

MX7 Color Doppler Ultrasound System

Performance Specifications

System Overview

Application

General
Abdomen
Gynecology
Obstetrics
Cardiac
Small Parts
Urology
Vascular
Nerve
Pediatric
EM

Transducer Types

Curved array
Linear array
Phased array
Volume
Pencil

Imaging Modes

B-mode
THI 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
UWN+(Ultra-Wideband Non-linear Plus) Contrast Imaging™
Tissue Tracking QA
Stress Echo
Elastography
iScape™ View (Panoramic Imaging)
Smart 3D

Standard Features

B-mode
THI and PSH™
M-mode
Color Doppler Imaging
Power Doppler Imaging and Directional PDI
Pulsed Wave Doppler
iBeam™ (Spatial Compound Imaging)
iClear™ (Speckle Suppression Imaging)
iTouch™ (Auto Image Optimization)
Echo Boost™
Zoom/iZoom (Full Screen Zoom)
FCI (Frequency Compound Imaging)
B steer
ExFOV (Extended Field of View)
HR Flow™ (High Resolution Flow)
Raw data processing
iScan helper

1 active probe port
Hard drive: 128 GB SSD
4-USB
HDMI
iStorage
McAfee
MedTouch
MedSight
Net Storage
Built-in Battery
Power adapter

Optional Features

iScape™ View
Free Xros M™
Free Xros CM™
Tissue Doppler Imaging
Continuous Wave Doppler
UWN+ Contrast Imaging™
LVO (Left Ventricular Opacification)
Strain Elastography
Stress Echo
Tissue Tracking QA
Smart 3D™ (Freehand 3D)
RIMT
AutoEF
iWorks™ (Auto Workflow Protocol)
iNeedle™ (Needle Visualization)
iVocal
McAfee
DVR Module
iLive
Smart Face
VA grid
DICOM
Clinical Measurement Package
Mobile Trolley
ECG module
Internal WiFi
Ultrasound gel
U-Bank (2 batteries or 4 batteries)
Barcode reader
Footswitch
External DVD R/W drive
Dust-proof cover
Multilingual controls overlay

Language Support

Software: Chinese, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Icelandic, Italian, Lithuanian, Norwegian, Polish, Portuguese, Russian, Serbian, Spanish, Swedish, Turkish

Control panel overlay
User manual



Physical Specifications

Dimension and Weight

Width: 364±5 mm
Depth: 322±5 mm
Height: 44±3 mm
Weight: About 3.0 kg (without battery)
About 3.5 kg (with battery)

Monitor

15.6-inch high resolution color LED monitor
Resolution: 1920 × 1080
Automatic brightness adjustment
Screen Saver
Open angle adjustable: 0 – 180°
View angle (right/left): ≥ 170°

Handle

Probe port
1 port connect to a transducer

Electrical Power

AC adapter Input:
- Voltage: 100 – 240V AC
- Frequency: 50/60 Hz
- Power input: 2.0 – 1.0A
Battery: Lithium-Ion Battery Pack
14.4V, 6600mAh (single battery)

Operating Environment

Ambient temperature: 0 – 40 °C
Relative humidity: 20% – 85% (no condensation)
Atmospheric pressure: 700hPa – 1060hPa

Storage & Transportation Environment

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

User Interface

Control Panel

Power/Battery Indicator

Performance Specifications

User Interface (continued)

Function Keys
Ergonomic Soft Key Operation
Backlit keys, ensuring accurate work in the dark room
Programmable keys, available for user-defined functions
Trackball, speed adjustment
Key Brightness adjustment
Integrated speakers, audio volume adjustment

Touchscreen

12.3-inch high sensitivity anti-glare color touchscreen
Resolution: 1920x720
Digital brightness and contrast adjustment through preset
Viewing angle: ≥170 degrees
Support touch screen gestures
Support either hand writing or with gloves on

System Boot-Up

SSD: Boot-up from complete shut-down in about 22 sec (without McAfee)
Boot-up from standby mode in about 5 sec
Shut down in about 13 sec

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

Body Mark

More than 232 bodymarks for versatile application

Screen information* (presettable)

Common info:
- Mindray logo
- Hospital name
- Exam date
- Exam time
- Acoustic power
- Mechanical index
- Tissue thermal index
- 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
- Dynamic Trackpad indices

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

Imaging Parameters

Overview

Digital beamformer
Up to 1032192 channels
64-beam forming

B-Mode

Frame rate (max): 610 f/s
A.Power: depend on probe
TGC: 8 sliders
Depth: 30 Levels
Gain: 0 – 100, 1/step
Steer: 5 Levels (available on linear transducers)

FOV: On/off
FOV Size: random adjustable
FOV Position: random adjustable
Image Quality: Pen/Gen/Res (depend on probe)

Persistence: 0 – 7, 1/step
Dyn Ra.: 30 – 350
Gray Map: 1 – 8, 1/step
Tint Map: off, 1 – 8, 1/step
ExFov: off, 1 – 2 (extended FOV available on convex and linear transducers)

iClear: Off, 1 – 7, 1/step
iBeam: Off, 1 – 3, 1/step
Line Density: L, M, H, UH
L/R Flip: On/off
U/D Flip: On/off
Rotation: 0, 90°, 180°, 270°
iTouch: On/off
iTouch: -12 – 12, 3db/step

