



# M7

## Color Doppler Ultrasound System

### Datasheet

Version 4.1

**mindray**  
healthcare within reach

The M7 series is an ergonomically designed portable and ease-of-use machine for multi-specialty use like adults, pregnant women, pediatric patients and neonates. It is intended for use in abdominal, gynecology, obstetrics, peripheral vascular, small parts, urological, cardiac, anesthesia, emergency, ICU/CCU, pediatrics and neonates, transcranial (neonatal cephalic), first aid, interventional, MSK, athletic medical treatment and intraoperative exams.

## 1 System Overview

### 1.1 Application

- Abdomen
- Obstetrics
- Gynecology
- Cardiology
- Small parts
- Urology
- Vascular
- Pediatrics
- Nerve
- Emergency Medicine

### 1.2 Transducer types

- Curved array
- Linear array
- Phased array
- 4D Volume
- Pencil

### 1.3 Imaging modes

- B-Mode
- Tissue Harmonic and PSH (Phase Shift Harmonic Imaging)
- M-Mode/Color M-mode
- Free Xros M (Anatomical M-mode)
- Free Xros CM (Curved Anatomical M-mode)
- Color Doppler Imaging
- Power Doppler Imaging/Directional PDI
- Pulsed Wave Doppler
- Continuous Wave Doppler
- TDI (Tissue Doppler Imaging)
- Smart 3D™ (Freehand 3D)
- 4D
- iScape™ View (Panoramic Imaging)

### 1.4 Standard features

- B-Mode

- THI and PSH
- M-Mode
- Color Doppler Imaging
- Power Doppler Imaging and Directional PDI
- Pulsed Wave Doppler
- HPRF (High Pulse Repeat Frequency)
- iBeam™ (Spatial Compounding Imaging)
- iTouch™ (Auto Optimization)
- Zoom/iZoom™ (Full Screen Zoom)
- B steer
- Trapezoid Imaging
- ExFOV Imaging
- iStation™
- Integrated 320G hard drive
- Network Storage Function (Transfer PC format data to shared folder on PC or another M7 system)
- Remote control function
- V access function
- User-defined keys
- 1 active probe port
- 1 pencil probe port
- 2-USB ports
- 1 S-Video output port
- 1 Ethernet port
- Built-in Battery: LI231001A
- Power adapter
- Control panel film with language

### 1.5 Optional features

- iClear™ (Speckle Suppression Imaging)
- Continuous Wave Doppler
- Free Xros M
- Free Xros CM
- iScape™ View
- Smart 3D™
- 4D (Including: Static 3D, Real time 4D, Volume Transducer is necessary)
- IMT (Auto Intima-Media Thickness Evaluation)
- TDI (Include TVI, TEI, TVD, TVM)
- TDI Quantitative Analysis
- Stress Echo
- iNeedle™ (Needle Visualization Enhancement)

- Abdominal Package (Including exam mode, comments, measurements, body marks and report template)
  - Obstetrical Package (Including exam mode, comments, measurements, body marks and report template)
  - Gynecological Package (Including exam mode, comments, measurements, body marks and report template)
  - Cardiac Package (Including exam mode, comments, measurements, body marks and report template)
  - Small Parts Package (Including exam mode, comments, measurements, body marks and report template)
  - Urological Package (Including exam mode, comments, measurements, body marks and report template)
  - Vascular Package (Including exam mode, comments, measurements, body marks and report template)
  - Pediatric Package (Including exam mode, comments, measurements, body marks and report template)
  - Emergency Medicine Package (Including exam mode, comments, measurements, body marks and report template)
  - Nerve Blocks Package (Including exam mode, comments, measurements, body marks and report template)
  - DICOM Basic (including Verify, Storage, Print, Storage Commitment, Media Storage)
  - DICOM Worklist
  - DICOM MPPS (Modality Performed Procedure Step)
  - DICOM OB/GYN structured report
  - DICOM Vascular structured report
  - DICOM Cardiac structured report
  - DICOM Query/Retrieve
- All the features without hardware can support 90 days trials.

## 1.6 Language support

- Software: English, Chinese, German, Spanish, French, Italian, Portuguese,

Russian, Czech, Polish

- Keyboard input: English, Chinese, German, Spanish, French, Italian, Portuguese, Russian, Czech, Polish, Icelandic, Norwegian, Swedish, Finnish, Turkish, Danish
- Control panel overlay: English, Chinese, German, Spanish, French, Italian, Portuguese, Russian
- User manual: English, Chinese, German, Spanish, French, Italian, Portuguese, Russian

## 2 Physical Specification

### 2.1 Dimension and weight

- Width: 361mm
- Depth: 357mm
- Height: 75mm
- Weight: approx. 5.5kg (without batteries, 4D board and adapter)

### 2.2 Monitor

- 15-inch high resolution color LCD monitor
- Resolution: 1024×768
- Brightness adjustable
- Screen Saver
- Open angle adjustable: 0°-150° (The angle between the monitor and control panel)
- View angle (right/left): 85°

### 2.3 Handle

### 2.4 Probe port

- 1 port connects to a transducer or the probe extend module
- 1 pencil probe ports

### 2.5 Electrical power

- AC adapter Input:
  - Voltage: 100-240V~ (AC adapter)
  - Voltage: 220-240V~ (Configured with UMT-300 Mobile Trolley)
  - Frequency: 50/60 Hz
  - Current: 1.5-0.6A (AC adapter)
  - Power: 600VA (Configured with UMT-300 Mobile Trolley)
- AC adapter Output: 12V  $\overline{\overline{=}}$  , 10A
- Battery: Lithium-Ion Battery Pack

11.1V  $\approx$  , 4500mAh

## 2.6 Operating Environment

- Ambient temperature: 0-40 °C
- Relative humidity: 30%-85% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

## 2.7 Storage & Transportation Environment

- Ambient temperature: -20~55 °C
- Relative humidity: 30%-95% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

## 2.8 Alloy Enclosure

- All-alloy enclosure design

# 3 User Interface

## 3.1 Control panel

- Power/Battery Indicator
- Alphanumeric Keys
- Function Keys
- Knobs
- Ergonomic Soft Key Operation
- Backlit keys, ensuring accurate work in the dark room
- 8-segment TGC control
- 8 programmable keys, available for user-defined functions
- Trackball, color and sensitivity adjustment
- Key Brightness adjustment
- Integrated Speakers, Audio Volume Adjustment

## 3.2 System boot-up

- Boot-up from complete shut-down in about 50 sec
- Boot-up from standby mode in about 12 sec
- Shut down in about 12 sec

## 3.3 Comments

- Supports text input and arrow
- Adjustable text size and arrow size and direction
- Supports home position
- Covers various application
- More than 800 comments items for versatile application
- User customizable

## 3.4 Bodymark

- More than 135 bodymarks for versatile application
- User customizable

## 3.5 Screen information\*

- Common info:
  - Mindray logo
  - Hospital name
  - Exam date
  - Exam time
  - Acoustic power
  - Mechanical index
  - Tissue thermal index
  - ID, 2<sup>nd</sup> ID, Last name, First Name, Middle initial, Gender, Age
  - Probe model
  - ECG icon (when ECG connected)
  - Operator
  - TGC Curve
  - Focus position
  - Thumbnail
  - Imaging parameters
  - Help guidance

\*Not all items are listed in this part, detail info please refer to user manual

# 4 Imaging Parameters

## 4.1 Overview

- Digital beamformer
- Up to 1024 channels
- 8-beam forming

## 4.2 B-mode

- Display formats: Single(B), Dual(B+B), Quad(4B)
- iClear™: Off; On, 1-4 steps
- iBeam™: Off/On
- iTouch™: Auto optimization (TGC, Gain)
- Frequency (depend on probe)
- B steer: available on linear transducers
- ExFOV: extended FOV available on convex, and volume transducers
- Trapezoid: available on linear transducers
- Depth: 1.8-38.8cm (depend on transducer )
- Frame rate (max): 643 f/s

- Acoustic output power: 7%-100%, 3% /step
- TGC: 8 pods on control panel
- LGC: 8 segments on soft menu
- Dynamic range: 30-160, 5/step
- Gain: 0-100, 1-2/step
- Focus number: 1-4, adjustable
- Focus position: Max. 16, adjustable
- FOV (Field of View): N/M2/M1/W, 4 steps
- Line density: L/M/H/UH
- Persistence: 0-7, 8 steps
- Horizontal Scale: on/off
- L/R flip and U/D flip: on/off
- Rotation: 0°, 90°, 180°, 270°
- TSI (Tissue Specific Imaging): general/muscle/fluid/fat
- Gray Map: 8 types
- Colorize map: off; 10 types
- Mid Line: on/off

