

S-Fusion™ *for Liver*

V series Quick Guide



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9. Acquire/Recall US Volume
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The components of S-Fusion™

Field Generator (Transmitter)

Generates an electromagnetic field to find the location of sensor.



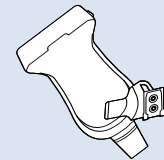
Probe Sensors (2EA)

Detects the strength and orientation of the generated electro-magnetic field, and relays the information to the tracking unit.



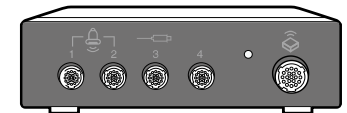
Tracking Bracket

Allows mounting of probe sensors onto the probe.



Tracking Unit

Calculates the position and orientation of the probe and the biopsy needle based on the data from the sensors. It also displays this information on the monitor.

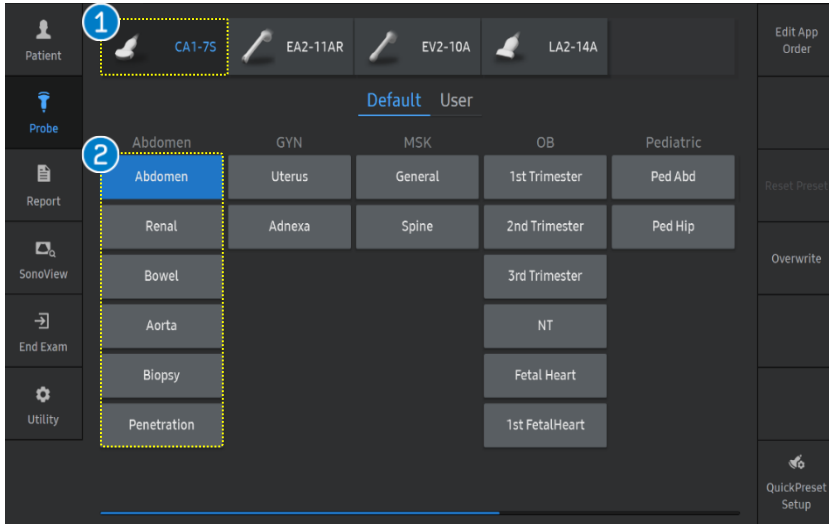


External Marker

- Compensates the movement of the patient by placing it on the patient and through a function that finds the patient's position.
- In case of 'Matching Auto' method, this function allows you to complete the initial registration automatically by attaching external markers to the patient's body before starting S-Fusion.
- Also, in case of 'External marker' method, it can automatically register them, when there are CT data containing markers.



1. Patient Registration

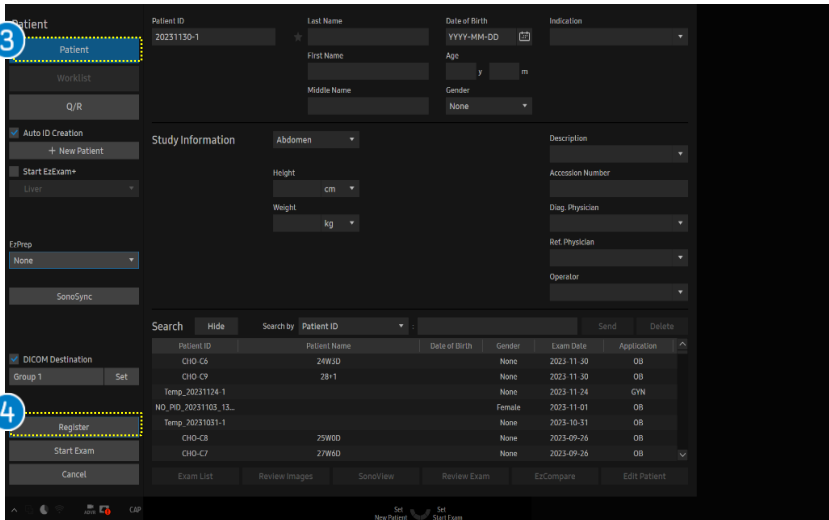


1 Select a Probe

Select a [Probe] for scanning Liver

2 Select a Preset

Select a [Abdomen] preset in Abdomen menu.



3 Patient

Input the patient information.

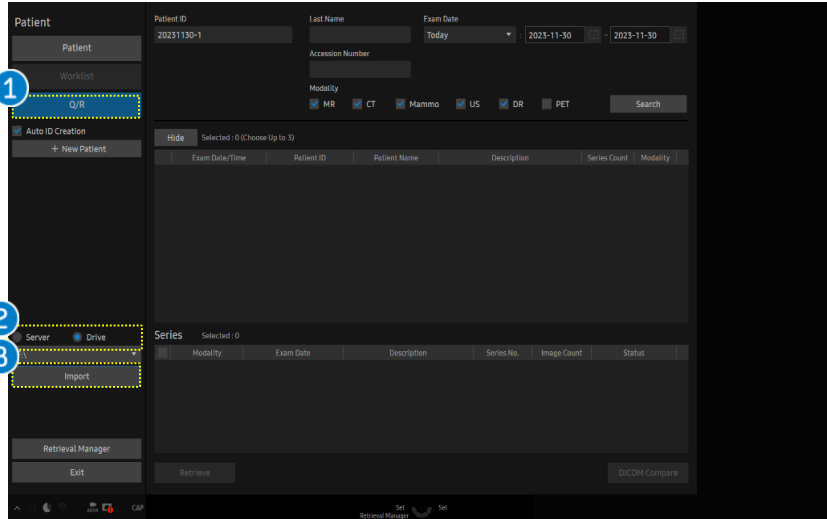
4 Register

After entering the patient information, select the [Register] button to start an exam.

★Tips

In the case of using a worklist server, you can directly access worklist page and search for the patient information.

2. Query & Retrieve the datasets

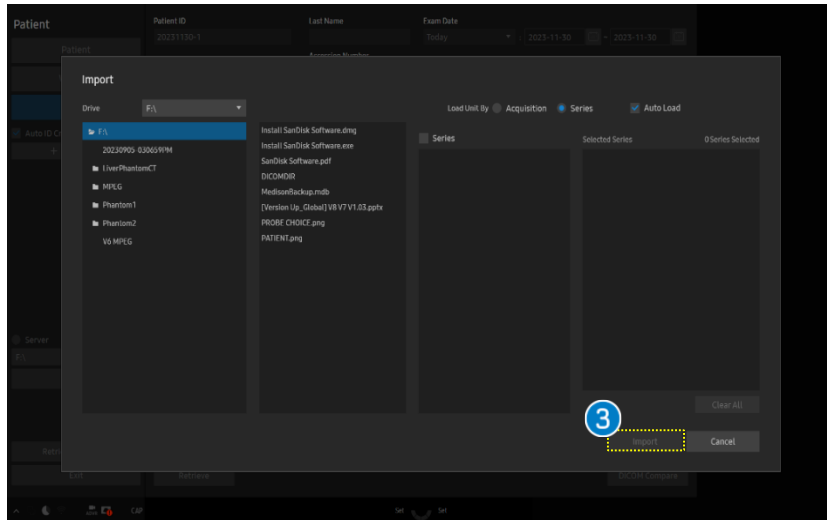


1 Q/R

Click the [Q/R] menu.

2 Source

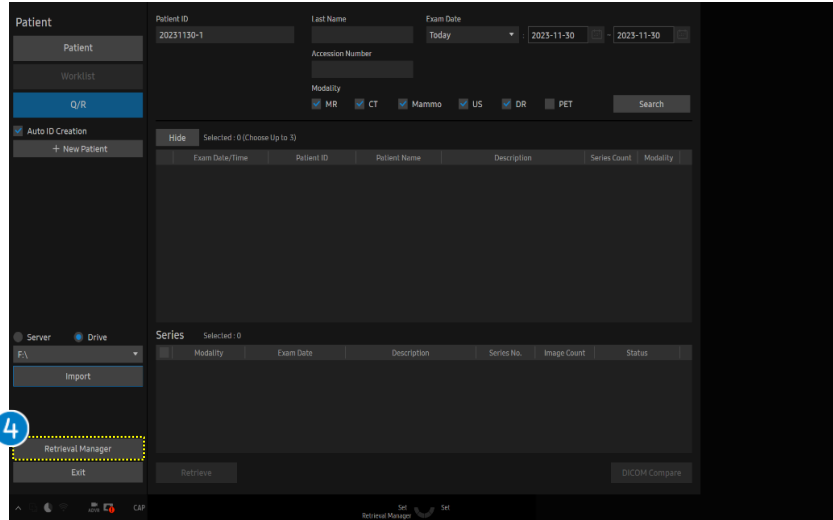
Choose between Server/Drive.
To use Drive source, Put USB in with Fusion data (MR/CT/US/DR/PET).



