Quick Card

3D/4D for Gynecology

ACUSON Sequoia Ultrasound System
3.5 (VB30)

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SIEMENS Healthineers

Getting Started

The 3D volume data set is a series of 2D images gathered over a timed acquisition.

- The 9VE4 and 7VC2 transducers perform an automated mechanical calibrated acquisition of the volume data set

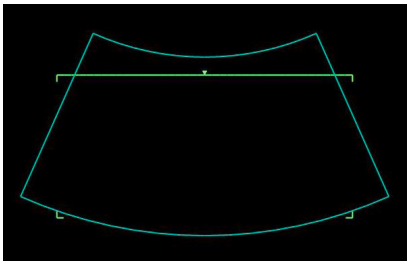
Step 1

- Press **3D/4D control**

- Select **3D** or **4D** from the touch screen

Step 2

- Place the Volume of Interest (VOI) to include the anatomy desired. The VOI can be curved by selecting the Curve option on the trackball left set key
- The Volume of Interest box may be deactivated by selecting the VOI key on the touch screen. When disabled, the entire field of view will be acquired in the volume



3D

- Press the **Update** key, and the system will automatically acquire a sweep and display the volume

4D

- Press the **Update** key to start the acquisition. The system will enter live 4D imaging; select Freeze to stop the acquisition

Step 3

3D

- Press **Image** to store a volume

4D

- During live acquisition, press the **Clip** key to store a 4D clip
- Press the **Image** key to store a single volume on a frozen image

- Stored 3D volumes are marked with a cube graphic

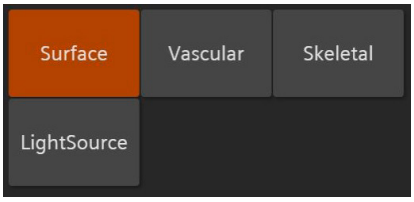
- Stored 4D volume clips are marked with a cube containing a “play” icon

Render Modes

There are four render modes available:

- **Surface:** Smooths the image contours, creating a soft sculptured appearance for highlighting surface features of soft tissue
- **Vascular (Minimum Intensity Projection/Min IP):** Best for visualizing hypo-echoic lesions and vascular structures
- **Skeletal (Maximum Intensity Projection/Max IP):** Best for intrauterine devices and bony structures
- **Light Source:** Helps increase depth perception, reveals surface details, provides an element of texture, and can provide a deeper understanding of relational anatomy. The adjustable light source direction is automatically activated in a 1:1 layout, but may be activated/deactivated in any layout by selecting the **Light** key on the touch screen.

Use the trackball to adjust the direction of the light.



FlexPlane

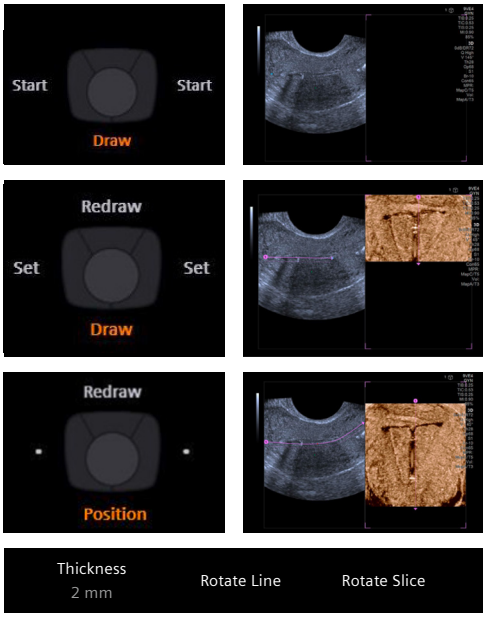
The FlexPlane tool allows the user to obtain and visualize anatomy of any shape along any plane. This is especially useful when imaging complex or irregularly shaped structures.