## 4.3 THI and PSH

- Available on all types of transducer (except CW2s)
- Patent PSH technology, obtains purer harmonic, better contrast resolution
- iClear™ available

## 4.4 M-mode

- Display formats: V1:1, V1:2, L/R, Full (V: vertical, H: horizontal, L: left, R: right)
- Color M-mode available
- Acoustic output power: 7%-100%, 3%/step
- Dynamic range: 30-160, 5/step
- Gain: 0-100, 1-2/step
- Speed: 1-6, 6 steps
- M soften: 0-4, 5 steps
- Colorize map: off; 10 types
- Gray Map: 8 types
- Edge enhancement: 0-3

## 4.5 Free Xros M (option)

- Display formats: V1:1, V1:2, L/R, Full (V: vertical, H: horizontal, L: left, R: right)
- Color Free Xros M available
- Up to 3 lines
- Speed: 1-6, 6 steps
- Colorize map: off, 10 types
- Gray Map: 8 types

## 4.6 Free Xros CM (option)

- Display formats: V1:1, V1:2, L/R, Full (V: vertical, H: horizontal, L: left, R: right)
- Acoustic output power: 7%-100%
- Gain: 0-100, 1/step
- Speed: 1-6, 6 steps
- Colorize map: off; 10 types
- Gray Map: 8 types

## 4.7 Color Doppler Imaging

- Dual live
- Frequency (depend on probe)
- Max velocity: 264.9cm/s
- Steer: max. 20° (linear transducer)
- Max frame rate: 372f/s
- Acoustic output power: 7%-100%
- Gain: 0-100, 2-3/step
- ROI size/position: adjustable
- Scale: 30 steps
- Wall filter: 0-7, 8 steps
- PRF: max. 15.5kHz, min.0.3kHz
- Packet size: 0-3, 4 steps
- Flow state: L/M/H, 3 steps
- Smooth: 0-4, 5 steps
- B/C Align: on/off
- Priority: 0%-100%, 10%/step
- Map: 21 types (Variance)
- Invert: on/off
- Persistence: 0-4, 5 steps
- Line density: L/M/H/UH, 4 steps

## 4.8 Power Doppler Imaging

- Dual live
- Support directional PDI
- Frequency (depend on probe)
- Acoustic output power: 7%-100%
- Dynamic range: 10-70, 5/step
- Gain: 0-100, 2-3/step
- ROI size/position: adjustable
- Steer: max. 20° (linear transducers)
- Scale: 30 steps
- Wall filter: 0-7, 8 steps
- PRF: max. 15.5kHz, min.0.3kHz
- Packet size: 0-3, 4 steps
- Flow state: L/M/H, 3 steps
- Smooth: 0-4, 5 steps
- B/C Align: on/off
- Priority: 0%-100%, 10%/step

- Map: 8 types
- Directional color map: 4 types
- Persistence: 0-4, 5 steps
- Line density: L/M/H/UH, 4 steps

#### 4.9 PW/CW-Mode

- Display formats: V1:1, V1:2, L/R, Full (V: vertical, H: horizontal, L: Left)
- iTouch™: Auto optimization (Baseline, PRF)
- Frequency (depend on probe)
- PW velocity: max. 924cm/s
- CW velocity: max. 5600cm/s
- Sample volume size: 0.5-20mm (PW only), 0.5-5mm/step
- Sample gate depth: adjustable
- Scale: max. 5600cm/s
- Baseline: -4~4, 9 steps
- PW Steer: max. 20° (linear transducer)
- Audio: 0%-100%, 2%/step
- PW PRF: max. 24kHz, min. 0.7kHz
- Gain: 0-100, 3-4/step
- Dynamic range: 24-72, 2/step
- Sweep speed: 1-6, 6 steps
- Wall filter: 0-6, 7 steps
- Invert: on/off
- Auto invert: on/off
- Angle correction: -80°~80°, 1/step
- Quick angle: 0°, -60°, 60°
- Gray map: 8 types
- Colorize map: Off; 10 types
- Time/frequency resolution: 0-3, 4 steps
- Auto calc: on/off
- Trace area: above, below, all

#### 4.10 Tissue Velocity/Energy Imaging (included in TDI option)

- Available on phased array transducer
- Dual live: side by side displays B and B+TVI
- Max frame rate: 428f/s
- PRF: max. 7.8kHz, min. 0.3kHz
- Acoustic output power: 7%-100%
- Gain: 0-100, 2/step
- Dynamic range: 10-70, 5/step (TEI only)
- ROI size/position: adjustable
- Scale: max. 30 steps, 5.0-100cm/s
- Baseline: -8~8, 17 steps (TVI only)

- Wall filter: 0-7, 8 steps
- Packet size: 0-3, 4 steps
- Tissue state: L/M/H, 3 steps
- Smooth: 0-4, 5 steps
- B/C Align: on/off
- Priority: 0%-100%, 10%/step
- Color map: 11 types
- Invert: on/off (TVI only)
- Persistence: 0-4, 5 steps
- Line density: L/M/H/UH, 4 steps

#### 4.11 Tissue Velocity Doppler(included in TDI option)

- Available on phased array transducer
- Display formats: V1:1, V1:2, L/R, Full (V: vertical, H: horizontal, L: left, R: right)
- Sample volume size: 0.5-20mm , 12 steps
- Sample gate depth: adjustable
- Scale: max. 69.6 cm/s
- Baseline: -4~4, 9 steps
- Audio: 0%-100%, 2%/step
- PRF: max. 24.0kHz, min. 0.7kHz
- Gain: 0-100, 3-4/step
- Dynamic range: 24-72, 2/step
- Speed: 1-6, 6 steps
- Wall filter: 0-6, 7 steps
- Invert: on/off
- Auto invert: on/off
- Angle correction: -80°~80°, 1/step
- Quick angle: 0°, -60°, 60°
- Gray map: 8 types
- Colorize map: Off; 10 types
- Time/frequency resolution: 0-3, 4 steps

#### 4.12 Tissue Velocity Motion (included in TDI option)

- Display formats: V1:1, V1:2, L/R, Full (V: vertical, H: horizontal, L: left, R: right)
- Acoustic output power: 7%-100%
- Dynamic range: 30-160, 5/step
- Gain: 0-100, 1-2/step
- Speed: 1-6, 6 steps
- M soften: 0-4, 5 steps
- Gray Map: 8 types
- Edge enhance: 0-3, 4 steps

#### 4.13 Smart 3D™ (option)

- Smart 3D™



- Display formats: Single, Dual, Quad
  - Reset: reset ROI, reset curve, reset orientation
  - Quick Rotation: 0°, 90°, 180°, 270°
  - Inversion: on/off
  - Accept VOI: on/off
  - Render modes: Surface, Max, Min, X-ray
  - Direction: D/U, U/D, L/R, R/L, F/B, B/F (D: down, U: up, L: left, R: right, F: front, B: back)
  - Threshold: 0%-100%, 1%/step
  - Transparency: 0%-100%, 5%/step
  - Smooth: 0-20, 21 steps
  - Brightness: 0%-100%, 2%/step
  - Contrast: 0%-100%, 2%/step
  - Colorize map: off; 5 types
  - Edit
    - Rotation control: X, Y, Z axis
    - Area selection: inside polygon, outside polygon; inside contour, outside contour; inside rect, outside rect
    - Other operations: undo, redo, undo all, done
- 4.14 4D (option)
- Available on volume transducer (4CD4s)
  - Static 3D and 4D
    - 4D frame rate: max. 30 vps
    - Display formats: Single, Dual, Quad
    - Reset: reset ROI, reset curve, reset orientation
    - Quick Rotation: 0°, 90°, 180°, 270°
    - Inversion: on/off
    - Accept VOI: on/off
    - Render modes: Surface, Max, Min, X-ray
    - Direction: D/U, U/D, L/R, R/L, F/B, B/F (D: down, U: up, L: left, R: right, F: front, B: back)
    - Threshold: 0%-100%, 1%/step
    - Transparency: 0%-100%, 5 %/step
    - Smooth: 0-20, 21 steps
    - Brightness: 0%-100%, 2%/step
    - Contrast: 0%-100%, 2%/step
    - Colorize map: off; 5 types
- Edit
    - Rotation control: X, Y, Z axis
    - Area selection: inside polygon, outside polygon; inside contour, outside contour; inside rect, outside rect
    - Other operations: undo, redo, undo all, done
- 4.15 iScape™ View (option)
- Panoramic imaging
  - Available on all transducers
  - Acquisition method: B
  - Imaging length: 110cm
  - Colorize map: off; 8 types
  - Rotation: 0°~355°
- 4.16 Zoom
- iZoom™
    - Full screen zoom
    - Normal image, Zoom standard area, Zoom image area, 3 steps
    - Spot zoom (write zoom) 1-10x
    - Pan zoom (read zoom) 1-10x
- 4.17 TDI QA (option)
- Dedicated quantification tool for TDI velocity analysis
  - Freehand ROI: manually deploy ROI on the cine
  - Up to 8 ROIs
  - ROI tracking
  - Std.Height: 1.5-50 mm
  - Std.Width: 1.5-50 mm
  - Std.Angle: -89°~90°
  - Export: export current data as a CSV format file
- 4.18 Stress Echo (option)
- Stress echo provides tools for ECG triggered acquisition, display, selection, comparison, evaluation and archiving of multiple cardiac loops during various stages of a stress echo examination
  - Standard acquisition protocols: treadmill, ergometer and pharmacological stress echo
  - User definable scoring conventions: ASE 16 (with score 4-7), ASE 17 (with score 4-7)

