

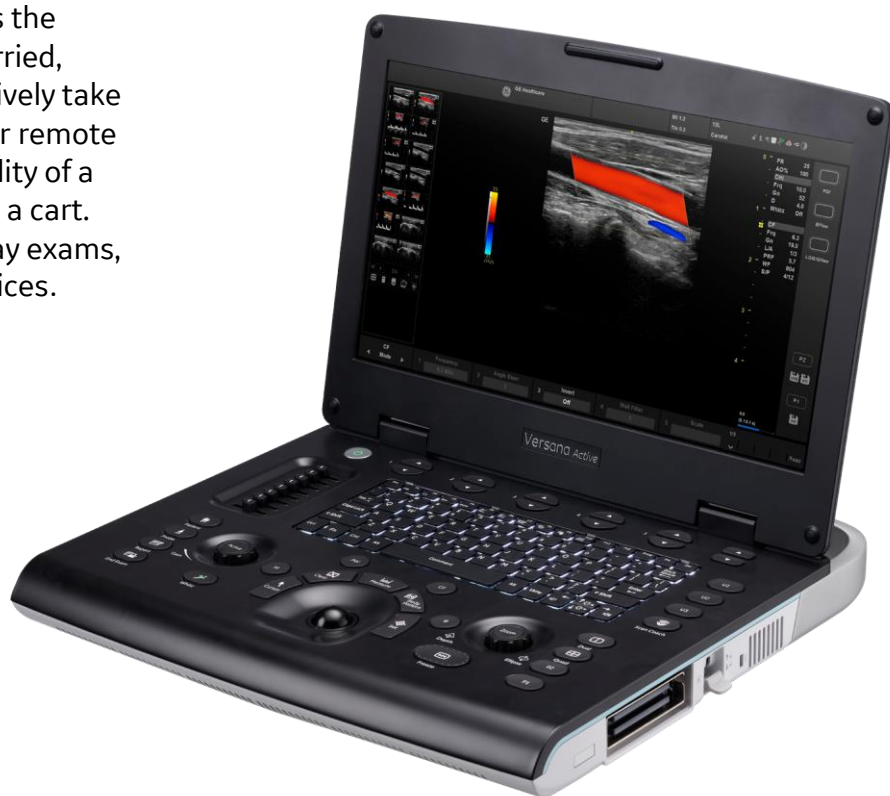


Versana Active

Ultrasound System

Specification sheet

Versana Active™ ultrasound system delivers the imaging capability of a console in a hand-carried, lightweight package that enables you to actively take your system to your patients, on premises or remote facilities. This reliable system brings the agility of a laptop unit with capability for attaching it to a cart. Adaptable to cover a broad range of everyday exams, it is easy to carry to clinics and physician offices.



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1. General specifications

1.01 Dimensions and weight

Height	58 mm
Width	390 mm
Length	362 mm
Weight (no Peripherals)	5.0 kg with battery

1.02 Electrical power

Voltage: 100 – 240 VAC

Frequency: 50/60 Hz

Power consumption: No more than 200 VA with peripherals

1.03 Console design

1 in built active probe ports

Integrated SSD (256 GB standard)/(1TB option)

Integrated speakers

2. User interface

2.01 Operator keyboard

Full alphanumeric keypad covered with washable protection film

8 TGC pods

2.02 Monitor

15.6" (344.16 x 193.59 mm) high-resolution LCD (1920 x 1080 pixels)

Brightness/contrast/color temperature adjustment

3. System overview

3.01 Applications

Abdominal

Obstetrical

Gynecological

Small parts

Musculoskeletal

Vascular/peripheral vascular

Urological

Applications (cont.)

Pediatric

Cardiac

Thoracic

Transcranial

Transvaginal

Transrectal

3.02 Scanning methods

Electronic convex

Electronic linear

Electronic micro convex

Electronic sector

3.03 Transducer type

Convex array

Linear array

Microconvex array

Sector phased array

3.04 Operating modes

B-Mode

Coded Harmonic Imaging

M-Mode

Anatomical M-Mode (option)

Curved AMM (option)

Color M-Mode

Color Flow mode (CFM)

Power Doppler Imaging (PDI)

Directional PDI

B-Flow™ (B-Flow Color) (option)

PW Doppler with high PRF

CW Doppler mode (option)

Contrast agency detection (option)

TVI mode (option)

Elastography (option)

4. System standard features

Installation wizard

Whizz

CrossXBeam™

SRI-HD (High Definition Speckle Reduction Imaging)

B-Steer

Coded Phase Inversion Harmonic Imaging

Virtual Convex

Patient information database

Image Archive on integrated SSD

Raw Data Analysis

Voice comments

Real-time automatic Doppler calculations

OB Calculations

Fetal Trending

Multi-gestational calculations

Hip dysplasia calculations

Gynecological calculations

Vascular calculations

Breast Productivity

Urological calculations

Renal calculations

Cardiac calculations

On-board reporting package

MPEGvue

Network storage

Remote capability: InSite™ Exc

My Trainer

Scan Assistant

Standby

QAnalysis

5. System options

CW Doppler

Anatomical M-Mode

Curved AMM

LOGIQ View

Advanced 3D (Easy 3D)

B-Flow (B-Flow color)

Tissue Velocity Imaging (TVI)

TVM

Auto Bladder (Dynamic image optimization,
Auto measurement and Auto annotation)

Stress Echo

Scan Coach

Auto EF

Sono Biometry (BPD/HC/AC/HL/FL)

Auto IMT

Breast Care

Thyroid productivity	A package in thyroid measurement with including measurement and relevant description (Includes TI-RADS ACR)
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Needle recognition

Follow-up tool

DICOM® 3.0 Connectivity

Tricefy™ Uplink

Contrast agency detection

Elastography

6. Peripheral Options

Sony UP-D898MD B/W thermal printer

Sony UP-D25MD Color thermal printer

1-pedal and 3-pedal type footswitch

USB stick

External USB HDD

DVD RW kit

USB Wireless adaptor: sales availability varies in different countries

ECG Module

HP Office 200 printer

Bluetooth adapter

7. Display modes

7.01 Live and stored display format

Widescreen	<ul style="list-style-type: none"> • Full size and split screen • Both with thumbnails for still and Cine
Review image format	4x4 and thumbnails for still and Cine format
Simultaneous capability	<ul style="list-style-type: none"> • Dual B (B/B) • B + CFM/PDI • B + PW/M • B + CFM + M • Real-time triplex mode (B + CFM/PDI+PW) • B + B-Flow/B-Flow Color
Zoom	Write (HD)/read 67X
Colorized Image	<ul style="list-style-type: none"> • Colorized B • Colorized B-Flow • Colorized M • Colorized PW • Colorized CW • Colorized 3D
Timeline display	<ul style="list-style-type: none"> • Independent dual B/PW or CW display • Display Format <ul style="list-style-type: none"> – Top/bottom selectable format (Size: 1/2:1/2; 1/3:2/3; 2/3:1/3) – Side/side selectable format (Size: 1/2:1/2; 1/4:3/4; TL only)
Virtual Convex LOGIQ View	