LGC: 8 point
Dual Live: On/off
Auto Merge: On/off (available on linear transducers)

H Scale: On/off
Echo Boost: Off, 1, 2 (available on phased transducers)
Smooth: 0 – 6, 1/step

TSI (Tissue Specific Imaging): General, Muscle, Fluid, Fat
Zoom Value: 0.8 – 10
HDScope: Off, 1 – 3, 1/step
V1:1: On/off (available on linear transducers)

iNeedle:
- B/iNeedle (On/off)
- Needle Dir.: Auto, Left, Right

THI and PSH

Available on all types of transducer
Patent PSH™ technology, obtains purer harmonic, better contrast resolution, higher SNR, exceptional high frequency harmonic
iClear™ available
Image quality: depends on transducers

M-mode

A.Power: Depend on probe
Gain: 0 – 100, 1/step
Depth: Same as B
Speed: 25mm/s, 35mm/s, 50mm/s, 65mm/s, 100mm/s, 200mm/s
Dynamic Range: 30 – 180, 5/step
Gray Map: 1 – 8, 1/step
Tint Map: Off, 1 – 8, 1/step
Display format: V2:3, V3:2, H2:3, V3:1, FULL
M Soften: 0 – 4, 1/step
Edge Enhance: 0 – 3, 1/step
Color M-mode available (convex and phased probe only)

Free Xros M™

Speed: 25mm/s, 35mm/s, 50mm/s, 65mm/s, 100mm/s, 200mm/s
Tint Map: Off, 1 – 8, 1/step
Display Format: V2:3, V3:2, H2:3, V3:1
Color Free Xros M available
Gra Map: 1 – 8, 1/step
Display: Cur./All; show A/B/C On/off

Free Xros CM

Only available on TDI
Speed: 25mm/s, 35mm/s, 50mm/s, 65mm/s, 100mm/s, 200mm/s
Tint Map: Off, 1 – 8, 1/step
Display Format: V2:3, V3:2, H2:3, V3:1
Gray Map: 1 – 8, 1/step
Angle: Adjustable

Color Doppler Imaging

Frame rate (max): 260 f/s
PRF: 0.1 kHz – 14.3 kHz
Velocity: 1.0 cm/s – 148.9 cm
HR Flow™: High Resolution Flow provides better image quality and flow sensitivity

A.power: same as B
Gain: 0 – 100, 2/step
Baseline: -8 – 8, 1/step
Scale: 30 levels

Quick Steer (available on linear transducers)
Steer (available on linear transducers)

ROI size/position: Adjustable
ROI Center Depth: Adjustable
Img Quality: 3 levels
Persistence: 0 – 6, 1/step
Smooth: 0 – 6, 1/step
Color Map: V0 – V10; VV0 – VV9
Flow State: L, M, H
Priority: 0% – 100%, 1%/step

WF: 8 Levels
Line Density: L, M, H, UH
Dual Live: On/off
Invert: On/off
Auto Invert: On/off (available on linear transducers)

B/C Align: On/off
Velocity tag: On/off

Performance Specifications

Imaging Parameters (continued)

Packet Size:	0 – 3, 1/step
iTouch:	On/off
Smart Track:	On/off

Power Doppler Imaging

PRF:	0.1 kHz – 14.3 kHz
HR Flow™:	High Resolution Flow provides better image quality and sensitivity

A.power:	same as B
Gain:	0 – 100, 2/step

Steer (available on linear transducers)

Scale:	30 steps
ROI size/position:	Adjustable
ROI Center Depth:	Adjustable
Img Quality:	Power/3 levels; HRFlow/1 level
Persistence:	0 – 6, 1/step
Smooth:	0 – 6, 1/step
Dynamic Range:	10 – 70, 5/step
Flow State:	L, M, H
Color Map:	P0 – P3; dP0 – dP3
Priority:	0% – 100%, 1/step
WF:	8 levels
Line Density:	L, M, H, UH
Dual Live:	On/off
Invert:	On/off
B/C Align:	Same as Color
Packet Size:	0 – 3, 1/step
iTouch:	On/off
Smart Track:	On/off
Auto Invert:	On/off

PW/CW-Mode

PW velocity:	11 cm/s – 770.0 cm/s
CW velocity:	5 cm/s – 3850.0 cm/s
PW PRF:	0.7 kHz – 20 kHz
CW PRF:	0.3 kHz – 100 kHz
A.Power:	Same as B
Gain:	0 – 100, 2/step
Baseline:	9 levels
Steer (available on linear transducers)	
Scale:	30 levels
Audio:	0% – 100%, 2%/step
Angle:	-89 – 89, 1/step
SVD:	random adjustable
Img Quality:	3 levels
Speed:	25mm/s, 35mm/s, 50mm/s, 65mm/s, 100mm/s, 200mm/s
SV:	0.5 – 30mm (PW only)
SV position:	Random adjustable
Dynamic range:	24 – 72, 2/step
Gray map:	1 – 10, 1/step
Tint Map:	Off, 1 – 8, 1/step
Display format:	V2:3, V3:2, H2:3, V3:1, FULL
Invert:	On/off
Auto Invert:	On/off (available on linear transducers)
WF (depend on probe)	
Quick Angle:	-60°, 0°, 60°