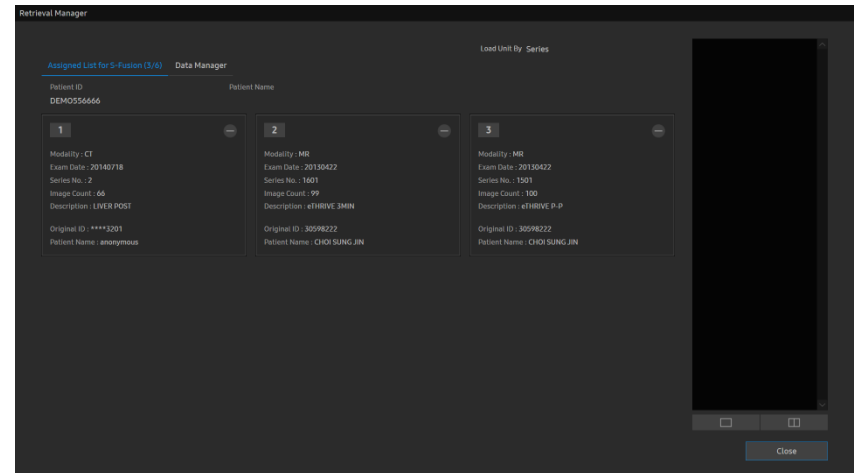
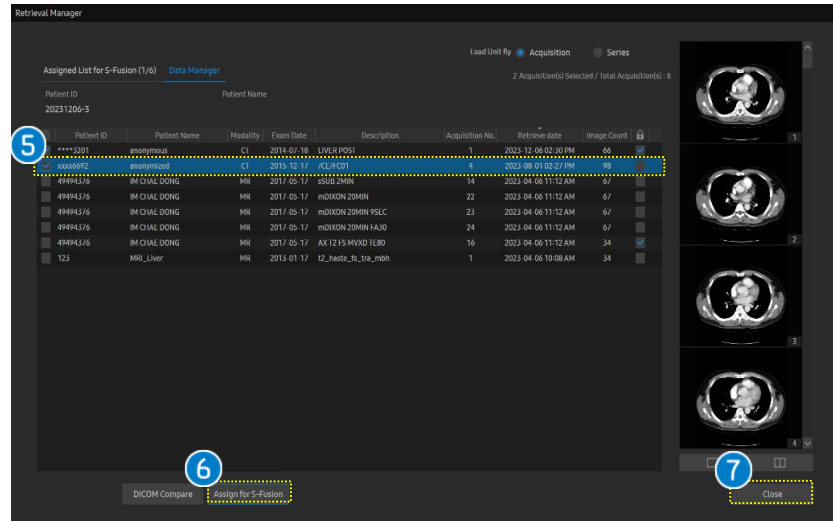
3 Import

Press [Import] to bring in the data.
Select desired data and press [Import].

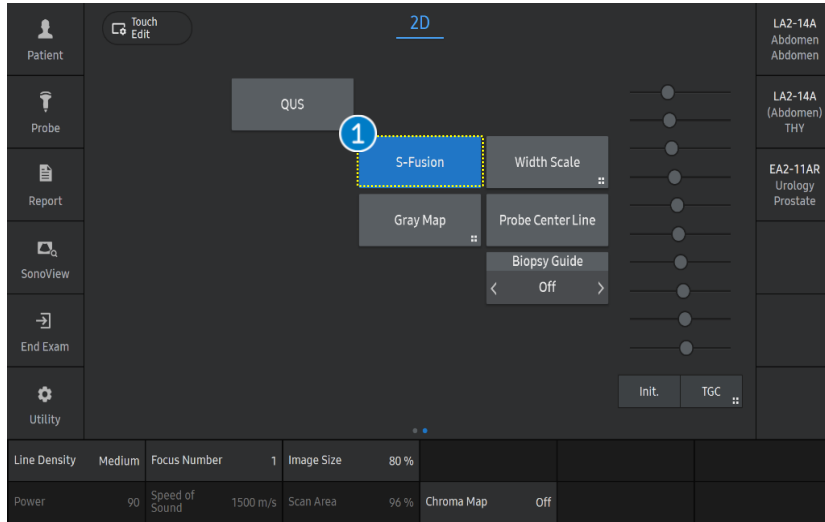
2. Query & Retrieve the datasets



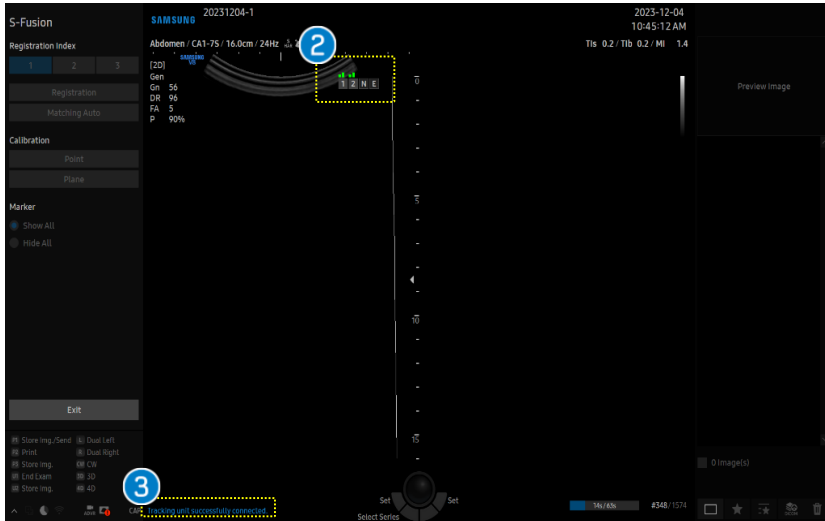
- 4 Retrieval Manager
Press [Retrieval Manager] to assign the fusion data. Then, 'Data Manager' window will display on the screen.
- 5 Select Data
Check the box of the datasets which you desire for registration with US Image.
- 6 Assign
Choose [Assign for S-fusion] button for selected series to be temporally assigned to the current ID.
- 7 Close
Click the [Close] button on Retrieval Manager. You will be ready to start S-Fusion. Assigned list for S-fusion will pop up.



3. Activate S-Fusion™



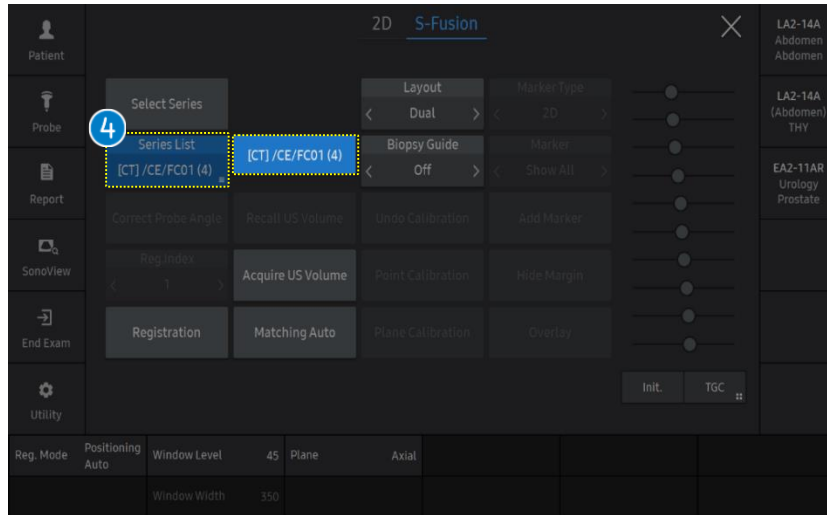
1 S-Fusion Select the [S-Fusion] button on the touch screen to start S-Fusion for Liver.



2 Check the sensor The green bar indicates the signal strength is at a proper status.

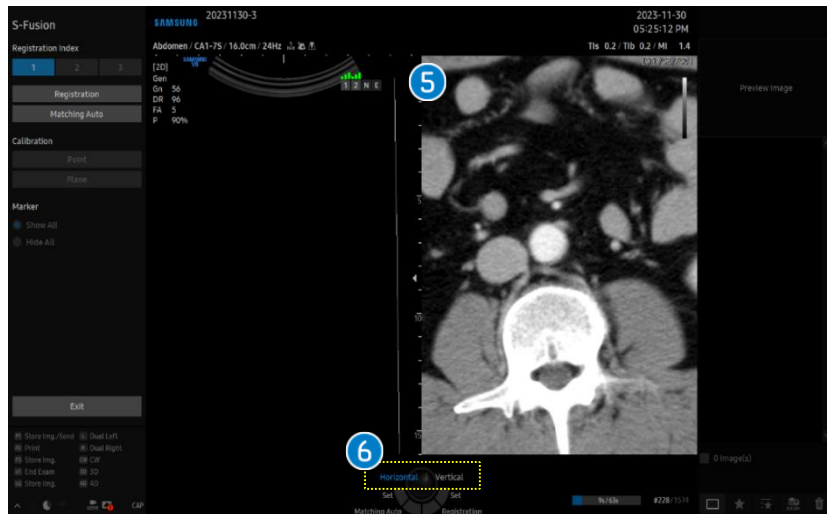
3 Connect the tracking unit If the tracking unit is connected properly, 'Tracking unit successfully connected' message will be displayed.

4. Select a Series



4 Series List

With [Select a series] button, Retrieved series will be displayed on the touch screen menu.



