* Reference Manual

Samsung Medison is providing an additional SONOACE R5 Reference Manual. GA tables and references for each application are included in the Reference Manual.



# Image Managements

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## ❖ 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 Reviewing Images]

### ❖ Starting and Finishing Image Review

During scanning, press the **Freeze** button on the control panel. The scanning is stopped and the system switches to the image review mode screen.

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

## How to Review Images

Use the trackball on the control panel. You can search for saved images in chronological order by rotating the Trackball to the left or right. The number of images saved so far and the number of the image currently under review are displayed in the user information area.

The Soft menu is changed when images are reviewed. Select the item and adjust the value with the softmenu switch [1] – [5] on the control panel.

### ■ Auto Run

Use the Soft Menu switch [1]. CINE Mode or LOOP Mode is automatically played and repeated. To stop Auto Run, press this button again.

### ■ CINE/LOOP

Use the Soft Menu switch [2]. This option appears only when both CINE and LOOP are available, as in M Mode or Spectral Doppler Mode. You can select an image to play in CINE and LOOP by pressing the button. The selection is displayed in the left side of the user information area.

### ■ Cine Edit

Use the Soft Menu switch [3]. Set the range of the Cine mode. When you press this button, the Cine Edit Bar will be displayed and the Soft Menu will be changed;

- ▶ Set Cine start point: press the Soft Menu switch [3] **Frame Start** and set the start point using the **Set** button.
- ▶ Set Cine end point: press the Soft Menu switch [4] **Frame End** and set the start point using the **Set** button.
- ▶ Finish setting: press the Soft Menu switch [5] **Cine Save** to save the start and the end point.



#### Set using the Cine Edit Bar

Set the start point using trackball and the **Set** button and press the **Change** button to set the end point

### ■ Cine Save

Use the Soft Menu switch [4]. Save the Cine whole Cine images.

**NOTE:**

- ▶ When saving a Cine image, the current time at the top right of the screen stops displaying. When the image is saved, the current time displays again. The saved Cine image contains the time at which saving started.
- ▶ This system is optimized at a maximum of 60 Hz when playing Cine. Up to 60 Hz can be set during Auto Run, but if it is set higher than 60 Hz, the speed of the image may slow down. In Cine Save, images are saved at the actual frame rate.

**■ Speed (%)**

Use the Soft Menu switch **[5]**. Change the speed of Auto Run. When you press this button repeatedly, it changes as 10%, 40%, 70% and 100%.

**■ Reviewing Images in Multi-Image Mode**

Only images in an active area can be reviewed in multi-image mode. To review images in another area, change the active area by using the **Set** or the **Dual** button on the control panel.

## :: Annotating Images

### Text

You can enter comments or text over an image. This function can be useful when the diagnosis area is differentiated or displayed.

#### Starting Text Mode

Press the **Text** key in the Keyboards. The system will switch to text mode.

#### Typing Text

Use keyboards. You can move the cursor by using the trackball or the arrow keys on the keyboard.



[Figure 6.2 Text Mode]

## Autotext

This function allows you to enter text automatically by using an abbreviation. In this way, you can enter text easily and quickly. When Autotext is enabled, the autotext list appears on the screen.

TA	Transabdominal
TES	Testicle
THA	Thalamus

[Figure 6.3 The Autotext List]



**NOTE:** Select **Setup > System > General > Autotext Set**

## Deleting Text

Press the **Clear** button on the control panel. All the text entered on the screen will be deleted.

## Exiting Text Mode

Press the **Exit** button on the control panel.

## BodyMarker

You can place a BodyMarker over an image. This function can be useful when the diagnosis area is differentiated or displayed.



[Figure 6.4 BodyMarker Mode]

### Starting BodyMarker Mode

Press the **BodyMarker** key on the keyboards. The system will switch to BodyMarker input mode and BodyMarkers will appear in the user information area.



**NOTE:** If **Setup > System > Display > BodyMarker After Freeze** is set to 'On' and the **Freeze** button is clicked, the mode immediately switches to BodyMarker mode.

## ❏ Entering BodyMarker

1. Press the **BodyMarker** key on the control panel, BodyMarkers will appear on the user information area.
  - ▶ The types of BodyMarker shown in the Soft Menu vary with the diagnosis mode.
  - ▶ A maximum of 5 BodyMarkers are displayed on the screen at any one time. When there are more BodyMarkers than this, press the **BodyMarker** key or the Space bar repeatedly to move to other pages.
2. Press the Soft Menu switch for the BodyMarker that you want. The BodyMarker will appear in the image.
  - ▶ Position the probe cursor on the BodyMarker using the trackball.
  - ▶ Use the **Angle** dial-button on the control panel to adjust the angle of the probe cursor.
3. Press the **Set** button to finish.

## ❏ Changing BodyMarker Position

1. Press the **Change** button on the control panel.
2. Move the BodyMarker to a desired position by using the **Trackball**.
3. Press the **Change** button on the control panel again to confirm the new position.

## ❏ Deleting BodyMarker

Press the **Clear** button on the control panel.

## ❏ Exiting BodyMarker Mode

Press the **Exit** button on the control panel.

## Indicator

You can place an Indicator over an image. This function can be useful when the diagnosis area is differentiated or displayed. You can place one or more Indicators on specific positions.



[Figure 6.5 Indicator Mode]

### Starting Indicator Mode

Press the **Indicator** button on the control panel. The system will switch to the Indicator mode.

### Entering Indicator

1. Press the **Indicator** button on the control panel and an Indicator will appear on the screen.
2. Move the Indicator to a desired position by using the trackball.
3. Adjust the Indicator direction by using the **Angle** dial on the control panel.
4. Press the **Set** button to finish. Press the **Exit** button to cancel.

### **Deleting Indicator**

Press the **Clear** button on the control panel and all Indicators displayed on the screen will be deleted.

### **Exiting Indicator Mode**

Press the **Exit** button on the control panel.

## :: Saving and Transferring Images

### Saving Images



**WARNING:** You must enter the patient ID because all images are saved according to patient ID. Failure to enter a patient ID may result in a loss of and/or critical error(s) in previously saved images.

Press the **Save** button on the control panel. The saved images can be edited and managed with SONOVIEW.



#### Thumbnail

If **Setup > System > Misc. > Thumbnail** is set to 'On', the saved images are displayed in thumbnail area.

### ▣ Saving an Image with Text



**NOTE:** It's convenient to save an image with description for later search.

For more information about entering text, refer to 'Annotating Images' in this chapter.

## Transferring Images

Send images using DICOM. For more information on the DICOM server settings and DICOM operation, see the section on "Setting DICOM" in 'Chapter 7. Utilities'.

### ▣ Transferring Images in Real Scan Mode

There are two methods of sending images: sending one scanned image at a time immediately after each scan and sending selected images after the scanning process is complete. For more information about transferring images, see the section on "Setting DICOM" in 'Chapter 7. Utilities'.

## **Transferring Images in SONOVIEW**

Select an exam in the Exam View screen to transfer all images in the exam, or select and transfer images one by one in the Exam Review screen. For more information, see the section on “SONOVIEW” in this chapter.

## :: Printing and Recording Images

### Printing Images

Press the **Print** button on the control panel to print out a scanned image using a printer. For details on how to set-up a printer, refer to 'Chapter 7. Utilities.'

### Recording Images



**NOTE:** Please make sure that a VCR is properly connected to the system.

To record an image with the VCR during scanning, press the recording button of the connected standard VCR.

## SONOVIEW

SONOVIEW is an integrated image management program in SONOACE R5. It allows you to save, view and delete images, and export data to a standard PC.

The image file type used in this product is based on DICOM, an international standard specification. As a result, PACS can be implemented without any additional cost, and it's easy to exchange image data with other hospitals or equipment. Furthermore, for enhanced data compatibility, it supports the bitmap file format, which is most commonly used in standard PCs.

### Starting SONOVIEW

Press the **SONOVIEW** button on the control panel. If there are the saved images available for the current exam, the information and saved images for the exam appear when SONOVIEW starts.



**WARNING:** Make sure to register a patient before saving images or using SONOVIEW.

All diagnosis information in the product is saved and managed for each patient ID. As a result, saving images without entering a patient ID may result in a loss of and/or critical error(s) in previously saved image.



[Figure 6.6 SONOVIEW]

## Exam View



**NOTE:** If you select an icon on the *Exam View* screen, the name of icon will be displayed.

### Starting Exam View

Press **Exam Search** on the Review screen. The *Exam View* screen appears.



[Figure 6.7 Exam View]

In the center of the *Exam View* screen is the exam list with information on the patients' IDs, names, age, genders, examination dates, and the number of images saved. On the top right-hand corner of the screen are the total number of examinations, number of selected examinations, number of selected images and the size of selected images.

## ❏ Selecting Exam

Use the trackball and the **Set** button to select an examination. To cancel the exam selection, press the **Set** button once again.

Press **Select All** to select all examinations at once, or press **Deselect All** to deselect all exams.

To view exams saved in a storage devices, select Hard drive, MO drive, FLASH, or ODD from **Source** on the screen. Selecting a source brings up information on the used space and total space for the source.

## ❏ Searching Exam

Enter the patient's ID, name, and exam date, and press **Search** to bring up an exam list with examinations that are identical or similar to the search conditions. You can search exams using as little as a single character or number for your search string.

### ■ Searching by Period

Select a period from the combo box at the top of the exam List. Today, 1Week, 1Mon, 3Mon, and 1Year show the exams for the respective periods dating back from the current date, and All Exams shows all examinations.

### ■ Showing All Exam

Select **Show All** at the top of the exam list. All exam lists saved in the selected source will be displayed.

## ❏ View Exam

Use the trackball and the **Set** button to select an exam to view, and then press Review Exams at the top of the screen. The screen will switch to the Review screen and show images for the selected exam.

## ❏ Deleting Exam

Use the trackball and the **Set** button to select an exam to delete, and then press **Delete Exams** at the top of the screen.

## ❏ Exam Export

Multiple exams can be selected and exported simultaneously.

1. Select exam(s) and press **Export** to bring up the Export window.
2. Select MO drive, Flash Memory, or ODD as the destination drive for the export. Current directories and files in the selected drive will be displayed on the screen.
3. Select BMP, JPEG, TIFF, or DICOM as the file format.
4. Specify the file name. Exams and images share the same file name: if there are multiple images in the exam, each file name will end with a serial number.
5. Specify the directory name. After entering the directory name, press **Make Directory** to create a folder in the destination medium. The new folder will be reflected as a directory in the selected drive. To delete the directory, press **Remove Directory**.



**NOTE:** When you use the ODD, **Make Directory** and **Delete Directory** are not available.

6. Once all fields have been entered, press **Export**. To cancel, press **X** at the top right-hand corner of the screen.

[Figure 6.8 Exam Export]



When selecting 2D Cine, an image and a video are saved together. The saved AVI file (\*.avi) can be played by a video viewer which contains Windows Media Player.

When selecting Hide Patient Information, the function is disabled.

## Exam Backup

MO, ODD, and Flash Memory can be used.

1. Install the target medium for backup.
  - ▶ MO or ODD: Insert the medium in the drive and wait until the LED light goes out.
  - ▶ If using Flash Memory, connect it to the USB port on the left side or rear panel of the product.
2. Select exam(s) and press **Backup Exams**
3. At the medium selection window, select MO, ODD or Flash and then press **OK**.

Once the backup process is complete, you will be prompted whether to delete the exam(s) saved in the hard disk. Select your response for whether to delete or keep the exam(s). If you select “delete,” all backed up exam(s) will be deleted from the hard disk completely.

## Exam Restore

MO, ODD, and Flash Memory can be used.

1. Connect the MO, ODD, or Flash Memory with exam backup information to the product and wait until the LED light goes out.
2. Use Source at the top left-hand corner of the screen to select the connected medium.
3. When the saved exam list appears, select appropriate exam(s) and perform Review, Delete, DICOM Send and other necessary functions. Note that the Delete function cannot be performed when using ODD.

To move exam(s) to the system hard disk, select the exam(s) and press **Restore**.

### Using USB MO Drive

USB MO drives can be connected to the USB port on the front panel. Only one MO drive can be used at a time, and if two or more drives are connected, only one will be recognized.

When you have finished using the drive, you must use the Eject function from Storage Manager to remove the MO disk or disconnect the drive after turning the product off.



**WARNING:** If you are using a new MO disk for the first time, use the 'MO Format' function from Storage Manager to format the disk first.

### ■ Using USB Flash Memory

USB flash memory can be connected to the USB port on the front panel. Only one flash memory can be used at a time.

You do not need to format new USB flash memory. If you need to format the USB flash memory, ensure that the file system type used is 'FAT' or 'FAT32'.



**WARNING:** To disconnect the USB flash memory from the product, use the 'Unplug' function from Storage Manager to remove it from the product.

### ■ Using ODD

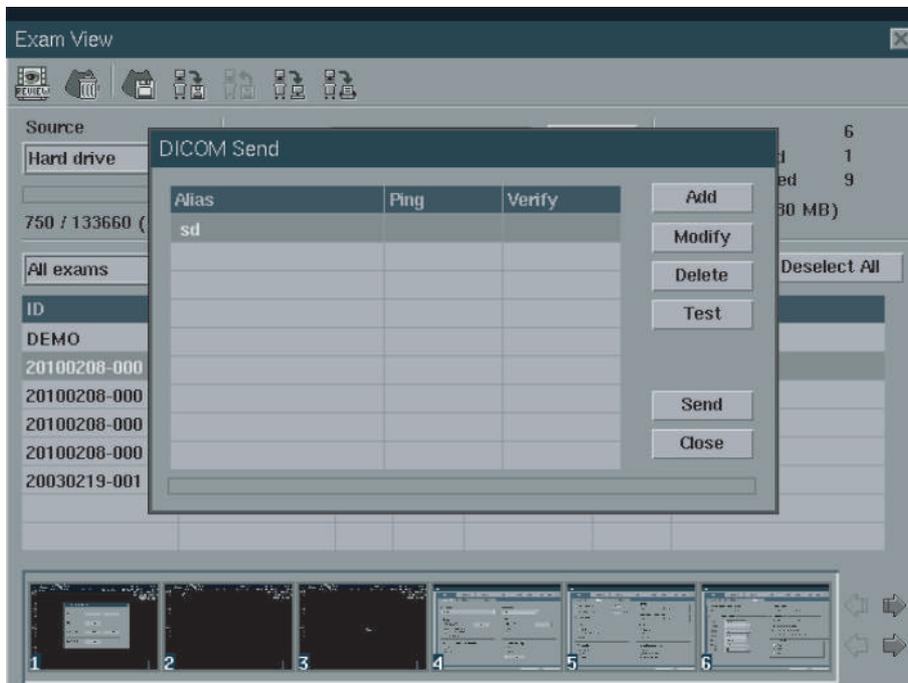
Only one ODD drive can be used at a time. After using the ODD, use the Eject function from Storage Manager to eject the medium.

If using a re-writable ODD, you can erase all recorded data using the Format function from Storage Manager.

## ❏ Sending Exam

This function uses the DICOM network. The **DICOM Send** button will not work if the DICOM function is not configured.

1. Select exam(s) and press **Send** at the bottom of the screen.



[Figure 6.9 DICOM Send]

- ▶ If you want to add a new server after selecting exam(s), select **Add** from the DICOM Send window, enter the necessary information, and then press **Ok**.
  - ▶ Press **Modify** to view or edit the server information after selecting exam(s).
  - ▶ Select **Delete** to delete the server after selecting exam(s), or select **Test** to check the DICOM connection to the server.
2. When all steps are complete, press **Send** to send the selected exam(s) to the selected server.

