

## System Description

The M7/M7T 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.

## Dimensions and Weight

- Width: 361mm (14.21 inch)
- Depth: 357mm (14.06 inch)
- Height: 75mm (2.95 inch)
- Weight: approx. 6.5kg (including batteries and 4D board, without power adapter)

## Electrical Power

### AC adapter input

- Voltage
  - > 100-240V~ (AC adapter)
  - > 220-240V~, 50/60Hz (configured with UMT-300)
- Frequency: 50/60Hz
- Input power
  - > 1.5- 0.6A (AC adapter)
  - > 600 VA (configured with UMT-300)

### AC adapter output:

- Voltage: 12V ===
- Output current: 10A

### Battery

- Lithium-Ion Battery Pack: 11.1V === , 4500mAh

## Operating Environment

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

## Storage & Transportation Environment

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

## Probe

### Probe Types

- Linear array probe
- Phased array probe
- Convex array probe
- 4D mechanical volume probe

### Scanning Methods

- Electronic convex with extend FOV
- Electronic linear with slant scanning and trapezoid
- Electronic sector

### Probe Model

- C5-2s-----Convex Transducer
- V10-4s-----Cavity Micro-Convex Transducer
- V10-4Bs-----Cavity Micro-Convex Transducer
- 6C2s-----Micro-Convex Transducer
- 4CD4s-----4D Mechanical Volume Transducer
- 7L4As-----Linear Transducer
- L12-4s-----Linear Transducer
- L14-6s-----Linear Transducer
- L7-3s-----Linear Transducer
- 7L5s-----Linear Transducer
- P7-3s--High Frequency Phased Array Transducer
- P12-4s--High Frequency Phased Array Transducer
- P4-2s-----Phased Array Transducer
- L14-6Ns-----Linear Transducer
- CW2s-----Continuous Wave Transducer
- Available Needle-guided Bracket for Probe:
  - > C5-2s: NGB-006

- V10-4s/V10-4Bs: NGB-004
- 6C2s: NGB-005
- 7L4s: NGB-007
- L12-4s: NGB-007
- L14-6s: NGB-016
- L7-3s: NGB-007
- 7L5s: NGB-007
- P4-2s: NGB-011

- ✓ 1 Serial port
- ✓ 1 Audio output port: Left/Right
- ✓ 1 Mic In port
- ✓ 1 Remote control port
- ✓ 1 Composite video output port
- ✓ 1 DVI-I (Digital Video Interface-Integrated) output port
- V/A extend module
  - ✓ Audio input port Left/Right
  - ✓ Composite video input port
  - ✓ Separate video input port
- ECG module
  - ✓ ECG Lead port
  - ✓ Connection port: to connect to I/O extend module
  - ✓ Should be configured with I/O extend module

## Appearance Design

- Display
  - 15inch LCD, High-Resolution 1024 X 768
  - Brightness Adjustment
  - Screen Saver: Time and graph presettable
  - Boot time: 50s
  - Boot time (from standby): 12s
  - Open angle adjustable: 150°
- Control Panel
  - Power/Battery Indicator
  - Alphanumeric Keys
  - Function Keys
  - Knobs
  - Ergonomic soft key operation
  - Backlight Keys
  - 8 segment TGC
  - Blank Keys for User-defined Functions
  - Trackball: color and Sensitivity Adjustment
  - Brightness adjustment
  - Integrated Speakers, Audio Volume Adjustment
- Handle
- Transducer port
  - 1 port, connect to a probe or the probe extend module
- Transducer locking lever
- Power input port
  - Connect to the power adapter
- I/O(input/output) extend port
  - connect to the I/O extend module
  - I/O extend module:
    - ✓ 2 USB port
    - ✓ 1 ECG port

- USB port: 2
- Ethernet port
  - Connect to the network
- S-Video separate video output
  - For image signal output
- Wireless LAN support
- Mobile Trolley
  - UMT-200
  - UMT-300
    - ✓ 15-inch Extra LCD Display (optional)
    - ✓ Power supply module (optional)
    - ✓ External DVD R/W Storage(optional)