- Customized stages: up to 6 views per stage, and up to 12 stages per study
- View: standard views (PSLA, PSAX, A4C, A2C), and customized views
- Image acquisition
  - R-wave trigger
  - Acquire mode: Manual ROI or full screen
  - Ability to acquire frames or clips in B-mode, M-mode, Color, PW and TDI
- Image selection
  - Attach the images with view annotation label (PSLA, PSAX, A4C, A2C, and customized views)
- Review
  - Automatically adjust to the number of images user defined
- Wall Motion Scoring
  - ASE 16 (with score 4-7), or ASE 17 (with score 4-7)
  - Graphical display of scoring (Normal, Hyperkinetic, Severely Hyperkinetic, Akinetic, Dyskinetic)
- LV volume measurement
  - Measurement of LV Volume in all phases of cardiac cycle
- Report
  - Reporting for both Wall Motion Scoring and LV volume measurement

#### 4.19 iNeedle™ (option)

- Needle visualization enhancement
- Available on L14-6Ns, L12-4, L14-6s, 7L4s
- Available on B mode
- Steer angle: +/-50°, +/-40°, +/-30°, +/-20°
- B/iNeedle: On/Off ( provide a comparision between normal and enhanced images)

## 5 Cine Review and Post Processing

### 5.1 Cine review

- Available in all modes
- Frame by frame manual cineloop review or auto playback with variable speed
- Independent cine review in 2D Dual and Quad mode one by one

- Maximum cine memory is up to 8380 frames or 131s (depend on the mode)
- Maximum 4D cine memory is around 100M
- Retrospective storage (1-120s, or 1-120 cycles, pre-settable) and prospective storage (1-480s, or 1-120cycles, pre-settable)
- Frame compare: compare different frames for one cine in dual format
- Cine compare: compare two or more than two cines in dual or quad format
- Jump to first and jump to last: one keystroke review the first or last frame
- Start point and end point: selectable

### 5.2 Post Processing

- B-mode:
  - Zoom
  - gray map
  - colorize map
  - flip
  - rotation
- M-mode:
  - gray map
  - colorize map
  - display format
- Color/Power:
  - Invert
  - Baseline
  - color map
  - B display
- PW/CW:
  - angle correction
  - quick angle
  - invert
  - dynamic range
  - gray map
  - colorize map

## 6 Measurement/Analysis and Report\*

### 6.1 Generic measurements

- B-mode
  - Depth
  - Distance
  - Angle
  - Area: Ellipse, Trace, Spline, Cross



- Volume: 3-Distance, Ellipse, Ellipse+Distance
- Cross
- Parallel
- Trace Length
- Ratio (D) (Distance ratio)
- Ratio (A) (Area ratio)
- B Histogram
- B Profile (not available for M7T)
- Color Velocity
- Volume Flow
- M-mode
  - Distance
  - Time
  - Slope
  - Velocity
  - Heart Rate
- Doppler mode
  - Time
  - Heart Rate
  - D Velocity (Doppler velocity)
  - Acceleration
  - D Trace (Doppler spectrum trace)
  - PS/ED (PS: Peak Systolic Velocity; ED: End Diastolic Velocity)
  - Volume Flow
- Automatic Doppler Spectrum Analysis
  - Automatic real-time tracing
  - 1, 2, 3, 4, 5 auto calculation cycles
  - User configurable display of measurement items
  - Support PI, RI, TAMAX, TAMEAN, Volume Flow calculations
  - Appropriate factory setting according to applications

## 6.2 Clinical option measurement package

- Abdominal
  - B-mode measure:
    - Liver
    - Renal L (Renal Length)
    - Renal H (Renal Height)
    - Renal W (Renal Width)
    - Cortex (Renal Cortical Thickness)
    - Adrenal L (Adrenal Length)
    - Adrenal H (Adrenal Height)
    - Adrenal W (Adrenal Width)

- CBD (Common bile duct)
- Portal V Diam (Portal Vein Diameter)
- CHD (Common hepatic duct)
- GB L (Gallbladder Length)
- GB H (Gallbladder Height)
- GB wall th (Gallbladder wall thickness)
- Panc duct (Pancreatic duct)
- Panc head (Pancreatic head)
- Panc body (Pancreatic body)
- Panc tail (Pancreatic tail)
- Spleen
- Aorta Diam (Aorta Diameter)
- Aorta Bif (aorta bifurcation)
- Iliac Diam (iliac diameter)
- Pre-BL L (Previous-Bladder Length)
- Pre-BL H (Previous-Bladder Height)
- Pre-BL W (Previous-Bladder Width)
- Post-BL L (Posterior-Bladder Length)
- Post-BL H (Posterior-Bladder Height)
- Post-BL W (Posterior-Bladder Width)

### B-mode Calculation:

- Renal Vol (Renal Volume)
- Pre-BL Vol (Previous-Bladder Volume)
- Post-BL Vol (Posterior-Bladder Volume)
- Mictur.Vol (Micturated Volume)

### B-mode study:

- Kidney (Length, Width, Height, Volume)
- Adrenal (Length, Width, Height, Volume)
- Bladder (Length, Width, Height, Volume)

### Doppler-mode measure:

- Ren A Org (Renal Artery Origin)
- Arcuate A (Arcuate Artery)
- Segment A (Segmental Artery)
- Interlobar A (Interlobar Artery)
- Renal A (Renal Artery)
- M Renal A (Main Renal Artery)
- Renal V (Renal Vein)
- Aorta
- Celiac Axis
- SMA (Superior Mesenteric Artery)
- C Hepatic A (Common Hepatic Artery)
- Hepatic A (Hepatic Artery)

- Splenic A (Splenic Artery)
- IVC (Inferior Vena Cava)
- Portal V (Portal Vein)
- M Portal V (M Portal Vein)
- Lt Hepatic V (Left Hepatic Vein)
- Rt Hepatic V (Right Hepatic Vein)
- Hepatic V (Hepatic Vein)
- M Hepatic V (Middle Hepatic Vein)
- Splenic V (Splenic Vein)
- SMV (Superior Mesenteric Vein)
- Obstetrics
  - B-mode measure:
    - GS (Gestational Sac Diameter)
    - YS (Yolk Sac)
    - CRL (Crown Rump Length)
    - NT (Nuchal Translucency)
    - BPD (Biparietal Diameter)
    - OFD (Occipital Frontal Diameter)
    - HC (Head Circumference)
    - AC (Abdominal Circumference)
    - FL (Femur Length)
    - TAD (Abdominal Transversal Diameter)
    - APAD (Anteroposterior Abdominal Diameter)
    - TCD (Cerebellum Diameter)
    - Cist Magna (Cist Magna)
    - LVW (Lateral Ventricle Width)
    - HW (Hemisphere Width)
    - OOD (Outer Orbital Diameter)
    - IOD (Inter Orbital Diameter)
    - HUM (Humerus Length)
    - Ulna (Ulna Length)
    - RAD (Radius Length)
    - Tibia (Tibia Length)
    - FIB (Fibula Length)
    - CLAV (Clavicle Length)
    - Vertebrae (Length of Vertebrae)
    - MP (Middle Phalanx Length)
    - Foot (Foot Length)
    - Ear (Ear Length)
    - APTD (Anteroposterior trunk diameter)
    - TTD (Transverse trunk diameter)
    - FTA (Fetal Trunk Cross-sectional Area)
    - THD (Thoracic Diameter)
    - HrtC (Heart Circumference)
  - TC (Thoracic circumference)
  - Umb VD (Umbilical Vein Diameter)
  - F-kidney (Fetal kidney Length)
  - Mat Kidney (Matrix Kidney Length)
  - Cervix L (Cervical Length)
  - AF (Amniotic Fluid)
  - NF (Nuchal Fold)
  - Orbit (Orbit)
  - PL Thickness (Placental Thickness)
  - Sac Diam1 (Gestational Sac Diameter 1)
  - Sac Diam2 (Gestational Sac Diameter 2)
  - Sac Diam3 (Gestational Sac Diameter 3)
  - AF1 (Amniotic Fluid 1)
  - AF2 (Amniotic Fluid 2)
  - AF3 (Amniotic Fluid 3)
  - AF4 (Amniotic Fluid 4)
  - LVIDd (Left Ventricular Internal Diameter at End-diastole)
  - LVIDs (Left Ventricular Internal Diameter at End-systole)
  - LV Diam (Left Ventricular Diameter)
  - LA Diam (Left Atrium Diameter)
  - RVIDd (Right Ventricular Internal Diameter at End-diastole)
  - RVIDs (Right Ventricular Internal Diameter at End-systole)
  - RV Diam (Right Ventricular Diameter)
  - RA Diam (Right Atrium Diameter)
  - IVSd (Interventricular Septal Thickness at End-diastole)
  - IVSs (Interventricular Septal Thickness at End-systole)
  - IVS (Interventricular Septal Thickness)
  - LV Area (Left Ventricular Area)
  - LA Area (Left Atrium Area)
  - RV Area (Right Ventricular Area)
  - RA Area (Right Atrium Area)
  - Ao Diam (Aorta Diameter)
  - MPA Diam (Main Pulmonary Artery Diameter)
  - LVOT Diam (Left Ventricular Outflow Tract Diameter)
  - RVOT Diam (Right Ventricular Outflow