8. Selectable alternating modes

B/M/PW/CW/CF/PDI/TVI/TVD

B + B

B + M

B + PW/CW

B + CFM/PDI

B + CFM/PDI + PW/CW

B + TVI

B + TVI + TVD

Multi-image split screen (quad screen)

Live/Frozen

Independent CINE playback

9. Display annotation

9.01 General user interface

Patient name: First, last (up to 64 total characters)

Patient ID (Up to 64 characters)

Other ID (Up to 64 characters)

Age, gender and date of birth

Hospital name

Date format:
3 types selectable

- MM/DD/YYYY
- DD/MM/YYYY
- YYYY/MM/DD

Time format:
2 types selectable

- 24 hours
- 12 hours

Gestational age from

- LMP
- EDD
- GA
- BBT

Displayed Acoustic Output

- TIs: Thermal Index Soft Tissue
- TIc: Thermal Index Cranial (Bone)
- TIb: Thermal Index Bone
- MI: Mechanical Index

% of maximum power output

Probe name

Map name

Probe orientation

Depth scale marker

Lateral scale marker

Focal zone marker

Image depth

Zoom depth

9.02 B-Mode

Gain

Dynamic range

Imaging frequency

Edge enhance

Frame average

Frame rate

Gray map

SRI-HD

CrossXBeam

9. Display annotation *(cont.)*

9.03 Color Flow Mode

Line density

Frame average

Packet size

Color velocity range and baseline

Color threshold marker

Color gain

Inversion

Frequency

9.04 PDI Mode

Line density

Frame average

Packet size

Directional PDI

Color velocity range and baseline

Power threshold marker

PDI Gain

Inversion

9.05 B-Flow/B-Flow Color Mode

Gain

Background

SRI HD

Accumulation

Flow Type/Model

Rejection

Colorize

Edge Enhance

Gray Map

Frame Average

Power Output

Sensitivity/PRI

Dynamic Range

Frequency

Suppression

Flash Suppression

9.05 B-Flow/B-Flow Color Mode *(cont.)*

Enhance

Threshold

Map Compress

Map

Wall Filter

Transparency

9.06 M-Mode

Gain

Dynamic Range (Use the Dynamic Range of B-Mode)

Time Scale

AMM

9.07 Doppler Mode

Gain

Angle Correct

Sample Volume Depth and Sample Volume Length

Wall Filter

Velocity and/or Frequency Scale

Spectrum Inversion

Time Scale

Scale

Doppler Frequency

9.08 Elastography

Frequency

Soft Compress

Hard Compress

Scale

9.09 Contrast

Visualization

Contrast Clock1

Contrast Clock2

Contrast Only

Dual View

9. Display annotation (cont.)

9.09 Contrast (cont.)

Trigger Off

Time Delay

Dynamic Range

Frequency

SRI HD

Colorize

Gray Map

Frame Average

Line Density

Accumulation

Hybrid Map

Visualization

Flash

ContrastTech

Max Enhance

Contrast Only

Target MI

9.10 Easy 3D

Utilities

Texture

Gray Surface

Render

Threshold1

Threshold2

Scan Distance

Colorize

9.11 Advanced 3D

DefineAxis

Group Planes

Reslice

Tile

10. General system parameters

10.01 System setup

10 Pre-programmable Categories

User Programmable Preset Capability

Factory Default Preset Data

Languages

English, Latin American Spanish, French, German, Italian, Brazilian Portuguese, Chinese (simplified), Swedish, Russian, Norwegian, Danish, Dutch, Finnish

OB Report Formats

Tokyo Univ., Osaka Univ., USA, Europe, and ASUM

User defined annotations

Body patterns

Customized comment home position

10.02 System scanning parameters

Digital Agile Beamformer Architecture

223907 system processing channels

Max. Frame Rate: 1790 fps, probe dependents and modes

Displayed Imaging Depth: 1 – 33 cm

Minimum Depth of Field: 0 – 1 cm, probe dependent

Maximum Depth of Field: 0 – 33 cm, probe dependent

Transmission Focus: 1 – 8 Focal Points selectable, probe dependent and application

Quad Beamforming

Continuous Dynamic Receive Focus/Aperture

Multi-Frequency/Wideband Technology

Frequency Range: 1.7 to 18 MHz

256 Shades of Gray

269 dB systematic Dynamic Range

Adjustable Field of View (FOV): up to 168 degree, probe dependent

Image Reverse: Right/Left

Image Rotation of 0° 90°180° 270°

10. General system parameters

(cont.)

10.03 B-Mode

Acoustic power output	0 – 100%, 2, 5 and 10 steps
Gain	From 0 – 90 dB, 1 dB per step
Adjustable dynamic range	36 – 96 dB, 3 or 6 dB per step
Frame averaging	8 steps
Gray scale map	6 or 8 types, probe and application dependent
B colorization	9 types
Frequency	Up to 4 selectable, probe dependent
Line density	5 – 7 steps, probe dependent
Line density zoom	5 – 7 steps, probe dependent
Thermal index	TIC, TIS, TIB
Image reverse	On/off
Focus number	8 steps
Focus width	3 types
Suppression	6 steps
Edge enhance	7 steps
Rejection	6 steps
Steered linear	$\pm 12^\circ$, $\pm 15^\circ$, probe dependent
Scanning size (FOV or angle, probe dependent)	
SRI-HD	Up to 8 levels selectable
CrossXBeam	Up to 9 angles selectable, probe dependent
Depth	1-33 cm, 0.5, 1 or 2 cm per step, probe dependent

10.04 Coded Harmonic Imaging

Coded Phase Inversion Harmonic Imaging

Available on all probes

Line density	5 or 6 steps, probe dependent
Line density zoom	5 or 6 steps, probe dependent
Suppression	6 steps
Edge enhance	7 steps
Gray scale map	6 or 8 types, probe and application dependent
Tint map	9 types

10.04 Coded Harmonic Imaging (cont.)

Gain	0 – 90 dB, 1 dB per step
Dynamic range	51 – 78 dB, 3 dB per step; 36 – 48 dB/78 – 96 dB, 6 dB per step;
Rejection	6 steps
Frequency	Up to 4 steps, probe dependent