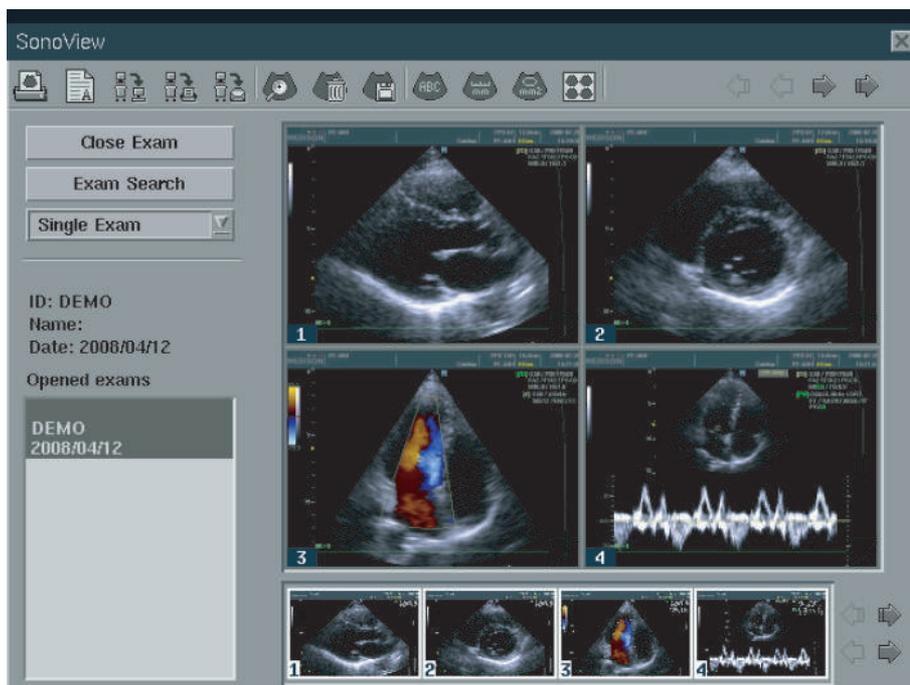
## Printing Exam

This function uses printer(s) on the DICOM network. **DICOM Print** will not work if the DICOM function is not configured.

1. Select exam(s) and press **DICOM Print**.
2. Steps for printing exams are the same as for sending exams.

## Exam Review

Saved images can be managed using measurement, printing, sending and many other functions.



[Figure 6.10 Exam Review]



**NOTE:** If you select an icon on the Exam View screen, the name of icon will be displayed.

## Exam Information

Patient names, IDs, and exam dates are displayed in the left-hand center of the *Exam Review* screen.

## Opened Exams

This displays the list of exams currently in progress or exams selected from Exam View.

If multiple exams are selected from Exam View, you can use the trackball and the **Set** button to quickly browse through the exams. For example, after selecting multiple exams from Exam View, press **Review Exam** to switch to the Review screen and bring up the list of selected exams in Opened Exams.

## Close Exam

Closes the current exam(s).

## Exam Search

The *Exam View* screen appears. You can browse through exams to select, change, save, send, or backup. For more information, see 'Exam View.'

### ■ Single Exam

This displays all the images for selected exams in the order they are saved.

Use the trackball over the Preview window at the bottom of the screen to select image(s) to show on the screen. Images will be numbered according to their order.

### ■ Compare Exams

This function is useful for comparing multiple images.

Select images in the Preview window at the bottom of the screen. The border of selected images will go bright.

Place the cursor over the image display window and press the **Set** button on the control panel to display the image at the selected location. A maximum of 4 images can be compared at the same time.

## ✦ Selecting images and Full Screen Image View

### ■ Selecting Images

Use the trackball on the control panel to move the cursor over an image and press the **Set** button. To select multiple images, use the trackball and the **Set** button while holding down the **Ctrl** key on the keyboard.

### ■ Full Screen Image View

This displays a full screen view of one selected image.

Place the cursor over the image and press the **Set** button on the control panel twice. To return to the Review screen, press the **Exit** button or press **Close** on the screen.

When in full screen image view, use the arrows on the screen to navigate to the previous or next images.

## ✦ Using Preview

This function previews selected exam(s).

Images displayed on the current screen are indicated with white borders. You can use the arrow buttons on the right to browse through the images if there are 4 or more images.

## ✦ Printing

This function prints images or simple reports.

1. Press **Print** from the *Exam Review* screen.
2. Select settings from the Print window.
  - ▶ Column : sets the number of column of image
  - ▶ Row : sets the number of row of image
  - ▶ Portrait : sets the paper horizontally
  - ▶ Landscape : sets the paper vertically
  - ▶ Image Only : prints only images
  - ▶ Report Only : prints only report

- ▶ Images and Report : prints both images and report
  - ▶ Copies: sets the number of copies
3. Press **Ok** and Print screen will be displayed. Select printer and paper.
  4. Click **Print** to start printing. Press **Cancel** to cancel.

## Report

You can query the report for the selected exam or enter new information in it.

1. Press **Add Comments** from the *Exam Review* screen.
2. Enter details in the Report window.
3. Press **Ok** to save the information. Press **Cancel** to cancel.

## DICOM Send (Optional)

This function uses DICOM to send selected images. This button is deactivated for products that do not support the DICOM option.

1. Select image(s) and press **DICOM Send** on the *Exam Review* screen.
2. The number of selected images will be displayed on the screen. Press **Ok** to bring up the *DICOM* window.
3. After confirming the settings, press **Send** to send the image(s). Press **Cancel** to cancel.

## DICOM Printing (Optional)

This function uses DICOM to print selected images. This button is deactivated for products that do not support the DICOM option.

1. Select image(s) and press **DICOM Print** on the *Exam Review* screen.
2. The number of selected images will be displayed on the screen. Press **Ok** to bring up the *DICOM* window.
3. After confirming the settings, press **Print** to print the image(s). Press **Cancel** to cancel.

For more information on DICOM printers, please refer to the printer manual or the DICOM Conformance Statement.

## E-mail

This function sends e-mails with image attachments.

1. Select image(s) and press **E-mail** on the *Exam Review* screen.
2. Enter the user's name, e-mail address, the recipient's e-mail address, subject and message. Please note that server names and e-mail addresses are case-sensitive.
3. Press **Send** to send the e-mail. Press **Cancel** to cancel.

In order to use the E-mail function, you must specify the e-mail (SMTP) server and you must own an e-mail account on the mail server.

You can specify the Outgoing Mail Server on the *E-mail Setup* screen.



**NOTE:** If e-mails cannot be sent even though the mail server is functional, check that the ICMP (ping) is open for the mail server. If the ICMP (ping) is closed, the e-mail function may not work properly.

## Magnification

This function magnifies a part of the image displayed on the screen.

1. Press **Magnifier** on the *Exam Review* screen. The mouse cursor changes to a magnifying glass shape.
2. Place the magnifying glass over an area and press the **Set** button.

## Delete

Select image(s) and press **Delete Image** on the *Exam Review* screen. To delete many images at once, use **Trackball** and **Set** button during pressing **Ctrl** key on the keyboard.



**WARNING:** Current exam cannot be deleted. The deleted exams are not be recovered.

## Export

This function saves the images in BMP, JPEG, TIFF or DICOM file formats.

1. Press **Export** on the *Exam Review* screen. The mouse cursor changes to a floppy diskette shape.
2. Place the floppy diskette shape over an area and press the **Set** button. *The Export* window will be displayed.
3. Enter the directory and file names for the image file(s) and press **Export** to save the images in the selected file format.



When selecting 2D Cine, an image and a video are saved together. The saved AVI file (\*.avi) can be played by a video viewer which contains Windows Media Player.

When selecting Hide Patient Information, the function is disabled.



**NOTE:** Do not use blank spaces in file names or directory names. The Export function will not work for file names or directory names containing blank spaces.

## Text

Use this function to insert text into the image.

1. Press **Add Text** on the *Exam Review* screen.
2. Place the cursor over the image and press the **Set** button. The image will be displayed in full screen view.
3. Move the cursor to a desired location and insert the text. To change the font size or color, press **Font Style**.

## Distance

This function measures the distance between any two points on 2D images.

1. Press **Distance** on the *Exam Review* screen.
2. Place the cursor over the image and press the **Set** button. The image will be displayed in full screen view.
3. Move the cursor to a desired location and press the **Set** button to set the start point.

4. Use the trackball to move the cursor to another location and press the **Set** button to set the end point.
  - ▶ Press the **Change** button before assigning the end point to change the position of the start point. The distance between the two points will be displayed on the screen.
  - ▶ You can use the same method to take multiple measurements. Note that the measurement results are not saved with the image.
5. To finish measurement, press the **Exit** button on the control panel or Close on the screen.

## Ellipse

Use this function to draw an ellipse over the 2D image, and then measure the perimeter and area of the ellipse.

1. Press **Ellipse** on the *Exam Review* screen.
2. Place the cursor over the image and press the **Set** button. The image will be displayed in full screen view.
3. Move the cursor to a desired location and press the **Set** button to set the start point.
4. Use the trackball to move the cursor to another location and press the **Set** button to set the end point. Press the **Change** button before assigning the end point to change the position of the start point.
5. After adjusting the size of the ellipse, press the **Set** button to confirm the size of the ellipse. The perimeter and area of the ellipse will be displayed on the screen.
  - ▶ You can use the same method to take multiple measurements. Note that the measurement results are not saved with the image.
6. To finish measurement, press the **Exit** button on the control panel or **Close** on the screen.

## **Layout**

Use this function to configure the number of images to show on the *Exam Review* screen.

On the Exam Review screen, press **Layout** and select items from Single to 3\*3 in the *Image Layout window*.

## **Closing SONOVIEW**

Press the **SONOVIEW** button or click **X** on the screen to close SONOVIEW.



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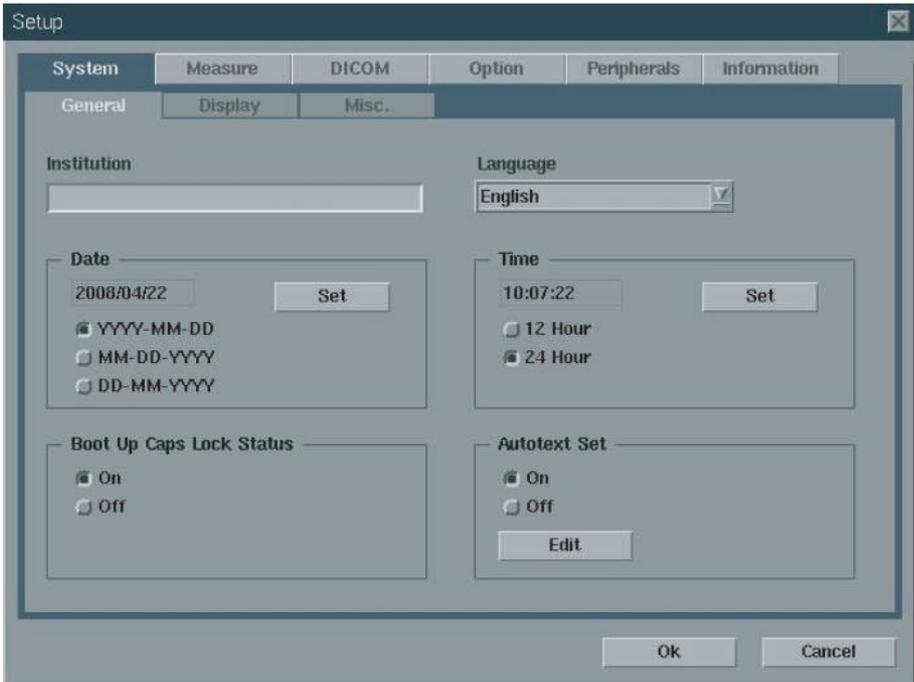
# ⚙️ Setting System

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. Press the **Setup** key on the keyboard. *Setup* screen is appeared.
- 2. Select **System** in the Setup menu.
- 3. Set the specific system values according to each item on the screen.
- 4. Click **Ok** to finish the setup. To close the screen, click **Cancel** or **X**.

## General

Select the **General** tab in the **System** menu.



[Figure 7.1 System – General]

## ■ Institution

Enter the name of the hospital/institution.

## ■ Language

This sets the language to be used. English, Deutsch, Français, Italiano, Español, Russian, and Simplified Chinese are available. To display the screen in the selected language, reboot the system after completing setup. The input setup of key button is automatically updated.

## ■ Date

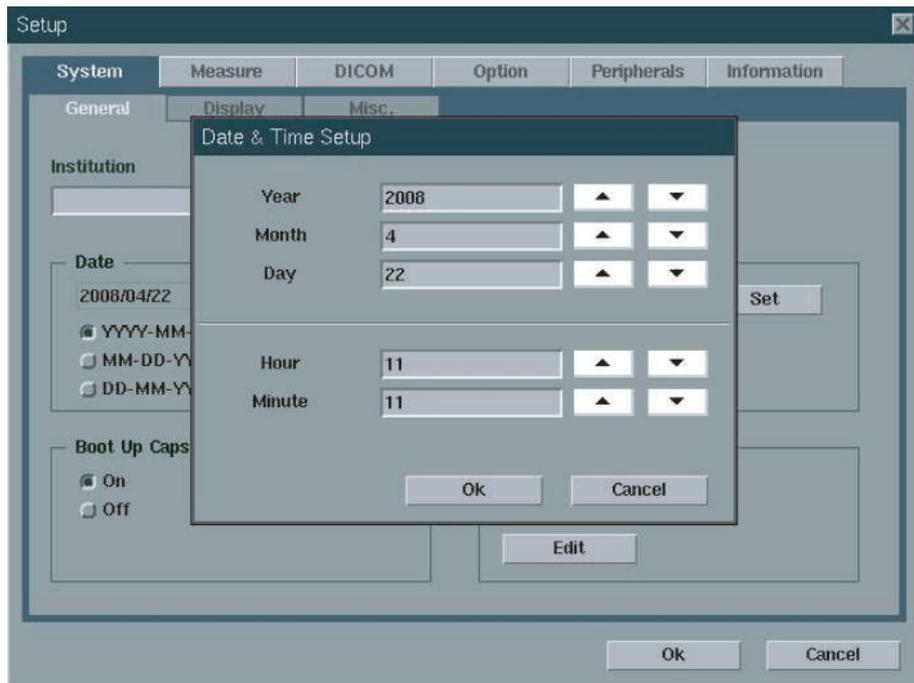
Set the date and its format.

## ■ Time

Set the time and its format.

**Tips!**

How to set the date and time.



[Figure 7.2 Date & Time Setup]

1. Click **Set** in the **Title** tab of System menu.
2. Set the Date/Time using the trackball and **Set** button.
3. After finishing setup correctly, click **Ok**. To cancel setup, click **Cancel**.

## ■ Boot up caps lock status

This menu sets the initial status of Caps Lock after system boot-up. Its default value is 'Off'. This Caps Lock enables capital letter entry without the need to press the **Shift** key.

## ■ Autotext Set

Select **Autotext Set** to use the Autotext text function. Its default value is 'Off'.

Using the Autotext text function allows fast and easy input of text statements. For example, to enter the text 'Tumor', you only need to enter 'Tu' and the system will search the word from the abbreviation list and automatically enter the word 'Tumor'.

### Tips!

#### How to edit the Autotext Set.

Click **Edit** on the screen. The Autotext Table Edit table window will be appeared. To add a new abbreviation, click **New**, and to completely delete an existing abbreviation, click the entry to be deleted and then click **Delete**.

'Delay(msec)' sets seconds to input the full word after enter the abbreviation. The unit value is msec, and 1000msec is 1second.



[Figure 7.3 Autotext Set Edit]

## Display

To set the information about images and related data, select the **Display** tab in the **System** menu.

### ■ Auto Freeze

After the preset time span (Minute) of inactivity, the scan mode is automatically frozen.

### ■ Screen Saver

After the preset time span (Minute) of inactivity, the screen saver is automatically started.

### ■ Post Map

This sets the display of the Post Map in the Feedback section at the bottom of the screen.

### ■ TGC Line

This sets whether or not the TGC line is displayed. If 'Off' is selected, the TGC Line is not shown. If 'Off after 3 seconds' is selected, the TGC value appears when a TGC value is adjusted, but disappears after 3 seconds. If 'On' is selected, the TGC Line is always shown.