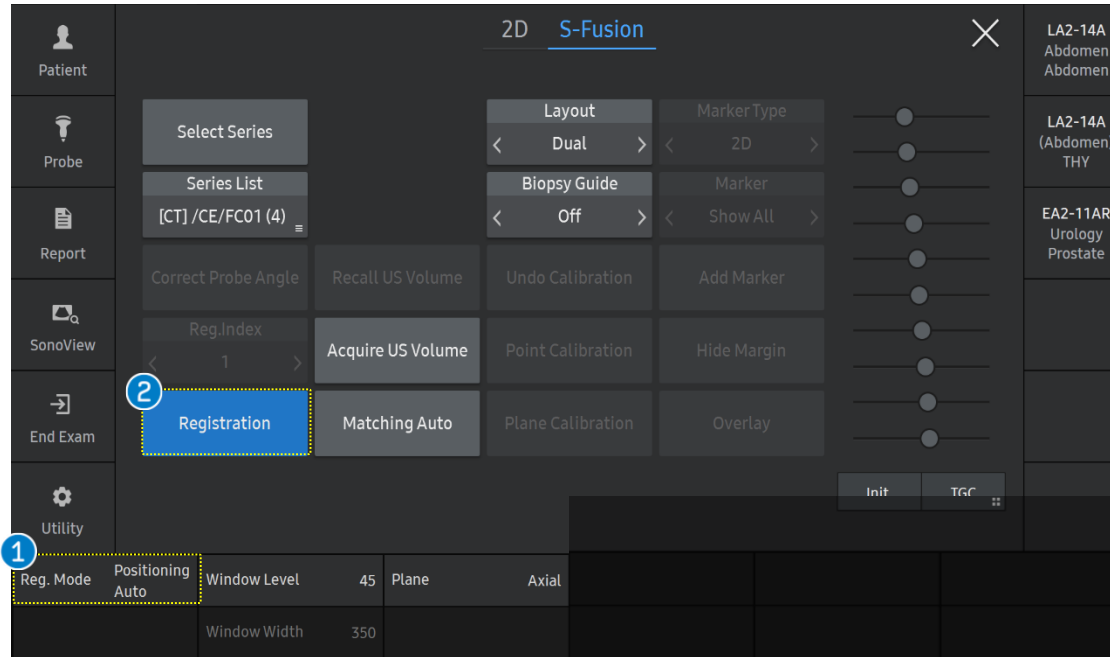
5 Select data

Selected data will be displayed on the monitor screen. If you want to change to another datasets, you can switch to a different series on the list.

6 Horizontal/Vertical

Use the [Change] button on the control panel to activate [Horizontal] or [Vertical] direction to find the desire location from the retrieved datasets using trackball.

5-1. Registration - Positioning Auto



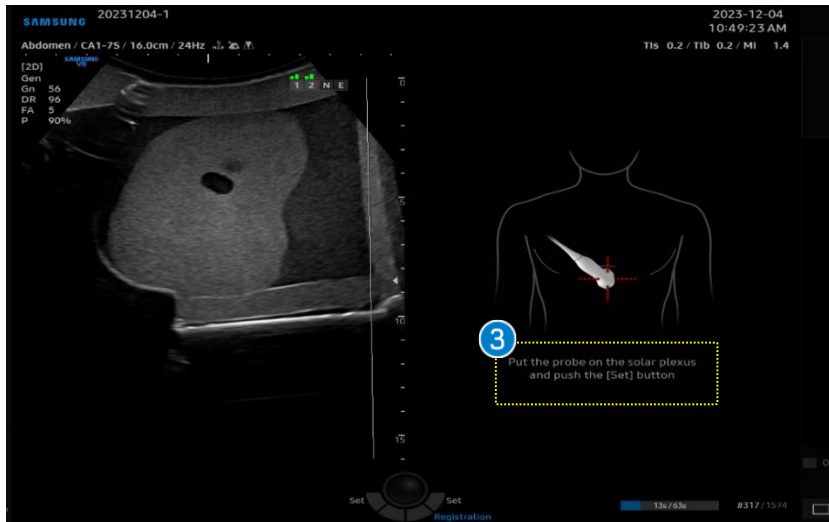
1 Registration Mode

Select the [Positioning Auto] from the registration mode on the touch screen. 'Positioning Auto' helps to offer quick and efficient examination with one-step initial registration between CT/MR and US.

2 Registration

Tap the [Registration] button to start a registration.

5-1. Registration - Positioning Auto



3 Orientation Lock

Position the transducer in the sagittal direction and following this guideline 'Put the probe on the solar plexus and push the [Set] button on the control panel.



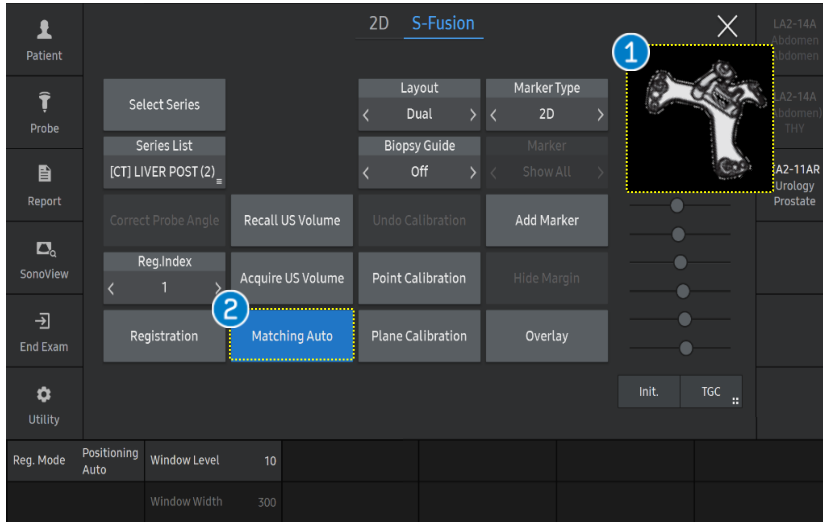
4 Check the Registration

Following the message on the bottom of the monitor screen 'Registration has started'. You can check registration accuracy on the monitor screen.

★Tips

To increase the accuracy after registration is completed, you may proceed to [Calibration] to register images more in detail.

5-2. Registration - Matching Auto



1 Attaching External Marker

By attaching external markers to the patient's body before starting an exam.

2 Matching Auto

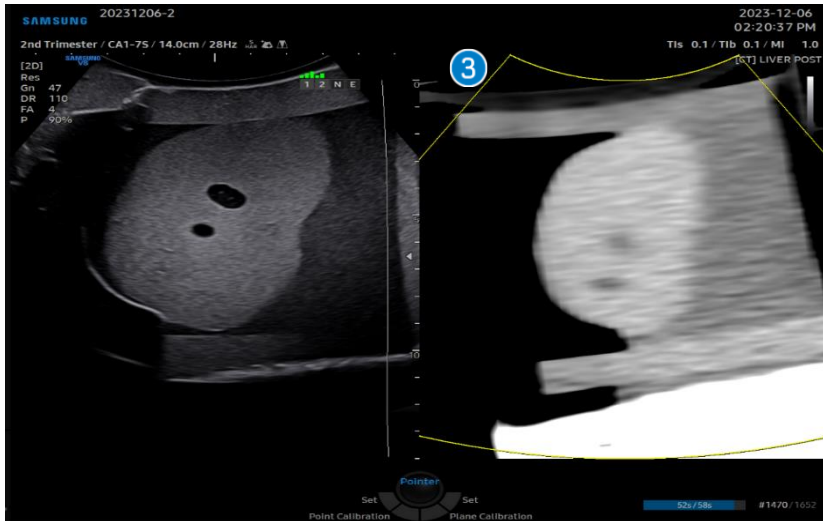
Tap the [Matching Auto] button to start a registration.

This function allows you to complete the initial registration automatically by attaching external markers to the patient's body. Then you can remove the external marker.

3 Check the Registration

Following the message on the bottom of the monitor screen 'Registration has started'.

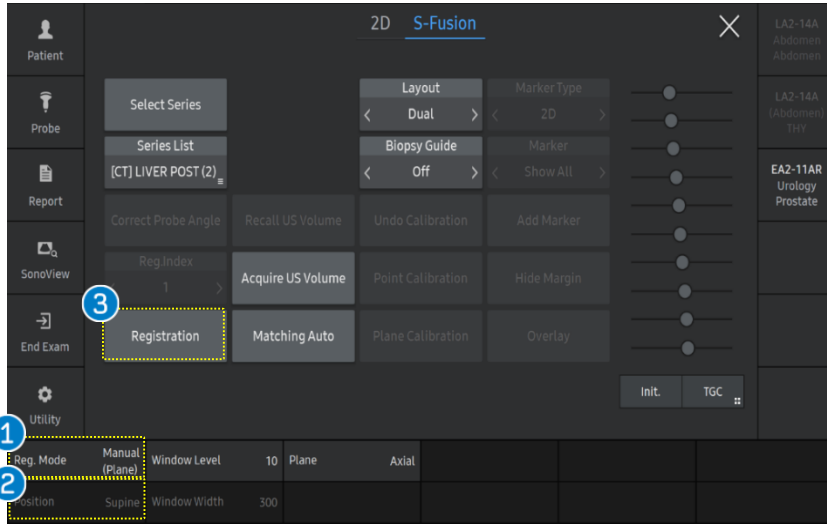
You can check registration accuracy on the monitor screen.



★Tips

To increase the accuracy after registration is completed, you may proceed to [Calibration] to register images for more detail.

