Versana Essential™ Ultrasound System

Specification sheet

Versana Essential is a general purpose diagnostic ultrasound imaging system for use by qualified and trained healthcare professionals enabling visualization and measurement of anatomical structures and fluid.

ROWAMED
rowamed.com

General Specifications

Dimensions and weight	
Height with 39.6 cm (15.6") LED back-lit monitors	Fixed 1360 mm (53.54")
Width	• Keyboard: 550 mm (21.65") • Caster: 486 mm (19.13")
Depth	• Maximum: 577 mm (22.71") • Caster: 640 mm (25.19")
Weight	• With 39.6 cm/15.6" monitor – 35 kg (77 lb)

Electrical power
Voltage 100-240 VAC
Frequency 50/60 Hz
Power consumption maximum of 300 VA with peripherals

Console design
Standard 3 probe ports
Integrated SSD (128 GB) solid state drive
Integrated speakers
Four probe holders, removable for cleaning and washing
Gel holder, removable for cleaning and washing
Front and rear handles
Probe cable management hooks
Removable air filters

Wheels
Wheel diameter: 120 mm (4.7")
Locking mechanism that provides rolling lock and caster swivel lock

User interface

Operator keyboard
Ergonomic full-size keyboard
Six TGC slider segments

Monitor	
40 cm (15.6") high-resolution LED back-lit monitors	
Fixed monitor arm	
Tilt/rotate	• Tilt angle: -90˚ to 30˚ • Rotate angle: -90˚ to 90˚
Fold-down for transportation	
Brightness and contrast adjustment	
Audio/volume adjustments	

System overview

Applications
Abdominal
Obstetrical
Gynecological
Small Parts
Musculoskeletal (Conventional/Superficial)
Vascular/Peripheral Vascular
Urological
Pediatric
Transcranial
Adult cardiac
Transrectal

Scanning methods
Electronic convex
Electronic linear
Electronic micro convex
Electronic sector

Transducer types
Convex array
Linear array
Micro convex array
Sector phased array

System Overview *(cont.)*

Operating modes
B-Mode
M-Mode
Anatomical M-Mode (Option)
Color Flow Mode (CFM)
Power Doppler Imaging (PDI)
PW Doppler with High PRF
CW Doppler Mode (Option)
TVI Mode (Option)

System standard features
Whizz
Scan Coach
CrossXBeam™
SRI-HD (High Definition Speckle Reduction Imaging)
Coded Phase Inversion Harmonic Imaging
Virtual Convex
Patient information database
Image archive on integrated SSD
Raw data analysis (TruScan architecture)
My Trainer
Real-time automatic Doppler calculations
OB calculations
Fetal trending
Multigestational calculations
Hip dysplasia calculations
Gynecological calculations
Vascular calculations
Urological calculations
Renal calculations
Cardiac calculations
Remote capability: InSite™ ExC
On-board reporting package (Option)
Network storage

Software Options

In some systems and in some regions, the following options may be available
Coded phase inversion harmonic imaging
Color M-Mode
Directional PDI
CFM
PDI
CW Doppler
Anatomical M-Mode
Color M-Mode
LOGIQView
Easy 3D
Auto IMT
SonoBiometry
Scan Coach
Scan Assistant
On-board reporting (option)
DICOM® 3.0 connectivity

Peripheral options
Digital UP-D898DC b/w thermal printer
Digital UP-D898MD b/w thermal printer
898 printer paper
Digital UP-D25MD color thermal printer
1-pedal type footswitch ‘Whanam FSU-1000’
Footswitch MKF 2-MED USB GP26
512G SSD
ECG Kits
USB Stick 8G
1TB mobile USB HDD
USB DVD RW kit
Bluetooth connectivity
USB wireless adaptor

Software Options *(cont.)*

Display modes	
Live and stored display format	• Wide screen: full size and split screen – both with thumbnails for still and CINE • Review image format: 4x4 and thumbnails for still and CINE
Live and Stored Display Format *(cont.)*	• Simultaneous capability • Dual B (B/B) – B/CFM or PDI – B/PW or B/M – B + CFM/M – Real-time Triplex Mode (B + CFM or PDI+PW) – B or CrossXBeam/PW – B or CrossXBeam/CFM or PDI – B/CrossXBeam – Real-time Triplex Mode (B or CrossXBeam + CFM or PDI/PW)

Selectable alternating probe dependent modes	
B or CrossXBeam/PW	
B or CrossXBeam + CFM (PDI)/PW (CW)	
B + CFM (PDI)/PW (CW)	
Easy 3D-Mode	
B/CW	
Multi-image split screen (quad screen)	
Live and/or frozen	
B or CrossXBeam + B or CrossXBeam/CFM or PDI	
Independent CINE playback	
PW/CW display formats	• Top/bottom selectable format • Side/side selectable format
Virtual convex	
Timeline only	
Zoom: write (HD)/read	
Colorized image	• Colorized B • Colorized M • Colorized PW • Colorized CW – colorized 3D