## Peripherals Supported

- Black / white video printer (Digital)
  - SONY UP-D897
  - MITSUBISHI P95DW-N
  - MITSUBISHI P93DC
- Color video printer(Digital): SONY UP-D23MD
- Graph / text printer
  - HP Deskjet D2568
  - HP OfficeJet J3600 (HP Officejet J3608 All-in-One)
  - HP Color LaserJet CM1015

## Hardware Options

- External USB DVD-RW: SE-S224Q

- I/O extend module: IOM-21
- Probe extend module: PEM-21
- V/A extend module: VAM-11
- ECG module: ECG-21
- ECG lead
- Footswitch:
  - 971-SWNOM (2-pedal)
  - SP-997-350 (3-pedal)
- Mobile trolley
  - UMT-200
    - Weight: 21kg
    - Width: 470mm
    - Depth: 657mm
    - Height selective (not available after installed)
      - ✓ Platform: 810-870mm
      - ✓ Handle position: 890-950mm
  - UMT-300
    - Without LCD module (with power module and DVD):
      - ✓ Height: 855-1015mm
      - ✓ Width: 514mm
      - ✓ Depth: 653mm
      - ✓ Weight: 43kg
    - With LCD module (with power module and DVD):
      - ✓ Height: 1550-1830mm
      - ✓ Width: 514mm
      - ✓ Depth: 653mm
      - ✓ Weight: 52kg
      - ✓ Platform height (adjustable): 855-1010mm
- Pack
- Dust-proof cover
- Battery Pack (LI23I001A)
- Wireless-LAN adapter
- Probes
- Needle-guided brackets

### **Application**

- Abdomen
- Obstetrics
- Gynecology
- Cardiology
- Small Parts
- Urology
- Vascular
- Pediatrics

### **Exam Mode**

- Adult ABD
- ABD-Difficult
- Ped-ABD
- Neonatal ABD
- Kidney
- OB1
- OB2/3
- Fetal Cardiac
- GYN
- Adult Cardiac
- CAR-Difficult
- Ped-Cardiac
- Neonatal CAR
- Carotid
- IMT
- Lower Ext Artery
- Lower Ext Vein
- Upper Ext Artery
- Upper Ext Vein
- TCI (TCD for FDA version)
- Urology
- Prostate
- Thyroid
- Breast
- Testicle
- MSK
- Superficial
- Orthopedic
- Neonatal Head
- Nerve
- EM ABD
- EM FAST
- EM OB
- EM Vascular
- EM Superficial
- User-defined (1~15)

### **Imaging Mode**

- B-Mode with Tissue Harmonic Imaging
- Slant scanning for linear probes (B, color/power, PW/CW independent)
- M -Mode
- Color M Mode (CM)
- Free Xros M Mode
- Curved Free Xros M Mode (Free Xros CM)
- Color Free Xros M

- Trapezoid Imaging for Linear Probe
- ExFOV Imaging for Convex Probe
- Color(CDFI)
- Power(CDE/PDE)
- D-CDE (D-PDE)
- PW (Pulse Wave Doppler)
- HPRF (High Pulse Repeat Frequency)
- CW (Continuous Wave Doppler)
- TDI (Tissue Doppler imaging)
  - TVI (Tissue Velocity Imaging)
  - TEI (Tissue Energy Imaging)
  - TVM (Tissue Doppler Velocity M Mode)
- Smart 3D
- Static 3D
- 4D (Real-time 3D)
- iScape™
- Tissue Doppler Imaging
- TDI Quantitative Analysis Package
- Contrast Harmonic Imaging
- iBeam™ (Spatial Compounding Imaging for Linear and Convex Probe)
- Multi-frequency probes for 2D and Doppler imaging modes
- iClear™: adaptive speckle suppression imaging for all probes
- iTouch™ (B/PW/CW/Color)
- TSI (Tissue Specific Imaging)
  - Color mode: 7707Hz (Max.)
  - PW mode: 6600Hz (Max.)
  - CW mode: 44000Hz (Max.)
- Adjustable focus number: 4
- System processing channels: 1024
- Magnification factor:
  - Spot: 1-10
  - Pan: 1-10
- Full screen (iZoom): zoom in the image area only, or zoom in both the image area and some other elements
- System dynamic range: ≥160dB
- Adjustable focus positions (Max.): 16
- Maximum frame rate in 4D reaches 30 frames/s
- Frame compare
- Display Mode:
  - B/C/D triplex mode
  - Dual live: B/C, B/TDI,
  - Adjustable 2D/ time line display format
  - Single window
  - Dual-split: B/C, B/TDI, B/M, B/PW
  - Quad-split
- Maximum iScape imaging length: 110cm

