

ACUSON SC2000 PRIME
Ultrasound System

Quick Reference Guide

Release 5.1
Intracardiac Echocardiography (ICE)

siemens-healthineers.com/ultrasound



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System Overview



1. Monitor – moves up and down, swivels right to left
2. Control Panel & Keyboard – contains exam controls
3. Transducer Holders – storage for transducers not in use
4. Transducer Ports – three ports for active transducers; two parking ports for transducers not in use
5. Physio Module – ECG and Transthoracic Impedance Respirometer connections
6. Wheel Lock / Steer
 - a. Up position – two-wheel steer
 - b. Down position – lock
 - c. Middle – four-wheel steer
7. Rear Wheel Handle – for additional ease in manipulating the system
8. Filter

System Overview

Connecting and Disconnecting the Transducer



Unlock



Lock





Monitor Mobility



1. Lock/unlock to raise and lower monitor
2. Lock/unlock for arm swivel adjustment
3. Monitor handle
4. Fold-down monitor

System Overview

Control Panel



1. Swivel console
2. Raise and lower console
3. Lock/unlock lever for control panel mobility

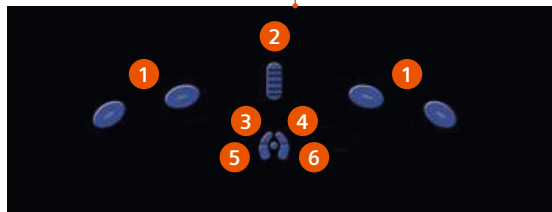
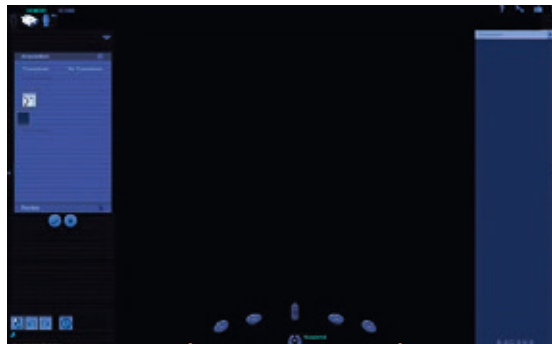


1. Power On/Off
2. New Patient Entry
3. Volume
4. Alphanumeric Keyboard
5. DGC Control
6. LED Displays
7. 2D and Overall Gain
8. Freeze/ Cine
9. Color on/off and Color Gain
10. PW on/off and PW Gain
11. CW on/off and CW Gain
12. TEQ (TEQ ultrasound technology)
13. Measure
14. Clip Capture (store a dynamic clip)
15. Image Store (store a static image)
16. Depth
17. Review



System Overview

Home Base Controls



- | | |
|-----------------|-------------|
| 1. Soft Keys | 4. Priority |
| 2. Scroll Wheel | 5. Select |
| 3. Update | 6. Next |



1. Soft Keys – change depending on imaging mode
2. Scroll Wheel – scrolls through images in review mode
3. Update – refreshes 2D-mode, color Doppler flow data; use to move Doppler sample position
4. Select – selects on-screen menu items and assigns trackball to on-screen tools
5. Track Ball – acts as pointer
6. Priority – cycles through activated imaging modes (2D, color Doppler, CW, PW)
7. Next – cycles through imaging mode tools currently controlled by trackball
8. Wrist Support – ergonomic support for wrist



System Overview

Physio Module



1. ECG port
2. Auxiliary IN/ OUT – used for large panel display, stress echo ECG
(compatible with eSie Measure workflow acceleration package)
3. Auxiliary CW Transducer Port




- For lead change, press **Physio (F13)** key; rotate knob corresponding to lead selection on **LED Display**
- Lead II is the default





Transthoracic Impedance Respirometer

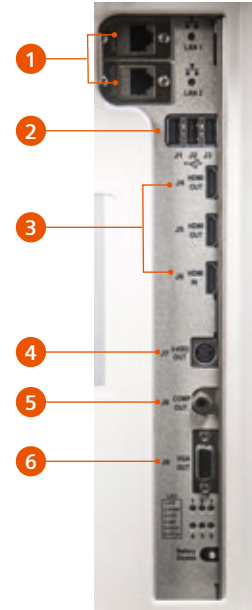
- Attached ECG leads sense changes in the patient's impedance in the chest, for computing the respiration signal
- Press **Physio (F13)**  key; use soft key to activate Respirometer (**Resp**)