Time line display	
Independent dual B/PW or CW display	
Display Formats	• 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)

Display Annotation

General user interface	
Patient name: first, last (max 28 characters displayed per each patient, up to 64 total characters per each patient)	
Patient ID (max 64 characters)	
Other ID (max 64 characters)	
Age, sex and date of birth	
Hospital name (max 23 characters displayed)	
Date format: three types selectable	• MM/DD/YY • DD/MM/YY • YY/MM/DD
Time format: two types selectable	• 24 hours • 12 hours
Gestational age from	• LMP • GA • EDD • BBT
Displayed acoustic output	• TIS: Thermal Index Soft Tissue • TIC: Thermal Index Cranial • TIB: Thermal Index Bone • MI: Mechanical Index
% of maximum power output	
Probe name	
Map names	
Probe orientation	
Depth scale marker	
Focal zone markers	
Image depth	
Zoom depth	

B-Mode
Gain
Dynamic range
Imaging frequency
Edge enhance
Frame averaging
Acoustic frame rate
Whizz on/off
SRI-HD
CrossXBeam

Display Annotation *(cont.)*

B-Mode *(cont.)*	
Adjustable	• Acoustic power • Gain • Dynamic range • Frame averaging • Gray scale map • Frequency • Line density • Scanning size (FOV or angle – probe dependent, refer to probe specifications) • B colorization • Reject • Suppression • SRI-HD • Edge enhance • Sound of speed

M-Mode
Acoustic power
Gray scale map
Sweep speed
M colorization
M display format
Rejection

Color Flow Mode
Line density
Frame average
Packet size
Color velocity range and baseline
Color threshold marker
Color gain
Inversion

PDI mode
Line density
Frame averaging
Packet size
Power, directional PDI
Color velocity range and baseline
Color threshold marker
PDI gain

PDI mode *(cont.)*
Inversion
Line density
Frame average

Doppler Mode
Gain
Angle
Sample volume depth and width
Wall filter
Spectrum inversion
Time scale
PRF
Doppler frequency

Anatomical M-Mode
M-Mode cursor adjustable at any plane or angle
Can be activated from a CINE loop from a live or stored image
Available with Color Flow Mode

Pulse Wave Doppler Mode	
Adjustable	• Acoustic power • Gain • Gray scale map • Transmit frequency • Wall filter • PW colorization • Velocity scale range • Sweep speed • Sample volume • Depth • Angle correction • Spectrum inversion • Trace method • Baseline shift • Doppler auto trace • Compression • Trace direction • Trace sensitivity

Display Annotation *(cont.)*

Color Flow Mode	
Adjustable	• Acoustic power • Color maps, including velocity-variance maps • Gain • Velocity scale range • Wall filter • Packet size • Line density • Spatial filter • Steer angle • Baseline shift • Frame average • Threshold • Accumulation mode • Sample volume control • Flash suppression

Power Doppler Imaging	
Adjustable	• Acoustic power • Color maps • Directional map • Gain • Velocity scale range • Wall filter • Packet size • Line density • Spatial filter • Steering angle • Frame average • Threshold • Accumulation mode • Sample volume control • Flash suppression

Continuous Wave Doppler	
Adjustable	• Acoustic power • Gain • Gray scale map • Transmit frequency • Wall filter • CW colorization • Velocity scale range • Sweep speed • Angle correction • Spectrum inversion • Trace method • Baseline shift • Doppler auto trace • Compression • Trace direction • Trace sensitivity

Whizz
Continuous auto-optimize B-Mode image gray scale, image brightness and image uniformity

Coded harmonic imaging
Coded phase inversion harmonic imaging
Available on all probes

LOGIQView
Extended Field of View imaging
Available on 3Sc-RS, E8C-RS, L5-11-RS, C2-5–RS
For use in B-Mode
Auto detection of scan direction
Post-process zoom
Auto fit on monitor
Measurements in B-Mode

Easy 3D	
Allows unlimited rotation and planar translations, 3D reconstruction from CINE sweep	• Utilities • Texture • Grey surface • Render • Threshold1 • Threshold2 • ScanDistance • Colorize

Scan Coach
Modules showing basic scanning techniques with graphic of beam formation, indicative probe position, schematic of anatomy and example clinical image

Scan Assistant
Factory programs
User defined programs
Steps include image annotations, mode transitions, basic imaging controls and measurement initiation

Display Annotation *(cont.)*

Virtual convex
Provides a convex field of view
Compatible with CrossXBeam
Available on linear and sector transducers