## Imaging Features

- Display Depth
  - Minimum: 18mm----L14-6s
  - Maximum: 388mm-----C5-2s
- Frame rate (Max.):
  - B mode: 643----L14-6s
  - Color mode: 368----P4-2s
- PRF (probe dependent)
  - Color mode: 14.3kHz
  - PW mode: 24kHz
  - CW mode: 160kHz
- Flow velocities (probe dependent)
  - Color mode: 226cm/s
  - PW mode: 462cm/s
  - CW mode: 3080cm/s
- WF (1-7 levels)

## System Language

- Software display and keyboard input available: Chinese/English/German/Spanish/French/Italian/Portuguese/Russian/Czech/Polish
- Keyboard input available only: Icelandic/Norwegian/Swedish/Finnish/Turkish/Danish
- Control panel overlay available: Chinese/German/Spanish/French/Italian/Portuguese/Russian/Czech/Polish
- Operation manual available: Chinese/English/German/Spanish/French/Italian/Portuguese/Russian

## System Configuration

## **Standard Configuration**

- High resolution 15 inch LCD display
- PW
- HPRF
- Color doppler flow imaging
- Power doppler flow imaging
- Directional power doppler flow imaging
- Tissue harmonic imaging
- Trapezoid imaging
- iBeam™
- iTouch™
- iStation™
- 320G integrated hard disk
- Multi-language screen display and control panel overlay
- Travelling case

## **Software Options**

- iClear™
- CW module
- iScape module
- Free Xros M (Anatomical M)
- Smart 3D module
- 4D module
- IMT
- TDI(Tissue Doppler imaging) module
- Abdominal package (including related exam mode, comments, measurements, body marks and report)
- Obstetrical package (including related exam mode, comments, measurements, body marks and report)
- Gynecological package (including related exam mode, comments, measurements, body marks and report)
- Cardiac package (including related exam mode, comments, measurements, body marks and report)
- Small parts package (including related exam mode, comments, measurements, body marks and report)
- Urological package (including related exam mode, comments, measurements, body marks and report)
- Vascular package (including related exam mode, comments, measurements, body marks and report)
- Pediatric package (including related exam mode, comments, measurements, body marks and report)
- Nerve blocks package (including related exam mode, comments, measurements, body marks and report)

- Emergency medicine package (including related exam mode, comments, measurements, body marks and report)
- DICOM basic function module (including: task management, DICOM storage, DICOM print, DICOM storage commitment, DICOM media storage (including DICOM DIR), etc.)
- DICOM Worklist
- DICOM MPPS
- DICOM OB/GYN structured report
- DICOM vascular structured report
- DICOM cardiac structured report
- DICOM Query/Retrieve
- Free Xros CM
- TDI Quantitative Analysis

## **Display Annotations**

- Manufacturer logo
- Hospital name: up to 64 characters can be displayed
- Exam date: 3 types selectable, YY/MM/DD, MM/DD/YY, DD/MM/YY
- Exam time: 2 formats
- Acoustic output indices: MI, TIC, TIS, TIB
- Freeze icon
- Gender
- Age
- ID: up to 64 characters can be displayed
- Name: up to 64 characters can be displayed
- Probe model
- Current exam mode
- ECG icon (displays when connects with a physiology module)
- Accession#
- Operator: up to 64 characters can be displayed
- Menu
- Image
- ECG trace
- Probe orientation mark
- Time line
- Coordinate axis, including depth, time, velocity/frequency
- TGC curve
- Focus
- Comment
- Body Mark

- Measure caliper
- Gray/ color scale bar
- Thumbnail
- Cine icon
- Trackball functionality status icon
- Help information
- Soft Menu
- Status icons
- Biopsy guideline
- Measure result window(up to 8 results can be displayed)
- Image parameters