System Overview

Input / Output Panel

Connections located on the back of the system

1. Ethernet ports (2)
 - a. LAN 1: hospital network connection
 - b. LAN 2: CARTOSOUND system connection
2. USB ports (3)
3. HDMI ports (3)
 - a. OUT to external monitor
 - b. OUT to video recorder for recording
 - c. IN from video recorder for playback
4. S-Video port – OUT to video recorder
5. Composite video port – OUT to video recorder
6. VGA port – OUT to an external monitor



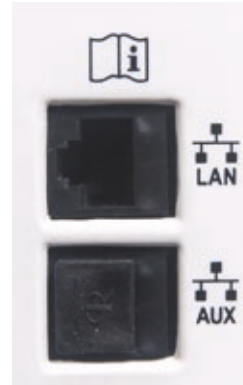


Two **USB ports** are also located on the back of the control panel.



System Overview

Rear Panel – Connection for Network Port and CARTOSOUND® Module



Network


CARTOSOUND®
Module connection

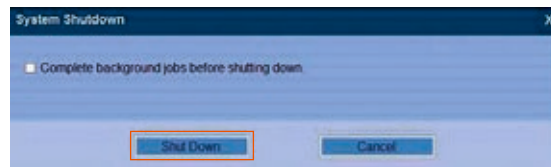
Note: These ports require Siemens-installed adapter cables connected to the ports on the inside panel.

CARTOSOUND® is a registered trademark of Biosense Webster, part of the Johnson & Johnson Family of Companies



Power Supply

1. Press  to turn system on/off
 - a. Control lights up green when powered on
 - b. Control flashes green when system is shut down but power cord is still plugged in
 - c. No light indicates system is completely shut down and power cord is unplugged
2. When shutting down, select **Shut Down** from dialog box
3. Wait approximately 20 seconds after system powers off to unplug power cord (Power control should flash green)



System Overview

Monitor Layout

1. Access Bar – displays tools for accessing patient information
2. Patient Demographics – lists patient information, date and time, institution name
3. Imaging Parameters – lists imaging parameter settings for active mode(s)
4. Image Menu – displays selection tools and task steps specific to active imaging mode
5. Task Pane – provides tools and functionality for steps in a workflow (e.g. measurements and calculations) and image thumbnails; use drop-down to change contents
6. Common Controls – controls used in workflows, such as Undo and Redo
7. Home Base Controls – functions assigned to home base controls

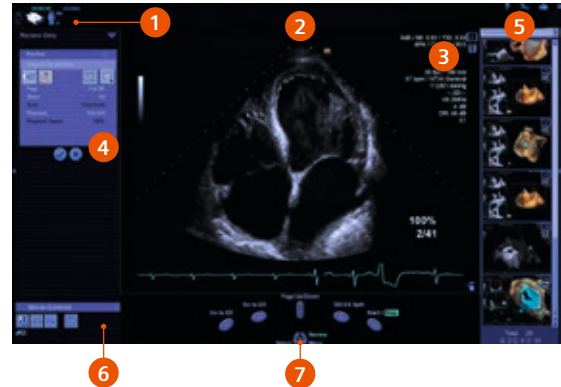
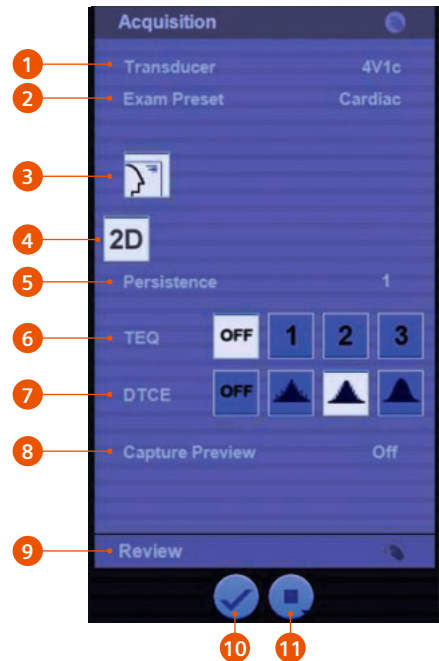