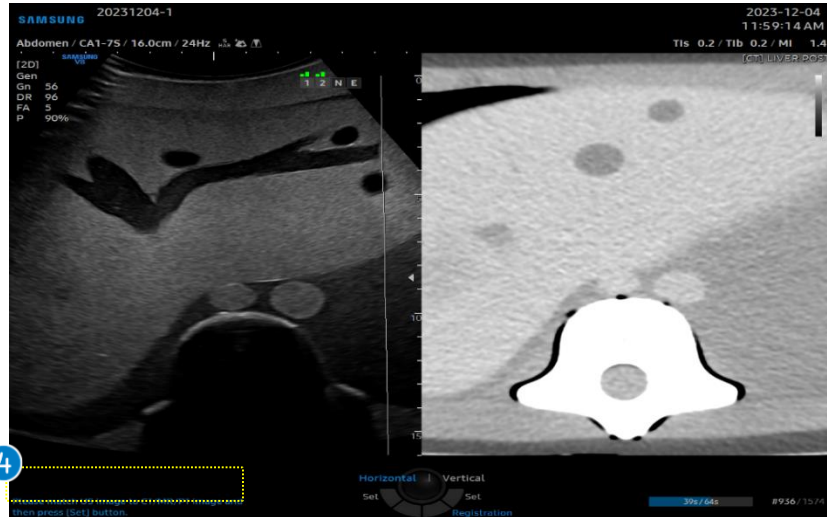
5-3. Registration - Manual(plane)



1 Registration Mode Select the [Manual(plane)] from the registration mode on the touch screen.

2 Position In case of the Manual Registration, it is available to select patient position 'Supine' or 'Prone'.

3 Registration Tap the [Registration] button to start a registration.

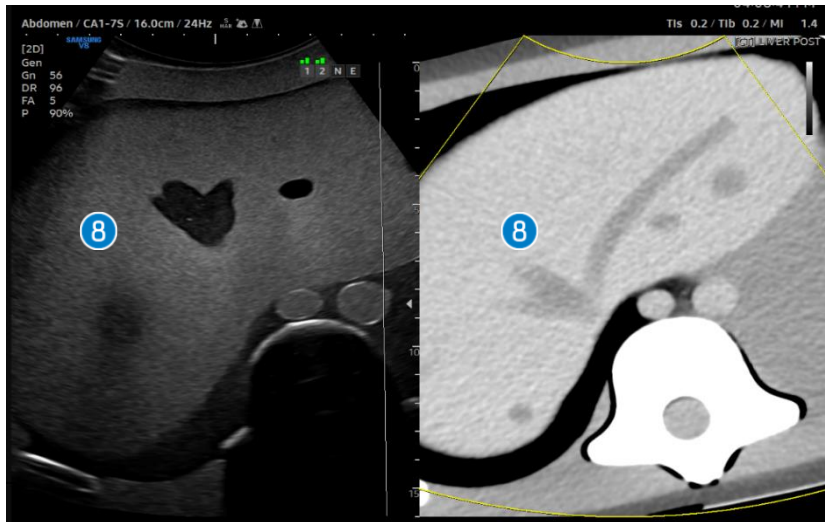
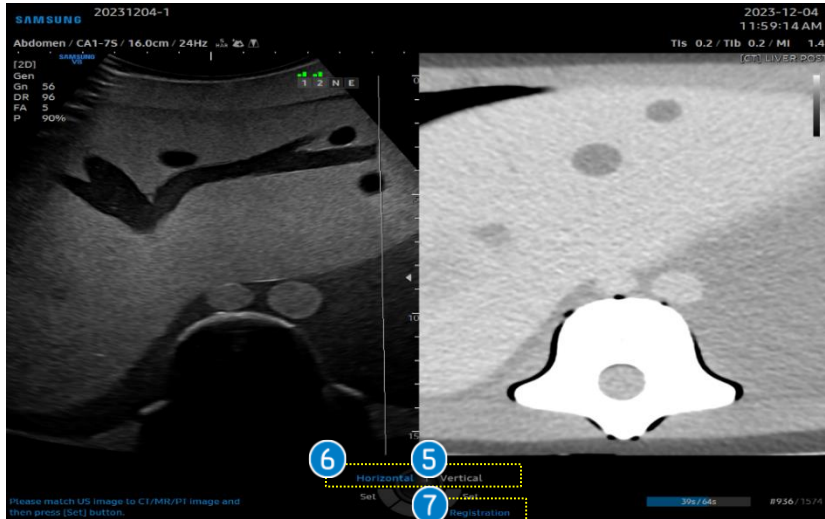


4 Match plane Match US image to CT/MR/PT image and press [set] button.

★Tips

If you want a registration for renal, select prone position and the system will automatically recognized the position of patient as prone.

5-3. Registration - Manual(plane)



5 Vertical

Use the change button on the control panel to activate the [Vertical]. It will be available to find the desired slice from the retrieved datasets using the trackball.

6 Horizontal

Use the change button on the control panel to activate the [Horizontal]. It will be available to find the desired location from the retrieved datasets using the trackball.

7 Registration

Use the change button on the control panel to activate the [Registration]. Match the reference plane to the real time ultrasound image. Set the point lock on the same location which is the anatomical landmark.

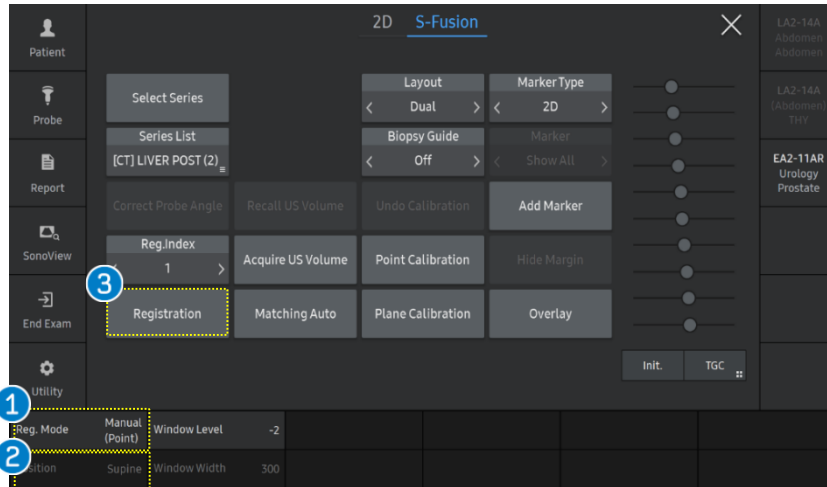
8 Check the registration

Following the message on the bottom of the monitor screen 'Registration has started'. You can check the accuracy of images on the monitor screen.

★Tips

To increase the accuracy after registration is completed, you may proceed to [Calibration] to register images more in detail.

5-3. Registration - Manual(point)

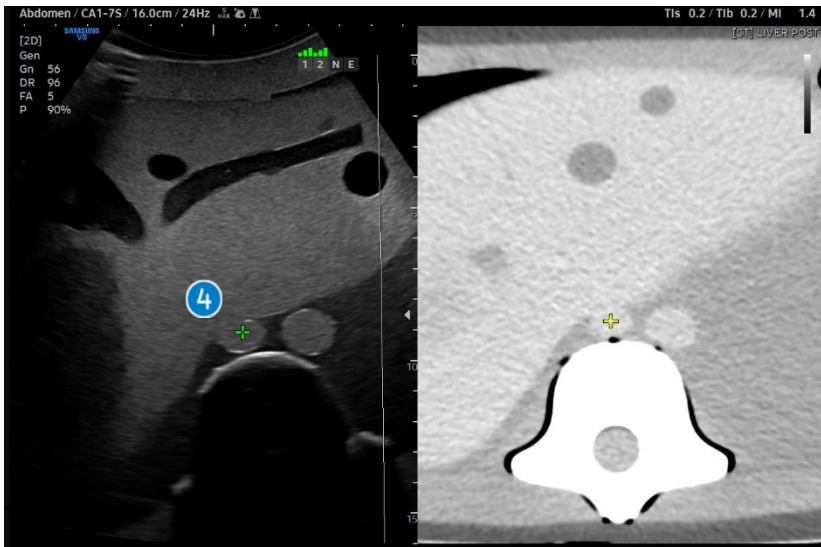


1 Registration Mode Select the [Manual(point)] from the registration mode on the touch screen.

2 Position In case of the Manual Registration, it is available to select patient position 'Supine' or 'Prone'.

3 Registration Tap the [Registration] button to start a registration.

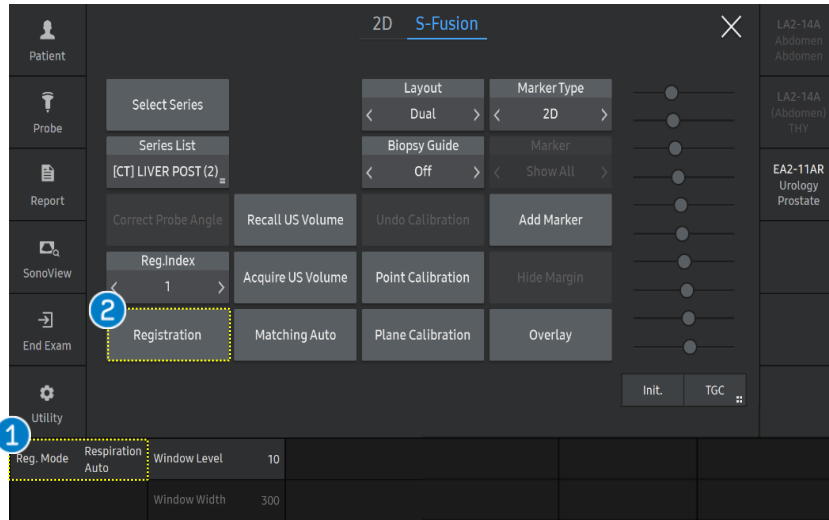
4 Match point Match the same anatomical marker on the same plane on US image and other modality.