## Comments and Body Mark

### **Comment**

#### **Text comment**

- Comment text (option)
  - Abdomen: 89
  - OB: 97
  - Cardiology: 80
  - GYN: 69
  - Vascular: 110
  - Urology: 61
  - SMP: 124
  - Pediatrics: 35
  - Nerve blocks: 52
  - EM: 127
- User-defined Comments
  - Add
  - Delete

#### **Arrow**

- Arrow Size
- Arrow position
- Arrow orientation

#### **Trace**

- Control panel operation

### **Body Mark**

#### **Application package (Option)**

- Abdomen: 13
- OB: 25
- Cardiology: 18
- GYN: 7
- Vascular: 17
- Urology: 7
- SMP: 46

- Nerve blocks: 32
- EM: 38

#### **User-defined**

- New
- Copy
- Export
- Load
- Delete
- Edit

## Storage/ Connection

- 320G integrated hard disk
- External DVD-R/W (Optional)
- USB ports
- Image archive on hard disk and DVD, temporary saving in cine memory
- Live capture: Retrospective (1-120s, or 1-120 cycles); Prospective (1-480s, or 1-120 cycles)
- Thumbnail
- Single image formats: BMP, JPG, DCM, FRM, supports off-line analysis
- Multi-frame images formats: AVI, DCM, CIN, supports off-line analysis
- Clip length: 1-60s, 1-16 cycles
- Storage area:
  - Image area: 640×480
  - Standard area: 800×600
  - Full-screen: 1024×768
- iVision
- Cine review: Auto, Manual (auto review segment can be set), supports linked cine review for 2D, M/D images.
- Send/ print image after End Exam
- Cine memory capacity (Max.)
  - B mode: 8380 frames----L14-6s
  - Color mode: 7413 frames----L14-6s (11457 if BC wide function is turned on)
  - PW/M mode: 131s
- Max. frames in HDD
  - 11184810 frames (JPG format)
  - 138026 frames (FRM format)
- DICOM:
  - DICOM Storage
  - DICOM print
  - DICOM Worklist

- Query/ Retrieve
- Structured Report (SR)
- Storage Commitment
- MPPS
- Media review

## **iStation™**

Intelligent patient data management platform

- Integrated search engine for patient data
- Detailed patient information view
- Intelligent data backup/ restore
- Patient data/ image sending
- Patient data deleting
- Exam managing: create new exam, activate exam and continue exam
- Recycle Bin

## **Measure/Calc/Study**

### *Caliper*

#### **2D-mode**

- Depth
- Distance
- Angle
- Area
- Volume
- Cross
- Parallel
- T Length
- Ration (D)
- Ratio (A)
- B-Hist
- B-Profile (not available for M7T)
- Color Vel
- VF Diam

#### **M-mode**

- HR
- Slope
- Distance
- Time
- Velocity

#### **Doppler mode**

- D Velocity
- HR

- Time
- Acceleration
- D Trace
- PS/ED

## **Application**

Optional package for various specific clinical uses

### **Abdomen**

- 2D-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
  - Iliac Diam
  - 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)
- 2D-mode Calculation
  - Renal Vol (Renal Volume)
  - Pre-BL Vol (Previous-Bladder Volume)
  - Post-BL Vol (Posterior-Bladder Volume)
  - Mictur.Vol (Micturated Volume)
- 2D-mode study
  - Kidney
  - Adrenal

- Bladder
- 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)
  - Hepatic V (Hepatic Vein)
  - M Hepatic V (Middle Hepatic Vein)
  - Splenic V (Splenic Vein)
  - SMV (Superior Mesenteric Vein)