10.05 SRI-HD

High Definition Speckle Reduction Imaging Provides multiple levels of speckle reduction

Compatible with side-by-side DualView display

Compatible with all linear, convex and sector transducers

Compatible with B-Mode, 3D/4D imaging

10.06 CrossXBeam

Provides 3, 5, 7, 9 of spatial compounding

Live side-by-side DualView display

Compatible with	• Color Mode	• PW
	• SRI-HD	• Coded Harmonic
	• Virtual Convex	Imaging

Available on 4C-RS, L6-12-RS, E8C-RS, E8Cs-RS, 8C-RS, L8-18i-RS, 9L-RS, 12L-RS, LK760-RS,

10.07 Color Flow Mode

Baseline	0 – 100%, 10% per step
Invert	Off/on
CF/PDI focus depth	Default pre-settable for 10 – 100% of ROI in depth, 15% or 20% per step
CF/PDI flash suppression	5 steps
CF/PDI angle steer	0, $\pm 10^\circ$, $\pm 15^\circ$, $\pm 20^\circ$, probe dependent
Packet size	8 – 24, probe and application dependent
Line density	5 steps
Line density zoom	5 steps
Frame average	7 steps
PRF	0.1 – 27.2 KHz
Spatial filter	6 steps
Gain	0 – 40 dB, 0.5 dB per step

10. General system parameters

(cont.)

10.07 Color Flow Mode (cont.)

Wall filter	4 steps, probe and application dependent
Scanning size (FOV or angle)	probe dependent
CF/PDI vertical size (mm) of ROI	Default pre-settable
CF/PDI center depth (mm) of ROI	Default pre-settable
CF/PDI frequency	Up to 5 steps, probe dependent
Color maps, including velocity-variance maps	20 types, probe and application dependent
Transparent map	5 steps
Color threshold	0 – 100%, 10% per step
Accumulation	8 steps

10.08 Power Doppler Imaging Mode

PDI map	14 types
CF/PDI focus depth	Default pre-settable for 10 – 100% of ROI in depth, 15% or 20% per step
CF/PDI acoustic output	0 – 100%, 2%, 5% or 10% per step
CF/PDI angle steer	0, $\pm 10^\circ$, $\pm 15^\circ$, $\pm 20^\circ$, probe dependent
Packet size	8 – 24, probe and application dependent
Spatial filter	6 steps
Frame average	7 steps
PRF	0.1 – 26 KHz
Power threshold	0 – 100%, 10% per step
Gain	0 – 40 dB, 0.5 dB per step
Wall filter	4 steps, probe and application dependent
CF/PDI frequency	Up to 5 steps, probe dependent
Transparent map	5 steps
Invert	On/off
Accumulation	8 steps

10.09 M-Mode

Gain	-20 – 20 dB, 1 dB per step
Gray scale map	6 or 8 types, probe dependent
Colorization	9 types
Scanning size (FOV or angle, probe dependent, see probe specifications)	
Rejection	6 steps
Compression	13 steps
Sweep Speed	8 steps
M/PW display format	Vert 1/3B, Vert 1/2B, Vert 2/3B, Horiz 1/2B, Horiz 1/4B, TL only

10.10 Anatomical M-Mode (option)

M-Mode cursor adjustable at any plane

Can be activated from a Cine loop from a live or stored image

Measure and analysis capability

Available with Color Flow mode

Curved AMM

10.11 Pulse Wave Doppler Mode

Acoustic power	0 – 100%, 2, 5 and 10 steps
Gain	0 – 85 dB, 1 dB per step
Gray scale map	Up to 8 types
PRF	0.3 – 27.9 KHz
Transmit frequency	1.7 - 10 MHz, probe dependent
Wall filter	5.5 – 5000 Hz, 27 steps, probe dependent
PW colorization	Up to 6 types
Velocity scale range	0.1 – 7011 cm/s
Sample volume depth	0.1 – 33 cm, probe dependent
Sweep speed	0 – 7, 8 steps
SV gate	1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16 mm
Angle correction	-90° - 90°, 1° per step
M/PW display format	Vert 1/3B, Vert 1/2B, Vert 2/3B, Horiz 1/2B, Horiz 1/4B, TL only
Spectrum inversion	Off/on
Simultaneous	Off (PW only)/on

10. General system parameters

(cont.)

10.11 Pulse Wave Doppler Mode (cont.)

PW angle steer	0, ±10°, ±15°, ±20° (use angle steer of B-Mode), probe dependent
Trace method	Off, Max, Mean
Baseline shift	11 steps
Auto Calcs/Doppler Auto Trace	Off, Frozen, Live
Compression	0.5 – 2.4 (0.5, 0.7, 0.9, 1, 1.1, 1.4, 1.6, 2, 2.4)
Trace direction	Above, Below, Both
Trace sensitivity	0 – 40, 2 per step

10.12 Continues Wave Doppler Mode

Gray scale map	8 types
Baseline	11 steps
Angle correct	-90° – 90°, 1° per step
Spectral color	6 types
Invert	Off/on
Cycles to average/ Spectral averaging	5 steps
Gain	0 – 85 dB, 1 dB per step
Wall filter	5.5 – 5000 Hz, 27 steps, dependent on probe and application
CW-Mode includes	<ul style="list-style-type: none"> • Transmit frequency: 1.9, 4.2, 5.0, 6.2 MHz • CW colorization: tint map A/B/C/D/E/F • Velocity scale range: 0.2 – 6105 cm/s • Spectrum inversion • Trace method: Max, Mean, Off • Auto Calcs/Doppler Auto Trace: Frozen, Live, Off • Trace direction: Above, Below, Both

Trace sensitivity: 0 – 40, 2 per step

10.13 Cine memory/image memory

384 MB of Cine memory

Selectable Cine sequence for Cine review

Prospective Cine mark

Measurements/calculations and annotations on Cine playback

Scrolling timeline memory

Dual image Cine display

Quad image Cine display

10.13 Cine memory/image memory (cont.)

Cine gauge and Cine image number display

Cine review loop

Cine review speed	11 steps (11, 13, 14, 17, 22, 25, 31, 48, 100, 200, 400%)
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10.14 Image storage

On-board database of patient information

Conversion to formats	JPEG, AVI, WMV
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Live image and stored image side-by-side display

Reload of archived data sets

Network storage support for Import, Export, DICOMRead, SaveAs, MPEGvue

Storage formats	<ul style="list-style-type: none"> • DICOM – compressed/uncompressed, single/multi-frame, with/without Raw Data • Export JPEG, WMV (MPEG 4) and AVI formats • DICOM still image storage size: ~4.1 MB • Display format: full size, 4x4 and thumbnails
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Storage devices	<ul style="list-style-type: none"> • Internal hard drive partition of 100 GB (256 GB console), and 814 GB (1TB console option) for image storage • External USB HDD and USB memory stick support for Import, Export, DICOM Read, SaveAs, and MPEGvue • CD-RW storage: 700 MB • DVD storage: -R (4.7 GB)
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10.15 Connectivity and DICOM

Ethernet network connection	<ul style="list-style-type: none"> • DICOM 3.0 (option) • Verify • Print • Store • Modality worklist • Storage commitment • Modality Performed Procedure Step (MPPS) • Query/retrieve • Structured reporting template (can be compared to vascular and OB standard) • Remote capability InSite™ Exc
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10. General system parameters

(cont.)