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, easy 3D

CrossXBeam	
Provides four levels of spatial compounding (low, medium, high, max), probe dependent	
Live side-by-side DualView display	
Compatible with	• Color Mode • PW • SRI-HD • Coded harmonic imaging • Virtual convex
Available on L5-11-RS, E8C-RS, C2-5-RS	

General System Parameters

System setup
Eight pre-programmable categories
User programmable preset capability
Factory default preset data
Languages: English, Brazilian Portuguese, Chinese (simplified), Danish, Dutch, Finnish, French, German, Italian, Norwegian, Russian, Latin America Spanish, Swedish
OB report formats including Tokyo, Osaka, USA, Europe, and ASUM
User defined annotations
Body patterns
Customized comment home position

CINE memory/image memory
384 MB of CINE memory
Selectable CINE sequence for CINE review

CINE memory/image memory *(cont.)*
Prospective CINE mark
Measurements/calculations and annotations on CINE playback
Scrolling timeline memory
Dual image CINE display
Quad image CINE display
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%)

Image storage	
On-board database of patient information	
Storage formats: DICOM	• Compressed/uncompressed • Single/multi-frame • With/without raw data
Export JPEG, WMV (MPEG 4) and AVI formats	
DICOM still image storage size: ~2.1 MB	
Display format: full size, 4x4 and thumbnails	

Storage devices:
Internal hard drive partition of 55 GB for image storage
External USB HDD and USB memory stick support for Import, Export, DICOM Read, SaveAs, and MPEGVue
DVD storage: -R (4.7 GB)
Conversion to formats: JPEG, AVI, WMV
Live image and stored image side-by-side display
Reload of archived data sets
Network storage support for Import, Export, DICOM Read, SaveAs, MPEGVue

Connectivity and DICOM	
Ethernet network connection	• DICOM 3.0 (Optional) • Verify • Print • Store • Modality worklist • Storage commitment • Modality performed procedure step (MPPS) • Query/retrieve • Structured reporting template – which can be compared to vascular and OB standard values • Remote capability InSite ExC

General System Parameters *(cont.)*

Scanning parameters
Digital agile beamformer architecture
112,500 system processing channels
Max. frame rate: 1228 F/s (probe and mode dependent)
Displayed imaging depth: 2-33 cm (0.78-13")/displayed imaging depth: 2-33 cm (0.78-13")
Minimum depth of field: 0-2 cm/0-0.78" (zoom) (probe dependent)
Maximum depth of field: 2-33 cm (0.78-13") (probe dependent)
Transmission focus: 1-8 focal points selectable (probe and application dependent)
Quad beamforming
Continuous dynamic receive focus/aperture
Multi-frequency/wideband technology
Frequency Range: 1.7-13 MHz
256 shades of gray
263 dB systematic dynamic range
Adjustable dynamic range (36-96 dB)
Adjustable Field of View (FOV): up to 128 degrees (probe dependent)
Image reverse: right/left
Image rotation of 0°, 90°, 180° and 270°

B-Mode
Acoustic power output: 0-100%, 2, 5, and 10 steps
Gain: from 0-90 dB, 1 dB steps
Dynamic range: 36-96 dB, 36~48/78~96, 6 dB step
Adjustable dynamic range: 36-96 dB, 3 or 6 dB steps
Frame average: 8 steps
Gray scale map: 6 or 8 types (probe dependent)
B colorization: 9 types
Frequency: up to 11 selectable (probe dependent)
Line density: 5 steps
Line density zoom: 5 steps
Thermal index: TIC, TIS, TIB
Image reverse: on/off
Focus number: 8 steps
Focus width: 3 types
Suppression: 6 steps

B-Mode *(cont.)*
Edge enhance: 7 steps
Rejection: 6 steps
Steered linear: ±10°, ±15˚ (probe dependent)
Scanning size (FOV or angle – depending on the probe)
SRI-HD: up to 8 levels selectable
CrossXBeam: up to 9 angles selectable
Depth: 2-33 cm (0.78-13"), 0.5 or 1 cm (0.2 or -0.39") step, probe dependent

Color Flow Mode
Baseline: 0-100%, 10% steps
Invert: on/off
CF/PDI focus depth: default pre-settable for 10-100% of ROI in depth, 15% or 20% step
CF/PDI flash suppression: 5 steps
CF/PDI angle steer: 0, ±10˚, ±15˚
Packet size: 8-24, dependent on probe and application
Line density: 5 steps
Line density zoom: 5 steps
Frame average: 7 steps
PRF: 0.2-21 KHz/22 steps
Spatial filter: 6 steps
Gain: 0-40 dB, 0.5 dB steps
Wall filter: 4 steps, dependent on probe and application
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 16 steps, depending on probe
Color maps, including velocity-variance maps: 14 types depending on application
Transparent: 5 steps
Color threshold: 0-100%, 10% steps
Accumulation: 8 steps
Flash suppression