### ■ TI (Thermal Index) Display

The system sets TI values automatically. However, this menu allows the user to choose manually from one of the three TI parameters as desired: Default, TI<sub>s</sub> or TI<sub>b</sub>.

### ■ HPRF

Enable or disable High Pulse Repetition Frequency (HPRF) supported in the PW Spectral Doppler mode. If it is set to 'On,' HPRF is supported by default.

### ■ BodyMarker After Freeze

Determine whether the system will automatically switch to the BodyMarker mode when the **Freeze** button is pressed. If it is set to 'On,' a BodyMarker appears when the **Freeze** button is pressed during scanning. If it is set to 'Off,' a BodyMarker appear only when **BodyMarker** is pressed during scanning.

### ■ 2D Image Size

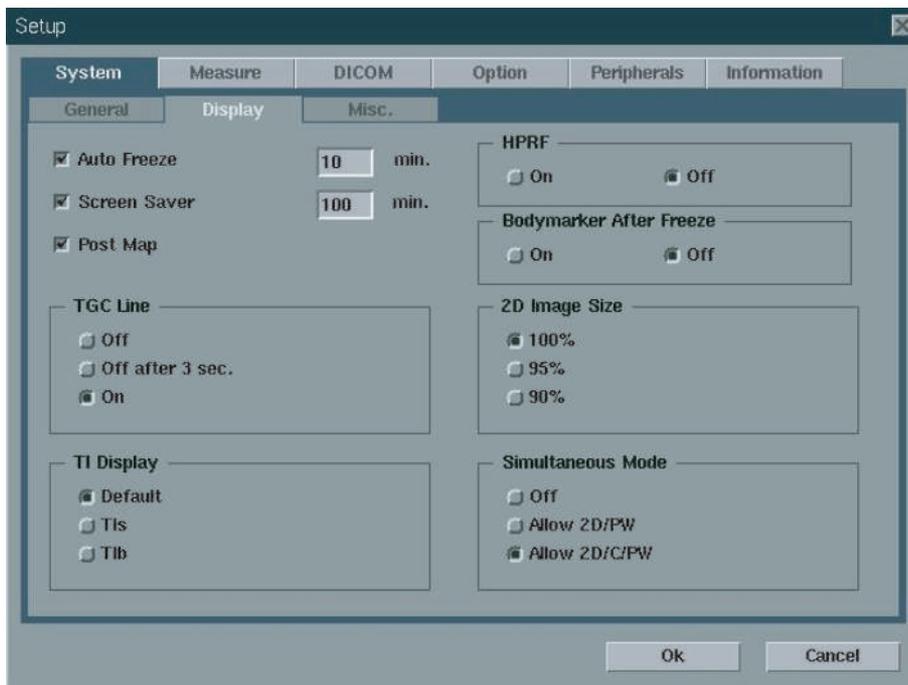
The Image size can be set to 100%, 95% or 90%.

### ■ Simultaneous Mode

This menu determines whether or not simultaneous mode is enabled in PW Spectral Doppler Mode.

- ▶ 'Off': Select this if you do not wish use simultaneous mode.

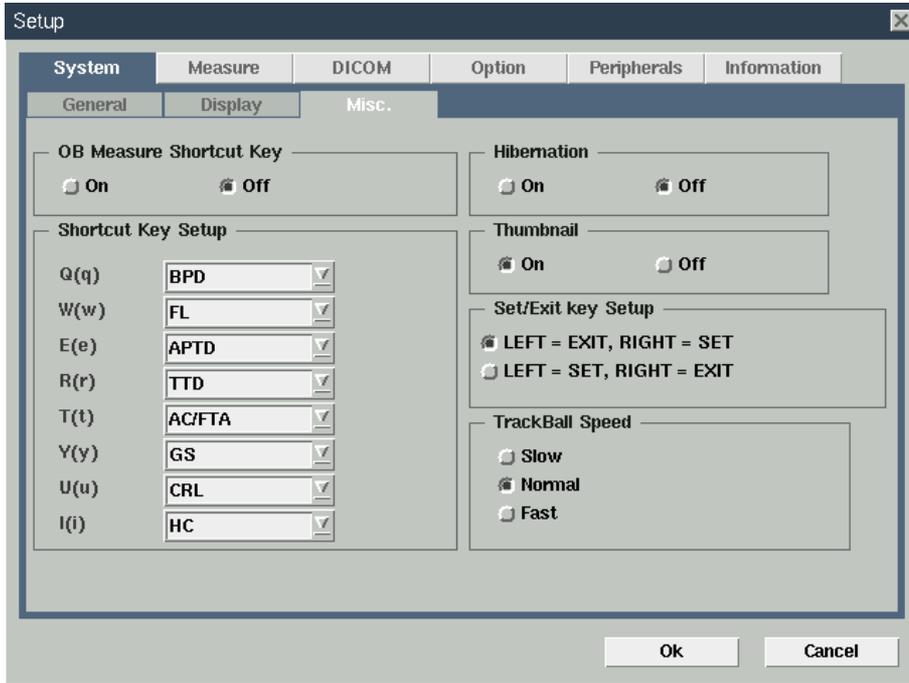
- ▶ 'Allow 2D / PW': Select this if you wish to use simultaneous mode in 2D/PW mode.
- ▶ 'Allow 2D / C / PW': Select this if you wish to use simultaneous mode in 2D/C/PW mode.



[Figure 7.4 System – Display]

## Misc.

Select the **Misc.** tab in the **System** menu.



[Figure 7.5 System – Misc.]

### ■ OB Measure Shortcut Key

Select On to start a desired obstetrics measurement instantly with shortcut keys in the keyboards.

### ■ Shortcut Key Setup

Assign commonly used obstetrics measurement items to number keys in the keyboards. Select BPD, FL, APTD, TTD, AC/FTA, GS, or CRL.

### ■ Hibernation

To booting speed up, set this item as 'On'.



**NOTE:** The system turns off with normal shutdown after 30th booting with 'Hibernation On'. However the system will start with 'Hibernation On' on the next booting.

### ■ Thumbnail

To use thumbnail list, set this item as 'On'. Thumbnails of saved images are showed up on the right side of the screen.

### ■ Set / Exit Key Setup

Set the position of the **Set** and **Exit** buttons.

### ■ Trackball Speed

Set the trackball speed during scan mode to **Slow**, **Normal** or **Fast**.

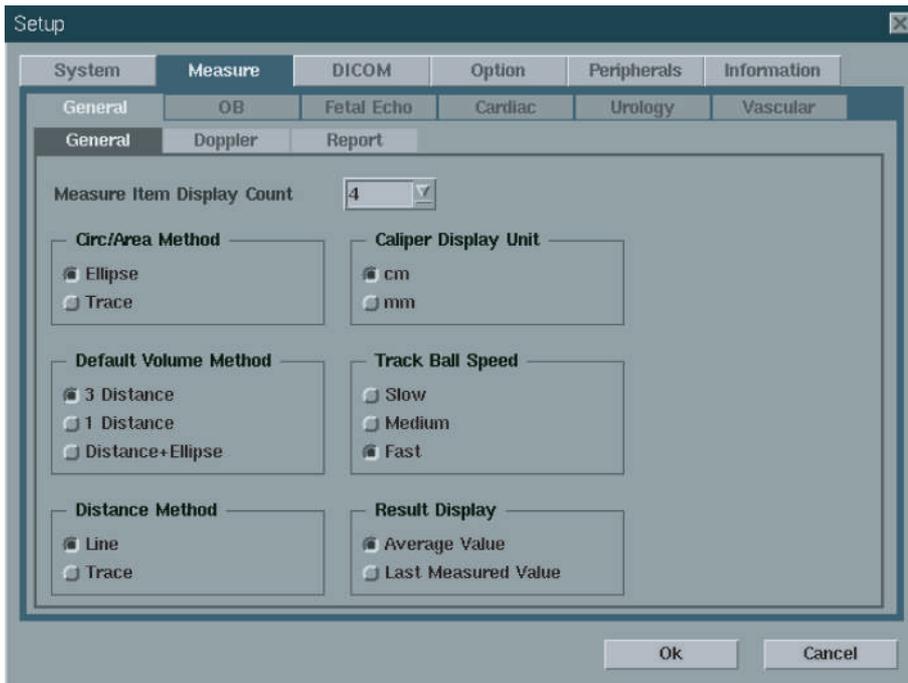
## ⚙️ Setting Measurements

Select **Measure** in the Setup menu to set up measurement functions.

1. Press the **Setup** key on the keyboard. *Setup* screen is appeared.
2. Select **Measure** in the Setup menu.
3. Set the specific system values according to each item on the screen.
4. Click **Ok** to finish the setup. To close the screen, click **Cancel** or **X**.

### General

Select the **General** tab in the **Measure** menu to set general measurement settings.



[Figure 7.6 Measure - General]

## General

Select **General** tab.

### ■ Measure Item Display Count

Select the number of measurement items to be between 1 and 4. If you select 'Hide', measurement items are not displayed.

### ■ Circ/Area Method

Select either the 'Ellipse' or 'Trace' caliper to be the default tool for measurement.

### ■ Default Volume Method

Select either the '3 Distance', '1 Distance' or 'Distance + Ellipse' items to be used as the default tool in volume measurement.

### ■ Distance Method

Set either 'Line' or 'Trace' as the distance measurement method.

### ■ Caliper Display Unit

Set either 'cm' (centimeter) or 'mm' (millimeter) as the caliper display unit.

### ■ Trackball Speed

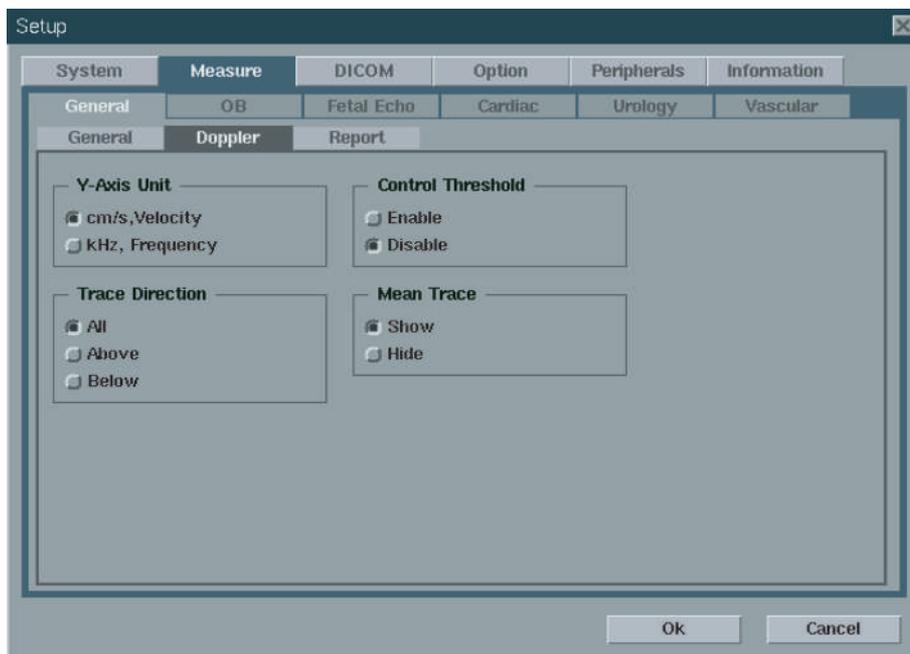
Set the trackball speed to either 'Fast', 'Medium' or 'Slow'.

### ■ Result Display

Set the output format of measurement results in the report. When 'Average Value' is selected, the report shows the average value of the last three measurement results. When 'Last Measured Value' is selected, the last measurement value is shown.

## Doppler

Select the **Doppler** tab in the **General** tab.



[Figure 7.7 Measure - Doppler]

### ■ Y-Axis Unit

This sets the vertical (Y) axis unit in Spectral Doppler Mode.

### ■ Trace Direction

When Auto Trace and Limited Trace functions are used in Spectral Doppler Mode, this sets the range of the measurement values.

### ■ Control Threshold

The trace threshold can be adjusted by rotating the **Menu** dial-button when tracing is not finished after Auto trace / Limited trace.

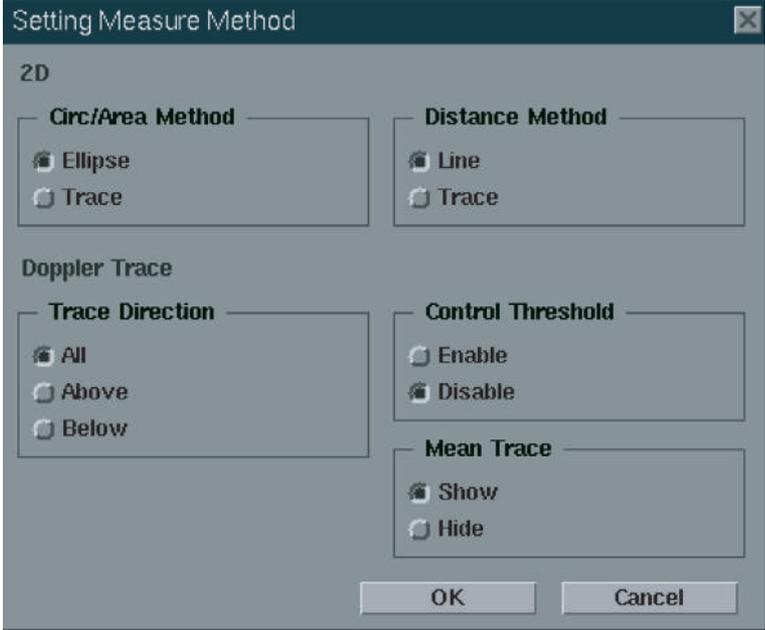
### ■ Mean Trace

This menu specifies the use of Mean Trace Line on the screen for Auto trace / Limited trace.



**How to change Doppler setting during measurement**

Press the space bar after pressing the **Calc** button to bring up the *Setting Measure Method* window shown below.

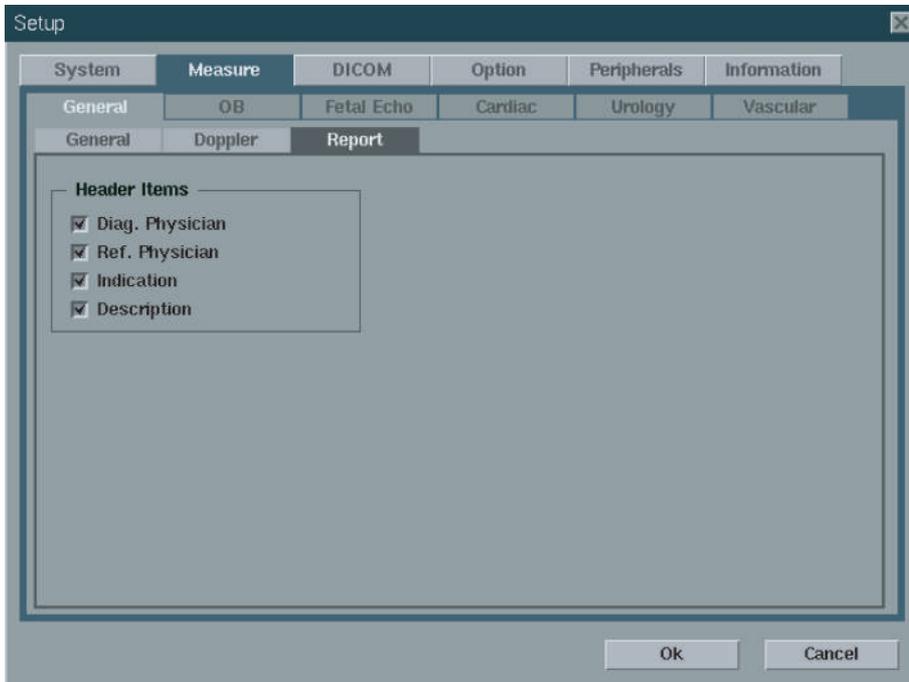


[Figure 7.8 Setting Measure method]

## Report

Select the **Report** tab in the **General** tab.