10.16 Virtual convex

Provides a convex field of view

Compatible with CrossXBeam for linear transducers

Available on linear and sector transducers

10.17 LOGIQView (option)

Extended Field of View Imaging

Available on 4C-RS, L6-12-RS, 8C-RS, 3Sc-RS, E8C-RS, E8Cs-RS, L8-18i-RS, 6S-RS, LK760-RS, 12L-RS, 9L-RS, 12S-RS probes

For use in B-Mode

CrossXBeam is available on linear probes

Auto detection of scan direction

Post-process zoom

Rotation

Auto fit on monitor

Measurements in B-Mode

Up to 60 cm scan length

10.18 Easy 3D (option)

Allows unlimited rotation and planar translations

3D reconstruction from Cine sweep

Utilities: Average off/Average light/Average medium/Average strong

Gray surface: Off/on

Threshold1: 0 – 255

Threshold2: 0 – 255

Scan distance: 1.0 – 15.0

Colorize: 0 – 360

10.19 Advanced 3D (option)

Define axis: Select 2 points as start and end point of long axis

Group planes: Off/Main/Parallel/Angular

Reslice: Cube/Virtual Rescan/Cubic Plane

Tile: 1/2/4/6

10.20 Elastography (option)

Available on L6-12-RS, 9L-RS, 12L-RS

Semi-quantification	<ul style="list-style-type: none">• Frame reject: 0 – 8• Axial smoothing: 0 – 4• Noise reject: 0 – 8• Sample Volume: 0 – 4, depend on probe• Lateral smoothing: 0 – 4• Window: 0 – 8• Map: 8• Frame average: 0 – 10• Line Density: 0 – 4• Soft compress: 0 – 10• Hard compress: 0 – 10
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10.21 Contrast agency detection (option)

Available on 4C

- Line density: 0 – 4
- SRI HD: 0 – 2
- Suppression: 0 – 5
- Frame average: 0 – 7
- Dynamic range: 36 – 96 dB
- Rotation: Up/down
- Modes/Frequency: Pen (Penetration), Gen (General) and Pes (Resolution) and
- Display tissue image and contrast-enhanced image simultaneously in split screen
- 2 contrast timers
- Time delay: 0.3 – 10 seconds
- Accumulation mode: 8 steps
- Max Enhance: On/Off
- Gray map: 10 types

10.22 B-Flow (option)

Available on 4C-RS, L6-12-RS, 12L-RS, 9L-RS

Background	On/off
Sensitivity/PRI	1 – 50, 17 steps
Line density	5 steps
Edge enhance	7 steps
Frame average	0 – 7, 8 steps
Gray scale map	8 maps
Tint map	5 maps
Dynamic range	36 – 96 dB, 16 steps
Rejection	6 steps
Gain	0 – 90 dB range, 1 dB per step
B-Flow Color	
Accumulation	8 levels

10. General system parameters

(cont.)

10.23 TVI (option)

Myocardial Doppler imaging with color overlay on tissue image

Available on the sector probes

Tissue color overlay can be removed to show just the 2D image, still retaining the tissue velocity information

QAnalysis: Multiple Time Motion trace display from selected points in the myocardium

10.24 TVM (option)

TVI with M-Mode active

Available on the sector probes

Provides both myocardium motion velocity and direction

10.25 Stress Echo (option)

Advanced and flexible stress echo examination capabilities

- Provides exercise and pharmacological protocol templates
- 8 default templates
- Template editor for user configuration of existing templates or creation of new templates
- Reference scan display during acquisition for stress level

Comparison (dual screen)

- Baseline level/Previous level selectable
- Raw data continuous capture
- Over 87.5 seconds available
- Wall motion scoring (bulls eye and segmental)
- Smart stress: Automatically set up various scanning parameters (geometry, frequency, gain, etc.) according to same projection on previous level

10.26 Follow-up tool (option)

The follow-up tool is intended to more accurately perform serial scans on a patient, and compare the images of a previous ultrasound exam with the current exam.

10.27 Breast care (option)

Breast care is a customizable workflow designed for breast scanning. With its guiding, user can complete various modes of imaging, measurement, lesion BI-RADS® classification, and find positive area efficiently. That's an easy reference in the device when patient is in subsequent visit.

10.28 Needle recognition (option)

Needle recognition allows you to obtain precise needle imaging in the dashed box. It is available with probes on L6-12-RS, 12L-RS, 4C-RS, 9L-RS.

10.29 Scan Coach (option)

Scan Coach is a contextual reference tool. It is with clinical guidance for scan plane acquisition and references for anatomical structures. It can be displayed on-demand by the user. Clinical reference images & animations to depict information related to each step. It covers five applications.

- Abdomen
- Obstetrics
- Gynecology
- Cardiology
- Vascular

10.30 MyTrainer

Abstracted from basic user manual, it lists out FAQs from customers and instructs customer how to solve problems by themselves timely.

10.31 Battery (option)

The lithium ion battery provides power when an AC power source is not available.

10.32 Scan Assistant

Scan Assistant provides an automated exam script that moves you through an exam step-by-step. This allows you to focus on performing the exam rather than on controlling the system and can help you to increase consistency while reducing keystrokes.

10.33 InSite™ Exc

InSite™ Exc is a direct link with a GE Online Service Engineer, Applications Support Engineer or a Request for Service.

10.34 Whizz

Whizz will continuously optimize the brightness, contrast and uniformity of B-Mode images when scanning different tissues. Whizz in PW/CW Doppler Mode optimizes the spectral data. Auto adjusts the Velocity Scale/PRF (live imaging only), baseline shift, and invert (if preset). Upon deactivation, the spectrum is still optimized.

10. General system parameters

(cont.)