Duplex/Triplex:	On/off
HPRF:	On/off
iTouch:	On/off
T/F Res:	0 – 6, 1/step
Auto Calculate:	On/off
Auto Calc Cycle:	1 – 5, 1/step
Trace Sensitivity:	0 – 5, 1/step
Auto Calc Parameter	
Trace Smooth:	off, 1 – 4, 1/step
Trace Area:	Above, Below, All
Auto Calc Loop	

Tissue Velocity/Energy Imaging

Available on phased array transducer	
Max frame rate:	937.0 f/s
PRF:	0.4 kHz – 14.3 kHz
Velocity:	5 cm/s – 144.7 cm/s
A.Power:	Same as B
Gain:	0 – 100, 2/step
Baseline:	-8 – 8, 1/step (TVI only)
Scale:	30 levels
Img Quality:	2 levels
Persistence:	0 – 6, 1/step
Smooth:	0 – 6, 1/step
Dyn Ra.:	10 – 70, 5/step (TEI only)
Tissue State:	L, M, H
Color Map:	TVI: TVV1 – TVV10
TEI: P0 – P3, dP0 – dP3	
Priority:	0 – 100, 1%/step
WF:	8 levels
Line Density:	L, M, H, UH
Dual live:	On/off
Invert:	On/off
B/C Align:	On/off
Velocity tag:	On/off (TVI only)
Packet size:	0 – 3, 1/step

Tissue Velocity Doppler

Available on phased array transducer	
Scale:	30 levels
Velocity:	7.01 cm/s – 616.0 cm/s
PRF:	0.7 kHz – 20 kHz
A.power:	Same as B
Gain:	0 – 100, 2/step
Baseline:	9 levels
Audio:	0 – 100%, 2%/step
Angle:	-89 – 89, 1/step
SVD:	random adjustable
Img Quality:	2 levels
Speed:	25mm/s, 35mm/s, 50mm/s, 65mm/s, 100mm/s, 200mm/s
SV size:	same as PW
Dyn Ra.:	24 – 72, 2/step
Gray Map:	1 – 10, 1/step
Tint map:	Off, 1 – 8, 1/step
Display Format:	V2:3, V3:2, H2:3, V3:1, FULL
Invert:	On/off
WF:	10 levels
Quick Angle:	-60°, 0°, 60°
Duplex/triplex:	Same as PW

T/F Res:	0 – 6, 1/step
iTouch:	On/off

Tissue Velocity Motion

A.power:	Same as B
Smooth:	0 – 6, 1/step
Velocity tag:	On/off
Persistence:	0 – 6, 1/step
Img Quality:	2 levels
Tissue State:	L, M, H
Speed:	25mm/s, 35mm/s, 50mm/s, 65mm/s, 100mm/s, 200mm/s
Display format:	V2:3, V3:2, H2:3, V3:1, FULL
Color Map:	TVV1 – TVV10
Packet Size:	0 – 3, 1/step
Priority:	0% – 100%, 1%/step
WF:	8 levels

iScape™ View

Panoramic imaging	
Available on all transducers	
Acquisition method:	B mode, Power mode and Color mode
Imaging length:	292.80 cm
Tint map:	off; 8 types
Rotation:	0° – 355°

Elastography

Available Probes:	
- L12-3RCs	
- L14-6Ns	
- L20-5s	
- V11-3s	
- L13-3s	
Support strain ratio measurement	
Unique shell analysis function	
Stress compensation technology reduces deeper tissue artifacts, obtains more uniform stress throughout whole field	
Stress indicator:	Supports frame by frame stress indication
Opacity:	0 – 5, 1/step
Map:	E1 – E6
Smooth:	0 – 5, 1/step
ROI:	Random adjustable
ROI Center Depth:	Random adjustable
Invert:	On/off
Depth:	linear: 1.5 – 5cm
Display Format:	V1:1, H1:1, FULL
Strain Scale:	0 – 5, 1/step
Map Position:	0% – 100%, 5%/step
Dyn Ra.:	0 – 5, 1/step
Strain Mode:	0 – 1, 1/step
E Sensitivity:	0 – 5, 1/step
Image Quality:	Three levels of fundamental frequency, three levels of harmonic frequency

Performance Specifications

Imaging Parameters (continued)

UWN+ Contrast Imaging™*

Ultra Wideband Non-linear Plus contrast imaging technology, which provides exceptional contrast agent detecting capability, not only extracts second harmonic, but also non-linear fundamental signals

Micro Flow Enhancement (MFE) available

Available Probe:

- SC5-1Ns

A.Power:	Same as B
TGC:	Same as B
Depth:	Same as B
Gain:	0 – 100, 1/step
Persistence:	0 – 7, 1/step
Dyn Ra.:	Same as B
Gray Map:	1 – 8, 1/step
Tint Map:	Off, 1 – 8, 1/step
FOV:	On/off
FOV Size:	Random adjustable
FOV Position:	Random adjustable
ExFov:	Off, 1 – 2, 1/step
iClear:	Off, 1 – 7, 1/step
Line Density:	L, M, H, UH
L/R Flip:	On/off
U/D Flip:	On/off
Rotation Counter-Clockwise:	Same as B
Dual Live:	On/off
iTouch:	On/off
iTouch:	-8 – 8, 2db/levels
Image Quality:	3 levels
Mix:	
- Dual Live on:	Contrast/C&T
- Dual Live off:	Contrast/C&T/Tissue
Mix Map:	0 – 6, 1/step
Timer1:	On/off
Timer2:	On/off
Destruct:	On/off
Destruct Time:	500 – 2000, 75/step
Destruct Power:	-30 – 0, 0.3/step
MFE:	On/off
MFE Period:	0.1s, 0.2s, 0.4s, 0.6s, 0.8s, 1.0s, MAX
Retro Capture:	On/off
Pro Capture:	On/off
Smooth:	0 – 6, 1/step
CEUSPos:	On/off

* The system is designed for compatibility with commercially available ultrasound contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is cleared for use. Contrast related product features are enabled only on systems for delivery to an authorized country or region of use. Mindray medical systems makes no claims concerning the safety or effectiveness of contrast agents.

Stress Echo

Available on cardiac sector transducers

14 factory protocols

User-defined protocols

ECG triggered acquisition, display, selection, comparison, evaluation and archiving of multiple cardiac loops during various stages of a stress echo examination

ASE16 (with score 4-7), ASE 17 (with score 4-7)

Customized stages: Up to 7 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, LVO

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

LVO

Available Probe: P4-2s

Dedicated left ventricle contrast imaging tool

iBeam™

Spatial compound imaging

3 angles maximum

Available on convex and linear transducers

iTouch™

Auto image optimization

B-mode: Gain, TGC

Color: Gain

Power: Gain

PW: Gain, scale, PRF, WF

Contrast imaging: Gain, TGC

Echo Boost™

Only for cardiac exams

Improve the homogeneity of cardiac images through the whole field of view

Better contrast resolution of myocardium tissue layers

Better noise control in cardiac chambers and muscles

B steer

Only for linear transducers

ExFov

Extended field of view

Available for all convex and linear transducers

Zoom

Zoom: Spot zoom (write zoom) up to 10x, Pan zoom (read zoom) 0.8x – 10x

iZoom: Convertible 3 steps ;normal image, zoom standard area, zoom only image area

QSave

Quick save image parameter setting after image adjustment done

Support Save, Create, Restore

Tissue Tracking QA

Available on P4-2s

Tissue tracking quantitative analysis

Mandatory ECG connection before TT QA cine acquisition

Six views for analysis: ALAX, A4C, A2C, PSAXB, PSAXM, PSAXAP

Reload: Reload cine again for new study

Edit: Modify trace points

Start tracking

Accept & compute: Start tracking myocardium movement when user accept trace result

Display effect: 0/1; at 0, tracking in velocity vector arrow; at 1, tracking in dots

Trace method: 3 point or manual for ALAX, A4C, A2C; manual for PSAXB, PSAXM, PSAXAP

Bull's Eye: Trace result in bull's eye model

Torsion: Torsion rate curve display

LGC: available

Valve's open and close time index: MVC, MVC', AVC, AVO, MVO

Data export: Export data in CSV file

Cycle: ECG triggered cardiac cycle Recognition for analysis

Auto play: Stop, X1/10, X1/5, X1/4, X1/3, X1/2, X1, X2, X3

Thickness: 1 – 30mm, 1mm/step; adjust Trace thickness

Track point: 20 – 40, 1/step

Parameter: Volume, Speed, Displace., L Strain, L Strain R, T Strain, T Strain R, Area, R Strain, R Strain R, C Strain, C Strain R, Rotation, Rot. R

Smooth: 0 – 4, 1/step

Smart 3D™

Acquisition Method: Rocked, Linear

VR/MPR: Set parameters for volume rendered image or MPR plane

Performance Specifications

Imaging Parameters (continued)

Ref. Image:	Switch VR or A/B/C plane
Display formats:	Quad, Dual, Single, MPR only, A4:1
VOI:	On/off
Reset:	All, orientation, reset curve
VR orientation:	0°, 90°, 180°, 270° for quick rotation
Inversion:	Inversion, gray
Accept VOI:	On/off
Flip:	Flip VR
Sync:	Synchronize VR with selected plane
Render modes:	Surface, Min, Max, X-ray
View direction:	Down/up, left/right, front/back
Threshold:	0% – 100%, 1%/step (only on VR)
Opacity:	0% – 100%, 5%/step (only on VR)
Smooth:	0 – 10, 1/ step
Tint:	Off; 8 types
Brightness:	0% – 100%, 2%/step
Contrast:	0% – 100%, 2%/step
Tool:	Auto rotation
- Rotation control:	Play, single loop, loop
- Direction:	Left/right, up/down
- Position:	Set Start/Set end
Edit	
- Eraser:	Soft eraser/ hard eraser, Polygon, Contour, Rect, line
- Eraser Diameter:	8 – 80, 1/step
- Undo:	Undo, Undo all