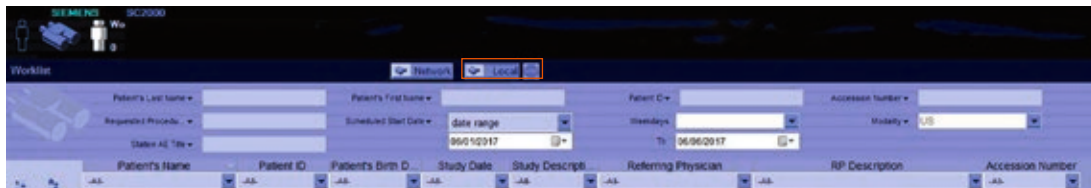
Image Menu

1. Transducer Selection – changes active transducer
2. Exam Preset Selection – menu of predefined exam presets
3. Imaging Parameters – hides or displays active imaging parameter settings
4. Imaging Mode – displays active imaging mode(s)
5. Persistence – frame averaging (determines number of frames combined into final image)
6. TEQ Ultrasound Technology – sets the desired TEQ level
7. Dynamic TCE Tissue Contrast Enhancement Technology – sets the desired level of speckle reduction from OFF to high
8. Capture Preview – allows preview of clip before saving
9. Review – review exam images
10. End Exam and save data
11. End Exam without saving data




Pre-registered Patient from Local Database

1. Select the **Worklist**  icon on the screen.
2. Narrow search results by Date(s), Patient Name, Patient ID and select **Local**.




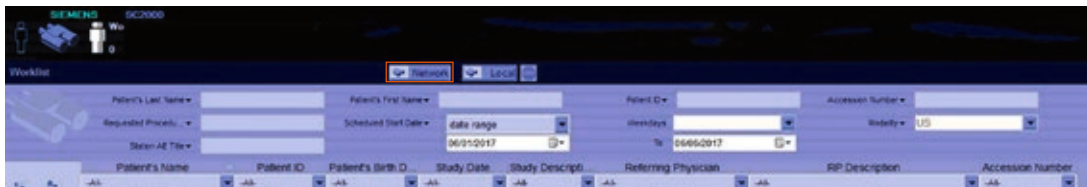
The screenshot shows the Siemens SC2000 Worklist interface. At the top, there are icons for a person, a camera, and a document. Below these, the 'Worklist' tab is selected, and the 'Local' button is highlighted with a red box. The interface contains several search fields: 'Patient's Last name', 'Patient's First name', 'Patient ID', 'Accession number', 'Requested Procedure', 'Scheduled Start Date' (with a 'date range' dropdown), 'Modality', and 'State/Alt Title'. Below these fields is a table with columns: 'Patient's Name', 'Patient ID', 'Patient's Exam ID', 'Study Date', 'Study Description', 'Referring Physician', 'RP Description', and 'Accession Number'. The table is currently empty.


3. Select patient and select **Open Patient Folder**  located in the bottom left-hand corner to obtain demographics page.
4. Select **OK** to begin exam.

Exam Basics

Pre-registered Patient from Modality Worklist




1. Select the **Worklist**  icon on the screen.
2. Narrow search results by Date(s), Patient Name, Patient ID and select **Network**.








3. Select patient and select **Open Patient Folder**  located in the bottom left-hand corner to obtain demographics page.
4. Select **OK** to begin exam.



Restarting a Previously Completed Exam

1. Select the **Find Patient**  icon on the access bar, or press **Patient Browser (F2)**  on the keyboard.
2. Select the required study.
3. Select **Open Patient Folder**  located in the bottom left-hand corner.
4. Update exam or workflow information as needed.
5. Select **OK**.

Exam Basics

Control		Function
Find Patient/ Patient Browser	 	<p><i>Opens or closes the data view</i></p> <p>Use data view to search for and view patient records Narrow results by date, patient information</p> <p>Note: F2 key on keyboard also activates Patient Browser</p>
Review		<p><i>Activates or deactivates the Review function</i></p> <p>Views previously saved images and clips during active or previous exam</p>
Static Capture		<p><i>Captures a frozen image</i></p>
Clip Capture		<p><i>Captures a live image</i></p> <p>Note: To obtain a retrospective capture, Freeze then press Clip Capture</p>



Review and Volume Review

Review and Volume Review options are located as options in Image Menu on the left side of the monitor while in Review mode.