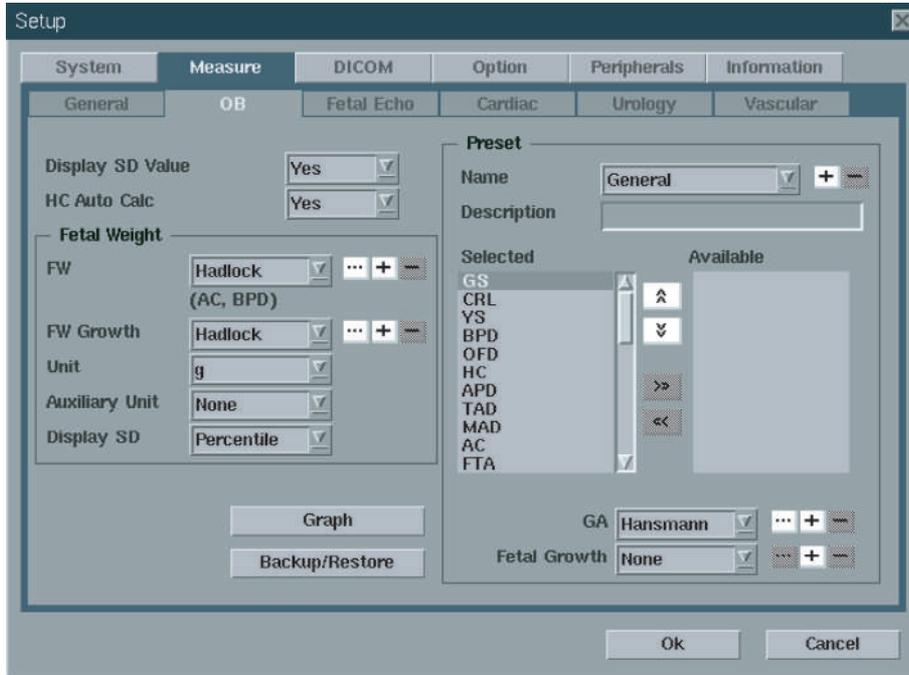
Select items to mark the header on the report. The header will be shown only the item has its data.



[Figure 7.9 Measure - Report]

## OB

Select the **OB** tab in the **Measure** menu.



[Figure 7.10 Measure – OB]

### ■ Display SD Value

This menu sets whether SD (Standard Deviation) is displayed or not. If 'Yes' is selected, the SD value is shown on the screen and on the report. If 'No' is selected, it is not shown and its range value appears on the report.

### ■ HC Auto Calc

This menu is used to set the HC Auto Calculation. 'Yes' shows the HC value on the screen and in the report using the result of OFD and BPD calculation. 'No' will not show the HC value on the screen.

### ■ Fetal Weight

This menu is used to set the measurement items used for fetal examination. In the fetal weight and fetal weight growth fields, more measurement items can be added.

- ▶ **Unit:** This sets the unit of fetal weight measurement. You can choose from grams [g], ounces [oz], and pounds [lb].

- ▶ **Auxiliary Unit:** This sets the auxiliary unit of fetal weight measurement. Unit sets the available auxiliary unit. For instance, set the unit as Gram [g], available units are None, oz, lb, or lb+oz. If you select lb+oz as an auxiliary unit, the value will be shown like as xx lb yy oz.
- ▶ **Display SD:** This menu sets the SD information shown in the result display section: No, SD or Percentile. Both SD and Percentile appear in the report.

## ■ Preset

Measurement items used during exams are set.

Set a specific preset in the Name field. If 'General' is selected, all items can be used. If 'Fetal Biometry' is selected, only Fetal Biometry-related items can be used.

### ▶ User Preset

If the  beside the Name field is selected, a user can set a new preset.

Enter a title in the Preset Name field and an explanation in the Description field. Press **Ok**.



[Figure 7.11 New Preset]

After a new preset is made, register items in the right-hand list to use in obstetrics measurement. When  is clicked, the items in the right list are moved to the left list to be used with the user preset. To delete the items from the left list, select them and click .

To delete a user preset, select it and click . Because 'General and Fetal Biometry' are system presets, cannot be deleted.

### ▶ Table and Equation

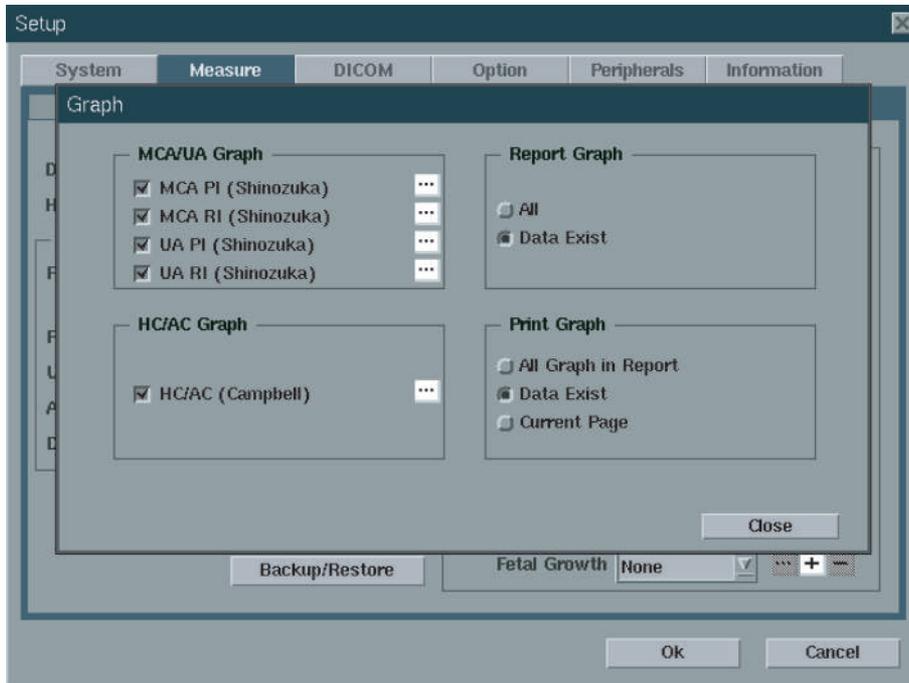
The measurement items used in the Preset menu are GA and Fetal Growth. The measurement values of GA and Fetal Growth are shown in table or equation form.

When  is clicked, the contents of the GA or Fetal Growth's table and equation contents are shown. When  is clicked, a user can set a specific value, and when  is clicked, the table and equation set by the user are erased. However, the default values provided by the system are not erased.

For more information about each table and equation, refer to the Reference Manual.

## ■ Graph

The user can select graphs to mark on the OB report or print. Press **Graph** button and select items. After selecting/deselecting a specific item, click **Close**.



[Figure 7.12 Graph]

### ▶ MCA/UA Graph

Select MCA/UA graphs (MCA PI, MCA RI, UA PI, and UA RI) to include in the OB report.

### ▶ HC/AC Graph

Include HC/AC ratio in the graph.

### ▶ Report Graph

Select graph to include in the report. 'All' displays all graphs, and 'Data Exist' displays only the graph has its data.

### ▶ Print Graph

Select graph to print. 'All Graph in Report' prints all graphs of the report, and 'Data Exist' prints only the graph has its data. 'Current Page' prints the current page of report.

## ■ Backup / Restore

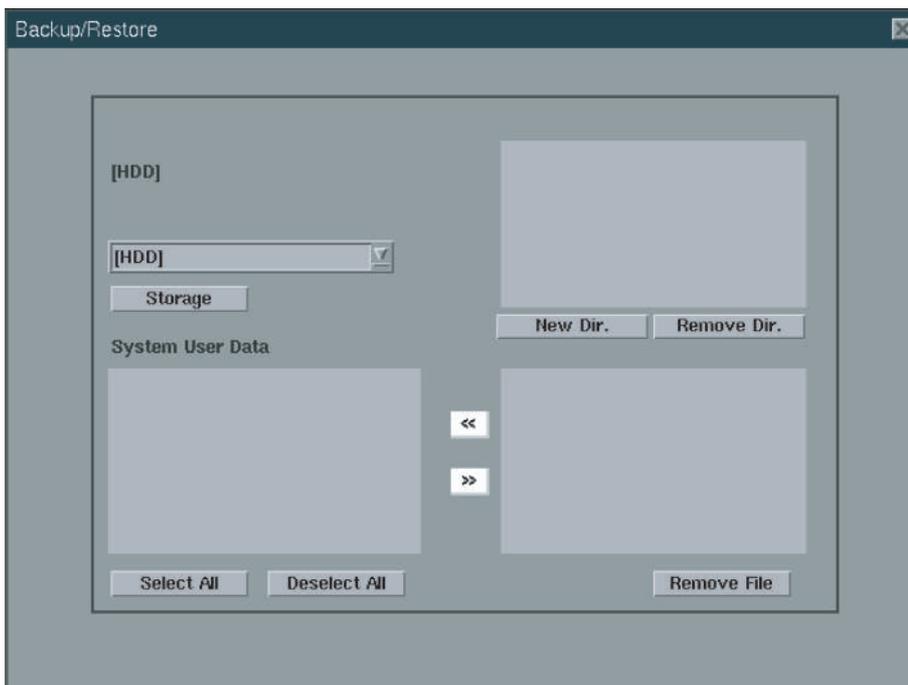
### ▶ Backup

If you want to back up a new user preset to MO Media, Flash Memory, HDD, or CD, press **Backup/Restore** on the screen. When the setting window is displayed, select the disk and directory. Directories can be created or deleted using the **New Dir.** or **Remove Dir.** Take care when deleting directories or files. Once a file or directory is erased, it cannot be restored.

During user-preset backup, all user reference tables/equations are backed up. Separate tables/equations backup is therefore not necessary.

### ▶ Restore

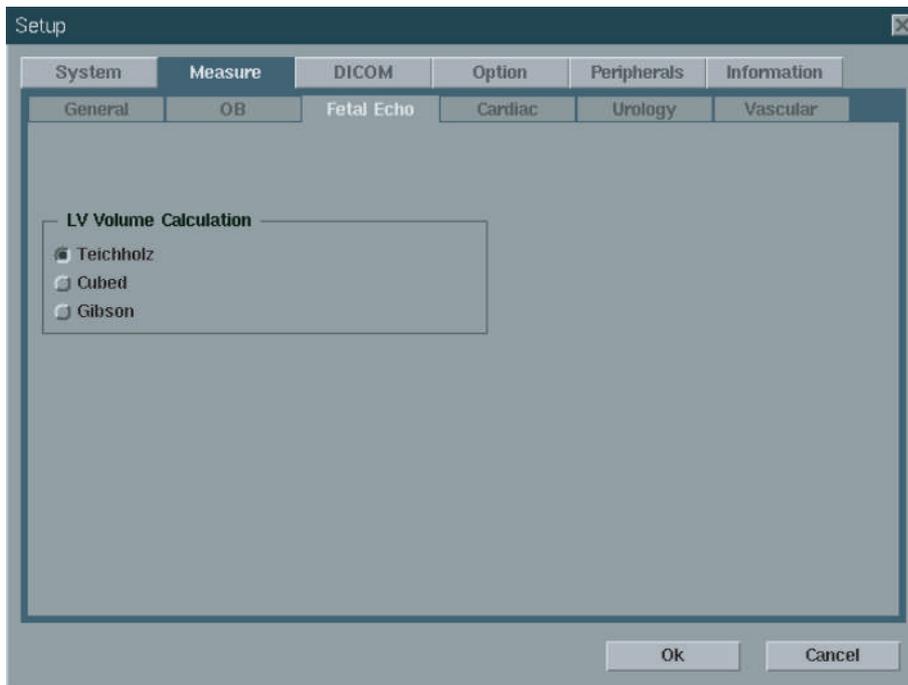
To bring up the backed up user preset, click **Backup/Restore**. When the **Backup/Restore** screen appears, select the disk and directory which the user preset is to be restored to.



[Figure 7.13 Backup/Restore]

## Fetal Echo

Select the **Fetal Echo** tab in the **Measure** menu.



[Figure 7.14 Measurement Setting– Fetal Echo]

During obstetric measurement, Fetal volume can be measured in M Mode. The calculation method is set in the 'LV Volume Calculation'.

## Cardiac

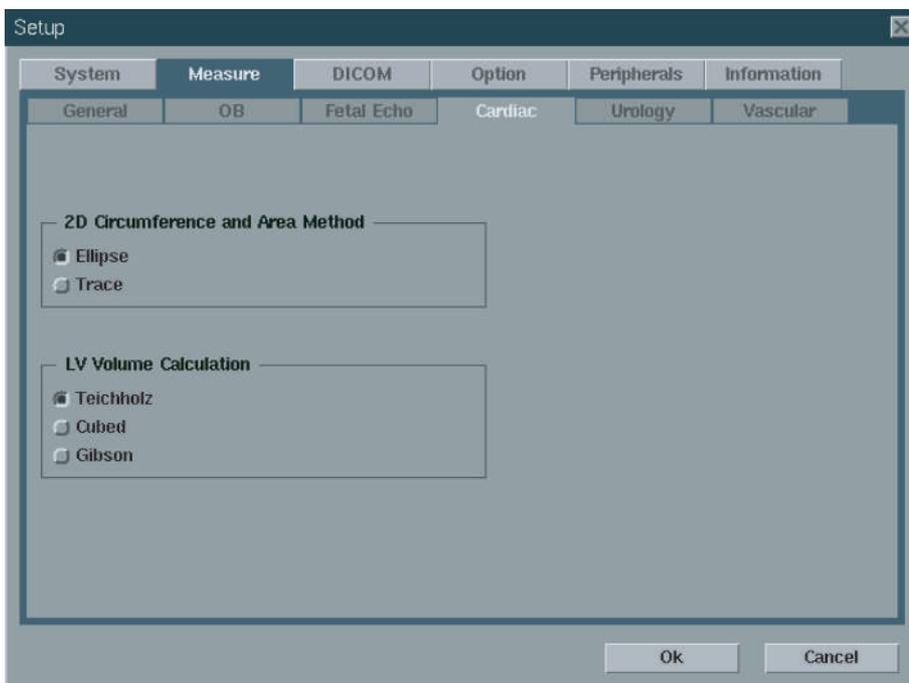
Select the **Cardiac** tab in the **Measure** menu.

### ■ 2D Circumference and Area Method

Select either the 'Ellipse' or 'Trace' caliper to be the default tool for 2D Circumference and Area measurement.

### ■ LV Volume Calculation

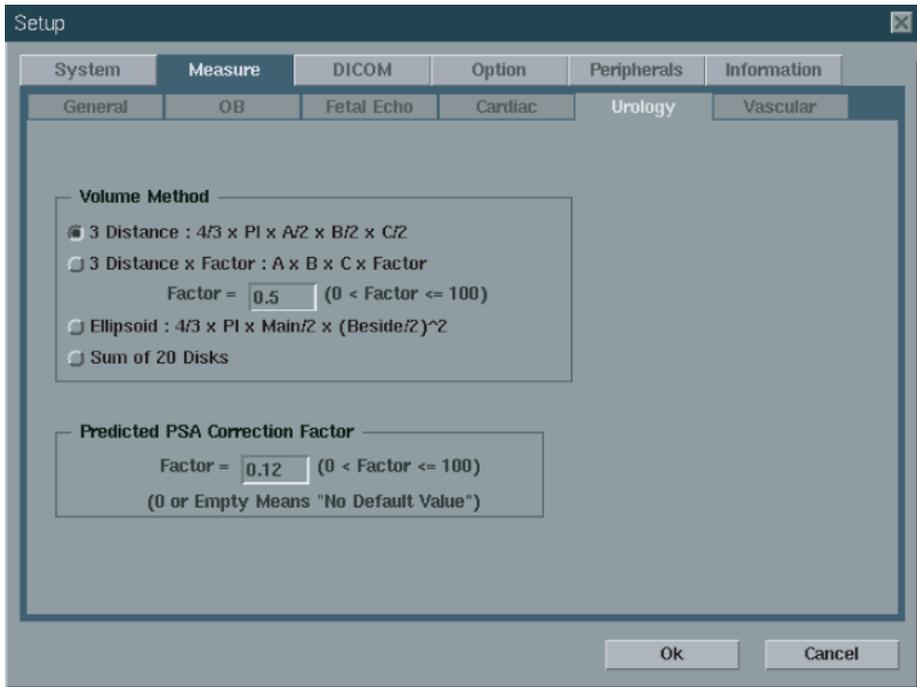
The LV Volume Calculation method is set with this menu.