10.35 Controls available while “live”

Write Zoom

B/M-Mode

- Gain
- TGC
- Dynamic Range
- Acoustic Output
- Transmission Focus Position
- Transmission Focus Number
- Line Density Control
- Sweep Speed for M-Mode
- Number of Angles for CrossXBeam

PW-Mode

- Gain
- Acoustic Output
- Transmission Frequency
- Scale
- Wall Filter
- Sample Volume Gate
 - Length
 - Depth
- Volume

Color Flow Mode

- CFM Gain
- CFM Velocity Range
- Acoustic Output
- Wall Filter
- Packet Size
- Line Density
- CFM Spatial Filter
- CFM Frame Average
- Frequency/Velocity Baseline Shift

10.36 Controls available on Freeze or Recall

SRI-HD

CrossXBeam – Display non-compounded and compounded image simultaneously in split screen

Easy 3D reconstruction from a stored Cine loop

CrossXBeam is disabled on Freeze or Recall

TGC

Colorized B and M

Frame average (loops only)

Dynamic range

Anatomical M-Mode

GrayMap

Post gain

Baseline shift (PW, CW)

Sweep speed

10.36 Controls available on Freeze or Recall (cont.)

Compression

Rejection

Colorized spectrum

Display format

Angle Correct

Quick Angle Correct

Overall gain (loops and stills)

Color map

Transparency map

CFM display threshold

Invert for Color/Doppler

11. Measurements/calculations

11.01 General B-Mode

Depth and distance

Circumference (ellipse/trace)

Area (ellipse/trace)

Volume (ellipsoid)

% Stenosis (area or diameter)

Angle between 2 lines

11.02 General M-Mode

Depth

Distance

Time

Slope

Heart rate

11.03 General Doppler measurements/calculations

Velocity

Time

A/B ratio (velocities)

PS (Peak Systole)

ED (End Diastole)

11. Measurements/calculations

(cont.)

11.03 General Doppler measurements/calculations (cont.)

PS/ED (PS/ED ratio)

ED/PS (ED/PS ratio)

AT (Acceleration Time)

ACCEL (Acceleration)

TAMAX (Time Averaged Maximum Velocity)

Volume Flow (TAMEAN and vessel area)

Heart Rate

PI (Pulsatility Index)

RI (Resistivity Index)

11.04 Real-time Doppler auto measurements/calculations

PS (Peak Systole)

ED (End Diastole)

MD (Minimum Diastole)

PI (Pulsatility Index)

RI (Resistivity Index)

AT (Acceleration Time)

ACC (Acceleration)

PS/ED (PS/ED Ratio)

ED/PS (ED/PS Ratio)

HR (Heart Rate)

TAMAX (Time Averaged Maximum Velocity)

PVAL (Peak Velocity Value)

Volume Flow (TAMEAN and Vessel Area)

11.05 OB measurements/calculations

Gestational age by	<ul style="list-style-type: none"> • GS (Gestational Sac) • CRL (Crown Rump Length) • FL (Femur Length) • BPD (Biparietal Diameter) • AC (Abdominal Circumference) • HC (Head Circumference) • APTD x TTD (Anterior/Posterior Trunk Diameter by Transverse Trunk Diameter)
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Trunk Diameter	<ul style="list-style-type: none"> • FTA (Fetal Trunk Cross-sectional Area) • HL (Humerus Length) • BD (Binocular Distance) • FT (Foot Length) • OFD (Occipital Frontal Diameter)
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11.05 OB measurements/calculations (cont.)

Trunk Diameter (cont.)	<ul style="list-style-type: none"> • TAD (Transverse Abdominal Diameter) • TCD (Transverse Cerebellum Diameter) • THD (Thorax Transverse Diameter) • TIB (Tibia Length) • ULNA (Ulna Length)
------------------------	---

Estimated Fetal Weight (EFW) by	<ul style="list-style-type: none"> • AC, BPD • AC, FL, HC 	<ul style="list-style-type: none"> • AC, BPD, FL, HC
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Calculations and ratios	<ul style="list-style-type: none"> • FL/BPD • CI (Cephalic Index) • FL/HC 	<ul style="list-style-type: none"> • CTAR (Cardio-Thoracic Area Ratio)
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SonoBiometry	<ul style="list-style-type: none"> • BPD • AC • FL 	<ul style="list-style-type: none"> • HC • HL
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Measurements/calculations by: ASUM, ASUM 2001, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chitty, Eik-Nes, Ericksen, Goldstein, Hadlock, Hansmann, Hellman, Hill, Hohler, Jeanty, JSUM, Kurtz, Mayden, Mercer, Merz, Moore, Nelson, Osaka University, Paris, Rempen, Robinson, Shepard, Shepard/Warsoff, Tokyo University, Tokyo/Shinozuka, Yarkoni

Fetal graphical trending

Growth percentiles

Multi-gestational calculations

Fetal qualitative description (anatomical survey)

Fetal Environmental Description (Biophysical profile)

Programmable OB tables

Over 20 selectable OB calculations

Expanded worksheets

11.06 GYN measurements/calculations

Right ovary length, width, height

Left ovary length, width, height

Uterus length, width, height

Cervix length, trace

Ovarian volume

ENDO (Endometrial thickness)

Ovarian RI

Uterine RI

Follicular measurements

11. Measurements/calculations

(cont.)

11.07 Vascular measurements/calculations

DCCA (Distal Common Carotid Artery)

MCCA (Mid Common Carotid Artery)

PCCA (Proximal Common Carotid Artery)

DICA (Distal Internal Carotid Artery)

MICA (Mid Internal Carotid Artery)

PICA (Proximal Internal Carotid Artery)

DECA (Distal External Carotid Artery)

PECA (Proximal External Carotid Artery)

VERT (Vertebral Velocity)

SUBCLAV (Systolic Subclavian Velocity)

Automatic IMT

11.08 Urological calculations

Volume (Auto bladder volume)

Prostate volume

Left/right renal volume

Generic volume

Post-void bladder volume

12. Cardiac measurements/calculations

12.01 B-Mode measurements

Aorta	<ul style="list-style-type: none"> • Aortic Root Diameter (Ao Root Diam) • Aortic Arch Diameter (Ao Arch Diam) • Ascending Aortic Diameter (Ao Asc) • Descending Aortic Diameter (Ao Desc Diam) • Aorta Isthmus (Ao Isthmus) • Aorta (Ao st junct)
Aortic valve	<ul style="list-style-type: none"> • Aortic Valve Cusp Separation (AVCusp) • Aortic Valve Area Planimetry (AVA Planimetry) • (Trans AVA)
Left atrium	<ul style="list-style-type: none"> • Left Atrium Diameter (LA Diam) • LA Length (LA Major) • LA Width (LA Minor) • Left Atrium Area (LAA(d), LAA(s)) • Left Atrium Volume, Single Plane, Method of Disk (LAEDV A2C, LAESV A2C) (LAEDV A4C, LAESV A4C)