Power Doppler imaging
PDI map: 14 types

General System Parameters *(cont.)*

Power Doppler imaging *(cont.)*

- CF/PDI focus depth: default pre-settable for 10-100% of ROI in depth, 15% or 20% step
- CF/PDI acoustic output: 0-100%, 2%, 5% or 10% step
- CF/PDI angle steer: 0, ±10˚, ±15˚
- Packet size: 8-24, dependent on probe and application
- Spatial filter: 6 steps
- Frame average: 7 steps
- PRF: 0.2-21 KHz/22 steps
- Power threshold: 0-100%, 10% steps
- Gain: 0-40 dB, 0.5 dB steps
- Wall filter: 4 steps depending on probe and application
- CF/PDI frequency: up to 16 steps, depending on probe
- Transparent: 5 steps
- Invert: on/off
- Accumulation: 8 steps

M-Mode

- Gray scale map: 6 or 8 types (probe dependent)
- Colorization: 9 types
- Scanning size (FOV or angle – depending on probe, see probe specifications)
- Rejection: 6 steps
- M/PW display format: V-1/3B, V-1/2B, V-2/3B, H-1/2B, H-1/4B, timeline only

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

Pulse wave Doppler Mode

- Acoustic power: 0-100%, 2, 5, and 10 steps
- Gain: 0-85 dB, 1 dB step
- Gray scale map: up to 8 types
- PRF: 0.5-26.8 KHz
- Transmit frequency: 1.7~6 MHz, probe dependent
- Wall filter: 6-3150 Hz, 25 steps, dependent on probe

Pulse wave Doppler Mode *(cont.)*

- PW colorization: up to 6 types
- Velocity scale range: 0.1~3631 cm/s
- Sweep speed: 0~7, 8 steps
- Sample volume depth: 0.2~33 cm, probe dependent
- SV gate: 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16 mm
- Angle correction: -90~90, 1 step
- M/PW display format: V-1/3B, V-1/2B, V-2/3B, H-1/2B, H-1/4B, timeline only
- Spectrum inversion
- Duplex: simultaneous: on/off (PW only)
- PW angle steer: 0, ±10, 15
- Sample volume depth: 206 steps default pre-settable, probe dependent
- Trace method: off, max, mean
- Baseline shift: 11 steps
- Doppler auto trace
- 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 steps

Continuous Wave Doppler (option)

- Gray scale map: 8 types
- Baseline: 11 steps
- Angle correct: ±90˚, 1˚ step
- Spectral color: 6 types
- Invert: on/off
- Spectral average: 5 steps
- Gain: 0-85 dB, 1 dB steps
- Wall filter: 5.5-5000 Hz, 27 steps, dependent on probe and application

CW-Mode includes:	• Transmit frequency • CW colorization • Velocity scale range: 0.2-6105 cm/s (0.078-2403") • Spectrum inversion • Trace method • Doppler auto trace • Trace direction • Trace sensitivity

General System Parameters *(cont.)*

Whizz

Auto-optimize B-Mode image gray scale, image brightness and image uniformity

Coded Harmonic Imaging

Coded phase inversion harmonic imaging

Available on all probes

Line density: 5 steps

Line density zoom: 5 steps

Suppression: 6 steps

Edge enhance: 7 steps

Gray scale map: 6 types

Tint map: 9 types

Gain: 0-90 dB, 1 dB step

Dynamic range: 36-96 dB, 3 dB step; 36-48/78-96, 6 dB step

Rejection: 6 step

Frequency: up to 4 steps, probe depended

LOGIQView

Extended Field of View imaging

Available on 4C-RS, L6-12-RS, C2-5-RS, 3Sc-RS, E8C-RS, L5-11-RS

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 160 cm (63") scan length

Easy 3D

Allows unlimited rotation and planar translations

3D reconstruction from CINE sweep

Utilities: average off/average light/average medium/average strong

Grey surface: 0-100%

Threshold1: 0-255

Threshold2: 0-255

Scan distance: 1.0-15.0 mm

Colorize: 0-360

Scan Coach

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

Applications include, abdomen, obstetrics, gynecology, carotid and cardiac

My Trainer

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

Virtual Convex

Provides a convex field of view

Compatible with CrossXBeam

Available on linear and sector transducers

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

CrossXBeam

Provides 3, 5, 7 and 9 levels of spatial compounding

Live side-by-side DualView display

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

Available on L5-11-RS, C2-5-RS, E8C-RS

General System Parameters *(cont.)*

Controls available while "live"	
Write zoom	
B/M/CrossXBeam 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	
Dynamic range	
Acoustic output	
Transmission frequency	
Scale	
Wall filter	
Sample volume gate	• Length • Depth

Color Flow Mode	
CFM gain	
CFM velocity range	
Acoustic output	
Wall echo filter	
Packet size	
Frame rate control	
CFM spatial filter	
CFM frame average	
Frequency/velocity baseline shift	