### **Obstetrics**

- 2D-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)
  - 2D-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
  - 2D-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 end diastole)
    - IVSs (interventricular septal thickness at end systole)
  - Doppler-mode Measure
    - Umb A (Umbilical Artery)
    - Duct Venos (Ductus Venos)
    - 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)
- Available Obstetrics Formulae**
- GA (gestational age) Formulae
    - GS: 4
    - CRL: 9
    - BPD: 11
    - HC: 6
    - AC: 3
    - FL: 12
    - OFD: 3
    - FTA: 1
    - THD: 1
    - HUM: 2
    - CLAV: 1
    - TCD: 2
    - OOD: 1
    - EFW1: 2
    - EFW2: 2
    - Mean Sac Diam: 1
  - FG (fetal growth) Formulae
    - GS: 4
    - CRL: 6
    - BPD: 11
    - HC: 6
    - AC: 6
    - FL: 10
    - OFD: 4
    - APAD: 1
    - TAD: 1
    - FTA: 1
    - THD: 1
    - HUM: 2
    - Ulna: 1
    - Tibia: 1
    - RAD: 2
    - FIB: 2
    - CLAV: 1
    - TCD: 3
    - Cist Magna: 1
    - EFW1: 9
    - EFW2: 9

- MCA PI: 1
- MCA RI: 1
- Umb A PI: 1
- Umb A RI: 1
- AFI: 1
- Fetal Weight Formulae: 11

## Cardiology

- 2D-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)
- 2D-mode Calculation

- LA/Ao (LA Diam (cm) / Ao Diam (cm))
- Ao/LA (Aorta Diameter/Left Atrium Diameter)
- 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
  - Ao/LA (Aorta Diameter/Left Atrium Diameter)
- Doppler 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
  - LVOT AccT (Left Ventricular Outflow Tract Acceleration Time)
  - AAO Vmax (Ascending Aorta Maximum Velocity)
  - DAo Vmax (Descending Aorta Maximum Velocity)
  - AV Vmax (Aorta Valve Maximum Velocity)
  - AV VTI (Aorta Valve Velocity)-Time Integral
  - LVPEP (Left Ventricular Pre-ejection Period)
  - LVET (Left Ventricular Ejection Time)
  - AV AccT (Aorta Valve Acceleration Time)
  - AV DecT (Aorta Valve Deceleration Time)
  - RVET (Right Ventricular Ejection Time)
  - RVPEP (Right Ventricular Pre-ejection Period)
  - TV Vmax (Tricuspid Valve Maximum Velocity)
  - TV E Vel (Tricuspid Valve E-wave Flow Velocity)
  - TV A Vel (Tricuspid Valve A-wave Flow Velocity)

- TV VTI (Tricuspid Valve Velocity)-Time Integral)
- TV AccT (Tricuspid Valve Acceleration Time)
- TV DecT (Tricuspid Valve Deceleration Time)
- TV A Dur (Tricuspid Valve A-wave Duration)
- RVOT Vmax (Right Ventricular Outflow Tract Maximum Velocity)
- RVOT VTI (Right Ventricular Outflow Tract Velocity)-Time Integral)
- PV Vmax (Pulmonary Valve Maximum Velocity)
- PV VTI (Pulmonary Valve Velocity)-Time Integral)
- PV AccT (Pulmonary Valve Acceleration Time)
- MPA Vmax (Main Pulmonary Artery Maximum Velocity)
- RPA Vmax (Right Pulmonary Artery Maximum Velocity)
- LPA Vmax (Left Pulmonary Artery Maximum Velocity)
- PVein S Vel (Pulmonary Vein S-wave Flow Velocity)
- PVein D Vel (Pulmonary Vein D-wave Flow Velocity)
- PVein A Vel (Pulmonary Vein A-wave Flow Velocity)
- PVein A Dur (Pulmonary Vein A-wave Duration)
- PVein S VTI (Pulmonary Vein S-wave Velocity)-time Integral)
- PVein D VTI (Pulmonary Vein D-wave Velocity)-time Integral)
- PVein DecT (Pulmonary Vein Deceleration Time)
- IVC Vel (Insp) (Inferior Vena Cava Inspiration Maximum Velocity)
- IVC Vel (Expir) (Inferior Vena Cava Expiration Maximum Velocity)
- SVC Vel (Insp) (Superior Vena Cava Inspiration Maximum Velocity)
- SVC Vel (Expir) (Superior Vena Cava Expiration Maximum Velocity)
- MR Vmax (Mitral Valve Regurgitation Maximum Velocity)
- MR VTI (Mitral Valve Regurgitation Velocity)-Time Integral)
- MS Vmax (Mitral Valve Stenosis Maximum Velocity)
- dP/dt (Rate of Pressure Change)
- AR Vmax (Aortic Valve Regurgitation Maximum Velocity)
- AR VTI (Aortic Valve Regurgitation Velocity)-Time Integral)
- AR DecT (Aortic Valve Regurgitation Deceleration Time)
- AR PHT (Aortic Valve Regurgitation Pressure Half Time)
- AR Ved (Aortic Valve Regurgitation Velocity) at end-Diastole)
- TR Vmax (Tricuspid Valve Regurgitation Maximum Velocity)
- 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<sup>2</sup>) = 220 / MV PHT (ms)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