12.01 B-Mode measurements (cont.)

Left ventricle	<ul style="list-style-type: none"> • Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) • Left Ventricle Length (LVLd, LVLs) • Left Ventricle Outflow Tract Diameter (LVOT Diam) • Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs) • Left Ventricle Length (LV Major) • Left Ventricle Width (LV Minor) • Left Ventricle Outflow Tract Area (LVOT) • Left Ventricle Mass Index (LVPWd, LVPWs) • Ejection Fraction, Teichholz/Cube (LVIDd, LVIDs) • Left Ventricle Posterior Wall Fractional Shortening (LVPWd, LVPWs) • Mitral Valve • E-Point-to-Septum Separation (EPSS) • Mitral Valve Area Planimetry (MVA Planimetry)
Pulmonic valve	<ul style="list-style-type: none"> • Pulmonic Diameter (Pulmonic Diam)
Right ventricle	<ul style="list-style-type: none"> • Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Outflow Tract Diameter (RVOT Diam)
System inferior vena cava	<ul style="list-style-type: none"> • Systemic Vein Diameter (Systemic Diam)

12.02 M-Mode measurements

Aorta	<ul style="list-style-type: none"> • Aortic Root Diameter (Ao Root Diam) • Aortic Valve Diameter (AV Diam) • Aortic Valve Cusp Separation (AVCusp) • Aortic Valve Ejection Time (LVET)
Left atrium & Left ventricle	<ul style="list-style-type: none"> • Left Atrium Diameter to Ao Root Diameter Ratio (LA/Ao Ratio) • Left Atrium Diameter (LA Diam) • Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs) • Left Ventricle Ejection Time (LVET) • Left Ventricle Pre-Ejection Period (LVPEP) • Interventricular Septum (IVS)
Mitral valve	<ul style="list-style-type: none"> • E-Point-to-Septum Separation (EPSS) • Mitral Valve Anterior Leaflet Excursion (D-E Excursion) • Mitral Valve D-E Slope (D-E Slope) • Mitral Valve E-F Slope (E-F Slope)

12. Cardiac measurements/ calculations *(cont.)*

12.02 M-Mode measurements *(cont.)*

Pulmonic valve	<ul style="list-style-type: none"> • QRS complex to end of envelope (Q-to-PV close) • Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Outflow Tract Diameter (RVOT Diam)) • Right Ventricle Ejection Time (RVET) • Right Ventricle Pre-Ejection Period (RVPEP)
Tricuspid valve	<ul style="list-style-type: none"> • QRS complex to end of envelope (Q-to-TV close)

12.03 Doppler mode measurements

Aortic valve	<ul style="list-style-type: none"> • Aortic Valve Mean Velocity (AVTrace) • Aortic Valve Velocity Time Integral (AVTrace) • Aortic Valve Mean Pressure Gradient (AVTrace) • Aortic Valve Peak Pressure Gradient (AR Vmax) • Aortic Insufficiency Peak Velocity (AR Vmax) • Aortic Insufficiency End-Diastolic Velocity (AR Trace) • Aortic Valve Peak Velocity (AV Vmax) • Aortic Valve Deceleration Time (AVTrace) • Aortic Valve Ejection Time (AVET) • Aortic Valve Area according to PHT
Left ventricle	<ul style="list-style-type: none"> • Left Ventricle Outflow Tract Peak Pressure Gradient (VLOT Vmax) • Left Ventricle Outflow Tract Peak Velocity (LVOT Vmax) • Left Ventricle Outflow Tract Mean Pressure Gradient (LVOT Trace) • Left Ventricle Outflow Tract Velocity Time Integral (LVOT Trace) • Left Ventricle Ejection Time (LVET)
Mitral valve	<ul style="list-style-type: none"> • Mitral Valve Regurgitant Mean Velocity (MR Trace) • Mitral Regurgitant Mean Pressure Gradient (MR Trace) • Mitral Regurgitant Velocity Time Integral (MR Trace) • Mitral Valve Mean Velocity (MRTrace) • Mitral Valve Velocity Time Integral (MR Trace) • Mitral Valve Mean Pressure Gradient (MR Trace) • Mitral Regurgitant Peak Pressure Gradient (MR Vmax) • Mitral Valve Peak Pressure Gradient (MR Vmax)

12.03 Doppler mode measurements *(cont.)*

Mitral valve <i>(cont.)</i>	<ul style="list-style-type: none"> • Mitral Regurgitant Peak Velocity (MR Vmax) • Mitral Valve Peak Velocity (MR Vmax) • Mitral Valve Velocity Peak A (MV A Velocity) • Mitral Valve Velocity Peak E (MV E Velocity) • Mitral Valve Area according to PHT (MV PHT) • Mitral Valve E-Peak to A-Peak Ratio (A-C and D-E) (MV E/ARatio) • Mitral Valve Acceleration Time (MV ACC Time) • Mitral Valve Deceleration Time (MV Dec. Time) • Mitral Valve Acceleration Time/Deceleration Time Ratio (MVAcc/Dec. Time)
Pulmonic valve	<ul style="list-style-type: none"> • Pulmonic Insufficiency Peak Pressure Gradient (PR Vmax) • Pulmonic Insufficiency End-Diastolic Pressure Gradient (PRTrace) • Pulmonic Valve Peak Pressure Gradient (PV Vmax) • Pulmonic Insufficiency Peak Velocity (PR Vmax) • Pulmonic Insufficiency End-Diastolic Velocity (Prend Vmax) • Pulmonic Valve Peak Velocity (PV Vmax) • Pulmonary Artery Diastolic Pressure (PV Trace) • Pulmonic Insufficiency Mean Pressure Gradient (PR Trace) • Pulmonic Valve Mean Pressure Gradient (PV Trace) • Pulmonic Insufficiency Mean Square Root Velocity (PR Trace) • Pulmonic Insufficiency Velocity Time Integral (PR Trace) • Pulmonic Valve Mean Velocity (PV Trace) • Pulmonic Valve Velocity Time Integral (PV Trace) • Pulmonic Insufficiency Pressure Half Time (PR PHT) • Pulmonic Valve Flow Acceleration (PV Acc Time) • Pulmonic Valve Acceleration Time (PV Acc Time) • Pulmonic Valve Ejection Time (PVET) • QRS complex to end of envelope (Q-to-PV close) • Pulmonic Valve Acceleration to Ejection Time Ratio (PV Acc Time, PVET)