Controls available on "freeze" or recall
Automatic optimization
SRI-HD
CrossXBeam – display non-compounded and compounded

Controls available on "freeze" or recall *(cont.)*
Image simultaneously in split screen
3D reconstruction from a stored CINE loop
B/M/CrossXBeam mode
Gray map optimization
TGC
Colorized B and M
Frame average (loops only)
Dynamic range
Anatomical M-Mode
Sweep speed
Gray map
Baseline shift
Sweep speed
Invert spectral wave form
Compression
Rejection
Colorized spectrum
Display format
Doppler audio
Angle correct
Quick angle correct
Auto angle correct
Overall gain (loops and stills)
Color map
Transparency map
Frame average (loops only)
Flash suppression
CFM display threshold
Spectral invert for color/Doppler
Anatomical M-Mode on CINE loop

Measurements/Calculations

General B-Mode
Depth and distance
Circumference (ellipse/trace)

Measurements/Calculations *(cont.)*

General B-Mode
Area (ellipse/trace)
Volume (ellipsoid)
% stenosis (area or diameter)
Angle between two lines

General M-Mode
M-Depth
Distance
Time
Slope
Heart rate

General Doppler measurements/calculations
Velocity
Time
A/B ratio (velocities/frequency ratio)
PS (Peak Systole)
ED (End Diastole)
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)

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)

Real-time doppler auto measurements/calculations *(cont.)*
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)

OB measurements/calculations	
Gestational age by	• 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) • FTA (Fetal Trunk Cross-sectional Area) • BD (Binocular Distance) • FT (Foot Length) • OFD (Occipital Frontal Diameter) • TAD (Transverse Abdominal Diameter) • HL (Humerus Length) • TCD (Transverse Cerebellum Diameter)
Gestational age by *(cont.)*	• THD (Thorax Transverse Diameter) • TIB (Tibia Length) • ULNA (Ulna Length)

Estimated fetal weight (EFW) by:
AC, BPD
AC, BPD, FL, HC
AC, FL, HC
BPD, APTD, TTD, FL

Calculations and ratios
FL/BPD
FL/HC
CI (Cephalic Index)
CTAR (Cardio-Thoracic Area Ratio)

Measurements/Calculations *(cont.)*

SonoBiometery
Includes four measurements – BPD, HC, AC, FL
Measurements/calculations by: ASUM, ASUM 2001, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chitty, Eik-Nes 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 (4)
Fetal qualitative description (anatomical survey)
Fetal environmental description (biophysical profile)
Programmable OB tables
Over 20 selectable OB calculations
Expanded worksheets

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
Summary reports

Vascular measurements/calculations
SYS DCCA (Systolic Distal Common Carotid Artery)
DIAS DCCA (Diastolic Distal Common Carotid Artery)
SYS MCCA (Systolic Mid Common Carotid Artery)
DIAS MCCA (Diastolic Mid Common Carotid Artery)
SYS PCCA (Systolic Proximal Common Carotid Artery)
DIAS PCCA (Diastolic Proximal Common Carotid Artery)
SYS DICA (Systolic Distal Internal Carotid Artery)
DIAS DICA (Systolic Distal Internal Carotid Artery)

Vascular measurements/calculations *(cont.)*
SYS MICA (Systolic Mid Internal Carotid Artery)
DIAS MICA (Diastolic Mid Internal Carotid Artery)
SYS PICA (Systolic Proximal Internal Carotid Artery)
DIAS PICA (Diastolic Proximal Internal Carotid Artery)
SYS DECA (Systolic Distal External Carotid Artery)
DIAS DECA (Diastolic Distal External Carotid Artery)
SYS PECA (Systolic Proximal External Carotid Artery)
DIAS PECA (Diastolic Proximal External Carotid Artery)
VERT (Systolic Vertebral Velocity)
SUBCLAV (Systolic Subclavian Velocity)
Automatic IMT
Summary reports

Urological calculations
Bladder volume
Prostate volume
Left/right renal volume
Generic volume
Post-void bladder volume

Cardiac measurements/calculations	
B-Mode measurements	
Aorta	• 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	• Aortic Valve Cusp Separation (AV Cusp) • Aortic Valve Area Planimetry (AVA Planimetry) • (Trans AVA)
Left atrium	• Left Atrium Diameter (LA Diam) • LA Length (LA Major) • LA Width (LA Minor) • Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao ratio) • Left Atrium Area (LAA(d), LAA(s)) • Left Atrium Volume, Single Plane, Method of Disk (LAEDV A2C, LAESV A2C) (LAEDV A4C, LAESV A4C)