4D

Available on volume transducers	
Static 3D and real time 4D Acquisition preparation:	
4D frame rate: max. 80 vps	
Render modes:	Surface, Min, Max, X-ray, iLive
Reset VOI	
Flip VOI	
ContrastVR:	0%-100%
Depth VR:	Off, Black, Cyan, Blue, Rose
Smooth:	0-10
QSave	
Zoom	
iZoom	
3D Print Quality:	Low, Mid, High
Generate Mesh	
File Format:	.stl, .obj, .ply, .3mf, .off
Save mesh to USB	
Threshold:	0%-100%
Smooth:	0-10
X Axis	
Y Axis	
Z Axis	
TGC	
Smart Face	
Recognize fetal face automatically and then display the face in a recommended viewing angle	
Face+	

iNeedle™

Needle visualization enhancement
Best angle indicator
Available on linear and curved transducers

AutoEF

Adjust Frame
Diastole FR
Systole FR
Volume curve: On/off
Adjustment for the border of endocardium

Smart track

Continuously track the flow and detect the best color box position and angle in real time scanning.
The Linear probes in carotid, Upper Ext A, Upper Ext V, Lower Ext A, Lower Ext V, EM Vascular exam modes support the Smart Track function.

RIMT (RF-Data based IMT)

Available in single/dual B carotid exam mode
Side: Left/right
Calculation of 6 RIMT values, RIMT average value, SD and ROI W
Report operation:
- Data deleting
- RIMT trend graphic viewing
- Preview

Cine Review and Raw Data Processing

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 25492 frames or 263.3 s (depend on the mode)
Retrospective storage (online setting available, 1 – 120 s, or 1 – 120 cycles, presettable) and prospective storage (1 – 480 s, or 1 – 390 cycles, 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

Raw Data Processing

B-mode:
- TGC
- Gain
- Dynamic range
- Gray map
- Tint map
- iClear
- L/R Flip
- U/D Flip

- Rotation
- LGC
- Dual Live
- Auto Merge
- H Scale
- Echo Boost
- Smooth
- Zoom Value
M-mode:
- Gain
- Speed
- Dynamic Range
- Gray Map
- Tint Map
- Display format
- Edge Enhance

Color:

- Gain
- Baseline
- Smooth
- Color map
- Dual Live
- Invert
- Priority
- Velocity tag

PW:

- Gain
- Baseline
- Audio
- Angle
- Speed
- Dynamic range
- Gray map
- Tint Map
- Display format
- Invert
- WF
- Quick Angle
- T/F Res

Measurement/Analysis and Report*

Generic Measurements

B-Mode

Distance
Ellipse
Trace
Spline
Cross
Angle (2L)
Angle (3P)
Double Dist
Trace Len
Trace Len (Spline)
Parallel
Distance P-L
IMT
B-Profile

Performance Specifications

Measurement/Analysis and Report* (continued)

B-Hist (Ellipse)
 B-Hist (Trace)
 B-Hist (Spline)
 B-Hist (Rectangle)
 Depth
 Color Vel
 Strain Hist
 Elas. Hist
 Color Vel Profile
 Elas.
 Strain
 Smart Trace
 Volume
 Volume (Ellipse)
 Volume (E+Dist.)
 Ratio (D)
 Volume
 Volume
 Volume (Ellipse)
 Volume (E+Dist.)
 Ratio (A)
 Area1
 Area2
 Directional Ratio
 D1
 D2
 RAC
 Sag
 XS
 Volume Flow
 Vas Area
 TAMEAN
 TAMAX
 Elas. Ratio
 A
 B
 Strain Ratio
 A
 B
M-Mode
 HR
 HR (R-R)
 Slope
 Distance
 Time
 Velocity
D-Mode
 PS/ED
 Vel
 HR
 HR (R-R)
 Time
 Acceleration
 D Trace
 Ratio (Vel)
 Ratio (VTI)

Volume Flow
 Vas Area
 TAMEAN
 TAMAX

AutoCalc

PS
 ED
 MD
 PPG
 TAMAX
 Vol Flow(TAMAX)
 TAMEAN
 Vol Flow(TAMEAN)
 DT
 MPG
 MPPG
 VTI
 AT
 S/D
 D/S
 PI
 RI
 PV
 HR

Report

Specific report template by application
 Editable value in report
 Images selectable
 Anatomy information
 User-defined report template
 Selecting report modules
 Adding/removing measurement items from the report
 Changing report layout
 Load/save comment
 Viewing history reports
 Preview and printing reports
 Able to Export as PDF file
 Set the calculation method for the final value in batch

Smart OB™

Auto measurement for OB, a special tool for easy OB scan, and greatly reduce time and increase productivity
 Support BPD, HC, OFD, FL, AC
 Measurement result can be modified by user

Smart NT

NT auto measurement
 Auto detection of NT inside ROI

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

Exam Storage and Management

Exam Storage

SSD:
 - 128 GB, more than 45.6 GB internal hard drive reserved for patient data storage