12. Cardiac measurements/ calculations (cont.)

12.03 Doppler mode measurements (cont.)

Right ventricle	<ul style="list-style-type: none"> • Right Ventricle Outflow Tract Peak Pressure Gradient (RVOT Vmax) • Right Ventricle Outflow Tract Peak Velocity (RVOT Vmax) • Right Ventricle Outflow Tract Velocity Time Integral (RVOT Trace) • Right Ventricle Ejection Time (RV Trace) • Stroke Volume by Pulmonic Flow (RVOT Planimetry, RVOT Trace) • Right Ventricle Stroke Volume Index by Pulmonic Flow (RVOT Planimetry, RVOT Trace)
System	<ul style="list-style-type: none"> • Pulmonary Artery Peak Velocity (PV Vmax) • Pulmonary Vein Velocity Peak A (reverse) (P Vein A) • Pulmonary Vein Peak Velocity (P Vein D, P Vein S) • Systemic Vein Peak Velocity (PDA Diastolic, PDA Systolic) • Ventricular Septal Defect Peak Velocity (VSD Vmax) • Atrial Septal Defect (ASD Diastolic, ASD Systolic) • Pulmonary Vein A-Wave Duration (P Vein A Dur) • IsoVolumetric Relaxation Time (IVRT) • IsoVolumetric Contraction Time (IVCT) • Pulmonary Vein S/D Ratio (P Vein D, P Vein S) • Ventricular Septal Defect Peak Pressure Gradient (VSD Vmax) • Pulmonic-to-Systemic Flow Ratio (Qp/Qs)
Tricuspid valve	<ul style="list-style-type: none"> • Tricuspid Regurgitant Peak Pressure Gradient (TR Vmax) • Tricuspid Valve Peak Pressure Gradient (TV Vmax) • Tricuspid Regurgitant Peak Velocity (TR Vmax) • Tricuspid Valve Peak Velocity (TV Vmax) • Tricuspid Valve Velocity Peak A (TV A Velocity) • Tricuspid Valve Velocity Peak E (TV E Velocity) • Tricuspid Regurgitant Mean Pressure Gradient (TR Trace) • Tricuspid Valve Mean Pressure Gradient (TV Trace) • Tricuspid Regurgitant Velocity Time Integral (TR Trace) • Tricuspid Valve Mean Velocity (TV Trace) • Tricuspid Valve Velocity Time Integral (TV Trace)

12.03 Doppler mode measurements (cont.)

Tricuspid valve (cont.)	<ul style="list-style-type: none"> • Tricuspid Valve Time to Peak (TV Acc/Dec Time) • Tricuspid Valve Ejection Time (TV Acc/Dec Time) • Tricuspid Valve A-Wave Duration (TV A Dur) • QRS complex to end of envelope (Q-to-TV close) • Tricuspid Valve Pressure Half Time (TV PHT) • Tricuspid Valve E-Peak to A-Peak Ratio (TV E/A Velocity)
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12.04 Color Flow Mode measurements

Aortic valve	<ul style="list-style-type: none"> • Proximal Isovelocity Surface Area: Regurgitant Flow (AR Trace) • Proximal Isovelocity Surface Area: Regurgitant Volume Flow (AR Trace) • Proximal Isovelocity Surface Area: Aliased Velocity (AR Vmax)
Mitral valve	<ul style="list-style-type: none"> • Proximal Isovelocity Surface Area: Regurgitant Flow (MR Trace) • Proximal Isovelocity Surface Area: Regurgitant Volume Flow (MR Trace) • Proximal Isovelocity Surface Area: Aliased Velocity (MR Vmax)

12.05 Combination mode measurements

Aortic valve	<ul style="list-style-type: none"> • Aortic Valve Area (Ao Diam., LVOT Vmax, AV Vmax) • Aortic Valve Area by Continuity Equation by Peak Velocity (Ao Diam, LVOT Vmax, AV Vmax) • Stroke Volume by Aortic Flow (AVA Planimetry, AV Trace) • Cardiac Output by Aortic Flow (AVA Planimetry, AV Trace, HR) • Aortic Valve Area by Continuity Equation VTI (Ao Diam, LVOT Vmax, AV Trace)
Left ventricle	Cardiac Output, Teichholz/Cubic (LVIDd, LVI Ds, HR)
Mitral valve	<ul style="list-style-type: none"> • Stroke Volume by Mitral Flow (MVA Planimetry, MV Trace) • Cardiac Output by Mitral Flow (MVA Planimetry, MV Trace, HR)

12. Cardiac measurements/ calculations *(cont.)*

12.06 Cardiac worksheet

Parameter: Lists the mode, the measurement folder and the specific measurement

Measured Value: Up to six measurement values for each item. Average, maximum, minimum, or last

Generic study in cardiology

13. Probes

13.01 4C-RS

Convex probe

Applications	Abdominal, OB/GYN, Vascular, Urological, Thoracic, Pediatric, MSK
Number of elements	128
Convex radius	60 mm
FOV	58°
Footprint	66.2 x 18.3 mm
B-Mode imaging frequency	2.0, 3.0, 4.0, 5.0 MHz
Harmonic imaging frequency	3.0, 4.0, 5.0 MHz
CFM/PDI/PWD frequency	2.0 MHz (CFM/PDI) 2.5, 2.8, 3.3 MHz
Biopsy guide	Multi-angle, reusable bracket

13.02 L6-12-RS

Linear probe

Applications	Vascular, Small parts, Pediatrics, MSK, Thoracic
Number of elements	128
Footprint	47 x 11.4 mm
B-Mode imaging frequency	6.0, 8.0, 10.0, 11.0 MHz
Harmonic imaging frequency	8.0, 10.0, 12.0, 13.0 MHz
CFM/PDI frequency	4.0, 5.0, 6.0 MHz
PWD frequency	4.0, 4.5, 5.0 MHz
Steered angle	±20°
Biopsy guide	Multi-angle, reusable bracket

13.03 12L-RS

Linear probe

Applications	Vascular, Small parts, Pediatrics, MSK, Thoracic
Number of elements	192
Footprint	47.1 x 12.7 mm
B-Mode imaging frequency	6.0, 8.0, 10.0, 12.0 MHz
Harmonic imaging frequency	8.0, 10.0, 12.0, 13.0 MHz
CFM/PDI/PWD frequency	4.2, 6.3, 7.7 MHz
Steered angle	±20°
Biopsy guide	Multi-angle, reusable bracket