Measurements/Calculations *(cont.)*

Cardiac measurements/calculations *(cont.)*	
Left ventricle	• Left Ventricle Mass (LVPWd, LVPWs) • Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) Left Ventricle Length (LVLd, LVLs) • Left Ventricle Mass (LVPWd, LVPWs) • 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 Area, Two Chamber/Four Chamber/Short Axis (LVA (d), LVA (s)) • Left Ventricle Endocardial Area, Width (LVA (d), LVA(s)) • Left Ventricle Epicardial Area, Length (LVAepi (d), LVAepi (s)) • Left Ventricle Mass Index (LVPWd, LVPWs) • Ejection Fraction, Teichholz/Cube (LVIDd, LVIDs) • Left Ventricle Posterior Wall Fractional Shortening (LVPWd, LVPWs) • Left Ventricle Stroke Index, Teichholz/Cube (LVIDd, LVIDs and Body Surface Area) • Left Ventricle Fractional Shortening (LVIDd, LVIDs) • Left Ventricle Stroke Volume, Teichholz/Cubic (LVIDd, LVIDs) • Left Ventricle Stroke Index, Single Plane, Two Chamber, Method of Disk (LVI Dd, LVIDs, LVSd, LVSs) • Left Ventricle Stroke Index, Single Plane, Four Chamber, Method of Disk (LVI Dd, LVIDs, LVSd, LVSs) • Left Ventricle Stroke Index, Bi-Plane, Bullet, Method of Disk (LVAd, LVAs) • Interventricular Septum (IVS) • Left Ventricle Internal Diameter (LVI D) • Left Ventricle Posterior Wall Thickness (LVPW)
Mitral valve	• Mitral Valve Annulus Diameter (MV Ann Diam) • E-Point-to-Septum Separation (EPSS) • Mitral Valve Area Planimetry (MVA Planimetry)
Pulmonic valve	• Pulmonic Valve Area (PV Planimetry) • Pulmonic Valve Annulus Diameter (PV Annulus Diam) • Pulmonic Diameter (Pulmonic Diam)

Cardiac measurements/calculations *(cont.)*	
Right atrium	• Right Atrium Diameter, Length (RAD Ma) • Right Atrium Diameter, Width (RAD Mi) • Right Atrium Area (RAA) • Right Atrium Volume, Single Plane, Method of Disk (RAAd) • Right Atrium Volume, Systolic, Single Plane, Method of Disk (RAAs)
Right ventricle	• Right Ventricle Outflow Tract Area (RVOT Planimetry) • Left Pulmonary Artery Area (LPA Area) • Right Pulmonary Artery Area (RPA Area) • Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Diameter, Length (RVD Ma) • Right Ventricle Diameter, Width (RVD Mi) • Right Ventricle Wall Thickness (RVAWd, RVAWs) • Right Ventricle Outflow Tract Diameter (RVOT Diam) • Left Pulmonary Artery (LPA) • Main Pulmonary Artery (MPA) • Right Pulmonary Artery (RPA)
System inferior vena cava	• Systemic Vein Diameter (Systemic Diam) • Patent Ductus Arterosis Diameter (PDA Diam)
System inferior vena cava *(cont.)*	• Pericard Effusion (PEs) • Patent Foramen Ovale Diameter (PFO Diam) • Ventricular Septal Defect Diameter (VSD Diam) • Interventricular Septum (IVS) Fractional Shortening (IVSd, IVSs)
Tricuspid valve	• Tricuspid Valve Area (TV Panimetry) • Tricuspid Valve Annulus Diameter (TV Annulus Diam)

M-Mode measurements	
Aorta	• Aortic Root Diameter (Ao Root Diam) • Aortic Valve • Aortic Valve Diameter (AV Diam) • Aortic Valve Cusp separation (AV Cusp) • Aortic Valve Ejection Time (LVET)
Left atrium	• Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao Ratio) • Left Atrium Diameter (LA Diam)
Left ventricle	• Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) • Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs) • Left Ventricle Ejection Time (LVET) • Left Ventricle Pre-Ejection Period (LVPEP)

Measurements/Calculations *(cont.)*

M-Mode measurements *(cont.)*	
Left ventricle *(cont.)*	• Interventricular Septum (IVS) • Left Ventricle Internal Diameter (LVI D) • Left Ventricle Posterior Wall Thickness (LVPW)
Mitral valve	• E-Point-to-Septum Separation (EPSS) • Mitral Valve Leaflet Separation (D-E Excursion) • Mitral Valve Anterior Leaflet Excursion (D-E Excursion) • Mitral valve D-E Slope (D-E Slope) • Mitral Valve E-F Slope (E-F Slope)
Pulmonic valve	• QRS Complex to End of Envelope (Q-PV close)
Right ventricle	• Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Wall Thickness (RVAWd, RVAWs) • Right Ventricle Outflow Tract Diameter (RVOT Diam) • Right Ventricle Ejection Time (RVET) • Right Ventricle Pre-Ejection Period (RVPEP)
System	• Pericard Effusion (PE (d))
Tricuspid valve	• QRS Complex to End of Envelope (Q-TV close)