1. **Review** – allows viewing of acquired images
2. **Volume Review** – opens the image in raw data format and allows for post-processing volume manipulation

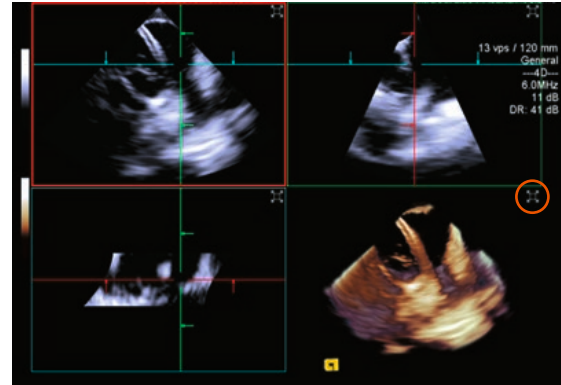
Exam Basics

Volume Image Layout

- Multiple layout options are available in volume imaging
- The B-mode images are referred to as multiplanar reconstructions (MPR) or reference planes
- The image on the bottom right is the volume image



Select the one-up icon to individually view one of the MPRs or the volume image



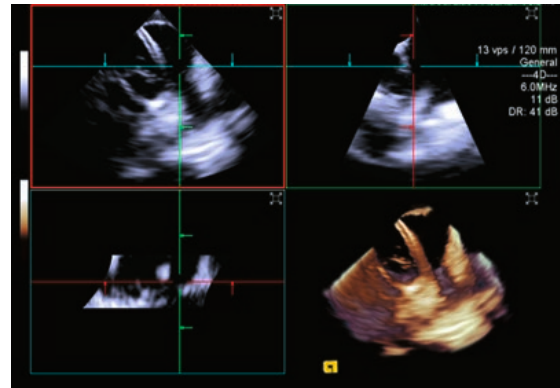
Volume Imaging Planes

There are three imaging planes:

1. Azimuthal (Y) – right-to-left; corresponds to the A plane, which is color coded red
2. Elevation (Z) – front-to-back; corresponds to the B plane, which is color coded green
3. Coronal (X) – top-to-bottom; corresponds to the C plane, which is color coded blue

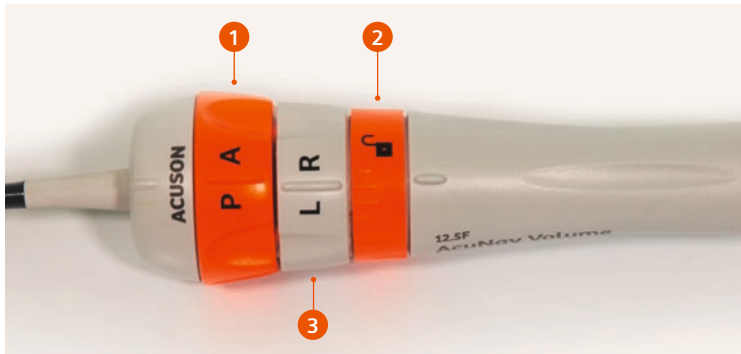


The axis markers within each MPR are also color coded and correspond to the imaging plane of the same color.



Catheter Controls

1. Anterior/Posterior Flexion (A/P) – adjusts the catheter tip in an anterior/posterior direction
2. Left/Right Flexion (L/R) – adjusts the catheter tip in a left/right direction
3. Tension Control – holds the flexion of the catheter when moved either A/P or L/R







Alignment markers along the top of the catheter indicate all controls are in a neutral position. These markers should be aligned before removing the catheter from the patient.



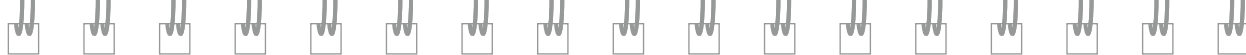


2D Imaging and Tools

Commonly Used B-mode Controls

Control		Function
2D		<p>2D mode / B-mode</p> <p>Press to enter / exit 2D mode</p> <p>Rotate to increase / decrease gain (available on live or frozen image)</p> <p>Use Next key to change sector size / position</p>
Gain Freeze / Cine		<p>Freezes image, sweep, or spectral display</p> <p>Rotate to scroll through frames</p> <p>Rotate to increase / decrease 2D gain (live imaging only)</p>
Depth		<p>Changes imaging depth</p> <p>Rotate to increase / decrease depth</p>
Multiple Frequency Imaging		<p>Adjusts transmit frequency of the active multi-frequency transducer</p> <p>Toggle up or down to change transmit frequency</p> <p>Note: Decrease frequency for penetration; increase for detail resolution</p>





**RES™
enhanced
resolution
imaging**

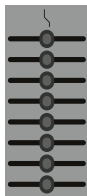


Activates or deactivates RES enhanced resolution imaging

Press **RES** and choose ROI; press **RES** again
Resolution and frame rate increases