[Figure 7.15 Measure – Cardiac]

# Urology

Select the **Urology** tab in the **Measure** menu.



[Figure 7.16 Measure– Urology]

## ■ Volume Method

- ▶ 3 Distance: The volume value is calculated using three diameters in the longitudinal and transverse planes.  $(4 / 3 \times 3.14 \times A \times B \times C / 8)$
- ▶ 3 Distance x Factor: The volume value is calculated using three diameters from the longitudinal plane and transversal plane and a factor (F) value entered by a user.  $( A \times B \times C \times F)$
- ▶ Ellipsoid: The volume value is calculated using the lengths of the Main axis and the beside axis.  $(4 / 3 \times 3.14 \times \text{Main} / 2 \times (\text{Beside} / 2)^2)$
- ▶ Sum of 20 Disks: The volume value is calculated by summing the areas in the 20-parallel planes.  $(d / 20 \times (A1 + A2 + \dots + A20))$ , d : the sum of distances between disks)



**NOTE:** 3 Distances: A = 1<sup>st</sup> Dia. ; B = 2<sup>nd</sup> Dia. ; C = 3<sup>rd</sup> Dia.

The default factor value (F) is '0.5'. If it is changed, a value between 0 and 100 (0 < factor <= 100) is recommended.

## ■ Predicted PSA Correction Factor

The Predicted PSA Correction Factor can be changed. The default value is 0.12.

## Vascular

Select the **Vascular** tab in the **Measure** menu. You can set the peak velocity used in the calculation of the 'A/B Ratio' and 'ICA/CCA Ratio'.



[Figure 7.17 Measure– Vascular]

## ⚙️ Setting DICOM (Optional)

Select the **DICOM** tab in the Setup menu. This function is used to set up the DICOM server and other DICOM-related functions.



**NOTE:** For more information, refer to the user manual of the corresponding server and the DICOM Conformance Statement.

Service	Alias	AE Title	IP Address	Port

[Figure 7.18 Setup - DICOM]

## Setting DICOM Information

Enter the DICOM information for the product in use. For automatic DICOM transmission, select 'Acquisition in Progress' after completing the fields. For automatic print out, select 'Print After Each image'.

### ■ AE Title

Enter the DICOM Application Entity title of the ultrasound system. This title uses to distinguish the ultrasound system in the network. (Ex. US1, US2)

### ■ Station Name

Enter a name to differentiate pieces of ultrasound system. (Ex. SONOACE1, SONOACE2)

### ■ Port

Enter the Port Number of the server being used.

### ■ Network Status

Display the current status of the network.

## Network Setup

To set the network like IP address, press **System Network Settings**. To set the IP value automatically, press 'Using Dynamic IP Configuration'. If you enter the wrong IP address, the network will not run.

To finish the network setup, click **Apply**. To cancel setup, click **Close**.

## Adding or Changing the DICOM Server

Click **Add** to enter the information related to the DICOM Server.

### ■ Store Server Information

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

### ■ Service

Select the kind of server to use. The supported DICOM servers are Store, Print, and Worklist.

### ■ Alias

Enter the name of the DICOM server being used.

### ■ AE Title

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

### ■ Transfer Mode

Select any one of the three image transfer methods.

- ▶ Batch: send all images when you click the **End Exam**.
- ▶ Send As You Go: send the image whenever you press the **Save** button.
- ▶ Manual: send the image manually only in the SonoView.

### ■ Connect Timeout

Set how many seconds the system will wait until get response.

### ■ IP Address

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

### ■ Port

Enter the Port Number of the server being used. Consult your network administrator before specifying this option.

### ■ Retry Interval

Set how many seconds the system will wait if the transmission fails.

### ■ Maximum Retries

Set how many times the system will retry.

DICOM Configuration	
Service	STORE
Alias	
AE Title	
Transfer Mode	Batch
Connect Timeout	10 s
IP Address	
Port	
Retry Interval	30 s
Maximum Retries	3

[Figure 7.19 DICOM Configuration-Store]

## 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 service, please refer to the user manual for the printer 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 paper type. Select from Paper, Clear Film, and Blue Film.

**■ Film Size**

Specify the paper size. Select from 8inchx10 inch, 10 inchx12 inch, 10 inchx14 inch, 11 inchx14 inch, 14 inchx14 inch, 14 inchx17 inch, 24cmx24cm, 24cmx30cm, and A4.

**■ Destination**

Specify the paper pathway. Select Magazine or Processor.

**■ 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.

The screenshot shows a 'Printer Setup' dialog box with the following settings:

Color	GRAYSCALE	Medium Type	PAPER
Format	2X3	Film Size	8INX10IN
Orientation	PORTRAIT	Destination	MAGAZINE
Magnification	REPLICATE	Priority	HIGH
Border Density	BLACK	Copies(1-99)	1
Empty Density	BLACK	Configuration Information	
Min Density	0		
Max Density	0		

[Figure 7.20 DICOM Configuration - Print]

## Worklist Server Settings

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

### ■ Open MWL on Patient key

Sets the screen that appears when pressing the **Patient** button on the control panel.

If this function is selected, pressing the **Patient** button opens the *Modality Worklist* window. If not selected, pressing the **Patient** button opens the *Patient Information* screen.

### ■ Update Method

Sets the method for updating Worklist.

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



To update a worklist, in the **Search** tab on the *Patient Information* screen, select **Worklist** for Search Source and press **Search**.

- ▶ On Startup and Every: Worklist is updated at the system boot-up and then updated continually at a set interval.

■ **Scheduled Station AE Title**

Sets the range of AE Title to fetch from the hospital’s Worklist server.

- ▶ All: Obtains the list of patients saved under all AE Titles within the server.
- ▶ This System: Obtains the list of patients for the AE Titles set under the DICOM tab.
- ▶ Another: Obtains the list of patients for the AE Title directly entered by the user.



**NOTE:** This function is available only if when the Worklist server is configured.

■ **Start Date**

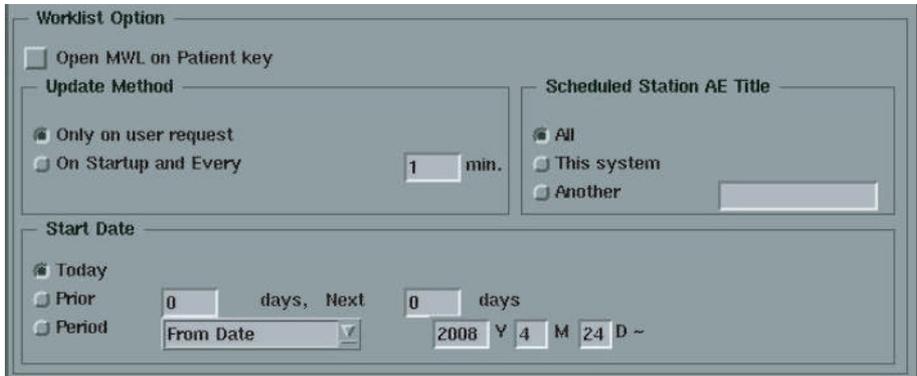
Set the range of dates to search.

- ▶ Today: Obtains the list of patients for the current date.
- ▶ Prior\_days, Next\_days: Obtains the list of patients for dates between n days prior to the current date and n days after the current date.
- ▶ Period: Enter a date and the system obtains the list of patients during the period.

From Date: Enter a date and the system obtains the list of patients starting from the date entered up until the current date.

To Date: Enter a date and the system obtains the list of patients starting from the current date up until the date entered.

From Date To Date: Enter two separate dates and the system obtains the list of patients between the two dates entered.



[Figure 7.21 DICOM Configuration – Worklist]

## Editing the DICOM Server Information

Click **Edit** in the setting DICOM window to edit the server information already entered.

## Deleting DICOM Server

Click **Delete** in the setting DICOM window to erase the current server information.

## Testing DICOM Server

Select a service and click **Test** on the screen. The connection with the selected service is tested and the results are shown.

## DICOM Log

Click **Log** in the setting DICOM window, and the screen will be changed. Set or copy the current DICOM log file.

DICOM log file is the history of all DICOM services performed so far on the product.

Click **Close** to finish the DICOM log.

### ■ Log Settings

Set the DICOM Log.

- ▶ Delete archived log file after: set the number of days to wait before deleting the archived history. After that period, the log file will be deleted. However there is only one log file, it will not be deleted.
- ▶ Log File Maximum Size: set the maximum size of each history file archived. Set the unit as Kbytes.

### ■ Explanation

View the log setting.

## ■ DICOM Log

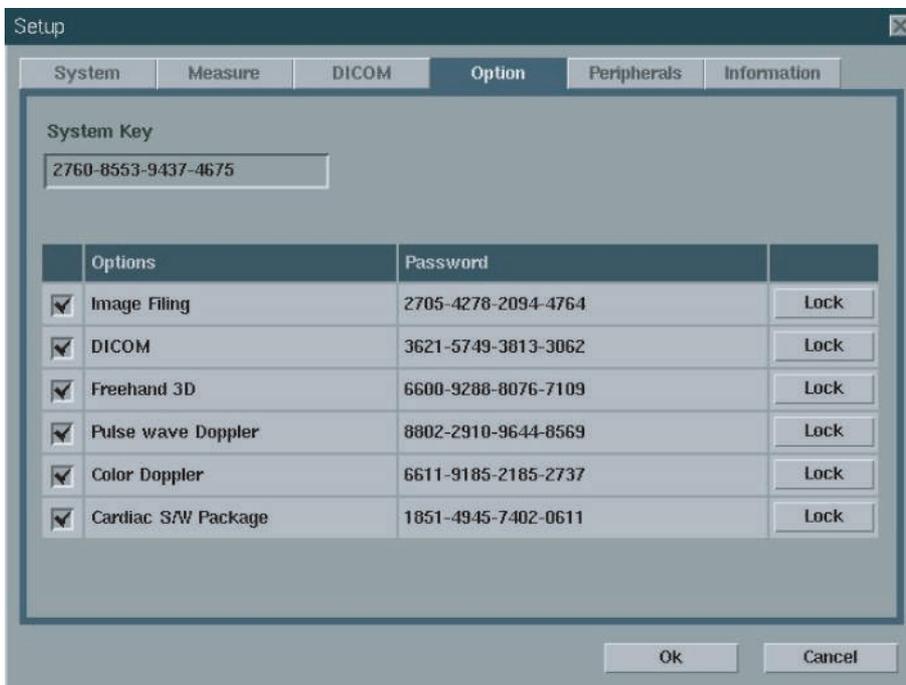
View, copy, or delete the DICOM log files.

- ▶ View Selected File: Select the log file from 'Select log files to copy' and click **View selected file**.
- ▶ Copy Selected Files:
  1. Select the log files and set the storage file format on the 'Copy to'.
  2. Set the 'Delete files after copy' whether to delete the log files saved in the hard disk of the system.
  3. Click **Copy selected files**.
- ▶ Delete Selected Files: Select the log file and click **Delete Selected Files**.

## :: Setting Option

The S/W serial No information of the system is shown in this window. You can select/cancel S/W options. A user cannot modify options. Click **Option** tab in the Setup menu.

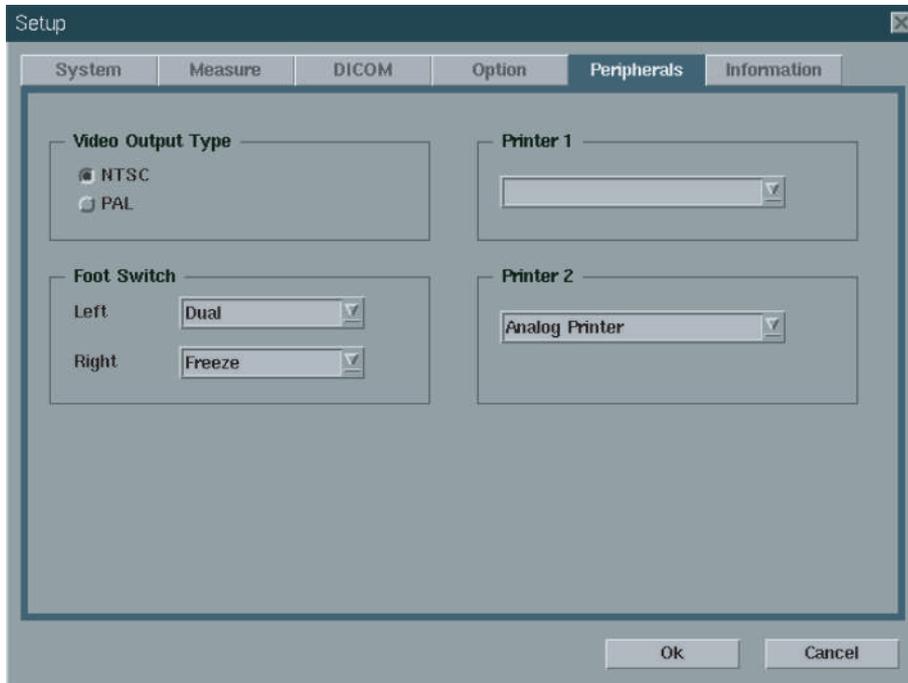
If the password you enter is not correct, the options are not activated. If the password is not correct, click **Cancel**.



[Figure 7.22 Setup - Option]

## ⚙️ Setting Peripheral Devices

The following describes how to set up the video output type, video input type, printer, foot switch and network. Select the **Peripherals** tab in the Setup menu.



[Figure 7.23 Setup - Peripherals]

### ■ Video Output Type

Set the video output type as NTSC or PAL.

### ■ Foot Switch

Assign functions to the left and right pedals of the foot switch. Four options are available: Dual, Freeze, Update and Store.

### ■ Printer 1

Select a printer to use. After connecting a USB printer to the USB port of the system, select the printer type on the screen and click **Ok**. The printer can then be used immediately.

The USB printer can only be used to print out Report and SonoView screens.

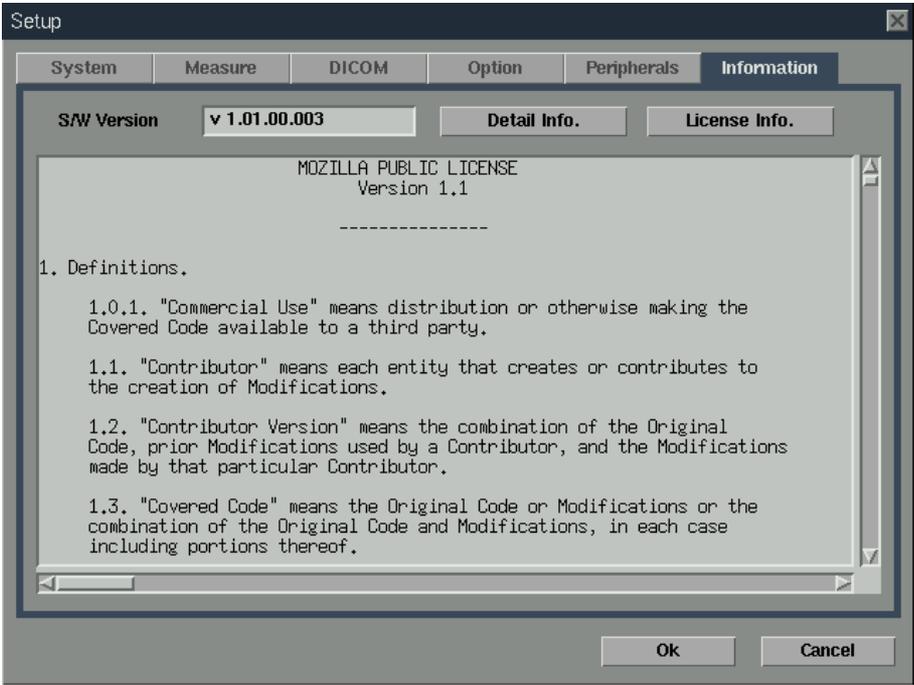
- ▶ HP Color LaserJet 3600
- ▶ HP OfficeJet J5780
- ▶ HP F2410
- ▶ HP DeskJet 5940
- ▶ HP LaserJet 1320
- ▶ HP P1102
- ▶ HP DeskJet 6540
- ▶ HP LaserJetP2015
- ▶ HP P1566
- ▶ HP DeskJet 6940
- ▶ HP OfficeJet ProK550

## ■ Printer 2

Select a printer to use when you press the **Print** button. Following printers are available; Sony UP-D897, Sony UP-D23MD (UPC-21S), Sony UP-D23MD (UPC-21L), Sony UP-D25MD (UPC-21S), Sony UP-D25MD (UPC-21L)

# :: Information

The information menu displays information about the system S/W version. Select the **Information** tab in the Setup menu. Press the **Detail Info.** to view more detailed information.