- Capable of storage up to approximately 173242 single frames (FRM format)

Storage area:

- Pre-settable: image area, standard area, full-screen
 - Image area: 1430×810
 - Standard area: 1920×920
 - Full-screen: 1920×1080

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/MP4 format (CIN: system format)
 Support backup/send to USB devices, DVD-RW media

iWorks™

Auto workflow protocol
 Templates are user configurable
 Functions: Pause, stop, replace, repeat, skip, insert single step, return and continue, steps in thumbnail
 iWorks setup mode: B/Dual/B+Color/B+PW/B+Color+PW/B+CW/B+Color+CW/B+M
 iWorks setup annotation: Support up to 2 annotations, location and font size are configurable
 iWorks setup bodymark: Select existing library, and probe indicator is pre-settable
 iWorks setup measurement: Select existing measurement library
 Template import and export are available

Connectivity

Ethernet Network Connection

Cable connection
 Wireless connection: Internal WIFI (including EAP Network)

DICOM 3.0

DICOM Basic
 - Verify (SCU, SCP)
 - Print
 - Store
 - Storage Commitment
 - Media Exchange
 DICOM Worklist
 DICOM Query/Retrieve
 DICOM Modality Performed Procedure Step - MPPS

Performance Specifications

Connectivity (continued)

DICOM OB/GYN structure report
DICOM Cardiac structure report
DICOM Vascular structure report
DICOM Breast structure report
DICOM Abdomen SR

iStorage

Direct network storage tool between ultrasound system and personal computer

MedSight

An interactive app that lets you transfer clinical images straight from Mindray Ultrasound system to a smart device, such as mobile phone or tablet PC
Needs to be installed on mobile terminal
Transfer images or clips from system to mobile terminal through WiFi
Support both iOS (7.0 and above) and Android (4.0 and above) system

- For iOS powered smart device: DICOM is mandatory
- For Android powered smart device: DICOM not necessary

MedTouch

Connect Ultrasound machine to smart devices based on Android and iOS system, such as tablet PC or mobile phone. Remote control of Ultrasound machine and tutorial software iScanHelper study on smart devices

Support Android and iOS powered smart devices

- Android 4.0 and above
- iOS 7.0 and above
- DICOM not necessary

Net Storage

Support sending images or exams to the shared directory of your PC server

iStorage

Data transfer

Security

Anti-Virus: McAfee and Windows Defender VPN

Transducers

Curved array

C5-1s

Application: Fetal, Abdominal, Pediatric, Musculo-skeletal (Conventional), Thoracic/Pleural, Peripheral vessel, Urology
Bandwidth: 1.2 – 6.0 MHz
Depth: 4.0 – 40.0 cm
Number of Elements: 128
FOV (max): 61°
Extended FOV: 72°
Convex Radius: 60 mm
Physical Footprint: 76.7×28 mm

Footprint: 68×18 mm
B-mode Frequencies: 1.2 – 3.8, 1.7 – 5.2, 2.0 – 6.0 MHz
Harmonic Frequencies: 4.0, 5.0, 6.0 MHz
Color Frequencies: 2.0, 2.5, 3.0, 3.5 (HR Flow) MHz
PW Frequencies: 2.0, 2.5, 3.0 MHz
Biopsy Guide: NGB-022, available, multi-angle, reusable

V11-3s

Application: Fetal, Trans-rectal, Transvaginal, Urology
Bandwidth: 3.0 – 11.0 MHz
Depth: 1.5 – 28.0 cm
Number of Elements: 128
FOV (max): 140°
Extended FOV: 179°
Convex Radius: 11 mm
Physical Footprint: 24.85×21.8 mm
Footprint: 24×9 mm
B-mode Frequencies: 3.0 – 7.0, 4.0 – 9.0, 5.0 – 11.0 MHz
Harmonic Frequencies: 8.0, 9.0, 10.0 MHz
Color Frequencies: 4.4, 5.0, 5.0, 5.5 (HR Flow) MHz
PW Frequencies: 4.4, 5.0, 5.7 MHz
-Biopsy Guide: NGB-004, available, single angle, reusable; NGB-045, available, single angle, reusable

Linear array

L12-3RCs

Application: Abdominal, Pediatric, Small Organ (breast, thyroid, testes), Musculoskeletal (Conventional, Superficial), Thoracic/Pleural, Peripheral vessel
Bandwidth: 3.0 – 12.8 MHz
Depth: 1.5 – 35.0 cm
Number of Elements: 192
Field of View (max): 3.80 cm
Steered Angle: ±12°, ±6°, 0 (B steer); -30° – 30° (Color/PW steer)
Physical Footprint: 55.6×22 mm
Footprint: 43.5×8.2 mm
B-mode Frequencies: 3.0 – 8.3, 4.4 – 10.2, 5.6 – 12.8 MHz
Harmonic Frequencies: 8.0, 10.0, 12.0 MHz
Color Frequencies: 4.4, 5.0, 7.2, 7.2 (HR Flow) MHz
PW Frequencies: 4.2, 5.0, 7.2 MHz
Biopsy Guide: NGB-043 available, multi-angle, reusable; NGB-044 available, multi-depth, reusable