Note: Available in live imaging only

**Depth Gain
Compensation
(DGC)**



Manually adjusts gain / brightness

Default all slide pods in the center
Slide pods to increase / decrease brightness

**SpaceTime
resolution
control**

Adjusts the balance between the temporal and spatial resolution

Located on the **LED Display**

Rotate rotary knob to adjust between spatial and temporal resolution

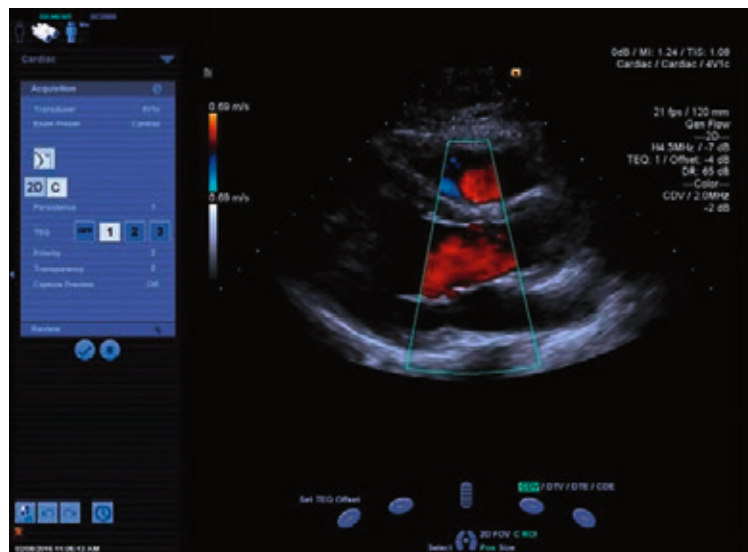
2D Imaging and Tools

Commonly Used Doppler Controls



Color Doppler



Use the **Next** key (right click) to change the Position and Size of the Color region of interest (ROI).






Next

4D Imaging and Tools

Acquire a Basic Volume

1. Obtain desired 2D TEE or ICE view
2. Press  (**4D**)
3. Press  (**Clip Store**) to acquire the volume

Acquire a Volume with RES Enhanced Resolution Imaging






1. Obtain desired 2D TEE or ICE view
2. Press  (**RES**) and adjust region of interest box to include needed anatomy
3. Press  (**4D**)
4. Press  (**Clip Store**) to acquire the volume








RES is best to use when capturing data for a particular structure of interest (e.g., a valve). It provides a focused image of that structure and often achieves higher volume rates.





Name / Tool	Icon	Description
Screen Format		<i>Displays a menu of available display formats</i>
Axis Markers		<i>Hides or displays all axis markers on the volume and reference planes</i>
Cut Plane		<i>Enables or disables the cut plane function for viewing the anatomy of interest in a volume</i>
Unsynchronized Cut Plane		<i>Enables or disables synchronization of the cut plane with any of the reference planes</i>
Box Edit Reset		<i>Cancels any changes made to the volume using the box editing tool</i>

4D Imaging and Tools

Name / Tool	Icon	Description
Wireframe with Cut Plane		Hides or displays the wireframe around the volume
Reference Plane Lock		Maintains the relative positions of the planes when one of the locked planes is manipulated
Reference Plane View		Displays reference planes in one view
SieShell		Animates the volume to display the volume as two vertical halves
Image Parameters (On/Off)		Enables or disables on-screen image parameters





X Y Z Rotation Controls

The X Y Z controls are located on the control panel and can be used to rotate the volume

X – rotates the volume along the coronal plane in an up and / or down direction

Y – rotates the volume along the azimuthal plane in a left-to-right direction

Z – rotates the volume along the elevational plane in a front-to-back direction

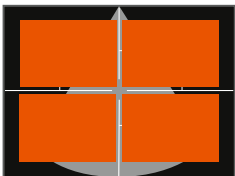


The scroll wheel (located above the trackball) can be used to quickly cut through slices of a volume image.