13.04 E8Cs-RS

Endo micro convex probe

Applications	OB/GYN, Urological, Transvaginal, Transrectal
Number of elements	128
Convex radius	8.73 mm
FOV	168°
Footprint	18.6 x 13.9 mm
B-Mode imaging frequency	6.0, 8.0, 10.0 MHz
Harmonic imaging frequency	7.0, 8.0, 10.0 MHz
CFM/PDI/PWD frequency	4.0, 5.0, 6.0 MHz
Biopsy guide	Fixed angle, disposable or reusable bracket

13.05 LK760-RS

Linear probe

Applications	MSK
Number of elements	128
Footprint	67.0 x 13.0 mm
B-Mode imaging frequency	5.0, 7.0, 9.0 MHz
Harmonic imaging frequency	6.0, 8.0, 10.0 MHz
CFM/PDI/PWD frequency	3.5, 4.2, 5.0 MHz
Steered angle	±10°
Biopsy guide	Not available

13. Probes (cont.)

13.06 E8C-RS

Endo micro convex probe

Applications	OB/GYN, Urological, Transvaginal, Transrectal
Number of elements	128
Convex radius	10.73 mm
FOV	128°
Footprint	16.9 x 21.2 mm
B-Mode imaging frequency	6.0, 8.0, 10.0 MHz
Harmonic imaging frequency	7.0, 8.0, 10.0 MHz
CFM/PDI/PWD frequency	4.2, 5.0, 6.3 MHz
Biopsy guide	Fixed angle, disposable or reusable bracket

13.07 8C-RS

Micro convex probe

Applications	Pediatrics, Pediatric Cardiac, MSK
Number of elements	128
Convex radius	10.73 mm
FOV	131°
Footprint	22.0 x 12.0 mm
B-Mode imaging frequency	6.0, 8.0, 10.0 MHz
Harmonic imaging frequency	6.0, 7.0, 8.0, 10.0 MHz
CFM/PDI/PWD frequency	4.2, 5.0, 6.3 MHz
Biopsy guide	Not available

13.08 3Sc-RS

Phased array sector probe

Applications	Cardiac, Vascular, Transcranial, Thoracic, Abdominal
Number of elements	64
FOV	120°
Footprint	23.7 x 18.4 mm
B-Mode imaging frequency	2.0, 3.0, 4.0 MHz
Harmonic imaging frequency	3.0, 3.2, 3.5, 4.0 MHz
CFM/PDI/PWD frequency	1.7, 2.0, 2.5, 3.3 MHz
CWD frequency	1.9 MHz
Biopsy guide	Multi-angle, reusable bracket

13.09 6S-RS

Phased array sector probe

Applications	Cardiac, Vascular, Transcranial, Pediatrics
Number of elements	64
FOV	120°
Footprint	23.5 x 16.8 mm
B-Mode imaging frequency	4.0, 5.0, 6.0 MHz
Harmonic imaging frequency	4.0, 5.0, 6.0, 7.0 MHz
CFM/PDI/PWD frequency	2.5 (CFM/PDI), 3.0, 4.0, 4.5 MHz
CWD frequency	4.2 MHz
Biopsy guide	Not available

13.10 12S-RS

Phased array sector probe

Applications	Pediatrics, Pediatric Cardiac, Vascular, Transcranial
Number of elements	96
FOV	120°
Footprint	17.6 x 13.2 mm
B-Mode imaging frequency	6.0, 8.0, 10.0, 11.0 MHz
Harmonic imaging frequency	9.0, 10.0, 12.0 MHz
CFM/PDI/PWD frequency	4.1 (CFM/PDI), 4.5, 5.0, 5.6, 6.7 MHz
CWD frequency	4.2, 5.0, 6.2 MHz
Biopsy guide	Not available

13.11 9L-RS

Linear probe

Applications	Vascular, Small parts, Pediatrics, MSK, Abdominal, Thoracic
Number of elements	192
Footprint	53 x 14.1 mm
B-Mode imaging frequency	5.0, 7.0, 9.0 MHz
Harmonic imaging frequency	6.0, 8.0, 10.0 MHz
CFM/PDI/PWD frequency	4.0, 5.0 MHz
Steered angle	±20°
Biopsy guide	Multi-angle, reusable bracket

13. Probes (cont.)

13.12 L8-18i-RS

Linear probe

Applications	MSK, Small parts, Vascular
Number of elements	168
Footprint	34.8 x 11.1 mm
B-Mode imaging frequency	8.0, 12.0, 14.0, 16.0 MHz
Harmonic imaging frequency	9.0, 15.0, 18.0 MHz
CFM/PDI/PWD frequency	6.7, 8.3, 10.0 MHz
Steered angle	±20°
Biopsy guide	Not available

13.13 Inputs and outputs

HDMI output

S-video and composite output with optional adapter

1000 BASE-TX Ethernet (RJ45)

4 USB ports

14. Cart (optional)

The ergonomic trolley cart, features 4 easy on – off lockable 120 mm diameter wheels, system mounting, power cord hooks and clips for neat arrangement of power cords, probe holders with cord management holder, and gel holder.

14.01 Cart dimension

Dimensions: L 555 x D 515 x H 890 mm

Weight: 21 Kg

14.02 Printer shelf (optional)

Dimensions: L 293 x D 217 x H 122 mm

14.03 Cart tray (optional)

The cart tray offers easy storage up to 1 kg load

Dimensions: L 305 mm X D 222 mm X H 77 mm

14.04 GYN probe holder (optional)

Horizontal positioning of endocavitary probe

Dimensions: L 217 mm X D 52 mm X H 126 mm

14.05 Dimension with additional options

Dimensions: L 555 x D 590 x H 890 mm

Weight: 23 Kg

15. Trolley case

The case features 3 protective compartments for the probes, and 3 additional compartments for power adapters, cord, and manuals.

15.01 Dimension

L 495 x D 275 x H 460 mm

Weight: 4 kg

16. Inputs and outputs

16.01 HDMI output (1920 x 1080 resolution)

Ethernet (RJ45)

USB (4x)

17. Safety conformance

The Versana Active is CE marked to Council Directive 93/42/EEC on medical devices

Conforms to the following standards for safety

- IEC 60601-1 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
- IEC 60601-1-2 Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – requirements and tests EMC Emissions Group 1 Class A device requirements as per CISPR 11
- IEC 60601-2-37 Medical electrical equipment – Part 2-37: Particular requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment
- ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing within a risk management process
- EN 62366-1 Medical devices –Part 1: Application of usability engineering to medical devices



Imagination at work

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