★Tips

To increase the accuracy after registration is completed, you may proceed to [Calibration] to register images more in detail.

5-4. Registration - Respiration Auto

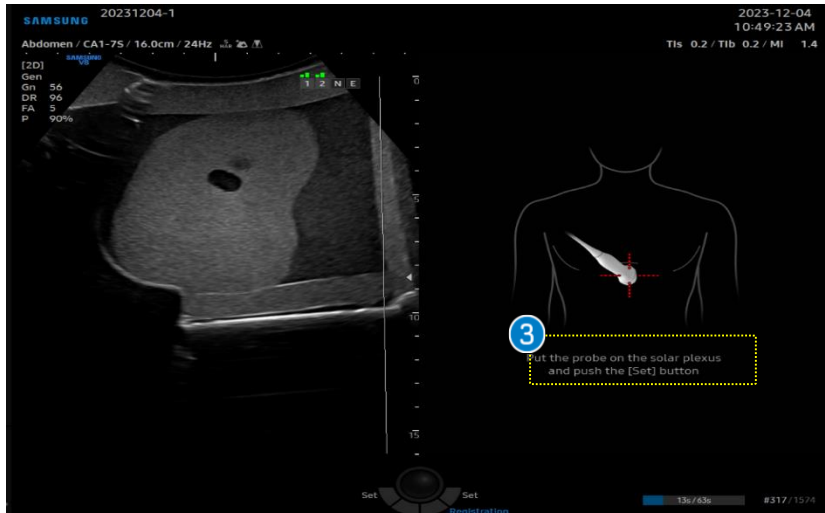


1 Registration Mode

Select the [Respiration Auto] from the registration mode on the touch screen. This mode is only available with CT data.

2 Registration

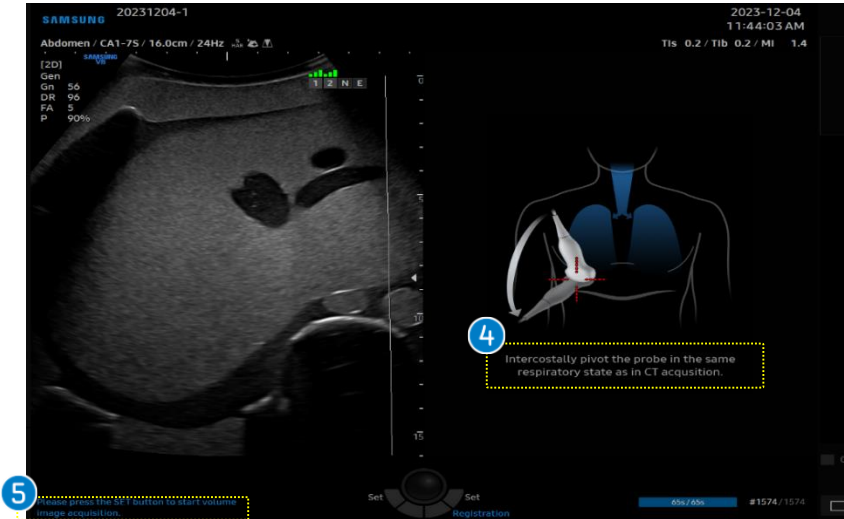
Tap the [Registration] button to start a registration.



3 Orientation Lock

Position the transducer in the 'Sagittal' direction and following this guideline 'Put the probe on the solar plexus and push the [Set] button' on the control panel.

5-4. Registration - Respiration Auto



- 4 Check the intercostal view

To find the best intercostal view, pivot the probe and use the respiratory state similar to that of the CT operation [Inhalation].

- 5 Start a volume acquisition

Press the [Set] button and pivot the transducer to acquire a 3D volume data of the Liver.



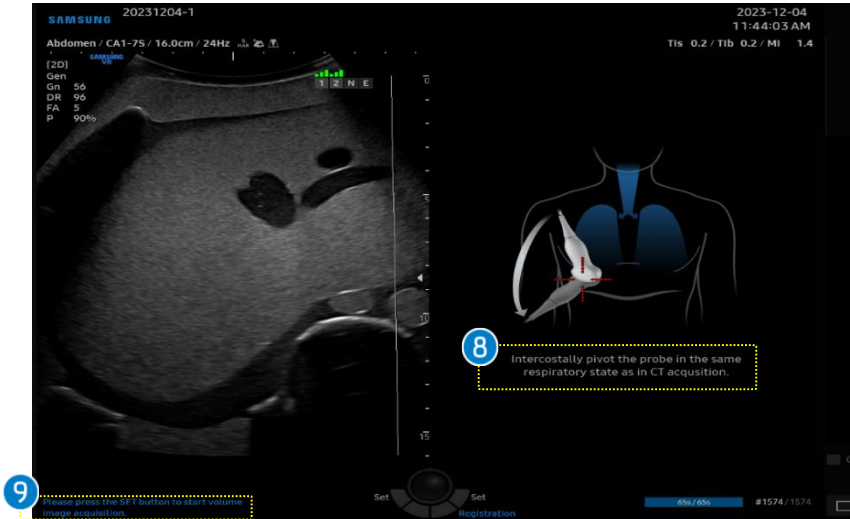
- 6 Acquire volume data

Acquire freehand 3D data by tilting the probe, data must include the diaphragm.

- 7 Finish the volume acquisition

Press the [Set] button to finish volume image acquisition.

5-4. Registration - Respiration Auto



- 8 Check the intercostal view

To find the best intercostal view, pivot the probe and use the respiratory state similar to that of the US operation [Exhalation].

- 9 Start a volume acquisition

Press the [Set] button and pivot the transducer to acquire a 3D volume data of the Liver.



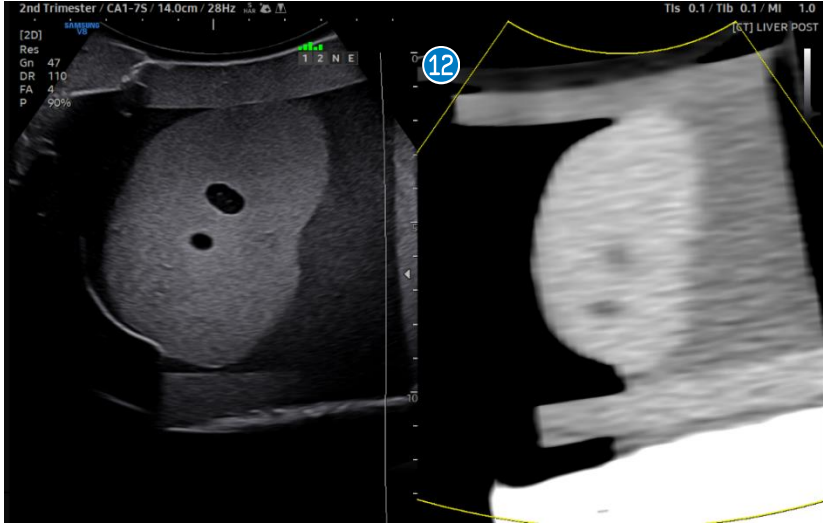
- 10 Acquire volume data

Acquire freehand 3D data by tilting the probe. data must include the diaphragm.

- 11 Finish the volume acquisition

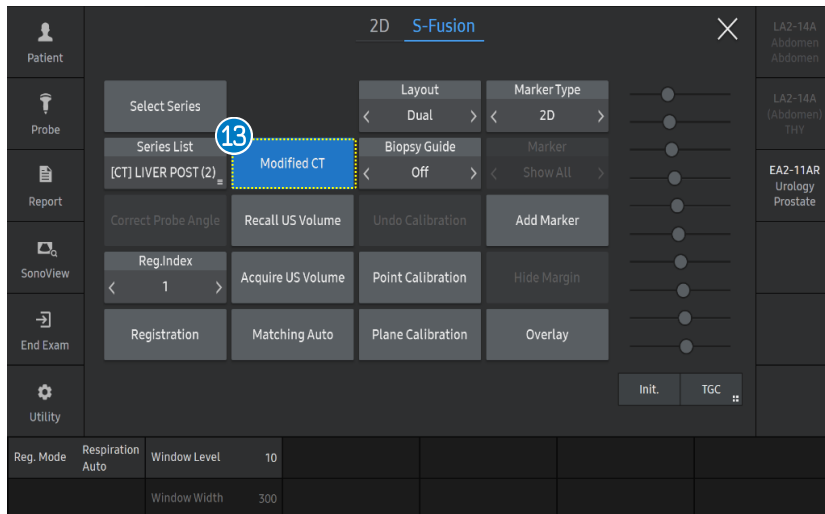
Press the [Set] button to finish the volume image acquisition.