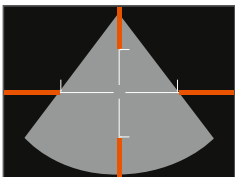
4D Imaging and Tools

Rotation and Manipulation Icons



X/Y Rotation Tool

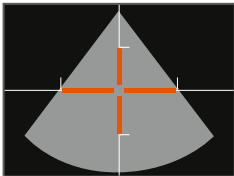
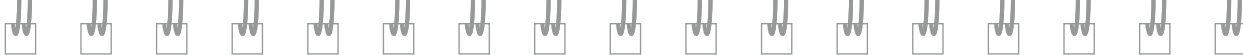
- Place cursor over area in orange
- Allows X and Y axis rotation of axis markers



Z Rotation Tool

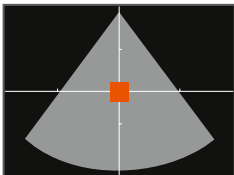
- Place cursor over area in orange
- Allows Z axis rotation of axis markers





Pan Tool (single axis marker)

- Place cursor over area in orange
- Allows panning of a single axis marker up / down or left / right

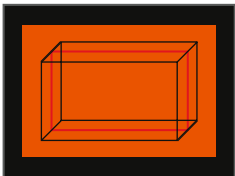


Pan Tool (both axis markers)

- Place cursor over area in orange
- Allows panning of a reference area and adjusts both axis markers

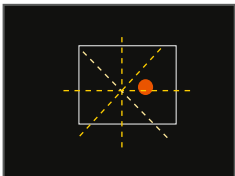
4D Imaging and Tools

Rotation and Manipulation Icons



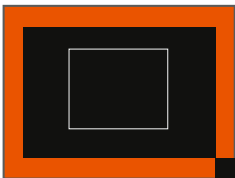
4D Volume X/Y Rotation Tool

- Place cursor over area in yellow
- Allows X/Y axis rotation of the 4D volume



4D Volume Pivot Point of Reference Plane

- Second level of X/Y 4D volume rotation tool
- Sets pivot point for 4D volume reference plane rotation
- Turn on **Box Edit** from soft keys, then left click and right click to adjust the plane



4D Volume Z Rotation Tool

- Place cursor over area in yellow
- Allows Z axis rotation of the 4D volume

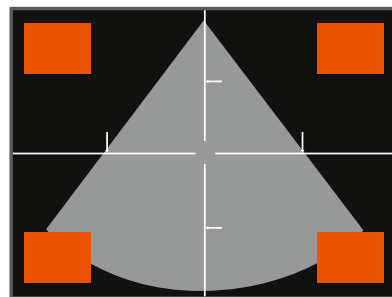




SieSynch Tool

Function: synchronizes the volume to a particular reference plane.

- Place cursor over any of the areas in orange
- Press the **Select** key for synchronization

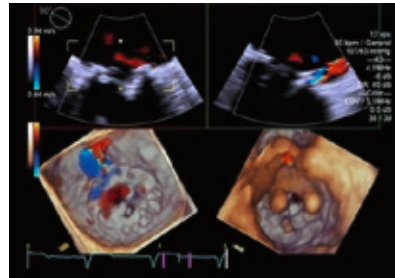


4D Imaging and Tools

Dual V

Function: simultaneously displays two views of the same volume from opposite viewing angles by displaying two orthogonal reference planes and two opposing volume views.

- Acquire a 4D volume, for example of the mitral valve
- Select **Dual V** from the Image Menu



*Each of the two volume images can be manipulated individually by placing the cursor directly on the volume and pressing the **Select** key, or by rotating the **X**, **Y**, and **Z** controls.*

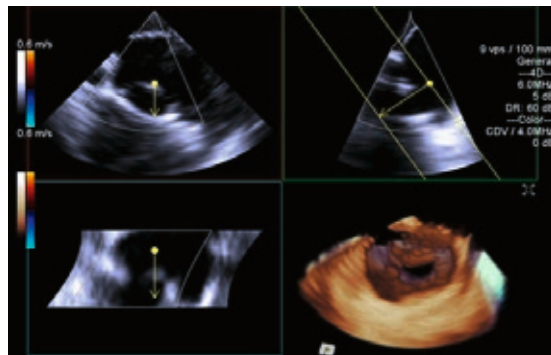




D'Art Navigation Tool

Function: allows cropping and visualization of a structure from a designated point of interest.

1. Select **D'Art** from the soft keys
2. Place cursor within an MPR at or slightly above the anatomy of interest and press **Select**
3. Drag the arrow in the direction for desired view
4. To adjust region of interest (ROI), position cursor over any of the four corners of the ROI box
5. Press **Select** and use the trackball to adjust the ROI size
6. Select either the yellow circle or the arrow to adjust the position of the ROI

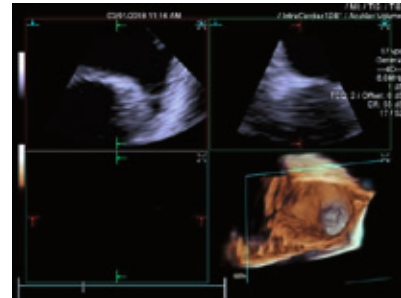


4D Imaging and Tools

En Face

Function: provides automated adjustment of the volume to obtain an en face view of the left atrial appendage (LAA).