L15-3RCs

Application: Abdominal, Pediatric, Small Organ (Small organ-breast, thyroid, testes), Musculo-skeletal (Conventional), Musculo-skeletal (Superficial), Thoracic/Pleural (For detection

of fluid and pleural motion/sliding.), Peripheral vessel
Bandwidth: 3.0 – 15.0 MHz
Depth: 1.5 – 35.0 cm
Number of Elements: 192
Field of View (max): 3.82 cm
Steered Angle: ±12°, ±6°, 0 (B steer); -30° – 30° (Color/PW steer)
Physical Footprint: 61 mm×24.4 mm
Footprint: 43.35 mm×8.05 mm
B-mode Frequencies: 3.0~9.0, 5.0~12.0, 8.0~15.0 MHz
Harmonic Frequencies: 10.0, 11.0, 12.0 MHz
Color Frequencies: 5, 6.2, 7.3, 7.3 (HR Flow) MHz
PW Frequencies: 5, 6.2, 7.3 MHz

L24-6RCs

Application: Pediatric, Small organ (breast, thyroid, testes), Musculo-skeletal (Conventional), Musculo-skeletal (Superficial), Peripheral vessel
Bandwidth: 6.0 – 24.0 MHz
Depth: 0.5 – 7.0 cm
Number of Elements: 192
Field of View (max): 2.87 cm
Steered Angle: ±12°, ±6°, 0 (B steer); -20° – 20° (Color steer); -30° – 30° (PW steer)
Physical Footprint: 50 mm×24 mm
Footprint: 32.4 mm×6.4 mm
B-mode Frequencies: 6.0~13.0, 9.0~16.6, 12.5~24.0 MHz
Harmonic Frequencies: 14.0, 16.0, 18.0 MHz
Color Frequencies: 9.0, 11.0, 13.0 MHz
PW Frequencies: 8.3, 10.0, 12.5 MHz
Biopsy Guide: Not available

L14-6Ns

Application: Abdominal, Pediatric, Small Organ (breast, thyroid, testes), Musculo-skeletal (Conventional, Superficial), Thoracic/Pleural, Peripheral vessel
Bandwidth: 3.5 – 16 MHz
Depth: 1.5 – 35.0 cm
Number of Elements: 192
Field of View (max): 3.80 cm
Steered Angle: ±12°, ±6°, 0 (B steer); -30° – 30° (Color/PW steer)
Physical Footprint: 47.5×10.9 mm
Footprint: 44.2×8.5 mm
B-mode Frequencies: 3.5 – 9.3, 5.4 – 11.2, 6.6 – 16 MHz
Harmonic Frequencies: 10.0, 11.0, 12.0 MHz
Color Frequencies: 5.0, 6.2, 7.3, 8 (HR Flow) MHz
PW Frequencies: 5.0, 6.2, 7.3 MHz
Biopsy Guide: NGB-007, available, multi-angle, reusable

Performance Specifications

Transducers (continued)

L20-5s

Application:	Abdominal, Pediatric, Small Organ (breast, thyroid, testes), Musculo-skeletal (Conventional, Superficial), Thoracic/Pleural, Peripheral vessel
Bandwidth:	6.0 – 23.0 MHz
Depth:	1.5 – 35.0 cm
Number of Elements:	192
Field of View (max):	2.86 cm
Steered Angle:	±12°, ±6°, 0 (B steer); -30° – 30° (Color/PW steer)
Physical Footprint:	42.23×22.10 mm
Footprint:	31.5×4.5 mm
B-mode Frequencies:	6.0 – 13, 9.0 – 11.6, 12.5 – 23.0 MHz
Harmonic Frequencies:	14.0, 16.0, 18.0 MHz
Color Frequencies:	8.9, 11.4, 13.3, 13.0 (HR Flow) MHz
PW Frequencies:	8.9, 10.0, 13.3 MHz
Biopsy Guide:	Not available

L24-6Hs

Application:	Abdominal, Intraoperative (includes abdominal, thoracic, and vascular etc), Pediatric, Small organ (breast, thyroid, testes), Musculo-skeletal (Conventional), Musculo-skeletal (Superficial), Peripheral vessel
Bandwidth:	6.0 – 24.0 MHz
Depth:	0.5 – 7.0 cm
Number of Elements:	192
Field of View (max):	2.87 cm
Steered Angle:	±12°, ±6°, 0 (B steer); -20° – 20° (Color steer); -30° – 30° (PW steer)
Physical Footprint:	37.7 mm×12.5 mm
Footprint:	32.4 mm×6.4 mm
B-mode Frequencies:	6.0~13.0, 9.0~16.6, 12.5~24.0 MHz
Harmonic Frequencies:	14.0, 16.0, 18.0 MHz
Color Frequencies:	9.0, 11.0, 13.0 MHz
PW Frequencies:	8.3, 10.0, 12.5 MHz
Biopsy Guide:	Not available