Doppler Mode measurements	
Aortic valve	• Aortic Insufficiency Mean Pressure Gradient (AR Trace) • Aortic Insufficiency Peak Pressure Gradient (AR Vmax) • Aortic Insufficiency End Diastole Pressure Gradient (AR Trace) • Aortic Insufficiency Mean Velocity (AR Trace) • Aortic Insufficiency Velocity Time Integral (AR Trace) • Aortic Valve Mean Velocity (AV Trace) • Aortic Valve Velocity Time Integral (AV Trace) • Aortic Valve Mean Pressure Gradient (AV Trace) • 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 Peak Velocity at Point E (AV Vmax) • Aorta Proximal Coarctation (Coarc Pre-Duct) • Aorta Distal Coarctation (Coarc Post-Duct) • Aortic Valve Insufficiency Pressure Half Time (AR PHT) • Aortic Valve Flow Acceleration (AV Trace) • Aortic Valve Pressure Half Time (AV Trace)

Doppler Mode measurements *(cont.)*	
Aortic valve *(cont.)*	• Aortic Valve Acceleration Time (AV Acc Time) • Aortic Valve Deceleration Time (AV Dec Time) • Aortic Valve Ejection Time (AVET) • Aortic Valve Acceleration to Ejection Time Ratio (AV Acc Time, AVET) • Aortic Valve Area(VTI): AVA (Vmax) • Left Ventricle Outflow Tract Peak Pressure Gradient (LVOT Vmax) • Left Ventricle Outflow Tract Peak Velocity (LVOT Vmax) • Left Ventricle Outflow Tract Mean Pressure Gradient (LVOT Trace) • Left Ventricle Outflow Tract Mean Velocity (LVOT Trace) • Left Ventricle Outflow Tract Velocity Time Integral (LVOT Trace) • Left Ventricle Ejection Time (LVET)
Mitral valve	• Mitral Valve Regurgitant Flow Acceleration (MR Trace) • 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 (MV Trace) • Mitral Valve Velocity Time Integral (MV Trace) • Mitral Valve Mean Pressure Gradient (MV Trace) • Mitral Regurgitant Peak Pressure Gradient (MR Vmax) • Mitral Valve Peak Pressure Gradient (MV Vmax) • Mitral Regurgitant Peak Velocity (MR Vmax) • Mitral Valve Peak Velocity (MV 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 Flow Deceleration (MV DecT) • Mitral Valve Pressure Half Time (MV PHT) • Mitral Valve Flow Acceleration (MV AccT) • 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 Ejection Time ((MVET) • Mitral Valve A-Wave Duration (MV A Dur) • Mitral Valve Time to Peak (MV TTP) • Mitral Valve Acceleration Time/Deceleration Time Ratio (MVAcc/Dec Time) • Stroke Volume Index by Mitral Flow (MVA Planimetry, MVTrace)

Measurements/Calculations *(cont.)*

Doppler Mode measurements *(cont.)*	
Pulmonic valve	• 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)
Right ventricle	• Right Ventricle Outflow Tract Peak Pressure Gradient (RVOT Vmax) • Right Ventricle Outflow Tract Peak Velocity (RVOT Vmax) • Right Ventricle Outflow Tract Velocity Time Integral (RVOTTrace) • Right Ventricle Ejection Time (RV Trace) • Stroke Volume by Pulmonic Flow (RVOT Planimetry, RVOTTrace) • Right Ventricle Stroke Volume Index by Pulmonic Flow (RVOT Planimetry, RVOT Trace)
System	• 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)

Doppler Mode Measurements *(cont.)*	
System *(cont.)*	• 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	• 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 Mean Velocity (TR Trace) • Tricuspid Regurgitant Velocity Time Integral (TR Trace) • Tricuspid Valve Mean Velocity (TV Trace) • Tricuspid Valve Velocity Time Integral (TV Trace) • Tricuspid Valve Time to Peak (TV TTP) • Tricuspid Valve Ejection Time (TV Acc/Dec Time) • Tricuspid Valve A-Wave Duration (TV A Dur) • QRS Complex to End of Envelope (Q-TV Close) • Tricuspid Valve Pressure Half Time (TV PHT) • Stroke Volume by Tricuspid Flow (TV Planimetry, TV Trace) • Tricuspid Valve E-Peak to A-Peak Ratio (TV E/A Velocity)

Color Flow Mode Measurements	
Aortic Valve	• Proximal Isovelocity Surface Area: Regurgitant Orifice Area (AR Radius) • Proximal Isovelocity Surface Area: Radius of Aliased Point (AR Radius) • 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)