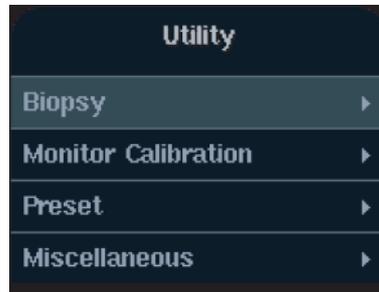


[Figure 7.24 Information]

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

## :: Utility

Press **Utility** key on the keyboard. The **Utility** menu appears at the left side of the screen. You can select a menu with the **Menu** dial-button on the control panel.

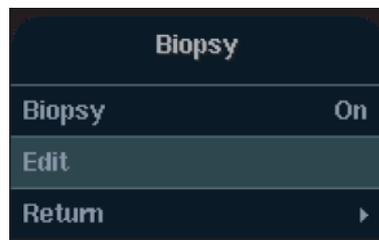


[Figure 7.25 Utility menu]

## Biopsy

Select **Biopsy** in Utility menu. For accurate examination, you should set a biopsy guideline before performing a biopsy.

Before performing biopsy, make sure that the Biopsy Guide Line is adjusted.



[Figure 7.26 Biopsy menu]

## Editing 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. Select **Edit** in the Biopsy menu. The warning message will appear.
2. If you click **Ok**, the Biopsy Edit screen appears. Click **Cancel** to escape from the Biopsy menu.
3. After the *Biopsy Edit* screen appears, you can adjust the Biopsy Guide Line with the soft menu on the keyboard.
  - ▶ **[1] Start:** Move the trackball up and down to designate the starting point of the Biopsy Guide Line.
  - ▶ **[2] Angle:** Move the trackball right and left to decide the direction of Biopsy Guide Line movement.
4. Press the Soft Menu switch **[4] Save** to setting. The confirmation message will appear before saving settings.
5. Click **OK** on the message to apply the changed Biopsy Guide Line. Press the Soft Menu switch **[5] Cancel** to cancel saving.



[Figure 7.27 Biopsy Edit]

## Starting and Finishing Biopsy



**NOTE:** The biopsy guideline must be adjusted before a biopsy can be performed.

1. Select **On** in the Biopsy menu. The message below appears.
2. Click **OK**, and the Biopsy Guide Line will appear on the screen.
3. Insert a needle along the Guide Line. And then perform biopsy as desired.
4. To finish the biopsy, click **Off** in the Biopsy menu.

## Monitor Calibration

Select **Monitor Calibration** in Utility menu. Set the color or brightness of the image.

Monitor Calibration	
Gamma	1.0
Brightness	0
Contrast	112
R Gain	1.0
G Gain	1.0
B Gain	1.1
Default	
Save	
Return	▶

[Figure 7.28 Monitor Calibration]

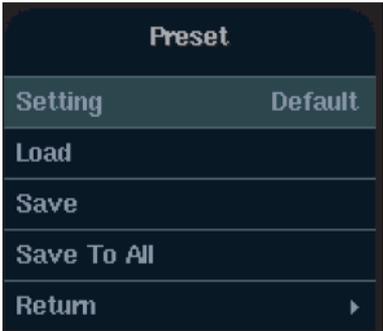
- ▶ Gamma: Set up contrast and brightness.
- ▶ Brightness: Set up brightness.
- ▶ Contrast: Set up contrast.

- ▶ R Gain: Set the red color proportion.
- ▶ G Gain: Set the green color proportion.
- ▶ B Gain: Set the blue color proportion.
- ▶ Default: Go back to default setting.
- ▶ Save: Save the setting.

## Preset

Preset allows the user to adjust Image Settings and select a Setting to apply to the system.

Select **Preset** in the utility menu.

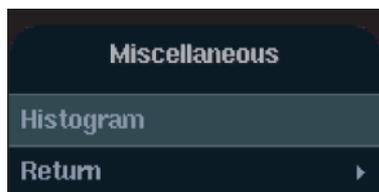


[Figure 7.29 Preset]

- ▶ Setting: Use the **Menu** dial-button to make your selection. You can use the default Image Setting or choose from the User1 ~ User5 slots. If you select the value from User1 to User5, you can setup the image setting.
- ▶ Load: Select the desired Setting value and press **Load** to apply the value to the current screen.
- ▶ Save: After Image Setting, select the desired Setting value and press the **Save**.

## Miscellaneous

Select **Miscellaneous** in the utility menu.



[Figure 7.30 Miscellaneous]

## Histogram

Shows the brightness level of the selected area in a histogram.

1. Select **Histogram** in the **Miscellaneous** menu.
2. Specify an area that a histogram is to cover. Use the trackball and the **Set** button to specify area 1, 2 and 3.
  - ▶ Press the **Change** button to change the shape of the selected area into an ellipse.
3. Histogram 1, 2 and 3 will appear on the screen.



[Figure 7.31 Histogram]

# Maintenance

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- ▣ ***System Maintenance*..... 8-4**
  - Cleaning and disinfections ..... 8-4
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- ▣ ***Data Maintenance*..... 8-9**
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## :: Operating Environment

When installing the console, please consider the following:



**CAUTION:** Too large a difference in the gain value settings of adjacent TGC slides may lead to the generation of stripes in an image.

- ▶ Avoid humidity.
- ▶ Avoid direct sunlight.
- ▶ Avoid places with extreme temperature variations.
- ▶ Optimal conditions for the system are temperatures of 10 ~ 35° C and humidity of 30 ~ 75%.
- ▶ 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



**NOTE:** The expected service life of this equipment is 7 years.

### Cleaning and disinfections

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



**WARNING:**

- ▶ Turn off the system and disconnect the system power cord from the wall outlet. Otherwise, it may result in electric shock or fire.
- ▶ Always use protective eyewear and gloves when cleaning and disinfecting the equipment.

#### ▣ Cleaning



**CAUTION:**

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

#### ■ Console

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

#### ■ Cleaning Monitor

Wipe the LCD surface with a soft dry cloth. When the LCD panel has dirt on it, wipe it 2 - 3 times or more in one direction.



**NOTE:** For information on cleaning and disinfection of the probe and biopsy kit, please refer to "Chapter 9. Probes."

## Disinfections



**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 system power cord from the wall outlet.
2. Mix the disinfection solution compatible with your system according to label instructions for solution strength.
3. Wipe the system surfaces with the disinfectant solution, following the disinfectant label 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 label.

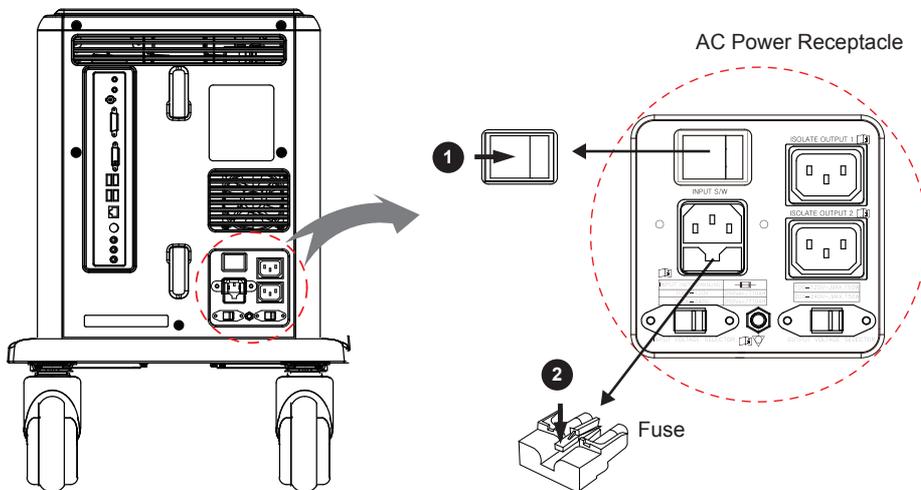
## Fuse Replacement

The power protection fuse protects the product from excess current. If the power monitoring protection circuit detects excess current, it shuts off the current to the equipment in order to prevent overheating and to restrict the ultrasound power output.

If the fuse blows, replace it as shown below.



**CAUTION:** To avoid risk of electric shock, always disconnect the plug from the system prior to fuse replacement.



[Figure 8.1 Fuse replacement]

1. Turn off the system. (See ❶)
2. Take the fuse out by pressing the middle of fuse. (See ❷)
3. Insert the fuse holder into the appliance inlet.
4. After installing the new fuse, connect the power cord to the system.

Fuse information is shown in the following table.

Input Ratings	Fuse Ratings	Company	Order No.
100-120VAC	10AH/250V	Orisel	55T210000
200-240VAC	10A/250V	Orisel	55T210000

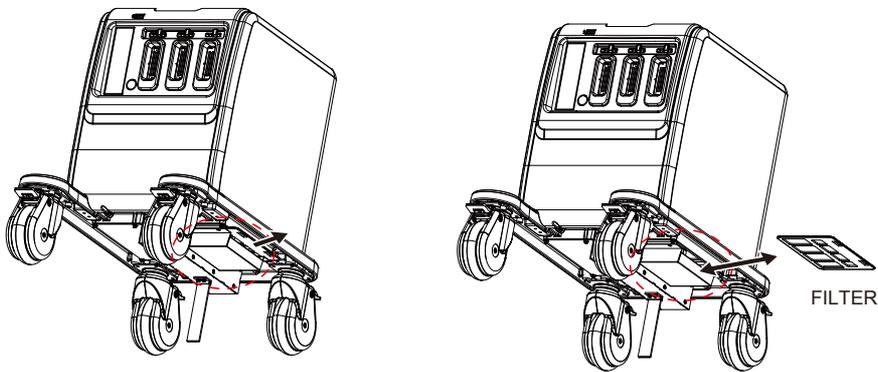
## Cleaning The Air Filters

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

It is recommended 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 8.2 Cleaning the Air Filters]

1. Pull the filter under the front of the console to away from the product.
2. Shake the filter to remove the dust and wash in a mild soapy solution.
3. Rinse and air dry or dry with a cloth.
4. Slide the filter back into the product.



**NOTE:** Allow the wet filter to dry thoroughly before installing. The wet filter can cause the 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 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 shock on the product or internal error. Thus, back-up on a regular basis.

### User Setting Backup

Always keep a backup copy of all information related to the user settings in case of data loss. Backup of user settings may only be performed by a qualified technician, and not by the user. Please contact Samsung Medison Customer Service when it needs to be backed up. However, the user setting on the GA Table used for obstetrics diagnosis may be backed up by the user. For more information, please refer to 'OB Measurement Setup' in Chapter 7 'Utilities.'

### Patient Data Backup

The SONOVEIW program can be used for backing up basic patient information and scanned images. By default, the data is saved automatically in the system. However, the user can choose to save it manually as well. If the system needs to be reinstalled due to product failure etc., the Samsung Medison Customer Service staff will restore basic patient information and scanned images that have been saved in the system. For more information, please refer to "Saving and Transferring Images" in Chapter 6 'Image Management.'

## Software

Changes can be made to the product software to make it suitable for a particular user's environment. However, these software changes may not be performed by the user alone. Please contact Samsung Medison Customer Service for assistance in software changes.



**CAUTION:** Minor software changes may be carried out without notifying the manufacturer.

If any error occurs in the operating system (LINUX) or it requires upgrading, please follow the instructions of the operating system designer.

This product contains Mencoder, which is distributed under the GPL license. Mencoder is free software and can be modified and redistributed according to the GNU General Public License Version 2 published by the Free Software Foundation (FSF).



**NOTE:** The Mencoder source code can be found at [www.mplayerhq.hu](http://www.mplayerhq.hu).

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## ∴ Probes

The probe is a device that sends and receives ultrasound for acquiring image data. It is also called a Transducer or Scanhead. The ultrasonographic image scanner uses the image data received by the probe to display the images of each organ on the screen. For best quality images, select the appropriate probe for the each application.

The system limits patient contact temperature to 43 degrees Celsius, and acoustic power values to their respective U.S. FDA limits. A power protection fuse circuit protects against over-current conditions. If the power monitor protection circuit senses an over-current condition, then the drive current to the probe is shut off immediately, preventing overheating of the probe surfaces and limiting acoustic output. Validation of the power protection fuse circuit is performed under normal system operation. For invasive probes, additional protections are designed to keep patient contact surface temperature under 43 degrees Celsius in the event of a single fault failure.

### ▣ 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 configure the probe with the best settings for the particular organ being scanned.

The applications and functions that can be used according to the probes in the SONOACE R5 are as follows.

Probe	Application	Biopsy	Harmonic	Pulse Inversion	Q Scan
C2-4/20	Abdomen	X	O	O	O
	Cardiac				
C2-5	OB	O	O	O	O
	Gynecology				
	Abdomen				
	Fetal Heart				
	Renal				
C2-8	OB	O	O	O	O
	Gynecology				
	Abdomen				
	Fetal Heart				
	Renal				

Probe	Application	Biopsy	Harmonic	Pulse Inversion	Q Scan
CN2-8	OB	O	O	X	O
	Gynecology				
	Abdomen				
	Fetal Heart				
	Renal				
CN4-9	Neonatal	X	X	X	O
	Pediatric				
	Vascular				
L5-12/60	Breast	O	X	X	O
	Small Parts				
	Vascular				
	Musculoskeletal				
LE5-12	Breast	O	X	X	O
	Small Parts				
	Vascular				
	Musculoskeletal				
LN5-12/40	Breast	O	X	X	O
	Small Parts				
	Vascular				
	Musculoskeletal				
LN5-12	Breast	O	O	X	O
	Small Parts				
	Vascular				
	Musculoskeletal				
EC4-9	OB	O	X	X	O
	Gynecology				
	Urology				
EVN4-9	OB	O	O	X	O
	Gynecology				
	Urology				

**NOTE:**

- ▶ Besides, user can have or select own preset between User1-5.
- ▶ Refer to 'Chapter3. Starting Diagnosis' for how to set probe and its preset.

## TI Table

TI (Thermal Index) is displayed on the title of the screen and shows the estimate of the temperature increase in specific body tissues. The thermal index consists of the following indices: soft tissue (TIs), bone (Tlb), and cranial bone (Tlc). This product will show the TI automatically by the probe and application. See the following table.

Probes	Application												
	Obstetrics	Gynecology	Abdomen	Fetal Heart	Cardiac	Breast	Vascular	Urology	Renal	Small Parts	Neonatal	Pediatric	Musculoskeletal
C2-4/20			TIs		TIs								
C2-5	Tlb	TIs	TIs	Tib					TIs				
C2-8	Tlb	TIs	TIs	Tlb					TIs				
CN2-8	Tlb	TIs	TIs	Tlb					TIs				
CN4-9							TIs				Tlc	TIs	
L5-12/60						TIs	TIs			TIs			TIs
LE5-12						TIs	TIs			TIs			TIs
LN5-12/40						TIs	TIs			TIs			TIs
LN5-12						TIs	TIs			TIs			TIs
EC4-9	Tlb	TIs						TIs					
EVN4-9	Tlb	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 only approved by Samsung Medison. Refer to the table of 'Cleaning and Disinfecting the Probe' section this chapter for detail.