L13-3s

Application:	Ophthalmic, Abdominal, Pediatric, Small Organ (breast, thyroid, testes), Musculo-skeletal (Conventional, Superficial), Thoracic/Pleural, Peripheral vessel
Bandwidth:	3.2 – 12.3 MHz
Depth:	1.5 – 35.0 cm
Number of Elements:	128
Field of View (max):	3.79 cm
Steered Angle:	±12°, ±6°, 0 (B steer); -30° – 30° (Color/PW steer)
Physical Footprint:	61×24.4 mm

Footprint:	44.2×8.5 mm
B-mode Frequencies:	3.2 – 9.6, 5.4 – 11.0, 6.6 – 12.3 MHz
Harmonic Frequencies:	8.0, 9.4, 10.6 MHz
Color Frequencies:	4.0, 5.0, 6.2, 6.2 (HR Flow) MHz
PW Frequencies:	4.0, 5.0, 6.2 MHz
Biopsy Guide:	NGB-007, available, multiangle, reusable

Phased array

P4-2s

Application:	Abdominal, Pediatric, Neonatal Cephalic, Adult Cephalic, Thoracic/Pleural, Cardiac Adult, Cardiac Pediatric
Bandwidth:	1.5 – 4.5 MHz
Depth:	2.0 – 38.0 cm
Number of Elements:	64
Field of View (max):	90°
Physical Footprint:	25.2×20.6 mm
Footprint:	23.4×15.2 mm
B-mode Frequencies:	1.5 – 2.5, 2.5 – 3.5, 3.5 – 4.5 MHz
Harmonic Frequencies:	3.4, 3.8, 3.8, 4.2, 4.2 MHz
Color Frequencies:	2.0, 2.3, 2.5, 2.5 (HR Flow) MHz; TDI: 3.0, 3.8 MHz
PW Frequencies:	2.0, 2.3, 2.5 MHz; TDI: 2.5, 4.0 MHz
CW Frequency:	2.0 MHz
Biopsy Guide:	NGB-011, available, multi angle, reusable

Pencil

DE11-3s

Application:	Fetal, Trans-rectal, Trans-vaginal, Urology
Bandwidth:	3.0 – 12.0 MHz
Depth:	1.5 – 28.0 cm
Number of Elements:	128
FOV (max):	149°
Extended FOV:	40°
Convex Radius:	11 mm
Physical Footprint:	24.9 mm×21.8 mm

Peripheral Devices and Accessories

Black/White Analog Video Printer

MITSUBISHI P95DW-N

Black/white analog video printer

SONY UP-X898MD

Color Digital Video Printer

SONY UP-D25MD

Footswitch

USB port:	971-SWNOM (2-pedal/3-pedal)
USB port:	FS-81-SP (1-pedal)
Support User-definable functions (Freeze, Save, Print)	

Built-in DVR

Built-in digital video recorder, save space and is a useful tool for education and memory

Max storage length each time:	60 min
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Built-in Battery for Main Unit

Replaceable and rechargeable lithium battery
Empty battery recharged to full in 4h
Continuous work time: About 1.5 hour in B mode

Mobile Trolley

MT3

Power supply module	
Dimensions (W×D):	about 519 mm × 578 mm
Platform height:	887 – 1207 mm; adjustable
Weight:	
- Without retractable cable and probe extend module:	28.8 kg
- With retractable cable and without probe extend module:	32.5 kg
- Without retractable cable and with probe extend module:	30.9 kg
- With retractable cable and probe extend module:	34.6 kg
Probe holders	
Auxiliary output cable	
Probe extend module	
Cover grounding cable	

Barcode reader

1-D barcode reader:	SYMBOL LS2208
2-D barcode reader:	SYMBOL DS4308
JADAK HS-1M	
JADAK HS-1R (supporting RFID)	

U-Bank

U-Bank with 2 batteries Weight:	1.95 kg
U-Bank with 4 batteries Weight:	2.87 kg

Footswitch

USB port:	FS-81-SP-2(single pedal), 971-SWNOM (2/3-pedal)
Support User-definable functions (Freeze, Save, Print)	

ECG

6-pin, AHA, for 3-lead wires	
ECG wave display:	On/off
ECG source:	Lead/External
Position:	0 – 100%, 5%/step
Trig mode:	off/single/dual/timer
Gain:	0 – 30, 1/step
Sweep speed:	6 steps
Invert:	On/off

Built-in Wireless adapter

Encryption:	WPA, WPA2
Max transfer speed:	300Mbps
Protocols:	IEEE 802.11 ac/a/b/g/n
Frequency:	2.4G/5G

Performance Specifications

System Inputs and Outputs

I/O Port

USB 3.0:	4 ports
Ethernet:	1 port
HDMI:	1 port
S-Video:	1 port

ECG module

ECG port:	1
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Safety and Conformance

Quality Standards

ISO 9001
ISO 13485

Design standards

EN 60601-1 and IEC 60601-1
EN 60601-1-2 and IEC 60601-1-2
EN 60601-1-6 and IEC 60601-1-6
EN 60601-2-37 and IEC60601-2-37
EN 62304 and IEC 62304
EN 62366 and IEC 62366
EN ISO 17664 and ISO 17664

CE declaration

The 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. Mindray reserves the right to make changes in specifications and features shown herein, or discontinue the product at any time without notice or obligation. Contact Mindray Representative for the most current information.

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