1. Select the **En Face** icon from the Image Menu (minimal adjustment of axis markers may be necessary)
2. To exit En Face select **Reset Orientation** from the soft keys

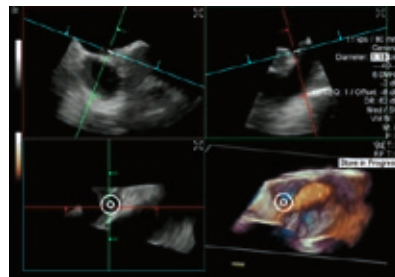




Circle Tool


Function: Guidance tool for assessment and quantification of anatomical structures on 2D and 4D volume images using a circle of varying diameters during live 4D volume imaging.

1. Select the **Circle Tool** icon from the Image Menu
2. Adjust the size and shape using the **Priority** key and the trackball



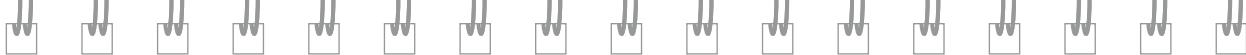
Measurements

Generic Measurement

Press the **Calcs**  key on the control panel to access the measurements and calculation packages.

- The measurement function is available during a patient study, in **Cine** or while in **Review** mode
- The system transfers the values of labeled measurements to the worksheets and patient report
- Unlabeled (generic) measurements display only on the image and are not transferred to the worksheets and patient report



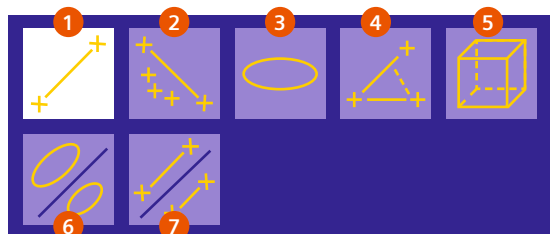


To	Do this
Position a caliper	Roll the trackball Note: Calipers available for positioning are green
Anchor a caliper	Press Select or Next Note: The anchored caliper and corresponding measurement are white. Subsequent calipers are available for positioning after rolling the trackball
Complete a measurement	Position the final caliper required for measurement and press Select
Reposition an anchored caliper	Press Select soft key to activate first caliper Press Next to activate second caliper for repositioning Reposition and anchor activated caliper
Delete a completed measurement	Press the Select Set soft key and press the Delete Set soft key or press Delete on the keyboard

Measurements

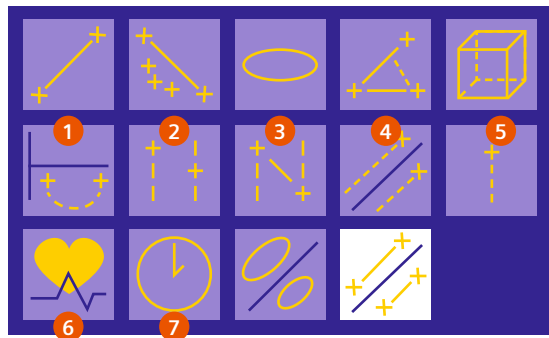
2D Generic Measurement Tools

1. Distance – Length of a straight line
2. Trace – Circumference of an irregular shape or area inside a manual trace
3. Ellipse – Major (D1) axis and minor (D2) axis, circumference and area of an ellipse
4. Angle – Calculates degree of the acute angle
5. Volume – Calculates volume by using three distance measurements
6. Area Ratio – Calculates ratio of two areas
7. Distance Ratio – Calculates ratio of two distances