**WARNING:**

- ▶ Do not use mineral oil, oil-based solutions, or other non-approved material 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
  - Lanoline
  - 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 that you should purchase appropriate ones on your own.

**WARNING:**

- ▶ Always keep sheaths in a sterile state.
- ▶ Sheaths are disposable. Do not reuse them.
- ▶ If sheaths are torn or soiled after use, wash 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. Use sterile gloves.
2. Unpack the sheath and fill it with acoustic coupling gel.
3. Insert the probe into the sheath and pull the latex tip to cover the probe completely. If possible, cover the probe cable as well.
4. Ensure that there is no air bubble within the ultrasound gel.
5. If necessary, secure the sheath to the probe and the probe cable.
6. Dispose of the sheath after use.

## Probe Precautions

The probe can easily be damaged by improper use or by contacting 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 the Samsung Medison Customer Support Department. Using damaged probes may result in electric shocks and other hazards to the patients and/or users.



### CAUTION:

- ▶ Do not apply mechanical shock 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.

## 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 for preventing infection. This is the responsibility of the user who manages and maintains the disinfection procedures for the equipment. Always use legally approved detergents and sheaths.

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 a surgery.

The most effective method to prevent infection among patients is to use each probe only once. However, probes may need to be re-used as they are complex in design and expensive. Consequently, protective devices such as sheaths must be used, and 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:**

- ▶ Regularly receive short-circuit examination from the Samsung Medison Customer Support Department. Do not immerse the probe into liquid.
- ▶ 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. It may result in a short circuit.
- ▶ 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

Using an inappropriate detergent or disinfectant may damage 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.

### Information of Detergent, Disinfectant, and Ultrasound Gel

Use an appropriate one with following tables. All probes are under tested in 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	W	L
Active Ingredient	Quaternary Ammonium (N-Alkyl)							IPA							NA			
C2-4/20																		
C2-5		•	•															•
C2-8		•	•															
CN2-8		•	•															•
CN4-9		•																•
L5-12/60		•	•															
LE5-12		•	•															•
LN5-12/40		•	•															•
LN5-12		•	•															•
EC4-9		•	•															•
EVN4-9		•	•															•

Names	Disinfectants															
	Cidex OPA <sup>2,3,6)</sup>	Cidex Plus <sup>2)</sup>	Metricide <sup>2)</sup>	Omnicide (28)	Omnicide 14NS	Omnicide - FG2	Nuclear	Wavicide-01 <sup>3)</sup>	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	Ortho-phthalaldehyde	Glutaraldehyde											Nonionic surfactant	Sodium Hypochlorite		
C2-4/20		•						•								•
C2-5	•	•				•	•	•							•	
C2-8	•					•	•	•							•	
CN2-8	•	•				•	•	•							•	
CN4-9	•	•				•	•	•							•	
L5-12/60	•	•				•	•								•	
LE5-12	•	•				•	•	•							•	
LN5-12/40	•	•						•							•	
LN5-12	•	•						•							•	
EC4-9	•	•				•	•	•							•	
EVN4-9	•	•				•	•	•							•	

Names	Disinfectants								Cleaner					
	Virkon	Sporox	Sporox II	Gigasept	Gigasept AF <sup>3)</sup>	Gigasept FF	Hibitane	PeraSave	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		Bersteinsäure	Chlorhexidine gluconate solution	Peracetic Acid	Dodecylphenoethoxylate, Sodium Xylene Sulfonate	NA	Proteolytic Enzymes		Alcohol	
C2-4/20			•											
C2-5		•									•	•	•	
C2-8		•											•	
CN2-8											•	•	•	
CN4-9											•	•	•	
L5-12/60											•		•	
LE5-12		•									•	•	•	
LN5-12/40											•	•	•	
LN5-12											•	•	•	
EC4-9											•	•	•	
EVN4-9											•	•	•	

Names	Cleaner			Gel								
	Ethanol 75%	Metrizyme	Mckesson	Natural Image	Aquasonics 100 <sup>3)</sup>	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							
C2-4/20	•				•							
C2-5		•			•							
C2-8			•		•							
CN2-8		•	•		•							
CN4-9		•	•		•							
L5-12/60		•	•		•							
LE5-12		•	•		•							
LN5-12/40		•	•		•							
LN5-12		•	•		•							
EC4-9		•	•		•							
EVN4-9		•	•		•							


**Tips!**
**Symbols**

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

Following is information about manufacturer (or Distributor) of Detergent, Disinfectant, and Ultrasound Gel.

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	Product & Gamble Australia Pty. Ltd.	+61-1800-028-280(Australia)
Nuclear	Nation Diagonostics 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. The use of even 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 during wetting until all parts are dry. This will help prevent liquid from entering non-liquid-tight areas of the probe.

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 body fluid 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.

## Disinfection

Only disinfect vaginal and rectal probes. 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:

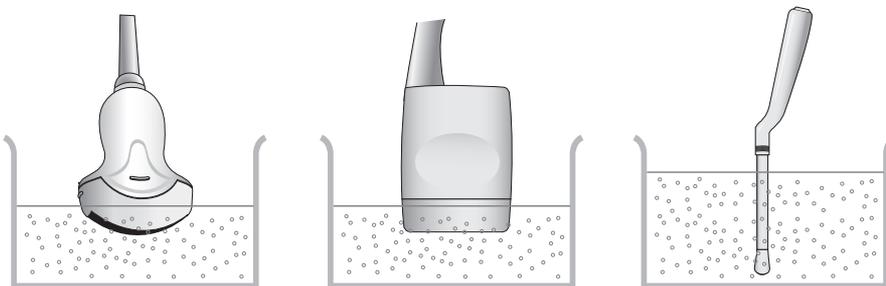
- ▶ If a pre-mixed solution is used, be sure to observe the solution expiration date.
- ▶ The type of tissue it will contact during use dictates the level of disinfection required for a device. Ensure that the solution strength and duration of contact are appropriate for disinfection.



### 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 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 disposition of the disinfectant.
2. Mix the disinfectant compatible with your probe according to instructions for solution strength.
3. Immerse the probe into the disinfectant as shown in the illustration below.
4. Using the instructions on the disinfectant, 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]

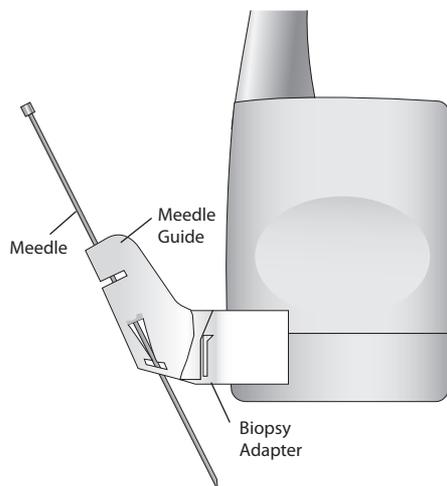
## :: Biopsy

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 adaptor, 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]

- ▶ **Adaptor:** 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 adaptor from getting soiled by any unwanted substances during the examination (blood and other body 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

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 prevention procedures and disinfection.

Use only Samsung Medison-approved biopsy kits. Other bands may not properly fit Samsung Medison probes. 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.

**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.

### 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. Insert the needle into the needle guide. 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

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. Do not use the needle guide if the needle is not following the intended path. Contact Samsung Medison Customer Service Department for service.

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



### **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.

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 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.

Refer to the table of 'Cleaning and Disinfecting the Probe' section in this chapter for detail.



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

### ■ Cleaning and disinfection of 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 biopsy kit for damage such as cracks, rust or breakage. If damage is evident, discontinue use of the biopsy kit and contact Samsung Medison Customer Service Department.

## ■ Cleaning and Disinfection of 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 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 disposition 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 Customer Service Department.

## Assembling the Biopsy Kit

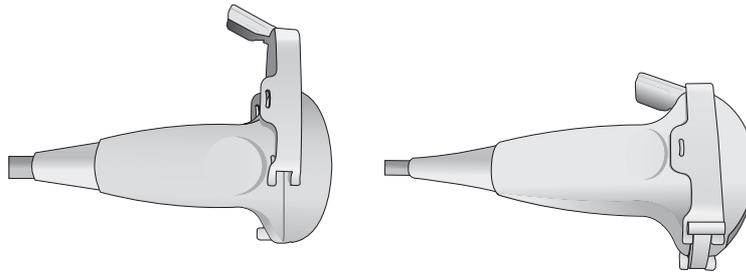
### ❏ C2-5Biopsy Guide (Plastic)

#### ■ Specification

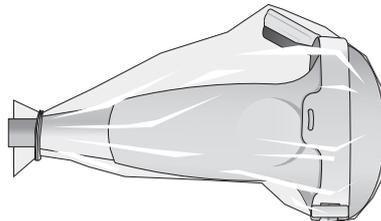
<b>Model name</b>	BP-KIT-045	
<b>Component</b>	Biopsy Bracket	1 EA
	Needle Guide(16G)	6 EA
	Needle Guide(18G)	6 EA
	Needle Guide(20G)	6 EA
	Needle Guide(22G)	6 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	16G, 18G, 20G, 22G	

#### ■ Installation

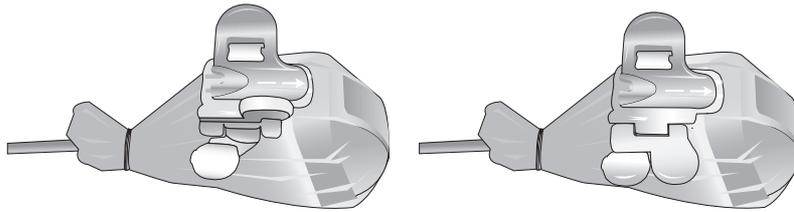
1. Mount the adapter onto the probe.



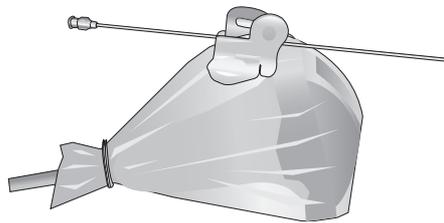
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



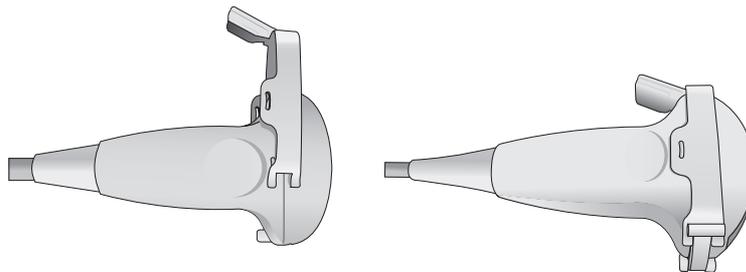
## C2-5 Biopsy Guide (Metal)

### ■ Specification

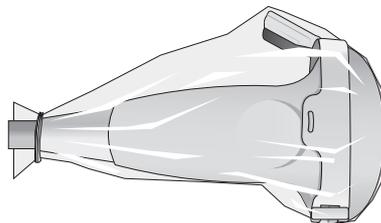
<b>Model name</b>	BP-KIT-042	
<b>Component</b>	Biopsy Bracket	1 EA
	Needle Guide(16G)	6 EA
	Needle Guide(18G)	6 EA
	Needle Guide(20G)	6 EA
	Needle Guide(22G)	6 EA
<b>Material</b>	Stainless Steel	
<b>Available Gauges</b>	16G, 18G, 20G, 22G	

### ■ Installation

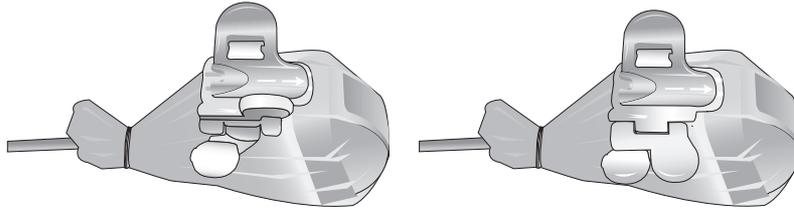
1. Mount the adapter onto the probe.



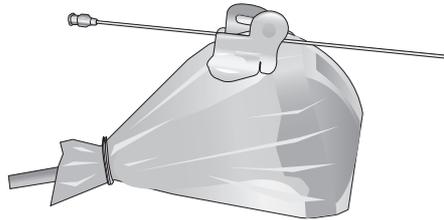
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



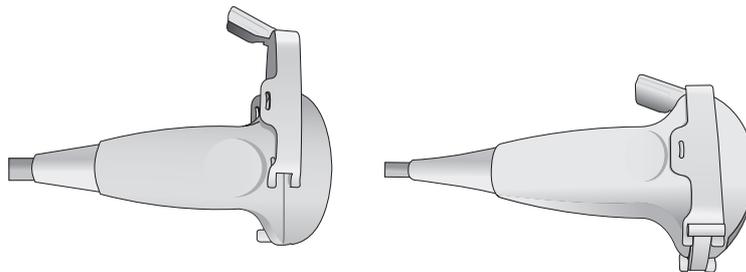
## C2-8 Biopsy Guide

### ■ Specification

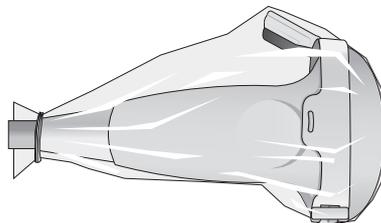
<b>Model name</b>	BP-KIT-035	
<b>Component</b>	Biopsy Bracket Needle Guide	1 EA 24 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	16G, 18G, 22G	

### ■ Installation

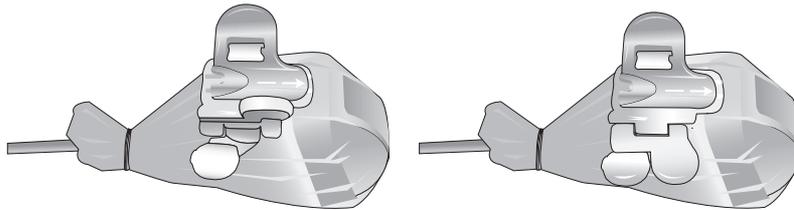
1. Mount the adapter onto the probe.



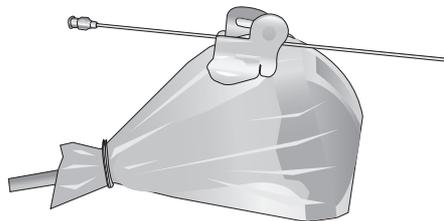
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



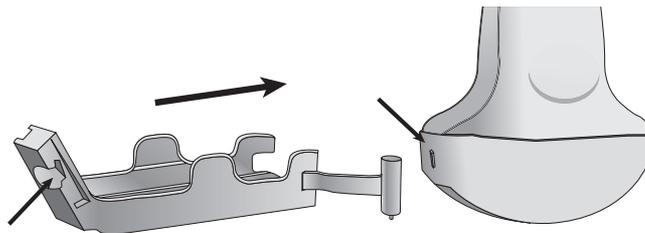
## ■ CN2-8 Biopsy Guide

### ■ Specification

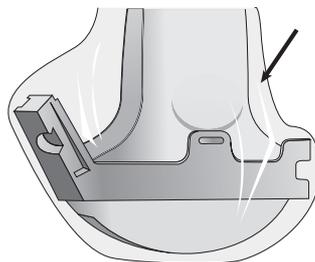
<b>Model name</b>	BP-KIT-038	
<b>Component</b>	Adapter	1 EA
	Needle Guide(16G)	8 EA
	Needle Guide(18G)	8 EA
	Needle Guide(22G)	8 EA
	Verification KIT	1 EA
	User Manual	1 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	16G, 18G, 22G	

### ■ Installation

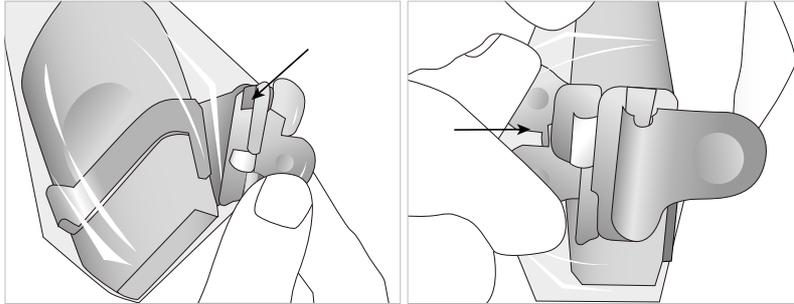
1. Mount the adapter onto the probe.