### Tract Diameter)

#### B-mode calculation:

- Mean Sac Diam (Mean Gestational Sac Diameter)
- AFI
- EFW1 (Estimated Fetal Weight 1)
- EFW2 (Estimated Fetal Weight 2)
- HC/AC
- FL/AC
- FL/BPD
- AXT
- CI
- FL/HC
- HC(c)
- HrtC/TC
- TCD/AC
- LVW/HW
- LVD/RVD
- LAD/RAD
- AoD/MPAD
- LAD/AoD

#### B-mode study:

- AFI (Auto)

#### M-mode measure:

- FHR (Fetal Heart Rate)
- LVIDd (Left ventricular diameter at end diastole)
- LVIDs (Left ventricular diameter at end systole)
- RVIDd (Right ventricular diameter at end diastole)
- RVIDs (Right ventricular diameter at end systole)
- IVSd (interventricular septal thickness at en diastole)
- IVSs (interventricular septal thickness at en systole)

#### Doppler-mode measure:

- Umb A (Umbilical Artery)
- Duct Ven (Ductus Ven)
- Placenta A (Placenta Artery)
- MCA (Middle Cerebral Artery)
- Fetal Ao (Fetal Aorta)
- Desc Aorta (Descending Aorta)
- Ut A (Uterine Artery)
- Ovarian A (Ovarian Artery)

- FHR (Fetal Heart Rate)

#### • Cardiology

##### B-mode measure:

- LA Diam (Left Atrium Diameter)
- LA Major (Left Atrium major Diameter)
- LA Minor (Left Atrium minor Diameter)
- RA Major (Right Atrium major Diameter)
- RA Minor (Right Atrium minor Diameter)
- LV Major (Left Ventricular major Diameter)
- LV Minor (Left Ventricular minor Diameter)
- RV Major (Right Ventricular major Diameter)
- RV Minor (Right Ventricular minor Diameter)
- LA Area (Left Atrium area)
- RA Area (Right Atrium area)
- LV Area (d) (Left Ventricular area at end-diastole)
- LV Area (s) (Left Ventricular area at end-systole)
- RV Area (d) (Right Ventricular area at end-diastole)
- RV Area (s) (Right Ventricular area at end-systole)
- LVIDd (Left Ventricular Internal Diameter at end-diastole)
- LVIDs (Left Ventricular Internal Diameter at end-systole)
- RVDd (Right Ventricular Diameter at end-diastole)
- RVDs (Right Ventricular Diameter at end-systole)
- LVPWd (Left Ventricular Posterior wall thickness at end-diastole)
- LVPWs (Left Ventricular Posterior wall thickness at end-systole)
- RVAWd (Right Ventricular Anterior wall thickness at end-diastole)
- RVAWs (Right Ventricular Anterior wall thickness at end-systole)
- IVSd (Interventricular Septal thickness at end-diastole)

- IVSs (Interventricular Septal thickness at end-systole)
  - Ao Diam (Aorta Diameter)
  - Ao Arch Diam (Aorta arch Diameter)
  - Ao Asc Diam (Ascending Aorta Diameter)
  - Ao Desc Diam (Descending Aorta Diameter)
  - Ao Isthmus (Aorta Isthmus Diameter)
  - Ao st junct (Aorta ST junct Diameter)
  - Ao Sinus Diam (Aorta Sinus Diameter)
  - Duct Art Diam (Ductus Arteriosus Diameter)
  - Pre Ductal (Previous ductal Diameter)
  - Post Ductal (Posterior ductal Diameter)
  - ACS (Aortic Valve Cusp Separation)
  - LVOT Diam (Left Ventricular Outflow Tract Diameter)
  - AV Diam (Aorta Valve Diameter)
  - AVA (Aortic Valve Area)
  - PV Diam (Pulmonary valve Diameter)
  - LPA Diam (Left pulmonary Artery Diameter)
  - RPA Diam (Right pulmonary Artery Diameter)
  - MPA Diam (Main pulmonary Artery Diameter)
  - RVOT Diam (Right Ventricular Outflow Tract Diameter)
  - MV Diam (Mitral Valve Diameter)
  - MVA (Mitral Valve area)
  - MCS (Mitral Valve Cusp Separation)
  - EPSS (Distance between point E and Interventricular Septum when mitral valve is fully open)
  - TV Diam (Tricuspid valve Diameter)
  - TVA (Tricuspid Valve Area)
  - IVC Diam (Insp) (Inferior vena cava inspiration Diameter)
  - IVC Diam (Expir) (Inferior vena cava expiration Diameter)
  - SVC Diam (Insp) (Superior vena cava inspiration Diameter)
  - SVC Diam (Expir) (Superior vena cava expiration Diameter)
  - LCA (Left Coronary Artery)
  - RCA (Right Coronary Artery)
  - VSD Diam (Ventricular Septal defect Diameter)
  - ASD Diam (Atrial Septal defect Diameter)
  - PDA Diam (Patent ductus Arteriosus Diameter)
  - PFO Diam (Patent Oval Foramen Diameter)
  - PEd (Pericardial Effusion at diastole)
  - PEs (Pericardial Effusion at systole)
- B-mode calculation:
- LA/Ao (Left Atrium Diameter/ Aorta Diameter)
  - Ao/LA (Aorta Diameter/Left Atrium Diameter)
- B-mode study:
- S-P Ellipse
  - B-P Ellipse
  - Bullet
  - Mod. Simpson
  - Simp SP(A2C)
  - Simp SP(A4C)
  - Simpson BP
  - Cube (2D)
  - Teichholz (2D)
  - Gibson (2D)
  - LA Vol (A-L)
  - LA Vol (Simp)
  - LV Mass (Cube-2D)
  - LV Mass (T-E)
  - LV Mass (A-L)
  - MVA (VTI)
  - AVA (VTI)
  - Qp/Qs
  - PISA MR
  - PISA AR
  - PISA TR
  - PISA PR
- M-mode measure:
- LA Diam (Left Atrium Diameter)
  - LVIDd (Left Ventricular Internal Diameter at end-diastole)
  - LVIDs (Left Ventricular Internal Diameter at end-systole)