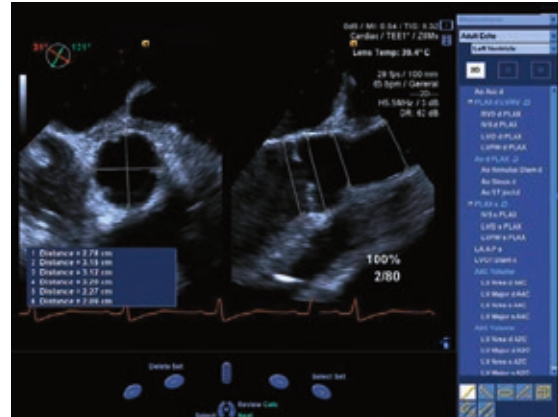
Doppler Generic Measurement Tools

1. Doppler Trace – Velocity Time Integral (VTI), Peak Pressure Gradient (Pk PG), Mean Pressure Gradient (MnPG)
2. Doppler Calc – Velocity (V) and Pressure Gradient (PG) for each caliper
3. Delta Doppler Calc – Difference in Velocity (dV) at the two caliper positions, Time Duration (dT) between the two caliper positions, Heart Rate, Slope, and Pressure Half Time
4. Velocity Ratio – Calculates ratio of two velocities
5. Velocity – Velocity and Pressure Gradient
6. Heart Rate – Measure a heart rate
7. Time – Time Duration between two caliper positions



Labeled Measurement

1. Press the **Calcs**  key
2. Position the Cursor over desired measurement and press the **Select** key
3. A green arrow displays next to the measurement label in the task pane
4. The required measurement tools is activated
5. The caliper displays in the center of the 2D image or Doppler spectrum
6. A checkmark appears next to the measurement label in the task pane once measurement is completed



Labeled measurements will populate into the patient report.





Joystick Control

- Nine available functions
- Joystick handle enables movement of the mouse cursor and supports the left, center, and right mouse controls
- Serves as an alternative to the control panel





Controls

The handle of the joystick control has the same functionalities as the trackball on the control panel

1. Next
2. Priority
3. Select



Available functions vary depending on active imaging mode

Joystick Control

Controls

1. **C** – Enter/exit color Doppler
2. **RES** – Enter/exit RES
3. **PW** – Enter/exit pulsed wave Doppler
4. **CW** – Enter/exit continuous wave Doppler
5. **4D** – Enter/exit 4D imaging





Connectivity




53

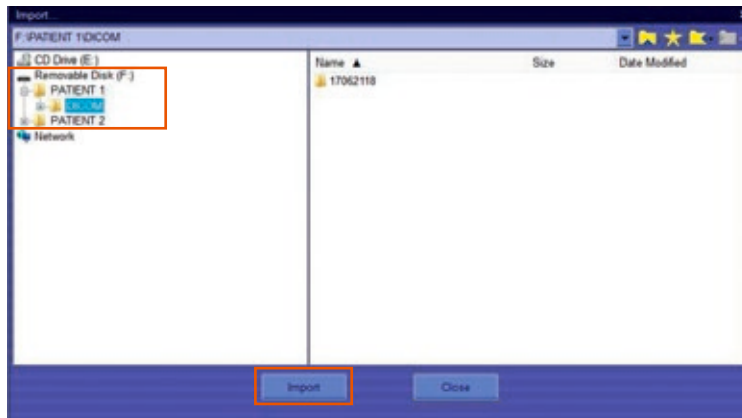
- Joystick control attaches to standard hospital bed with a clamp
- Connect to ACUSON SC2000 PRIME ultrasound system via a USB connection






Import / Export

Importing a Study

1. Select **Find Patient** 
on the access bar or press **Patient Browser**  on the keyboard
2. Select **Import Data** 
3. Select file location
4. Find desired file and select **Import**



Exporting a Study

1. Select **Find Patient**  on the access bar or press **Patient Browser**  on the keyboard
2. Choose desired file and select **Export Data** 
3. Select media type
4. Select **Target** destination
5. Select **Properties** options
6. Select **Export**





Creating a Teaching File

Teaching Files

- Combine selected images, clips, and volumes from individual or multiple patient studies to create a single teaching file
- The system saves teaching files with a unique Patient ID
- The system cannot add images, clips, or volumes that display patient identifying information

Creating a Teaching File

1. Activate **Review**  and select desired images
2. Select **Create Teaching File** 
3. Add images to a new or existing teaching file
 - a. New teaching file: enter a name for the teaching file in the **Anonymized Name** field and select **Create New**
 - b. Add images to existing teaching file: select required teaching file in **Existing Teaching Files** list and choose **Add to Existing**
4. Close the **Create Teaching File** dialog box







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An estimated 5 million patients globally everyday benefit from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics and molecular medicine, as well as digital health and enterprise services.

We are a leading medical technology company with more than 170 years of experience and 18,000 patents globally. With more than 48,000 dedicated colleagues in 75 countries, we will continue to innovate and shape the future of healthcare.

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