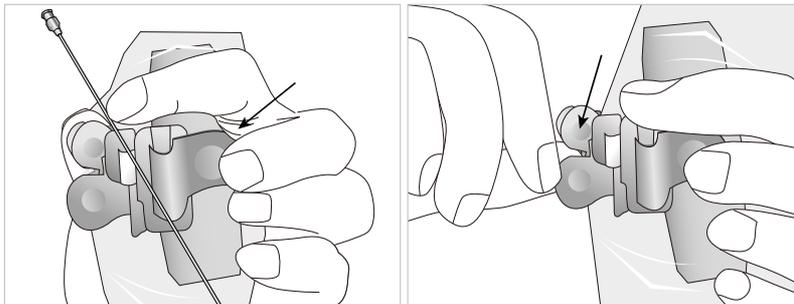
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



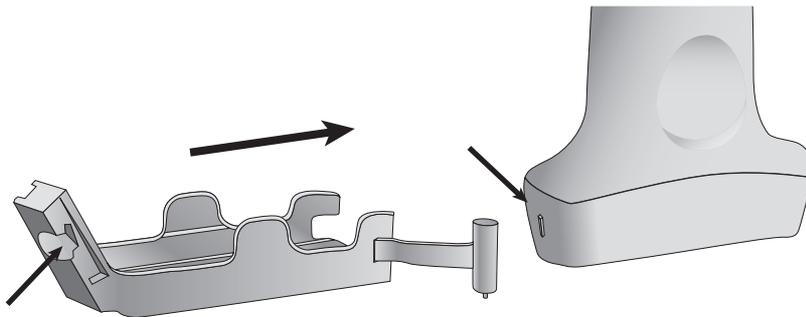
## L5-12/60 Biopsy Guide

### ■ Specification

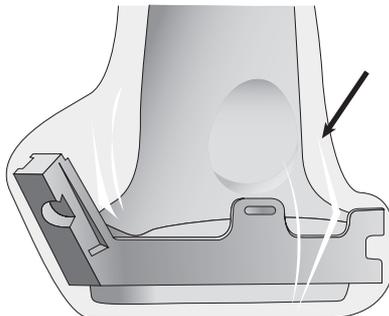
<b>Model name</b>	BP-KIT-039	
<b>Component</b>	Adapter	1 EA
	Needle Guide(16G)	8 EA
	Needle Guide(18G)	8 EA
	Needle Guide(22G)	8 EA
	Verification KIT	1 EA
	User Manual	1 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	16G, 18G, 22G	

### ■ Installation

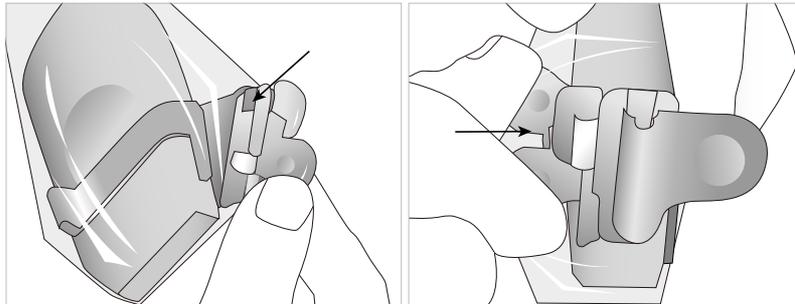
1. Mount the adapter onto the probe.



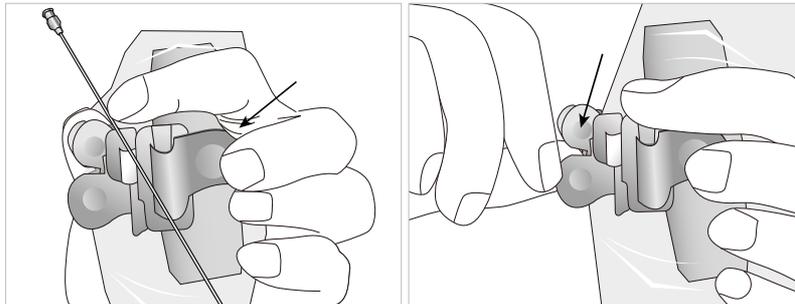
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



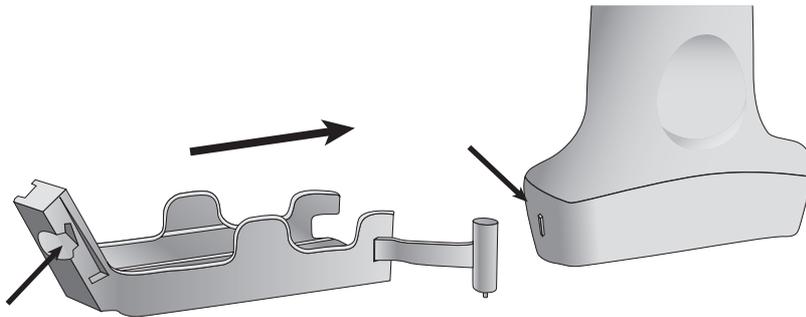
## LE5-12 Biopsy Guide

### ■ Specification

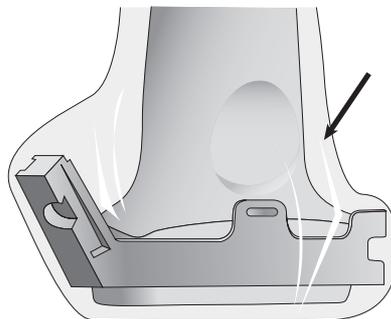
<b>Model name</b>	BP-KIT-040	
<b>Component</b>	Biopsy Adapter	1 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	16G, 18G, 22G	

### ■ Installation

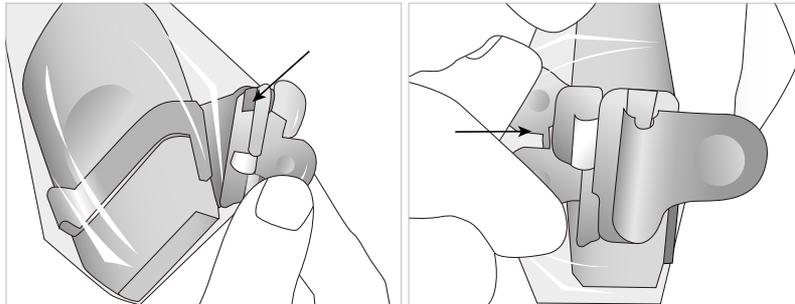
1. Mount the adapter onto the probe.



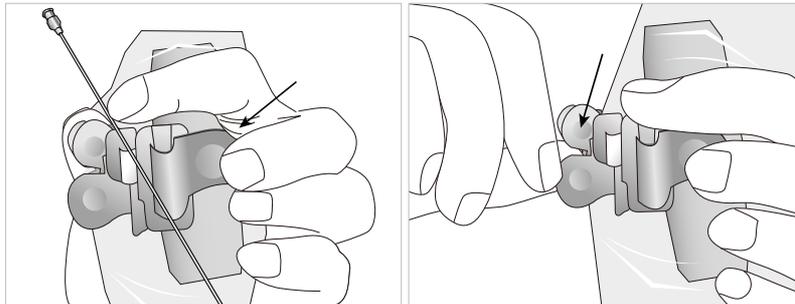
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



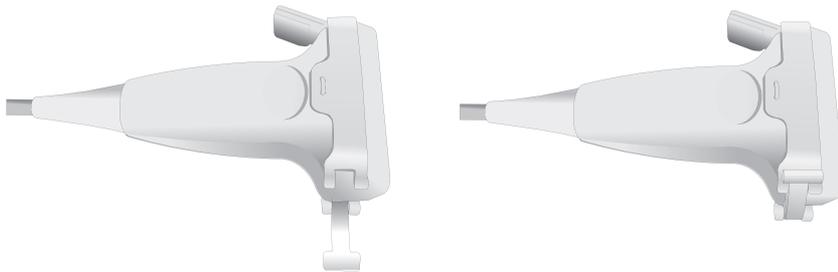
## LN5-12/40 Biopsy Guide

### ■ Specification

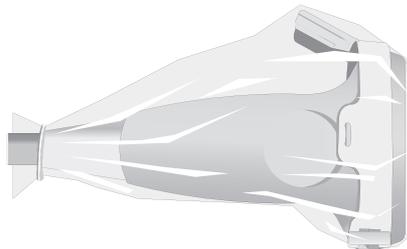
<b>Model name</b>	BP-KIT-036	
<b>Component</b>	Adapter	1 EA
	Needle Guide	24 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	16G, 18G, 22G	

### ■ Installation

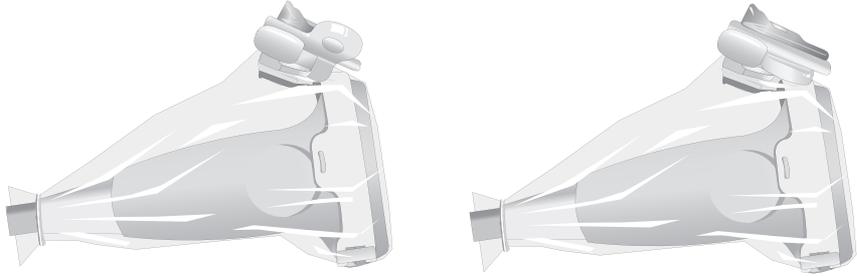
1. Mount the adapter onto the probe.



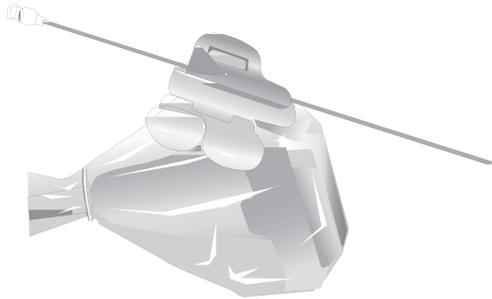
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



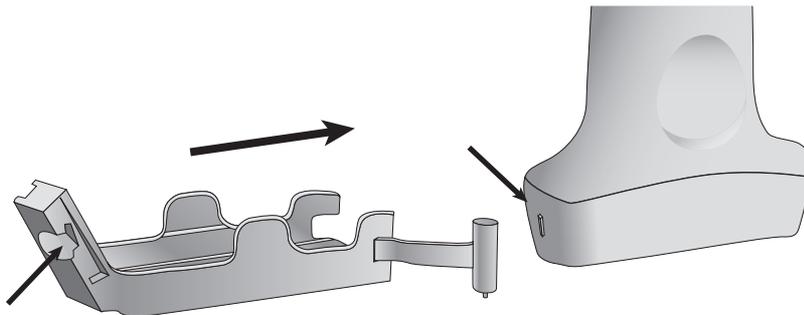
## LN5-12 Biopsy Guide

### ■ Specification

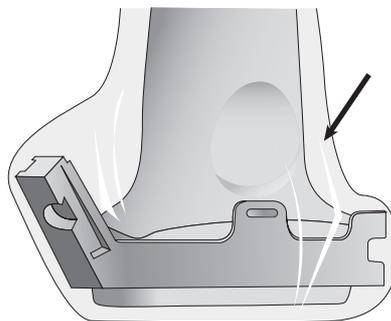
<b>Model name</b>	BP-KIT-040	
<b>Component</b>	Biopsy Adapter	1 EA
	16Ga disposable needle guide/probe cover KIT	8 EA
	18Ga disposable needle guide/probe cover KIT	8 EA
	22Ga disposable needle guide/probe cover KIT	8 EA
<b>Material</b>	Acetal Copolymer	
<b>Available Gauges</b>	14G, 18G, 22G	

### ■ Installation

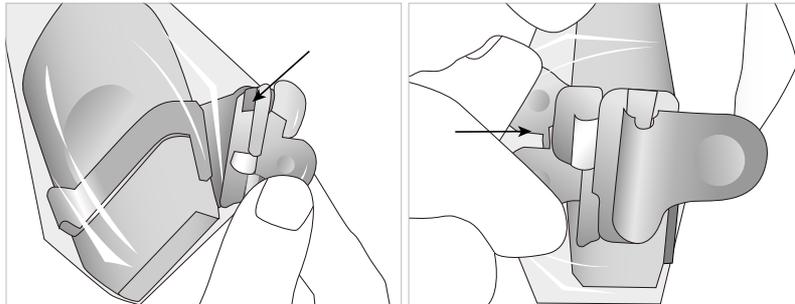
1. Mount the adapter onto the probe.



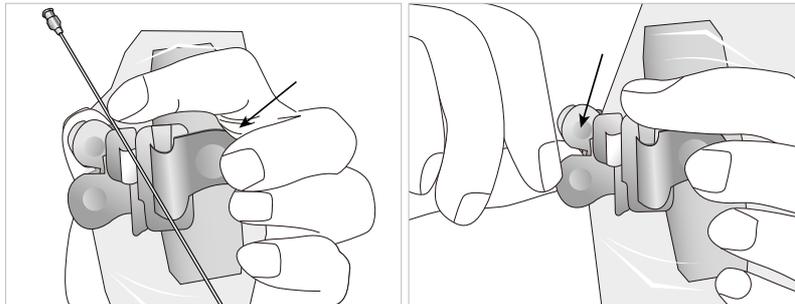
2. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter.



3. Secure the Needle Guide Clip.



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



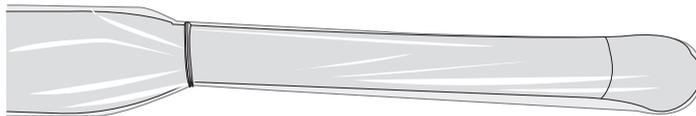
## EC4-9, EVN4-9 Biopsy guide

### ■ Specifications

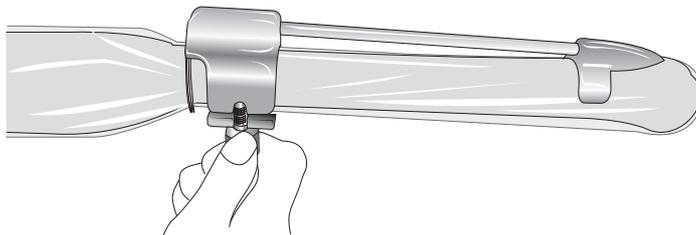
<b>Model name</b>	BP-KIT-024	
<b>Component</b>	Biopsy Adapter	1 EA
	Sheath	2 EA
<b>Material</b>	Stainless	
<b>Available Gauges</b>	16G	

### ■ Installation

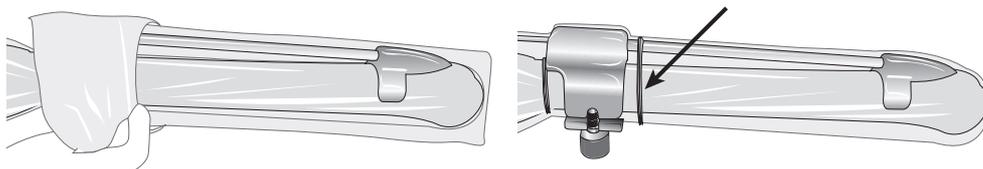
1. Fill the sheath with the ultrasound gel and place the sheath all the way down to the Adapter. And then tie with rubber band.



2. Mount the adapter onto the probe



3. Place the sheath again and tie with the rubber band again. Tie the lower part than 1.



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