The user can choose from:

- **Line** – A straight line in any direction
- **Trace** – A freehand line traced in any direction
- **Spline** – An open spline controlled by selecting the set key along the path of the spline

Once the desired option is chosen:

- Press either **Set** control to begin the line
- Press either **Set** key again to end the Line/Trace tools or to change the direction of the Spline tool (double-click either **Set** control to end the Spline)
- To redraw the slice, press the **Update** control
- Use the rotary soft keys to adjust the volume thickness as well as line or slice orientation; to enable measurements on the rendered image, set the thickness to **Off**

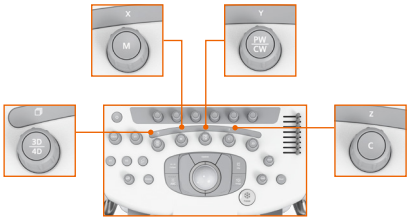


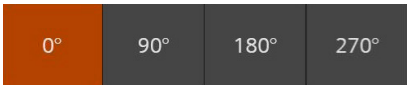
MPR & VR Orientation

Adjust the Multiplanar Renderings (MPR) and the volume using the rotation tools on the control panel. These controls can be used during 4D live acquisition.

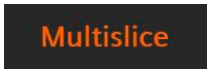
- Select the desired quadrant from the touch screen
- The MPR slicing function is manipulated using the 3D/4D control
- The X axis is manipulated using the M-mode control
- The Y axis is manipulated using the PW Doppler control
- The Z axis is manipulated using the Color Doppler control

Use the rotation tools on the touch screen to quickly rotate the volume rendering by set degrees.

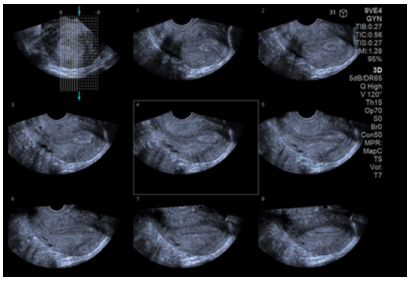




Multislice

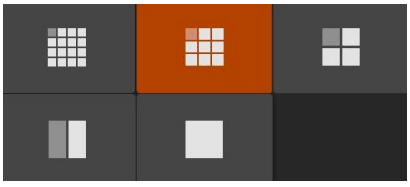


The Multislice tab contains options for viewing multiple slices of the selected MPR plane at the same time. It is often referred to as a CT or MRI view.



- Select the desired plane using the A, B, and C keys

- Select the desired layout from the touch screen

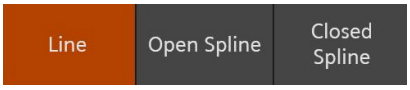


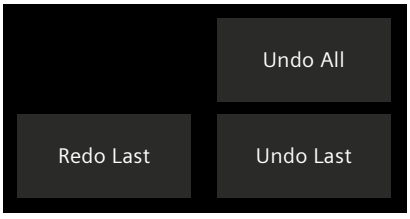
- Use the rotary soft keys to adjust the number of slices, distance between slices, and the position of the slices

Editing

The editing tab contains options for removing unnecessary structures.

- Select the desired tool from the touch screen
- Use the trackball and **Set** keys to delineate the area for removal
- Place the scissor icon in the area to be removed and press the **Set** key to finalize
- Edits may be reversed using the touch screen options





Additional Optimization – Acquisition

Angle

- Determines the angle of the volume sweep

Quality

- Adjusts the resolution and sweep speed between Low, Mid, and High

Additional Optimization – VR

Threshold

- Decreasing the threshold removes low-level echoes while increasing the threshold adds low-level echoes

Opacity

- Adjusts the transparency of the voxel

Smooth

- Averages the edges of the voxels with adjacent voxels to smooth the volume image appearance

Brightness

- Changes the voxel saturation

Contrast

- Raises or lowers the percentage of contrast to enhance differences in tissue

Tint

- Applies assigned color shades to the gray scale

Additional Optimization – MPR

Dynamic Range

- Decreasing the threshold removes low-level echoes while increasing the threshold adds low-level echoes

Map

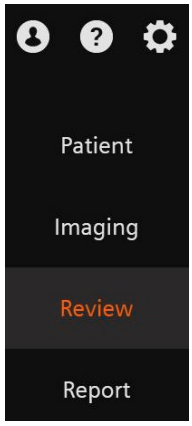
- Adjusts the transparency of the voxel

Tint

- Applies assigned color shades to the gray scale

Review

- Select **Review** from the touch screen with the pointer, select the image for review



- Select the **3D/4D** tab on the touch screen to activate the volume manipulation tools if desired

- Any additional images stored while the volume is active in the **3D/4D** tab will be stored as volumes or volume clips. Additional images stored while in the **Review** tab will be stored as still images.

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[1] *Personalization of diagnosis, therapy selection and monitoring, aftercare, and managing health.*

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