MX7

Color Doppler Ultrasound System

Datasheet

Release V1.4.1

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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

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
- DVR Module
- 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

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MX7 Color Doppler Ultrasound System

Performance Specifications

User Interface

Control Panel

Power/Battery Indicator
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

Touch screen

12.3-inch high sensitivity anti-glare color touch screen
Resolution: 1920×720
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:	Sdjustable

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

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Performance Specifications

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
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

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Performance Specifications

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

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:

- C5-1s

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
CEUS Pos:	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

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Performance Specifications

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
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

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, presettable)

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
B-Hist (Ellipse)
B-Hist (Trace)
B-Hist (Spline)
B-Hist (Rectangle)

Performance Specifications

- 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
- MMPG
- 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:
- Presettable: 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 presettable
- 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

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

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

L20-5s

- Application: Ophthalmic, 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

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MX7 Color Doppler Ultrasound System

Performance Specifications

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

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

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

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

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

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Performance Specifications

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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