- 2D-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

- M-mode:

- LVIMP
- Cube
- Teichholz
- Gibson
- LV Mass (Cube)

- Doppler-mode:

- MVA(VTI)
- AVA(VTI)
- LV TEI

- RVSP
- PAEDP
- RV TEI
- Qp/Qs
- PISA MR
- PISA AR
- PISA TR
- PISA PR
- TDI mode
  - Ea/Aa (medial)
  - ATa (medial)
  - DTa (medial)

- **Vascular**

- 2D-mode Measure

- Vas Diam (Vascular Diameter)
- Vas Area (Vascular Area)
- 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)

- 2D-mode Calculation

- Stenosis D (Stenosis Diameter)
- Stenosis A (Stenosis Area)
- Vol Flow(Diam)- TAMAX (Volume Flow Diameter)
- Vol Flow(Area)- TAMAX (Volume Flow Area)

- 2D-mode Study

- Volume Flow
- Stenosis
- IMT (Intima-Media Thickness)

- 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 A (Subclavian Artery)
- 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)
- Vas Trace (Vascular Trace)
- Doppler-mode Study
  - Volume Flow

## **Gynecology**

- 2D-mode Measure
  - UT L
  - UT H
  - UT W
  - Cervix L
  - Cervix H
  - Cervix W
  - Endo
  - Ovary L
  - Ovary H
  - Ovary W
  - Follicle1-16 L
  - Follicle1-16 W
  - Follicle1-16 H
- 2D-mode Calculation
  - Ovary Vol
  - UT Vol
  - Uterus Body
  - UT-L/ CX-L
- 2D-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**

- 2D-mode Measure
  - Renal L
  - Renal H
  - Renal W
  - Cortex
  - Adrenal L
  - Adrenal H
  - Adrenal W
  - Prostate L
  - Prostate H
  - Prostate W
  - Seminal L
  - Seminal H
  - Seminal W
  - Testis L
  - Testis H
  - Testis W

- Pre-BL L
- Pre-BL H
- Pre-BL W
- Post-BL L
- Post-BL H
- Post-BL W
- 2D-mode Calculation
  - Renal Vol
  - Prostate Vol
  - Testis Vol
  - Pre-BL Vol
  - Post-BL Vol
  - Mictur.Vol
- 2D-mode Study
  - Kidney
  - Adrenal
  - Prostate
  - Seminal Vesicle
  - Testis
  - Bladder

#### **Small Parts**

- 2D-mode Measure
  - Thyroid L
  - Thyroid H
  - Thyroid W
  - Isthmus H
  - Testis L (Testicular Length)
  - Testis H (Testicular Height)
  - Testis W (Testicular Width)
  - Mass1 D1-3
  - Mass2 D1-3
  - Mass3 D1-3
- 2D-mode Calculation
  - Thyroid Vol
- 2D-mode Study
  - Thyroid
  - Testic
  - Mass1-3
- Doppler-mode Measure
  - STA

- ITA

#### **Orthopedics**

- 2D-mode Measure
  - HIP
  - HIP-Graf

#### **Diagnostic Report**

- View/add images
- Edit report
- Obstetric/vascular analysis
- Fetal growth curve
- Print report
- Import/export report
- View history report

# Safety & Conformance

## **Quality Standards**

- ISO 9001:2000
- ISO 13485:2003

## **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

## **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.

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

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The contents of this manual are subject to change without prior notice and without our legal obligation.

Note: the contents in this datasheet are applied to Version 2.0 of system software for M7/M7T diagnostic ultrasound system.