- RVDd (Right Ventricular Diameter at end-diastole)
  - RVDs (Right Ventricular Diameter at end-systole)
  - LVPWd (Left Ventricular Posterior wall thickness at end-diastole)
  - LVPWs (Left Ventricular Posterior wall thickness at end-systole)
  - RVAWd (Right Ventricular Anterior wall thickness at end-diastole)
  - RVAWs (Right Ventricular Anterior wall thickness at end-systole)
  - IVSd (Interventricular Septal thickness at end-diastole)
  - IVSs (Interventricular Septal thickness at end-systole)
  - Ao Diam (Aorta Diameter)
  - Ao Arch Diam (Aorta arch Diameter)
  - Ao Asc Diam (Ascending Aorta Diameter)
  - Ao Desc Diam (Descending Aorta Diameter)
  - Ao Isthmus (Aorta Isthmus Diameter)
  - Ao st junct (Aorta ST junct Diameter)
  - Ao Sinus Diam (Aorta Sinus Diameter)
  - LVOT Diam (Left Ventricular outflow tract Diameter)
  - ACS (Aortic valve Cusp Separation)
  - LPA Diam (Left pulmonary Artery Diameter)
  - RPA Diam (Right pulmonary Artery Diameter)
  - MPA Diam (Main pulmonary Artery Diameter)
  - RVOT Diam (Right Ventricular outflow tract Diameter)
  - MV E Amp (Amplitude of the Mitral Valve E wave)
  - MV A Amp (Amplitude of the Mitral Valve A wave)
  - MV E-F Slope (Mitral Valve E-F slope)
  - MV D-E Slope (Mitral Valve D-E slope)
  - MV DE (Amplitude of the Mitral Valve DE wave)
  - MCS (Mitral Valve Cusp Separation)
  - EPSS (Distance between point E and the interventricular septum)
  - PEd (Pericardial effusion at diastole)
  - PEs (Pericardial effusion at systole)
  - LVPEP (Left Ventricular pre-ejection period)
  - LVET (Left Ventricular ejection time)
  - RVPEP (Right Ventricular pre-ejection period)
  - RVET (Right Ventricular ejection time)
  - HR (Heart Rate)
- M-mode calculation:
- LA/Ao (Left Atrium Diameter/Aorta Diameter)
  - Ao/LA (Aorta Diameter/Left Atrium Diameter)
- M-mode study:
- LVIMP (M)
  - Cube (M)
  - Teichhloz (M)
  - Gibson (M)
  - LV Mass (Cube-M)
- Doppler-mode measure:
- MV Vmax (Mitral Valve Maximum Velocity)
  - MV E Vel (Mitral Valve E-wave Velocity)
  - MV A Vel (Mitral Valve A-wave Velocity)
  - MV E VTI (Mitral Valve E-wave Velocity)-Time Integral
  - MV A VTI (Mitral Valve A-wave Velocity)-Time Integral
  - MV VTI (Mitral Valve Velocity)-Time Integral
  - MV AccT (Mitral Valve Acceleration Time)
  - MV DecT (Mitral Valve Deceleration Time)
  - IVRT (isoVelocity Relaxation Time)
  - IVCT (isoVelocity Compression Time)
  - MV E Dur (Mitral Valve E-wave Duration)
  - MV A Dur (Mitral Valve A-wave Duration)
  - LVOT Vmax (Left Ventricular Outflow Tract Velocity)
  - LVOT VTI (Left Ventricular Outflow

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| Tract Velocity)-Time Integral)                                       | Maximum Velocity)                                                  |
| - LVOT AccT (Left Ventricular Outflow Tract Acceleration Time)       | - RPA Vmax (Right Pulmonary Artery Maximum Velocity)               |
| - AAO Vmax (Ascending Aorta Maximum Velocity)                        | - LPA Vmax (Left Pulmonary Artery Maximum Velocity)                |
| - DAA Vmax (Descending Aorta Maximum Velocity)                       | - PVein S Vel (Pulmonary Vein S-wave Flow Velocity)                |
| - AV Vmax (Aorta Valve Maximum Velocity)                             | - PVein D Vel (Pulmonary Vein D-wave Flow Velocity)                |
| - AV VTI (Aorta Valve Velocity)-Time Integral)                       | - PVein A Vel (Pulmonary Vein A-wave Flow Velocity)                |
| - LVPEP (Left Ventricular Pre-ejection Period)                       | - PVein A Dur (Pulmonary Vein A-wave Duration)                     |
| - LVET (Left Ventricular Ejection Time)                              | - PVein S VTI (Pulmonary Vein S-wave Velocity)-time Integral)      |
| - AV AccT (Aorta Valve Acceleration Time)                            | - PVein D VTI (Pulmonary Vein D-wave Velocity)-time Integral)      |
| - AV DecT (Aorta Valve Deceleration Time)                            | - PVein DecT (Pulmonary Vein Deceleration Time)                    |
| - RVET (Right Ventricular Ejection Time)                             | - IVC Vel (Insp) (Inferior Vena Cava Inspiration Maximum Velocity) |
| - RVPEP (Right Ventricular Pre-ejection Period)                      | - IVC Vel (Expir) (Inferior Vena Cava Expiration Maximum Velocity) |
| - TV Vmax (Tricuspid Valve Maximum Velocity)                         | - SVC Vel (Insp) (Superior Vena Cava Inspiration Maximum Velocity) |
| - TV E Vel (Tricuspid Valve E-wave Flow Velocity)                    | - SVC Vel (Expir) (Superior Vena Cava Expiration Maximum Velocity) |
| - TV A Vel (Tricuspid Valve A-wave Flow Velocity)                    | - MR Vmax (Mitral Valve Regurgitation Maximum Velocity)            |
| - TV VTI (Tricuspid Valve Velocity)-Time Integral)                   | - MR VTI (Mitral Valve Regurgitation Velocity)-Time Integral)      |
| - TV AccT (Tricuspid Valve Acceleration Time)                        | - MS Vmax (Mitral Valve Stenosis Maximum Velocity)                 |
| - TV DecT (Tricuspid Valve Deceleration Time)                        | - dP/dt (Rate of Pressure Change)                                  |
| - TV A Dur (Tricuspid Valve A-wave Duration)                         | - AR Vmax (Aortic Valve Regurgitation Maximum Velocity)            |
| - RVOT Vmax (Right Ventricular Outflow Tract Maximum Velocity)       | - AR VTI (Aortic Valve Regurgitation Velocity)-Time Integral)      |
| - RVOT VTI (Right Ventricular Outflow Tract Velocity)-Time Integral) | - AR DecT (Aortic Valve Regurgitation Deceleration Time)           |
| - PV Vmax (Pulmonary Valve Maximum Velocity)                         | - AR PHT (Aortic Valve Regurgitation Pressure Half Time)           |
| - PV VTI (Pulmonary Valve Velocity)-Time Integral)                   | - AR Ved (Aortic Valve Regurgitation Velocity) at end-Diastole)    |
| - PV AccT (Pulmonary Valve Acceleration Time)                        | - TR Vmax (Tricuspid Valve Regurgitation Maximum Velocity)         |
| - MPA Vmax (Main Pulmonary Artery                                    |                                                                    |



- TR VTI (Tricuspid Valve Regurgitation Velocity)-Time Integral
  - PR Vmax (Pulmonary Valve Regurgitation Maximum Velocity)
  - PR VTI (Pulmonary Valve Regurgitation Velocity)-Time Integral)
  - PR PHT (Pulmonary Valve Regurgitation Pressure Half Time)
  - PR Ved (Pulmonary Valve Regurgitation Velocity) at end-Diastole)
  - VSD Vmax (Ventricular Septal Defect Maximum Velocity)
  - ASD Vmax (Atrial Septal Defect Maximum Velocity)
  - PDA Vel (d) (Patent Ductus Arteriosus Velocity at End-diastole)
  - PDA Vel (s) (Patent Ductus Arteriosus Velocity at End-systole)
  - Coarc Pre-Duct (Coarctation of Pre-Ductus)
  - Coarc Post-Duct (Coarctation of Post-Ductus)
  - HR (Heart Rate)
  - RAP (Right Atrium Pressure)
- Doppler-mode calculation:
- $MV E/A (MV E Vel (cm/s) / MV A Vel (cm/s))$
  - $MVA(PHT) (MVA(PHT) (cm^2) = 220 / MV PHT (ms) \text{Mitral Valve Orifice Area (PHT)})$
  - TV E/A (Tricuspid Valve E-Vel/A-Vel)
  - TVA(PHT) (Tricuspid Valve Orifice Area (PHT))
- TDI measure:
- Ea(medial) (Mitral Valve medial Early diastolic motion)
  - Aa(medial) (Mitral Valve medial Late diastolic motion)
  - Sa(medial) (Mitral Valve medial Systolic motion)
  - ARa(medial) (Mitral Valve medial Acceleration Rate)
  - DRa(medial) (Mitral Valve medial Deceleration Rate)
  - Ea(lateral) (Mitral Valve lateral Early