Measurements/Calculations *(cont.)*

Color Flow Mode Measurements *(cont.)*	
Mitral valve	• Proximal Isovelocity Surface Area: Regurgitant Orifice Area (MR Radius) • Proximal Isovelocity Surface Area: Radius of Aliased Point (MR Radius) • 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)

Combination Mode measurements	
Aortic valve	• Aortic Valve Area (Ao Root Diam, LVOT Vmax, AV Vmax) • Aortic Valve Area by Continuity Equation by Peak Velocity (Ao Root 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 Root Diam, LVOT Vmax, AV Trace)
Left ventricle	• Cardiac Output, Teichholz/Cubic (LVIDd, LVI Ds, HR) • Cardiac Output Two Chamber, Single Plane, Area-Length/Method of Disk(Simpson) (LVAd, LVAs, HR) • Cardiac Output Four Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs, HR) • Ejection Fraction Two Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs) • Ejection Fraction Four Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs) • Left Ventricle Stroke Volume, Single Plane, Two Chamber/Four Chamber, Area-Length (LVAd, LVAs) • Left Ventricle Stroke Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (Simpson) (LVIDd, LVIDs, LVAd, LVAs) • Left Ventricle Volume, Two Chamber/Four Chamber, Area-Length (LVAd, LVAs) • Ejection Fraction, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Stroke Volume, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Volume, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Stroke Index, Single Plane, Two Chamber/Four Chamber, Area-Length (LVSd, LVSs and BSA)

Combination Mode measurements *(cont.)*	
Left ventricle *(cont.)*	• Left Ventricle Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (LVAd, LVAs) • Left Ventricle Volume, Apical View, Long Axis, Method of Disk (LVAd, LVAs)
Mitral valve	• Stroke Volume by Mitral Flow (MVA Planimetry, MV Trace) • Cardiac Output by Mitral Flow (MVA Planimetry, MV Trace, HR)
Pulmonic valve	• Stroke Volume by Pulmonic Flow (PV Planimetry, PV Trace) • Cardiac Output by Pulmonic Flow (PV Planimetry, PV Trace, HR)
Tricuspid valve	• Cardiac Output by Tricuspid Flow (TV Planimetry, TV Trace, HR)

Cardiac worksheet
Parameter: lists the mode, the measurement folder and the specific measurement
Measured value: up to 100 measurement values for each item. Average, maximum, minimum, or last

Generic study in cardiology
Stroke Volume (SV)
Cardiac Output (CO)

Probes

C2-5-RS, convex probe
Applications: abdomen, obstetrics, gynecological, vascular, urology, musculoskeletal conventional

C2-5-RS, convex probe *(cont.)*
Number of elements: 96
Convex Radius: 49.1 mmR
FOV: 70.2°
Footprint: 19.32 x 66.66 mm (0.76 x 2.62")
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, 2.8, 3.6 MHz
Biopsy guide: multi-angle, reusable bracket

L5-11-RS, linear probe
Applications: vascular, small parts, pediatrics, musculoskeletal conventional and superficial
Number of element: 96
Footprint: 47.38 x 11.28 mm (1.87 x 0.44")
B-Mode imaging frequency: 7.0, 9.0, 11.0 MHz
Harmonic imaging frequency: 9.0, 11.0, 13.0 MHz
CFM/PDI/PWD frequency: 3.7, 4.4, 5.6 MHz
Steered Angle : ±15°
Biopsy guide: multi-angle, reusable bracket

E8C-RS, endo micro convex probe
Applications: obstetrics, gynecological, urology, transvaginal, transrectal
Number of elements: 128
Convex radius: 10.73 mmR
FOV: 128°
Footprint: 16.9 x 21.2 mm (0.66 x 0.83")

E8C-RS, endo micro convex probe *(cont.)*
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

3Sc-RS, phased array sector probe
Applications: cardiac, transcranial, abdominal
Number of elements: 64
FOV: 120°
Footprint: 27.6 x 19.3 mm (1.1 x 0.76")
B-Mode imaging frequency: 2.0, 3.0, 4.0 MHz
Harmonic imaging frequency: 3.0, 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

Inputs and outputs
Composit TV output
S-Video output
VGA output
HDMI output
100BASE-TX ethernet (RJ45)
USB ports

Safety Conformance

Safety conformance	
The ULTRA 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 safety • IEC 60601-1-2 Medial electrical equipment – Part 1-2 General requirements for safety – Collateral Standard: Electromagnetic compatibility – requirements and tests EMC Emissions Group 1 Class A device requirements as per CISPR 11

Safety Conformance *(cont.)*

Safety conformance *(cont.)*	
Conforms to the following standards for safety *(cont.)*	• IEC 60601-2-37 Medical electrical equipment – Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment • ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing • EN 62366 Medical devices – Application of usability engineering to medical devices

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