5-4. Registration - Respiration Auto



12 Check the registration

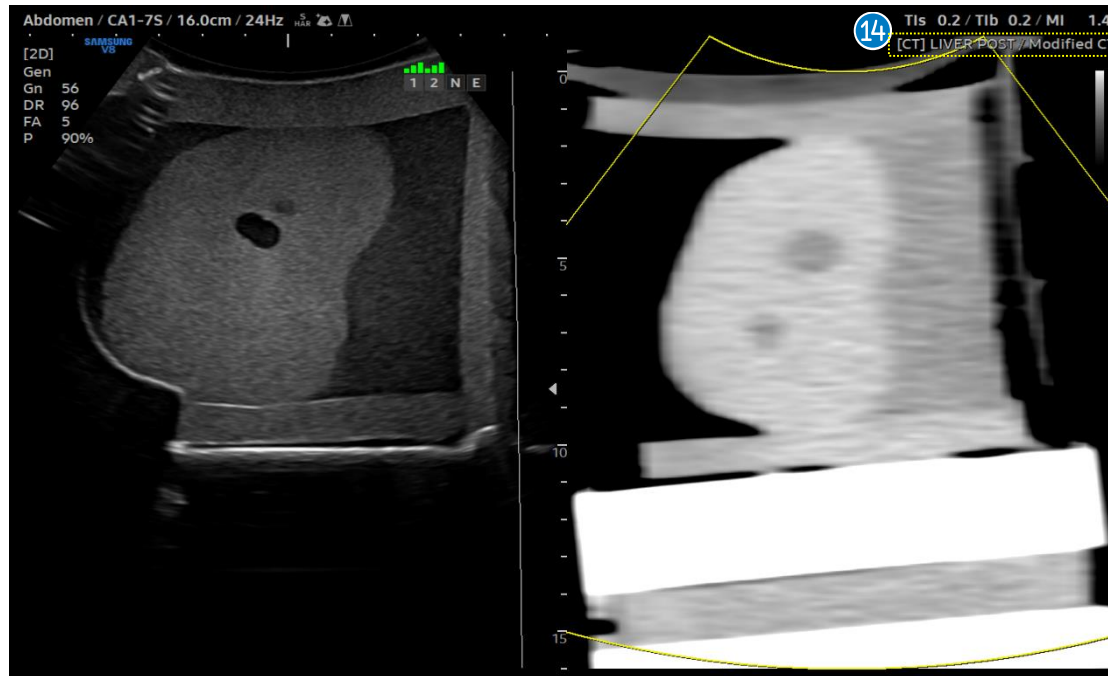
Following the message on the bottom of the monitor screen 'Registration has started'. You can check the accuracy of images on the monitor screen.



13 Select Modified CT

Press the [Modified CT] button on the touch screen to use the Respiration Auto Mode.

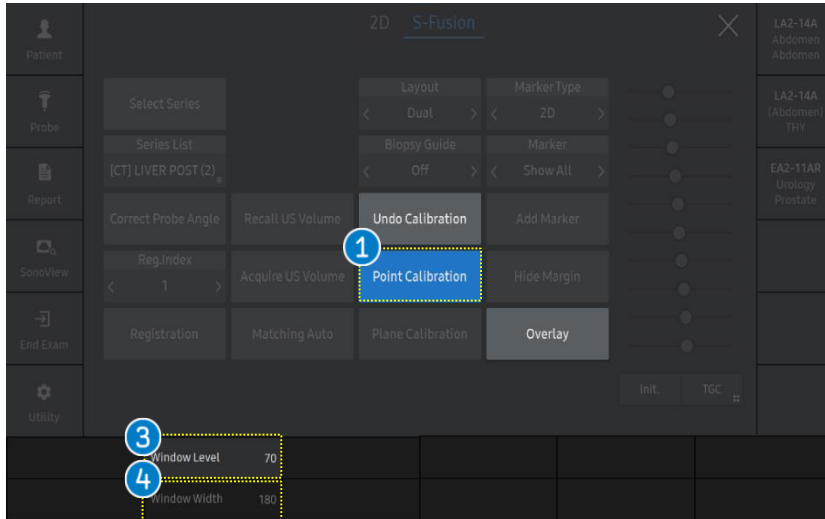
5-4. Registration - Respiration Auto



14 Modified CT image

Respiration compensated image will be displayed on the right side. The [Modified CT] will be displayed on the top of the image. You can check the matched images on the monitor screen.

6. Calibration_ 1) Point Calibration



1 Point Calibration

When you select [Point Calibration] button on the touch screen, a [+] marker will be displayed on the image.



2 Mark the same location

The [+] marker will be displayed on the US image, put the marker at the same anatomical area on both US and CT/MR sequentially. Then system will be updated with new registration information.

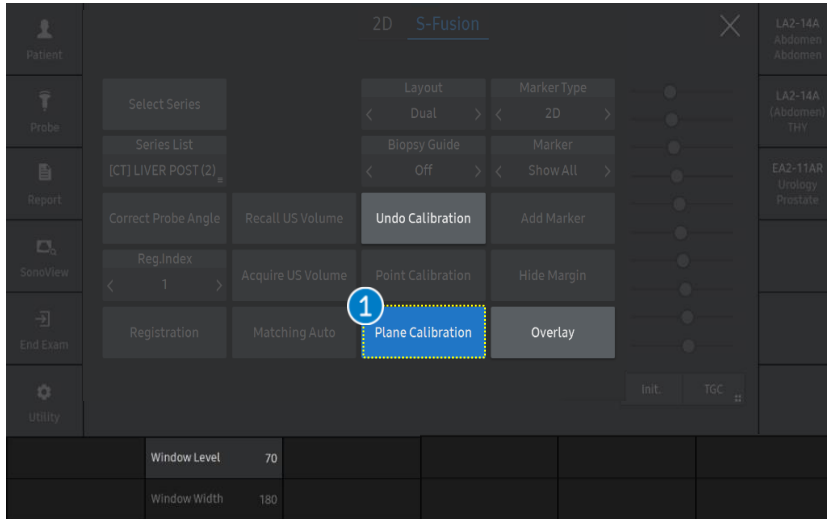
3 W.Level

Adjusts the "Brightness" of CT/MR data.

4 W.Width

Adjusts the "Contrast" of CT/MR data.

6. Calibration_ 2) Plane Calibration



1 Plane Calibration

When you select [Plane Calibration] button on the touch screen, you will be able to adjust the plane of CT/MR datasets.

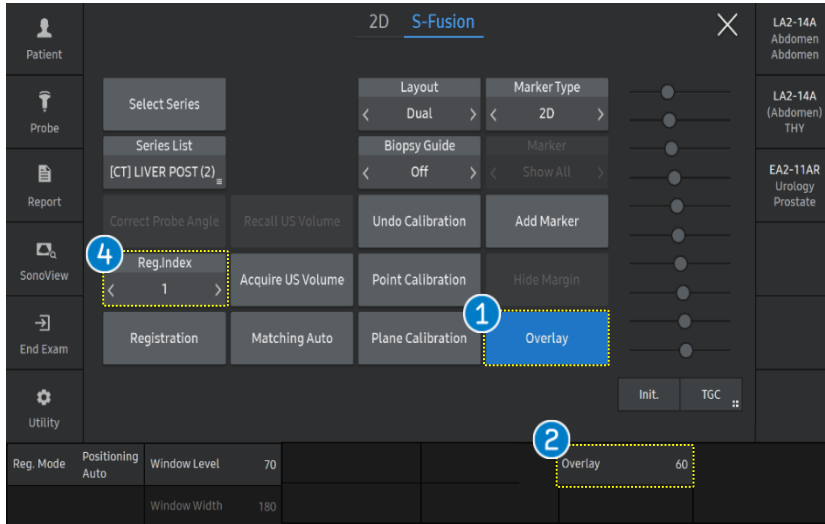
2 Match the same plane

Based on US image, you can adjust the CT/MR data.

- Up, Down, Right and Left direction using [Horizontal] of the [Change] button on the control panel.
- Angle of CT/MR image data by using the [Angle] button on the control panel.
- Select the slice of CT/MR image data by using the [Vertical] of the [Change] button on the control panel.

After matching the US image, press the [Set] button on the control panel.

6. Calibration_ 3) Overlay

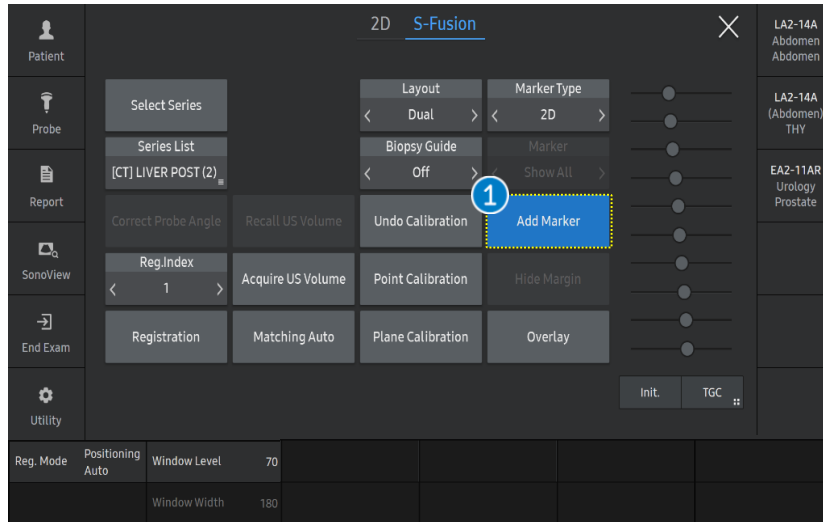


<p>1 Overlay</p>	<p>The real time US Image will be superimposed over the MR Images. Available to turn this function on or off.</p>
<p>2 Overlay Level(%)</p>	<p>When the level is increased, the US image will be more superimposed. If the level is decreased, the CT/MR data will be more superimposed.</p>