- diastolic motion)
  - Aa(lateral) (Mitral Valve lateral Late diastolic motion)
  - Sa(lateral) (Mitral Valve lateral Systolic motion)
  - ARa(lateral) (Mitral Valve lateral Acceleration Rate)
  - DRa(lateral) (Mitral Valve lateral Deceleration Rate)
- Cardiac study items (B mode):
- S-P Ellipse
  - B-P Ellipse
  - Bullet
  - Mod.Simpson
  - Simpson SP (A2C)
  - Simpson SP (A4C)
  - Simpson BP
  - Cube
  - Teichholz
  - Gibson
  - LA Vol(A-L)
  - LA Vol (Simp)
  - RA Vol (Simp)
  - LV Mass (Cube)
  - LV Mass (A-L)
  - LV Mass (T-E)
  - Qp/Qs
  - PISA MR
  - PISA AR
  - PISA TR
  - PISA PR
- Cardiac study items (M mode):
- LVIMP (Left Ventricular Index of Myocardial Performance)
  - Cube
  - Teichholz
  - Gibson
  - LV Mass (Cube)
- Cardiac study items (Doppler mode):
- MVA(VTI)
  - AVA(VTI)
  - LV TEI
  - RVSP
  - PAEDP
  - RV TEI
  - Qp/Qs

- PISA MR
- PISA AR
- PISA TR
- PISA PR

**Cardiac study items (TDI mode):**

- Ea (medial)
- Aa (medial)
- ARa (medial)
- DRa (medial)
- Sa (medial)
- Ea (lateral)
- Aa (lateral)
- ARa (lateral)
- DRa (lateral)
- Sa (lateral)

- **Vascular**

**B-mode measure:**

- Normal (D) (Vessel Diameter)
- Resid (D) (Residual Diameter)
- Normal (A) (Vessel Area)
- Resid (A) (Residual Area)
- CCA IMT (Common Carotid Artery IMT)
- Bulb IMT (Bulbillate IMT)
- ICA IMT (Internal Carotid Artery IMT)
- ECA IMT (External Carotid Artery IMT)

**B-mode calculation:**

- Stenosis D (Stenosis Diameter)
- Stenosis A (Stenosis Area)

**B-mode study:**

- Stenosis
- IMT

**Doppler-mode measure:**

- CCA (Common Carotid Artery)
- Bulb (Bulbillate)
- ICA (Internal Carotid Artery)
- ECA (External Carotid Artery)
- Vert A (Vertebral Artery)
- Innom A (Innominate Artery)
- Subclav V (Subclavian Vein)
- Axill A (Axillary Artery)
- Brachial A (Brachial Artery)
- Ulnar A (Ulnar Artery)
- Radial A (Radial Artery)
- Subclav A (Subclavian Artery)
- Axill V (Axillary Vein)
- Cephalic V (Cephalic Vein)

- Basilic V (Basilic Vein)
  - Ulnar V (Ulnar Vein)
  - Radial V (Radial Vein)
  - C.Iliac A (Common Iliac Artery)
  - Ex.Iliac A (External Iliac Artery)
  - CFA (Common Femoral Artery)
  - SFA (Superficial Femoral Artery)
  - Pop A (Popliteal Artery)
  - TP Trunk A (Tibial Peroneal Trunk Artery)
  - Peroneal A (Peroneal Artery)
  - P.Tib A (Posterior Tibial Artery)
  - A.Tib A (Anterior Tibial Artery)
  - Dors.Ped A (Dorsalis Pedis Artery)
  - C.Iliac V (Common Iliac Vein)
  - Ex.Iliac V (External Iliac Vein)
  - Femoral V (Femoral Vein)
  - Saph V (Great Saphenous Vein)
  - Pop V (Popliteal Vein)
  - TP Trunk V (Tibial Peroneal Trunk Vein)
  - Sural V (Sural Vein)
  - Soleal V (Soleal Vein)
  - Peroneal V (Peroneal Vein)
  - P.Tib V (Posterior Tibial Vein)
  - A.Tib V (Anterior Tibial Vein)
  - ACA (Anterior Cerebral Artery)
  - MCA (Middle Cerebral Artery)
  - PCA (Posterior Cerebral Artery)
  - AComA (Ant.communicating br.)
  - PComA (Post.communicating br.)
  - BA (Basilar Artery)
  - IIA (Internal Iliac Artery)
  - PFA (Deep Femoral Artery)
  - Ba V (Basilar Vein)
  - Brachial V (Brachial Vein)
  - IIV (Internal Iliac Vein)
  - CFV (Common Femoral Vein)
  - SFV (Superficial Femoral Vein)
  - PFV (Deep Femoral Vein)
  - SSV (Small Saphenous Vein)
- Doppler-mode calculation:**
- ICA/CCA (internal carotid artery PS/ common carotid artery PS)
- Doppler-mode study:**
- ABI (Ankle Brachial Index)

- **Gynecology**

## B-mode measure:

- UT L (Uterine Length)
- UT H (Uterine Height)
- UT W (Uterine Width)
- Cervix L (Uterine Cervix Length)
- Cervix H (Uterine Cervix Height)
- Cervix W (Uterine Cervix Width)
- Endo (Endometrium Thickness)
- Ovary L (Ovary Length)
- Ovary H (Ovary Height)
- Ovary W (Ovary Width)
- Follicle1-16 L (Follicle 1-16 Length)
- Follicle1-16 W (Follicle 1-16 Width)
- Follicle1-16 H (Follicle 1-16 Height)

## B-mode calculation:

- Ovary Vol (Ovary Volume)
- UT Vol (Uterine Volume)
- Uterus Body
- UT-L/ CX-L (Uterine Length / Cervix Length)
- Follicle 1-16

## B-mode study:

- Uterus (Length, height and width of uterus, endometrium thickness)
- Uterine Cervix (Length, height and width of uterine cervix)
- Ovary (Length, height and width of ovary)
- Follicle 1-16 (Length and width of follicle 1-16)

## • Urology

### B-mode measure:

- Renal L (Renal Length)
- Renal H (Renal Height)
- Renal W (Renal Width)
- Cortex (Renal Cortical Thickness)
- Adrenal L (Adrenal Length)
- Adrenal H (Adrenal Height)
- Adrenal W (Adrenal Width)
- Prostate L (Prostate Length)
- Prostate H (Prostate Height)
- Prostate W (Prostate Width)
- Seminal L (Seminal Vesicle Length)
- Seminal H (Seminal Vesicle Height)
- Seminal W (Seminal Vesicle Width)
- Testis L (Testicular Length)

- Testis H (Testicular Height)
- Testis W (Testicular Width)
- Pre-BL L (Previous-Bladder Length)
- Pre-BL H (Previous-Bladder Height)
- Pre-BL W (Previous-Bladder Width)
- Post-BL L (Posterior-Bladder Length)
- Post-BL H (Posterior-Bladder Height)
- Post-BL W (Posterior-Bladder Width)

## B-mode calculation:

- Renal Vol (Renal Volume)
- Prostate Vol (Prostate Volume)
- Testis Vol (Testicular Volume)
- Pre-BL Vol (Previous-Bladder Volume)
- Post-BL Vol (Posterior-Bladder Volume)
- Mictur.Vol (Micturated Volume)

## B-mode study:

- Kidney
- Adrenal
- Prostate
- Seminal Vesicle
- Testis
- Bladder

## • Small Parts

### B-mode measure

- Thyroid L (Thyroid Length)
- Thyroid H (Thyroid Height)
- Thyroid W (Thyroid Width)
- Isthmus H (Isthmus Height)
- Testis L (Testicular Length)
- Testis H (Testicular Height)
- Testis W (Testicular Width)

- Mass1 D1-3
- Mass2 D1-3
- Mass3 D1-3

## B-mode calculation:

- Thyroid Vol (Thyroid Volume)

## B-mode study:

- Thyroid
- Testis
- Mass1-3

## Doppler-mode measure:

- STA (Superior Thyroid Artery)
- ITA (Inferior Thyroid Artery)

## • Orthopedics

### B-mode measure:

- Hip
- Hip-Graf
- d/D
- Hip( $\alpha$ ), Hip( $\beta$ )
- **Emergency**
  - B-mode Measure:**
    - Renal L (Renal Length)
    - Renal H (Renal Height)
    - Renal W (Renal Width)
    - CBD (Common bile duct)
    - Portal V Diam (Portal Vein Diameter)
    - CHD (Common hepatic duct)
    - GB wall th (Gallbladder wall thickness)
    - Aorta Diam (Aorta Diameter)
    - Aorta Bif
    - Ureter
    - Pre-BL L (Pre-Animal Bladder Length)
    - Pre-BL H (Pre-Animal Bladder Height)
    - Pre-BL W (Pre-void Bladder Width)
    - Post-BL L (Post-void Bladder Length)
    - Post-BL H (Post-void Bladder Height)
    - Post-BL W (Post-void Bladder Width)
    - GS (Gestational Sac Diameter)
    - YS (Yolk Sac)
    - BPD (Biparietal Diameter)
    - CRL (Crown Rump Length)
    - UT L (Uterine Length)
    - UT H (Uterine Height)
    - UT W (Uterine Width)
    - Endo (Endometrium Thickness)
    - Ovary L (Ovary Length)
    - Ovary H (Ovary Height)
    - Ovary W (Ovary Width)
  - B-mode Calculation:**
    - Renal Vol (Renal Volume)
    - Pre-BL Vol (Pre-void Bladder Volume)
    - Post-BL Vol (Post-void Bladder Volume)
    - Mictur.Vol (Micturated Volume)
    - Ovary Vol (Ovary Volume)
    - UT Vol (UT Volume)
    - Uterus Body
  - B-mode Study:**
    - Uterus
    - Ovary
    - Kidney

- Bladder
- M/Doppler-mode Measure:
  - FHR (Fetal Heart Rate)

### 6.3 Report

- Specific report template to the application
- Editable value in report
- Images are selectable
- Support anatomical graphics in vascular reports
- Titles are pre-settable in setup
- Export as PDF/RTF format

\* Not all measurements are listed in this part;  
For more detailed information please refer to User Manual

## 7 Exam Storage and Management

### 7.1 Exam storage

- 320GB hard drive. More than 280GB internal hard drive reserved for patient data storage
- Capable of storage up to approximately 138,026 single frames (FRM format)
- Storage area
  - Pre-settable: image area, standard area, full-screen
  - Image area: 640\*480
  - Standard area: 800\*600
  - Full-screen: 1024\*768

### 7.2 Exam management

- iStation™ workstation dedicated for patient exam management
- Patient exam query/retrieve
- Support review of current and past exam
- New exam, Active exam, Continue exam functions, End exam are available
- Support measurements and calculations on archived exam and images
- Export image as BMP/JPG/TIFF/DCM/FRM format (FRM: system format)
- Export cine as DCM/AVI/CIN format (CIN: system format)
- Support backup/send to USB devices, DVD-RW media

## 8 Connectivity

### 8.1 Ethernet Network Connection

- Wired connection
- Wireless connection: Wireless Ethernet adapter(option)

### 8.2 Network Storage

### 8.3 DICOM 3.0

- DICOM Basic (option)
  - Verify (SCU, SCP)
  - Print
  - Store
  - Storage Commitment
  - Media Exchange
- DICOM Worklist (option)
- DICOM Query/Retrieve (option)
- DICOM Modality Performed Procedure Step - MPPS (option)
- DICOM OB/GYN structure report (option)
- DICOM Cardiac structure report (option)
- DICOM Vascular structure report (option)

## 9 Probes

### 9.1 Curved array

- C5-2s
  - Application: Adult Abdomen, Gynecology, Obstetrics
  - Bandwidth: 2.1-5.1 MHz(-6dB)
  - Number of Elements: 128
  - FOV (max): 76°
  - Extended FOV: 96°
  - Convex Radius: 51mm
  - Physical Footprint: 76.3mm× 25.6mm
  - Footprint: 64mm × 16.2mm
  - B-mode Frequencies: 2.5, 3.5, 5.0 MHz
  - Harmonic Frequencies: 5.0, 6.0 MHz
  - Doppler Frequencies: 2.5, 3.0 MHz
  - Biopsy Guide: available, multi angle, reusable
- V10-4s
  - Application: Gynecology, Obstetrics, Urology
  - Bandwidth: 4.5-9.5 MHz(-6dB); 3.6-10.0 MHz(-20dB)

- Number of Elements: 128
- FOV (max): 163°
- Extended FOV: 180°
- Convex Radius: 11 mm
- Physical Footprint: 22.1mm ×21.5mm
- Footprint: 22.1mm×9.1mm
- B-mode Frequencies: 5.0, 6.5, 8.0MHz
- Harmonic Frequencies: 8.0, 9.0MHz
- Doppler Frequencies: 4.0, 5.0MHz
- Biopsy Guide: available, single angle, reusable

- V10-4Bs
  - Application: Gynecology, Obstetrics, Urology
  - Bandwidth: 4.5-9.5 MHz(-6dB); 3.6-10.0 MHz(-20dB)
  - Number of Elements: 128
  - FOV (max): 163°
  - Extended FOV: 180°
  - Convex Radius: 11 mm
  - Physical Footprint: 22.1mm ×21.5mm
  - Footprint: 22.1mm×9.1mm
  - B-mode Frequencies: 5.0, 6.5, 8.0MHz
  - Harmonic Frequencies: 8.0, 9.0MHz
  - Doppler Frequencies: 4.0, 5.0MHz
  - Biopsy Guide: available, single angle, reusable

- 6C2s
  - Application: Abdomen, Pediatrics, Transcranial, Vascular, Small parts, Musculoskeletal
  - Bandwidth: 4.2-9.2MHz(-6dB)
  - Number of Elements: 128
  - FOV (max): 99°
  - Extended FOV: 118°
  - Convex Radius: 16mm
  - Physical Footprint: 33.5mm×24.8mm
  - Footprint: 29mm×10mm
  - B-mode Frequencies: 5.5, 6.5, 8.0MHz
  - Harmonic Frequencies: 8.0, 9.0MHz
  - Doppler Frequencies: 4.4, 5.0MHz
  - Biopsy Guide: available, multi angle, reusable

### 9.2 Volume curved array

- 4CD4
  - Application: Gynecology, Obstetrics,

### Abdomen

- Bandwidth: 2.5-5.4MHz(-6dB)
- Number of Elements: 128
- FOV (max): 80°(B) × 70°(sweep)
- Convex Radius: 51.5mm
- Physical Footprint: 73mm × 51.6mm
- Footprint: 51mm × 15.5mm
- B-mode Frequencies: 2.5, 4.5, 6.0MHz
- Harmonic Frequencies: 5.0, 6.0MHz
- Doppler Frequencies: 2.5, 3.0MHz
- Biopsy Guide: not available

### 9.3 Linear array

#### • L14-6s

- Application: Small parts, Vascular, Pediatrics, Superficial, Musculoskeletal, Neurology
- Bandwidth: 5.1-12.5MHz(-6dB); 3.5-16.0MHz(-20dB)
- Number of Elements: 128
- Field of View (max): 25mm
- Steered Angle: +/-6°, +/-20°
- Physical Footprint: 47mm × 22.8mm
- Footprint: 30mm × 8mm
- B-mode Frequencies: 8.0, 10.0, 12.0MHz
- Harmonic Frequencies: 10.0, 11.0MHz
- Doppler Frequencies: 5.7, 6.6MHz
- Biopsy Guide: available, multi angle, reusable

#### • L14-6Ns

- Application: Small parts, Vascular, Pediatrics, Superficial, Musculoskeletal, Neurology
- Bandwidth: 5.1-12.5 MHz (-6dB); 3.5-16.0MHz(-20dB)
- Number of Elements: 192
- Field of View (max): 38mm
- Steered Angle: +/-6°, +/-20°
- Physical Footprint: 61.0mm × 24.5mm
- Footprint: 44.2mm × 8.5mm
- B-mode Frequencies: 8.0, 10.0, 12.0MHz
- Harmonic Frequencies: 10.0, 11.0MHz
- Doppler Frequencies: 5.7, 6.6MHz
- Biopsy Guide: not available

#### • L12-4s

- Application: Small parts, Vascular, Musculoskeletal, Pediatrics, Abdomen
- Bandwidth: 4.0-11.0MHz (-6dB); 3.0-13.0MHz (-20dB)
- Number of Elements: 192
- Field of View (max): 38mm
- Steered Angle: +/-6°, +/-20°
- Physical Footprint: 61mm × 24.5mm
- Footprint: 44.2mm × 8.5mm
- B-mode Frequencies: 6.0, 7.5, 10.0MHz
- Harmonic Frequencies: 10.0, 11.0MHz
- Doppler Frequencies: 5.0, 5.7MHz
- Biopsy Guide: available, multi angle, reusable

#### • 7L4s

- Application: Small parts, Vascular, Pediatrics, Superficial, Musculoskeletal, Neurology
- Bandwidth: 5.0-11.0MHz (-6dB); 3.5-13.0MHz (-20dB)
- Number of Elements: 128
- Field of View (max): 38mm
- Steered Angle: +/-6°, +/-12°
- Physical Footprint: 61mm × 24.4mm
- Footprint: 43mm × 10mm
- B-mode Frequencies: 5.0, 7.5, 10.0MHz
- Harmonic Frequencies: 8.0, 10.0MHz
- Doppler Frequencies: 5.0, 5.7MHz
- Biopsy Guide: available, multi angle, reusable