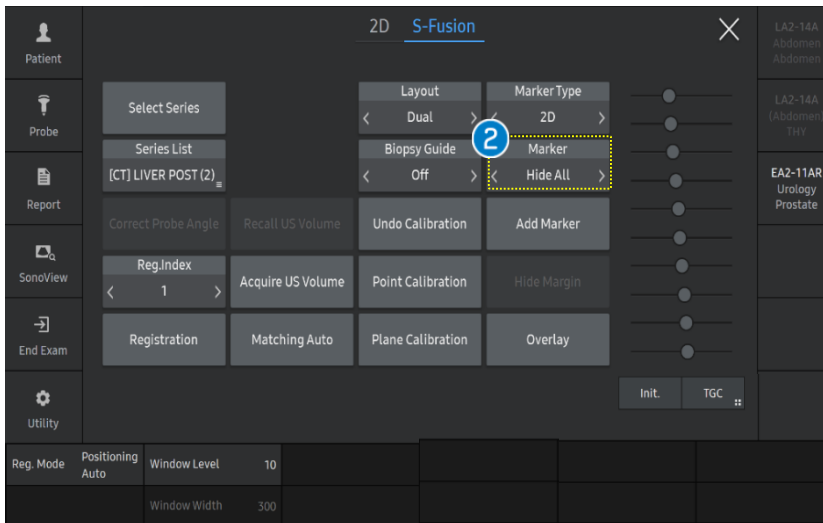
<p>3 Superimposed image</p>	<p>Superimposed image will be displayed based on Overlay level. You can also registration between US and CT/MR images by Plane Calibration.</p>
<p>4 Reg.Index</p>	<p>Selects the saved registration.</p>

7. Marker- Add and hide marker



1 Add Marker

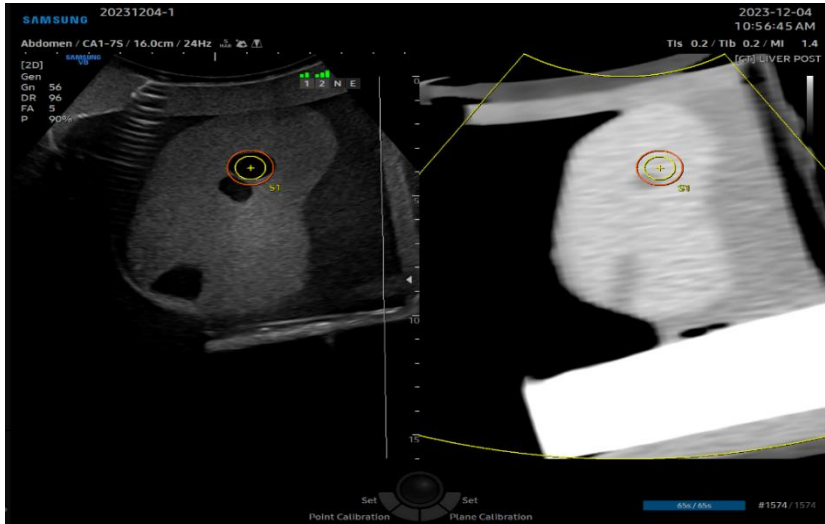
Tap the [Add Marker] on the touch screen.



2 Hide Marker

Tap the [Hide Marker] on the touch screen to hide all the marker.

7. Marker- Marker type



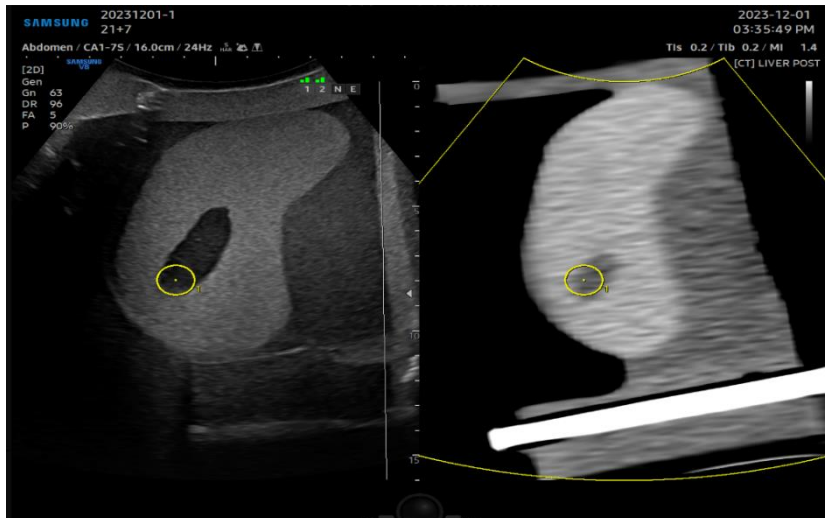
1 Set the marker

Set the point on either the US image or CT/MR image, then this marker can be used to flag the location of a point of interest.

Marker Type
< Sphere >

★Tips

The shape of position marker will be displayed differently depends on the distance to the cross section.

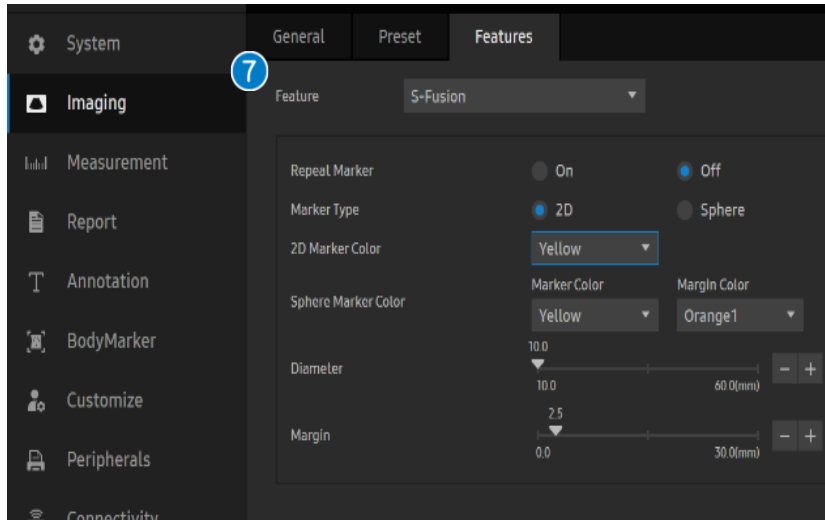
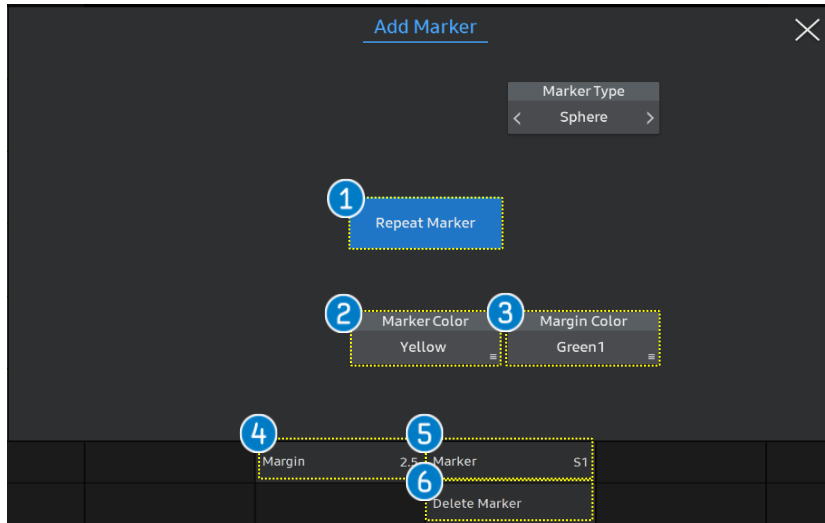


2 Set the Marker

Set the point on either the US image or CT/MR image, then this marker can be used to flag the location of a point of interest.

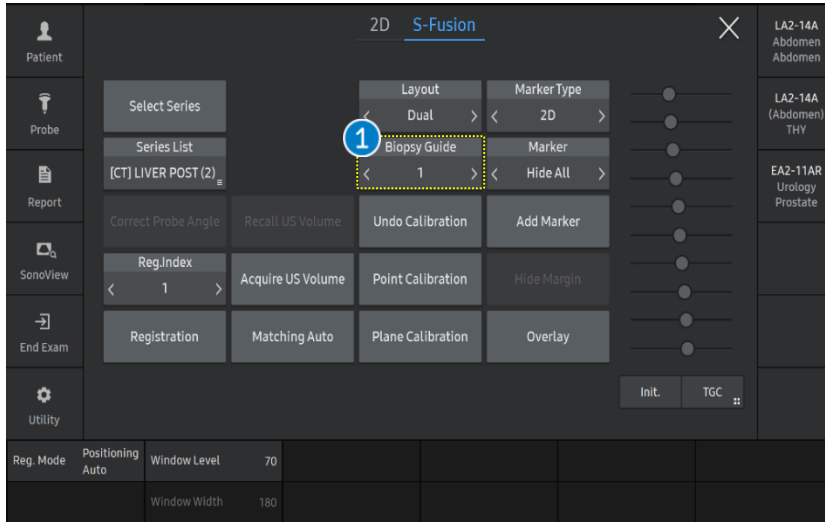
Marker Type
< 2D >

7. Marker- Marker setting



① Repeat Marker	Press it if you want to mark the marker repeatedly.
② Change Marker Color	Change Marker color.
③ Change Margin Color	Change Margin Color when marker type is sphere.
④ Margin size	Adjust margin size when marker type is Sphere.
⑤ Marker	Select the marker you want to delete.
⑥ Delete Marker	Press it to delete marker.
⑦ Setup	Go to Setup > Imaging > Features to set initial setup for Marker type, color, diameter, etc.