#### • L7-3s

- Application: Small parts, Vascular, Pediatrics, Superficial, Musculoskeletal, Neurology
- Bandwidth: 3.0-6.5 MHz (-6dB); 2.0-8.0MHz (-20dB)
- Number of Elements: 128
- Field of View (max): 38mm
- Steered Angle: +/-6°, +/-12°
- Physical Footprint: 61mm × 24.4mm
- Footprint: 43mm × 10mm
- B-mode Frequencies: 4.0, 5.0, 6.0MHz
- Harmonic Frequencies: 6.0, 7.0MHz
- Doppler Frequencies: 3.8, 5.0MHz
- Biopsy Guide: available, multi angle, reusable



- 7L5s
  - Application: Small parts, Vascular, Pediatrics, Musculoskeletal
  - Bandwidth: 4.5-10.0 MHz(-6dB); 3.0-12.0MHz (-20dB)
  - Number of Elements: 128
  - Field of View (max): 52mm
  - Steered Angle: +/-5°, +/-10°
  - Physical Footprint: 70mm×24.6mm
  - Footprint: 56mm×10mm
  - B-mode Frequencies: 5.0, 7.5, 10.0MHz
  - Harmonic Frequencies: 8.0, 10.0MHz
  - Doppler Frequencies: 5.0, 5.7MHz
  - Biopsy Guide: available, multi angle, reusable
- 7LT4s
  - Application: Small parts, Vascular, Pediatrics, Superficial, Musculoskeletal, Neurology
  - Bandwidth: 5.0-10.0MHz(-6dB); 3.5-13.5MHz(-20dB);
  - Number of Elements: 128
  - Field of View (max): 40mm
  - Steered Angle: +/-5°, +/-12°
  - Physical Footprint: 61mm×24.4mm
  - Footprint: 43mm×10.0mm
  - B-mode Frequencies: 5.0, 7.5, 10.0MHz
  - Harmonic Frequencies: 8.0, 10.0MHz
  - Doppler Frequencies: 5.0, 5.7MHz
  - Biopsy Guide: not available

#### 9.4 Phased array

- P4-2s
  - Application: Adult Cardiac, Transcranial, Pediatric Abdomen
  - Bandwidth: 1.9-4.0MHz (-6dB)
  - Number of Elements: 64
  - Field of View (max): 90°
  - Physical Footprint: 38.2mm×30.5mm
  - Footprint: 23.4mm×15.2mm
  - B-mode Frequencies: 2.0, 2.5, 3.0MHz
  - Harmonic Frequencies: 3.2, 3.6MHz
  - Doppler Frequencies: 2.0, 2.3MHz; TDI 2.5, 3.0MHz
  - CW Frequency: 2MHz
  - Biopsy Guide: available, multi angle, reusable

- P7-3s
  - Application: Pediatric Cardiac
  - Bandwidth: 2.6-6.7MHz (-6dB)
  - Number of Elements: 96
  - Field of View (max): 90°
  - Physical Footprint: 34mm×24.5mm
  - Footprint: 17.4mm×12.5mm
  - B-mode Frequencies: 3.6, 5.0, 6.6MHz
  - Harmonic Frequencies: 6.0, 7.0MHz
  - Doppler Frequencies: 3.3, 4.0MHz; TDI 3.3, 4.0MHz
  - CW Frequency: 3.3MHz
  - Biopsy Guide: available, multi angle, reusable
- P12-4s
  - Application: Neonatal Cardiac, Transcranial
  - Bandwidth: 4.2-11.0MHz (-6dB)
  - Number of Elements: 96
  - Field of View (max): 90°
  - Physical Footprint: 22mm×20mm
  - Footprint: 14.0mm×10.5mm
  - B-mode Frequencies: 6.0, 8.0, 10.0MHz
  - Harmonic Frequencies: 8.0, 10.0MHz
  - Doppler Frequencies: 4.7, 5.7MHz; TDI 4.0, 4.7MHz
  - CW Frequency: 5MHz
  - Biopsy Guide: available, multi angle, reusable
- P7-3Ts
  - Application: Transesophageal Echo
  - Bandwidth: 3.1-7.2MHz (-6dB);
  - Number of Elements: 64
  - Field of View (max): 90°
  - Physical Footprint: 14mm×12mm
  - Footprint: 14mm×12mm
  - B-mode Frequencies: 3.6, 5.0, 6.6MHz
  - Harmonic Frequencies: 6.0, 7.0MHz
  - Doppler Frequencies: 2.7, 3.3MHz; TDI 3.3, 4.0
  - CW Frequency: 3.3MHz
  - Biopsy Guide: not available

#### 9.5 CW probe

- CW2s
  - Application: Transcranial, Cardiac, Pediatrics

- Number of Elements: 2
- CW Frequency: 2.0MHz
- Biopsy Guide: not available
- CW5s
  - Application: Vascular
  - Number of Elements: 2
  - CW Frequency: 5.0MHz
  - Biopsy Guide: not available

- Full battery lasts more than 64h in standby mode
- Empty battery recharged to full in 2-3h
- Continuous work time: about 1.5 hour in B mode

#### 10.10 DVD R/W

- External USB DVD R/W drive

#### 10.11 Mobile Trolley

- UMT-200
  - Without Extra LCD Display
  - Platform Height: not adjustable after installed
- UMT-300
  - 15-inch Extra LCD Display (optional)
  - Power supply module (optional)
  - External DVD R/W Storage (optional)
  - Platform Height: 855-1010mm adjustable

#### 10.12 Barcode reader

- 1-D barcode reader: SYMBOL LS2208
- 2-D barcode reader: SYMBOL DS6707

## 10 Peripheral Devices and Accessories

### (Option)

#### 10.1 Probe extend module:PEM-21

One extend three probe ports  
Support the probes without the trolley  
exclude 4CD4s

#### 10.2 Black/white digital video printer

- SONY UP-D897
- MITSUBISHI P93DC
- MITSUBISHI P95DW-N

#### 10.3 Color digital video printer

- SONY UP-D23MD

#### 10.4 Color analog printer

- SONY UP-20, MITSUBISHI CP910E

#### 10.5 Graph/text printer

- HP Deskjet D2568
- HP OfficeJet J3600 (HP Officejet J3608 All-in-One)
- HP Color LaserJet CM1015

#### 10.6 Wireless printer

- HPOTOSMART PLUS e-ALL-IN-ONE B 210a

#### 10.7 Footswitch

- USB port: 971-SWNOM (2-pedal)
- USB port: SP-997-350 (3-pedal)
- Support User-definable functions (Freeze, Save, Print)

#### 10.8 ECG module ECG-21

- ECG lead port: 6 pin, IEC&AHA
- Connection port: connect to I/O extend module

#### 10.9 Built-in Battery

- Model: LI23I001A
- Replaceable and rechargeable lithium battery

## 11 System Inputs and Outputs

#### 11.1 I/O Extend port

- I/O Extend module IOM-21 (option)
  - USB: 2 port
  - ECG: 1 port
  - Serial port: 1 port
  - Remote: 1 port
  - Audio out: 1 port
  - Video out: 1 port
  - DVI-I: 1 port
  - Microphone: 1 port
- V/A extend module VAM-11 (option)
  - Audio in: 1 port
  - Video in: 1 port
  - S-Video in: 1 port

#### 11.2 Video/Audio output

- S-Video out: 1 port, PAL/NTSC

#### 11.3 Other input/output

- USB: 2 ports
- Ethernet: 1 port

## 12 Safety and Conformance

#### 12.1 Quality standards

- ISO 9001

- ISO 13485

## 12.2 Design standards

- UL 60601-1
- CSA C22.2 No. 601-1
- EN 60601-1 and IEC 60601-1
- EN 60601-1-1 and IEC 60601-1-1
- EN 60601-1-2 and IEC 60601-1-2
- EN 60601-2-37 and IEC60601-2-37
- EN60601-1-4 and IEC60601-1-4
- EN60601-1-6 and IEC60601-1-6

## 12.3 CE declaration

M7/ M7T system is fully in conformance with the Council Directive 93/42/EEC Concerning Medical Devices, as amended by 2007/47/EC. The number adjacent to the CE marking (0123) is the number of the EU-notified body that certified meeting the requirements of Annex II of the Directive.

### NOTICE:

Not all features or specifications described in this document may be available in all probes and/or modes.

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