8. Biopsy On/Off

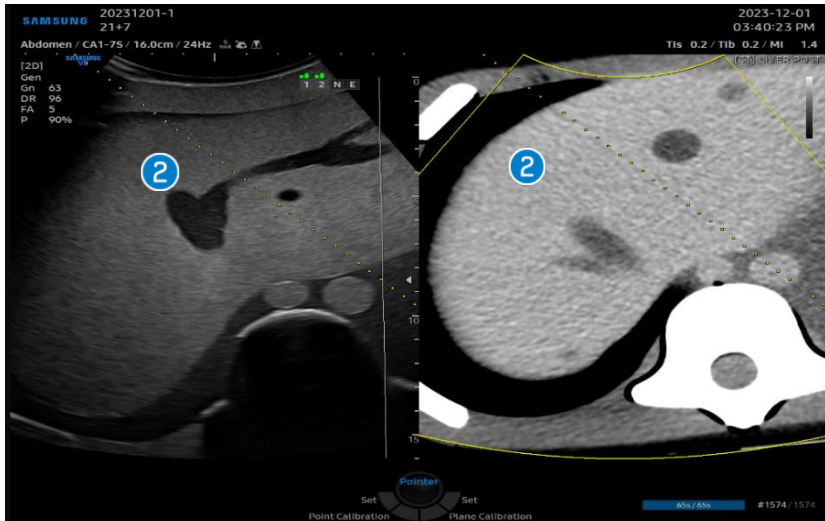


1 Biopsy On/Off

The Biopsy guideline appears on US images.

★Tips

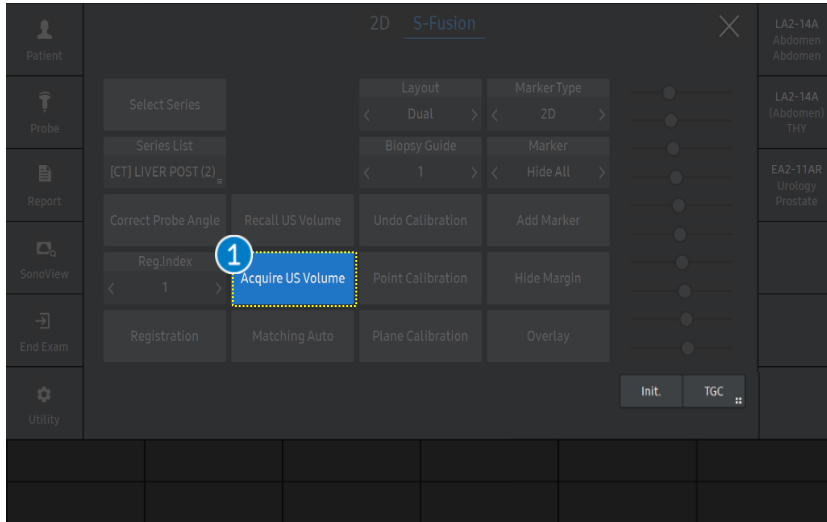
Number below (1~3) indicates number on the biopsy bracket. You can adjust the angle of biopsy line rotating flexible key.



2 Display the biopsy line

Biopsy line will appeared on the monitor screen. If the biopsy guideline displayed on the screen are incorrect, access to the [Utility] and press the [Edit] button to calibrate properly.

9. Acquire/Recall US Volume

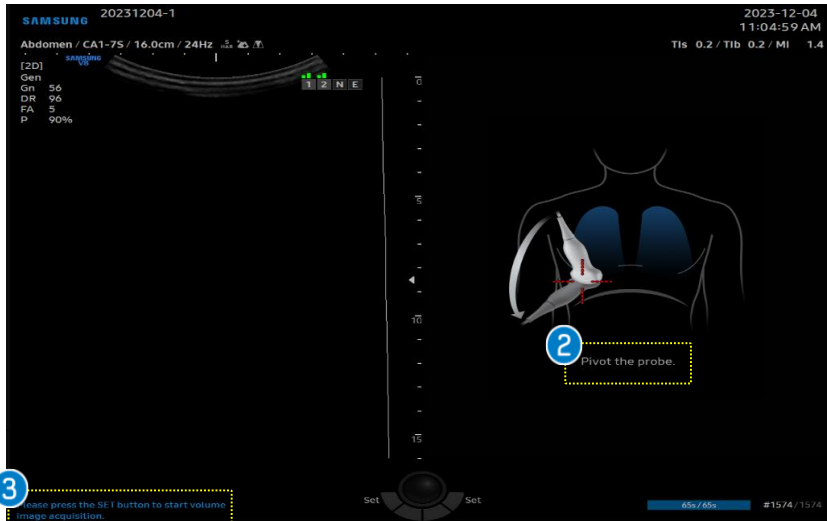


1 Acquire US Volume

If you tap the [Acquire US Volume], the screen will switch to the Dual mode automatically.

★Tips

This function is useful to check US image before and after procedures such as RFA, Biopsy etc.



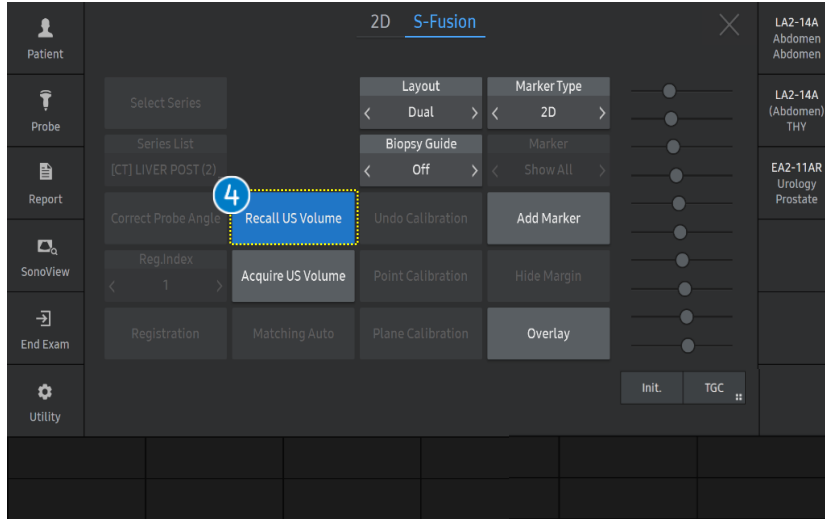
2 Acquire volume data

Following this guideline 'Pivot the probe' and acquire US volume to save a Freehand 3D dataset.

3 Finish the volume acquisition

After acquiring dataset, Please press the [Set] button on the control to end the volume acquisition.

9. Acquire/Recall US Volume



4 Recall US Volume

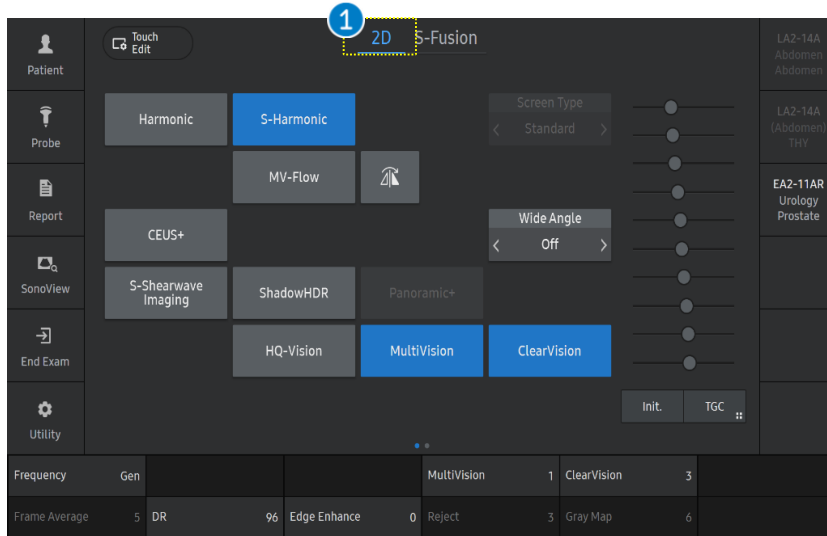
Tap the [Recall US Volume] to load the acquired 3D Volume. The last acquired US volume data will be displayed on the right side of the monitor screen.



5 Acquired US Volume data

The acquired US volume data will be displayed the right side of the monitor screen, it can be useful to compare between previous US image and current US image.

10. Image Parameters



1 2D

Select the [2D] button to change parameters on 2D mode.

★Tips

You can enter 2D, C, PD, Elastoscan+(only on Linear), CEUS+, S-Shearwave, MV-flow, HQ-Vision, mode.

- The features, options may not be commercially available in some countries.
- Sales and shipments are effective only after the approval by the regulatory affairs. Please contact your local sales representative for further details.
- This Quick guide does not include all of the details of instruction, for more detail, please refer to V series User Manual.
- Do not distribute this document to customers unless relevant regulatory and legal affairs officers approve such distribution.
- This User Quick Guide is based on V series V1.05.
- Disclaimer: Some Images in this content were obtained from other system.

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